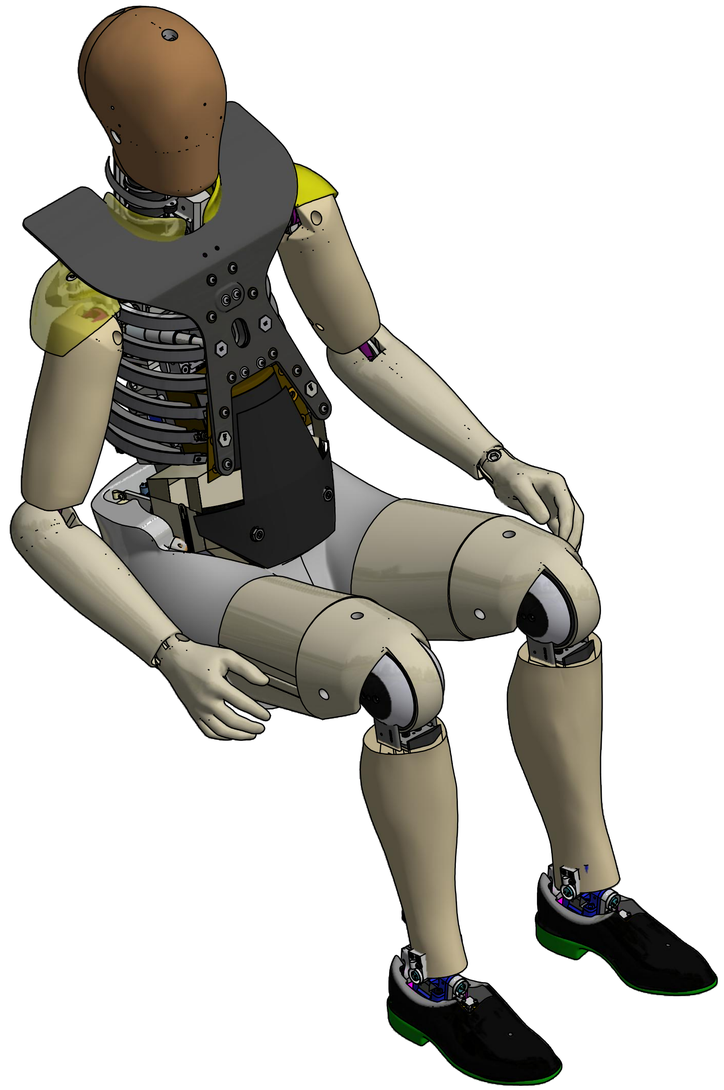
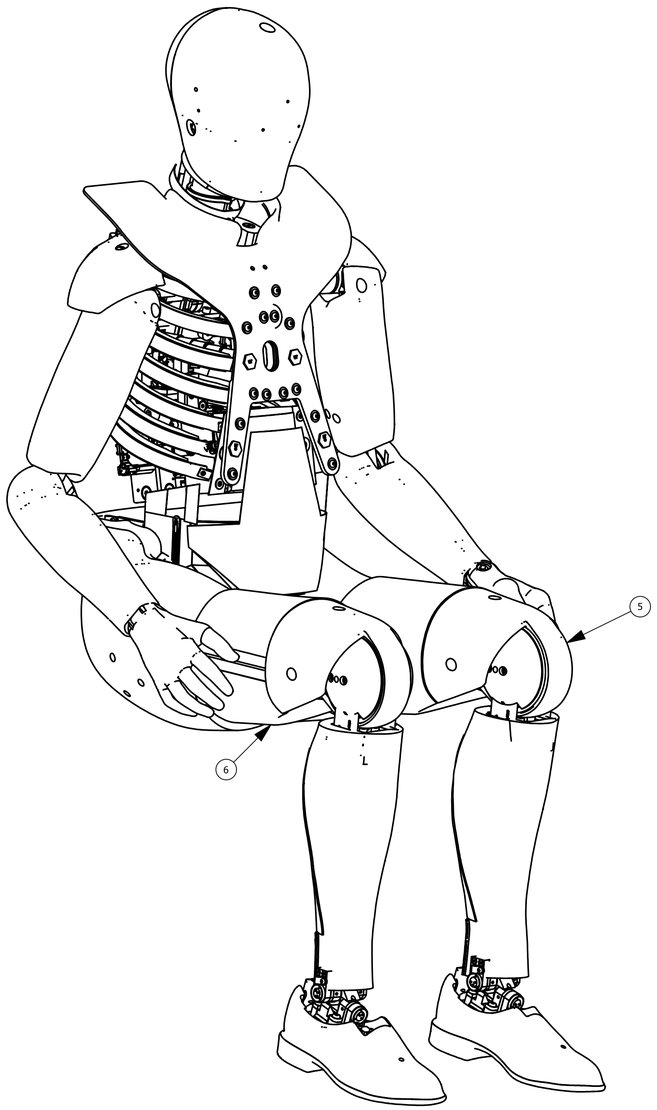
Parts List and Drawings
THOR-50M Advanced Frontal Crash Test Dummy
THOR-50M Male

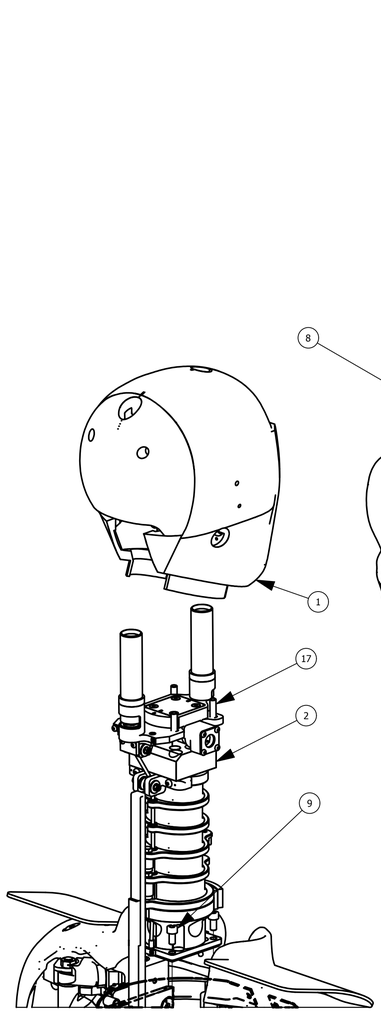


August 2018

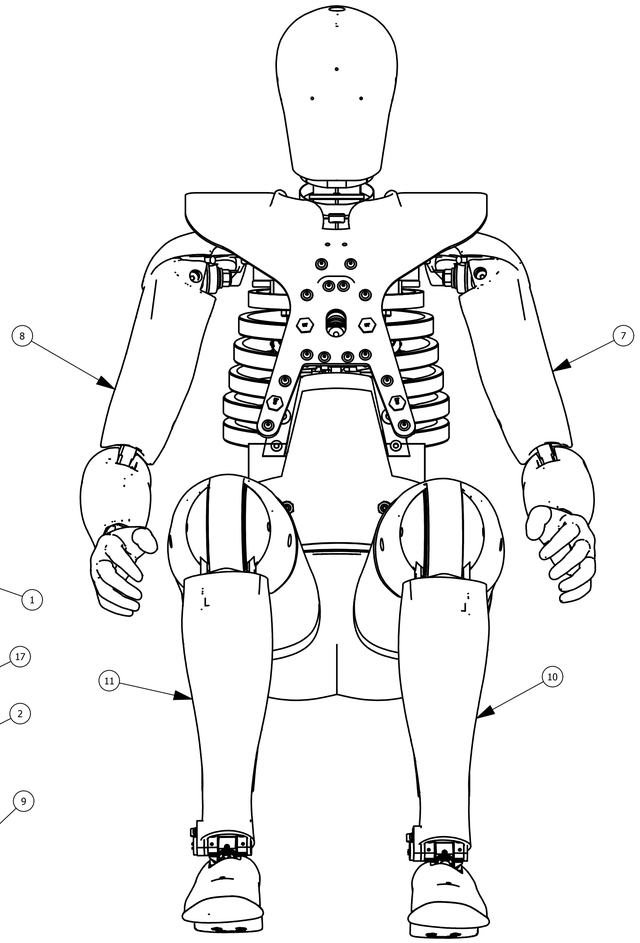
Prepared by:
OFFICE OF CRASHWORTHINESS STANDARDS
and
VEHICLE RESEARCH and TEST CENTER
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

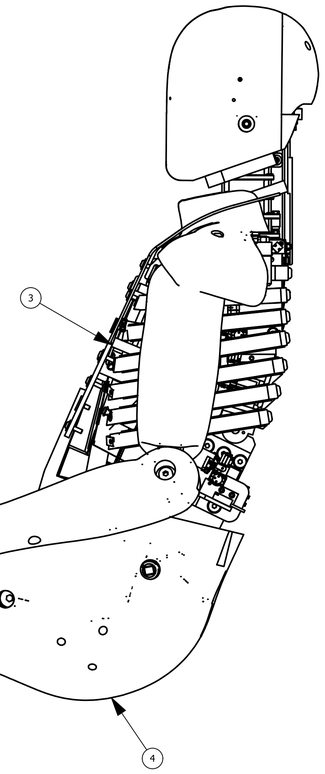
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	G	REVISED PARTS 472-7000-1 & 472-7000-2 REMOVED MOLDED FOOT AND ADDED MOLDED SHOE; SHEET 3 OF 3 - BALLOON #6 WAS #7; QTY. OF ITEM 14 - SA572-S129 AND ITEM 15 - SA572-S113 WAS 1; ADDED PART #SA572-S126 - Ø1.0 ACHILLES LOAD CELL AND PART #SA572-S114 - ROTARY POTENTIOMETER	10/19/2011	
	H	ADDED SHT. 4 OF 6 EXTERNAL DIMENSIONS ADDED SHT. 5 OF 6 PARTS GROUPING FOR WEIGHT & C.G. ADDED SHT. 6 OF 6 COMPLEX/IRREGULAR SHAPED PARTS ON SHT. 3 OF 6 SENSOR/LOAD CELL LOCATIONS * REMOVED SA572-S113 - TILT SENSOR, DUEL AXIS * ADDED ITEM #22 & 23 * QTY. OF ITEM #13 WAS 1 * QTY. OF ITEM #14 WAS 5 * ADDED TILT SENSOR TITLES AND ACCELEROMETER MOUNT TITLES * BALLOON #20 IN THE LOWER LEG WAS #21 * BALLOON #21 IN THE LOWER LEG AND HEAD WAS #22 * ADDED NOTE #1	9/19/2017	DW



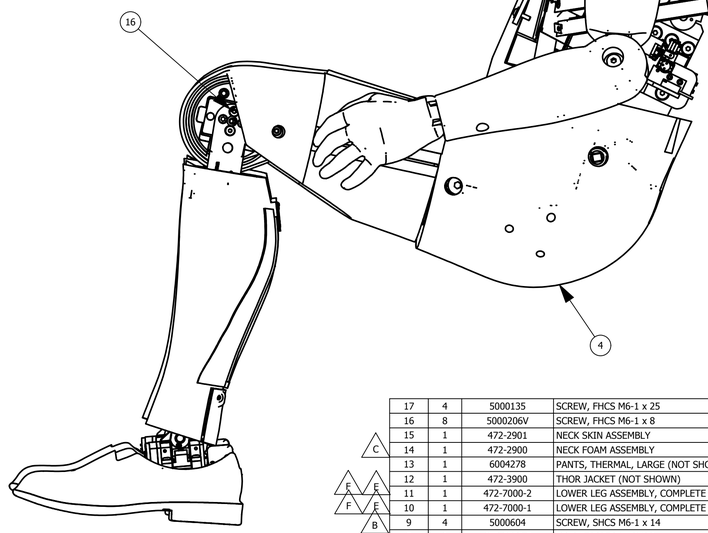


HEAD AND NECK ASSEMBLY
SCALE 1/3





KNEE COVER 472-5353
REMOVED FOR CLARITY



	ITEM	QTY	PART NUMBER	DESCRIPTION
	17	4	5000135	SCREW, FHCS M6-1 x 25
	16	8	5000206V	SCREW, FHCS M6-1 x 8
C	15	1	472-2901	NECK SKIN ASSEMBLY
	14	1	472-2900	NECK FOAM ASSEMBLY
	13	1	6004278	PANTS, THERMAL, LARGE (NOT SHOWN)
	12	1	472-3900	THOR JACKET (NOT SHOWN)
E	11	1	472-7000-2	LOWER LEG ASSEMBLY, COMPLETE - RIGHT
E	10	1	472-7000-1	LOWER LEG ASSEMBLY, COMPLETE - LEFT
B	9	4	5000604	SCREW, SHCS M6-1 x 14
	8	1	472-6000-2	RIGHT ARM ASSEMBLY
	7	1	472-6000-1	LEFT ARM ASSEMBLY
C	6	1	472-5100-2	RIGHT UPPER LEG ASSY.
	5	1	472-5100-1	LEFT UPPER LEG ASSY.
	4	1	472-4000	PELVIS ASSEMBLY
D	3	1	472-3000	THORAX MECHANICAL ASSEMBLY
	2	1	472-2000	MECHANICAL ASSEMBLY, NECK
D	1	1	472-1000	HEAD ASSEMBLY

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION

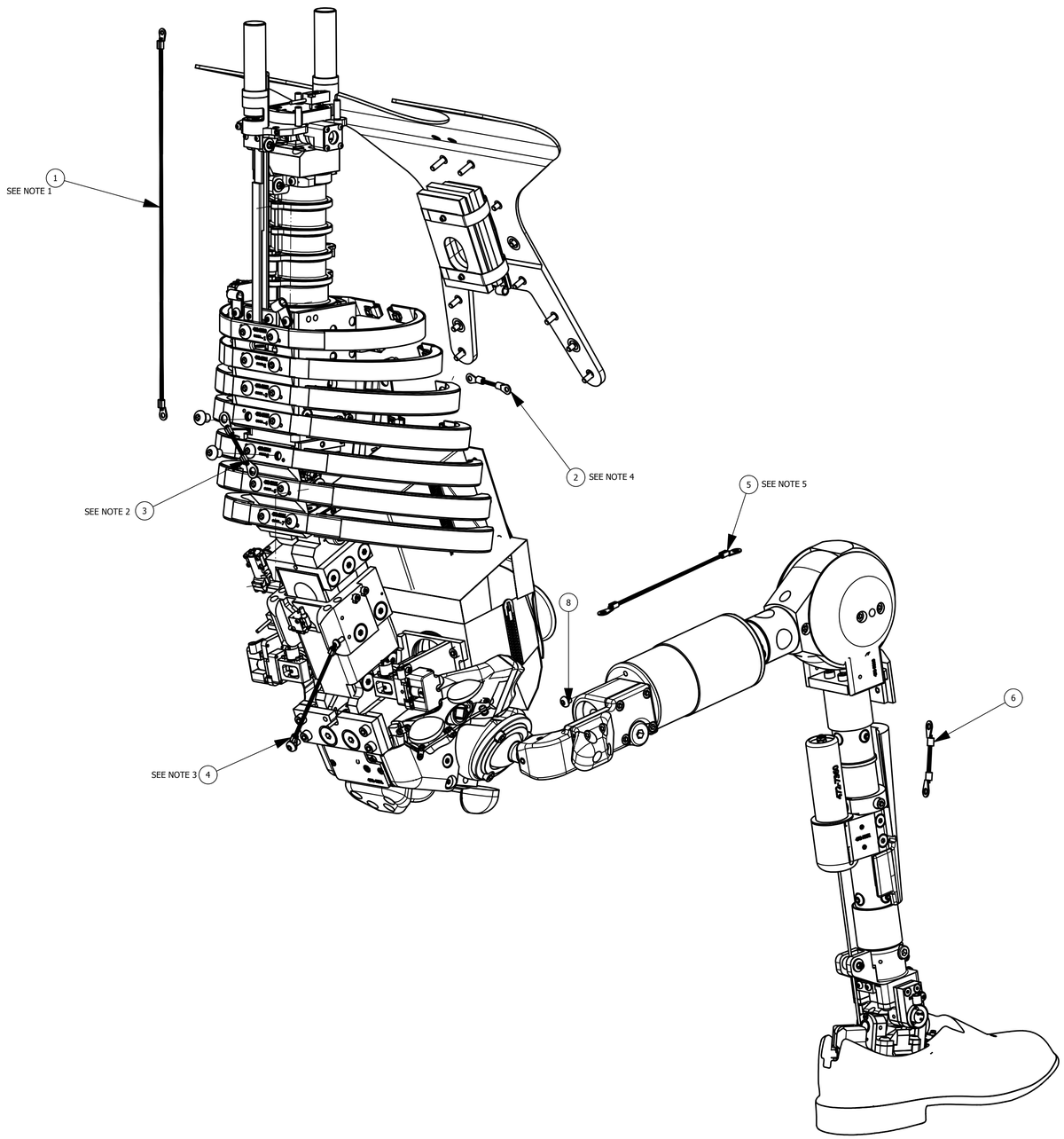
TOLERANCES
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS
SURFACE FINISH
X 2 ±0.5 63
XX ±0.2
XXX ±0.05
X.XXX ±0.01
REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	PROJECT NO:	DRAWN BY: D. WALKER	DATE: 12/8/2016
	MATERIAL:		
NEXT ASSEMBLY	HEAT TREAT:	CHECKED BY:	DATE:
TOTAL QTY IN DUMMY	FINISH:	PROJECT MGR: J. WANG	DATE: 3/1/2012

DESCRIPTION: MECHANICAL ASSEMBLY THOR-50M
SIZE: A1 | SHEET: 1 OF 6 | DRAWING NO.: 472-0000 | REV: H

472-0000.iam



NOTES:

1. 472-8700 ATTACHES TO THE SPINE AT THE UPPER THORACIC SPINE BACK PLATE AND TO THE NECK MOUNTING PLATFORM WITH THE HARDWARE PROVIDED.
2. 472-8702 ATTACHES TO RIB #4 AND RIB #5 USING THE EXISTING RIB MOUNTING HARDWARE.
3. 472-8703 ATTACHES TO THE THORACIC SPINE FLEX JOINT ADAPTOR PLATE AND THE LOWER ABDOMEN REAR ATTACHMENT PLATE USING THE M4 x 10 AND M6 x 10 SCREWS PROVIDED IN THE TOOL KIT.
4. 472-8701 ATTACHES TO THE MID-STERNUM ASSEMBLY AND RIB #4 USING THE EXISTING RIB MOUNTING HARDWARE AND CABLE CLAMP MOUNTING HARDWARE.
5. 472-8704 ATTACHES TO THE FEMUR LOAD CELL WHEN THE LOAD CELL IS INSTALLED.
6. 472-8706 ATTACHES TO THE DUMMY AT THE LOWER ABDOMEN REAR ATTACHMENT PLATE USING THE SAME M6 SCREW THAT ATTCHES 472-8703.

F

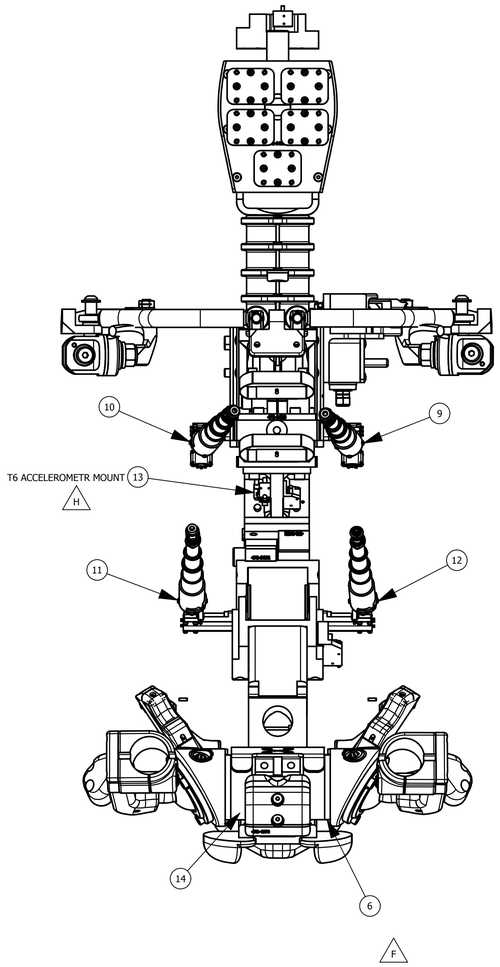
ITEM	QTY	PART NUMBER	DESCRIPTION
8	1	5000357V	SCREW, BHCS M6-1 x 6
7	1	472-8706	INSTRUMENT GROUND STRAP, MAIN GROUND (NOT SHOWN) SEE NOTE 6
6	2	472-8705	INSTRUMENT GROUND STRAP, TIBIA
5	2	472-8704	INSTRUMENT GROUND STRAP, FEMUR
4	1	472-8703	INSTRUMENT GROUND STRAP, LUMBAR SPINE
3	1	472-8702	INSTRUMENT GROUND STRAP, THORACIC SPINE
2	1	472-8701	INSTRUMENT GROUND STRAP, MID STERNUM
1	1	472-8700	INSTRUMENT GROUND STRAP, HEAD/NECK

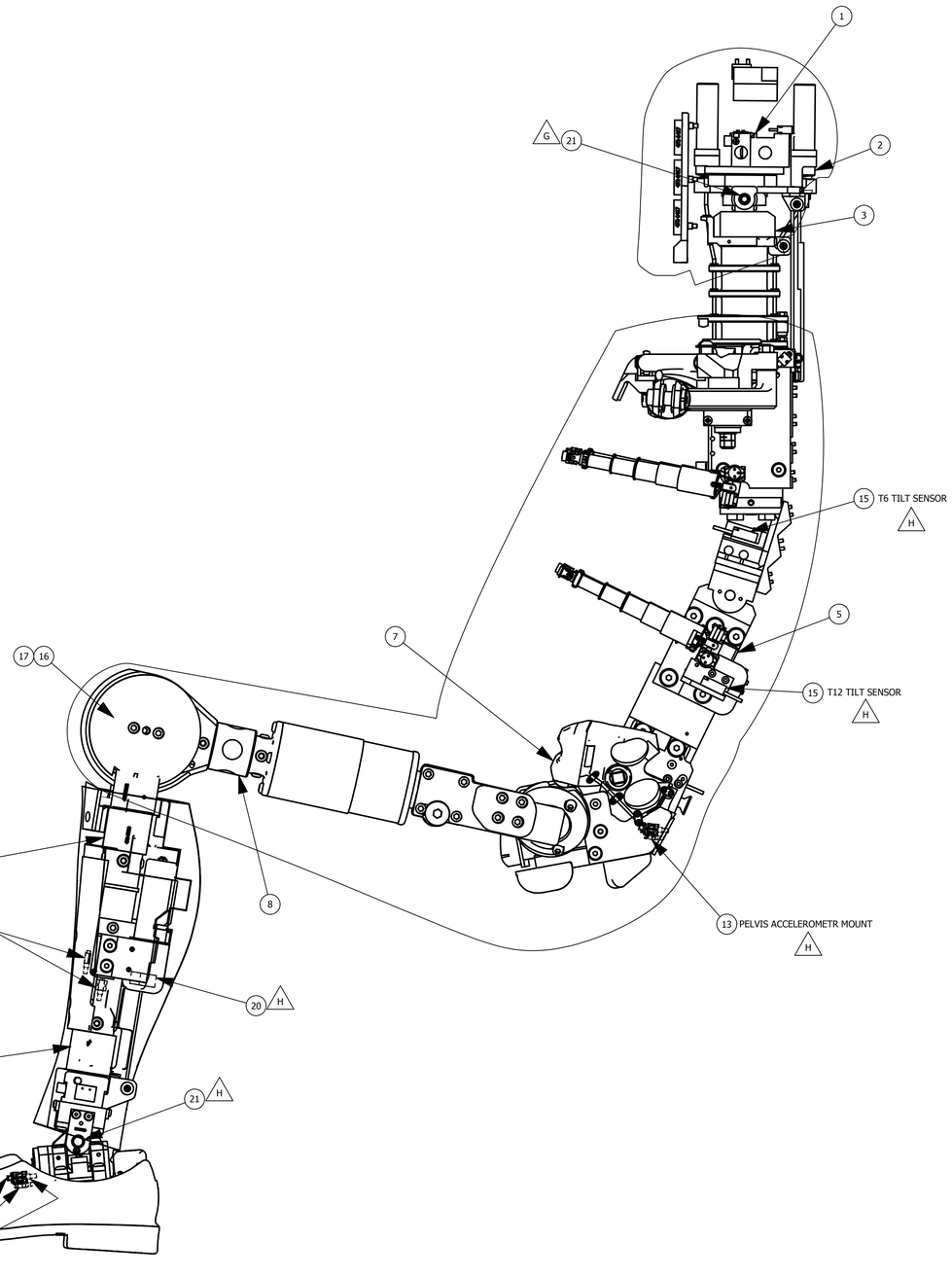
TOLERANCES:
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ±1.0, X.X ±0.2, X.XX ±0.1, X.XXX ±0.05
ANGLES ±1.0°
FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

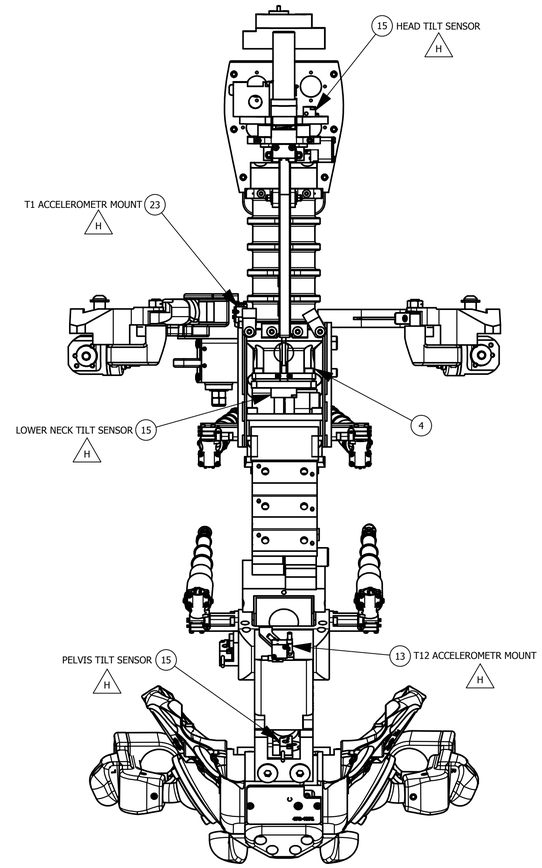
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DRAWN BY: B. KIMES	DATE: 10/19/2011	DESCRIPTION: GROUND STRAP LOCATIONS THOR-50M
ENGINEER: J.WANG	DATE: 4/2/2012	SIZE: A1 SHEET: 2 OF 6 SCALE: 1/4 DRAWING NO.: 472-0000 REV: H

472-0000_GND-STRAPS.iam







NOTES

H 1. FOR LOWER ABDOMEN INSTRUMENTATION REFERENCE DRAWING 472-4700.

	ITEM	QTY	PART NUMBER	DESCRIPTION
	23	1	472-3857	T1 ACCEL. MOUNT ASSEMBLY
G	22	10	SA572-S4	UNIAXIAL PIEZORESISTIVE ACCELEROMETER
	21	7	SA572-S114	ROTARY POTENTIOMERTER
	20	2	SA572-S126	Ø1.0" ACHILLES LOAD CELL
	19	2	SA572-S33	FIVE CHANNEL LOWER TIBIA LOAD CELL
	18	2	SA572-S32	FIVE CHANNEL UPPER TIBIA LOAD CELL
	17	1	SA572-S90-R	STRING POT, MINI (RIGHT)
	16	1	SA572-S90-L	STRING POT, MINI (LEFT)
G	15	5	SA572-S44	TILT SENSOR, DUAL AXIS
	14	1	SA572-S129	ACETABULUM LOAD CELL ASS'Y., RIGHT
G	13	3	472-4203	TRI PACK ACCEL. ASSY
	12	1	472-3580	IRTRACC ASSY, LOWER LEFT
	11	1	472-3570	IRTRACC ASSY, LOWER RIGHT
	10	1	472-3560	IRTRACC ASSY, UPPER RIGHT
	9	1	472-3550	IRTRACC ASSY, UPPER LEFT
	8	2	SA572-S120	FEMUR LOAD CELL
	7	2	SA572-S119	A.S.I.S. LOAD CELL
	6	1	SA572-S128	ACETABULUM LOAD CELL ASS'Y. (LEFT)
	5	1	SA572-S127	THORACIC SPINE LOAD CELL
	4	1	SA572-S111	LOWER NECK LOAD CELL
	3	1	SA572-S110	UPPER NECK LOAD CELL
	2	2	SA572-S112	Ø.850" SKULL SPRING LOAD CELL
	1	1	472-1200	ACCEL. MOUNTING PLATE, HEAD

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5°
.XX ± 0.1
.XXX ± 0.01

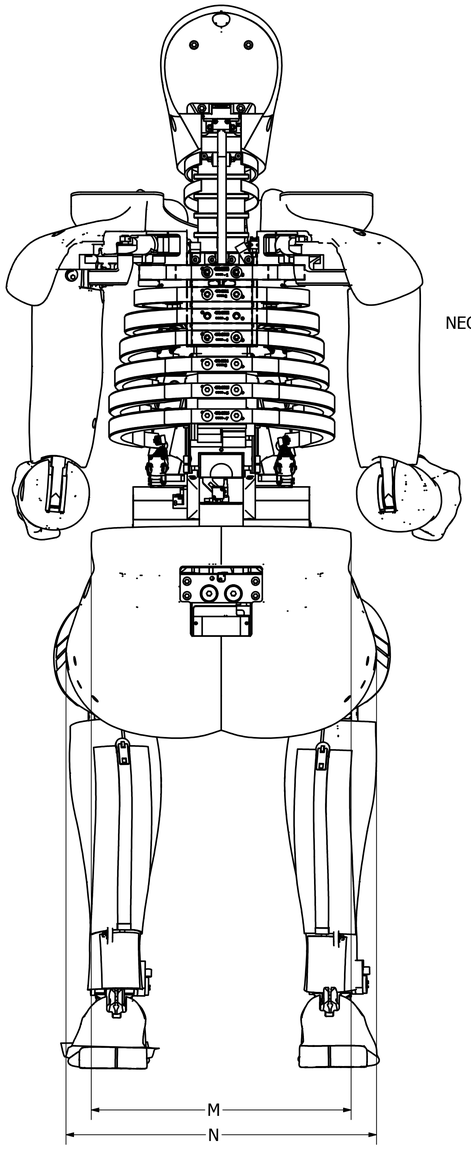
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DRAWN BY: Dave Walker DATE:
PROVED BY: DATE:
ENGINEER: J. WANG DATE: 4/2/2012

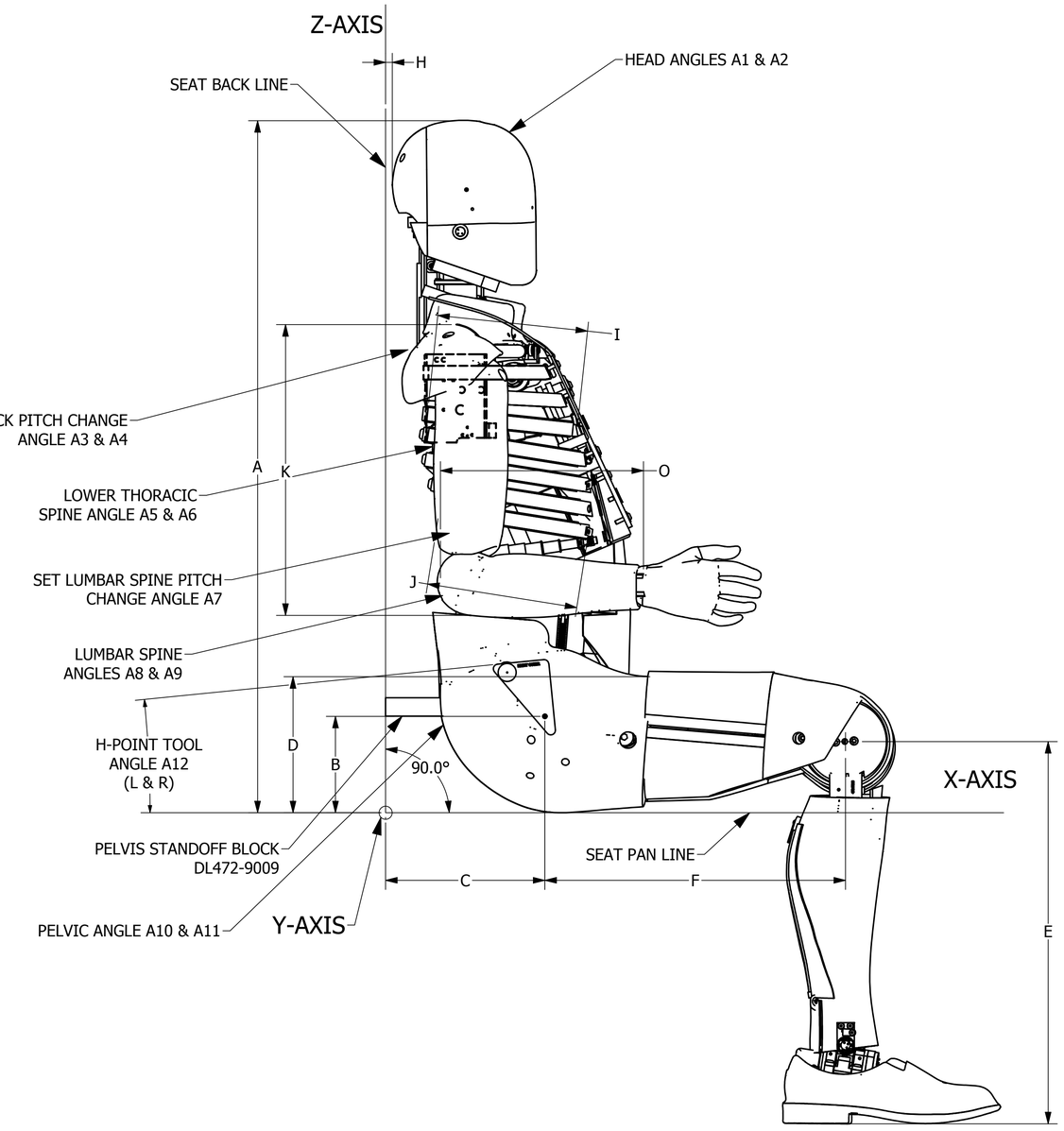
DESCRIPTION: SENSOR/LOAD CELL LOCATIONS THOR-50M

SIZE A1 SHEET 3 OF 6 DRAWING NO. 472-0000 REV. H
SCALE NTS

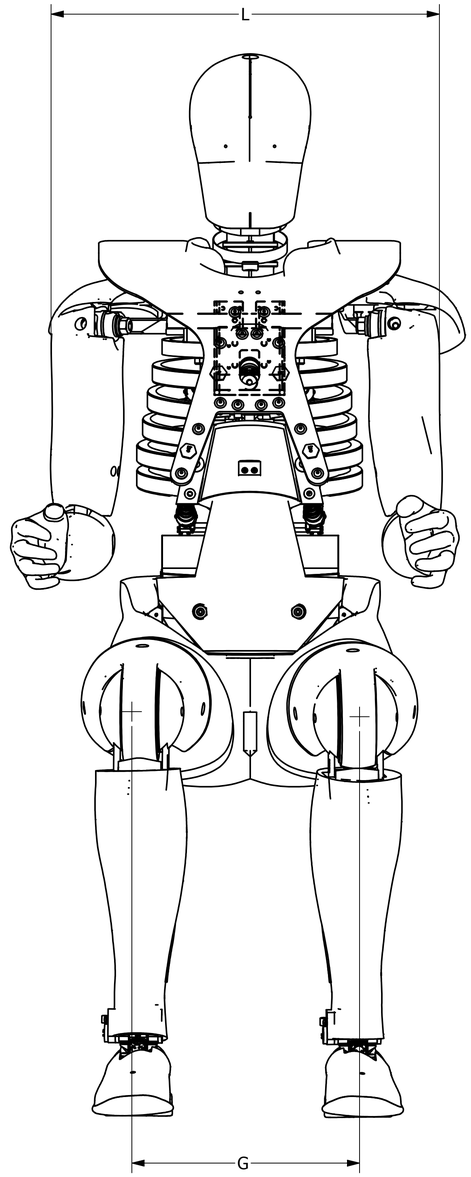
472-0000_sensors ARS.iam



BACK VIEW



SIDE VIEW



FRONT VIEW

ANGULAR MEASUREMENTS					
SYM.	DESCRIPTION			SPEC.	TOL. +/-
A1	Head Angle about X-Axis	Setup	(Head Tilt Sensor)	0°	2°
A2	Head Angle about Y-Axis	Setup	(Head Tilt Sensor)	-4°	2°
A3	Neck Pitch Change Angle About X-Axis		(T1 Tilt Sensor)	0°	2°
A4	Neck Pitch Change Angle About Y-Axis		(T1 Tilt Sensor)	-8°	2°
A5	Lower Thoracic Spine Angle about X-Axis		(T6 Tilt Sensor)	0°	2°
A6	Lower Thoracic Spine Angle about Y-Axis		(T6 Tilt Sensor)	10°	2°
A7	Lumbar Spine Pitch Change Setting (ERECT)			-9º	SET
A8	Lumbar Spine Angle about X-Axis		(T12 Tilt Sensor)	0°	2°
A9	Lumbar Spine Angle about Y-Axis		(T12 Tilt Sensor)	5°	2°
A10	Pelvic Angle about X-Axis	Setup	(Pelvic Tilt Sensor)	0°	2°
A11	Pelvic Angle about Y-Axis	Setup	(Pelvic Tilt Sensor)	0°	2°
A12	H-Point Tool Angle			0°	2°

LINEAR MEASUREMENTS				
SYM.	DESCRIPTION		SPEC. MM	TOL. MM +/-
A	Sitting Height		942	10
B	Hip Pivot Height	Setup	114	5
C	Hip Pivot Seat Back	Setup	217	5
D	Thigh Clearance		165	5
E	Knee Pivot to Bottom of Foot		525	5
F	Knee Pivot to Hip Pivot		423	5
G	Knee Centerline to Knee Centerline		252	5
H	Head Back to Seat Back Line		76	SET
I	Rib #3 Depth		224	5
J	Rib #7 Depth		220	5
K	Shoulder to Elbow Length		393	5
L	Breadth Across Arms		471	9
M	Min. Waist Breadth		336	5
N	Max. Hip Breadth		403	5
O	Back of Elbow to Wrist Pivot		292	5

NOTES:
1. SEE EXTERNAL DIMENSIONS SECTION OF THE PROCEDURES FOR ASSEMBLY, DISASSEMBLY, AND INSPECTION (PADI) MANUAL FOR DUMMY SETUP PROCEDURES.

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION
TOLERANCES
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X.x ±0.2 ±0.5
X.XX ±0.1
X.XXX ±0.05
REMOVE BURRS & BREAK SHARP EDGES
DRAWN: D. WALKER 12/8/2016
CHECKED BY: DATE:
ENGINEER: DATE:
PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:
NEXT ASSEMBLY
QTY
TOTAL QTY IN DUMMY
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
DESCRIPTION: EXTERNAL DIMENSIONS THOR-50M
SIZE: A1 SHEET 1 OF 6
DRAWING NO.: 472-0000
REV: H

472-0000_External Dim.iam

PARTS GROUPING FOR WEIGHTS AND C.G.

HEAD 472-1115		
DESCRIPTION	PART NUMBER	QTY
SKULL ASSEMBLY	472-1100	1
CONFOR FOAM, FACE	472-1401	1
ACCELEROMETER MOUNTING PLATE ASSEMBLY, HEAD	472-1200	1
HEAD CAP	472-1110	1
SCREW, SHCS M6x1 x 16	5000081	4
SCREW, PHILLIPS NYLON M3 X .5 X 6	5001116	2
SKIN ASSEMBLY	472-1320	1
CAP SKIN	472-1310	1

NECK 472-2115		
DESCRIPTION	PART NUMBER	QTY
CABLE ASSEMBLY, NECK	472-2100	1
CABLE SEAT COVER, NECK	472-2015	2
NECK PULLEY BRACKET ASSEMBLY	472-2300	1
OCCIPITAL CONDYLE SCREW	472-2016	1
MOUNTING PLATFORM ASSEMBLY, NECK	472-2200	1
OCCIPITAL CONDYLE PIN, NECK	472-2011	1
NECK PULLEY PLATE	472-2012	1
ROTARY POTENTIOMETER WASHER, NECK	472-2021	1
ROTARY POTENTIOMETER CLAMP, NECK	472-2020	2
ROTARY POTENTIOMETER COVER, NECK	472-2014	1
OCCIPITAL CONDYLE CAM, NECK	472-2019	1
ROTARY POTENTIOMETER HOUSING, NECK	472-2013	1
UPPER NECK LOAD CELL STRUCTURAL REPLACEMENT	472-2700	1
LOWER NECK LOAD CELL STRUCTURAL REPLACEMENT	472-2600	1
SCREW, FHCS M2x0.4 x 6	5000469	4
M6 HI-COLLAR LOCK WASHER S.S.	5001110	8
SCREW, SHCS M6-1 x 14 mm	5000604	8
NUT, HEX JAM M5	5000380V	4
M4 X 0.7 X 20 LG. BHCS	5000007	2
M3 X 0.5 X 5 LG. BHCS	5000674	2
SCREW, SHCS M4x0.7 x 6	5000076	1
M2 X 0.4 X 6 LG. SHCS	5000082	4
M3 X 0.5 X 8 LG. BHCS	5000410	3
M3 X 0.5 X 30 LG. BHCS SS	5000749	2
M3 X 0.5 X 3 LG. SSS CONE PT.	5001112	1
LOWER NECK LOAD CELL BUMPER	472-2002	1
LOWER NECK LOAD CELL BUMPER COVER	472-2001	1
M5 X 0.8 X 12 LG. BHCS	5000654	2
UPPER NECK LOAD CELL	SA572-S110	1
LOWER NECK LOAD CELL	SA572-S111	1

THORAX 472-3015		
DESCRIPTION	PART NUMBER	QTY
SPINE MECHANICAL ASSEMBLY	472-3600	1
THORAX ELLIPTICAL RIB #1 - ASSEMBLY	472-3310	1
THORAX ELLIPTICAL RIB #2 - ASSEMBLY	472-3320	1
THORAX ELLIPTICAL RIB #3 - ASSEMBLY	472-3330	1
THORAX ELLIPTICAL RIB #4 - ASSEMBLY	472-3340	1
THORAX ELLIPTICAL RIB #5 - ASSEMBLY	472-3350	1
THORAX ELLIPTICAL RIB #6 - ASSEMBLY	472-3360	1
THORAX ELLIPTICAL RIB #7 - ASSEMBLY	472-3370	1
THORAX ELLIPTICAL RIB STIFFENER #1	472-3510	1
THORAX ELLIPTICAL RIB STIFFENER #2	472-3511	1
THORAX ELLIPTICAL RIB STIFFENER #3	472-3512	1
THORAX ELLIPTICAL RIB STIFFENER #4	472-3513	1
THORAX ELLIPTICAL RIB STIFFENER #5	472-3514	1
THORAX ELLIPTICAL RIB STIFFENER #6	472-3515	1
THORAX ELLIPTICAL RIB STIFFENER #7	472-3516	1
M8 X 1.25 X 10 LG. BHCS	5000454	14
THORAX BIB ASSEMBLY	472-3400	1
M5 X 0.8 X 22 LG. BHCS	5000571	2
M5 X 0.8 X 12 LG. BHCS	5000654	2
M5 X 0.8 X 20 LG. BHCS	5000210	6
IRTRACC CONNECTING BOLT, LOWER THORAX	472-3520	2
1/4 COATED CABLE CLAMP	9003723	2
M5 X 0.8 X 6 LG. BHCS	5000214	2
UPPER ABDOMEN ASSEMBLY	472-4600	1
SCREW, FHCS M8-1.25 x 25	5000117	2
IRTRACC ASSEMBLY, UPPER LEFT	472-3550	1
IRTRACC ASSEMBLY, UPPER RIGHT	472-3560	1
IRTRACC ASSEMBLY, LOWER RIGHT	472-3570	1
IRTRACC ASSEMBLY, LOWER LEFT	472-3580	1
LOWER ABDOMEN MECHANICAL ASS'Y	472-4700	1
M4 X 0.7 X 8 LG. SHCS	5000989	4
SCREW, FHCS M10-1.5 x 25	5001127	2
CLIP NUT, M5 (MONADNOCK #130300-M5-1)	5000513	10
IRTRACC CONNECTING BOLT, UPPER THORAX	472-3518	2
M4 X 0.7 X 10 LG. SHCS	5000151	4
SHOULDER ASSEMBLY	472-3800	1
DUMMY LIFTING STRAP	472-3517	1
BRACKET, LIFTING STRAP	472-3115	1
SCREW, BHCS M5-0.8 x 10	5000003	2
WASHER, M5 x 15 x 1.2 S.S.	5001126	12

LOWER ABDOMEN 472-4715		
DESCRIPTION	PART NUMBER	QTY
INTERNAL MOUNTING WELD ASSEMBLY	472-4710	1
ATTACH BRACKET WELD ASS'Y. RIGHT	472-4720-2	1
ATTACH BRACKET WELD ASS'Y, LEFT	472-4720-1	1
3D IRTRACC ASS'Y, LEFT, THOR-50M ABDOMEN	472-4730-1	1
3D IRTRACC ASS'Y, RIGHT, THOR-50M ABDOMEN	472-4730-2	1
POTENTIOMETER COVER	472-4760	2
M3 X 0.5 X 12 LG. SHCS	5001103	12
M3 X 0.5 X 20 LG. SHCS	5000312	6
M6 X 1 X 20 LG. SHCS	5000001	4
3/16 CABLE CLAMP	6004191	2
M3 X 0.5 X 8 LG. SHCS	5000388	2
REAR ATTACHMENT PLATE	472-4761	1
LOWER ABDOMEN DISTRIBUTION PLATE	472-4762	2
LOWER ABDOMEN FRONT FOAM LAYER	472-4764	1
LOWER ABDOMEN REAR FOAM LAYER	472-4765	1
LOWER ABDOMEN BAG, SEWING ASSEMBLY	472-4763	1
SCREW, SHCS M6x1 x 16	5000081	4

UPPER ARM, LEFT AND RIGHT 472-6200		
DESCRIPTION	PART NUMBER	QTY
UPPER HUMERUS ASSEMBLY	472-6200	1

LOWER ARM, LEFT AND RIGHT 472-6515		
DESCRIPTION	PART NUMBER	QTY
BUSHING, UPPER ARM AND ELBOW PIVOT	472-6590	1
WASHER-SHOULDER JOINT SPRING	472-6950	1
NUT - ELBOW PIVOT	472-6610	1
WASHER, 1.06 OD x .53 ID x .06 THK.	9001260	1
SCREW, SHSS M10 x 30	5000506	1
LOWER ARM MOLDED	472-6520	1
WASHER - UPPER ARM & ELBOW PIVOT	472-6600	1
LOWER WRIST ROTATION ASSY.	472-6700	1
M12 X 1.75 X 30 LG. SHCS	5000441	1
M10 X 25 LG. SHSS	5000492	1

HAND, LEFT 472-6900-1		
DESCRIPTION	PART NUMBER	QTY
HAND ASM MOLDED, LEFT	472-6900-1	1

HAND, RIGHT 472-6900-2		
DESCRIPTION	PART NUMBER	QTY
HAND ASM MOLDED, RIGHT	472-6900-2	1

PELVIS 472-4000		
DESCRIPTION	PART NUMBER	QTY
PELVIS ASSEMBLY	472-4000	1

UPPER LEG, LEFT 472-5115-1		
DESCRIPTION	PART NUMBER	QTY
LEFT UPPER LEG ASSY.	472-5100-1	1
INSTRUMENT GROUND STRAP, FEMUR	472-8704	1

UPPER LEG, RIGHT 472-5115-2		
DESCRIPTION	PART NUMBER	QTY
RIGHT UPPER LEG ASSY.	472-5100-2	1
INSTRUMENT GROUND STRAP, FEMUR	472-8704	1

LOWER LEG, LEFT 472-7015-1		
DESCRIPTION	PART NUMBER	QTY
LOWER LEG MECHANICAL ASSEMBLY	472-7300	1
BASE, TORQUE - ANKLE TOP	472-7580	1
STOP ASSEMBLY - DORSI	472-7530	1
BRACKET, ACHILLES PULLEY	472-7560	1
SCREW, FHCS M3 x 12	9010449	2
SHAFT, ACHILLES CABLE PULLEY	472-7561	1
NEEDLE ROLLER BEARING	9000509	2
ACHILLES WASHER	9000508	2
ANKLE BUSHING PLATE ASSEMBLY - FREE END	472-7540	1
ANKLE BUSHING PLATE ASSEMBLY - POT END	472-7582	1
RETAINER, POTENTIOMETER	472-7585	1
SCREW, FHCS M4X0.7 X 20	9010448	2
POTENTIOMETER	SA572-S114	1
POTENTIOMETER CLAMP	472-7581	1
SCREW, SHCS M2X0.4 X 6	9010560	6
CLAMP, NYLON LOOP	9005135	1
SCREW, SHCS M3 X 0.5 X 12	5000103	5
FLATWASHER, #4 TYPE B NARROW	9000510	2
NUT, NYLOCK M3X0.5	9010450	2
PULLEY, ACHILLES CABLE	472-7562	1
BOLT & SLEEVE ASSEMBLY, ANKLE	472-7563	1
SCREW, FHCS M4-0.7 x 12	9000873	2
STOP ASSEMBLY, PLANTAR	472-7527	1
KNEE CLEVIS WELDMENT	472-7200	1
SCREW, SHCS M6 x 1.0 X 16mm LONG	9000852	4
KNEE BUMPER, MOLDED	472-7110	1
SCREW, BHCS M5 x 10	9003042	2
LOWER LEG FLESH, LEFT	472-7370-1	1
TIBIA GUARD	472-7115	1
SCREW, BHCS M6x1.0 x 16	9010453	2
INSTRUMENT GROUND STRAP, TIBIA	472-8705	1

LOWER LEG, RIGHT 472-7015-2		
DESCRIPTION	PART NUMBER	QTY
LOWER LEG MECHANICAL ASSEMBLY	472-7300	1
BASE, TORQUE - ANKLE TOP	472-7580	1
STOP ASSEMBLY - DORSI	472-7530	1
BRACKET, ACHILLES PULLEY	472-7560	1
SCREW, FHCS M3 x 12	9010449	2
SHAFT, ACHILLES CABLE PULLEY	472-7561	1
NEEDLE ROLLER BEARING	9000509	2
ACHILLES WASHER	9000508	2
ANKLE BUSHING PLATE ASSEMBLY - FREE END	472-7540	1
ANKLE BUSHING PLATE ASSEMBLY - POT END	472-7582	1
RETAINER, POTENTIOMETER	472-7585	1
SCREW, FHCS M4X0.7 X 20	9010448	2
POTENTIOMETER	SA572-S114	1
POTENTIOMETER CLAMP	472-7581	1
SCREW, SHCS M2X0.4 X 6	9010560	6
CLAMP, NYLON LOOP	9005135	1
SCREW, BHCS M4 x 0.7 x 8	5000103	5
FLATWASHER, #4 TYPE B NARROW	9000510	2
NUT, NYLOCK M3X0.5	9010450	2
PULLEY, ACHILLES CABLE	472-7562	1
BOLT & SLEEVE ASSEMBLY, ANKLE	472-7563	1
SCREW, FHCS M4-0.7 x 12	9000873	2
STOP ASSEMBLY, PLANTAR	472-7527	1
KNEE CLEVIS WELDMENT	472-7200	1
SCREW, SHCS M6 x 1.0 X 16mm LONG	9000852	4
KNEE BUMPER, MOLDED	472-7110	1
SCREW, BHCS M5 x 10	9003042	2
LOWER LEG FLESH, RIGHT	472-7370-2	1
TIBIA GUARD	472-7115	1
SCREW, BHCS M6x1.0 x 16	9010453	2
INSTRUMENT GROUND STRAP, TIBIA	472-8705	1

MOLDED SHOE, LEFT 472-7815-1		
DESCRIPTION	PART NUMBER	QTY
MOLDED SHOE ASSY. - LEFT	472-7800-1	1
ANKLE CENTER BLOCK ASS'Y.	472-7510	1
RETAINING WASHER	472-7515	4
CAP, BASE TORQUE	472-7522	2
SCREW, BHCS M6 x 1 x 12	5000356	5
BASE, TORQUE - BOTTOM	472-7523	1
TORQUE CYLINDER	472-7524	8
ANKLE BUSHING PLATE ASSEMBLY - FREE END	472-7540	1
SCREW, SSFP, M3X0.5 X 3	9010109V	2
SCREW, FHCS M4-0.7 x 12	9000873	2
SCREW, FHCS M4X0.7 X 20	9010448	2
STOP ASSEMBLY - EVERSION	472-7533	1
STOP ASSEMBLY - INVERSION	472-7534	1
SCREW, BHCS M4 x 0.7 x 8	5000103	1
CLAMP, NYLON LOOP	9005135	1
ANKLE BUSHING PLATE ASSEMBLY - POT END	472-7582	1
RETAINER, POTENTIOMETER	472-7585	1
POTENTIOMETER	SA572-S114	1
POTENTIOMETER CLAMP	472-7581	1
SCREW, SHCS M2X0.4 X 6	9010560	6
SCREW, BHCS M3X0.5 X 8	5000410	4
SCREW, FHCS M3X0.5 X 16	9010446	2
SCREW, FHCS M6x1.0 X 16	9000826	4

MOLDED SHOE, RIGHT 472-7815-2		
DESCRIPTION	PART NUMBER	QTY
MOLDED SHOE ASS'Y. - RIGHT	472-7800-2	1
ANKLE CENTER BLOCK ASS'Y.	472-7510	1
RETAINING WASHER	472-7515	4
CAP, BASE TORQUE	472-7522	2
SCREW, BHCS M6 x 1 x 12	5000356	5
BASE, TORQUE - BOTTOM	472-7523	1
TORQUE CYLINDER	472-7524	8
ANKLE BUSHING PLATE ASSEMBLY - FREE END	472-7540	1
SCREW, SSFP, M3X0.5 X 3	9010109V	2
SCREW, FHCS M4-0.7 x 12	9000873	2
SCREW, FHCS M4X0.7 X 20	9010448	2
STOP ASSEMBLY - EVERSION	472-7533	1
STOP ASSEMBLY - INVERSION	472-7534	1
SCREW, BHCS M4 x 0.7 x 8	5000103	1
CLAMP, NYLON LOOP	9005135	1
ANKLE BUSHING PLATE ASSEMBLY - POT END	472-7582	1
RETAINER, POTENTIOMETER	472-7585	1
POTENTIOMETER	SA572-S114	1
POTENTIOMETER CLAMP	472-7581	1
SCREW, SHCS M2X0.4 X 6	9010560	6
SCREW, BHCS M3X0.5 X 8	5000410	4
SCREW, FHCS M3X0.5 X 16	9010446	2
SCREW, FHCS M6x1.0 X 16	9000826	4

ASSEMBLY WEIGHT			
SEGMENT	SPECIFIED WEIGHT		
	DRAWING REFERENCE	Kg.	TOL.
HEAD	472-1115	4.68	TBD
NECK	472-2115	2.37	TBD
THORAX	472-3015	21.95	TBD
LOWER ABDOMEN	472-4715	2.67	TBD
UPPER ARM, LEFT OR RIGHT	472-6200	1.7	TBD
LOWER ARM, LEFT OR RIGHT	472-6515	1.66	TBD
HAND, LEFT	472-6900-1	0.55	TBD
HAND, RIGHT	472-6900-2	0.55	TBD
PELVIS	472-4000	15.24	TBD
UPPER LEG, LEFT	472-5115-1	5.7	TBD
UPPER LEG, RIGHT	472-5115-2	5.7	TBD
LOWER LEG, LEFT	472-7015-1	3.39	TBD
LOWER LEG, RIGHT	472-7015-2	3.39	TBD
MOLDED SHOE, LEFT	472-7815-1	1.6	TBD
MOLDED SHOE, RIGHT	472-7815-2	1.6	TBD
TOTAL DUMMY WEIGHT		76.11	TBD

CENTER OF GRAVITY

DUMMY SEGMENT	DRAWING REFERENCE	C.G. DIR.	SPEC. mm	TOL. mm ±
HEAD	472-1115	X	5.6	TBD
		Y	0.0	TBD
		Z	57.4	TBD
NECK	472-2115	X	-0.3	TBD
		Y	0.0	TBD
		Z	-109.7	TBD
THORAX	472-3015	X	43.7	TBD
		Y	9.7	TBD
		Z	-64.5	TBD
LOWER ABDOMEN	472-4715	X	78.7	TBD
		Y	-0.8	TBD
		Z	-45.0	TBD
UPPER ARM, LEFT	472-6200	X	-1.5	TDB
		Y	2.0	TBD
		Z	125.0	TBD
UPPER ARM, RIGHT	472-6200	X	-1.5	TBD
		Y	-2.0	TBD
		Z	125.0	TBD
LOWER ARM, LEFT	472-6515	X	-5.1	TBD
		Y	0.3	TBD
		Z	93.2	TBD
LOWER ARM, RIGHT	472-6515	X	-5.1	TBD
		Y	-0.3	TBD
		Z	-93.2	TBD
HAND. LEFT	472-6900-1	X	2.0	TBD
		Y	1.5	TBD
		Z	57.2	TBD
HAND, RIGHT	472-6900-2	X	2.0	TBD
		Y	-1.5	TBD
		Z	57.2	TBD
PELVIS	472-4000	X	111.8	TBD
		Y	0.0	TBD
		Z	49.3	TBD
UPPER LEG, LEFT	472-5115-1	X	1.8	TBD
		Y	2.5	TBD
		Z	-124.5	TBD
UPPER LEG, RIGHT	472-5115-2	X	1.8	TBD
		Y	-2.5	TBD
		Z	-124.5	TBD
LOWER LEG, LEFT	472-7015-1	X	8.1	TBD
		Y	2.5	TBD
		Z	-199.4	TBD
LOWER LEG, RIGHT	47-7015-2	X	8.1	TBD
		Y	-2.5	TBD
		Z	-199.4	TBD
MOLDED SHOE, LEFT	472-7815-1	X	43.2	TBD
		Y	-2.5	TBD
		Z	53.3	TBD
MOLDED SHOE, RIGHT	472-7815-2	X	43.2	TBD
		Y	2.5	TBD
		Z	53.3	TBD

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS AND TOLERANCES ARE AS FOLLOWS:
X ±0.5 ANGLES ±1°
.XX ±0.2
.XXX ±0.1
.XXXX ±0.01

DRAWN: Dave Walker 10/26/2015
CHECKED BY: DATE:
ENGINEER: DATE:

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PARTS GROUPING FOR WEIGHT & C.G.
THOR-50M

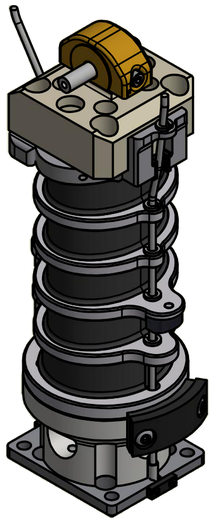
SIZE A1 | SHEET 5 OF 6 | DRAWING NO. 472-0000 | REV. H
SCALE NTS

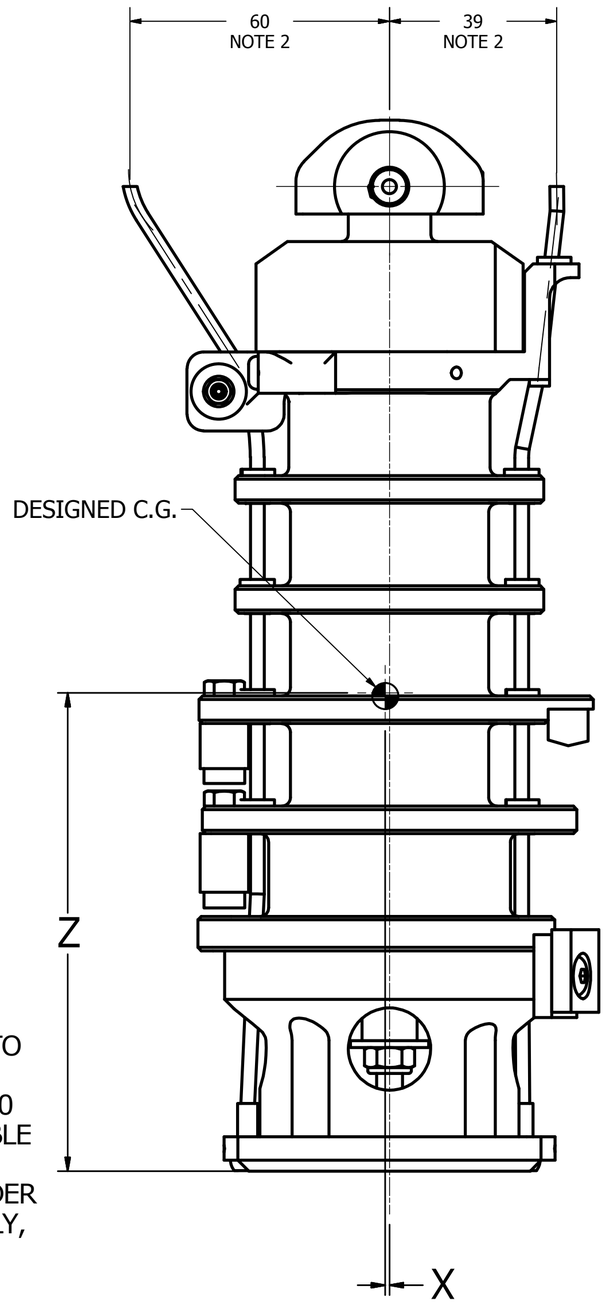
COMPLEX/IRREGULAR SHAPED PARTS	
Dwg./Part No.	Description
472-1111	HEAD, MACHINED
472-1110	HEAD CAP
472-1321	HEAD SKIN, MOLDED
472-1310	CAP SKIN
472-3895-1	SHOULDER COVER, LEFT
472-3895-2	SHOULDER COVER, RIGHT
472-4382-2	ILIAC WING RIGHT
472-4382-1	ILIAC WING, LEFT
472-4812-1	TROCHANTER, LEFT
472-4812-2	TROCHANTER, RIGHT
472-4100	PELVIS FLESH, MOLDED
472-5503-1	THIGH FLESH - LEFT
472-5502	KNEE FLESH LEFT/RIGHT
472-5503-2	THIGH FLESH - RIGHT
472-6270	UPPER ARM FLESH
472-6520	LOWER ARM MOLDED
472-6900-1	HAND ASM. MOLDED, LEFT
472-6900-2	HAND ASM. MOLDED, RIGHT
472-7802-1	SHOE UPPER - LEFT
471-7804-1	HEEL PAD MOLDED - LEFT
472-7803-1	BALL OF FOOT PAD MOLDED - LEFT
472-7801-1	SHOE SOLE - LEFT
472-7115	TIBIA GUARD
472-7802-2	SHOE UPPER - RIGHT
472-7803-2	BALL OF FOOT PAD MOLDED - RIGHT
472-7804-2	HEEL PAD MOLDED - RIGHT
472-7801-2	SHOE SOLE - RIGHT
472-7370-1	LOWER LEG FLESH, LEFT
472-7370-2	LOWER LEG FLESH, RIGHT

NOTES

1. THERE ARE NO ADDITIONAL DIMENSIONS BEYOND WHAT IS PROVIDED ON THE DRAWINGS, BUT THE 3D SHAPE CAN BE FOUND WITHIN THE PARAMETRIC CAD MODELS.
2. NOTE THAT THE CAD MODELS ARE FOR REFERENCE ONLY AND ARE NOT USED TO SPECIFY IRREGULAR SHAPES FOR QUALIFICATION PURPOSES.

		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS: X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01 ANGLES ± 0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
		PROJECT NO.:		DESCRIPTION: COMPLEX/IRREGULAR SHAPED PARTS THOR-50M
		MATERIAL:	DRAWN BY: D. WALKER DATE: 12/8/2016	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET 6 OF 6 DRAWING NO.: 472-0000 REV: H
TOTAL QTY IN DUMMY		FINISH:	ENGINEER: DATE:	SCALE:





NOTES:

1. ALL OF THE PARTS AND ASSEMBLIES LISTED ARE TO BE INCLUDED IN THE WEIGHT AND CG LOCATION DETERMINATION; REFERENCE DRAWINGS 472-2000 MECHANICAL ASSEMBLY, NECK AND 472-2100 CABLE ASSEMBLY, NECK; FOR LOCATIONS.
2. FRONT AND REAR CABLES USED ARE THE REMAINDER OF THE CABLES; 472-2130 - REAR CABLE ASSEMBLY, NECK, AND 472-2150 - FRONT CABLE ASSEMBLY, NECK; AFTER MODIFICATION AS STATED ON DRAWING 472-1115 - HEAD C.G. PART GROUPING FOR BALLAST WEIGHT DESIGN.
3. REFER TO DRAWING 472-0000 SHT. 5 OF 5 FOR C.G. AND WEIGHT SPECIFICATION.
4. THE C.G. ORIGIN IS THE BOTTOM CENTER OF THE LOWER NECK LOAD CELL STRUCTURAL REPLACEMENT AND THE COORDINATE SYSTEM IS ORIENTATED WITH THE "Z" DIMENSION PERPENDICULAR TO THE BOTTOM OF THE LOWER NECK LOAD CELL STRUCTURAL REPLACEMENT.

ITEM	QTY	PART NUMBER	DESCRIPTION
31	2	5000654	M5 X 0.8 X 12 LG. BHCS
30	1	472-2001	LOWER NECK LOAD CELL BUMPER COVER
29	1	472-2002	LOWER NECK LOAD CELL BUMPER
28	1	5001112	M3 X 0.5 X 3 LG. SSS CONE PT.
27	1	5000989	M4 X 0.7 X 8 LG. SHCS
26	2	5000007	M4 X 0.7 X 20 LG. BHCS
25	8	5000604	SCREW, SHCS M6-1 x 14 mm
24	8	5001110	M6 HI-COLLAR LOCK WASHER S.S.
23	1	472-2600	LOWER NECK LOAD CELL STRUCTURAL REPLACEMENT
22	1	472-2700	UPPER NECK LOAD CELL STRUCTURAL REPLACEMENT
21	1	472-2019	OCCIPITAL CONDYLE CAM, NECK
20	1	472-2011	OCCIPITAL CONDYLE PIN, NECK
19	1	472-2016	OCCIPITAL CONDYLE SCREW
18	1	472-2300	NECK PULLEY BRACKET ASSEMBLY
17	2	472-2015	CABLE SEAT COVER, NECK
16	1	472-2108	CENTER CABLE LOWER BUSHING 2, NECK
15	1	5000503	M6 X 1 HEX LOCK NUT SS
14	1	5001113	M6 FENDER WASHER S.S.
13	1	472-2018	NECK NEOPRENE SPACER
12	2	5001109	M5 x.8 x 12 HHCS
11	1	472-2520	LOWER NECK STOP ASSEMBLY
10	1	472-2500	UPPER NECK STOP ASSEMBLY
9	6	5000469	SCREW, FHCS M2x0.4 x 6
8	1	472-2150	FRONT NECK CABLE ASSEMBLY (SEE NOTE 2)
7	1	472-2130	REAR NECK CABLE ASSEMBLY (SEE NOTE 2)
6	1	472-2140	CENTER CABLE ASSEMBLY, NECK
5	1	472-2103	CABLE COVER, NECK
4	1	472-2102	CENTER CABLE FIXTURE, NECK
3	1	472-2106	CABLE GUIDE, NECK
2	8	472-2105	NECK CABLE GUIDE
1	1	472-2110	ASSEMBLY, NECK

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN Dave Walker	9/26/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

NECK C.G. AND PART GROUPING

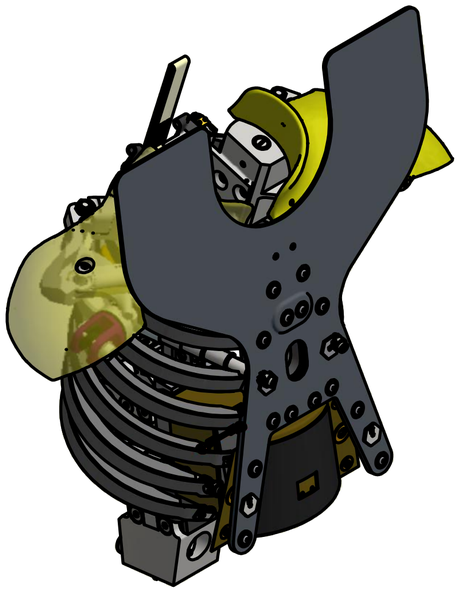
THOR-50M

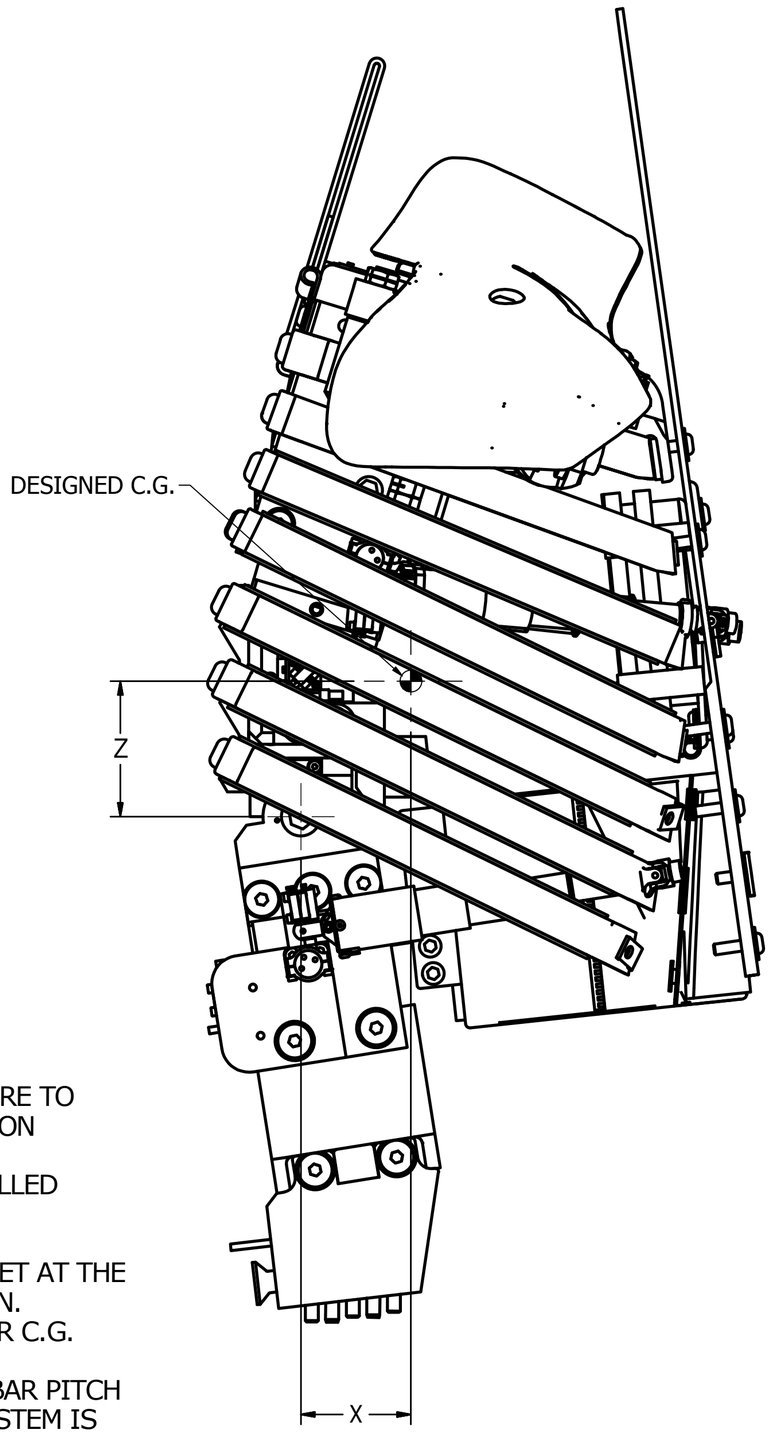
THIRD ANGLE PROJECTION

SIZE A2 | DRAWING NUMBER 472-2115 | REV

SCALE: 1 : 1 | SHEET 1 OF 1

472-2115.iam





NOTES:

1. ALL OF THE PARTS AND ASSEMBLIES LISTED ARE TO BE INCLUDED IN THE WEIGHT AND CG LOCATION DETERMINATION.
2. JACKET, 472-3900, NOT SHOWN, TO BE INSTALLED AND SECURED TO LOWER STRUCTURE USING ADHESIVE TAPE.
3. LUMBAR PITCH CHANGE ASSEMBLY IS TO BE SET AT THE SLOUCH (9°) POSITION FOR C.G. CALCULATION.
4. REFER TO DRAWING 472-0000 SHT. 5 OF 5 FOR C.G. AND WEIGHT SPECIFICATIONS.
5. THE C.G. ORIGIN IS THE CENTER OF THE LUMBAR PITCH CHANGE ASSEMBLY AND THE COORDINATE SYSTEM IS ORIENTATED WITH THE "Z" DIMENSION PERPENDICULAR TO THE TOP OF THE LUMBAR SPINE PITCH CHANGE ASSEMBLY.

ITEM	QTY	PART NUMBER	DESCRIPTION
39	1	472-8702	INSTRUMENT GROUND STRAP, THORACIC SPINE
38	1	472-8701	INSTRUMENT GROUND STRAP, MID STERNUM
37	1	472-3800	SHOULDER ASSEMBLY
36	4	5000151	M4 X 0.7 X 10 LG. SHCS
35	2	472-3518	IRTRACC CONNECTING BOLT, UPPER THORAX
34	14	5001126	M5 FLAT WASHER LARGE OD SS
33	10	5000513	CLIP NUT, M5 (MONADNOCK #130300-M5-1)
32	2	5001127	SCREW, FHCS M10-1.5 x 25
31	4	5000989	M4 X 0.7 X 8 LG. SHCS
30	1	472-3580	IRTRACC ASSEMBLY, LOWER LEFT
29	1	472-3570	IRTRACC ASSEMBLY, LOWER RIGHT
28	1	472-3560	IRTRACC ASSEMBLY, UPPER RIGHT
27	1	472-3550	IRTRACC ASSEMBLY, UPPER LEFT
26	2	5000117	SCREW, FHCS M8-1.25 x 25
25	1	472-4600	UPPER ABDOMEN ASSEMBLY
24	2	5000214	M5 X 0.8 X 6 LG. BHCS
23	2	9003723	1/4 COATED CABLE CLAMP
22	2	472-3520	IRTRACC CONNECTING BOLT, LOWER THORAX
21	6	5000210	M5 X 0.8 X 20 LG. BHCS
20	2	5000654	M5 X 0.8 X 12 LG. BHCS
19	2	5000571	M5 X 0.8 X 22 LG. BHCS
18	1	472-3517	THORAX RIB #1 DUMMY LIFT STRAP
17	1	472-3400	THORAX BIB ASSEMBLY
16	14	5000454	M8 X 1.25 X 10 LG. BHCS
15	1	472-3516	THORAX ELLIPTICAL RIB STIFFENER #7
14	1	472-3515	THORAX ELLIPTICAL RIB STIFFENER #6
13	1	472-3514	THORAX ELLIPTICAL RIB STIFFENER #5
12	1	472-3513	THORAX ELLIPTICAL RIB STIFFENER #4
11	1	472-3512	THORAX ELLIPTICAL RIB STIFFENER #3
10	1	472-3511	THORAX ELLIPTICAL RIB STIFFENER #2
9	1	472-3510	THORAX ELLIPTICAL RIB STIFFENER #1
8	1	472-3370	THORAX ELLIPTICAL RIB #7 - ASSEMBLY
7	1	472-3360	THORAX ELLIPTICAL RIB #6 - ASSEMBLY
6	1	472-3350	THORAX ELLIPTICAL RIB #5 - ASSEMBLY
5	1	472-3340	THORAX ELLIPTICAL RIB #4 - ASSEMBLY
4	1	472-3330	THORAX ELLIPTICAL RIB #3 - ASSEMBLY
3	1	472-3320	THORAX ELLIPTICAL RIB #2 - ASSEMBLY
2	1	472-3310	THORAX ELLIPTICAL RIB #1 - ASSEMBLY
1	1	472-3600	SPINE MECHANICAL ASSEMBLY

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 125 ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

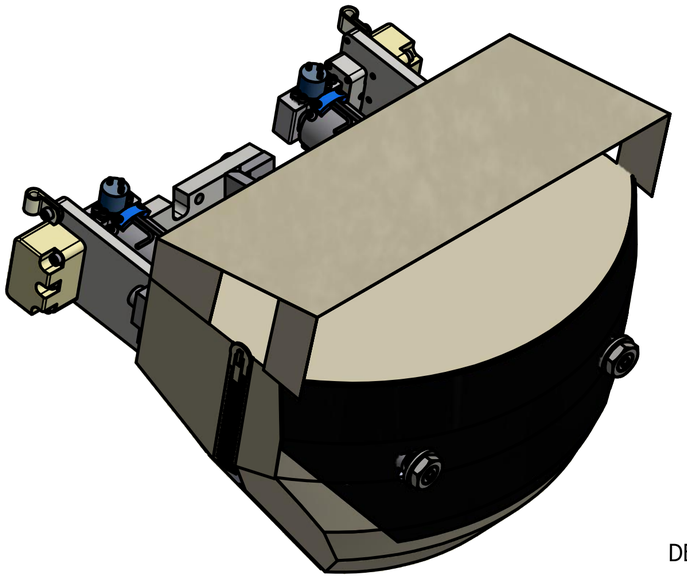
APPROVALS	DATE
DRAWN Dave Walker	9/29/2016
CHECKED	
ENG	
APPROVED	

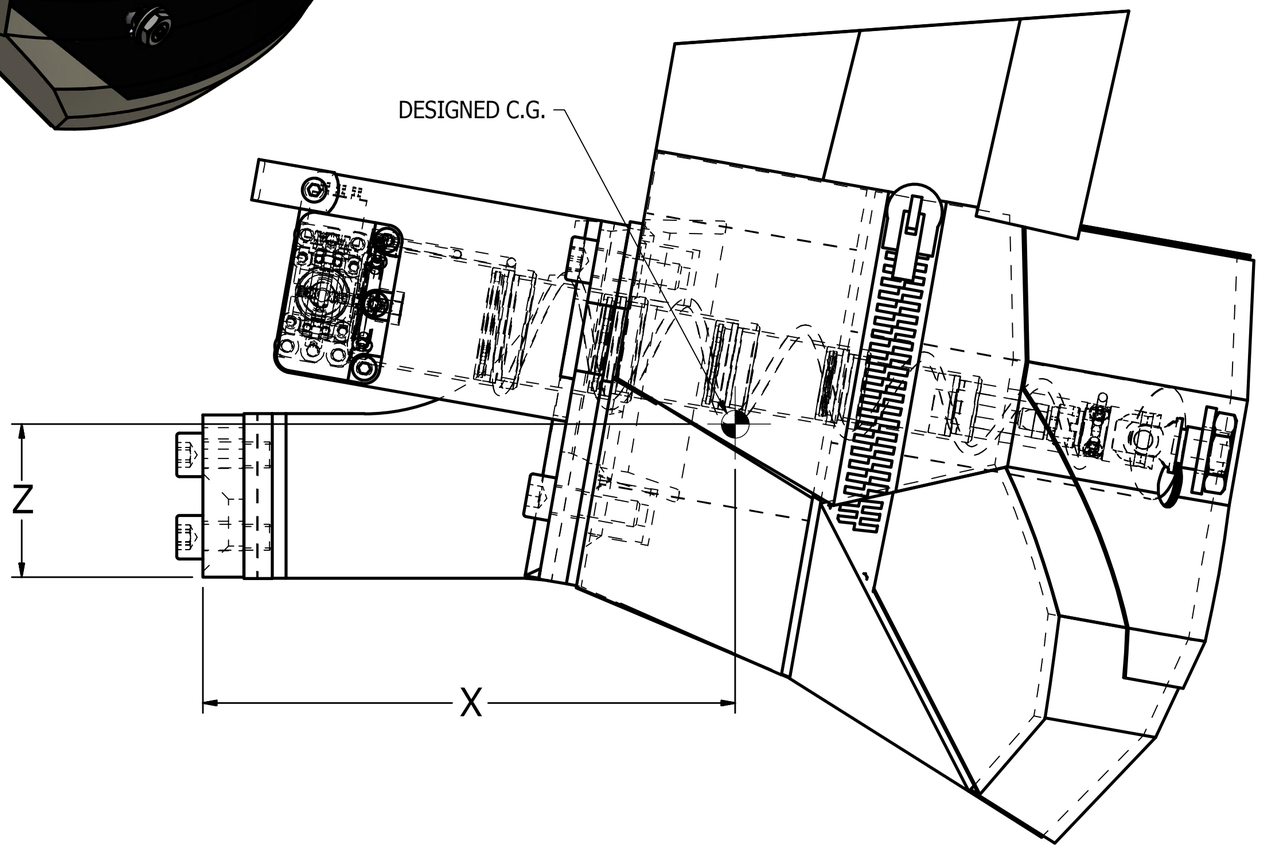
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

THORAX C.G. AND PARTS GROUPING
THOR-50M

THIRD ANGLE PROJECTION
SIZE A2 | DRAWING NUMBER 472-3015 | REV
SCALE: 1 / 2 | SHEET 1 OF 1

472-3015.iam





NOTES:

1. ALL OF THE PARTS AND ASSEMBLIES LISTED ARE TO BE INCLUDED IN THE WEIGHT AND CG LOCATION DETERMINATION.
2. REFER TO DRAWING 472-0000 SHT. 5 OF 5 FOR C.G. AND WEIGHT SPECIFICATIONS.
3. THE C.G. ORIGIN IS THE BOTTOM OF THE REAR ATTACHMENT PLATE AND THE COORDINATE SYSTEM IS ORIENTATED WITH THE "Z" DIMENSION PERPENDICULAR TO THE BOTTOM OF THE REAR ATTACHMENT PLATE.

ITEM	QTY	PART NUMBER	DESCRIPTION
17	4	5000081	SCREW, SHCS M6x1 x 16
16	1	472-4763	LOWER ABDOMEN BAG, SEWING ASSEMBLY
15	1	472-4765	LOWER ABDOMEN REAR FOAM LAYER
14	1	472-4764	LOWER ABDOMEN FRONT FOAM LAYER
13	2	472-4762	LOWER ABDOMEN DISTRIBUTION PLATE
12	1	472-4761	REAR ATTACHMENT PLATE
11	2	5000388	M3 X 0.5 X 8 LG. SHCS
10	2	6004191	3/16 CABLE CLAMP
9	4	5000001	M6 X 1 X 20 LG. SHCS
8	6	5000312	M3 X 0.5 X 20 LG. SHCS
7	12	5001103	M3 X 0.5 X 12 LG. SHCS
6	2	472-4760	POTENTIOMETER COVER
5	1	472-4730-2	3D IRTRACC ASS'Y, RIGHT, THOR-50M ABDOMEN
4	1	472-4730-1	3D IRTRACC ASS'Y, LEFT, THOR-50M ABDOMEN
2	1	472-4720-1	ATTACH BRACKET WELD ASS'Y, LEFT
3	1	472-4720-2	ATTACH BRACKET WELD ASS'Y. RIGHT
1	1	472-4710	INTERNAL MOUNTING WELD ASSEMBLY

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

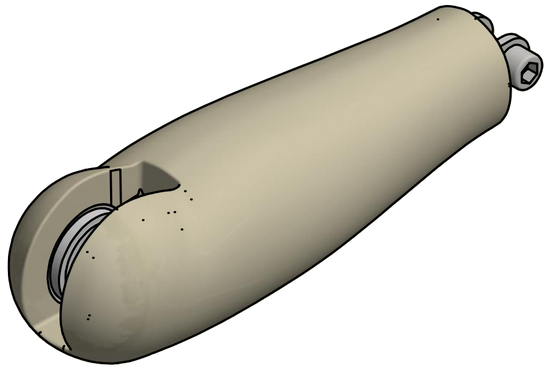
APPROVALS	DATE
DRAWN Dave Walker	9/29/2016
CHECKED	
ENG	
APPROVED	

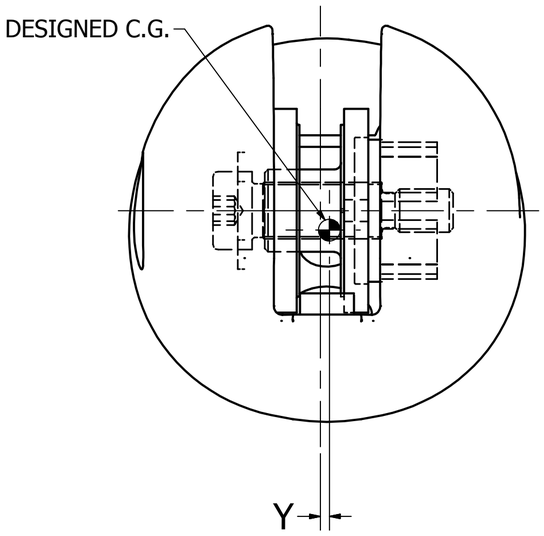
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

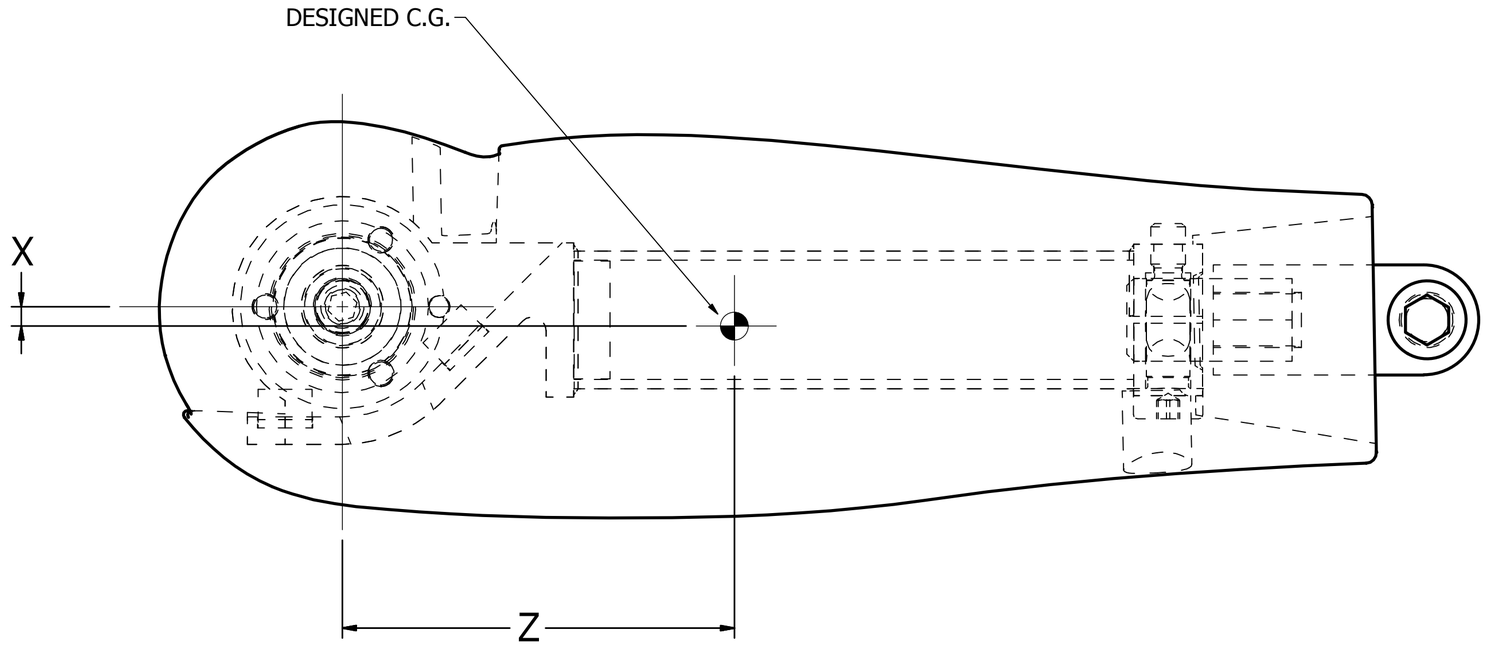
LOWER ABDOMEN C.G. AND PARTS GROUPING
THOR-50M

THIRD ANGLE PROJECTION
SIZE A2 | DRAWING NUMBER 472-4715 | REV
SCALE: 1 : 1 | SHEET 1 OF 1

472-4715.iam







ITEM	QTY	PART NUMBER	DESCRIPTION
10	1	5000492	M10 X 25 LG. SHSS
9	1	5000441	M12 X 1.75 X 30 LG. SHCS
8	1	472-6700	LOWER WRIST ROTATION ASSY.
7	1	5000506	SCREW, SHSS M10 x 30
6	1	9001260	WASHER, 1.06 OD x .53 ID x .06 THK.
5	1	472-6610	NUT - ELBOW PIVOT
4	1	472-6950	WASHER-SHOULDER JOINT SPRING
3	1	472-6590	BUSHING, UPPER ARM AND ELBOW PIVOT
2	1	472-6600	WASHER - UPPER ARM & ELBOW PIVOT
1	1	472-6520	LOWER ARM MOLDED

PARTS LIST

NOTES:
1. ALL OF THE PARTS AND ASSEMBLIES LISTED ARE TO BE INCLUDED IN THE WEIGHT AND CG LOCATION DETERMINATION.
2. REFER TO DRAWING 472-0000 SHT. 5 OF 5 FOR C.G. AND WEIGHT SPECIFICATIONS.
3. THE C.G. ORIGIN IS THE CENTER OF THE CENTER OF THE ELBOW YOKE AND THE COORDINATE SYSTEM IS ORIENTATED WITH THE "Z" DIMENSION PARALLEL WITH THE CENTERLINE OF THE STRUCTURAL ASS'Y. LOWER ARM - UPPER PART.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

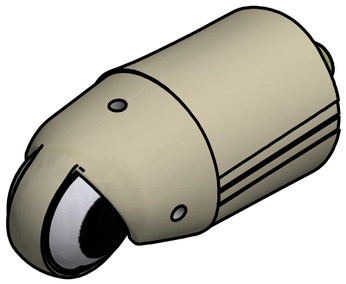
APPROVALS	DATE
DRAWN Dave Walker	9/29/2016
CHECKED	
ENG	
APPROVED	

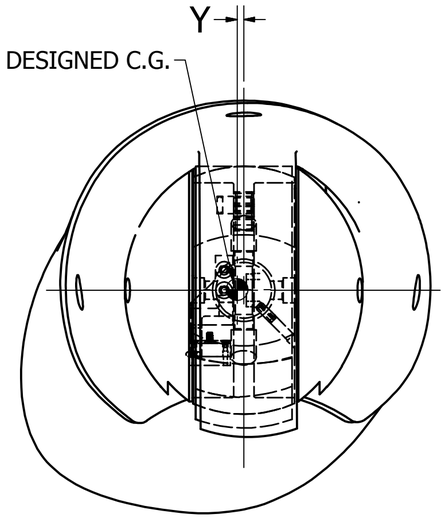
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

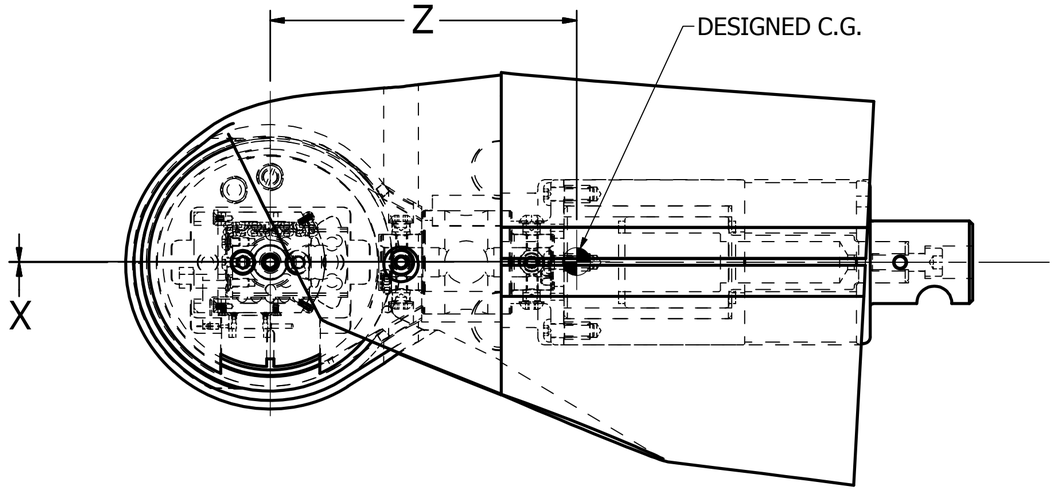
LOWER ARM C.G. AND PARTS GROUPING
THOR-50M

THIRD ANGLE PROJECTION
SIZE A2 | DRAWING NUMBER 472-6515 | REV
SCALE: 1 : 1 | SHEET 1 OF 1

472-6515.iam







NOTES:

1. ALL OF THE PARTS AND ASSEMBLIES LISTED ARE TO BE INCLUDED IN THE WEIGHT AND CG LOCATION DETERMINATION.
2. REFER TO DRAWING 472-0000 SHT. 5 OF 5 FOR C.G. AND WEIGHT SPECIFICATIONS.
3. THE C.G. ORIGIN IS THE CENTER OF THE KNEE CAP ASS'Y. AND THE COORDINATE SYSTEM IS ORIENTATED WITH THE "X" DIMENSION PERPENDICULAR TO THE CENTERLINE OF THE FEMUR PLUNGER ASS'Y.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-8704	INSTRUMENT GROUND STRAP, FEMUR
1	1	472-5100-1	LEFT UPPER LEG ASSY.

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT

FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN Dave Walker	10/3/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

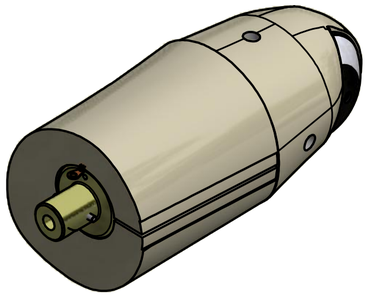
UPPER LEG, LEFT - C.G. AND PARTS GROUPING
THOR-50M

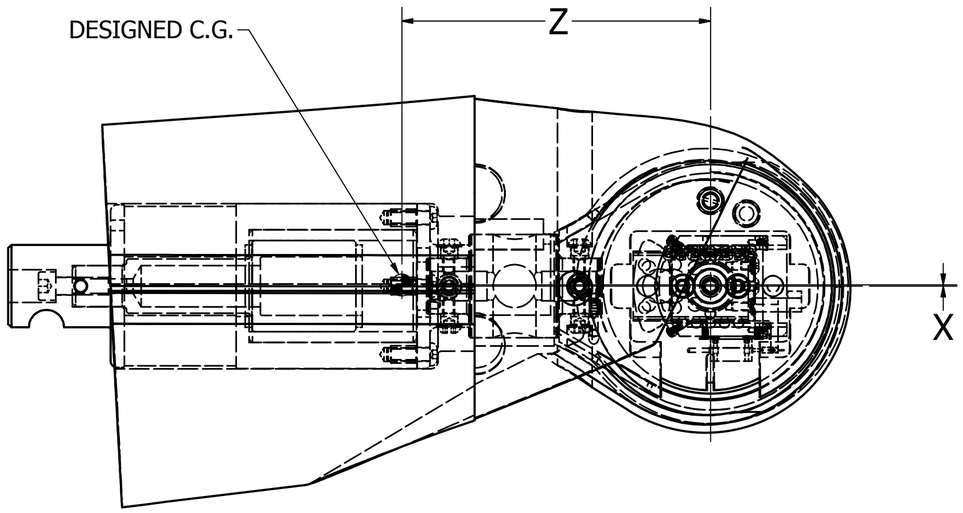
THIRD ANGLE PROJECTION

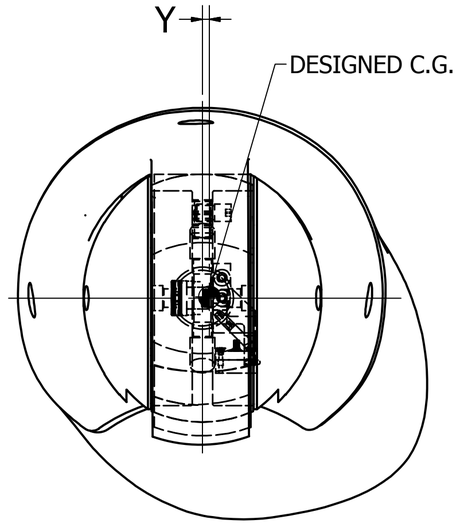
SIZE A2 | DRAWING NUMBER 472-5115-1 | REV

SCALE: 1 / 2 | SHEET 1 OF 1

472-5115-1.iam







NOTES:

1. ALL OF THE PARTS AND ASSEMBLIES LISTED ARE TO BE INCLUDED IN THE WEIGHT AND CG LOCATION DETERMINATION.
2. REFER TO DRAWING 472-0000 SHT. 5 of 5 FOR C.G. AND WEIGHT SPECIFICATIONS.
3. THE C.G. ORIGIN IS THE CENTER OF THE KNEE CAP ASS'Y. AND THE COORDINATE SYSTEM IS ORIENTATED WITH THE "X" DIMENSION PERPENDICULAR TO THE CENTERLINE OF THE FEMUR PLUNGER ASS'Y.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-8704	INSTRUMENT GROUND STRAP, FEMUR
1	1	472-5100-2	RIGHT UPPER LEG ASSY.

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT

FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN Dave Walker	10/3/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

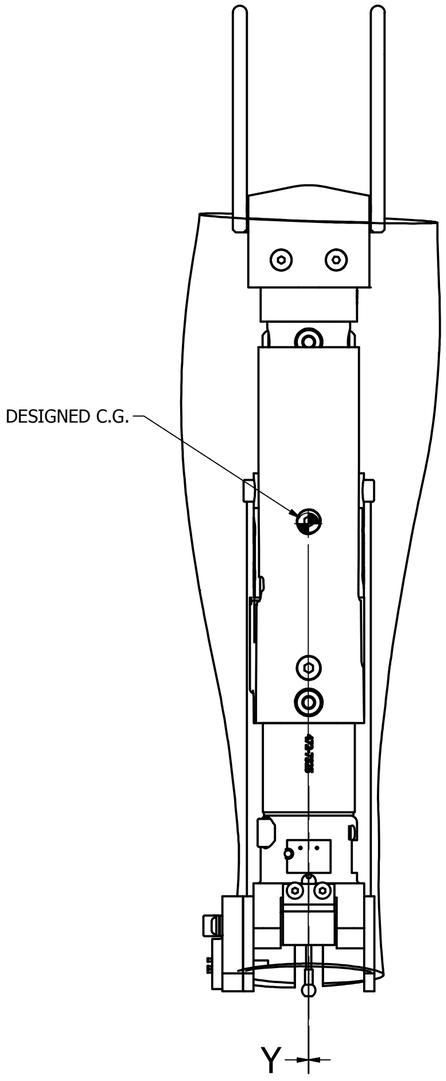
UPPER LEG, RIGHT C.G. AND PARTS GROUPING
THOR-50M

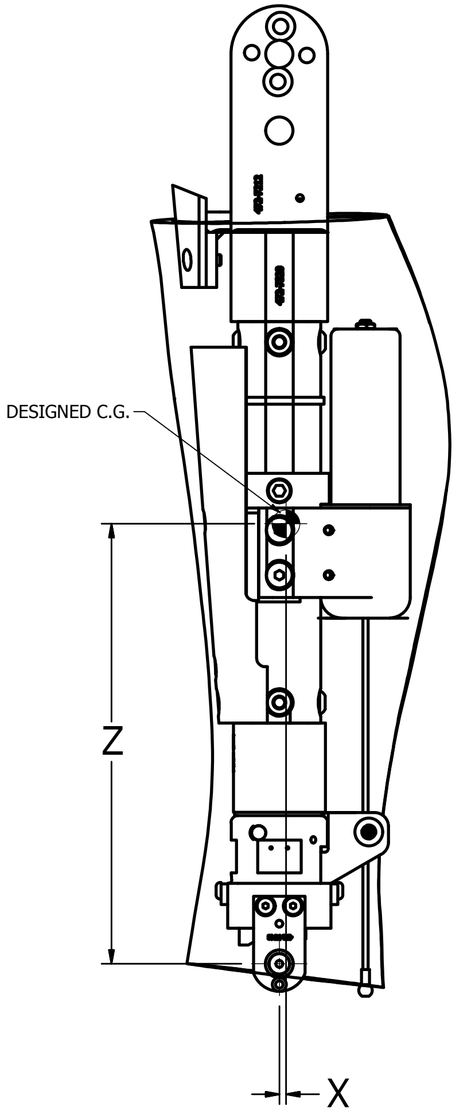
THIRD ANGLE PROJECTION

SIZE A2 | DRAWING NUMBER 472-5115-2 | REV

SCALE: 1 / 2 | SHEET 1 OF 1

472-5115-2.iam





ITEM	QTY	PART NUMBER	DESCRIPTION
31	1	472-8705	INSTRUMENT GROUND STRAP, TIBIA
30	2	9010453	SCREW, BHCS M6x1.0 x 16
29	1	472-7115	TIBIA GUARD
28	1	472-7370-1	LOWER LEG FLESH, LEFT
27	2	9003042	SCREW, BHCS M5 x 10
26	1	472-7110	KNEE BUMPER, MOLDED
25	4	9000852	SCREW, SHCS M6 x 1.0 X 16mm LONG
24	1	472-7200	KNEE CLEVIS WELDMENT
23	1	472-7527	STOP ASSEMBLY, PLANTAR
22	2	9000873	SCREW, FHCS M4-0.7 x 12
21	1	472-7563	BOLT & SLEEVE ASSEMBLY, ANKLE
20	1	472-7562	PULLEY, ACHILLES CABLE
19	2	9010450	NUT, NYLOCK M3X0.5
18	2	9000510	FLATWASHER, #4 TYPE B NARROW
17	5	5000103	SCREW, BHCS M4 x 0.7 x 8
16	1	9005135	CLAMP, NYLON LOOP
15	6	9010560	SCREW, SHCS M2X0.4 X 6
14	1	472-7581	POTENTIOMETER CLAMP
13	1	SA572-S114	POTENTIOMETER (NON-ACTIVE)
12	2	9010448	SCREW, FHCS M4X0.7 X 20
11	1	472-7585	RETAINER, POTENTIOMETER
10	1	472-7582	ANKLE BUSHING PLATE ASSEMBLY - POT END
9	1	472-7540	ANKLE BUSHING PLATE ASSEMBLY - FREE END
8	2	9000508	ACHILLES WASHER
7	2	9000509	NEEDLE ROLLER BEARING
6	1	472-7561	SHAFT, ACHILLES CABLE PULLEY
5	2	9010449	SCREW, FHCS M3 x 12
4	1	472-7560	BRACKET, ACHILLES PULLEY
3	1	472-7530	STOP ASSEMBLY - DORSI
2	1	472-7580	BASE, TORQUE - ANKLE TOP
1	1	472-7300	LOWER LEG MECHANICAL ASSEMBLY

PARTS LIST

NOTES:

1. ALL OF THE PARTS AND ASSEMBLIES LISTED ARE TO BE INCLUDED IN THE WEIGHT AND CG LOCATION DETERMINATION.
2. REFER TO DRAWING 472-0000 SHT 5 OF 5 FOR C.G. AND WEIGHT SPECIFICATIONS.
3. THE C.G. ORIGIN IS THE CENTER OF THE ANKLE BUSHING PLATE ASSEMBLY-FREE END AND THE COORDINATE SYSTEM IS ORIENTATED WITH THE "X" DIMENSION PERPENDICULAR TO THE CENTERLINE OF THE LOWER LEG MECHANICAL ASSEMBLY.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

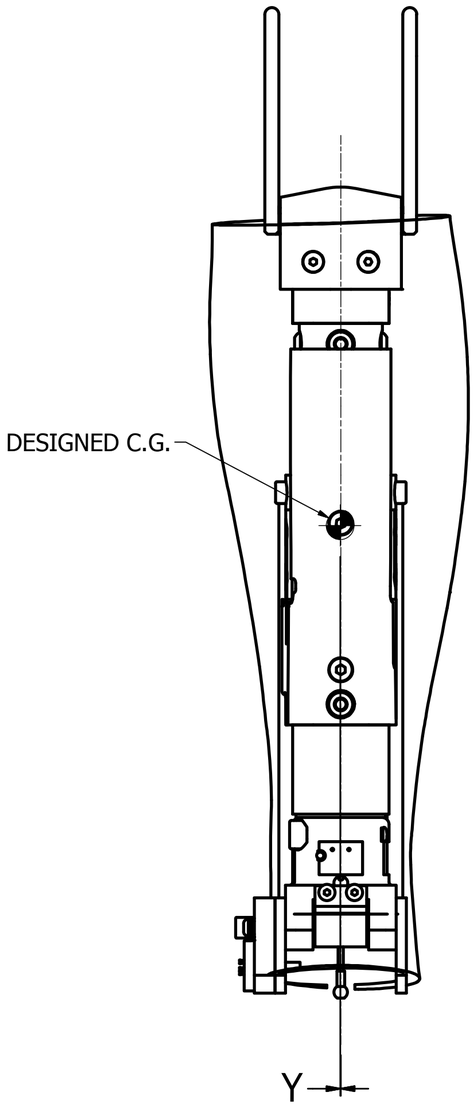
APPROVALS	DATE
DRAWN Dave Walker	10/3/2016
CHECKED	
ENG	
APPROVED	

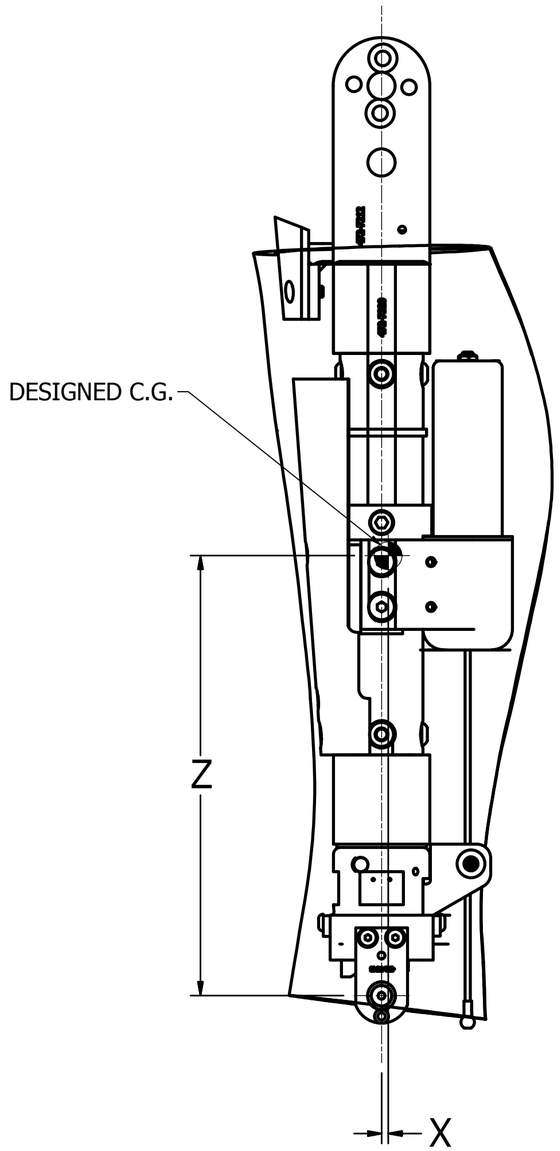
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LOWER LEG, LEFT - C.G. AND PARTS GROUPING
THOR-50M

THIRD ANGLE PROJECTION
SIZE A2 | DRAWING NUMBER 472-7015-1 | REV
SCALE: 1 / 2 | SHEET 1 OF 1

472-7015-1.iam





NOTES:

1. ALL OF THE PARTS AND ASSEMBLIES LISTED ARE TO BE INCLUDED IN THE WEIGHT AND CG LOCATION DETERMINATION.
2. REFER TO DRAWING 472-0000 SHT 5 OF 5 FOR C.G. AND WEIGHT SPECIFICATIONS.
3. THE C.G. ORIGIN IS THE CENTER OF THE ANKLE BUSHING PLATE ASSEMBLY-FREE END AND THE COORDINATE SYSTEM IS ORIENTATED WITH THE "X" DIMENSION PERPENDICULAR TO THE CENTERLINE OF THE LOWER LEG MECHANICAL ASSEMBLY.

ITEM	QTY	PART NUMBER	DESCRIPTION
31	1	472-8705	INSTRUMENT GROUND STRAP, TIBIA
30	2	9010453	SCREW, BHCS M6x1.0 x 16
29	1	472-7115	TIBIA GUARD
28	1	472-7370-2	LOWER LEG FLESH, RIGHT
27	2	9003042	SCREW, BHCS M5 x 10
26	1	472-7110	KNEE BUMPER, MOLDED
25	4	9000852	SCREW, SHCS M6 x 1.0 X 16mm LONG
24	1	472-7200	KNEE CLEVIS WELDMENT
23	1	472-7527	STOP ASSEMBLY, PLANTAR
22	2	9000873	SCREW, FHCS M4-0.7 x 12
21	1	472-7563	BOLT & SLEEVE ASSEMBLY, ANKLE
20	1	472-7562	PULLEY, ACHILLES CABLE
19	2	9010450	NUT, NYLOCK M3X0.5
18	2	9000510	FLATWASHER, #4 TYPE B NARROW
17	5	5000103	SCREW, BHCS M4 x 0.7 x 8
16	1	9005135	CLAMP, NYLON LOOP
15	6	9010560	SCREW, SHCS M2X0.4 X 6
14	1	472-7581	POTENTIOMETER CLAMP
13	1	SA572-S114	POTENTIOMETER (NON-ACTIVE)
12	2	9010448	SCREW, FHCS M4X0.7 X 20
11	1	472-7585	RETAINER, POTENTIOMETER
10	1	472-7582	ANKLE BUSHING PLATE ASSEMBLY - POT END
9	1	472-7540	ANKLE BUSHING PLATE ASSEMBLY - FREE END
8	2	9000508	ACHILLES WASHER
7	2	9000509	NEEDLE ROLLER BEARING
6	1	472-7561	SHAFT, ACHILLES CABLE PULLEY
5	2	9010449	SCREW, FHCS M3 x 12
4	1	472-7560	BRACKET, ACHILLES PULLEY
3	1	472-7530	STOP ASSEMBLY - DORSI
2	1	472-7580	BASE, TORQUE - ANKLE TOP
1	1	472-7300	LOWER LEG MECHANICAL ASSEMBLY

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

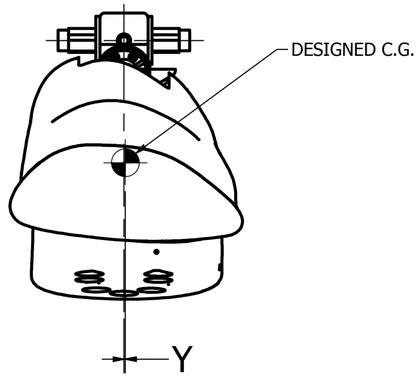
APPROVALS	DATE
DRAWN Dave Walker	10/11/2016
CHECKED	
ENG	
APPROVED	

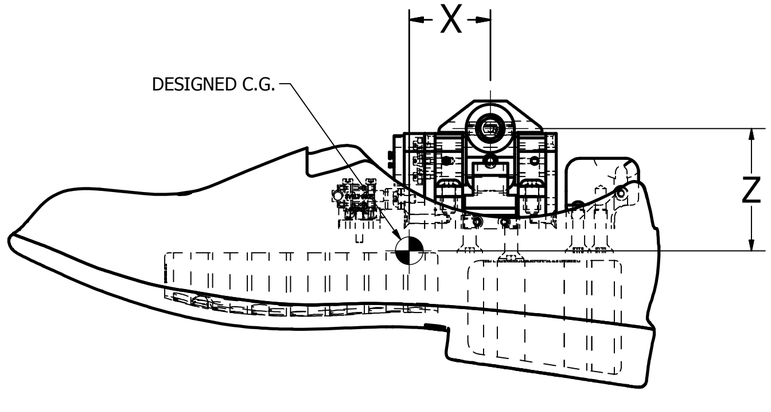
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LOWER LEG, RIGHT - C.G. AND PARTS GROUPING
THOR-50M

THIRD ANGLE PROJECTION
SIZE A2 | DRAWING NUMBER 472-7015-2 | REV
SCALE: 1 / 2 | SHEET 1 OF 1

472-7015-2.iam





NOTES:

1. ALL OF THE PARTS AND ASSEMBLIES LISTED ARE TO BE INCLUDED IN THE WEIGHT AND CG LOCATION DETERMINATION, REFERENCE DRAWINGS 472-7000-1 LOWER LEG ASSEMBLY.
2. REFER TO DRAWING 472-0000 SHT 5 OF 5 FOR C.G. AND WEIGHT SPECIFICATIONS.
3. THE C.G. ORIGIN IS THE CENTER OF THE ANKLE PIVOT AND THE COORDINATE SYSTEM IS ORIENTATED WITH THE "X" DIMENSION PARALLEL TO THE FOOT BONE.

ITEM	QTY	PART NUMBER	DESCRIPTION
23	4	9000826	SCREW, FHCS M6x1.0 X 16
22	2	9010446	SCREW, FHCS M3X0.5 X 16
21	4	5000410	SCREW, BHCS M3X0.5 X 8
20	6	9010560	SCREW, SHCS M2X0.4 X 6
19	1	472-7581	POTENTIOMETER CLAMP
18	1	SA572-S114	POTENTIOMETER (NON-ACTIVE)
17	1	472-7585	RETAINER, POTENTIOMETER
16	1	472-7582	ANKLE BUSHING PLATE ASSEMBLY - POT END
15	1	9005135	CLAMP, NYLON LOOP
14	1	5000103	SCREW, BHCS M4 x 0.7 x 8
13	1	472-7534	STOP ASSEMBLY - INVERSION
12	1	472-7533	STOP ASSEMBLY - EVERSION
11	2	9010448	SCREW, FHCS M4X0.7 X 20
10	2	9000873	SCREW, FHCS M4-0.7 x 12
9	2	9010447	SCREW, SHSS, M3X0.5 X 3
8	1	472-7540	ANKLE BUSHING PLATE ASSEMBLY - FREE END
7	8	472-7524	TORQUE CYLINDER
6	1	472-7523	BASE, TORQUE - BOTTOM
5	5	5000356	SCREW, BHCS M6 x 1 x 12
4	2	472-7522	CAP, BASE TORQUE
3	4	472-7515	RETAINING WASHER
2	1	472-7510	ANKLE CENTER BLOCK ASS'Y.
1	1	472-7800-1	MOLDED SHOE ASSY. - LEFT

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT

FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN Dave Walker	10/12/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

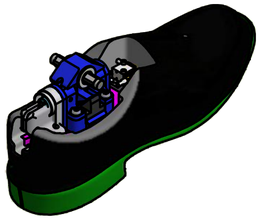
MOLDED SHOE, LEFT - C.G. AND PARTS GROUPING
THOR 50M

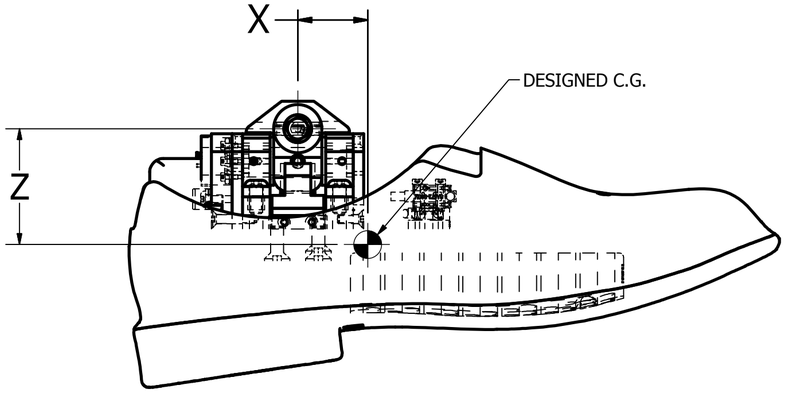
THIRD ANGLE PROJECTION

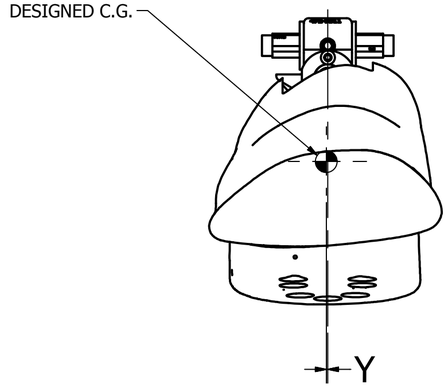
SIZE A2 | DRAWING NUMBER 472-7815-1 | REV

SCALE: 1 / 2 | SHEET 1 OF 1

472-7815-1.iam







NOTES:

1. ALL OF THE PARTS AND ASSEMBLIES LISTED ARE TO BE INCLUDED IN THE WEIGHT AND CG LOCATION DETERMINATION, REFERENCE DRAWINGS 472-7000-1 LOWER LEG ASSEMBLY.
2. REFER TO DRAWING 472-0000 SHT 5 OF 5 FOR C.G. AND WEIGHT SPECIFICATIONS.
3. THE C.G. ORIGIN IS THE CENTER OF THE ANKLE PIVOT AND THE COORDINATE SYSTEM IS ORIENTATED WITH THE "X" DIMENSION PARALLEL TO THE FOOT BONE.

ITEM	QTY	PART NUMBER	DESCRIPTION
23	4	9000826	SCREW, FHCS M6x1.0 X 16
22	2	9010446	SCREW, FHCS M3X0.5 X 16
21	4	5000410	SCREW, BHCS M3X0.5 X 8
20	6	9010560	SCREW, SHCS M2X0.4 X 6
19	1	472-7581	POTENTIOMETER CLAMP
18	1	SA572-S114	POTENTIOMETER (NON-ACTIVE)
17	1	472-7585	RETAINER, POTENTIOMETER
16	1	472-7582	ANKLE BUSHING PLATE ASSEMBLY - POT END
15	1	9005135	CLAMP, NYLON LOOP
14	1	5000103	SCREW, BHCS M4 x 0.7 x 8
13	1	472-7534	STOP ASSEMBLY - INVERSION
12	1	472-7533	STOP ASSEMBLY - EVERSION
11	2	9010448	SCREW, FHCS M4X0.7 X 20
10	2	9000873	SCREW, FHCS M4-0.7 x 12
9	2	9010447	SCREW, SHSS, M3X0.5 X 3
8	1	472-7540	ANKLE BUSHING PLATE ASSEMBLY - FREE END
7	8	472-7524	TORQUE CYLINDER
6	1	472-7523	BASE, TORQUE - BOTTOM
5	5	5000356	SCREW, BHCS M6 x 1 x 12
4	2	472-7522	CAP, BASE TORQUE
3	4	472-7515	RETAINING WASHER
2	1	472-7510	ANKLE CENTER BLOCK ASS'Y.
1	1	472-7800-2	MOLDED SHOE ASS'Y. - RIGHT

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN Dave Walker	10/12/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

MOLDED SHOE, RIGHT - C.G. AND PARTS GROUPING
THOR 50M

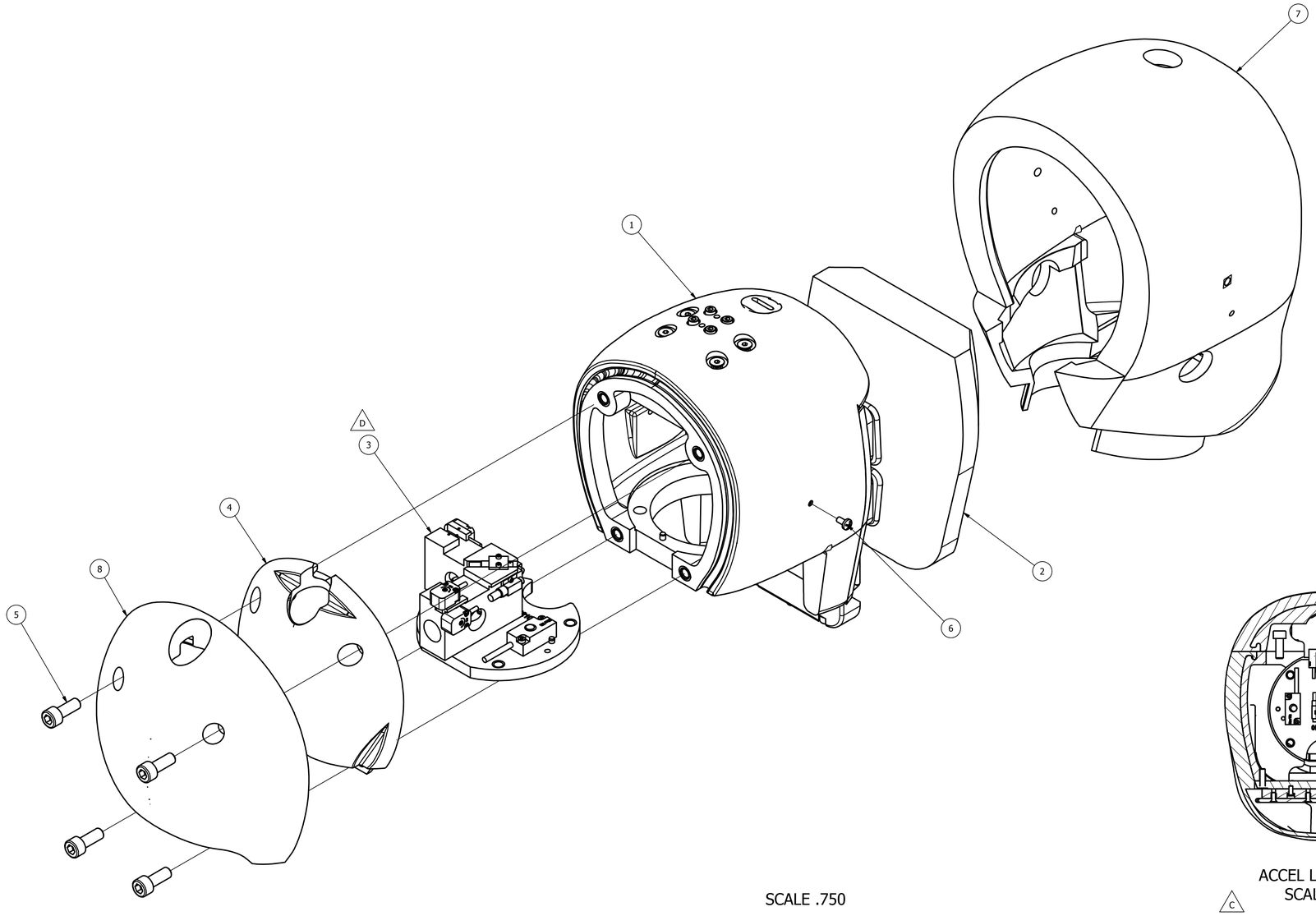
THIRD ANGLE PROJECTION

SIZE A2 | DRAWING NUMBER 472-7815-2 | REV

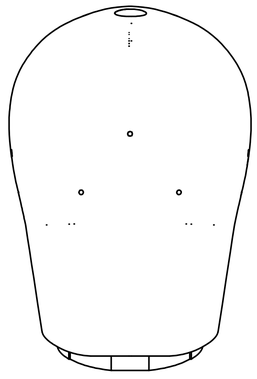
SCALE: 1 / 2 | SHEET 1 OF 1

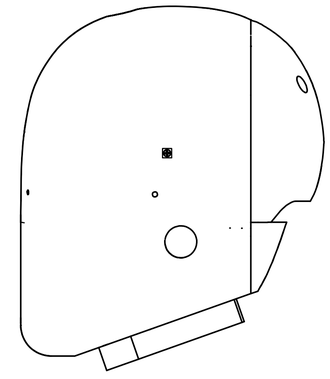
472-7815-2.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1HDM000 R12 AND CONVERTED TO METRIC FOR THOR-M	8/31/2011	BK
	B	REMOVE 472-1400, ADD 472-1401	11/5/2012	BK
	C	ADD ACCEL LOCATION VIEWS & DIMENSIONS	1/31/2013	BK
	D	ADDED ARS's TO ACCCELEROMETER MOUNTING PLATE ASSEMBLY, HEAD - 4721200	5/19/2014	DW
	E	REMOVED PART #5000135 - M6 X 1 X 25 LG. FHCS	8/10/2015	DW
	F	IN NOTE 3 "QUALIFICATION" WAS "CERTIFICATION".	8/7/2017	DW

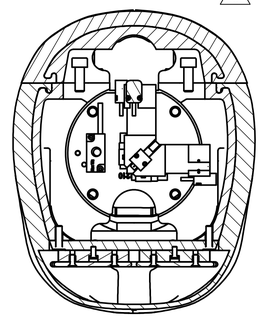


SCALE .750





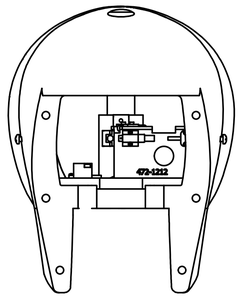
C



C

ACCEL LOCATIONS
SCALE 1 / 2

C



NOTES:

1. THE HEAD IS ATTACHED TO THE HEAD MOUNTING PLATE ON THE NECK ASSEMBLY, AND IS SECURED WITH FOUR M6 X 1 X 25 FHCS WHICH ARE INSERTED THROUGH THE BOTTOM OF THE HEAD MOUNTING PLATE, THE BASE OF THE SKULL, AND THREAD INTO THE HEAD ACCELEROMETER MOUNTING PLATE.

2. ITEM 7 (M3 X .5 X 6 NYLON SCREW) IS USED TO MARK THE LOCATION OF THE HEAD C.G.

3. REFER TO QUALIFICATION MANUAL FOR PERFORMANCE SPECIFICATIONS FOR THIS ASSEMBLY.

F

ITEM	QTY	PART NUMBER	DESCRIPTION
8	1	472-1310	CAP SKIN
7	1	472-1320	SKIN ASSEMBLY
6	2	5001116	SCREW, PHILLIPS NYLON M3 X .5 X 6
5	4	5000081	SCREW, SHCS M6x1 x 16
4	1	472-1110	HEAD CAP
3	1	472-1200	ACCELEROMETER MOUNTING PLATE ASSEMBLY, HEAD
2	1	472-1401	CONFOR FOAM, FACE
1	1	472-1100	SKULL ASSEMBLY

PARTS LIST

D
B

472-0000	1		
NEXT ASSEMBLY	QTY		
TOTAL QTY IN DUMMY	1		

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
X DECIMALS ANGLES FINISH
X.X ±0.1 ±0.5°
X.XX ±0.05
X.XXX ±0.01
REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PROJECT NO.:	
MATERIAL:	
HEAT TREAT:	
FINISH:	
DRAWN: B. KIMES	DATE: 8/31/2011
CHECKED BY:	DATE:
ENGINEER: J. WANG	DATE: 1/10/2012

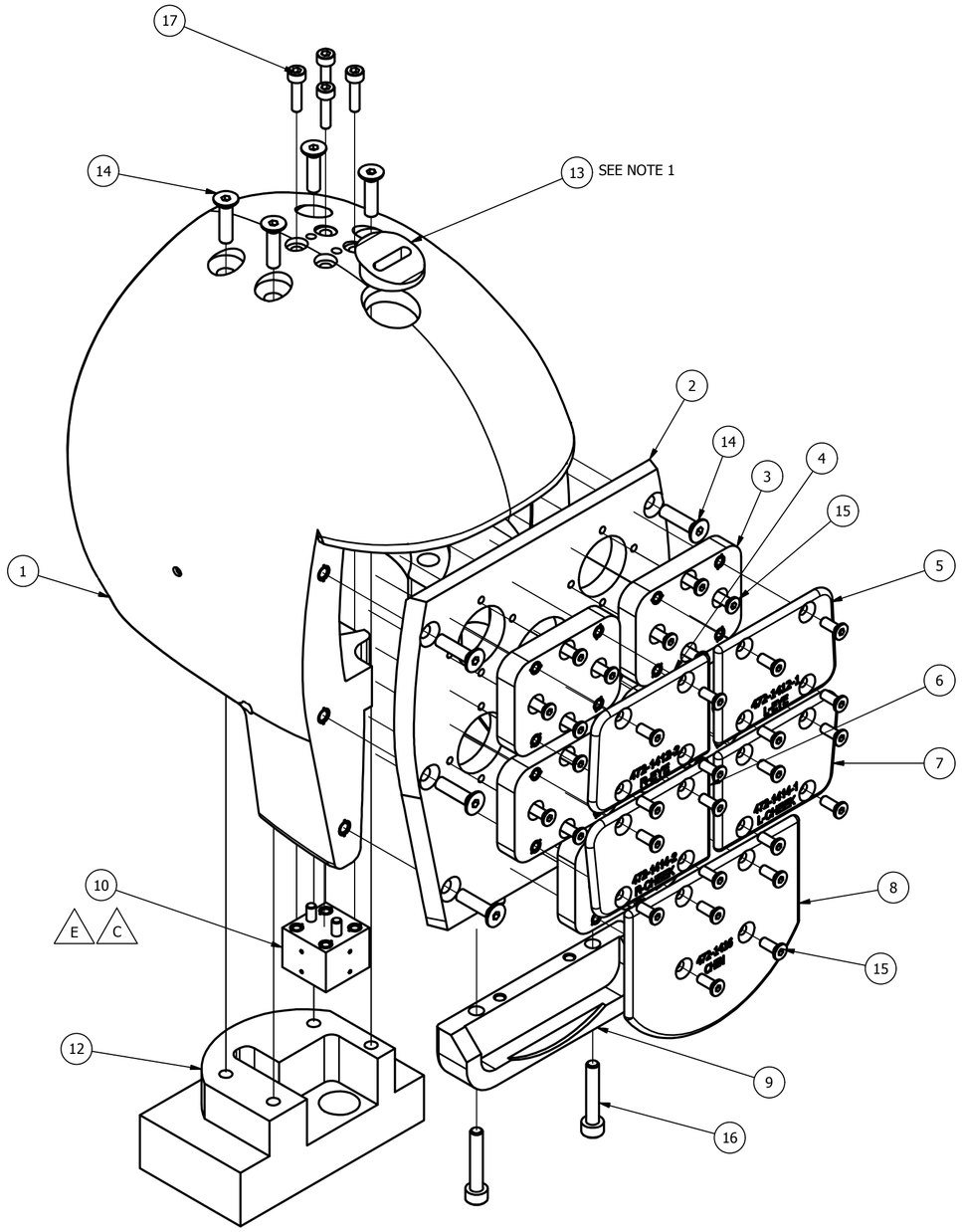
DOCUMENT: HEAD ASSEMBLY THOR-50M

SIZE: A1 | SHEET: 1 of 1 | DRAWING NO.: 472-1000 | REV: F

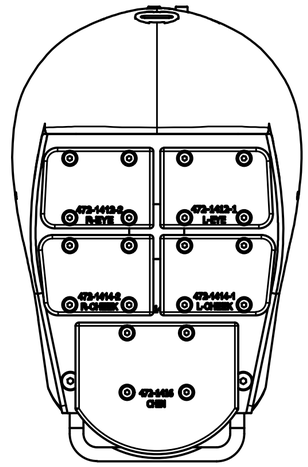
SCALE: .500

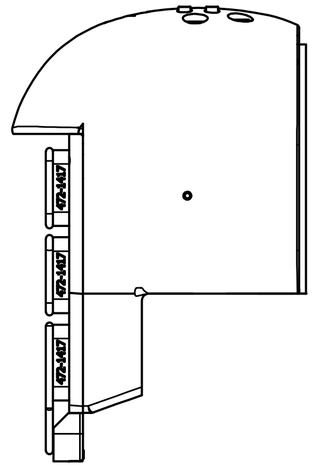
472-1000 ARS.iam

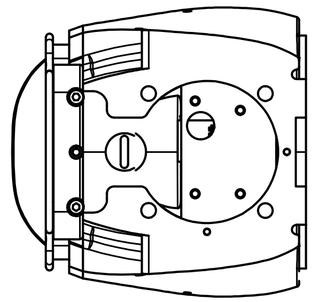
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1HDM100 R17 AND CONVERTED TO METRIC FOR THOR-M	8/31/2011	BK
	B	5000203 (M3) QTY 20 WAS 5000023 (M4)	5/25/2012	BK
	C	UPDATE VIEWS TO SHOW CHANGE TO 472-1101	6/14/2012	BK
	D	5000388 WAS 5000119; 5000116 WAS 5000203	12/20/2012	BK
	E	UPDATED VIEWS TO SHOW CHANGE TO 472-1101	5/20/2014	DW
	F	ADDED PART #472-1115 - HEAD C.G PART GROUP FOR BALLAST WEIGHT	8/4/2015	DW



SCALE .750







	ITEM	QTY	PART NUMBER	DESCRIPTION
D	17	4	5001103	M3 X 0.5 X 12 LG. SHCS
	16	2	5001117	SCREW, SHCS M4 X 0.7 X 22
	15	40	5000116	SCREW, FHCS M3-0.5 x 8
	14	10	5000025	SCREW, FHCS M4-0.7 x 16
D B	13	1	472-1116	PLUG, HEAD
	12	1	472-1120	HEAD BALLAST
F	11	1	472-1115	HEAD C.G. PART GROUP FOR BALLAST WEIGHT DESIGN
	10	1	472-1101	BIAXIAL ACCELEROMETER ASSEMBLY, HEAD
	9	1	472-1411	CHIN GUARD
	8	1	472-1416	CHIN LOAD CELL PLATE
	7	1	472-1414-1	LEFT CHEEK LOAD CELL PLATE
	6	1	472-1414-2	RIGHT CHEEK LOAD CELL PLATE
	5	1	472-1412-1	LEFT EYE LOAD CELL PLATE
	4	1	472-1412-2	RIGHT EYE LOAD CELL PLATE
	3	5	472-1417	FACE LOAD CELL, MOCK
	2	1	472-1410	FACE PLATE
	1	1	472-1111	HEAD, MACHINED

PARTS LIST

NOTES:

1. TIGHTEN HEAD PLUG THEN GRIND FLUSH WITH SKULL OUTER SURFACE.

472-1000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5 1.6
X.X ± 0.2
X.XX ± 0.1
X.XXX ± 0.01
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

DRAWN BY: B. KIMES DATE: 8/25/2011
CHECKED BY: DATE:
ENGINEER: J. WANG DATE: 1/10/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

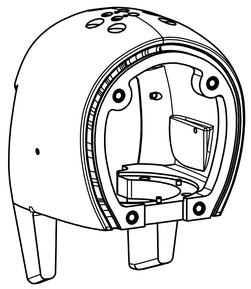
DESCRIPTION: SKULL ASSEMBLY THOR-50M

SIZE: A2 SHEET 1 OF 1 SCALE: .500

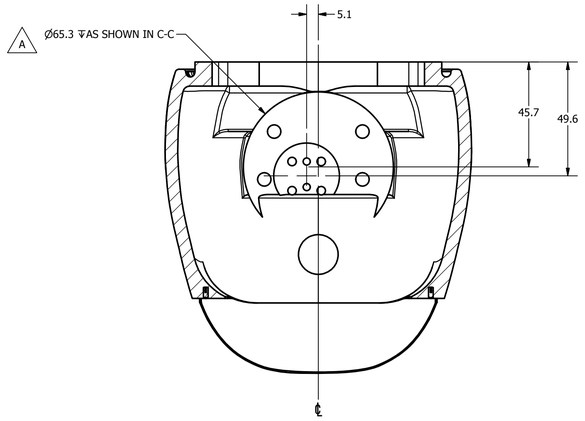
DRAWING NO.: 472-1100 REV: F

472-1100 ARS.iam

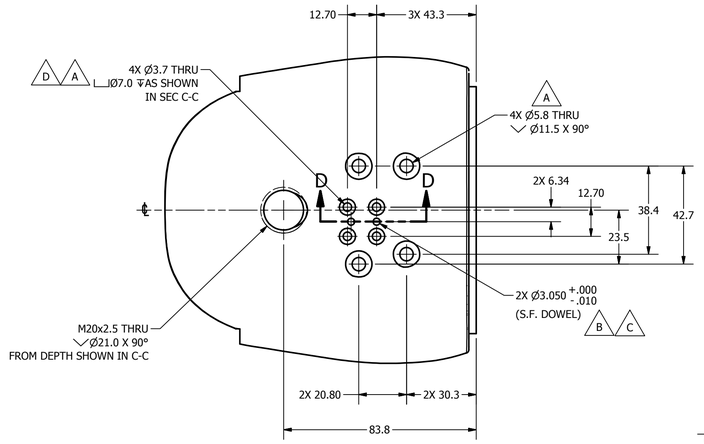
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1HDM111 Rev A AND CONVERTED TO METRIC FOR THOR-M; DIMENSION Ø65.3 ⧩ AS SHOWN IN C-C WAS Ø65.3 +0.00/-0.12 TO DEPTH SHOWN; 4X Ø3.5 THRU C'BORE Ø6.0 ⧩ AS SHOWN IN SEC. C-C WAS (4X) Ø4.8 ⧩ DEPTH SHOWN Ø3.3 THRU; 4X Ø5.5 THRU C'SINK Ø10.5 X 90° WAS 4X Ø5.1 THRU C'SINK Ø9.8 X 82.0°; 2X Ø2.998 +.000/-.010 (P.F. DOWEL) WAS 2X Ø3.2 THRU SLIP FIT DOWEL; 36.08 ±.02 WAS 36.08 ±.03; Ø89.40 ⧩ AS SHOWN WAS Ø89.04 +0.05/-0.00 TO DEPTH SHOWN; 4X Ø6.4 THRU EQUI-SPACED ON A Ø76.2 B.C. AS SHOWN WAS 4X Ø17/64 THRU EQUALLY SPACED ON B.C. Ø76.2; Ø89.40 ⧩ AS SHOWN WAS Ø89.4 +0.05/-0.00 TO DEPTH SHOWN; 128.2 WAS 128.0	8/26/2011	BK
	B	REMOVED 5000934, SLIP FIT HOLES WERE PRESS FIT IN TOP OF HEAD, ADDED M3 HELICOILS (5000333)	9/17/2012	TMV
	C	(S.F. DOWEL) DOWEL PIN HOLES IN TOP OF HEAD WHERE (P.F. DOWEL)	8/7/2017	DW
	D	HOLE DIMENSION 4X Ø3.7 THRU ⌴ Ø7.0 AS SHOWN IN SEC C-C WAS 4X Ø3.7 THRU ⌴ Ø6.0 ⧩ AS SHOWN IN SEC C-C	1/25/2018	DW

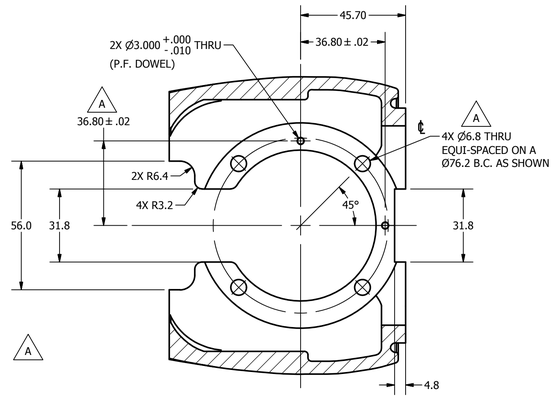


SCALE .500

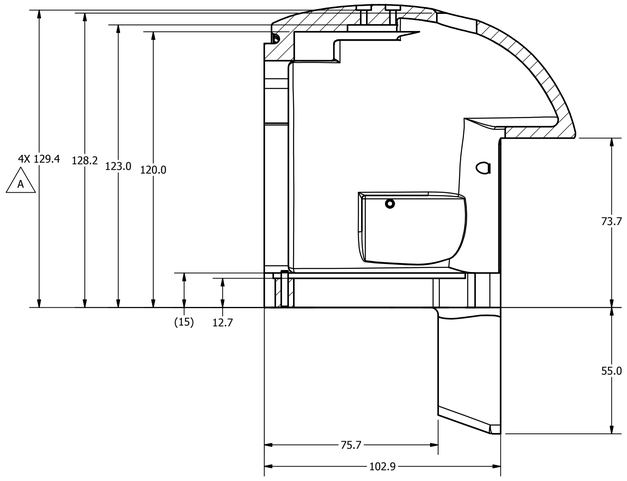


SECTION A-A
SCALE .750

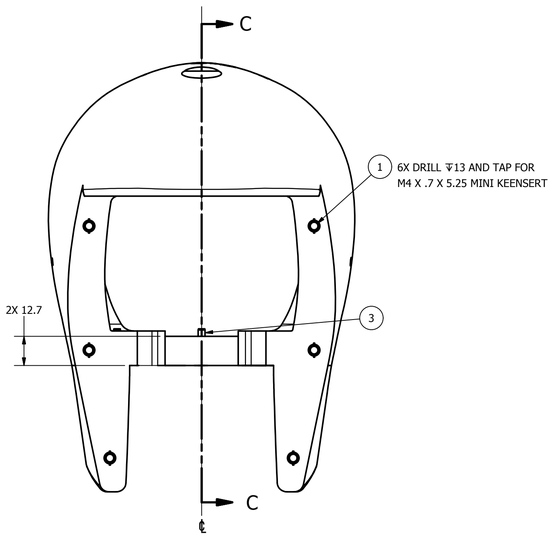


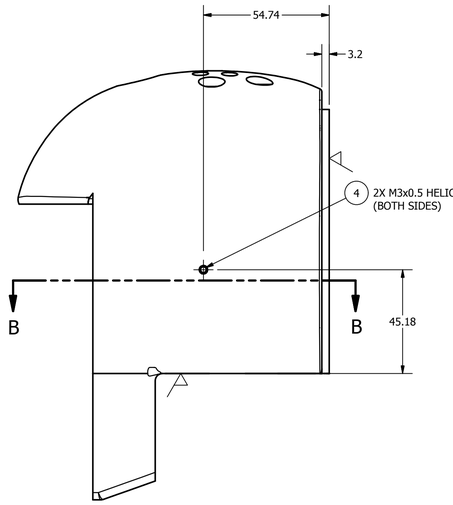


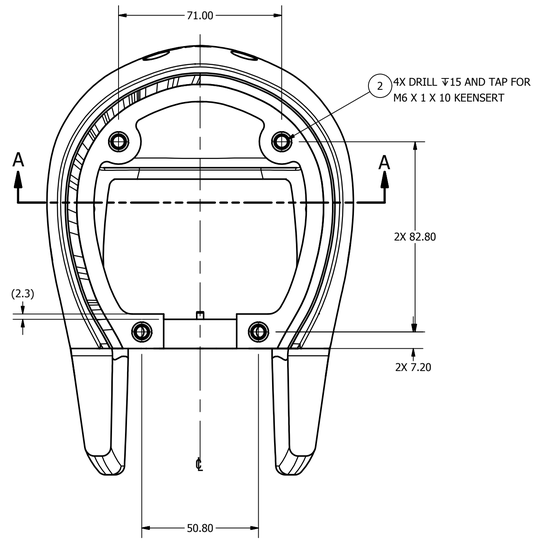
SECTION B-B
SCALE .750

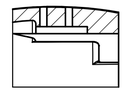


SECTION C-C
SCALE .750









SECTION D-D
SCALE .750

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

ITEM	QTY	PART NUMBER	DESCRIPTION
4	2	5000333	HELI-COIL, M3x0.5 X 6 LG SST
3	2	5000592	M3 X 16 LG. DOWEL PIN
2	4	5001108	M6 X 1 X 10 LG. LIGHTWEIGHT KEENSERT
1	6	5000724	M4 X 0.7 X 5.25 LG. MINI KEENSERT

PARTS LIST

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS NOTED OTHERWISE DIMENSIONS ARE IN MILLIMETERS. DECIMAL ANGLES FINISH. X ±.5 ±0.5 125. XX ±.1 XXX ±.05 XXXX ±.01. REMOVE BURRS & BREAK SHARP EDGES 0.2 MAX.

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

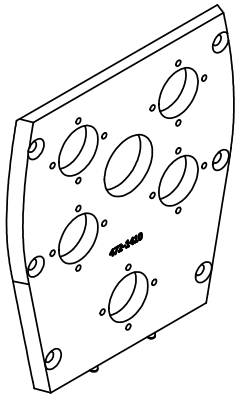
		PROJECT NO.:	
472-1100	1	MATERIAL: 357 CAST ALUMINUM	DRAWN: Dave Walker 8/26/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:
TOTAL QTY IN DUMMY	1	WEIGHT:	ENGINEER: J. WANG DATE: 1/10/2012

ASSEMBLY: HEAD, MACHINED

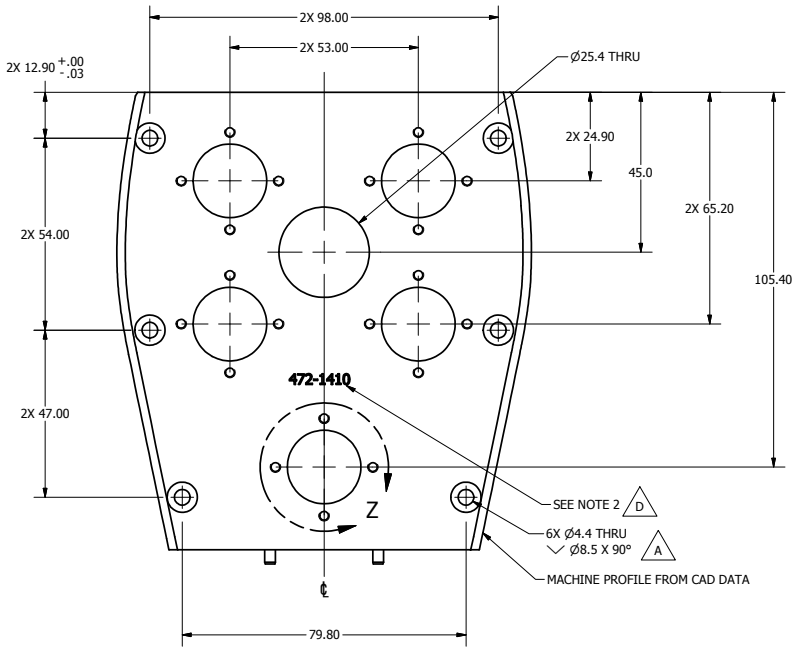
SIZE: A1 SHEET: 1 OF 1 SCALE: .750 DRAWING NO.: 472-1111 REV: D

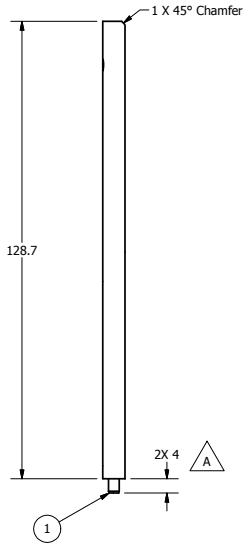
472-1111.iam

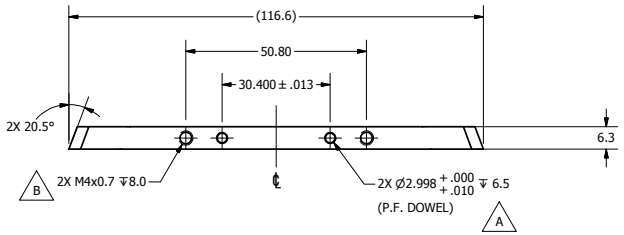
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FCM110 R04 AND CONVERTED TO METRIC FOR THOR-M; Ø4.4 THRU C'SINK Ø8.5 X 90˚ WAS Ø4.5 THRU C'SINK Ø8.4 X 82˚; 2X 4 WAS 2X 3; Ø2998+.000/-.010 ↓6.5 WAS Ø3.174+.000/-.011 ↓ 6.4; ADD NOTE 3, (OPTIONAL) TO NOTE 2	8/25/2011	BK
	B	REMOVE KEENSERTS, TAP HOLES TO THREAD SIZE	2/15/2012	BK
	C	M3 THRU HOLES WERE M4 (20X)	5/25/2012	BK
	D	CORRECT TYPO ON PART, 472 WAS 470	8/15/2012	BK

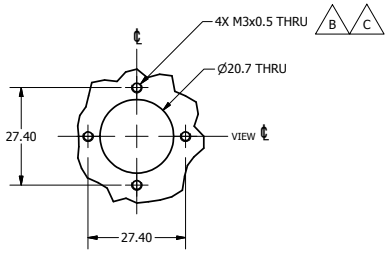


SCALE .750









DETAIL Z
5 PLACES
SCALE 1.000

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

A 2. STAMP OR ETCH PART NUMBER (3mm CHARACTERS) WHERE SHOWN. (OPTIONAL)

3. INSTALL DOWEL PINS AFTER ANODIZE.

ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	5000284	M3 X 10 LG. DOWEL PIN

PARTS LIST

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5˚; FINISH 1.6

REMOVE BURRS & BREAK SHARP EDGES

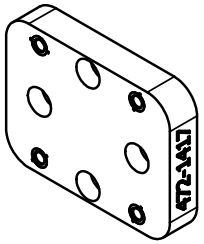
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PROJECT NO.:			
472-1100	1	MATERIAL: 7075-T6 ALUMINUM	DRAWN BY: B. KIMES — DATE: 8/25/2011
NEXT ASSEMBLY	QTY	ITEM TRACK:	CHECKED BY: — DATE:
TOTAL QTY IN DUMMY	1	WEIGHT: CLEAR ANODIZE	ENGINEER: J. WANG — DATE: 1/10/2012

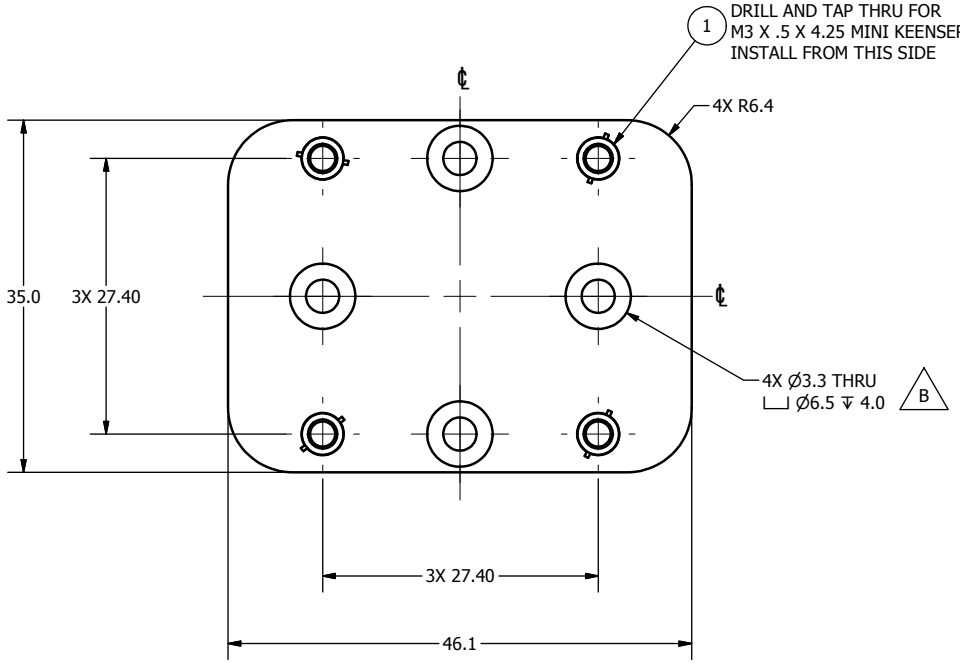
DESCRIPTION: FACE PLATE

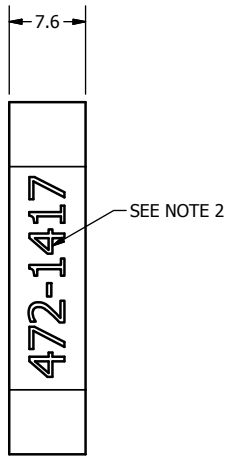
SIZE: A2 — SHEET: 1 OF 1 — SCALE: 1.000 — DRAWING NO.: 472-1410 — REV: D

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FCM117 R03 AND CONVERTED TO METRIC FOR THOR-M;	8/24/11	BK
	B	5000724 WAS 5001107; Ø3.3 THRU C'BORE Ø6.5 WAS Ø3.8 THRU C'BORE Ø7.1	3/16/2012	BK
	C	M3 X.5 KEENSERT WAS M4 X .7	5/25/2012	BK



SCALE 1.000





C B

ITEM	QTY	PART NUMBER	DESCRIPTION
1	4	5001107	M3 X 0.5 X 4.25 LG. MINI KEENSERT

PARTS LIST

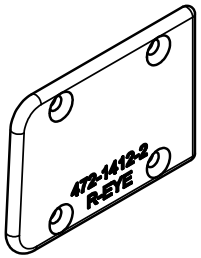
NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

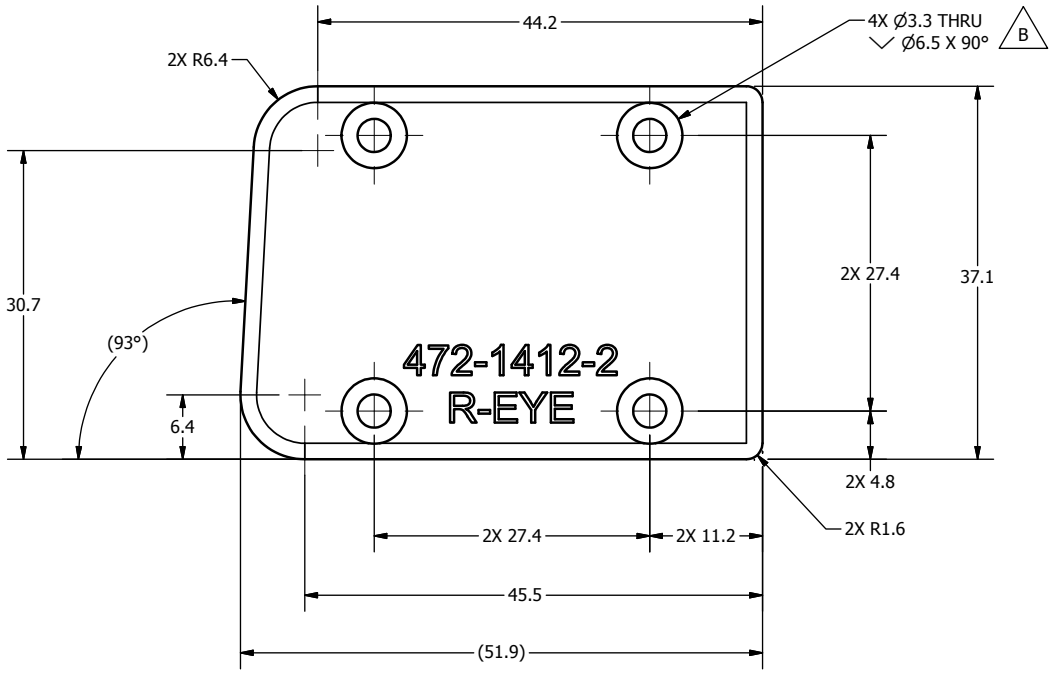
2. STAMP OR ETCH PART NUMBER (3mm CHARACTERS) WHERE SHOWN. (OPTIONAL)

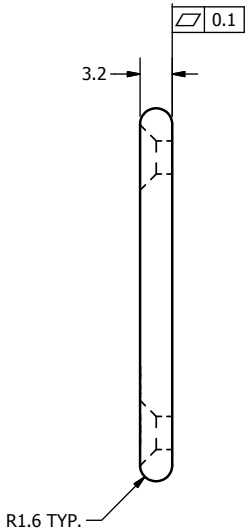
DO NOT SCALE DRAWING		TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		REMOVE BURRS & BREAK SHARP EDGES			
PROJECT NO.:		DRAWN BY: B. KIMES	DATE: 8/25/2011	DESCRIPTION: FACE LOAD CELL, MOCK	
472-1100	1	MATERIAL: 7075-T6 ALUMINUM			
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1 DRAWING NO.: 472-1417 REV: C
TOTAL QTY IN DUMMY	1	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 2.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FCM112 R06 AND CONVERTED TO METRIC FOR THOR-M	8/25/2011	BK
	B	Ø3.3 C'SINK Ø6.5 X 90° WAS Ø3.8 C'SINK Ø7.1 X 82°	5/25/2012	BK



SCALE 1.000



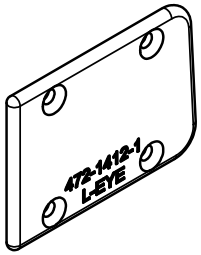


NOTES:

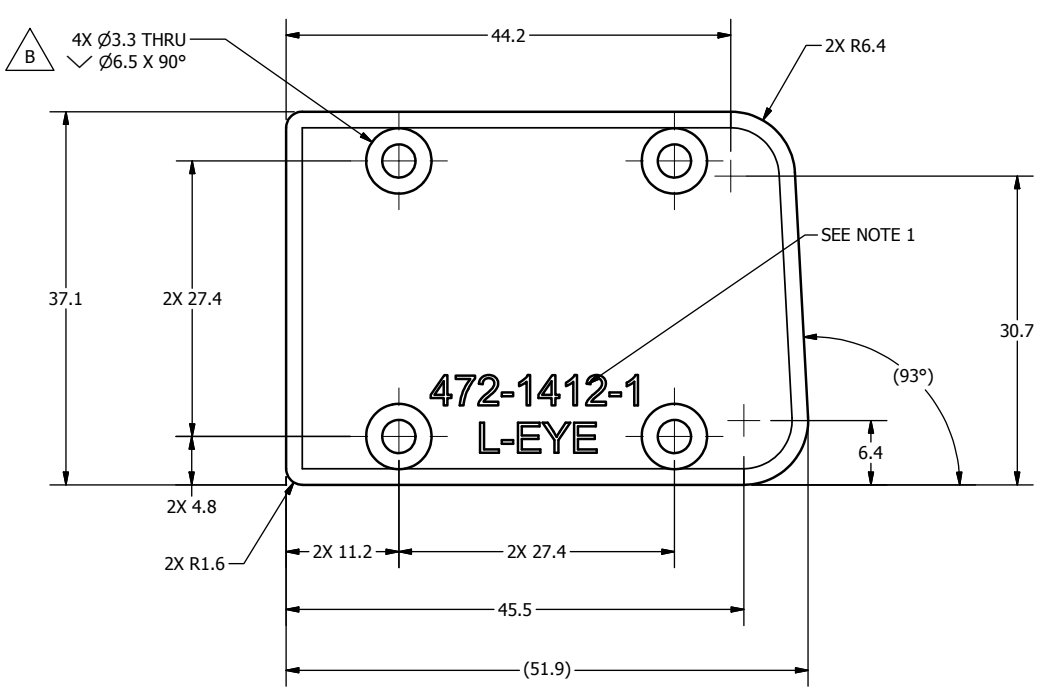
1. STAMP OR ETCH PART NUMBER AND "R-EYE" (3mm CHARACTERS) AS SHOWN. (OPTIONAL)

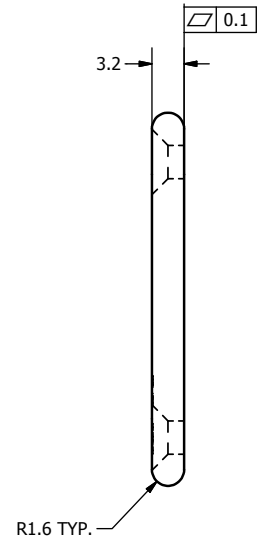
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION PROJECT NO.:	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
472-1100	1	MATERIAL: 440C STAINLESS STEEL	DRAWN BY: B. KIMES	DATE: 8/25/2011	DESCRIPTION: RIGHT EYE LOAD CELL PLATE
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 55-59	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1 DRAWING NO.: 472-1412-2 REV: B
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 2.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FCM113 R05 AND CONVERTED TO METRIC FOR THOR-M	8/25/2011	BK
	B	Ø3.3 C'SINK Ø6.5 X 90° WAS Ø3.8 C'SINK Ø7.1 X 82°	5/25/2012	BK



SCALE 1.000



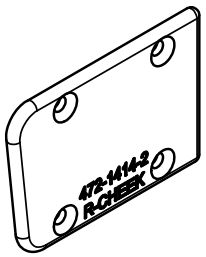


NOTES:

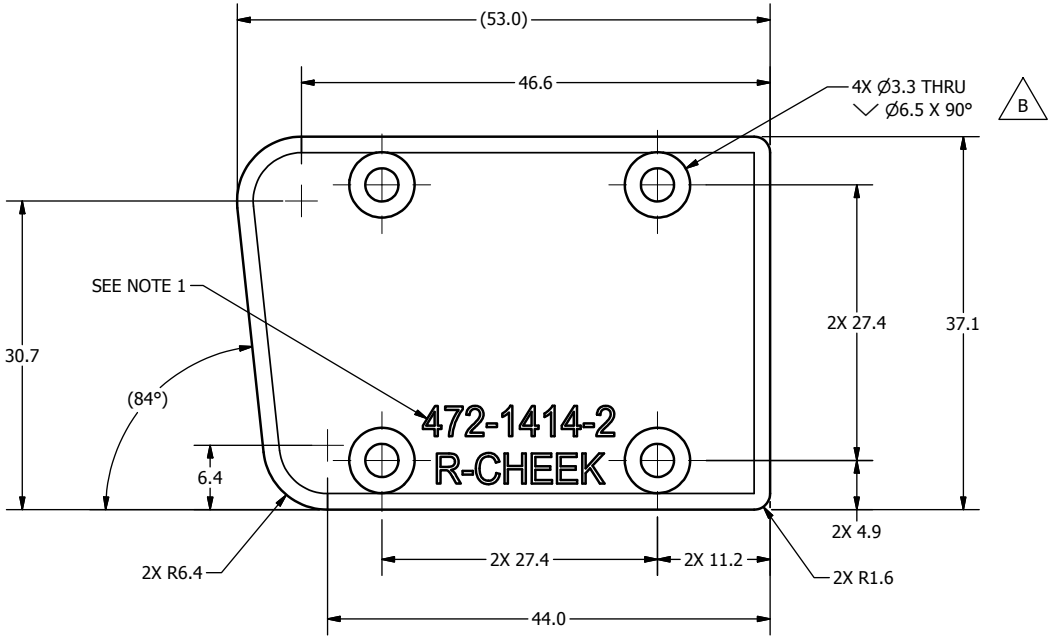
1. STAMP OR ETCH PART NUMBER AND "L-EYE" (3mm CHARACTERS) AS SHOWN. (OPTIONAL)

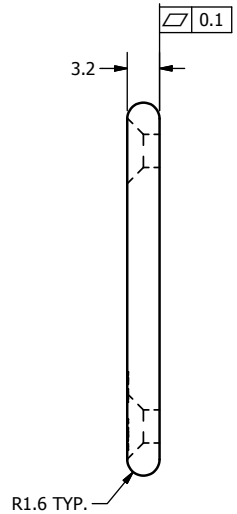
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: LEFT EYE LOAD CELL PLATE		
PROJECT NO.:					
		MATERIAL: 440C STAINLESS STEEL	DRAWN BY: B. KIMES	DATE: 8/25/2011	
472-1100	1	HEAT TREAT: Rc 55-59	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1
NEXT ASSEMBLY	QTY	FINISH:	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 2.000
TOTAL QTY IN DUMMY	1				DRAWING NO.: 472-1412-1 REV: B

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FCM114 R05 AND CONVERTED TO METRIC FOR THOR-M	8/25/2011	BK
	B	Ø3.3 C'SINK Ø6.5 X 90° WAS Ø3.8 C'SINK Ø7.1 X 82°	5/25/2012	BK



SCALE 1.000



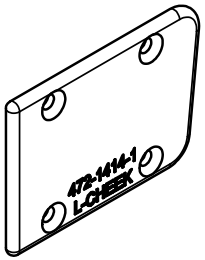


NOTES:

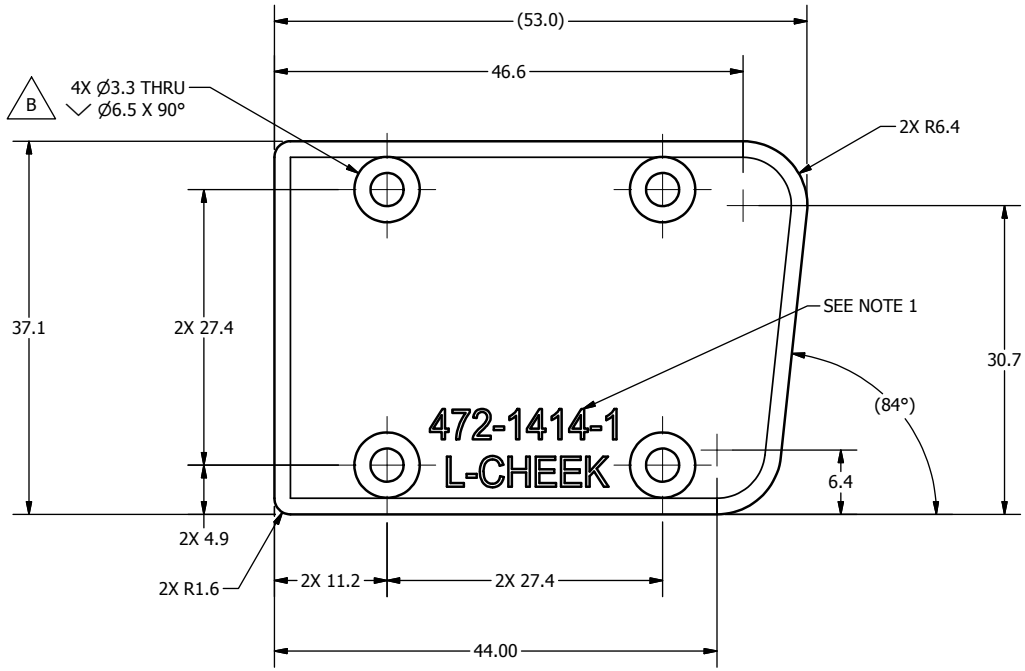
1. STAMP OR ETCH PART NUMBER AND "R-CHEEK" (3mm CHARACTERS) AS SHOWN. (OPTIONAL)

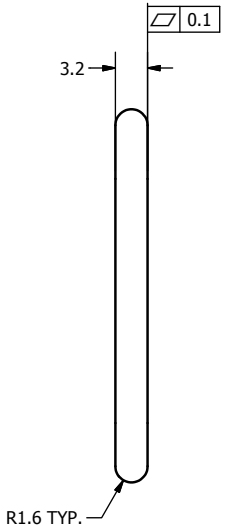
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION PROJECT NO.:	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
472-1100	1	MATERIAL: 440C STAINLESS STEEL	DRAWN BY: B. KIMES	DATE: 8/25/2011	DESCRIPTION: RIGHT CHEEK LOAD CELL PLATE
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 55-59	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1 DRAWING NO.: 472-1414-2 REV: B
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 2.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FCM115 R05 AND CONVERTED TO METRIC FOR THOR-M	8/25/2011	BK
	B	Ø3.3 C'SINK Ø6.5 X 90° WAS Ø3.8 C'SINK Ø7.1 X 82°	5/25/2012	BK



SCALE 1.000



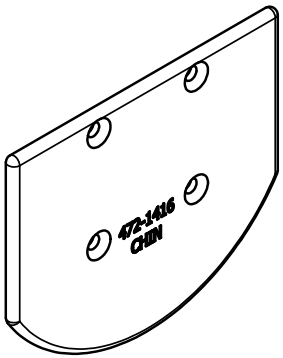


NOTES:

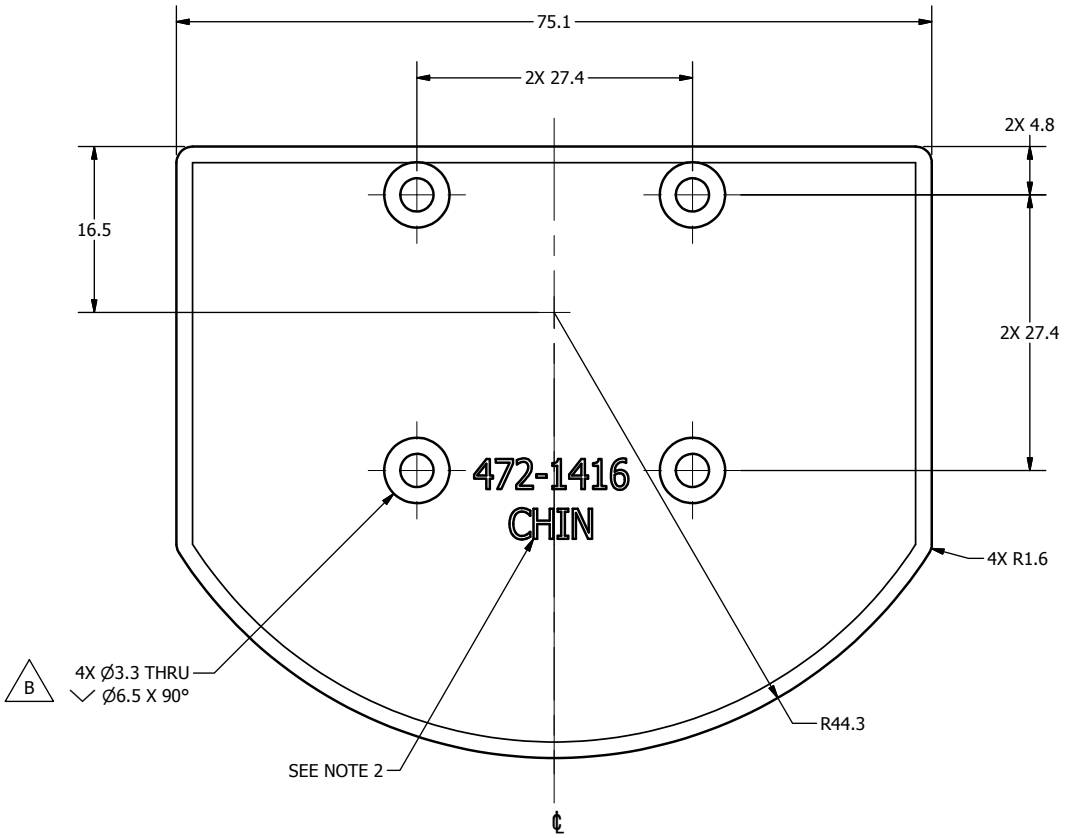
1. STAMP OR ETCH PART NUMBER AND "L-CHEEK" (3mm CHARACTERS) AS SHOWN. (OPTIONAL)

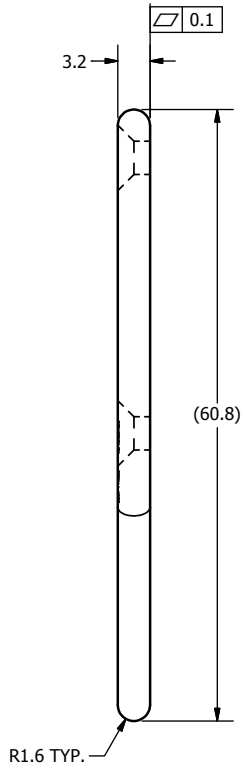
DO NOT SCALE DRAWING THIRD ANGLE PROJECTION		TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
PROJECT NO.:		DRAWN BY: B. KIMES	DATE: 8/25/2011	DESCRIPTION: LEFT CHEEK LOAD CELL PLATE	
472-1100	1	MATERIAL: 440C STAINLESS STEEL	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1 DRAWING NO.: 472-1414-1 REV: B
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 55-59	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 2.000
TOTAL QTY IN DUMMY	1	FINISH:			

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FCM116 R04 AND CONVERTED TO METRIC FOR THOR-M	8/25/2011	BK
	B	Ø3.3 C'SINK Ø6.5 X 90° WAS Ø3.8 C'SINK Ø7.1 X 82°	5/25/2012	BK



SCALE 1.000





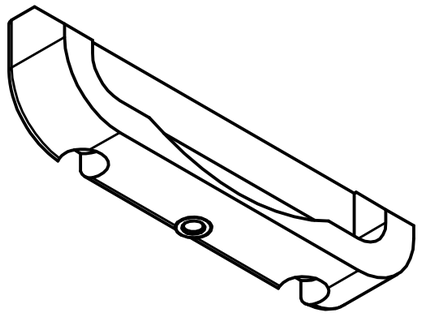
NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

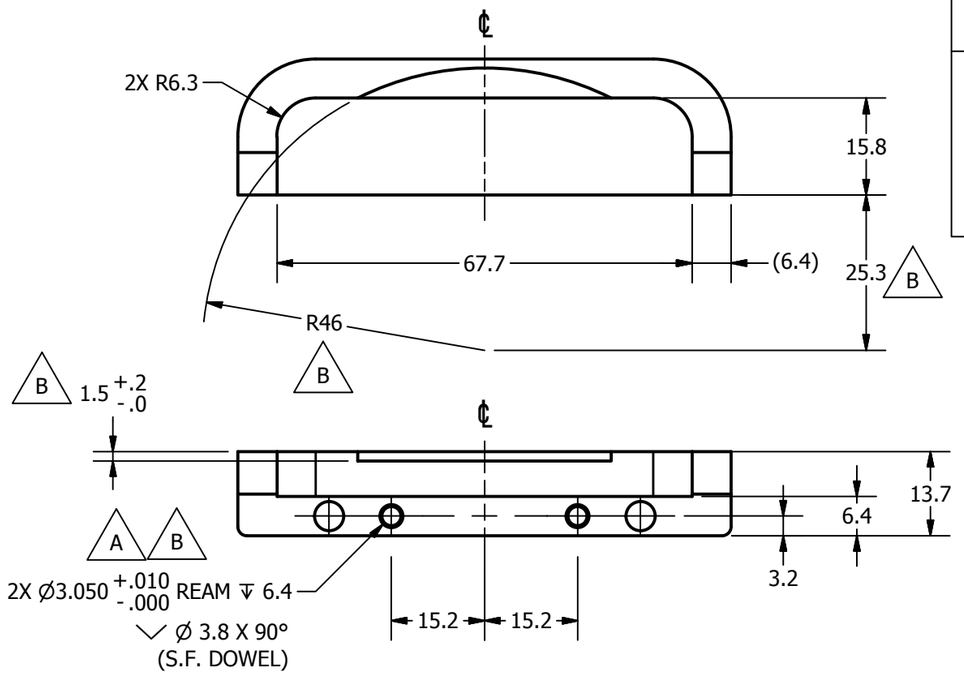
2. STAMP OR ETCH PART NUMBER AND "CHIN" (3mm CHARACTERS) AS SHOWN. (OPTIONAL)

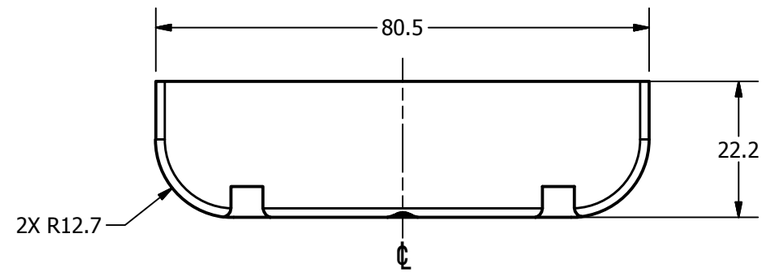
DO NOT SCALE DRAWING		TOLERANCES		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES		DESCRIPTION: CHIN LOAD CELL PLATE	
PROJECT NO.:		DRAWN BY: B. KIMES	DATE: 8/25/2011		
472-1100	1	MATERIAL: 440C STAINLESS STEEL		SIZE: A3	SHEET: 1 OF 1
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 55-59	CHECKED BY:	DATE:	DRAWING NO.: 472-1416
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 2.000
					REV: B

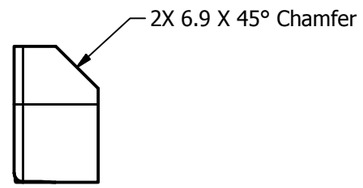
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FCM111 R04 AND CONVERTED TO METRIC FOR THOR-M; Ø3.03+.03/-.00 WAS Ø3.20+.03/-.00; 90˚ WAS 82˚; Ø4.3 C'BORE Ø8.5 WAS Ø4.0 C'BORE Ø7.0; 50.80 WAS 50.9	8/25/2011	BK
	B	ADDED CUTOUT FOR CHIN PLATE; DIM. 2X Ø3.050 +.010/-.000 REAM ↧ 6.4 ⌵Ø3.8 X 90˚ (S.F. DOWEL) WAS 2X Ø3.03 +.03/-.00 ↧6.4 ⌵ Ø3.8 X 90˚ (S.F. DOWEL); DIM. 2X Ø4.80 +.13/-.03 THRU ⌴Ø8.25 x ↧5.0 AS SHOWN WAS Ø4.3 THRU ⌴ Ø8.5 ↧ 5.0 AS SHOWN	1/20/2017	DW

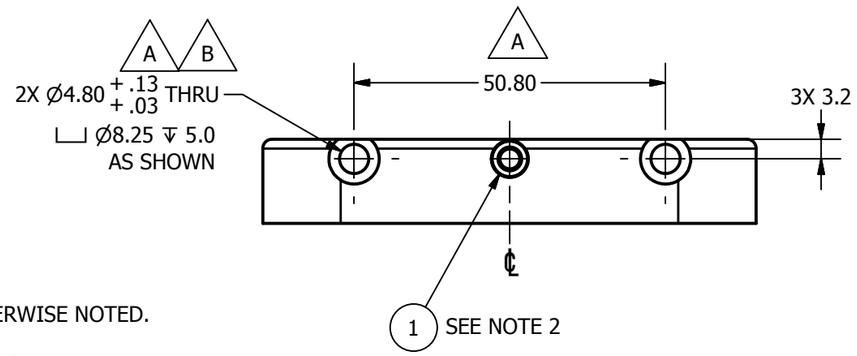


SCALE 1.000









NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. DRILL Ø5.94 - Ø5.74 TAPERED HOLE ↧9.0, HEAT INSERT WITH SOLDER IRON AND INSERT FLUSH WITH SURFACE. (SEE MANUFACTURER INSTRUCTIONS)

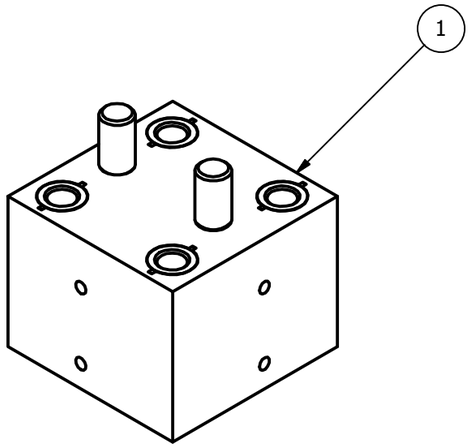
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5001114	INSERT, M4 X .7 X 4.7 (THERMOSET)

PARTS LIST

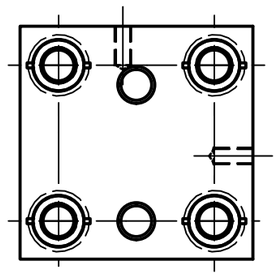
DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION		TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5˚; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: CHIN GUARD	
472-1100	1	MATERIAL: ACETAL, BLACK	DRAWN BY: B. KIMES / DATE: 8/25/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: / DATE:	SIZE: A3 / SHEET: 1 OF 1	DRAWING NO.: 472-1411 / REV: B
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG / DATE: 1/10/2012	SCALE:	

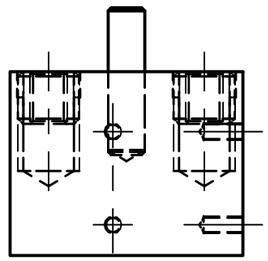
472-1411-.iam

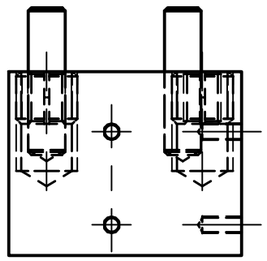
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1HDM101 R01 AND CONVERTED TO METRIC FOR THOR-M	8/30/2011	BK
	B	UPDATE VIEWS TO SHOW CHANGE TO 472-1119	6/12/2012	BK
	C	REMOVED SA572-S4, ACCELEROMETERS	5/20/2014	DW



SCALE 2.000







ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	472-1119	TOP BI-AXIAL ACCEL MOUNT, HEAD

PARTS LIST

472-1100	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5° 1.6
X.X ± 0.2
X.XX ± 0.1
X.XXX ± 0.01
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

DRAWN BY: B. KIMES — DATE: 8/25/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/10/2012

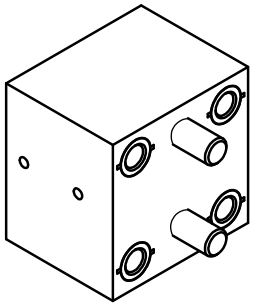
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION:
BIAXIAL ACCELEROMETER ASSEMBLY, HEAD
THOR-50M

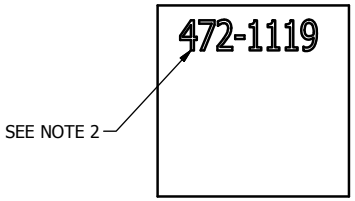
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 2.000 | DRAWING NO.: 472-1101 | REV: C

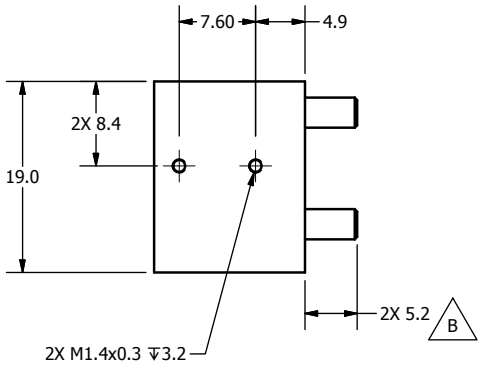
472-1101 ARS.iam

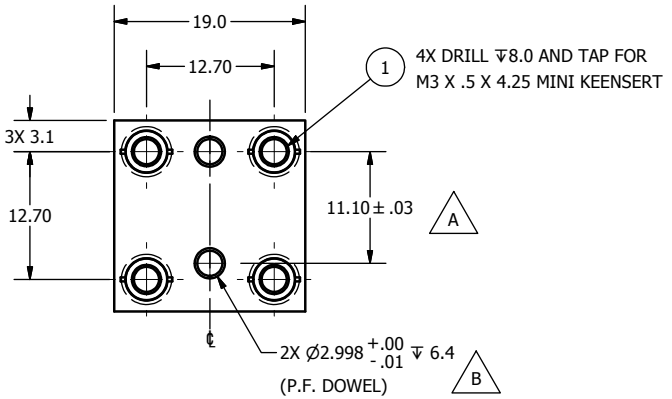
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1HDM119 R02 AND CONVERTED TO METRIC FOR THOR-M; 11.10±.03 WAS 11.10	8/25/2011	BK
	B	ADD 5000183; Ø2.998+.00/-.01 ↓6.4 (P.F. DOWEL) WAS Ø3.20+.03/-.00 ↓6.4 (S.F. DOWEL); ADD 2X 5.2	5/21/2012	TMV

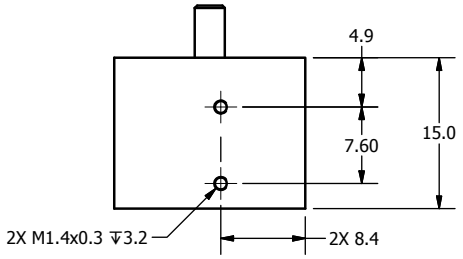


SCALE 2.000









B

ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	5000183	PIN, DOWEL M3 X 12 mm
1	4	5001107	M3 X 0.5 X 4.25 LG. MINI KEENSERT

PARTS LIST

NOTES:

1. DIMENSIONS SYMMETRIC ACROSS ℄, UNLESS OTHERWISE NOTED.

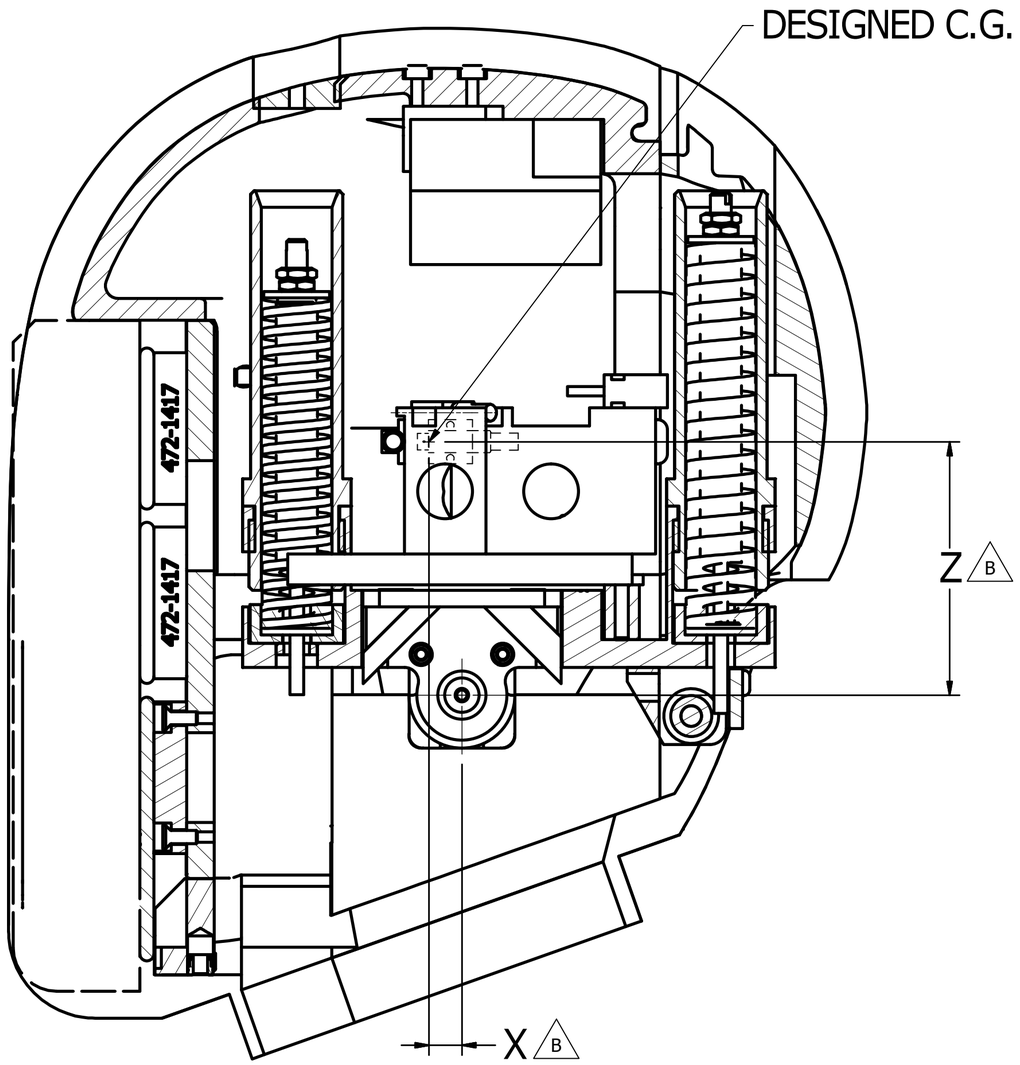
2. STAMP OR ETCH PART NUMBER (3mm CHARACTERS) WHERE SHOWN. (OPTIONAL)

		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: TOP BI-AXIAL ACCEL MOUNT, HEAD	
472-1101	1	MATERIAL: 7075-T6 ALUMINUM	DRAWN BY: B. KIMES	DATE: 8/25/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1 DRAWING NO.: 472-1119 REV: B
TOTAL QTY IN DUMMY	1	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 2.000

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1HDM118 R3, AND CONVERTED TO METRIC FOR THOR-M	7/30/2015	DW
	B	REVISED NOTES 6 & 7 AND ADDED C.G. DIMENSIONS	2/23/2017	DW

HEAD BALLASTING NOTES:

1. DESIGN AND INSTALL THE BALLAST WEIGHT, 472-1120, IN THE HEAD SO THAT THE FOLLOWING DESIGN HEAD WEIGHT AND CG REQUIREMENTS ARE ACHIEVED.
2. ALL OF THE PARTS AND ASSEMBLIES LISTED ARE TO BE INCLUDED IN THE WEIGHT AND CG LOCATION DETERMINATION.
3. NON-ACTIVE INSTRUMENTS (WITHOUT WIRES) ARE TO BE USED IN PLACE OF ACTUAL INSTRUMENTATION.
4. THE FRONT AND REAR CABLES WERE SHORTENED SO THAT THE CABLE WOULD NOT EXTEND BELOW THE OCCIPITAL CONDYLE LOCATION.
5. THE DESIGN CG LOCATION IS IDENTIFIED BY A SMALL HOLE IN THE SKULL AND SKIN ON EACH SIDE OF THE HEAD.
6. (B) REFER TO DRAWING 472-0000 SHT. 5 OF 5 FOR C.G. AND WEIGHT SPECIFICATIONS.
7. THE C.G. ORIGIN IS THE CENTER OF THE OCCIPITAL CONDYLE AND THE COORDINATE SYSTEM IS ORIENTATED WITH THE "Z" DIMENSION PERPENDICULAR TO THE ACCELEROMETER MOUNTING PLATE ASSEMBLY.



PART NUMBER	ASSEMBLY	DESCRIPTION	QTY
5000410	472-2000	M3 X 0.5 X 8 LG. BHCS	3
472-2012	472-2000	NECK PULLEY PLATE	1
5000135	472-1000	SCREW, FHCS M6-1 x 25	4
SA572-S114	472-2000	ROTARY POTENTIOMETER	1
472-2130	472-2100	REAR CABLE ASSEMBLY, NECK SEE NOTE 4	1
5000380V	472-2000	NUT, HEX JAM M5	4
472-2150	472-2100	FRONT CABLE ASSEMBLY, NECK SEE NOTE 4	1
5000674	472-2000	SCREW, BHCS M3-0.5 x 5	4
5000749	472-2000	SCREW, BHCS M3-0.5 x 30	4
472-2014	472-2000	ROTARY POTENTIOMETER COVER, NECK	1
5000082	472-2000	SCREW, SHCS M2-0.4 x 6	4
472-2020	472-2000	ROTARY POTENTIOMETER CLAMP, NECK	2
472-2021	472-2000	ROTARY POTENTIOMETER WASHER, NECK	1
472-2013	472-2000	ROTARY POTENTIOMETER HOUSING, NECK	1
472-2200	472-2000	MOUNTING PLATFORM ASSEMBLY, NECK	1
472-1310	472-1000	CAP SKIN	1
472-1320	472-1000	SKIN ASSEMBLY	1
5001116	472-1000	SCREW, PHILLIPS NYLON M3 X .5 X 6	2
5000081	472-1000	SCREW, SHCS M6x1 x 16	4
472-1110	472-1000	HEAD CAP	1
472-1200	472-1000	ACCELEROMETER MOUNTING PLATE ASSEMBLY, HEAD	1
472-1401	472-1000	CONFOR FOAM, FACE	1
472-1100	472-1000	SKULL ASSEMBLY	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT

FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN Dave Walker	7/30/2015
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

HEAD C.G. PART GROUP FOR BALLAST WEIGHT DESIGN
THOR-50M

THIRD ANGLE PROJECTION

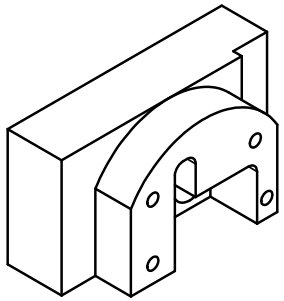
SIZE A2 | DRAWING NUMBER 472-1115 | REV B

SCALE:

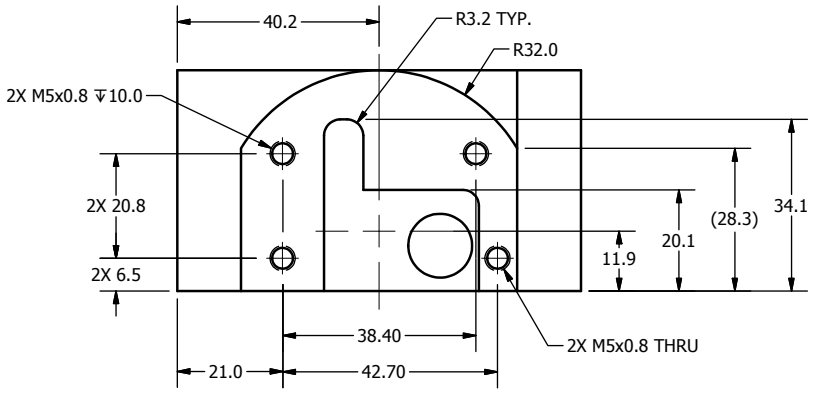
SHEET 1 OF 1

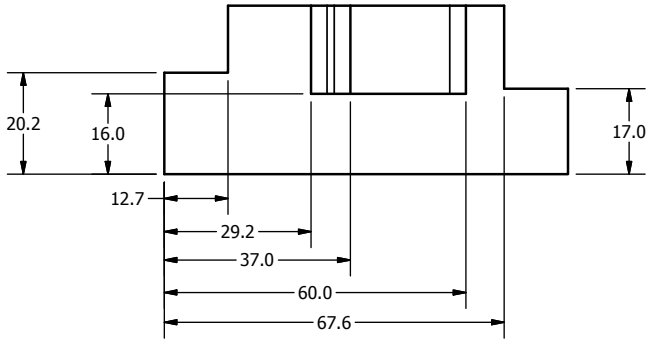
472-1115_Head CG.iam

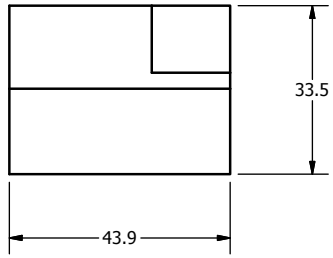
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1HDM120 R05 AND CONVERTED TO METRIC FOR THOR-M	8/25/2011	BK

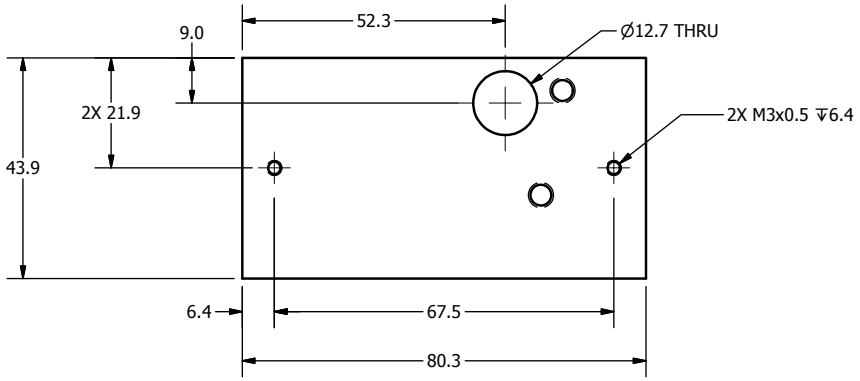


SCALE .750







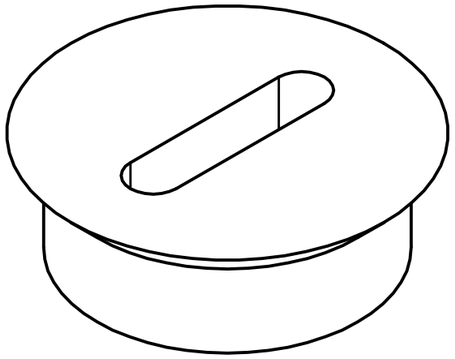


NOTES:

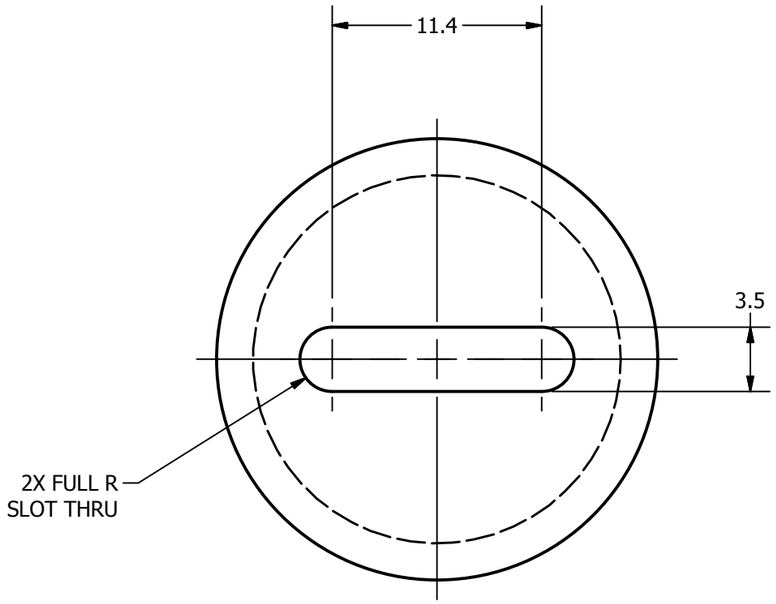
1. POWDER OR BEAD BLAST.
2. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.
3. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

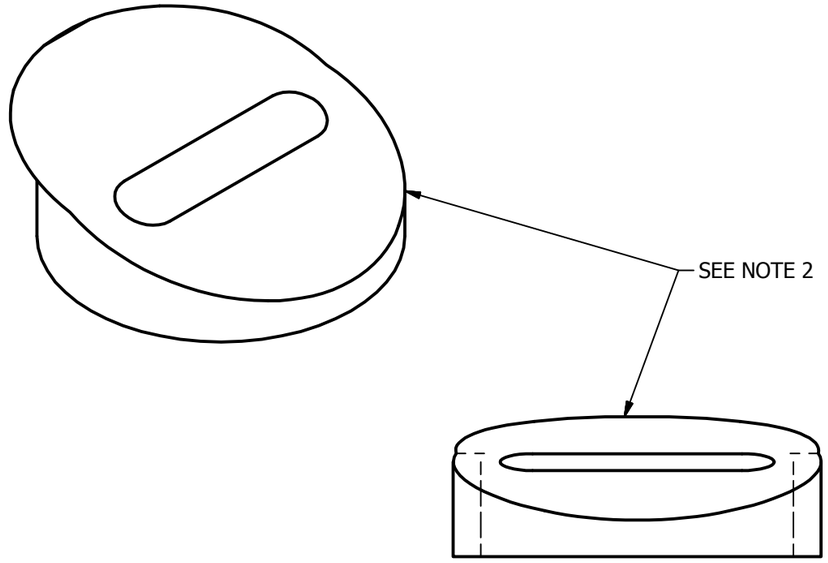
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
		PROJECT NO.:		DESCRIPTION: HEAD BALLAST
472-1100	1	MATERIAL: 1018 STEEL	DRAWN BY: B. KIMES DATE: 8/25/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET: 1 OF 1
TOTAL QTY IN DUMMY	1	FINISH: SEE NOTES	ENGINEER: J. WANG DATE: 1/10/2012	SCALE: 1.000 DRAWING NO.: 472-1120 REV: A

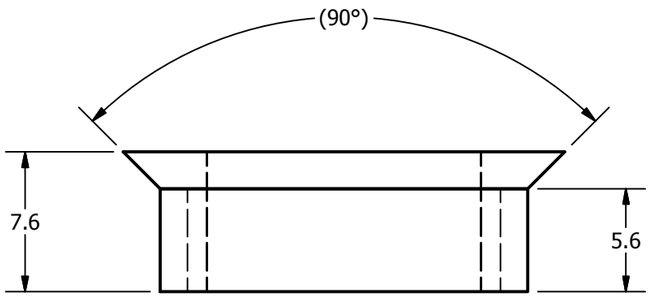
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1HDM116 R04 AND CONVERTED TO METRIC FOR THOR-M	8/26/2011	BK



SCALE 3.000







NOTES:

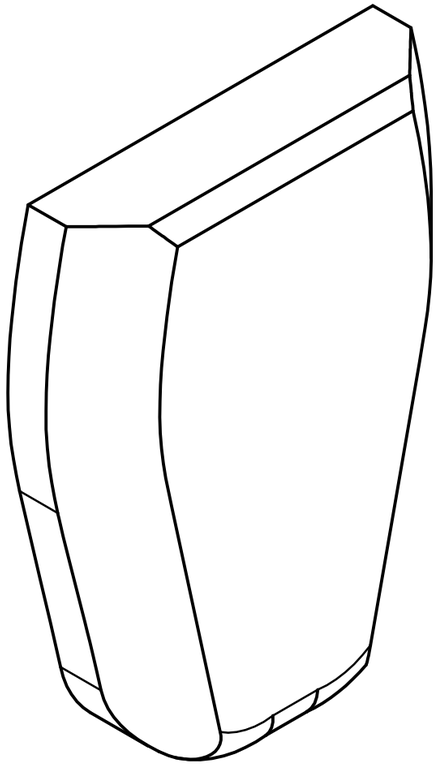
1. MAKE FROM M20 X 2.5 X 40 FHCS (5001115), MODIFY AS SHOWN.

2. PART IS MANUALLY MODIFIED AFTER ASSEMBLING IN SKULL, PROFILE IS GROUND FLUSH WITH OUTER SKULL SURFACE.

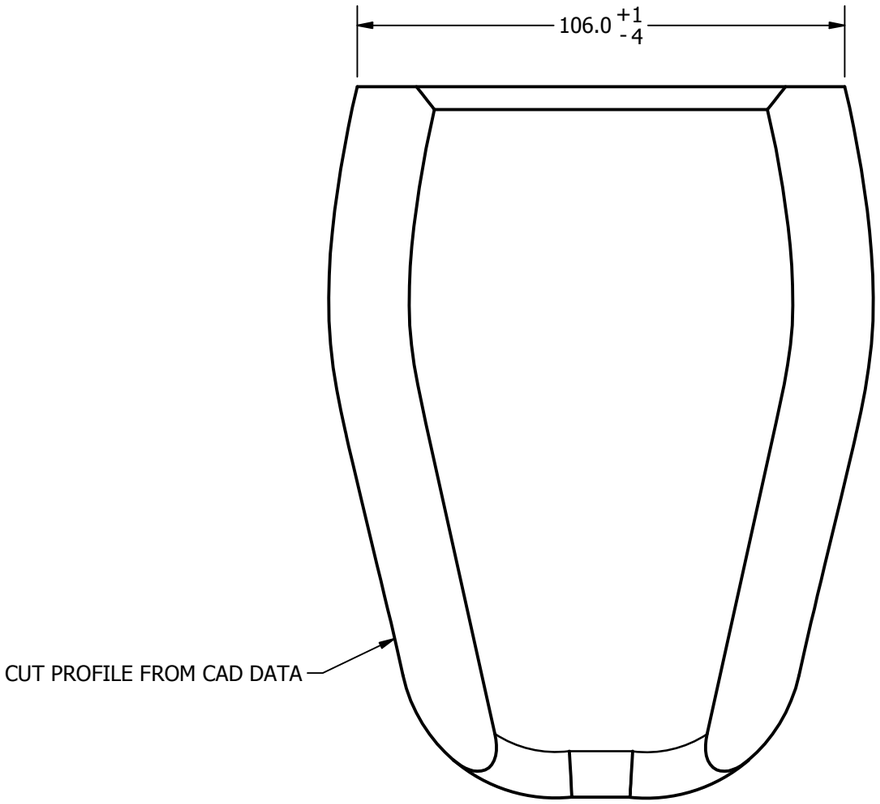
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ± 0.5 ± 0.5' 1.6 X.X ± 0.2 X.XX ± 0.1 X.XXX ± 0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: PLUG, HEAD	
472-1100	1	MATERIAL: SEE NOTES	DRAWN BY: B. KIMES DATE: 8/25/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET 1 OF 1 SCALE: 3.000	DRAWING NO.: 472-1116 REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG DATE: 1/10/2012		

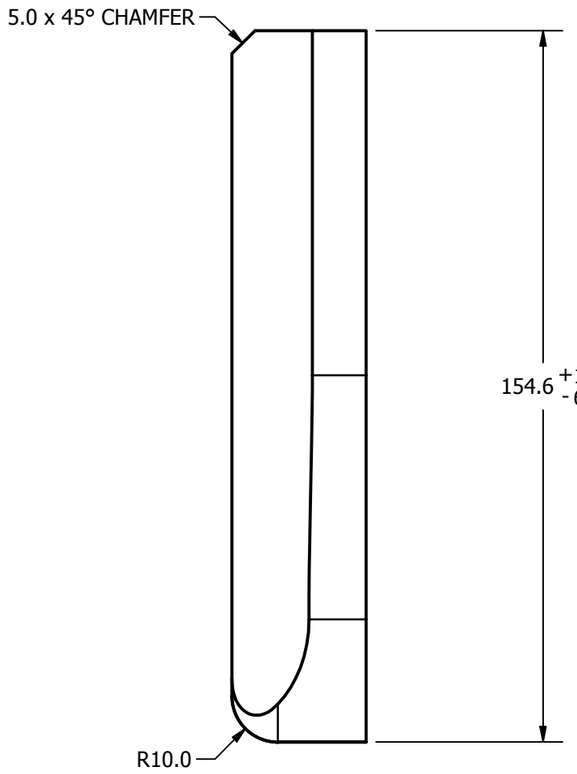
472-1116.iam

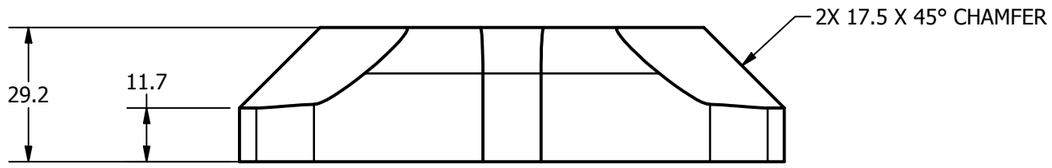
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FCM061 R03 FOR THOR-M	8/30/2011	BK
	B	MATERIAL WAS CF45 CONFOR FOAM (BLUE)	11/5/2012	BK
	D	ADDED NOTES 2 & 3	8/6/2018	DW



SCALE .750







NOTES:

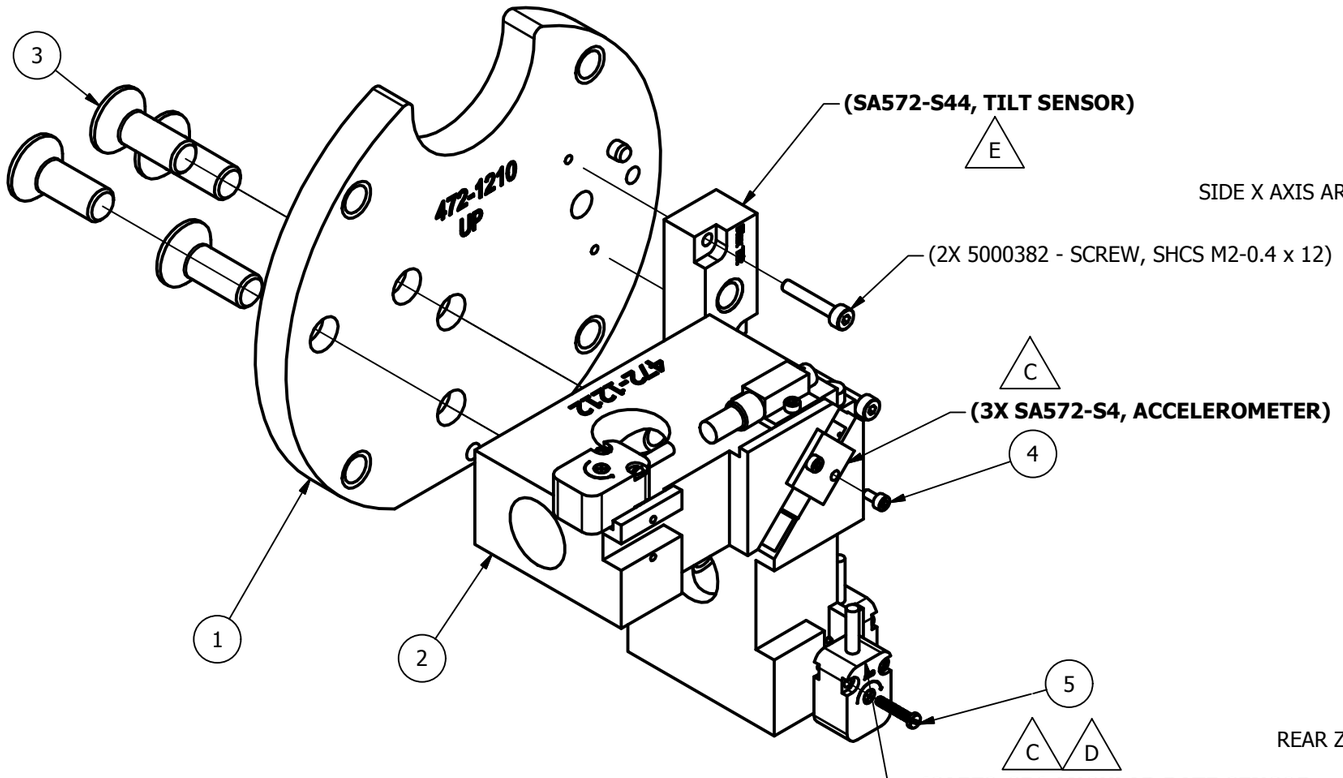
1. FOAM TOLERANCE ±1mm, UNLESS OTHERWISE SPECIFIED.
2. MATERIAL: CF47 Confor Foam (GREEN) OR EQUIVALENT.
3. QUALIFICATION SPECIFICATION TAKE PRECEDENCE.

D

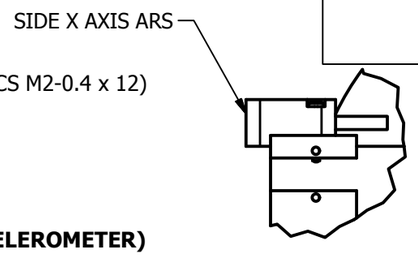
		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5' FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: CONFOR FOAM, FACE	
		PROJECT NO.:			
472-1400	1	MATERIAL: SEE NOTES	DRAWN BY: B. KIMES	DATE: 8/30/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 — DRAWING NO.: 472-1401 — REV: D
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: .750

472-1401.ipt

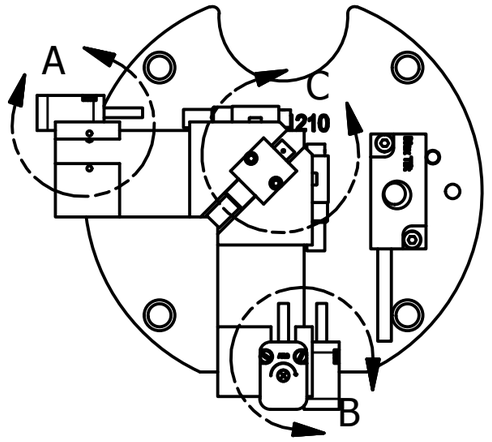
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1HDM200 R12 AND CONVERTED TO METRIC FOR THOR-M	8/31/2011	BK
	B	REORIENT ACCELEROMETERS PER NHTSA PRINT	12/20/2012	BK
	C	CHANGED QUANTITY OF SA572-S4, ACCELEROMETERS TO 3; ADDED ANGULAR RATE SENSORS; CHANGED DEFAULT TILT SENSOR TO SA572-S44; REMOVED PART #5001086 – SCREW, FHCS M4x0.7 x 12 LG FROM PARTS LIST	9/22/2014	DW
	D	REMOVED ANGULAR RATE SENSOR SA572-S55 FROM ARS LIST	8/17/2016	DW
	E	ADDED VIEW D-D; REMOVED (SA572-S113, TILT SENSOR, OPTIONAL ATTACH WITH 1X 5001086 – M4-0.7 x 12) FROM NOTE	3/14/2017	DW

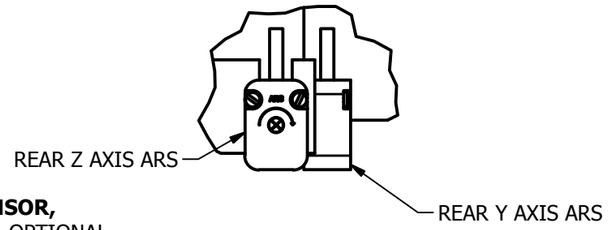


SCALE 1.000

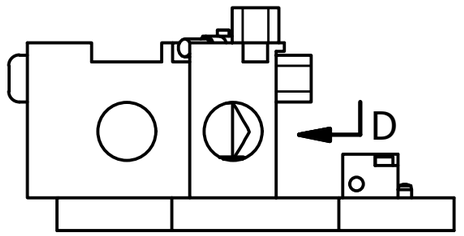


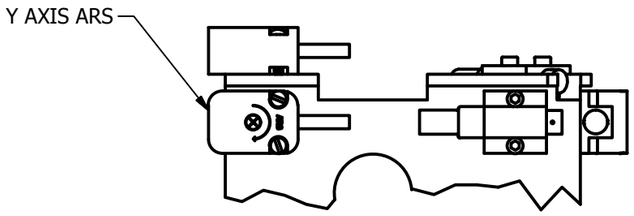
DETAIL A
SCALE 1.000



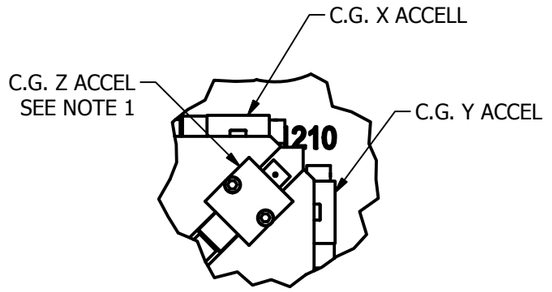


DETAIL B
SCALE 1.000





VIEW D-D
SCALE 1.000



DETAIL C
SCALE 1.000

NOTES:

1. Z AXIS ACCELEROMETERS ARE MOUNTED UPSIDE DOWN ON THE FIXTURE IN ORDER TO HAVE THE SIGN CONVENTION MATCH SAE J211.
2. ORIENTATION OF THE ACCELEROMETERS CORRESPONDS TO SAE J211.

ITEM	QTY	PART NUMBER	DESCRIPTION
5	6	6000000	SCREW, CHEESE HEAD M1.4-0.3 x 8
4	6	5000068	SCREW, SHCS M1.4 - 0.3 X 3 LG.
3	4	9000826	SCREW, FHCS M6x1.0 X 16
2	1	472-1212	7 ACCELEROMETER ARRAY FIXTURE
1	1	472-1210	ACCELEROMETER MOUNTING PLATE, HEAD

PARTS LIST

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ±0.5	±0.5'	1.6
X.X ±0.2		
X.XX ±0.1		
X.XXX ±0.01		

REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PROJECT NO.:	
472-1000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

MATERIAL:
HEAT TREAT:
FINISH:

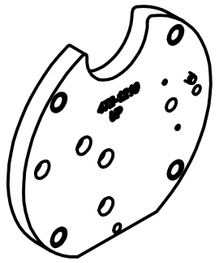
DRAWN BY: B. KIMES — DATE: 8/31/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/10/2012

DESCRIPTION: ACCELEROMETER MOUNTING PLATE ASSEMBLY, HEAD THOR-50M

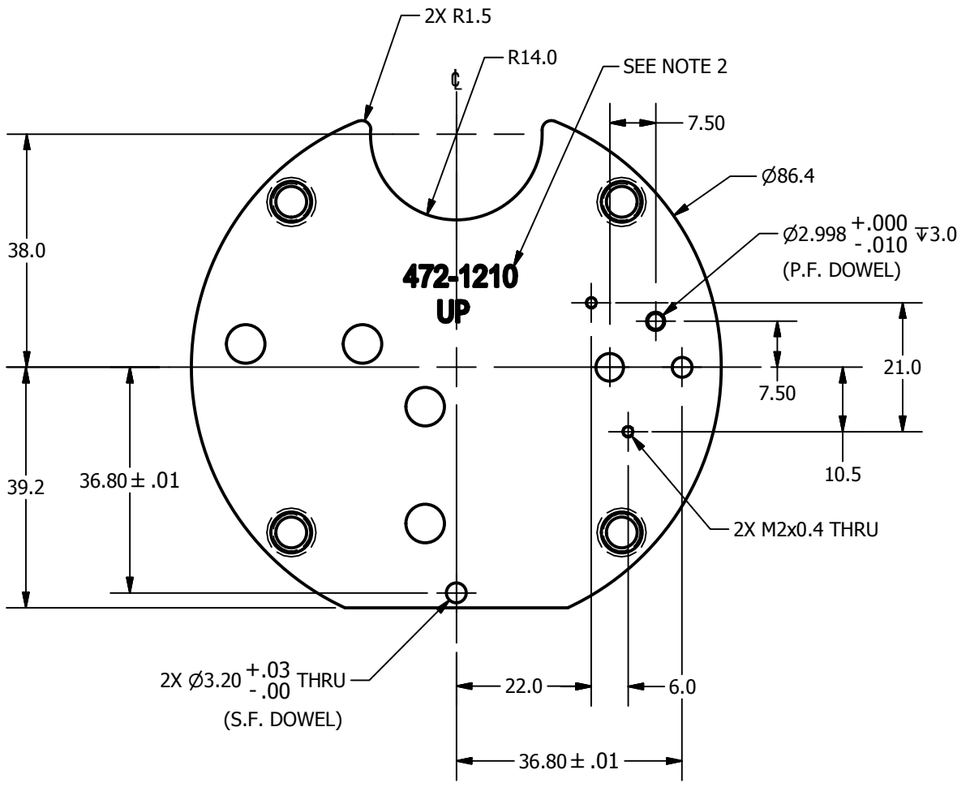
SIZE: A3 | SHEET: 1 OF 1 | SCALE: .750 | DRAWING NO.: 472-1200 | REV: E

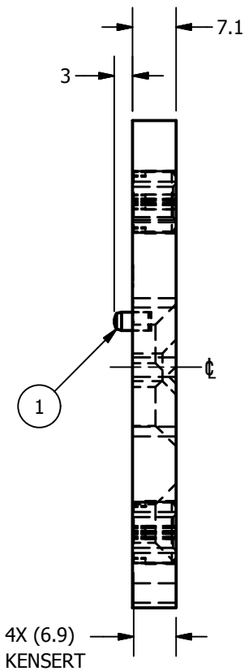
472-1200 ARS.iam

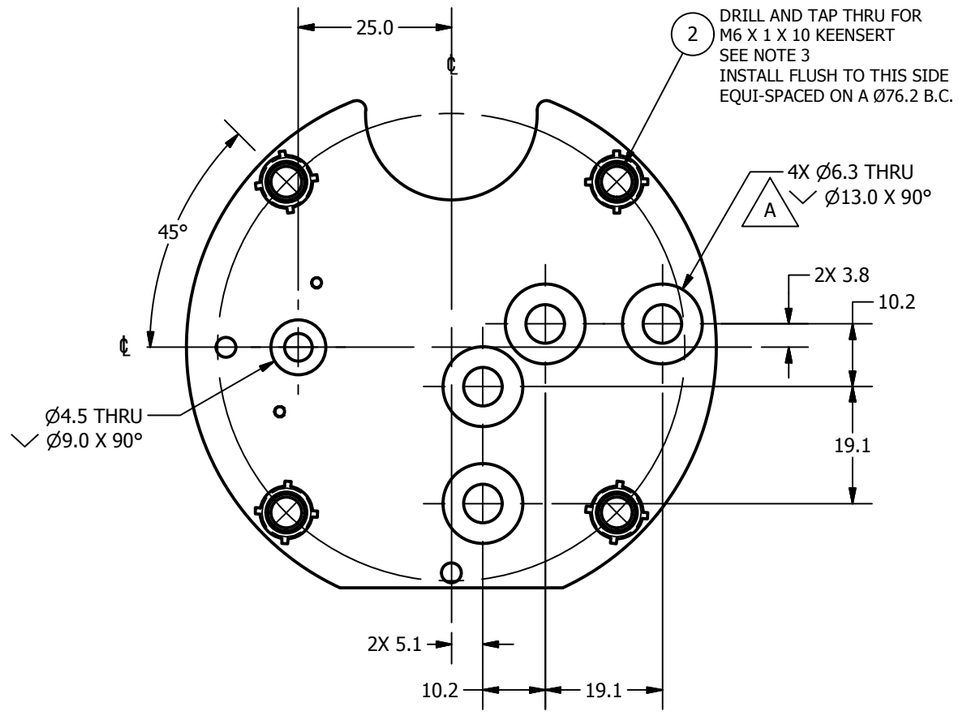
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1HDM210 R10 AND CONVERTED TO METRIC FOR THOR-M; Ø6.3 THRU C'SINKØ13.0 X 90° WAS Ø6.8 THRU C'SINKØ13.5 X 82°; ADD NOTE 3	8/30/2011	BK



SCALE .500







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. STAMP OR ETCH PART NUMBER AND "UP" (3mm CHARACTERS) WHERE SHOWN. (OPTIONAL)
3. (4X) GRIND KEENSERT HEIGHT TO 6.9mm BEFORE INSTALLING.
4. INSTALL KEENSERTS AND DOWEL PINS AFTER FINISH.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	4	5001108	M6 X 1 X 10 LG. LIGHTWEIGHT KEENSERT
1	1	5000385	M3 X 6 LG. DOWEL

PARTS LIST

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

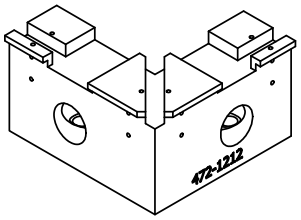
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5° 1.6
X.X ± 0.2
X.XX ± 0.1
X.XXX ± 0.01

REMOVE BURRS & BREAK SHARP EDGES

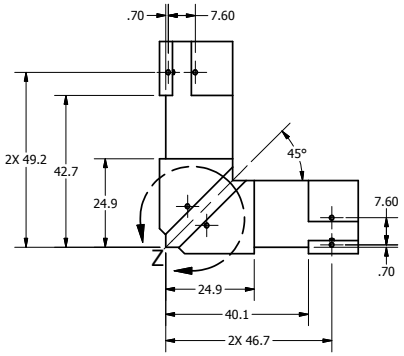
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

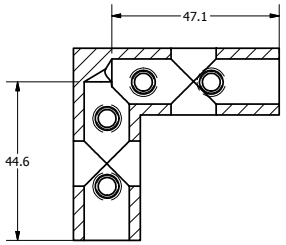
		PROJECT NO.:			DESCRIPTION: ACCELEROMETER MOUNTING PLATE, HEAD
472-1200	1	MATERIAL: 7075-T6 ALUMINUM	DRAWN BY: B. KIMES	DATE: 8/30/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-1210 REV: A
TOTAL QTY IN DUMMY	1	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 1.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1HDM212 R14 AND CONVERTED TO METRIC FOR THOR-M; ADD NOTE 2	8/31/2011	BK

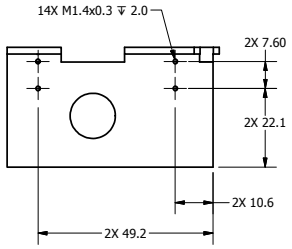


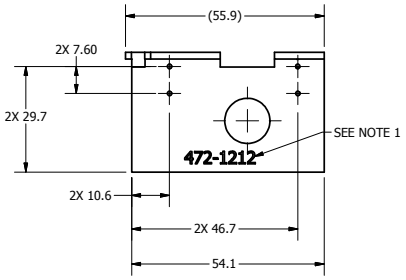
SCALE 1.000

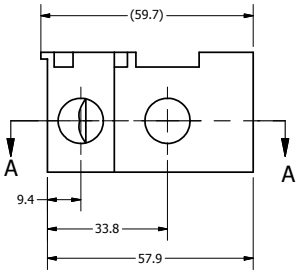


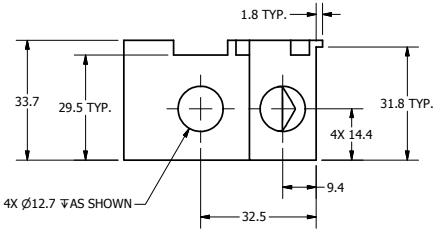


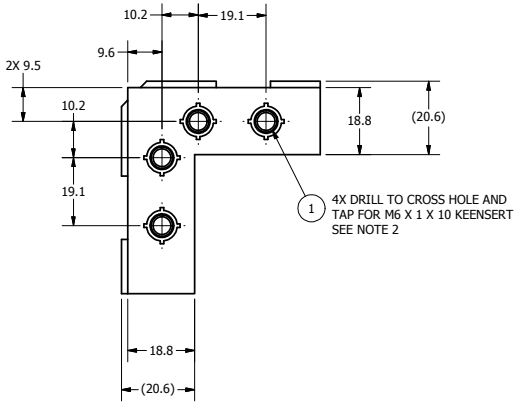
SECTION A-A
SCALE 1.000

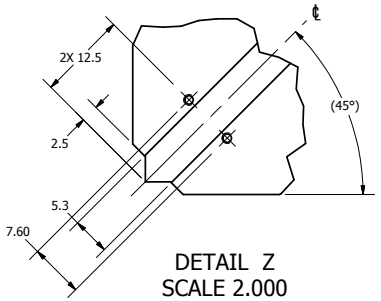












DETAIL Z
SCALE 2.000

DIMENSIONS SYMMETRIC ABOUT ℄

NOTES:

1. STAMP OR ETCH PART NUMBER (3mm CHARACTERS) WHERE SHOWN. (OPTIONAL)

A 2. (4X) GRIND KEENSERT HEIGHT TO 8.0mm BEFORE INSTALLING. INSTALL AFTER ANODIZE.

ITEM	QTY	PART NUMBER	DESCRIPTION
1	4	5001108	M6 X 1 X 10 LG. LIGHTWEIGHT KEENSERT

PARTS LIST

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6

REMOVE BURRS & BREAK SHARP EDGES

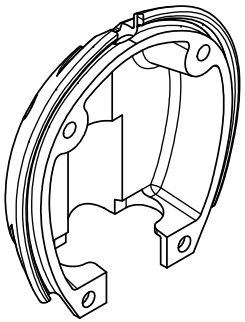
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: 7 ACCELEROMETER ARRAY FIXTURE

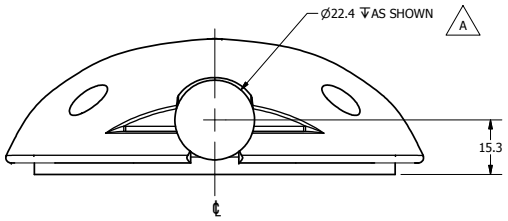
		PROJECT NO.:	
472-1200	1	MATERIAL: 7075-T6 ALUMINUM	DRAWN BY: B. KIMES — DATE: 8/31/2011
NEXT ASSEMBLY	QTY	ITEM TREAT:	CHECKED BY: — DATE:
TOTAL QTY IN DUMMY	1	WEIGHT: CLEAR ANODIZE	ENGINEER: J. WANG — DATE: 1/10/2012

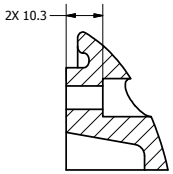
SIZE: A2 — SHEET: 1 OF 1 — SCALE: 1.000 — DRAWING NO.: 472-1212 — REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1HDM110 R09 AND CONVERTED TO METRIC FOR THOR-M; DIMENSION Ø22.4 AS SHOWN WAS Ø22.4 THRU; 32.0 WAS 32.1; 38.0 WAS 38.1; 2X 16.3 WAS 2X 16.2; R15.9 ↓ AS SHOWN WAS Ø30.1 ↓ 60.7; 2X Ø6.5 THRU WAS 2X Ø6.8 THRU; 2X Ø6.5 THRU C'BORE Ø10.7 ↓ AS SHOWN IN SEC. A-A WAS 2X Ø6.8 THRU C'BORE Ø10.7 ↓ 16.3 FROM DATUM A; ADDED DIMENSIONS 60.0, 38.1, 12.0 AND SECTION A-A	8/30/2011	BK

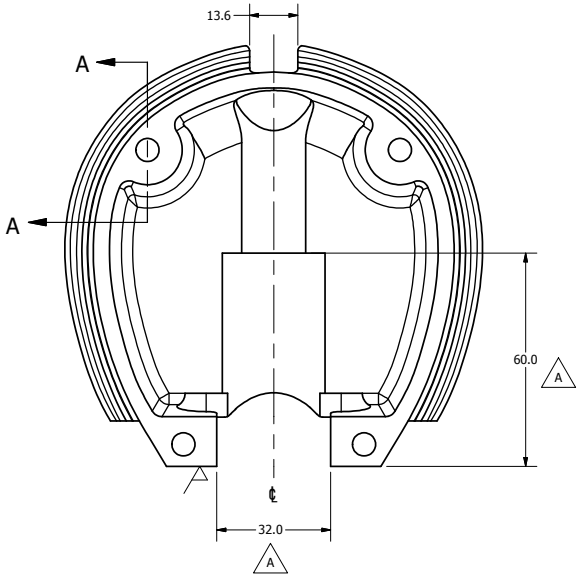


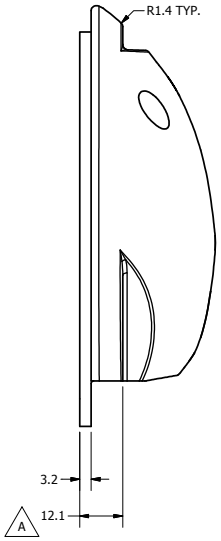
SCALE .750

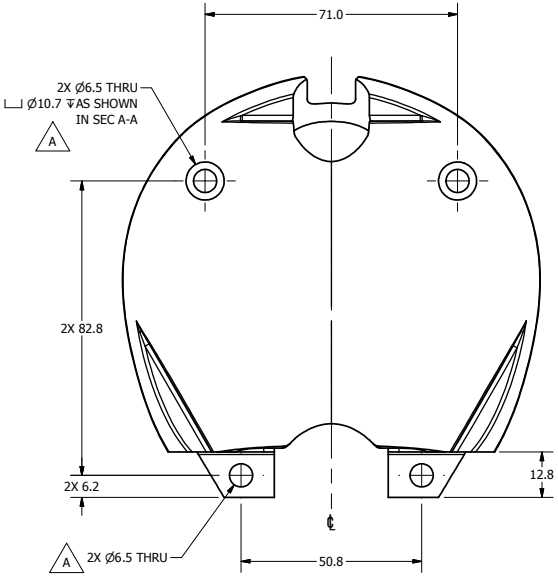


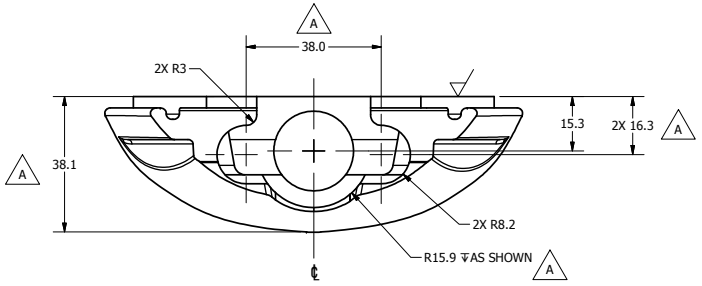


SECTION A-A
SCALE 1.000 A







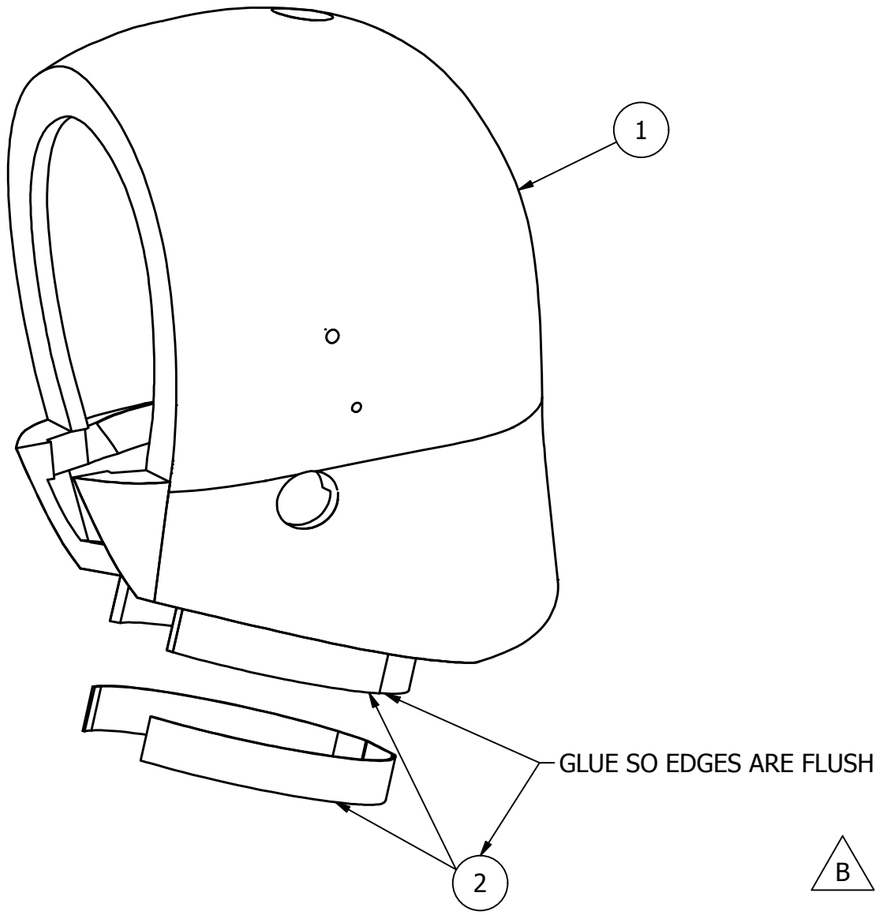


NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
		REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: HEAD CAP		
472-1000	1	MATERIAL: 357 CAST ALUMINUM	DRAWN BY: B. KIMES	DATE: 8/30/2011	
NEXT ASSEMBLY	QTY	PART TREAT:	CHECKED BY:	DATE:	SIZE: A2 SHEET 1 OF 1 DRAWING NO.: 472-1110 REV: A
TOTAL QTY IN DUMMY	1	WEIGHT:	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 1.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1HDM020 R20 FOR THOR-M	11/13/2012	BK
	B	REMOVE 472-1322, 472-1323	2/21/2013	BK
	C	IN TITLE BLOCK THOR-50M WAS THOR	7/17/2018	DW



B

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-1324	HEAD/NECK SKIN ZIPPER
1	1	472-1321	HEAD SKIN, MOLDED

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

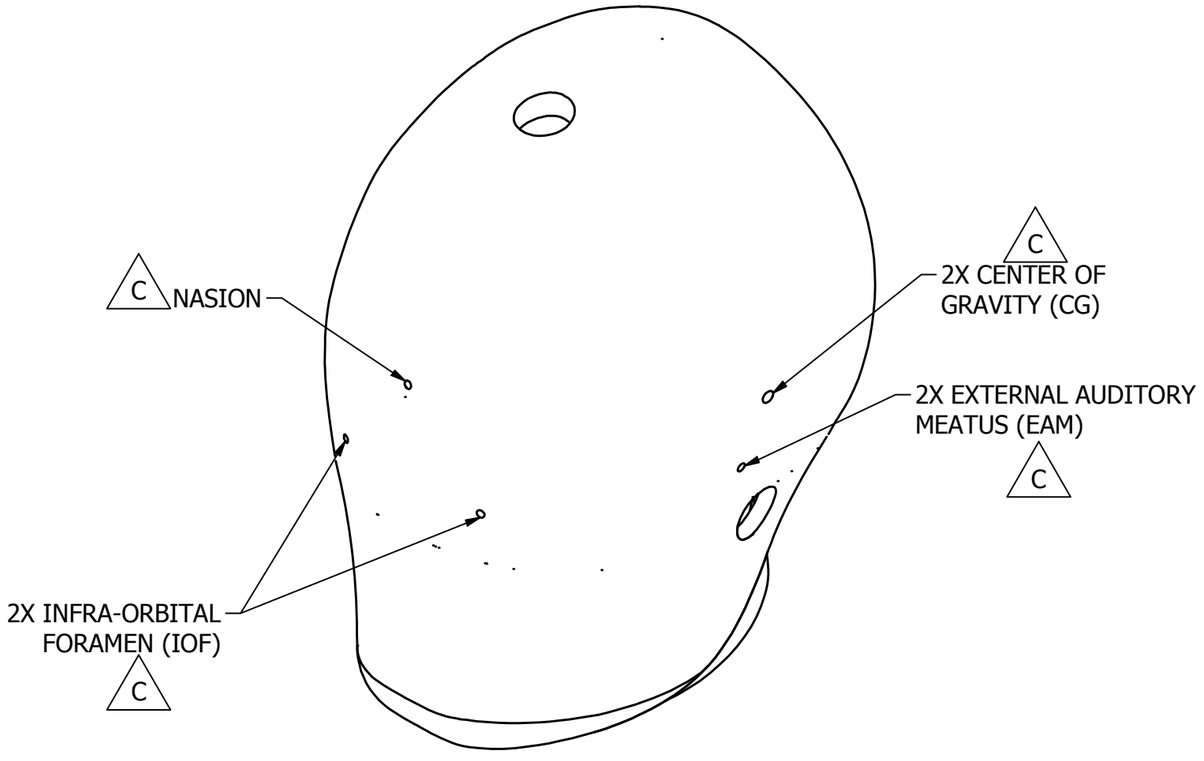
REMOVE BURRS & BREAK SHARP EDGES

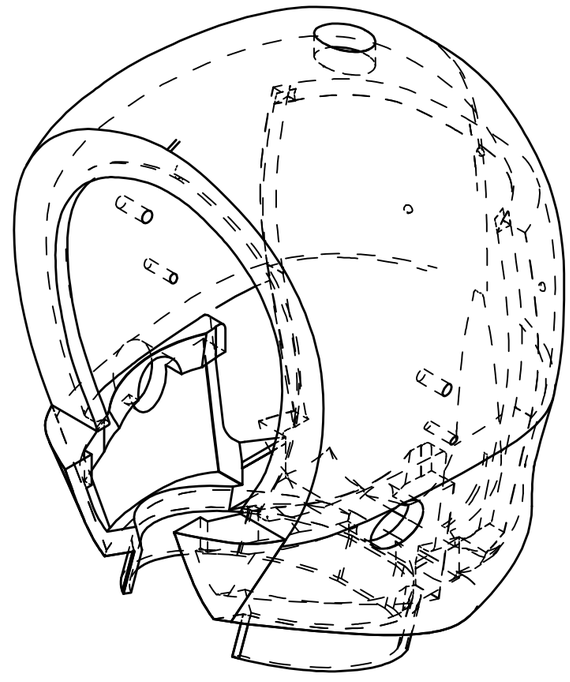
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

		PROJECT NO.:			
472-1000	1	MATERIAL:	DRAWN BY: srice	DATE: 4/12/2012	DESCRIPTION: SKIN ASSEMBLY THOR-50M
NEXT ASSEMBLY	QTY	HEAT TREAT: N/A	CHECKED BY: TMV	DATE: 4/13/2012	SIZE: B / SHEET: 1 OF 1 / DRAWING NO.: 472-1320 / REV: C
TOTAL QTY IN DUMMY	1	FINISH: N/A	ENGINEER: J. WANG	DATE: 1/23/2012	SCALE:

472-1320.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	8	CONVERTED FROM ENGLISH TO METRIC REMOVED VIEWS NOT USED	2/8/10	C. SPADE
	A	RENUMBERED FROM TIHDS021 R9 FOR THOR-M	11/27/2012	BK
	B	ADDED MATERIAL	4/16/2013	KHS
	C	ADDED HEAD LANDMARKS, CENTER OF GRAVITY (CG), EXTERNAL AUDITORY MEATUS (EAM), INFR-ORBITAL FORAMEN (IOF), & NASION	7/10/2015	DW
	D	IN TITLE BLOCK THOR-50M WAS THOR	7/17/2018	DW

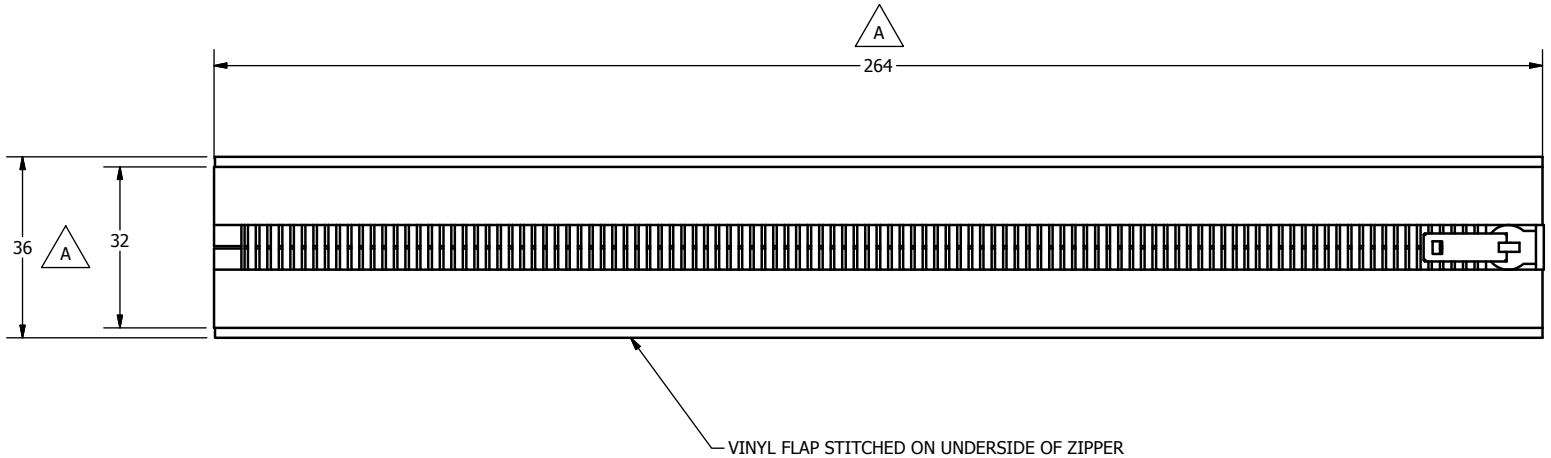




		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: HEAD SKIN, MOLDED THOR-50M	
472-1320	1	MATERIAL: URTHANE 67±5 "A"	DRAWN BY: srice / DATE: 4/12/2012		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV / DATE: 4/24/2013	SIZE: B / SHEET 1 OF 1	DRAWING NO.: 472-1321 / REV: D
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG / DATE: 1/23/2012	SCALE:	

472-1321.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
70706	A	264 WAS 10.4", 36 WAS 1.40"; ADD 32 DIMENSION; ADD MATERIAL AND TOLERANCE SPEC	12/20/2012	BK



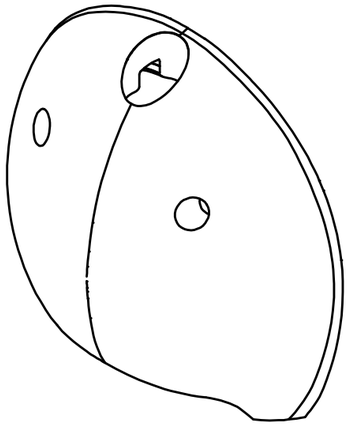
NOTES:

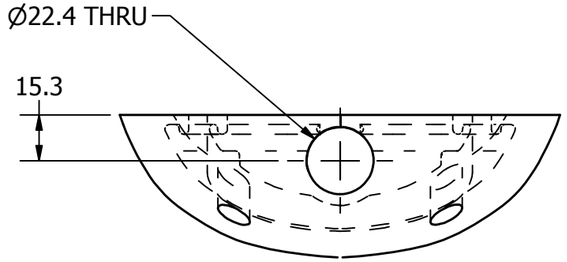
A 1. #5 BLACK OXIDE BRASS ZIPPER
STANDARD AUTOLOCK SLIDER
TOP AND BOTTOM SEPERATING
COLOR: BLACK
(LENZIP)

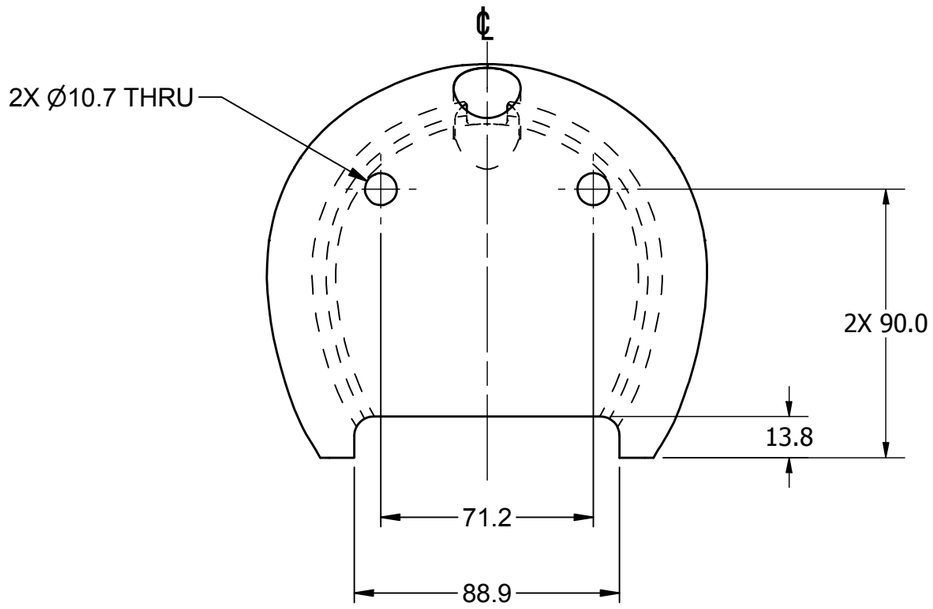
2. TOLERANCE: ±2mm

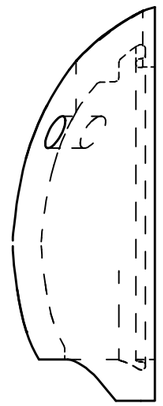
		PROJECT NO.:	DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES — UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
472-1320	1	MATERIAL: SEE NOTES	DRAWN BY: B. Kimes	DATE: 7/10/2012	DESCRIPTION: NECK/HEAD SKIN ZIPPER
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 — DRAWING NO.: 472-1324 — REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/26/2012	SCALE: 1.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1HDS010 R8 FOR THOR-M; ADD NOTE 1	11/13/2012	BK
	B	IN TITLE BLOCK THOR-50M WAS THOR	7/18/2018	DW









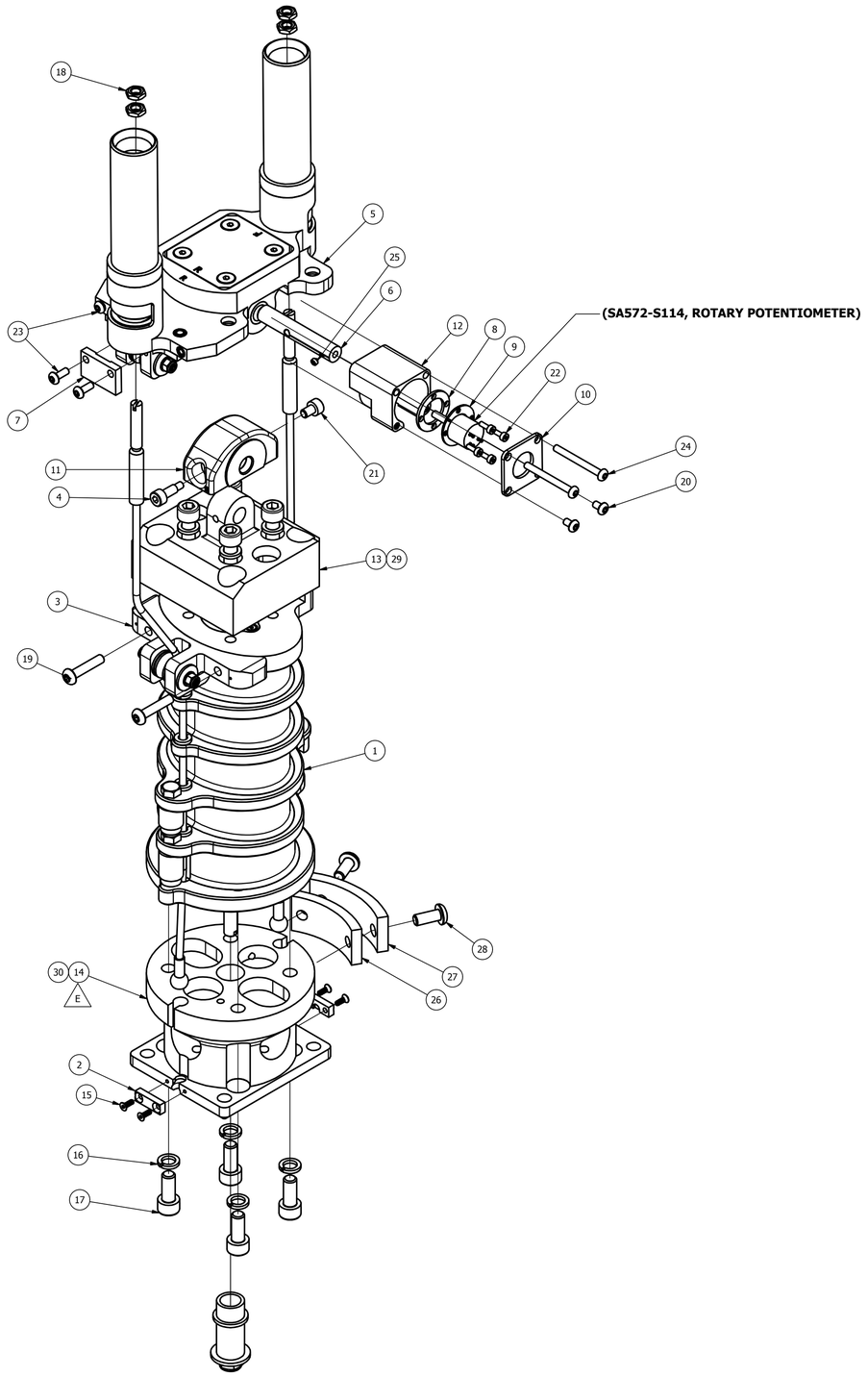
NOTES:

1. DIMENSIONS SYMMETRICAL ABOUT ℄, UNLESS OTHERWISE NOTED.

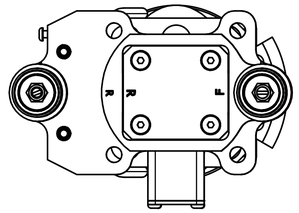
		PROJECT NO.:	DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ± 0.2 X.XX ± 0.1 X.XXX ± 0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
472-1000	1	MATERIAL:	DRAWN BY: srice	DATE: 9/2/2014	DESCRIPTION: CAP SKIN THOR-50M
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: B SHEET: 1 OF 1 DRAWING NO.: 472-1310 REV: B
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/23/2012	SCALE: N/A

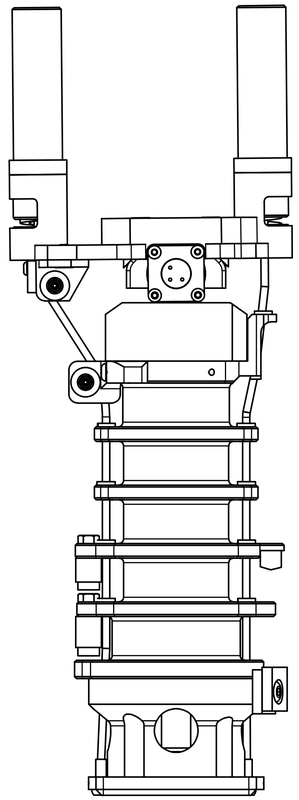
472-1310.ipt

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM000 R12 AND CONVERTED TO METRIC FOR THOR-M	8/23/2011	BK
	B	5000469 WAS 5000763	6/14/2012	BK
	C	ITEM #17 PART #5000604 – SCREW, SHCS M6-1 x 14mm WAS PART #5000081 – M6-1 x 16 LG. SHCS; ITEM #18 PART #5000380V – NUT, HEX JAM M5 WAS PART # 5000156 - M5 X 0.8 HEX LOCK NUT SS; ADDED PART #SA572-S110 – UPPER NECK LOAD CELL (OPTIONAL), AND PART #SA572-S111 - LOWER NECK LOAD CELL (OPTIONAL)	9/2/2015	DW
	D	REMOVED NOTE 2; REVISED PART #472-2200 - MOUNTING PLATFORM ASSMEBLY, NECK AND 472-2100 – CABLE ASSERMBLY, NECK	5/11/2016	DW
	E	REVISED ITEM #14 – 472-2600 – LOWER NECK LOAD CELL STRUCTURAL REPLACEMENT; ITEM #15 – 5000469 – SCREW, FHCS M2X0.4 X 6 WAS 5000469 – SCREW, FHCS M4X0.4 X 6; ITEM #21 – 5000076 – SCREW, SHCS M4-0.7 x 6 WAS 5000989 –M4-0.7 x 8 LG. SHCS	3/20/2017	DW



SCALE .750





NOTES:

1. A M3 X .5 X 8 BHCS IS USED TO ATTACH THE HEAD-SPINE GROUND STRAP TO THE HEAD/NECK MOUNTING PLATFORM.

D

ITEM	QTY	PART NUMBER	DESCRIPTION
C 30	1	SA572-S111	LOWER NECK LOAD CELL (OPTIONAL)
C 29	1	SA572-S110	UPPER NECK LOAD CELL (OPTIONAL)
28	2	5000654	M5 X 0.8 X 12 LG. BHCS
27	1	472-2001	LOWER NECK LOAD CELL BUMPER COVER
26	1	472-2002	LOWER NECK LOAD CELL BUMPER
25	1	5001112	M3 X 0.5 X 3 LG. SSS CONE PT.
24	2	5000749	M3 X 0.5 X 30 LG. BHCS SS
23	3	5000410	M3 X 0.5 X 8 LG. BHCS
22	4	5000082	M2 X 0.4 X 6 LG. SHCS
E 21	1	5000076	SCREW, SHCS M4x0.7 x 6
20	2	5000674	M3 X 0.5 X 5 LG. BHCS
19	2	5000007	M4 X 0.7 X 20 LG. BHCS
A 18	4	5000380V	NUT, HEX JAM M5
A 17	8	5000604	SCREW, SHCS M6-1 x 14 mm
16	8	5001110	M6 HI-COLLAR LOCK WASHER S.S.
E 15	4	5000469	SCREW, FHCS M2x0.4 x 6
E 14	1	472-2600	LOWER NECK LOAD CELL STRUCTURAL REPLACEMENT
13	1	472-2700	UPPER NECK LOAD CELL STRUCTURAL REPLACEMENT
12	1	472-2013	ROTARY POTENTIOMETER HOUSING, NECK
11	1	472-2019	OCCIPITAL CONDYLE CAM, NECK
10	1	472-2014	ROTARY POTENTIOMETER COVER, NECK
9	2	472-2020	ROTARY POTENTIOMETER CLAMP, NECK
8	1	472-2021	ROTARY POTENTIOMETER WASHER, NECK
7	1	472-2012	NECK PULLEY PLATE
6	1	472-2011	OCCIPITAL CONDYLE PIN, NECK
5	1	472-2200	MOUNTING PLATFORM ASSEMBLY, NECK
4	1	472-2016	OCCIPITAL CONDYLE SCREW
3	1	472-2300	NECK PULLEY BRACKET ASSEMBLY
2	2	472-2015	CABLE SEAT COVER, NECK
D 1	1	472-2100	CABLE ASSEMBLY, NECK

Parts List

472-0000	1	PROJECT NO.:	
NEXT ASSEMBLY	QTY	MATERIAL:	
TOTAL QTY IN DUMMY	1	HEAT TREAT:	
		FINISH:	

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ±0.5 ±0.5 125
.X ±0.1
.XX ±0.1
.XXX ±0.1
REMOVE BURRS & BREAK SHARP EDGES

DRAWN:	B. KIMES	7/28/2011
CHECKED BY:		DATE:
ENGINEER:	J. WANG	DATE: 1/9/12

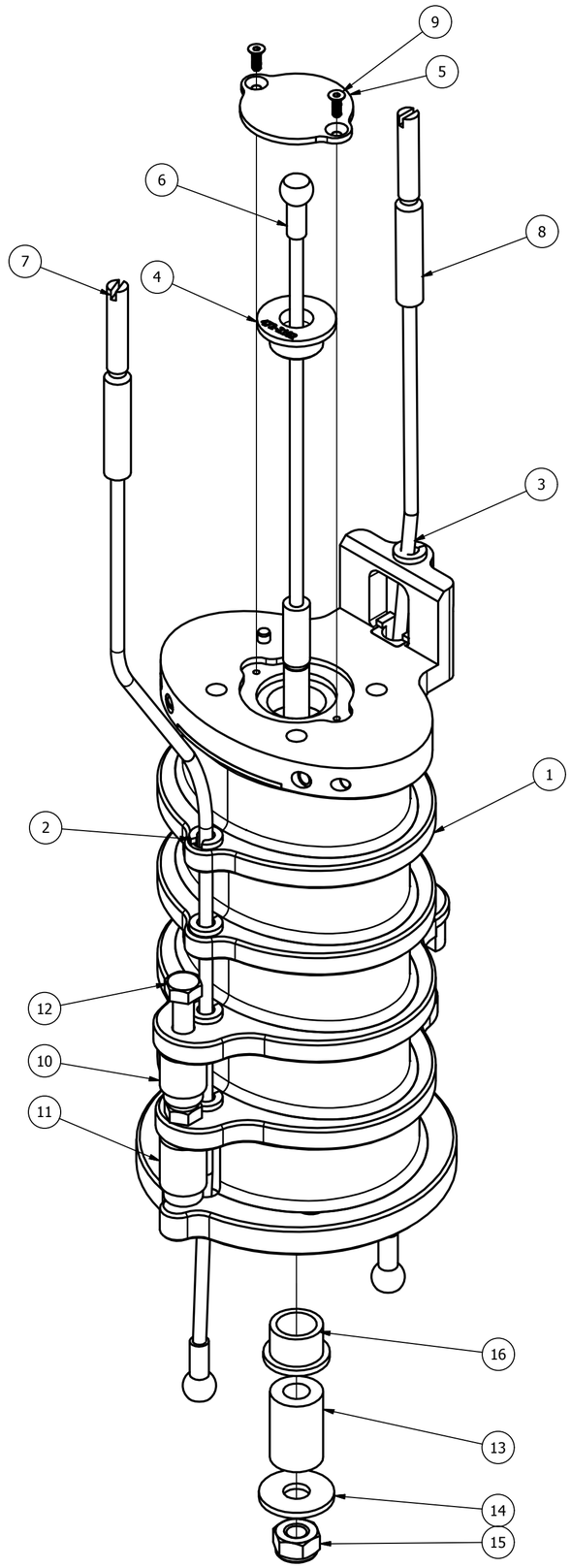
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: MECHANICAL ASSEMBLY, NECK

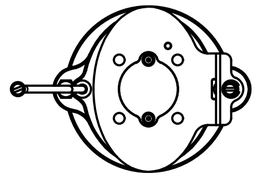
SIZE: A1	SHEET 1 OF 1	DRAWING NO.: 472-2000	REV: E
SCALE: .750			

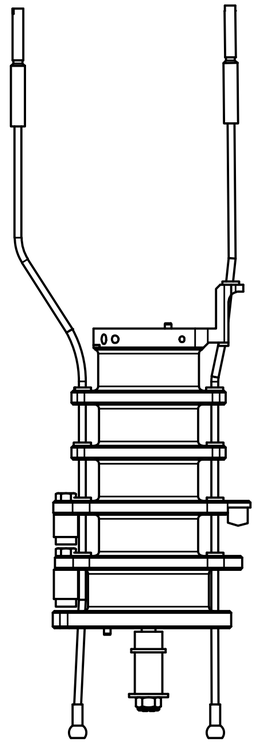
472-2000.iam

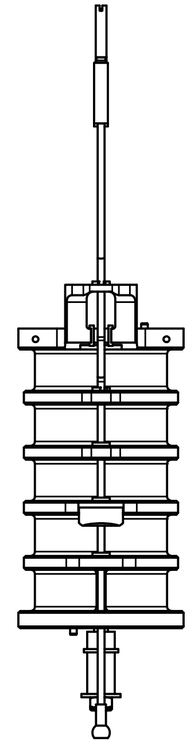
REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM100 R11 AND CONVERTED TO METRIC FOR THOR-M	8/28/2011	BK
	B	ITEM #1 PART #472-2110 DESCRIPTION WAS FRONT STOP ASSEMBLY, NECK; ITEM #13 PART #472-2107 DESCRIPTION WAS CENTER CABLE WASHER, NECK; ADDED ITEM #17 AND NOTE #2	6/9/2016	DW
	C	REMOVED PART #472-2107 – CENTER CABLE LOWER BUSHING 1, NECK; REMOVED NOTE #2; ITEM #9 – 5000469 – SCREW, FHCS M2X0.4 X 6 WAS 5000469 – SCREW, FHCS M4X0.4 X 6	2/21/2017	DW



SCALE 1.000







NOTES:

1. AFTER THE FRONT AND REAR CABLES ARE ASSEMBLED INTO THE BONDED NECK ASSEMBLY, CLIP THE CABLE GUIDES OVER THE CABLES AND PRESS THEM INTO THE CORRESPONDING NECK PLATES. IF NECESSARY, USE LOCTITE SUPER BONDER 495 OR EQUIVALENT TO SECURE GUIDES INTO PLACE.

ITEM	QTY	PART NUMBER	DESCRIPTION
16	1	472-2108	CENTER CABLE LOWER BUSHING 2, NECK
15	1	5000503	M6 X 1 HEX LOCK NUT SS
14	1	5001113	M6 FENDER WASHER S.S.
13	1	472-2018	NECK NEOPRENE SPACER
12	2	5001109	M5 x.8 x 12 HHCS
11	1	472-2520	LOWER NECK STOP ASSEMBLY
10	1	472-2500	UPPER NECK STOP ASSEMBLY
9	2	5000469	SCREW, FHCS M2x0.4 x 6
8	1	472-2150	FRONT CABLE ASSEMBLY, NECK
7	1	472-2130	REAR CABLE ASSEMBLY, NECK
6	1	472-2140	CENTER CABLE ASSEMBLY, NECK
5	1	472-2103	CABLE COVER, NECK
4	1	472-2102	CENTER CABLE FIXTURE, NECK
3	1	472-2106	CABLE GUIDE, NECK
2	8	472-2105	NECK CABLE GUIDE
1	1	472-2110	ASSEMBLY, NECK

PARTS LIST

472-2000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:
DRAWN BY: B. KIMES — DATE: 7/28/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/9/2012

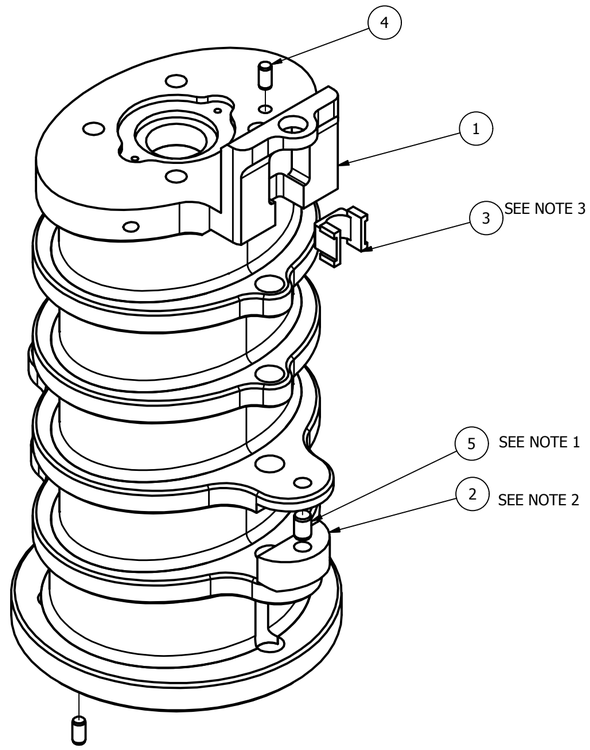
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: CABLE ASSEMBLY, NECK THOR-50M

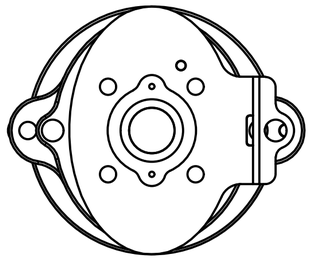
SIZE: A2 — SHEET 1 OF 1 — SCALE: .500 — DRAWING NO.: 472-2100 — REV: C

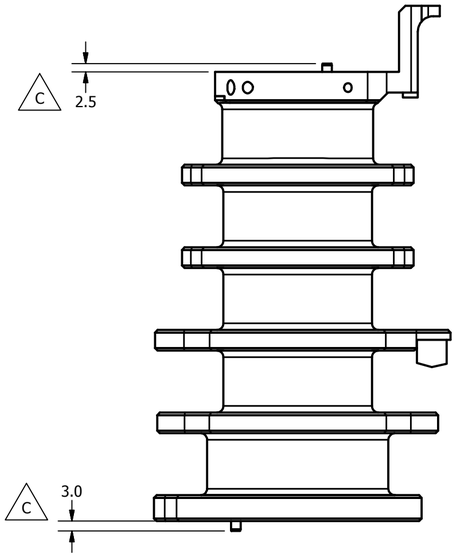
472-2100.iam

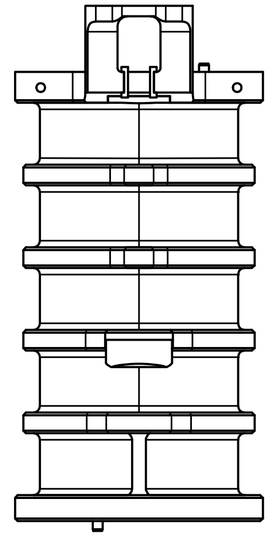
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM104 R03 AND CONVERTED TO METRIC FOR THOR-M	8/22/11	BK
	B	ADD LOCATING DOWELS	12/19/2011	BK
	C	5000680 WAS 5000524; ADD DOWEL DEPTH DIMENSIONS	11/28/2012	BK
	D	TITLE WAS FRONT STOP ASSEMBLY, NECK	6/9/2016	DW



SCALE 1.000







NOTES:

C

1. PRESS 5000680 INTO PART UNTIL PIN IS FLUSH WITH THE TOP SURFACE OF THE PLATE.
2. BOND 472-2101 TO 472-2120 AND 5000680 AS SHOWN, USING A HIGH STRENGTH, FLEXIBLE, TWO PART EPOXY.
3. SECURE INTO PLACE USING LOCTITE SUPER BONDER 495 OR EQUIVALENT.

C B

ITEM	QTY	PART NUMBER	DESCRIPTION
5	1	5000680	M4 X 6 LG. DOWEL PIN SS
4	2	5000385	M3 X 6 LG. DOWEL PIN
3	1	472-2104	TOP PLATE CABLE GUIDE, NECK
2	1	472-2101	FRONT STOP, NECK
1	1	472-2120	MOLDED ASSEMBLY, NECK

PARTS LIST

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 — ANGLES ±0.5° — FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

472-2100	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

PROJECT NO.:
MATERIAL:
DRAWN BY: B. KIMES — DATE: 7/28/2011
HEAT TREAT:
CHECKED BY: — DATE:
FINISH:
ENGINEER: J. WANG — DATE: 1/9/2012

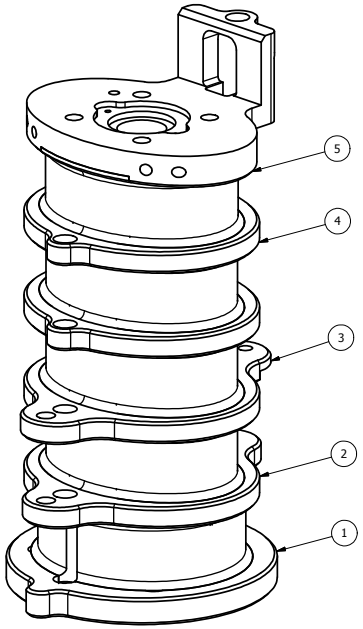
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: ASSEMBLY, NECK

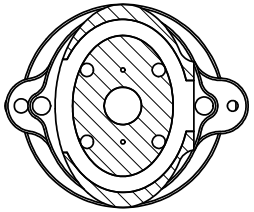
SIZE: A2 — SHEET: 1 OF 1 — SCALE: .750 — DRAWING NO.: 472-2110 — REV: D

472-2110.iam

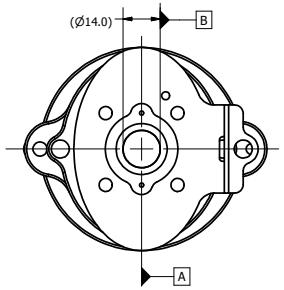
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM105 R02 AND CONVERTED TO METRIC FOR THOR-M	8/22/11	BK

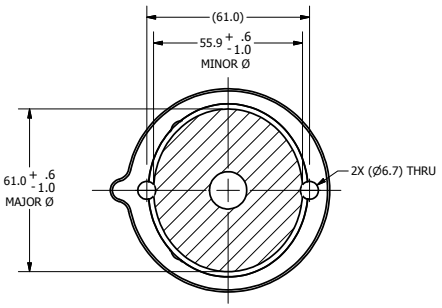


SCALE 1.000

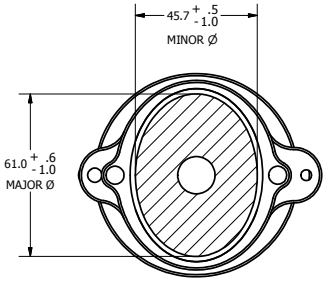


SECTION B-B
SCALE .750

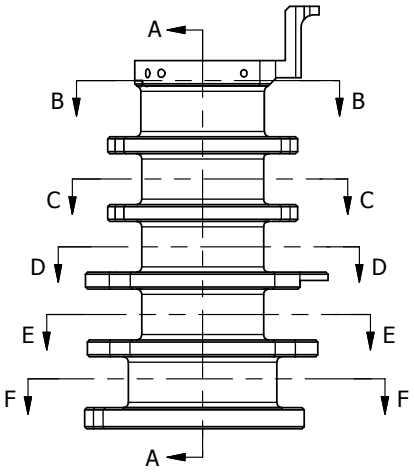


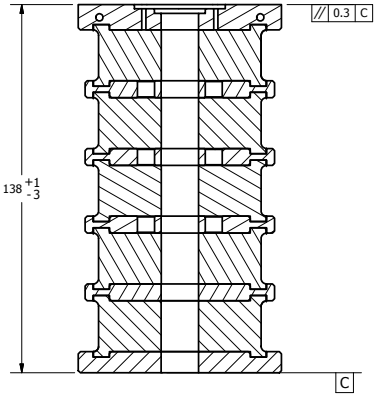


SECTION F-F
SCALE .750

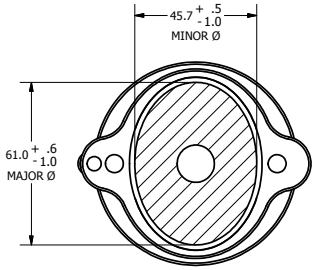


SECTION C-C
SCALE .750

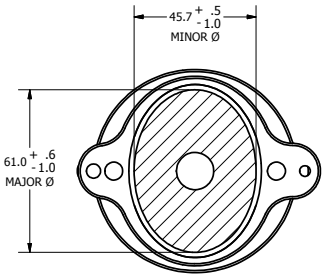




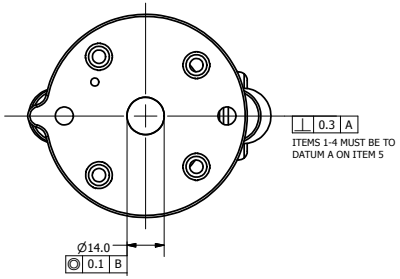
SECTION A-A
SCALE .750



SECTION E-E
SCALE .750



SECTION D-D
SCALE .750



ITEMS 1-4 MUST BE TO DATUM A ON ITEM 5

ITEMS 1-4 MUST COINCIDE WITH THE AXIS OF DATUM B ON ITEM 5

NOTES:

1. MATERIAL: INJECTION MOLDED BUTYL RUBBER SHORE A 75±2.
2. PERFORMANCE SPEC TAKES PRECEDENCE OVER DUROMETER.
3. PLUG ALL HOLES PRIOR TO MOLDING.

ITEM	QTY	PART NUMBER	DESCRIPTION
5	1	472-2125	TOP PLATE, NECK
4	2	472-2124	NECK PLATE 3
3	1	472-2123	NECK PLATE 2
2	1	472-2122	NECK PLATE 1
1	1	472-2121	NECK BASE

PARTS LIST

472-2110	1	SEE NOTES	
NEXT ASSEMBLY	QTY		
TOTAL QTY IN DUMMY	1		

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES

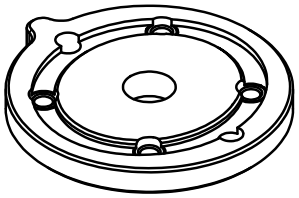
DRAWN BY: B. KIMES 7/28/2011
CHECKED BY:
ENGINEER: J. WANG 1/9/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

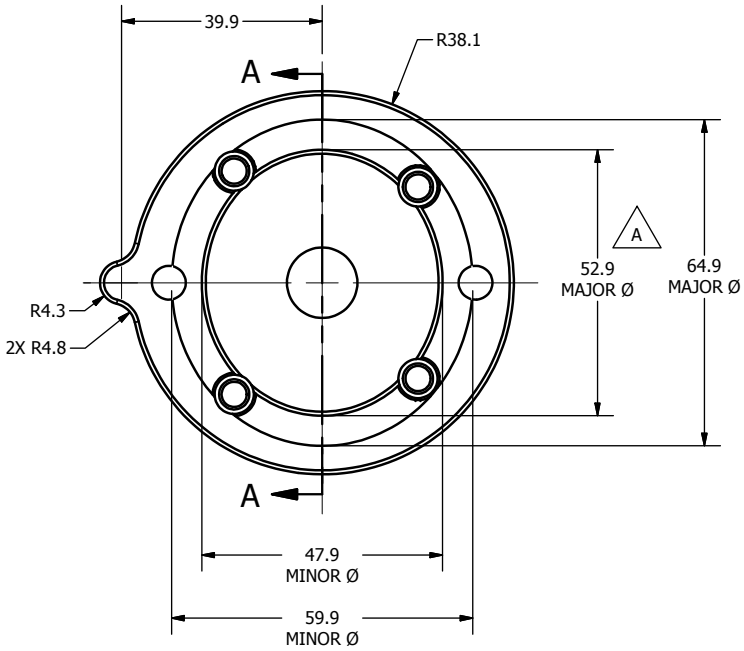
DESCRIPTION: MOLDED ASSEMBLY, NECK

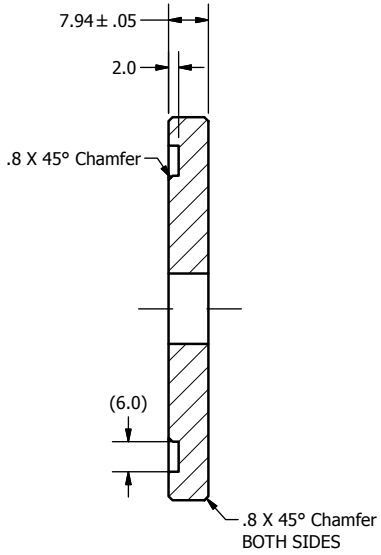
SIZE: A2 | SHEET 1 OF 1 | SCALE: .750 | DRAWING NO.: 472-2120 | REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM110 R11 AND CONVERTED TO METRIC FOR THOR-M; 61.00 WAS 61.0, 52.9 MAJORØ WAS 52.8, 44.40 WAS 44.4	8/22/2011	BK
	B	ADD DOWEL HOLE	12/19/2011	BK
	C	17.50 WAS 17.5; 19.05 WAS 19.0; 38.10 WAS 38.20	3/16/2012	BK

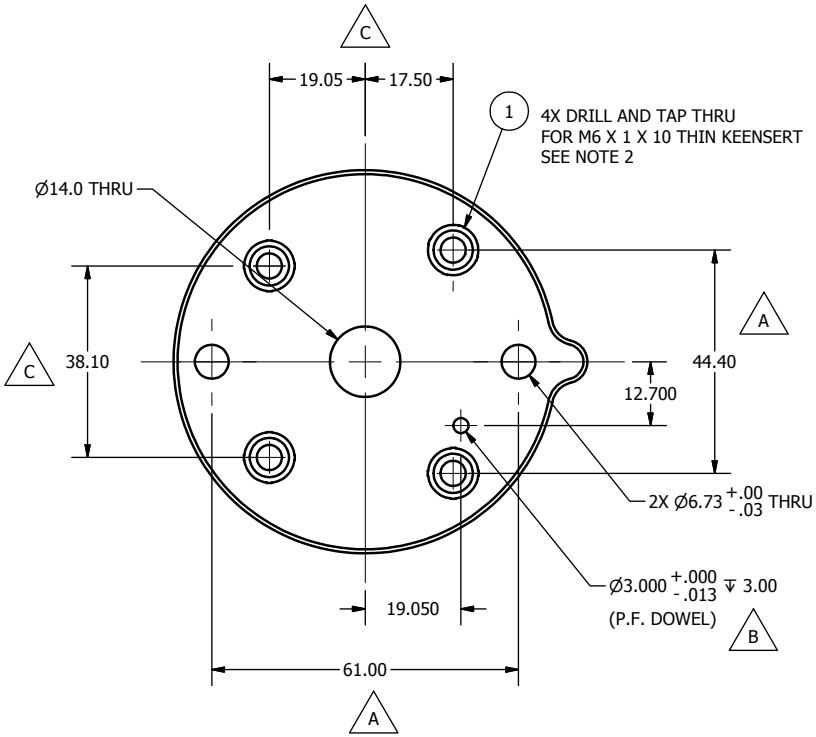


SCALE .750





SECTION A-A
SCALE 1.000



NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESSS OTHERWISE NOTED.

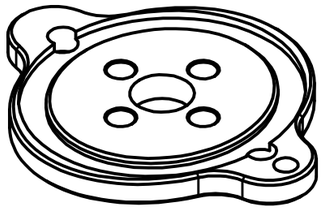
2. GRIND KEENSERTS TO 5.9+0/-1 BEFORE INSTALLING.

ITEM	QTY	PART NUMBER	DESCRIPTION
1	4	5001108	M6 X 1 X 10 LG. LIGHTWEIGHT KEENSERT

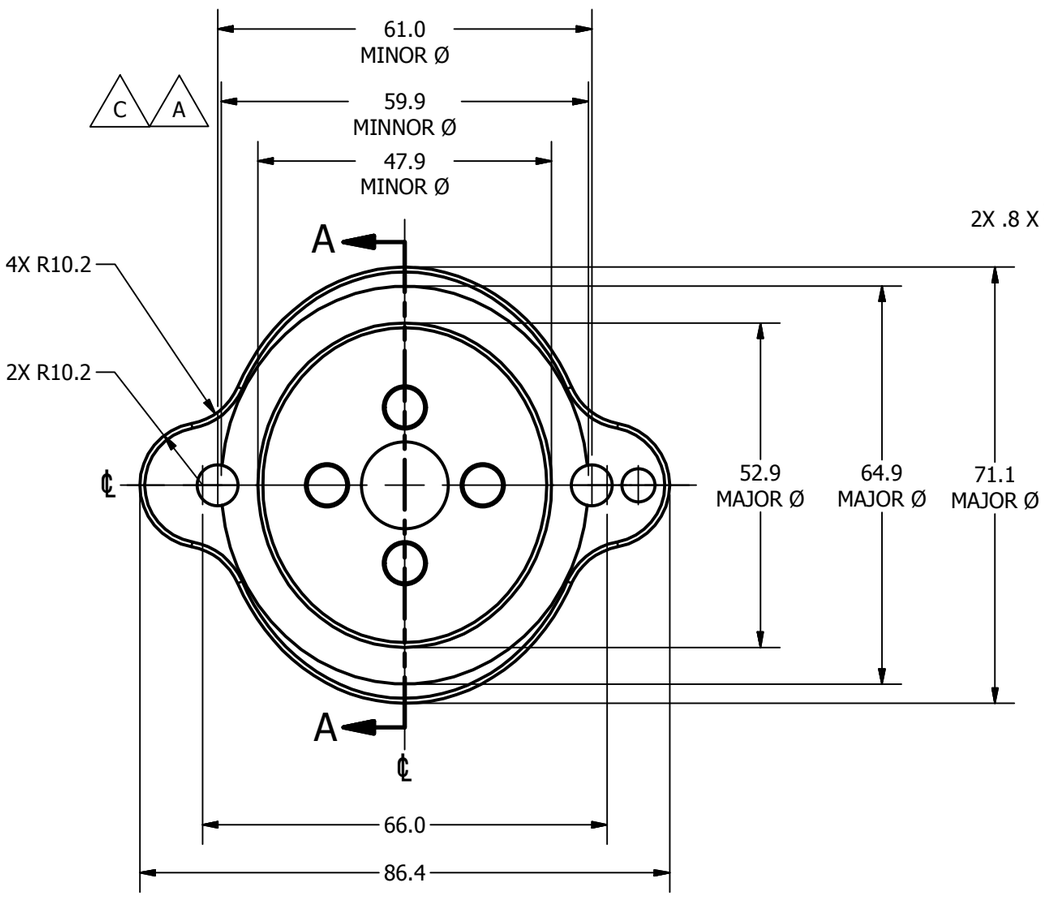
PARTS LIST

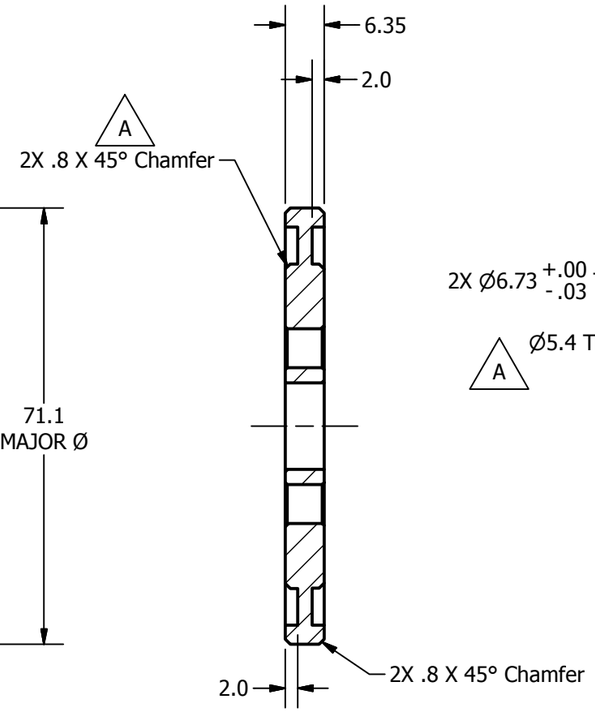
		DO NOT SCALE DRAWING	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
		THIRD ANGLE PROJECTION		
		PROJECT NO.:		DESCRIPTION: NECK BASE
472-2120	1	MATERIAL: 6061-T6 ALUMINUM	DRAWN BY: B. KIMES	DATE: 7/28/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/9/2012
			SIZE: A3 SHEET: 1 OF 1 SCALE: 1.000	DRAWING NO.: 472-2121 REV: C

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM112 R07 AND CONVERTED TO METRIC FOR THOR-M;59.5 MINORØ WAS 59.9; .8 X 45° CHAMFER WAS R.8; Ø5.3 WAS Ø5.1; 61.00 WAS 61.0	7/30/2011	BK
	B	ADDED VENT HOLES FOR MOLDING	6/12/2012	TMV
	C	DIM. 59.9 MINOR Ø WAS 59.5 MINIOR Ø	8/31/15	DW

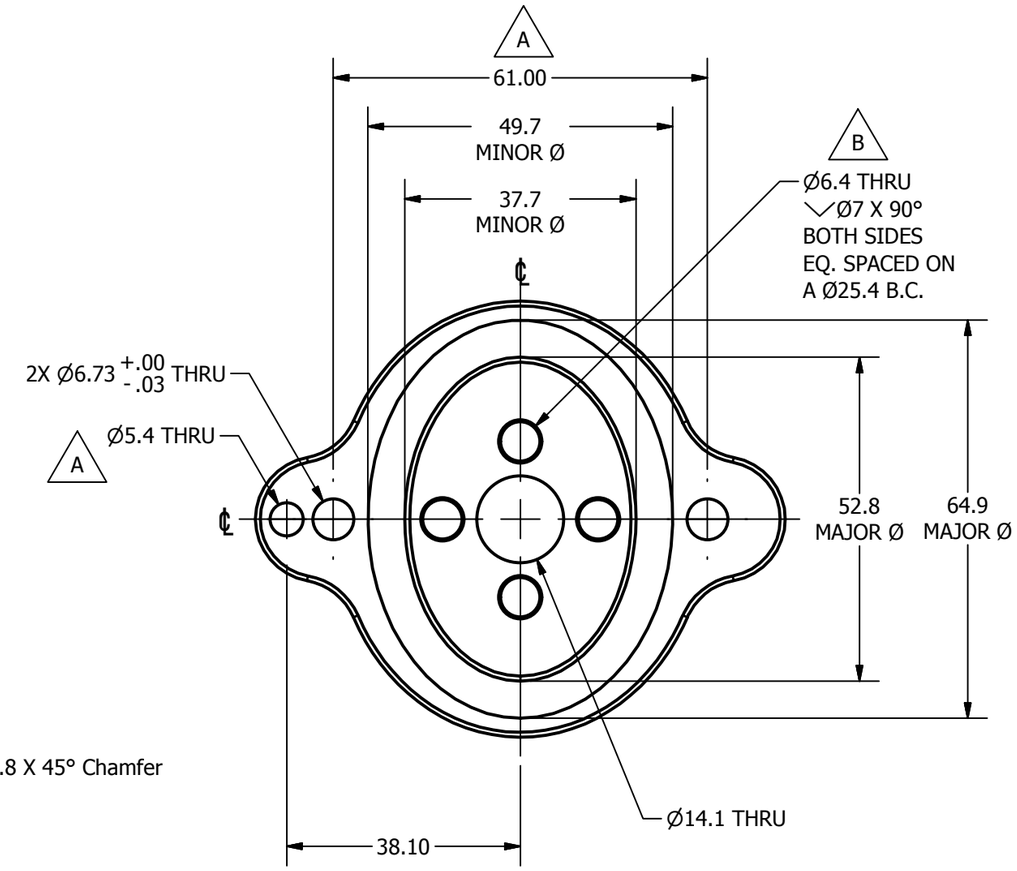


SCALE .750





SECTION A-A
SCALE 1.000



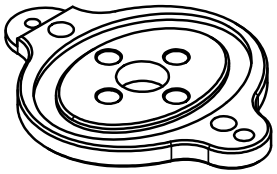
NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESSS OTHERWISE NOTED.

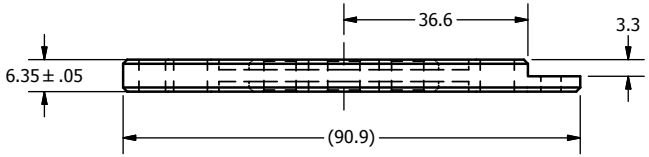
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION PROJECT NO.:	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION DESCRIPTION: NECK PLATE 1
472-2120	1	MATERIAL: 6061-T6 ALUMINUM	DRAWN BY: B. KIMES DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-2122 REV: C
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG DATE: 1/9/2012	SCALE: 1.000

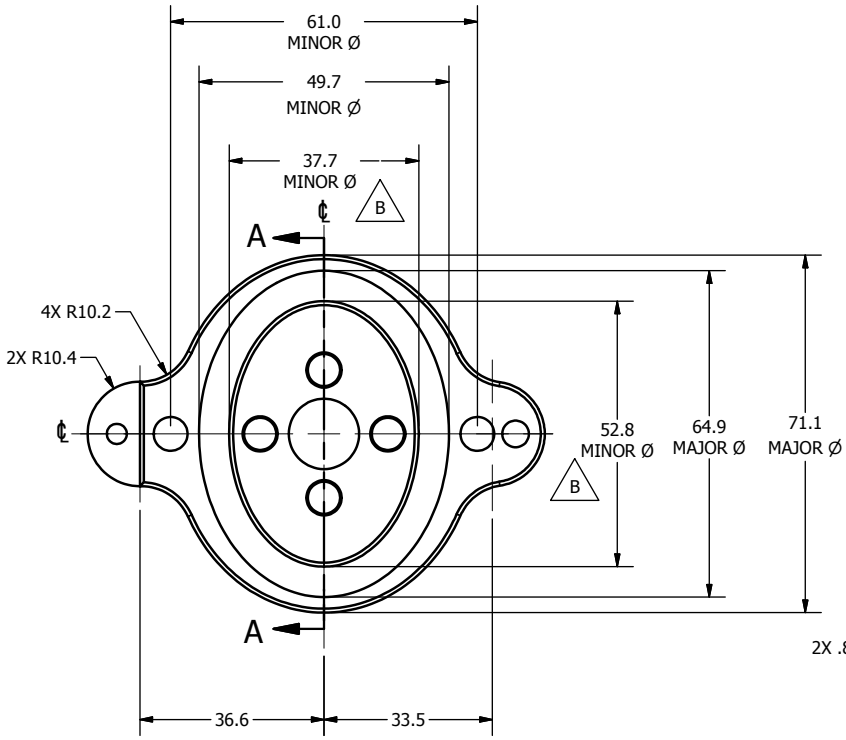
472-2122.ipt

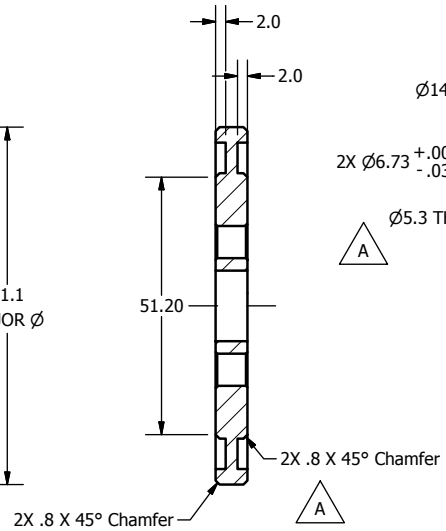
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM114 R08 AND CONVERTED TO METRIC FOR THOR-M; .8 X 45˚ CHAMFER WAS R.8; Ø5.3 WAS Ø5.1; 61.00 WAS 61.0; Ø3.997+.000/-.012 WAS Ø4.758+.000/-.013	8/22/2011	BK
	B	ADD MISSING MAJOR, MINOR Ø	4/11/2012	BK
	C	ADDED VENT HOLES FOR MOLDING	6/12/2012	TMV



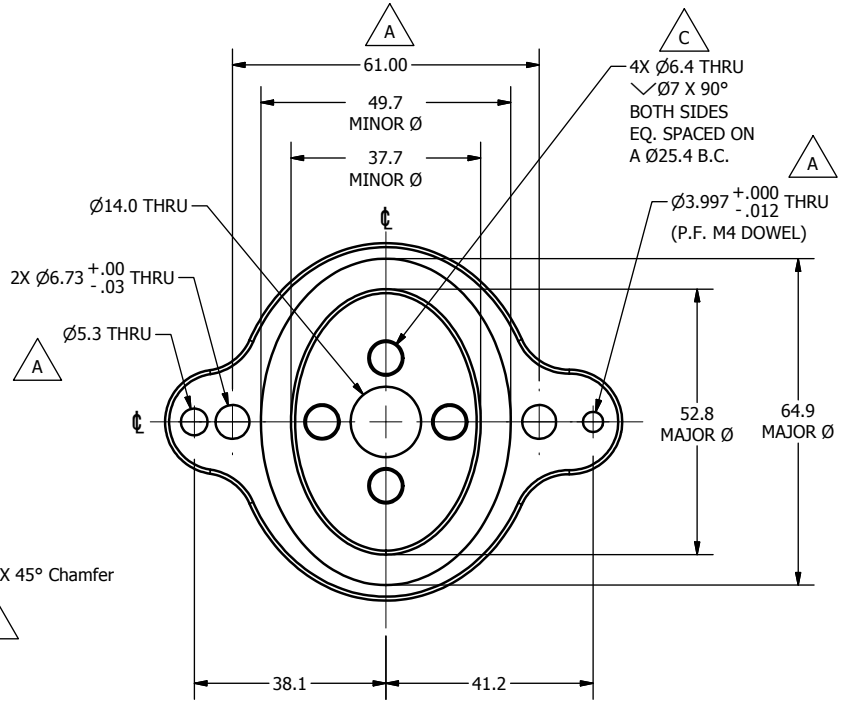
SCALE .750







SECTION A-A
SCALE 1.000

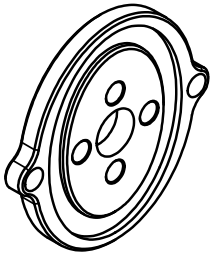


NOTES:

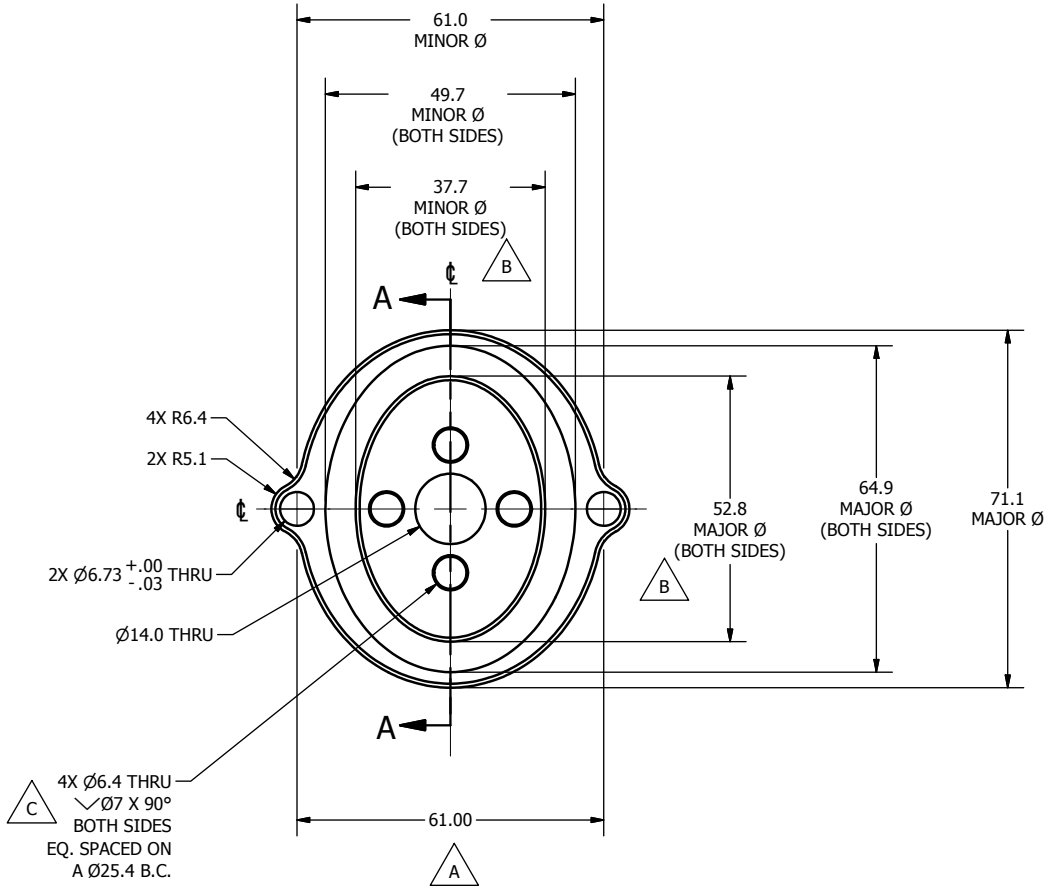
1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESSS OTHERWISE NOTED.

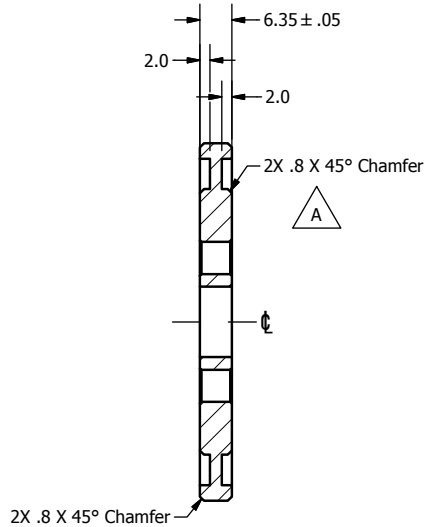
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5˚ FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES			
PROJECT NO.:			DESCRIPTION: NECK PLATE 2		
472-2120	1	MATERIAL: 6061-T6 ALUMINUM	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-2123 REV: C
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/9/2012	SCALE: 1.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM115 R07 FOR THOR-M; 61.00 WAS 61.0, .8 X 45° CHAMFER WAS R.8	7/30/2011	BK
	B	ADD MISSING MAJOR, MONOR Ø	4/11/2012	BK
	C	ADD VENT HOLES FOR MOLDING	6/13/2012	TMV



SCALE .750





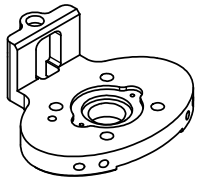
SECTION A-A
SCALE 1.000

NOTES:

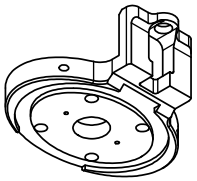
1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESSS OTHERWISE NOTED.

DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES			
PROJECT NO.:			DESCRIPTION: NECK PLATE 3		
472-2120	2	MATERIAL: 6061-T6 ALUMINUM	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/9/2012	SCALE: 1.000 DRAWING NO.: 472-2124 REV: C

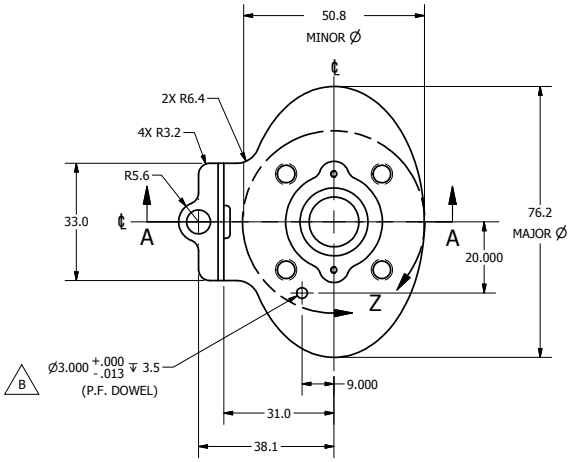
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM116 R17 AND CONVERTED TO METRIC FOR THOR-M; ADD NOTES 2, 3, 4	8/16/2011	BK
	B	ADD LOCATION DOWEL HOLE	12/19/2011	BK
	C	Ø3.03+.02/-0 WAS Ø3.174 +0/-.013, S.F. DOWEL WAS P.F.; CHANGE THREAD DEPTH, (8.8) WAS 3.1; ADD 2X 11.0 FULL THREAD	4/24/2012	BK

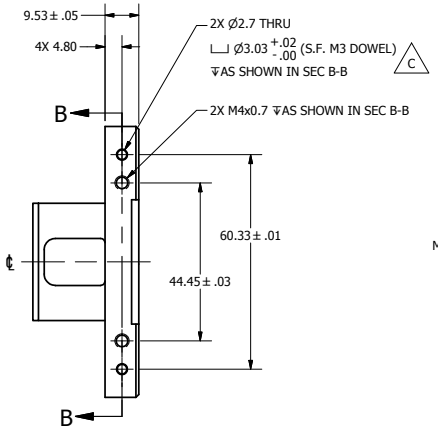


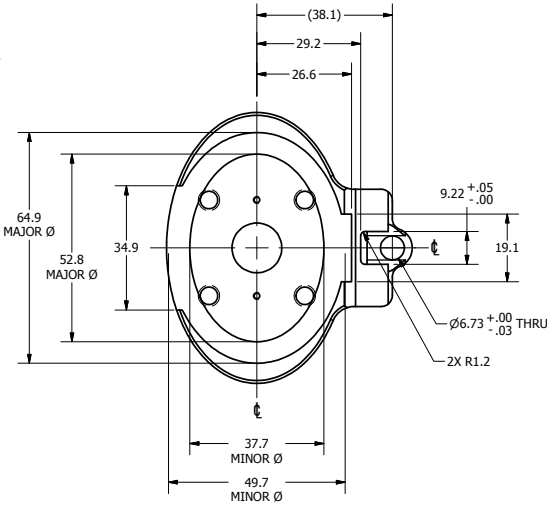
SCALE .750

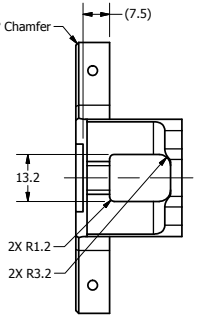


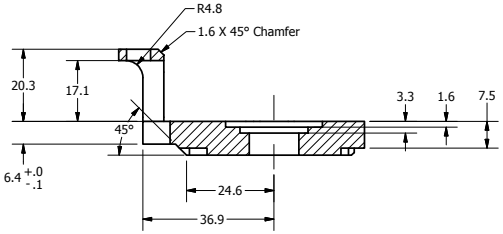
SCALE .750



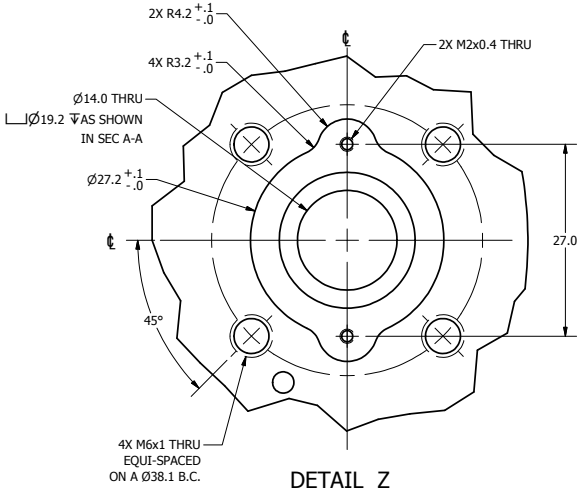




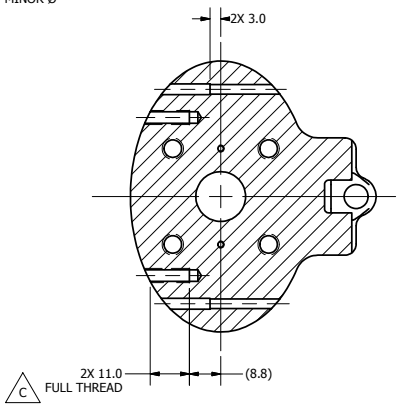




SECTION A-A
SCALE 1.000



DETAIL Z
SCALE 2.000



SECTION B-B
SCALE 1.000

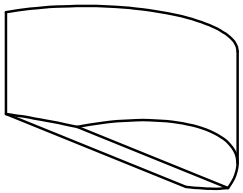
NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄ , UNLESSS OTHERWISE NOTED.
2. POWDER OR BEAD BLAST.
3. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.
4. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

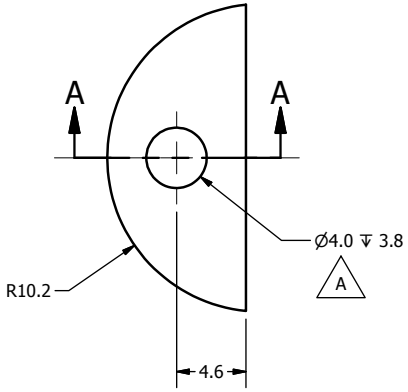
A

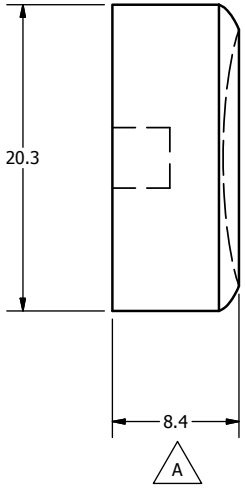
		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6		
		PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: TOP PLATE, NECK	
472-2120	1	MATERIAL: 1018 STEEL	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A2 SHEET 1 OF 1
TOTAL QTY IN DUMMY	1	WEIGHT: SEE NOTES	ENGINEER: J. WANG	DATE: 1/9/2012	SCALE: 1.000
				DRAWING NO.: 472-2125	REV: C

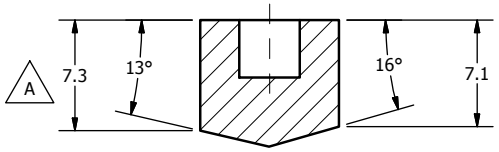
REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM123 R02 AND CONVERTED TO METRIC FOR THOR-M; Ø4.0 WAS Ø3.8; 8.4 WAS 8.3; 7.3 WAS 7.1	8/22/2011	BK
	B	MATERAIL WAS SBR RUBBER	3/02/2012	TMV



SCALE 3.000







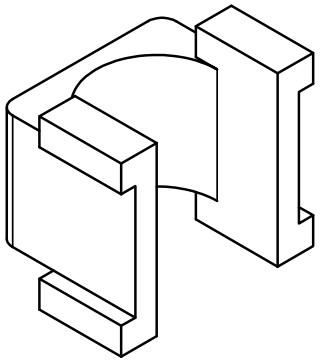
SECTION A-A
SCALE 3.000

NOTES:

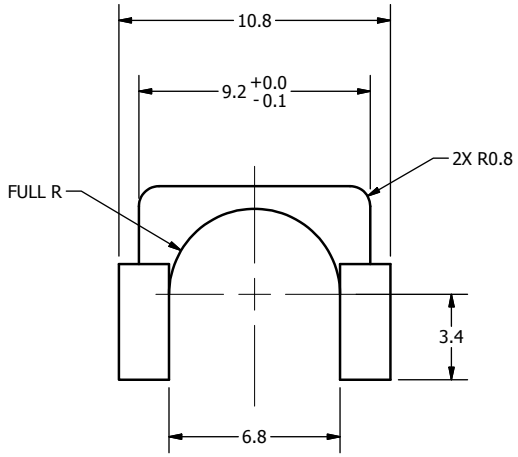
1. RUBBER TOLERANCE ±.5mm, UNLESS OTHERWISE NOTED.

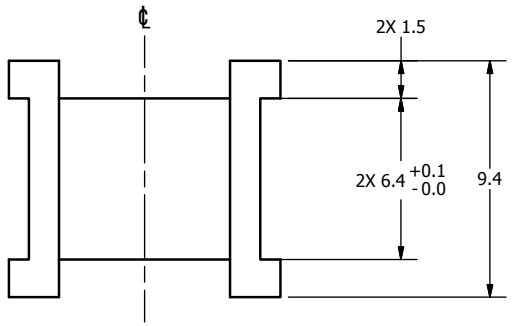
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: FRONT STOP, NECK	
472-2110	1	MATERIAL: NATURAL RUBBER 75±5 SHORE A	DRAWN BY: B. KIMES 7/28/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET 1 OF 1	DRAWING NO.: 472-2101 REV: B
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG DATE: 1/9/2012	SCALE: 3.000	

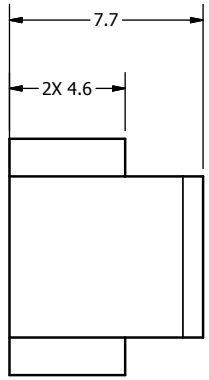
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM125 R03 FOR THOR-M	7/30/2011	BK



SCALE 5.000





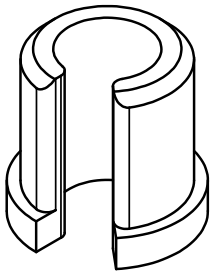


NOTES:

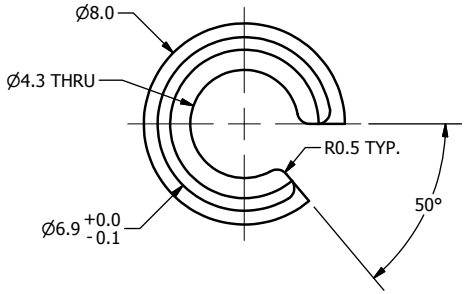
1. DIMENSIONS ARE SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

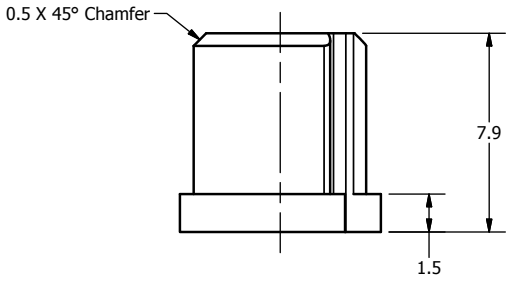
		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES		
		PROJECT NO.:		DESCRIPTION: TOP PLATE CABLE GUIDE, NECK	
472-2110	1	MATERIAL: Acetal Resin, Black	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-2104 REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/9/2012	SCALE: 5.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM129 R01 FOR THOR-M	7/30/2011	BK



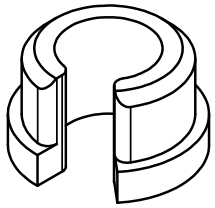
SCALE 5.000



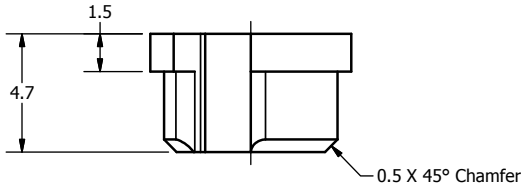


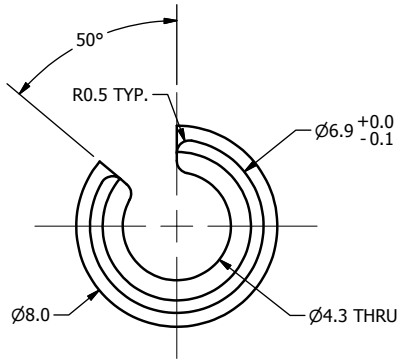
DO NOT SCALE DRAWING	THIRD ANGLE PROJECTION	TOLERANCES	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
	PROJECT NO.:			DESCRIPTION: NECK CABLE GUIDE	
472-2100	MATERIAL: Acetal Resin, Black	DRAWN BY: B. KIMES	DATE: 7/28/2011		
NEXT ASSEMBLY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1	DRAWING NO.: 472-2105 REV: A
TOTAL QTY IN DUMMY	FINISH:	ENGINEER: J. WANG	DATE: 1/9/2012	SCALE: 5.000	
8	8				
QTY					

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM130 R01 FOR THOR-M	7/30/2011	BK



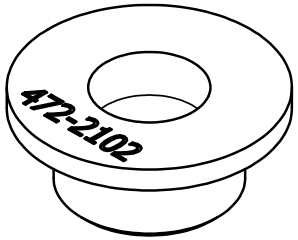
SCALE 5.000



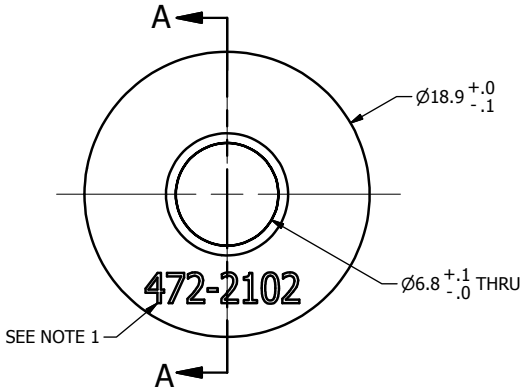


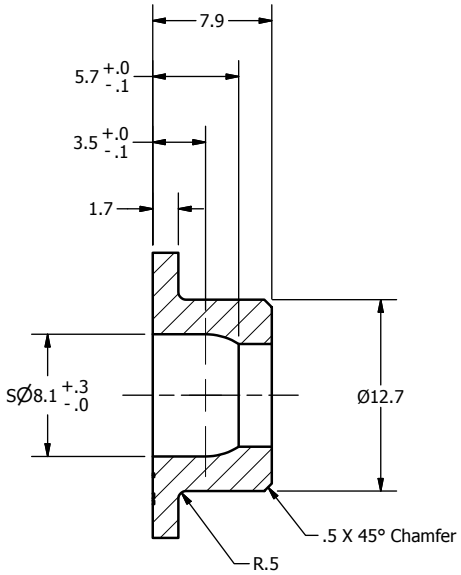
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: CABLE GUIDE, NECK		
PROJECT NO.:					
472-2100	1	MATERIAL: Acetal Resin, Black	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/9/2012	SCALE: 5.000
					DRAWING NO.: 472-2106 REV: A

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM120 R06 AND CONVERTED TO METRIC FOR THOR-M	7/30/2011	BK



SCALE 3.000





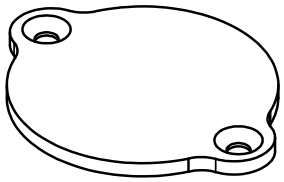
SECTION A-A
SCALE 3.000

NOTES:

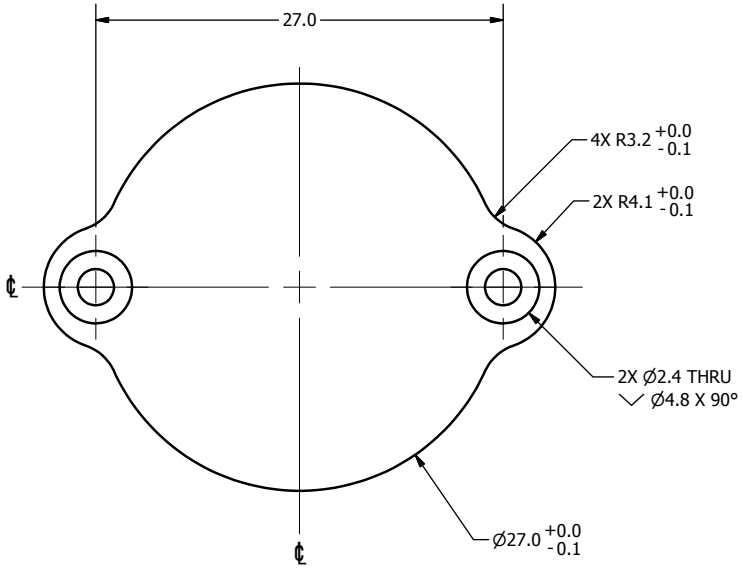
1. STAMP OR ETCH PART NUMBER (3mm CHARACTERS) WHERE SHOWN. (OPTIONAL)

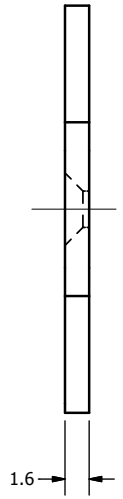
		DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: CENTER CABLE FIXTURE, NECK	
472-2100	1	MATERIAL: 7075-T6 ALUMINUM	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1 — DRAWING NO.: 472-2102 — REV: A
TOTAL QTY IN DUMMY	1	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG	DATE: 1/9/2012	SCALE: 3.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM124 R03 AND CONVERTED TO METRIC FOR THOR-M	7/30/2011	BK



SCALE 2.000



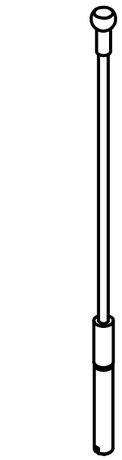


NOTE:

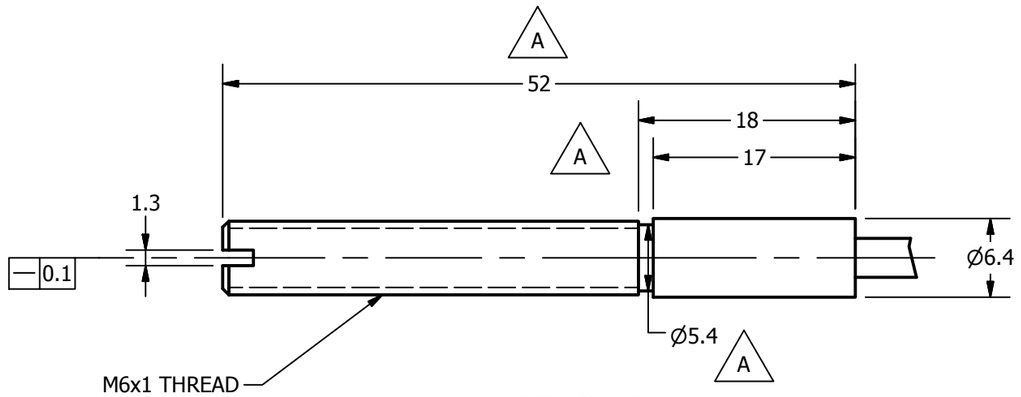
1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES			
PROJECT NO.:			DESCRIPTION: CABLE COVER, NECK		
472-2100	1	MATERIAL: Acetal Resin, Black	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-2103 REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/9/2012	SCALE: 3.000

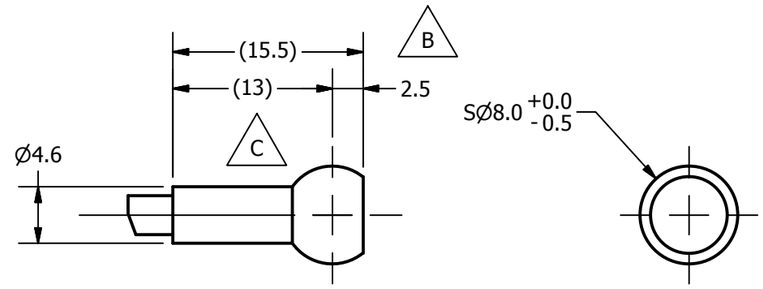
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM119 R04 AND CONVERTED TO METRIC FOR THOR-M; 52 WAS 54; 18 WAS 31; 17 WAS 28; Ø5.4 WAS Ø4	8/1/2011	BK
	B	ADD 2.5 DIMENSION; (15.5) WAS 15.5	6/25/2012	BK
	C	DIMENSION (13) WAS 13; REMOVED 10 DIMENSION; ADDED 316 STAINLESS TO MATERIAL; IN NOTE 1 3400 N WAS 1000 LBS.	3/8/2016	DW



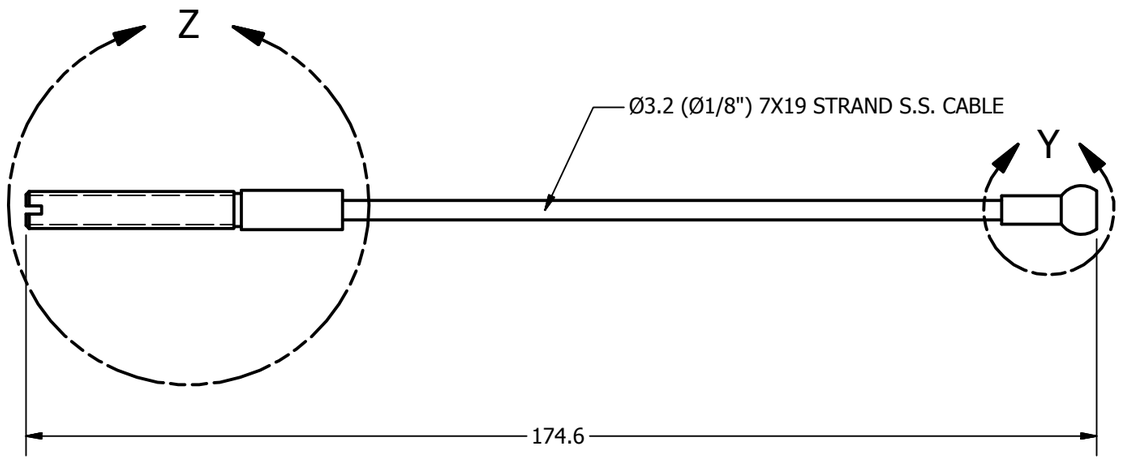
SCALE .500



DETAIL Z
THREADED END
SCALE 2.000



DETAIL Y
BALL END
SCALE 2.000



NOTES:

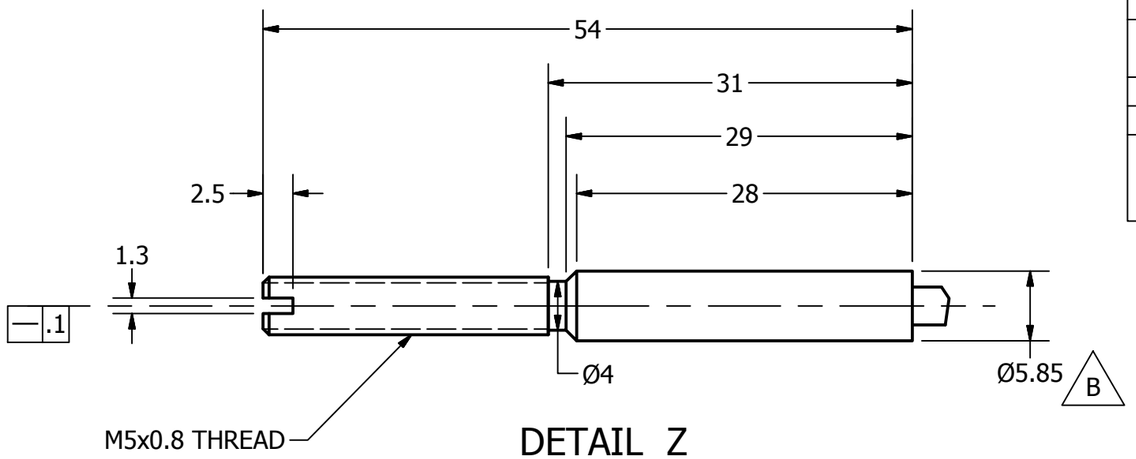
1. TENSILE STRENGTH OF CABLE ASSEMBLY: 3400 N. (C)
2. DIMENSIONS SHOWN ARE AFTER SWAGING AND MACHINING.

		DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
		PROJECT NO.:		DESCRIPTION: CENTER CABLE ASSEMBLY, NECK
472-2100	1	MATERIAL: 316 STAINLESS STEEL	DRAWN BY: B. KIMES; DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: ; DATE:	SIZE: A3; SHEET: 1 OF 1; DRAWING NO.: 472-2140; REV: C
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG; DATE: 1/9/2012	SCALE: 1.000

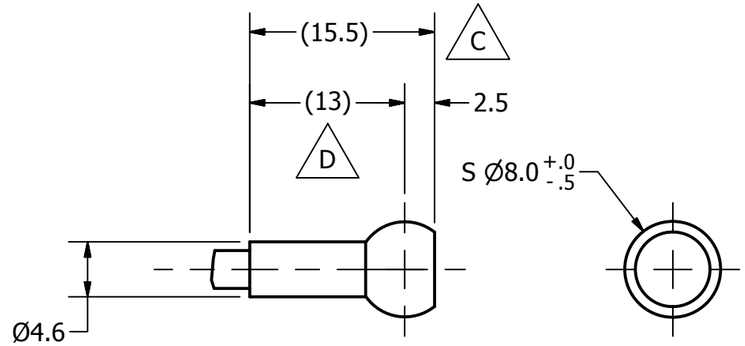
472-2140.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1NKM117 R1 AND CONVERT TO METRIC FOR THOR-M	8/1/2011	BK
	B	Ø5.85 WAS Ø6.4	6/13/2012	BK
	C	ADD 2.5 DIMENSION; (15.5) WAS 15.5	6/25/2012	BK
	D	DIMENSION (13) WAS 13; IN NOTE 1 3400 N WAS 1700 LBS.; ADDED 316 STAINLESS STEEL TO MATERIAL	3/9/2016	DW

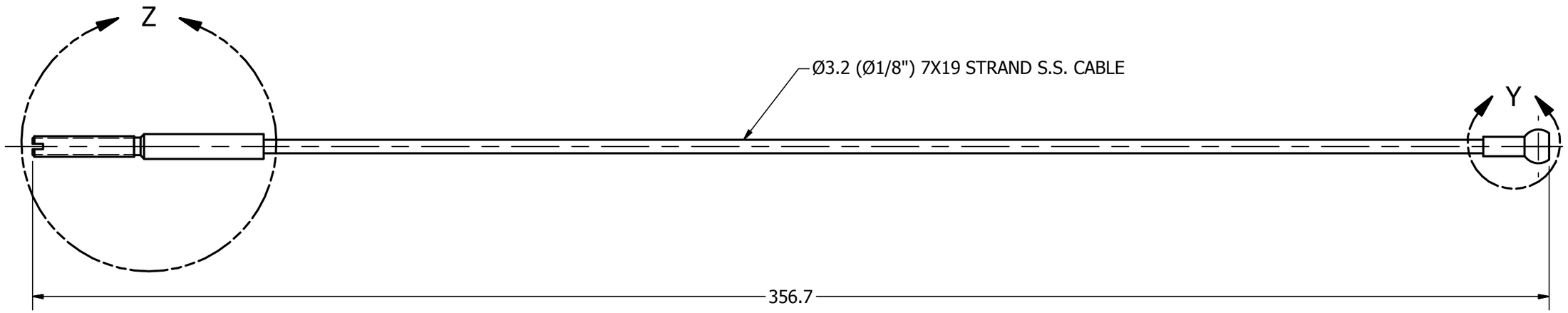
SCALE .250



DETAIL Z
THREADED END
SCALE 2 : 1



DETAIL Y
BALL END
SCALE 2 : 1



NOTES:

1. TENSILE STRENGTH OF CABLE ASSEMBLY: 3400 N. (D)

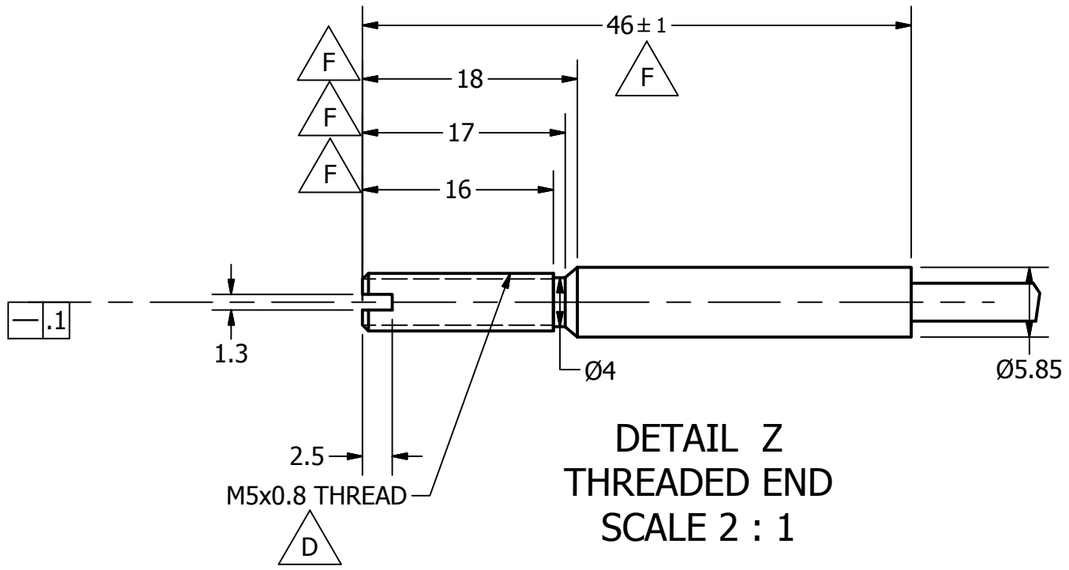
2. DIMENSIONS SHOWN ARE AFTER SWAGING AND MACHINING.

		DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
		PROJECT NO.:		DESCRIPTION: REAR CABLE ASSEMBLY, NECK
472-2100	1	MATERIAL: 316 STAINLESS STEEL	DRAWN BY: B. KIMES — DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: — DATE:	SIZE: B — SHEET: 1 OF 1 — DRAWING NO.: 472-2130 — REV: D
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG — DATE: 1/9/2012	SCALE: 1.000

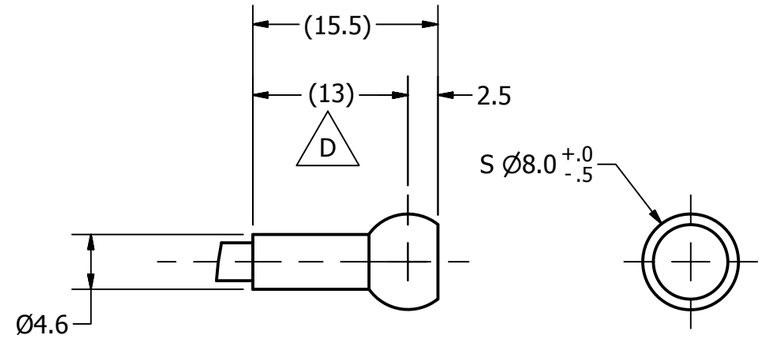
Rear Cable Assembly.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM122 R12 AND CONVERT TO METRIC FOR THOR-M	8/1/2011	BK
	B	Ø5.85 WAS Ø 6.4	6/13/2012	BK
	C	ADD 2.5 DIMENSION; (15.5) WAS 15.5	6/25/2012	BK
	D	DIMENSION 344.3 WAS 331.3, (13) WAS 13; REMOVED 10 DIMENSION IN DETAIL Y; ADDED THREAD NOTE IN DETAIL Z; ADDED 316 STAINLESS TO MATERIAL; IN NOTE 1 3400 N WAS 1700LBS.	3/8/2016	DW
	E	DIMENSION 336.3 WAS 344.3	8/31/2017	DW
	F	IN DETAIL Z REMOVED DIMENSIONS 31, 29, & 28; ADDED DIMENSIONS 16, 17, & 18; DIMENSION 46 ±1 WAS 54	2/22/2018	DW

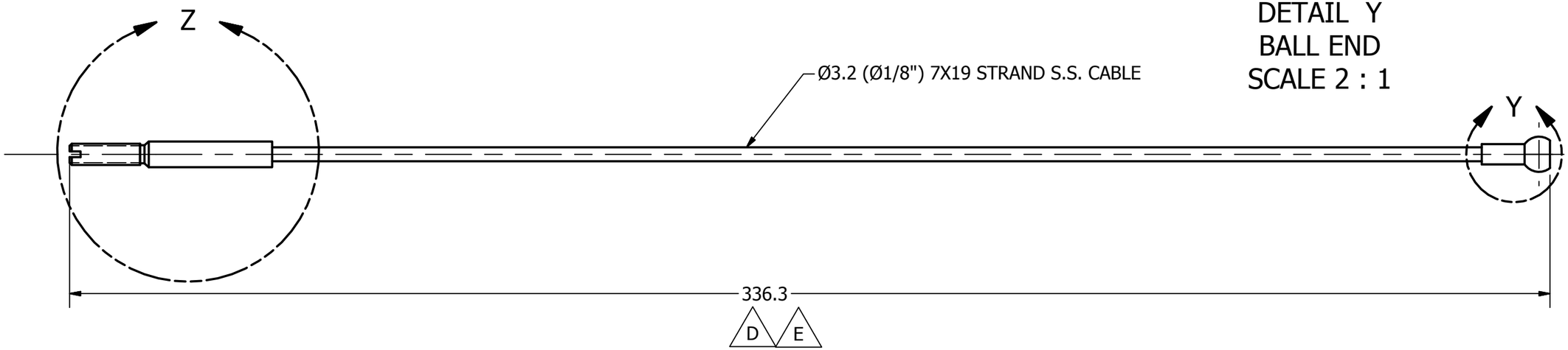
SCALE .250



DETAIL Z
THREADED END
SCALE 2 : 1



DETAIL Y
BALL END
SCALE 2 : 1



NOTES:

D

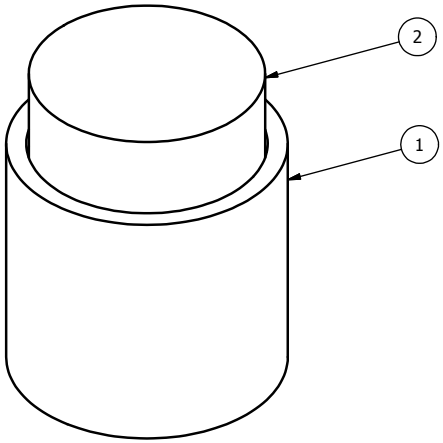
1. TENSILE STRENGTH OF CABLE ASSEMBLY: 3400 N.

2. DIMENSIONS SHOWN ARE AFTER SWAGING AND MACHINING.

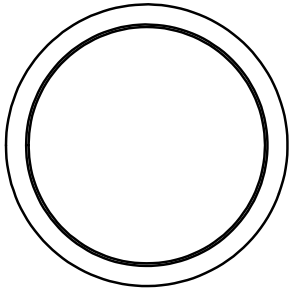
		DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
		PROJECT NO.:		DESCRIPTION: FRONT CABLE ASSEMBLY
472-2100	1	MATERIAL: 316 STAINLESS	DRAWN BY: B. KIMES — DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: — DATE:	SIZE: B — SHEET: 1 OF 1 — DRAWING NO.: 472-2150 — REV: F
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG — DATE: 1/9/2012	SCALE:

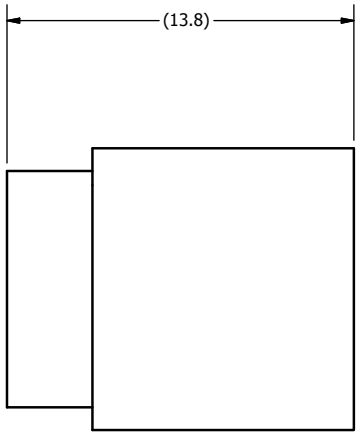
472-Front Cable Assembly.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM500 R05 FOR THOR-M	8/19/11	BK



SCALE 5.000





NOTES:

1. BOND 472-2511 TO 472-2510 USING A FLEXIBLE, HIGH STRENGTH, TWO PART RUBBER EPOXY.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-2511	NECK SOFT STOP 2
1	1	472-2510	NECK STOP 2

PARTS LIST

472-2100	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01
ANGLES ± 0.5°
FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

DRAWN BY: B. KIMES — DATE: 7/28/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/10/2012

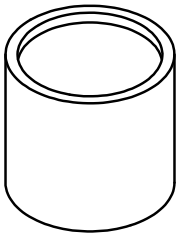
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: UPPER NECK STOP ASSEMBLY

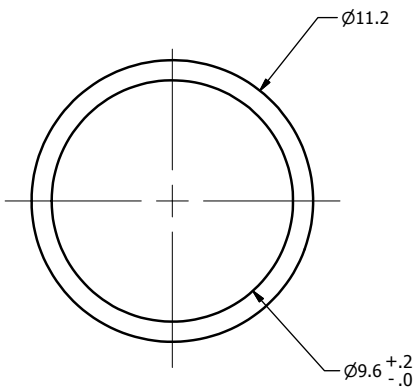
SIZE: A3 | SHEET: 1 OF 1 | SCALE:

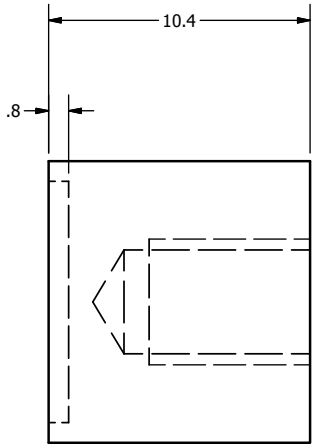
DRAWING NO.: 472-2500 | REV: A

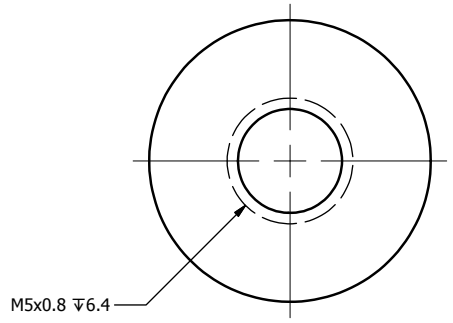
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM510 R06 AND CONVERTED TO METRIC FOR THOR-MØ9.6+.2/-.0 WAS 9.5	8/19/11	BK



SCALE 3.000

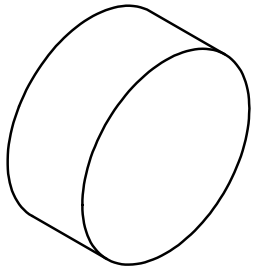




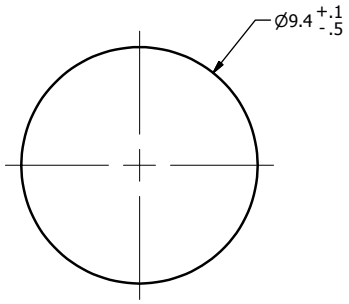


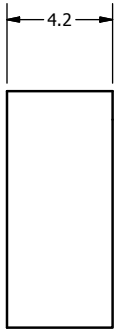
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: NECK STOP 2	
472-2500	1	MATERIAL: 303 STAINLESS STEEL	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 5.000 DRAWING NO.: 472-2510 REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM511 R03 FOR THOR-M	8/19/11	BK



SCALE 5.000



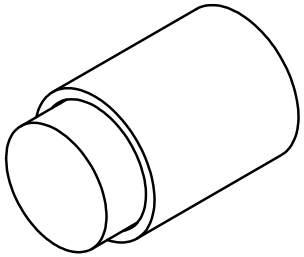


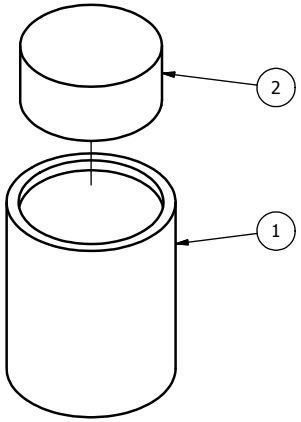
NOTES:

1. RUBBER TOLERANCE ± 0.5 AND DUROMETER ±5, UNLESS OTHERWISE NOTED.

		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES		
		PROJECT NO.:		DESCRIPTION: NECK SOFT STOP 2	
472-2500	1	MATERIAL: SBR RUBBER 75A	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-2511 REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 5.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM500 R05 AND CONVERTED TO METRIC FOR THOR-M	11/22/2011	SKK





SCALE 3.000

NOTES:

1.BOND TWO PARTS TOGETHER WITH HIGH STRENGTH, FLEXIBLE RUBBER EPOXY.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-2513	NECK SOFT STOP 1
1	1	472-2512	NECK STOP 1

PARTS LIST

472-2100	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01
ANGLES ±0.5°
FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

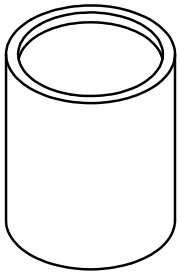
DRAWN BY: skantola — DATE: 11/22/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/10/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

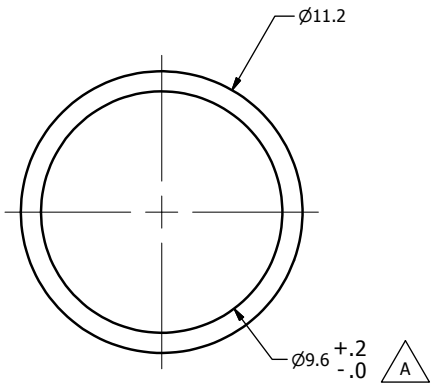
DESCRIPTION: LOWER NECK STOP ASSEMBLY

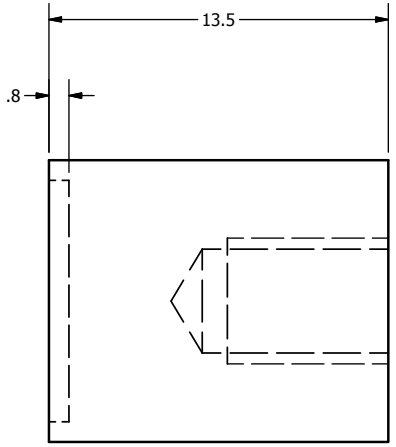
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 3.000 | DRAWING NO.: 472-2520 | REV: A

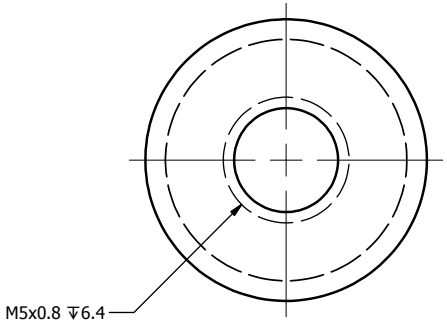
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM512 R06 AND CONVERTED TO METRIC FOR THOR-M; Ø9.6+.2/-.0 WAS Ø9.5	8/19/11	BK



SCALE 3.000

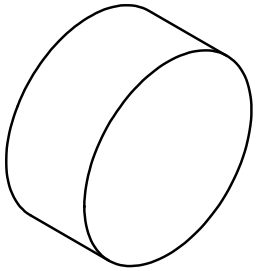




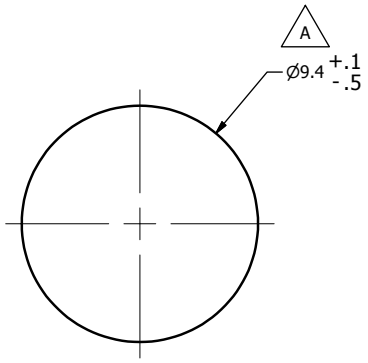


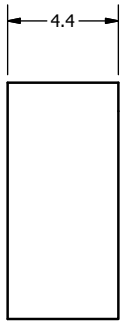
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: NECK STOP 1	
472-2501	1	MATERIAL: 303 STAINLESS STEEL	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 — DRAWING NO.: 472-2512 — REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 5.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM513 R02 FOR THOR-M; Ø9.4+.1/-.0 WAS Ø9.5	8/19/11	BK



SCALE 5.000



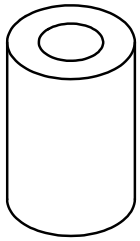


NOTES:

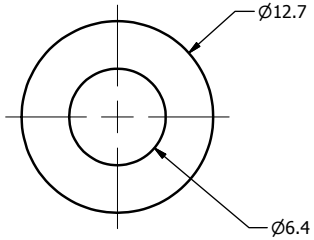
1. RUBBER TOLERANCE ±0.5 AND DUROMETER ±5, UNLESS OTHERWISE NOTED.

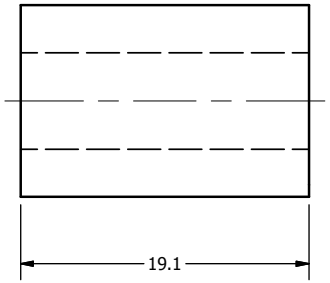
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: NECK SOFT STOP 1		
PROJECT NO.:					
472-2501	1	MATERIAL: SBR RUBBER 75A	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 5.000
					DRAWING NO.: 472-2513 REV: A

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM032 R01 FOR THOR-M	7/29/11	BK



SCALE 2.000

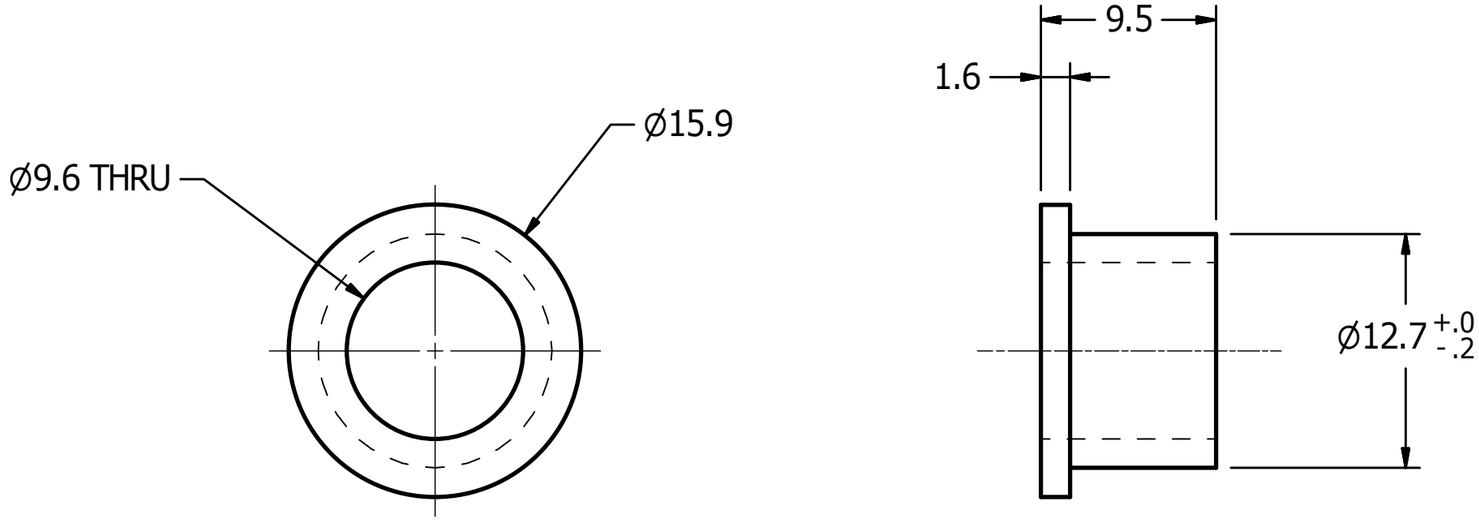




NOTES:

1. RUBBER TOLERANCE ±0.5 AND DUROMETER ±5, UNLESS OTHERWISE NOTED.

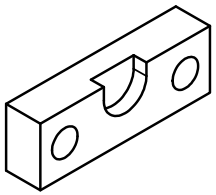
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: NECK NEOPRENE SPACER	
427-2100	1	MATERIAL: NEOPRENE 75A	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-2018 REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/9/2012	SCALE: 3.000



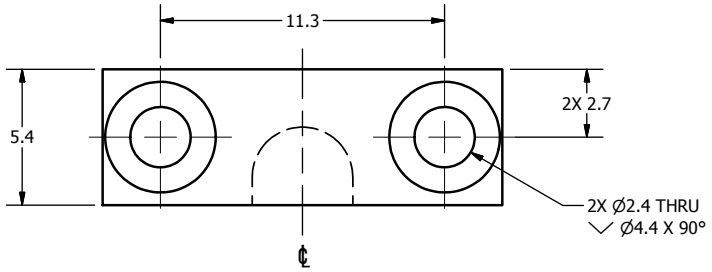
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	CENTER CABLE LOWER BUSHING 2, NECK THOR-50M
MATERIAL: Nylon 6/6	DRAWN: Dave Walker — 6/10/2016	
HEAT TREAT	CHECKED	SIZE: A3 — DRAWING NUMBER: 472-2108 — REV
FINISH	ENG	THIRD ANGLE PROJECTION — SCALE: 3 : 1 — SHEET: 1 OF 1
	APPROVED	

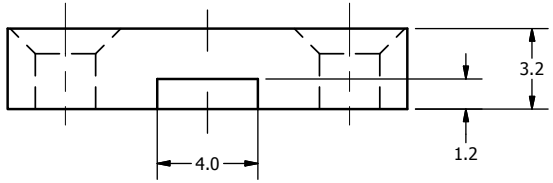
472-2108.ipt

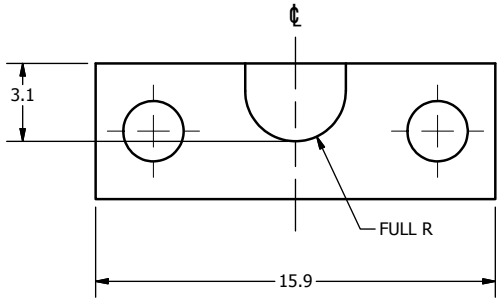
REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM022 R05 AND CONVERTED TO METRIC FOR THOR-M	8/22/2011	BK



SCALE 3.000





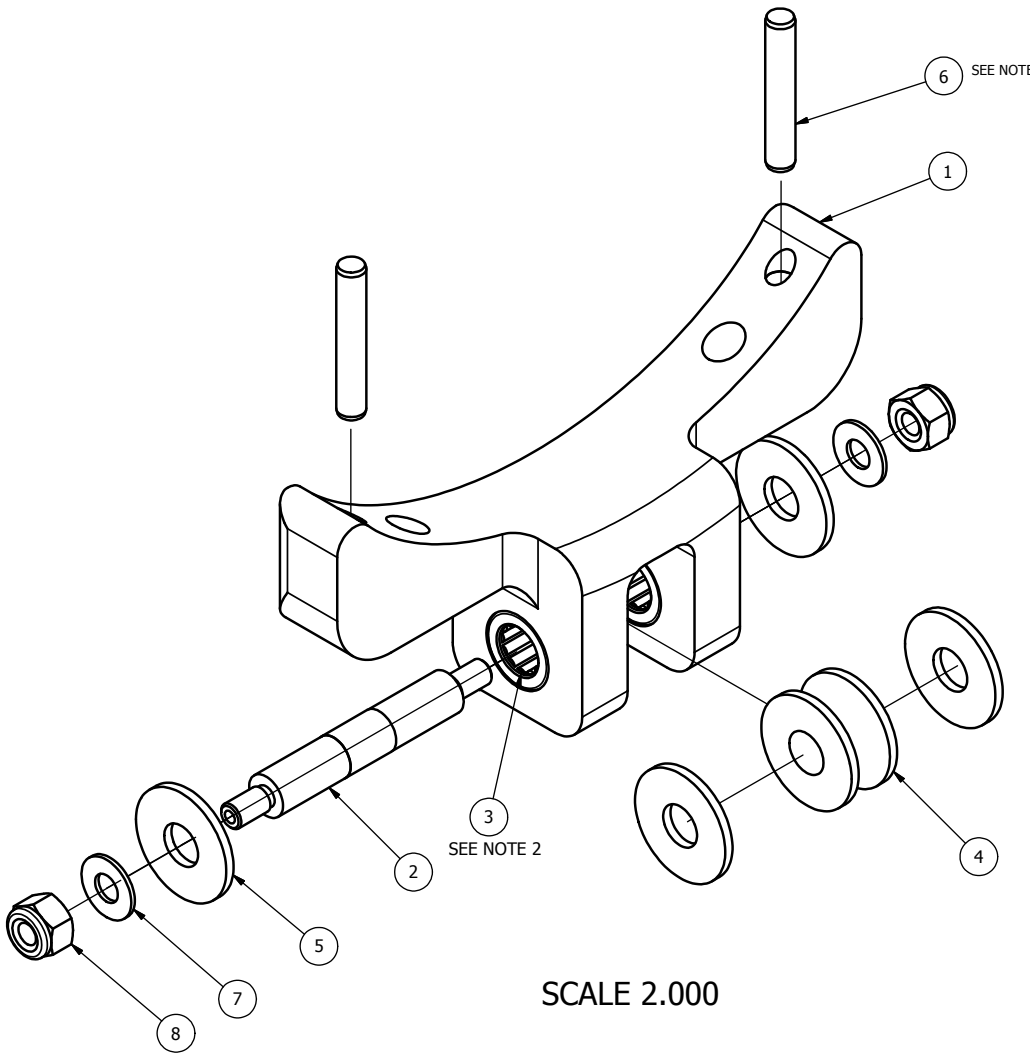


NOTES:

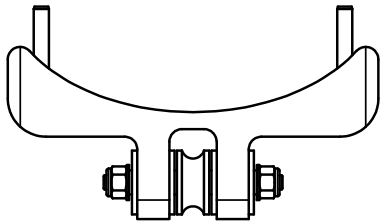
1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

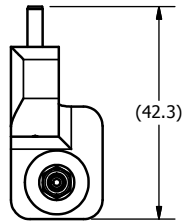
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: CABLE SEAT COVER, NECK	
472-2000	2	MATERIAL: Acetal Resin, Black	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/9/2012	SIZE: A3 SHEET: 1 OF 1 SCALE: 5.000 DRAWING NO.: 472-2015 REV: A

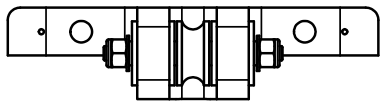
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM300 R05 AND CONVERTED TO METRIC FOR THOR-M; ADD NOTE 2	8/18/2011	BK



SCALE 2.000







ITEM	QTY	PART NUMBER	DESCRIPTION
8	2	5001106	M3 X 0.3 HEX LOCK NUT SS
7	2	5001095	M3 FLAT WASHER PLAIN ZINC
6	2	5000391	M3 X 18 LG. DOWEL PIN SS
5	4	9002595	WASHER, TEFLON .187 X .50 X .04 THK.
4	1	472-2312	NECK REAR CABLE PULLEY
3	2	9002597	BEARING, NEEDLE ROLLER (3/16 BORE)
2	1	472-2311	REAR CABLE PULLEY SHAFT, NECK
1	1	472-2310	REAR PULLEY BRACKET, NECK

PARTS LIST

NOTES:

1. PRESS FIT DOWEL PINS AS SHOWN.
2. PRESS THE BEARINGS (9002597) INTO PLACE, FLUSH WITH OUTSIDE SURFACE OF 472-2310.

472-2000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01. ANGLES ±0.5°. FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES

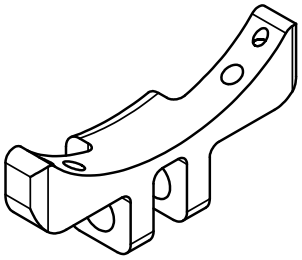
PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:
DRAWN BY: B. KIMES — DATE: 7/28/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/10/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

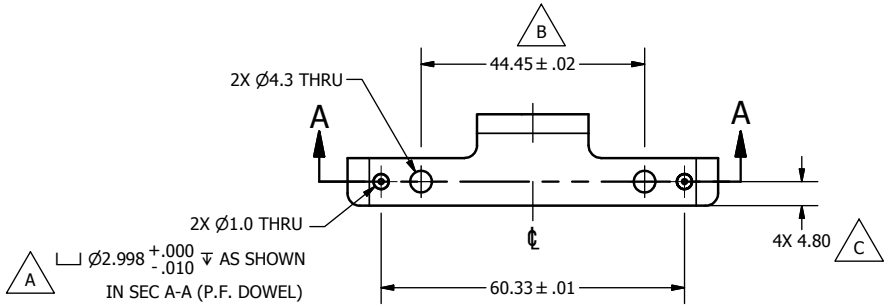
DESCRIPTION: NECK PULLEY BRACKET ASSEMBLY

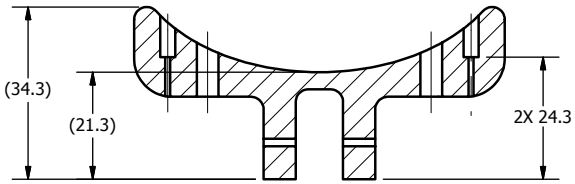
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 1.000 | DRAWING NO.: 472-2300 | REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM310 R07 AND CONVERTED TO METRIC FOR THOR-M; REMOVE NOTE 3, RENUMBER NOTES; C'BORE Ø2.998+.000/-.010 WAS Ø3.175+.000/-.013	8/18/2011	BK
	B	ADD TOLERANCE; 21.3 WAS 21.4	4/26/2012	BK
	C	ADD DIMENSION	11/27/2012	BK

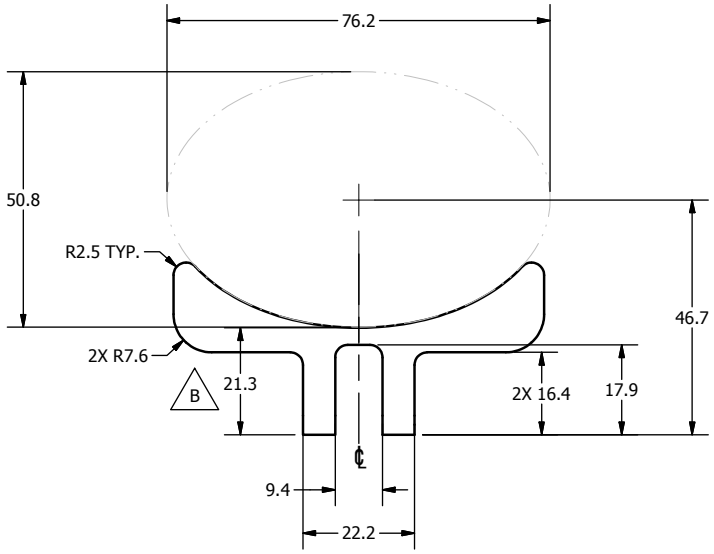


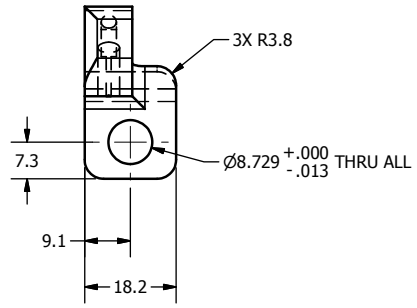
SCALE 1.000

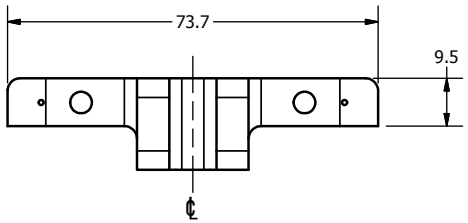




SECTION A-A
SCALE 1.000





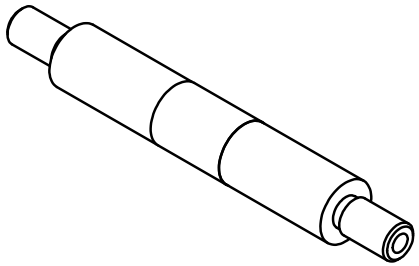


NOTES:

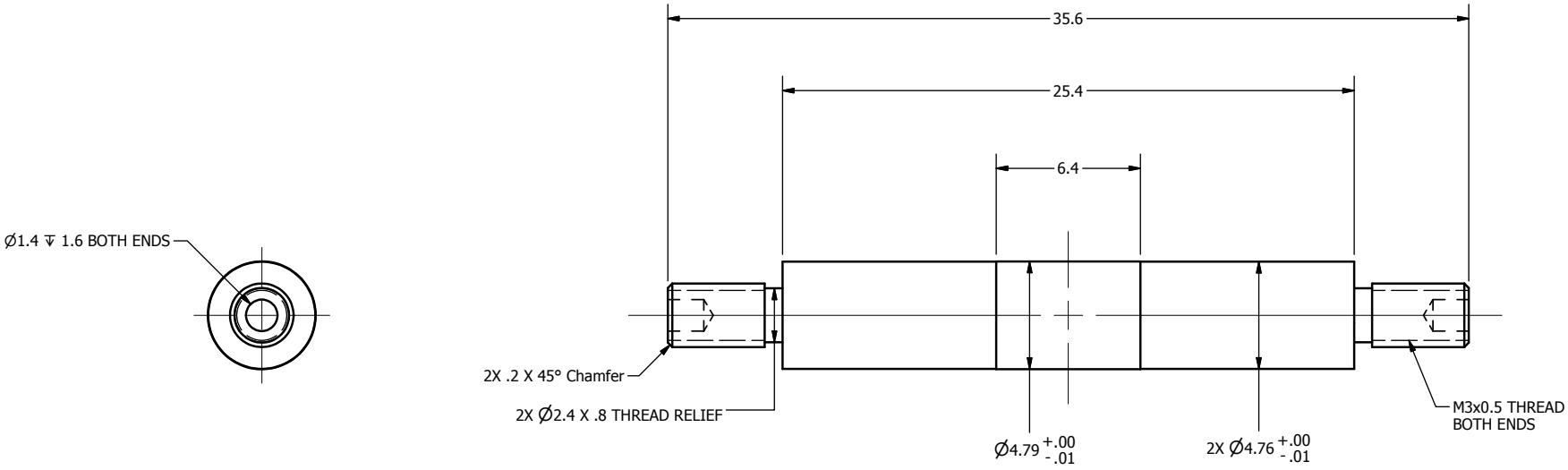
1. REMOVE ALL BURRS AND BREAK ALL SHARP EDGES.
2. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
3. POWDER OR BEAD BLAST.
4. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.
5. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES			
PROJECT NO.:			DESCRIPTION: REAR PULLEY BRACKET, NECK		
472-2300	1	MATERIAL: 1018 STEEL	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1 DRAWING NO.: 472-2310 REV: C
TOTAL QTY IN DUMMY	1	FINISH: SEE NOTES	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 1.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM311 R05 AND CONVERTED TO METRIC FOR THOR-M; REMOVE NOTE 1, RENUMBER NOTES	8/18/2011	BK



SCALE 3.000

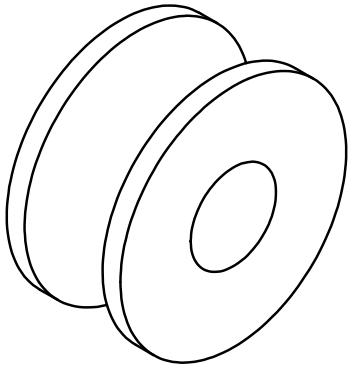


NOTES:

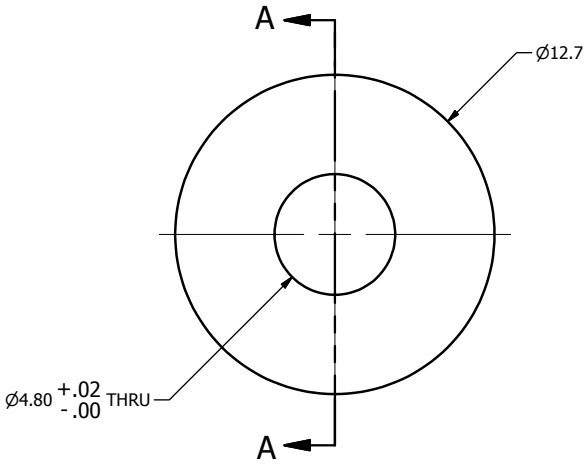
A 1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHREWISE NOTED.

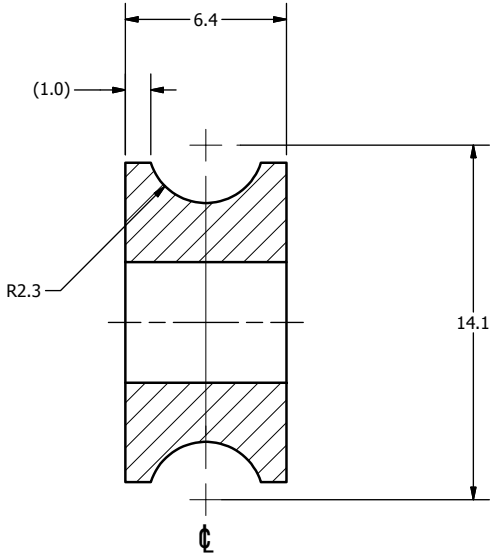
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: REAR CABLE PULLEY SHAFT, NECK		
472-2400	1	PROJECT NO.:			
472-2300	1	MATERIAL: ETD-150 STEEL	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-2311 REV: A
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 5.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM312 R04 FOR THOR-M	8/19/11	BK



SCALE 5.000

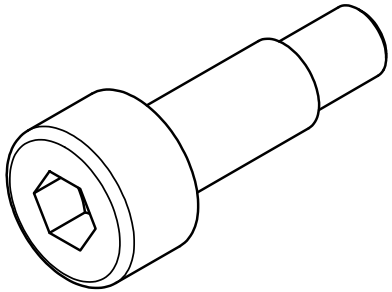




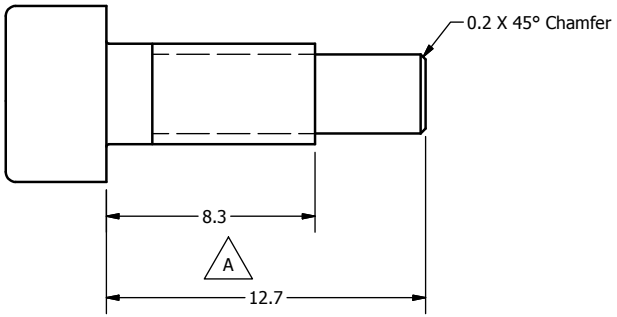
SECTION A-A
SCALE 5.000

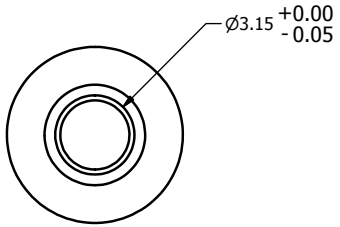
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
472-2400	1	PROJECT NO.:		DESCRIPTION: NECK REAR CABLE PULLEY	
472-2300	1	MATERIAL: OILITE BRONZE (SAE 841)	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1 DRAWING NO.: 472-2312 REV: A
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 5.000

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM027 R05 AND CONVERTED TO METRIC FOR THOR-M; 8.3 WAS 8.6, 12.7 WAS (12.7); ADD (5000459) TO NOTE	7/28/2011	BK



SCALE 5.000



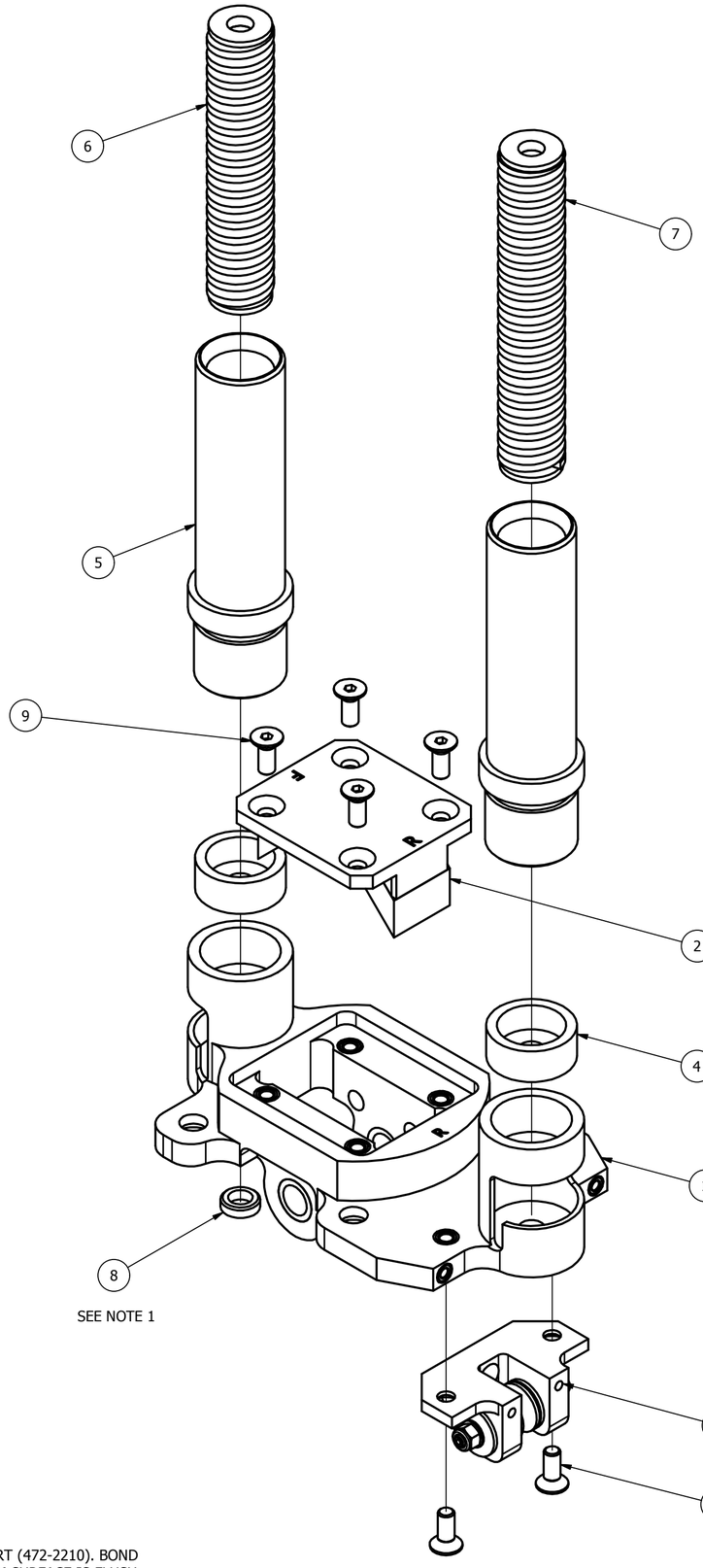


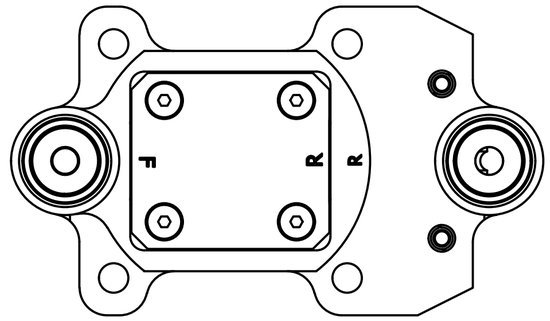
NOTES:

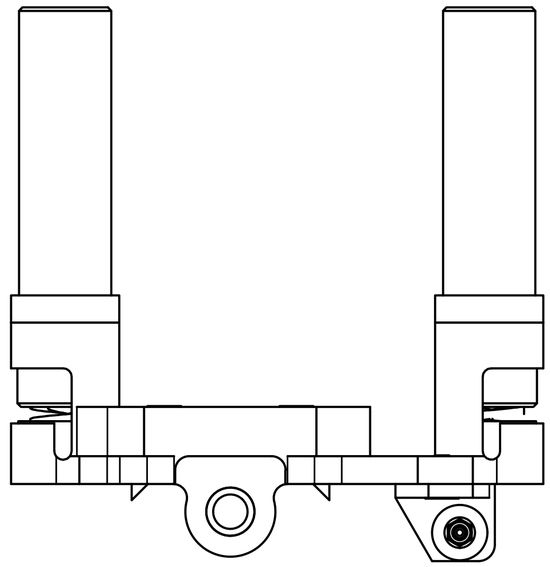
A 1. MAKE FROM M4 X0.7 X 14 SHCS (5000459), MODIFY AS SHOWN.

		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6		
		PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: OCCIPITAL CONDYLE SCREW	
472-2000	1	MATERIAL:	DRAWN BY: B. KIMES DATE: 7/28/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET 1 OF 1	DRAWING NO.: 472-2016 REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG DATE: 1/9/2012	SCALE: 5.000	

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM200 R13 AND CONVERTED TO METRIC FOR THOR-M	8/19/11	BK
	B	ADDED PART #SA572-S112 - Ø.850 SKULL SPRING LOAD CELL (OPTIONAL)	9/2/2015	DW
	C	REVISED PART #472-2230 - OC STOP ASSEMBLY	5/11/2016	DW







SCALE 1.000

NOTES:

1. CHEMICALLY CLEAN THE PART AND ITS MATING PART (472-2210). BOND WITH CYANOACRYLATE, MAKING SURE THE BOTTOM SURFACE IS FLUSH WITH ITS MATING PART.

2. SPRING LOAD CELL, SA572-S112, CAN BE USED INSTEAD OF 472-2201.

ITEM	QTY	PART NUMBER	DESCRIPTION
10	2	SA572-S112	Ø.850 SKULL SPRING LOAD CELL (OPTIONAL)
9	6	9001459	SCREW, FHCS M4 x 10
8	1	472-2204	FRONT CABLE BUSHING, NECK
7	1	472-2240	REAR SPRING ASSEMBLY
6	1	472-2220	FRONT SPRING ASSEMBLY
5	2	472-2203	NECK FRONT/REAR SPRING TUBE
4	2	472-2201	NECK SPRING LOAD CELL STRUCTURAL REPLACEMENT
3	1	472-2400	HEAD/NECK PULLEY BRACKET ASSEMBLY
2	1	472-2230	OC STOP ASSEMBLY
1	1	472-2210	HEAD/NECK MOUNTING PLATFORM

PARTS LIST

472-2000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

PROJECT NO.:

MATERIAL:

HEAT TREAT:

FINISH:

TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5°	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

REMOVE BURRS & BREAK SHARP EDGES

DRAWN BY: B. KIMES — DATE: 7/28/2011

CHECKED BY: — DATE:

ENGINEER: J. WANG — DATE: 1/10/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

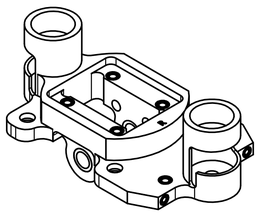
DESCRIPTION: MOUNTING PLATFORM ASSEMBLY, NECK

SIZE: A2 — SHEET: 1 OF 1 — SCALE: 1.000

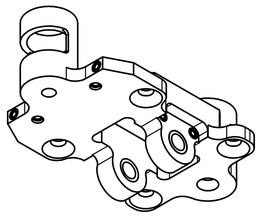
DRAWING NO.: 472-2200 — REV: C

472-2200.iam

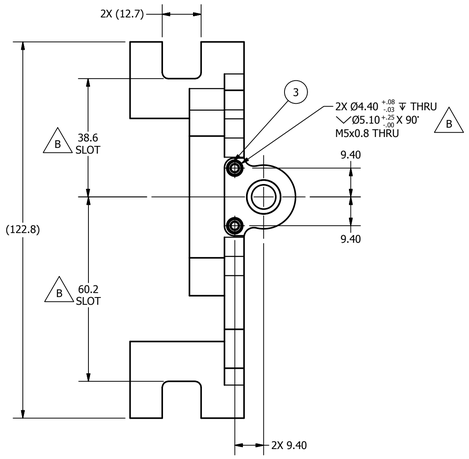
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM210 R12 AND CONVERTED TO METRIC FOR THOR-M; 39.50 WAS 39.5±.05; ADD NOTE 3	8/4/2011	BK
	B	ADDED "SLOT" TO DIMENSIONS; MOVED SLOT DIMENSIONS FROM SECTION A-A TO SIDE VIEW; 4X Ø6.80 +0.15/-0.03 THRU C'SINK Ø14.2 X 90° WAS 4X Ø6.5 THRU C'SINK Ø14.2 X 90°; M22x2.5 WAS M22x3; ADDED 2X R2.0TO INSIDE CORNERS; UPDATE KEENSERT HOLE CALLOUTS	1/30/2017	DW
	C	HOLE DIMENSION 4X Ø5.50 $^{+.08}_{-.03}$ ↧ 12.2 MAX ⌵Ø6.10 $^{+.25}_{-.00}$ x 90° M6x0.75 – 6H ↧ 6.50 MIN. WAS HOLE DIMENSION 4X Ø5.50 $^{+.08}_{-.03}$ ↧ THRU ⌵Ø6.10 $^{+.25}_{-.00}$ x 90° M6x0.75 – 6H ↧ 6.50 MIN.	2/5/2018	DW

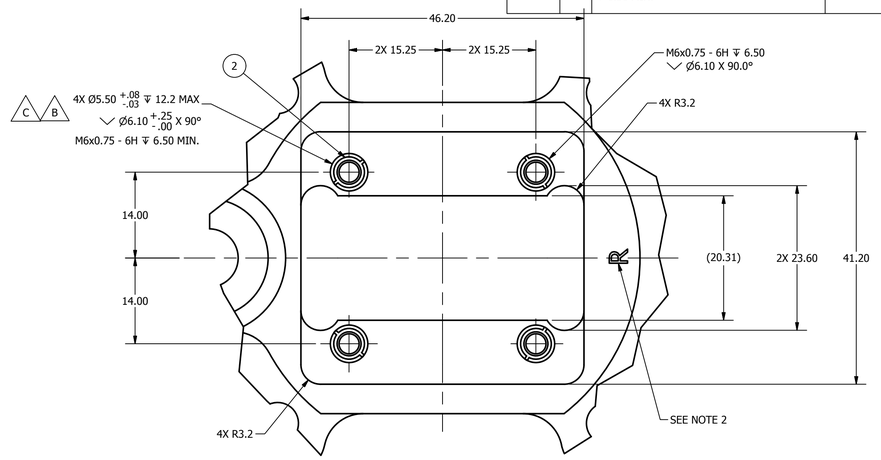


SCALE .750

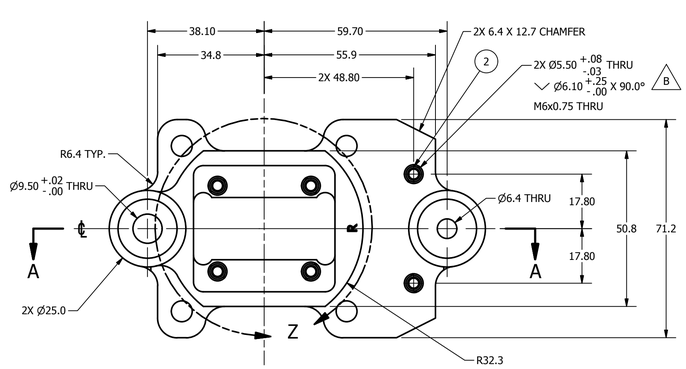


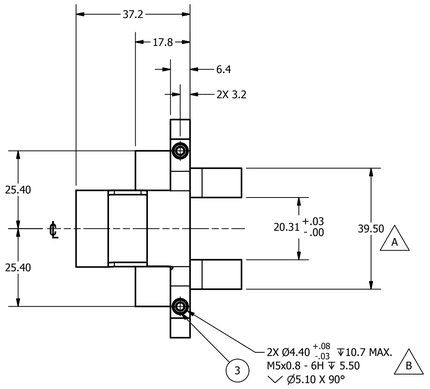
SCALE .750

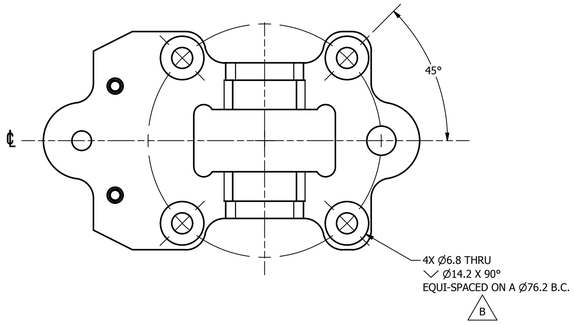


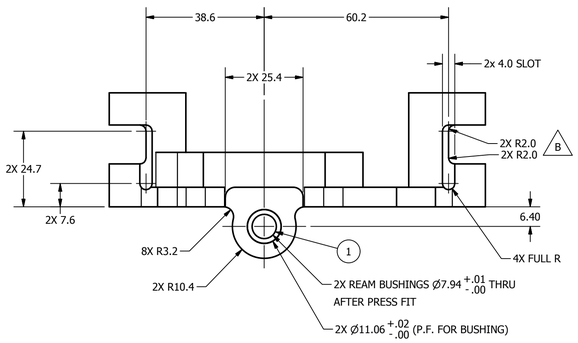


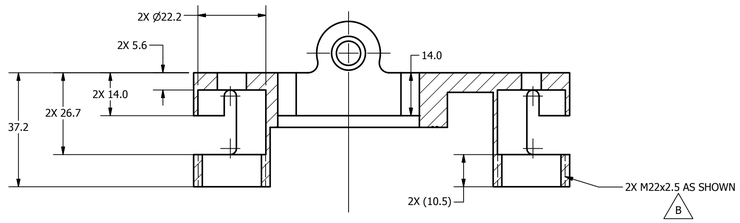
DETAIL Z
SCALE 2.000











SECTION A-A
SCALE 1.000

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. STAMP OR ETCH "R" (3mm CHARACTERS) AS SHOWN.
3. INSTALL KEENSERTS AND BUSHINGS AFTER ANODIZE.

ITEM	QTY	PART NUMBER	DESCRIPTION
3	4	5001107	M3 X 0.5 X 4.25 LG. MINI KEENSERT
2	6	5000724	M4 X 0.7 X 5.25 LG. MINI KEENSERT
1	2	472-2202	OCCIPITAL CONDYLE BUSHING

PARTS LIST

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ANGLES FINISH x ±.5 ±1° 1.6 .xx ±.02 .xxx ±.01 .xxxx ±.01 REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

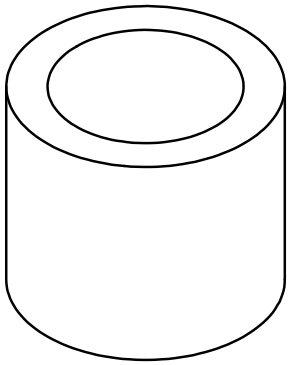
DESCRIPTION: HEAD/NECK MOUNTING PLATFORM

472-2200	1	MATERIAL: 7075-T6 ALUMINUM	DRAWN BY: B. KIMES	DATE: 7/28/2011	SIZE: A1
NEXT ASSEMBLY	QTY	PART FINISH:	CHECKED BY:	DATE:	SHEET 1 of 1
TOTAL QTY IN DUMMY	1	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 1.000

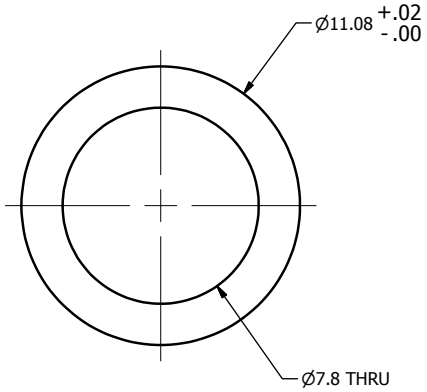
DRAWING NO.: 472-2210 REV: C

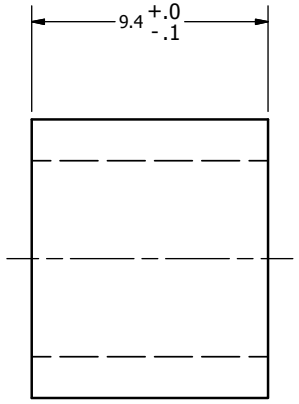
472-2210.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM216 R04 FOR THOR-M	8/1/2011	BK



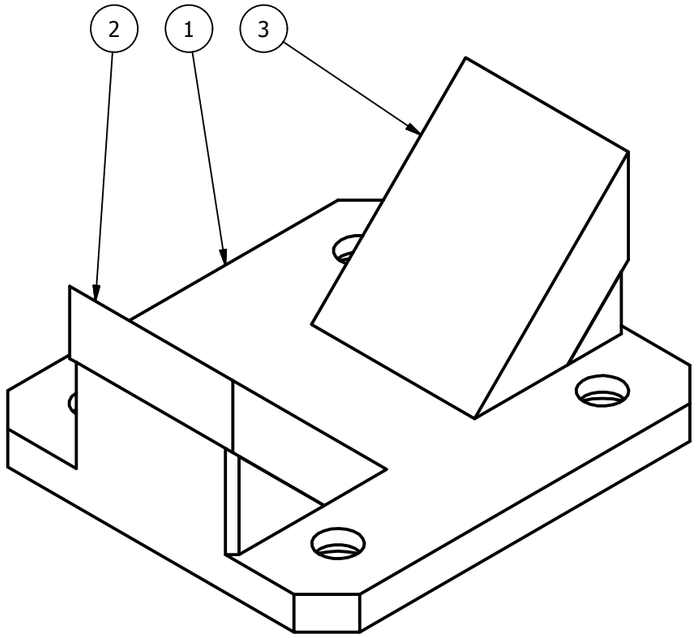
SCALE 5.000

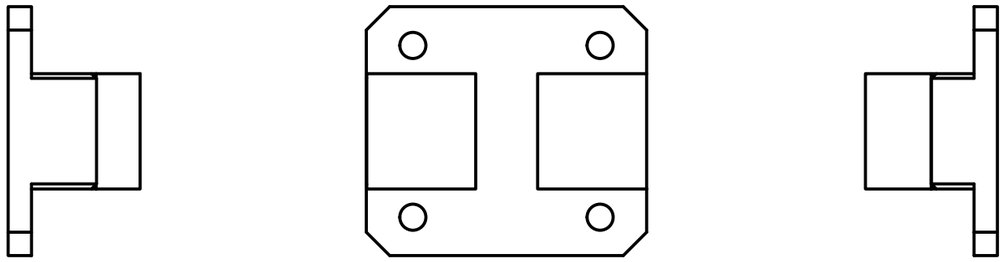




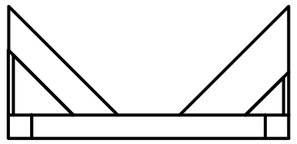
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: OCCIPITAL CONDYLE BUSHING	
472-2210	2	MATERIAL: OILITE BRONZE (SAE841)	DRAWN BY: B. KIMES DATE: 7/28/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET 1 OF 1	DRAWING NO.: 472-2202 REV: A
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG DATE: 1/10/2012	SCALE: 5.000	

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM045 R02 FOR THOR-M	8/4/11	BK
	B	REVISED PART #472-2231	5/11/2016	DW





SCALE 2.000



NOTES:

1. BOND PARTS 472-2232 AND 472-2233 TO 472-2231 USING HIGH STRENGTH, FLEXIBLE, TWO PART RUBBER EPOXY.

ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	472-2233	NECK REAR OC STOP
2	1	472-2232	NECK FRONT OC STOP
1	1	472-2231	FLEXION-EXTENSION STOP PLATE, NECK

B

PARTS LIST

472-2220	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5°	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:

MATERIAL:

HEAT TREAT:

FINISH:

DRAWN BY: B. KIMES — DATE: 7/28/2011

CHECKED BY: — DATE:

ENGINEER: J. WANG — DATE: 1/10/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: OC STOP ASSEMBLY

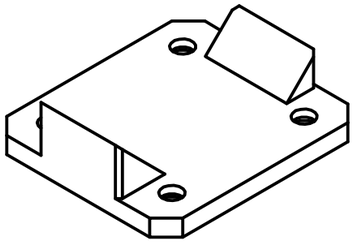
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 1.000

DRAWING NO.: 472-2230

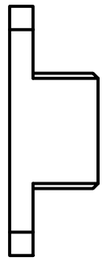
REV: B

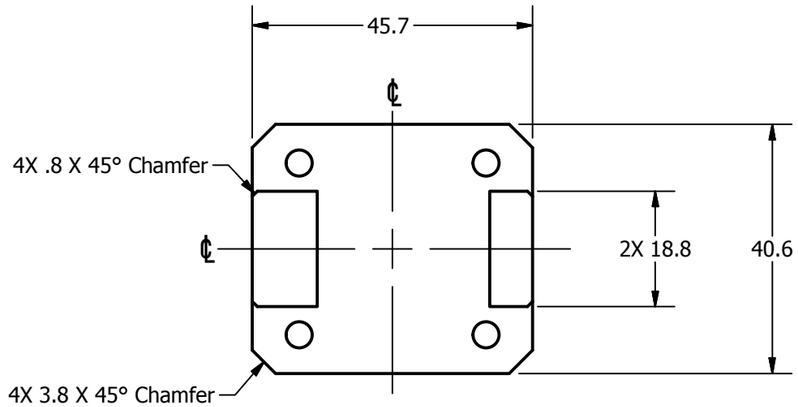
472-2230.iam

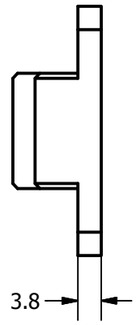
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM046 R02 AND CONVERTED TO METRIC FOR THOR-M	8/22/11	BK
	B	MOVED "F" AND "R" STAMPS TO THE TOP OF THE PLATE	5/11/2016	DW

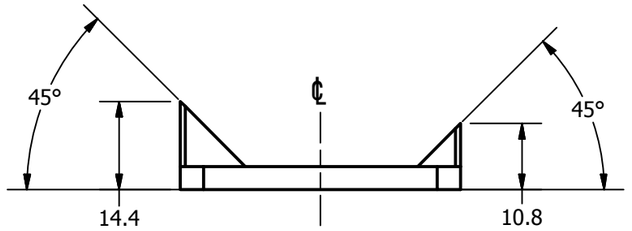


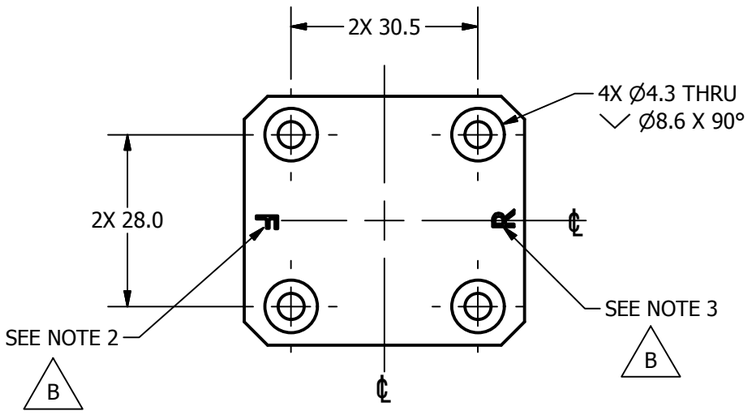
SCALE 1.000











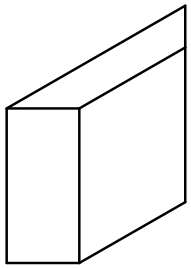
NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. STAMP OR ETCH "F" (3mm CHARACTERS) AT LOCATION SHOWN TO REPRESENT FRONT.
3. STAMP OR ETCH "R" (3mm CHARACTERS) AT LOCATION SHOWN TO REPRESENT REAR.

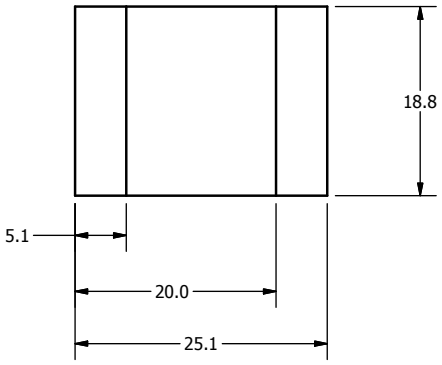
		DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: FLEXION-EXTENSION STOP PLATE, NECK	
472-2230	1	MATERIAL: 7075-T6 ALUMINUM	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1 — DRAWING NO.: 472-2231 — REV: B
TOTAL QTY IN DUMMY	1	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG	DATE: 1/10/12	SCALE: 1.000

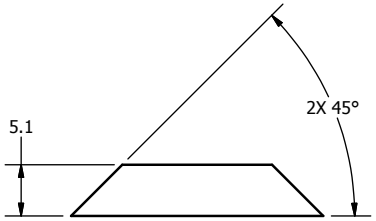
472-2231.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM047 R03 FOR THOR-M	8/4/11	BK



SCALE 2.000



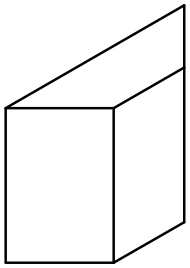


NOTES:

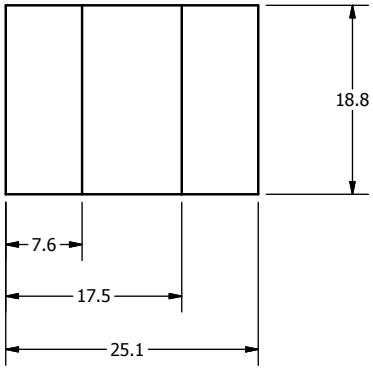
1. NEOPRENE TOLERANCE ±.5 AND DUROMETER ±5, UNLESS OTHERWISE SPECIFIED.

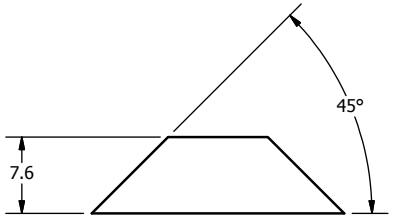
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES			
PROJECT NO.:			DESCRIPTION: NECK FRONT OC STOP		
472-2230	1	MATERIAL: NEOPRENE 65A	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-2232 REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 2.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM048 R03 FOR THOR-M	8/4/11	BK



SCALE 2.000



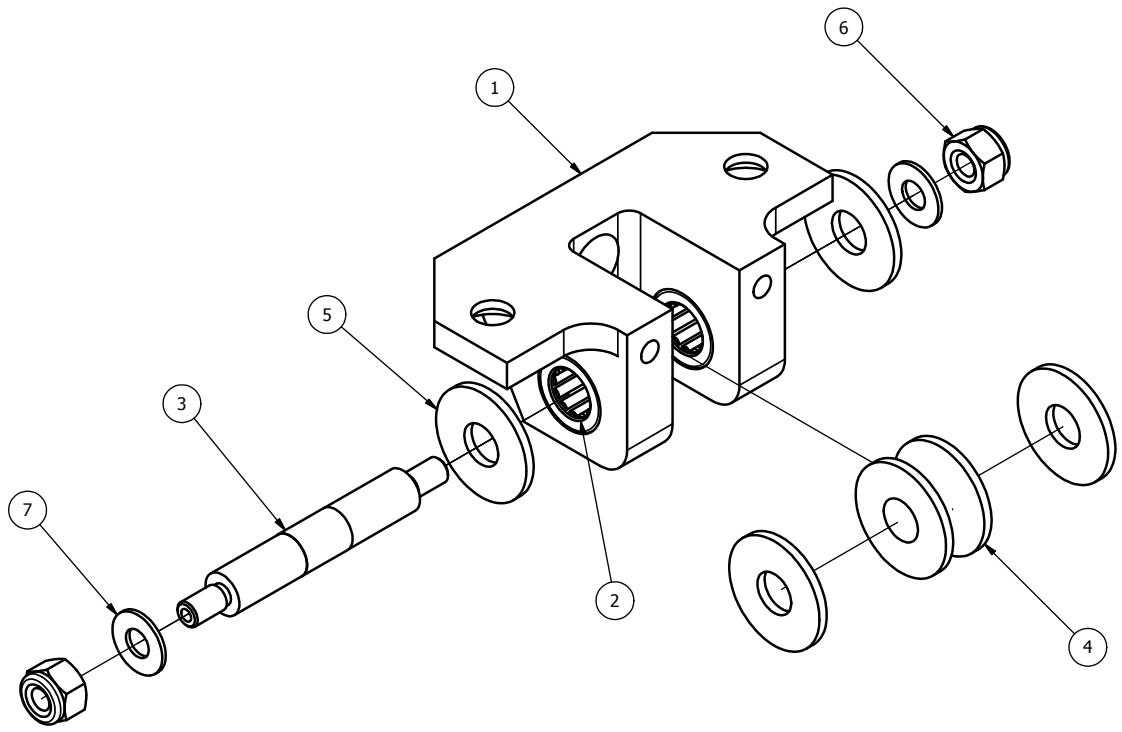


NOTES:

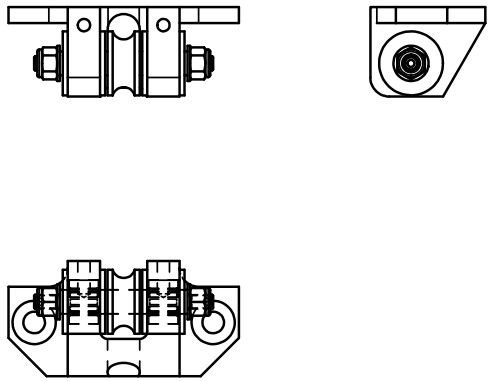
1. NEOPRENE TOLERANCE ±.5 AND DUROMETER ±5, UNLESS OTHERWISE SPECIFIED.

		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6		
		PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: NECK REAR OC STOP	
472-2230	1	MATERIAL: NEOPRENE 65A	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 / DRAWING NO.: 472-2233 / REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 2.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM400 R08 AND CONVERTED TO METRIC FOR THOR-M	8/19/11	BK



SCALE 2.000



NOTES:

1. PRESS THE BEARINGS (9002597) INTO PLACE, FLUSH WITH OUTSIDE SURFACE OF 472-2410.

ITEM	QTY	PART NUMBER	DESCRIPTION
7	2	5001095	M3 FLAT WASHER PLAIN ZINC
6	2	5001106	M3 X 0.3 HEX LOCK NUT SS
5	4	9002595	WASHER, TEFLON .187 X .50 X .04 THK
4	1	472-2312	NECK REAR CABLE PULLEY
3	1	472-2311	REAR CABLE PULLEY SHAFT, NECK
2	2	9002597	BEARING, NEEDLE ROLLER
1	1	472-2410	HEAD/NECK PULLEY BRACKET, NECK

PARTS LIST

472-2000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS — DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 — ANGLES ±0.5° — FINISH 1.6 — REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

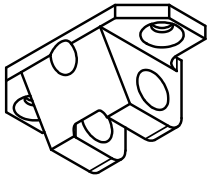
DRAWN BY: B. KIMES — DATE: 7/28/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/10/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

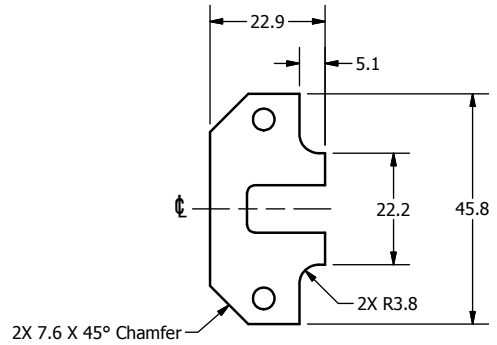
DESCRIPTION: HEAD/NECK PULLEY BRACKET ASSEMBLY

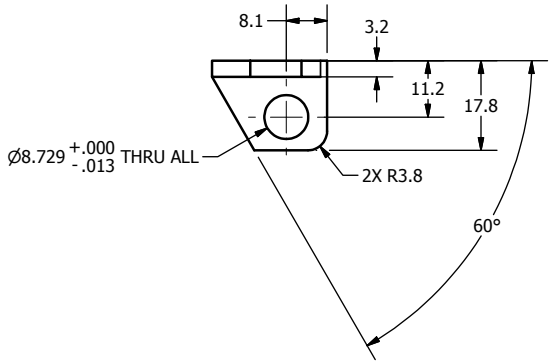
SIZE: A3 — SHEET: 1 OF 1 — SCALE: 1.000 — DRAWING NO.: 472-2400 — REV: A

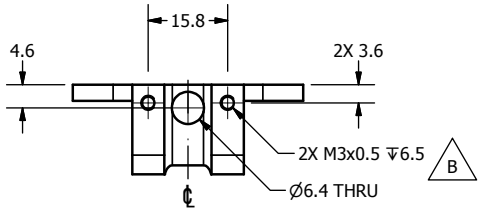
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM410 R11 AND CONVERTED TO METRIC FOR THOR-M	8/19/2011	BK
	B	M3 x .5 6.5 DP WAS M4 x .7 6.40 DP	6/14/2012	BK

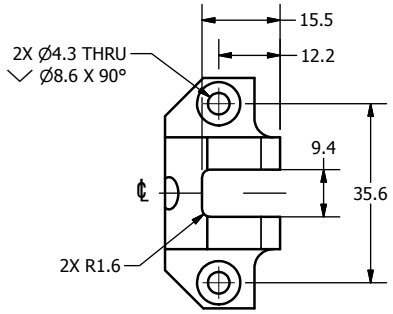


SCALE 1.000







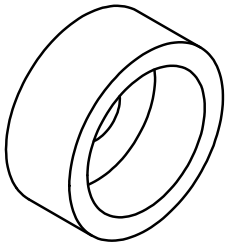


NOTES:

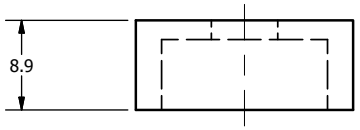
1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. POWDER OR BEAD BLAST.
3. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.
4. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

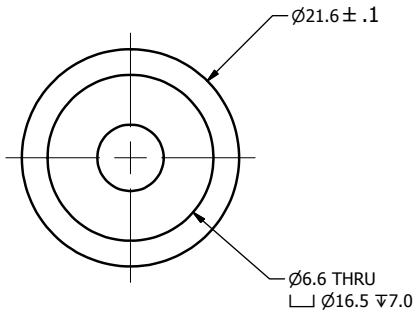
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: HEAD/NECK PULLEY BRACKET, NECK		
PROJECT NO.:					
472-2400	1	MATERIAL: 1018 STEEL	DRAWN BY: B. KIMES	DATE: 8/19/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1 DRAWING NO.: 472-2410 REV: B
TOTAL QTY IN DUMMY	1	FINISH: SEE NOTES	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 1.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM028 R05 FOR THOR-M	8/1/2011	BK



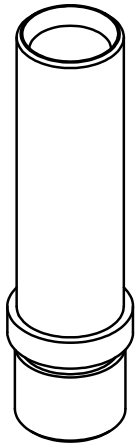
SCALE 2.000



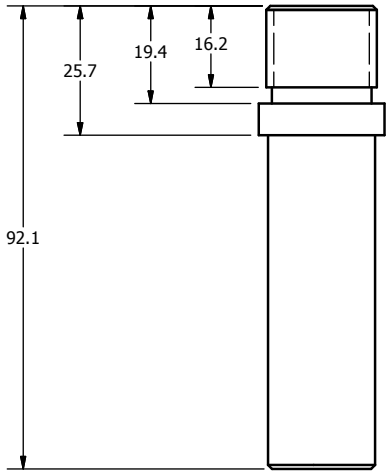


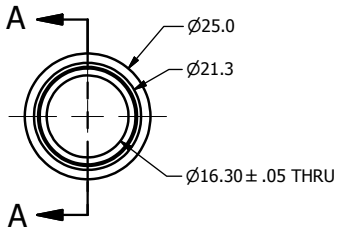
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ± 0.5 ± 0.5° 1.6 X.X ± 0.2 X.XX ± 0.1 X.XXX ± 0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: NECK SPRING LOAD CELL STRUCTURAL REPLACEMENT	
472-2200	2	MATERIAL: 303 STAINLESS STEEL	DRAWN BY: B. KIMES DATE: 7/28/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET 1 OF 1	DRAWING NO.: 472-2201 REV: A
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG DATE: 1/10/2012	SCALE: 2.000	

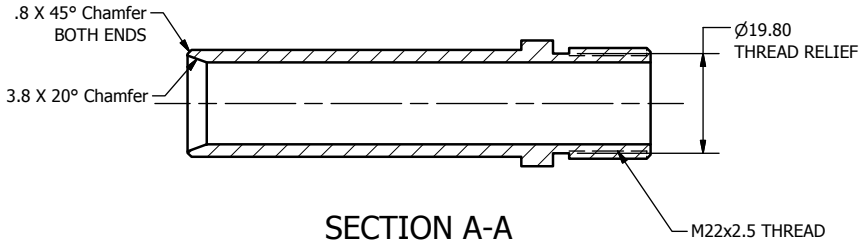
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM211 R07 AND CONVERTED TO METRIC FOR THOR-M	8/4/11	BK



SCALE 1.000



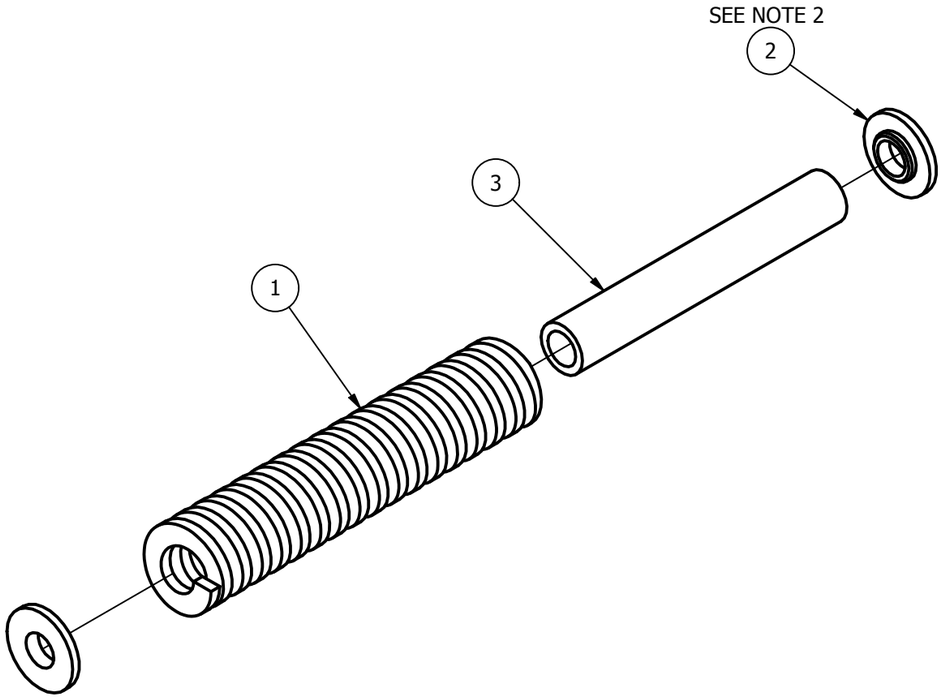




SECTION A-A
SCALE 1.000

		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: NECK FRONT/REAR SPRING TUBE	
472-2200	2	MATERIAL: Acetal Resin, Black	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 — DRAWING NO.: 472-2203 — REV: A
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 1.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM030 R04 AND CONVERTED TO METRIC FOR THOR-M	8/4/11	BK
	B	MOD NOTE 3 TO CUT 8005531 TO LENGTH AFTER INSERTION INTO SPRING, CHANGED ITEM 3	6/22/2012	TMV
	C	710N TO 790N WAS 830 TO 920 M	11/28/2012	BK
	D	ITEM #1 DESCRIPTION WAS SPRING, 16 X 8 I.D. X 76; ADDED NOTE 4	7/12/2018	DW



SCALE 1.000

NOTES:

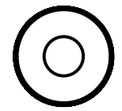
1. NOMINAL SPRING RATE IS SUPERSEDED BY STATIC TESTING REQUIREMENTS:
   SPRING RATE 17.8 ± 0.9 N/mm.
   MAXIMUM DEFLECTION TO SOLID HEIGHT MUST EXCEED 36mm.

2. NECK SPRING BUSHING: CHEMICALLY CLEAN THE MATING SURFACE AND JOIN WITH 5 MINUTE EPOXY UNDER LIGHT PRESSURE.

B 3. INSERT THE ELASTOMETRIC SPRING ELEMENT MATERIAL INTO THE COMPRESSION SPRING AND CUT TO LENGTH SPECIFIED ABOVE. THIS ASSEMBLY MUST BE STATICALLY TESTED TO MEET THE FOLLOWING REQUIREMENTS:
   DEFLECTION: AT 30mm, FORCE TO BE 710N TO 790N.
   SPRING CAP MUST BE IN PLACE AT EITHER END DURING THIS TEST.
   TEMPERATURE RANGE: 18-27°C 1 HOUR RECOVERY BETWEEN TESTS.

C

D 4. SPRING, (PART #5000517), DIMENSIONAL TOLERANCES ARE TO BE: O.D. & I.D. ± 0.5 AND LENGTH ± 1.0



B	3	1	472-2222	NECK FRONT SPRING DAMPING TUBE
	2	2	472-2221	NECK SPRING BUSHING
D	1	1	5000517	SPRING, 15.3 O.D. x 9.3 I.D. x 77.5 (SEE NOTE 4)
	ITEM	QTY	PART NUMBER	DESCRIPTION

PARTS LIST

472-2200	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 — ANGLES ±0.5° — FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

DRAWN BY: B. KIMES — DATE: 7/28/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/10/2012

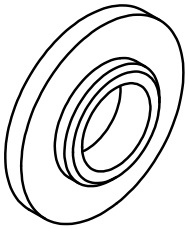
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: FRONT SPRING ASSEMBLY

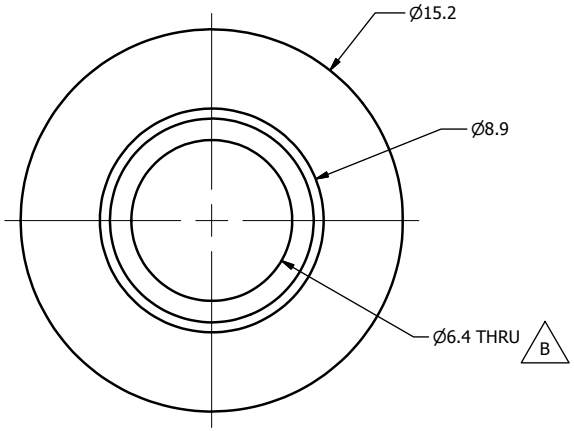
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 1.000 | DRAWING NO.: 472-2220 | REV: D

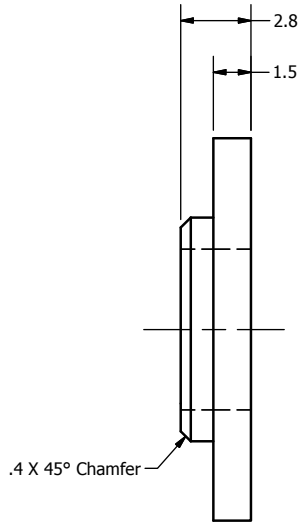
472-2220.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM023 R06 FOR THOR-M	8/4/11	BK
	B	Ø6.4 WAS Ø5.8	6/13/2012	BK



SCALE 3.000



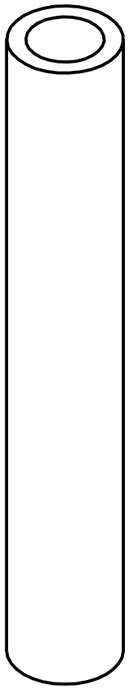


NOTES:

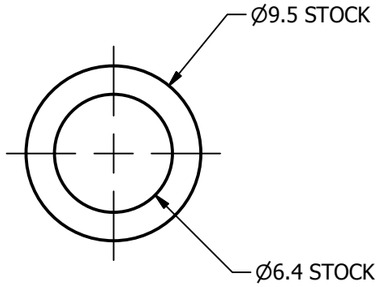
1. POWDER OR BEAD BLAST.
2. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.
3. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

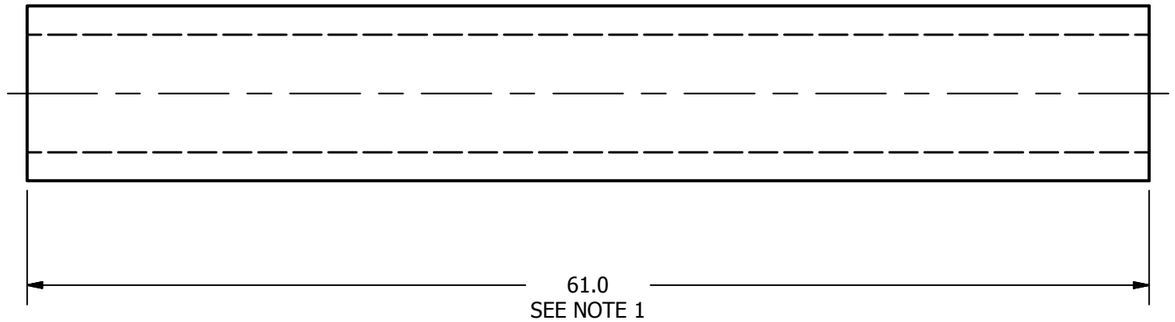
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
472-2240	2	PROJECT NO.:		DESCRIPTION: NECK SPRING BUSHING	
472-2220	2	MATERIAL: 4140 STEEL	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1 DRAWING NO.: 472-2221 REV: B
TOTAL QTY IN DUMMY	4	FINISH: SEE NOTES	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 5.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM031 R04 FOR THOR-M	8/4/11	BK
	B	IN NOTE #1 "QUALIFICATION" WAS "CERTIFICATION"	8/7/2017	DW



SCALE 2.000





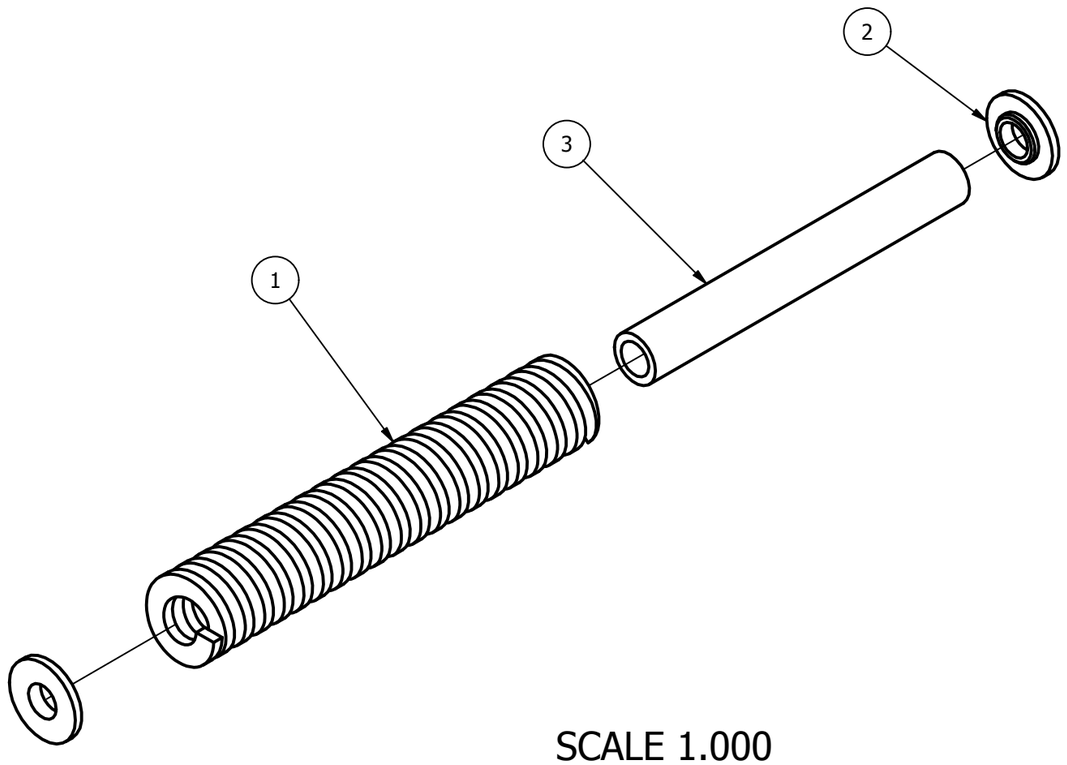
NOTES:

1. FINAL LENGTH TO BE DETERMINED DURING SPRING ASSEMBLY QUALIFICATION.

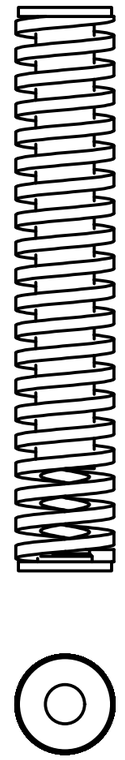
		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: NECK FRONT SPRING DAMPING TUBE	
		PROJECT NO.: THOR-M			
472-2220	1	MATERIAL: TYGON SE-200	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-2222 REV: B
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 3.000

472-2222.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM050 R05 AND CONVERTED TO METRIC FOR THOR-M	8/4/2011	BK
	B	MOD NOTE 3 TO CUT 8006381 TO LENGTH AFTER INSERTION INTO SPRING, CHANGED ITEM 3	6/22/2012	TMV
	C	684N TO 756N WAS 600 TO 660M	11/28/2012	BK
	D	ITEM #1 DESCRIPTION WAS SPRING, 16 X 8 I.D. X 89; ADDED NOTE 4	8/8/2018	DW



SCALE 1.000



NOTES:

1. NOMINAL SPRING RATE IS SUPERSEDED BY STATIC TESTING REQUIREMENTS:
   SPRING RATE 20.9 ± 1.0 N/mm.
   MAXIMUM DEFLECTION TO SOLID HEIGHT MUST EXCEED 40mm.

2. NECK SPRING BUSHING: CHEMICALLY CLEAN THE MATING SURFACE AND JOIN WITH 5 MINUTE EPOXY UNDER LIGHT PRESSURE.

B 3. INSERT THE ELASTOMETRIC SPRING ELEMENT MATERIAL INTO THE COMPRESSION SPRING AND CUT TO LENGTH SPECIFIED ABOVE. THIS ASSEMBLY MUST BE STATICALLY TESTED TO MEET THE FOLLOWING REQUIREMENTS:
   DEFLECTION: AT 30mm, FORCE TO BE 684N TO 756N.
C SPRING CAP MUST BE IN PLACE AT EITHER END DURING THIS TEST.
   TEMPERATURE RANGE: 18-27°C 1 HOUR RECOVERY BETWEEN TESTS.

D 4. SPRING, (PART #5000516), DIMENSIONAL TOLERANCES TO BE, O.D. & I.D. ± 0.5 AND LENGTH ± 1.0.

ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	472-2241	NECK REAR SPRING DAMPING TUBE
2	2	472-2221	NECK SPRING BUSHING
1	1	5000516	SPRING, 15.3 O.D. x 9.3 I.D. x 90.0 (SEE NOTE 4)

PARTS LIST

472-2200	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 — ANGLES ±0.5° — FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:
DRAWN BY: B. KIMES — DATE: 7/28/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/10/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

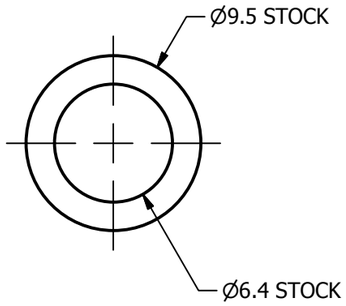
DESCRIPTION: REAR SPRING ASSEMBLY

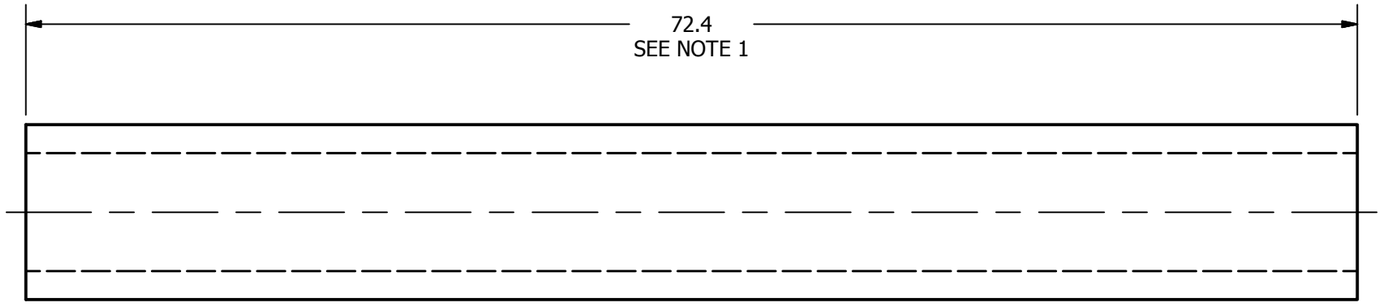
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 1.000 | DRAWING NO.: 472-2240 | REV: D

472-2240.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM051 R04 FOR THOR-M	8/4/2011	BK
	B	VITON 75A WAS VITON 90A	6/12/2012	BK
	C	IN NOTE #1 "QUALIFICATION" WAS "CERTIFICATION".	8/7/2017	DW

SCALE 1.000



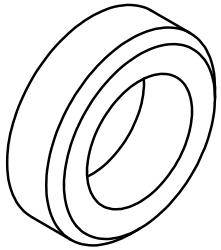


NOTES:

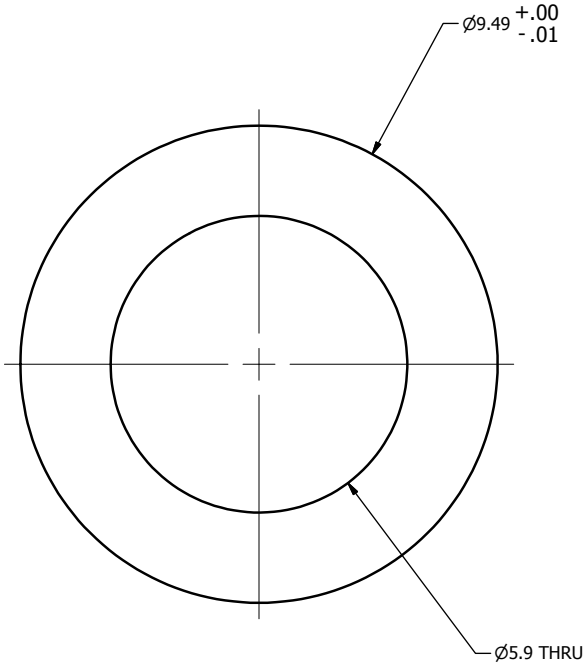
1. FINAL LENGTH WILL BE DETERMINED DURING SPRING ASSEMBLY QUALIFICATION. C

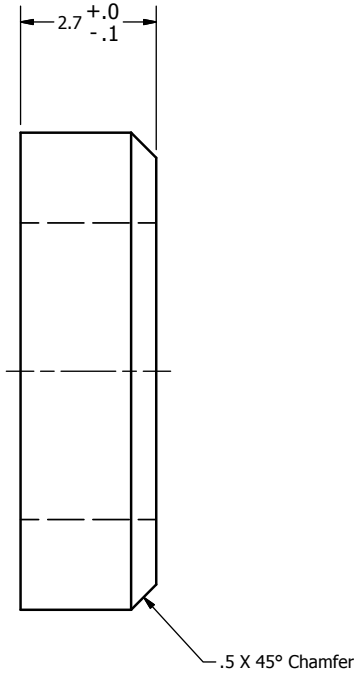
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.: THOR-50M		DESCRIPTION: NECK REAR SPRING DAMPING TUBE	
472-2240	1	MATERIAL: VITON 75A	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/10/2012	SIZE: A3 SHEET: 1 OF 1 SCALE: 3.000 DRAWING NO.: 472-2241 REV: C

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM214 R07 FOR THOR-M	8/4/11	BK



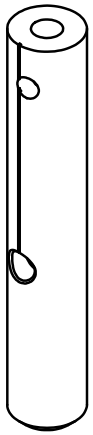
SCALE 5.000

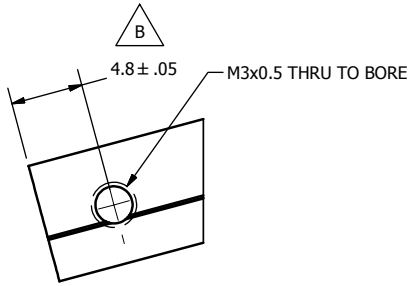




		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: FRONT CABLE BUSHING, NECK	
472-2200	1	MATERIAL: Acetal Resin, Black	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-2204 REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 10.000

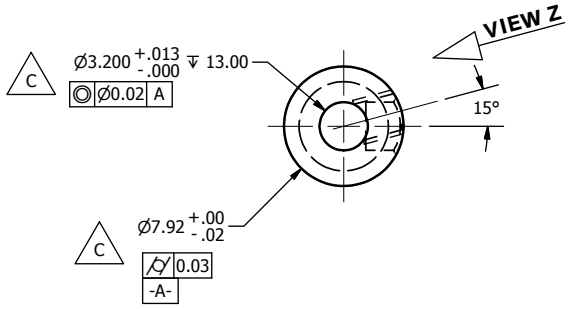
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM013 R01 AND CONVERTED TO METRIC FOR THOR-M	7/29/2011	BK
	B	46.8 WAS 48.8; 27.05 WAS 29.05; 4.80 WAS 6.80	2/7/2012	BK
	C	ADD FINISH MARK, HARDNESS NOTE, FEATURE CONTROL BOXES, DATUM A; Ø3.200+.013/-0 WAS Ø3.20+.1/-0; ADD CHAMFER	2/13/2013	BK

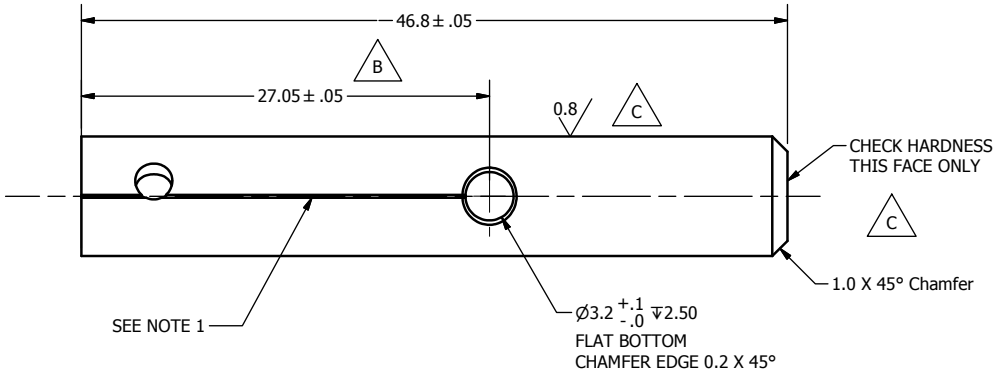




PARTIAL VIEW Z
SCALE 3.000

SCALE 2.000



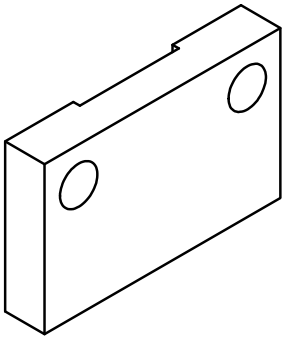


NOTES:

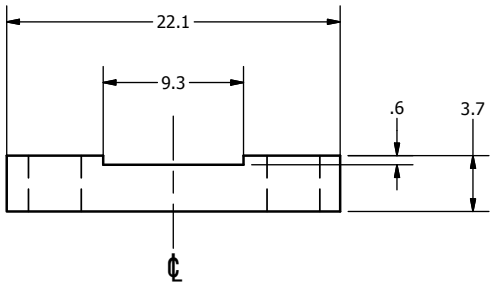
1. ENGRAVE A 0.2mm DEEP LINE THRU THE CENTER OF HOLE TO END AS SHOWN.
2. POWDER OR BEAD BLAST.
3. NICKEL PLATE 0.003mm-0.008mm MAX. AFTER MACHINING AND HEAT TREAT.
4. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

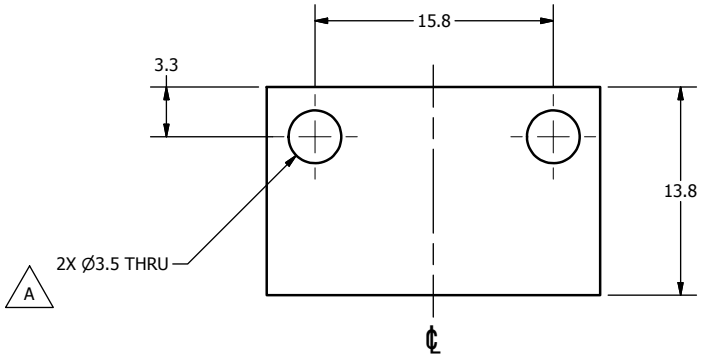
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: OCCIPITAL CONDYLE PIN, NECK	
472-2000	1	MATERIAL: S7 TOOL STEEL	DRAWN BY: B. KIMES DATE: 7/28/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 55-57	CHECKED BY: DATE:	SIZE: A3 SHEET: 1 OF 1	DRAWING NO.: 472-2011 REV: C
TOTAL QTY IN DUMMY	1	FINISH: SEE NOTES	ENGINEER: J. WANG DATE: 1/9/2012	SCALE: 3.000	

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM014 R05 AND CONVERTED TO METRIC FOR THOR-M; Ø3.5 WAS Ø4.0; REMOVE NOTE 1, RENUMBER NOTES	8/23/2011	BK



SCALE 3.000



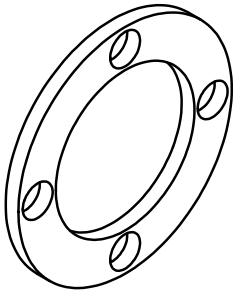


NOTES:

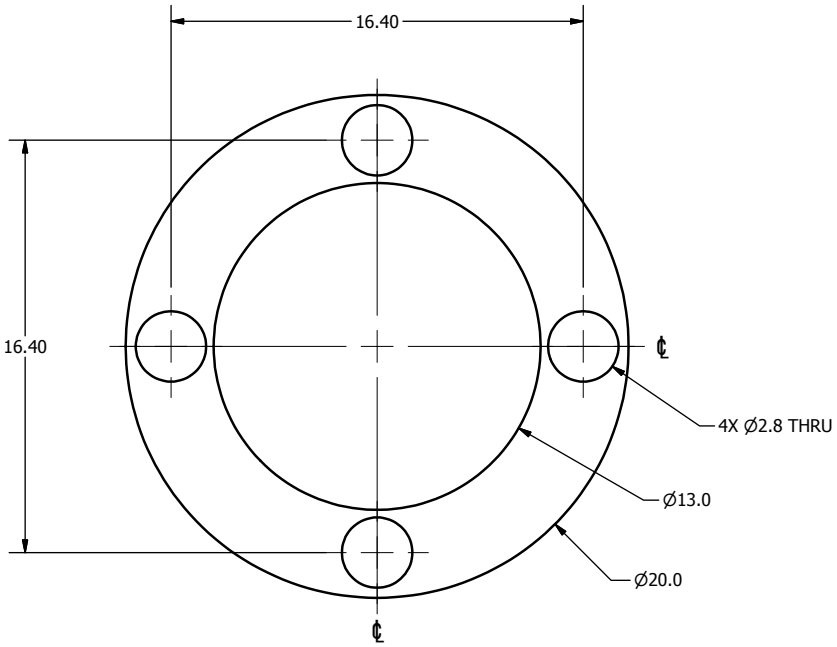
A 1. DIMENSION SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

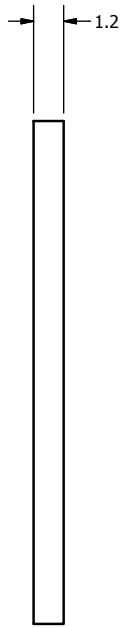
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: NECK PULLEY PLATE		
PROJECT NO.:					
472-2000	1	MATERIAL: Acetal Resin, Black	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/9/2012	SCALE: 3.000 DRAWING NO.: 472-2012 REV: A

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM053 R01 AND CONVERTED TO METRIC FOR THOR-M	7/30/2011	BK



SCALE 3.000



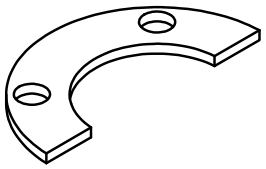


NOTES:

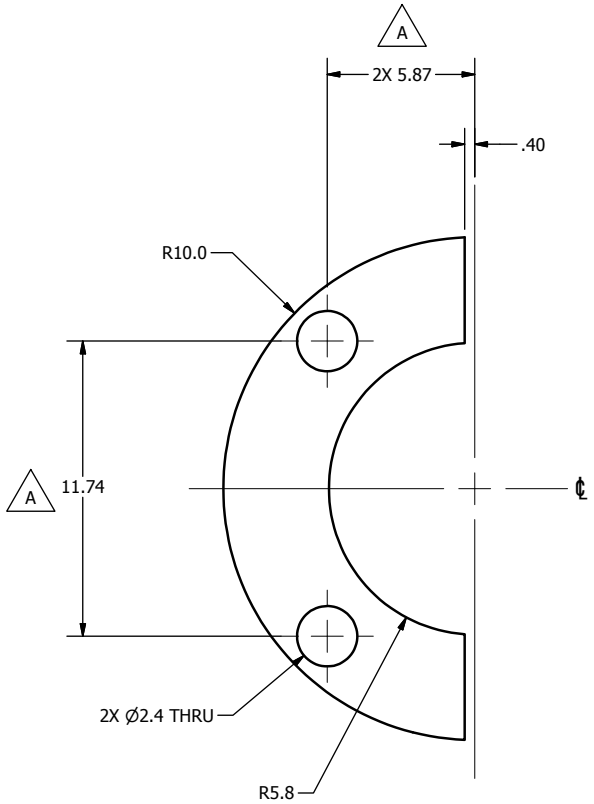
1. DIMENSIONS SYMMETRIC ABOUT ℄ , UNLESS OTHERWISE NOTED.

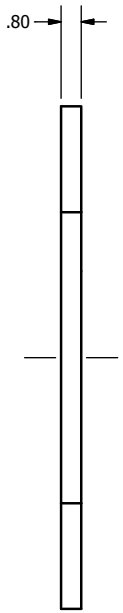
DO NOT SCALE DRAWING		TOLERANCES		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES		DESCRIPTION: ROTARY POTENTIOMETER WASHER, NECK	
PROJECT NO.:					
472-2000	1	MATERIAL: 6061-T6 ALUMINUM	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1
TOTAL QTY IN DUMMY	1	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG	DATE: 1/9/2012	SCALE: 5.000 DRAWING NO.: 472-2021 REV: A

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM052 R01 AND CONVERTED TO METRIC FOR THOR-M; 5.87 WAS 5.80; 11.74 WAS 11.60	8/23/2011	BK



SCALE 3.000



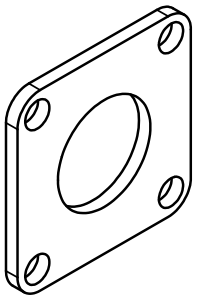


NOTES:

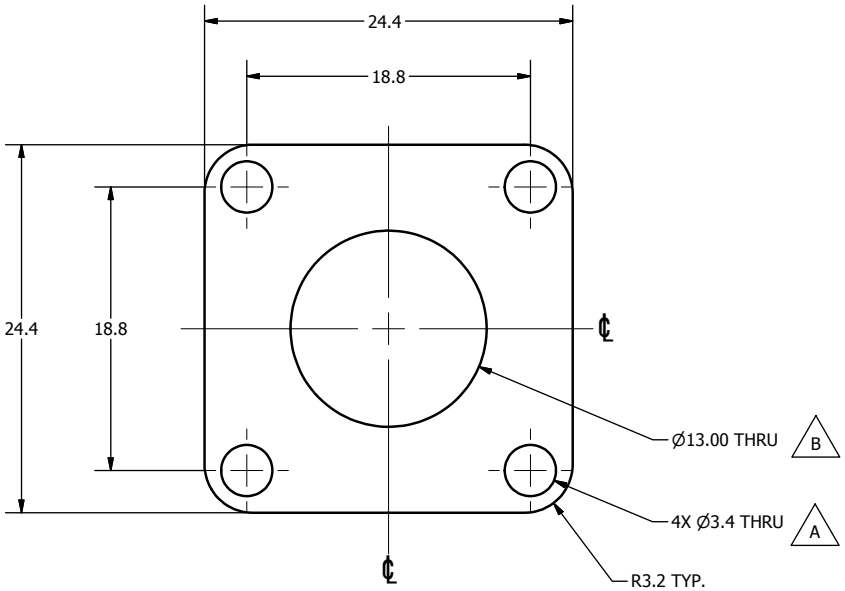
1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

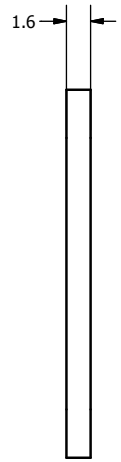
		DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: ROTARY POTENTIOMETER CLAMP, NECK	
472-2000	2	MATERIAL: 6061-T6 ALUMINUM	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1 — DRAWING NO.: 472-2020 — REV: A
TOTAL QTY IN DUMMY	2	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG	DATE: 1/9/2012	SCALE: 5.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM018 R12 AND CONVERTED TO METRIC FOR THOR-M; Ø3.4 WAS Ø3.2	7/29/2011	BK
	B	13.00 DIA WAS 6.4	2/8/2012	BK



SCALE 2.000



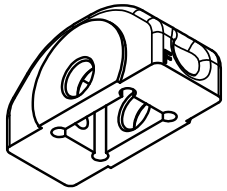


NOTES:

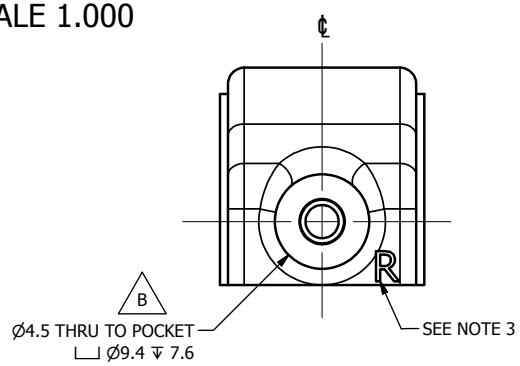
1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

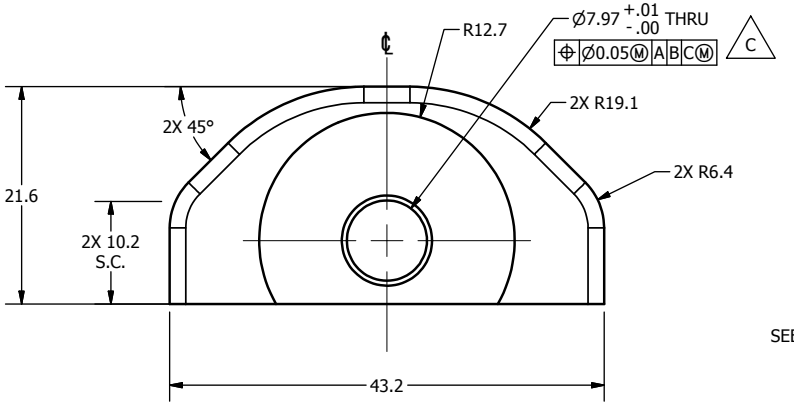
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES: ±0.5° FINISH: 1.6 REMOVE BURRS & BREAK SHARP EDGES			
PROJECT NO.:			DESCRIPTION: ROTARY POTENTIOMETER COVER, NECK		
472-2000	1	MATERIAL: 6061-T6 ALUMINUM	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1
TOTAL QTY IN DUMMY	1	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG	DATE: 1/9/2012	SCALE: 3.000
			DRAWING NO.: 472-2014		REV: B

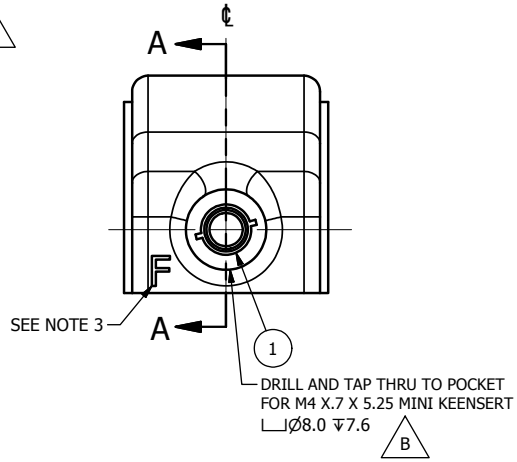
REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM043 R04 AND CONVERTED TO METRIC FOR THOR-M	8/22/2011	BK
	B	POCKET WAS THRU TO Ø; ADD C'BORE DIMENSION	4/3/2012	BK
	C	16.00 WAS 16.0; 19.20+.05/-0 WAS 19.2+.1/-0; 6.30 WAS 6.30 +0/-.03; ADD DATUMS A, B, C; ADD FEATURE CONTROL BOX; Ø7.97+.01/-0 WAS Ø8.1; ADD 4X CHAMFER, SEC B-B, 9.60	2/13/2013	BK

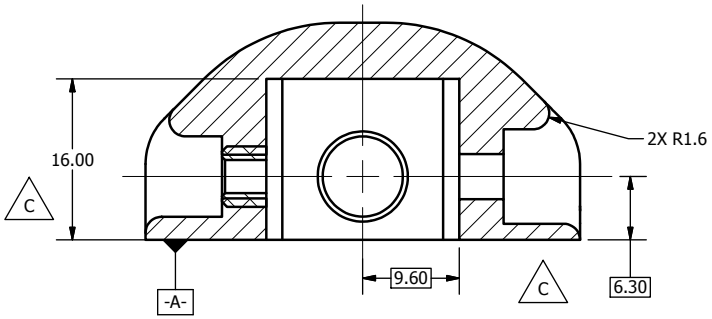


SCALE 1.000

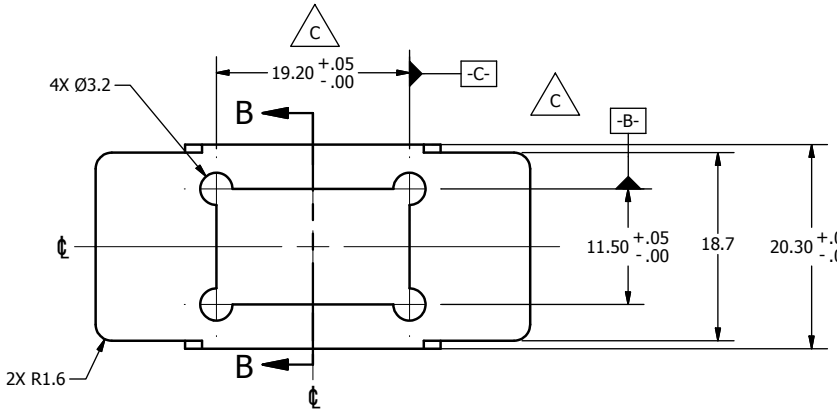


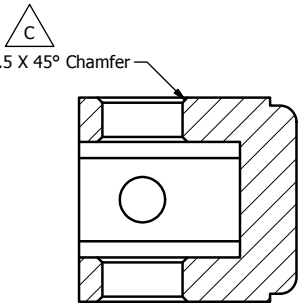






SECTION A-A
SCALE 2.000





C SECTION B-B
SCALE 2.000

NOTES:

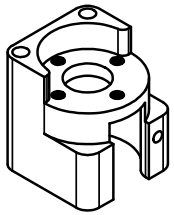
1. GRIND KEENSERT TO 4.2mm BEFORE INSTALLING.
2. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
3. STAMP OR ETCH (3mm CHARACTERS) AS SHOWN.

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5000724	M4 X 0.7 X 5.25 LG. MINI KEENSERT

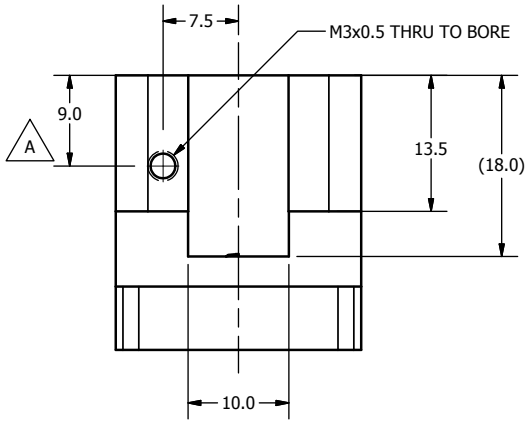
PARTS LIST

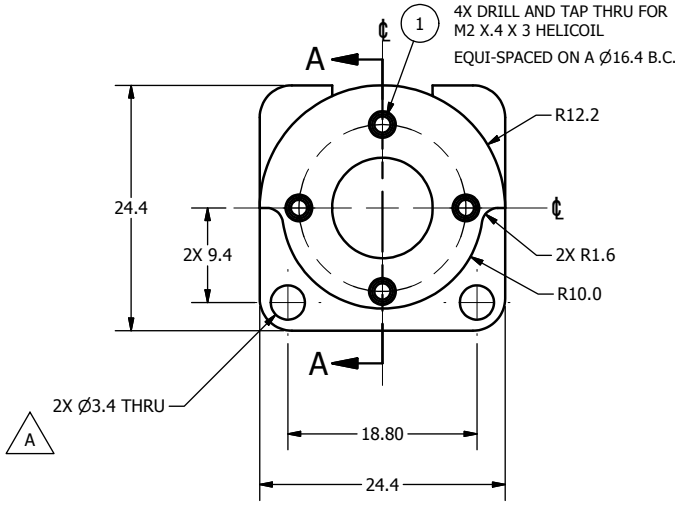
		PROJECT NO.:	DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
472-2000	1	MATERIAL: BRASS	DRAWN BY: B. KIMES	DATE: 7/28/2011	DESCRIPTION: OCCIPITAL CONDYLE CAM, NECK
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1 DRAWING NO.: 472-2019 REV: C
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/9/2012	SCALE: 2.000

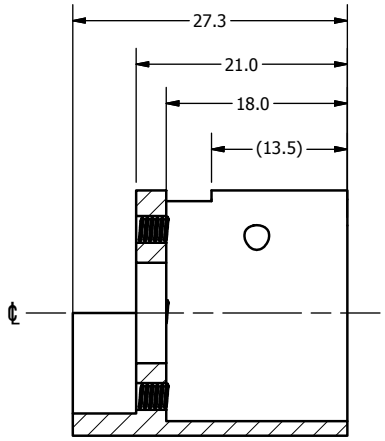
REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM017 R06 AND CONVERTED TO METRIC FOR THOR-M9.0 WAS 7.5, Ø3.4 WAS Ø3.2; ADD 2X R3.2	7/29/2011	BK



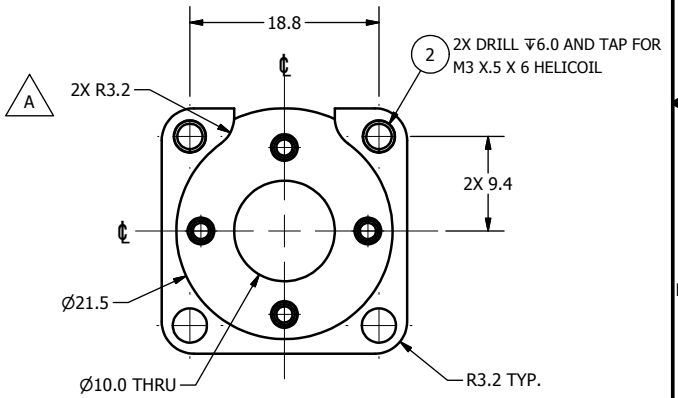
SCALE 1.000







SECTION A-A



NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

2. INSTALL HELICOILS AFTER FINISH.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	5000333	M3 X 0.5 X 6 LG. HELI-COIL
1	4	5001111	M2 X 0.4 X 3 LG. HELI-COIL

PARTS LIST

		PROJECT NO.:		
472-2000	1	MATERIAL: 7075-T6 ALUMINUM	DRAWN BY: B. KIMES	DATE: 7/28/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:
TOTAL QTY IN DUMMY	1	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG	DATE: 1/9/2012

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

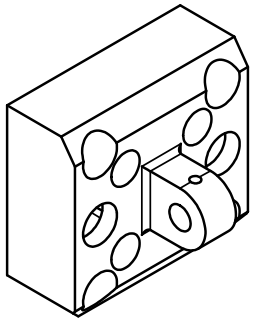
TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS — DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6 — REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

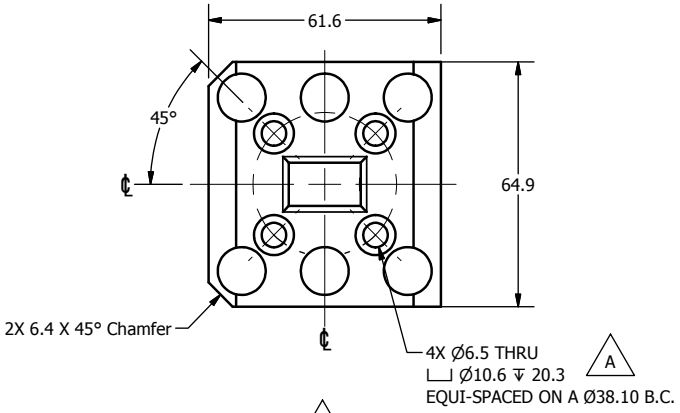
DESCRIPTION: ROTARY POTENTIOMETER HOUSING, NECK

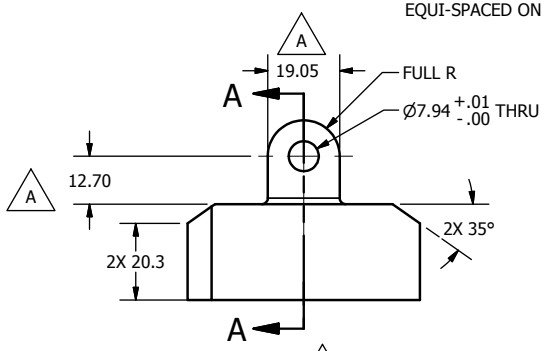
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 2.000 | DRAWING NO.: 472-2013 | REV: A

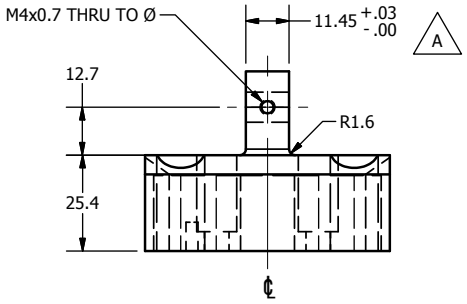
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM700 R02 AND CONVERTED TO METRIC FOR THOR-M; Ø6.5 THRU C'BORE Ø10.6 ↓ 20.3 EQUI-SPACED ON A Ø38.10 B.C. WAS Ø6.7 THRU C'BORE Ø10.3 ↓ 19.0 EQUI-SPACED ON A Ø38.1 B.C.; 19.05 WAS 19.10+.00/-.03; 12.70 WAS 12.7+.1/-0; 44.0 WAS 43.0; 11.45+.03/-.00 WAS 11.40±.05; WEIGHT .426±.03 WAS .435±.01	7/29/2011	BK
	B	ADD LOACTING DOWEL HOLE	7/28/2011	BK

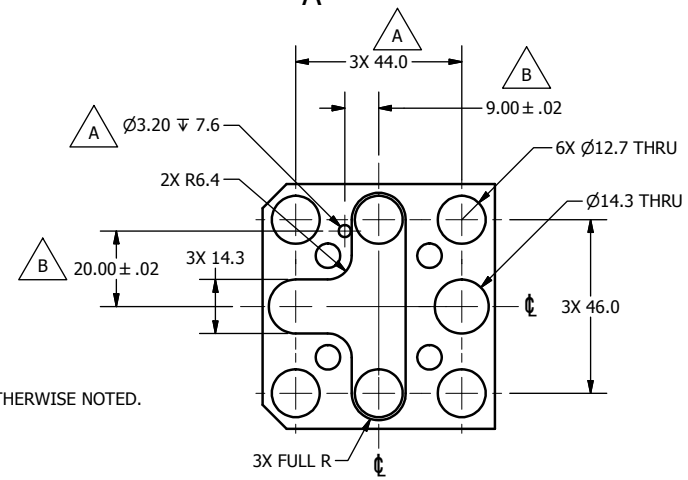


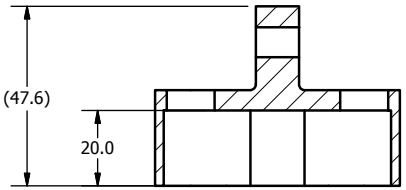
SCALE .750











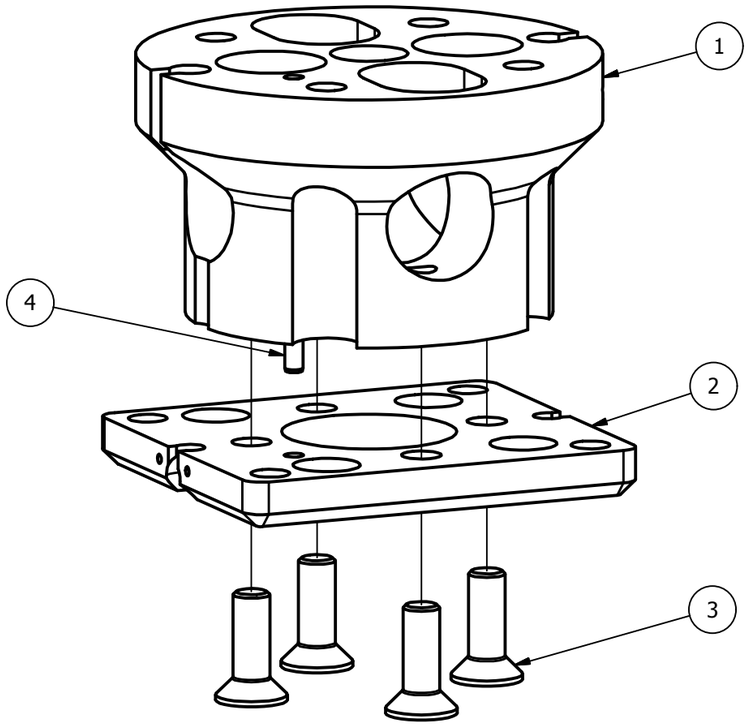
SECTION A-A
SCALE .750

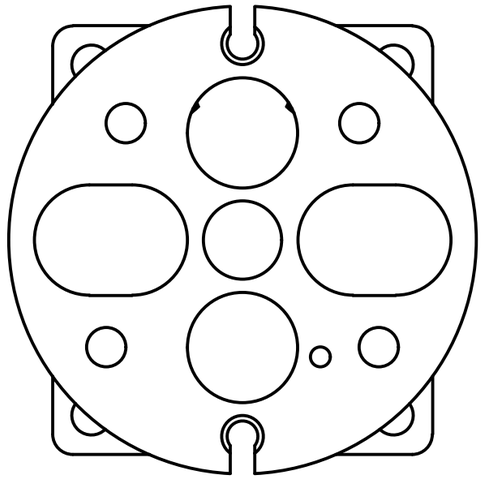
NOTES:

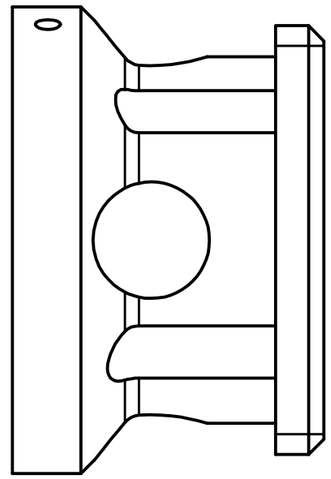
1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. POWDER OR BEAD BLAST.
3. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.
4. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.
5. WEIGHT: .426± 0.03 kg A

DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6			
PROJECT NO.:		REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: UPPER NECK LOAD CELL STRUCTURAL REPLACEMENT		
472-2000	1	MATERIAL: 1018 STEEL	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1 DRAWING NO.: 472-2700 REV: B
TOTAL QTY IN DUMMY	1	FINISH: SEE NOTES	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 0.750

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM600 R03 AND CONVERTED TO METRIC FOR THOR-M; ADD DOWEL, ITEM 4	7/29/2011	BK
	B	5000934 WAS 5000592	7/25/2012	BK
	C	REVISED ITEM #1 - 472-2610 - TOP, LOWER NECK LOAD CELL STRUCTURAL REPLACEMENT	1/30/2017	DW







ITEM	QTY	PART NUMBER	DESCRIPTION
4	1	5000934	M3 X 12 LG. DOWEL PIN
3	4	5000108	M6 X 1 X 18 LG. FHCS
2	1	472-2612	BOTTOM PLATE, LOWER NECK LOAD CELL STRUCTURAL REPLACEMENT
1	1	472-2610	TOP, LOWER NECK LOAD CELL STRUCTURAL REPLACEMENT

Parts List

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5° 1.6
X.X ± 0.2
X.XX ± 0.1
X.XXX ± 0.01

REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

472-2000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

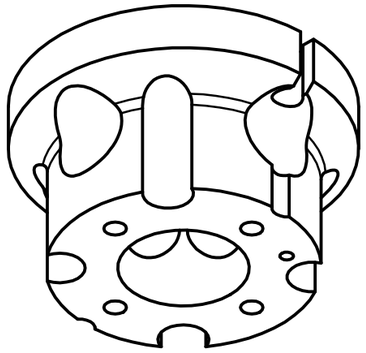
DRAWN BY: B. KIMES DATE: 7/29/2011
CHECKED BY: DATE:
ENGINEER: J. WANG DATE: 1/10/2012

DESCRIPTION: LOWER NECK LOAD CELL STRUCTURAL REPLACEMENT

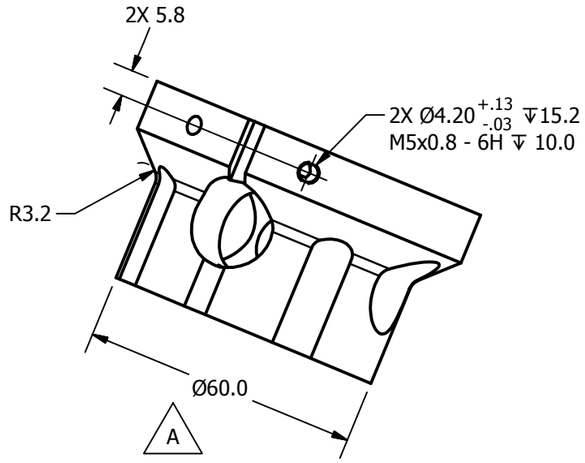
SIZE: A3 SHEET: 1 OF 1 SCALE: 1.000
DRAWING NO.: 472-2600
REV: C

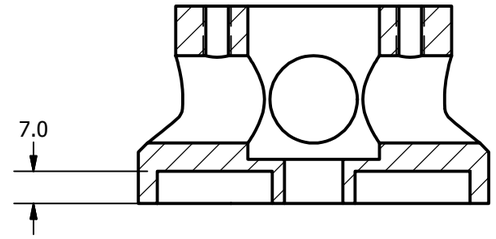
472-2600.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM600 R05 AND CONVERTED TO METRIC FOR THOR-M; Ø60.0 WAS Ø62.0; 11.0 WAS 11.2; Ø6.4 WAS Ø6.8	7/29/2011	BK
	B	DIM. 2X Ø8.6 +.5/-.0 THRU WAS 2X Ø8.0 THRU	8/27/2015	DW
	C	CENTER HOLE SIZES CHANGED TO MATCH LOAD CELL; ADDED WEIGHT HOLES, 2X Ø19.0, THROUGH SIDES; CHANGE TOP WEIGHT CUTOUTS; ADD SLOTS THROUGH CALE HOLES; DIMENSION 2X Ø6.8 THRU WAS 2X Ø 8.6 +.5/-.0	1/30/2017	DW

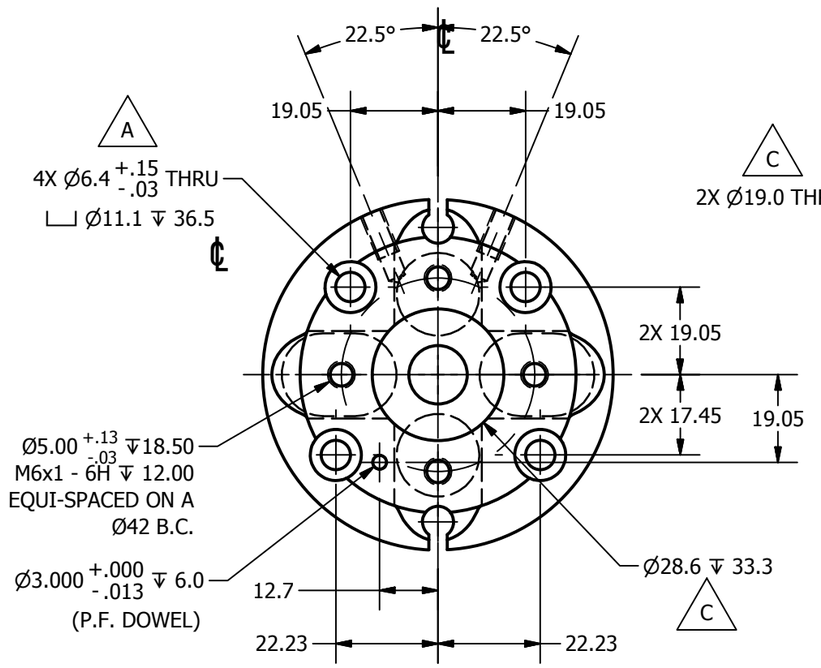


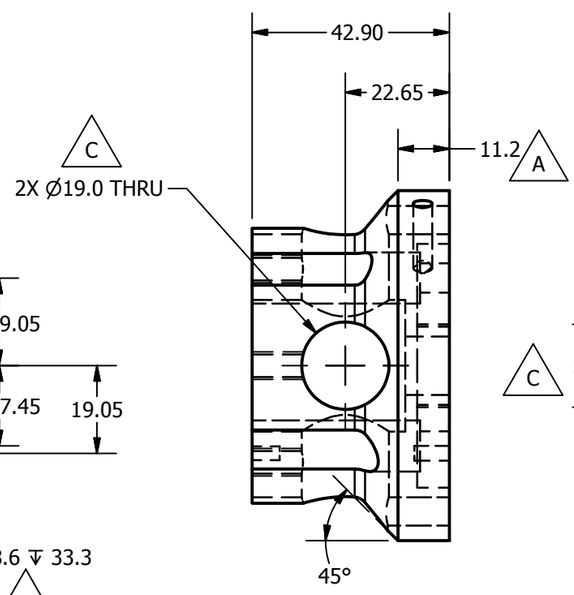
SCALE .750

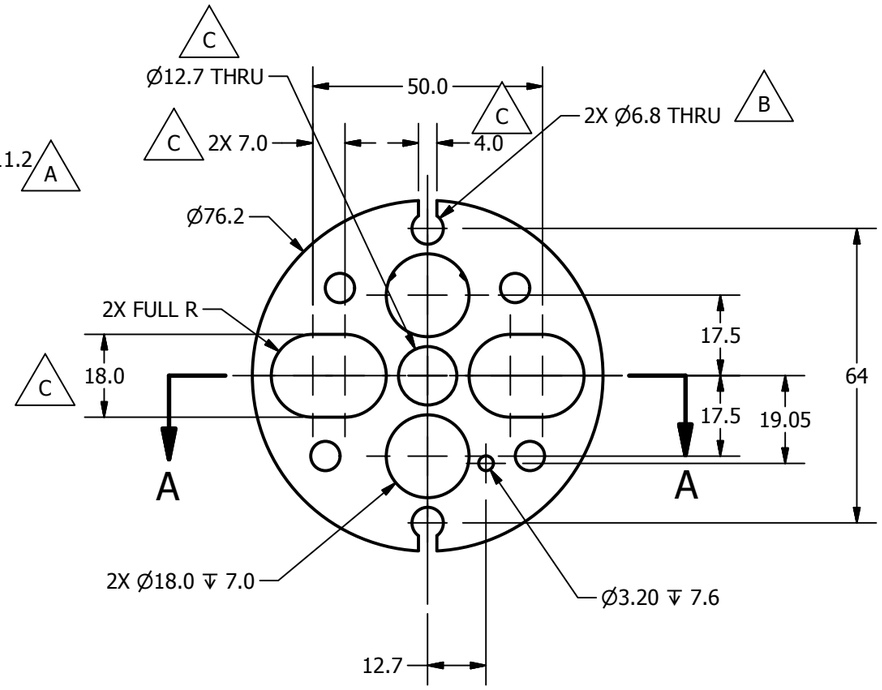




SECTION A-A
SCALE .750







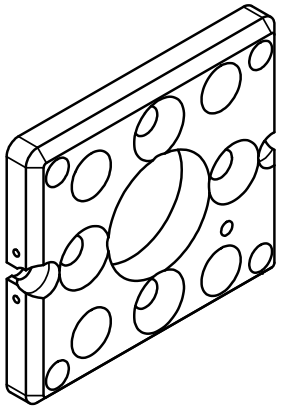
NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. POWDER OR BEAD BLAST.
3. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.
4. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

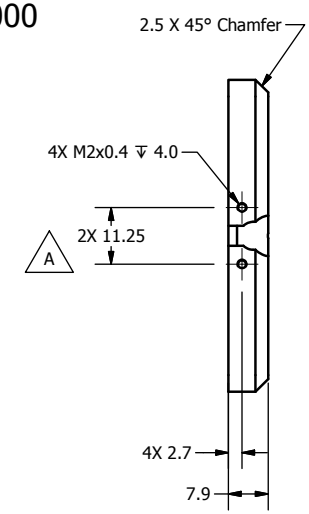
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01 ANGLES ± 0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: TOP, LOWER NECK LOAD CELL STRUCTURAL REPLACEMENT	
472-2600	1	MATERIAL: 1018 STEEL	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1 DRAWING NO.: 472-2610 REV: C
TOTAL QTY IN DUMMY	1	FINISH: SEE NOTES	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: .750

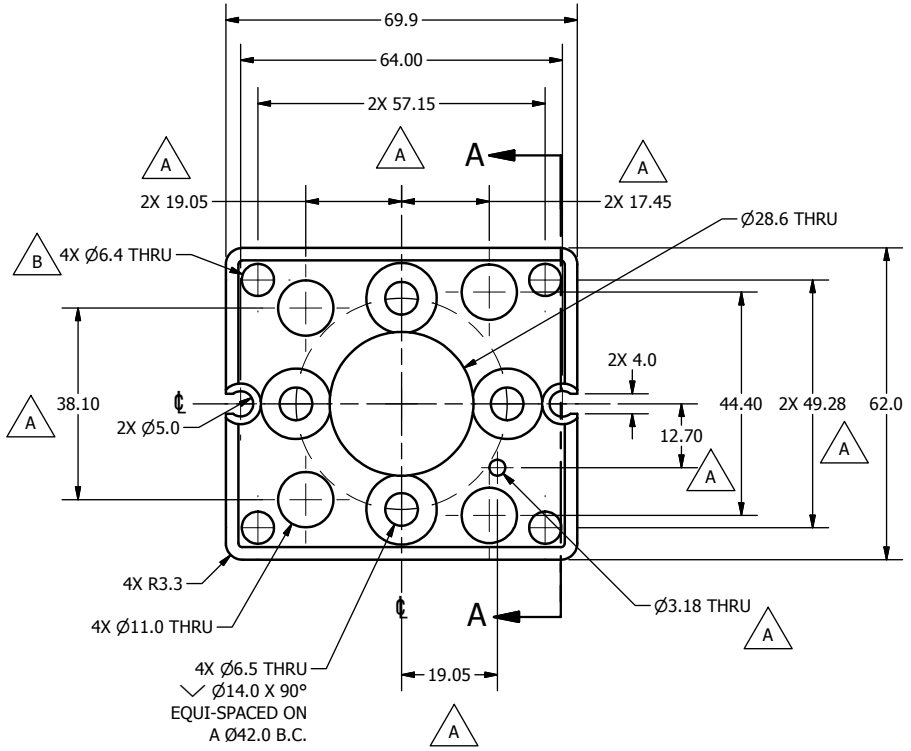
472-2610.ipt

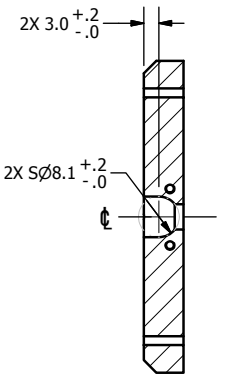
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM612 R03 AND CONVERTED TO METRIC FOR THOR-M; 57.15 WAS 57.2; 19.05 WAS 19.0; 17.45 WAS 17.5; 38.10 WAS 38.2; 49.28 WAS 49.3; 11.25 WAS 11.3; ADD LOCATING DOWEL PIN HOLE	7/29/2011	BK
	B	4X Ø6.4 WAS Ø5.4	4/25/2012	BK



SCALE 1.000







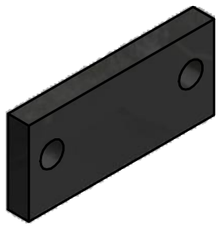
SECTION A-A
SCALE 1.000

NOTES:

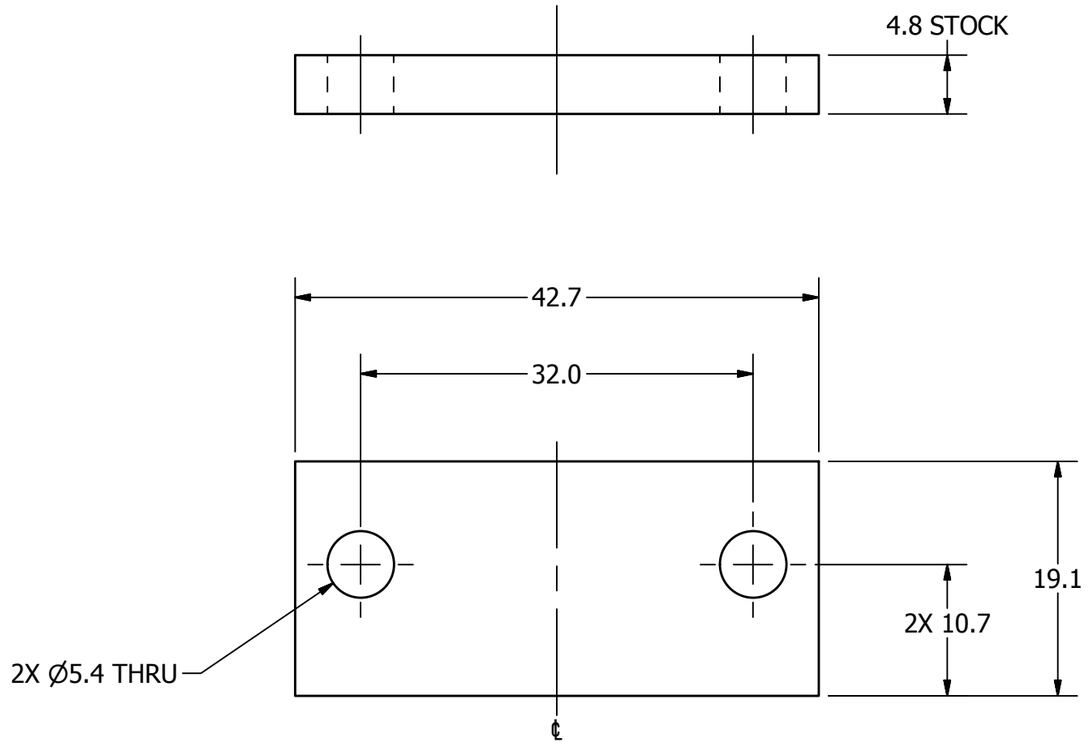
1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. POWDER OR BEAD BLAST.
3. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING AND HEAT TREAT.
4. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6; X.X ±0.2; X.XX ±0.1; X.XXX ±0.01; REMOVE BURRS & BREAK SHARP EDGES			
PROJECT NO.:			DESCRIPTION: BOTTOM PLATE, LOWER NECK LOAD CELL STRUCTURAL REPLACEMENT		
472-2600	1	MATERIAL: 4140 STEEL	DRAWN BY: B. KIMES	DATE: 7/28/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 35-45	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1
TOTAL QTY IN DUMMY	1	FINISH: SEE NOTES	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 1.000
			DRAWING NO.: 472-2612		REV: B

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	DBY
	A	RENUMBER FROM T1NKM025 R05 AND CONVERTED TO METRIC FOR THOR-M	9/7/2011	BK
	B	MATERIAL WAS BUNA-N RUBBER	3/2/2012	TMV
	C	ADDED NOTES 2 & 3; MATERIAL WAS NATURAL RUBBER	7/27/2015	DW



SCALE 1.000



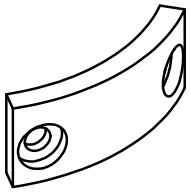
NOTES:

1. DIMENSIONS SYMMETRICAL ABOUT ℄, UNLESS OTHERWISE NOTED.
2. RUBBER DIMENSIONAL TOLERANCE ±0.5 UNLESS OTHERWISE SPECIFIED. (C)
3. MATERIAL: BUNA-N RUBBER, 50 ±5 SHORE A DURAMETER. (C)

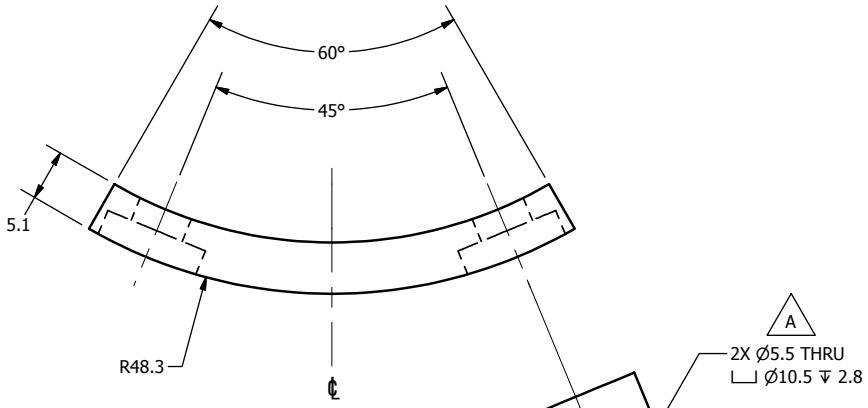
		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: LOWER NECK LOAD CELL BUMPER	
		PROJECT NO.:			
472-2000	1	MATERIAL: SEE NOTES	DRAWN BY: B. KIMES	DATE: 9/7/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT: B	CHECKED BY: TMV	DATE: 3/2/2012	SIZE: A3 SHEET: 1 OF 1 DRAWING NO.: 472-2002 REV: C
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/23/2012	SCALE: 2:1

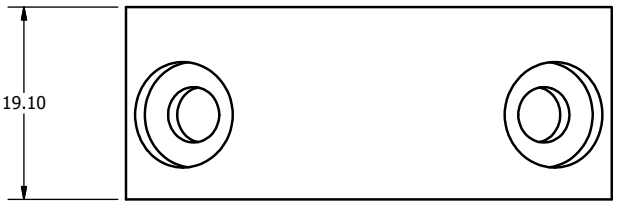
472-2002_Flat.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKM024 R03 AND CONVERTED TO METRIC FOR THOR-M; Ø5.5 THRU C'BORE Ø10.5 WAS Ø5.2 THRU C'BORE Ø9.3	9/7/2011	BK



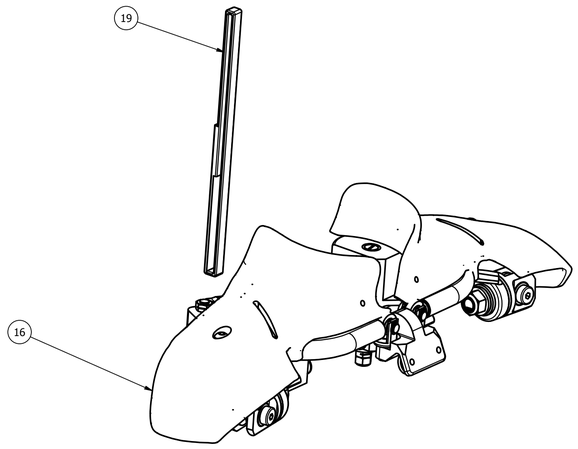
SCALE 1.000

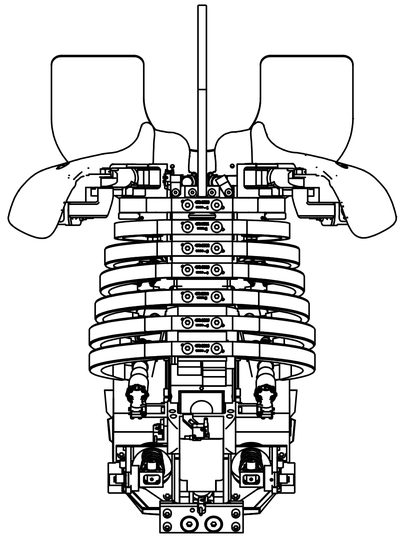


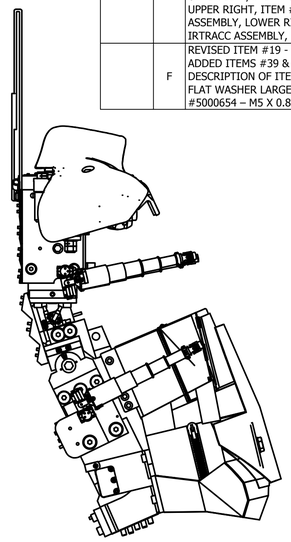


DO NOT SCALE DRAWING		TOLERANCES		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ± 0.5 ± 0.5° 1.6 X.X ± 0.2 X.XX ± 0.1 X.XXX ± 0.01 REMOVE BURRS & BREAK SHARP EDGES		DESCRIPTION: LOWER NECK LOAD CELL BUMPER COVER	
PROJECT NO.:					
472-2000	1	MATERIAL: Acetal Resin, Black	DRAWN BY: B. KIMES	DATE: 9/7/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/9/2012	SCALE: 2.000
					DRAWING NO.: 472-2001 REV: A

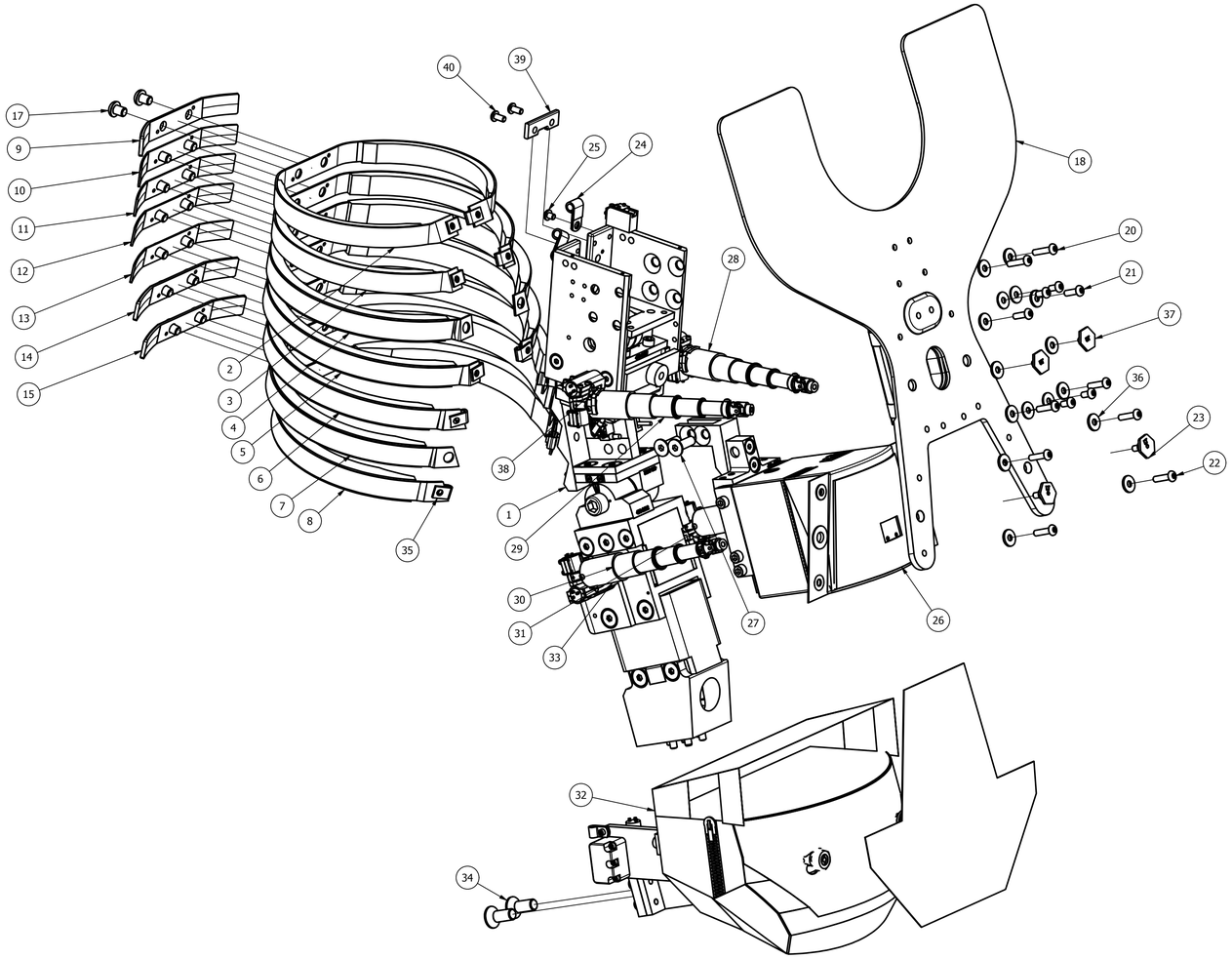
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1TXM000 R01 FOR THOR-M;	10/17/2011	BK
	B	5000989 QTY 8 WAS 5000151; ADD 472-3520 QTY 2, 472-3518 QTY 2 WAS 4; REMOVE 5000614 QTY 10, 5000454 QTY 14 WAS 4	7/20/2012	BK
	C	ADD 5000151 QTY 4; 5000989 QTY 4 WAS 8; UPDATE TO SHOW SPINEBOX CHANGES	10/12/2012	BK
	D	ADDED NOTE 3 AND SEE NOTE 3 TO VIEW; UPDATE BOM TO NEW PART DESCRIPTIONS FOR 472-3520, 472-3518	7/11/2012	BK
	E	ITEM NUMBER 16 WAS PART #472-3100 – SHOULDER MECHANICAL ASSEMBLY, REMOVED NOTE 1, PART NUMBERS 19 – 9003743 – WASHER, 1/4 x 3/4 x 1/8 REINFORCED RUBBER AND PART NUMBER 22 – PART #5000003 – M5 x 0.8 x 10 LG. BHCS.; REVISED ITEM #28 472-3550 - IRTRACC ASSEMBLY, UPPER LEFT, ITEM #29 472-3560 - IRTRACC ASSEMBLY, UPPER RIGHT, ITEM #30 472-3570 - IRTRACC ASSEMBLY, LOWER RIGHT & ITEM #31 472-3580 - IRTRACC ASSEMBLY, LOWER LEFT	6/2/2014	DW
	F	REVISED ITEM #19 - 472-6517 - THOR LIFT STRAP; ADDED ITEMS #39 & 40; REMOVED NOTE #1; DESCRIPTION OF ITEM #36 - PART #5001126 WAS M5 FLAT WASHER LARGE OD SS; ITEM #21 WAS PART #5000654 – M5 X 0.8 X 12 LG. BHCS	2/23/2017	DW

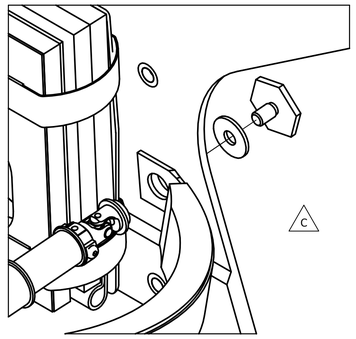






RIBS AND BIB REMOVED TO
SHOW INTERIOR ASSEMBLIES





IRTRACC ASSEMBLY
SCALE 1.000

	ITEM	QTY	PART NUMBER	DESCRIPTION
	40	2	5000003	SCREW, BHCS M5-0.8 x 10
F	39	1	472-3115	BRACKET, LIFTING STRAP
	38	4	5000151	M4 X 0.7 X 10 LG. SHCS
	37	2	472-3518	IRTRACC CONNECTING BOLT, UPPER THORAX
F	36	12	5001126	WASHER, M5 x 15 x 1.2 S.S.
	35	10	5000513	CLIP NUT, M5 (MONADNOCK #130300-M5-1)
	34	2	5001127	SCREW, FHCS M10-1.5 x 25
	33	4	5000989	M4 X 0.7 X 8 LG. SHCS
	32	1	472-4700	LOWER ABDOMEN MECHANICAL ASS'Y
	31	1	472-3580	IRTRACC ASSEMBLY, LOWER LEFT
	30	1	472-3570	IRTRACC ASSEMBLY, LOWER RIGHT
	29	1	472-3560	IRTRACC ASSEMBLY, UPPER RIGHT
	28	1	472-3550	IRTRACC ASSEMBLY, UPPER LEFT
	27	2	5000117	SCREW, FHCS M8-1.25 x 25
	26	1	472-4600	UPPER ABDOMEN ASSEMBLY
	25	2	5000214	M5 X 0.8 X 6 LG. BHCS
	24	2	9003723	1/4 COATED CABLE CLAMP
	23	2	472-3520	IRTRACC CONNECTING BOLT, LOWER THORAX
	22	6	5000210	M5 X 0.8 X 20 LG. BHCS
F	21	2	5000416	SCREW, BHCS M5-0.8 x 16
F	20	2	5000571	M5 X 0.8 X 22 LG. BHCS
F	19	1	472-3517	DUMMY LIFTING STRAP
	18	1	472-3400	THORAX BIB ASSEMBLY
	17	14	5000454	M8 X 1.25 X 10 LG. BHCS
	16	1	472-3800	SHOULDER ASSEMBLY
	15	1	472-3516	THORAX ELLIPTICAL RIB STIFFENER #7
	14	1	472-3515	THORAX ELLIPTICAL RIB STIFFENER #6
	13	1	472-3514	THORAX ELLIPTICAL RIB STIFFENER #5
	12	1	472-3513	THORAX ELLIPTICAL RIB STIFFENER #4
	11	1	472-3512	THORAX ELLIPTICAL RIB STIFFENER #3
	10	1	472-3511	THORAX ELLIPTICAL RIB STIFFENER #2
	9	1	472-3510	THORAX ELLIPTICAL RIB STIFFENER #1
	8	1	472-3370	THORAX ELLIPTICAL RIB #7 - ASSEMBLY
	7	1	472-3360	THORAX ELLIPTICAL RIB #6 - ASSEMBLY
	6	1	472-3350	THORAX ELLIPTICAL RIB #5 - ASSEMBLY
	5	1	472-3340	THORAX ELLIPTICAL RIB #4 - ASSEMBLY
	4	1	472-3330	THORAX ELLIPTICAL RIB #3 - ASSEMBLY
	3	1	472-3320	THORAX ELLIPTICAL RIB #2 - ASSEMBLY
	2	1	472-3310	THORAX ELLIPTICAL RIB #1 - ASSEMBLY
	1	1	472-3600	SPINE MECHANICAL ASSEMBLY

PARTS LIST

F NOTES:

2. ORIENT THE U-JOINT AS SHOWN, WITH THE PIVOT PINS IN THE VERTICAL AND HORIZANTAL DIRECTION.

D

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ±0.5 ±0.5 1.6
.X ±0.1
.XX ±0.1
.XXX ±0.05
REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

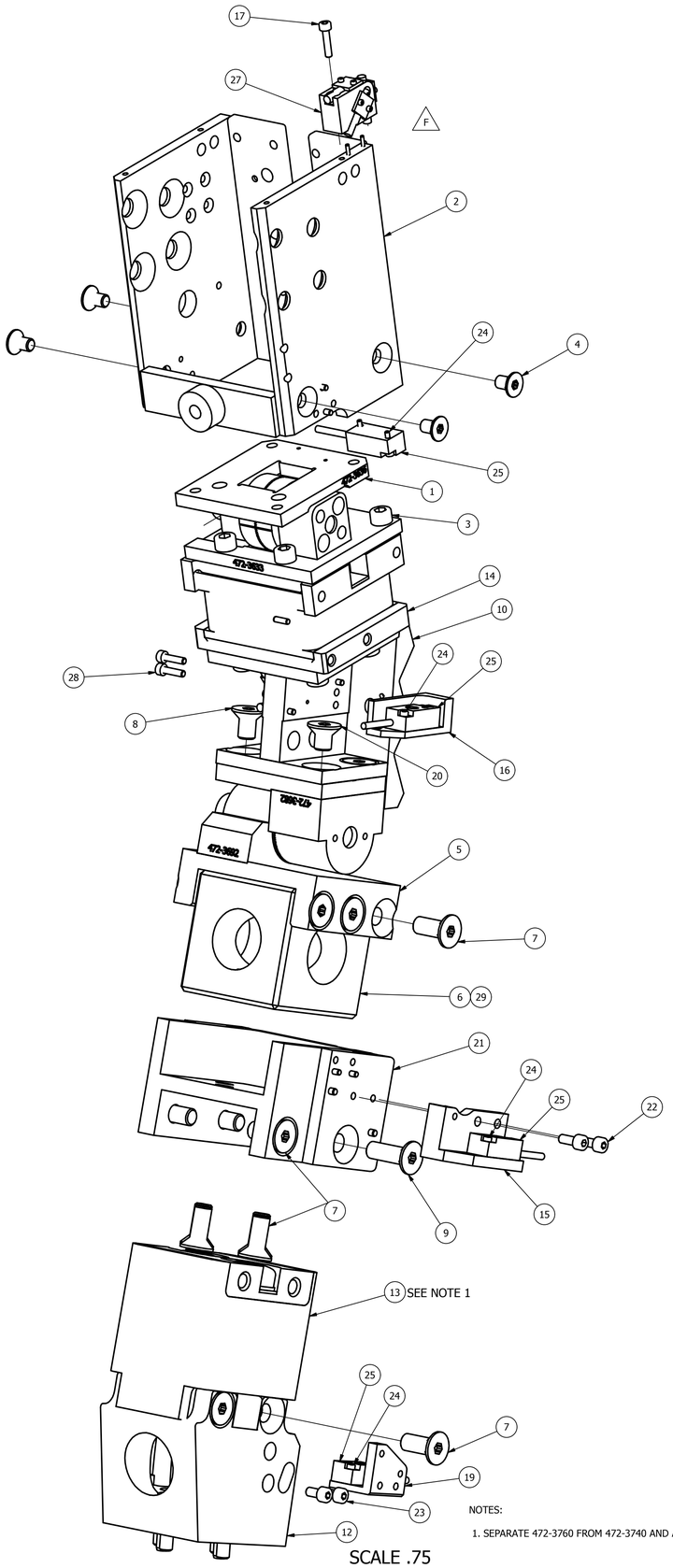
DESCRIPTION: THORAX MECHANICAL ASSEMBLY

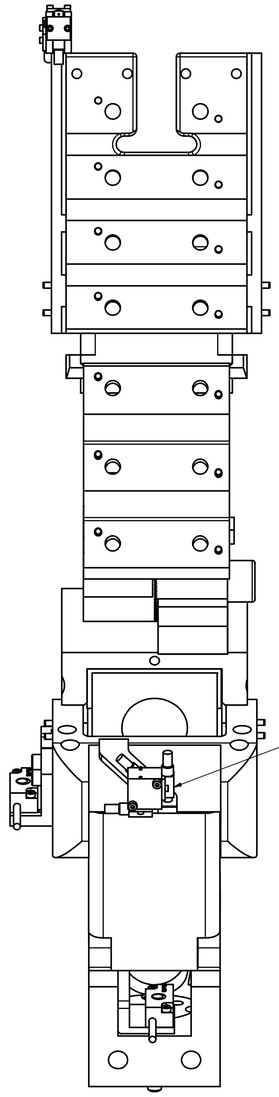
		PROJECT NO.:	
472-0000	1	MATERIAL:	
NEXT ASSEMBLY	QTY	HEAT TREAT:	
TOTAL QTY IN DUMMY	1	FINISH:	

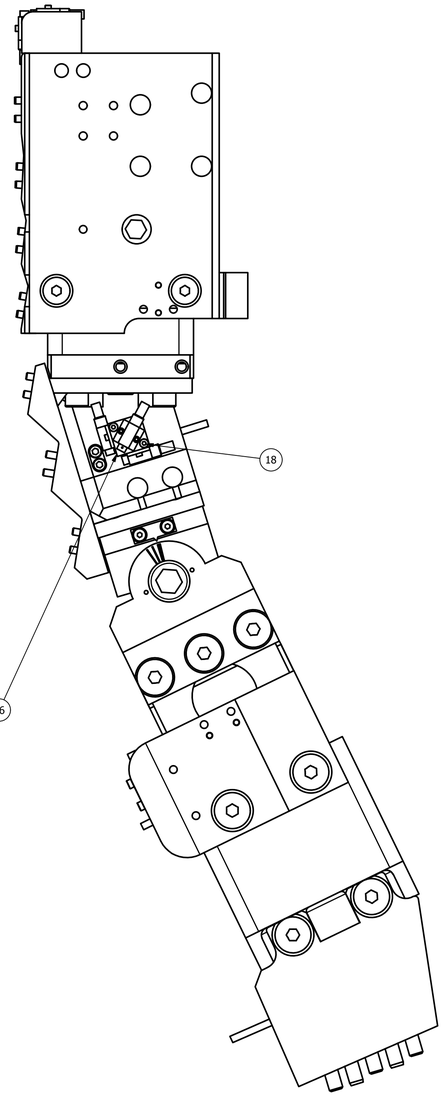
	B. KIMES	10/17/2011
PROVED BY:	DATE:	
ENGINEER:	J. WANG	DATE: 1/17/2012

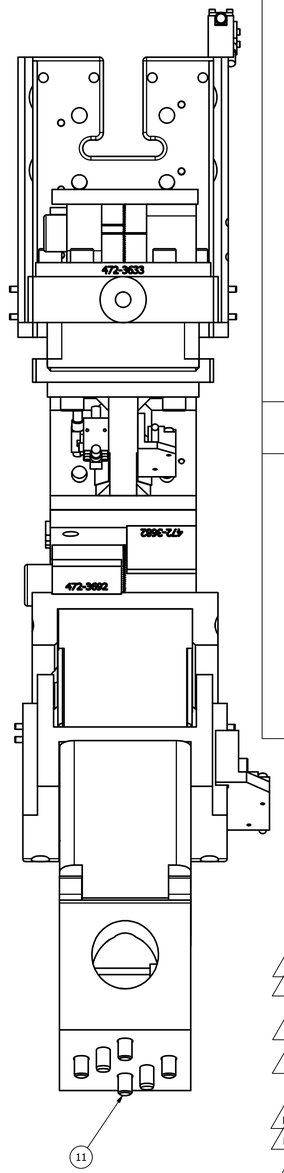
SIZE A1 SHEET 1 of 1 SCALE NTS DRAWING NO. 472-3000 REV F

472-3000.iam









NOTES:

1. SEPARATE 472-3760 FROM 472-3740 AND ASSEMBLE THE M6 X 20 SHCS TO MOUNT THE SPINE ASSEMBLY TO THE PELVIS.

SCALE .75

REVISION HISTORY

ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM000 R6 AND CONVERTED TO METRIC FOR THOR-M	9/29/2011	BK
	B	UPDATE TO SHOW SPINEBOX CHANGES	10/12/2012	BK
	C	ADDED ITEM #33, T1 ACCEL. MOUNT, PART NUMBER 472-3857	9/9/2014	DW
	D	ITEM #16 PART # 5000326 - SCREW, FHCS M4-0.7 x 12 WAS PART #5000152 - M4 x 0.7 x 12 LG. SHCS; QTY. OF ITEM #18 PART #5000252 – SCREW, SHCS M3-0.5 x 14LG WAS 3, QTY. OF ITEM 24 PART #5000151 – M4 X 0.7 X 10 LG. SHCS WAS 3; QTY OF ITEM #28 PART #SA572-S113 – TILT SENSOR AND ITEM #29 PART #SA572-S44 – TILT SENSOR WAS 3; ITEM #31 DESCEIPTION WAS TILT SENSOR ASSY, REAR THORACIC (SA572-S123), ITEM 32 DESCRIPTION WAS TILT SENSOR ASSY, THORACIC SPINE (SA572-S123); ADDED ITEM #34 PART# 5000023 - SCREW, FHCSM4-0.7 x 10, AND ITEM #35 Part #5000378V – SCREW, FHCS M3-0.5 x 14; PART #5000447 - SCREW, FHCS M4-0.7 x 16 WAS PART #5000646 - SCREW, FHCS M4-0.7 x 8; PART #5000354V – SCREW, FHCS M3-0.5 x 16 WAS PART #5000378V – SCREW, FHCS M3-0.5 x 14; PART #472-3778 – LOWER NECK TILT SENSOR ASSY. WAS PART #472-3635 – LOWER NECK TILT SENSOR MOUNT; REMOVED PART #SA572-S113 – TILT SENSOR; IN NOTE 2 SA572-S44 WAS SA572-S123; DESCRIPTION OF PART #472-3775-1 WAS TILT SENSOR ASSEMBLY, T6, SA572-S113 & SA572-S44, PART #472-3776-1 WAS TILT SENSOR ASS'Y., T12, SA572-S113 & SA572-S44, PART #472-3777-1 WAS TILT SENSOR ASS'Y., PELVIS, SA572-S113 & SA572-S44, PART #472-3775-2 WAS TILT SENSOR ASSEMBLY, T6, SA572-S44; ADDED PART #SA572-127 – THORACIC SPINE LOAD CELL (OPTIONAL); SHOW TILT SENSORS SA572-S44 AS DEFAULT AND SA572-S113 AS OPTIONAL	9/14/2015	DW
	E	REMOVED PART #5001090 – SCREW, FHCS M8-1.25 x 12; PART #5001092V – SCREW, FHCS M8-1.25 x 14 WAS #5001091 – SCREW, FHCS M8-1.25 x 16, RENUMBERED PARTS LIST	3/11/2016	DW
	F	ITEM # 8 PART #5001092V QTY. WAS 4; ADDED ITEM #20 PART #5001090 - SCREW, FHCS M8x1.25 x 12; ITEM #15 QTY. WAS 2, PART NUMBER WAS 5000326, DESCRIPTION WAS SCREW, FHCS M4-0.7 x 12; ITEM #16 PART NUMBER WAS 472-3775-1, DESCRIPTION WAS TILT SENSOR ASSEMBLY, T6, SA572-S113; ITEM #19 PART NUMBER WAS 472-3776-1, DESCRIPTION WAS TILT SENSOR ASS'Y., T12, SA572-S113; ITEM #20 PART NUMBER WAS 472-3777-1, DESCRIPTION WAS TILT SENSOR ASS'Y., PELVIS, SA572-S113; ITEM #21 PART NUMBER WAS 472-3731, DESCRIPTION WAS THORACIC SPINE LOAD CELL FLEX JOINT ADAPTOR PLATE ASSY.; REMOVED ITEM #28, 29, AND 31; ITEM #27 WAS #30; ITEM #29 WAS ITEM #33; REVISED ITEM #2 PART # 472-3620 - UPPER THORACIC SPINEBOX WELDMENT; REVISED ITEM #27 - 472-3857 - T1 ACCEL. MOUNT ASSEMBLY AND RELOCATED TO THE RIGHT SIDE OF THE UPPER THORACIC SPINEBOX WELDMENT - 472-3620	8/31/2017	DW

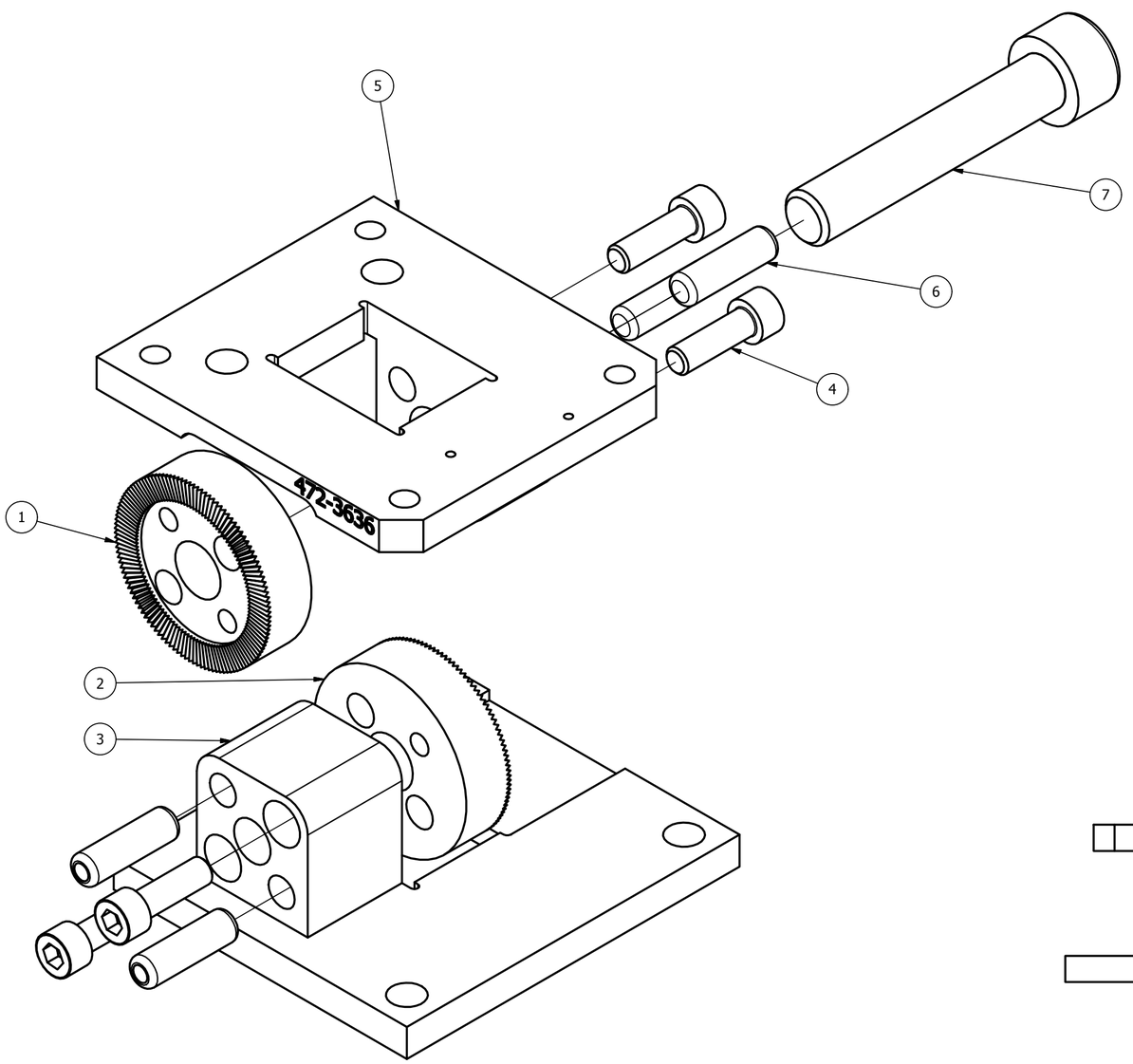
F	29	1	SA572-S127	THORACIC SPINE LOAD CELL (OPTIONAL)
F	28	2	5000568	SCREW, SHCS M3x0.5 X 12
	27	1	472-3857	T1 ACCEL. MOUNT ASSEMBLY
	26	2	472-4203	TRI-PACK ACCEL ASSY
F	25	4	SA572-S44	TILT SENSOR, DUAL AXIS
	24	8	5000215	M2 X 0.4 X 10 LG. SHCS
F	23	2	5000024	SCREW, SHCS M4-0.7 x 8
	22	2	5000151	SCREW, SHCS M4x0.7 X 10
	21	1	472-3733	THORACIC SPINE LOAD CELL FLEX JOINT ADAPTOR PLATE ASS'Y
F	20	2	5001090	SCREW, FHCS M8-1.25 x 12
F	19	1	472-3787	TILT SENSOR MOUNT ASSEMBLY, PELVIS
	18	4	5000985	M2 X 0.4 X 16 LG. SHCS
	17	1	5000252	SCREW, SHCS M3-0.5 x 14 LG.
F	16	1	472-3783	TILT SENSOR MOUNT, T6
F	15	1	472-3781	TILT SENSOR MOUNT, T12
	14	1	472-3646	UPPER THORACIC SPINE FLEX JOINT ASSEMBLY
	13	1	472-3746	LUMBAR SPINE FLEX JOINT ASSEMBLY
	12	1	472-3760	PELVIS/LUMBAR MOUNTING BLOCK ASSEMBLY
	11	4	5000001	SCREW, SHCS M6x1.0 x 20
	10	1	472-3650	LOWER THORACIC SPINE ASSEMBLY
	9	2	5000117	SCREW, FHCS M8-1.25 x 25 LG.
F E	8	2	5001092V	SCREW, FHCS M8-1.25 x 14
	7	16	5000868	SCREW, FHCS M8-1.25 x 20
	6	1	472-3720	THORACIC SPINE LOAD CELL STRUCTURAL REPLACEMENT
	5	1	472-3670	LUMBAR SPINE PITCH CHANGE ASSEMBLY
	4	4	5000204	SCREW, FHCS M6-1 x 10
	3	8	5000281	SCREW, SHCS M6-1 x 12
	2	1	472-3620	UPPER THORACIC SPINEBOX WELDMENT
	1	1	472-3630	NECK PITCH CHANGE MECHANISM ASSEMBLY
ITEM	QTY	PART NUMBER	DESCRIPTION	

PARTS LIST

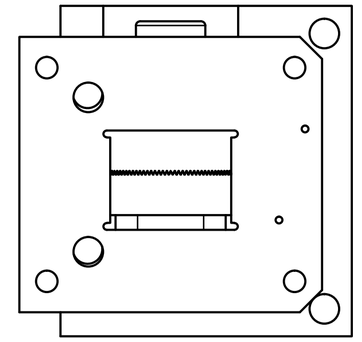
DO NOT SCALE DRAWING	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.1 X.XX ±0.1 X.XXX ±0.05 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION	PROJECT NO.:	DESCRIPTION:	SPINE MECHANICAL ASSEMBLY
472-0000 1	MATERIAL:	DRAWN: B. KIMES 9/29/2011	
NEXT ASSEMBLY QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A1 SHEET 1 of 1 DRAWING NO.: 472-3600 REV: F
TOTAL QTY IN DUMMY 1	FINISH:	ENGINEER: J. WANG DATE: 1/16/2012	SCALE: .750

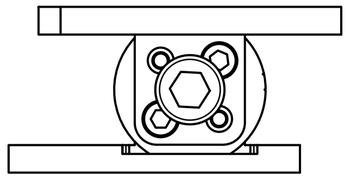
472-3600.iam

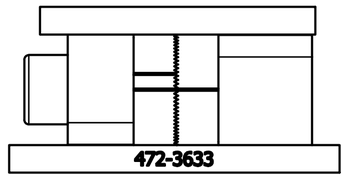
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM200 R10 AND CONVERTED TO METRIC FOR THOR-M	9/27/2011	BK
	B	REVISED OART #472-3636 – NECK PITCH CHANGE MECHANISM TOP PLATE	9/14/2015	DW
	C	REMOVED TILT SENSOR SA572-S111 MOUNTING HOLE AND DOWEL PIN	2/17/2017	DW
	D	REVISED ITEMS 1, 2, 3, 4, & 5	2/27-2018	DW

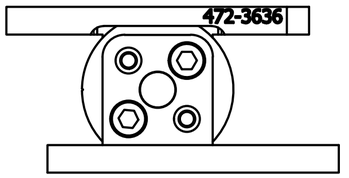


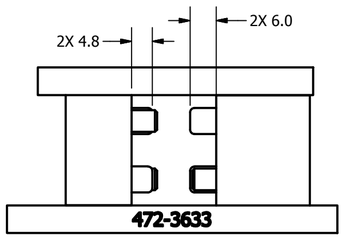
SCALE 1.500











STAR PATTERN MECHANISMS
AND BOLTS HIDDEN
TO SHOW DOWELS
SCALE 1.000

NOTES:

1. INSTALL THESE DOWELS (2X) FLUSH OR BELOW SURFACE.

2. THREADED END OF DOWELS SHOULD FACE OUT, AS SHOWN.

ITEM	QTY	PART NUMBER	DESCRIPTION
7	1	5001132	SCREW, SHCS M10x1.5 X 55
6	4	5000445	DOWEL PIN, PULL OUT M6 X 20
5	1	472-3636	NECK PITCH CHANGE MECHANISM TOP PLATE
4	4	472-3634	NECK PITCH CHANGE MECHANISM BOLT
3	1	472-3633	NECK PITCH CHANGE MECHANISM BASE PLATE
2	1	472-3631	NECK PITCH CHANGE MECHANISM, STAR PATTERN 2
1	1	472-3632	NECK PITCH CHANGE MECHANISM, STAR PATTERN 1

PARTS LIST

462-3600	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01
ANGLES ±0.5°
FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

DRAWN BY: B. KIMES — DATE: 9/27/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/16/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: NECK PITCH CHANGE MECHANISM ASSEMBLY THOR-50M

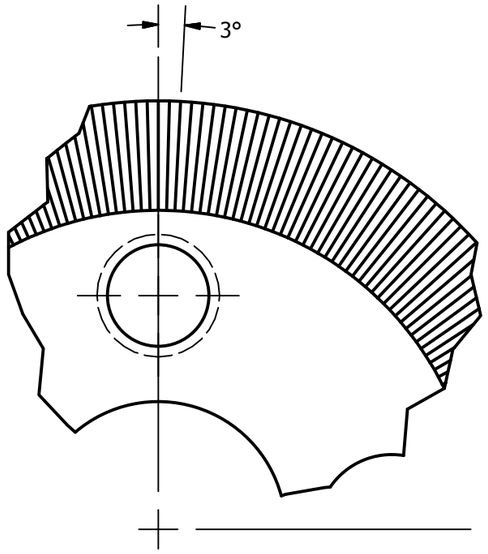
SIZE: A2 | SHEET: 1 OF 1 | DRAWING NO.: 472-3630 | REV: D

SCALE: 1.000

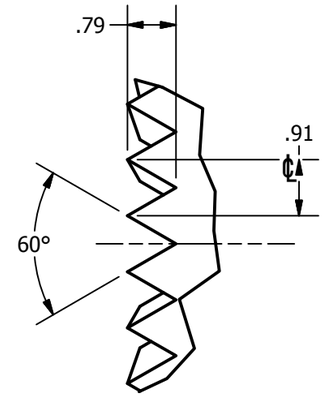
472-3630.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM210 R4 AND CONVERTED TO METRIC FOR THOR-M;	9/26/2011	BK
	B	Ø10.4 WAS Ø9.53+.03/-0	3/15/2012	BK
	C	HOLE DIMENSION Ø10.4 THRU ⌴ Ø26.0 ↧ 1.6 WAS Ø10.4 THRU ⌴ Ø19.1 ↧ 1.6, 2X M5x0.8 THRU WAS 2X M5x0.8 ↧ 7.0 (FLAT BOTTOM), AND 2X Ø6.08 +.01/-.00 THRU WAS 2X Ø6.03 +.02/-.00 ↧ 7.1	2/27/2018	DW

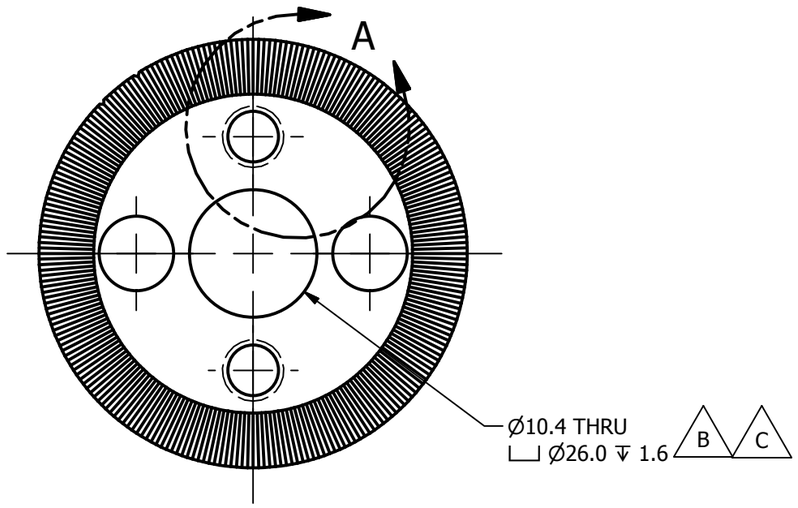
SCALE 2.000

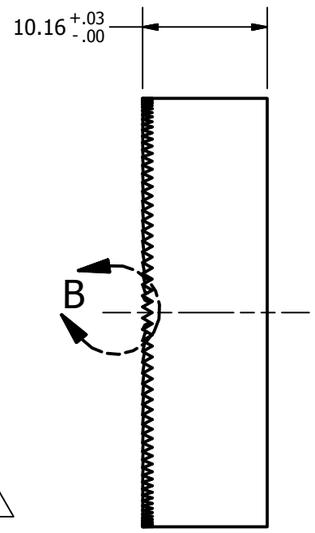


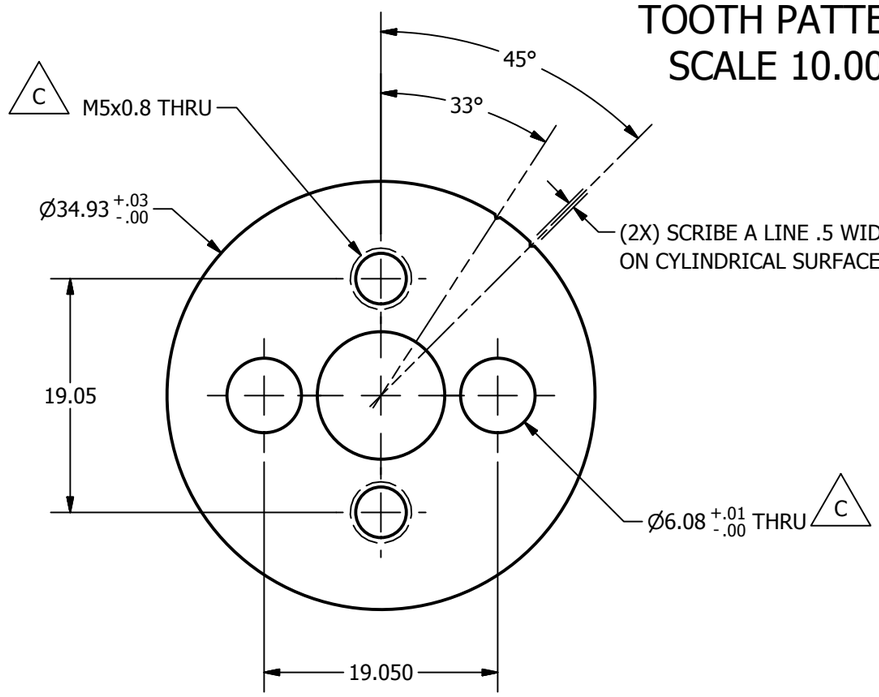
DETAIL A
SCALE 4.000



DETAIL B
TOOTH PATTERN
SCALE 10.000







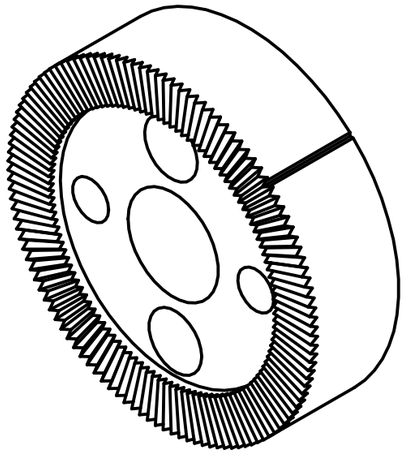
NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. FIRST CUT OF STAR PATTERN IS ALIGNED WITH VERTICLE; TOTAL OF 120 RADIAL LINES ARE REQUIRED FOR THE STAR PATTERN.

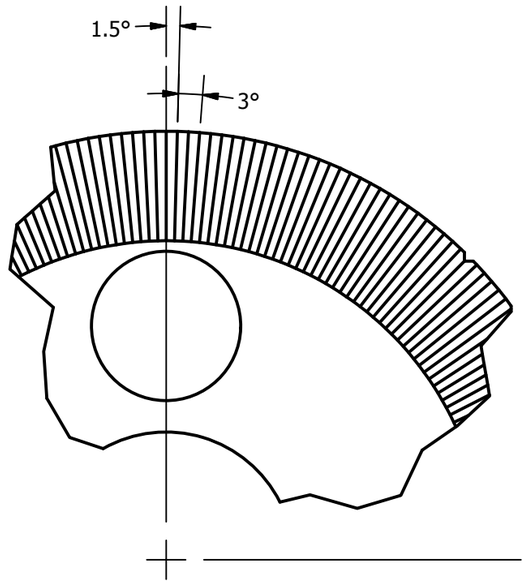
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5' FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
		PROJECT NO.: THOR-50M		DESCRIPTION: NECK PITCH CHANGE MECHANISM, STAR PATTERN 1
473-3630	1	MATERIAL: Stainless Steel, 440C	DRAWN BY: B. KIMES DATE: 9/26/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 56-59	CHECKED BY: DATE:	SIZE: A3 SHEET: 1 OF 1 DRAWING NO.: 472-3632 REV: C
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG DATE: 1/16/2012	SCALE: 1.000

472-3632.ipt

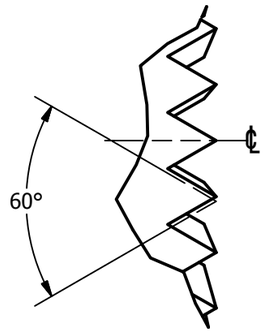
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM211 R3 AND CONVERTED TO METRIC FOR THOR-M	9/26/2011	BK
	B	Ø10.4 WAS Ø9.53+.03/-0	3/15/2012	BK
	C	HOLE DIMENSION 2X M5x0.8 THRU WAS 2X M5x0.8 ↧7.0 (FLAT BOTTOM), 2XØ6.08 +.01/-.00 THRU WAS 2X Ø6.03 +02/-.00 ↧ 7.10, AND Ø10.4 THRU ⌴Ø26.0 ↧1.6 WAS Ø10.4 THRU ⌴ Ø19.1 ↧ 1.6	2/26/2018	DW



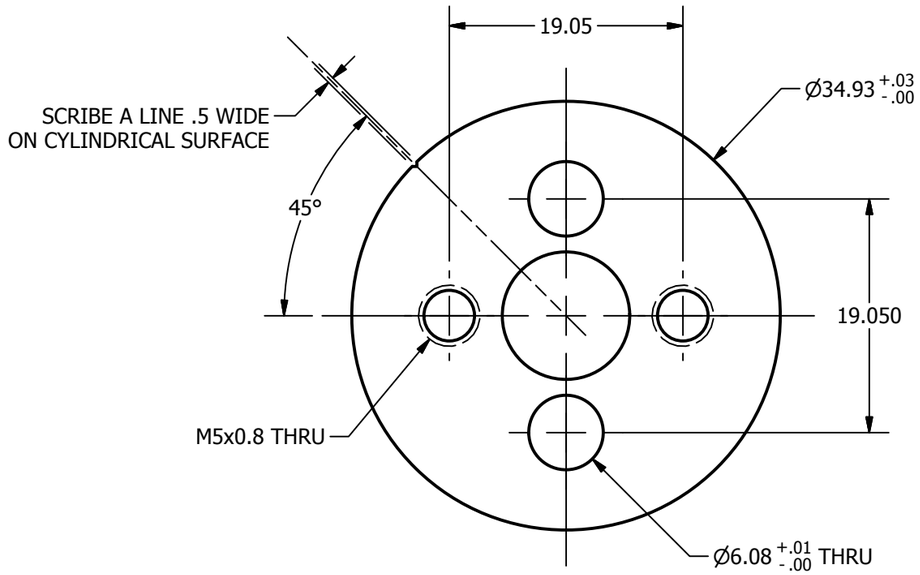
SCALE 2.000

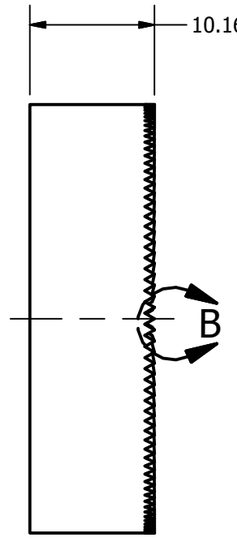


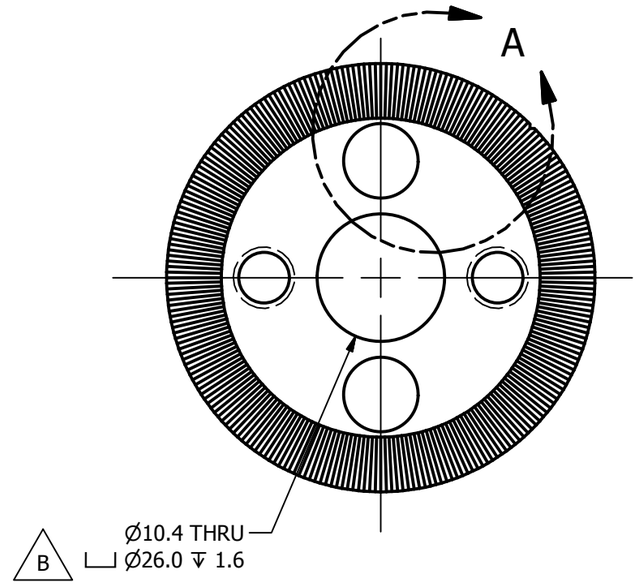
DETAIL A
SCALE 4.000



DETAIL B
TOOTH PATTERN
SCALE 10.000







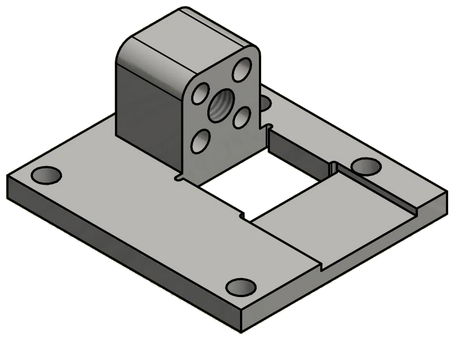
NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. FIRST CUT OF STAR PATTERN IS OFFSET 1.5° FROM VERTICLE; TOTAL OF 120 RADIAL LINES ARE REQUIRED FOR THE STAR PATTERN.

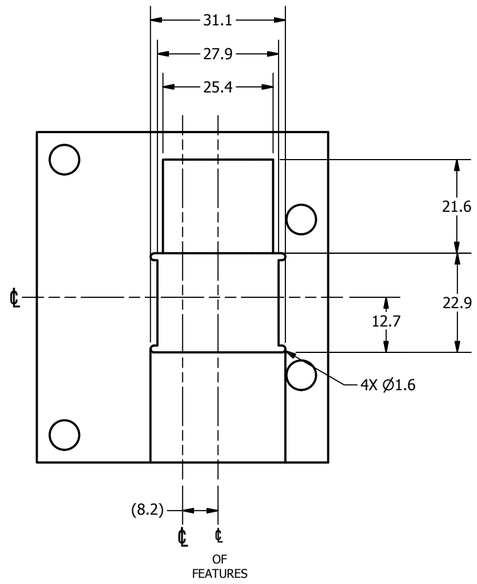
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.: THOR-50M		DESCRIPTION: NECK PITCH CHANGE MECHANISM, STAR PATTERN 2	
472-3630	1	MATERIAL: Stainless Steel, 440C	DRAWN BY: B. KIMES DATE: 9/26/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 56-59	CHECKED BY: DATE:	SIZE: A3 SHEET: 1 OF 1	DRAWING NO.: 472-3631 REV: C
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG DATE: 1/16/2012	SCALE: 1.000	

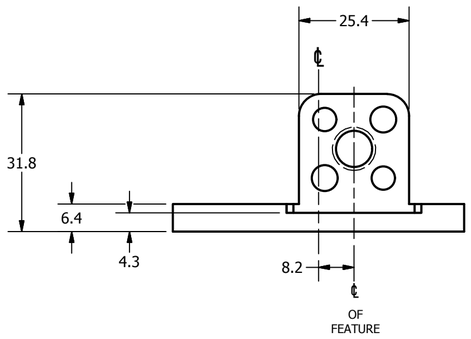
472-3631.ipt

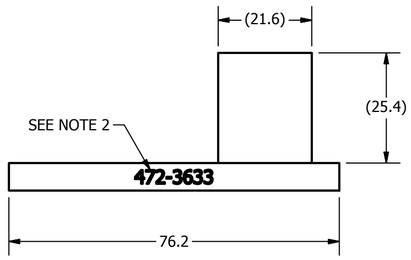
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM213 R10 AND CONVERTED TO METRIC FOR THOR-M	9/26/2011	BK
	B	HOLE DIMENSION 2X Ø5.40 +.13/-.03 THRU ⌴ Ø8.40 +.13/-.03 ↧11.10 WAS 2X Ø6.02 +.03/-.00 THRU ⌴ Ø8.4 ↧11.10; HOLE DIMENSION 4X Ø6.80 +.13/-.03 WAS 4X Ø6.4 THRU	2/26/2018	DW

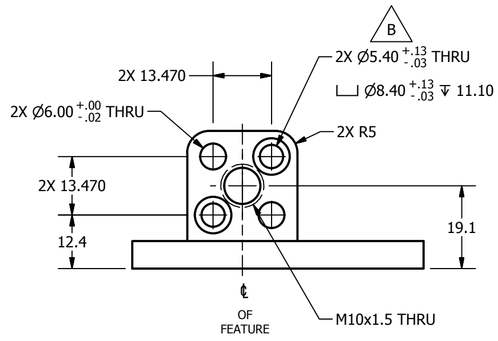


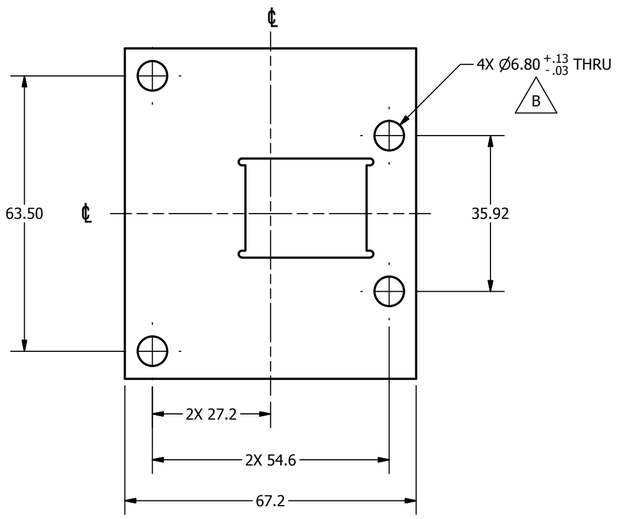
SCALE 1.000











NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. STAMP OR ETCH PART NUMBER (3mm CHARACTERS) WHERE SHOWN. (OPTIONAL)
3. POWDER OR BEAD BLAST.
4. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.
5. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

		PROJECT NO.: THOR-50M
472-3630	1	MATERIAL: 1018 STEEL
NEXT ASSEMBLY	QTY	HEAT TREAT:
TOTAL QTY IN DUMMY	1	FINISH: SEE NOTES

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01. ANGLES ± 0.5°. FINISH 1.6. REMOVE BURS & BREAK SHARP EDGES

DRAWN BY: B. KIMES — DATE: 9/26/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/16/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

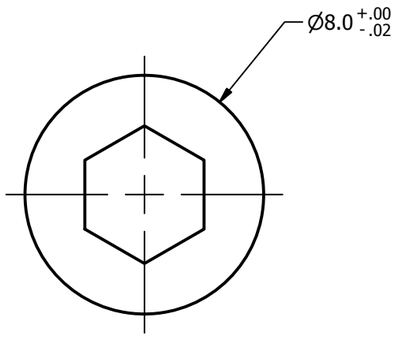
DESCRIPTION: NECK PITCH CHANGE MECHANISM BASE PLATE

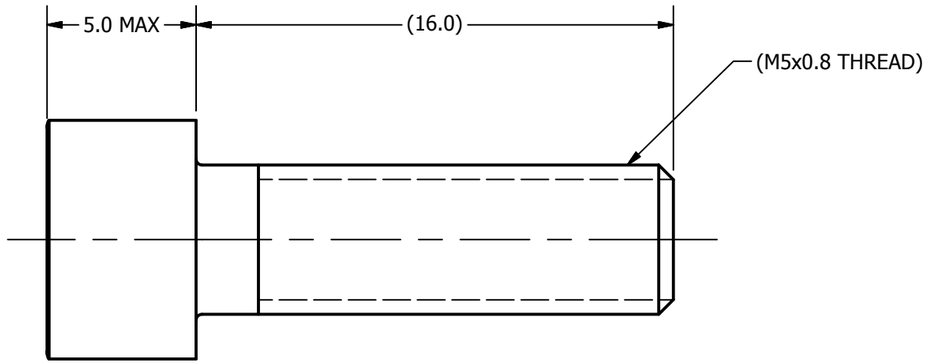
SIZE: A2 | SHEET: 1 OF 1 | SCALE: 1.000 | DRAWING NO.: 472-3633 | REV: B

472-3633.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM220 R01 AND CONVERTED TO METRIC FOR THOR-M	11/16/2011	BK
	B	NOTE 1 WAS MAKE FROM M6 x 10 SHOULDER SCREW (5001122); MODIFY AS SHOWN, DIMENSION 8.0 +0.0/-0.2; ADDED DIMENSION 5 MAX., AND DIMENSION (16.0)	2/26/2018	DW

SCALE 3.000





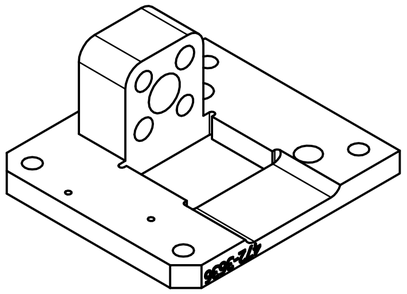
NOTES:

1. MAKE FROM SCREW, SHCS M5x0.8 x 16 (5000020), MODIFY AS SHOWN.

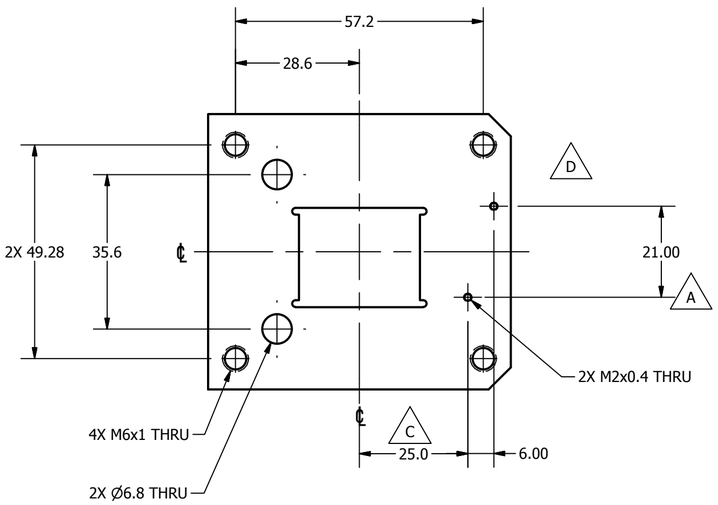
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ± 0.5 ± 0.5 1.6 X.X ± 0.2 X.XX ± 0.1 X.XXX ± 0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: NECK PITCH CHANGE MECHANISM BOLT	
472-3630	4	MATERIAL:	DRAWN BY: B. KIMES / DATE: 11/16/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: / DATE:	SIZE: B / SHEET: 1 OF 1 / DRAWING NO.: 472-3634 / REV: B	
TOTAL QTY IN DUMMY	4	FINISH:	ENGINEER: J. WANG / DATE: 1/16/2012	SCALE: 5.000	

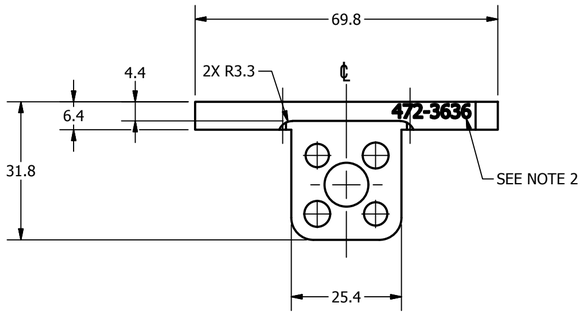
472-3634.iam

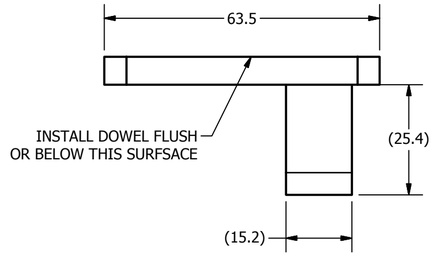
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM216 R15 AND CONVERTED TO METRIC FOR THOR-M; REORIENT IES SENSOR HOLES (M2)	9/26/2011	BK
	B	Ø10.1+.1/-0 WAS Ø9.5	3/15/2012	BK
	C	DIMENSION 25.0 WAS 31.0	9/14/2015	DW
	D	REMOVED HOLES Ø4.4 THRU C'BORE Ø7.5 DEPTH 4.3 & Ø3.000 +.000/+.010 THRU (P.F. DOWEL); REMOVED NOTE 6 AND ITEM #1 - 5000284 – M3 X 10 LG. DOWEL PIN	2/17/2017	DW
	E	HOLE DIMENSION 2X Ø5.40 +.13/-.03 THRU ⌴ Ø8.40 +.13/-.03 ↧ 5.1 WAS 2X Ø6.02 +.03/-.00 THRU ⌴ Ø8.4 ↧ 5.1, AND 2X Ø6.000 +.000/-.013 THRU (P.F. DOWEL) WAS 2X Ø6.000 +.000/+.013 THRU (P.F. DOWEL)	2/27/2018	DW

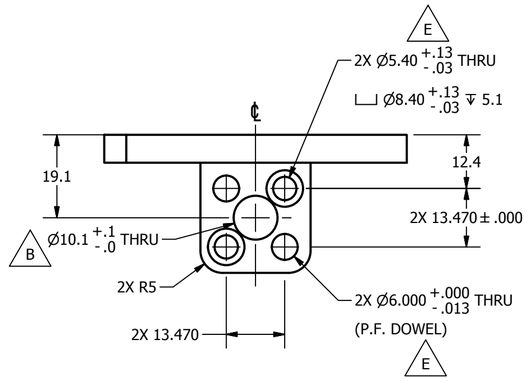


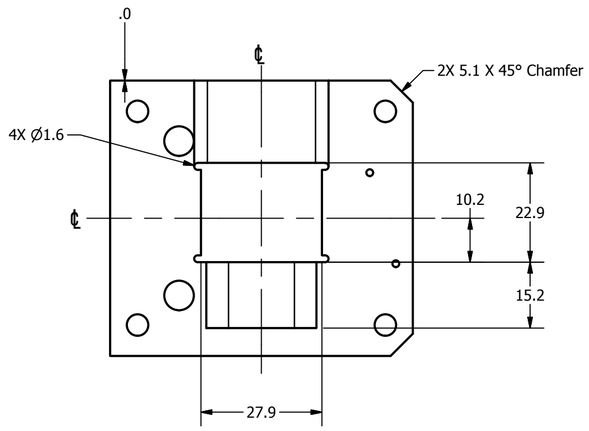
SCALE 1.000











NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. STAMP OR ETCH PART NUMBER (3mm CHARACTERS) WHERE SHOWN. (OPTIONAL)
3. POWDER OR BEAD BLAST.
4. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.
5. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

D

D

ITEM	QTY	PART NUMBER	DESCRIPTION
		PARTS LIST	
472-3630	1	1018 CRS	
NEXT ASSEMBLY	QTY		
TOTAL QTY IN DUMMY	1	SEE NOTES	

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS; DECIMALS X ± 0.5, X.X ± 0.1, X.XX ± 0.01, X.XXX ± 0.001; ANGLES ± 0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:

MATERIAL: 1018 CRS

HEAT TREAT:

FINISH: SEE NOTES

DRAWN BY: B. KIMES — DATE: 9/26/2011

CHECKED BY: — DATE:

ENGINEER: J. WANG — DATE: 1/16/2012

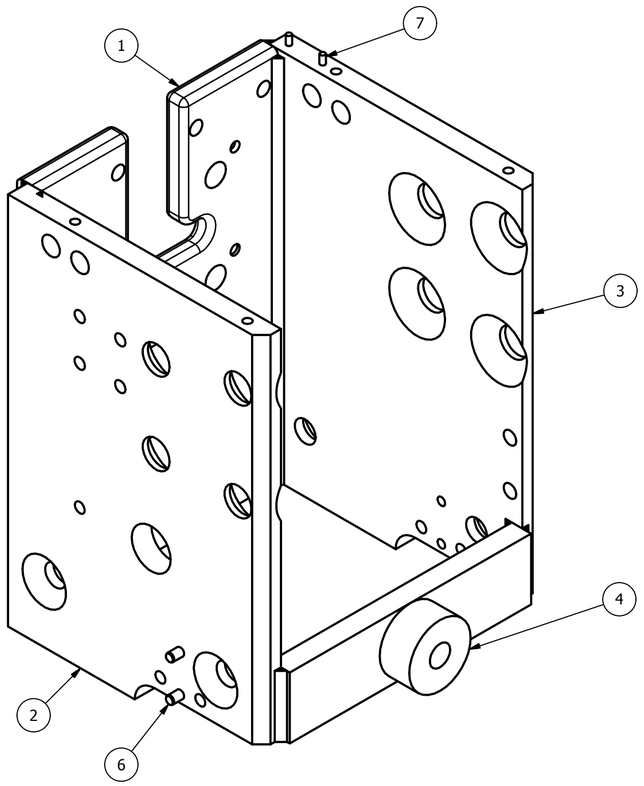
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: NECK PITCH CHANGE MECHANISM TOP PLATE THOR-50M

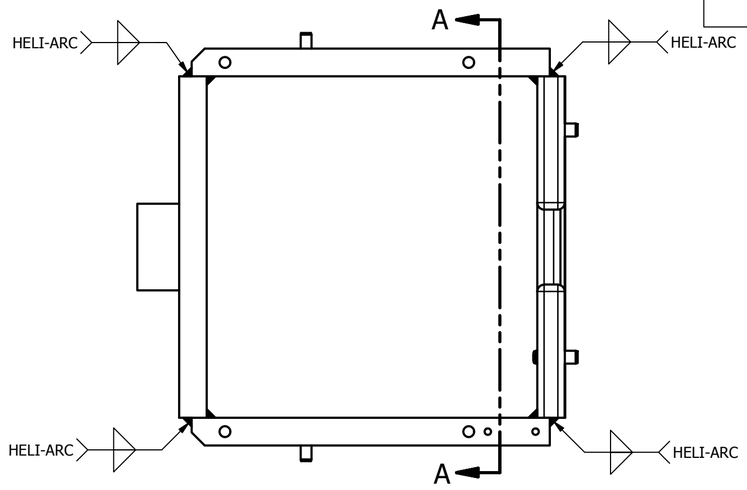
SIZE: A2 — SHEET: 1 OF 1 — SCALE: 1.000 — DRAWING NO.: 472-3636 — REV: E

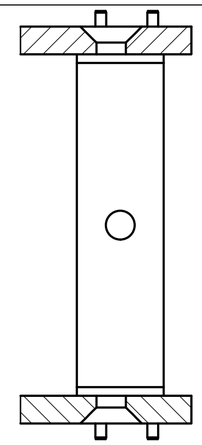
472-3636.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPW120 R3; ADD FRONT PLATE, NICKEL PLATE WAS TEFLON COAT	9/28/2011	BK
	B	78.72 +.3/-0 WAS 78.7	6/25/2012	BK
	C	UPDATE TO SHOW SIDE PLATE CHANGES	10/12/2012	BK
	D	QTY. OF ITEM #6 WAS 2 AND PART# WAS 5000933; ADDED ITEM #7 PART #5000169V - PIN, DOWEL M1.5 x 8 SS	8/31/2017	DW
	E	DIMENSION 3.0 WAS 4.0, PART #5000167 – PIN, DOWEL M1.5 x 6 WAS PART #5000169V – PIN, DOWEL M1.5 x 8 SS	1/25/2018	DW

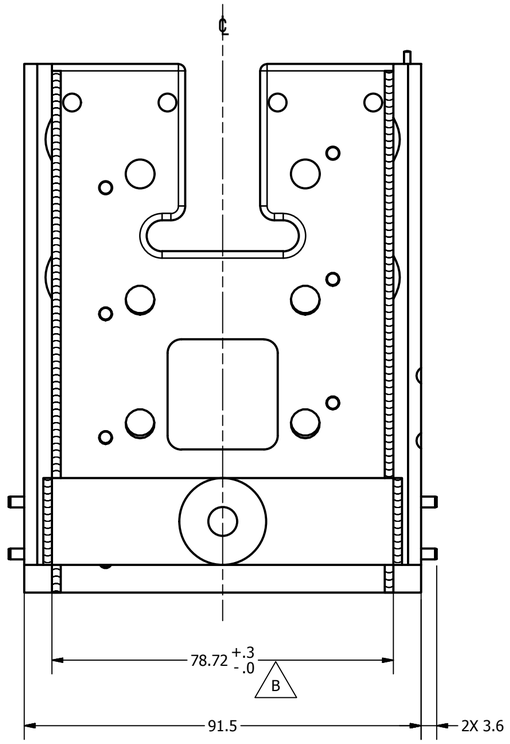


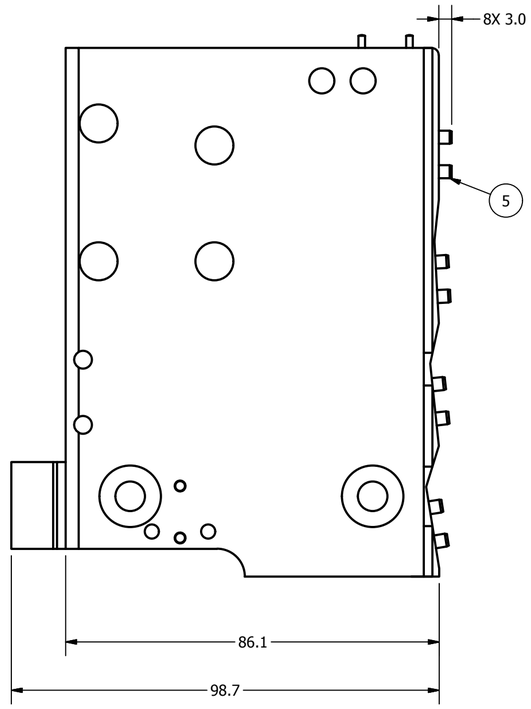
SCALE 1.000

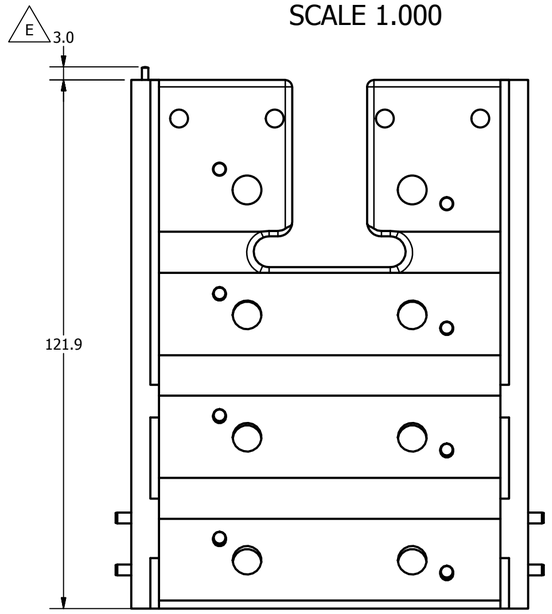




SECTION A-A
SCALE 1.000







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. WELDMENT TOLERANCE ±0.5mm, UNLESS OTHERWISE NOTED.
3. POWDER OR BEAD BLAST.
4. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER WELDING.
5. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.
6. INSTALL DOWEL PINS AFTER NICKEL PLATE.

E D D

ITEM	QTY	PART NUMBER	DESCRIPTION
7	2	5000167	PIN, DOWEL M1.5 x 6
6	4	5000869	PIN, DOWEL M2.5 X 8 LG.
5	8	5000384	M3 X 8 LG. DOWEL PIN
4	1	472-3624	UPPER THORACIC SPINE FRONT PLATE
3	1	472-3622	UPPER THORACIC SPINE SIDE PLATE, LEFT
2	1	472-3621	UPPER THORACIC SPINE SIDE PLATE, RIGHT
1	1	472-3623	UPPER THORACIC SPINE BACK PLATE

PARTS LIST

472-3600	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01. ANGLES ±0.5°. FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.: THOR-50M
MATERIAL:
HEAT TREAT:
FINISH: SEE NOTES
DRAWN BY: B. KIMES — DATE: 9/28/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/16/2012

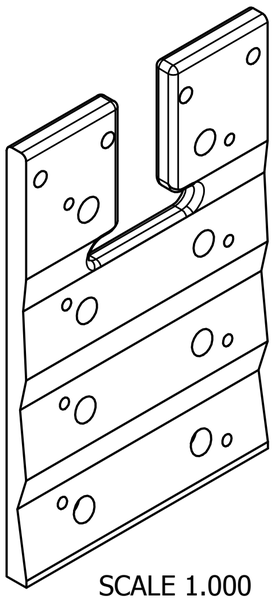
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: UPPER THORACIC SPINEBOX WELDMENT

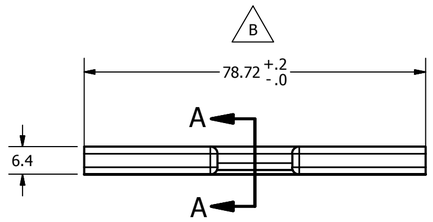
SIZE: A2 — SHEET 1 OF 1 — SCALE: 1.000 — DRAWING NO.: 472-3620 — REV: E

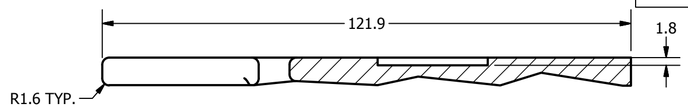
472-3620.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM123 R8 AND CONVERTED TO METRIC FOR THOR-M	9/27/2011	BK
	B	78.72+.2/-0 WAS 78.7	6/25/2012	BK
	C	ADD DATUMS D, E, BASIC DIMENSIONS, AND POSITIONAL TOLERANCING; DIMENSION HOLES FROM DATUM E; 38.10, [52.40] WAS (38.10), (52.40); ADD 20.62, NOTE TO DOWEL HOLE	10/1/2012	BK
	D	ADDED DIMENION 25.4	5/27/2014	DW

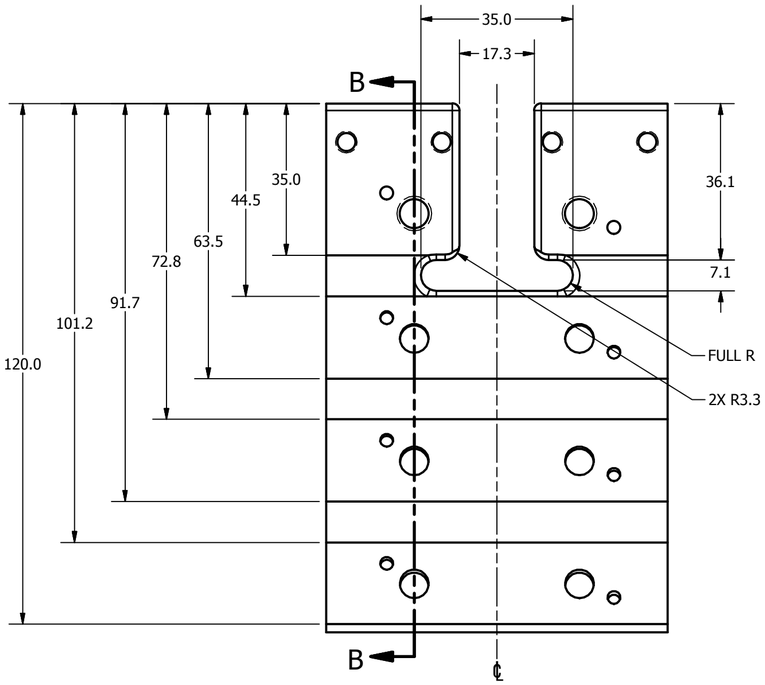


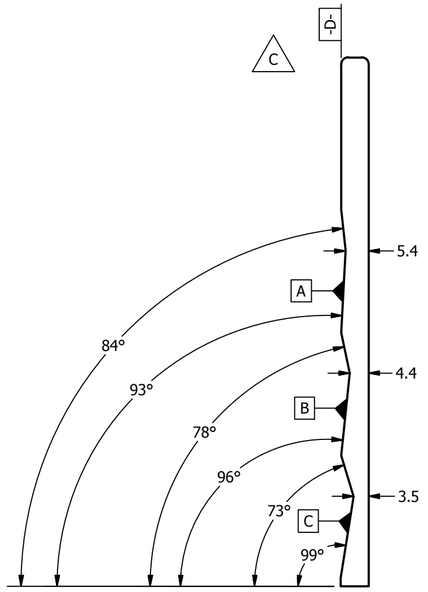
SCALE 1.000

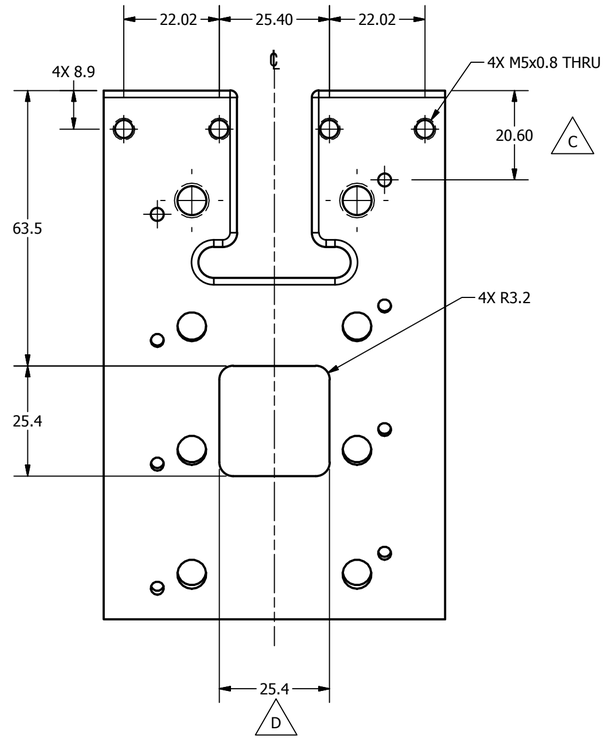


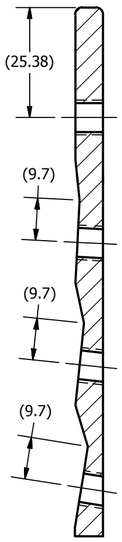


SECTION A-A
SCALE 1.000

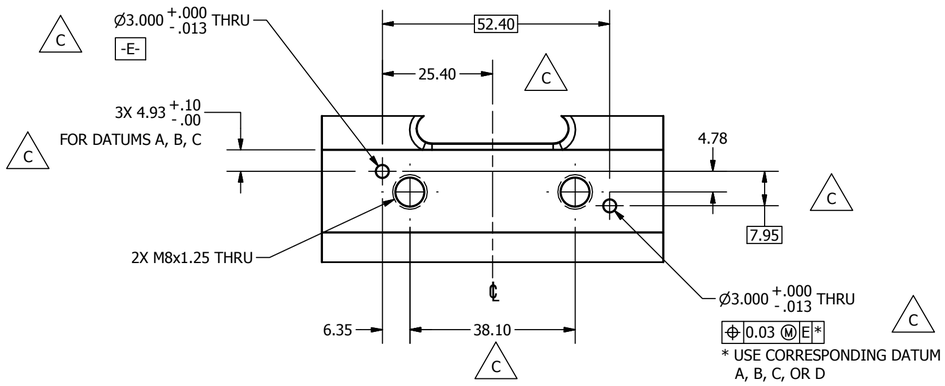








SECTION B-B
SCALE 1.000



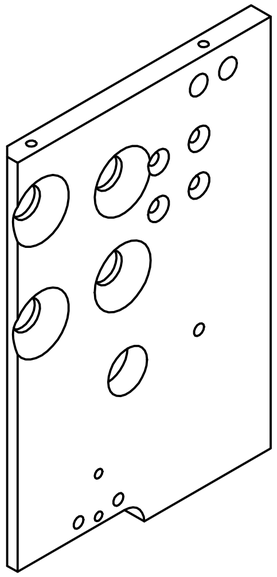
VIEW PERPENDICULAR TO
DATUMS A, B, & C
HOLE PATTERNS TYP. 3 PLACES
SCALE 1.000

NOTES:

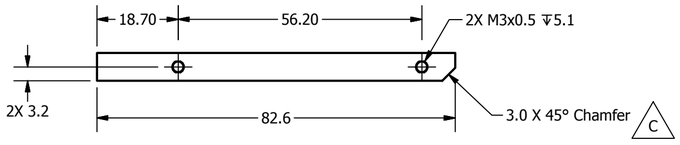
1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

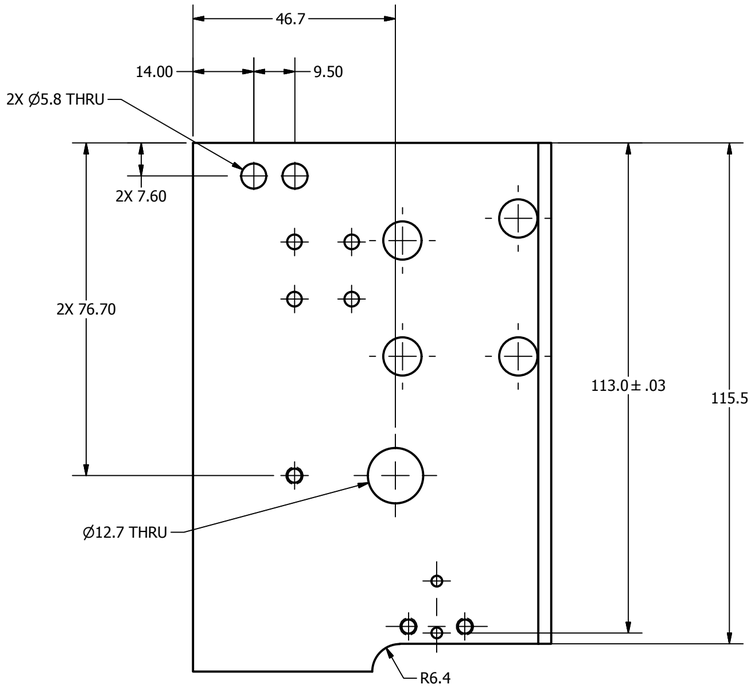
		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ± 0.5 X.X ± 0.2 X.XX ± 0.1 X.XXX ± 0.01 ANGLES ± 0.5 FINISH 1.6		
		PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: UPPER THORACIC SPINE BACK PLATE	
472-3620	1	MATERIAL: 1018 STEEL	DRAWN BY: B. KIMES DATE: 9/27/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:		
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG DATE: 1/16/2012	SIZE: A2 SHEET 1 OF 1 SCALE: 1.000	DRAWING NO.: 472-3623 REV: D

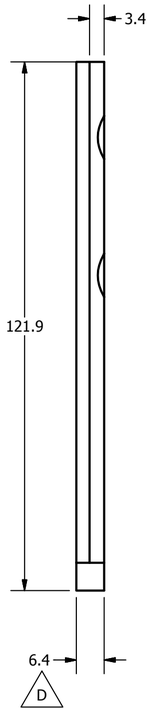
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM121 R5 AND CONVERTED TO METRIC FOR THOR-M	9/27/2011	BK
	B	CORRECT TYPO, -.013 WAS +.013	5/15/2012	BK
	C	ADD CHAMFER; MOVE HOLE PATTERN, 56.20 WAS 63.30; REMOVE 2X 111.5; ADD 2X 1.50	10/11/2012	BK
	D	ADDED DIMENSION 6.4	5/27/2014	DW
	E	ADDED HOLE NOTE 2X M4x0.7 6H THRU	3/7/2016	DW
	F	HOLE NOTE 2X Ø2.500 +.000/-.013 THRU (P.F. DOWEL) WAS Ø2.000 +.000/-.013 THRU (P.F. DOWEL)	5/9/2017	DW

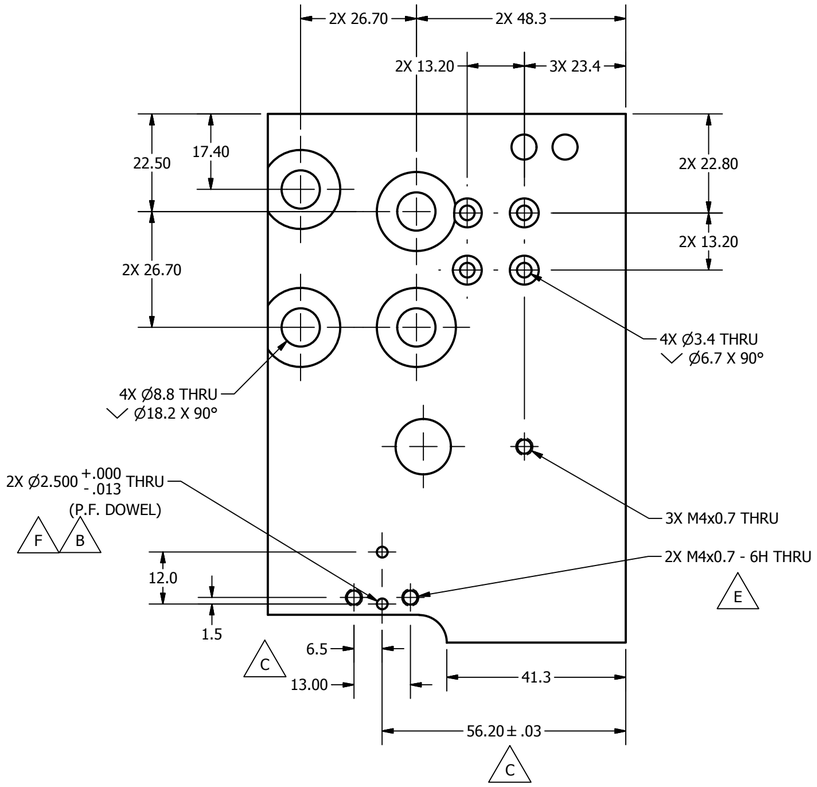


SCALE 1.000





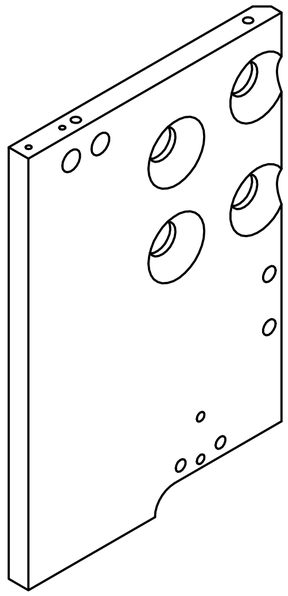




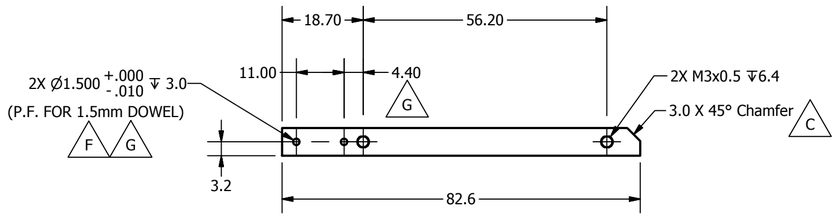
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ± 0.5 ± 0.5° 1.6 X.X ± 0.2 X.XX ± 0.1 X.XXX ± 0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: UPPER THORACIC SPINE SIDE PLATE, RIGHT	
472-3620	1	MATERIAL: 1018 STEEL	DRAWN BY: B. KIMES DATE: 9/27/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A2 SHEET 1 OF 1	DRAWING NO.: 472-3621 REV: F
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG DATE: 1/16/2012	SCALE: 1.000	

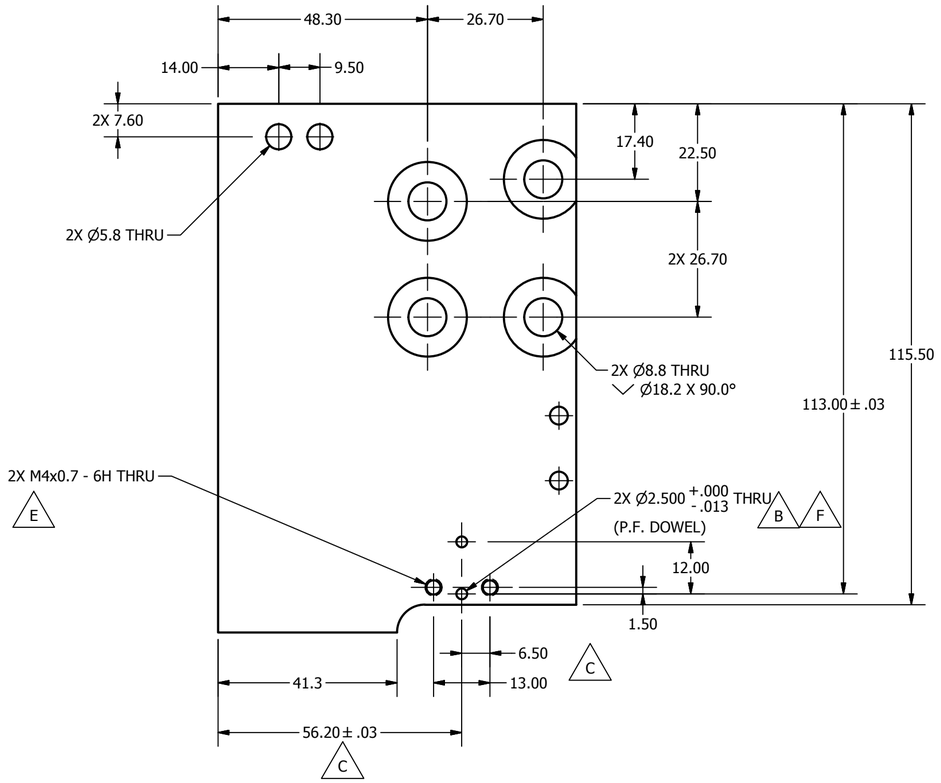
472-3621.ipt

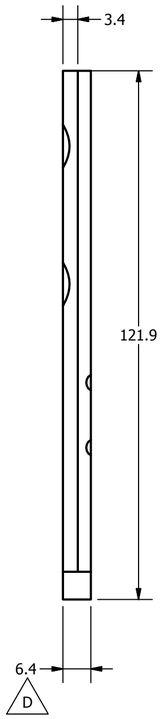
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM122 R2 AND CONVERTED TO METRIC FOR THOR-M	9/27/2011	BK
	B	CORRECT TYPO, -.013 WAS +.013	5/15/2012	BK
	C	ADD CHAMFER; MOVE HOLE PATTERN, 56.20 WAS 63.30; REMOVE 2X 111.5; ADD 2X 1.50	10/12/2012	BK
	D	ADDED DIMENSION 6.4	5/27/2014	DW
	E	ADDED HOLE NOTE 2X M4x0.7 - 6H THRU	3/7/2016	DW
	F	HOLE NOTE 2X Ø2.500 +.000/-.013 THRU (P.F. DOWEL) WAS Ø2.000 +.000/-.013 THRU (P.F. DOWEL); ADDED HOLES 2X Ø1.500 +.000/-.010 ↧6.0 (P.F. FOR 1.5mm DOWEL)	8/31/2017	DW
	G	DIMENSION 4.40 WAS 5.00, HOLE DIMENSION 2X Ø1.500 +.000/-.010 ↧ 3.0 (P.F. FOR 1.5mm DOWEL) WAS 2X Ø1.500 +.000/-.010 ↧ 6.0 (P.F. FOR 1.5mm DOWEL)	1/25/2018	DW

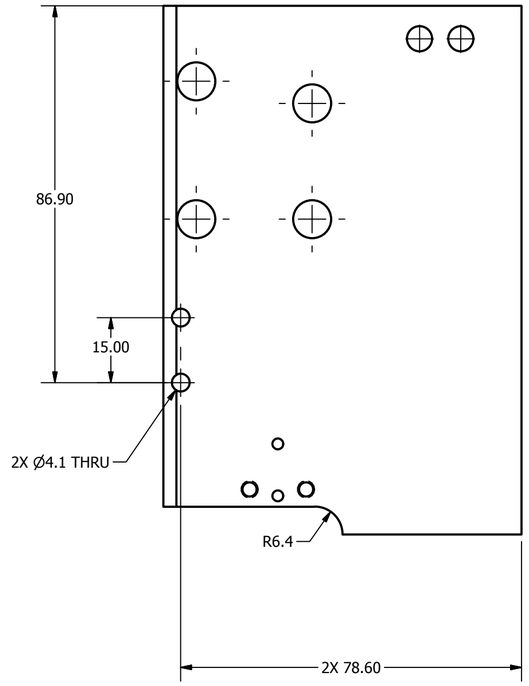


SCALE 1.000





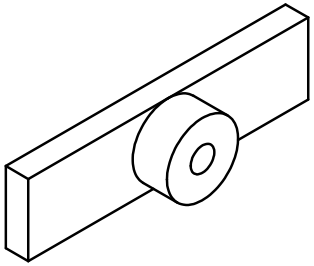




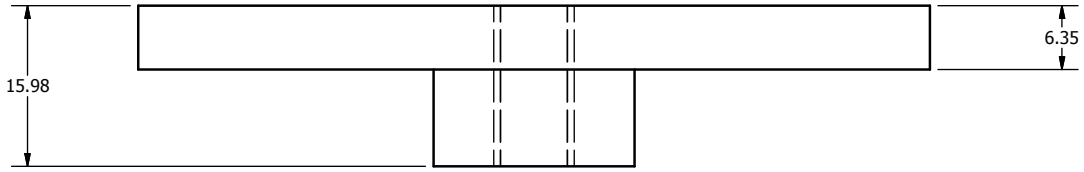
DO NOT SCALE DRAWING		TOLERANCES		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES		DESCRIPTION: UPPER THORACIC SPINE SIDE PLATE, LEFT THOR-50M	
PROJECT NO.:					
472-3620	1	MATERIAL: 1018 STEEL	DRAWN BY: B. KIMES	DATE: 9/27/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A2 SHEET 1 OF 1
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/16/2012	SCALE:
					DRAWING NO.: 472-3622 REV: G

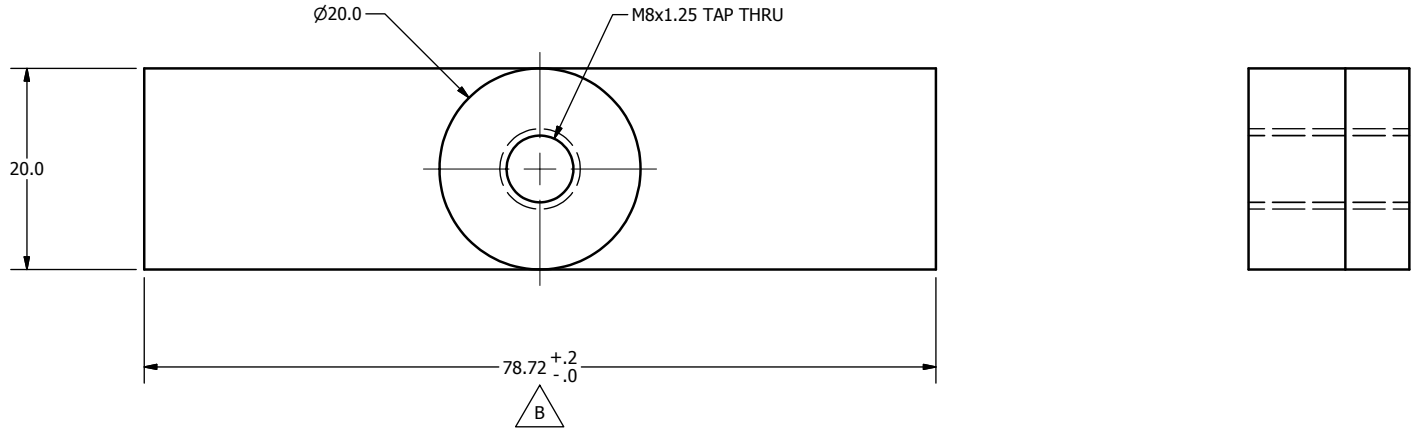
472-3622.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RELEASE TO PRODUCTION	9/23/2011	DW
	B	78.72+.2/-0 WAS 78.74	6/25/2012	BK



SCALE 1.000



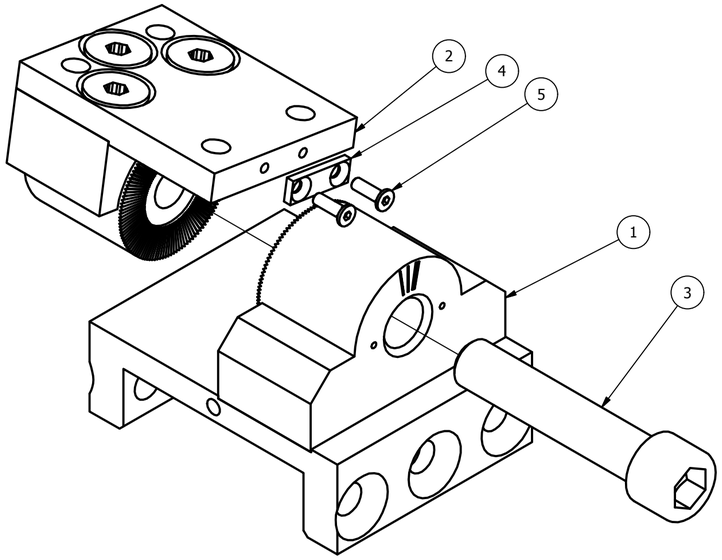


NOTES:

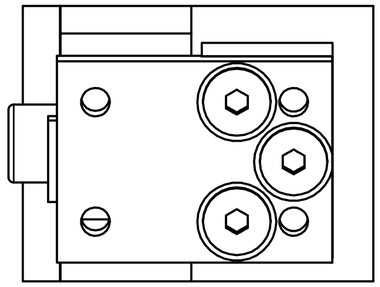
1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

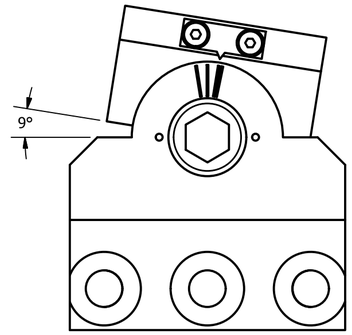
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6			
PROJECT NO.:		REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: UPPER THORACIC SPINE FRONT PLATE		
472-3620	1	MATERIAL: 1018 STEEL	DRAWN BY: dwashenko	DATE: 9/23/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: D. WASHENKO	DATE: 1/16/2012	SCALE: 2.000 DRAWING NO.: 472-3624 REV: B

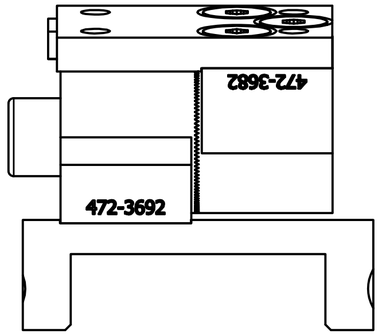
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM500 R04 AND CONVERTED TO METRIC FOR THOR-M	9/23/2011	BK
	B	PART #5000203 SCREW, FHCS M3-0.5 x 10 WAS 5001074 M3 X 0.5 X 10 LG. BHCS; REVISED PART 3 472-3713 LUMBAR SPINE PITCH CHANGE INDICATOR	8/25/2015	DW



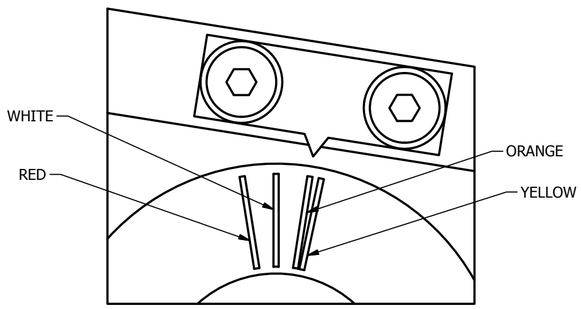
SCALE 1.000







POSTURE CHART		
POSTURE	COLOR	ANGLE
ERECT	RED	-9°
NEUTRAL	WHITE	0°
SLOUCHED	ORANGE	9°
SUPER SLOUCHED	YELLOW	12°



POSTURE SETTINGS
SCALE 3.000

NOTES:

1. USE LOCTITE ANTISEIZE LUBRICANT OR EQUIVALENT ON THE M12 X 16 S.H.C.S. PRIOR TO INSERTION. TORQUE BOLT TO 50 FT-LB TO TIGHTEN PITCH CHANGE MECHANISM.

2. TO ADJUST THE SPINE POSTURE, LOOSEN THE M8 S.H.C.S. AND ROTATE THE UPPER HALF OT THE SPINE WITH RESPECT TO THE LOWER HALF. ALIGN THE INDICATOR WITH THE PROPER COLOR OF THE POSTURE DESIRED. REFERENCE THE COLOR CHART FOR POSTURE SETTINGS.

ITEM	QTY	PART NUMBER	DESCRIPTION
5	2	5000203	SCREW, FHCS M3-0.5 x 10
4	1	472-3713	LUMBAR SPINE PITCH CHANGE INDICATOR
3	1	5000442	M12 X 1.75 X 60 LG. SHCS
2	1	472-3680	LUMBAR SPINE PITCH CHANGE UPPER HALF ASSEMBLY
1	1	472-3690	LUMBAR SPINE PITCH CHANGE LOWER HALF ASSEMBLY

PARTS LIST

472-3600	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION
PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01
ANGLES: ±0.5°
FINISH: 1.6
REMOVE BURRS & BREAK SHARP EDGES

DRAWN BY: B. KIMES — DATE: 9/23/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/12/2012

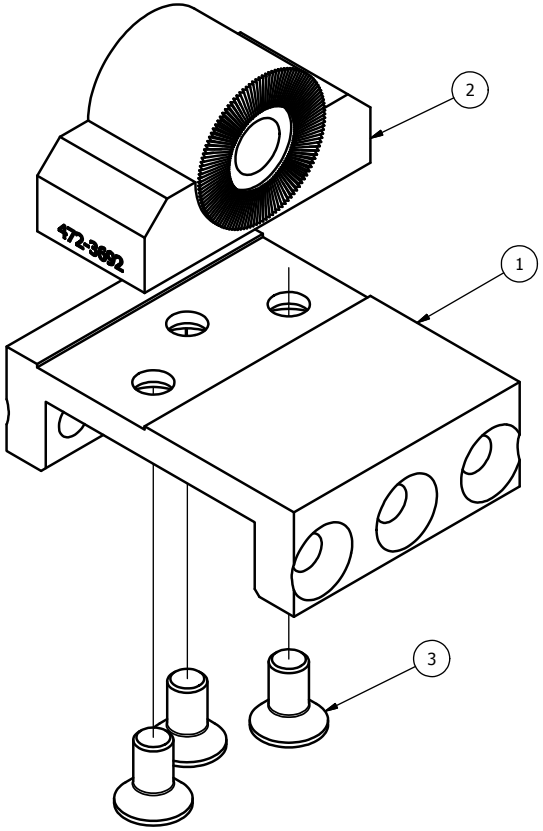
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: LUMBAR SPINE PITCH CHANGE ASSEMBLY THOR-50M

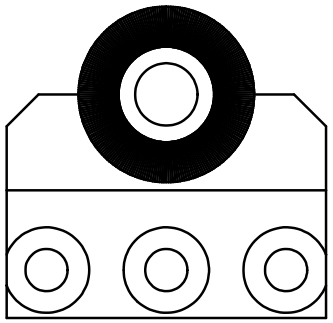
SIZE: A2 | SHEET: 1 OF 1 | SCALE: 2.000 | DRAWING NO.: 472-3670 | REV: B

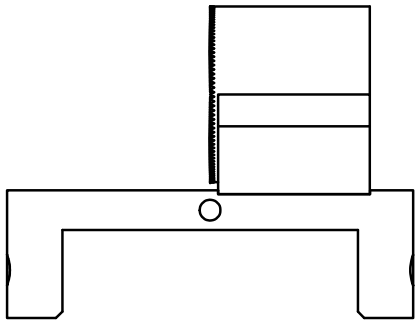
472-3670.iam

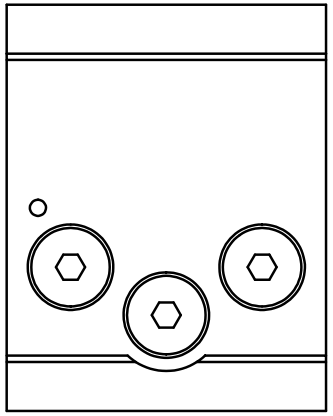
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM520 R04 AND CONVERTED TO METRIC FOR THOR-M	9/23/2011	BK



SCALE 1.000







NOTES:

1. ASSEMBLE SCREWS USING LOCTITE 271 THREADLOCKER OR EQUIVALENT.

ITEM	QTY	PART NUMBER	DESCRIPTION
3	3	5001091	M8 X 1.25 X 16 LG. FHCS
2	1	472-3692	LUMBAR SPINE PITCH CHANGE STAR WHEEL, RIGHT SIDE
1	1	472-3691	LUMBAR SPINE PITCH CHANGE BOTTOM PLATE

PARTS LIST

473-3670	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS — DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6

REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:

MATERIAL:

HEAT TREAT:

FINISH:

DRAWN BY: B. KIMES — DATE: 9/23/2011

CHECKED BY: — DATE:

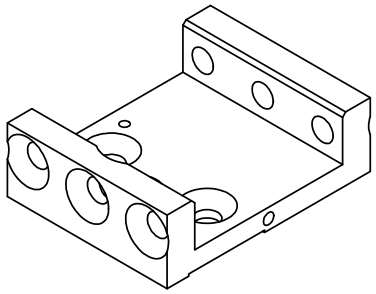
ENGINEER: J. WANG — DATE: 1/16/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

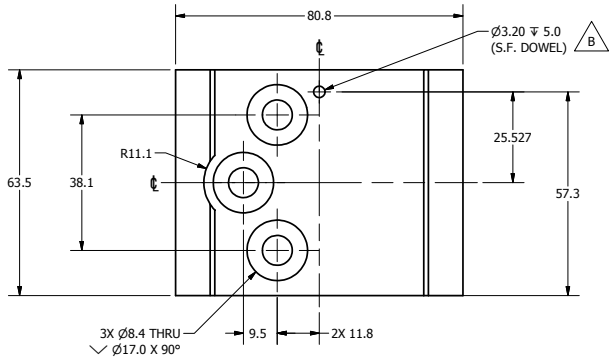
DESCRIPTION: LUMBAR SPINE PITCH CHANGE LOWER HALF ASSEMBLY

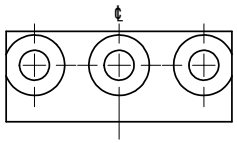
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 1.000 | DRAWING NO.: 472-3690 | REV: A

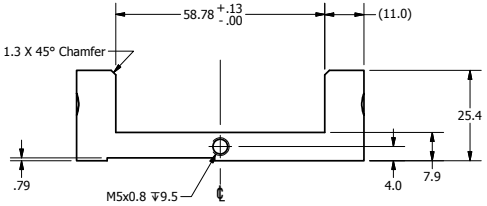
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM521 R06 AND CONVERTED TO METRIC FOR THOR-M	9/22/2011	BK
	B	ADD DOWEL LOCATION HOLE	12/19/2011	BK

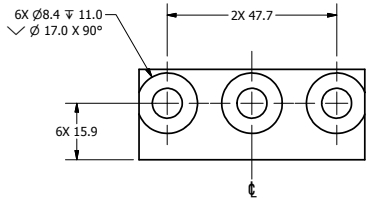


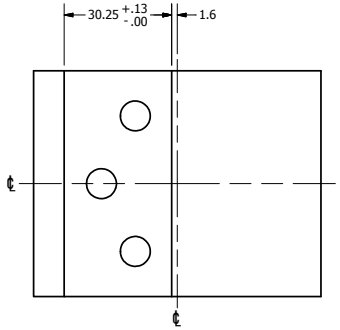
SCALE 1.000











NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. POWDER OR BEAD BLAST.
3. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.
4. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

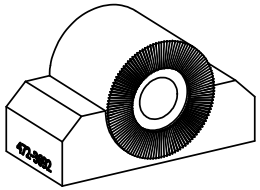
		DO NOT SCALE DRAWING	TOLERANCES
		PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES
472-3690	1	MATERIAL: 1018 STEEL	DRAWN BY: B. KIMES — DATE: 9/22/2011
NEXT ASSEMBLY	QTY	ITEM / PART#:	CHECKED BY: — DATE:
TOTAL QTY IN DUMMY	1	WEIGHT: SEE NOTES	ENGINEER: J. WANG — DATE: 1/16/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

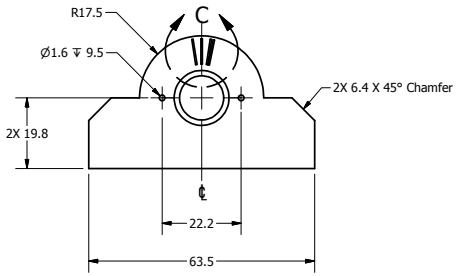
PROJECT NAME: LUMBAR SPINE PITCH CHANGE BOTTOM PLATE

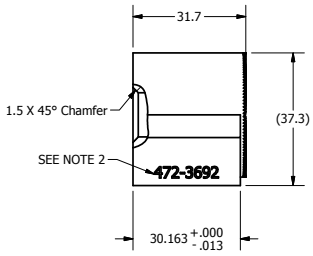
SIZE: A2 — SHEET: 1 OF 1 — SCALE: 1.000 — DRAWING NO.: 472-3691 — REV: B

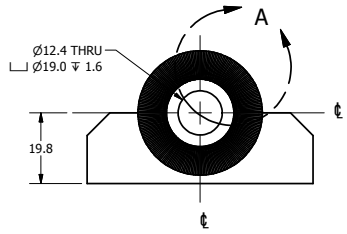
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM523 R0 AND CONVERTED TO METRIC FOR THOR-M	9/22/2011	BK

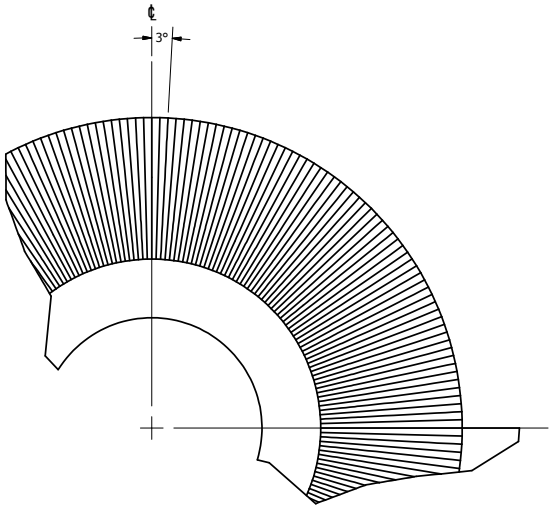


SCALE 1.000

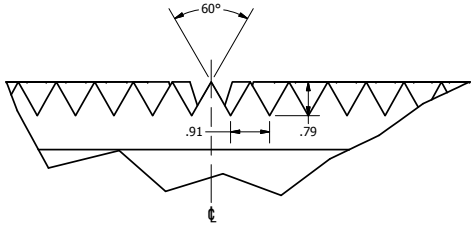




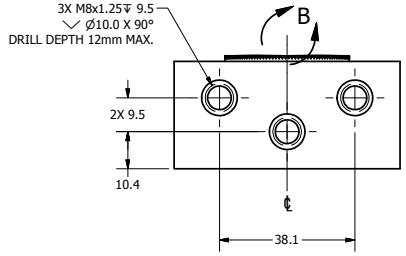


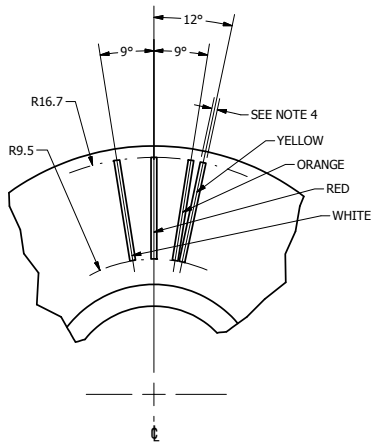


DETAIL A
SCALE 5.000



DETAIL B
TOOTH PATTERN
SCALE 12.000





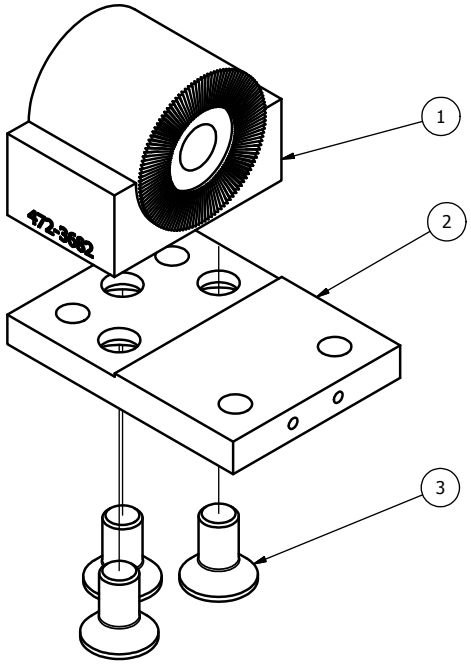
DETAIL C
SCALE 4.000

NOTES:

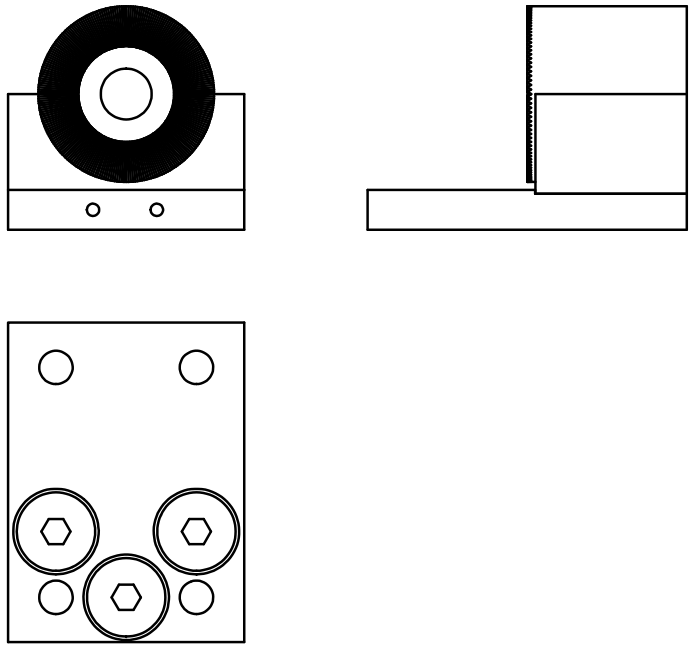
1. DIMENSIONS SYMMETRIC ABOUT ℄ , UNLESS OTHERWISE NOTED.
2. STAMP OR ETCH PAT NUMBER (3mm CHARACTERS) WHERE SHOWN. (OPTIONAL)
3. FIRST CUT OF STAR PATTERN OFFSET 1.5° FROM VERTICLE,
   TOTAL OF 120 RADIAL LINES ARE REQUIRED.
4. ENGRAVE LINES WITH MAXIMUM THICKNES OF 0.5mm, PAINT IN LINE AS SHOWN.

DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS DECIMALS X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6	
PROJECT NO.:		REMOVE BURRS & BREAK SHARP EDGES	PROJECT NAME: LUMBAR SPINE PITCH CHANGE STAR WHEEL, RIGHT SIDE
472-3690	1	MATERIAL: Stainless Steel, 440C	DRAWN BY: B. KIMES — DATE: 9/22/2011
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 56-60	CHECKED BY: — DATE:
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG — DATE: 1/16/2012
			SIZE: A2 — SHEET 1 OF 1 — SCALE: 1.000 — DRAWING NO.: 472-3692 — REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM510 R03 AND CONVERTED TO METRIC FOR THOR-M	9/22/2011	BK



SCALE 1.000



NOTES:

1. ASSEMBLE SCREWS USING LOCTITE 271 THREADLOCKER OR EQUIVALENT.

ITEM	QTY	PART NUMBER	DESCRIPTION
3	3	5001091	M8 X 1.25 X 16 LG. FHCS
2	1	472-3681	LUMBAR SPINE PITCH CHANGE TOP PLATE
1	1	472-3682	LUMBAR SPINE PITCH CHANGE STAR WHEEL, LEFT SIDE

PARTS LIST

472-3670	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01
ANGLES ± 0.5°
FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

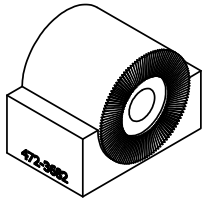
PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:
DRAWN BY: B. KIMES — DATE: 9/22/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/16/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

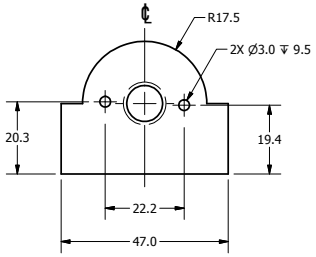
DESCRIPTION: LUMBAR SPINE PITCH CHANGE UPPER HALF ASSEMBLY

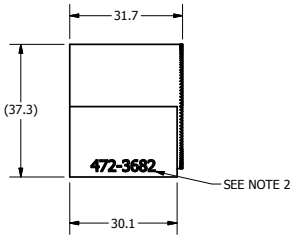
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 1.000 | DRAWING NO.: 472-3680 | REV: A

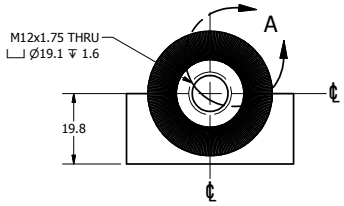
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM523 R0 AND CONVERTED TO METRIC FOR THOR-M	9/22/2011	BK

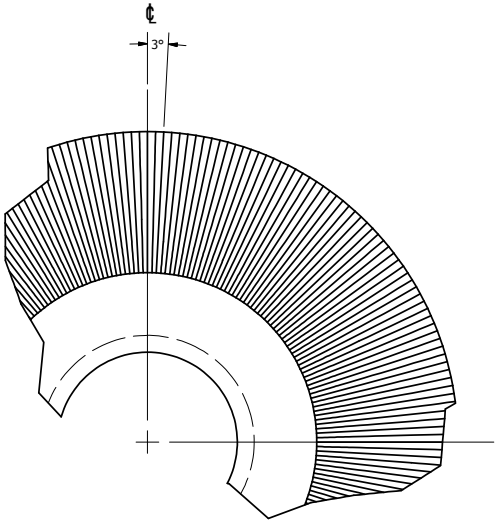


SCALE 1.000

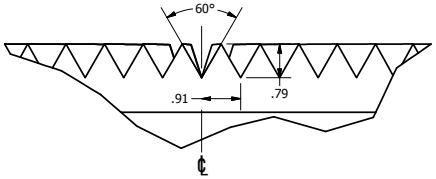




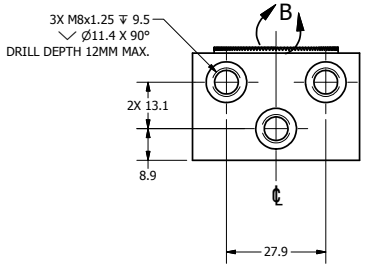




DETAIL A
SCALE 5.000



DETAIL B
TOOTH PATTERN
SCALE 12.000

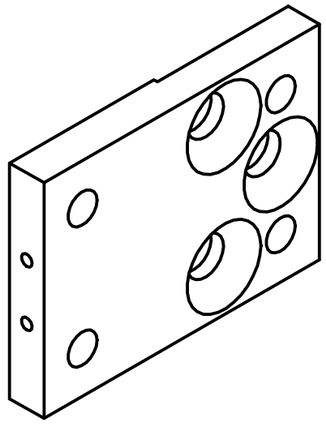


NOTES:

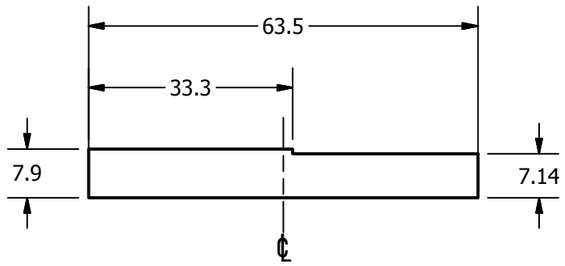
1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. STAMP OR ETCH PAT NUMBER (3mm CHARACTERS) WHERE SHOWN. (OPTIONAL)
3. FIRST CUT OF STAR PATTERN OFFSET 1.5° FROM VERTICLE,
   TOTAL OF 120 RADIAL LINES ARE REQUIRED.

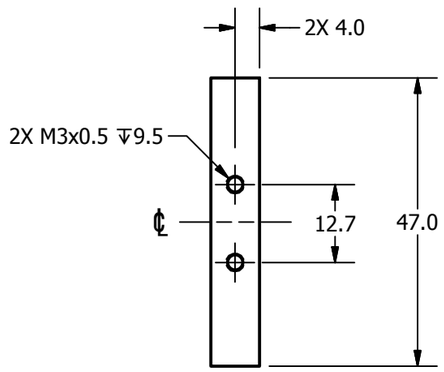
		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS. DECIMALS X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6	
		PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES	PROGRAM NAME: LUMBAR SPINE PITCH CHANGE STAR WHEEL, LEFT SIDE
472-3680	1	MATERIAL: Stainless Steel, 440C	DRAWN BY: B. KIMES	DATE: 9/22/2011
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 56-60	CHECKED BY:	DATE:
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/16/2012
			SIZE: A2	SHEET: 1 OF 1
			SCALE: 1.000	DRAWING NO.: 472-3682
				REV: A

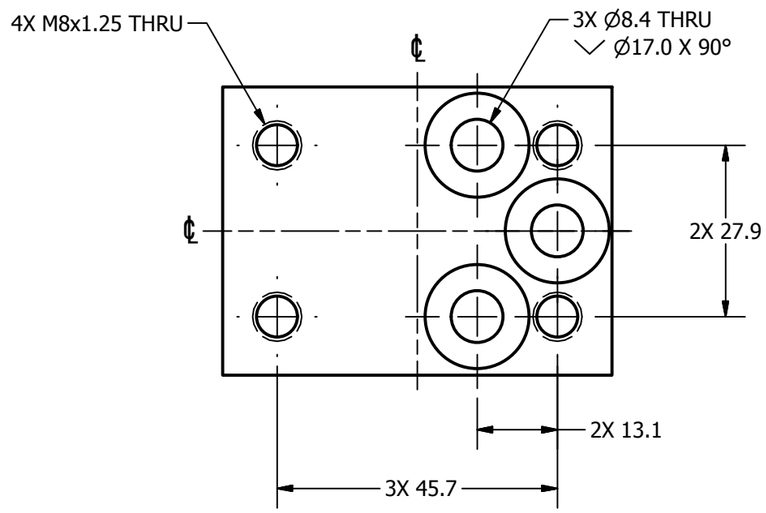
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM511 R05 AND CONVERTED TO METRIC FOR THOR-M	9/22/2011	BK



SCALE 1.000







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. POWDER OR BEAD BLAST.
3. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.
4. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

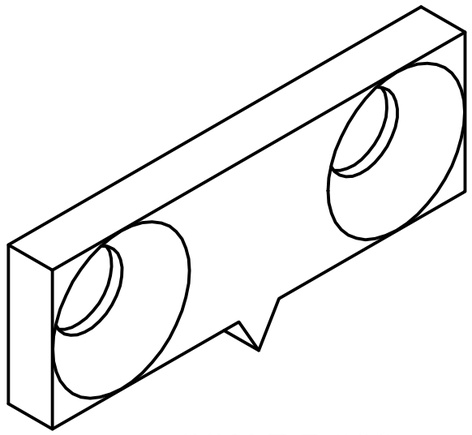
		PROJECT NO.:	DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5' 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES
472-3680	1	MATERIAL: 1018 STEEL	DRAWN BY: B. KIMES	DATE: 9/22/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:
TOTAL QTY IN DUMMY	1	FINISH: SEE NOTES	ENGINEER: J. WANG	DATE: 1/16/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

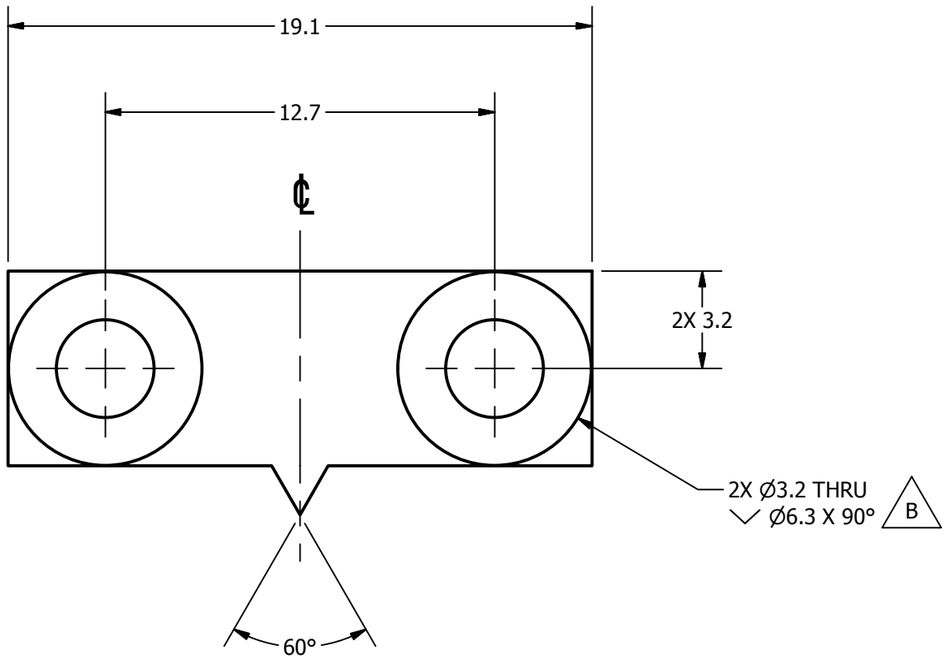
DESCRIPTION: LUMBAR SPINE PITCH CHANGE TOP PLATE

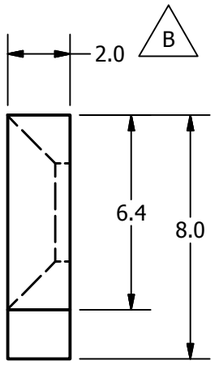
SIZE:	SHEET	DRAWING NO.:	REV:
A3	1 OF 1	472-3681	A
SCALE: 1.000			

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM523 R0 AND CONVERTED TO METRIC FOR THOR-M	9/21/2011	BK
	B	DIM. 2.0 WAS 1.6, AND HOLE DIM 2X Ø3.2 THRU ⌵ Ø6.3 X 90 WAS 2X Ø3.3 THRU	8/26/2015	DW



SCALE 5.000





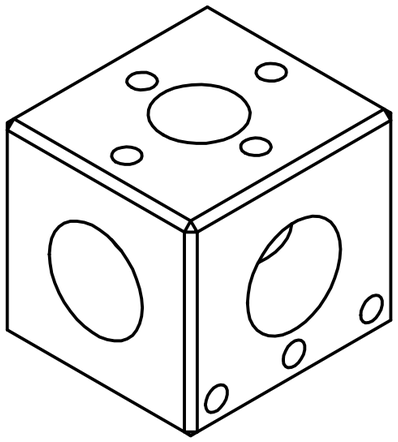
NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

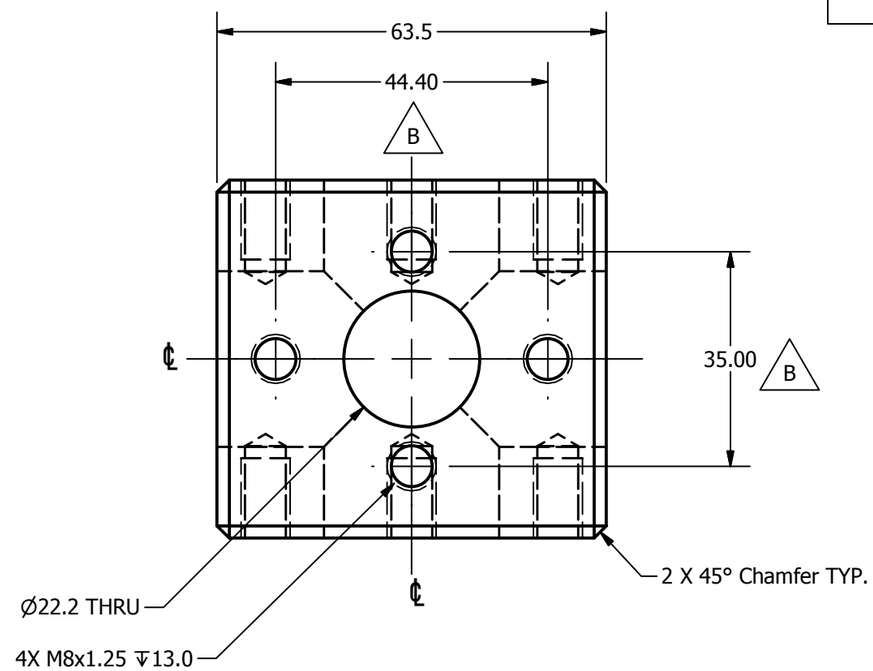
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ± 0.5 ± 0.5° 1.6 X.X ± 0.2 X.XX ± 0.1 X.XXX ± 0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
		PROJECT NO.:		DESCRIPTION: LUMBAR SPINE PITCH CHANGE INDICATOR THOR-50M
472-3670	1	MATERIAL: Brass, Soft Yellow	DRAWN BY: B. KIMES DATE: 9/21/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-3713 REV: B
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG DATE: 1/16/2012	SCALE: 5.000

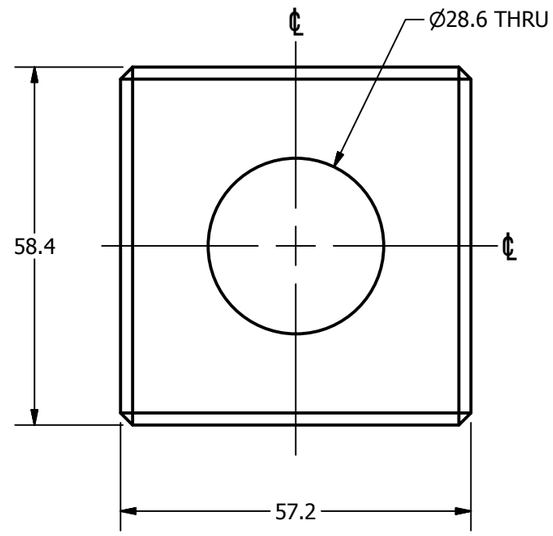
472-3713.ipt

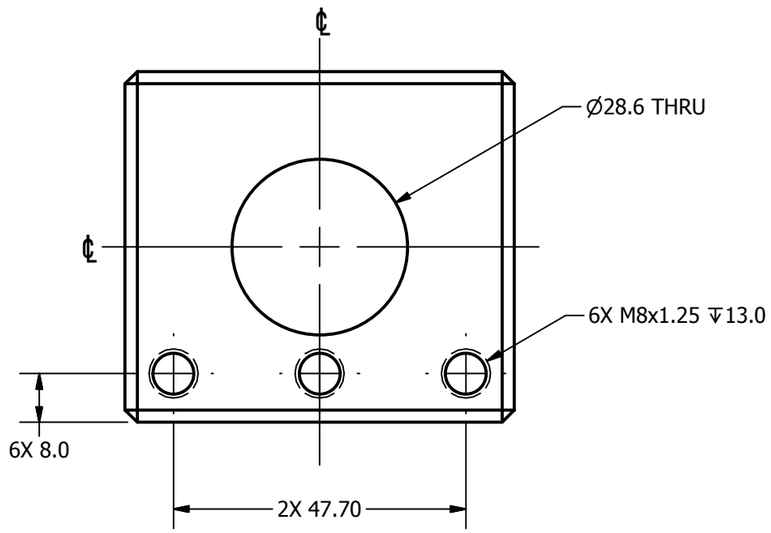
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REDESIGNED TO ONE PIECE FROM TWO PIECES FROM T1SPM620 R01; ADD WEIGHT SPEC	9/21/2011	BK
	B	44.45, 34.93 WAS 35.70, 34.90	6/15/2012	BK



SCALE .750







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. POWDER OR BEAD BLAST.
3. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.
4. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.
5. PART WEIGHT: 1.03 ±0.01 kg (2.27 ±0.02 LBS).

A

		PROJECT NO.:			
472-3600	1	MATERIAL: 1018 STEEL	DRAWN BY: B. KIMES	DATE: 9/21/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	
TOTAL QTY IN DUMMY	1	FINISH: SEE NOTES	ENGINEER: J. WANG	DATE: 1/16/2012	

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES — UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 — ANGLES ±0.5° — FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

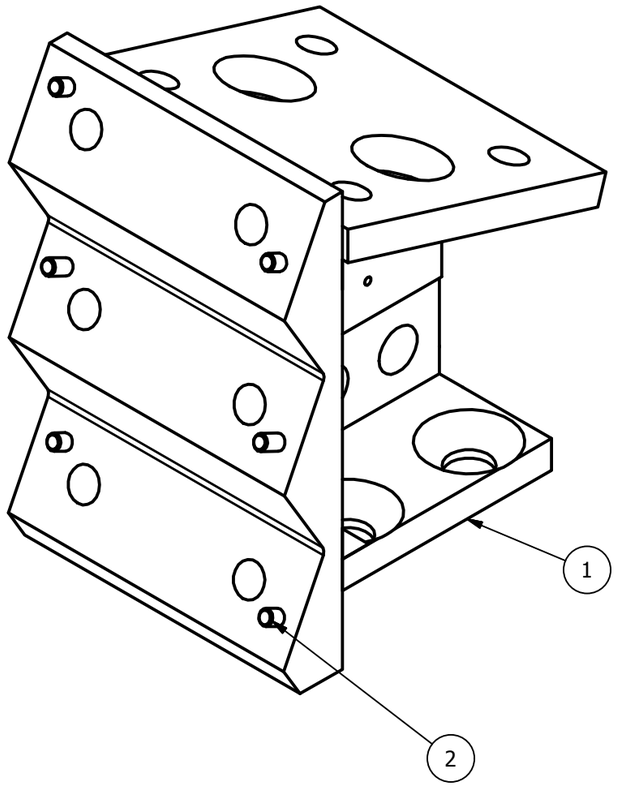
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: THORACIC SPINE LOAD CELL STRUCTURAL REPLACEMENT THOR-50M

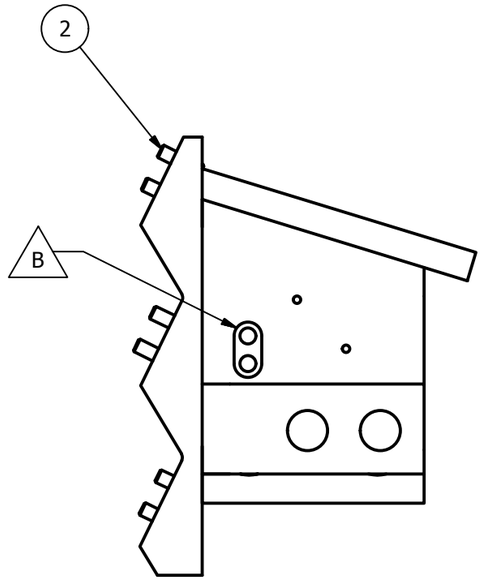
SIZE: A3 | SHEET: 1 OF 1 | DRAWING NO.: 472-3720 | REV: B | SCALE: 1.000

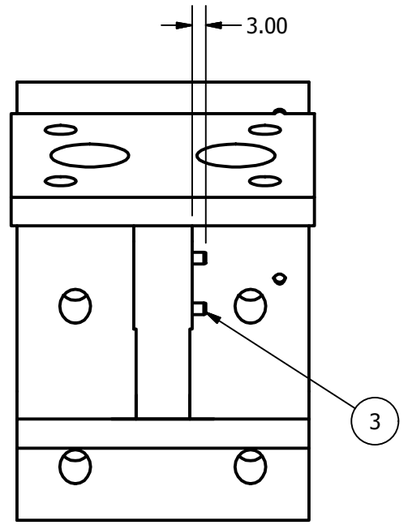
472-3720.ipt

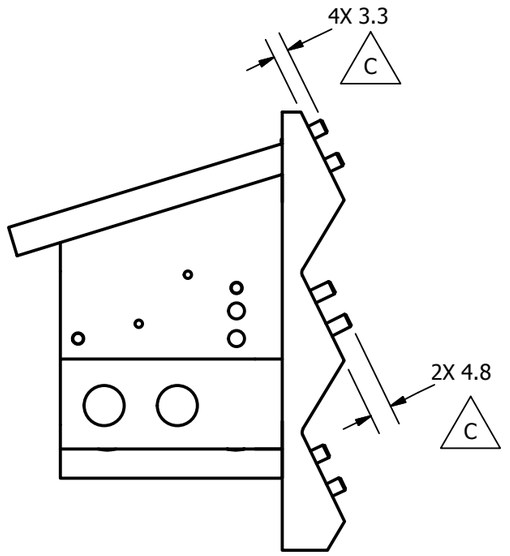
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM400 R3 AND CONVERTED TO METRIC FOR THOR-M	9/28/2011	BK
	B	ADDED COUNTERSINK TO HOLES IN ITEM #1 PART #472-3660; QTY. OF ITEM #2 PART #5000284 WAS 6; REVISED COUNTERSINK HOLES IN ITEM #1 PART #472-3660 – LOWER THORACIC SPINE WELDED ASSEMBLY	6/10/2015	DW
	C	REVISED ITEM #1 472-3660 - LOWER THORACIC SPINE WELDED ASSEMBLY; ADDED ITEM #3 5000869 - PIN, DOWEL M2.5 X 8 LG.; ADDED DIM, 4X 3.3 AND 2X 4.8	2/1/2017	DW



SCALE 1.000







ITEM	QTY	PART NUMBER	DESCRIPTION
3	2	5000869	PIN, DOWEL M2.5 X 8 LG.
2	6	5000284	PIN, DOWEL M3 x 10 LG.
1	1	472-3660	LOWER THORACIC SPINE WELDED ASSEMBLY

C

PARTS LIST

472-3600	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5° 1.6
X.X ± 0.2
X.XX ± 0.1
X.XXX ± 0.01
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:

MATERIAL:

HEAT TREAT:

FINISH:

DRAWN BY: B. KIMES DATE: 9/28/2011

CHECKED BY: DATE:

ENGINEER: J. WANG DATE: 1/16/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: LOWER THORACIC SPINE ASSEMBLY

SIZE: A3 SHEET 1 OF 1

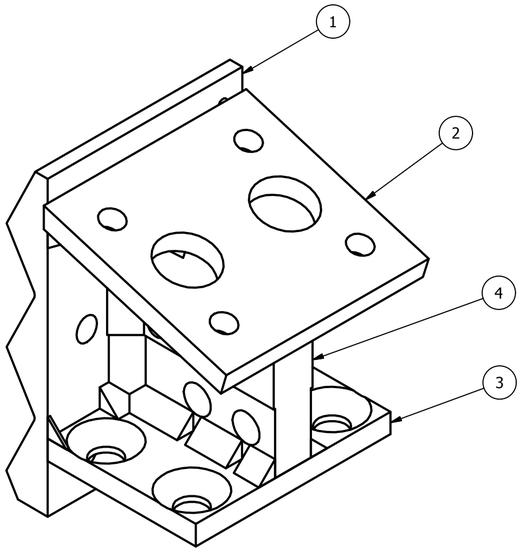
SCALE: .750

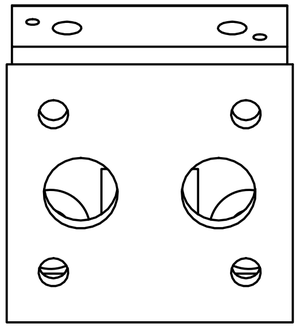
DRAWING NO.: 472-3650

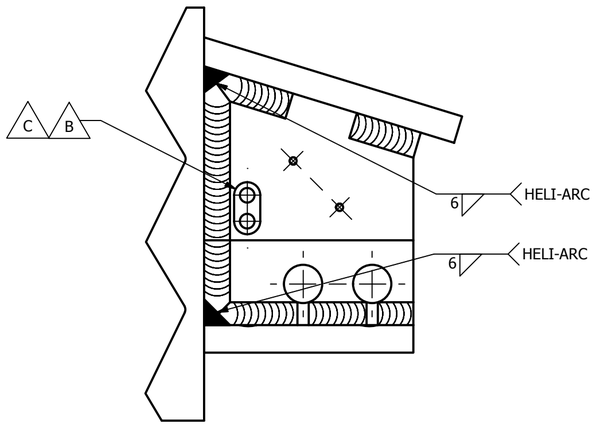
REV: C

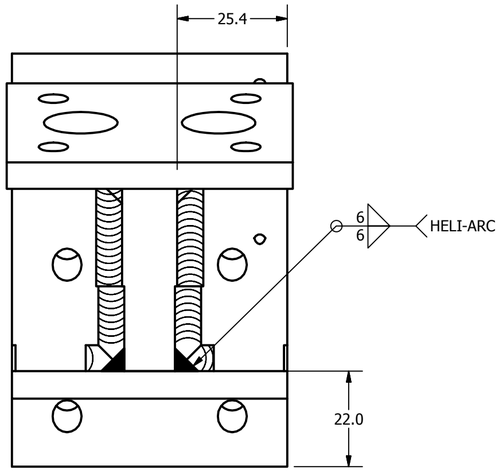
472-3650.iam

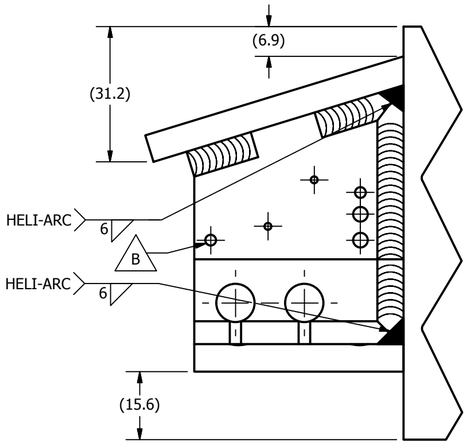
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPW400 R7 AND CONVERTED TO METRIC FOR THOR-M	9/20/2011	BK
	B	ADDED COUNTERSINK TO HOLES IN LEFT SIDE VIEW AND HOLE IN RIGHT SIDE VIEW IN ITEM #4 PART #472-3662 - CENTRAL PLATE, LOWER THORACIC SPIN	6/9/2015	DW
	C	REVISED COUNTERSINK HOLES IN ITEM #4 PART #472-3662 – CENTRAL PLATE, LOWER THORACIC SPINE	6/10/2015	DW
	D	REVISED ITEM #4 – 472-3662; ADDED NOTE #5	2/1/2017	DW











NOTES:

1. BEFORE PLATING, CHECK FIT WITH 472-4611 .
2. POWDER OR BEAD BLAST.
3. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER WELDING.
4. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.
5. ASSEMBLY CAN BE MACHINED FROM ONE PIECE, REFERENCE 472-3660M - OPTIONAL LOWER THORACIC SPINE BOX MACHINING.

ITEM	QTY	PART NUMBER	DESCRIPTION
4	1	472-3662	CENTRAL PLATE, LOWER THORACIC SPINE
3	1	472-3663	LOWER THORACIC SPINE BOTTOM PLATE
2	1	472-3661	TOP PLATE, LOWER THORACIC SPINE
1	1	472-3664	RIB MOUNTING PLATE, LOWER THORACIC SPINE

PARTS LIST

472-3650	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01. ANGLES ± 0.5. FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:

MATERIAL: Welded Steel Mild

HEAT TREAT:

FINISH: SEE NOTES

DRAWN BY: B. KIMES — DATE: 9/20/2011

CHECKED BY: — DATE:

ENGINEER: J. WANG — DATE: 1/16/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

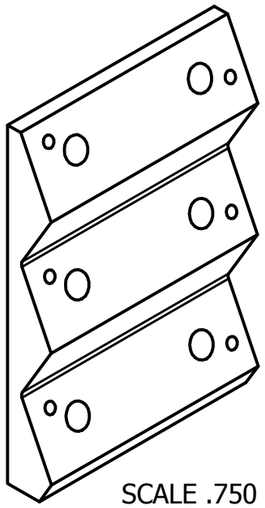
DESCRIPTION: LOWER THORACIC SPINE WELDED ASSEMBLY

SIZE: A2 — SHEET 1 OF 1 — SCALE: 1.000

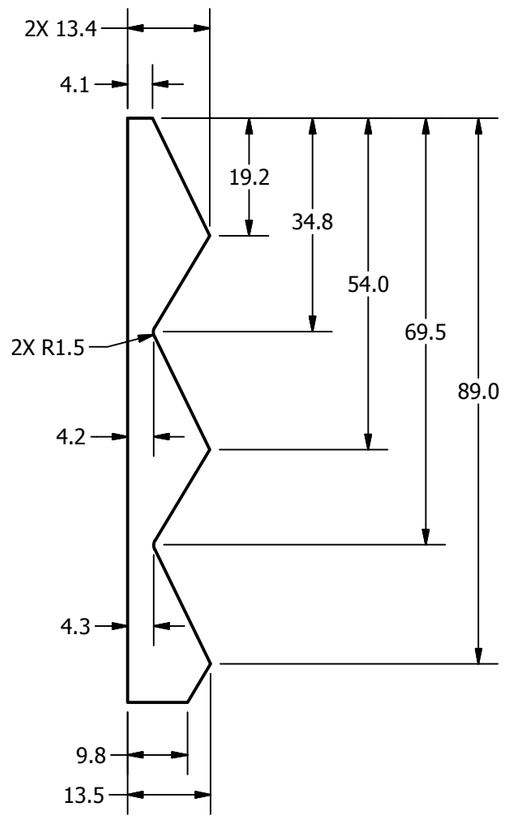
DRAWING NO.: 472-3660 — REV: D

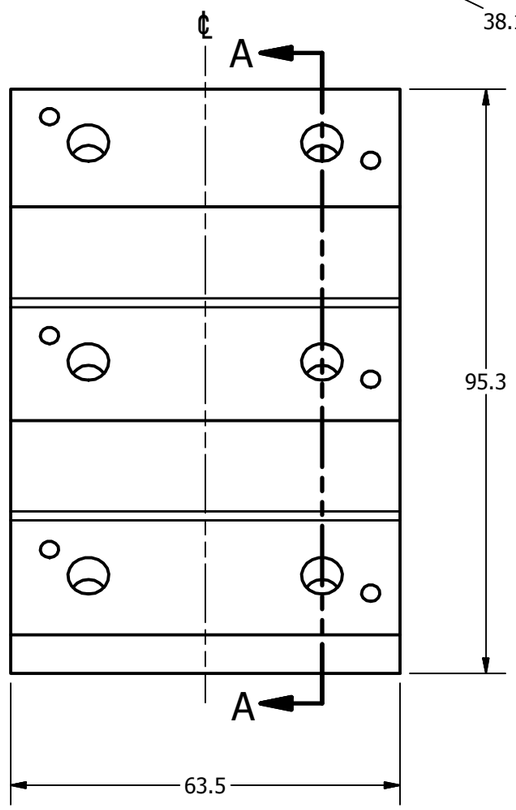
472-3660.iam

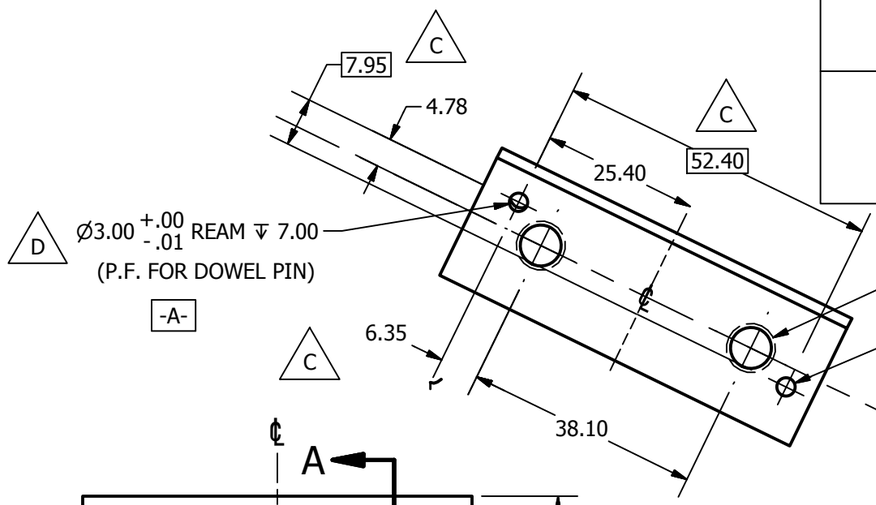
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM410 R04 AND CONVERTED TO METRIC FOR THOR-M	9/19/2011	BK
	B	-.013 WAS .013 (TYPO)	6/15/2012	BK
	C	ADD DATUMS A, B, C, D, BASIC DIMENSIONS, AND POSITIONAL TOLERANCING; DIMENSION HOLES FROM DATUM A; 11.53, 43.76, 75.16 WAS 11.5, 43.8, 75.2	10/3/2012	BK
	D	HOLE DIM. Ø3.00 +.00/-.01 REAM ↧7.00 (P.F. FOR DOWEL PIN) WAS Ø 3.000 +.00/-.013 THRU; HOLE DIM. 2X Ø6.80 +0.15/-0.03 THRU M8x1.5 THRU WAS 2X M8x1.25 THRU	2/1/2017	DW

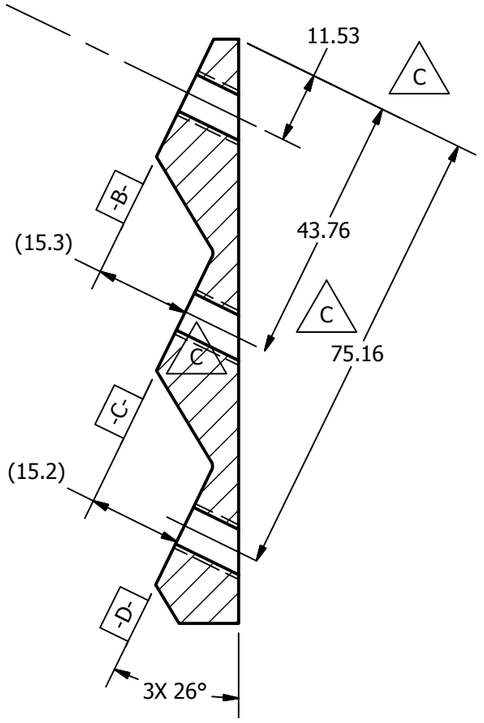


SCALE .750









SECTION A-A
SCALE 1.000

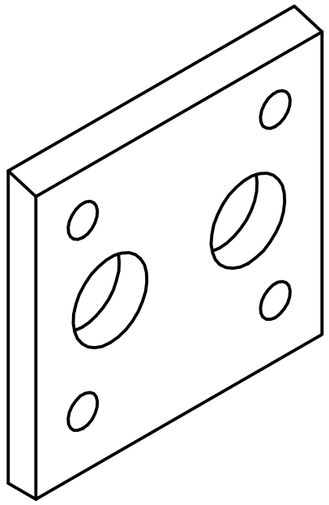
NOTES:

DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

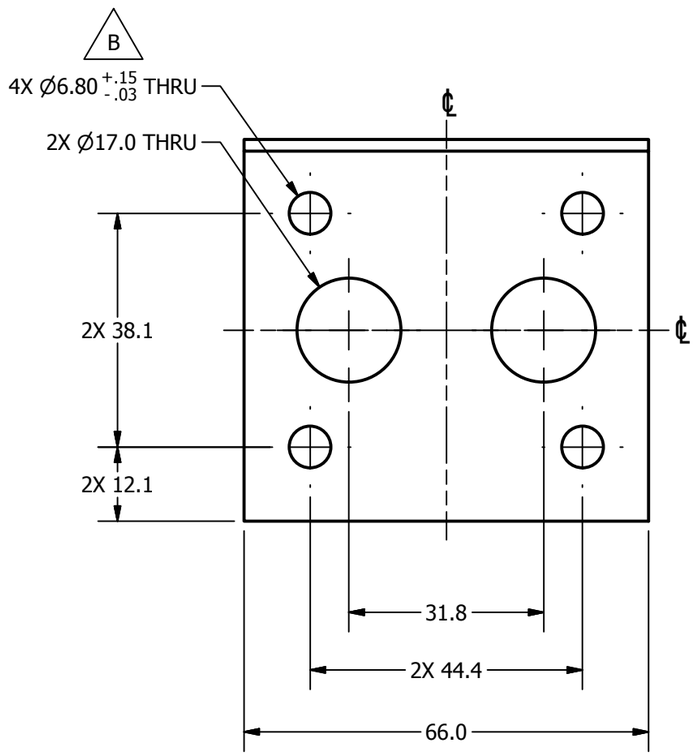
		DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5'; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
		PROJECT NO.:		DESCRIPTION: RIB MOUNTING PLATE, LOWER THORACIC SPINE
472-3660	1	MATERIAL: 1018 STEEL	DRAWN BY: B. KIMES	DATE: 9/19/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/16/2012
			SIZE: A3	SHEET: 1 OF 1
			SCALE: 1.000	DRAWING NO.: 472-3664
				REV: D

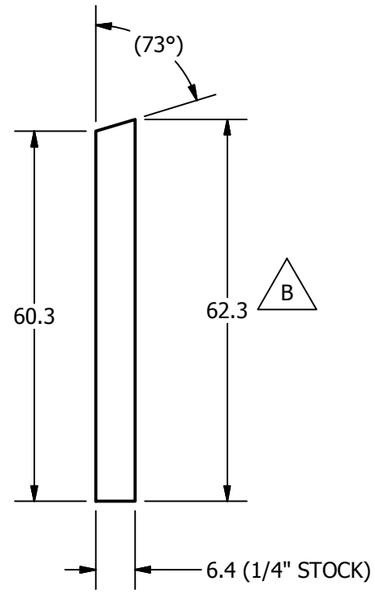
472-3664.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM411 R1 AND CONVERTED TO METRIC FOR THOR-M	9/19/2011	BK
	B	DIM. 62.3 WAS 62.2; HOLE DIM. 4X Ø6.80 +0.15/-0.03 THRU WAS 4X Ø6.4 THRU	2/1/2017	DW



SCALE 1.000





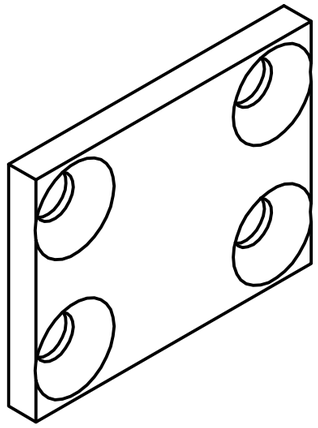
NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

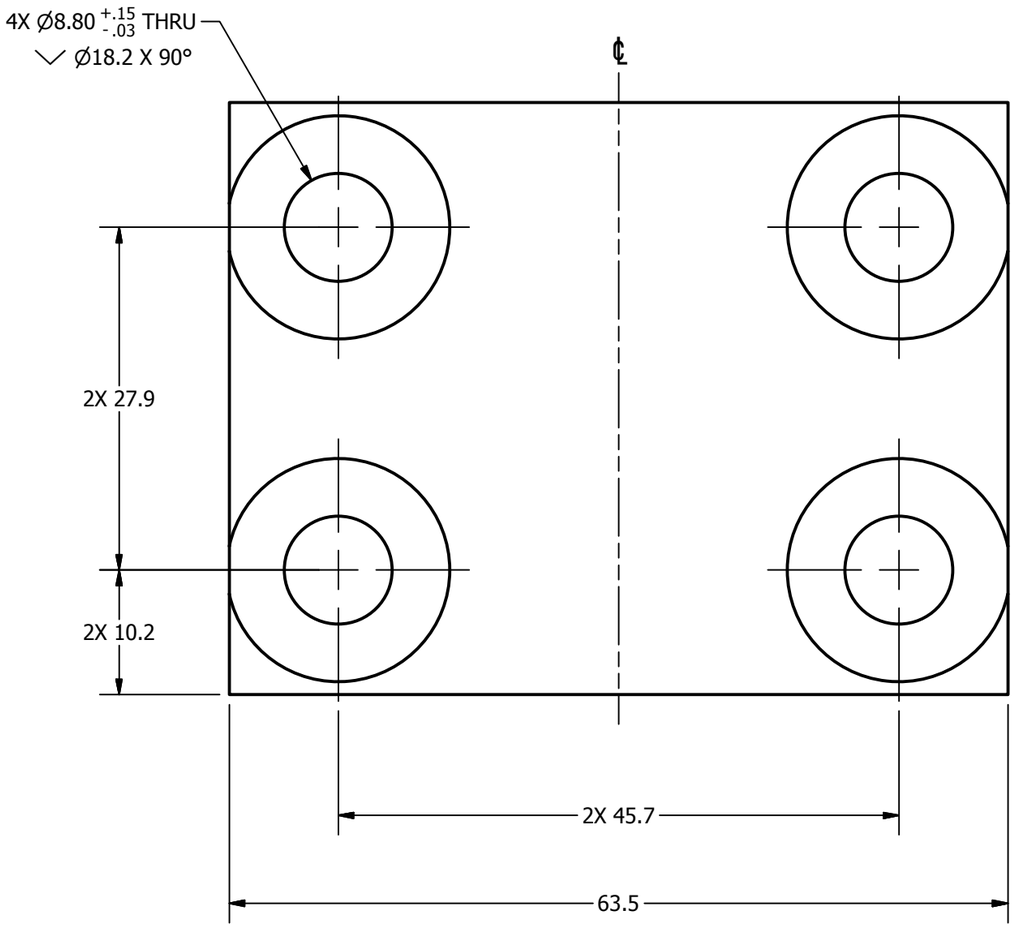
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.: THOR-NT		DESCRIPTION: TOP PLATE, LOWER THORACIC SPINE	
472-3660	1	MATERIAL: 1018 STEEL	DRAWN BY: B. KIMES DATE: 9/19/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET 1 OF 1	DRAWING NO.: 472-3661 REV: B
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG DATE: 1/16/2012	SCALE: 1.000	

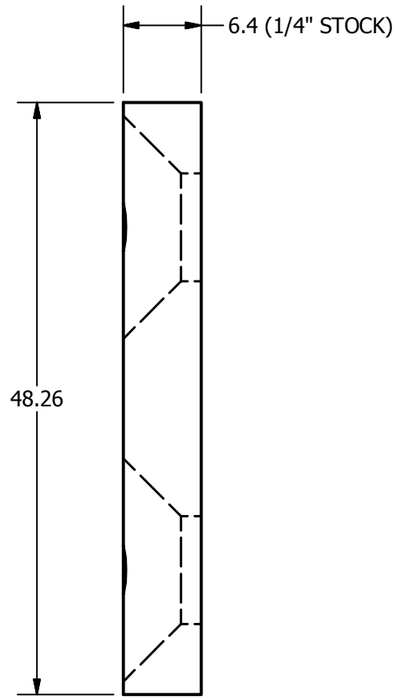
472-3661.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM413 R01 AND CONVERTED TO METRIC FOR THOR-M	9/19/2011	BK
	B	HOLE DIM. 4X Ø8.80 +.15/-.03 THRU C'SINK Ø18.2 X 90° WAS 4X Ø8.4 THRU C'SINK Ø16.5 X 90°	2/1/2017	DW



SCALE 1.000





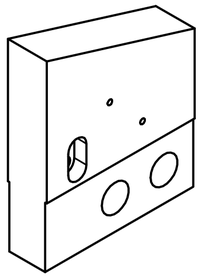
NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

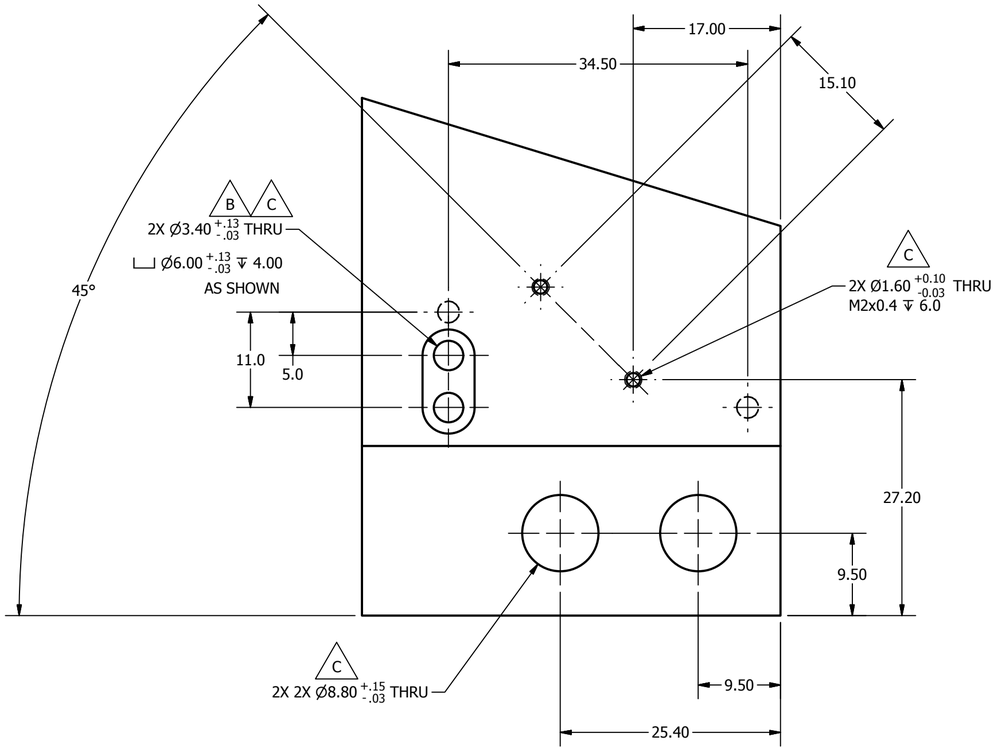
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ± 0.5 ± 0.5° 1.6 X.X ± 0.2 X.XX ± 0.1 X.XXX ± 0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
		PROJECT NO.: THOR-NT		DESCRIPTION: LOWER THORACIC SPINE BOTTOM PLATE
472-3660	1	MATERIAL: 1018 STEEL	DRAWN BY: B. KIMES DATE: 9/19/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-3663 REV: B
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG DATE: 1/16/2012	SCALE: 2.000

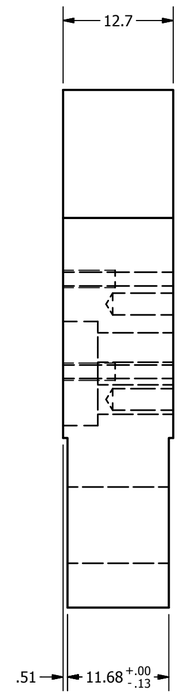
472-3663.ipt

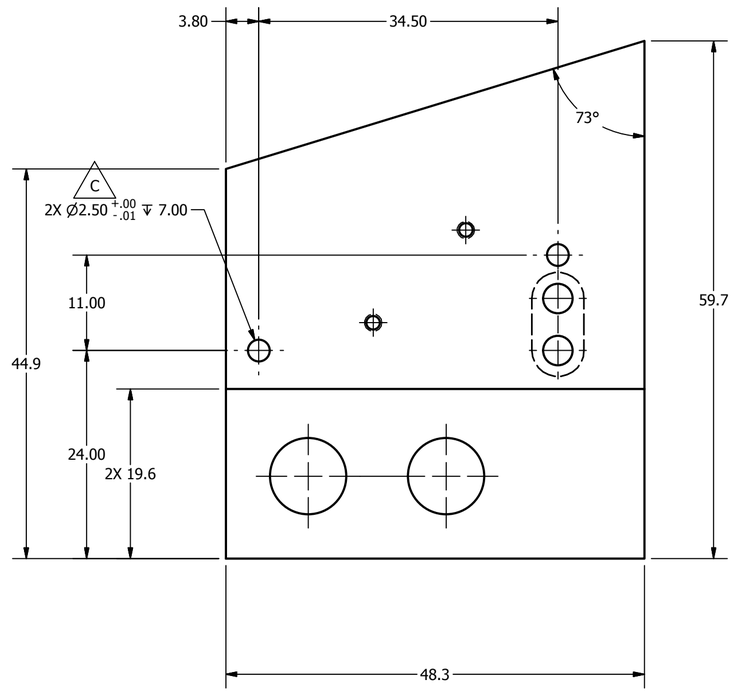
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM413 R01 AND CONVERTED TO METRIC FOR THOR-M	9/19/2011	BK
	B	HOLE NOTE Ø3.3 THRU CUTOUT AS SHOWN ↧4.0 ⌵ Ø6.0 x 90˚ WAS Ø3.3 THRU CUTOUT AS SHOWN ↧4.0; ADDED HOLE - Ø3.000 +.000/-.013 ↧ 7.5 ; HOLE NOTE Ø3.2 THRU ⌵ Ø6.3 X 90˚ WAS Ø3.0 THRU CUTOUT AS SHOWN ↧4.0 ⌵ Ø6.3 X 90˚	6/10/2015	DW
	C	RE-DIMENSIONED; HOLE DIM. 2X Ø3.40 +.13/-.03 THRU C'BORE Ø6.0 +.13/-.03 ↧4.00 WAS Ø3.2 THRU C'SINK Ø6.3 X 90˚, 2X Ø1.60 +0.10/-0.03 THRU M2x04 ↧ 6.0 WAS 2X DRILL THRU AND TAP M2x0.4 ↧ 6.0, 2X Ø2.50 +.00/-.01 ↧ 7.0 WAS Ø3.000 +.000/-.013 ↧ 7.50, AND 2X Ø8.80 +.15/-.03 THRU WAS 2X Ø8.3 THRU	2/1/2017	DW



SCALE 1.000

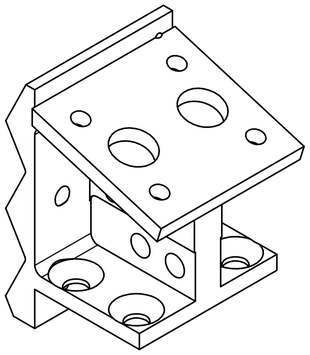


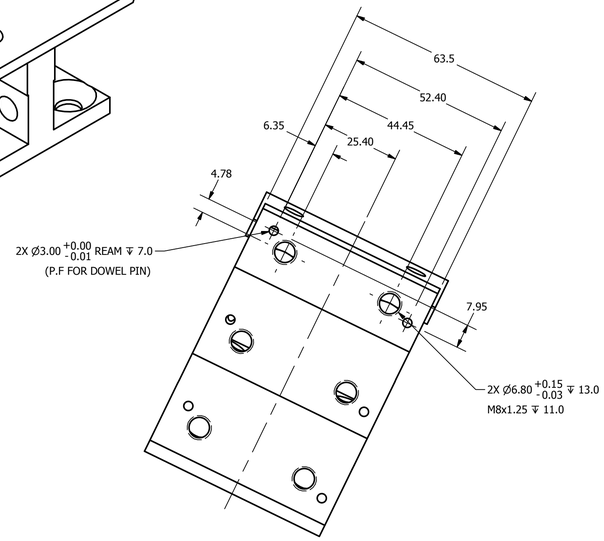


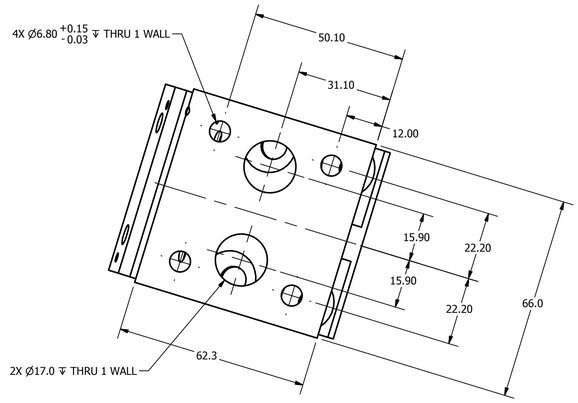


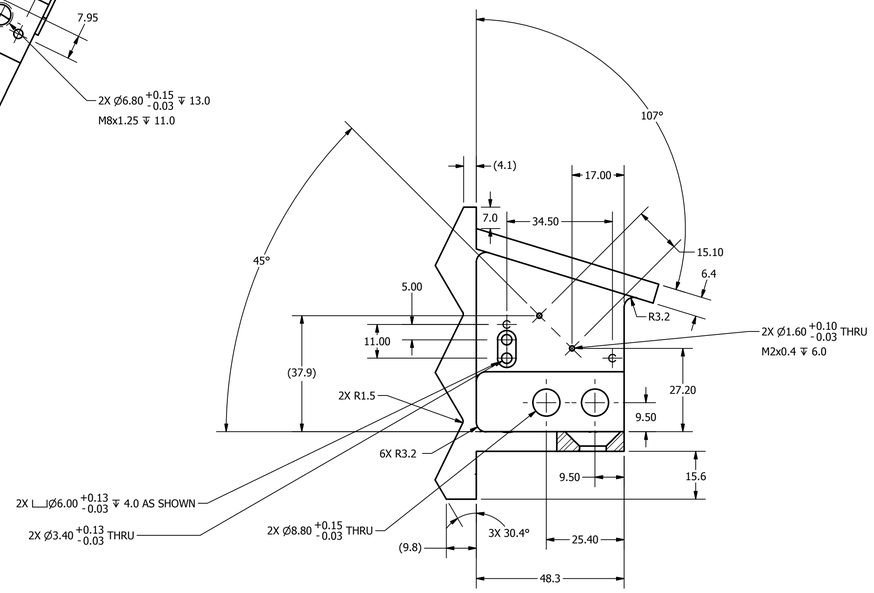
		PROJECT NO.:	DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
			THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ± 0.5 X.X ± 0.2 X.XX ± 0.1 X.XXX ± 0.01 ANGLES ± 0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: CENTRAL PLATE, LOWER THORACIC SPINE
472-3660	1	MATERIAL: 1018 STEEL		DRAWN BY: B. KIMES	DATE: 9/19/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:		CHECKED BY:	DATE:
TOTAL QTY IN DUMMY	1	FINISH:		ENGINEER: J. WANG	DATE: 1/16/2012
				SIZE: A2	SHEET 1 OF 1
				SCALE: 2.000	DRAWING NO.: 472-3662
					REV: C

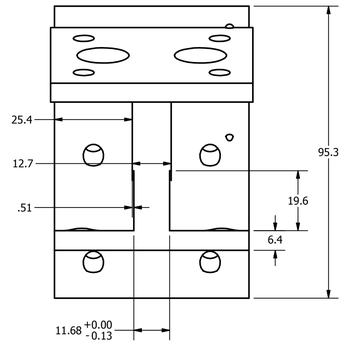
472-3662.ipt

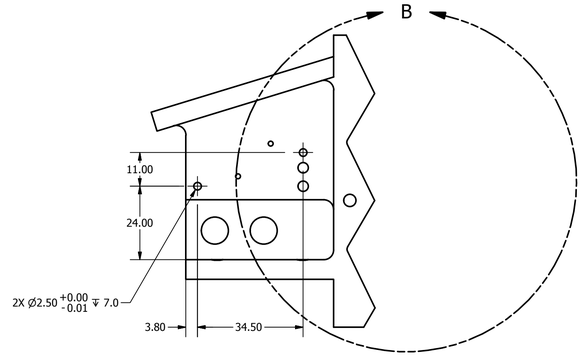


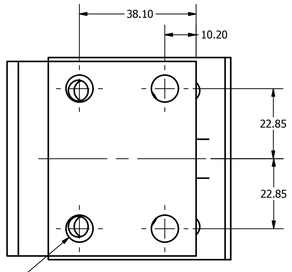


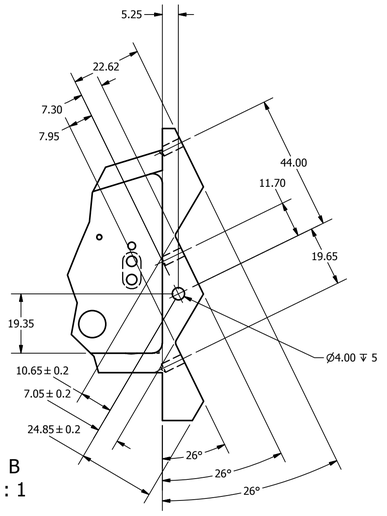












DETAIL B
SCALE 1 : 1

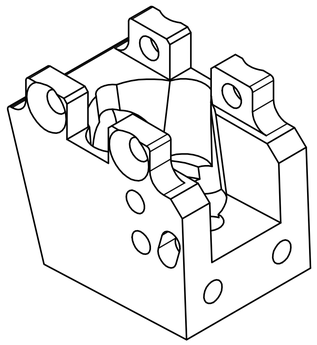
NOTES:

1. POWDER OR BEAD BLAST.
2. NICKEL PLATE 0.003mm - 0.008mm MAX.
3. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

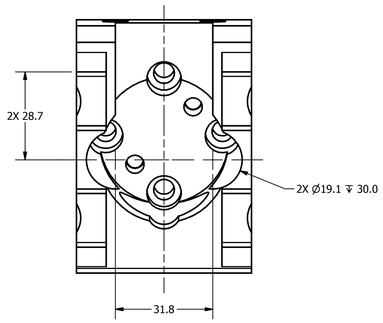
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED ANGLES ±.5°; ASME Y14.5M - 1994; **DO NOT SCALE DRAWING**	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	OPTIONAL LOWER THORACIC SPINEBOX MACHINING THOR-50M
	DRAWN Dave Walker	2/1/2017	
MATERIAL 1018 STEEL	CHECKED		
HEAT TREAT N/A	ENG		SIZE A1 · DRAWING NUMBER 472-3660M · REV
FINISH SEE NOTES	APPROVED		THIRD ANGLE PROJECTION · SCALE: 1 : 1 · SHEET 1 OF 1

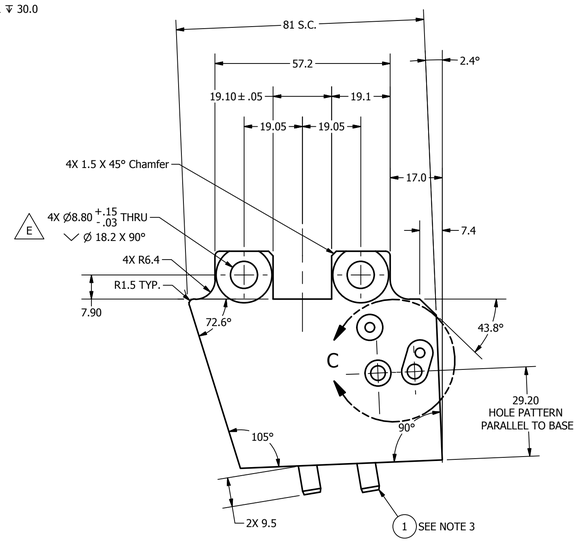
472-3660M.ipt

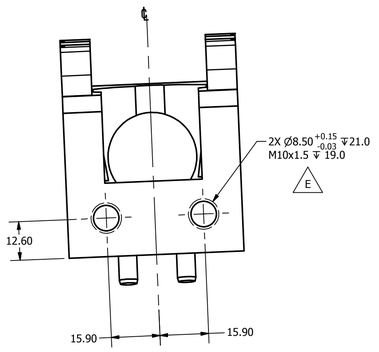
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM805 R0 AND CONVERTED TO METRIC FOR THOR-M, REDESIGNED TILT SENSOR ORIENTATION; 2X 19.1 DIA 30 DEEP WAS 2X R11.01 19 DEEP; 24.3 WAS 27.3	9/16/2011	BK
	B	24.3 WAS 27.3; 31.8, (31.8) WAS 30.3, (30.3)	2/14/2012	BK
	C	HOLE NOTE 2X Ø4.3 THRU ⌴Ø8.0 ↧4.0 ◡Ø8.2 x 90° WAS 2X Ø4.3 THRU ⌴Ø8.00 ↧8.0	6/9/2015	DW
	D	HOLE NOTE 2X Ø4.3 THRU ◡Ø9.2 x 90˚ WAS Ø4.3 THRU⌴Ø8.0 ↧4.0 ◡Ø8.2 x 90˚	6/9/2015	DW
	E	RE-DIMENSIONED; HOLE DIM. Ø6.8 +.15/-.03 THRUC'BORE Ø11.25 +.15/-.03 ↧AS SHOWN IN SECTION B-B WAS Ø6.80 THRU C'BORE Ø11.25 ↧46.00; 4X Ø8.80 +.15/-.03 THRU C'SINK Ø18.2 X 90˚ WAS 4X Ø8.8THRU C'SINK Ø18.2 X 90˚; 2X Ø8.50 +0.15/-0.03 ↧21.0 M10x1.5 ↧19.0; ADDED DOWEL PIN HOLES AND DETAIL C	2/2/2017	DW

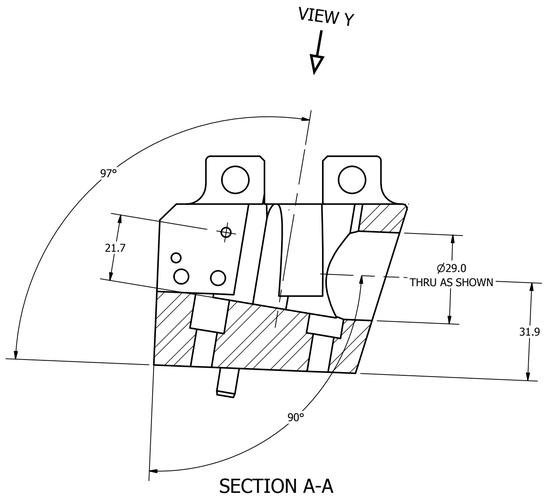


SCALE 1.000

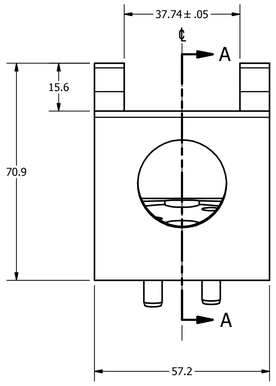


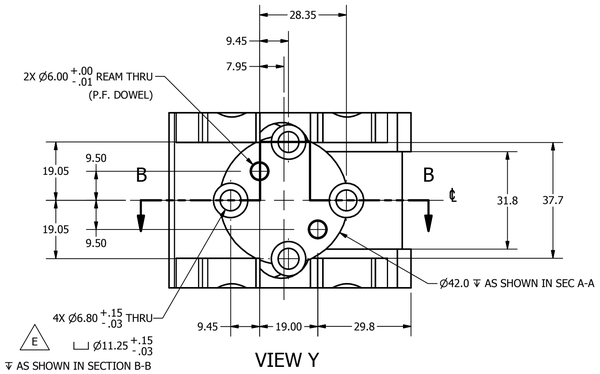




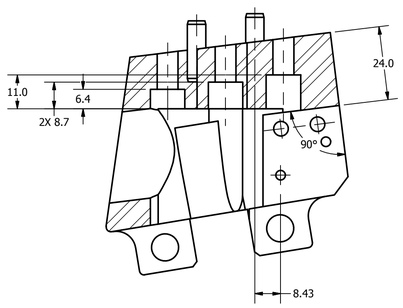


SECTION A-A
SCALE 1.000

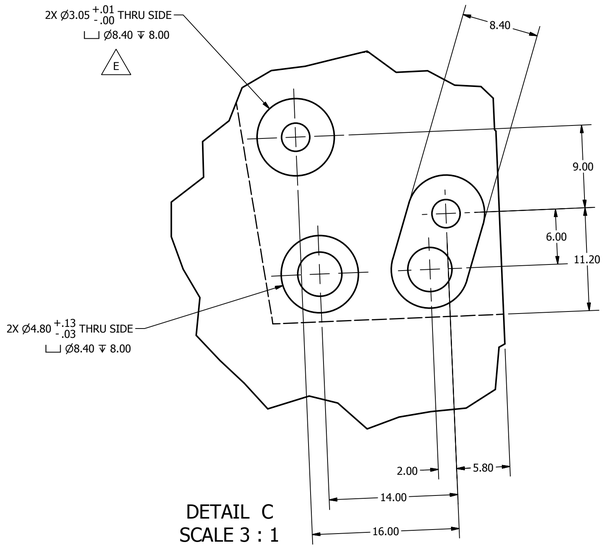




VIEW Y



SECTION B-B
SCALE 1.000



DETAIL C
SCALE 3 : 1

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. POWDER OR BEAD BLAST.
3. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.
4. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.
5. INSTALL DOWEL PINS AFTER PLATING.

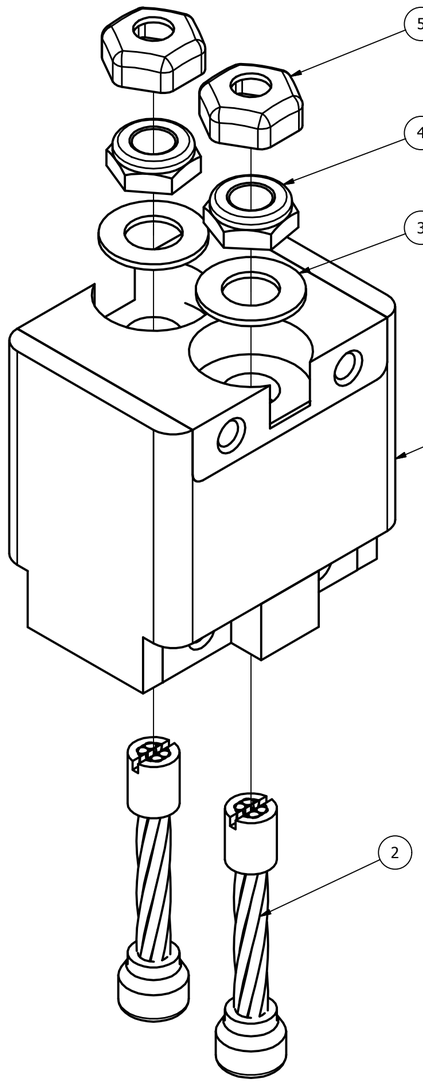
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	5001218	PIN, DOWEL M6 x 20

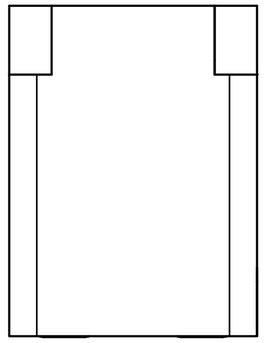
PARTS LIST

DO NOT SCALE DRAWING	TOLERANCES UNLESS OTHERWISE SPECIFIED: DECIMAL ANGLES FINISH X ±0.5 ±0.5 125 .XX ±0.1 .XXX ±0.1 .XXXX ±0.01	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION	REMOVE BURRS & BREAK SHARP EDGES		
PROJECT NO. THOR-50M		DRAWING TITLE: PELVIS/LUMBAR MOUNTING BLOCK ASSEMBLY THOR-50M	
472-3600 / 1 / MATERIAL: 1018 STEEL	DRAWN: B. KIMES 9/16/2011		
NEXT ASSEMBLY / QTY / HEAT TREAT:	CHECKED BY: / DATE:	SIZE: A1 / SHEET: 1 OF 1	DRAWING NO.: 472-3760 / REV: E
TOTAL QTY IN DUMMY / 1 / FINISH: SEE NOTES	ENGINEER: J. WANG / DATE: 1/17/2012	SCALE:	

472-3760.idw

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RELEASE TO PRODUCTION	10/25/2011	BK
	B	9003938 1/2 SAE FLAT WASHER TYPE-B ZINC WAS 9000135 WASHER FLAT 1/2 PTFE	2/2/2017	DW





ITEM	QTY	PART NUMBER	DESCRIPTION
5	2	472-3647	M12 VINYL NUT COVER
4	2	472-3747	M12x1.75 LOCKNUT, MODIFIED
3	2	9003938	1/2 SAE FLAT WASHER TYPE-B ZINC
2	2	472-3745	LUMBAR SPINE FLEX JOINT CABLE ASSEMBLY
1	1	472-3740	LUMBAR SPINE FLEX JOINT MOLDED ASSEMBLY

B

PARTS LIST

472-3600	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01
ANGLES ± 0.5
FINISH 1.6

REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.: THOR-50M
MATERIAL:
HEAT TREAT:
FINISH:
DRAWN BY: B. KIMES — DATE: 10/25/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/17/2012

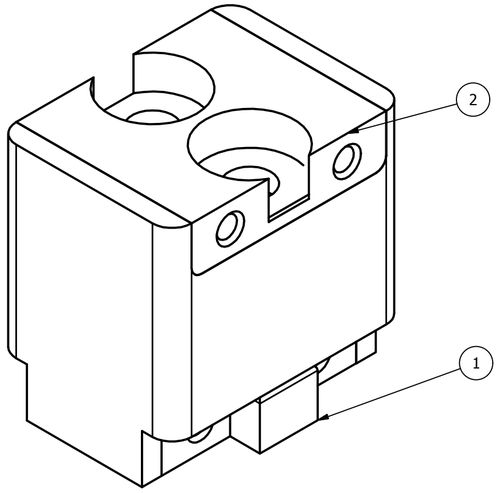
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: LUMBAR SPINE FLEX JOINT ASSEMBLY THOR-50M

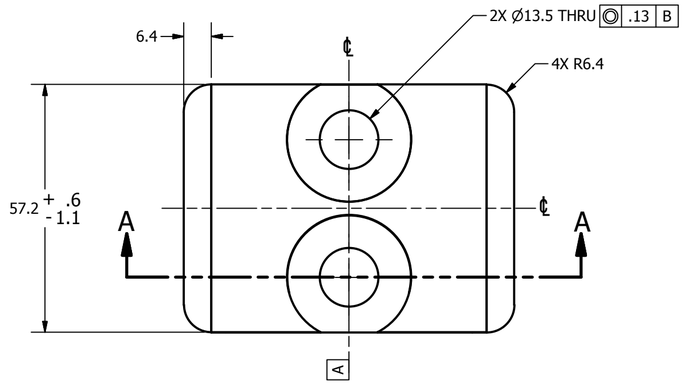
SIZE: A2 | SHEET 1 OF 1 | SCALE: 1.000 | DRAWING NO.: 472-3746 | REV: B

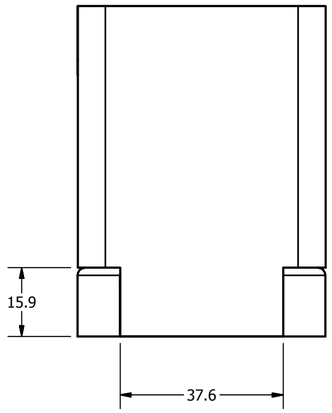
472-3746.iam

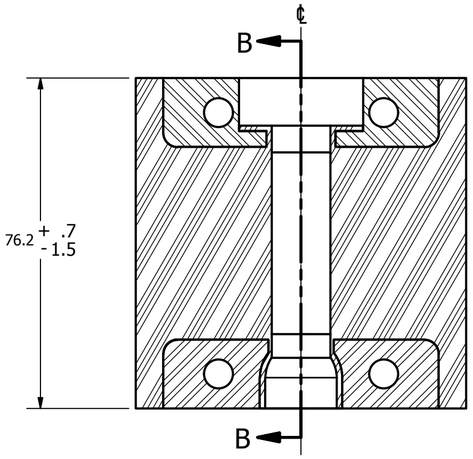
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM710 RB0 AND CONVERTED TO METRIC FOR THOR-M	9/20/2011	BK
	B	ADDED NOTE #3	2/23/2017	DW



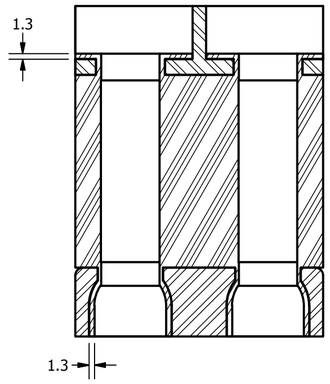
SCALE 1.000



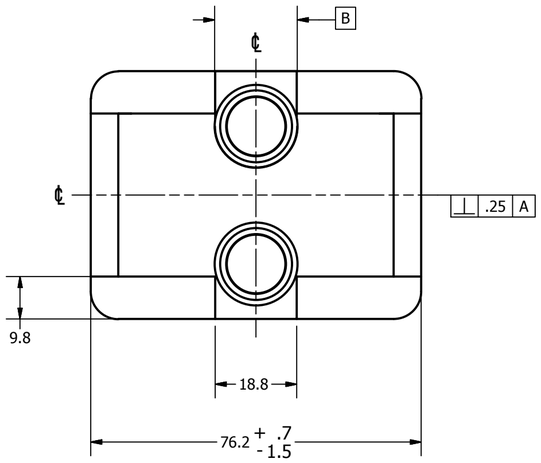




SECTION A-A
SCALE 1.000



SECTION B-B
SCALE 1.000



NOTES:

1. DIMENSIONS REPRESENT PART SIZE AFTER MOLDING.
2. RUBBER TOLERANCE ±0.5, UNLESS OTHERWISE SPECIFIED.
3. PERFORMANCE SPEC TAKES PRECEDENCE OVER DUROMETER.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-3741	LUMBAR SPINE FLEX JOINT TOP PLATE
1	1	472-3742	LUMBAR SPINE FLEX JOINT BOTTOM PLATE

PARTS LIST

472-3746	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:

MATERIAL: BUTYL RUBBER SHORE A 75±2

HEAT TREAT:

FINISH:

DRAWN BY: B. KIMES — DATE: 9/20/2011

CHECKED BY: — DATE:

ENGINEER: J. WANG — DATE: 1/16/2012

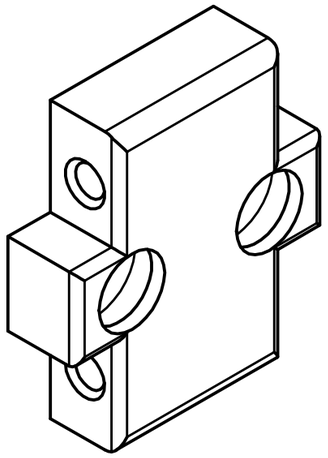
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: LUMBAR SPINE FLEX JOINT MOLDED ASSEMBLY

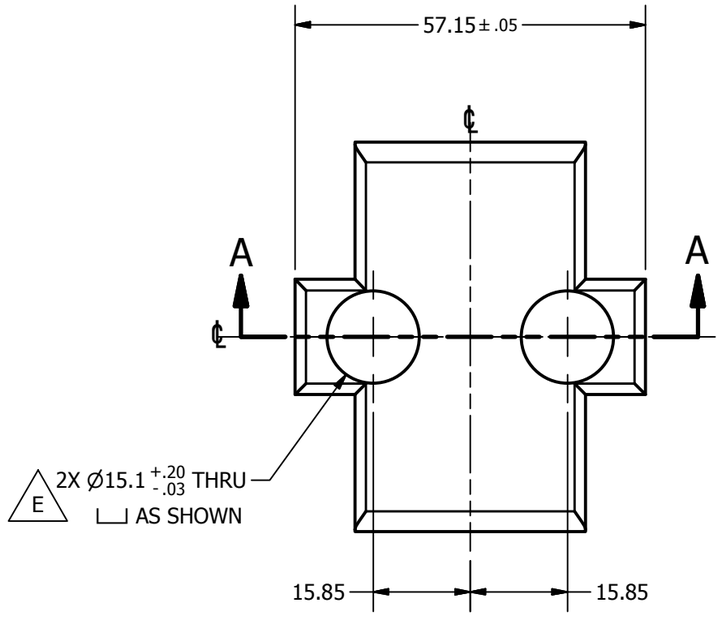
SIZE: A2 — SHEET 1 OF 1 — SCALE: 1.000 — DRAWING NO.: 472-3740 — REV: B

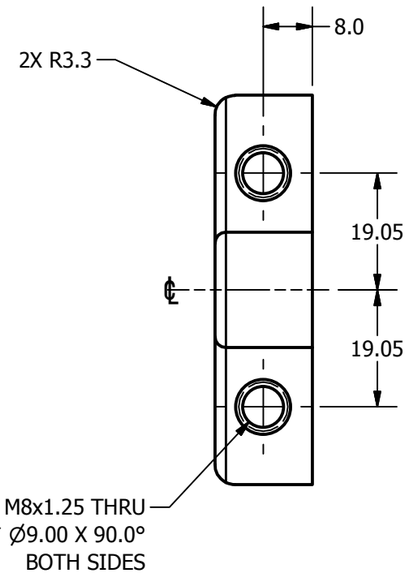
472-3740.iam

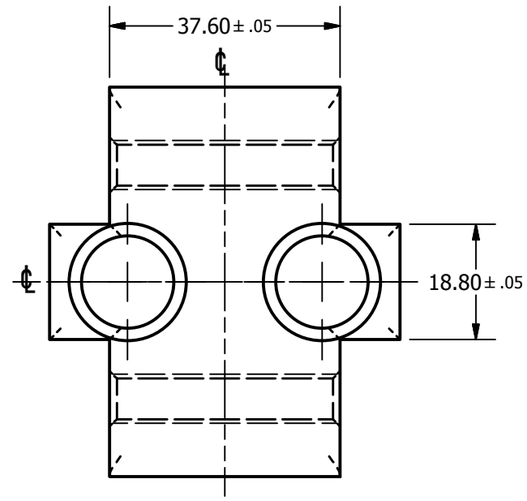
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM712 RB0 AND CONVERTED TO METRIC FOR THOR-M	9/20/2011	BK
	B	2X M8 x 1.25 HOLES WERE Ø6.6	6/15/2012	BK
	C	CHANGED NICKEL PLATE TO SATIN FLASH CHROME	7/23/2012	CEF
	D	FINISH .008mm MAX. WAS .0003 MAX.	11/9/2012	BK
	E	RE-DIMENSIONED; HOLE DIM. 2X Ø15.1 +0.20/-0.03 THRU C'BORE AS SHOWN WAS 2X Ø15.1 THRU C'BORE AS SHOWN; DIM. 2X SØ19.05 +0.20/-0.03 WAS 2X SØ19.05; AND ADDED R1.8 ±0.25 TYP. AROUND TOP SURFACE UNLESS NOTED OTHERWISE	2/2/2017	DW

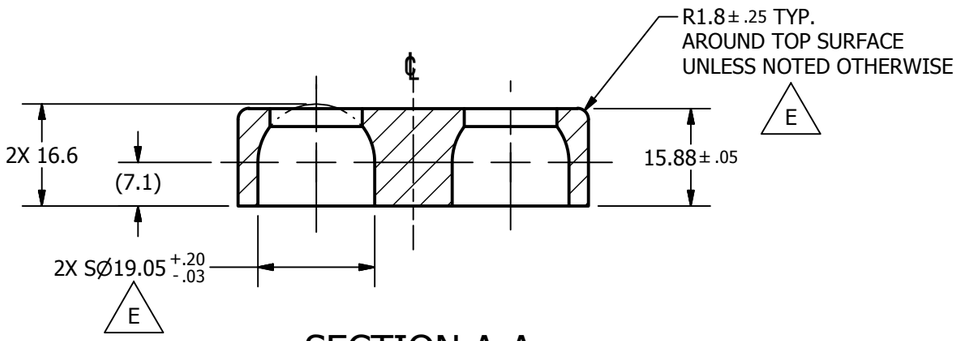


SCALE 1.000









SECTION A-A
SCALE 1.000

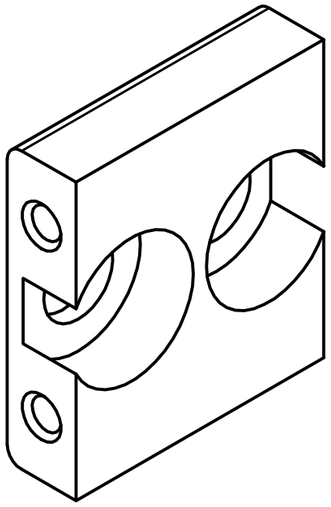
NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. POWDER OR BEAD BLAST.
3. SATIN FLASH CHROME PLATE 0.008mm MAX. AFTER MACHINING. (C) (D)
4. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

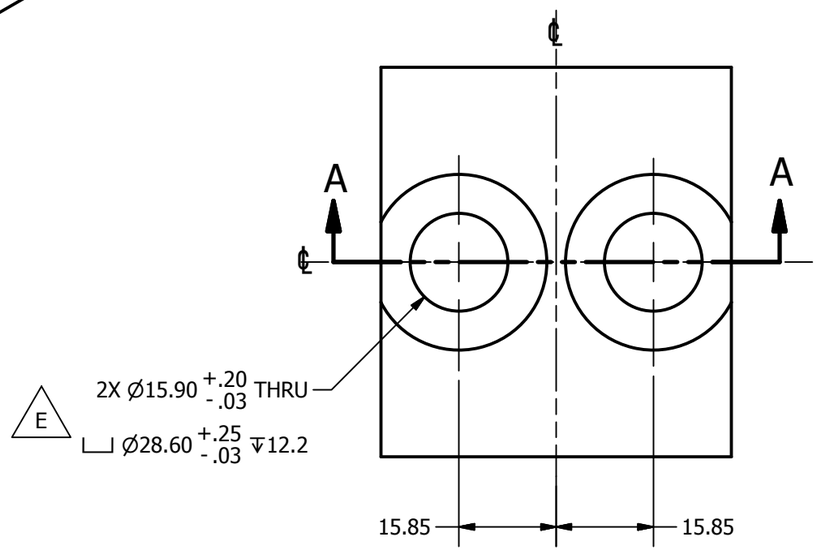
		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6		
		PROJECT NO.: THOR-50M	REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: LUMBAR SPINE FLEX JOINT BOTTOM PLATE	
472-3740	1	MATERIAL: 1018 STEEL	DRAWN BY: B. KIMES DATE: 9/20/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-3742 REV: E	
TOTAL QTY IN DUMMY	1	FINISH: SEE NOTES	ENGINEER: J. WANG DATE: 1/17/2012	SCALE: 1.000	

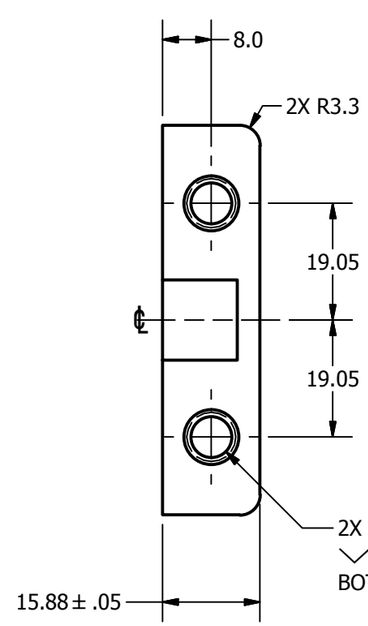
472-3742.ipt

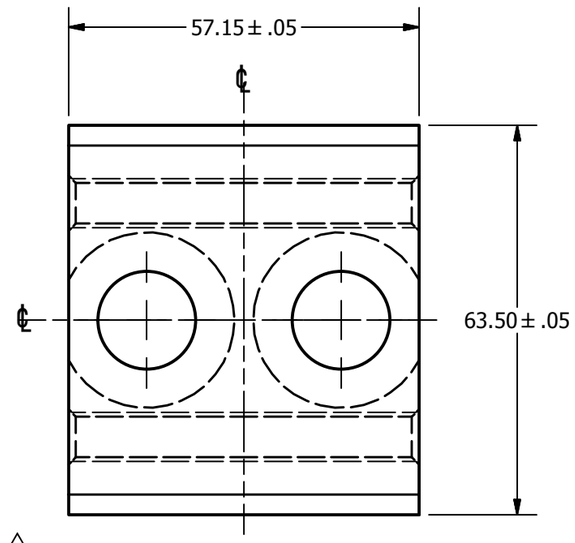
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM711 RB0 AND CONVERTED TO METRIC FOR THOR-M	9/20/2011	BK
	B	2X M8 x 1.25 HOLES WERE Ø6.6	6/15/2012	BK
	C	CHANGED NICKEL PLATE TO SATIN FLASH CHROME	7/23/2012	CEF
	D	FINISH .008mm MAX. WAS .0003 MAX.	11/9/2012	BK
	E	RE-DIMENSIONED; HOLE DIM. 2X Ø15.90 +0.20/-0.03 THRU C'BORE Ø28.60 +0.25/-0.03 ↧12.2 WAS 2X Ø15.9 THRU C'BORE Ø28.6 AS SHOWN	2/23/2017	DW

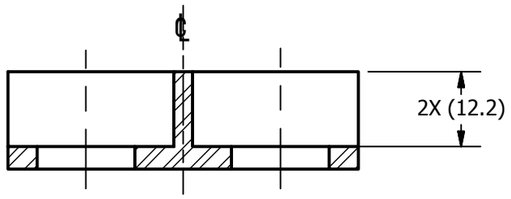


SCALE 1.000









SECTION A-A
SCALE 1.000

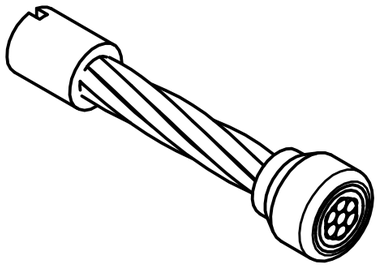
NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. POWDER OR BEAD BLAST.
3. SATIN FLASH CHROME PLATE 0.008mm MAX. AFTER MACHINING. (C) (D)
4. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

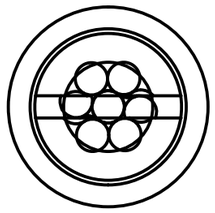
		PROJECT NO.:	DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5' FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
472-3740	1	MATERIAL: 1018 STEEL	DRAWN BY: B. KIMES	DATE: 9/20/2011	DESCRIPTION: LUMBAR SPINE FLEX JOINT TOP PLATE
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 / SHEET: 1 OF 1 / DRAWING NO.: 472-3741 / REV: E
TOTAL QTY IN DUMMY	1	FINISH: SEE NOTES	ENGINEER: J. WANG	DATE: 1/17/2012	SCALE: 1.000

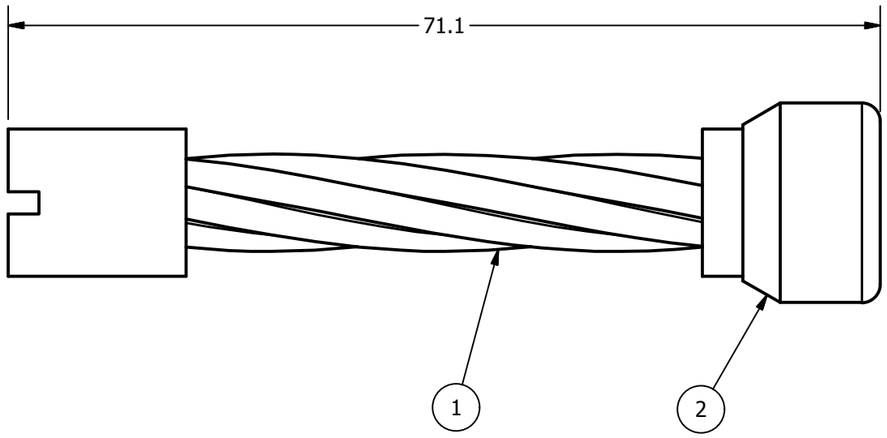
472-3741.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM720 R7 AND CONVERTED TO METRIC FOR THOR-M	10/25/2011	BK



SCALE 1.000





NOTES:

1. USE LOCTITE 271 OR EQUIVALANT TO LOCK 472-3743 IN PLACE AS SHOWN.
2. ONE SAMPLE FROM EACH ASSEMBLY BATCH NEEDS TO BE TESTED TO INSURE NO SLIPPAGE OF THE BALL OR THREADED SLEEVE ON THE CABLE SHALL OCCUR UNDER 1,700 LBS OF TENSILE LOAD.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-3743	THREADED BALL END
1	1	472-3744	LUMBAR SPINE FLEX JOINT CABLE

PARTS LIST

472-3746	2		
NEXT ASSEMBLY	QTY		
TOTAL QTY IN DUMMY	2		

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5°	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:		
MATERIAL:	DRAWN BY: B. KIMES	DATE: 10/25/2011
HEAT TREAT:	CHECKED BY:	DATE:
FINISH:	ENGINEER: J. WANG	DATE: 1/17/2012

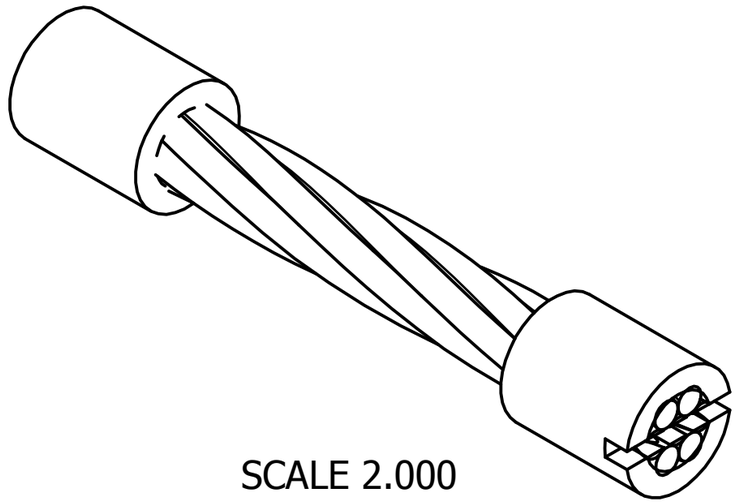
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: LUMBAR SPINE FLEX JOINT CABLE ASSEMBLY

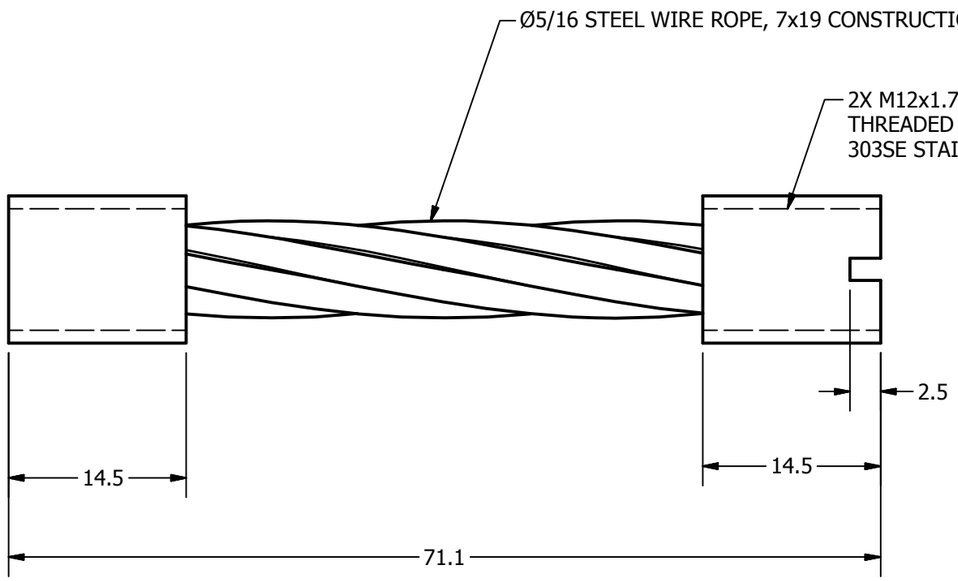
SIZE:	SHEET	DRAWING NO.:	REV:
A3	1 OF 1	472-3745	A

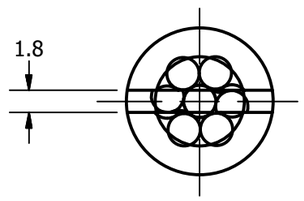
SCALE: 2.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM721 R2 AND CONVERTED TO METRIC FOR THOR-M	10/25/2011	BK



SCALE 2.000





NOTES:

1. DIMENSIONS SHOWN ARE FINAL DIMENSIONS AFTER SWAGING.

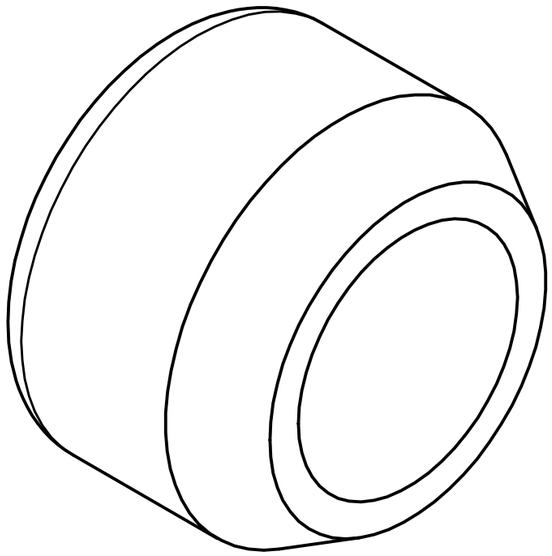
		PROJECT NO.:	DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ± 0.5 ± 0.5° 1.6 X.X ± 0.2 X.XX ± 0.1 X.XXX ± 0.01 REMOVE BURRS & BREAK SHARP EDGES
472-3745	1	MATERIAL:	DRAWN BY: B. KIMES	DATE: 10/25/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/17/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

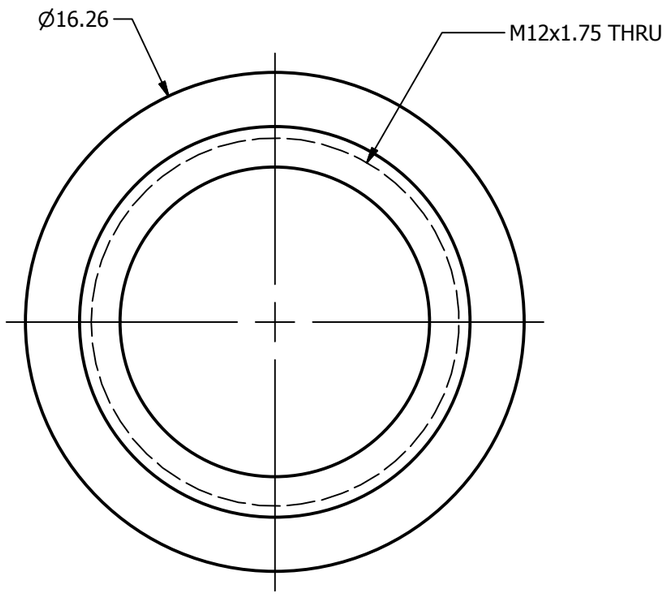
DESCRIPTION: LUMBAR SPINE FLEX JOINT CABLE

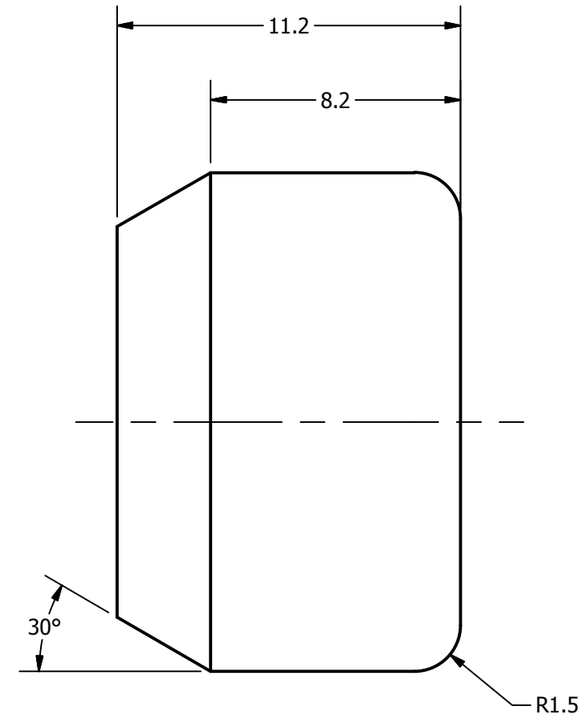
SIZE:	SHEET	DRAWING NO.:	REV:
A3	1 OF 1	472-3744	A
SCALE: 2.000			

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM321 R9 AND CONVERTED TO METRIC FOR THOR-M	10/25/2011	BK



SCALE 5.000





472-3745	1	PROJECT NO.:		
472-3645	1	MATERIAL: 304 STAINLESS STEEL	DRAWN BY: B. KIMES	DATE: 10/25/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/17/2012

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5'	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

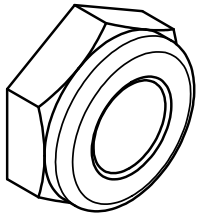
REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

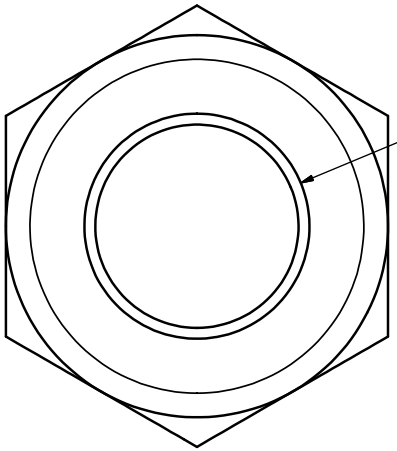
DESCRIPTION: THREADED BALL END

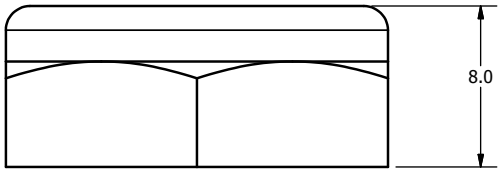
SIZE:	SHEET	DRAWING NO.:	REV:
A3	1 OF 1	472-3743	A
SCALE: 5.000			

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RELEASE TO PRODUCTION	10/25/2011	BK



SCALE 2.000





NOTES:

1. MAKE FROM 5000462 (M12x1.75 HEX HEAD LOCKNUT), MODIFY AS SHOWN.

472-3746	2		
472-3646	2		
NEXT ASSEMBLY	QTY		
TOTAL QTY IN DUMMY	4		

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

PROJECT NO.:

MATERIAL:

HEAT TREAT:

FINISH:

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5°	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

REMOVE BURRS & BREAK SHARP EDGES

DRAWN BY: B. KIMES — DATE: 10/25/2011

CHECKED BY: — DATE:

ENGINEER: J. WANG — DATE: 1/17/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

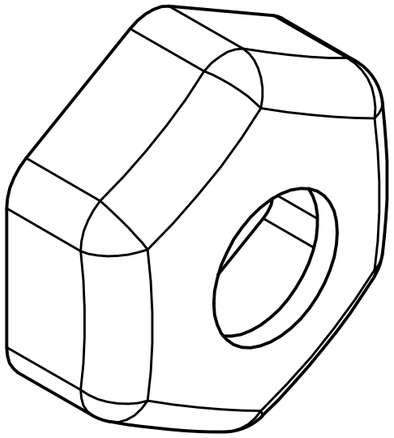
DESCRIPTION: M12x1.75 LOCKNUT, MODIFIED

SIZE: A3 | SHEET: 1 OF 1 | SCALE: 4.000

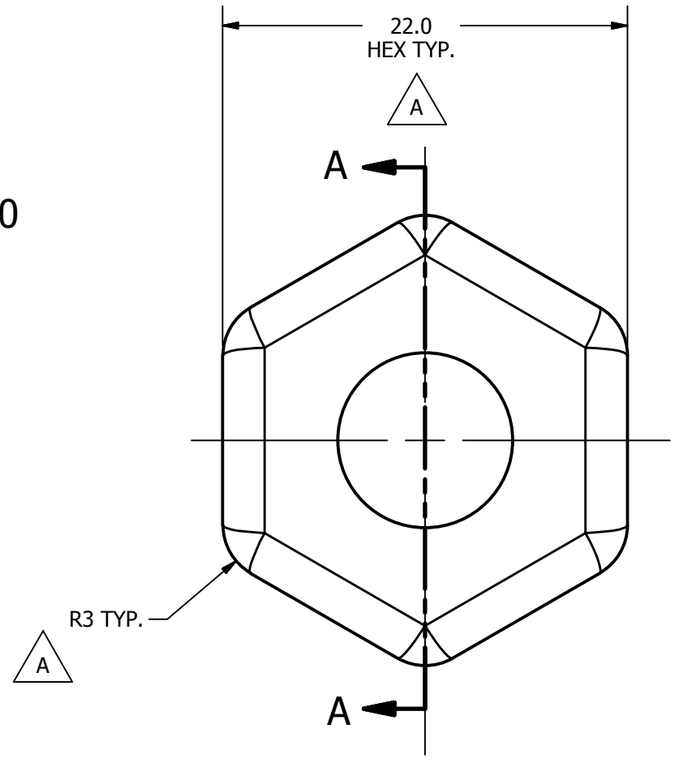
DRAWING NO.: 472-3747

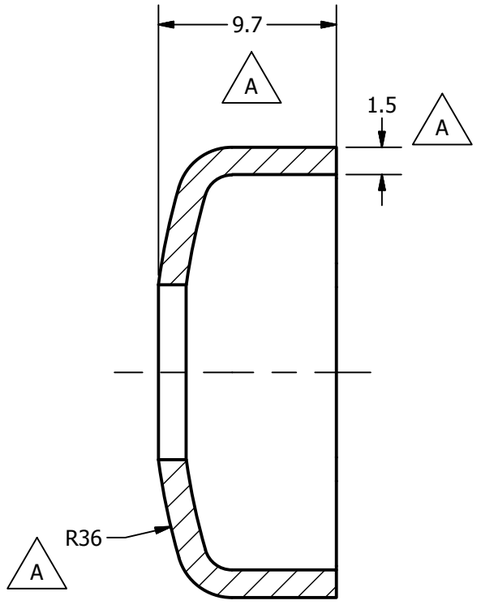
REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM313 AND CONVERTED TO METRIC FOR THOR-M; 9.7 WAS 7.6; ADD 1.5, (19.0), R36, R3 TYP., 22.0 HEX TYP.	12/15/2011	BK
	B	IN NOTE 1, 65 ±5 SHORE A WAS 50 ±5 SHORE A	8/12/2014	DW
	C	IN NOTE 1, ≥40 SHORE A WAS 65 ±5 SHORE A	9/14/2017	DW

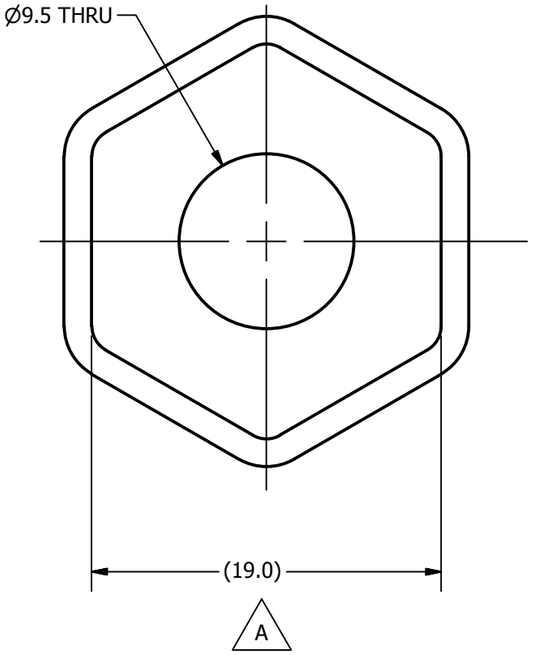


SCALE 3.000





SECTION A-A
SCALE 3.000



NOTES:

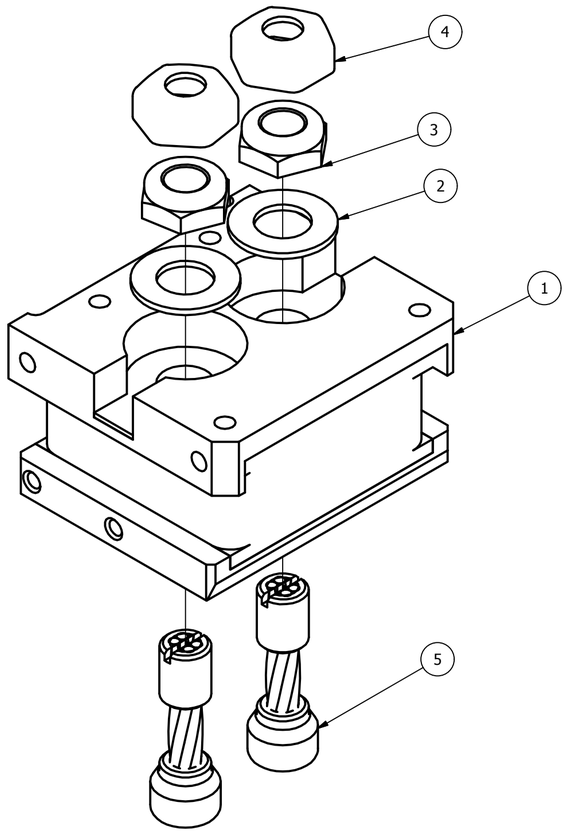
C

1. MATERIAL: POLYURETHANE OR EQUIVALENT, DUROMETER ≥40 SHORE A.
2. MUST COVER THE TOP OF A STANDARD METRIC LOCK NUT (REF #5000462).

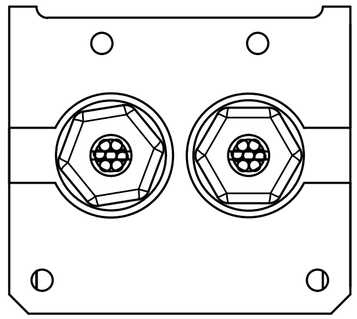
472-3746	2	PROJECT NO.:	DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5' 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
472-3646	2	MATERIAL: SEE NOTES	DRAWN BY: B. KIMES	DATE: 12/15/2011	DESCRIPTION: M12 VINYL NUT COVER THOR-50M
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-3647 REV: C
TOTAL QTY IN DUMMY	4	FINISH:	ENGINEER: J. WANG	DATE: 1/16/2012	SCALE: 3.000

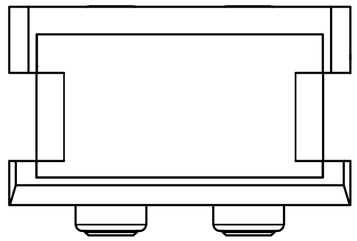
472-3647.ipt

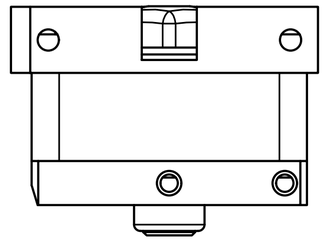
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RELEASE TO PRODUCTION	10/25/2011	BK
	B	9003938 1/2 SAE FLAT WASHER TYPE-B ZINC WAS 9000135 WASHER FLAT 1/2 PTFE	1/31/2017	DW



SCALE 1.000







ITEM	QTY	PART NUMBER	DESCRIPTION
5	2	472-3645	UPPER THORACIC SPINE FLEX JOINT CABLE ASS'Y.
4	2	472-3647	M12 VINYL NUT COVER
3	2	472-3747	M12x1.75 LOCKNUT, MODIFIED
2	2	9003938	1/2 SAE FLAT WASHER TYPE-B ZINC
1	1	472-3640	UPPER THORACIC SPINE FLEX JOINT MOLDED ASSEMBLY

PARTS LIST

472-3600	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01
ANGLES ± 0.5
FINISH 1.6

REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:

MATERIAL:

HEAT TREAT:

FINISH:

DRAWN BY: B. KIMES — DATE: 10/25/2011

CHECKED BY: — DATE:

ENGINEER: J. WANG — DATE: 1/16/2012

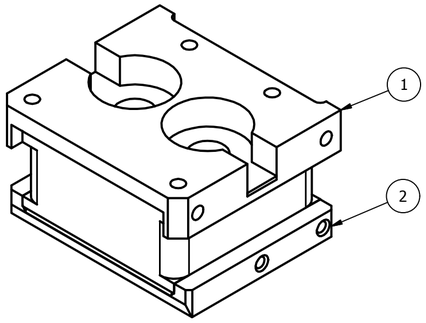
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: UPPER THORACIC SPINE FLEX JOINT ASSEMBLY THOR-5M

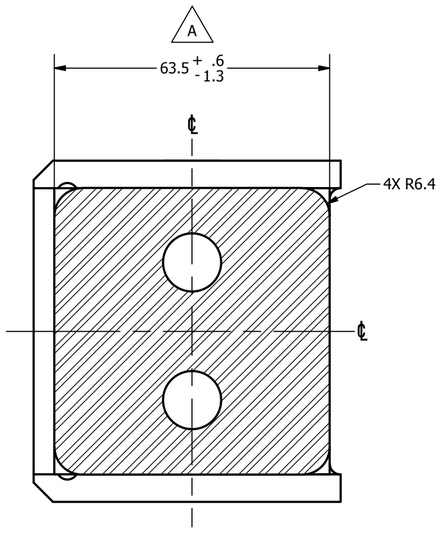
SIZE: A2 | SHEET 1 OF 1 | SCALE: 1.000 | DRAWING NO.: 472-3646 | REV: B

472-3646.iam

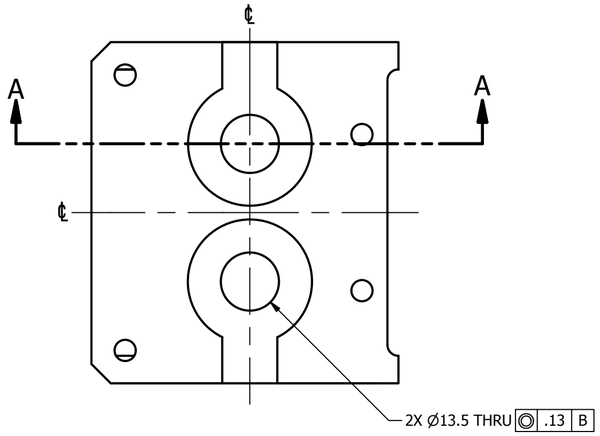
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM310 RB0 AND CONVERTED TO METRIC FOR THOR-M; 63.5 +.6/-1.3 WAS 63.5; 45.7 +.5/-.9 WAS 45.7; 66.0 +.7/-1.3 WAS 66.0; ADD (63.5)	9/20/2011	BK
	B	DIMENSION 63.5 +.6/-1.3 WAS (63.5); ADDED NOTES 1 AND 2	1/31/2017	DW

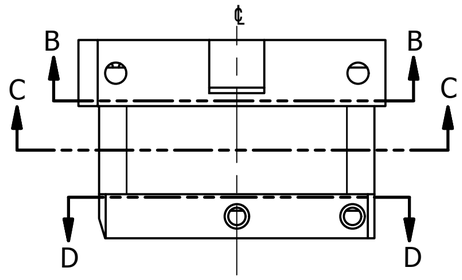


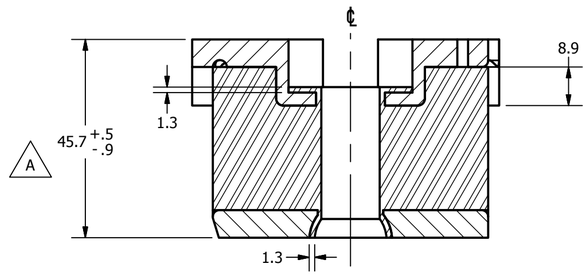
SCALE .750



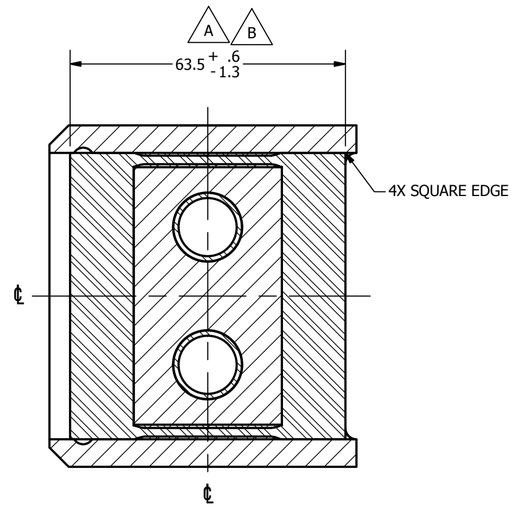
SECTION C-C
SCALE 1.000



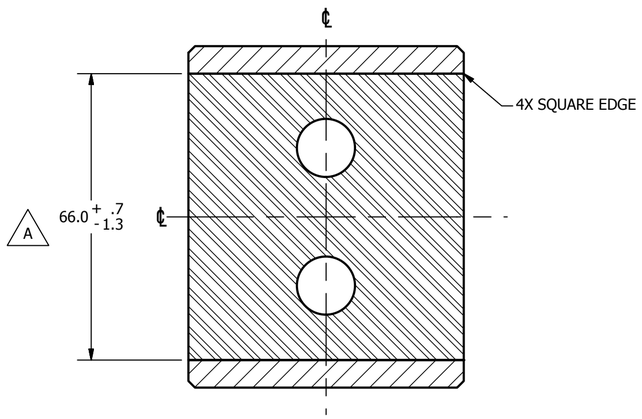




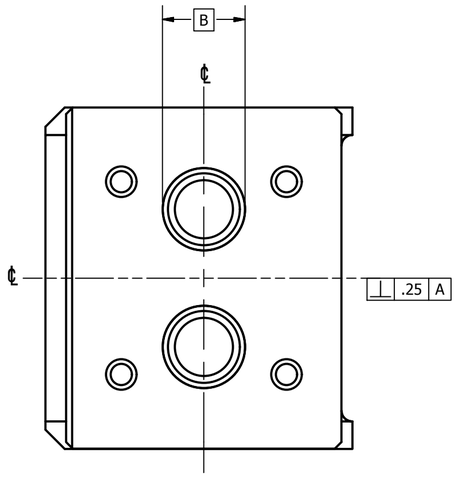
SECTION A-A
SCALE 1.000



SECTION B-B
SCALE 1.000



SECTION D-D
SCALE 1.000



NOTES:

B
1. PERFORMANCE SPEC TAKES PRECEDENCE OVER DUROMETER.
2. PREFORM ONE TEST. COMPRESS PART BY 8mm, STRETCH TO 10kN, COMPRESS BY 8mm, STRETCH TO 10kN, COMPRESS BY 8mm AND HOLD FOR 30 SECONDS, STRETCH TO 10kN, RETURN TO ORIGINAL POSITION. PART PASSES IF THERE IS NO DAMAGE TP THE RUBBER.
3. DIMENSIONS REPRESENT PART SIZE AFTER MOLDING.
4. RUBBER TOLERANCE ±0.5, UNLESS OTHERWISE SPECIFIED.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-3642	UPPER THORACIC SPINE FLEX JOINT BOTTOM PLATE
1	1	472-3641	UPPER THORACIC SPINE FLEX JOINT TOP PLATE

PARTS LIST

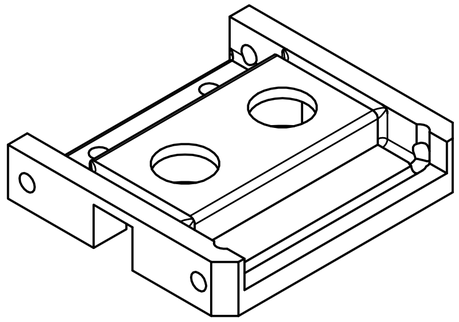
DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION
TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01; ANGLES ± 0.5; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

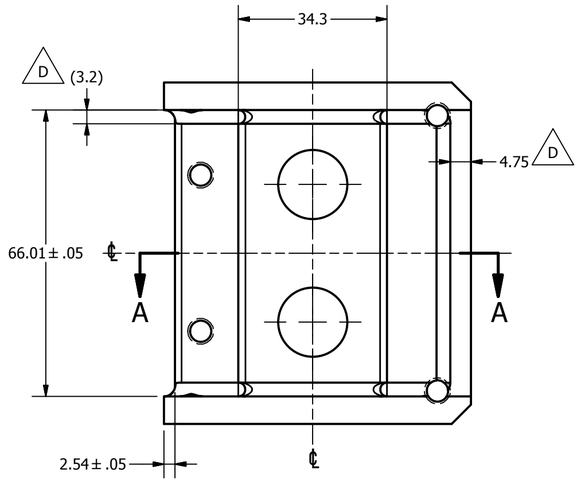
PROJECT NO.:				DESCRIPTION: UPPER THORACIC SPINE FLEX JOINT MOLDED ASSEMBLY	
472-3600	1	MATERIAL: BUTYL RUBBER SHORE A 75±2	DRAWN BY: B. KIMES	DATE: 9/20/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A2 / SHEET 1 OF 1 / DRAWING NO.: 472-3640 / REV: B
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/16/2012	SCALE:

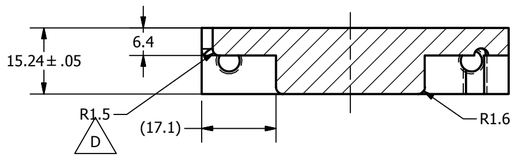
472-3640.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM311 RB0 AND CONVERTED TO METRIC FOR THOR-M	9/20/2011	BK
	B	CHANGED NICKEL PLATE TO SATIN FLASH CHROME	7/23/2012	CEF
	C	FINISH .008mm MAX. WAS .0003 MAX.	1/9/2012	BK
	D	RE-DIMENSIONED; Ø15.90 +0.15/-0.03 WAS 15.9 AND 1.6 TYP. WAS 2X 1.5; REMOVED 4X R3.3; ADDED R1.5, Ø3.2 BALL SLOT, 4.75, AND (3.2)	1/31/2017	DW

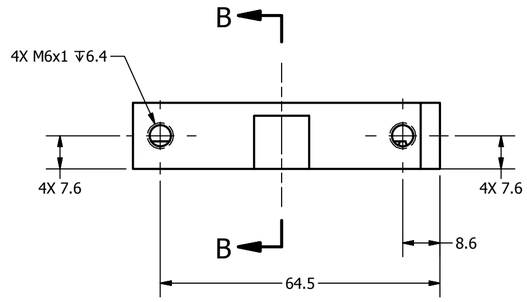


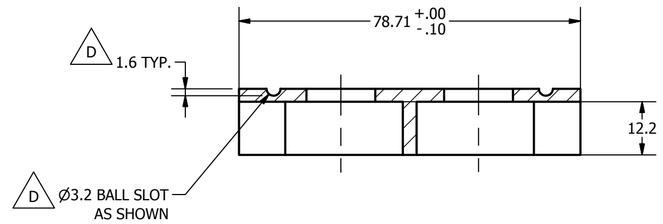
SCALE 1.000



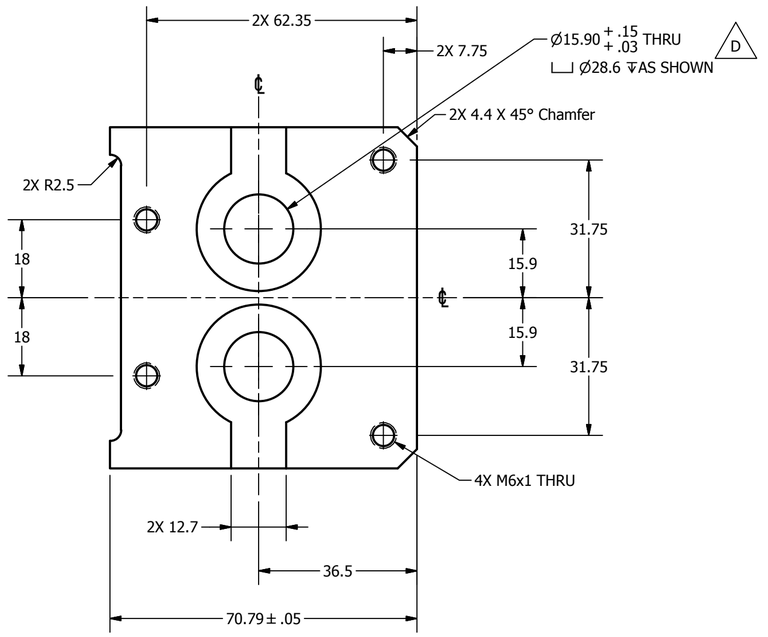


SECTION A-A
SCALE 1.000





SECTION B-B
SCALE 1.000



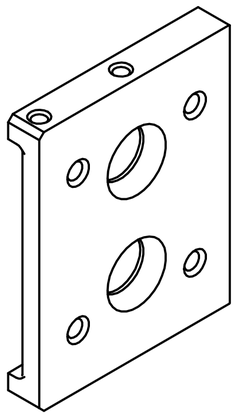
NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. POWDER OR BEAD BLAST.
3. SATIN FLASH CHROME PLATE 0.008mm MAX. AFTER MACHINING.
4. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

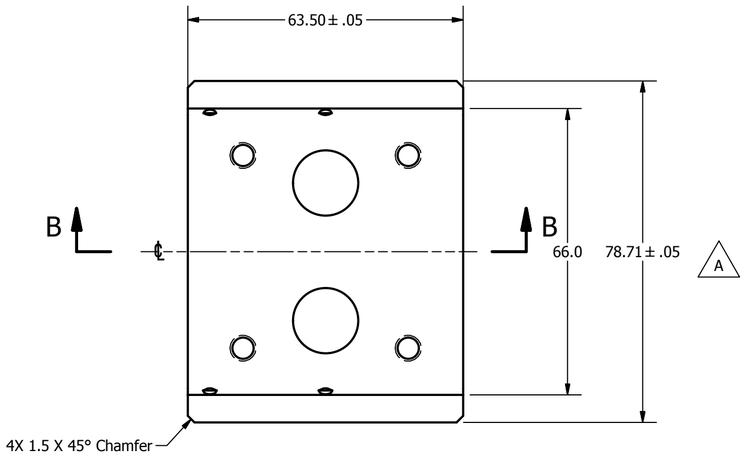
DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION		TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01; ANGLES ± 0.5°; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
		PROJECT NO.:	DESCRIPTION: UPPER THORACIC SPINE FLEX JOINT TOP PLATE		
472-3640	1	MATERIAL: 1018 STEEL	DRAWN BY: B. KIMES	DATE: 9/20/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A2 / SHEET 1 OF 1 / DRAWING NO.: 472-3641 / REV: D
TOTAL QTY IN DUMMY	1	FINISH: SEE NOTES	ENGINEER: J. WANG	DATE: 1/16/2012	SCALE: 1.000

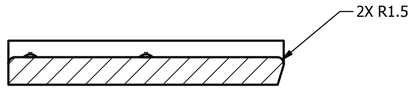
472-3641.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM312 RB0 AND CONVERTED TO METRIC FOR THOR-M; 78.71 +/-.05 WAS 78.71 +0/-.05	9/20/2011	BK
	B	CHANGED NICKEL PLATE TO SATIN FLASH CHROME	9/20/2011	
	C	FINISH .008mm MAX. WAS .0003 MAX.	11/9/2012	BK
	D	RE-DIMENSIONED; 73˚ WAS 65˚, 2X SØ19.5 +0.20/-0.03 WAS 2X SØ19.05, Ø15.10 +0.20/-0.03 THRU C'BORE AS SHOWN WAS Ø15.1 THRU C'BORE AS SHOWN; ADDED SECTION B-B	1/31/2017	DW

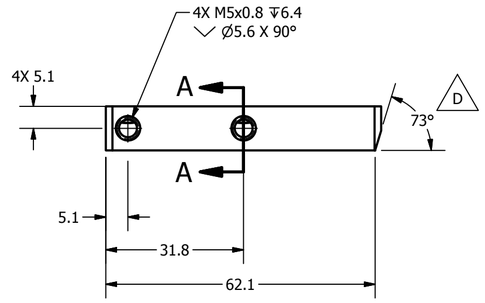


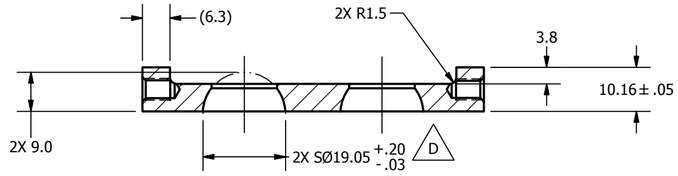
SCALE 1.000



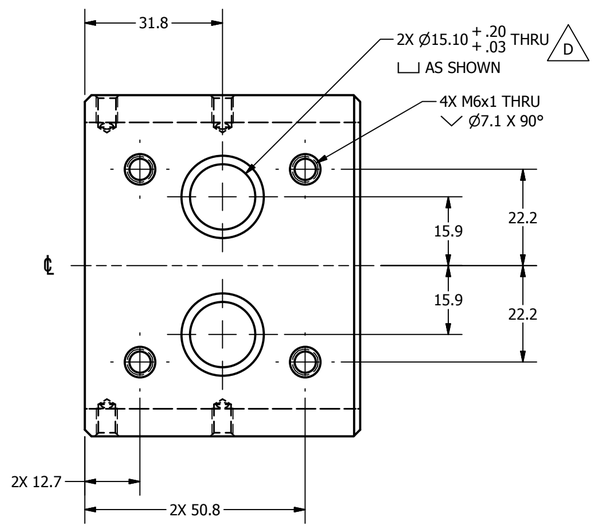


SECTION B-B
SCALE 1.000
D





SECTION A-A
SCALE 1.000



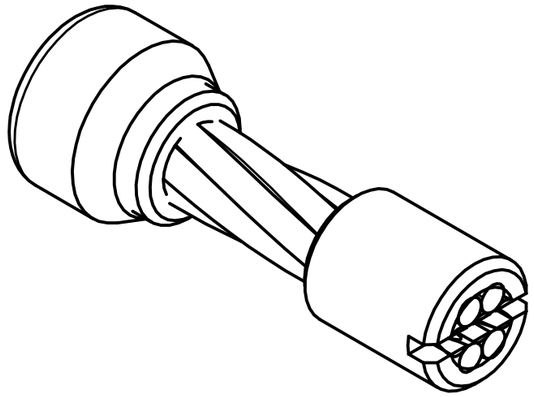
NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. POWDER OR BEAD BLAST.
3. SATIN FLASH CHROME PLATE 0.008mm MAX. AFTER MACHINING.
4. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

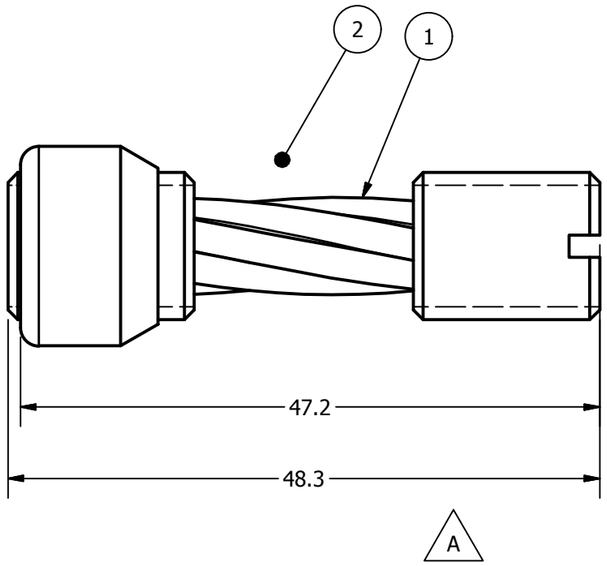
DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION		TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01; ANGLES ± 0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
		PROJECT NO.:	DESCRIPTION: UPPER THORACIC SPINE FLEX JOINT BOTTOM PLATE		
472-3640	1	MATERIAL: 1018 STEEL	DRAWN BY: B. KIMES	DATE: 9/20/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A2 / SHEET 1 OF 1 / DRAWING NO.: 472-3642 / REV: D
TOTAL QTY IN DUMMY	1	FINISH: SEE NOTES	ENGINEER: J. WANG	DATE: 1/16/2012	SCALE: 1.000

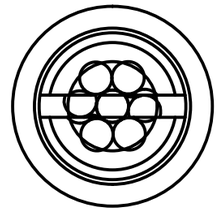
472-3642.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM320 R7 AND CONVERTED TO METRIC FOR THOR-M; ADD 48.3	10/25/2011	BK



SCALE 2.000





NOTES:

1. USE LOCTITE 271 OR EQUIVALANT TO LOCK 472-3743 IN PLACE AS SHOWN.
2. ONE SAMPLE FROM EACH ASSEMBLY BATCH NEEDS TO BE TESTED TO INSURE NO SLIPPAGE OF THE BALL OR THREADED SLEEVE ON THE CABLE SHALL OCCUR UNDER 1,700 LBS OF TENSILE LOAD.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-3743	THREADED BALL END
1	1	472-3644	UPPER THORACIC SPINE FLEX JOINT CABLE

PARTS LIST

472-3646	2
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	2

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 — ANGLES ±0.5° — FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:
DRAWN BY: B. KIMES — DATE: 10/25/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/16/2012

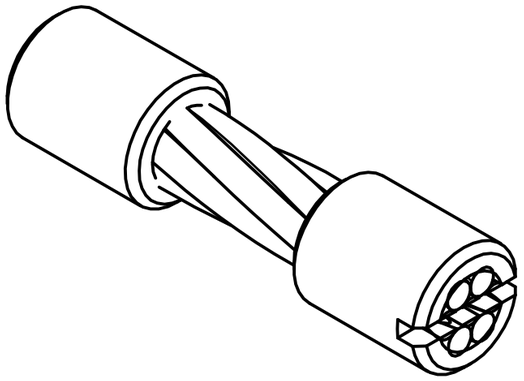
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: UPPER THORACIC SPINE FLEX JOINT CABLE ASS'Y. THOR-50M

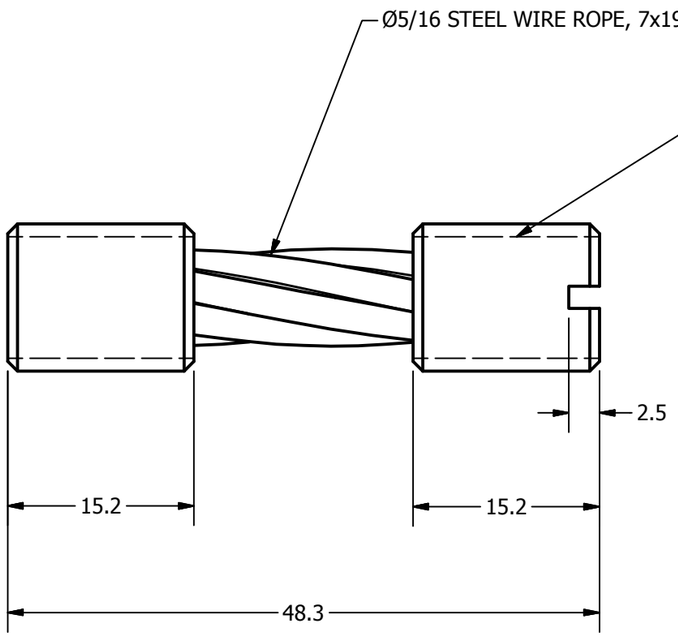
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 2.000 | DRAWING NO.: 472-3645 | REV: A

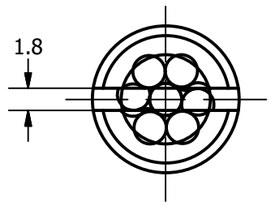
472-3645.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM325 R1 AND CONVERTED TO METRIC FOR THOR-M	10/25/2011	BK



SCALE 2.000



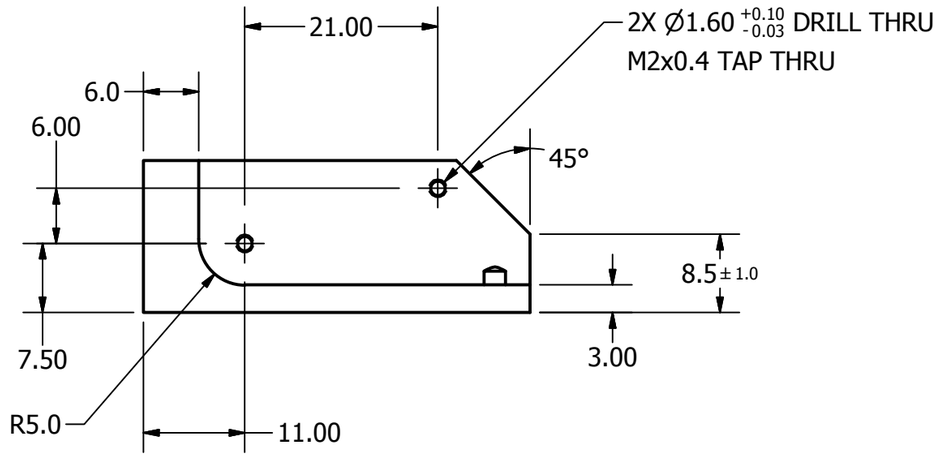


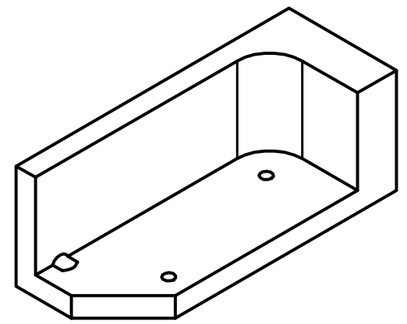
NOTES:

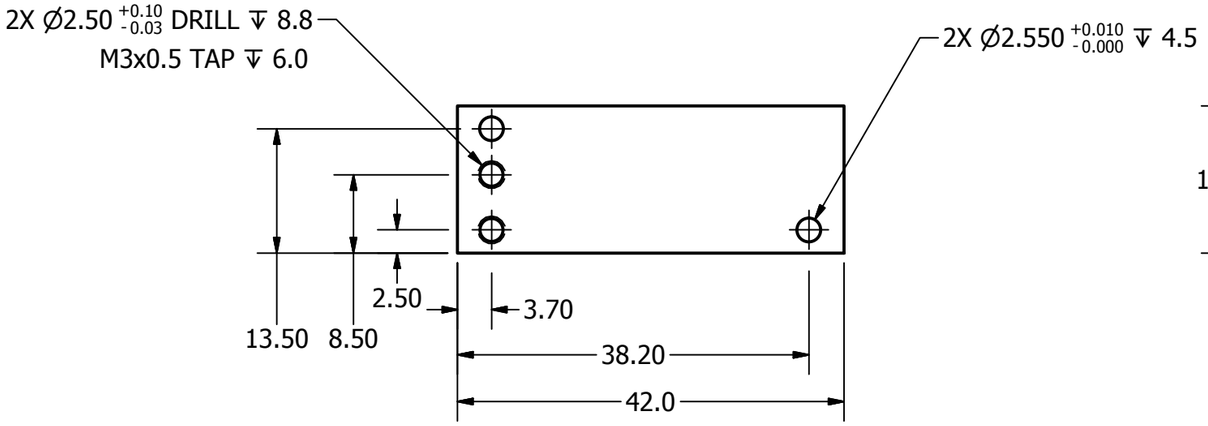
1. DIMENSIONS SHOWN ARE FINAL DIMENSIONS AFTER SWAGING.

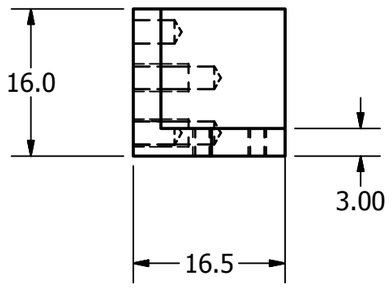
		PROJECT NO.:	DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ± 0.5 ± 0.5° 1.6 X.X ± 0.2 X.XX ± 0.1 X.XXX ± 0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
472-3645	1	MATERIAL:	DRAWN BY: B. KIMES DATE: 10/25/2011	DESCRIPTION: UPPER THORACIC SPINE FLEX JOINT CABLE	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 / SHEET: 1 OF 1 / DRAWING NO.: 472-3644 / REV: A	
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG DATE: 1/16/2012	SCALE: 2.000	

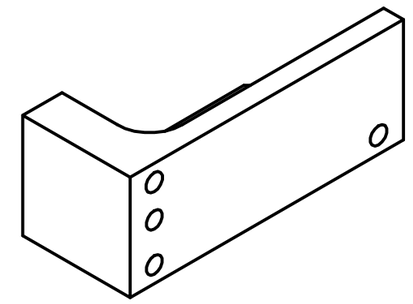
472-3644.iam





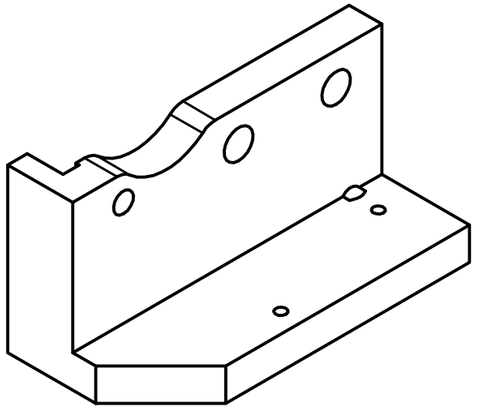


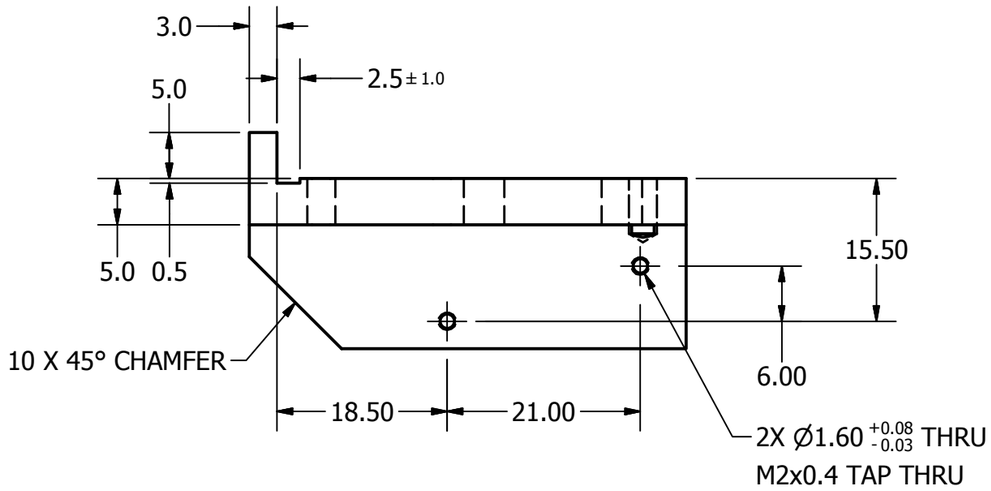


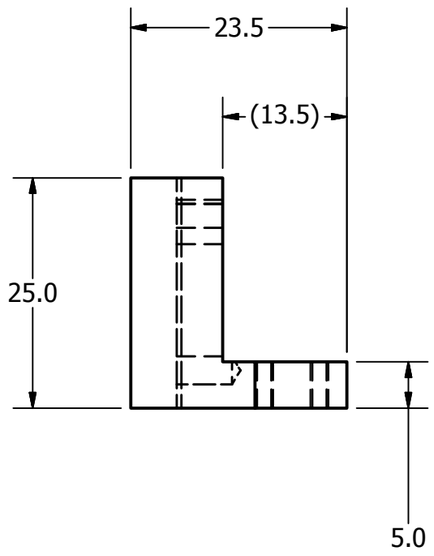


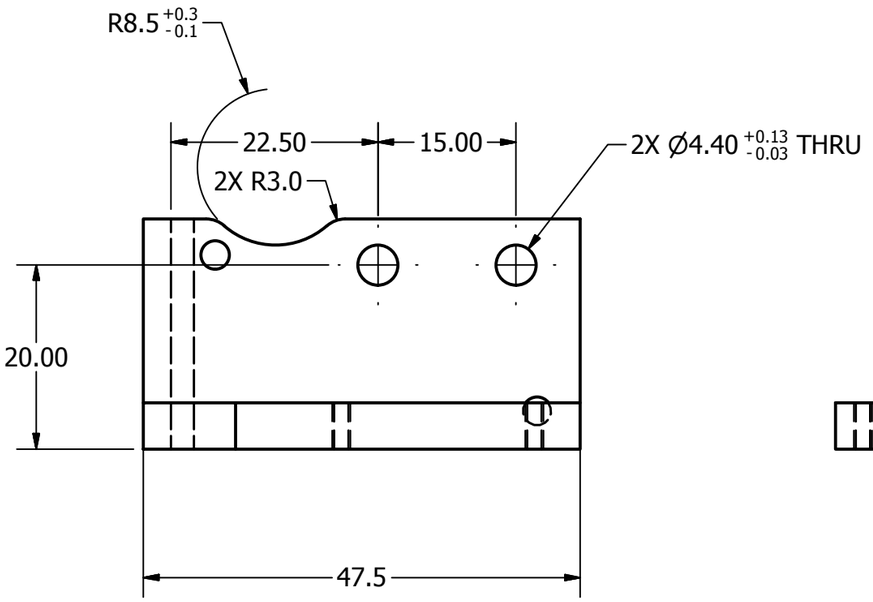
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 **DO NOT SCALE DRAWING**	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER	**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION**
	APPROVALS / DATE	TILT SENSOR MOUNT, T6
	DRAWN J. WANG / 9/18/2015	THOR-50M
MATERIAL 6061-T6 ALUMINUM	CHECKED	SIZE A3 · DRAWING NUMBER 472-3783 · REV
HEAT TREAT N/A	ENG	THIRD ANGLE PROJECTION · SCALE: 1.5 · SHEET 1 OF 1
FINISH CLEAR ANODIZE	APPROVED	

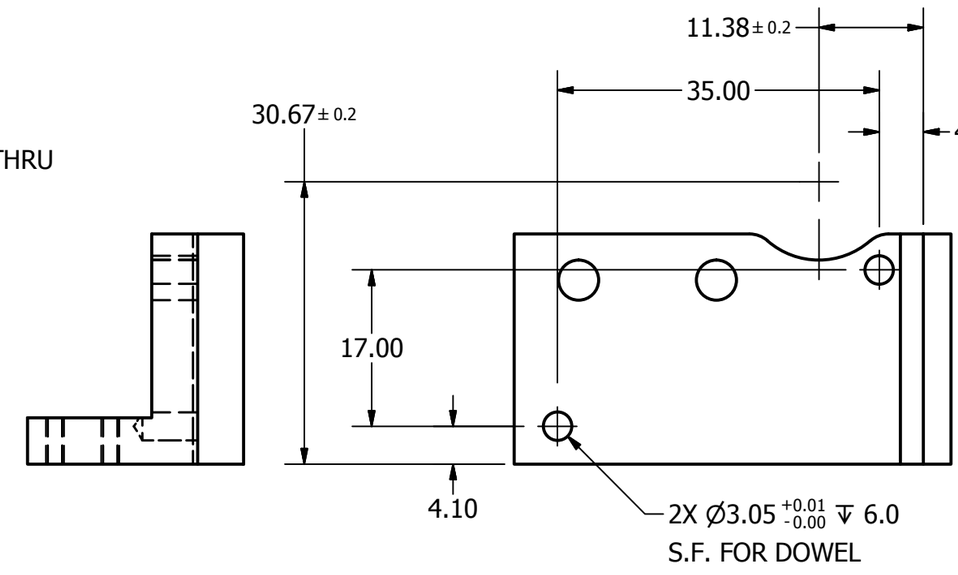
472-3783.ipt





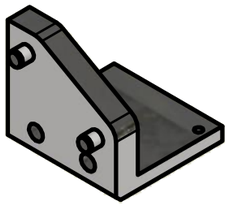


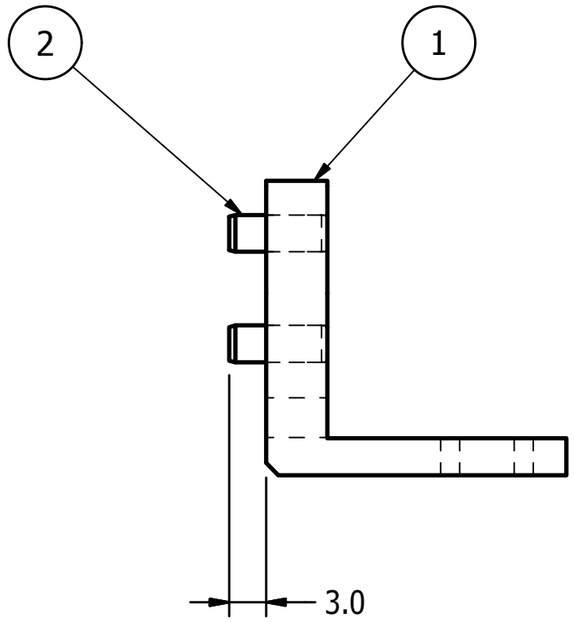




UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED 1.6 / ANGLES ±.5° ASME Y14.5M - 1994 **DO NOT SCALE DRAWING**	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER	**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION**
	APPROVALS / DATE	TILT SENSOR MOUNT, T12 THOR-50M
MATERIAL 6061-T6 ALUMINUM	DRAWN dwashenko 9/18/2015	
HEAT TREAT N/A	CHECKED	
FINISH CLEAR ANODIZE	ENG	
	APPROVED	
THIRD ANGLE PROJECTION	SIZE A3 / DRAWING NUMBER 472-3781 / REV	
	SCALE: 1.5 / SHEET 1 OF 1	

472-3781.ipt





ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	5000384	PIN, DOWEL M3 x 8
1	1	472-3782	TILT SENSOR MOUNT, PELVIS

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	Dave Walker	2/6/2017
MATERIAL		
CHECKED		
HEAT TREAT		
ENG		
FINISH		
APPROVED		

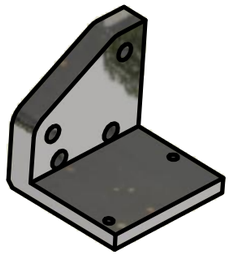
TILT SENSOR MOUNT ASSEMBLY, PELVIS
THOR-50M

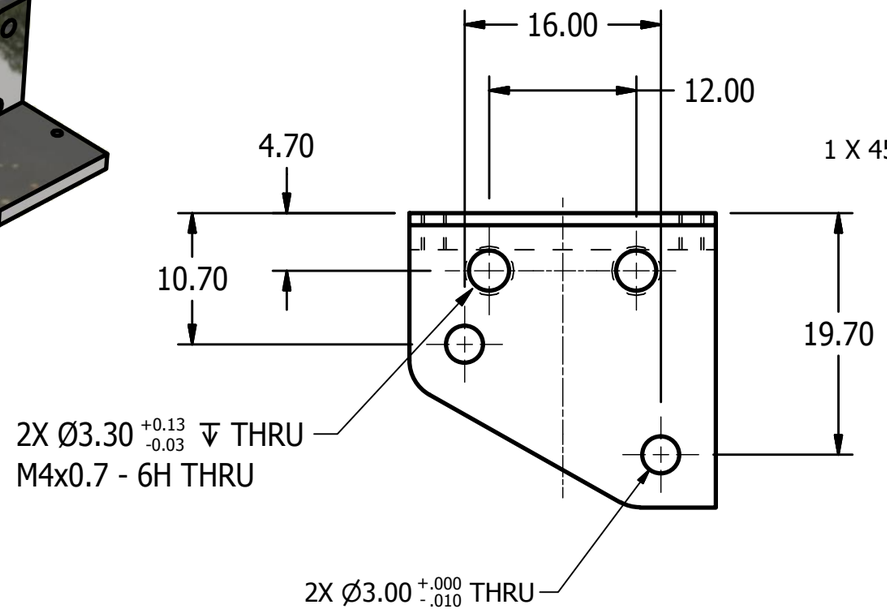
THIRD ANGLE PROJECTION

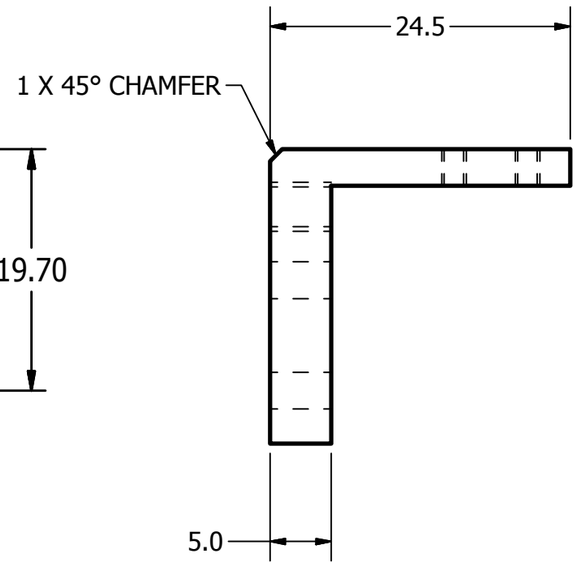
SIZE **A3** | DRAWING NUMBER 472-3787 | REV

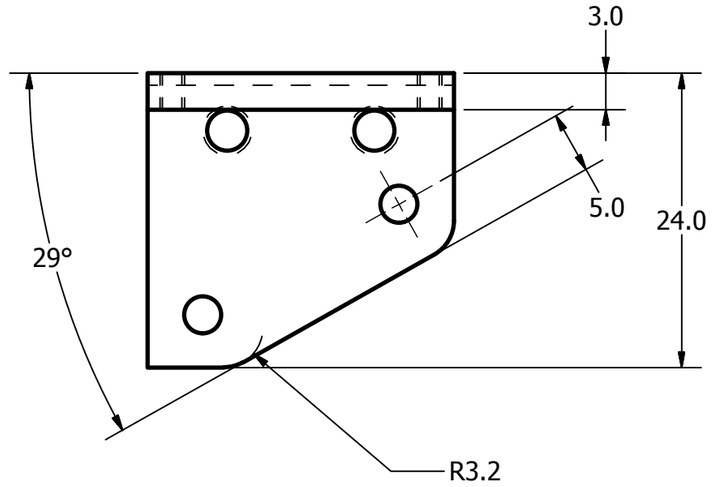
SCALE: 2 : 1 | SHEET 1 OF 1

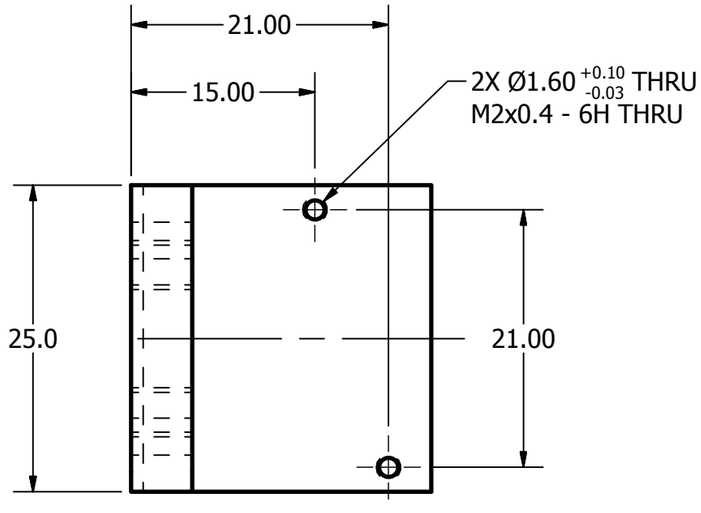
472-3787.iam











NOTES:

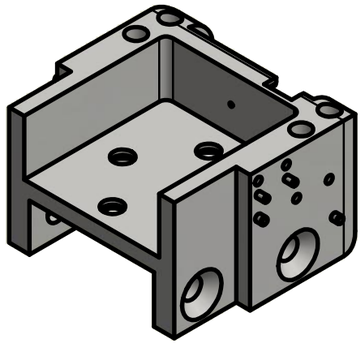
1. POWDER OR BEAD BLAST.

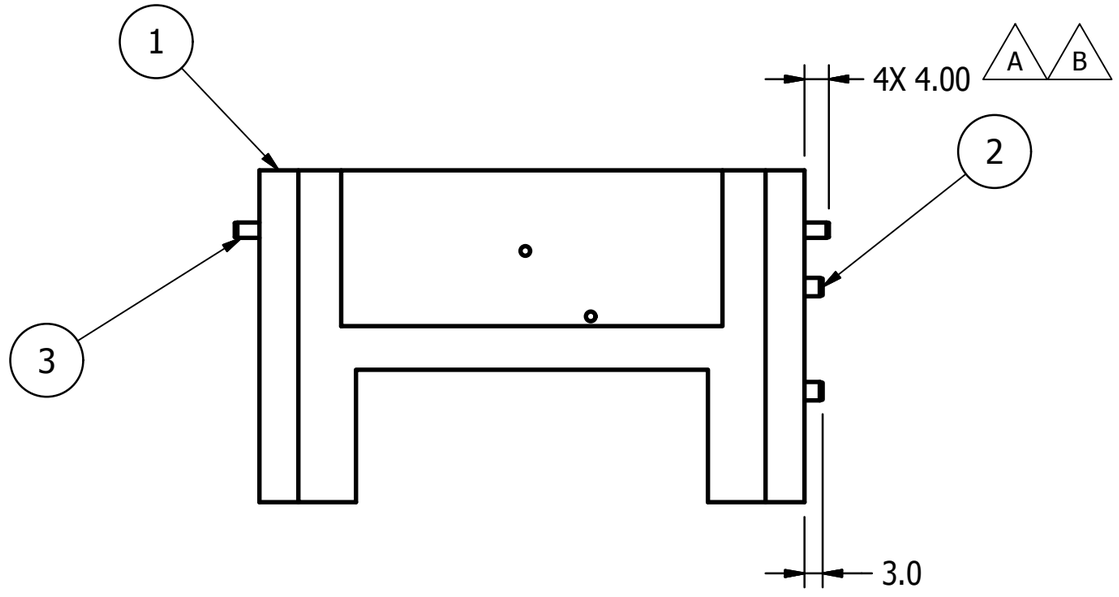
2. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 **DO NOT SCALE DRAWING**	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION**
	APPROVALS / DATE	TILT SENSOR MOUNT, PELVIS
MATERIAL: 4140 STEEL	DRAWN: Dave Walker — 2/6/2017	THOR-50M
HEAT TREAT: N/A	CHECKED	SIZE: **A3** — DRAWING NUMBER: 472-3782 — REV
FINISH: SEE NOTES	ENG — 10/30/2014	SCALE: 2 : 1 — SHEET: 1 OF 1
	APPROVED	THIRD ANGLE PROJECTION

472-3782.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	ADDED ITEM #3 5000869 – PIN, DOWEL M2.5 X 8 LG.	7/6/2017	DW
	B	DIMENSION 4X 4.00 WAS 4X 3.5	2/23/2018	DW





ITEM	QTY	PART NUMBER	DESCRIPTION
3	4	5000869	PIN, DOWEL M2.5 X 8 LG.
2	2	5000384	PIN, DOWEL M3 x 8
1	1	472-3731	THORACIC SPINE LOAD CELL FLEX JOINT ADAPTOR PLATE

A

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT

FINISH

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN Dave Walker	2/2/2017
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

THORACIC SPINE LOAD CELL FLEX JOINT ADAPTOR PLATE ASS'Y

THOR-50M

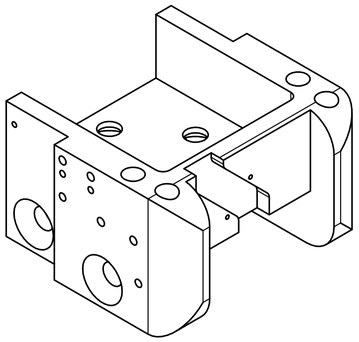
THIRD ANGLE PROJECTION

SIZE **A3** | DRAWING NUMBER 472-3733 | REV B

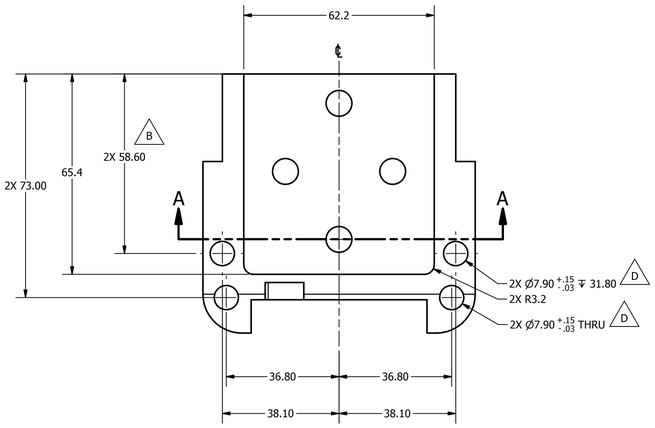
SCALE: 1 : 1 | SHEET 1 OF 1

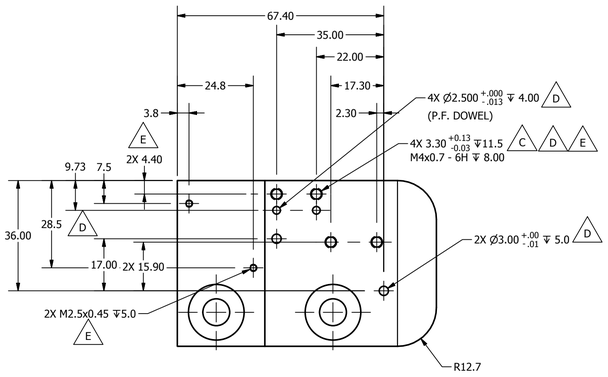
472-3733.iam

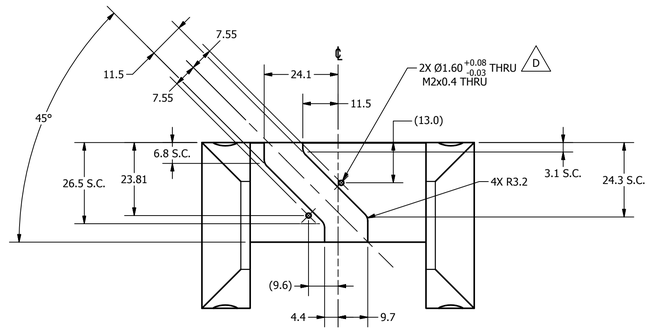
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1SPM610 R11 AND CONVERTED TO METRIC FOR THOR-M	9/21/2011	BK
	B	2X 58.57 WAS 2X 54.0	2/20/2012	BK
	C	ADDED M4-0.7 HOLES TO LEFT SIDE VIEW; HOLE NOTE 6X M4x0.7 ↧7.5 WAS 8X M4x0.7 ↧7.5; AND HOLE NOTE 4X M4x0.7 ↧7.6 WAS 2X M4x0.7 ↧7.6; HOLE NOTE 4X M4x0.7 ↧7.5 WAS 6X M4x0.7 ↧7.5	6/3/2015	DW
	D	RE-DIMENSIONED; ADDED 2X Ø3.00 +0.00/-0.01 ↧5.0 AND 2 - M4x0.7 ↧7.5 HOLES TO LEFT SIDE VIEW; HOLE DIM. 4X Ø3.30 +0.13/-0.03 ↧7.6 M4x0.7 ↧7.6 WAS 4X M4x0.7 ↧7.6; 4X Ø8.80 +0.15/-0.03 THRU C'SINK Ø18.2 X 90° BOTH SIDES WAS 2X Ø8.8 THRU C'SINK Ø18.2 X 90°; 4X Ø8.40 +0.15/-0.03 THRU C'SINK Ø18.2 X 90° WAS 4X 8.4 THRU C'SINK Ø18.2 X 90°;2X Ø1.60+0.08/-0.03 THRU M2x0.4 THRU WAS 2x M2x0.4 THRU; 2X Ø7.90 +.15/-.03 THRU WAS 2X Ø7.9 THRU; 2X Ø790 +.15/-.03 ↧31.8 WAS 2X 7.9 ↧31.8, ADDED 4X Ø2.500 +.000/-.012 ↧8.00 (P.F. DOWEL)	7/6/2017	DW
	E	REMOVED DIMENSION 39.43; DIMENSION 2X 4.40 WAS 2X 4.00; ADDED DIMENSION 2X4.40 LEFT SIDE VIEW; DIMENSIONS 4X 3.30 +0.13/-0.03 ↧11.5 M4x0.7 6H ↧8.0 WAS 4X 3.30 +0.13/-0.03 ↧7.5 M4x0.7 6H ↧7.5, ADDED HOLE NOTES 2X M2.5x0.45 ↧5.0	1/25/2018	DW

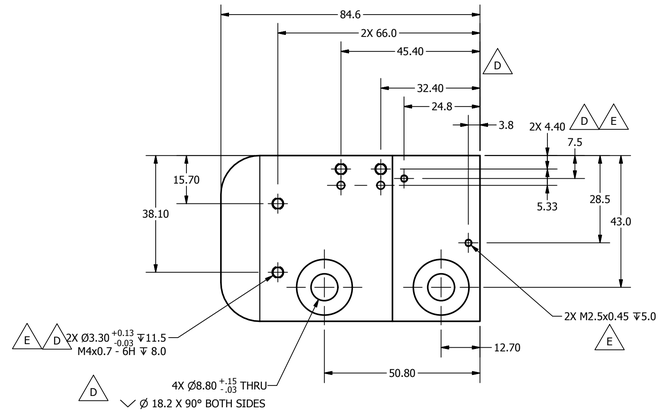


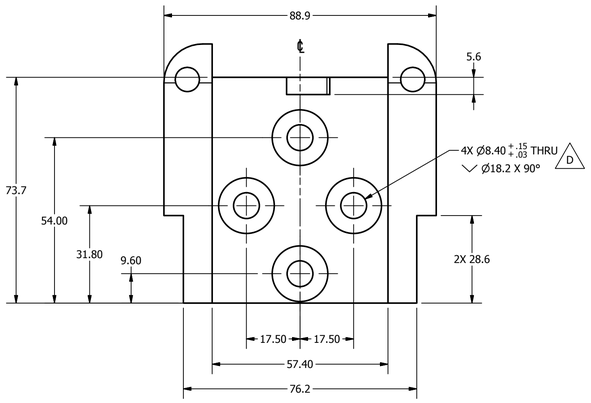
SCALE 1.000

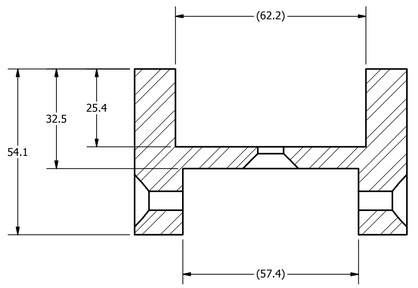












SECTION A-A
SCALE 1.000

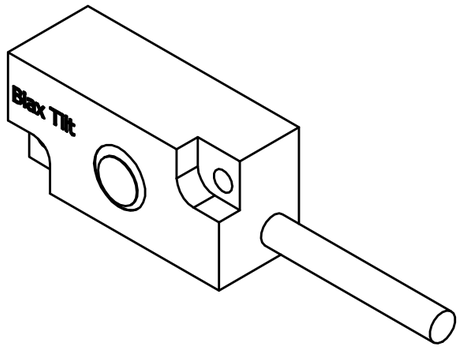
NOTES:

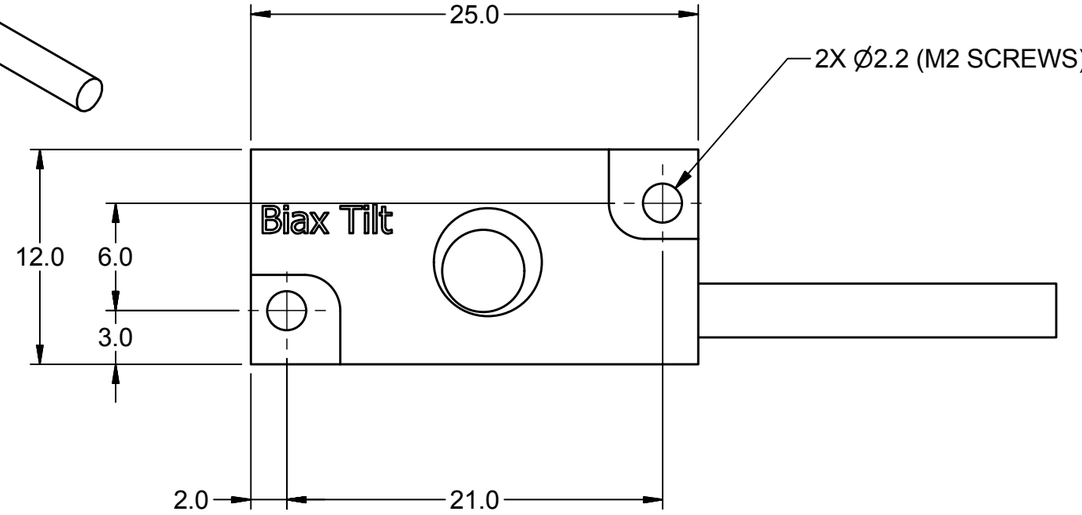
1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. POWDER OR BEAD BLAST.
3. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.
4. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

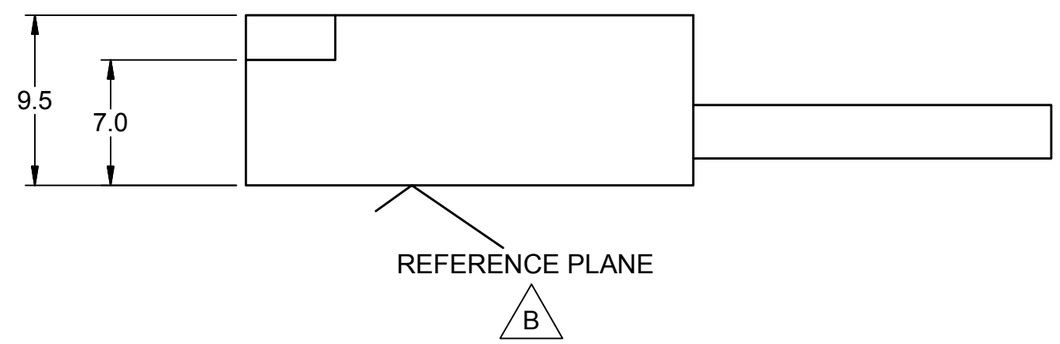
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION	PROJECT NO.:	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS. X.X ±0.1 X.XX ±0.05 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 BREAK SHARP EDGES	DRAWING TITLE: THORACIC SPINE LOAD CELL FLEX JOINT ADAPTOR PLATE		
			THOR-50M		
472-3600	1	MATERIAL: 1018 STEEL	DRAWN: B. KIMES	DATE: 9/21/2011	
NEXT ASSEMBLY	QTY	MATERIAL: N/A	CHECKED BY:	DATE:	SIZE: A1 SHEET: 1 of 1 SCALE: 1.000 DRAWING NO.: 472-3731 REV: E
TOTAL QTY IN DUMMY	1	FINISH: SEE NOTES	ENGINEER: J. WANG	DATE: 1/16/2012	

472-3731.ipt

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	A	SPEC RELEASE	BK	JW	5/13/2013
	B	ADDED NONLINEARITY TO TILT SENSOR SPECIFICATIONS AND REFERANCE PLANE TO FRONT VIEW	DW		5/25/2016







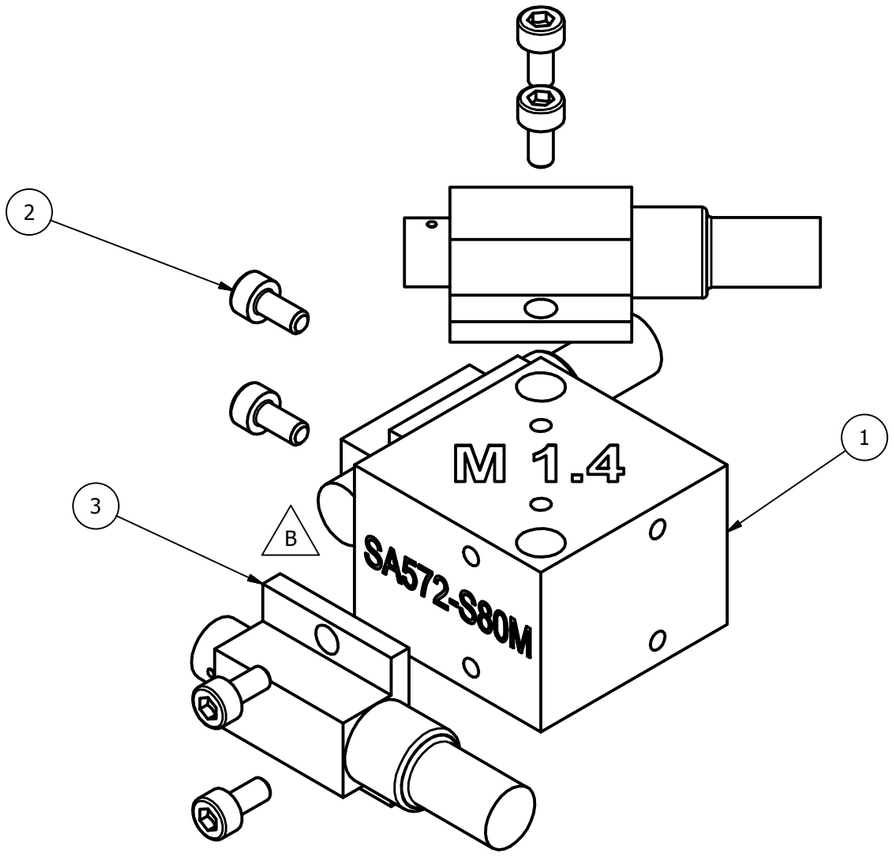
TILT SENSOR SPECIFICATION:

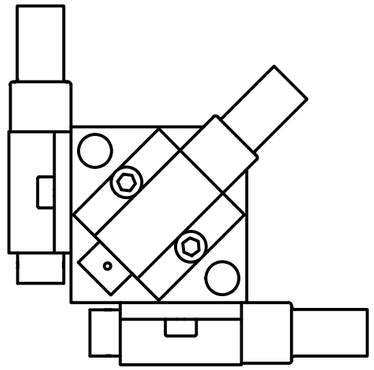
MASS: 5g
RANGE: ±80°
B RESOLUTION: 0.1°
B NONLINEARITY: +/- 0.2° OR +/- 1% READING
ACCURACY: ±0.5°
SUPPLY VOLTAGE 5 V
POWER CONSUMPTION: 6 mA

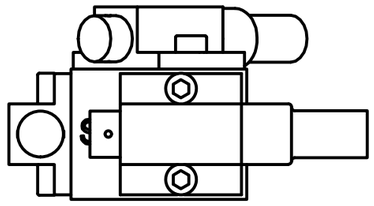
DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5 FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
PROJECT NO.:		DESCRIPTION: TILT SENSOR, DUAL AXIS
MATERIAL:	DRAWN BY: B. KIMES DATE: 11/29/2012	
HEAT TREAT:	CHECKED BY: DATE:	SIZE: B SHEET: 1 OF 1 DRAWING NO.: SA572-S44 REV: B SCALE: 3.000
FINISH:		

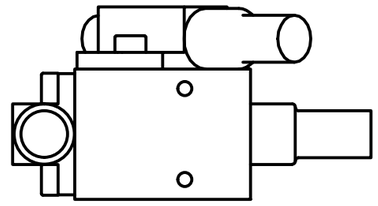
SA572-S44.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1INM100 AND CONVERTED TO METRIC FOR THOR-M	9/1/2011	KHS
	B	PART NUMBER SA572-S80M ENGRAVED ON TRI-PACK BLOCK WAS 472-4202	4/6/2017	DW









SCALE 3.000

ITEM	QTY	PART NUMBER	DESCRIPTION
3	3	SA572-S4	UNIAXIAL PIEZORESISTIVE ACCELEROMETER
2	6	5000068	SCREW, SHCS M1.4 - 0.3 X 3 LG.
1	1	SA572-S80M	TRI-PACK BLOCK

PARTS LIST

472-4360	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	4

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ±0.5 ±0.5 1.6
X.X ±0.2
X.XX ±0.1
X.XXX ±0.01
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

DRAWN BY: KHS DATE: 9/1/2011
CHECKED BY: TMV DATE: 9/14/2011
ENGINEER: J. WANG DATE: 1/17/2012

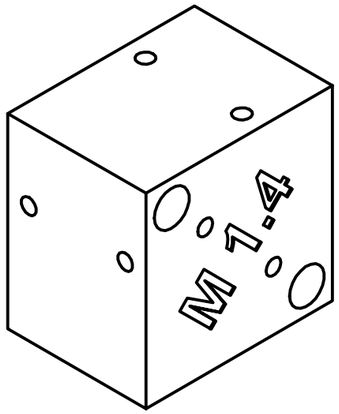
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: TRI-PACK ACCEL. ASSY.

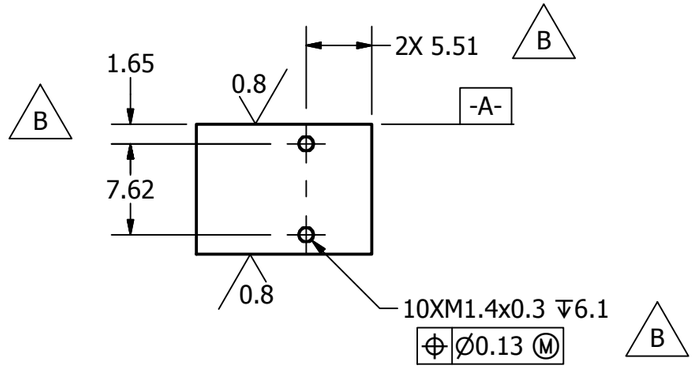
SIZE: B SHEET 1 OF 1 SCALE: 3:1
DRAWING NO.: 472-4203
REV: B

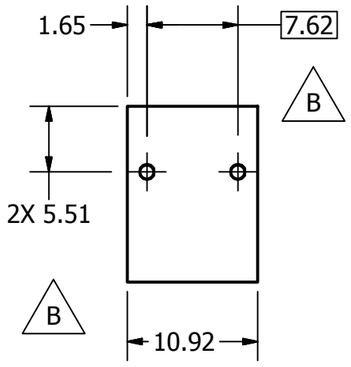
472-4203-FT.iam

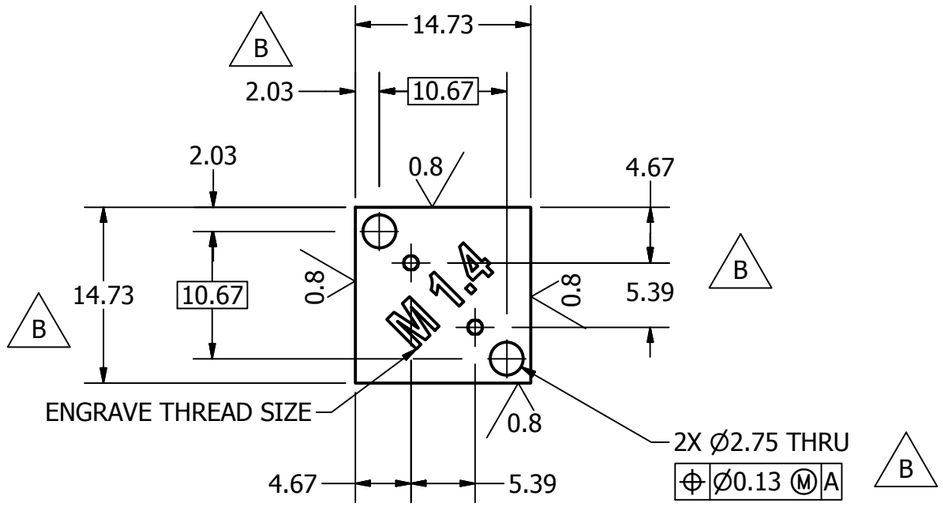
REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1INM130 AND CONVERTED TO METRIC FOR THOR-M	9/1/2011	KHS
	B	ADD TOLERANCE TO HOLES; ADD DATUM A; 10.92 WAS 10.9, 14.73 WAS 14.7, 2.03 WAS 2.0. 1.65 WAS 1.7, 4.67 WAS 4.7; ADD BASIC DIMENSION FOR HOLE SPANS; ADD FINISH MARKS; M1.4 TAP WAS THRU, ADD VIEWS AND DIMENSIONS FOR HOLES	12/21/2012	BK

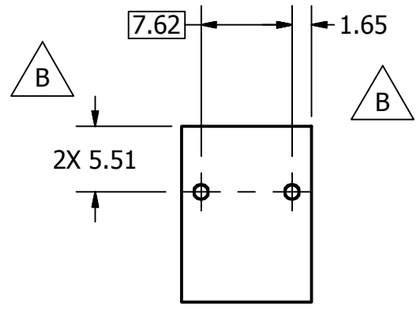


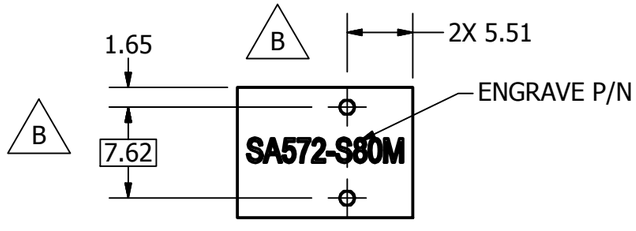
SCALE 3.000







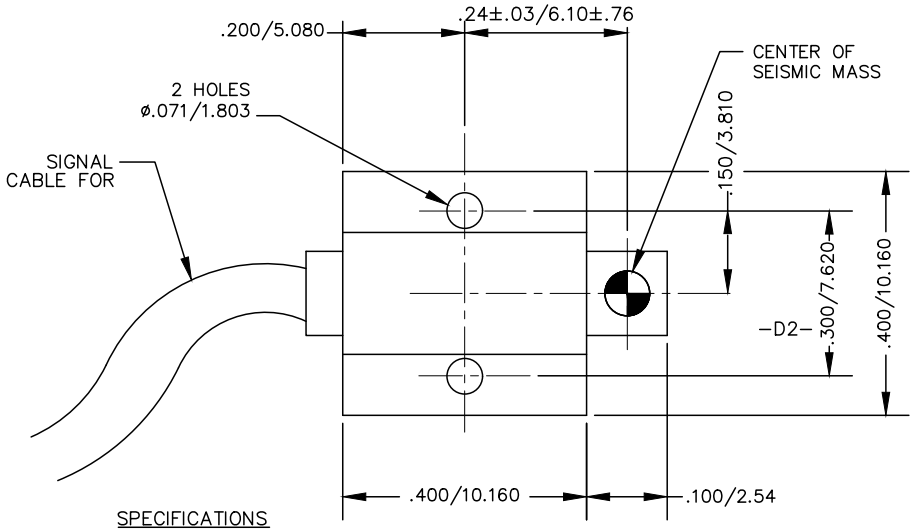


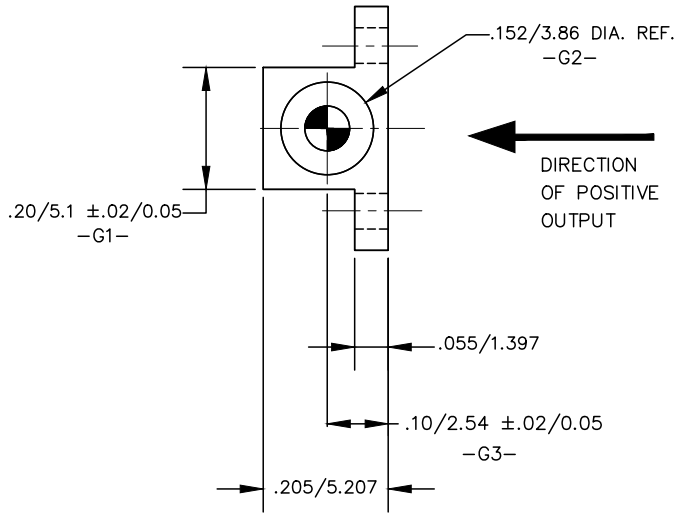


DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ± 0.2 X.XX ± 0.1 X.XXX ± 0.01 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: S4 TRIAXIAL ACCELEROMETER MOUNTING BLOCK METRIC	
PROJECT NO.:			
MATERIAL: Aluminum-7075-T6	DRAWN BY: KHS DATE: 9/1/2011		
HEAT TREAT:	CHECKED BY: TMV DATE: 9/9/2011	SIZE: B SHEET 1 OF 1	DRAWING NO.: SA572-S80M REV: B
FINISH: CLEAR ANODIZE	ENGINEER: J. WANG DATE: 1/18/2012	SCALE: 2:1	

REVISION RECORD

ITEM NO.	BY	DATE	DESCRIPTION
–G1–	DMW	10/3/2017	DIMENSION .20/5.0 ++P.02/0.05 WAS .02/0.05
–G2–			DIMENSION .152/3.86 DIA. REF. WAS .152/3.86 DIA.
–G3–			DIMENSION .10/2.54 ±.02/0.05 WAS .10/2.54
–G4–			SENSITIVITY WAS .20 mV/g MIN.
–G5–			DAMPING RATIO WAS UNDAMPED (.005)
–G6–			NON–LINEARITY & HYSTERESIS WAS ±2% MAX.
–G7–			ZERO OFFSET WAS ±25 mV
–G8–			EXCITATION WAS 10V DC
–G9–			THERMAL SENSITIVITY SHIFT WAS THERMAL SENSITIVITY –5% Typ. AT 0° F TO 150° F
–G10–			ADDED THERMAL ZERO SHIFT
–G11–			TEMPERATURE EXPOSURE – OPERATING 0° F TO +150° F [–18° C TO +66° C]
–G12–			MASS ≤1.4 GRAM (WITHOUT CABLE) WAS WEIGHT 1 gram (WITHOUT CABLE)





SPECIFICATIONS

	RANGE	±2000 g
–G4–	SENSITIVITY	0.20 mV/g TYP. AT 100Hz, 10g PEAK AT 10Vdc
	MOUNTED RESONANCE FREQUENCY	22,000 Hz.
	SIGNAL OUTPUT MUST BE COMPATIBLE AND RECORDABLE IN A DATA CHANNEL AS DEFINED BY SAE J211	
–G5–	DAMPING RATIO	0.005
	TRANSVERSE SENSITIVITY	±1% MAX.
–G6–	NON–LINEARITY & HYSTERESIS	±2% MAX.OF READING, TO FULL RANGE
–G7–	ZERO OFFSET	50 mV MAX.
–G8–	EXCITATION	2 to 10 Vdc
–G9–	THERMAL SENSITIVITY SHIFT	MAX. –0.10%/°C TYP. FROM 0°F TO +150° F
–G10–	THERMAL ZERO SHIFT	FROM 0° F TO +150°(–18°C TO +66°C), REF. 75° F (24°C)
–G11–	TEMPERATURE EXPOSURE OPERATING	0° F TO +150° F [–18° C TO +66° C]
–G12–	MASS	≤1.4 GRAM (WITHOUT CABLES)
	HUMIDITY	SEALED

UNITS ARE in/mm

TOLERANCES ARE: *

DECIMALS ANGLES
.X ±0.1/2.5 + 0.5°
.XX ±0.01/.25
.XXX ±0.005/.127
* unless otherwise noted

MATERIAL:

SCALE NONE

APPROVALS	DATE
DRAWN GTE	3/5/98
CHECKED	
ENG J McF H.P.	

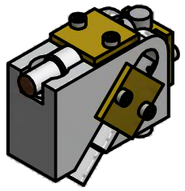
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

UNIAXIAL PIEZORESISTIVE ACCELEROMETER

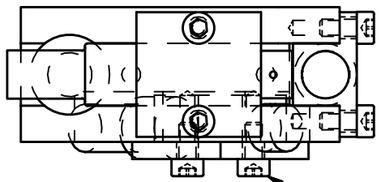
HYBRID III DUMMY FAMILY

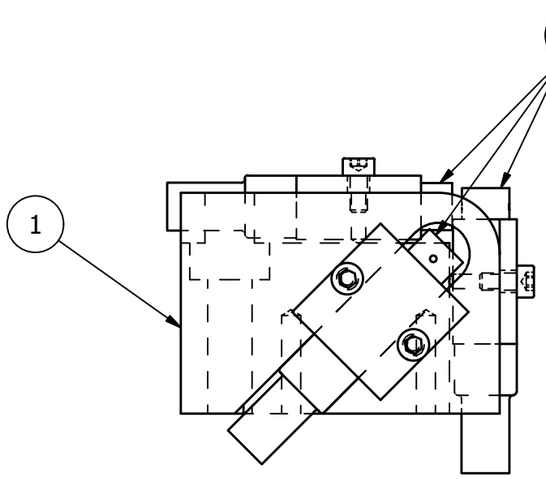
SIZE	DRAWING NUMBER	REV
A	SA572–S4	G

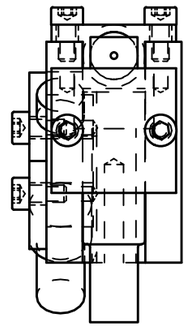
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REVISED ITEM #1 PART #472-3858 - T1 ACCEL MOUNT	8/31/2017	DW



SCALE 1 : 1







ITE	QTY	PART NUMBER	DESCRIPTION
3	6	5000068	SCREW, SHCS M1.4 - 0.3 X 3 LG.
2	3	SA572-S4	UNIAXIAL PIEZORESISTIVE ACCELEROMETER
1	1	472-3858	T1 ACCEL. MOUNT

A

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5'	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

		PROJECT NO.:		
472-3600	1	MATERIAL:	DRAWN BY: Dave Walker	DATE: 9/9/2014
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER:	DATE:

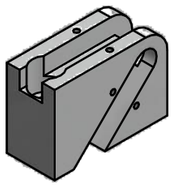
DESCRIPTION: T1 ACCEL. MOUNT ASSEMBLY

SIZE:	SHEET	DRAWING NO.:	REV:
A3	1 OF 1	472-3857	A

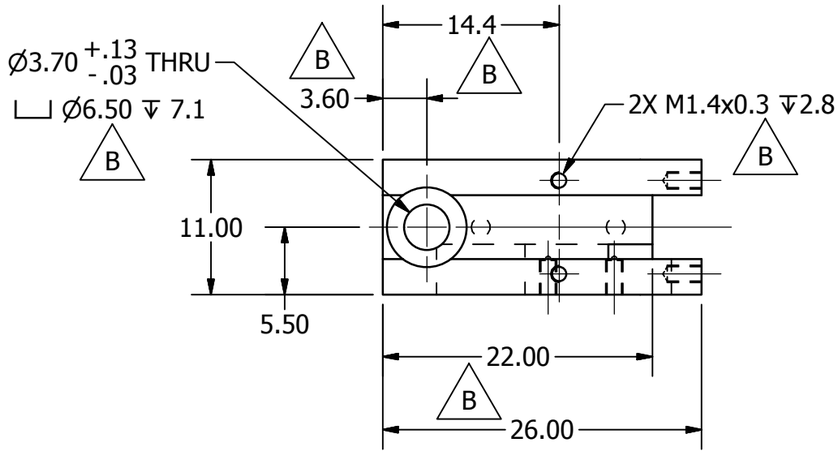
SCALE: 2:1

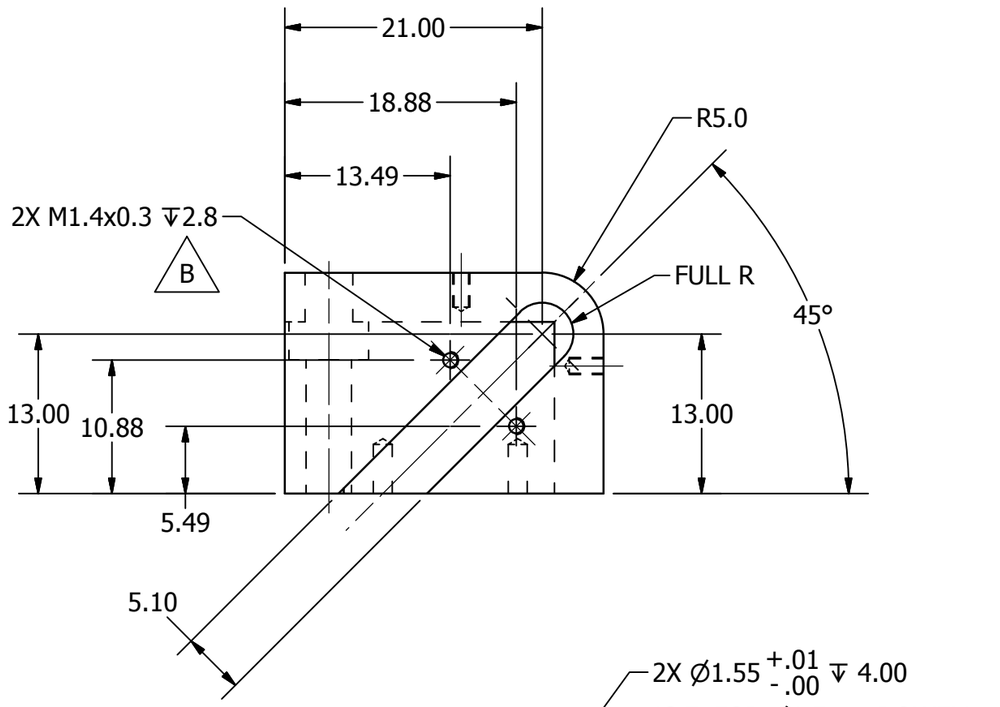
472-3857.iam

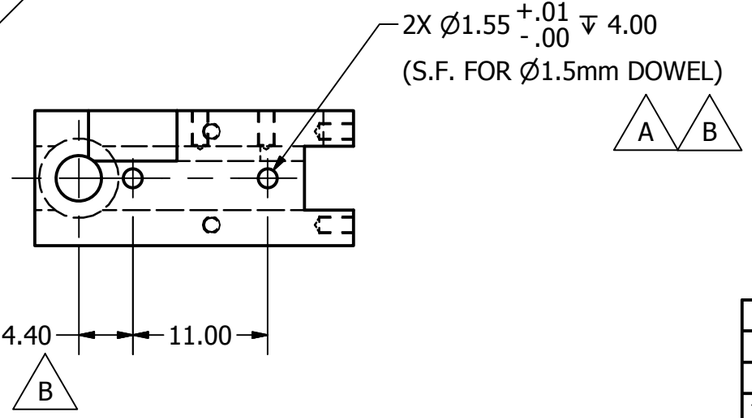
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	ADDED HOLES 2X Ø1.55 +.01/-.00 ↧6.0 (S.F. FOR Ø1.5mm DOWEL)	8/31/2017	DW
	B	DIMENSION 14.4 WAS 14.50, 3.6 WAS 4.00, 22.00 WAS 21.90; 4.40 WAS 5.00, 14.00 WAS 13.90, 2.90 WAS 2.95, 5.20 WAS 5.10; ADDED DIMENSION 7.6; HOLE DIMENSION Ø3.70 +.13/-.03 THRU ⌴ Ø6.50 ↧ 7.1 WAS DIMENSION Ø3.60 THRU ⌴ Ø6.50 ↧ 7.1, 2X M1.4x0.3 ↧2.8 WAS 2X M1.4x0.3 ↧3.8, AND 2X Ø1.55 +.01/-.00 ↧4.00 (S.F. FOR Ø1.5MM DOWEL) WAS 2X Ø1.55 +.01/-.00 ↧6.00 (S.F. FOR Ø1.5MM DOWEL)	2/26/2018	DW

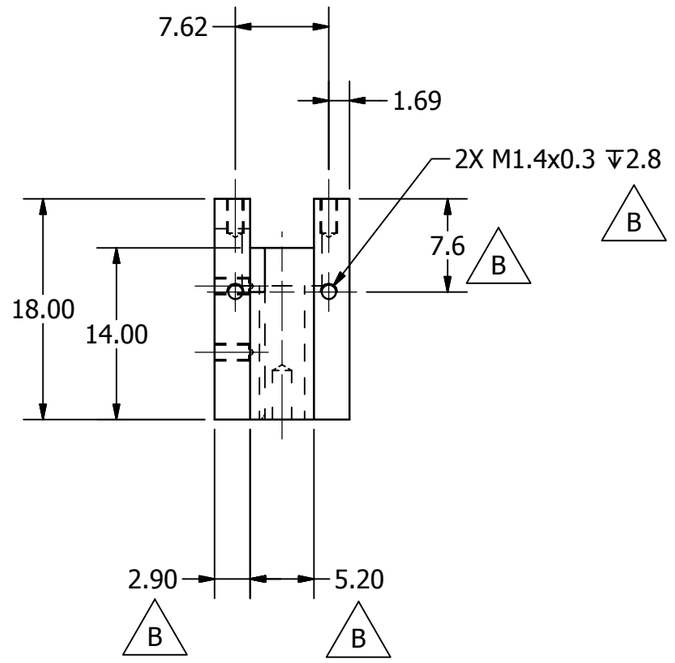


SCALE 1 : 1





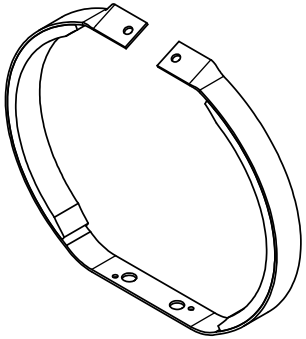




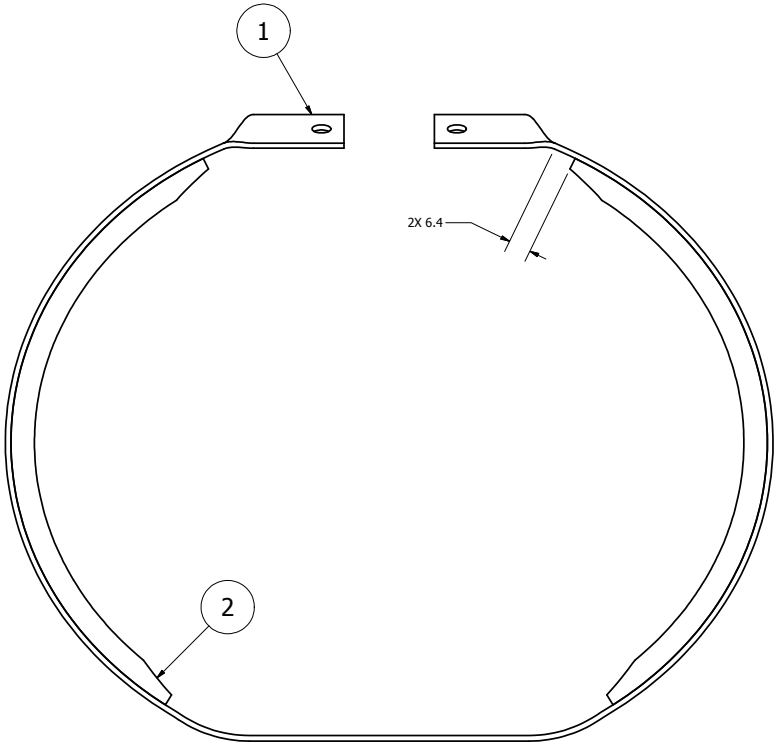
		PROJECT NO.:	DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES — UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
472-3857	1	MATERIAL: Aluminum 6061	DRAWN BY: Dave Walker	DATE: 9/9/2014	DESCRIPTION: T1 ACCEL. MOUNT
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 · SHEET: 1 OF 1 · DRAWING NO.: 472-3858 · REV: B
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER:	DATE:	SCALE: 2:1

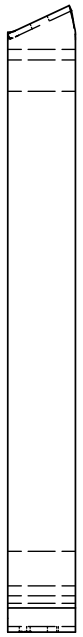
T1 Accel Mount.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM310 R2 AND CONVERTED TO METRIC FOR THOR-M	9/20/2011	TKN



ISO VIEW
SCALE 1:2





NOTES:

1. THE RIB IS ASSEMBLED BY VACUUM BONDING THE SPRING STEEL TO THE DAMPING MATERIAL USING HYSOL 9430 EPOXY ADHESIVE.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	472-3312	THORAX ELLIPTICAL RIB #1 - DAMPING MATERIAL
1	1	472-3311	THORAX ELLIPTICAL RIB #1 - STEEL

Parts List

472-3000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6

REMOVE BURRS & BREAK SHARP EDGES

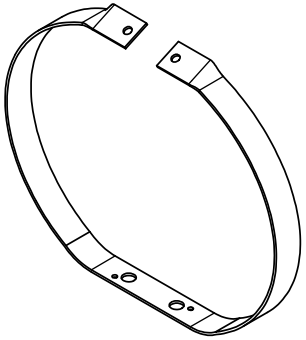
PROJECT NO.:
MATERIAL:
HEAT TREAT:
WEIGHT:
DRAWN BY: Thanh — DATE: 9/20/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/17/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

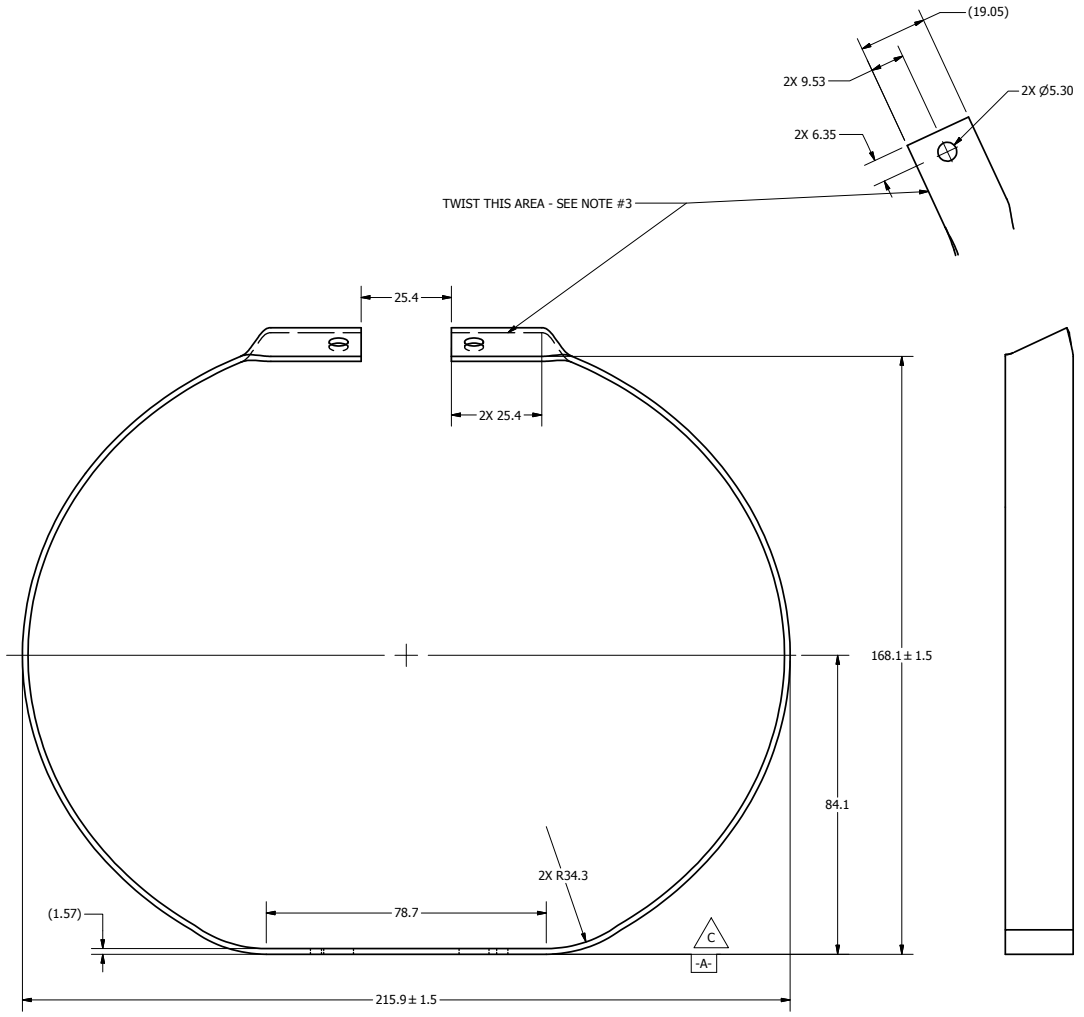
DESCRIPTION: THORAX ELLIPTICAL RIB #1 - ASSEMBLY

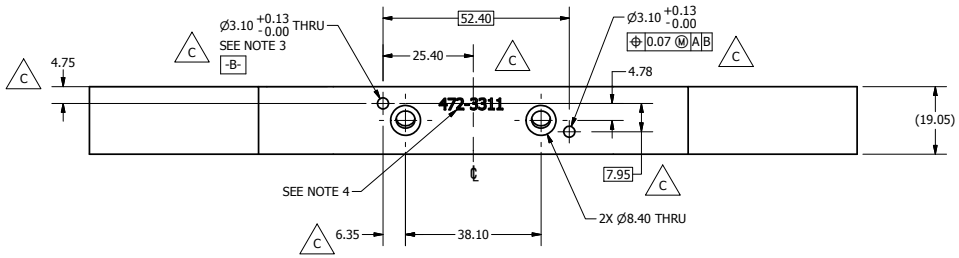
SIZE: A2 | SHEET: 1 OF 1 | SCALE: FULL | DRAWING NO.: 472-3310 | REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RUNUMBER FROM T1TXM311 R3 AND CONVERTED TO METRIC FOR THOR-M	9/21/2011	TKN
	B	FINISH E-COAT WAS BLK. OXIDE; REMOVE NOTES 6,7; ADD HEAT TREAT TO TITLE BLOCK	5/8/2012	BK
	C	3.10 WAS 3.03; REMOVE NOTE 5; ADD DATUM A,B, BASIC DIMENSIONS, AND POSITIONAL TOLERANCE; DIMENSION HOLES FROM DATUM B; ADD 4.75, 25.40	8/14/2012	BK



ISO VIEW
SCALE 1 : 2





NOTES:

1. MAKE RIB FROM 1070 ANNEALED SPRING STEEL 1.57MM THICK X 19.05MM WIDE.
2. ELLIPTICAL SHAPE SEMI-AXIS OUTSIDE DIMENSIONS ARE: X:107.95MM Y:93.22MM
3. AFTER RIB IS FORMED - PRIOR TO HEAT-TREAT, ORIENT THE RIB SO THAT THE HOLE PATTERN IS AS SHOWN.
   THEN TWIST THE RIB AT THE 25.4MM FLAT AREA BY BENDING THE BOTTOM OUTWARD BY 25°.
4. ENGRAVE DWG. #472-3311 AT THE LOCATION SPECIFIED.

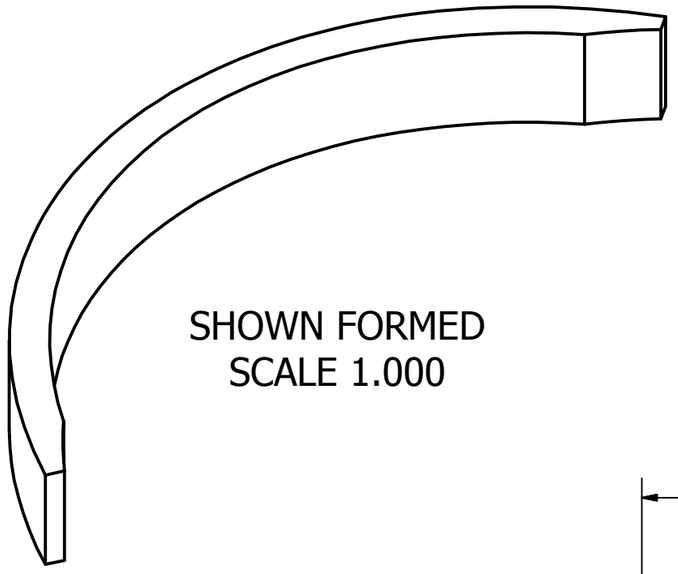
DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION
TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.3, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

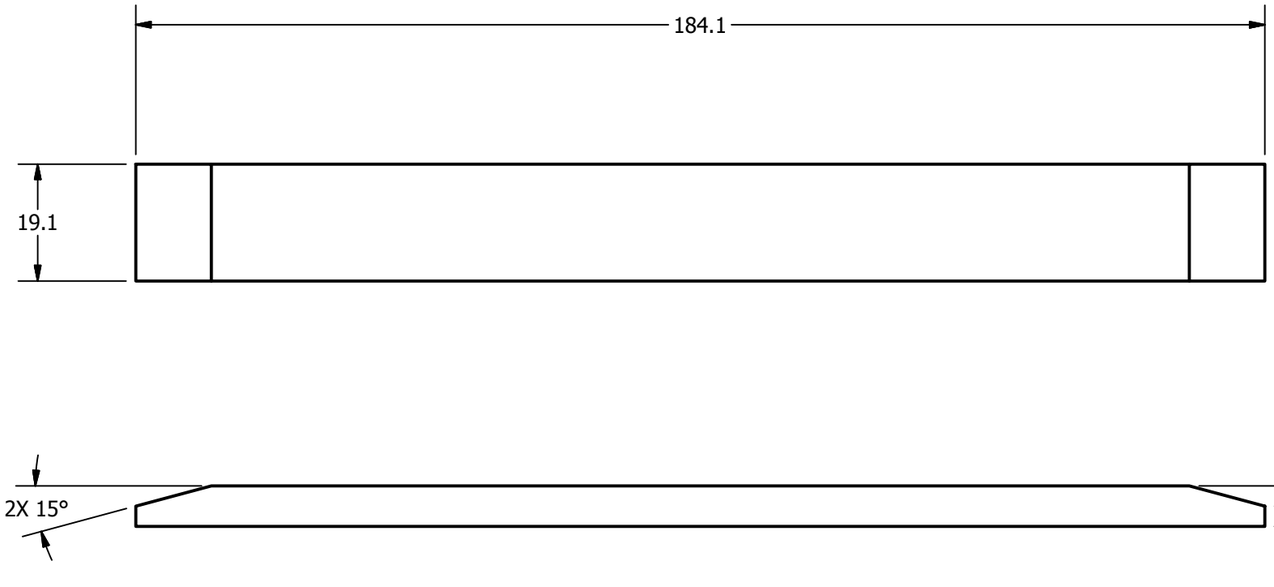
PROJECT NO.:			
472-3310	1	MATERIAL: 1070 SPRING STEEL	DRAWN BY: Thanh — DATE: 9/21/2011
NEXT ASSEMBLY	QTY	BEND RADIUS: Rc 43-47	CHECKED BY: — DATE:
TOTAL QTY IN DUMMY	1	FINISH: E-COAT	ENGINEER: J. WANG — DATE: 1/17/2012

DESCRIPTION: THORAX ELLIPTICAL RIB #1 - STEEL
SIZE: A2 — SHEET 1 OF 1 — SCALE: FULL — DRAWING NO.: 472-3311 — REV: C

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM312 R2 AND CONVERTED TO METRIC FOR THOR-M	9/20/2011	TKN

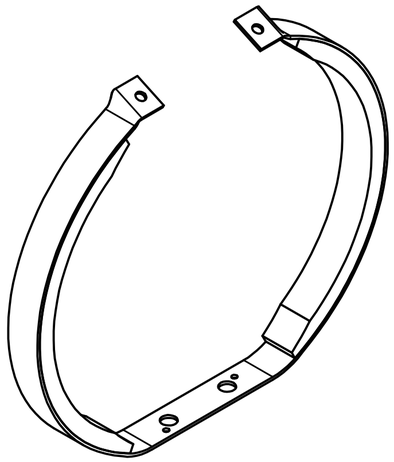


SHOWN FORMED
SCALE 1.000

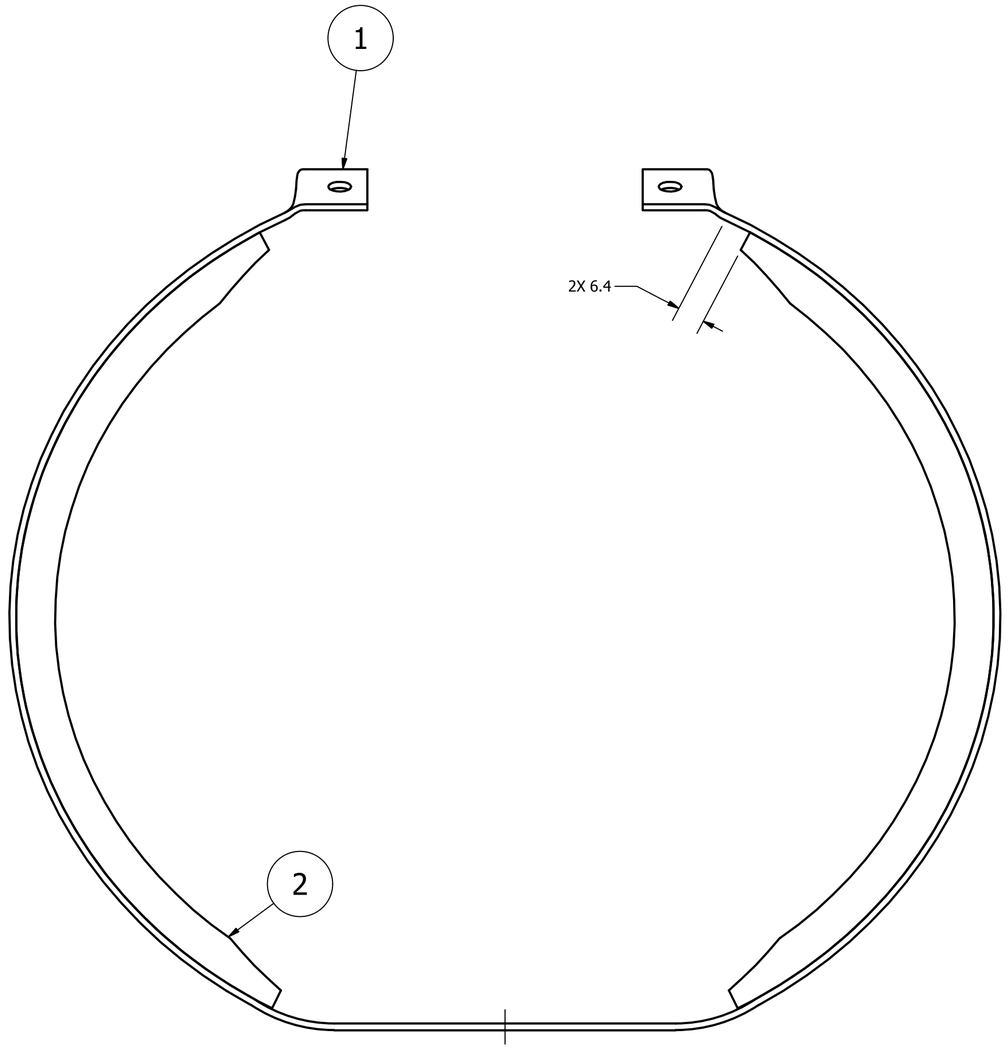


		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: THORAX ELLIPTICAL RIB #1 - DAMPING MATERIAL	
		PROJECT NO.:			
472-3310	2	MATERIAL: ISODAMP CN-62	DRAWN BY: Thanh	DATE: 9/20/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-3312 REV: A
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/17/2012	SCALE: FULL

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM320 R1 AND CONVERTED TO METRIC FOR THOR-M. MODIFY DAMPING COMPONENT BY INCREASE THE LENGTH FROM 209.6 TO 214.1 (TO MAINTAIN THE SAME SPACING BETWEEN LEFT AND RIGHT DAMPING MATERIAL) & REDUCE THICKNESS FROM 13.2 TO 9.0	9/20/2011	TKN



ISO VIEW
SCALE 1 : 2



NOTES:

1. THE RIB IS ASSEMBLED BY VACUUM BONDING THE SPRING STEEL TO THE DAMPING MATERIAL USING HYSOL 9430 EPOXY ADHESIVE.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	472-3322	THORAX ELLIPTICAL RIB #2 - DAMPING MATERIAL
1	1	472-3321	THORAX ELLIPTICAL RIB #2 - STEEL

Parts List

472-3000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01
ANGLES ±0.5° FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

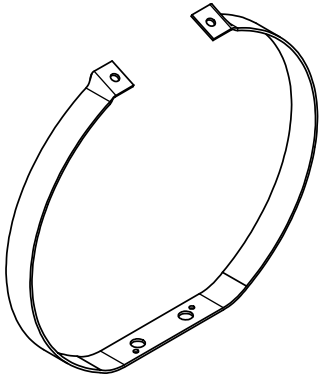
PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:
DRAWN BY: Thanh — DATE: 9/20/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/17/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

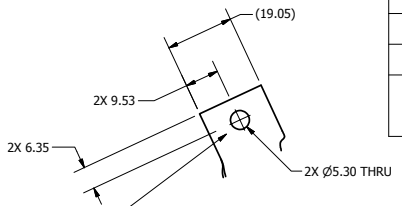
DESCRIPTION: THORAX ELLIPTICAL RIB #2 - ASSEMBLY

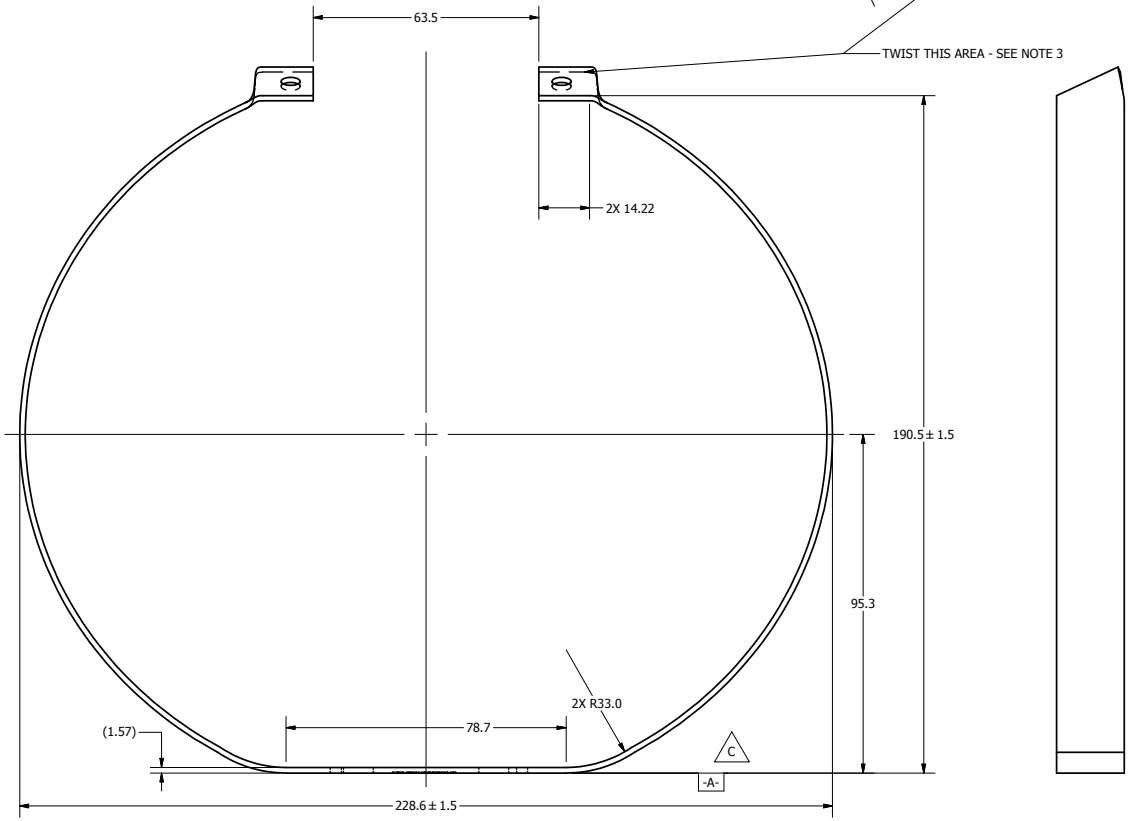
SIZE: A2 | SHEET: 1 OF 1 | SCALE: FULL | DRAWING NO.: 472-3320 | REV: A

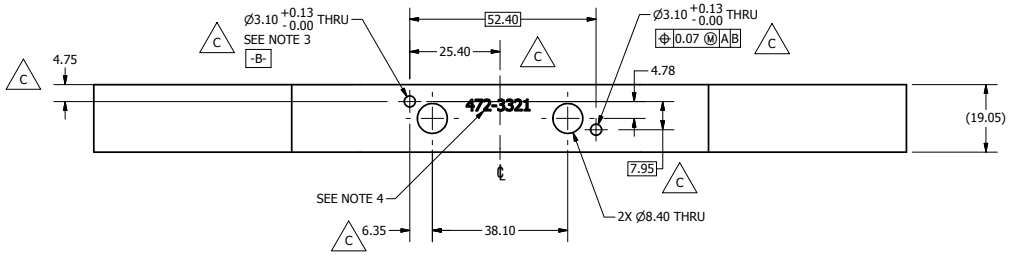
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM321 R3 AND CONVERTED TO METRIC FOR THOR-M	9/21/2011	TKN
	B	FINISH E-COAT WAS BLK. OXIDE; REMOVE NOTES 6,7; ADD HEAT TREAT TO TITLE BLOCK	5/8/2012	BK
	C	3.10 WAS 3.03; REMOVE NOTE 5; ADD DATUM A,B, BASIC DIMENSIONS, AND POSITIONAL TOLERANCE; DIMENSION HOLES FROM DATUM B; ADD 4.75, 25.40	8/14/2012	BK



ISO VIEW
SCALE 1 : 2







NOTES:

1. MAKE RIB FROM 1070 ANNEALED SPRING STEEL 1.57MM THICK X 19.05MM WIDE.
2. ELLIPTICAL SHAPE SEMI-AXIS OUTSIDE DIMENSIONS ARE: X:114.30MM Y:104.14MM
3. AFTER RIB IS FORMED - PRIOR TO HEAT-TREAT, ORIENT THE RIB SO THAT THE HOLE PATTERN IS AS SHOWN.
   THEN TWIST THE RIB AT THE 14.2MM FLAT AREA BY BENDING THE BOTTOM OUTWARD BY 25°.
4. ENGRAVE DWG. #472-3321 AT THE LOCATION SPECIFIED.

472-3320	1	MATERIAL: 1070 SPRING STEEL	
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 43-47	
TOTAL QTY IN DUMMY	1	FINISH: E-COAT	

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X.X ±0.3, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES

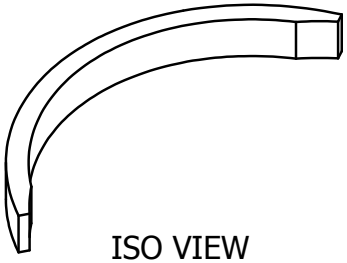
PROJECT NO.:	
DRAWN BY: Thanh	DATE: 9/21/2011
CHECKED BY:	DATE:
ENGINEER: J. WANG	DATE: 1/17/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

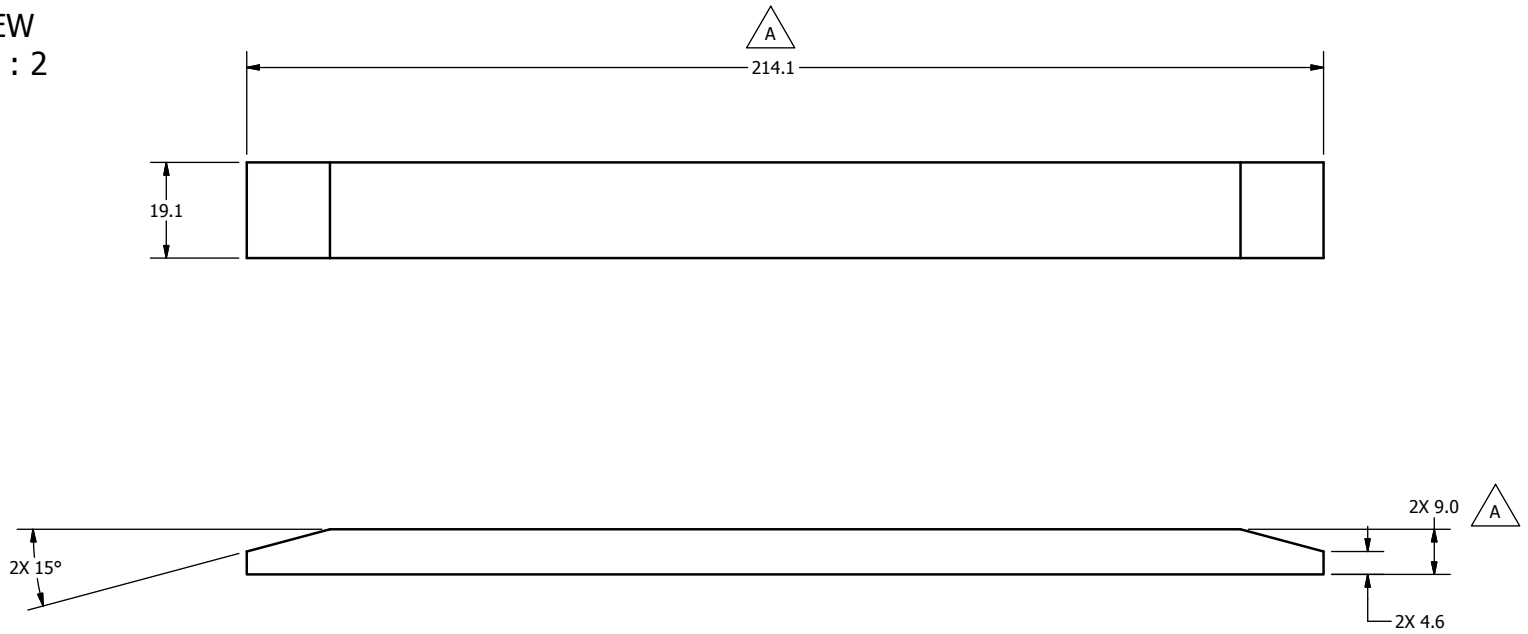
DESCRIPTION: THORAX ELLIPTICAL RIB #2 - STEEL

SIZE: A2 | SHEET: 1 OF 1 | SCALE: FULL | DRAWING NO.: 472-3321 | REV: C

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM322 R1 AND CONVERTED TO METRIC FOR THOR-M. INCREASE THE LENGTH FROM 209.6 TO 214.1 TO MAINTAIN THE SAME SPACING BETWEEN LEFT AND RIGHT DAMPING MATERIAL & REDUCE THICKNESS FROM 13.2 TO 9.0	9/20/2011	TKN

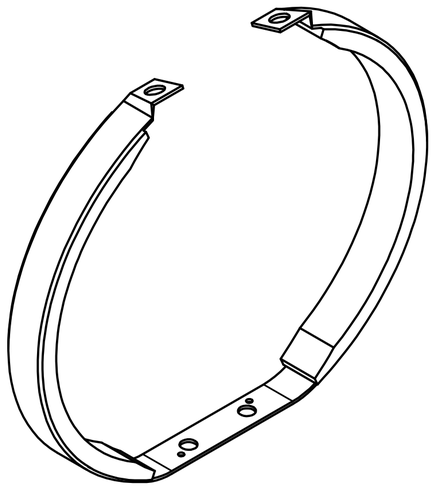


ISO VIEW
SCALE 1 : 2

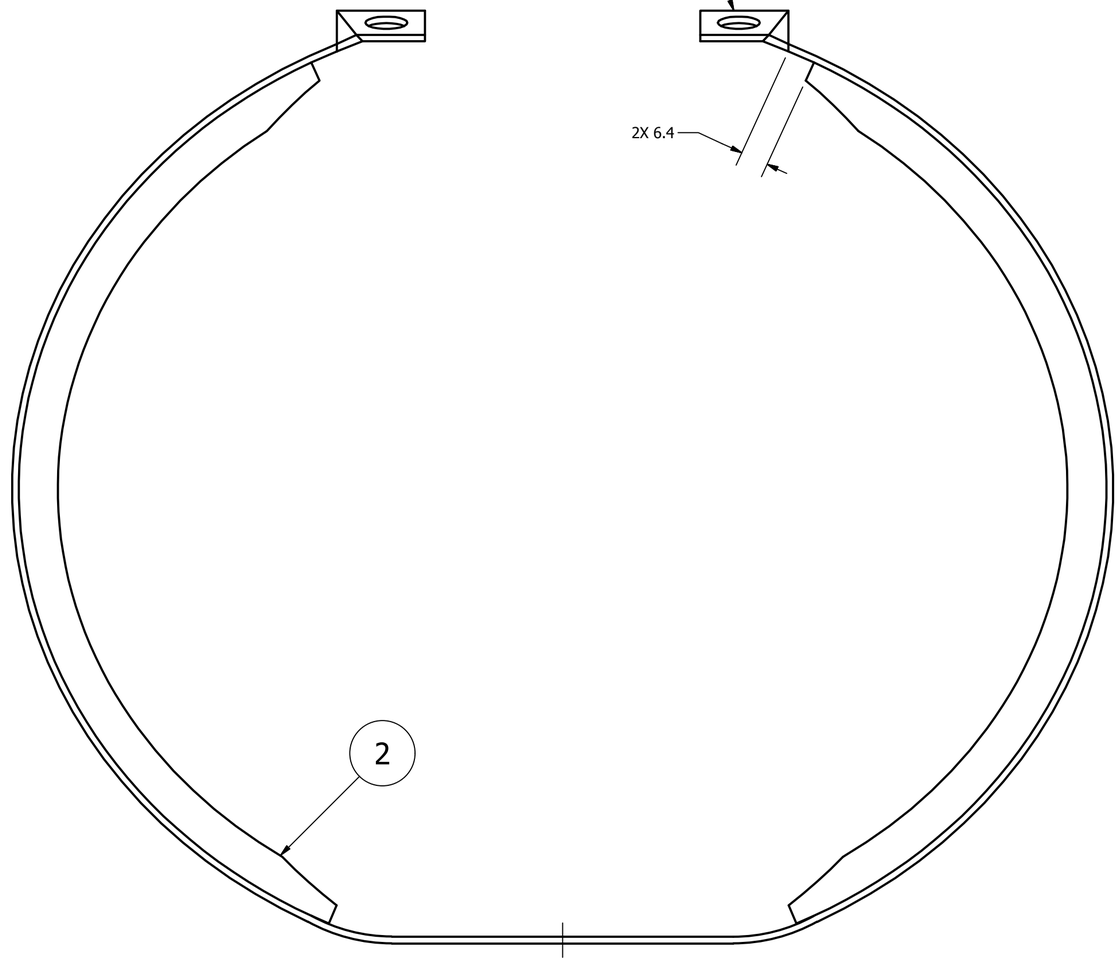


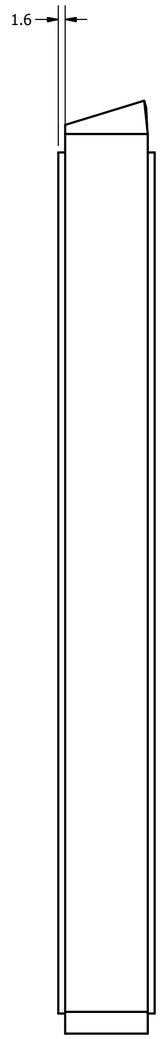
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: THORAX ELLIPTICAL RIB #2 - DAMPING MATERIAL		
PROJECT NO.:					
472-3320	2	MATERIAL: ISODAMP CN-62	DRAWN BY: Thanh	DATE: 9/20/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/17/2012	SCALE: FULL
					DRAWING NO.: 472-3322 REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER T1TXM330 RBO AND CONVERTED TO METRIC FOR THOR-M. MODIFY DAMPING COMPONENT BY INCREASE THE LENGTH FROM 241.3 TO 246.1 (TO MAINTAIN THE SAME SPACING BETWEEN LEFT AND RIGHT DAMPING MATERIAL) & REDUCE THICKNESS FROM 13.2 TO 9.0	9/20/2011	TKN



ISO VIEW
SCALE 1 : 2





NOTES:

1. THE RIB IS ASSEMBLED BY VACUUM BONDING THE SPRING STEEL TO THE DAMPING MATERIAL USING HYSOL 9430 EPOXY ADHESIVE.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	472-3332	THORAX ELLIPTICAL RIB #3 - DAMPING MATERIAL
1	1	472-3331	THORAX ELLIPTICAL RIB #3 - STEEL

Parts List

472-3000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5° 1.6
X.XX ± 0.1
X.XXX ± 0.01
REMOVE BURRS & BREAK SHARP EDGES

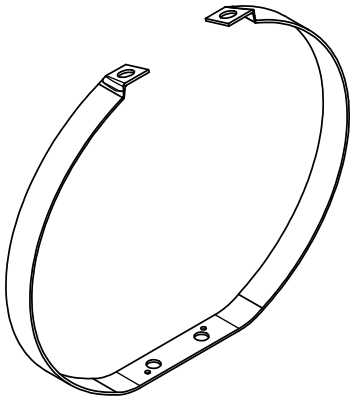
PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:
DRAWN BY: Thanh DATE: 9/20/2011
CHECKED BY: DATE:
ENGINEER: J. WANG DATE: 1/17/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

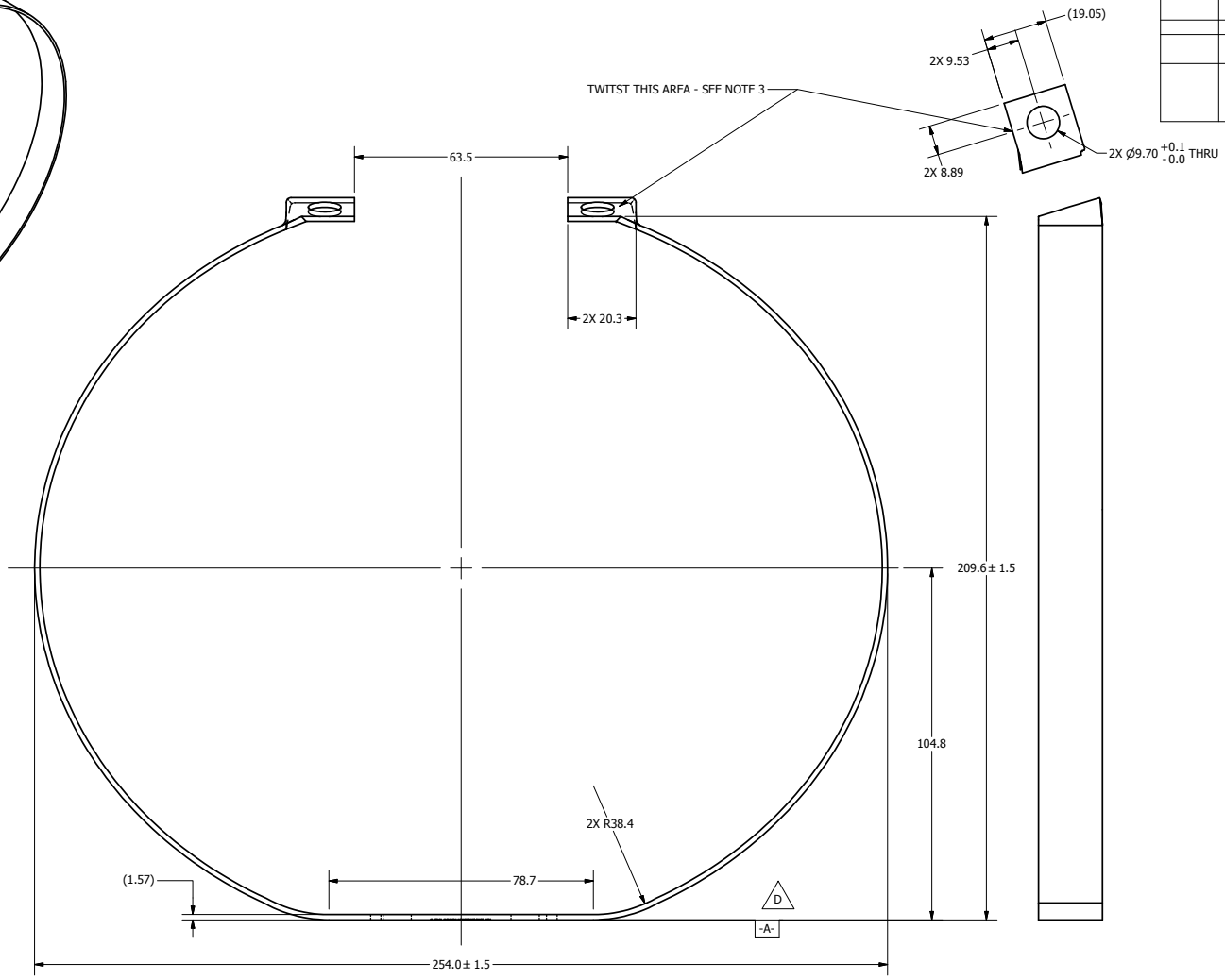
DESCRIPTION: THORAX ELLIPTICAL RIB #3 - ASSEMBLY

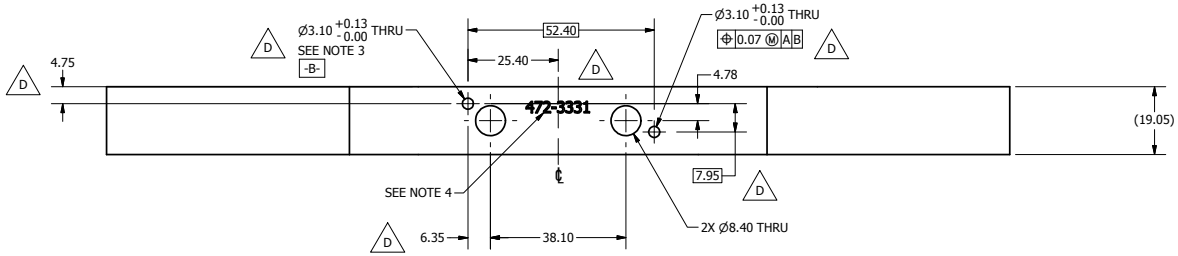
SIZE: A2 | SHEET: 1 OF 1 | SCALE: FULL | DRAWING NO.: 472-3330 | REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM331 R4 AND CONVERTED TO METRIC FOR THOR-M	9/21/2011	TKN
	B	112.52 WAS 125.52	4/26/2012	BK
	C	FINISH E-COAT WAS BLK. OXIDE; REMOVE NOTES 6,7; ADD HEAT TREAT TO TITLE BLOCK	5/8/2012	BK
	D	3.10 WAS 3.03; REMOVE NOTE 5; ADD DATUM A,B, BASIC DIMENSIONS, AND POSITIONAL TOLERANCE; DIMENSION HOLES FROM DATUM B; ADD 4.75, 25.40	8/14/2012	BK



ISO VIEW
SCALE 1 : 2





NOTES: D

1. MAKE RIB FROM 1070 ANNEALED SPRING STEEL 1.57MM THICK X 19.05MM WIDE.
2. ELLIPTICAL SHAPE SEMI-AXIS OUTSIDE DIMENSIONS ARE: X:127.00MM Y:112.52MM B
3. AFTER RIB IS FORMED - PRIOR TO HEAT-TREAT, ORIENT THE RIB SO THAT THE HOLE PATTERN IS AS SHOWN.
   THEN TWIST THE RIB AT THE 20.3MM FLAT AREA BY BENDING THE BOTTOM OUTWARD BY 17°.
4. ENGRAVE DWG. #472-3331 AT THE LOCATION SPECIFIED.

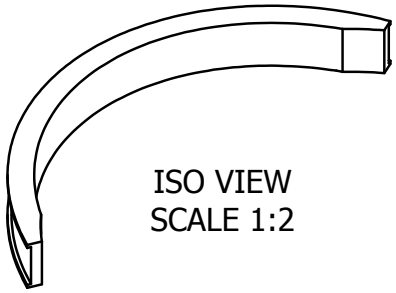
		DO NOT SCALE DRAWING	TOLERANCES
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH
		PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES
472-3330	1	MATERIAL: 1070 SPRING STEEL	DRAWN BY: Thanh; DATE: 9/21/2011
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 43-47	CHECKED BY: ; DATE:
TOTAL QTY IN DUMMY	1	FINISH: E-COAT	ENGINEER: J. WANG; DATE: 1/17/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

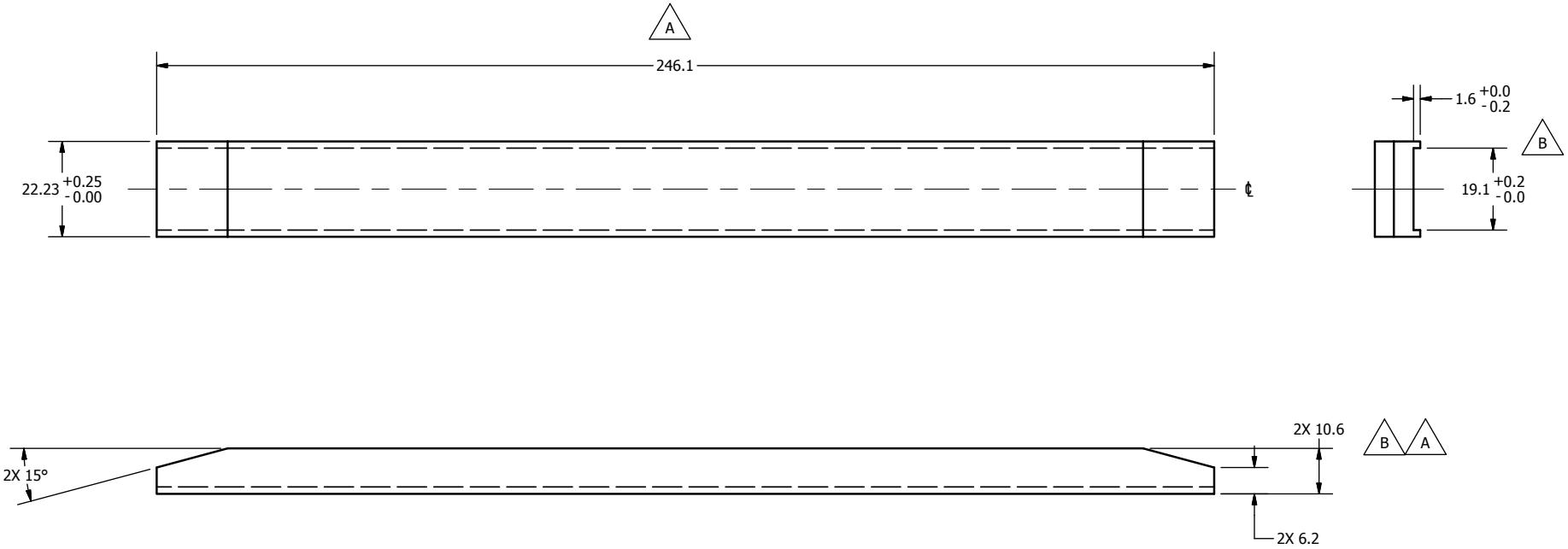
DESCRIPTION: THORAX ELLIPTICAL RIB #3 - STEEL

SIZE: A2; SHEET 1 OF 1; SCALE: FULL; DRAWING NO.: 472-3331; REV: D

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER T1TXM332 RB0 AND CONVERTED TO METRIC FOR THOR-M. INCREASE THE LENGTH FROM 241.3 TO 246.1 TO MAINTAIN THE SAME SPACING BETWEEN LEFT AND RIGHT DAMPING MATERIAL & REDUCE THICKNESS FROM 13.2 TO 9.0	9/20/2011	TKN
	B	ADD 1.6 X 19.1 GROOVE, CHANGE 9.0 TO 10.6 TO COMPENSATE DAMPING THICKNESS.	1/30/2011	ZJW

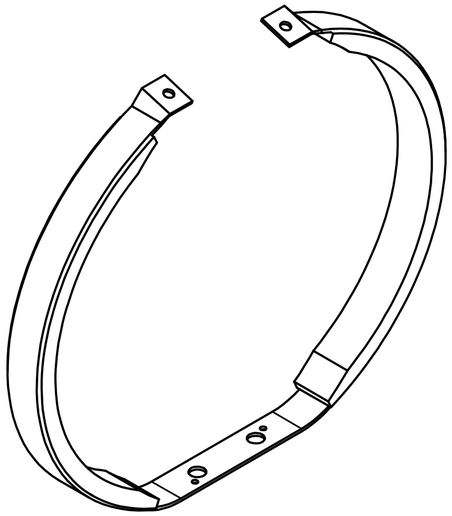


ISO VIEW
SCALE 1:2

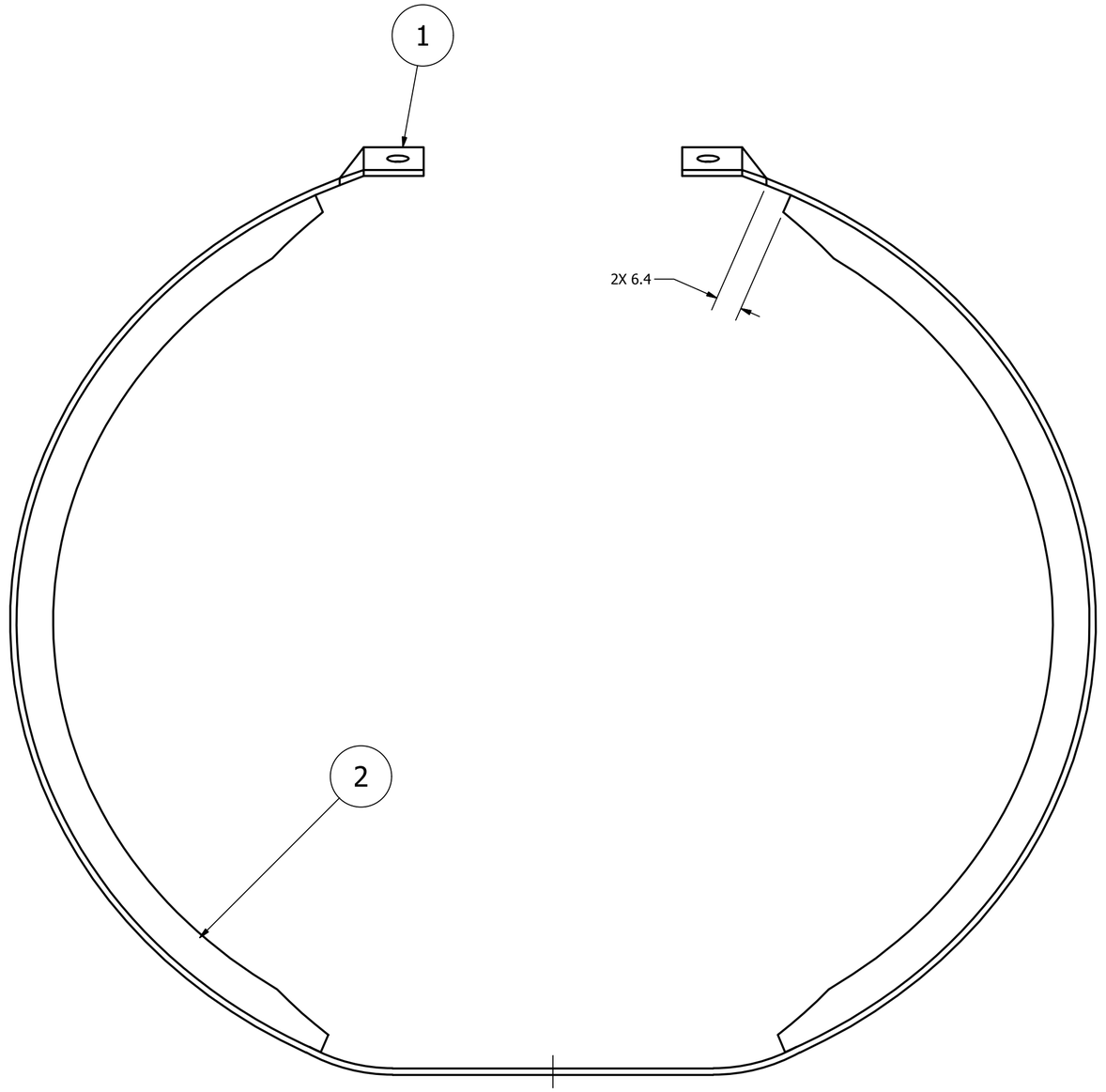


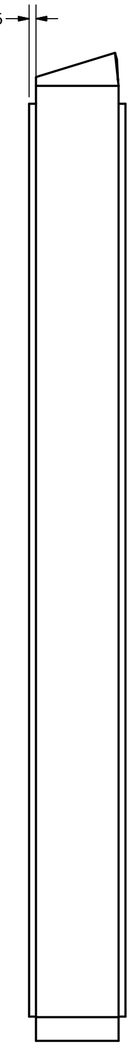
DO NOT SCALE DRAWING		TOLERANCES		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES		DESCRIPTION: THORAX ELLIPTICAL RIB #3 - DAMPING MATERIAL	
PROJECT NO.:		DRAWN BY: Thanh	DATE: 9/20/2011		
472-3330	2	MATERIAL: ISODAMP CN-62		SIZE: A3	SHEET 1 OF 1
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	DRAWING NO.: 472-3332
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/17/2012	SCALE: FULL
					REV: B

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM340 RBO AND CONVERTED TO METRIC FOR THOR-M. MODIFY DAMPING COMPONENT BY INCREASE THE LENGTH FROM 257.3 TO 262.1 (TO MAINTAIN THE SAME SPACING BETWEEN LEFT AND RIGHT DAMPING MATERIAL) & REDUCE THICKNESS FROM 13.2 TO 9.0	9/20/2011	TKN



ISO VIEW
SCALE 1 : 2





NOTES:

1. THE RIB IS ASSEMBLED BY VACUUM BONDING THE SPRING STEEL TO THE DAMPING MATERIAL USING HYSOL 9430 EPOXY ADHESIVE.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	472-3342	THORAX ELLIPTICAL RIB #4 - DAMPING MATERIAL
1	1	472-3341	THORAX ELLIPTICAL RIB #4 - STEEL

Parts List

472-3000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION
PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

TOLERANCES
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01
ANGLES ± 0.5
FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

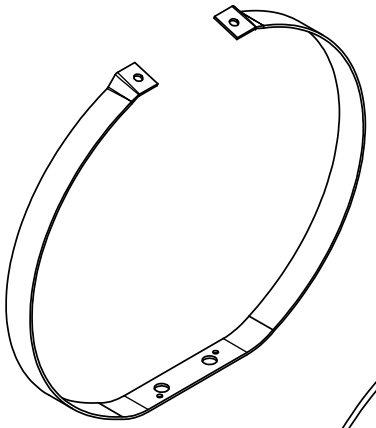
DRAWN BY: Thanh — DATE: 9/20/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/17/2013

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

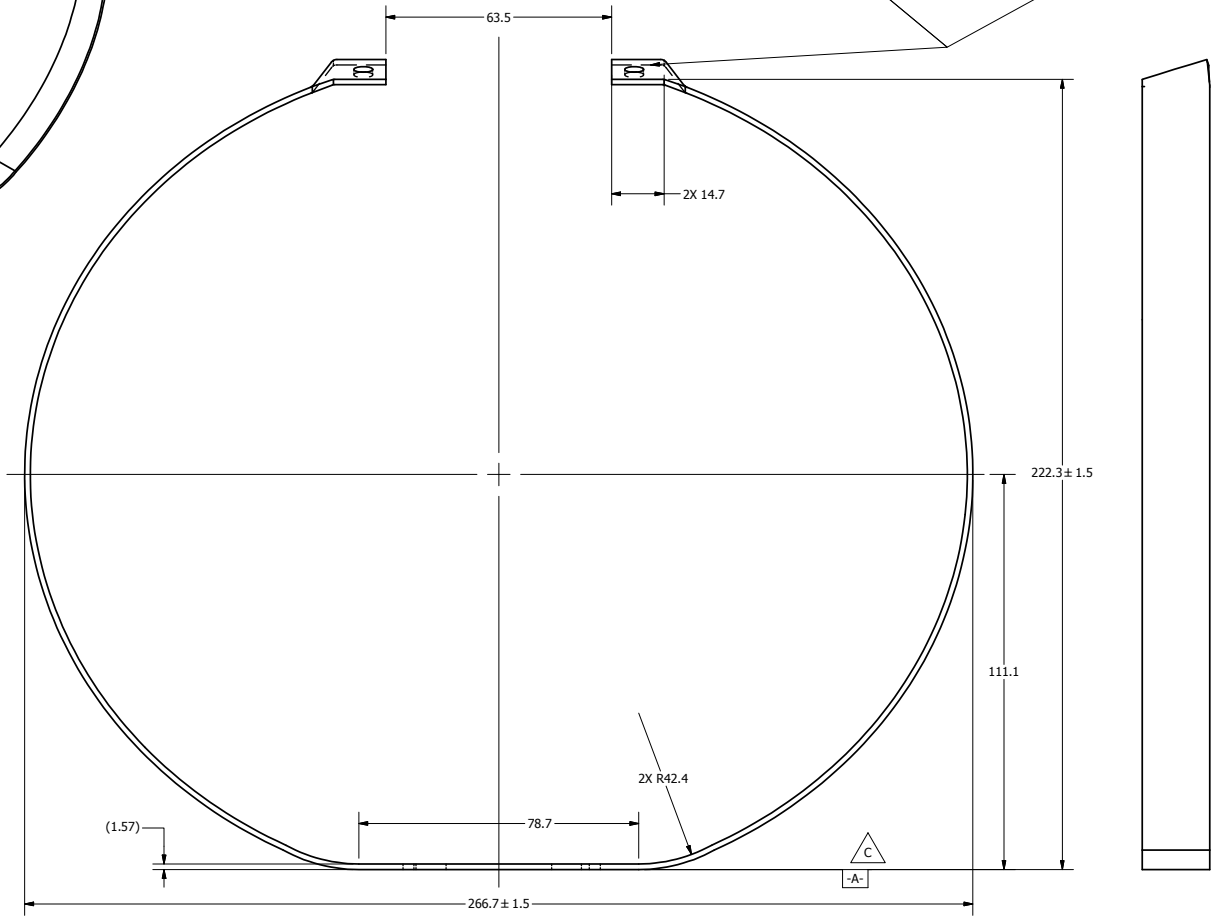
DESCRIPTION: THORAX ELLIPTICAL RIB #4 - ASSEMBLY

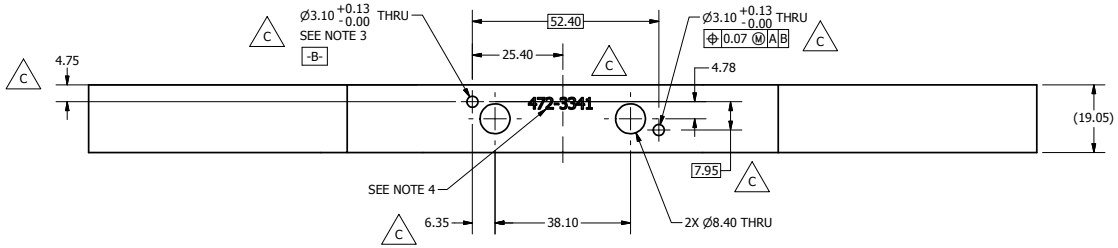
SIZE: A2 | SHEET 1 OF 1 | SCALE: FULL | DRAWING NO.: 472-3340 | REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM341 R3 AND CONVERTED TO METRIC FOR THOR-M	9/21/2011	TKN
	B	FINISH E-COAT WAS BLK. OXIDE; REMOVE NOTES 6,7; ADD HEAT TREAT TO TITLE BLOCK	5/8/2012	BK
	C	3.10 WAS 3.03; REMOVE NOTE 5; ADD DATUM A,B, BASIC DIMENSIONS, AND POSITIONAL TOLERANCE; DIMENSION HOLES FROM DATUM B; ADD 4.75, 25.40	8/14/2012	BK



ISO VIEW
SCALE 1 : 2





NOTES:

1. MAKE RIB FROM 1070 ANNEALED SPRING STEEL 1.57MM THICK X 19.05MM WIDE.
2. ELLIPTICAL SHAPE SEMI-AXIS OUTSIDE DIMENSIONS ARE: X:133.35MM Y:118.62MM
3. AFTER RIB IS FORMED - PRIOR TO HEAT-TREAT, ORIENT THE RIB SO THAT THE HOLE PATTERN IS AS SHOWN.
   THEN TWIST THE RIB AT THE 14.7MM FLAT AREA BY BENDING THE BOTTOM OUTWARD BY 17°.
4. ENGRAVE DWG. #472-3341 AT THE LOCATION SPECIFIED.

472-3340	1	MATERIAL: 1070 SPRING STEEL	
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 43-47	
TOTAL QTY IN DUMMY	1	FINISH: E-COAT	

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6

REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:

DRAWN BY: Thanh — DATE: 9/21/2011

CHECKED BY: — DATE:

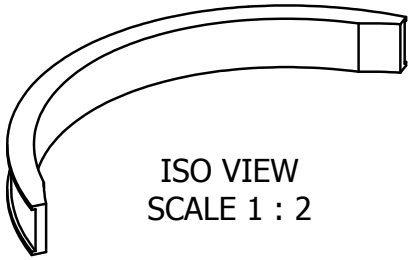
ENGINEER: J. WANG — DATE: 1/17/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

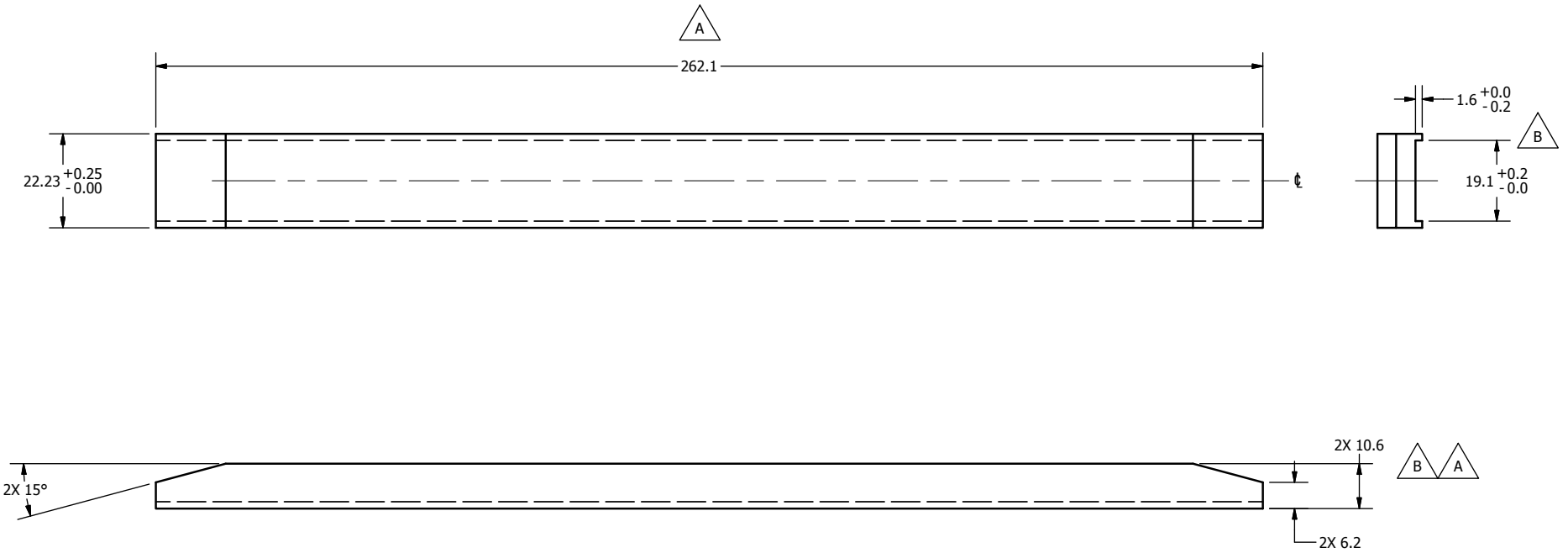
DESCRIPTION: THORAX ELLIPTICAL RIB #4 - STEEL

SIZE: A2 | SHEET 1 OF 1 | SCALE: FULL | DRAWING NO.: 472-3341 | REV: C

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM342 R BO AND CONVERTED TO METRIC FOR THOR-M. INCREASE THE LENGTH FROM 257.3 TO 262.1 TO MAINTAIN THE SAME SPACING BETWEEN LEFT AND RIGHT DAMPING MATERIAL & REDUCE THICKNESS FROM 13.2 TO 9.0	9/20/2011	TKN
	B	ADD 1.6 X 19.1 GROOVE, CHANGE 9.0 TO 10.6 TO COMPENSATE DAMPING THICKNESS.	1/30/2012	ZJW

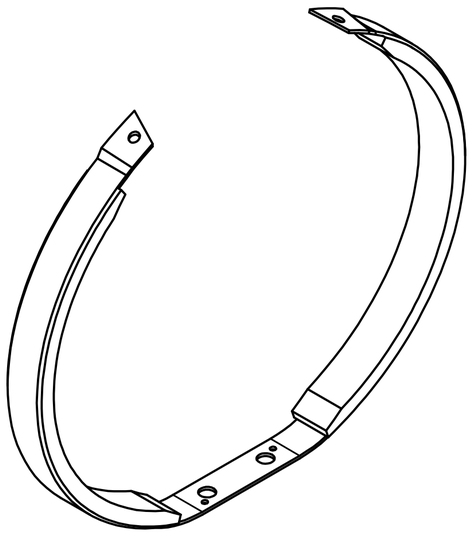


ISO VIEW
SCALE 1 : 2

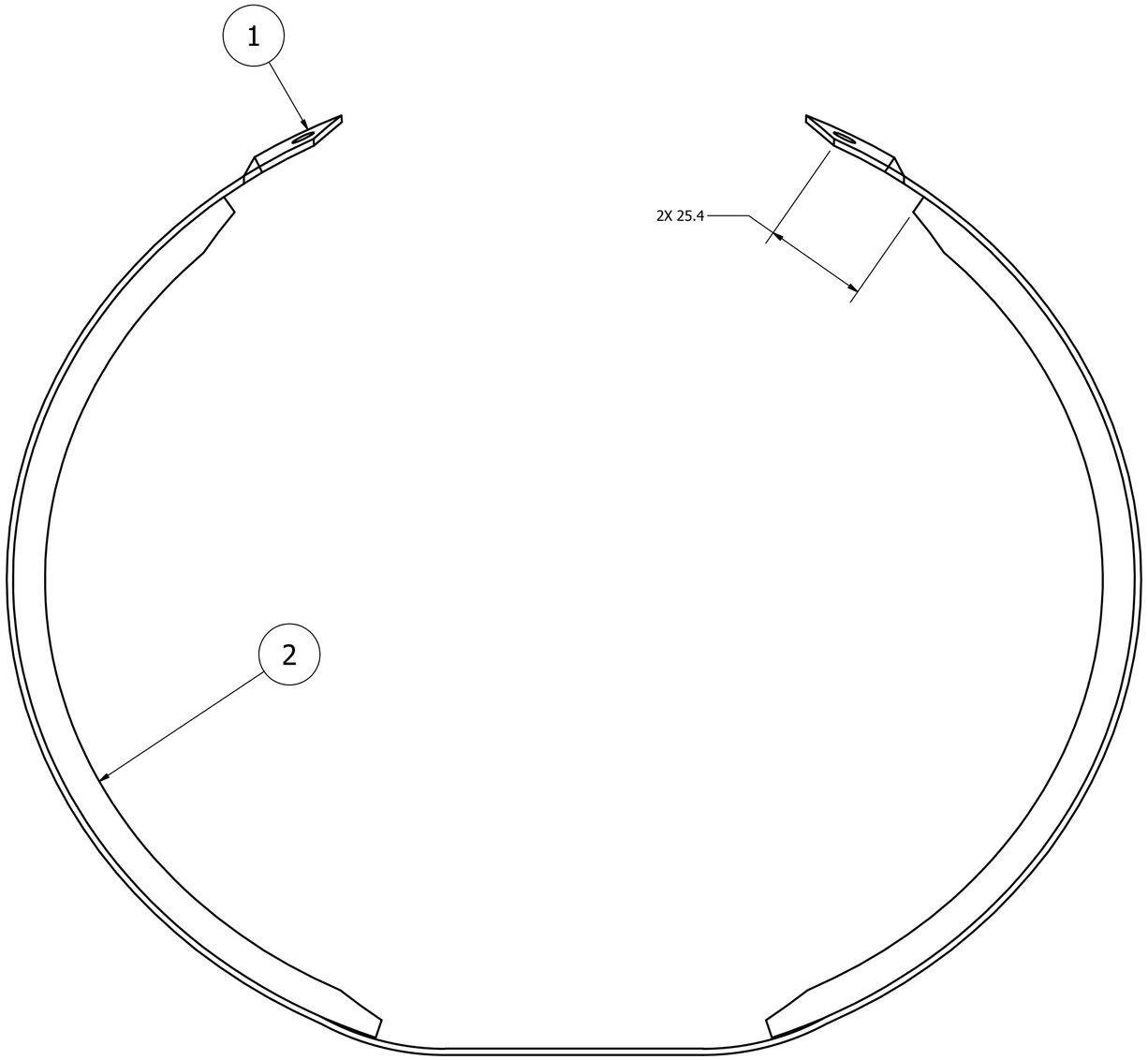


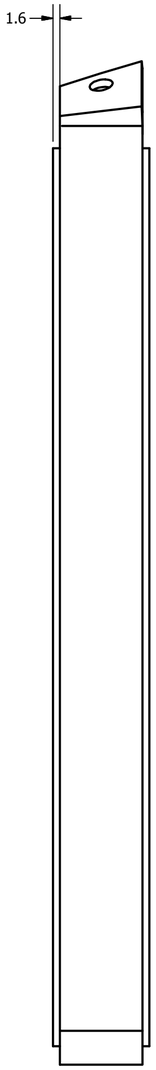
DO NOT SCALE DRAWING		TOLERANCES		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES		DESCRIPTION: THORAX ELLIPTICAL RIB #4 - DAMPING MATERIAL	
PROJECT NO.:		DRAWN BY: Thanh	DATE: 9/20/2011		
472-3340	2	MATERIAL: ISODAMP CN-62		SIZE: A3	SHEET 1 OF 1
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	DRAWING NO.: 472-3342 REV: B
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/17/2012	SCALE: FULL

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM350 RB0 AND CONVERTED TO METRIC FOR THOR-M	9/20/2011	TKN



ISO VIEW
SCALE 1 : 2





NOTES:

1. THE RIB IS ASSEMBLED BY VACUUM BONDING THE SPRING STEEL TO THE DAMPING MATERIAL USING HYSOL 9430 EPOXY ADHESIVE.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	472-3352	THORAX ELLIPTICAL RIB #5 - DAMPING MATERIAL
1	1	472-3351	THORAX ELLIPTICAL RIB #5 - STEEL

Parts List

472-3000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01
ANGLES ± 0.5
FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

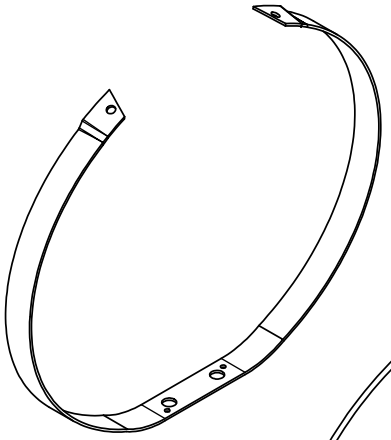
DRAWN BY: Thanh — DATE: 9/20/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/17/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

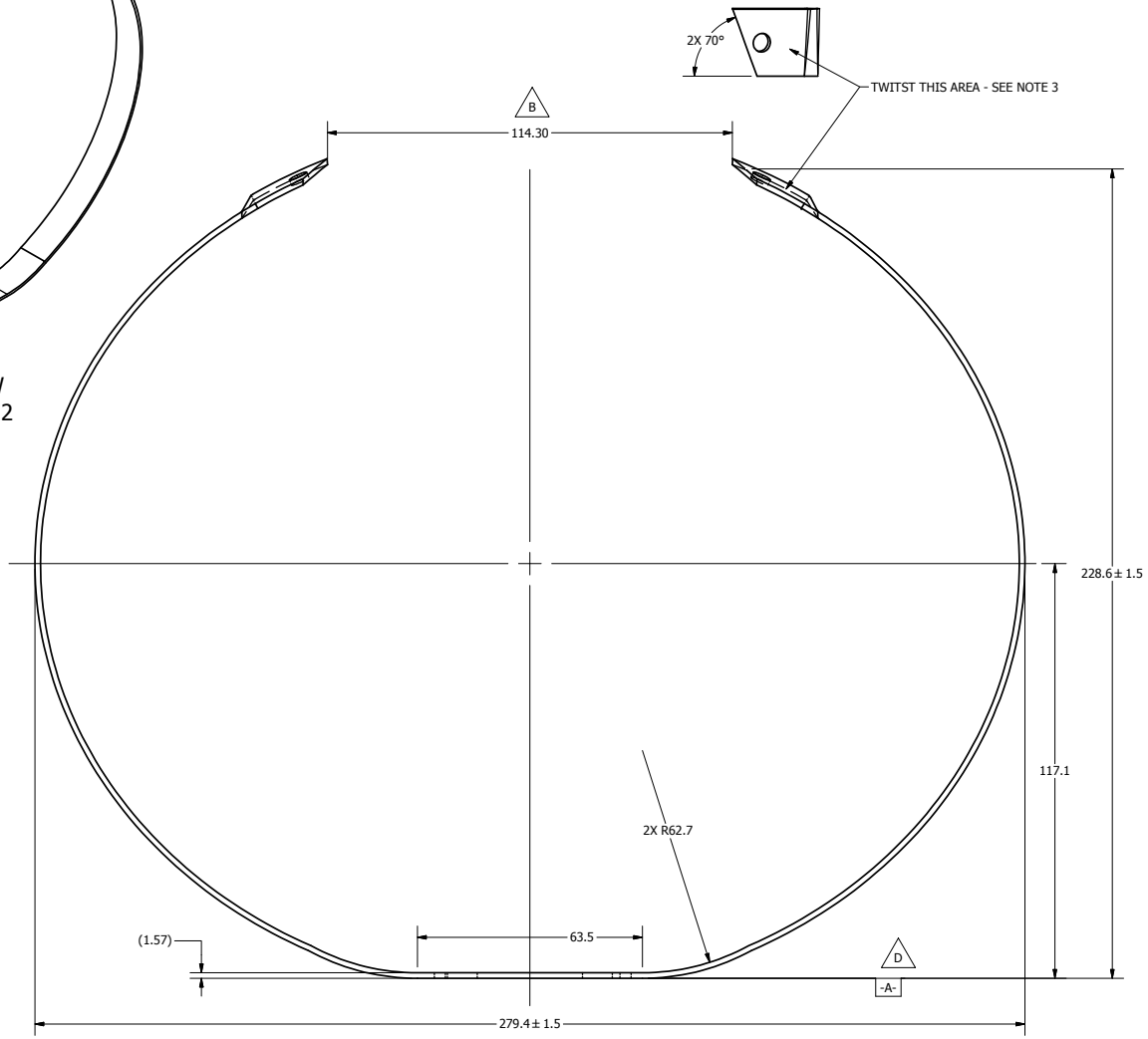
DESCRIPTION: THORAX ELLIPTICAL RIB #5 - ASSEMBLY

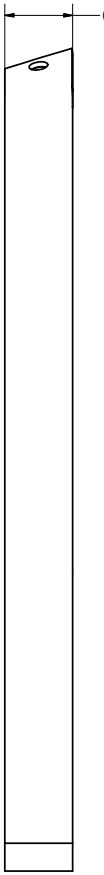
SIZE: A2 | SHEET 1 OF 1 | SCALE: FULL | DRAWING NO.: 472-3350 | REV: A

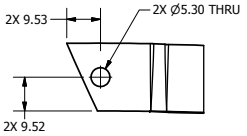
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM351 R3 AND CONVERTED TO METRIC FOR THOR-M	9/21/2011	TKN
	B	FINISH E-COAT WAS BLK. OXIDE; REMOVE NOTES 6,7; ADD HEAT TREAT TO TITLE BLOCK; ADD 114.3	5/8/2012	BK
	C	ADD VIEW TO SHOW HOLES	7/11/2012	BK
	D	3.10 WAS 3.03; REMOVE NOTE 5; ADD DATUM A,B, BASIC DIMENSIONS, AND POSITIONAL TOLERANCE; DIMENSION HOLES FROM DATUM B; ADD 4.75, 25.40	8/14/2012	BK



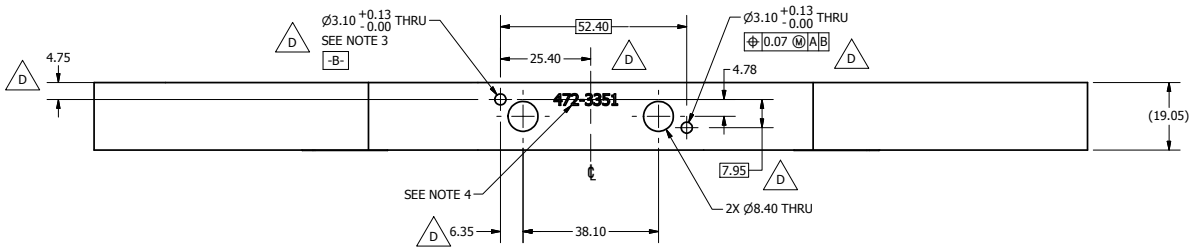
ISO VIEW
SCALE 1 : 2







VIEW PERPENDICULAR
TO HOLE AXIS
C
SCALE 1.000



NOTES: D

1. MAKE RIB FROM 1070 ANNEALED SPRING STEEL 1.57MM THICK X 19.05MM WIDE.
2. ELLIPTICAL SHAPE SEMI-AXIS OUTSIDE DIMENSIONS ARE: X:139.70MM Y:122.17MM
3. AFTER RIB IS FORMED - PRIOR TO HEAT-TREAT, ORIENT THE RIB SO THAT THE HOLE PATTERN IS AS SHOWN.
   THEN TWIST THE RIB AT THE 20.3MM FLAT AREA BY BENDING THE BOTTOM OUTWARD BY 8°.
4. ENGRAVE DWG. #472-3351 AT THE LOCATION SPECIFIED.

472-3350	1	MATERIAL: 1070 SPRING STEEL	
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 43-47	
TOTAL QTY IN DUMMY	1	FINISH: E-COAT	

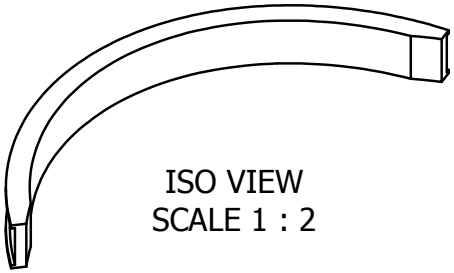
DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION
PROJECT NO.:
TOLERANCES — UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH
REMOVE BURRS & BREAK SHARP EDGES
DRAWN BY: Thanh — DATE: 9/21/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/14/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

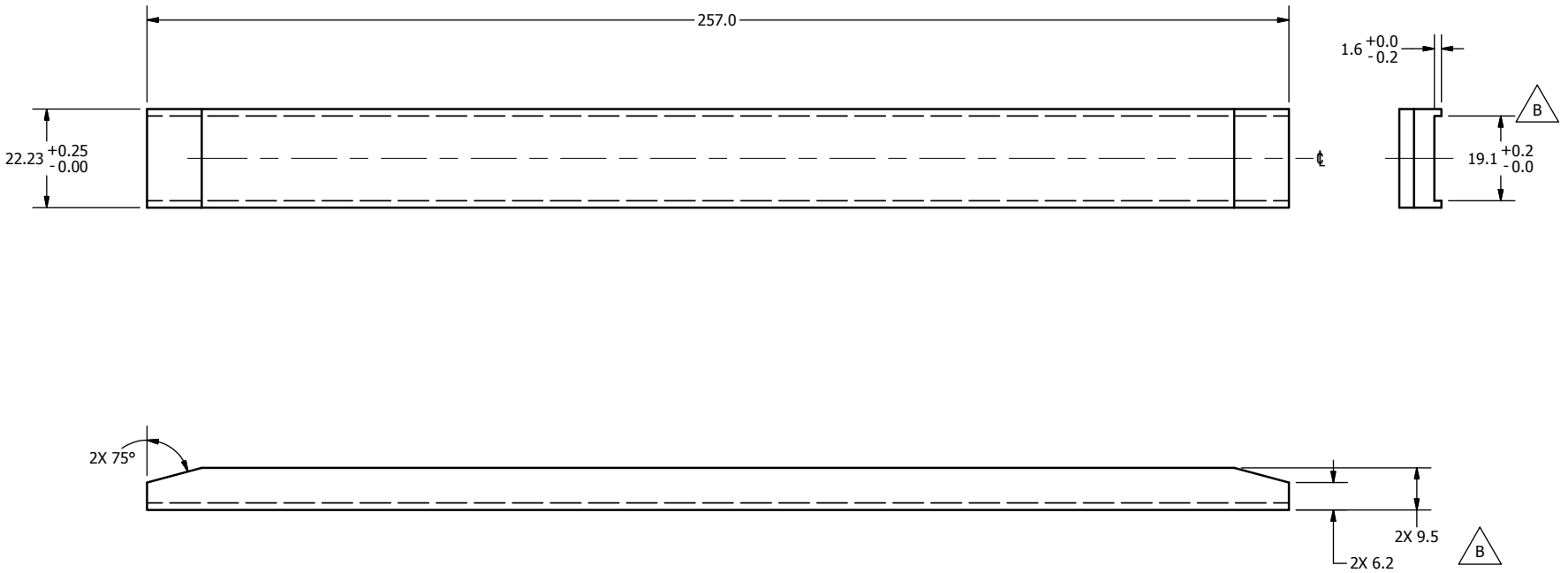
DESCRIPTION: THORAX ELLIPTICAL RIB #5 - STEEL

SIZE: A2 | SHEET 1 OF 1 | SCALE: FULL | DRAWING NO.: 472-3351 | REV: D

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER T1TXM352 RBO AND CONVERTED TO METRIC FOR THOR-M	9/20/2011	TKN
	B	ADD 1.6 X 19.1 GROOVE, CHANGE 7.9 TO 9.5 TO COMPENSATE DAMPING THICKNESS.	1/30/2011	ZJW

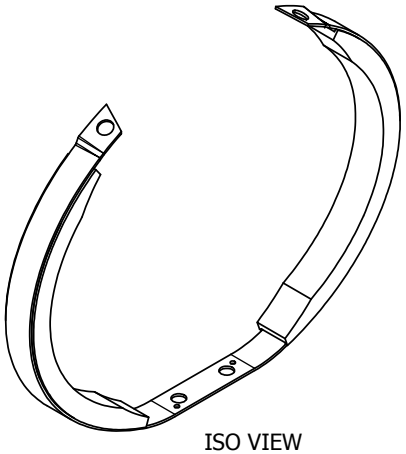


ISO VIEW
SCALE 1 : 2

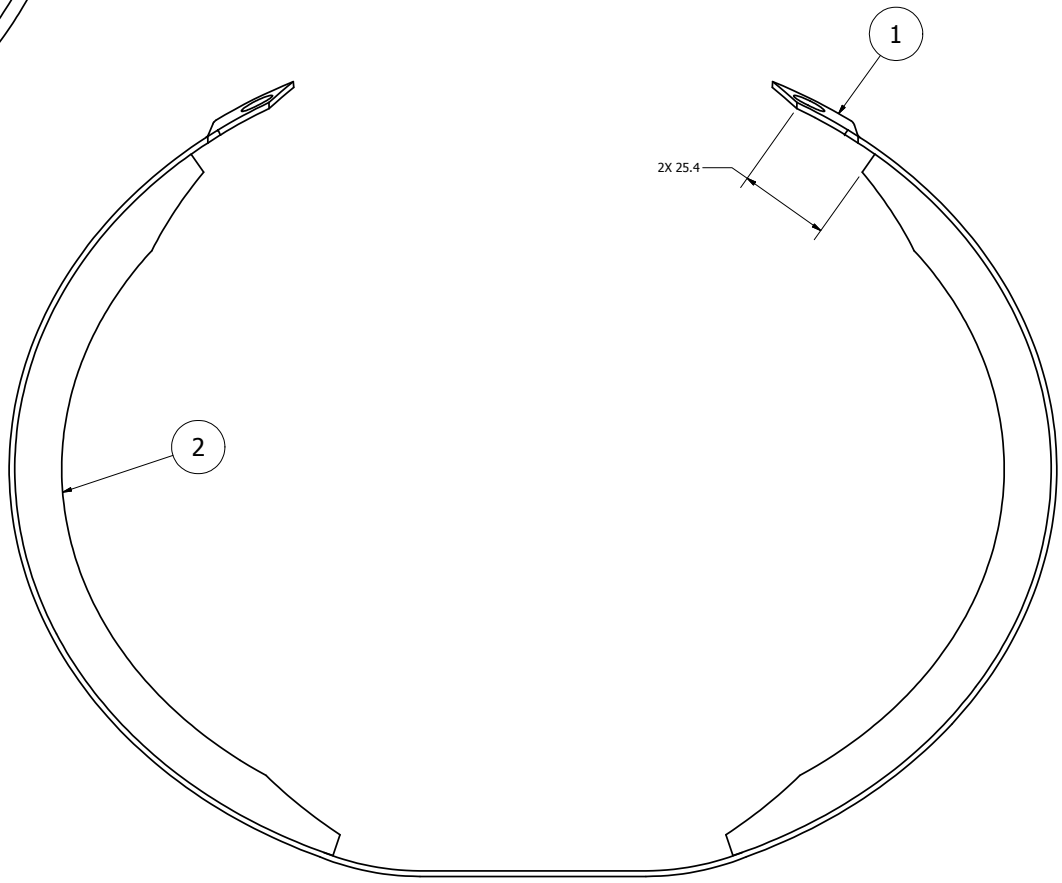


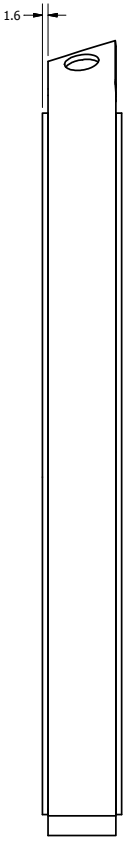
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES			
PROJECT NO.:		DRAWN BY: Thanh	DATE: 9/20/2011	DESCRIPTION: THORAX ELLIPTICAL RIB #5 - DAMPING MATERIAL	
472-3350	2	MATERIAL: ISODAMP CN-62			
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-3352 REV: B
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/14/2012	SCALE: FULL

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM360 RB0 AND CONVERTED TO METRIC FOR THOR-M	9/21/2011	TKN



ISO VIEW
SCALE 1 : 2





NOTES:

1. THE RIB IS ASSEMBLED BY VACUUM BONDING THE SPRING STEEL TO THE DAMPING MATERIAL USING HYSOL 9430 EPOXY ADHESIVE.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	472-3362	THORAX ELLIPTICAL RIB #6 - DAMPING MATERIAL
1	1	472-3361	THORAX ELLIPTICAL RIB #6 - STEEL

Parts List

472-3000	1	
NEXT ASSEMBLY	QTY	
TOTAL QTY IN DUMMY	1	

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6

REMOVE BURRS & BREAK SHARP EDGES

DRAWN BY: Thanh — DATE: 9/21/2011

CHECKED BY: — DATE:

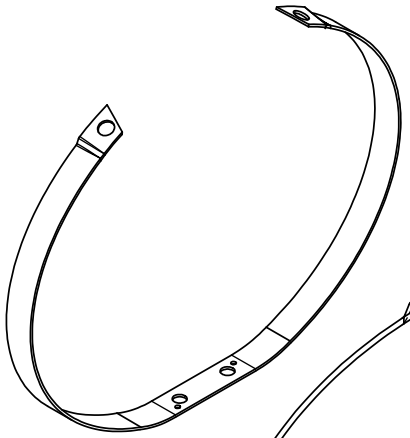
ENGINEER: J. WANG — DATE: 1/18/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

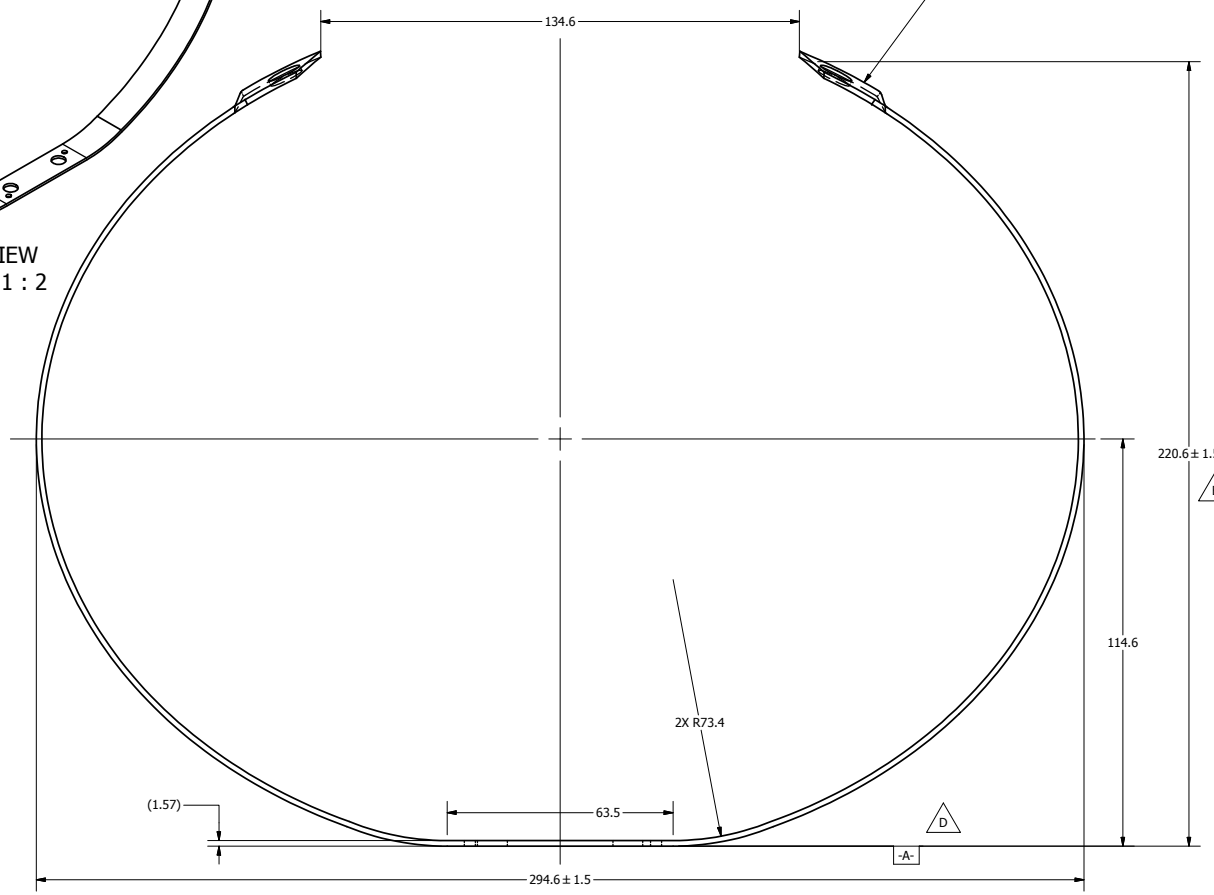
DESCRIPTION: THORAX ELLIPTICAL RIB #6 - ASSEMBLY

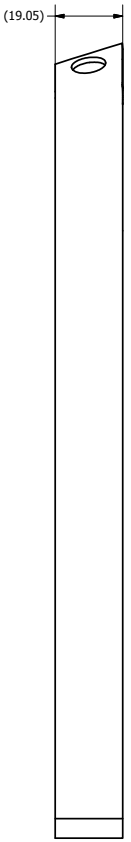
SIZE: A2 — SHEET 1 OF 1 — SCALE: FULL — DRAWING NO.: 472-3360 — REV: A

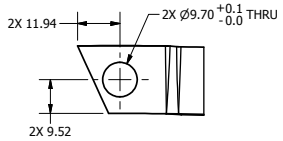
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM361 R3 AND CONVERTED TO METRIC FOR THOR-M	9/21/2011	TKN
	B	FINISH E-COAT WAS BLK. OXIDE; REMOVE NOTES 6,7; ADD HEAT TREAT TO TITLE BLOCK; ADD 220.6 +/-1.5	5/8/2012	BK
	C	ADD VIEW TO SHOW HOLES	7/11/2012	BK
	D	3.10 WAS 3.03; REMOVE NOTE 5; ADD DATUM A,B, BASIC DIMENSIONS, AND POSITIONAL TOLERANCE; DIMENSION HOLES FROM DATUM B; ADD 4.75, 25.40	8/14/2012	BK



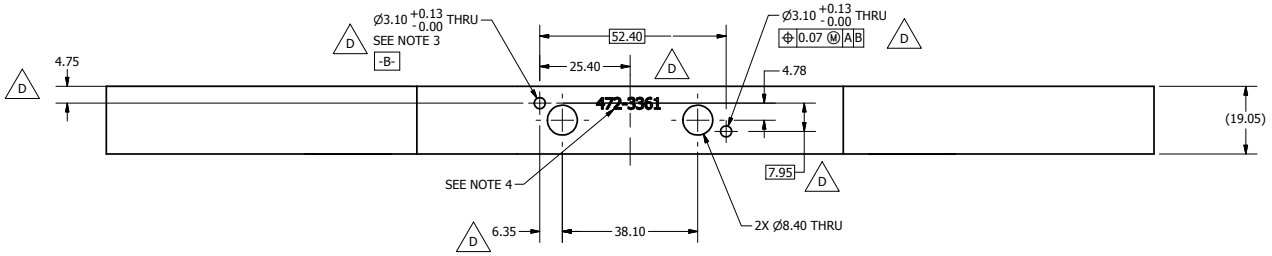
ISO VIEW
SCALE 1 : 2







VIEW PERPENDICULAR
TO HOLE AXIS
SCALE 1.000



NOTES:

1. MAKE RIB FROM 1070 ANNEALED SPRING STEEL 1.57MM THICK X 19.05MM WIDE.
2. ELLIPTICAL SHAPE SEMI-AXIS OUTSIDE DIMENSIONS ARE: X:147.32MM Y:119.38MM
3. AFTER RIB IS FORMED - PRIOR TO HEAT-TREAT, ORIENT THE RIB SO THAT THE HOLE PATTERN IS AS SHOWN.
   THEN TWIST THE RIB AT THE 20.3MM FLAT AREA BY BENDING THE BOTTOM OUTWARD BY 8°.
4. ENGRAVE DWG. #472-3361 AT THE LOCATION SPECIFIED.

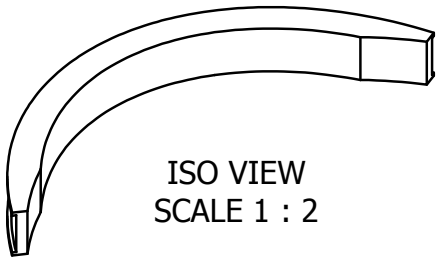
DO NOT SCALE DRAWING	THIRD ANGLE PROJECTION	TOLERANCES	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS DECIMALS X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6
PROJECT NO.:		REMOVE BURRS & BREAK SHARP EDGES	
472-3360	1	MATERIAL: 1070 SPRING STEEL	DRAWN BY: Thanh DATE: 9/21/2011
NEXT ASSEMBLY	QTY	BEND TABLE: Rc 43-47	CHECKED BY: DATE:
TOTAL QTY IN DUMMY	1	FINISH: E-COAT	ENGINEER: J. WANG DATE: 1/18/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

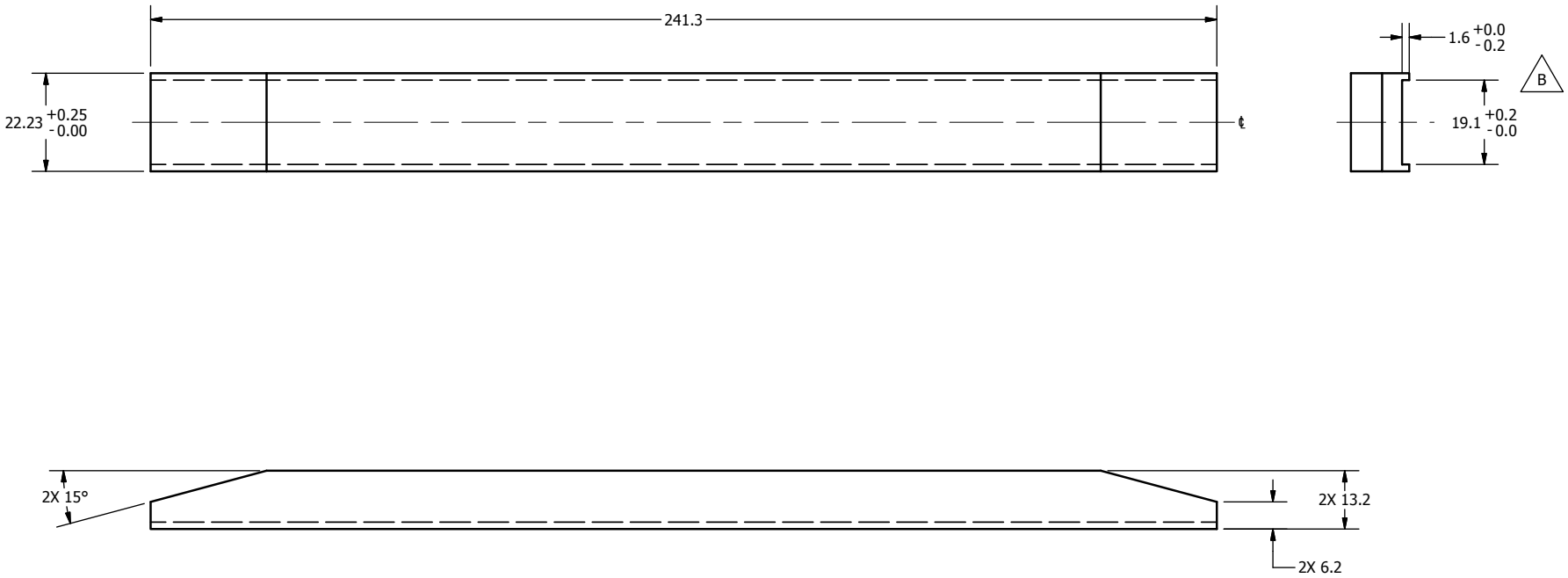
DESCRIPTION: THORAX ELLIPTICAL RIB #6 - STEEL

SIZE: A2 SHEET 1 OF 1 SCALE: FULL DRAWING NO.: 472-3361 REV: D

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM362 RB0 AND CONVERTED TO METRIC FOR THOR-M	9/21/2011	TKN
	B	ADD GROOVE 1.6 X 19.1 FOR BONDING ALIGNMENT, CHANGE FROM 11.6 TO 13.2 TO COMPENSATE THICKNESS	1/30/2012	ZJW

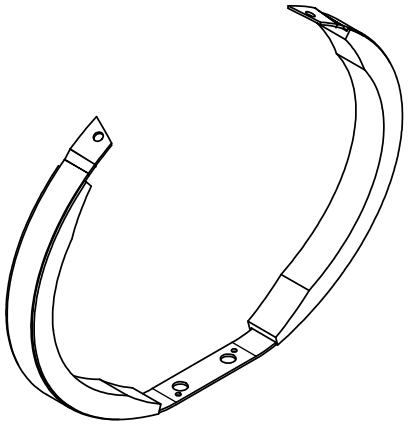


ISO VIEW
SCALE 1 : 2

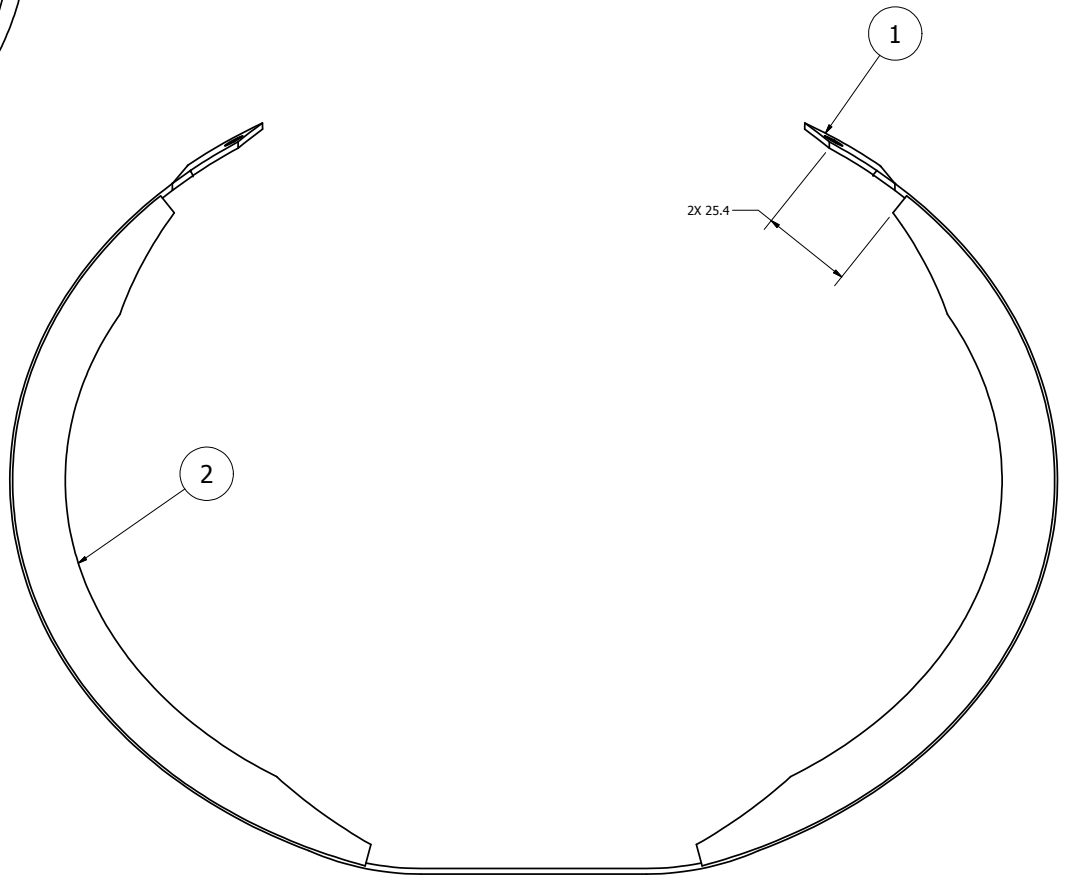


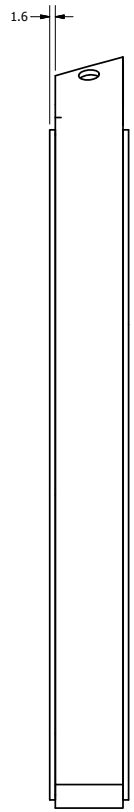
DO NOT SCALE DRAWING		TOLERANCES		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES		DESCRIPTION: THORAX ELLIPTICAL RIB #6 - DAMPING MATERIAL	
PROJECT NO.:		DRAWN BY: Thanh	DATE: 9/21/2011		
472-3360	2	MATERIAL: ISODAMP CN-62			
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/18/2012	SCALE: FULL
				DRAWING NO.: 472-3362	REV: B

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TSM370 RB0 AND CONVERTED TO METRIC FOR THOR-M	9/21/2011	TKN



ISO VIEW
SCALE 1 : 2





NOTES:

1. THE RIB IS ASSEMBLED BY VACUUM BONDING THE SPRING STEEL TO THE DAMPING MATERIAL USING HYSOL 9430 EPOXY ADHESIVE.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	472-3372	THORAX ELLIPTICAL RIB #7 - DAMPING MATERIAL
1	1	472-3371	THORAX ELLIPTICAL RIB #7 - STEEL

Parts List

472-3000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES

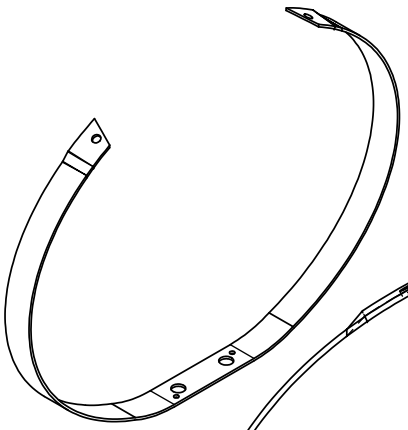
DRAWN BY: Thanh — DATE: 9/21/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/18/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

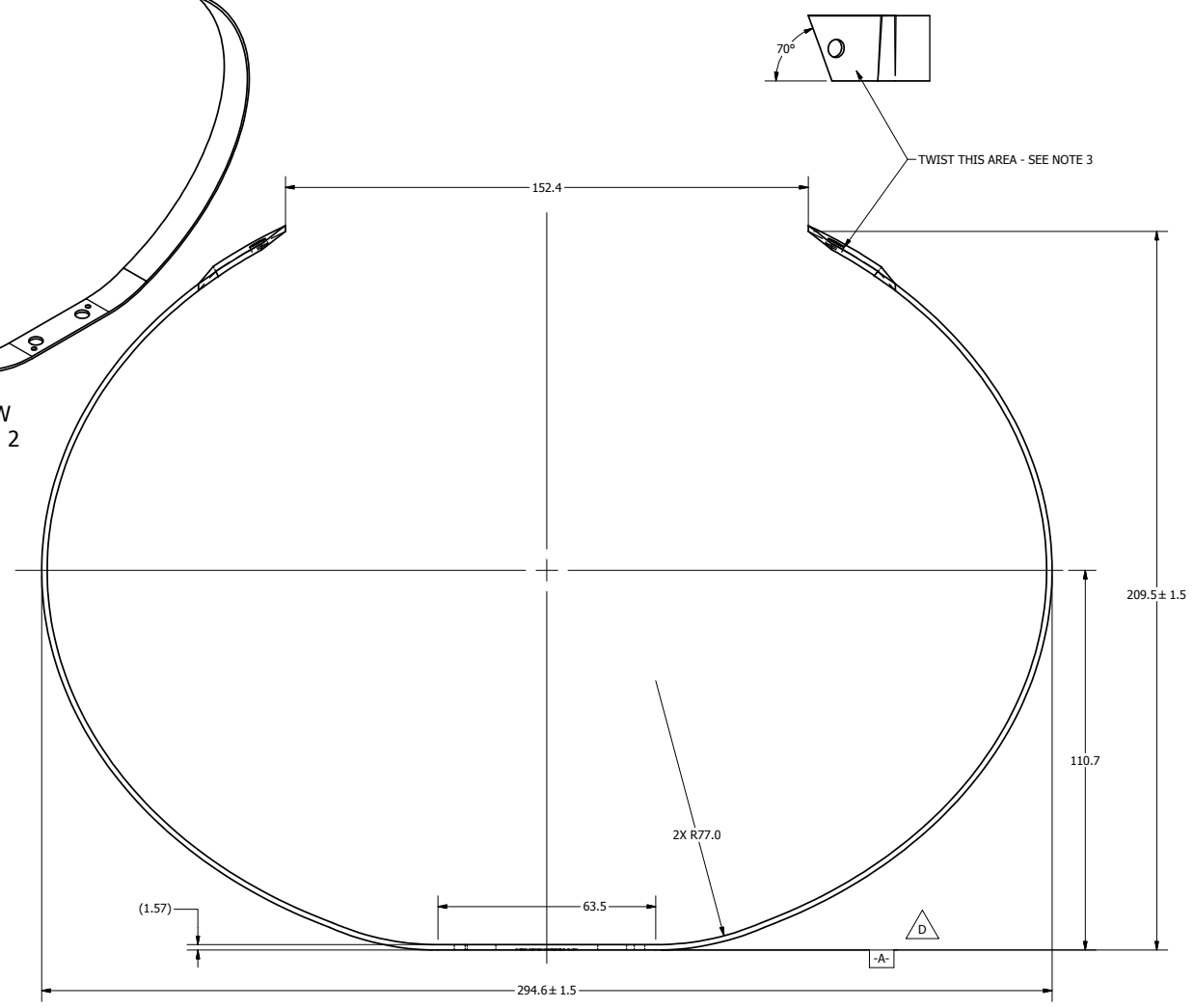
DESCRIPTION: THORAX ELLIPTICAL RIB #7 - ASSEMBLY

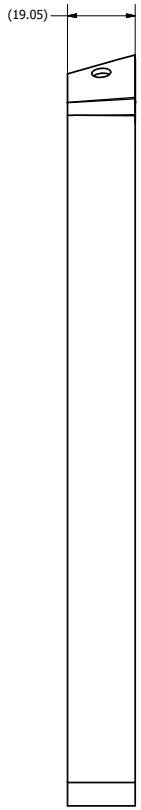
SIZE: A2 — SHEET 1 OF 1 — SCALE: FULL — DRAWING NO.: 472-3370 — REV: A

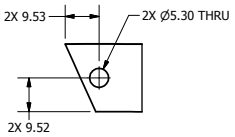
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM371 R4 AND CONVERTED TO METRIC FOR THOR-M0	9/21/2011	TKN
	B	FINISH E-COAT WAS BLK. OXIDE; REMOVE NOTES 6,7; ADD HEAT TREAT TO TITLE BLOCK	5/8/2012	BK
	C	ADD VIEW TO SHOW HOLES	7/11/2012	BK
	D	3.10 WAS 3.03; REMOVE NOTE 5; ADD DATUM A,B, BASIC DIMENSIONS, AND POSITIONAL TOLERANCE; DIMENSION HOLES FROM DATUM B; ADD 4.75, 25.40	8/14/2012	BK



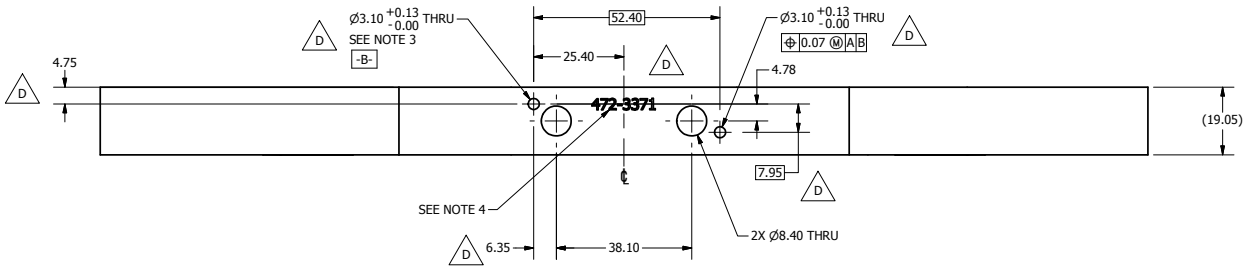
ISO VIEW
SCALE 1 : 2







VIEW PERPENDICULAR
TO HOLE AXIS
SCALE 1.000



NOTES:

1. MAKE RIB FROM 1070 ANNEALED SPRING STEEL 1.57MM THICK X 19.05MM WIDE.
2. ELLIPTICAL SHAPE SEMI-AXIS OUTSIDE DIMENSIONS ARE: X:147.32MM Y:115.32MM
3. AFTER RIB IS FORMED - PRIOR TO HEAT-TREAT, ORIENT THE RIB SO THAT THE HOLE PATTERN IS AS SHOWN.
   THEN TWIST THE RIB AT THE 20.3MM FLAT AREA BY BENDING THE BOTTOM OUTWARD BY 5°.
4. ENGRAVE DWG. #472-3371 AT THE LOCATION SPECIFIED.

472-3370	1	MATERIAL: 1070 SPRING STEEL	
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 43-47	
TOTAL QTY IN DUMMY	1	FINISH: E-COAT	

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION
PROJECT NO.:
TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.3, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES
DRAWN BY: Thanh — DATE: 9/21/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/18/2012

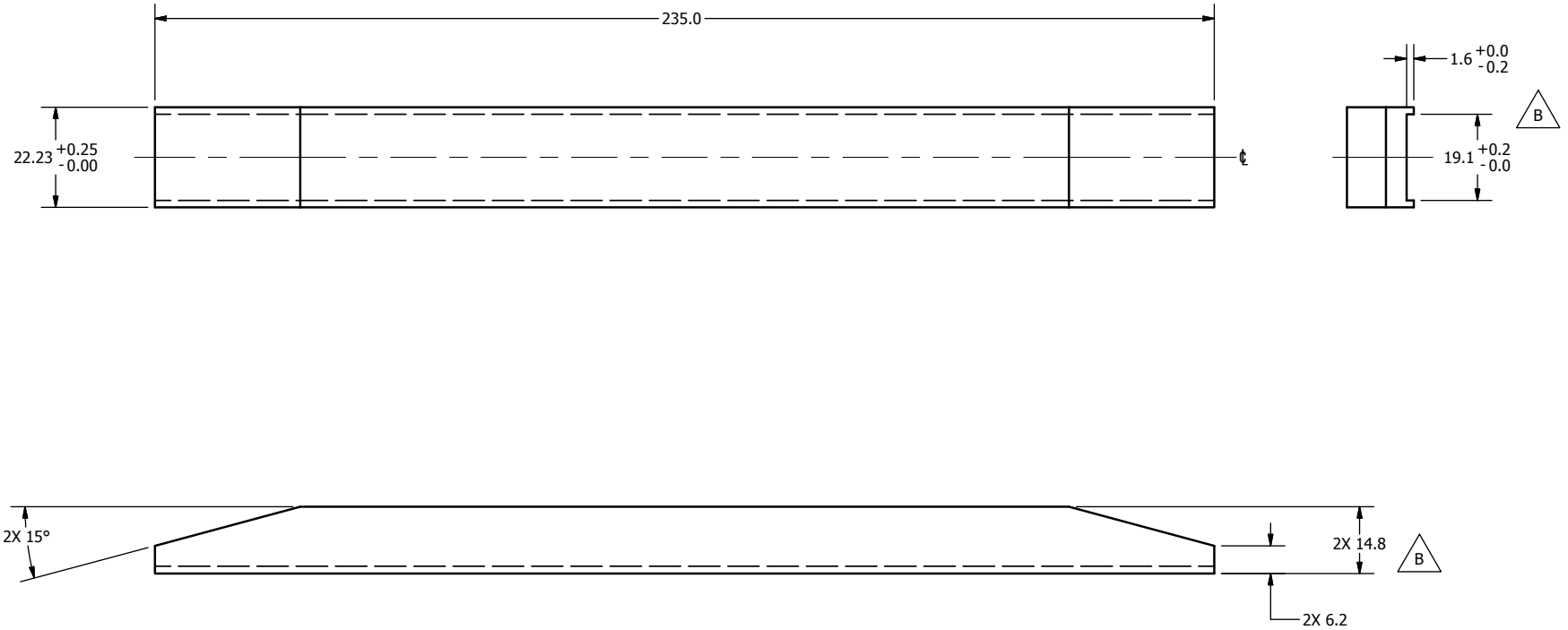
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: THORAX ELLIPTICAL RIB #7 - STEEL

SIZE: A2 | SHEET 1 OF 1 | DRAWING NO.: 472-3371 | REV: D
SCALE:

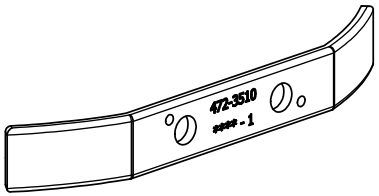
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM372 RB0 AND CONVERTED TO METRIC FOR THOR-M	9/21/2011	TKN
	B	ADD 1.6 X 19.1 GROOVE, CHANGE FROM 13.2 TO 14.8 TO COMPENSATE DAMPING THICKNESS.	1/30/2012	ZJW

ISO VIEW
SCALE 1 : 2

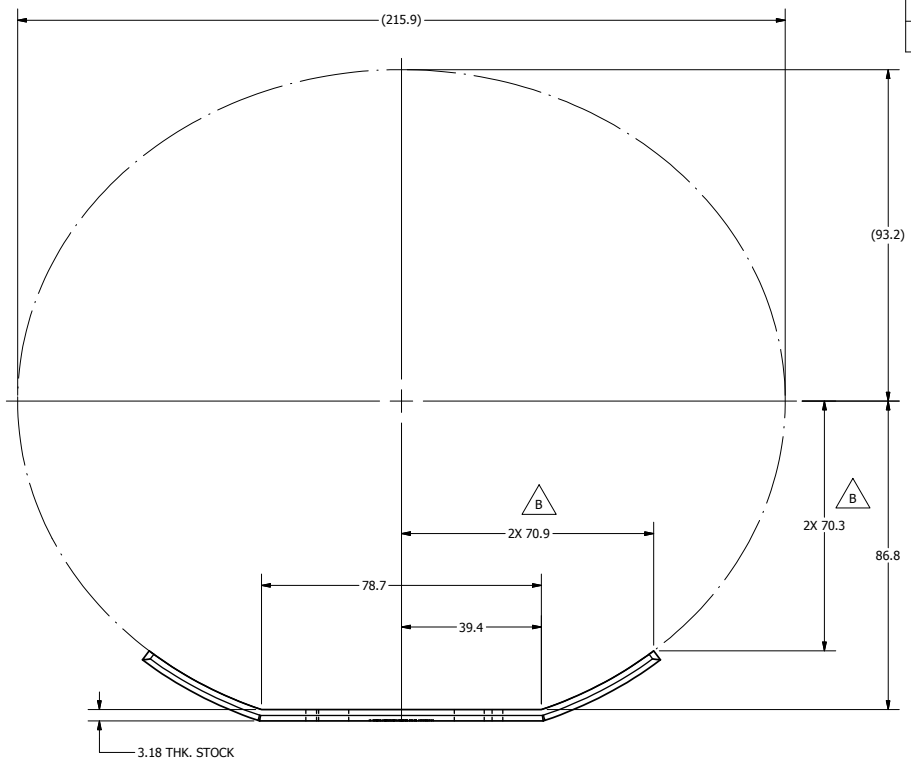


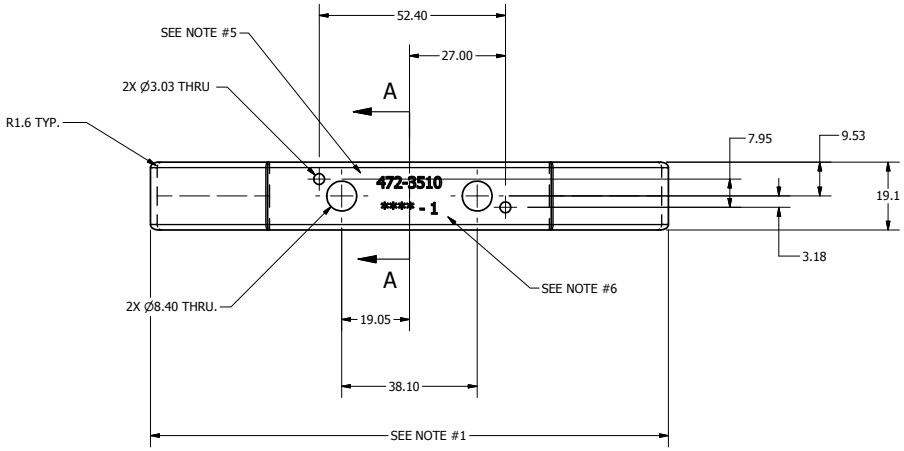
		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6		
		PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: THORAX ELLIPTICAL RIB #7 - DAMPING MATERIAL	
472-3370	2	MATERIAL: ISODAMP CN-62	DRAWN BY: Thanh	DATE: 9/21/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-3372 REV: B
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/18/2012	SCALE: FULL

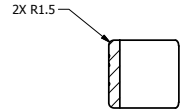
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM010 R5 AND CONVERTED TO METRIC FOR THOR-M	9/22/2011	TKN
	B	REMOVE FIT NOTES (4 & 5), ADD FINISH E-COAT; ADD 2X 70.3, 2X 70.9	3/22/2012	BK



ISO VIEW
SCALE 1 : 1







SECTION A-A
SCALE 1 : 1

B

NOTES:

1. LENGTH PRIOR TO BENDING IS 152.4MM
2. BENT ENDS FOLLOW THE ELLIPTICAL CURVES SHOWN.
3. SEMI-AXES ARE X=107.9MM, Y=93.2MM
4. HEAT TREAT TO Rc 50 +/- 2
5. ENGRAVE DWG. # 472-3510 AT THE LOCATION SPECIFIED.
6. ENGRAVE SERIAL NUMBER ****-# AT THE LOCATION SPECIFIED. WHERE **** IS A FOUR DIGIT SERIAL NUMBER FOR THE RIB SET AND # IS THE NUMBER OF THE RIB (1-7)

472-3000	1	MATERIAL: 01 TOOL STEEL	
NEXT ASSEMBLY	QTY	HEAT TREAT: SEE NOTES	
TOTAL QTY IN DUMMY	1	FINISH: E-COAT	

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES

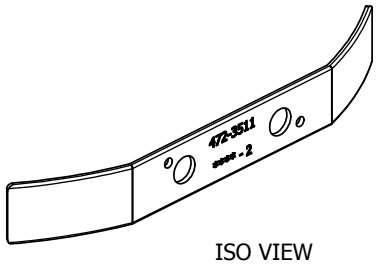
DRAWN BY: Thanh — DATE: 9/22/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/18/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

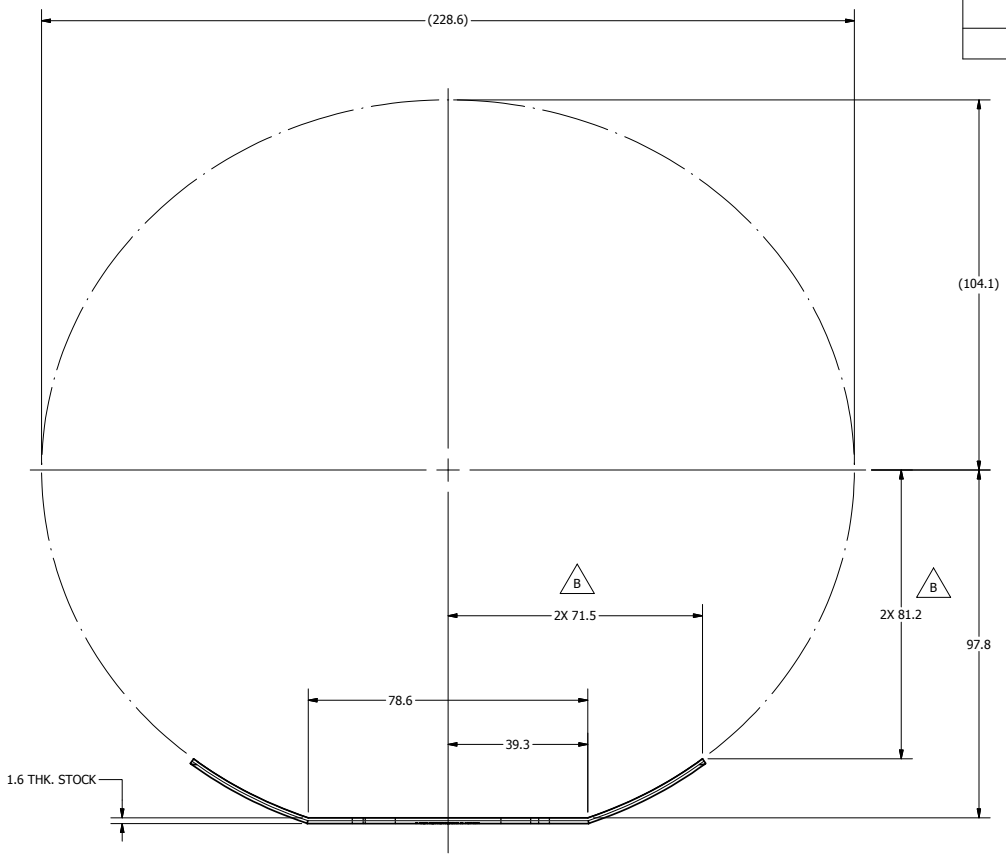
DESCRIPTION: THORAX ELLIPTICAL RIB STIFFENER #1

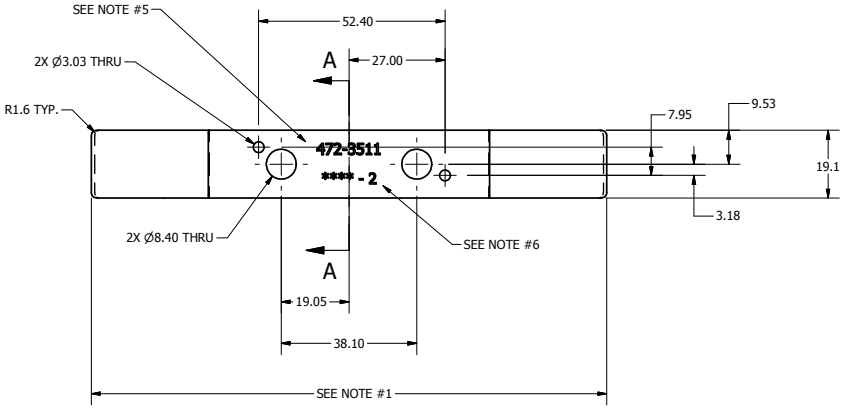
SIZE: A2 — SHEET 1 OF 1 — SCALE: FULL — DRAWING NO.: 472-3510 — REV: B

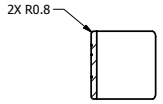
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM011 R6 AND CONVERTED TO METRIC FOR THOR-M	9/22/2011	TKN
	B	REMOVE FIT NOTES (4 & 5), ADD FINISH E-COAT; ADD 2X 81.2, 2X 71.5	3/22/2012	BK



ISO VIEW
SCALE 1 : 1







SECTION A-A
SCALE 1 : 1

B NOTES:

1. LENGTH PRIOR TO BENDING IS 152.4MM
2. BENT ENDS FOLLOW THE ELLIPTICAL CURVES SHOWN.
3. SEMI-AXES ARE X=114.3MM, Y=104.1MM
4. HEAT TREAT TO Rc 50 +/- 2
5. ENGRAVE DWG. # 472-3511 AT THE LOCATION SPECIFIED.
6. ENGRAVE SERIAL NUMBER ****-# AT THE LOCATION SPECIFIED. WHERE **** IS A FOUR DIGIT SERIAL NUMBER FOR THE RIB SET AND # IS THE NUMBER OF THE RIB (1-7)

		PROJECT NO.:	
472-3000	1	MATERIAL: 01 TOOL STEEL	DRAWN BY: Thanh DATE: 9/22/2011
NEXT ASSEMBLY	QTY	HEAT TREAT: SEE NOTES	CHECKED BY: DATE:
TOTAL QTY IN DUMMY	1	FINISH: E-COAT	ENGINEER: J. WANG DATE: 1/18/2012

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.3, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6

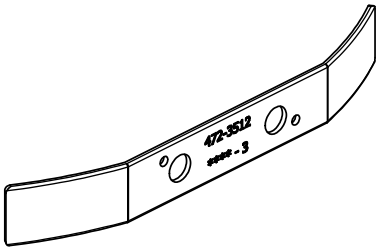
REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

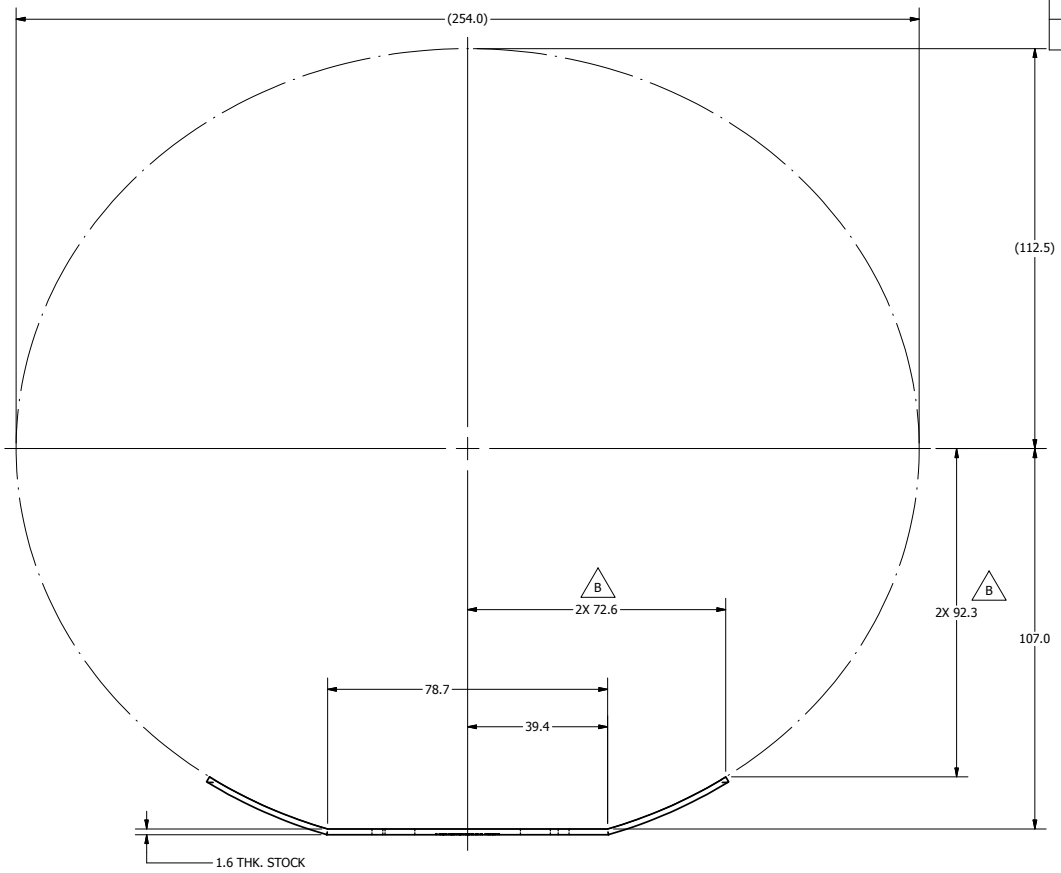
DESCRIPTION: THORAX ELLIPTICAL RIB STIFFENER #2

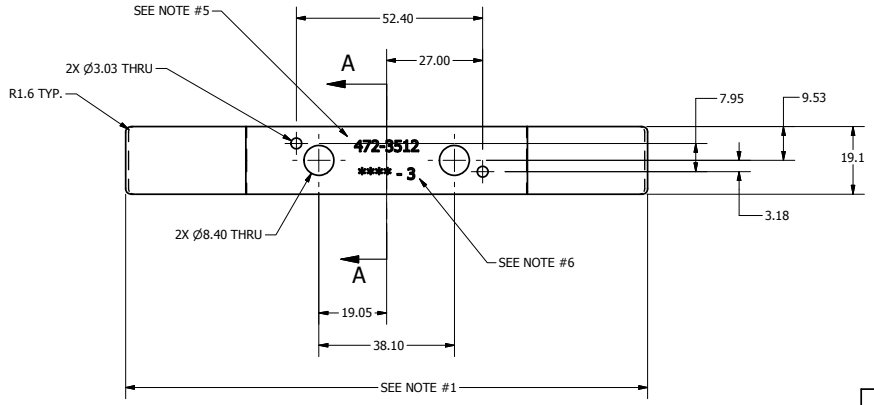
SIZE: A2 | SHEET: 1 OF 1 | SCALE: FULL | DRAWING NO.: 472-3511 | REV: B

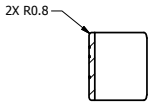
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM012 R6 AND CONVERTED TO METRIC FOR THOR-M	9/22/2011	TKN
	B	REMOVE FIT NOTES (4 & 5), ADD FINISH E-COAT; ADD 2X 92.3, 2X 72.6	3/22/2012	BK



ISO VIEW
SCALE 1 : 1







SECTION A-A
SCALE 1 : 1

B NOTES:

1. LENGTH PRIOR TO BENDING IS 152.4MM
2. BENT ENDS FOLLOW THE ELLIPTICAL CURVES SHOWN.
3. SEMI-AXES ARE X=127.0MM, Y=112.5MM
4. HEAT TREAT TO Rc 50 +/- 2
5. ENGRAVE DWG. # 472-3512 AT THE LOCATION SPECIFIED.
6. ENGRAVE SERIAL NUMBER ****-# AT THE LOCATION SPECIFIED. WHERE **** IS A FOUR DIGIT SERIAL NUMBER FOR THE RIB SET AND # IS THE NUMBER OF THE RIB (1-7)

472-3000	1	01 TOOL STEEL	
NEXT ASSEMBLY	QTY	SEE NOTES	
TOTAL QTY IN DUMMY	1	E-COAT	

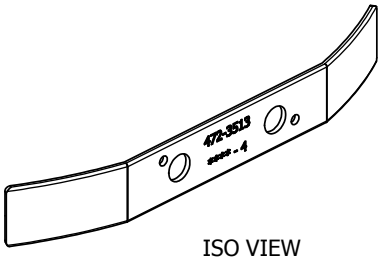
DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION
TOLERANCES — UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.3, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES
PROJECT NO.:
DRAWN BY: Thanh — DATE: 9/22/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/18/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

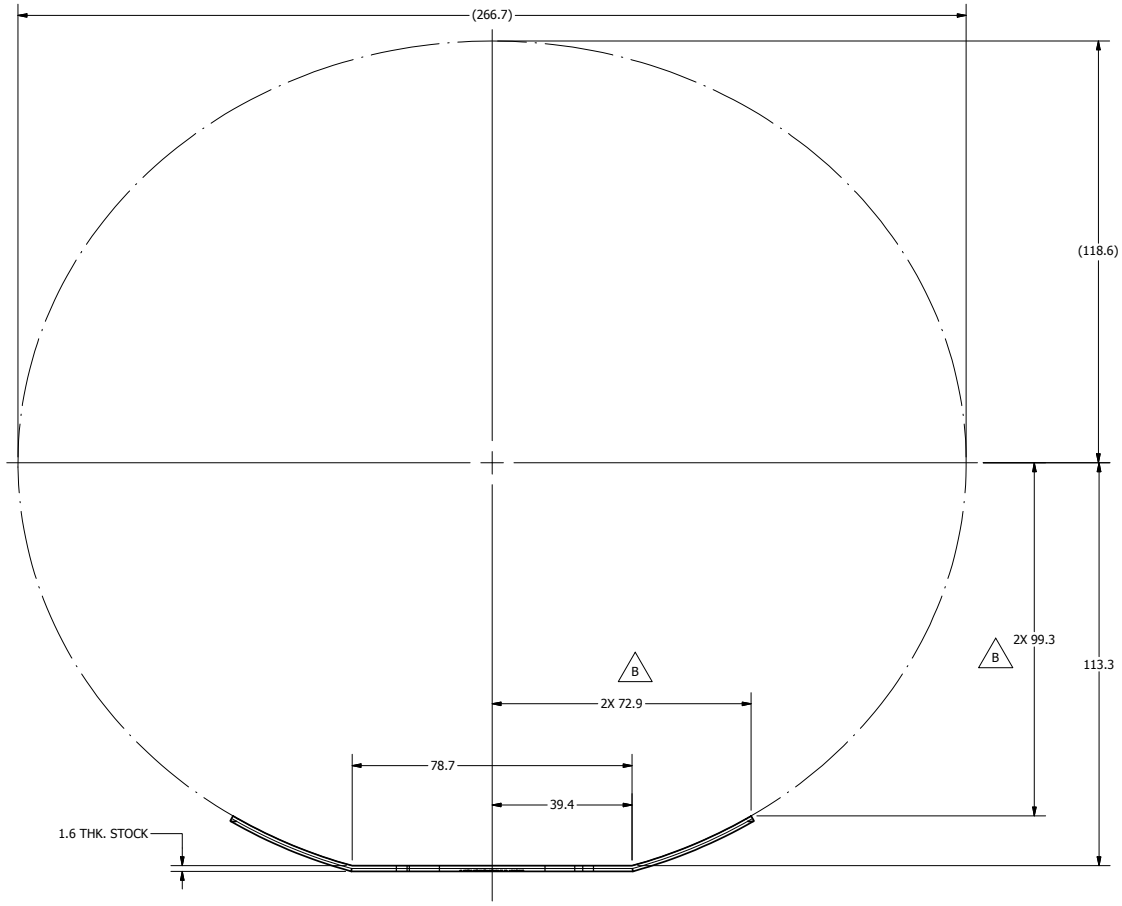
DESCRIPTION: THORAX ELLIPTICAL RIB STIFFENER #3

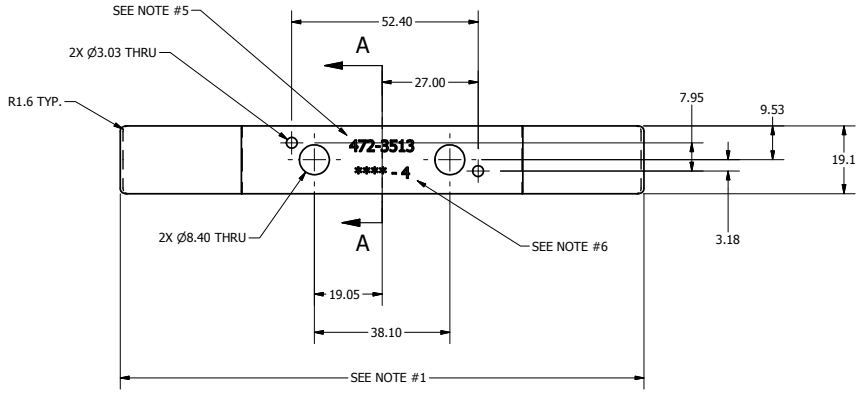
SIZE: A2 — SHEET 1 OF 1 — SCALE: FULL — DRAWING NO.: 472-3512 — REV: B

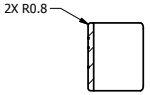
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM013 R6 AND CONVERTED TO METRIC FOR THOR-M	9/22/2011	TKN
	B	REMOVE FIT NOTES (4 & 5), ADD FINISH E-COAT; ADD 2X 99.3, 2X 72.9	3/22/2012	BK



ISO VIEW
SCALE 1 : 1







SECTION A-A
SCALE 1 : 1

B NOTES:

1. LENGTH PRIOR TO BENDING IS 152.4MM
2. BENT ENDS FOLLOW THE ELLIPTICAL CURVES SHOWN.
3. SEMI-AXES ARE X=133.4MM, Y=118.6MM
4. HEAT TREAT TO Rc 50 +/- 2
5. ENGRAVE DWG. # 472-3513 AT THE LOCATION SPECIFIED.
6. ENGRAVE SERIAL NUMBER ****-# AT THE LOCATION SPECIFIED. WHERE **** IS A FOUR DIGIT SERIAL NUMBER FOR THE RIB SET AND # IS THE NUMBER OF THE RIB (1-7)

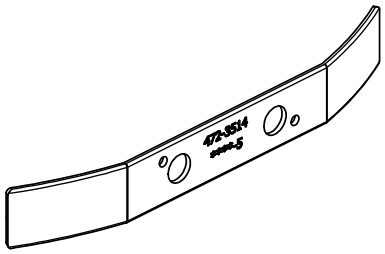
		DO NOT SCALE DRAWING	TOLERANCES
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 125
		PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES
472-3000	1	MATERIAL: 01 TOOL STEEL	DRAWN BY: Thanh; DATE: 9/22/2011
NEXT ASSEMBLY	QTY	HEAT TREAT: SEE NOTES	CHECKED BY: ; DATE:
TOTAL QTY IN DUMMY	1	FINISH: E-COAT	ENGINEER: J. WANG; DATE: 1/18/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

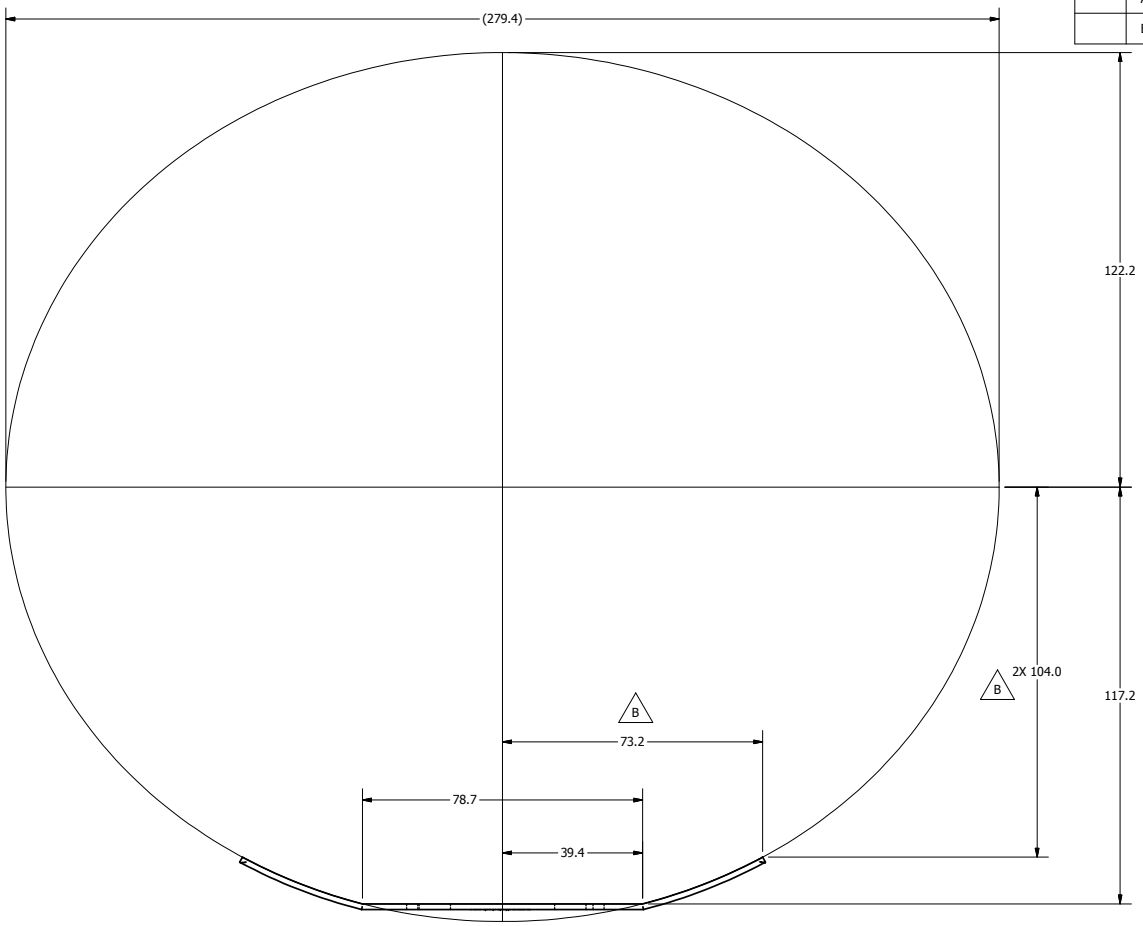
DESCRIPTION: THORAX ELLIPTICAL RIB STIFFENER #4

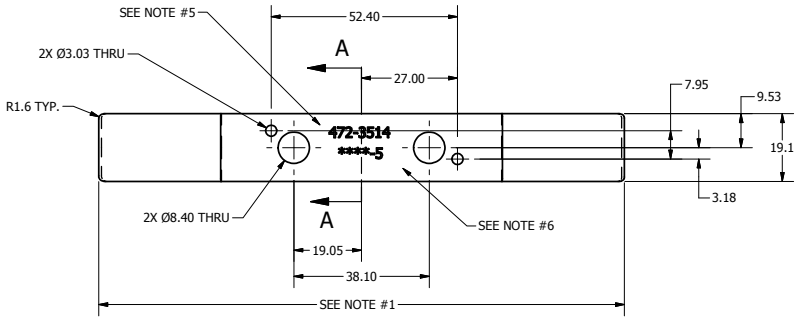
SIZE: A2; SHEET: 1 OF 1; SCALE: FULL; DRAWING NO.: 472-3513; REV: B

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM014 R6 AND CONVERTED TO METRIC FOR THOR-M	9/22/2011	TKN
	B	REMOVE FIT NOTES (4 & 5), ADD FINISH E-COAT; ADD 2X 104.0, 2X 73.2	3/22/2012	BK



ISO VIEW
SCALE 1 : 1





SECTION A-A
SCALE 1 : 1

B NOTES:

1. LENGTH PRIOR TO BENDING IS 152.4MM
2. BENT ENDS FOLLOW THE ELLIPTICAL CURVES SHOWN.
3. SEMI-AXES ARE X=139.7MM, Y=122.2MM
4. HEAT TREAT TO Rc 50 +/- 2
5. ENGRAVE DWG. # 472-3514 AT THE LOCATION SPECIFIED.
6. ENGRAVE SERIAL NUMBER ****-# AT THE LOCATION SPECIFIED. WHERE **** IS A FOUR DIGIT SERIAL NUMBER FOR THE RIB SET AND # IS THE NUMBER OF THE RIB (1-7)

472-3000	1	01 TOOL STEEL	
NEXT ASSEMBLY	QTY	SEE NOTES	
TOTAL QTY IN DUMMY	1	E-COAT	

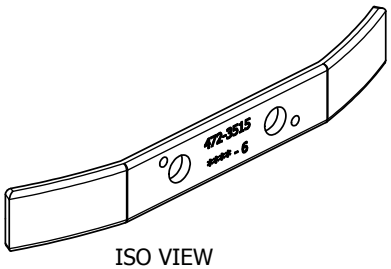
DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION
TOLERANCES — UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.3, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES
DRAWN BY: Thanh — DATE: 9/22/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/18/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

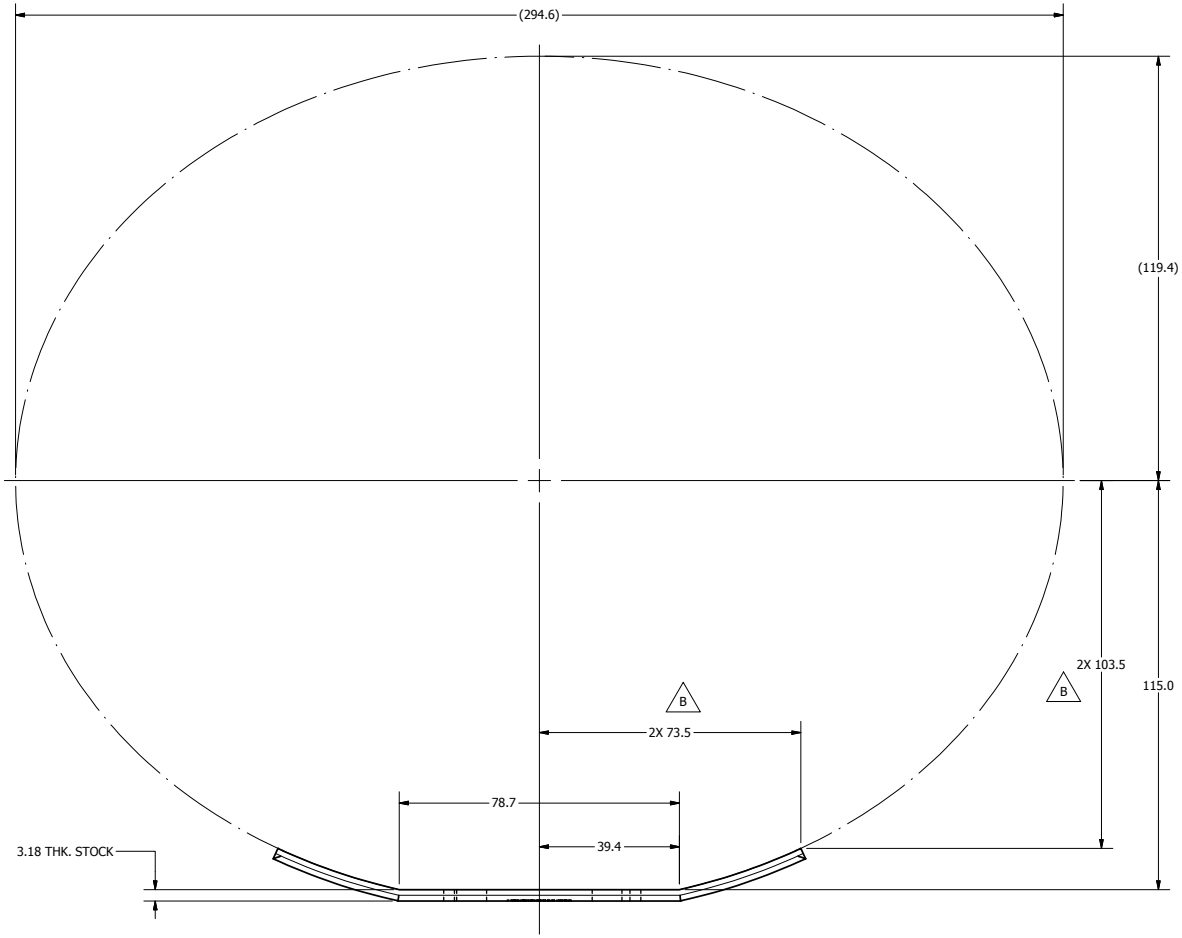
DESCRIPTION: THORAX ELLIPTICAL RIB STIFFENER #5

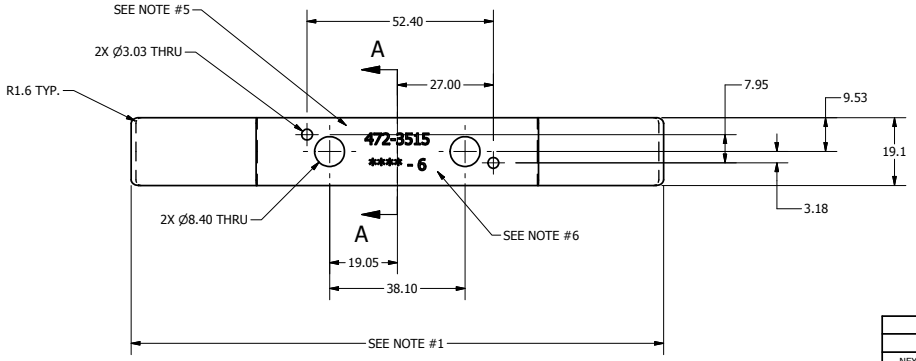
SIZE: A2 — SHEET 1 OF 1 — SCALE: FULL — DRAWING NO.: 472-3514 — REV: B

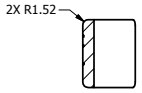
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM015 R5 AND CONVERTED TO METRIC FOR THOR-M	9/23/2011	TKN
	B	REMOVE FIT NOTES (4 & 5), ADD FINISH E-COAT; ADD 2X 103.5, 2X 73.5	3/22/2012	BK



ISO VIEW
SCALE 1 : 1







SECTION A-A
SCALE 1 : 1

NOTES:

1. LENGTH PRIOR TO BENDING IS 152.4MM
2. BENT ENDS FOLLOW THE ELLIPTICAL CURVES SHOWN.
3. SEMI-AXES ARE X=147.3MM, Y=119.4MM
4. HEAT TREAT TO Rc 50 +/- 2
5. ENGRAVE DWG. # 472-3515 AT THE LOCATION SPECIFIED.
6. ENGRAVE SERIAL NUMBER ****-# AT THE LOCATION SPECIFIED. WHERE **** IS A FOUR DIGIT SERIAL NUMBER FOR THE RIB SET AND # IS THE NUMBER OF THE RIB (1-7)

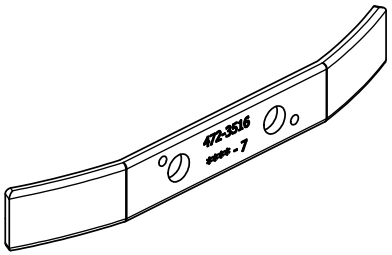
		DO NOT SCALE DRAWING	TOLERANCES
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.3, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH √
		PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES
472-3000	1	MATERIAL: 01 TOOL STEEL	DRAWN BY: Thanh; DATE: 9/23/2011
NEXT ASSEMBLY	QTY	HEAT TREAT: SEE NOTES	CHECKED BY: ; DATE:
TOTAL QTY IN DUMMY	1	FINISH: E-COAT	ENGINEER: J. WANG; DATE: 1/18/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

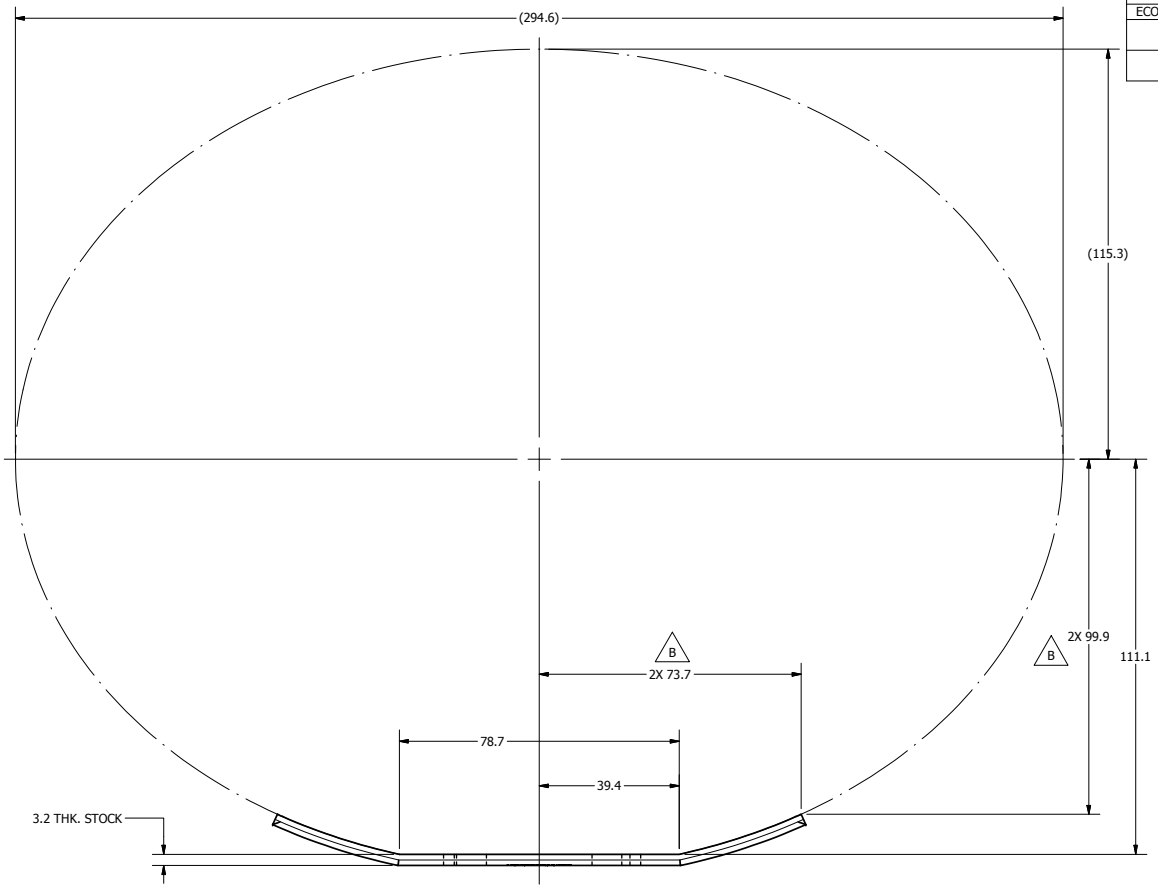
DESCRIPTION: THORAX ELLIPTICAL RIB STIFFENER #6

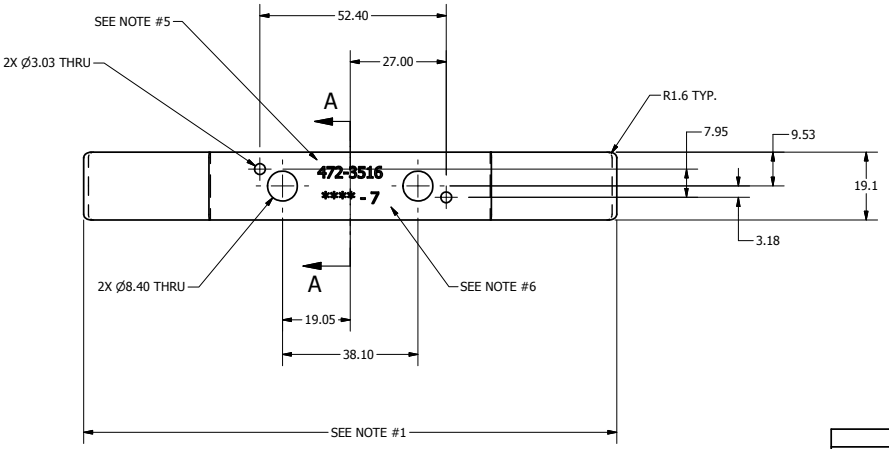
SIZE: A2; SHEET: 1 OF 1; SCALE: FULL; DRAWING NO.: 472-3515; REV: B

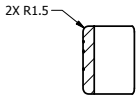
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM016 R5 AND CONVERTED TO METRIC FOR THOR-M	9/23/2011	TKN
	B	REMOVE FIT NOTES (4 & 5), ADD FINISH E-COAT ADD 2X 99.9, 2X 73.7	3/22/2012	BK



ISO VIEW
SCALE 1 : 1







SECTION A-A
SCALE 1 : 1

NOTES:

B

1. LENGTH PRIOR TO BENDING IS 152.4MM
2. BENT ENDS FOLLOW THE ELLIPTICAL CURVES SHOWN.
3. SEMI-AXES ARE X=147.3MM, Y=115.3MM
4. HEAT TREAT TO Rc 50 +/- 2
5. ENGRAVE DWG. # 472-3516 AT THE LOCATION SPECIFIED.
6. ENGRAVE SERIAL NUMBER ****-# AT THE LOCATION SPECIFIED. WHERE **** IS A FOUR DIGIT SERIAL NUMBER FOR THE RIB SET AND # IS THE NUMBER OF THE RIB (1-7)

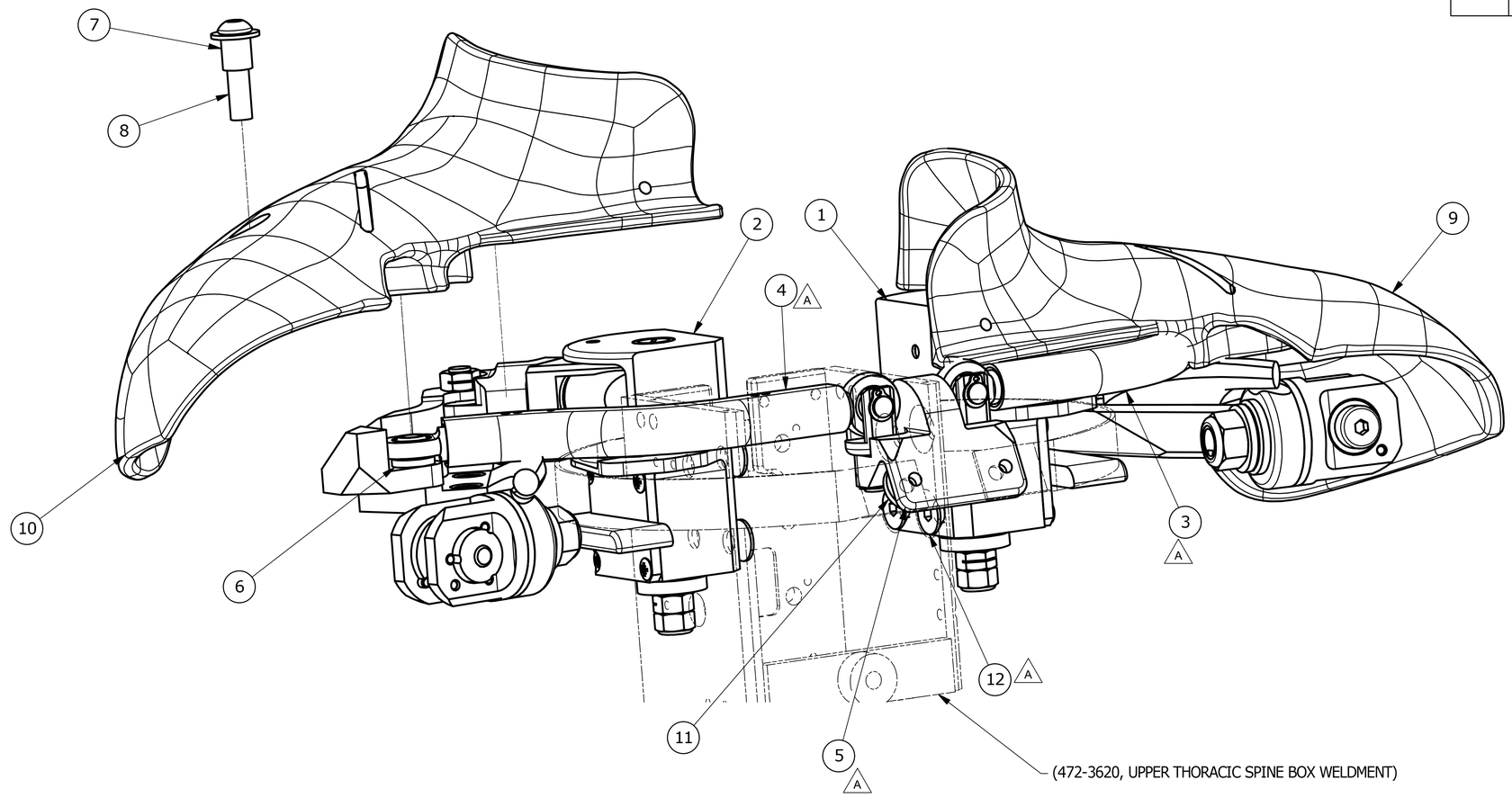
		DO NOT SCALE DRAWING	TOLERANCES
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X.X ±0.3 ±0.5 X.XX ±0.1 X.XXX ±0.01
		PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES
472-3000	1	MATERIAL: 01 TOOL STEEL	DRAWN BY: Thanh DATE: 9/23/2011
NEXT ASSEMBLY	QTY	HEAT TREAT: SEE NOTES	CHECKED BY: DATE:
TOTAL QTY IN DUMMY	1	FINISH: E-COAT	ENGINEER: J. WANG DATE: 1/18/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: THORAX ELLIPTICAL RIB STIFFENER #7

SIZE: A2 | SHEET: 1 OF 1 | SCALE: FULL | DRAWING NO.: 472-3516 | REV: B

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	A	REVISED ITEMS 3, 4, 5. ADDED ITEM 12	2/10/2014	JHC
	B	DRAWING NUMBER WAS AXSDM000M; REMOVED SD3 UPPER HUMERUS ASSEMBLY - AXAMM000; TITLE WAS SD3 SHOULDER AND ARMS ASSEMBLY;472-3810 WAS AXSDM300, 472-3840 WAS AXSDM400, 472-3850 WAS AXSDM100B, 472-3860 WAS AXSDM200B, 472-3870 WAS AXSDM040C, 472-3880 WAS AXSDM038, 472-3890 WAS AXSDM037A, 472-3891 WAS AXSDM037B, 472-3895-1 WAS AXSDM035, 472-3895-2 WAS AXSDM036 & 472-3898 WAS AXSDM033	9/9/2014	DW



ITEM	QTY	PART NUMBER	DESCRIPTION
12	8	5001090	SCREW, FHCS M8-1.25 x 12
11	2	472-3898	RUBBER SPACER WASHER
10	1	472-3895-2	SHOULDER COVER, RIGHT
9	1	472-3895-1	SHOULDER COVER, LEFT
8	2	472-3891	MODIFIED M8 BOLT
7	2	472-3890	SHOULDER COVER BUSHING
6	2	472-3880	ROD END SPACER ASSY
5	1	472-3870	STERNUM BRACKET
4	1	472-3860	RIGHT CLAVICLE ASSEMBLY
3	1	472-3850	LEFT CLAVICLE ASSEMBLY
2	1	472-3840	RIGHT SHOULDER ASSEMBLY
1	1	472-3810	LEFT SHOULDER ASSEMBLY

PARTS LIST

Please note that portions of these drawings are covered by U.S. Patent Nos. 9,514,659 and 9,799,234, assigned to Humanetics Innovative Solutions, Inc. (Humanetics) of Plymouth, Michigan, USA.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

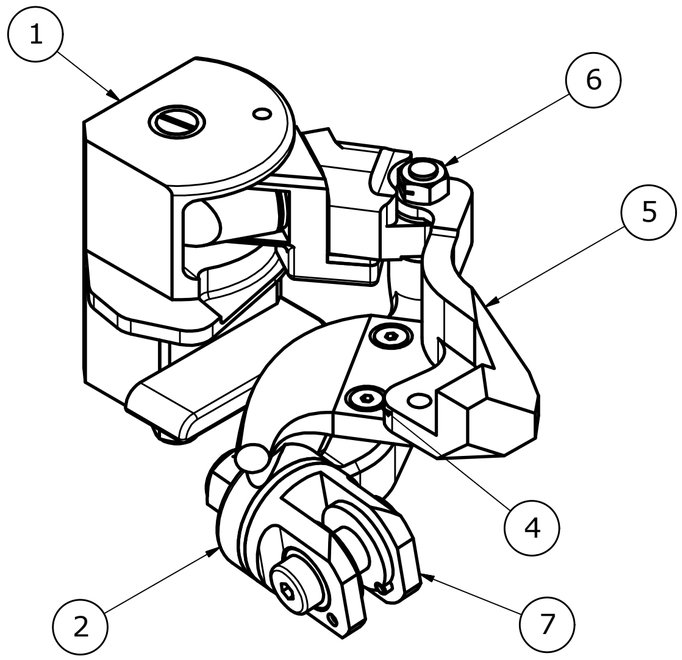
APPROVALS	DATE
DRAWN JIM CLEVENGER	8/5/2013
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

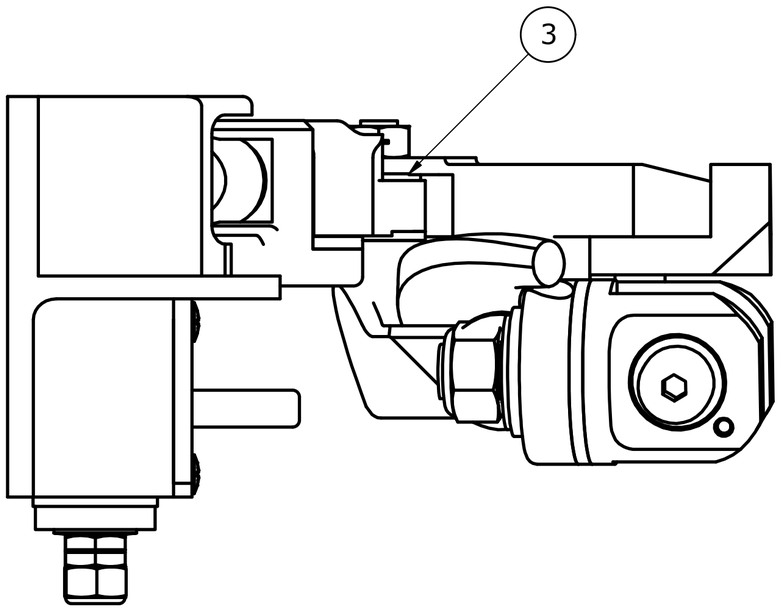
SHOULDER ASSEMBLY
THOR-50M

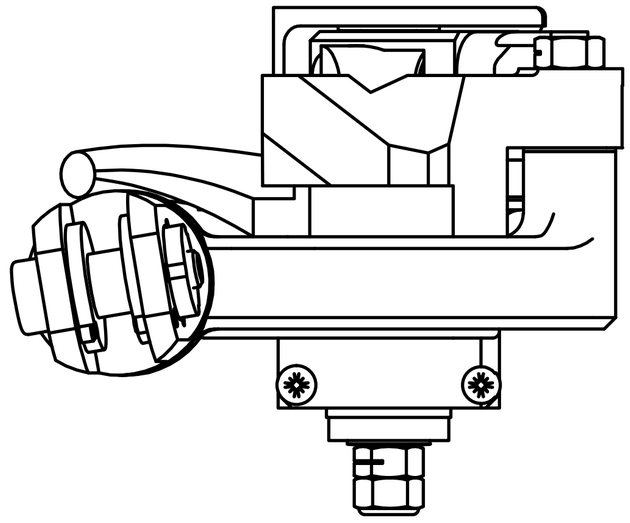
SIZE D | DRAWING NUMBER 472-3800 | REV B
SCALE: 1:1 | SHEET 1 OF 1

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM300; 472-3811 WAS AXSDM600, 472-3829-1 WAS AXSDM012B, 472-3818 WAS AXSDM030B, 472-3830-1 WAS AXSDM010B & 472-3831 WAS AXSDM500	9/9/2014	DW



SCALE 0.750





ITEM	QTY	PART NUMBER	DESCRIPTION
7	1	472-3831	ARM CLEVIS ASSEMBLY
6	1	5001164V	LOCKNUT, M8 x 1.25, SNEP #ESN H100
5	1	472-3830-1	SCAPULA, LH
4	2	5000467	SCREW, FHCS M5 x 0.8 x 16
3	1	472-3818	WASHER LINK, 18 x 8 x 1.5
2	1	472-3829-1	ARM LINK, LH
1	1	472-3811	LEFT SHOULDER PIVOT ASSEMBLY

PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/5/2013
CHECKED	
ENG	
APPROVED	

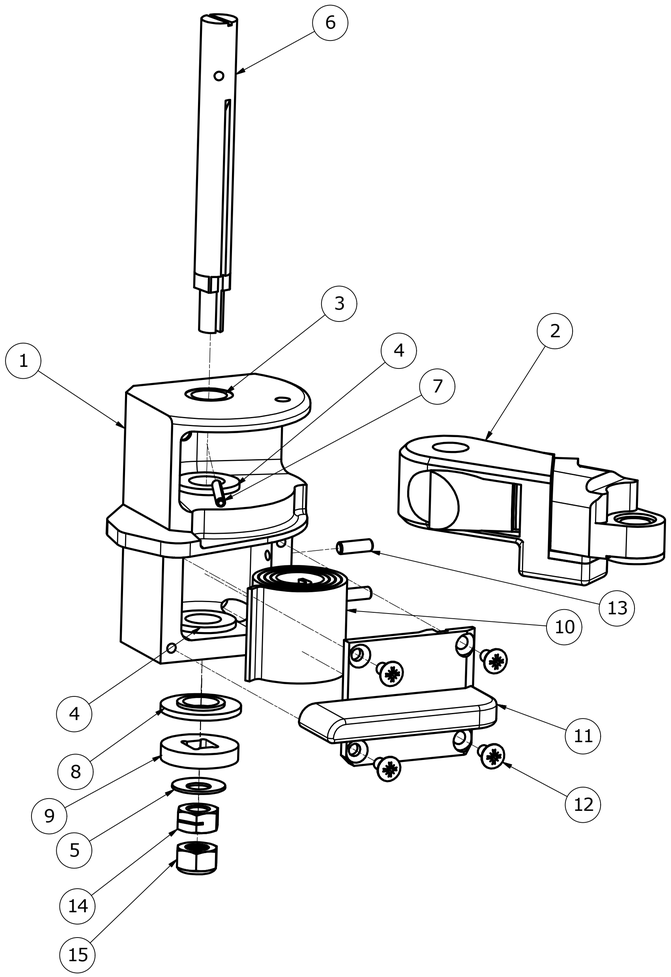
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

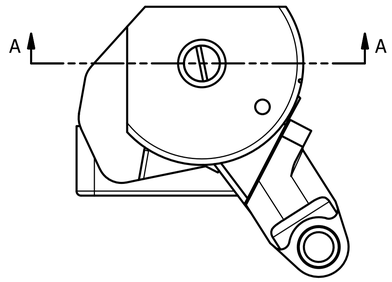
LEFT SHOULDER ASSEMBLY

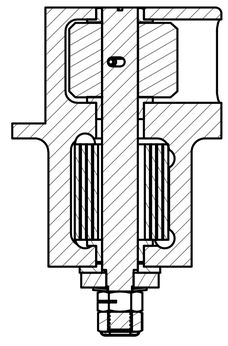
SIZE C | DRAWING NUMBER 472-3810 | REV A
SCALE: 1:1 | SHEET 1 OF 1

Left Shoulder Assembly.iam

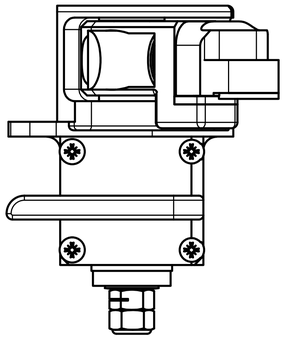
REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM600; IN PARTS LIST, 472-3812-1 WAS AXSDM002B, 472-3813-1 WAS AXSDM700, 472-3822 WAS AXSDFM020B, 472-3823 WAS AXSDM019B, 472-3824 WAS AXSDM001B, 472-3825 WAS AXSDM005C, 472-3826 WAS AXSDM004B, 472-3827 WAS AXSDM018 & 472-3828-1 WAS AXSDM014B	9/10/2014	DW
	B	MOVED BALLOON CALLOUTS TO EXPLODED VIEW	7/27/2015	DW

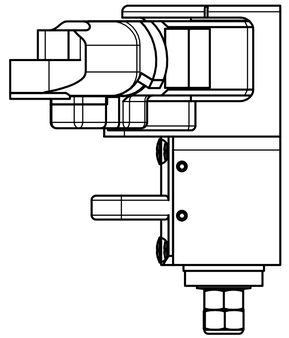






SECTION A-A
SCALE 1 : 1





ITE	QTY	PART NUMBER	DESCRIPTION
15	1	5001165V	NYLOCK, M8 x 1.25
14	1	5001164V	LOCKNUT, M8 x 1.25, SNEP #ESN H100
13	2	5000292V	SCREW, SSFP M4 x 12
12	4	5000699	SCREW, FHMS M4 x .7 x 8 PHILLIPS
A 11	1	472-3828-1	RIB GUIDE LOWER, LH
10	1	472-3827	SPRING
9	1	472-3826	WASHER
A 8	1	472-3825	SPRING HOUSING WASHER, LOWER
7	1	5000140	ROLL PIN, M3 x 24
A 6	1	472-3824	SPRING SHAFT
5	1	5001170V	SPRING DISC WASHER, 20 x 8.2 x 1.0
A 4	2	472-3823	SPRING HOUSING BUSHING, LOWER
3	1	472-3822	SPRING HOUSING BUSHING, UPPER
2	1	472-3813-1	SHOULDER SUPPORT ASSEMBLY, LH
A 1	1	472-3812-1	SPRING HOUSING COVER, LH

PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/8/2013
CHECKED	
ENG	
APPROVED	

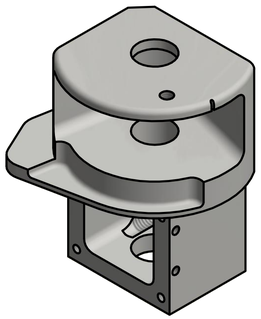
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

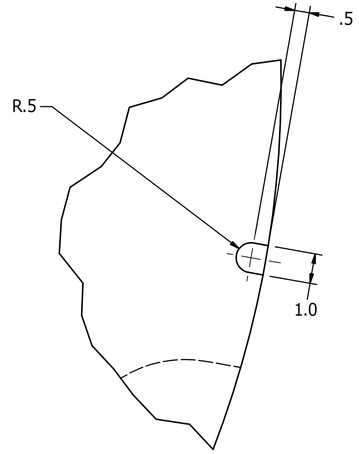
LEFT SHOULDER PIVOT ASSEMBLY

SIZE D | DRAWING NUMBER 472-3811 | REV B
SCALE: 1:1 | SHEET 1 OF 1

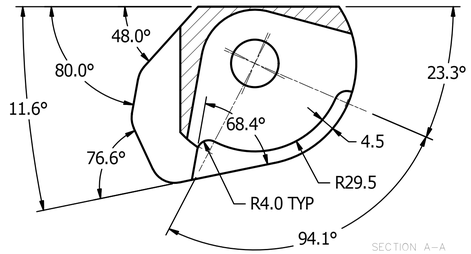
Shoulder Pivot Assembly - LH.iam

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM002B	9/10/2014	
	B	ADDED FINISH - ELECTROLESS NICKEL .008 MAX.; ADDED DIMENSION R2.0; ADDED ALIGNMENT NOTCH AND DETAIL "D"	9/14/2015	DW

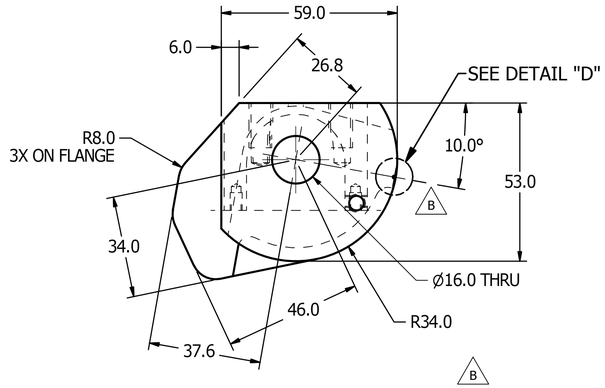


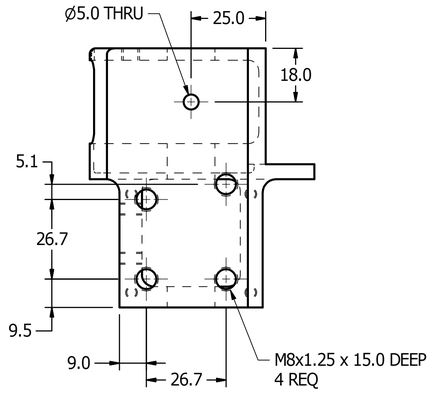


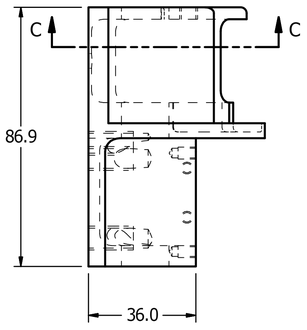
DETAIL D
SCALE 10 : 1
B

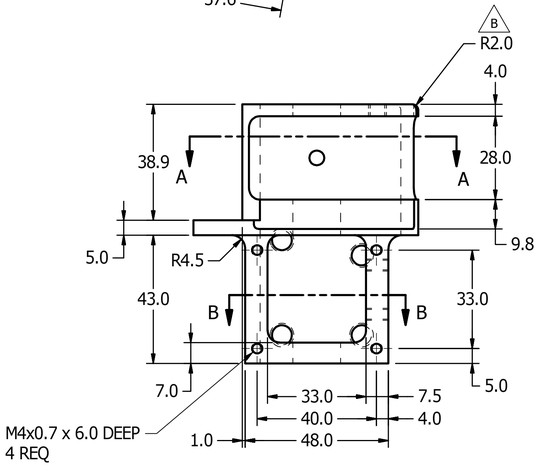


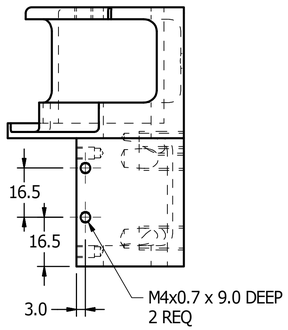
SECTION A–A
SCALE 1 : 1

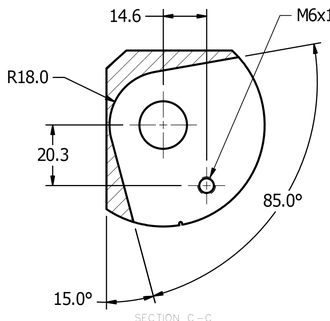




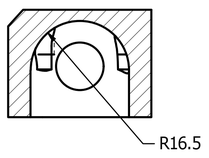








SECTION C–C
SCALE 1 : 1



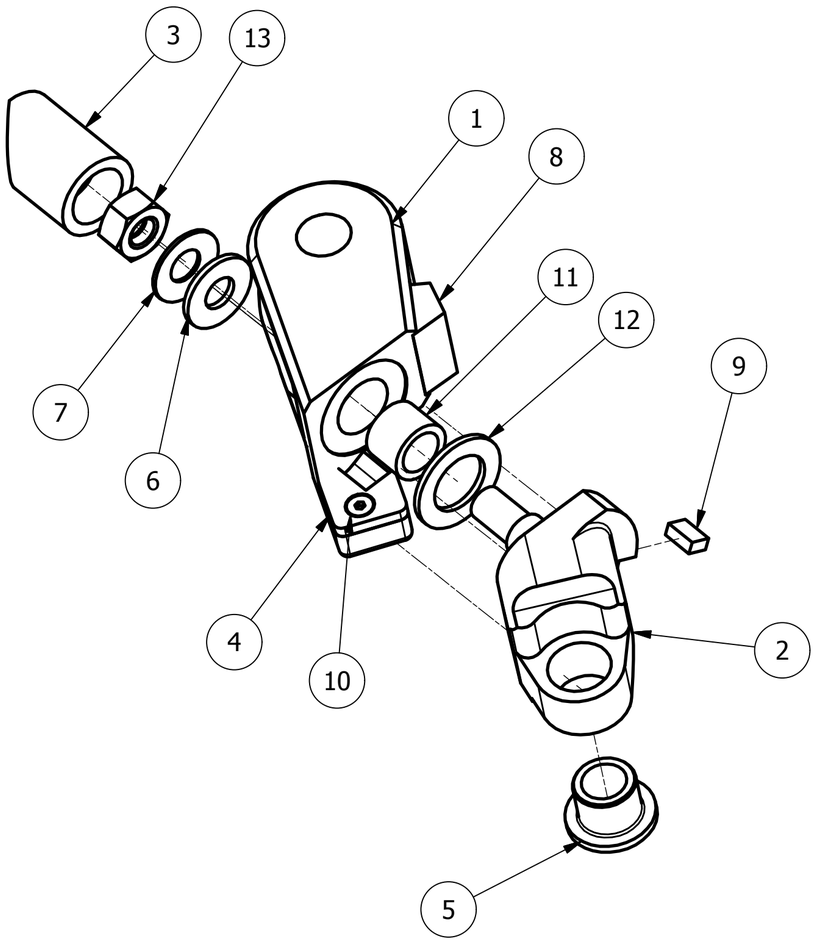
SECTION B–B
SCALE 1 : 1

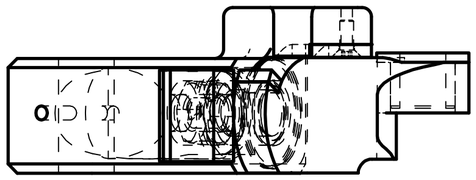
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS; TOLERANCES ARE: DECIMAL: ANGLES: MACHINED: X ±.5 ±.5; X.X ±.2; X.XX ±.1; ASME Y14.5M - 1994; DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	SPRING HOUSING COVER, LH
	DRAWN: JIM CLEVENGER	8/15/2013	
	CHECKED		
MATERIAL: Steel	ENG		
HEAT TREAT	APPROVED		SIZE: D; DRAWING NUMBER: 472–3812–1; REV: B
FINISH: ELECTROLESS NICKEL .008 MAX.			SCALE: 1:1; SHEET 1 OF 1

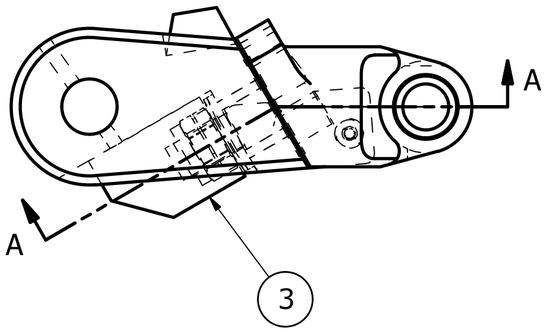
B

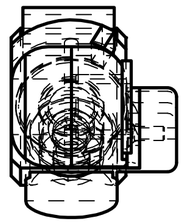
Spring Housing Cover - LH.ipt

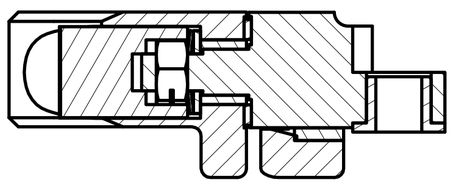
REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM700; IN PARTS LIST 472-3814 WAS AXSDM006B, 472-3815-1 WAS AXSDM008B, 47-3816 WAS AXSDM016C, 472-3817-1 WAS AXSDM025B, 472-3818 WAS AXSDM030B, 472-3819 WAS AXSDM017B, 472-3820 WAS AXSDM024B & 472-3821 WAS AXSDM031B	9/10/2014	DW
	B	MOVED BALLOON CALLOUTS TO EXPLODED VIEW	7/13/2015	DW
	C	ITEM #5 PART NUMBER WAS 5001168V AND ITEM #11 PART NUMBER WAS 5001169V	6/29/2017	DW











SECTION A–A
SCALE 1 : 1

ITEM	QTY	PART NUMBER	DESCRIPTION
13	1	5001164V	LOCKNUT, M8 x 1.25, SNEP #ESN H100
12	1	472-3821	LINK WASHER, 23 x 14.2 x 1.5
11	1	6001169V	BEARING, IGLIDUR 14 x 10 X 10 LG
10	1	5000116	SCREW, FHCS, M3 x .5 x 8
9	1	472-3820	BUFFER, VERTICAL
8	1	472-3819	REAR ROM BUFFER
7	1	5001170V	SPRING DISC WASHER, 20 x 8.2 x 1.0
6	1	472-3818	WASHER LINK, 18 x 8 x 1.5
5	1	6001168V	FLANGE BEARING, 14 OD x 20 FL x 10 ID x 12 LG
4	1	472-3817-1	BUFFER, LOWER LEFT
3	1	472-3816	FORWARD ROM BUFFER
2	1	472-3815-1	SHOULDER SUPPORT PIVOT, LH
1	1	472-3814-1	SHOULDER SUPPORT, LH

PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
ANGLES: ±.5
MACHINED:
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/8/2013
CHECKED	
ENG	
APPROVED	

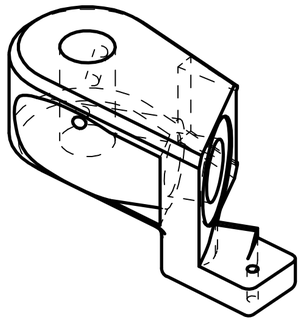
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

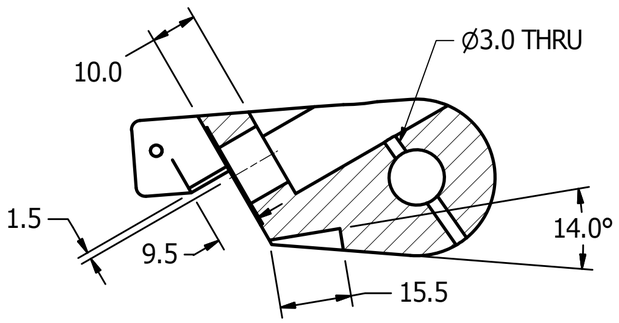
SHOULDER SUPPORT ASSEMBLY, LH

SIZE C | DRAWING NUMBER 472–3813–1 | REV C
SCALE: 1:1 | SHEET 1 OF 1

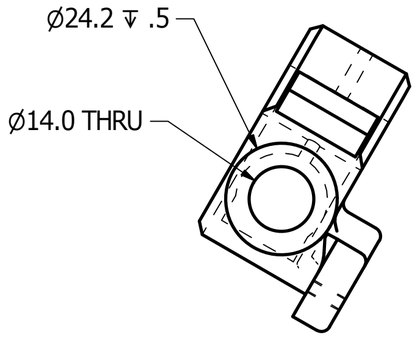
Shoulder Support Assembly - LH.iam

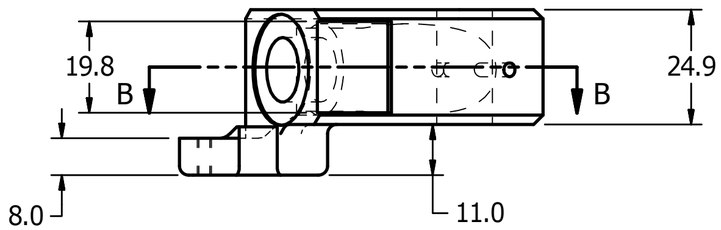
REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	DESI
	A	DRAWING NUMBER WAS AXSDM006B	9/10/2014	DW
	B	ADDED FINISH - ELECTROLESS NICKEL .008 MAX.	6/29/2015	DW

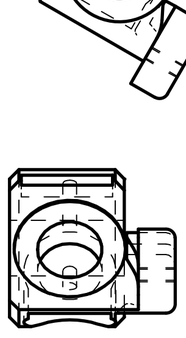


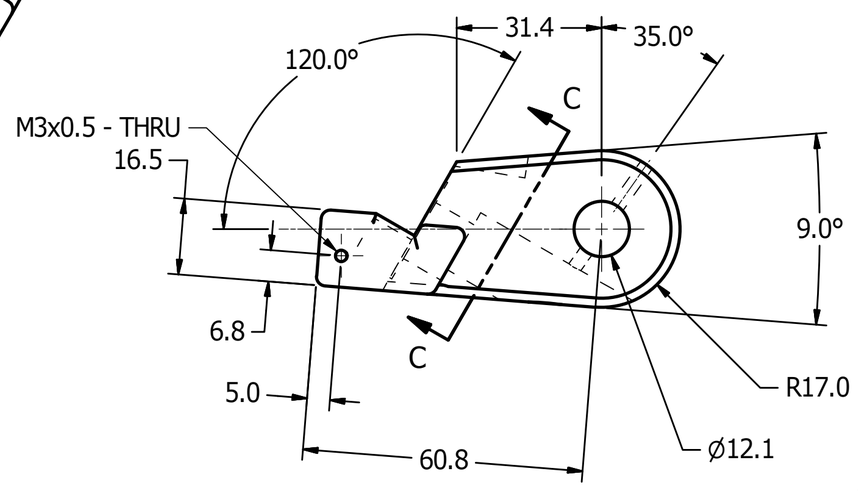


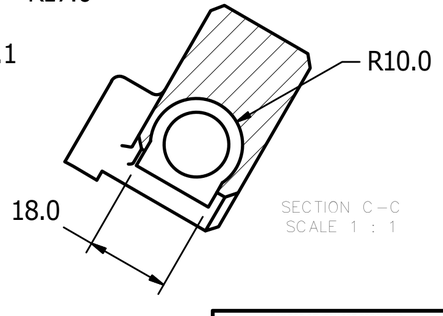
SECTION B–B
SCALE 1 : 1











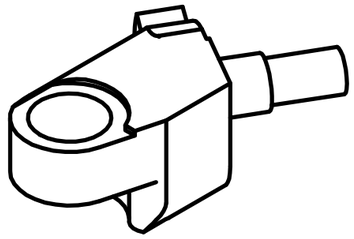
SECTION C–C
SCALE 1 : 1

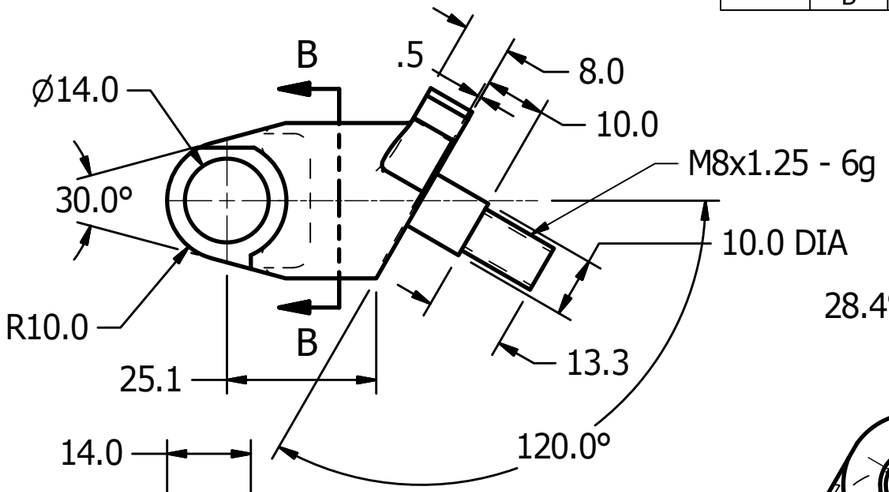
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; ANGLES: ±.5; MACHINED: 16 ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	SHOULDER SUPPORT, LH
	DRAWN: JIM CLEVENGER 8/15/2013	
	CHECKED	
MATERIAL: Steel	ENG	SIZE: C; DRAWING NUMBER: 472–3814–1; REV: B
HEAT TREAT	APPROVED	SCALE: 1:1; SHEET: 1 OF 1
FINISH: ELECTROLESS NICKEL .008 MAX.		

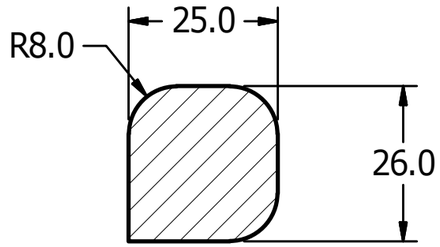
B

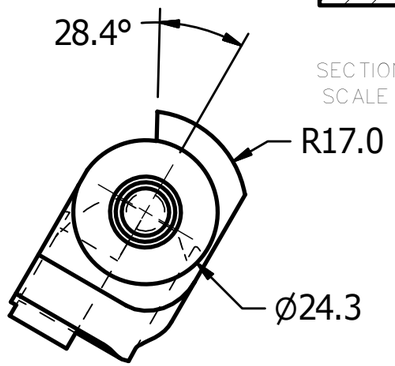
Shoulder Support - LH.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM008B	9/10/2014	DW
	B	ADDED FINISH - ELECTROLESS NICKEL .008 MAX.	6/29/2015	DW

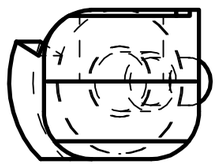


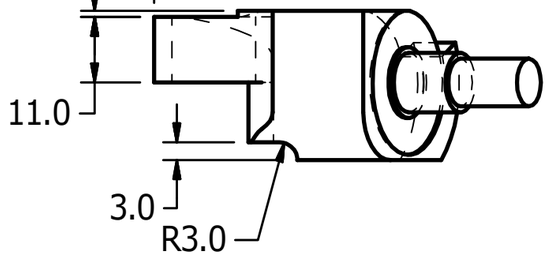


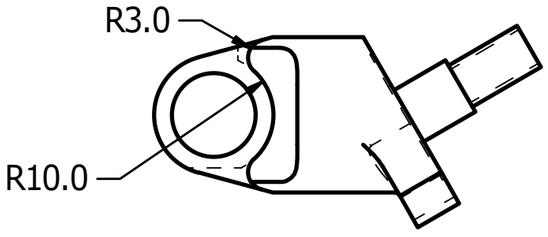




SECTION B–B
SCALE 1 : 1





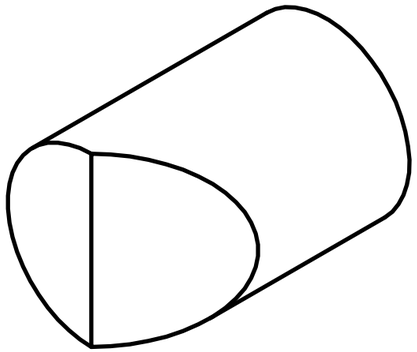


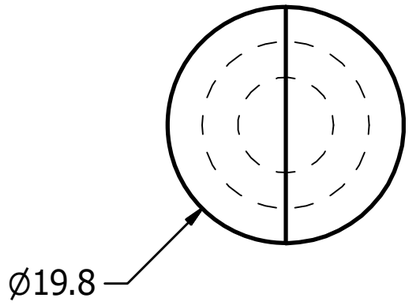
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; ANGLES: ±.5; MACHINED: 1.6 ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	SHOULDER SUPPORT PIVOT, LH
	DRAWN JIM CLEVENGER 8/15/2013	
	CHECKED	
MATERIAL Steel	ENG	SIZE B / DRAWING NUMBER 472–3815–1 / REV B
HEAT TREAT	APPROVED	
FINISH ELECTROLESS NICKEL .008 MAX.		SCALE: 1:1 / SHEET 1 OF 1

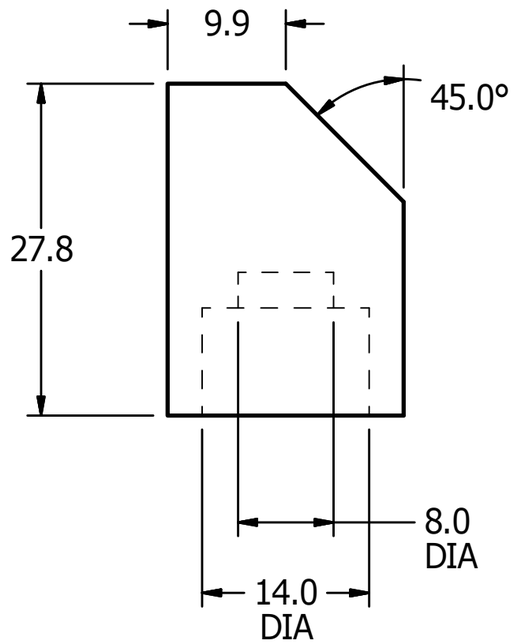
B

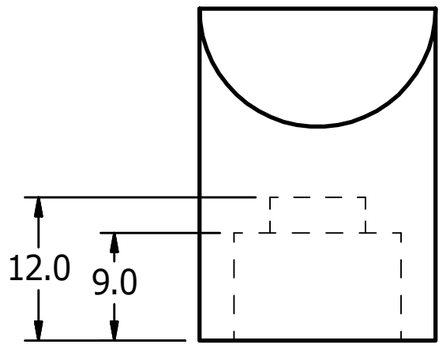
Shoulder Support Pivot - LH.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM016C	9/10/2014	DW









UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
ANGLES: ±.5
MACHINED: 1.6

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Urethane, Clear
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/20/2013
CHECKED	
ENG	
APPROVED	

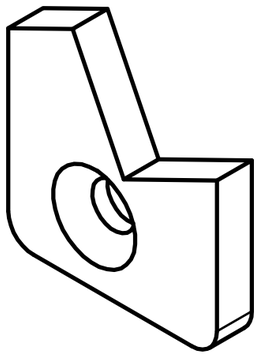
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

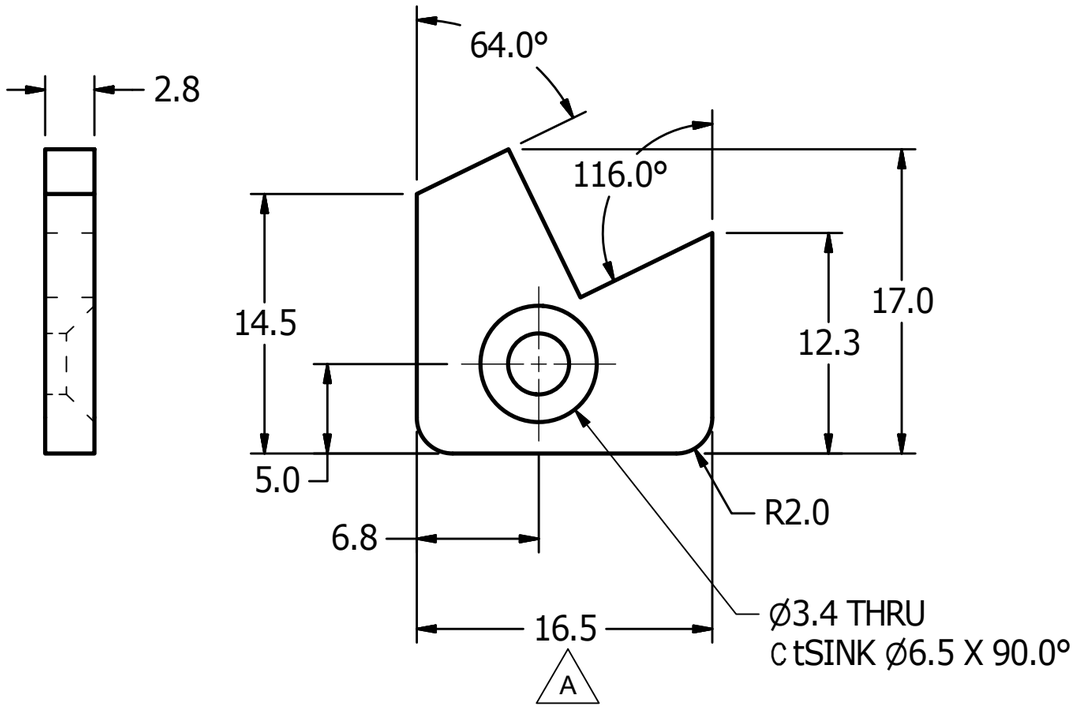
FORWARD ROM BUFFER

SIZE: B | DRAWING NUMBER: 472-3816 | REV: A
SCALE: 2X | SHEET: 1 OF 1

Buffer ROM Foward.ipt

REVISION HISTORY				
ZONE	RE	DESCRIPTION	DATE	BY
	A	ADDED DIMENSION 16.5	8/20/2013	DW
	B	DRAWING NUMBER WAS AXSDM025B	9/10/2014	DW





UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Acetal Resin, Black
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/20/2013
CHECKED	
ENG	
APPROVED	

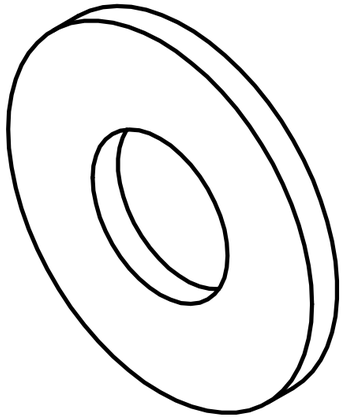
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

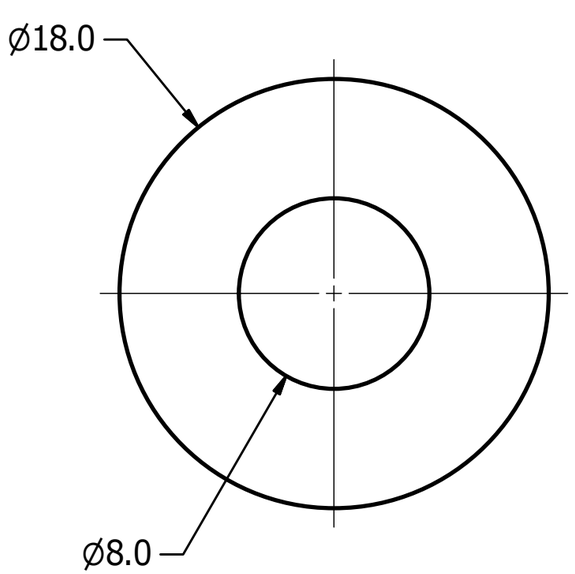
BUFFER, LOWER LEFT

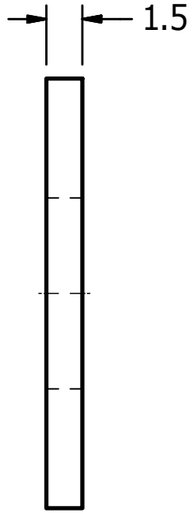
SIZE: B
DRAWING NUMBER: 472-3817-1
REV: B
SCALE: 3X
SHEET: 1 OF 1

Buffer Lower, Left.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	DESI
	A	DRAWING NUMBER WAW AXSDM030B	9/10/2014	DW







UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Acetal Resin, Black
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: JIM CLEVENGER	8/20/2013
CHECKED:	
ENG:	
APPROVED:	

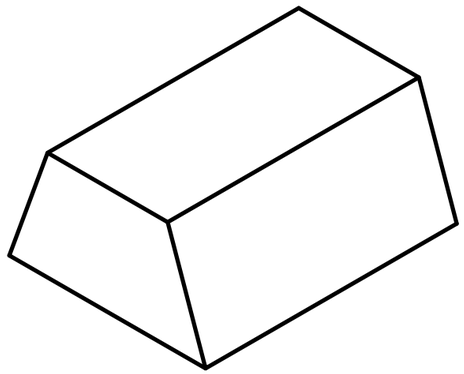
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

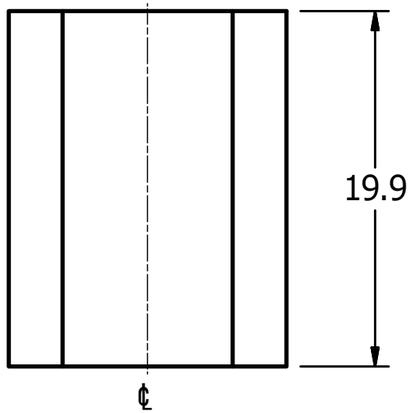
WASHER LINK, 18 x 8 x 1.5

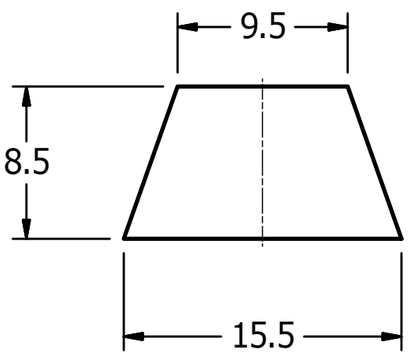
SIZE: B | DRAWING NUMBER: 472-3818 | REV: A
SCALE: 4X | SHEET: 1 OF 1

Washer, Link 18x8x1,5.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS ASXDM017B	9/10/2014	DW







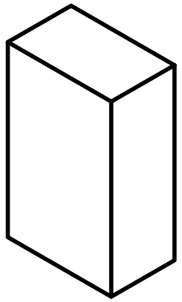
NOTES:

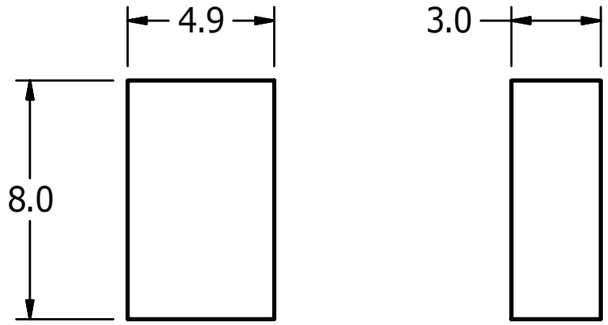
1. DIMENSIONS ARE SYMETRICAL ABOUT ℄

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; ANGLES: ±.5; MACHINED: 125 ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
MATERIAL: Urethane, Clear	APPROVALS / DATE	REAR ROM BUFFER
HEAT TREAT	DRAWN: JIM CLEVENGER 8/20/2013	SIZE: B
FINISH	CHECKED	DRAWING NUMBER: 472-3819
	ENG	REV: A
	APPROVED	SCALE: 3X
		SHEET: 1 OF 1

Link 1 ROM Rearward Buffer.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM024B	9/10/2014	DW





UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	Acetal Resin, Black
HEAT TREAT	
FINISH	

VEHICLE **R**ESEARCH and **T**EST **C**ENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/20/2013
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

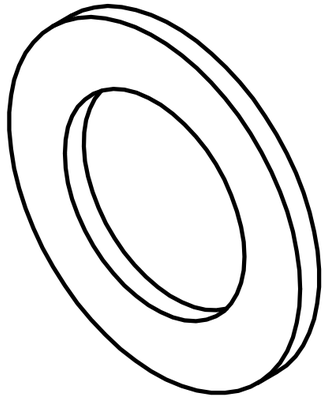
BUFFER, VERTICAL

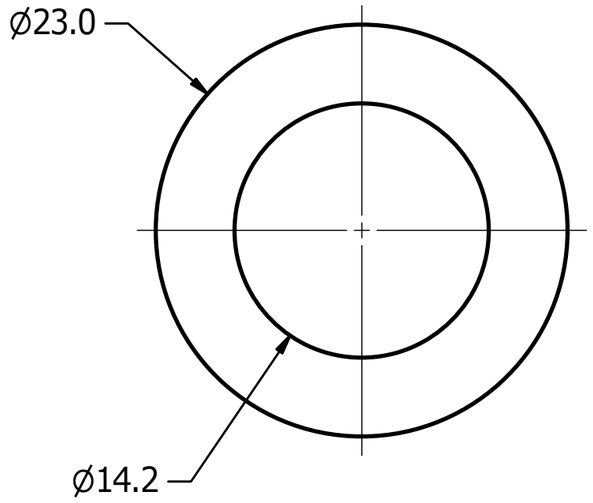
SIZE	DRAWING NUMBER	REV
B	472-3820	A

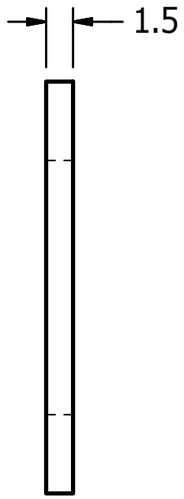
SCALE: 5X SHEET 1 OF 1

Buffer.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM031B	9/10/2014	DW







UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	Acetal Resin, Black
HEAT TREAT	
FINISH	

VEHICLE **R**ESEARCH and **T**EST **C**ENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/20/2013
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

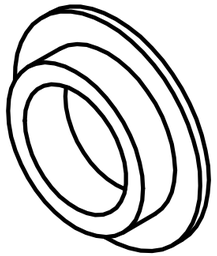
LINK WASHER, 23 x 14.2 x 1.5

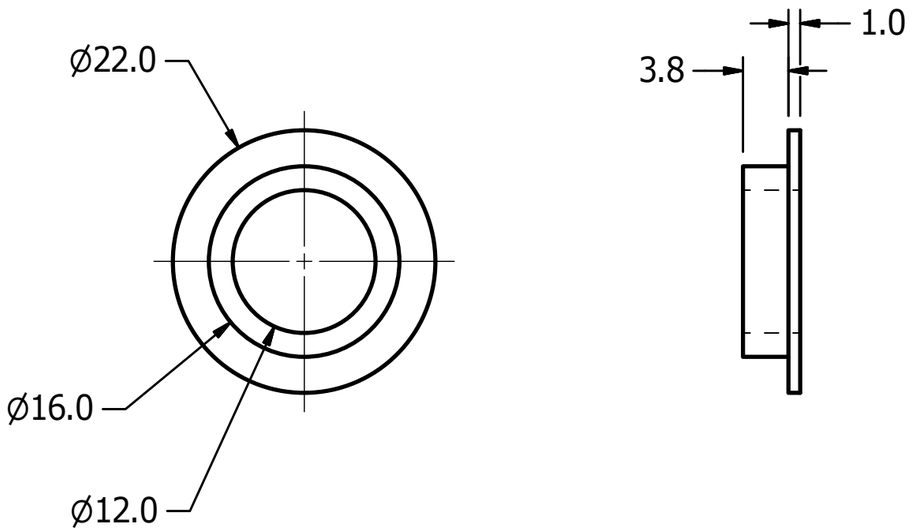
SIZE	DRAWING NUMBER	REV
B	472-3821	A

SCALE:	SHEET
3X	1 OF 1

Washer, Link 23x14.2x1,5.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	DESI
	A	DRAWING NUMBER WAS AXSDM020B	9/10/2014	DW





UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Acetal Resin, Black
HEAT TREAT:
FINISH:

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/21/2013
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

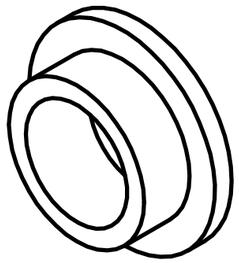
SPRING HOUSING BUSHING, UPPER

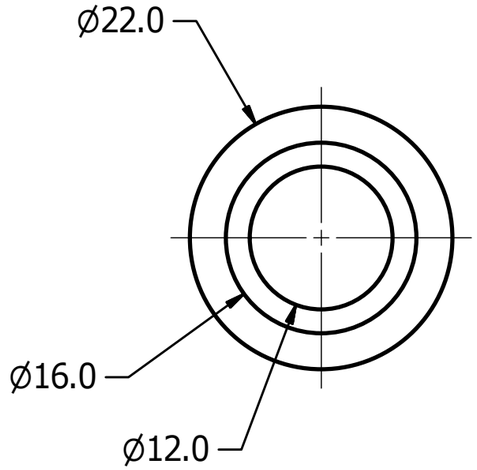
SIZE	DRAWING NUMBER	REV
B	472-3822	A

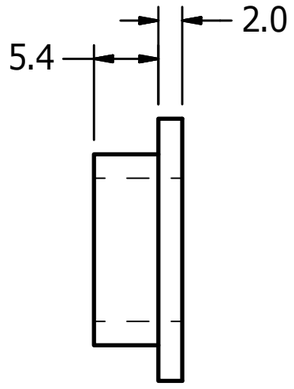
SCALE: 2X SHEET 1 OF 1

Bushing Spring Housing Upper.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM019B	9/10/2014	DW







UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Acetal Resin, Black
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: JIM CLEVENGER	8/21/2013
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

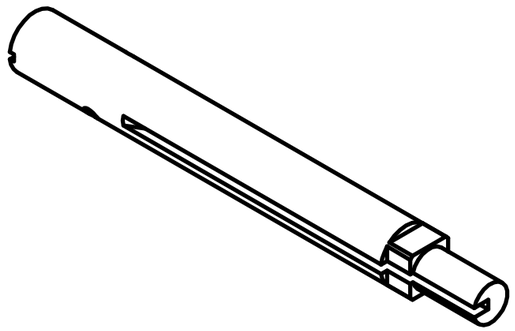
SPRING HOUSING BUSHING, LOWER

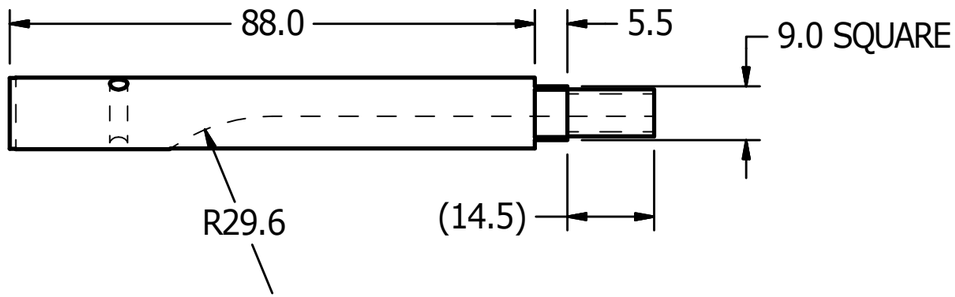
SIZE: B | DRAWING NUMBER: 472-3823 | REV: A

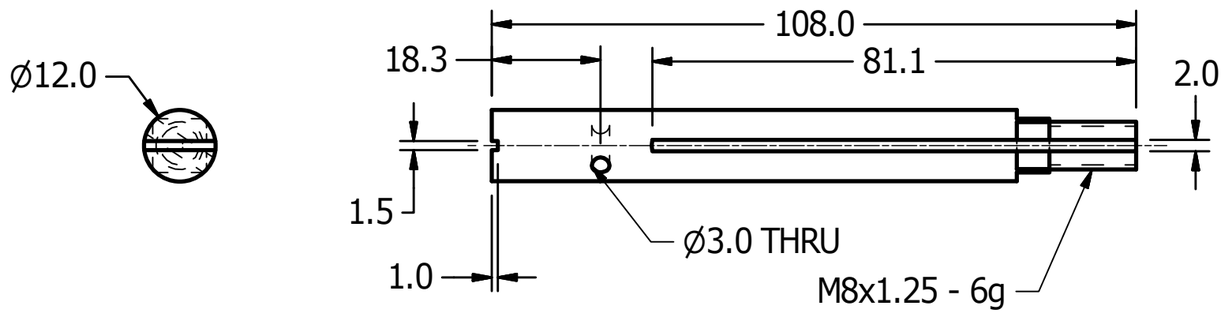
SCALE: 2X | SHEET: 1 OF 1

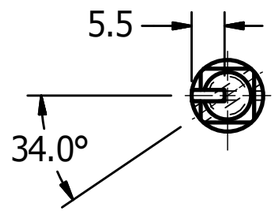
Bushing Spring Housing Lower.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM001B	9/10/2014	DW
	B	ADDED FINISH - ELECTROLESS NICKEL .008 MAX.	6/30/2015	DW





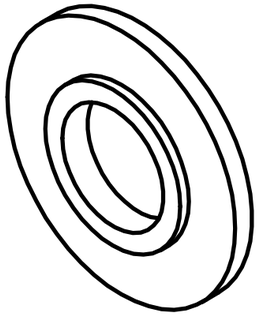


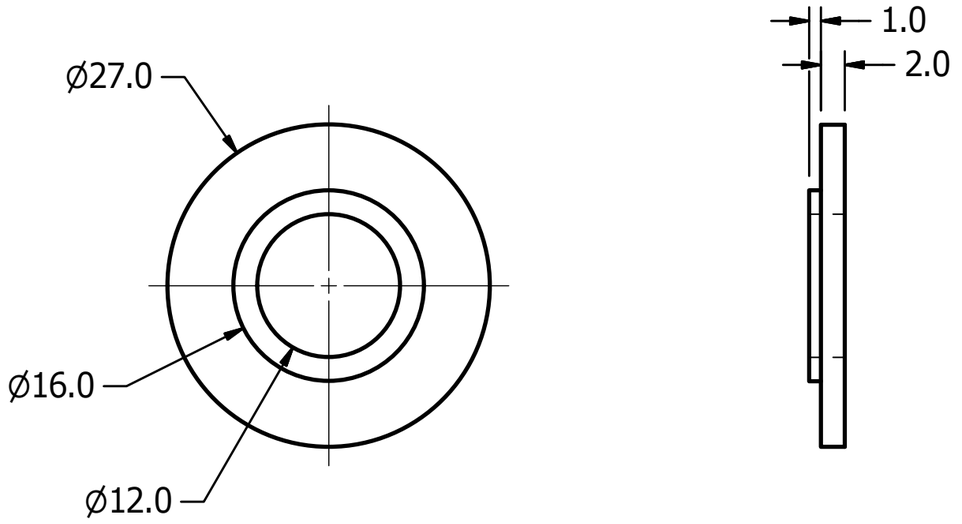


UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; ANGLES: ±.5; MACHINED: 1.6 ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
MATERIAL: Steel	APPROVALS / DATE	SPRING SHAFT
HEAT TREAT	DRAWN: JIM CLEVENGER 8/21/2013	SIZE: B; DRAWING NUMBER: 472-3824; REV: B
FINISH: ELECTROLESS NICKEL .008 MAX.	CHECKED / ENG / APPROVED	SCALE: 1:1; SHEET: 1 OF 1

Spring Shaft.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM005C	9/10/2014	DW





UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Acetal Resin, Black
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: JIM CLEVENGER	8/21/2013
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

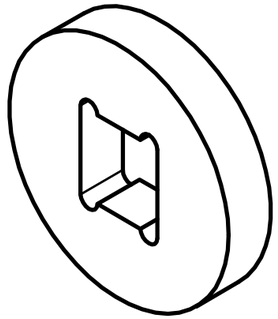
SPRING HOUSING WASHER, LOWER

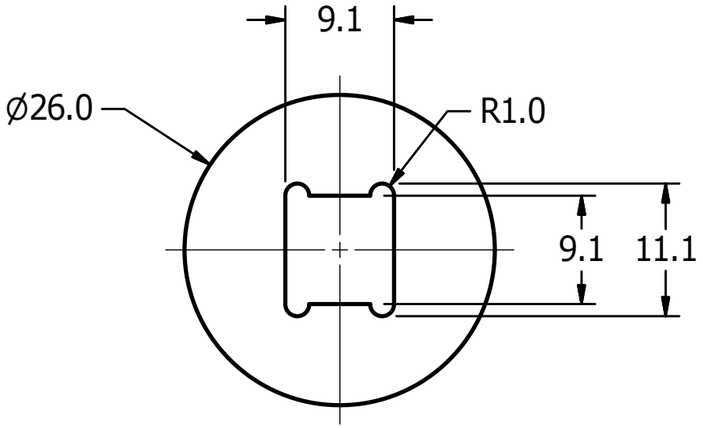
SIZE	DRAWING NUMBER	REV
B	472-3825	A

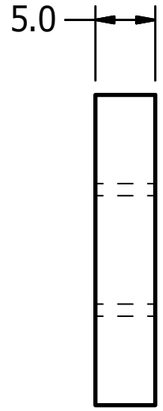
SCALE: 2X SHEET 1 OF 1

Washer Lower Spring Housing.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM004B	9/10/2014	DW







UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Aluminum 6061
HEAT TREAT:
FINISH: ANODIZE

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN: JIM CLEVENGER	8/21/2013
CHECKED:	
ENG:	
APPROVED:	

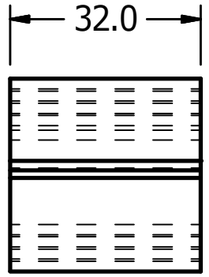
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

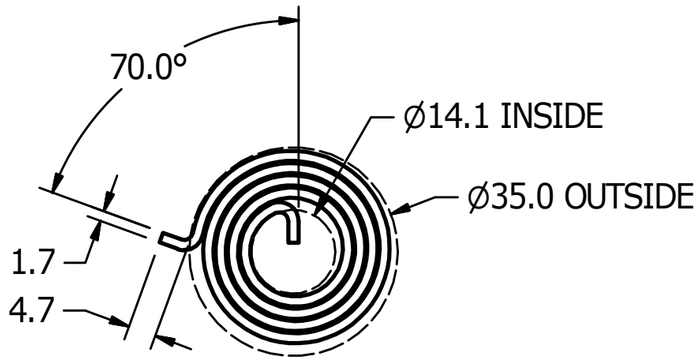
WASHER

SIZE: B | DRAWING NUMBER: 472-3826 | REV: A
SCALE: 2X | SHEET: 1 OF 1

Washer.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM018	9/10/2014	DW





UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Steel, SPRING
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: JIM CLEVENGER	8/21/2013
CHECKED:	
ENG:	
APPROVED:	

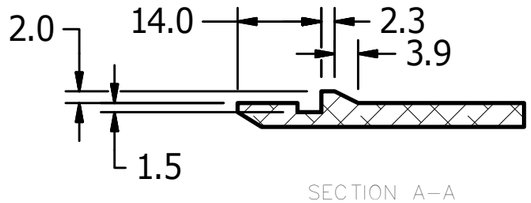
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

SPRING

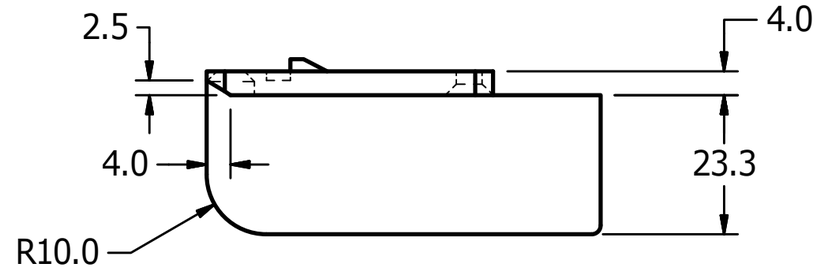
SIZE: B | DRAWING NUMBER: 472-3827 | REV: A
SCALE: 1:1 | SHEET: 1 OF 1

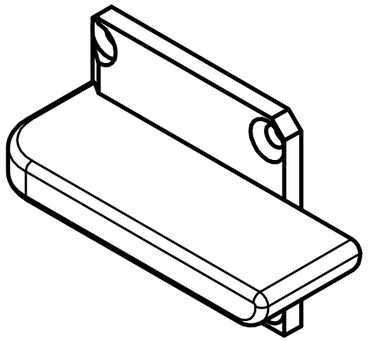
Spring.ipt

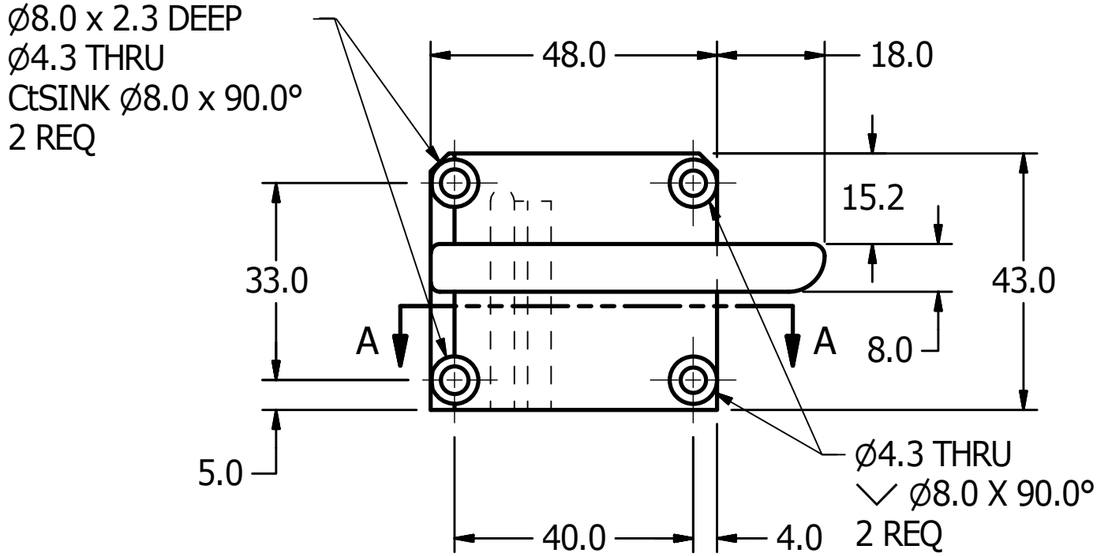
REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM014B	9/10/2014	DW

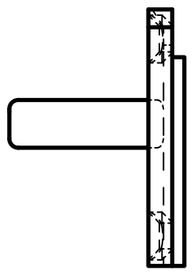


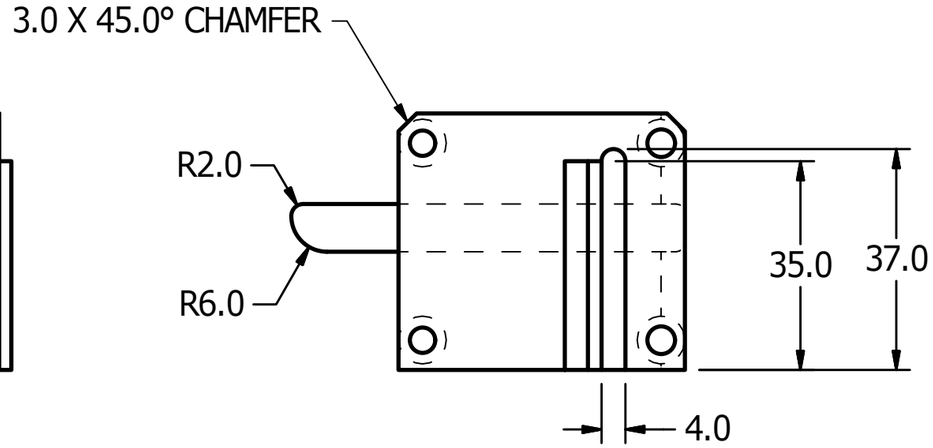
SECTION A–A
SCALE 1 : 1











UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
ANGLES: ±.5
MACHINED: 1.6
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Aluminum 6061
HEAT TREAT:
FINISH: ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/21/2013
CHECKED	
ENG	
APPROVED	

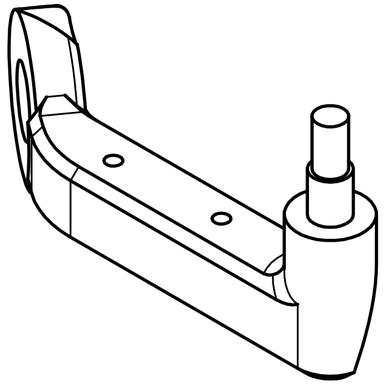
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

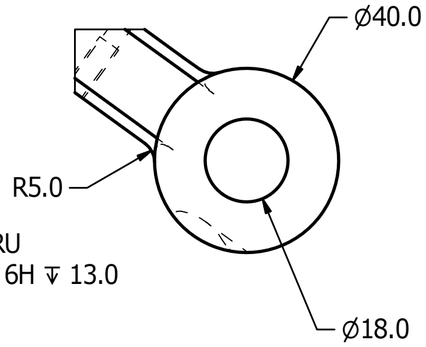
RIB GUIDE LOWER, LH

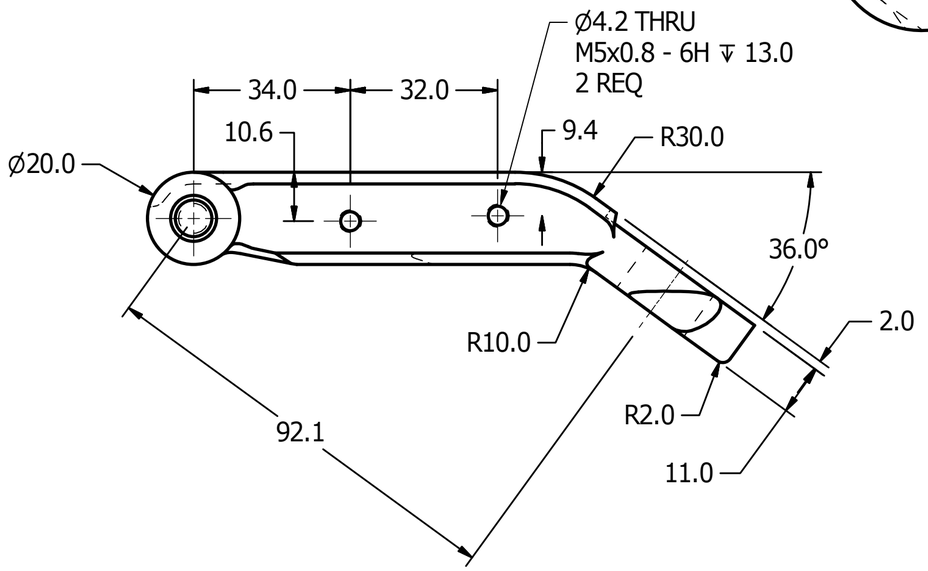
SIZE: B | DRAWING NUMBER: 472–3828–1 | REV: A
SCALE: 1:1 | SHEET: 1 OF 1

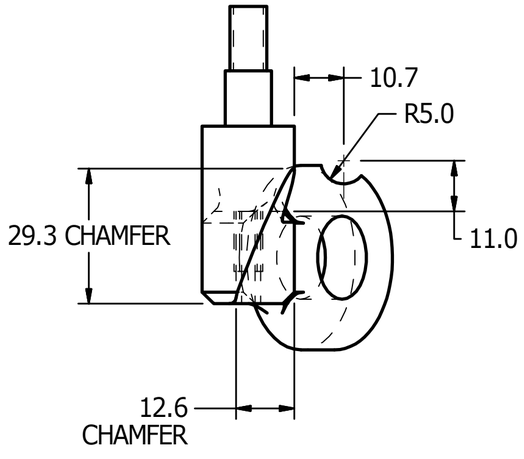
Rib Guide Lower, LH.ipt

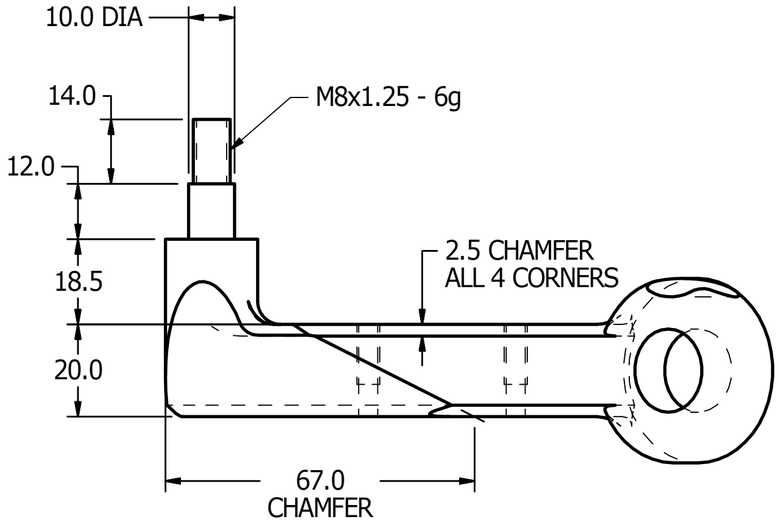
REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM012B	9/10/2014	DW
	B	ADDED FINISH - ELECTROLESS NICKEL .008 MAX.	6/30/2015	DW











UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
ANGLES: ±.5
MACHINED: 16
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Steel
HEAT TREAT:
FINISH: ELECTROLESS NICKEL .008 MAX.

B

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/15/2013
CHECKED	
ENG	
APPROVED	

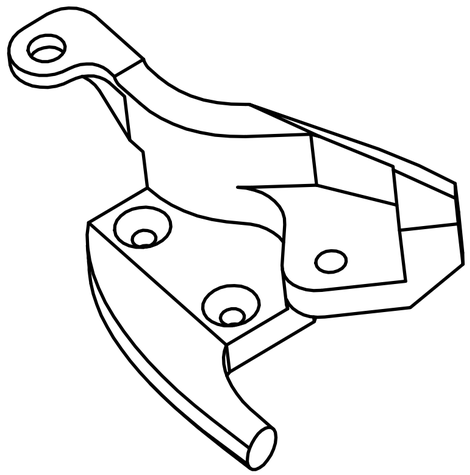
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

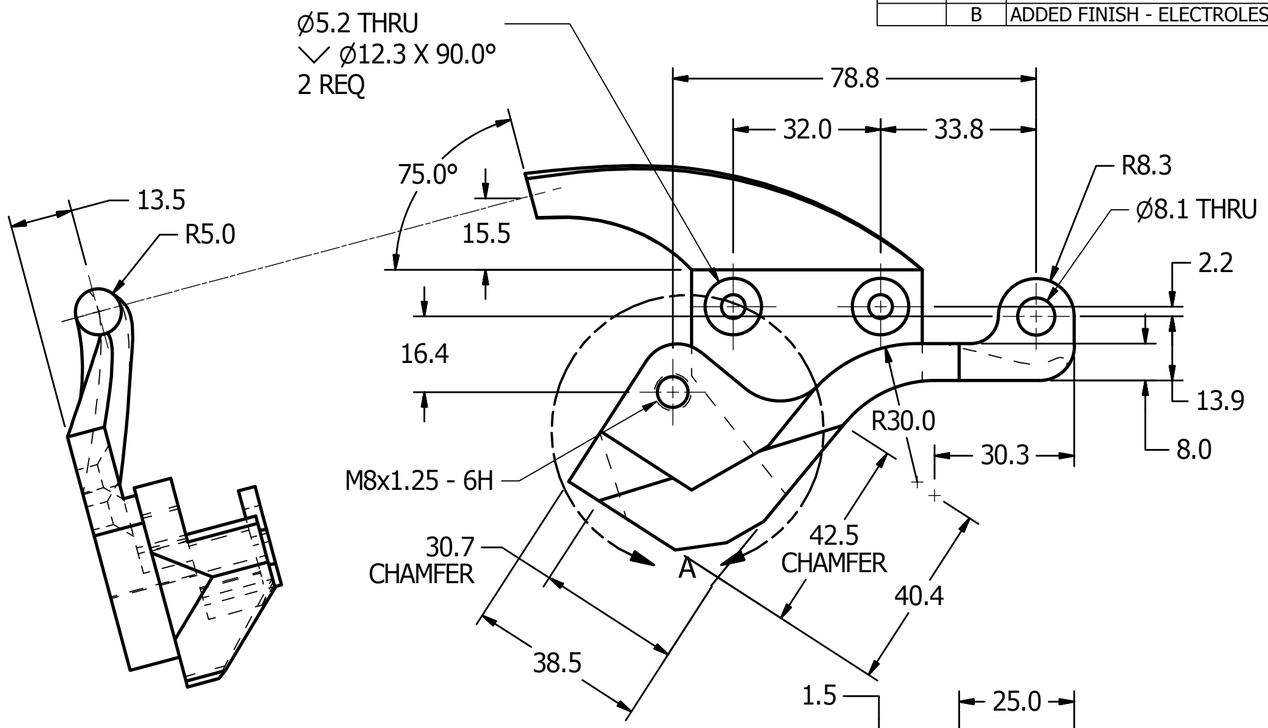
ARM LINK, LH

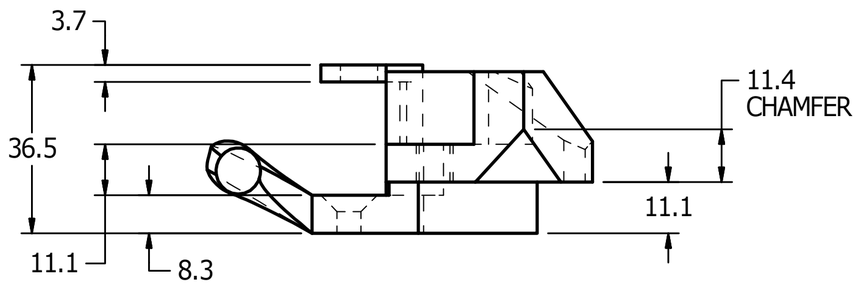
SIZE: C | DRAWING NUMBER: 472-3829-1 | REV: B
SCALE: 1:1 | SHEET: 1 OF 1

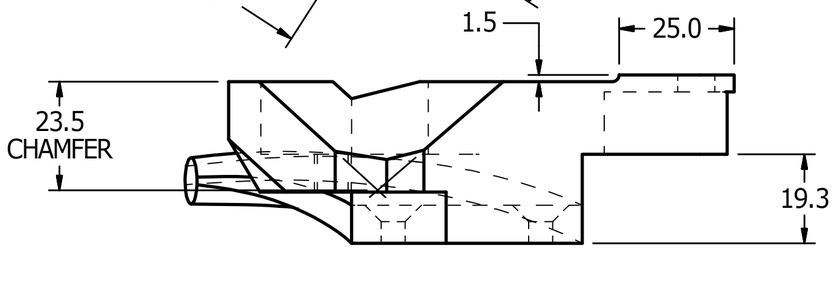
Arm Link, LH.ipt

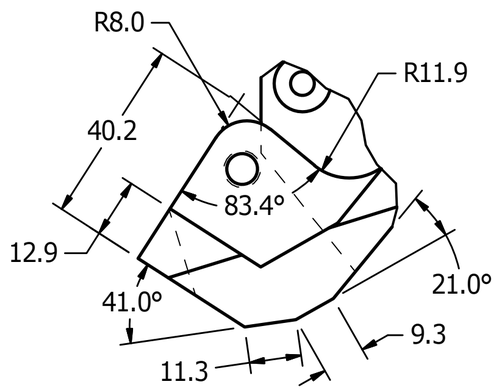
REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM010B	9/10/2014	DW
	B	ADDED FINISH - ELECTROLESS NICKEL .008 MAX.	6/30/2015	DW



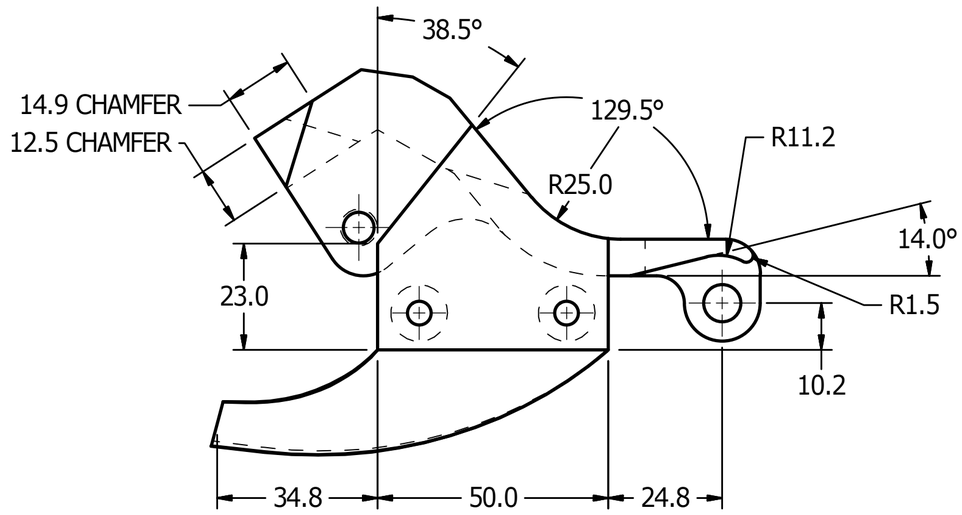








DETAIL A
SCALE 1 : 1

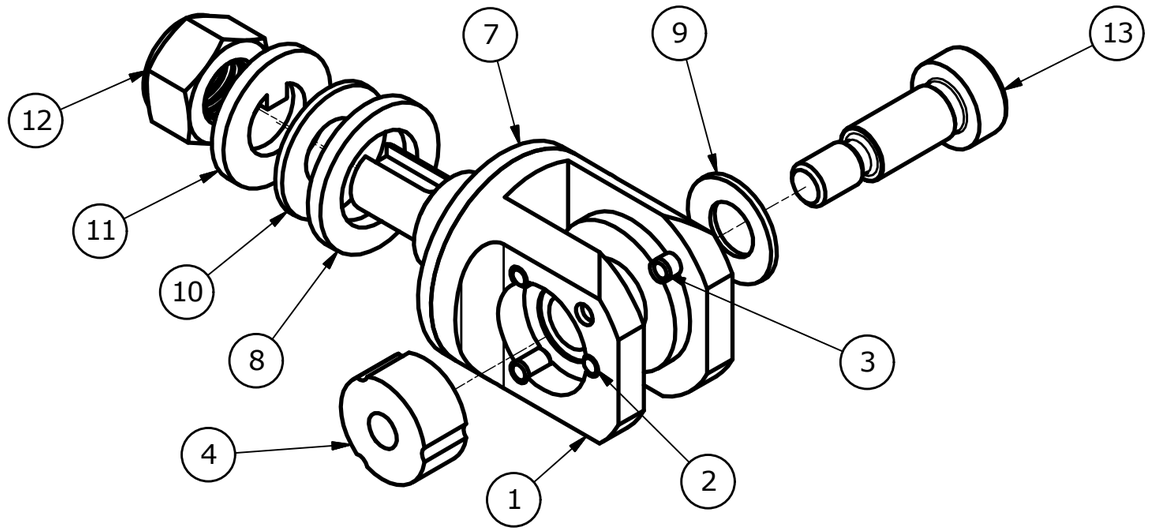


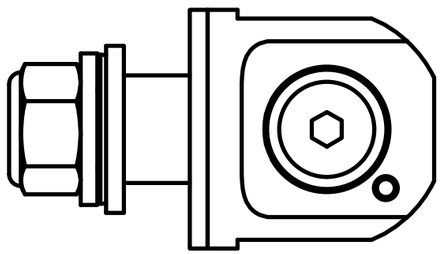
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; ANGLES: ±.5; MACHINED: √ ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	SCAPULA, LH
	DRAWN JIM CLEVENGER	8/19/2013	
	CHECKED		
MATERIAL Steel	ENG		SIZE C; DRAWING NUMBER 472-3830-1; REV B
HEAT TREAT	APPROVED		
FINISH ELECTROLESS NICKEL .008 MAX.			SCALE: 1:1; SHEET 1 OF 1

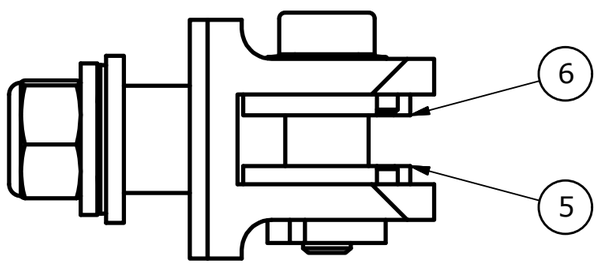
B

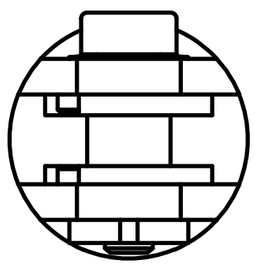
Scapula,
LH-Sept 2015

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM500; IN PARTS LIST 472-3832 WAS AXSDB042B, 472-3833 WAS AXSDM043B, 472-3834 WAS AXSDM056, 472-3835 WAS AXSDM045B, 472-3836 WAS AXSDM028B, 472-3837 WAS AXSDM029B, & 472-3838 WAS AXSDM510V	9/10/2014	DW
	B	ITEM #9 PART NUMBER WAS 5001166V, ITEM #10 PART NUMBER WAS 5001167V, & ITEM #12 PART NUMBER WAS 5001177V	6/29/2017	DW









ITEM	QTY	PART NUMBER	DESCRIPTION
13	1	5001172V	SCREW, SHSS M10 x 20mm LG.
12	1	5010638	LOCKNUT, NYLON, M12 x 1.75
11	1	472-3838	TABBED WASHER
10	1	5000764V	DISC SPRING WASHER, 25 x 12.2 x 1.25
9	1	5000763V	DISC SPRING WASHER, 20 x 10.2 x 1.1
8	1	472-3837	WASHER, ARM CLEVIS
7	1	472-3836	BUSHING, ARM PIVOT
6	1	472-3835	BUSHING, UPPER ARM
5	1	472-3834	WASHER, UPPER ARM
4	1	472-3833	NUT, UPPER ARM PIVOT
3	2	5000524	PIN, DOWEL M4 x 8
2	3	5000680	PIN, DOWEL M4 x 6
1	1	472-3832	ARM CLEVIS

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
ANGLES: ±.5
MACHINED: 1.6
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/7/2013
CHECKED	
ENG	
APPROVED	

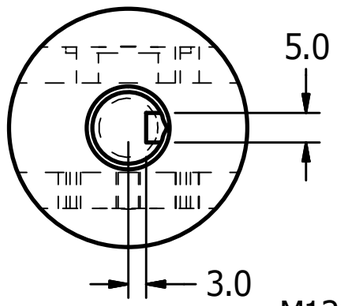
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

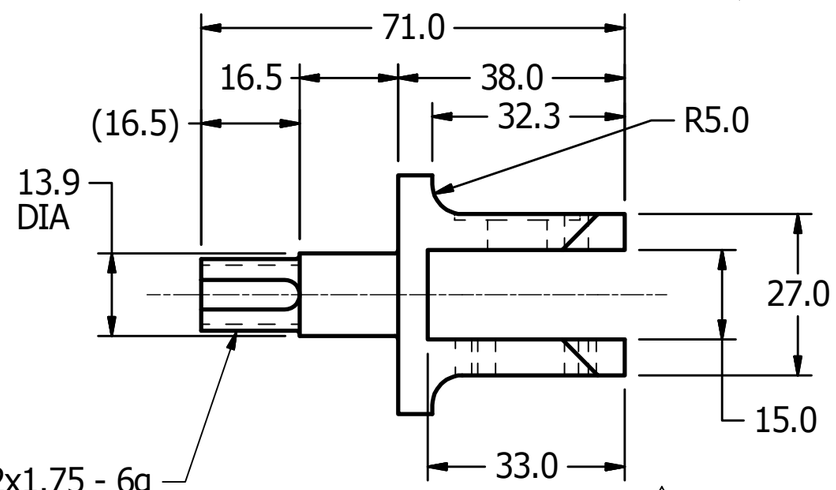
ARM CLEVIS ASSEMBLY

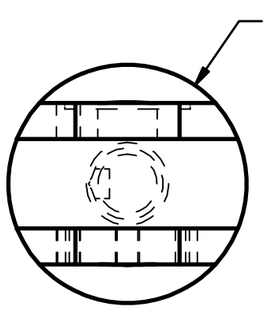
SIZE B | DRAWING NUMBER 472-3831 | REV B
SCALE: 1:1 | SHEET 1 OF 1

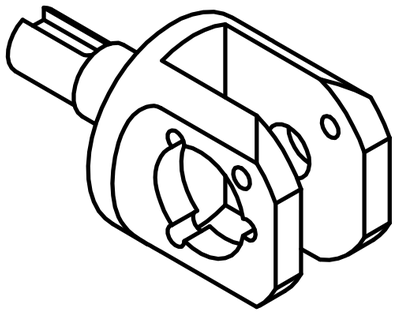
Arm Clevis Assembly.iam

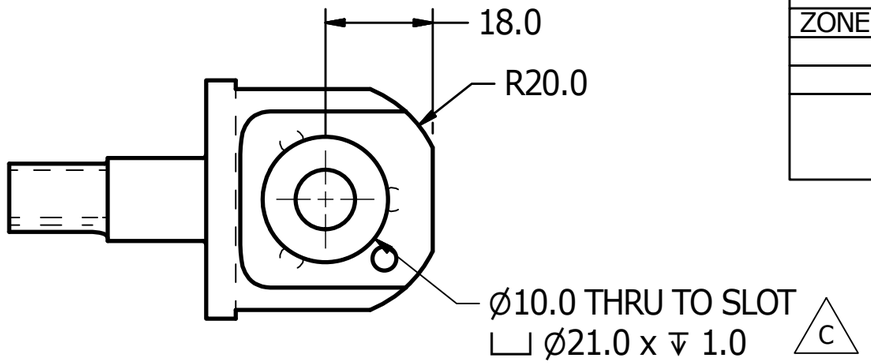
REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	9.90 WAS 9.9; 20.80 WAS 19.9	8/20/2013	JHC
	B	DRAWING NUMBER WAS AXSDM042B	9/10/2014	DW
	C	HOLE DIMENSION Ø10.0 THRU TO SLOT C'BORE Ø21.0 x 1.0 WAS Ø10.0 THRU TO SLOT C'BORE Ø21.0 x 1.5	3/15/2017	DW

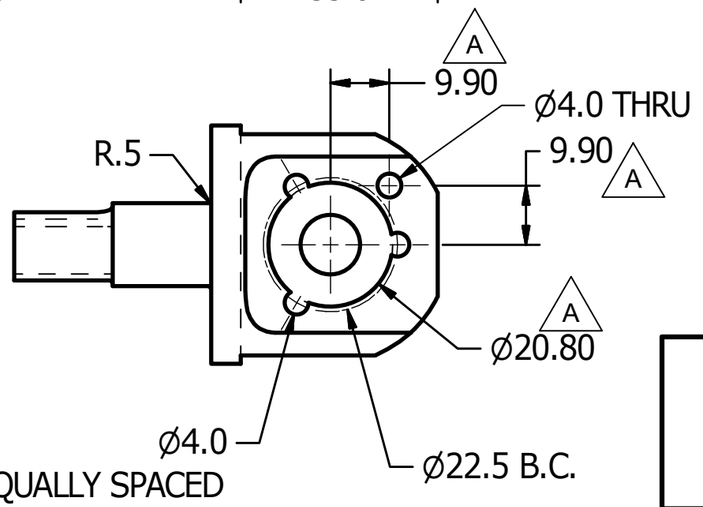












3 PLACES - EQUALLY SPACED

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Aluminum 6061
HEAT TREAT:
FINISH: ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/20/2013
CHECKED	
ENG	
APPROVED	

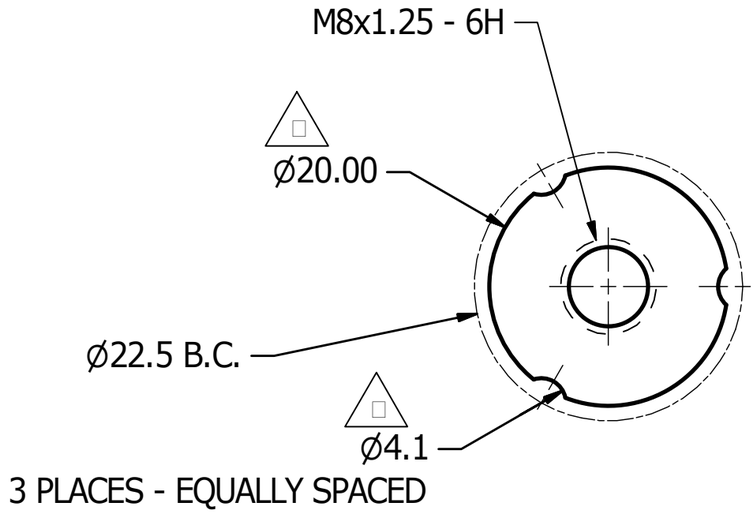
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

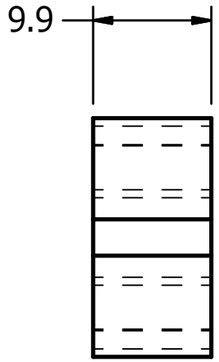
ARM CLEVIS

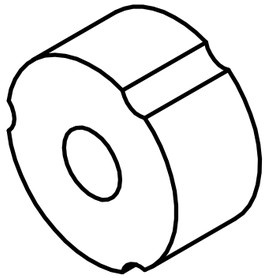
SIZE: B | DRAWING NUMBER: 472-3832 | REV: C
SCALE: 1:1 | SHEET: 1 OF 1

Arm Clevis.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	1	4.1 WAS 4.0; 20.00 WAS 20.0	8/20/2013	JHC
	A	DRAWING NUMBER WAS AXSDM043B	9/10/2014	DW



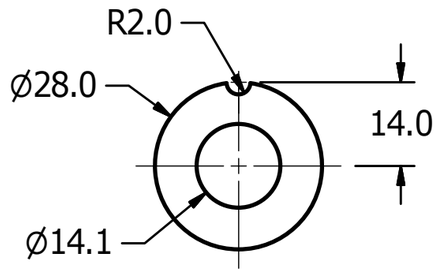


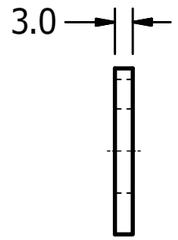


UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: ANGLES: MACHINED: X ±.5 ±.5 1.6 X.X ±.2 X.XX ±.1 ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	NUT, UPPER ARM PIVOT
	DRAWN: JIM CLEVENGER 8/20/2013	
	CHECKED	
MATERIAL: 303 S.S.	ENG	SIZE: B — DRAWING NUMBER: 472-3833 — REV: A
HEAT TREAT	APPROVED	
FINISH		SCALE: 2X — SHEET: 1 OF 1

Upper Arm Pivot Nut - Mod 1.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM046	9/10/2014	DW





UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Acetal Resin, Black
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: JIM CLEVENGER	8/20/2013
CHECKED:	
ENG:	
APPROVED:	

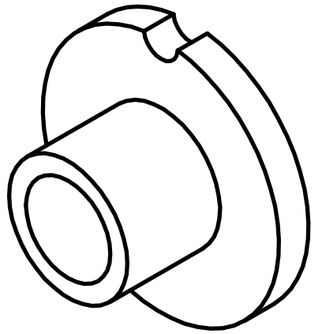
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

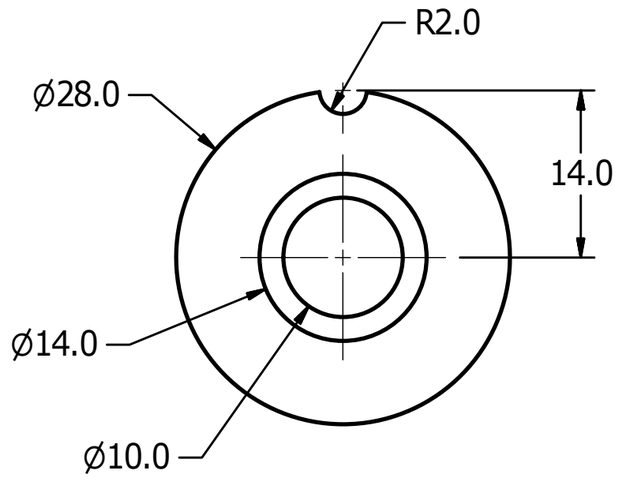
WASHER, UPPER ARM

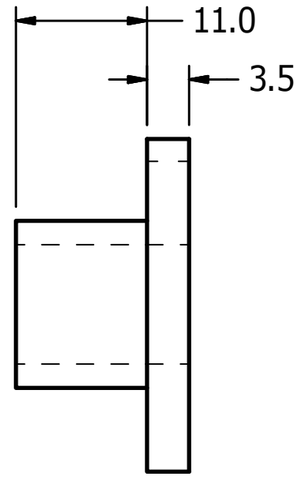
SIZE: B | DRAWING NUMBER: 472-3834 | REV: A
SCALE: 1:1 | SHEET: 1 OF 1

Washer, Upper Arm.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM045B	9/10/2014	DW







UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Acetal Resin, Black
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/20/2013
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

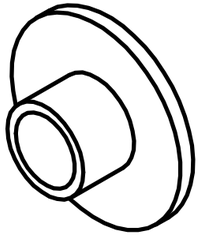
BUSHING, UPPER ARM

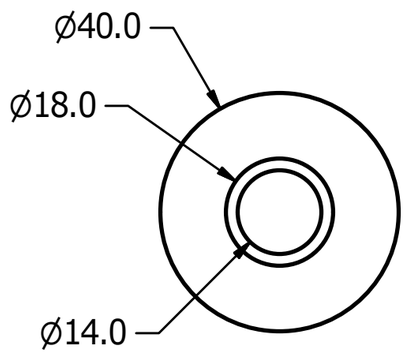
SIZE	DRAWING NUMBER	REV
B	472-3835	A

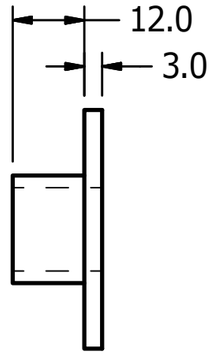
SCALE: 2X SHEET 1 OF 1

Bushing, Upper Arm.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM028B	9/10/2014	DW







UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5 1.6
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Acetal Resin, Black
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: JIM CLEVENGER	8/20/2013
CHECKED:	
ENG:	
APPROVED:	

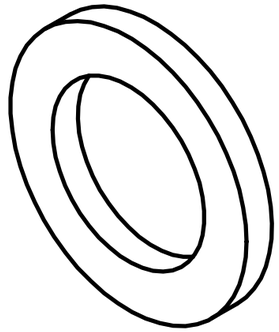
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

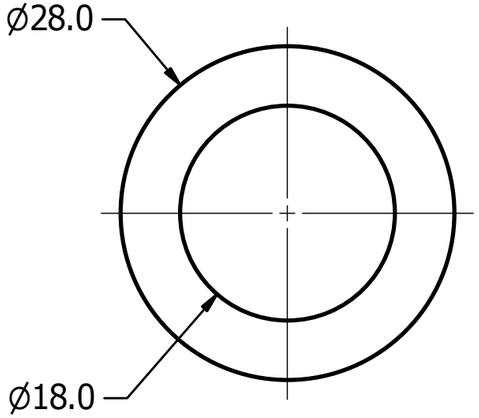
BUSHING, ARM PIVOT

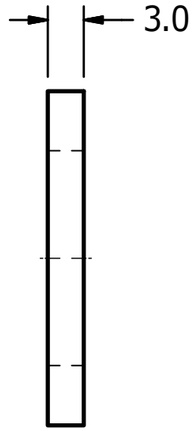
SIZE: B
DRAWING NUMBER: 472-3836
REV: A
SCALE: 1:1
SHEET: 1 OF 1

Bushing, Arm Pivot.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM029B	9/11/2014	DW







UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Stainless Steel
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: JIM CLEVENGER	8/20/2013
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

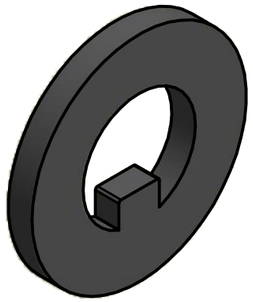
WASHER, ARM CLEVIS

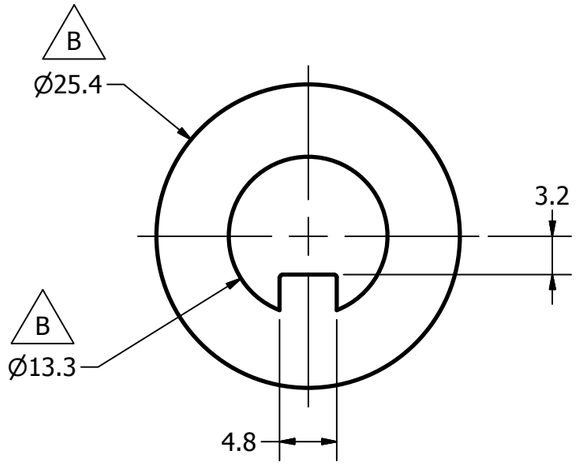
SIZE	DRAWING NUMBER	REV
B	472-3837	A

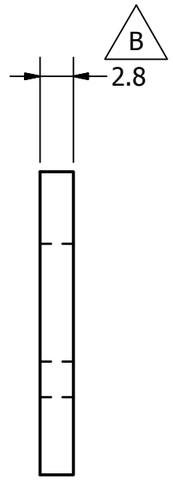
SCALE: 1:1 SHEET 1 OF 1

Washer, Arm Clevis.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM510V	9/11/2014	DW
	B	DIMENSION Ø25.4 WAS Ø27.9, Ø13.3 WAS Ø12.1, AND 2.8 WAS .8; REMOVED BEND IN TAB	9/4/2015	DW







UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Steel
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: JIM CLEVENGER	8/20/2013
CHECKED:	
ENG:	
APPROVED:	

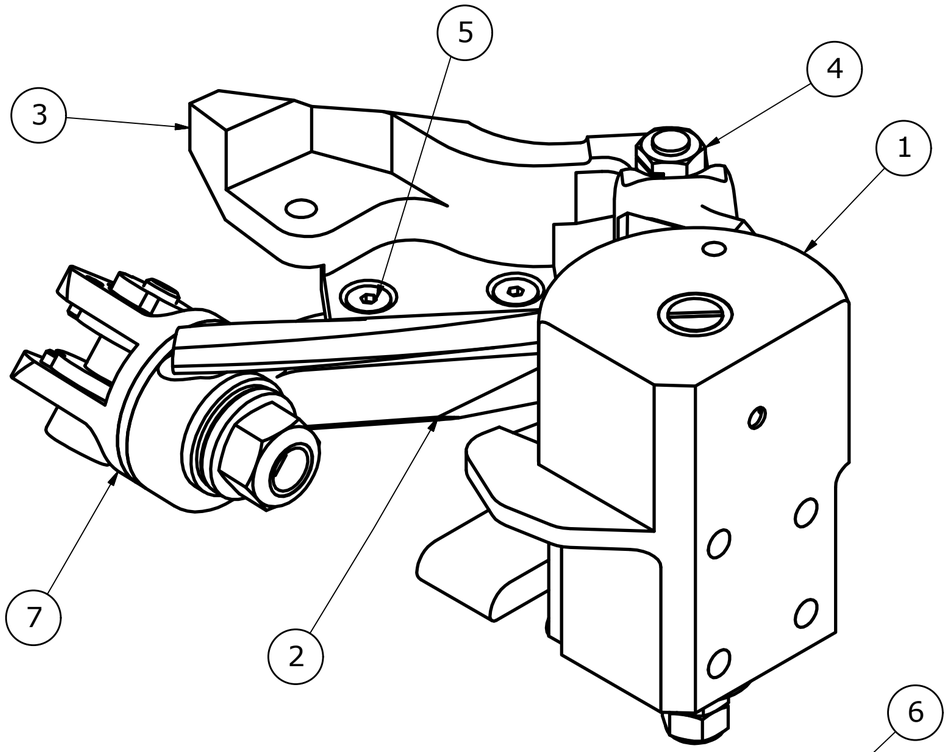
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

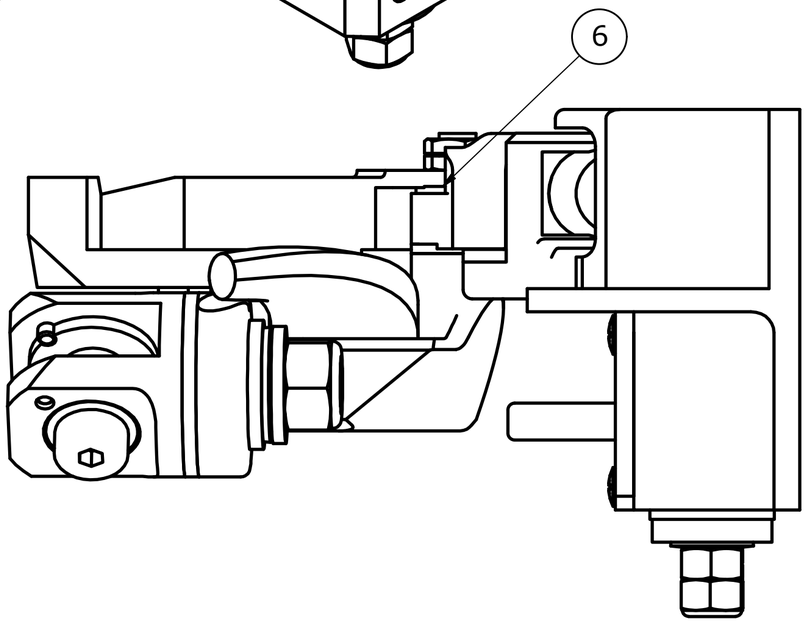
TABBED WASHER

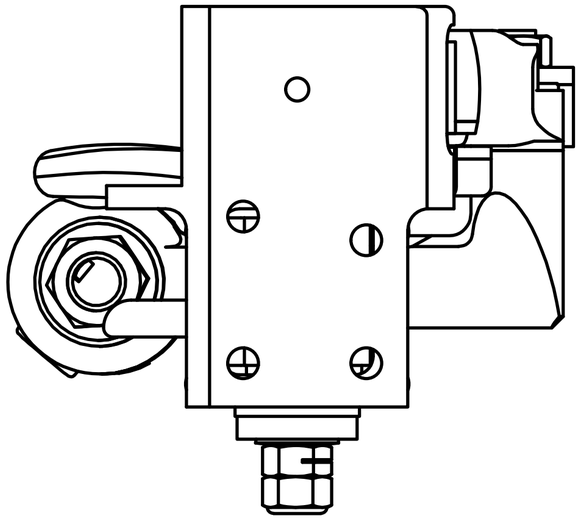
SIZE: B
DRAWING NUMBER: 472-3838
REV: B
SCALE: 2X
SHEET: 1 OF 1

Tabbed Washer.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM400; IN PARTS LIST 472-3841 WAS AXSDM900, 472-3829-2 WAS AXSDM013B, 472-2830-2 WAS AXSDM011B, 472-3818 WAS AXSDM030B & 472-3831 WAS AXSDM500	9/11/2014	DW







ITEM	QTY	PART NUMBER	DESCRIPTION
A 7	1	472-3831	ARM CLEVIS ASSEMBLY
A 6	1	472-3818	WASHER LINK, 18 x 8 x 1.5
5	2	5000467	SCREW, FHCS M5 x 0.8 x 16
4	1	5001164V	LOCKNUT, M8 x 1.25, SNEP #ESN H100
A 3	1	472-3830-2	SCAPULA, RH
2	1	472-3829-2	ARM LINK, RH
A 1	1	472-3841	RIGHT SHOULDER PIVOT ASSEMBLY

PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT

FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/5/2013
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

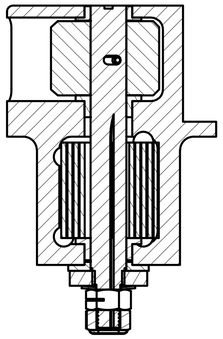
RIGHT SHOULDER ASSEMBLY

SIZE C | DRAWING NUMBER 472-3840 | REV A

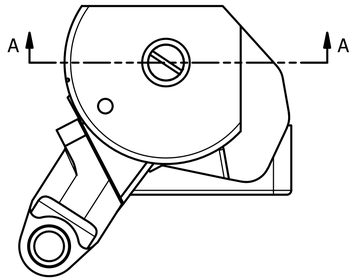
SCALE: 1:1 | SHEET 1 OF 1

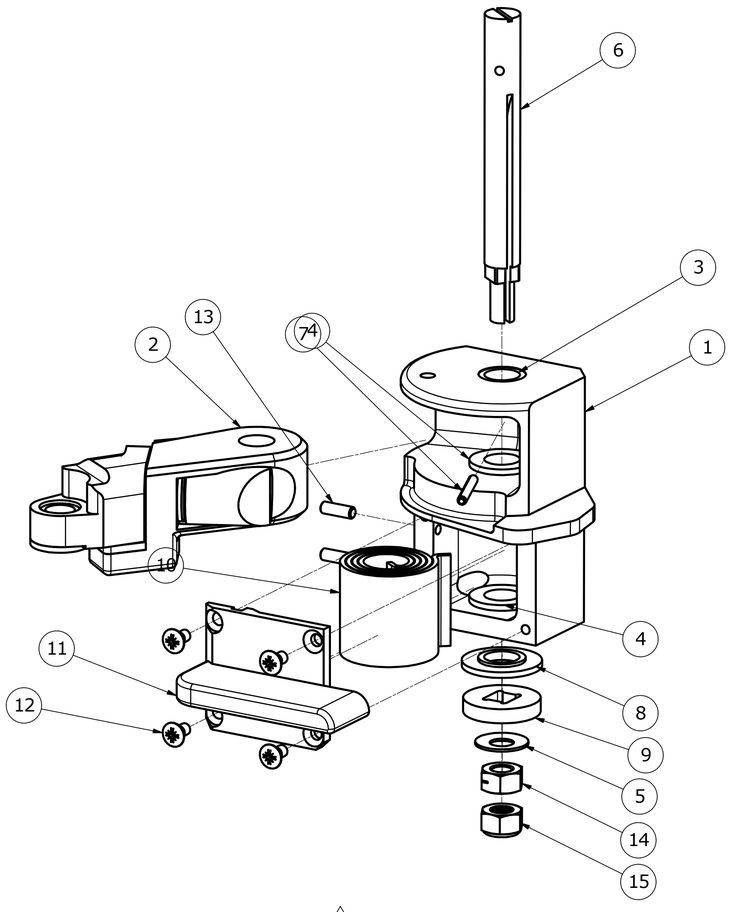
Right Shoulder Assembly.iam

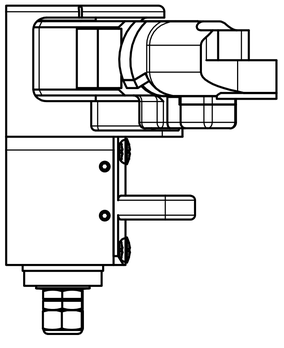
REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM900; IN PARTS LIST 472-3812-2 WAS AXSDM003C, 472-3813-2 WAS AXSDM800, 472-3822 WAS AXSDM0020B, 472-3823 WAS AXSDM019B, 472-3824 WAS AXSDM001B, 472-3825 WAS AXSDM005C, 472-3826 WAS AXSDM004B, 472-3827 WAS AXSDM018 & 472-3828-2 WAS AXSDM015B	9/11/2014	DW
	B	MOVED BALLOON CALLOUTS TO EXPLODED VIEW	7/27/2015	DW
	C	ITEM #15 PART NUMBER WAS 5001165V	6/29/2017	DW

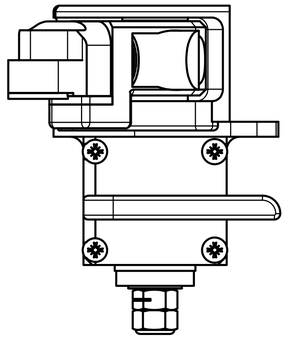


SECTION A-A
SCALE 1 : 1









ITE	QTY	PART NUMBER	DESCRIPTION
C	15	1	5000504V	NYLOCK, M8 x 1.25
	14	1	5001164V	LOCKNUT, M8 x 1.25, SNEP #ESN H100
	13	2	5000292V	SCREW, SSFP M4 x 12
	12	4	5000699	SCREW, FHMS M4 x .7 x 8 PHILLIPS
A	11	1	472-3828-2	RIB GUIDE LOWER, RH
	10	1	472-3827	SPRING
	9	1	472-3826	WASHER
A	8	1	472-3825	SPRING HOUSING WASHER, LOWER
	7	1	5000140	ROLL PIN, M3 x 24
A	6	1	472-3824	SPRING SHAFT
	5	1	5001170V	SPRING DISC WASHER, 20 x 8.2 x 1.0
A	4	2	472-3823	SPRING HOUSING BUSHING, LOWER
	3	1	472-3822	SPRING HOUSING BUSHING, UPPER
	2	1	472-3813-2	SHOULDER SUPPORT ASSEMBLY, RH
A	1	1	472-3812-2	SPRING HOUSING COVER, RH

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5 XX ±.2 XXX ±.1 ANGLES: ±.5 MACHINED:
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: JIM CLEVENGER	8/8/2013
CHECKED	
ENG	
APPROVED	

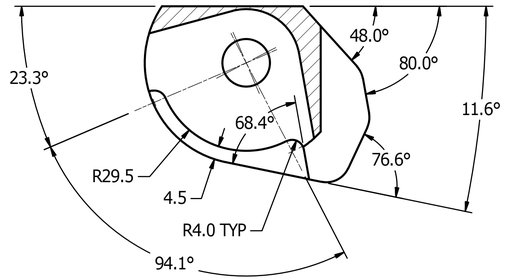
RIGHT SHOULDER PIVOT ASSEMBLY

MATERIAL
HEAT TREAT
FINISH

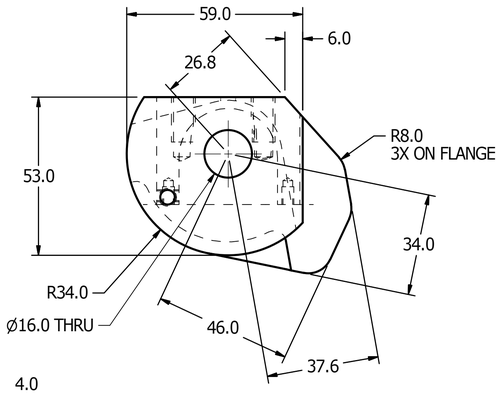
SIZE: D | DRAWING NUMBER: 472-3841 | REV: C
SCALE: 1:1 | SHEET: 1 OF 1

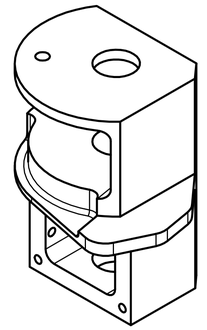
Shoulder Pivot Assembly - RH.iam

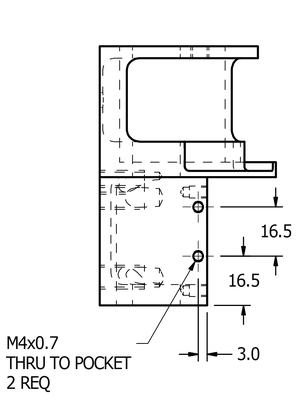
REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM003C	9/11/2014	DW
	B	ADDED FINISH - ELECTROLESS NICKEL .008 MAX.	6/29/2015	DW

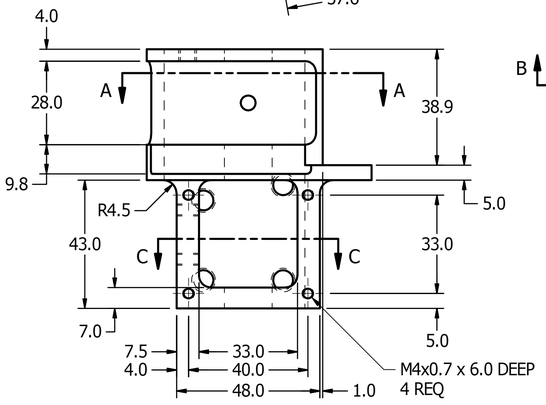


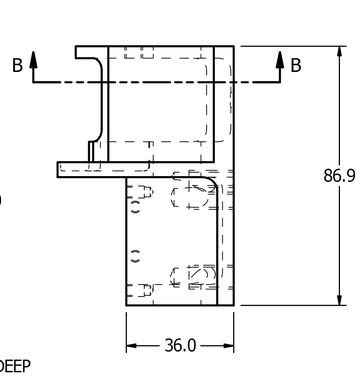
SECTION A–A
SCALE 1 : 1

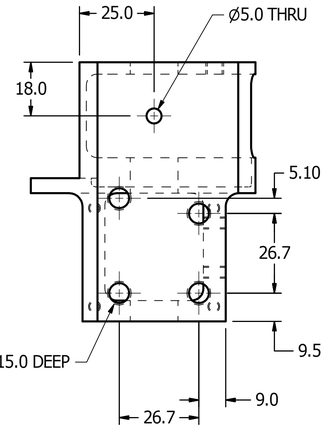


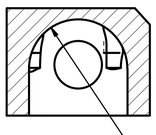






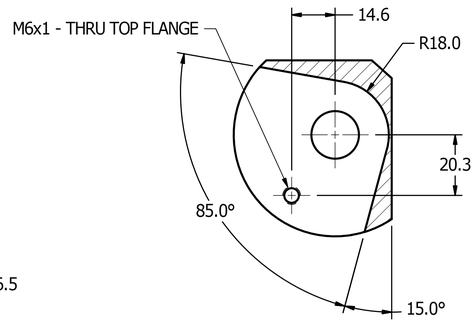






SECTION C–C
SCALE 1 : 1

R16.5



SECTION B–B
SCALE 1 : 1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
XX ±.2
XXX ±.1
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Steel
HEAT TREAT:
FINISH: ELECTROLESS NICKEL .008 MAX.

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: JIM CLEVENGER	8/14/2013
CHECKED:	
ENG:	
APPROVED:	

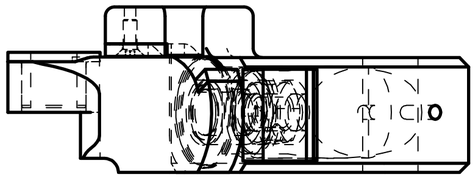
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

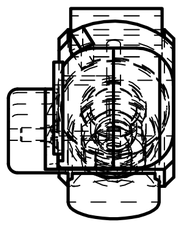
SPRING HOUSING COVER, RH

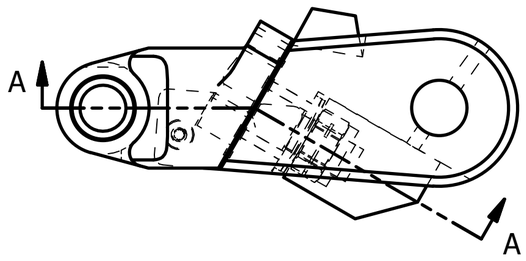
SIZE: D | DRAWING NUMBER: 472-3812-2 | REV: B
SCALE: 1:1 | SHEET: 1 OF 1

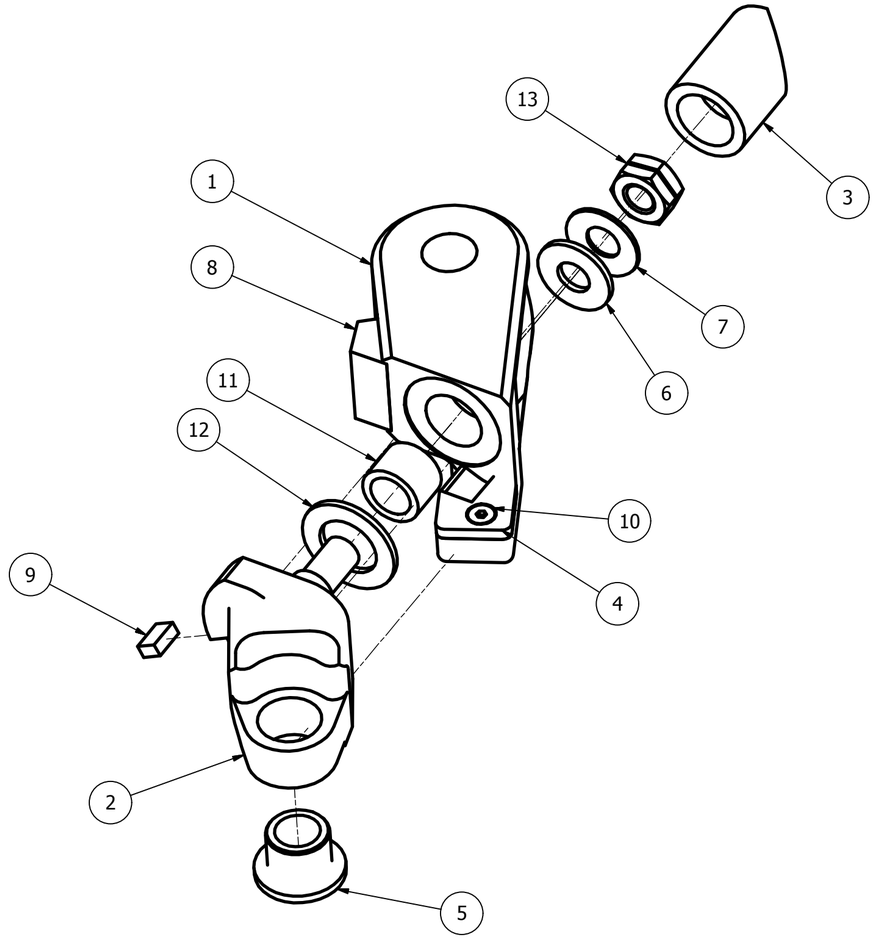
Spring Housing Cover - RH.ipt

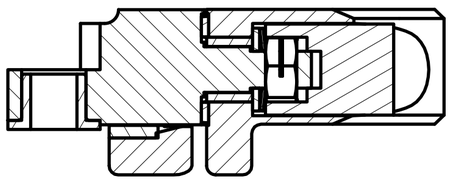
REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM800; IN PARTS LIST 472-3814-2 WAS AXSDM007B, 472-3815-2 WAS AXSDM009B, 472-3816 WAS AXSDM016C, 472-3817-2 WAS AXSDM026B, 472-3818 WAS AXSDM030B, 472-3819 WAS AXSDM017B, 472-3820 WAS AXSDM024B & 472-3821 WAS AXSDM031B	9/11/2014	DW
	B	MOVED BALLOON CALLOUTS TO EXPLODED VIEW	7/13/2015	DW
	C	ITEM #5 PART NUMBER WAS 5001168V, AND ITEM #11 PART NUMBER WAS 5001169V	6/29/2017	DW











SECTION A–A
SCALE 1 : 1

ITEM	QTY	PART NUMBER	DESCRIPTION
13	1	5001164V	LOCKNUT, M8 x 1.25, SNEP #ESN H100
A 12	1	472-3821	LINK WASHER, 23 x 14.2 x 1.5
11	1	6001169V	BEARING, IGLIDUR 14 x 10 X 10 LG
A 10	1	5000116	SCREW, FHCS, M3 x .5 x 8
A 9	1	472-3820	BUFFER, VERTICAL
A 8	1	472-3819	REAR ROM BUFFER
7	1	5001170V	SPRING DISC WASHER, 20 x 8.2 x 1.0
A 6	1	472-3818	WASHER LINK, 18 x 8 x 1.5
5	1	6001168V	FLANGE BEARING, 14 OD x 20 FL x 10 ID x 12 LG
A 4	1	472-3817-2	BUFFER, LOWER RIGHT
3	1	472-3816	FORWARD ROM BUFFER
2	1	472-3815-2	SHOULDER SUPPORT PIVOT, RH
A 1	1	472-3814-2	SHOULDER SUPPORT, RH

PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/8/2013
CHECKED	
ENG	
APPROVED	

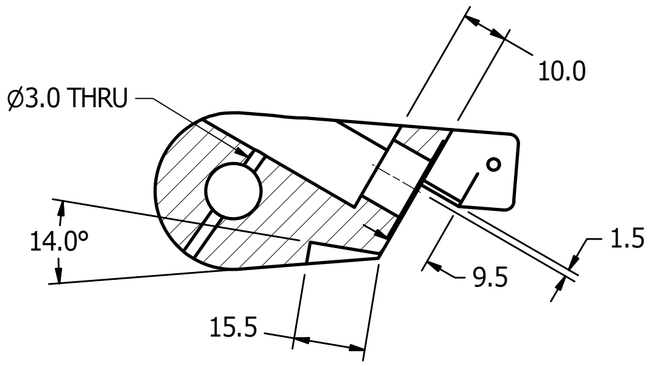
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

SHOULDER SUPPORT ASSEMBLY, RH

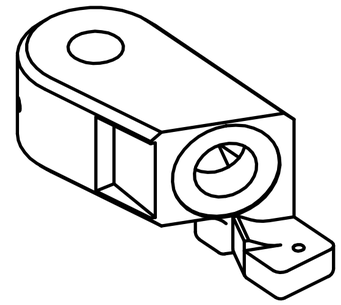
SIZE C | DRAWING NUMBER 472–3813–2 | REV C
SCALE: 1:1 | SHEET 1 OF 1

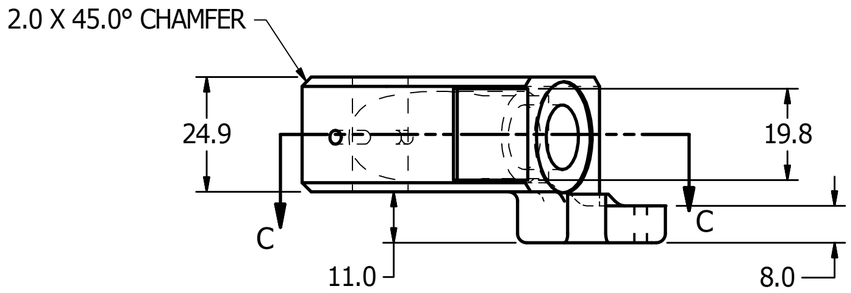
Shoulder Support Assembly, RH.iam

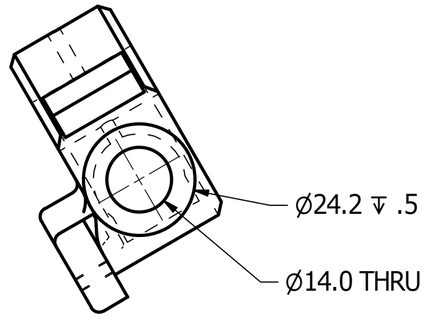
REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM007B	9/11/2014	DW
	B	ADDED FINISH - ELECTROLESS NICKEL .008 MAX.	6/29/2015	DW

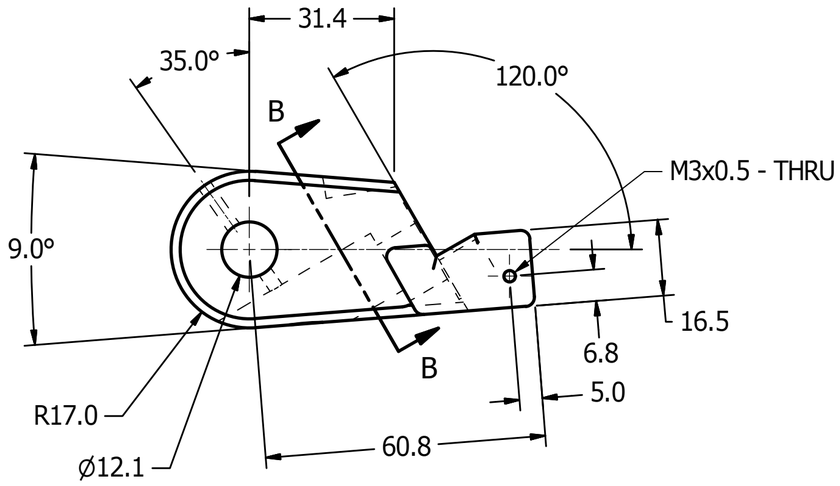


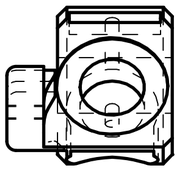
SECTION C–C
SCALE 1 : 1

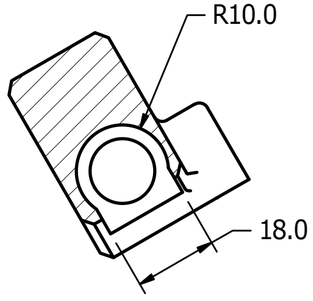












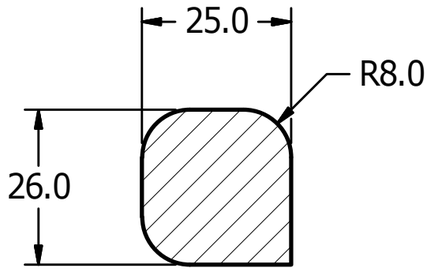
SECTION B–B
SCALE 1 : 1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; ANGLES: ±.5; MACHINED: 125 ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	SHOULDER SUPPORT, RH
	DRAWN JIM CLEVENGER	8/15/2013	
	CHECKED		
MATERIAL Steel	ENG		SIZE C; DRAWING NUMBER 472–3814–2; REV B
HEAT TREAT	APPROVED		
FINISH ELECTROLESS NICKEL .008 MAX.			SCALE: 1:1; SHEET 1 OF 1

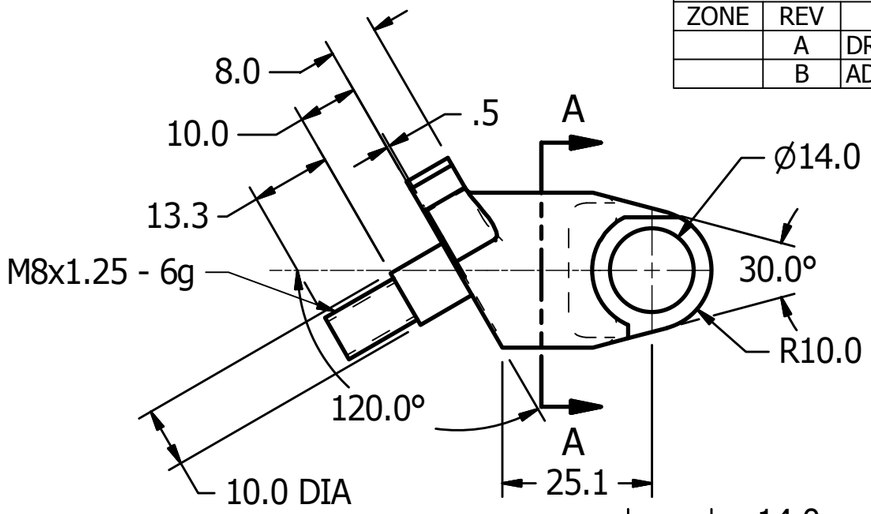
B

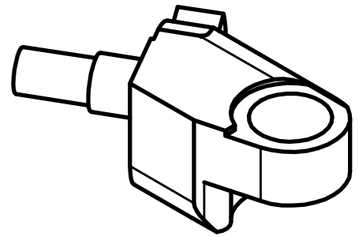
Shoulder Support - RH.ipt

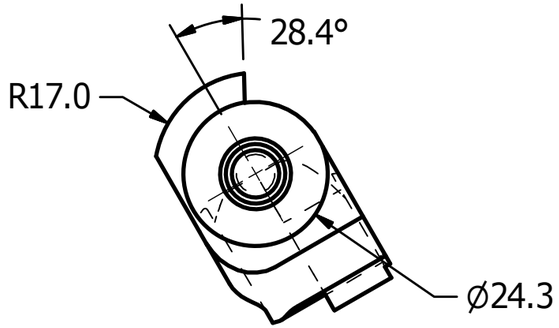
REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM009B	9/11/2014	DW
	B	ADDED FINISH - ELECTROLESS NICKEL .008 MAX.	6/29/2015	DW

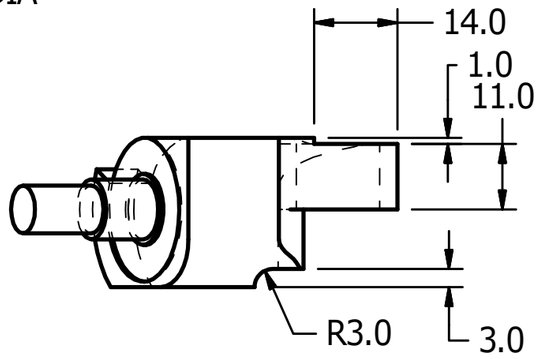


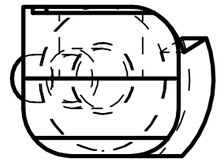
SECTION A–A
SCALE 1 : 1

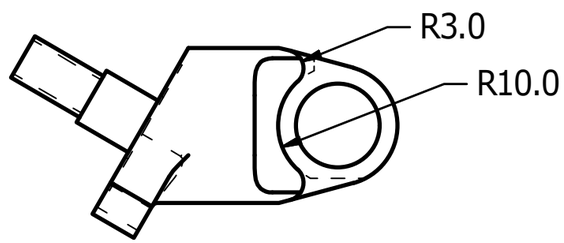












UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
ANGLES: ±.5
MACHINED: 1.6

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Steel
HEAT TREAT:
FINISH: ELECTROLESS NICKEL .008 MAX.

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/15/2013
CHECKED	
ENG	
APPROVED	

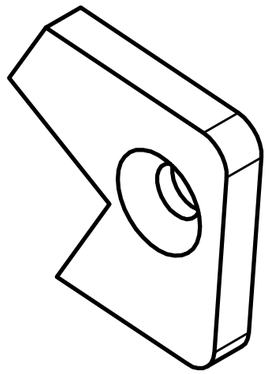
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

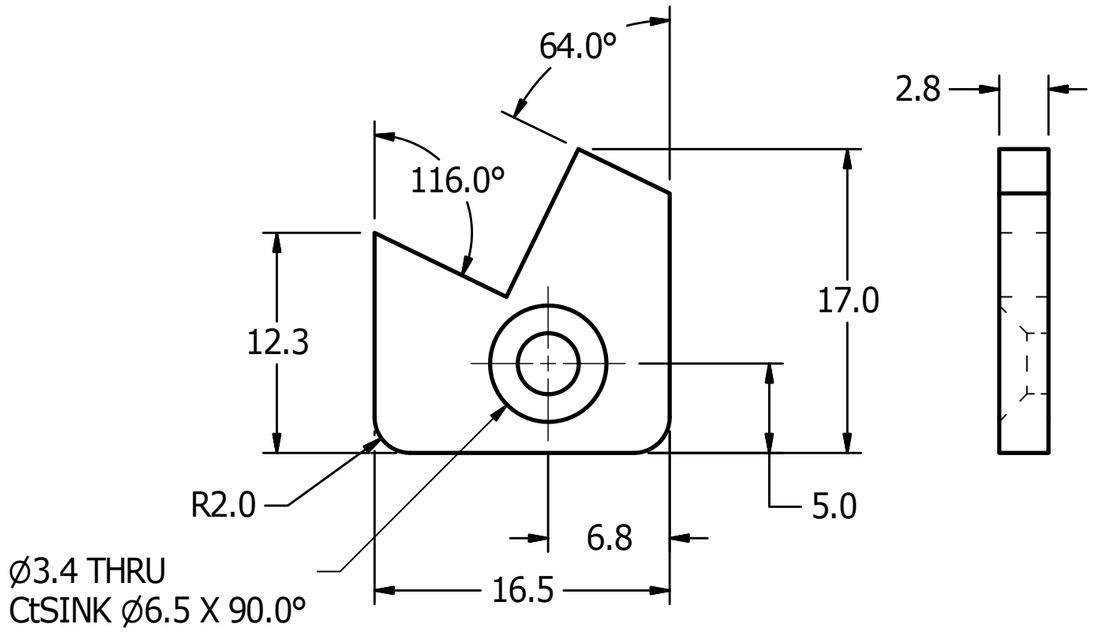
SHOULDER SUPPORT PIVOT, RH

SIZE: B | DRAWING NUMBER: 472–3815–2 | REV: B
SCALE: 1:1 | SHEET: 1 OF 1

Shoulder Support Pivot - RH.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM026B	9/11/2014	DW





UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Acetal Resin, Black
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/20/2013
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

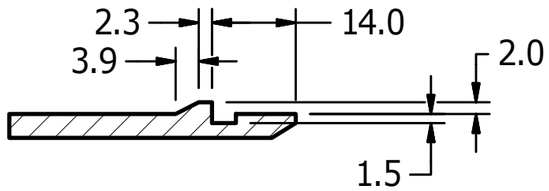
BUFFER, LOWER RIGHT

SIZE	DRAWING NUMBER	REV
B	472-3817-2	A

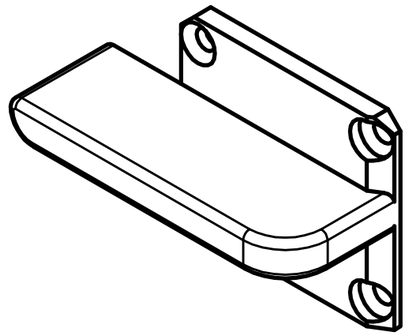
SCALE: 3X SHEET 1 OF 1

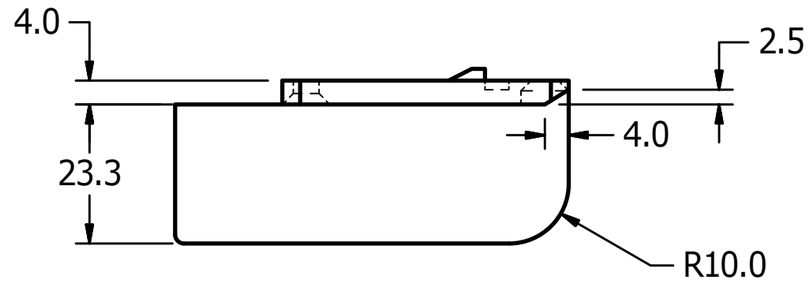
Buffer Lower, Right.ipt

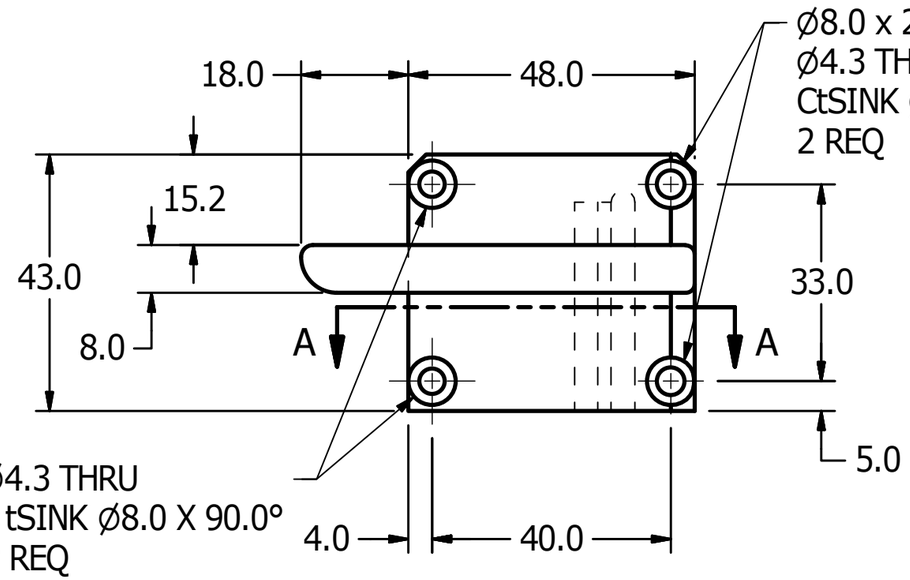
REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM015B	9/11/2014	DW

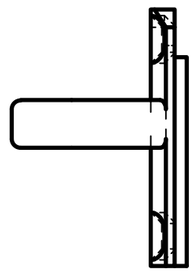


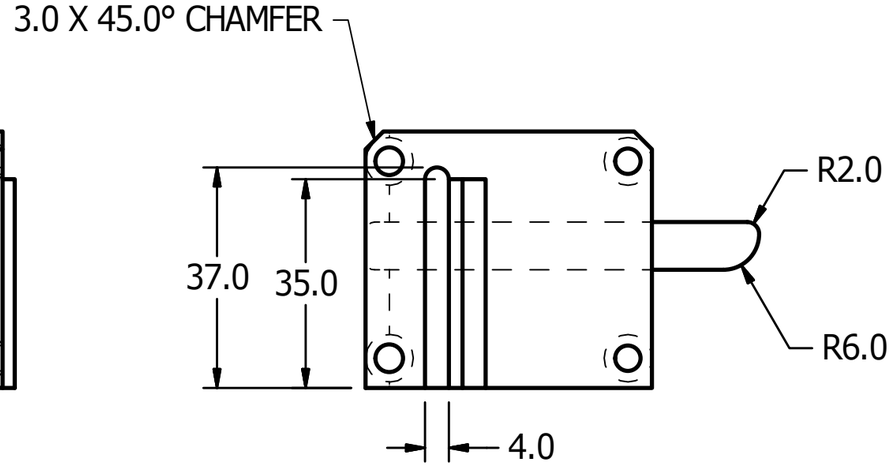
SECTION A–A
SCALE 1 : 1







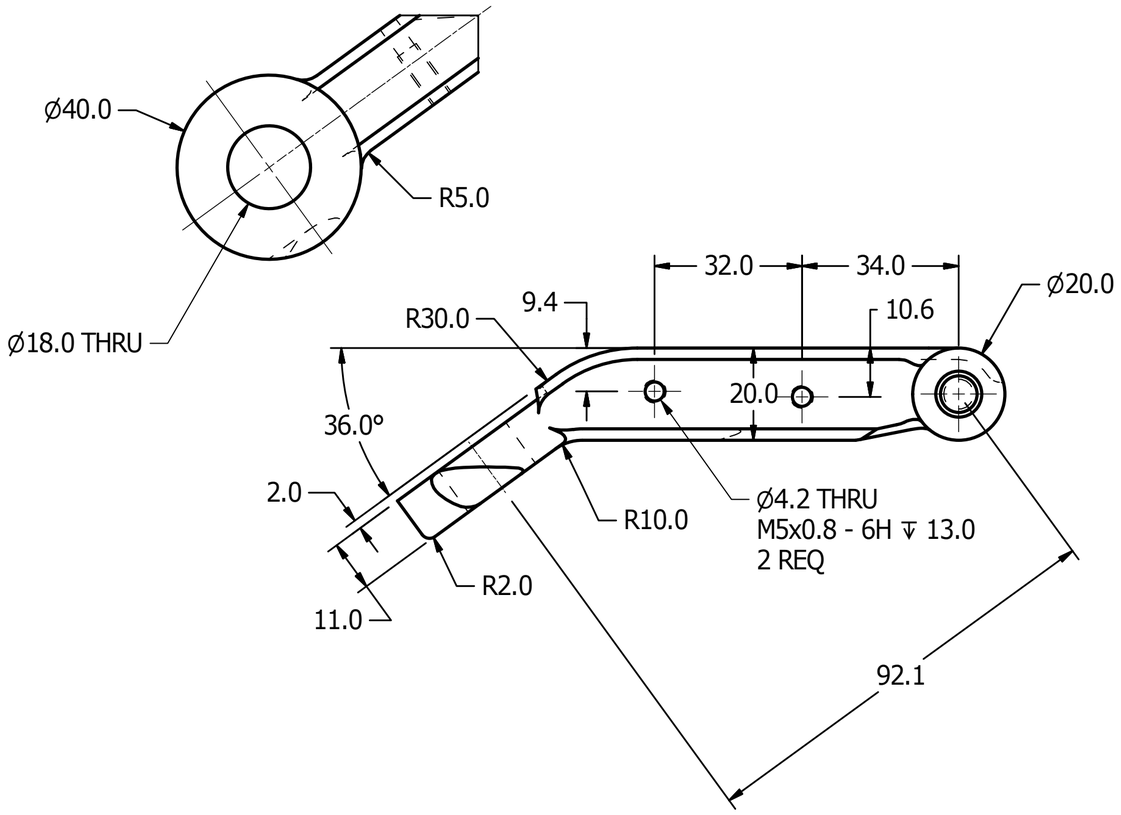


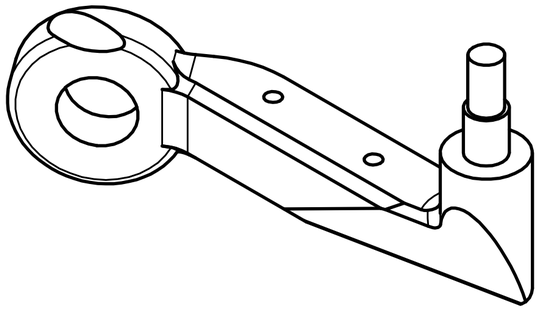


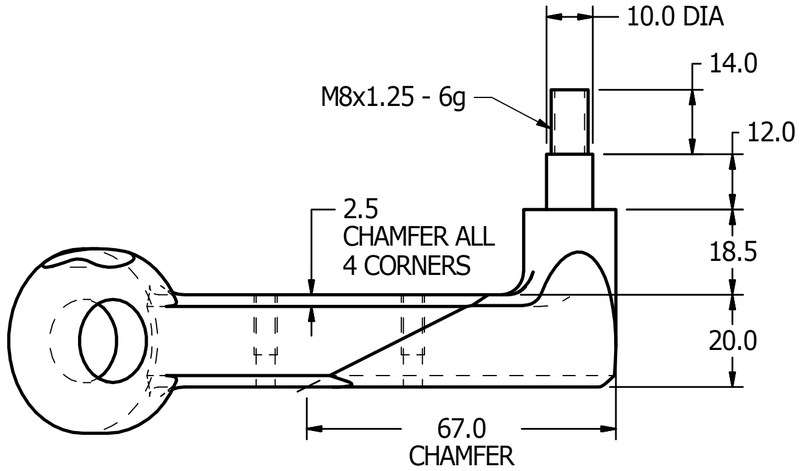
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; ANGLES: ±.5; MACHINED: 1.6. ASME Y14.5M - 1994. DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
	APPROVALS	DATE	RIB GUIDE LOWER, RH	
	DRAWN: JIM CLEVENGER	8/21/2013		
	CHECKED			
MATERIAL: Aluminum 6061	ENG			
HEAT TREAT	APPROVED		SIZE: B	DRAWING NUMBER: 472–3828–2 REV: A
FINISH			SCALE: 1:1	SHEET: 1 OF 1

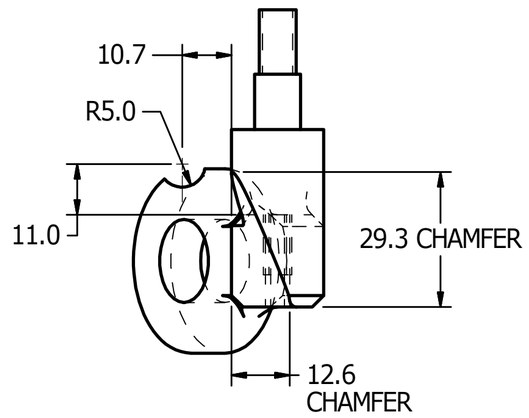
Rib Guide Lower, RH.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM013B	9/11/2014	DW
	B	ADDED FINISH - ELECTROLESS NICKEL .008 MAX.	8/26/2015	DW





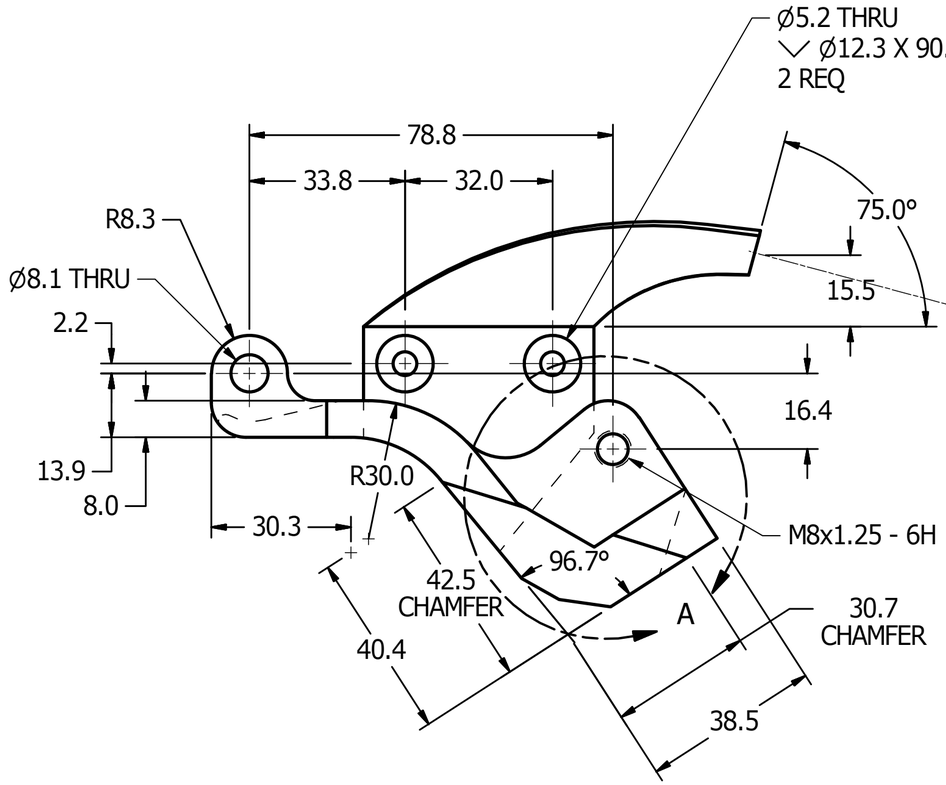


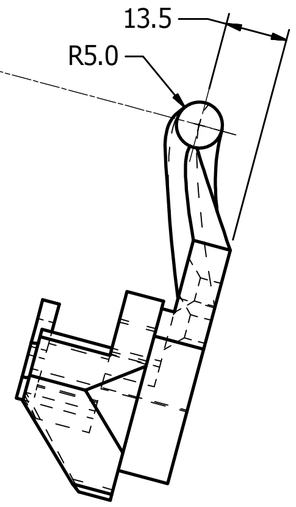


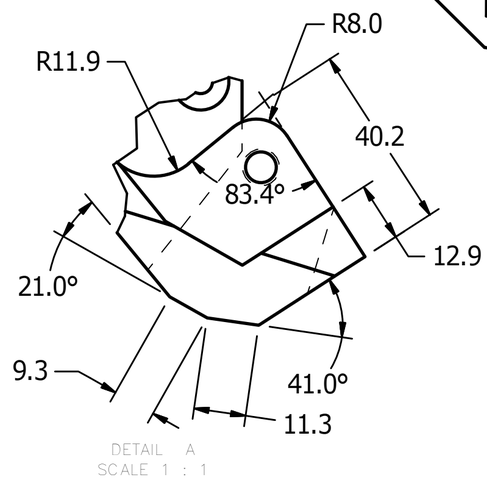
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 ANGLES: ±.5 MACHINED: 16 ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	ARM LINK, RH
	DRAWN JIM CLEVENGER 8/15/2013	
	CHECKED	
MATERIAL Steel	ENG	SIZE C — DRAWING NUMBER 472-3829-2 — REV B
HEAT TREAT	APPROVED	
FINISH ELECTROLESS NICKEL .008 MAX.		SCALE: 1:1 — SHEET 1 OF 1

Arm Link, RH.ipt

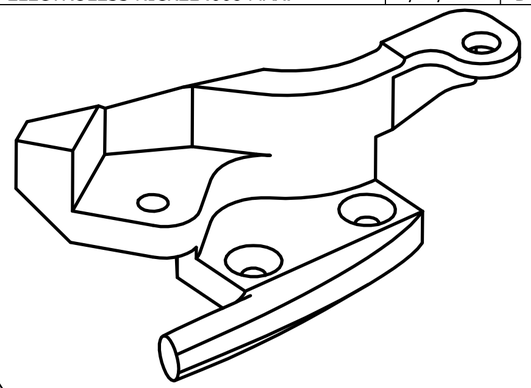
REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM011B	9/11/2014	DW
	B	ADDED FINISH - ELECTROLESS NICKEL .008 MAX.	6/30/2015	DW

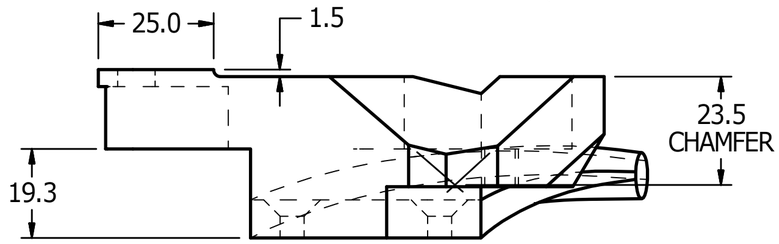


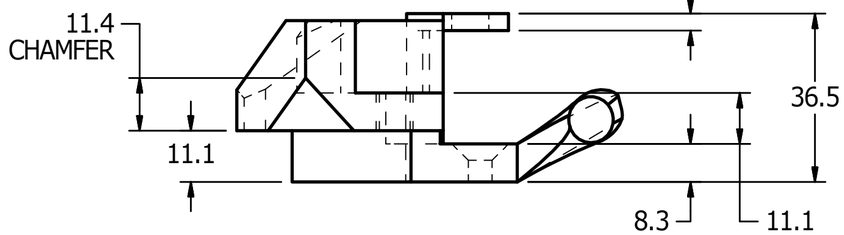


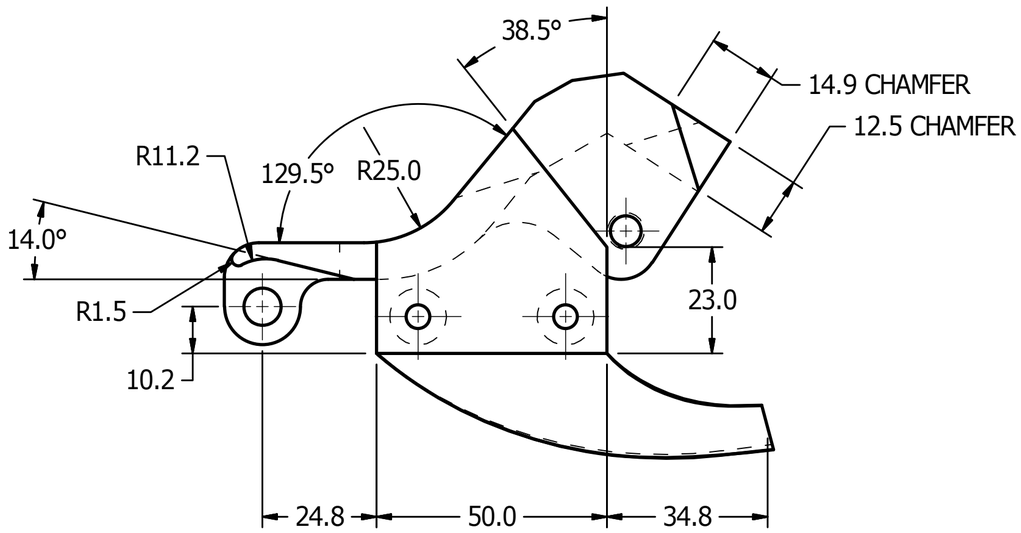


DETAIL A
SCALE 1 : 1







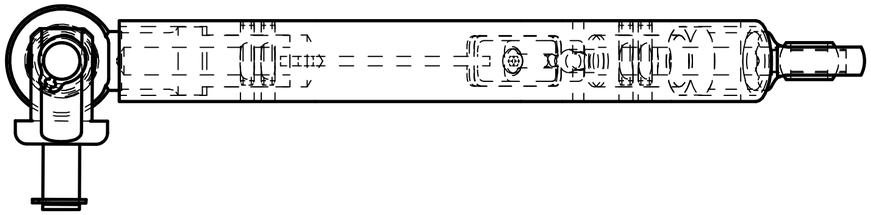


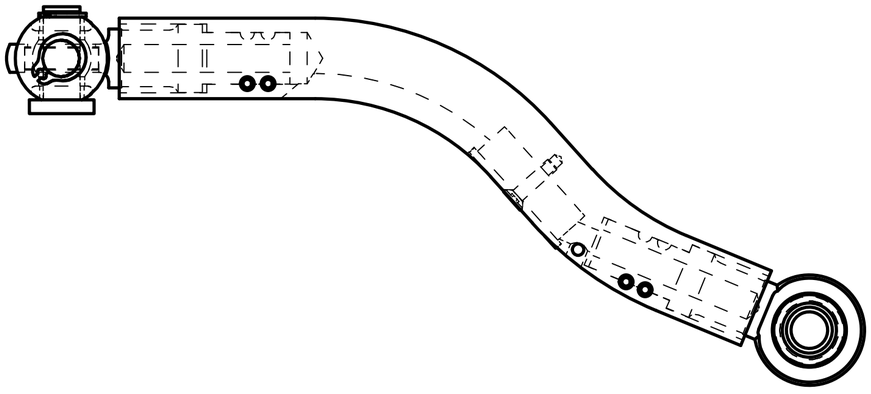
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; ANGLES: ±.5; MACHINED: √ ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	SCAPULA, RH
	DRAWN JIM CLEVENGER	8/19/2013	
	CHECKED		
MATERIAL Steel	ENG		SIZE C; DRAWING NUMBER 472-3830-2; REV B
HEAT TREAT	APPROVED		
FINISH ELECTROLESS NICKEL .008 MAX.			SCALE: 1:1; SHEET 1 OF 1

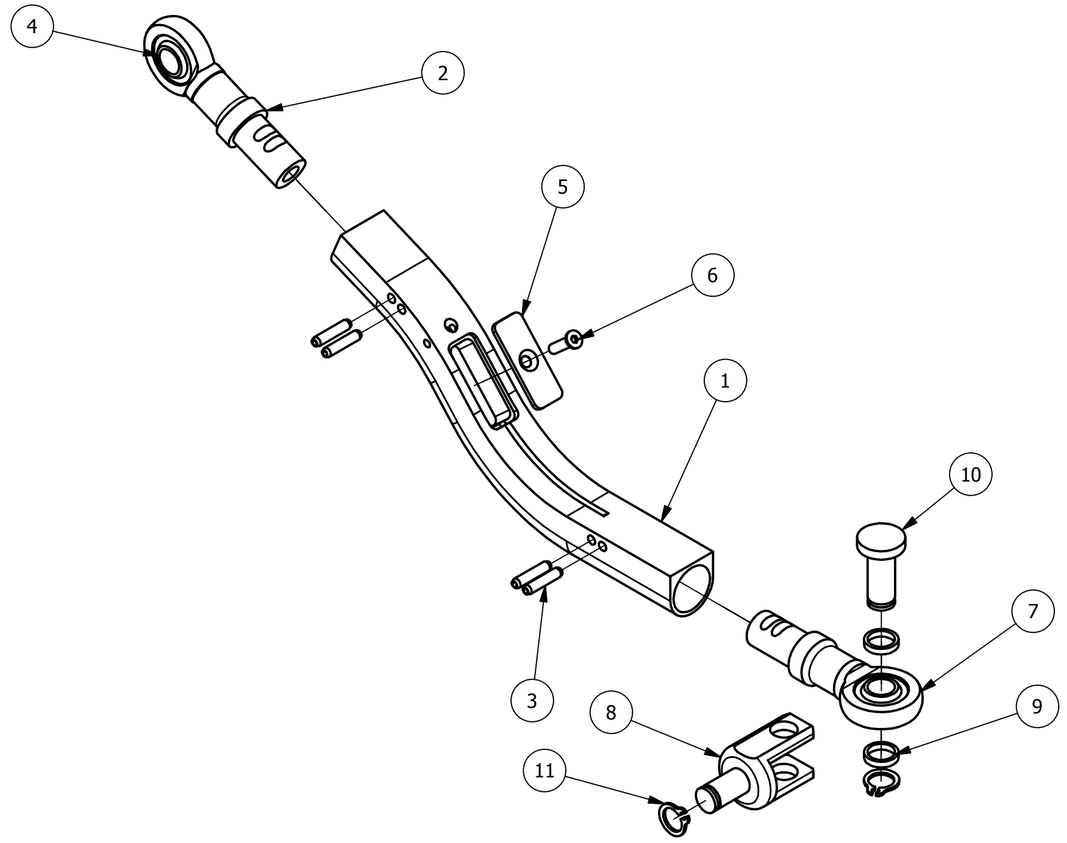
B

Scapula RH.ipt

REVISION HISTORY				
ZON	REV	DESCRIPTION	DATE	BY
	A	CHANGED SHEET SIZE TO C; REPLACED ITEMS AXSDM104B, AXSDM034B, AND AXSDM021B WITH ITEM 7, 8, 9, & 10; REMOVED ITEM 5001175V	2/5/2014	JHC
	B	DRAWING NUMBER WAS AXSDM100B; IN PARTS LIST 472-3851 WAS AXSDM101, 472-3852 WAS AXSDM103, 472-3853 WAS AXSDM102, 472-3854 WAS AXSDM105, 472-3855 WAS AXSDM107, 472-3856 WAS AXSDM108 & 472-3899 WAS AXSDM106	9/11/2014	DW
	C	ADDED EXPLODED VIEW	8/13/2015	DW







ITEM	QTY	PART NUMBER	DESCRIPTION
11	2	5001174V	8mm RETAINING RING
10	1	472-3899	LINKAGE PIN, INBOARD CLAVICLE
9	2	472-3856	ROD END BEARING SPACER, INBOARD
8	1	472-3855	LINKAGE BASE, INBOARD
7	1	472-3854	ROD END HOUSING, INBOARD
6	1	9010449	SCREW, FHCS M3 x 12
5	1	472-3853	CLAVICLE COVER PLATE
4	2	5000946	METRIC SPHERICAL BEARING
3	4	5000196	ROLL PIN, M3 x 14
2	1	472-3852	ROD END HOUSING, OUTBOARD
1	1	472-3851	CLAVICLE

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
ANGLES: ±.5
MACHINED: 16
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/12/2013
CHECKED	
ENG	
APPROVED	

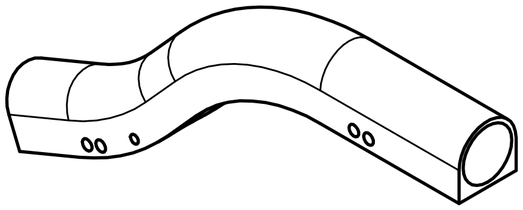
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

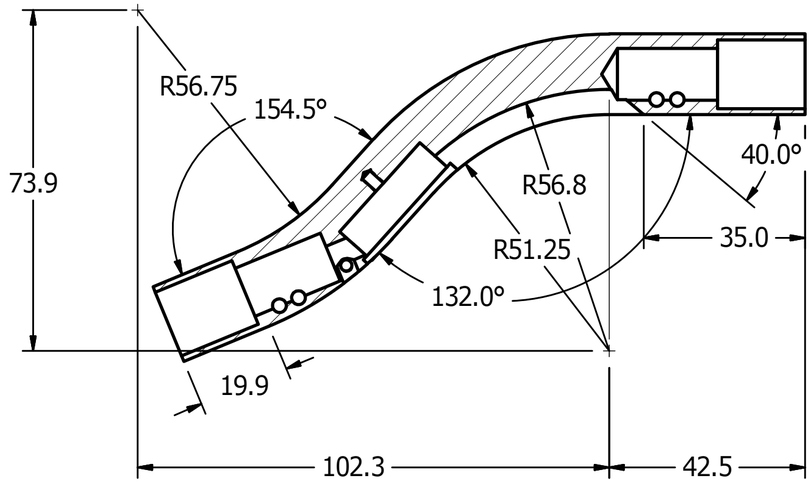
LEFT CLAVICLE ASSEMBLY

SIZE C | DRAWING NUMBER 472-3850 | REV C
SCALE: 1:1 | SHEET 1 OF 1

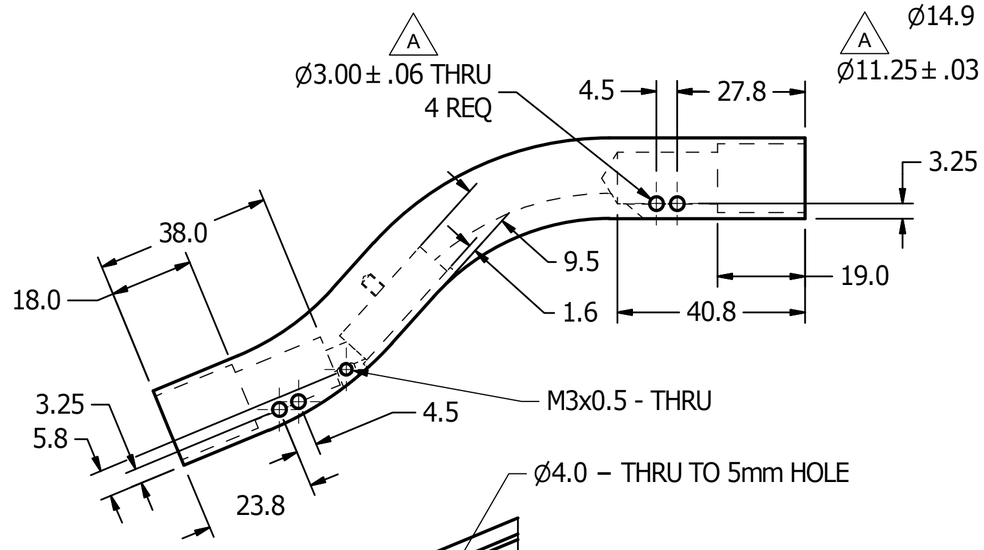
Clavicle Assembly, Left - Mod 1.iam

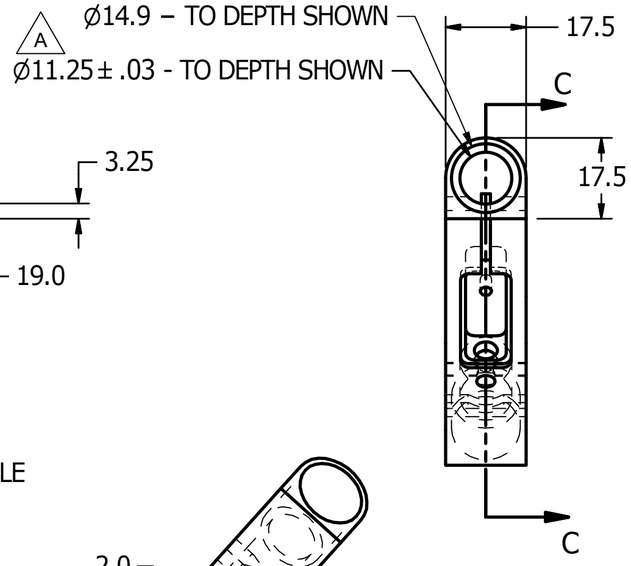
REVISION HISTORY				
ZON	RE	DESCRIPTION	DATE	BY
	A	ADDED TOLERANCES	8/13/2013	JHC
	B	DRAWING NUMBER WAS AXSDM101	9/11/2014	DW

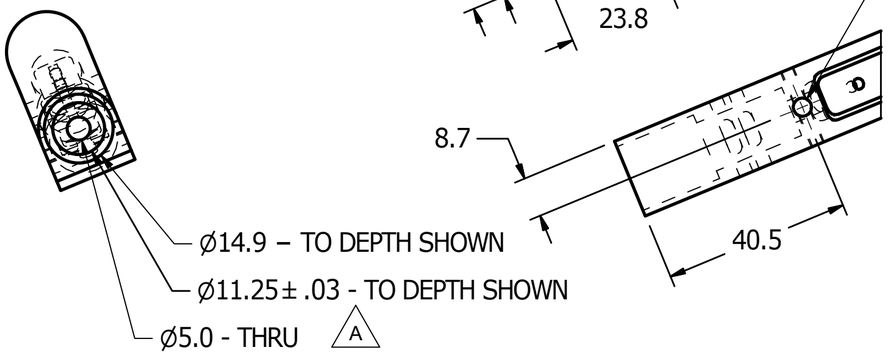


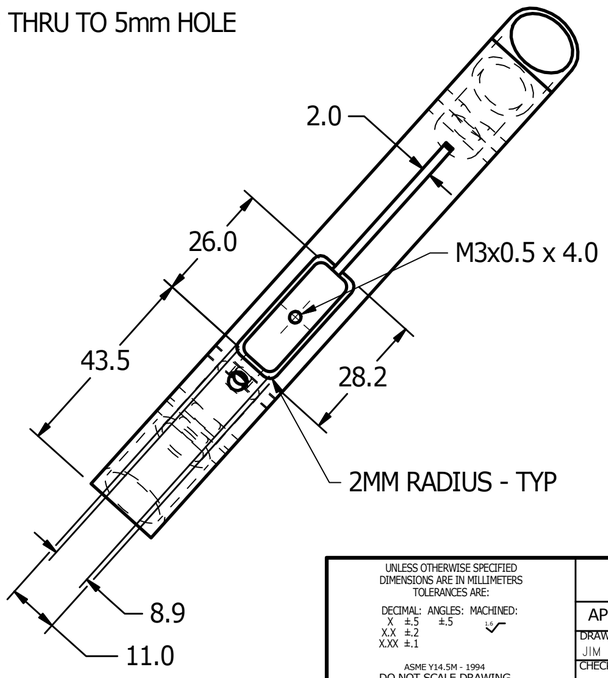


SECTION C – C
SCALE 1 : 1





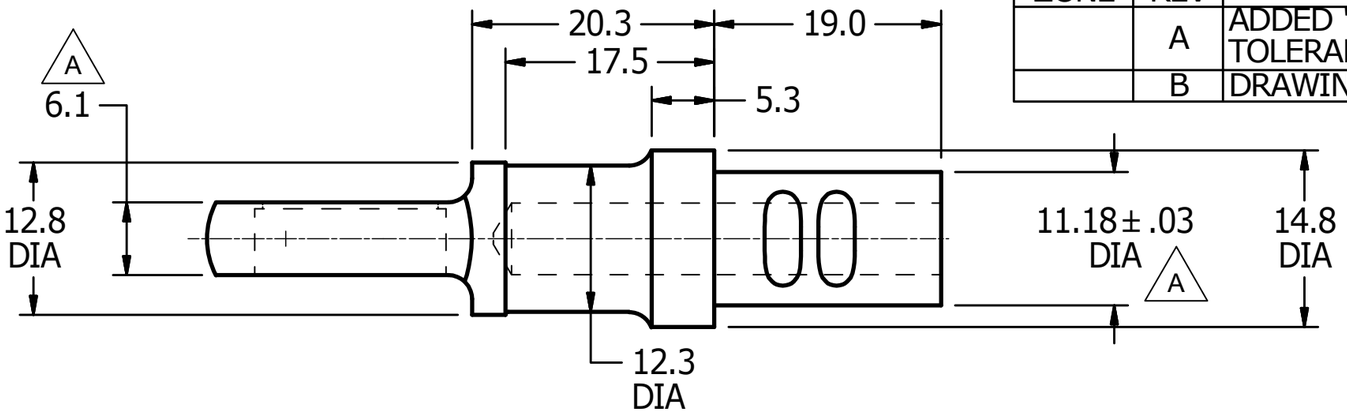


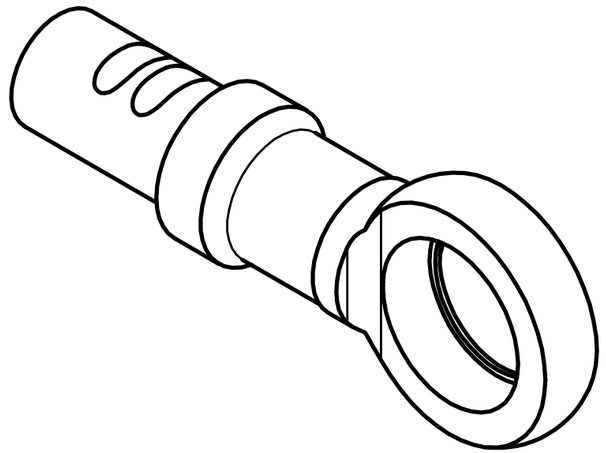


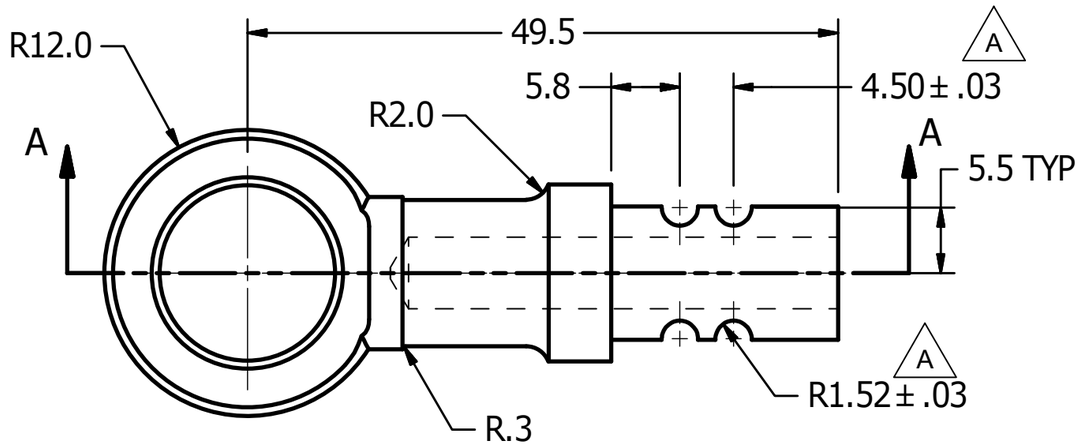
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; ANGLES: ±.5; MACHINED: 16 ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	CLAVICLE
	DRAWN JIM CLEVENGER	8/13/2013	
	CHECKED		
MATERIAL 4140 STEEL	ENG		SIZE C; DRAWING NUMBER 472–3851; REV B
HEAT TREAT 28–32 Rc	APPROVED		SCALE: 1:1; SHEET 1 OF 1
FINISH			

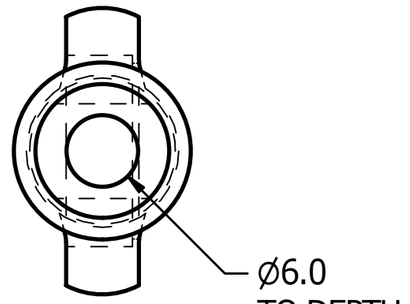
Clavicle - Mod 1.ipt

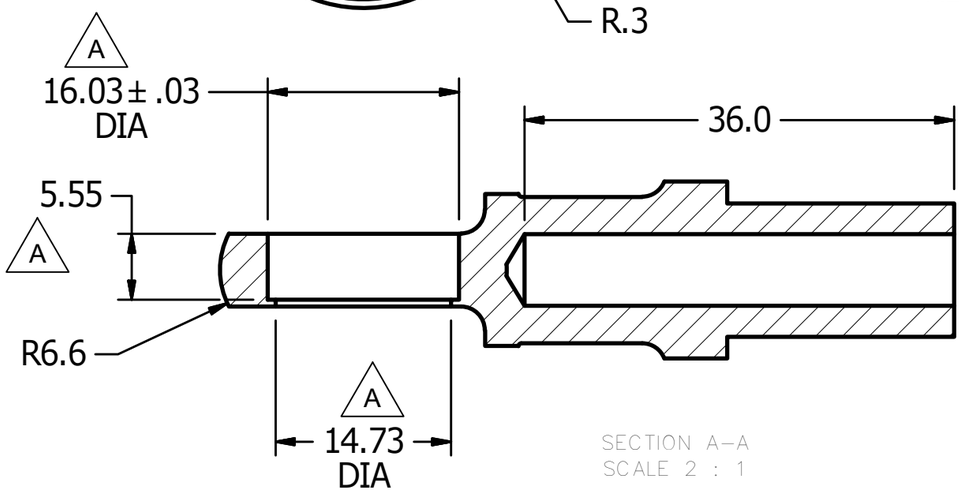
REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	ADDED "OUTBOARD" TO DESCRIPTION; ADDED TOLERANCE; 6.1 WAS 8.8; 5.55 WAS 7.3; 14.73 WAS 15.0	2/5/2014	JHC
	B	DRAWING NUMBER WAS AXSDM103	9/11/2014	DW









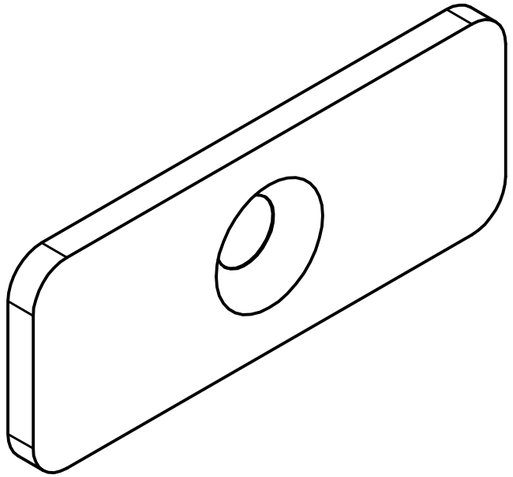


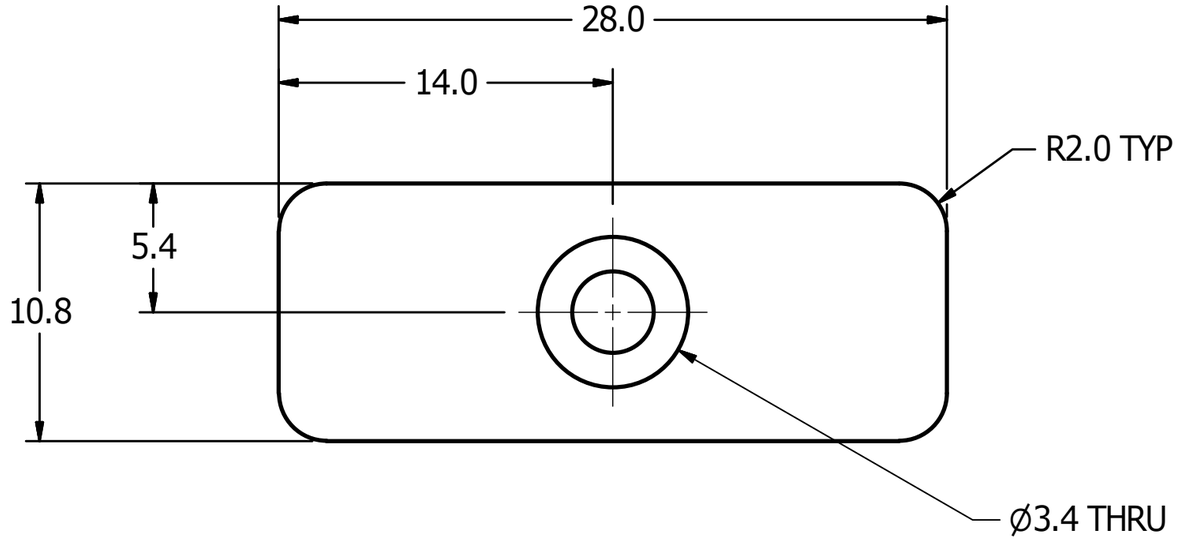
SECTION A–A
SCALE 2 : 1

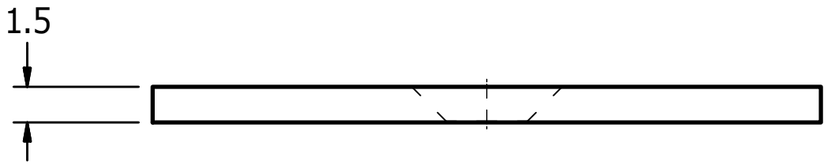
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 ANGLES: ±.5 MACHINED: 1.6 ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	ROD END HOUSING, OUTBOARD A
	DRAWN: JIM CLEVENGER 8/14/2013	
	CHECKED	
MATERIAL: 17–4 PH S.S.	ENG	SIZE: B — DRAWING NUMBER: 472–3852 — REV: B
HEAT TREAT	APPROVED	SCALE: 2X — SHEET: 1 OF 1
FINISH		

Rod End, Clavicle Assy.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	DESI
	A	DRAWING NUMBER WAS AXSDM102	9/11/2014	DW







UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Steel
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: JIM CLEVENGER	8/14/2013
CHECKED:	
ENG:	
APPROVED:	

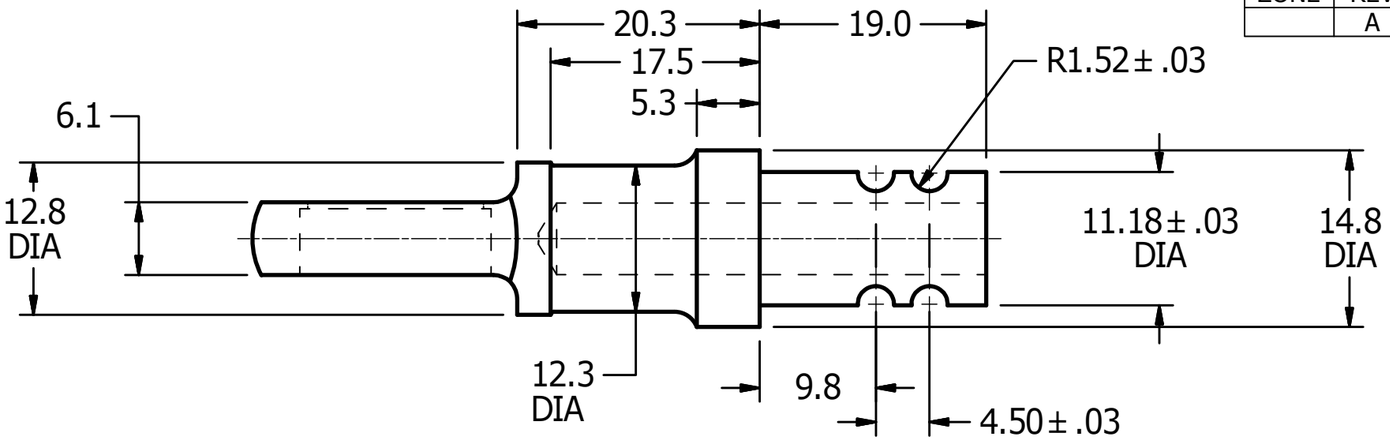
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

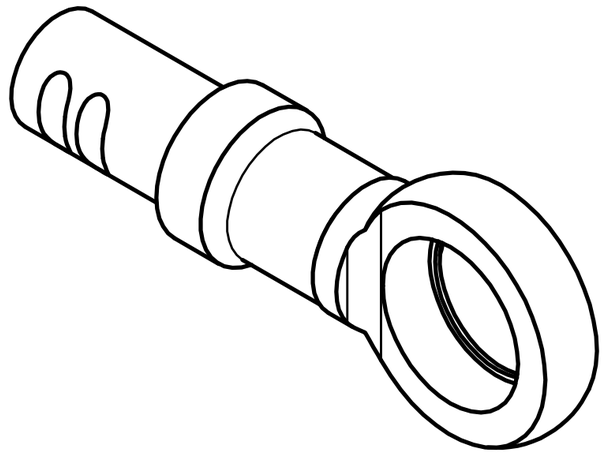
CLAVICLE COVER PLATE

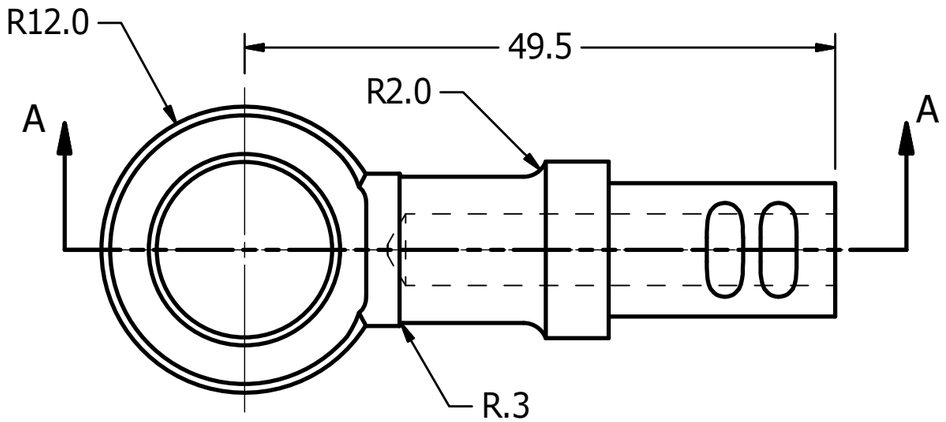
SIZE: B | DRAWING NUMBER: 472-3853 | REV: A
SCALE: 4X | SHEET: 1 OF 1

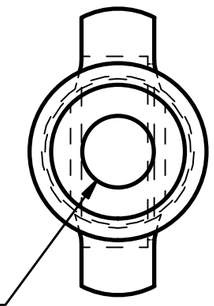
Clavicle Cover Plate.ipt

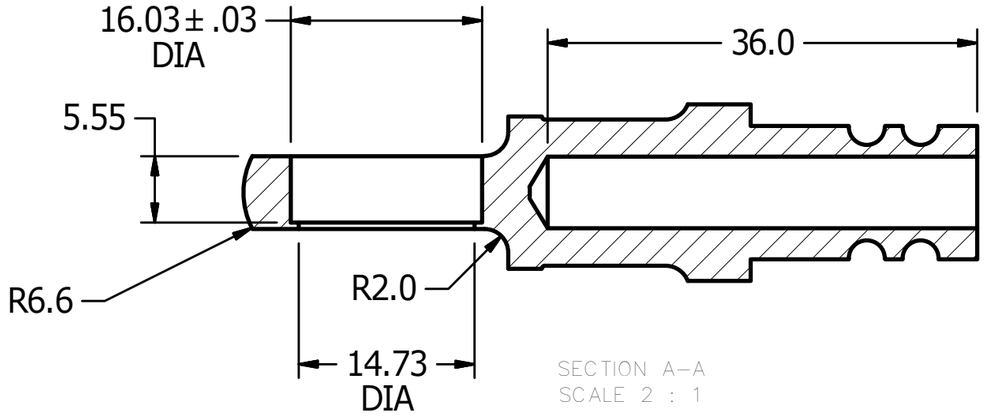
REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBERW WAS AXSDM105	9/11/2014	DW









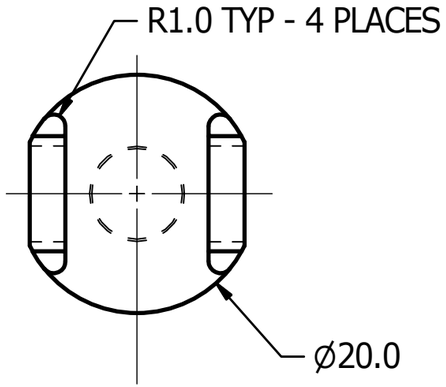


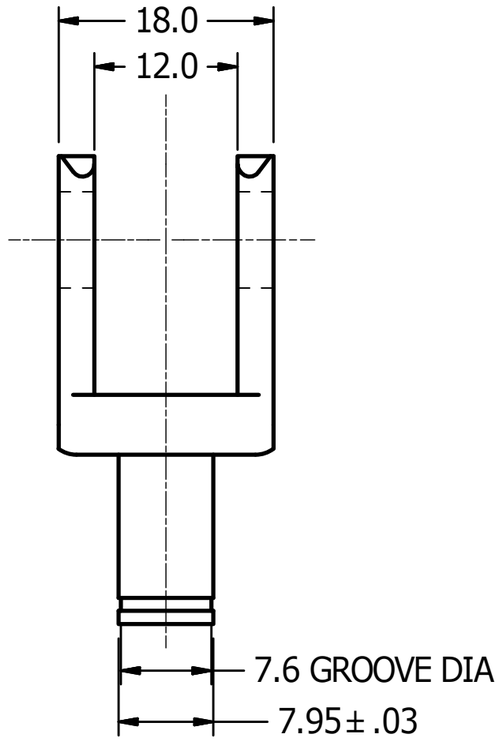
SECTION A–A
SCALE 2 : 1

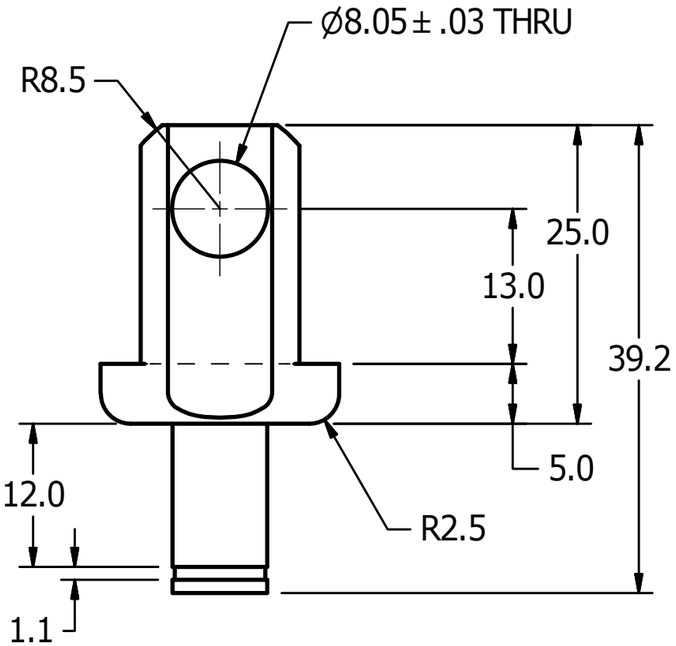
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 ANGLES: ±.5 MACHINED: 1.6 ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	ROD END HOUSING, INBOARD
	DRAWN: JIM CLEVENGER 8/14/2013	
	CHECKED	
MATERIAL: 17–4 PH S.S.	ENG	SIZE: B — DRAWING NUMBER: 472–3854 — REV: A
HEAT TREAT	APPROVED	SCALE: 2X — SHEET: 1 OF 1
FINISH		

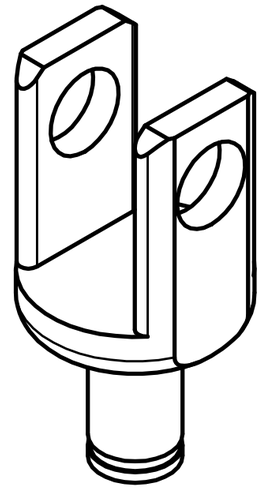
Rod End, Inboard, Clavicle Assy.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM107	9/11/2014	DW









UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
ANGLES: ±.5
MACHINED: 1.6
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Steel
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	2/10/2014
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LINKAGE BASE, INBOARD

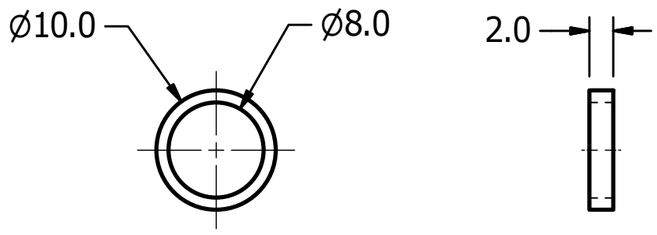
THOR–50M

SIZE: B | DRAWING NUMBER: 472–3855 | REV: A

SCALE: | SHEET: 1 OF 1

472-Inboard Clavicle Linkage.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	DESI
	A	DRAWING NUMBRER WAS AXSDM108	9/11/2014	DW



UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Aluminum 6061
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	2/10/2014
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

ROD END BEARING SPACER, INBOARD

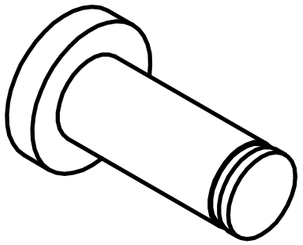
SIZE	DRAWING NUMBER	REV
B	472-3856	A

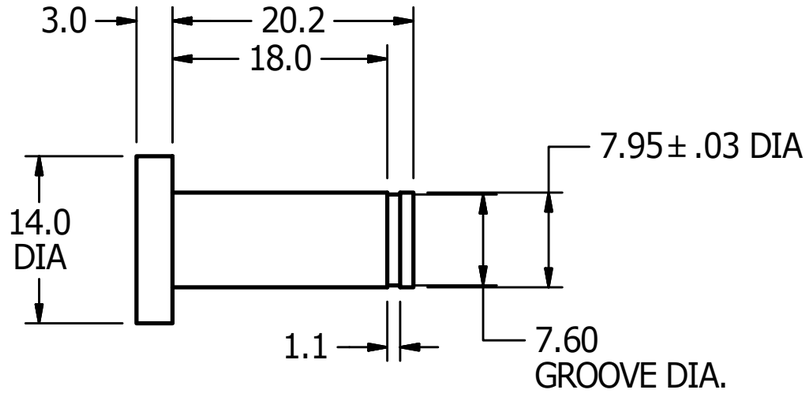
SCALE:

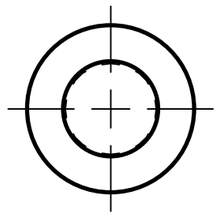
SHEET 1 OF 1

Inboard Clavicle Linkage Spacer.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXADM106	9/15/2014	DW







UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Steel
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: JIM CLEVENGER	2/10/2014
CHECKED:	
ENG:	
APPROVED:	

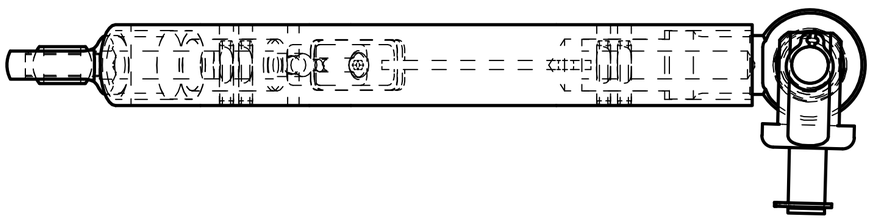
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

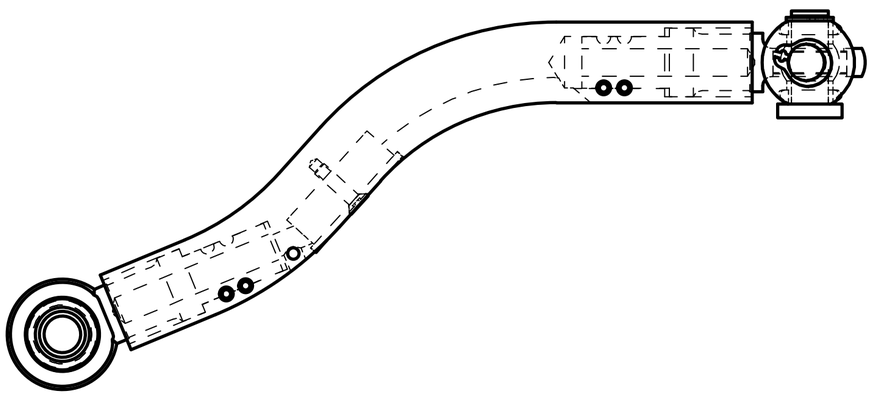
LINKAGE PIN, INBOARD CLAVICLE

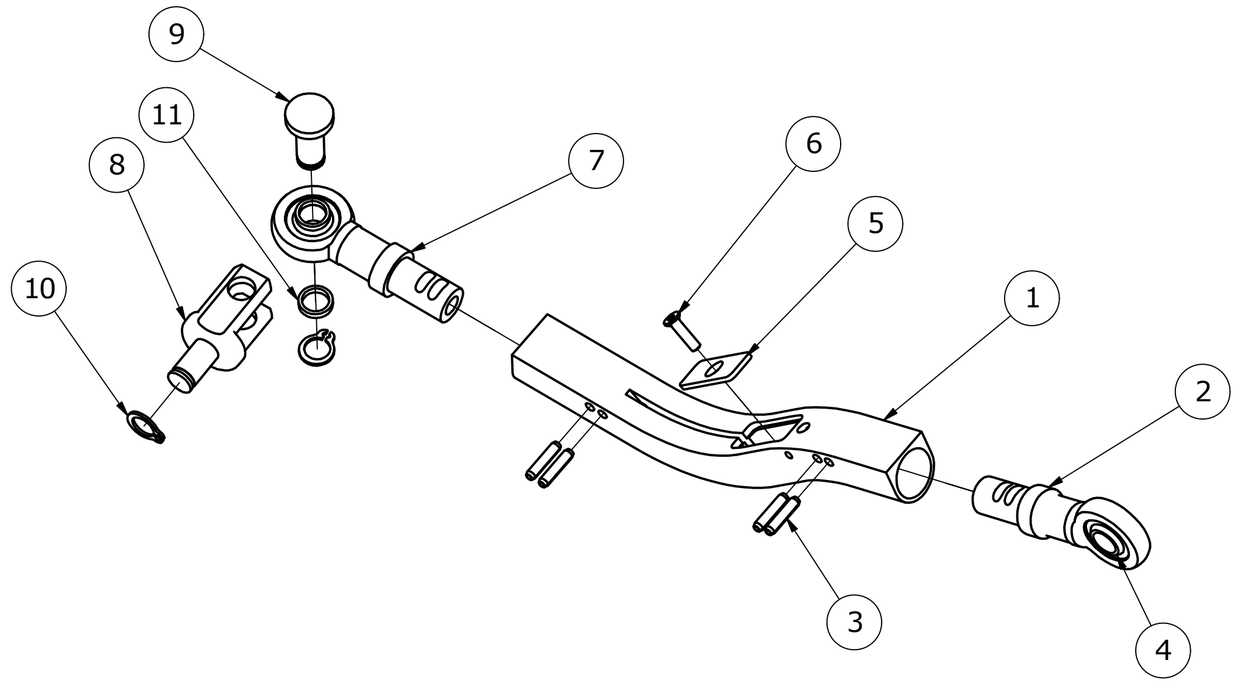
SIZE: B
DRAWING NUMBER: 472-3899
REV: A
SCALE:
SHEET: 1 OF 1

Inboard Clavicle Linkage Pin.ipt

REVISION HISTORY				
ZON	RE	DESCRIPTION	DATE	BY
	A	CHANGED SHEET SIZE TO C; REPLACED ITEMS AXSDM104B, AXSDM034B, AND AXSDM021B ITEM 7, 8, 9, & 10; REMOVED ITEM 5001175V	2/5/2014	JHC
	B	DRAWING NUMBER WAS AXSDM200B; IN PARTS LIST 472-3851 WAS AXSDM101, 472-3852 WAS AXSDM103, 472-3853 WAS AXSDM102, 472-3854 WAS AXSDM1058, 472-3855 WAS ASXDM107, 472-3857 WAS AXSDM106 & 472-3856 WAS AXSDM108	9/11/2014	DW
	C	ADDED EXPLODED VIEW, MOVED BALLOON CALLOUTS TO EXPLODED VIEW	7/27/2015	DW







ITEM	QTY	PART NUMBER	DESCRIPTION
B 11	2	472-3856	ROD END BEARING SPACER, INBOARD
10	2	5001174V	8mm RETAINING RING
B 9	1	472-3899	LINKAGE PIN, INBOARD CLAVICLE
8	1	472-3855	LINKAGE BASE, INBOARD
B 7	1	472-3854	ROD END HOUSING, INBOARD
6	1	5000377	SCREW, FHCS M3 x 12
B 5	1	472-3853	CLAVICLE COVER PLATE
4	2	5000946	METRIC SPHERICAL BEARING
3	4	5000196	ROLL PIN, M3 x 14
B 2	1	472-3852	ROD END HOUSING, OUTBOARD
B 1	1	472-3851	CLAVICLE

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
ANGLES: ±.5
MACHINED: 16
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/12/2013
CHECKED	
ENG	
APPROVED	

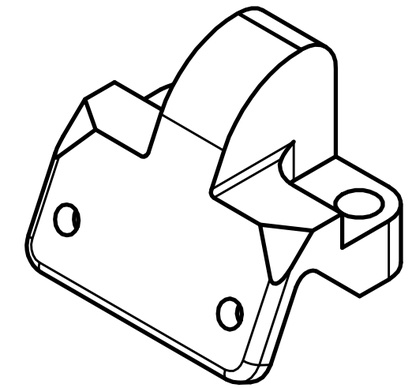
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

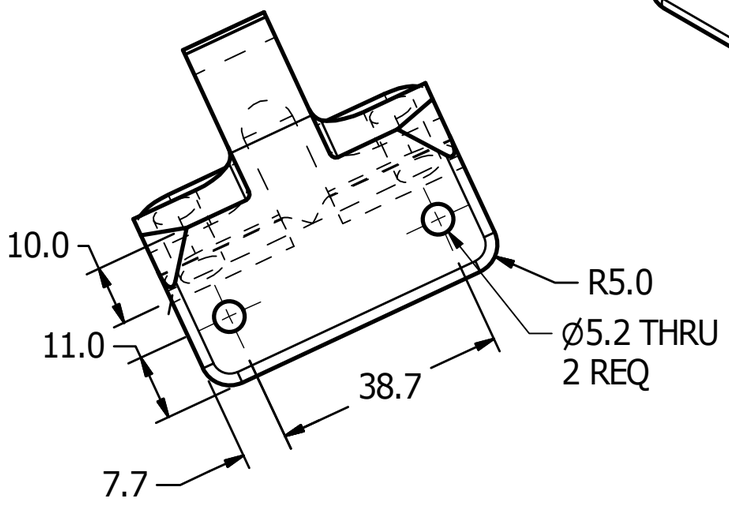
RIGHT CLAVICLE ASSEMBLY

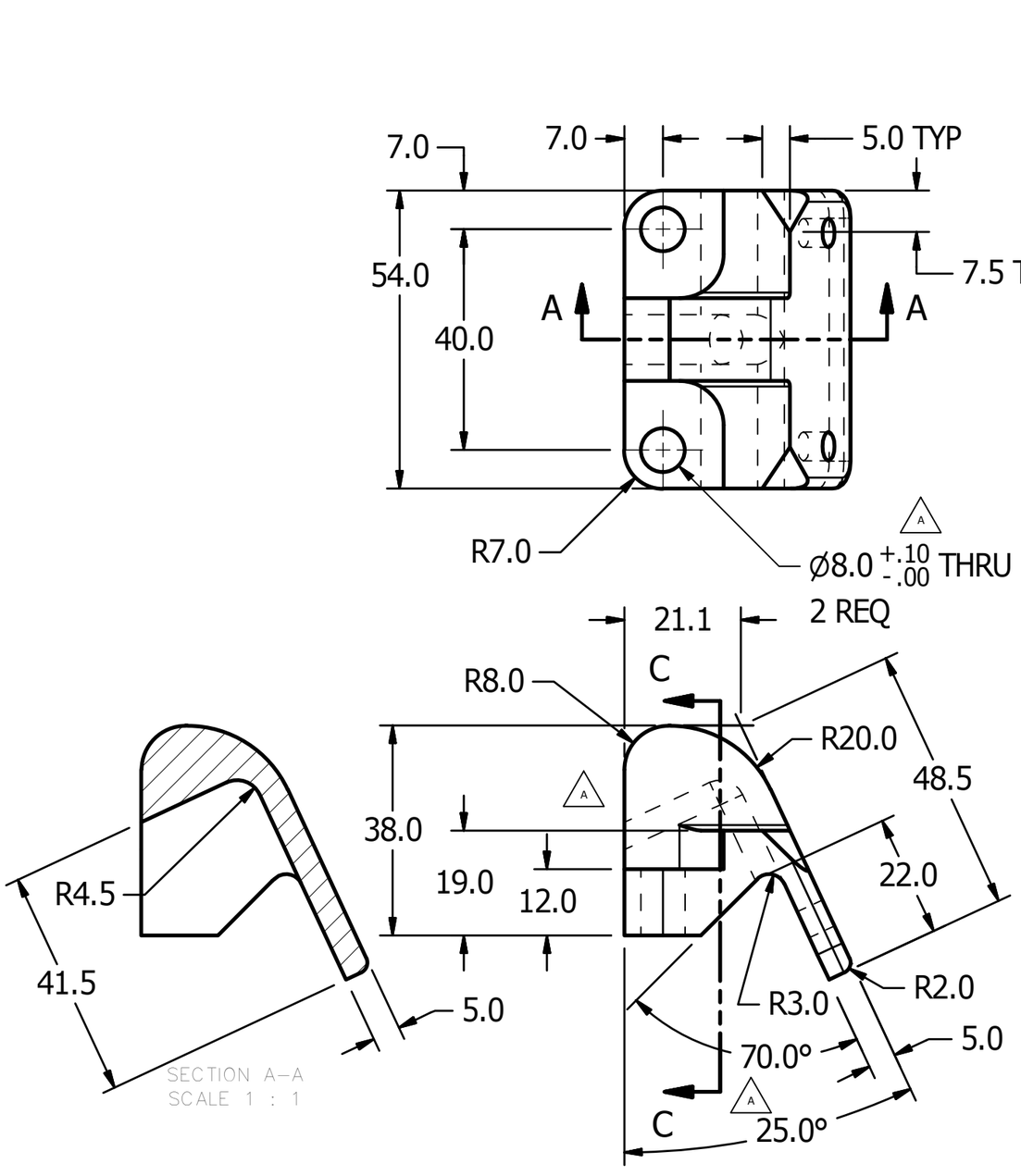
SIZE C | DRAWING NUMBER 472-3860 | REV C
SCALE: 1:1 | SHEET 1 OF 1

Clavicle Assembly, Right - Mod 1.iam

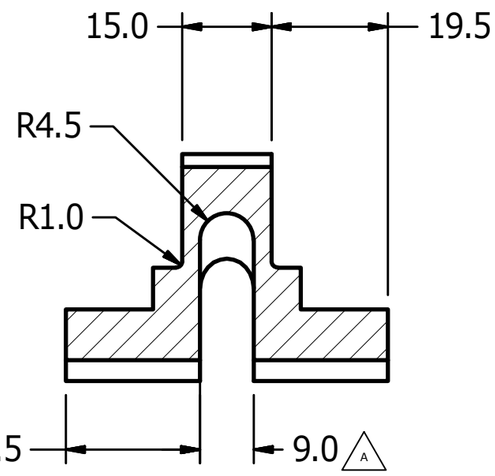
REVISION HISTORY				
ZON	REV	DESCRIPTION	DATE	BY
	A	15.0 WAS 18.0, 9.0 WAS 10.0, ADDED 70.0, ADDED 19.0; ADDED TOLERANCE	2/6/2014	JHC
	B	DRAWING NUMBER WAS AXSDM040C	9/11/2014	DW







SECTION A–A
SCALE 1 : 1



SECTION C–C
SCALE 1 : 1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
ANGLES: ±.5
MACHINED: 1.6
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Aluminum 6061
HEAT TREAT:
FINISH: ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/13/2013
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

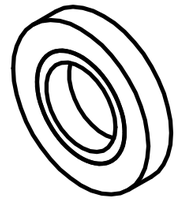
STERNUM BRACKET

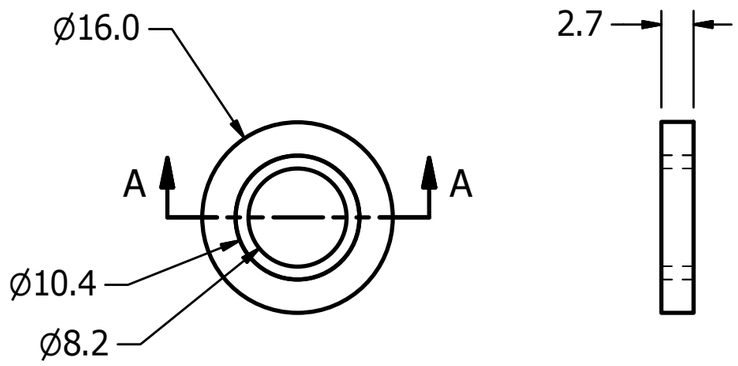
SIZE	DRAWING NUMBER	REV
B	472–3870	B

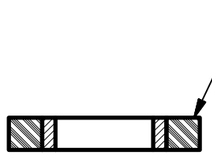
SCALE: 1:1 SHEET 1 OF 1

Sternum Bracket - Mod 1.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM038	9/11/2014	DW
	B	ADDED NOTE 1	7/27/2015	DW







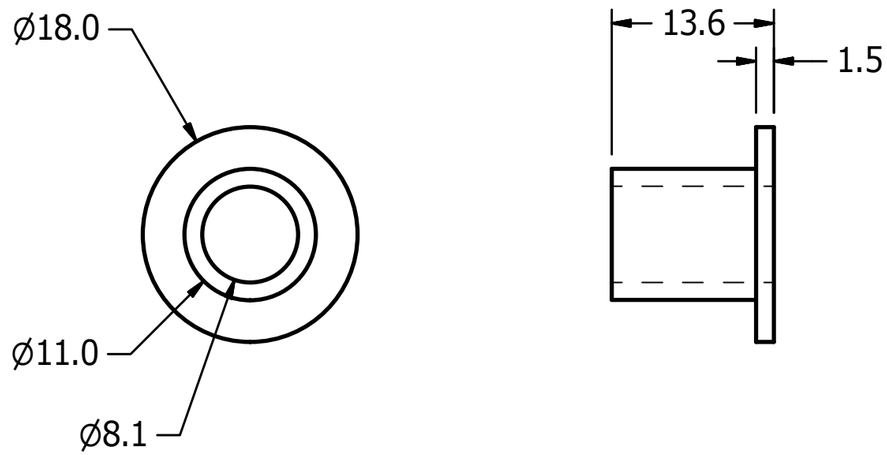
SECTION A-A
SCALE □ □□

NOTES:
1. MATERIAL:
INNER RING: ALUMINUM 6061-T6.
OUTER RING: NATURAL RUBBER, 50 ±5
SHORE A DUROMETER.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; ANGLES: ±.5; MACHINED: 1.6. ASME Y14.5M - 1994. DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	ROD END SPACER ASSY
	DRAWN: JIM CLEVENGER 10/29/2013	
	CHECKED	
MATERIAL: SEE NOTES	ENG	SIZE: B; DRAWING NUMBER: 472-3880; REV: B
HEAT TREAT	APPROVED	SCALE: 2X; SHEET: 1 OF 1
FINISH		

Rod End Spacer Assy.iam

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM037A	9/11/2014	DW



UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Aluminum 6061
HEAT TREAT:
FINISH:

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	10/29/2013
CHECKED	
ENG	
APPROVED	

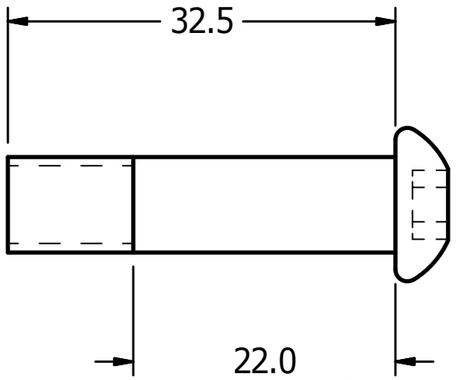
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

SHOULDER COVER BUSHING

SIZE: B | DRAWING NUMBER: 472-3890 | REV: A
SCALE: 2X | SHEET: 1 OF 1

Shoulder Cover Bushing.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM037B, ADDED "(5000260V) MODIFIY AS SHOWN" TO MATERIAL NOTE	9/11/2014	DW



MATERIAL

START WITH A M8-1.25 x 50mm LONG BHCS (5000260V)
MODIFY AS SHOWN.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Steel
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: JIM CLEVENGER	10/29/2013
CHECKED:	
ENG:	
APPROVED:	

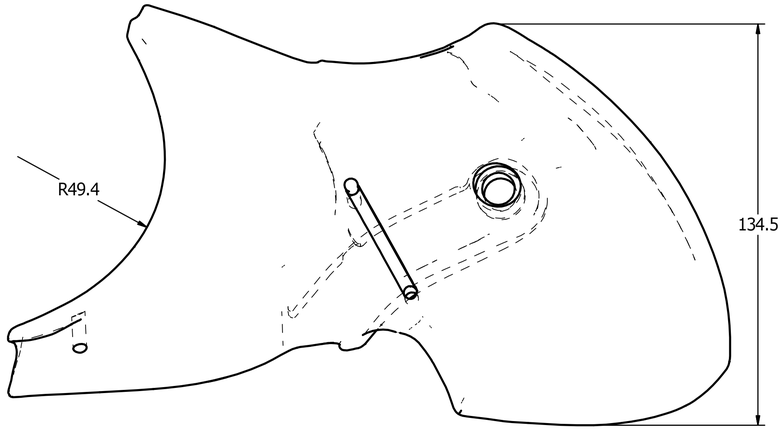
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

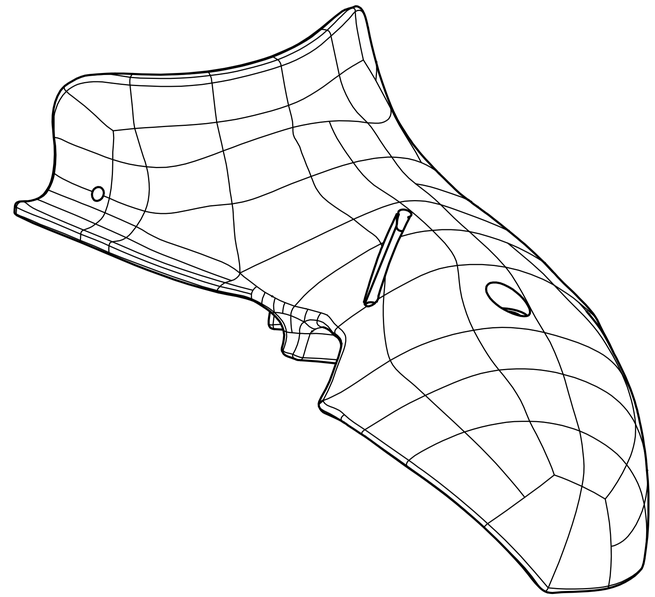
MODIFIED M8 BOLT

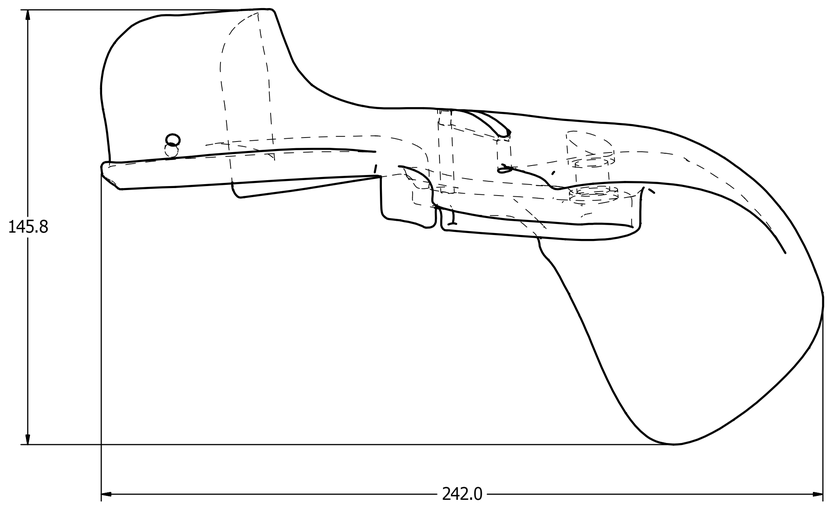
SIZE: B | DRAWING NUMBER: 472-3891 | REV: A
SCALE: 2X | SHEET: 1 OF 1

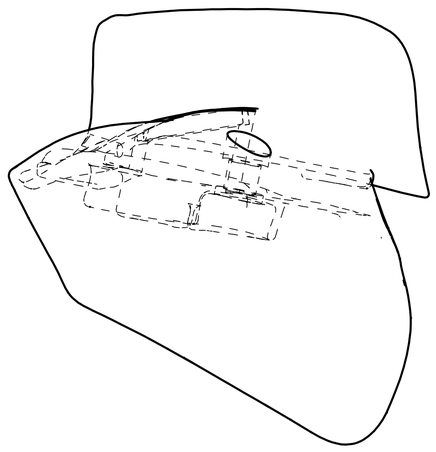
Modified M8 Bolt.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	CHANGED SHEET SIZE TO "D", DRAWING NUMBER WAS AXSDM035	9/11/2014	DW









NOTE:

A 3-D FILE IS AVAILIBLE
FOR REFERENCE FROM NHTSA

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
XX ±.2
XXX ±.1
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Urethane, Clear
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: JIM CLEVENGER	8/21/2013
CHECKED:	
ENG:	
APPROVED:	

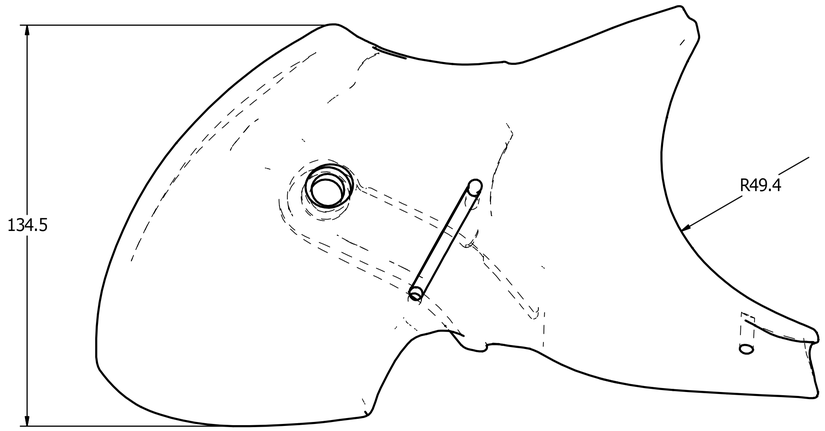
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

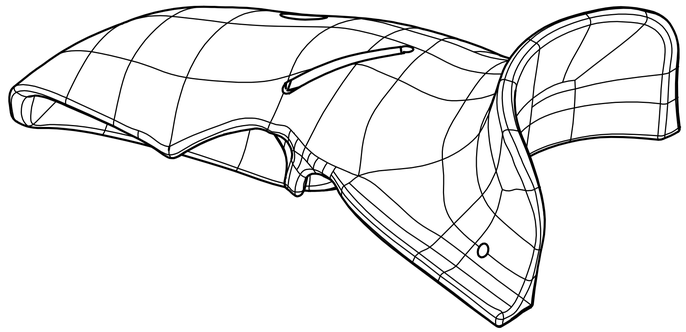
SHOULDER COVER, LEFT

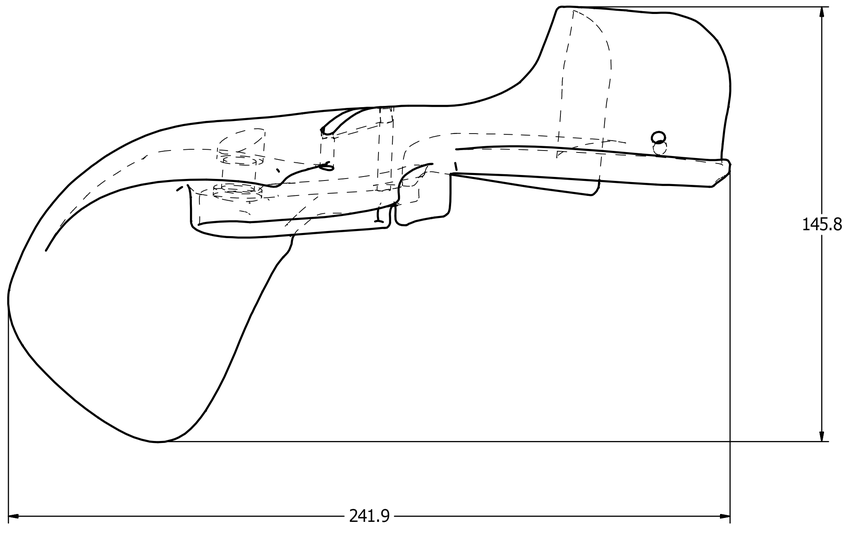
SIZE: D | DRAWING NUMBER: 472-3895-1 | REV: A
SCALE: 1:1 | SHEET 1 OF 1

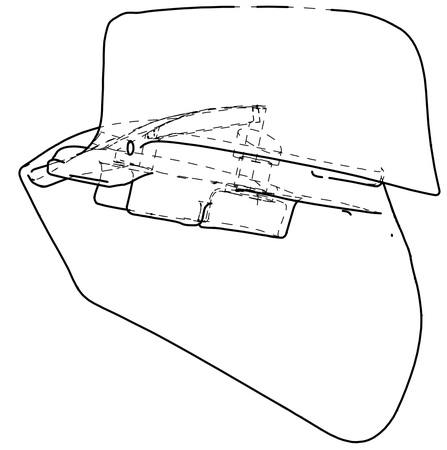
Shoulder Cover, Left.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	CHANGE SHEET SIZE TO "D", DRAWING NUMVBER WAS AXSDM036	9/11/2014	DW









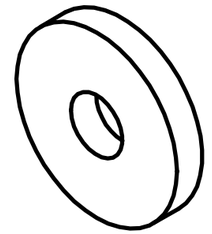
NOTE:

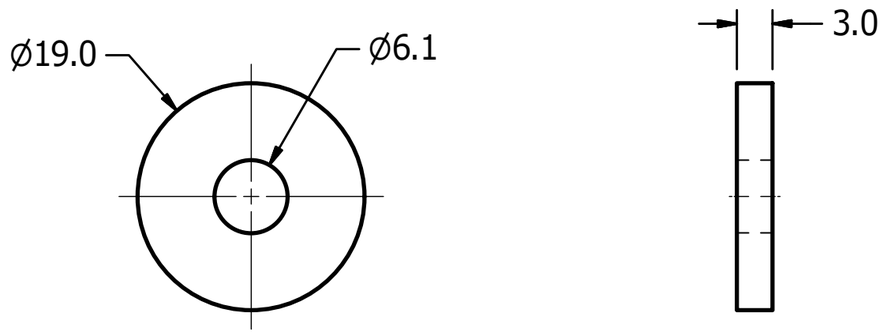
A 3-D FILE IS AVAILIBLE
FOR REFERENCE FROM NHTSA

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: ANGLES: MACHINED: X ±.5 ±.5 XX ±.2 XXX ±.1 ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	SHOULDER COVER, RIGHT
	DRAWN JIM CLEVENGER 8/21/2013	
	CHECKED	
MATERIAL Urethane, Clear	ENG	SIZE D — DRAWING NUMBER 472-3895-2 — REV A
HEAT TREAT	APPROVED	SCALE: 1:1 — SHEET 1 OF 1
FINISH		

Shoulder Cover, Right.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXSDM033	9/11/2014	DW
	B	ADDED NOTES 1 & 2; MATERIAL WAS RUBBER	7/27/2015	DW





NOTES:

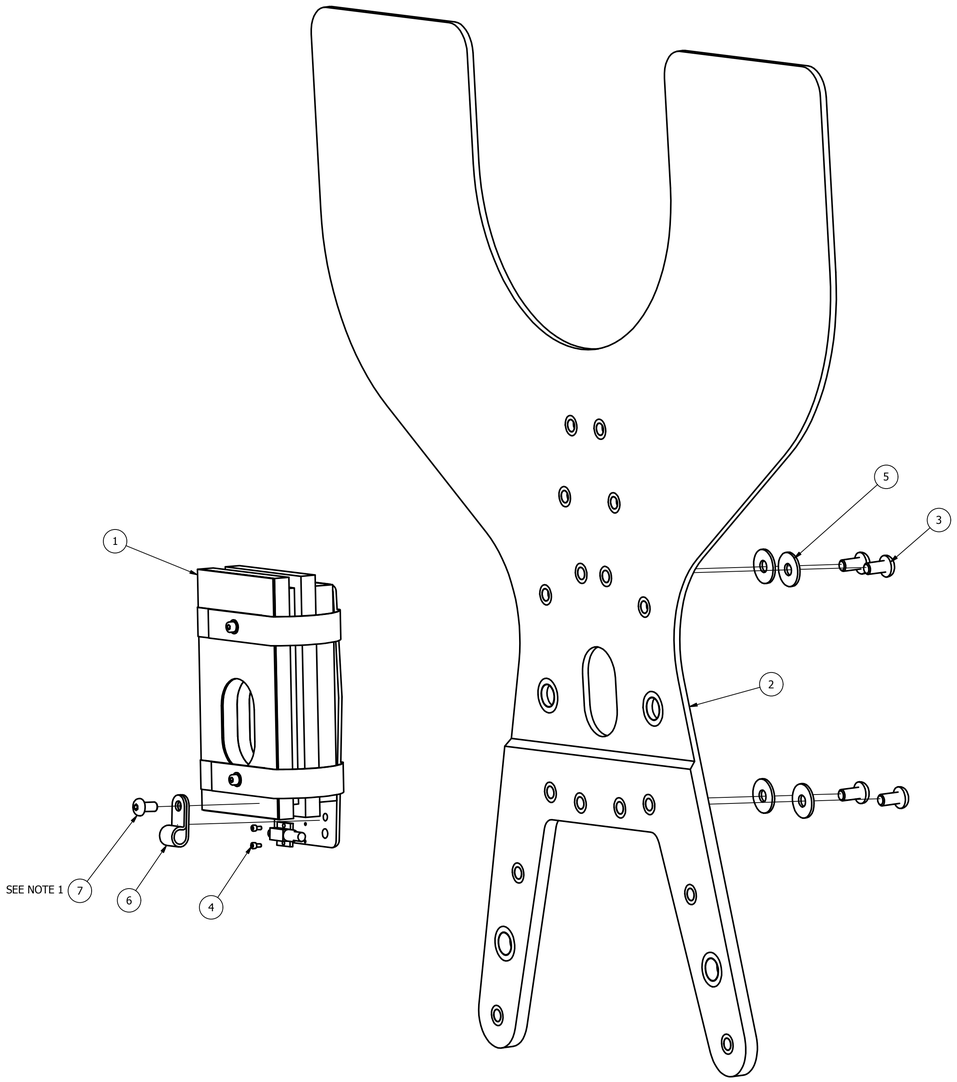
B 1. RUBBER DIMENSIONAL TOLERANCE ±0.5 UNLESS OTHERWISE SPECIFIED.

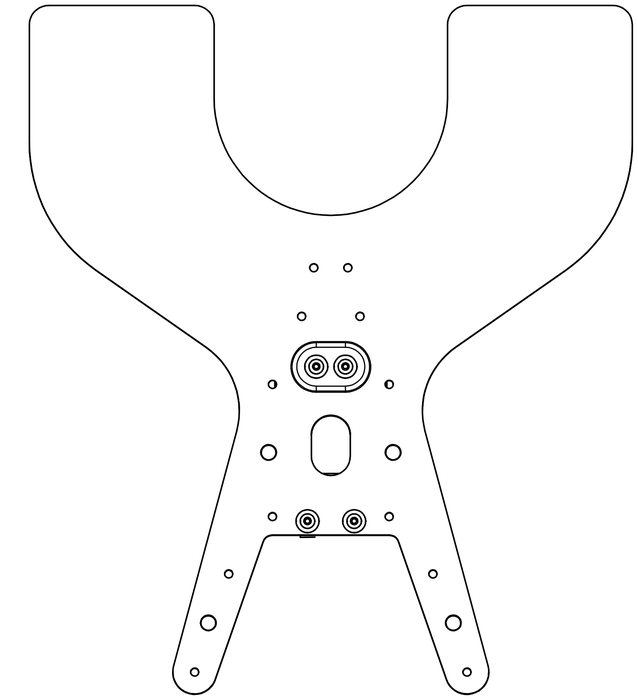
B 2. MATERIAL: BUNA-N RUBBER, 50 ±5 SHORE A DURAMETER.

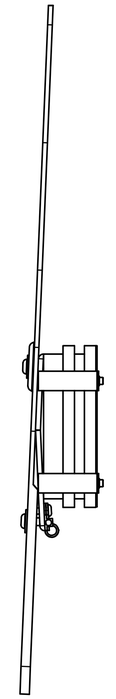
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; ANGLES: ±.5; MACHINED: 1.6 ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	RUBBER SPACER WASHER
	DRAWN: JIM CLEVENGER 2/10/2014	
	CHECKED	
MATERIAL: SEE NOTES	ENG	SIZE: B; DRAWING NUMBER: 472-3898; REV: B
HEAT TREAT	APPROVED	SCALE:
FINISH		SHEET: 1 OF 1

Rubber Spacer Washer.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1TXM100 R5 AND CONVERTED TO METRIC FOR THOR-M	10/26/2011	BK
	B	5001163 WAS 5000674	6/14/2012	BK
	C	UPDATE TO SHOW 472-3420 HOLE CHANGE	7/20/2012	BK
	D	ITEM 7 - 5000103 - SCREW, BHCS M4-0.7 X 8 WAS 5001163 - M4 X 0.7 x 5 LG. BHCS	2/24/2016	DW
	E	REVISED ITEM #1, 472-3410 - MID-STERNUM BONDING ASSEMBLY	3/1/2017	DW







SCALE .75

NOTES:

1. STRAIN RELIEVE THE ACCELEROMETER WIRE TO THE MID-STERNUM PLATE AS SHOWN.

ITEM	QTY	PART NUMBER	DESCRIPTION
7	1	5000103	SCREW, BHCS M4 x 0.7 x 8
6	1	9002655	WIRE CLAMP,NYLON 1/8 DIA.
5	4	5001126	WASHER, M5 X 15 X 1.2 S.S.
4	2	5000068	SCREW, SHCS M1.4 - 0.3 X 3 LG.
3	4	5000003	M5 X 0.8 X 10 LG. BHCS
2	1	472-3420	THORAX OUTER BIB
1	1	472-3410	MID-STERNUM BONDING ASSEMBLY

PARTS LIST

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS
MACHINED FINISH
X ±0.5 63
XX ±0.2
XXX ±0.1
XXXX ±0.05
REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

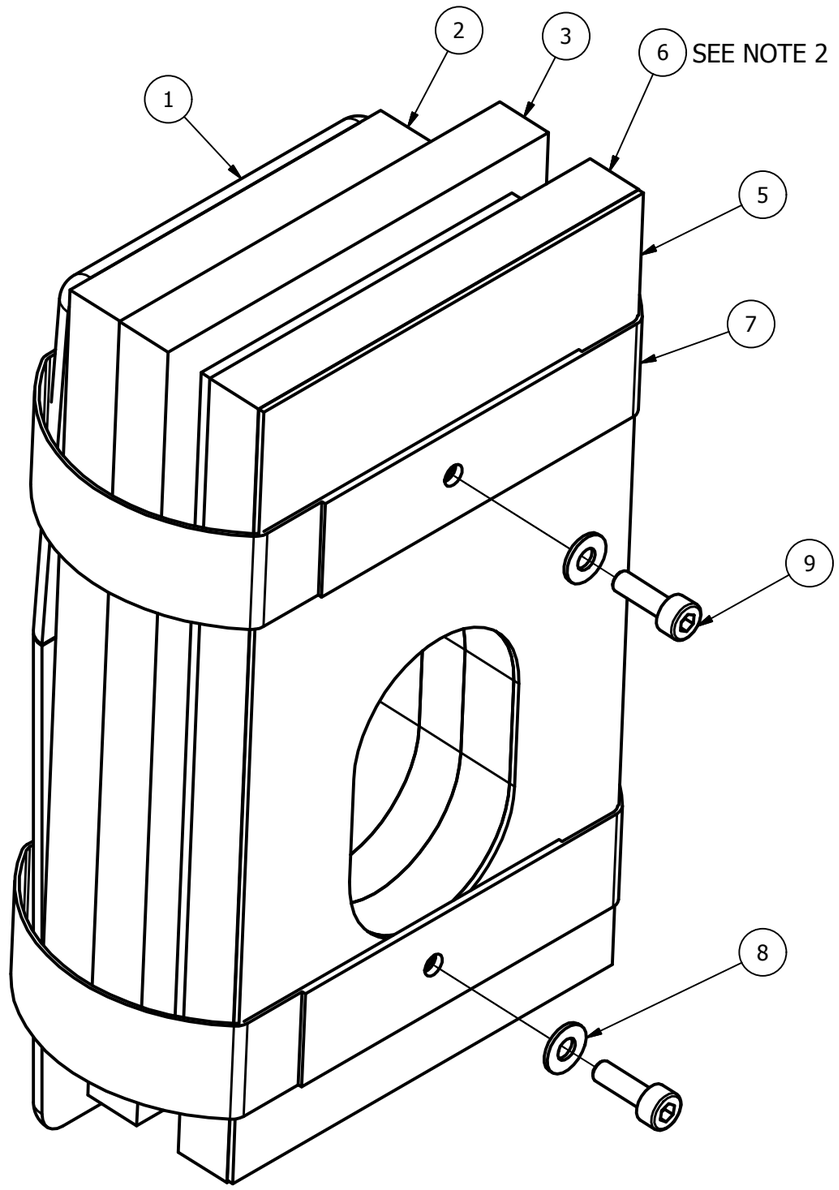
		PROJECT NO:	
472-3000	1	MATERIAL:	
NEXT ASSEMBLY	QTY	HEAT TREAT:	
TOTAL QTY IN DUMMY	1	FINISH:	

DRAWN BY: B. KIMES — DATE: 10/26/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/18/2012

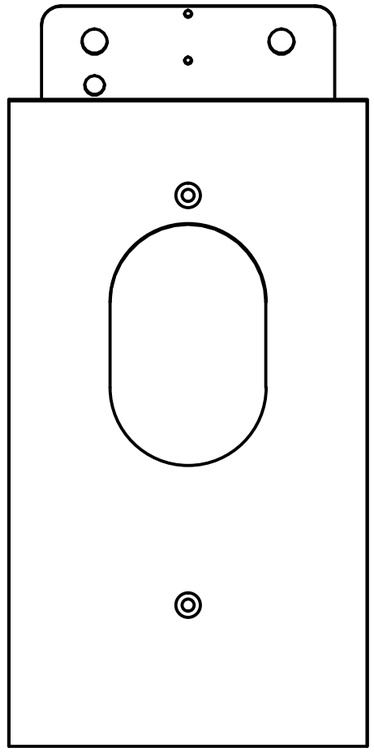
DESCRIPTION: THORAX BIB ASSEMBLY
SIZE: A1 — SHEET 1 OF 1 — SCALE: .500
DRAWING NO.: 472-3400 — REV: E

472-3400.iam

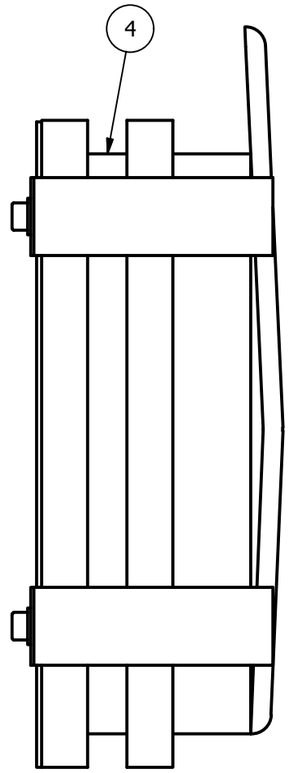
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1MSM015 R0 FOR THOR-M	9/13/2011	BK
	B	ADDED ITEM 6, 7, 8, & 9; ADDED NOTE #2; ITEM #3 PART NUMBER WAS 473-3414	1/31/2017	DW



SCALE 1.5 : 1



STRAPS HIDDEN TO SHOW
HOLE LOCATIONS



NOTES:

1. SAND BLAST AND CLEAN WITH ACETONE, THE AREA OF EACH METAL PLATE THAT WILL MAKE CONTACT WITH EITHER THE FOAM OR RUBBER.
2. ENSURE THE TAPPED HOLES ON ITEM 6 FACEOUT FROM FOAM.
3. ALIGN AND CENTER THE FRONT EDGE OF 472-3414 WITH 472-3413. MAKE SURE THE HOLE PATTERN ON THE METAL PLATE IS AS SHOWN.
4. CENTER EACH MID-STERNUM MASS PLATE (472-3411 & 472-2411-A) ON EACH MASS DAMPING FOAM (472-3414 AND 472-3412).
5. BOND FOAM AND RUBBER PADS TO PLATES USING PLIOBOND 30 INDUSTRIAL ADHESIVE OR EQUIVALENT.

B	ITEM	QTY	PART NUMBER	DESCRIPTION
B	9	2	5000458	M2.5 X 0.45 X 8 LG. SHCS
	8	2	5001094	M2.5 FLAT WASHER PLAIN ZINC
	7	2	472-3431	STERNUM MASS STRAP
B	6	1	472-3411-A	MID-STERNUM MASS #2
	5	1	472-3415	MID-STERNUM RUBBER PAD
	4	1	472-3412	MASS DAMPING FOAM #2, MID-STERNUM
	3	1	472-3411	MID-STERNUM MASS
	2	1	472-3414	MASS DAMPING FOAM #1, MID-STERNUM
	1	1	472-3413	MID-STERNUM PLATE

PARTS LIST

472-3400	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01
ANGLES ± 0.5°
FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:
DRAWN BY: B. KIMES — DATE: 9/13/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/17/2012

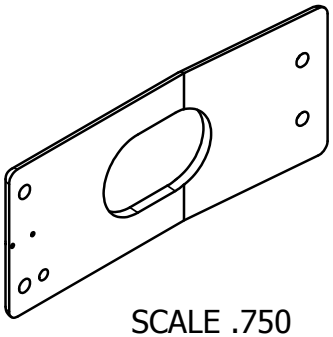
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: MID-STERNUM BONDING ASSEMBLY

SIZE: A3 | SHEET: 1 OF 1 | SCALE: 1.000 | DRAWING NO.: 472-3410 | REV: B

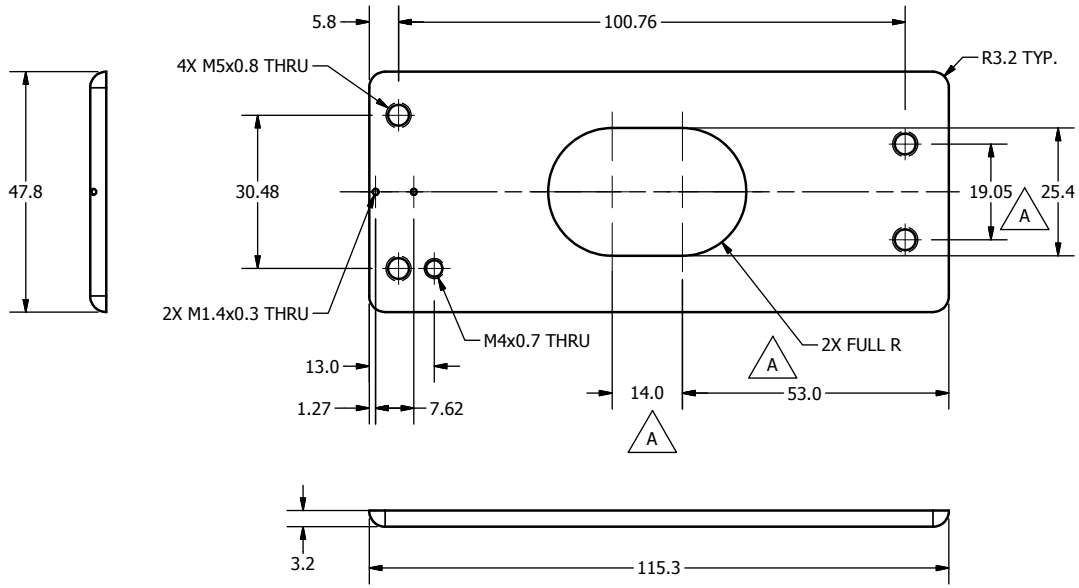
472-3410.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1MSM010 RB0 AND CONVERTED TO METRIC FOR THOR-M; ADD CENTER HOLE	9/13/2011	BK

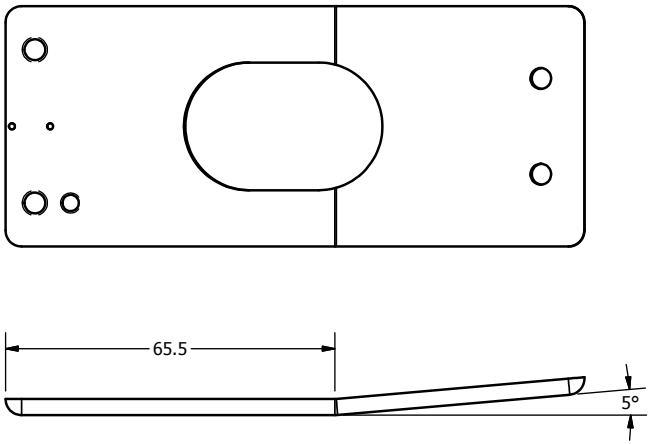


SCALE .750

STEP 1: MACHINING

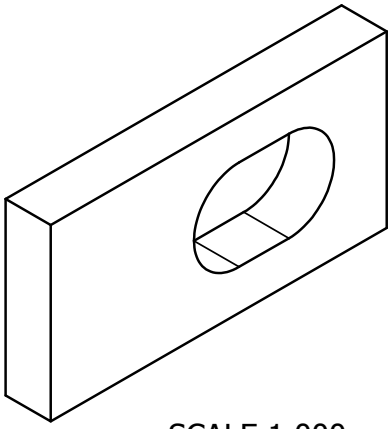


STEP 2: BENDING

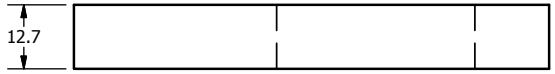


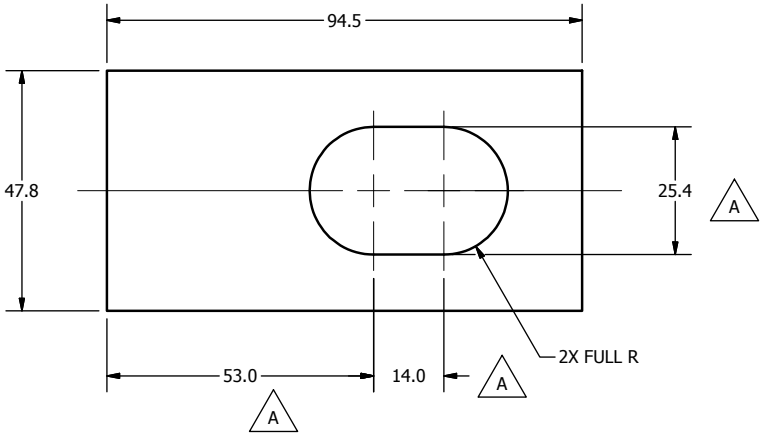
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: MID-STERNUM PLATE		
PROJECT NO.:					
472-3410	1	MATERIAL: 01 TOOL STEEL	DRAWN BY: B. KIMES	DATE: 9/13/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 40-43	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1 DRAWING NO.: 472-3413 REV: A
TOTAL QTY IN DUMMY	1	FINISH: TEFLON COATING	ENGINEER: J. WANG	DATE: 1/17/2012	SCALE: 1.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1MSM014 R0 FOR THOR-M; ADD CENTER HOLE	9/13/2011	BK



SCALE 1.000



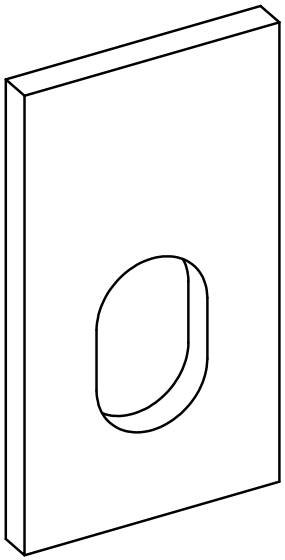


NOTES:

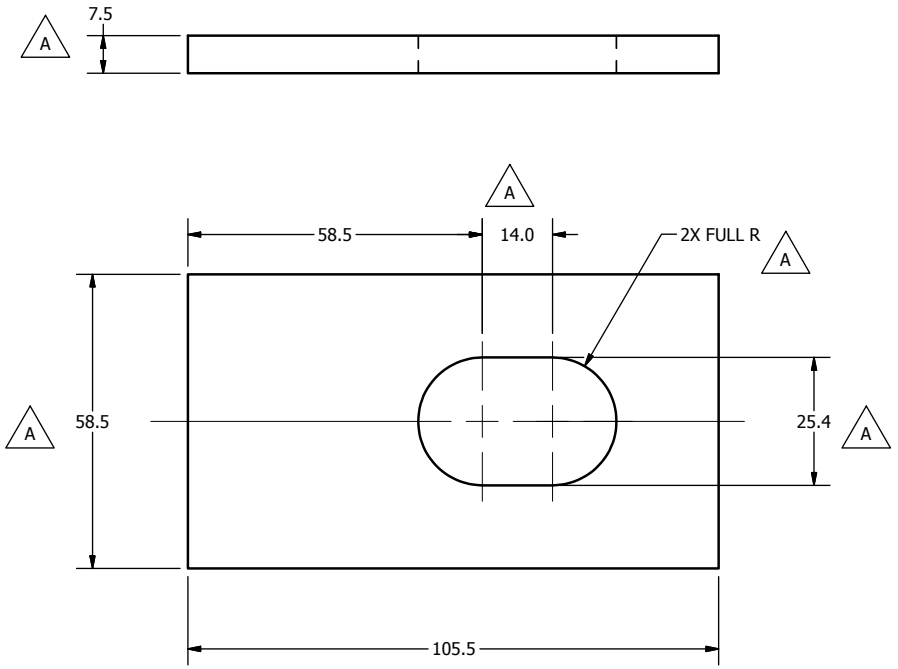
1. DIMENSION TOLERANCE ±.8 , UNLESS OTHERWISE NOTED.

DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES			
PROJECT NO.:			DESCRIPTION: MASS DAMPING FOAM #1, MID-STERNUM		
472-3410	1	MATERIAL: ESTER FOAM (6lb., CHARCOAL)	DRAWN BY: B. KIMES	DATE: 9/13/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/17/2012	SCALE: 1.000 DRAWING NO.: 472-3414 REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1MSM011 RB0 AND CONVERTED TO METRIC FOR THOR-M; 7.5, 58.5, 105.5 WAS 6.4, 58.4, 105.2; ADD CENTER HOLE, NOTES	10/26/2011	BK



SCALE 1.000

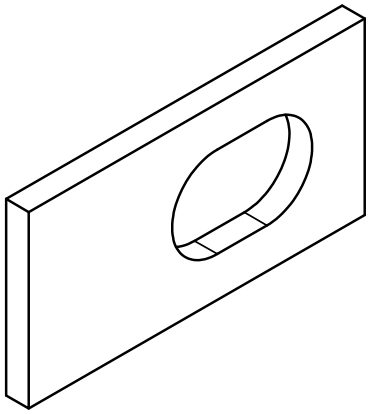


A NOTES:

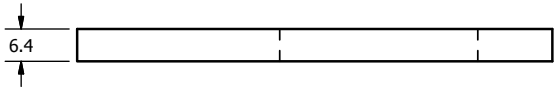
1. POWDER OR BEAD BLAST.
2. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.
3. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

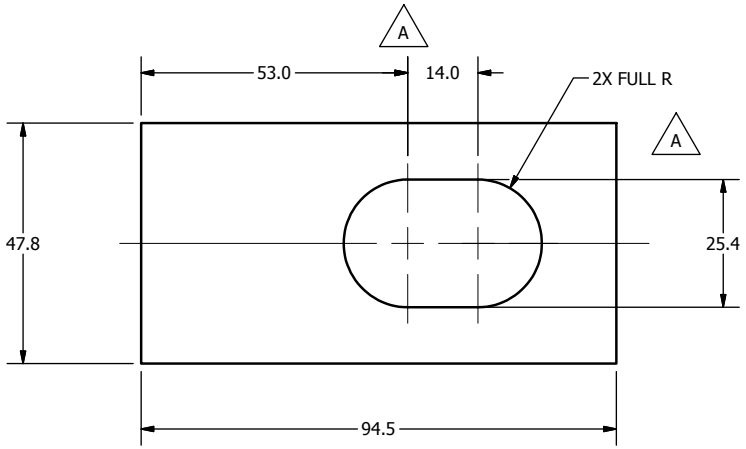
		DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
		PROJECT NO.:		DESCRIPTION: MID-STERNUM MASS
472-3410	2	MATERIAL: 1018 STEEL	DRAWN BY: A. ABRAMOSKI 8/17/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET: 1 OF 1 DRAWING NO.: 472-3411 REV: A
TOTAL QTY IN DUMMY	2	FINISH: SEE NOTES	ENGINEER: J. WANG DATE: 1/17/2012	SCALE: 1.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1MSM012 RB0 FOR THOR-M; ADD CENTER HOLE	9/12/2011	BK



SCALE 1.000



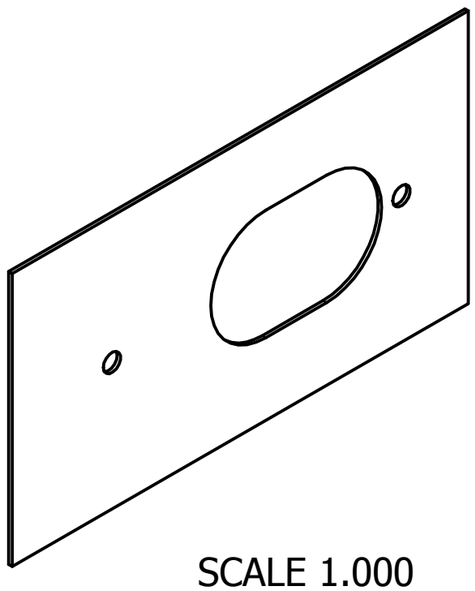


NOTES:

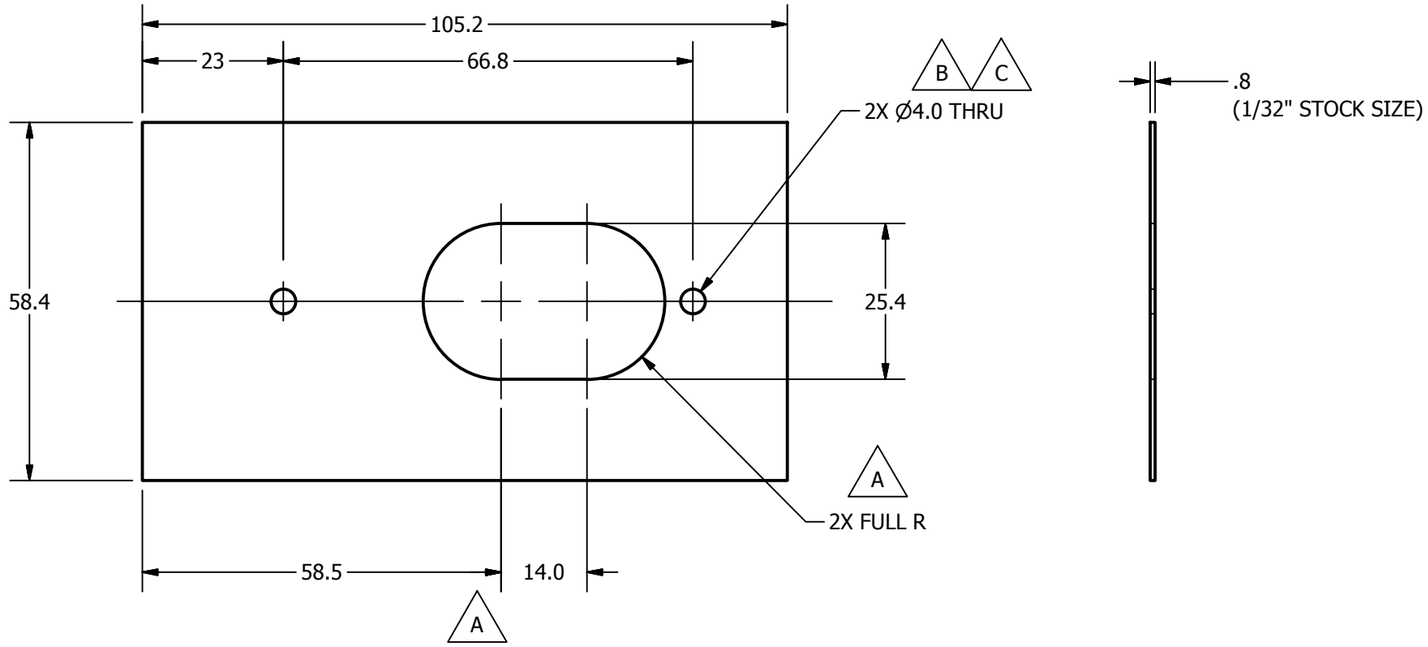
1. DIMENSION TOLERANCE ±.8 , UNLESS OTHERWISE NOTED.

DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES			
PROJECT NO.:		DRAWN BY: B. KIMES	DATE: 9/12/2011	DESCRIPTION: MASS DAMPING FOAM #2, MID-STERNUM	
472-3410	1	MATERIAL: ESTER FOAM (6LB., CHARCOAL)			
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1 DRAWING NO.: 472-3412 REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/17/2012	SCALE: 1.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1MSM015 R0 FOR THOR-M; ADD CENTER HOLE	9/13/2011	BK
	B	ADDED Ø4.0 THRU HOLES	1/31/2017	DW
	C	DIMENSION Ø4.0 THRU WAS Ø4.0 ±.05 THRU	2/5/2018	DW



SCALE 1.000

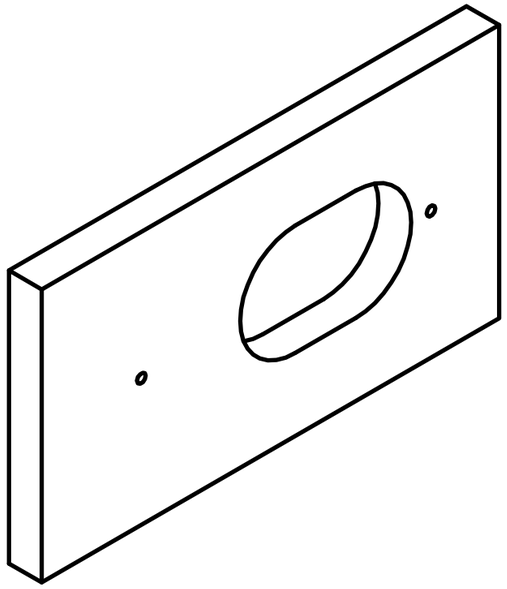


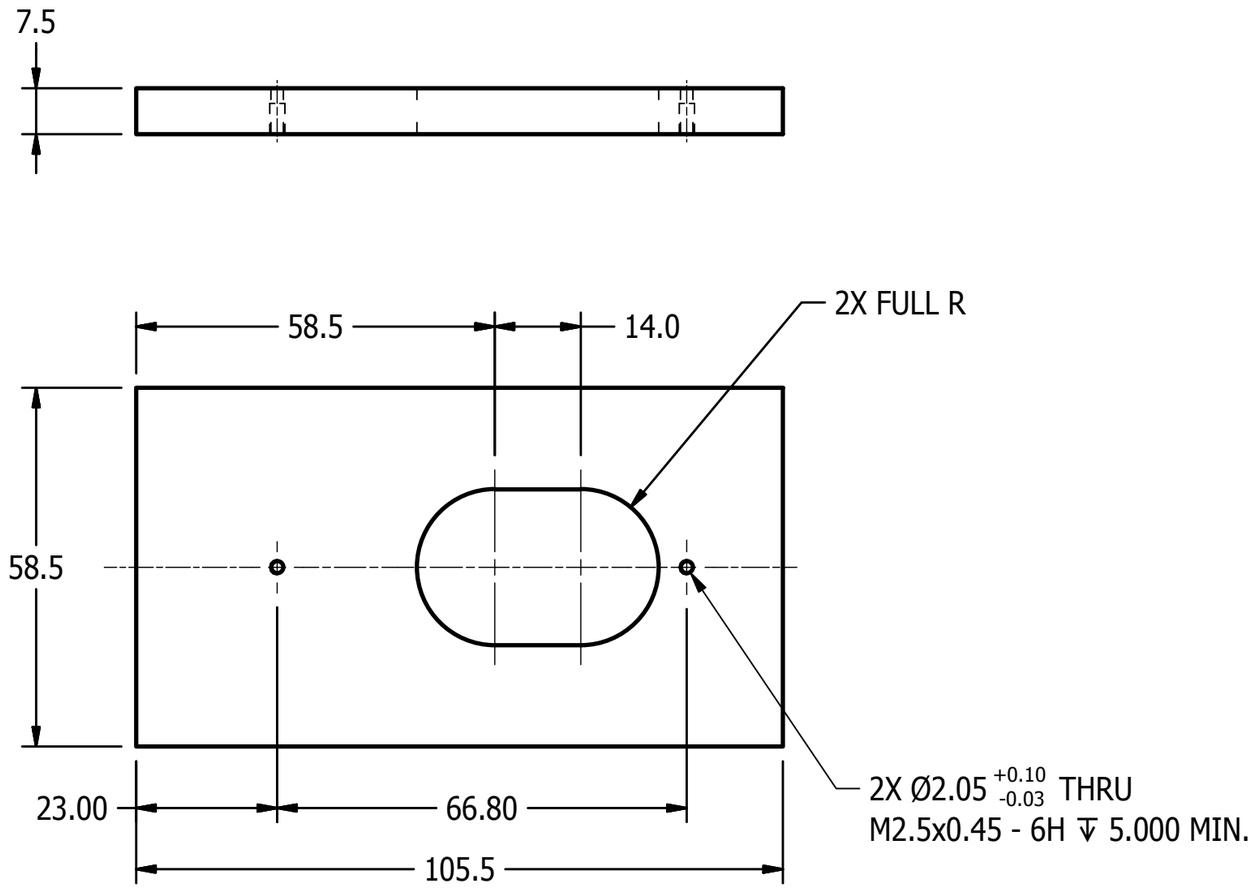
NOTES:

1. RUBBER TOLERANCE ±.5 AND DUROMETER ±5, UNLESS OTHERWISE SPECIFIED.

		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ± 0.5 ± 0.5° 1.6 X.X ± 0.2 X.XX ± 0.1 X.XXX ± 0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.: THOR-50M		DESCRIPTION: MID-STERNUM RUBBER PAD	
472-3410	1	MATERIAL: BUNA-N RUBBER 50A	DRAWN BY: B. KIMES DATE: 9/13/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET 1 OF 1	DRAWING NO.: 472-3415 REV: C
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG DATE: 1/17/2012	SCALE: 1.000	

472-3415.ipt





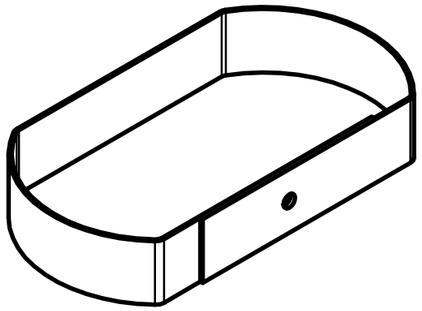
NOTES:

1. POWDER OR BEAD BLAST.
2. NICKEL PLATE 0.003m - 0.008mm MAX. AFTER MACHINING
3. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

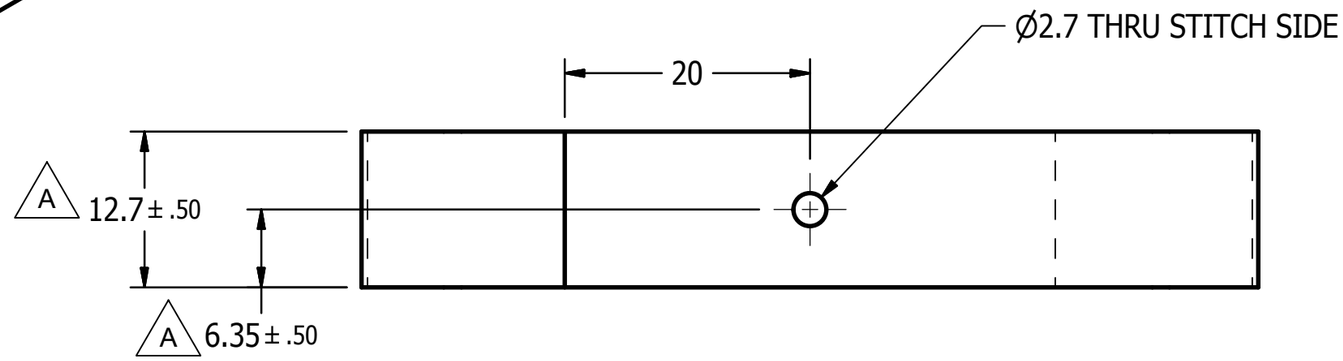
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6, ANGLES ±.5° ASME Y14.5M - 1994 **DO NOT SCALE DRAWING**	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER		**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION**
	APPROVALS	DATE	MID-STERNUM MASS #2 THOR-50M
	DRAWN Dave Walker	1/31/2017	
MATERIAL 1018 STEEL	CHECKED		
HEAT TREAT	ENG		
FINISH SEE NOTES	APPROVED		THIRD ANGLE PROJECTION SIZE **A3** DRAWING NUMBER 472-3411-A REV SCALE: 1 : 1 SHEET 1 OF 1

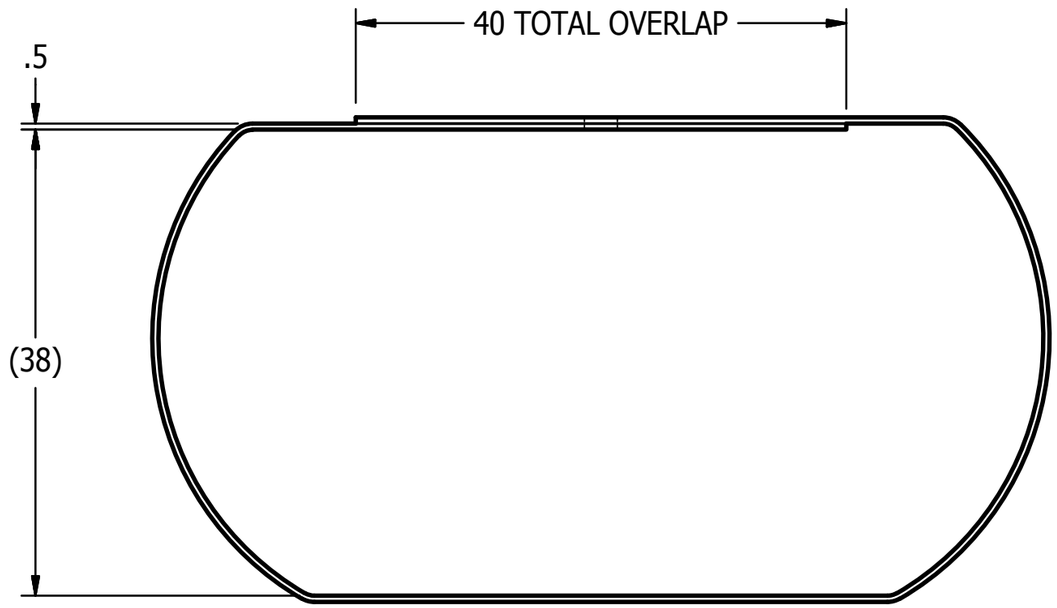
472-3411-A.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DIMENSION 12.7 ±.50 WAS 12.7 ±.05 AND 6.35 ±.50 WAS 6.35 ±.05	2/5/2018	DW



SCALE 1 : 1





NOTES:

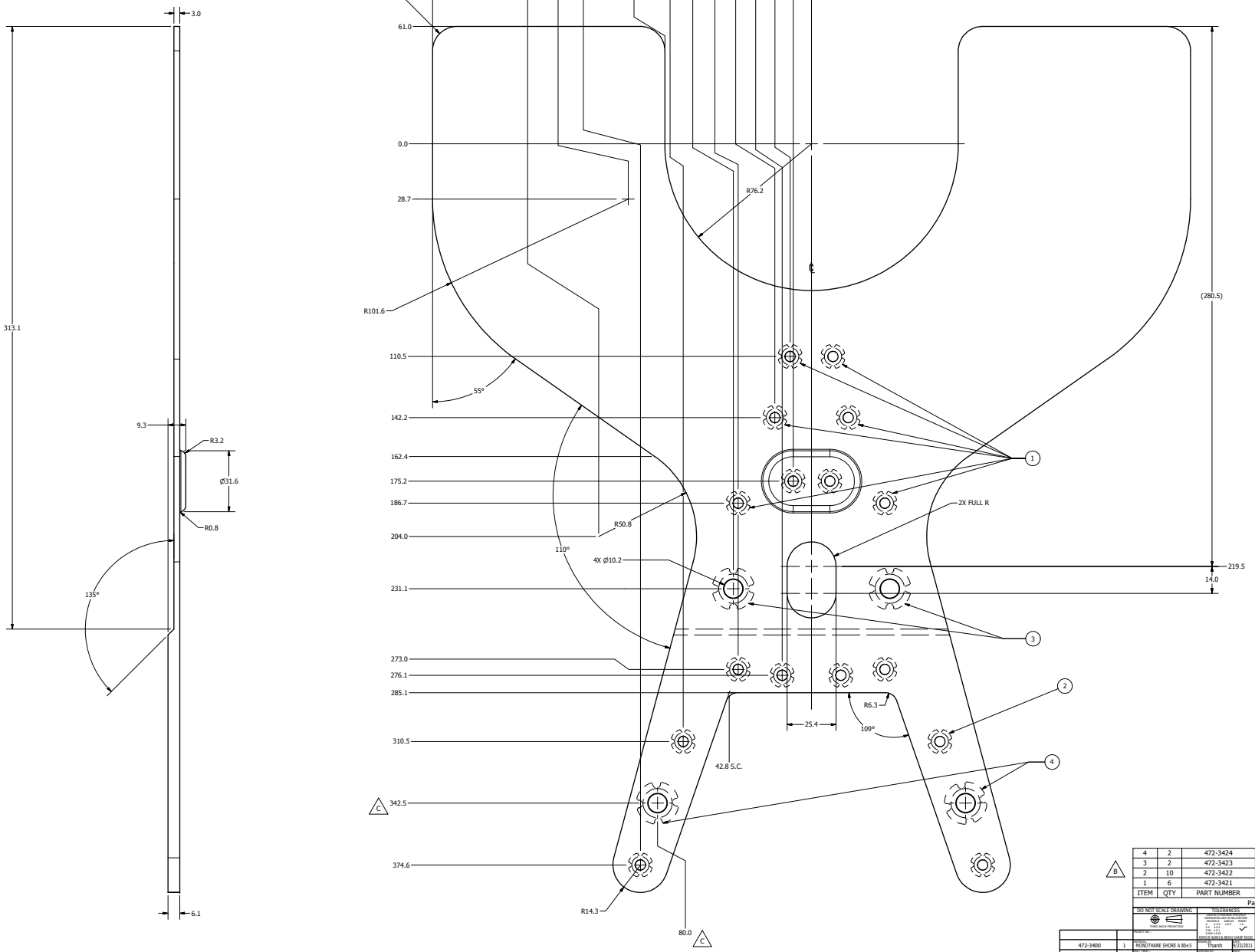
1. STRAP TO BE 220mm LONG, PRIOR TO STITCHING.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 **DO NOT SCALE DRAWING**	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION**
	APPROVALS / DATE	STERNUM MASS STRAP THOR-50M
MATERIAL: NYLON MESH	DRAWN: Dave Walker — 1/31/2017	
HEAT TREAT	CHECKED	
FINISH	ENG	
	APPROVED	
THIRD ANGLE PROJECTION	SIZE: A3 — DRAWING NUMBER: 472-3431 — REV: A SCALE: 2 : 1 — SHEET: 1 OF 1	

472-3431.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1TXM110 RB0 AND CONVERTED TO METRIC FOR THOR-M	9/23/2011	TKN
	B	REMOVED NOTE; REPLACED MESH WITH 472-3421, 472-3422, 472-3423 AND 472-3424; ADD MATERIAL	1/9/12	KHS
	C	342.5, 80.0 WERE 334.5, 79.4	7/20/2012	BK

PART IS SYMMETRICAL ACROSS CENTERLINE



ITEM	QTY	PART NUMBER	DESCRIPTION
4	2	472-3424	BIB INSERT - THICK, LARGE
3	2	472-3423	BIB INSERT - THIN, LARGE
2	10	472-3422	BIB INSERT - THICK, SMALL
1	6	472-3421	BIB INSERT - THIN, SMALL

Parts List

DO NOT SCALE DRAWING

TOLERANCES

472-3400	1	MONOTHANE SHORE A 80±5	
NEXT ASSEMBLY	QTY		
TOTAL QTY IN DUMMY	1		

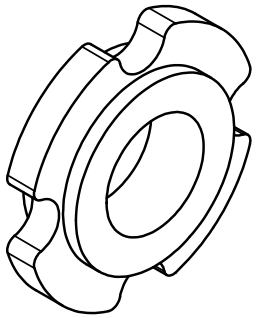
DRAWN	Thanh	9/23/2011
CHECKED		
ENGINEER	J. WANG	1/18/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

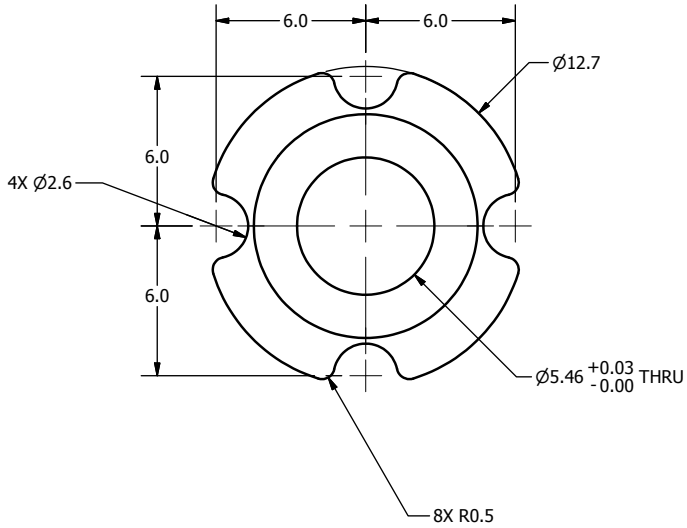
THORAX OUTER BIB

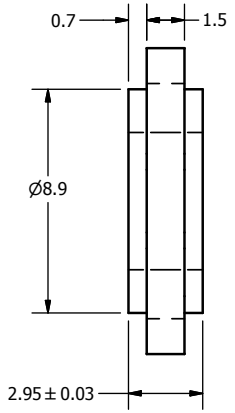
SIZE A1 | SHEET 1 OF 1 | SCALE FULL | 472-3420 | C

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RELEASE TO PRODUCTION	1/6/2012	KHS



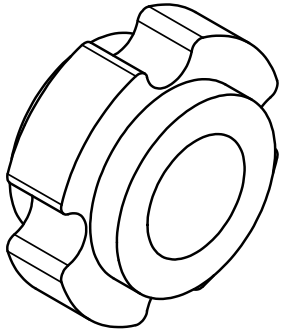
SCALE 5.000



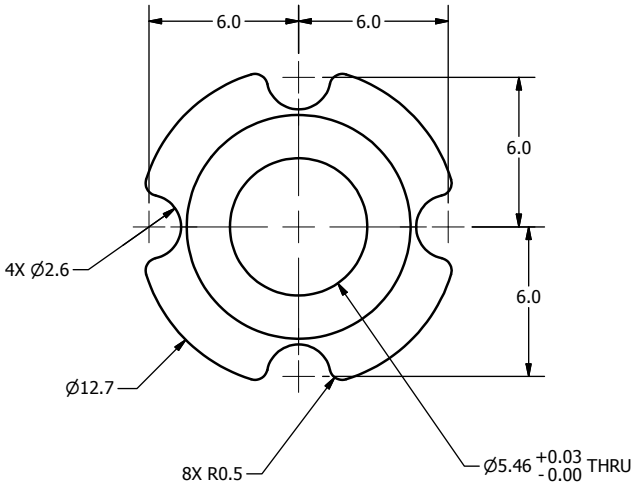


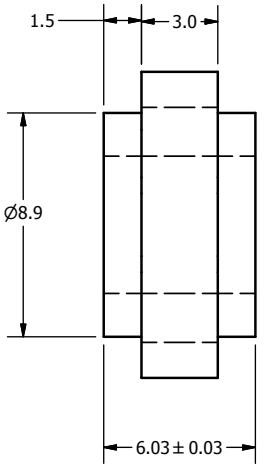
DO NOT SCALE DRAWING		THIRD ANGLE PROJECTION	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: BIB INSERT - THIN, SMALL	
472-3420	6	MATERIAL: Aluminum-7075	DRAWN BY: KHS	DATE: 1/6/2012	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV	DATE: 1/9/2012	SIZE: A3 SHEET 1 OF 1 — DRAWING NO.: 472-3421 — REV: A
TOTAL QTY IN DUMMY	6	FINISH:	ENGINEER: J. WANG	DATE: 1/18/2012	SCALE: 5:1

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RELEASE TO PRODUCTION	1/18/2012	KHS



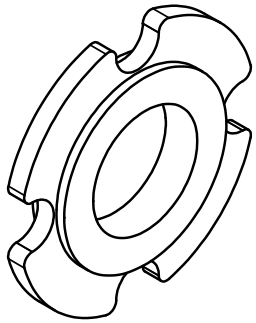
SCALE 5.000



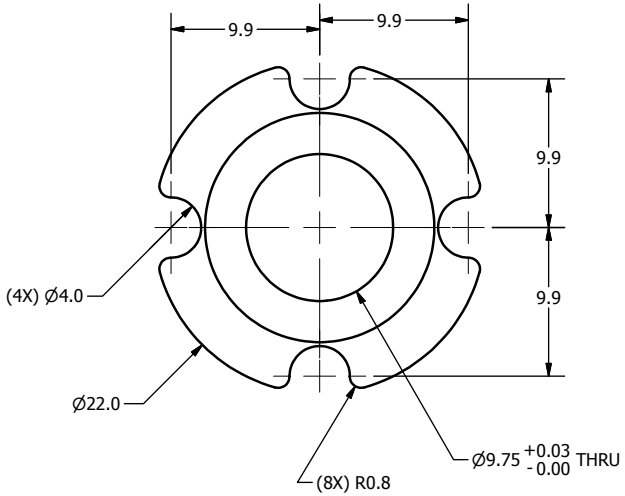


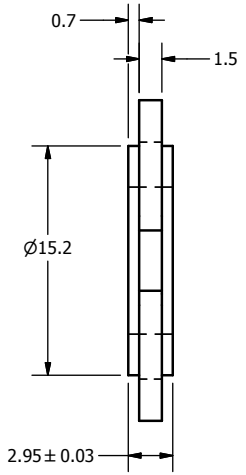
		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: BIB INSERT - THICK, SMALL	
		PROJECT NO.:	DRAWN BY: KHS DATE: 1/9/2012		
472-3420	10	MATERIAL: Aluminum-7075	CHECKED BY: TMV DATE: 1/9/2012	SIZE: A3 SHEET 1 OF 1	DRAWING NO.: 472-3422 REV: A
NEXT ASSEMBLY	QTY	HEAT TREAT:	ENGINEER: J. WANG DATE: 1/18/2012	SCALE: 5:1	
TOTAL QTY IN DUMMY	10	FINISH:			

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RELEASE TO PRODUCTION	1/9/2012	KHS



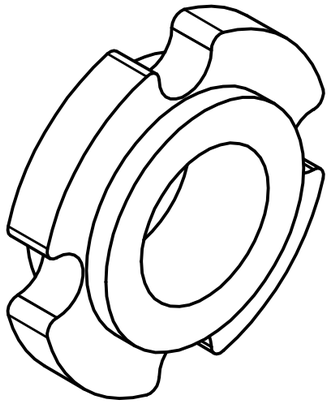
SCALE 3.000



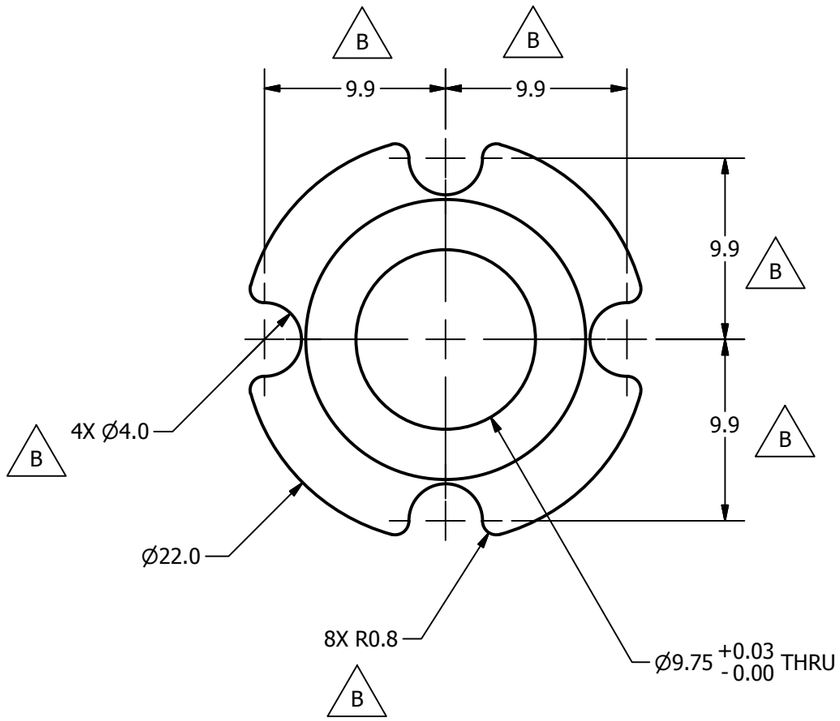


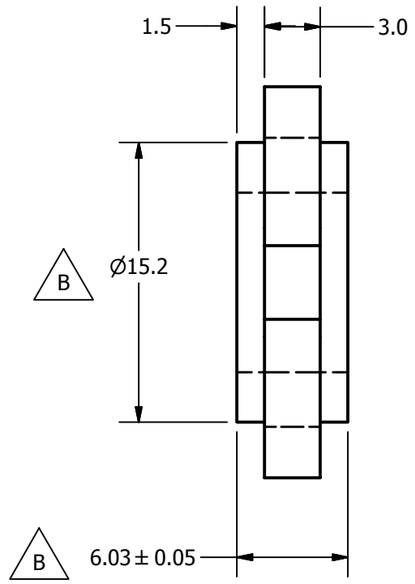
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: BIB INSERT - THIN, LARGE		
PROJECT NO.:		DRAWN BY: KHS	DATE: 1/9/2012	SIZE: A3	SHEET 1 OF 1
472-3420	2	MATERIAL: Aluminum-7075	CHECKED BY: TMV	DATE: 1/9/2012	DRAWING NO.: 472-3423
NEXT ASSEMBLY	QTY	HEAT TREAT:	ENGINEER: J. WANG	DATE: 1/18/2012	REV: A
TOTAL QTY IN DUMMY	2	FINISH:		SCALE: 3:1	

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RELEASE TO PRODUCTION	1/18/2012	KHS
70324	B	9.9 WAS 9.3,Ø4.0 WAS 5.0, R0.8 WAS R1.0, Ø15.2 WAS 13.5 THICKNESS WAS 6.02 +/- .03 MATERIAL WAS ALUMINUM 6061	11/27/2012	TMV



SCALE 3.000

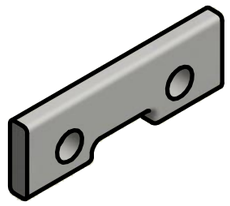


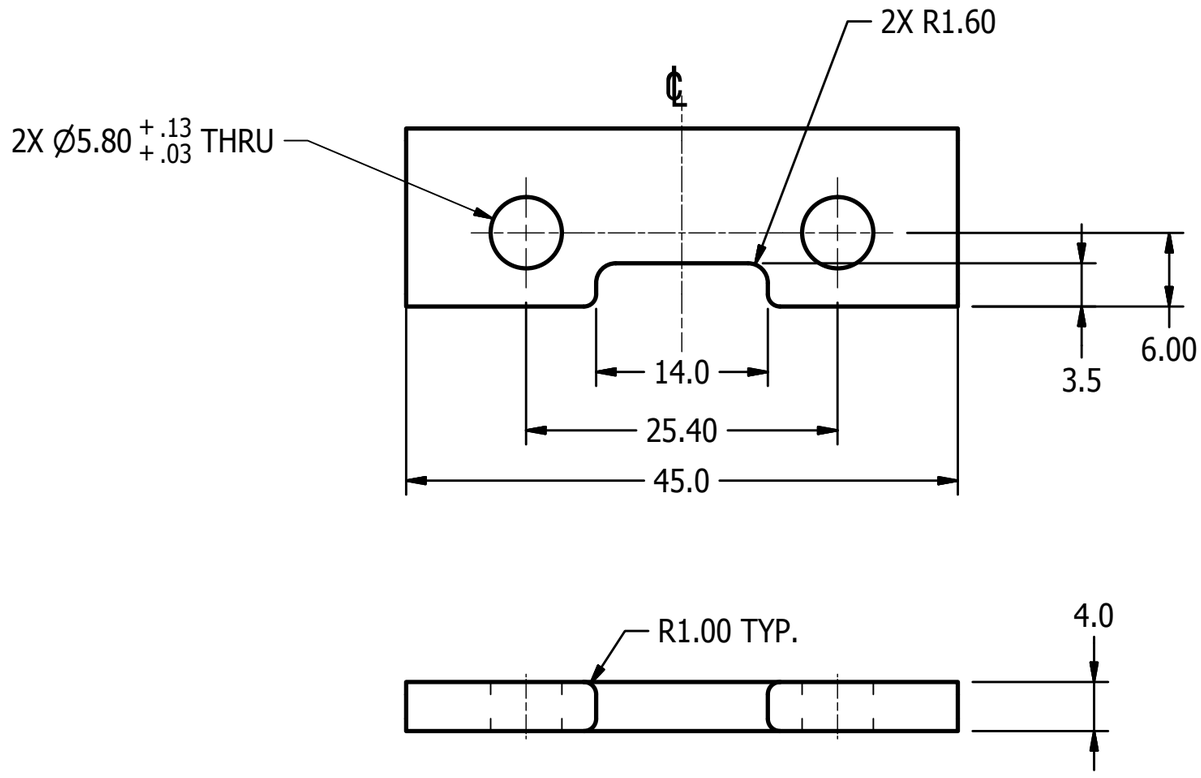


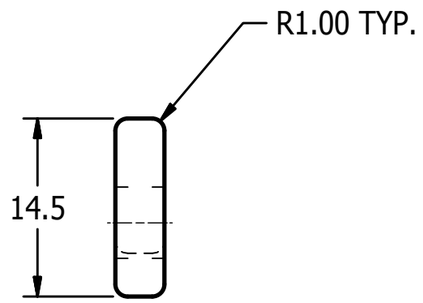
B

		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ± 0.5 ± 0.5° 1.6 X.X ± 0.2 X.XX ± 0.1 X.XXX ± 0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: BIB INSERT - THICK, LARGE	
472-3420	2	MATERIAL: Aluminum-7075	DRAWN BY: KHS DATE: 1/9/2012		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV DATE: 1/9/2012	SIZE: A3 SHEET: 1 OF 1	DRAWING NO.: 472-3424 REV: B
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG DATE: 1/18/2012	SCALE: 3:1	

472-3424.ipt







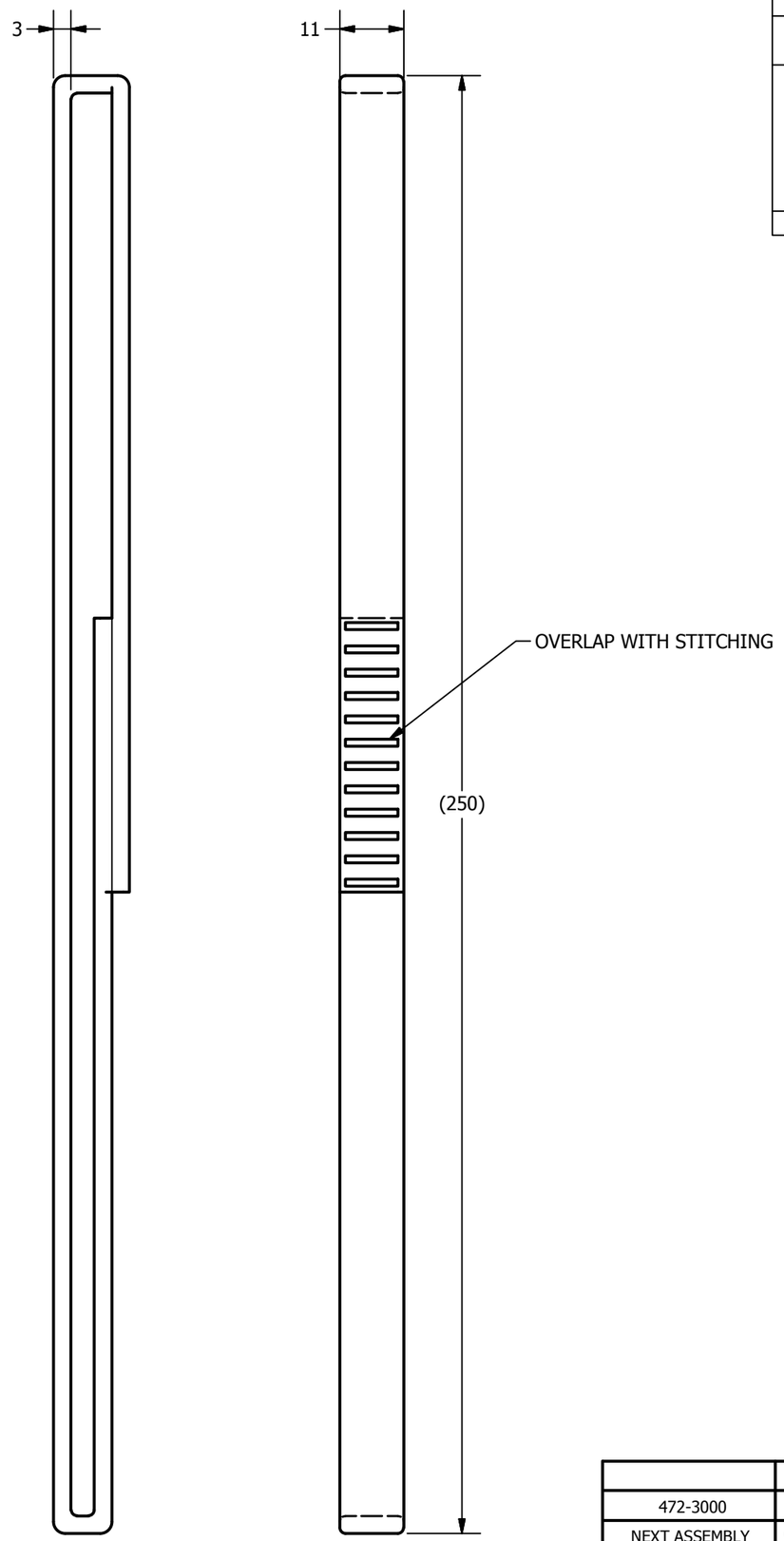
NOTES:

1. DIMENSIONS ARE SYMETRICAL ABOUT ℄ UNLESS OTHERWISE NOTED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED 1.6 / ANGLES ±.5° ASME Y14.5M - 1994 **DO NOT SCALE DRAWING**	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER		**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION**
	APPROVALS	DATE	BRACKET, LIFTING STRAP
	DRAWN Dave Walker	1/30/2017	
MATERIAL 1018 STEEL	CHECKED		
HEAT TREAT .008 ELECTROLESS NICKEL PLATE PER SIDE	ENG		
FINISH	APPROVED		
THIRD ANGLE PROJECTION	SIZE **A3**	DRAWING NUMBER 472-3115	REV
	SCALE: 2 : 1	SHEET 1 OF 1	

472-3115.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER T1TXM017 RN/C AND CONVERTED TO METRIC FOR THOR-M	9/23/2011	TKN
	B	REMOVED PARTS LIST; DIM. 150 MIN WAS 152, 76 MIN WAS 76, AND 38 MIN WAS 38; REMOVED STITCHING DIMENSIONS; ADDED DIMENSION 20 MAX; IN NOTE 1, 336mm WAS 343MM; IN NOTE 2, AS NECCESSARY WAS AS DIMENSIONED; ADDED NOTE 3	8/27/2015	DW
	C	COMPLETELY NEW STRAP DESIGN	1/31/2016	DW



NOTES:

1. 11mm X 250mm OPEN SLING, 15KN MINIMUM LOAD RATED.
2. COLOR BLUE/WHITE.

		PROJECT NO.:			
472-3000	1	MATERIAL: SEE NOTES	DRAWN BY: Thanh	DATE: 9/23/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/18/2012	

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5°	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

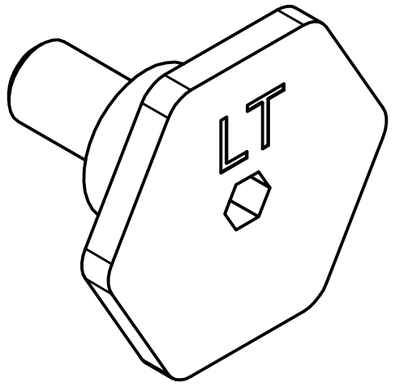
DESCRIPTION: DUMMY LIFTING STRAP

SIZE: A3 | SHEET: 1 OF 1 | DRAWING NO.: 472-3517 | REV: C

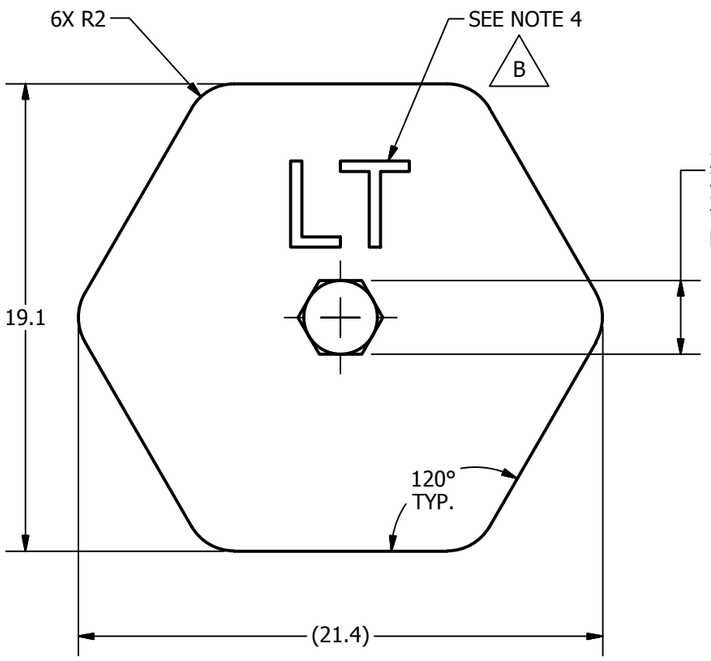
SCALE:

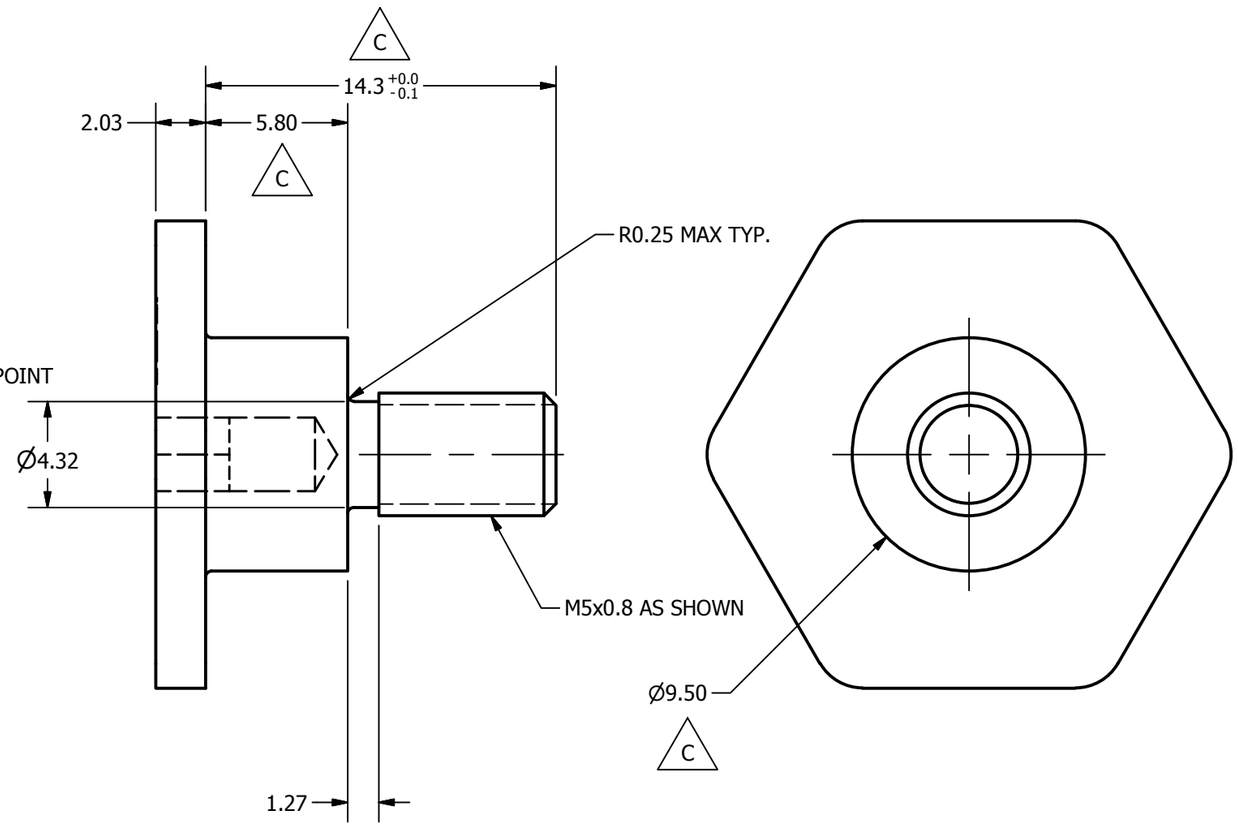
472-3517.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RELEASE TO PRODUCTION	7/25/2012	BK
	B	CHANGE DESC, "LOWER THOROAX" WAS "ABDOMEN"; STAMP "LT" ON PART AND ADDED NOTE 4; ADD VIEW	7/112013	BK
	C	ADDED HEX SOCKET HOLE AND SHOULDER; DIM. 14.3 +0.0/-0.1 WAS (17.0)	3/1/2017	DW



ISO VIEW
SCALE 3.0





NOTES:

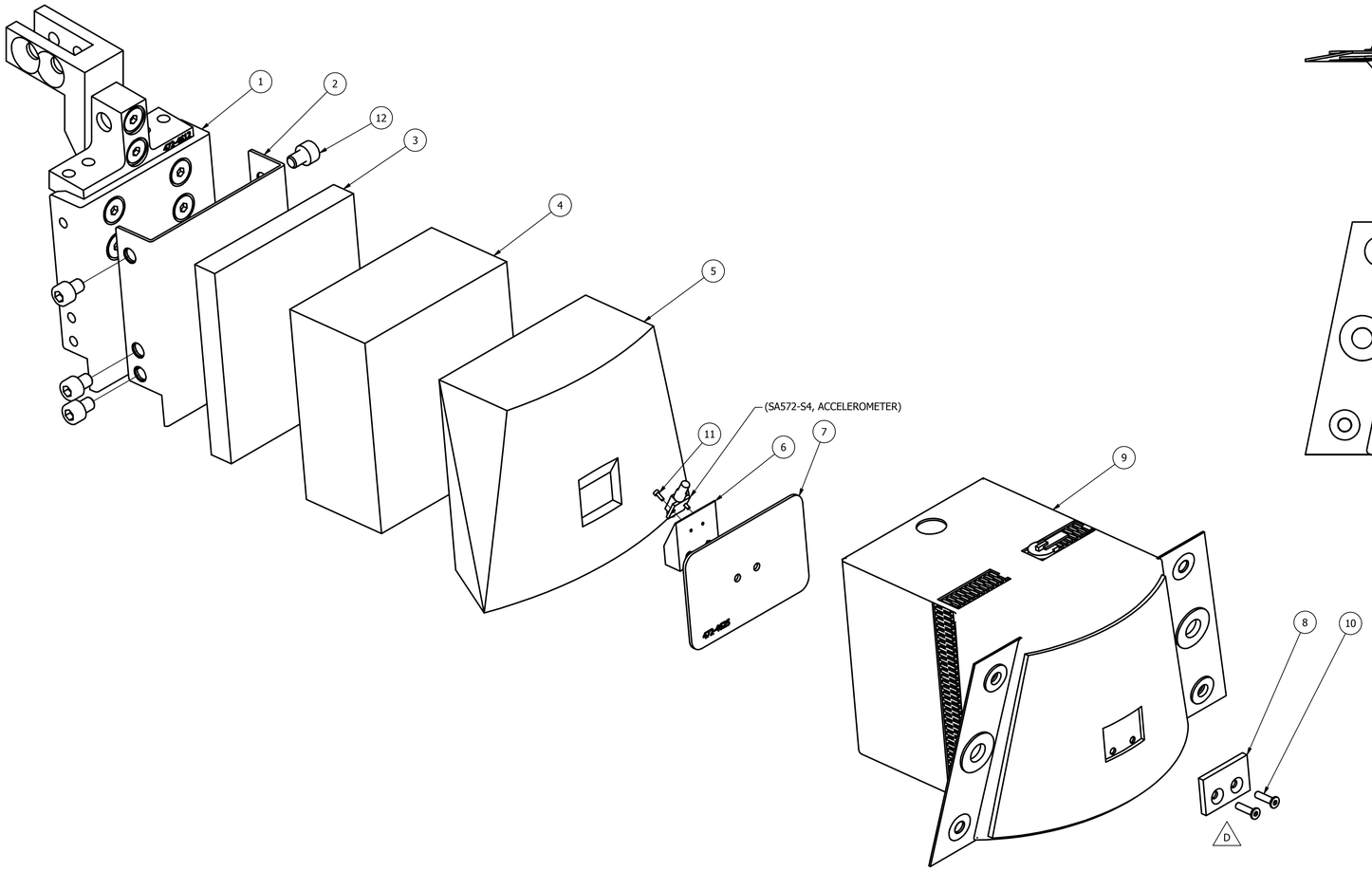
1. POWDER OR BEAD BLAST.
2. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.
3. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.
4. STAMP OR ETCH "LT" (3mm MIN. CHARACTERS) WHERE SHOWN.

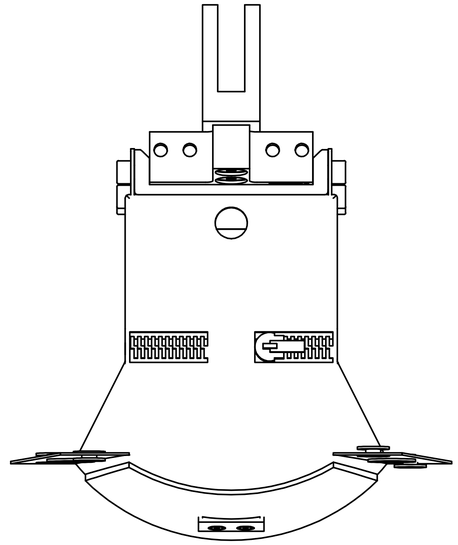
B

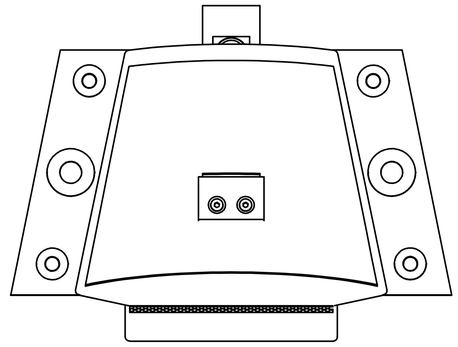
		DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
		PROJECT NO.:		DESCRIPTION: IRTRACC CONNECTING BOLT, LOWER THORAX
472-3000	2	MATERIAL: 1018 STEEL HEX	DRAWN BY: Thanh — DATE: 7/25/2012	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: — DATE:	SIZE: A3 — SHEET: 1 OF 1 — DRAWING NO.: 472-3520 — REV: C
TOTAL QTY IN DUMMY	2	FINISH: SEE NOTES	ENGINEER: J. WANG — DATE: 1/18/2012	SCALE: 4.000

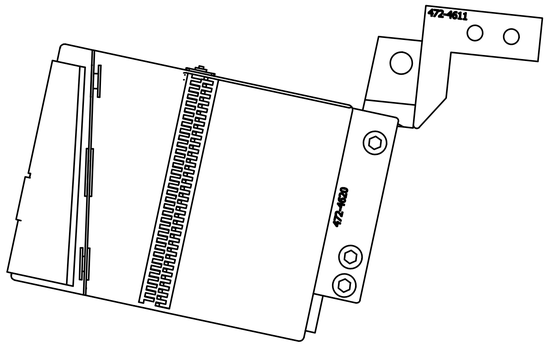
472-3520.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1UAM000 R05 AND CONVERTED TO METRIC FOR THOR-M	9/8/2011	BK
	B	UPDATE TO SHOW CHANGES TO 472-4622, 472-4623	2/4/2012	BK
	C	UPDATE TO SHOW PROPER VELCRO LOCATION	4/3/2012	BK
	D	MOVED ACCELEROMETER MOUNT PLATE 472-4626 OUTSIDE OF UPPER ABDOMEN BAG GROMMET ASSEMBLY 472-4627	4/10/2018	DW









SCALE .750

ITEM	QTY	PART NUMBER	DESCRIPTION
12	6	5000085	M6 X 1 X 8 LG. SHCS
11	2	5000375	M1.4 X 0.3 X 4 LG. SHCS
10	2	9010449	SCREW, FHCS M3 x 12
9	1	472-4627	GROMMET ASSEMBLY, UPPER ABDOMEN BAG
8	1	472-4626	ACCELEROMETER MOUNT PLATE
7	1	472-4625	LOAD DISTRIBUTION PLATE
6	1	472-4624	ACCELEROMETER MOUNT, UPPER ABDOMEN
5	1	472-4623	INTERNAL FOAM FRONT LAYER
4	1	472-4622	INTERNAL FOAM MIDDLE LAYER
3	1	472-4621	INTERNAL FOAM REAR LAYER
2	1	472-4620	UPPER ABDOMEN INTERN. MOUNT PLATE FRONT
1	1	472-4610	SPINAL MOUNT BRACKET ASSEMBLY

PARTS LIST

472-3000	1	MATERIAL:	
NEXT ASSEMBLY	QTY	HEAT TREAT:	
TOTAL QTY IN DUMMY	1	FINISH:	

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS; DECIMALS .X ±0.5, .XX ±0.25, .XXX ±0.1; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES

SCALE: THOR-50M	DRAWN BY: B. KIMES	DATE: 9/8/2011
	CHECKED BY:	DATE:
	ENGINEER: J. WANG	DATE: 1/18/2012

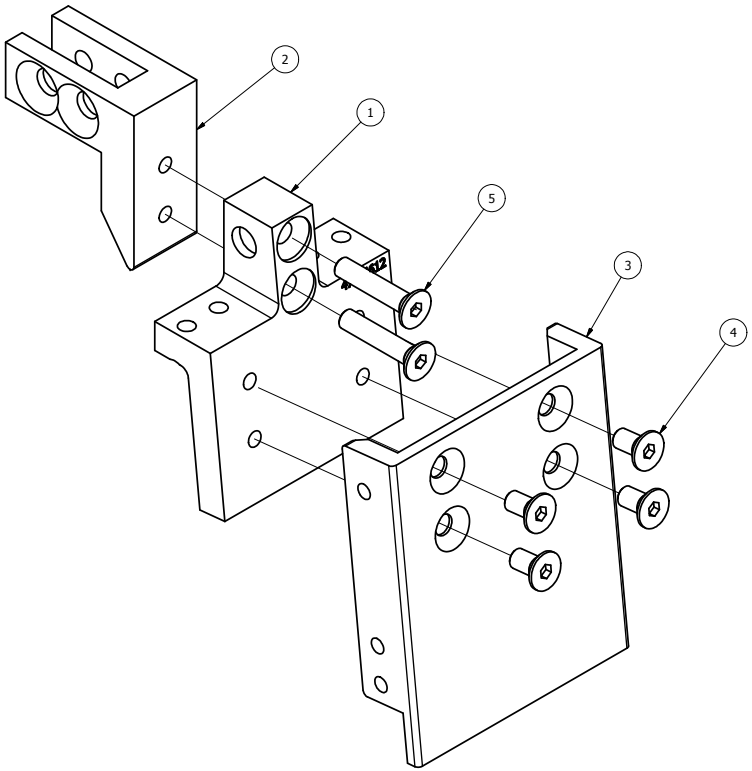
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: UPPER ABDOMEN ASSEMBLY

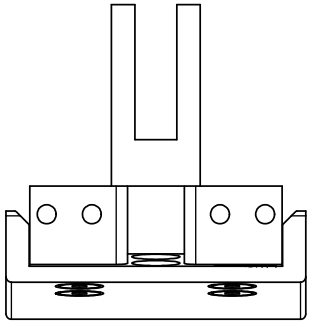
SIZE: A1 | SHEET: 1 of 1 | SCALE: .750 | DRAWING NO.: 472-4600 | REV: D

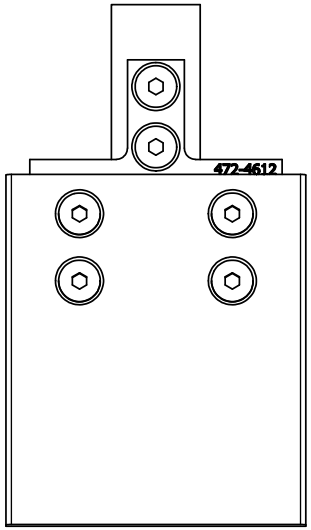
472-4600.iam

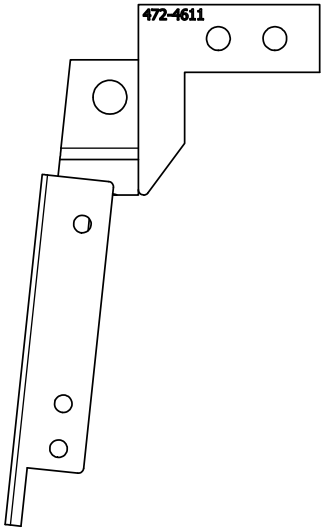
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1UAM100 R05 (AND CONVERTED TO METRIC) FOR THOR-M	9/7/2011	BK



SCALE 1.000







NOTES:

1. ASSEMBLE USING PERMANENT LIQUID THREAD LOCKER.

ITEM	QTY	PART NUMBER	DESCRIPTION
5	2	5000265	M6 X 1 X 30 LG. FHCS
4	4	5000139	M6 X 1 X 12 LG. FHCS
3	1	472-4613	UPPER ABDOMEN SPINAL MOUNT BRACKET
2	1	472-4611	THORACIC INSTR. BRACKET, UPPER ABDOMEN
1	1	472-4612	THORACIC INSTR. BRACKET BASE PLATE

PARTS LIST

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6

REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

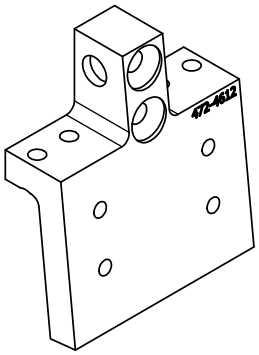
DESCRIPTION: SPINAL MOUNT BRACKET ASSEMBLY

		PROJECT NO.:	
472-4600	1	MATERIAL:	
NEXT ASSEMBLY	QTY	HEAT TREAT:	
TOTAL QTY IN DUMMY	1	WEIGHT:	

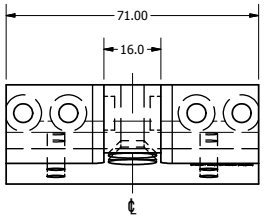
DRAWN BY: B. KIMES — DATE: 9/7/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/18/2012

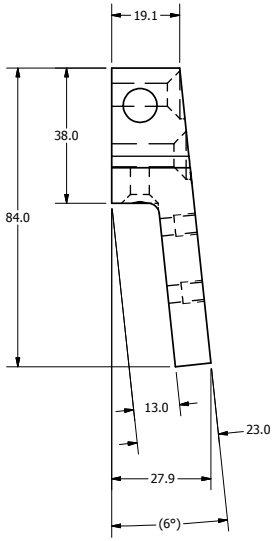
SIZE: A2 — SHEET: 1 OF 1 — SCALE: — DRAWING NO.: 472-4610 — REV: A

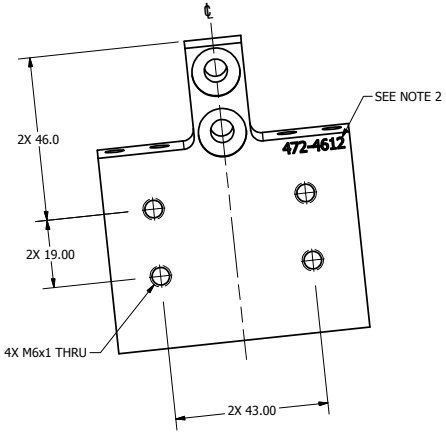
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1UAM111 R03 AND CONVERTED TO METRIC FOR THOR-M; ADD 2X SPOTFACE, R3.2 TYP., (OPTIONAL) TO NOTE 2, NOTES 1,3,5; FINISH WAS FLOUROCARBON	9/6/2011	BK

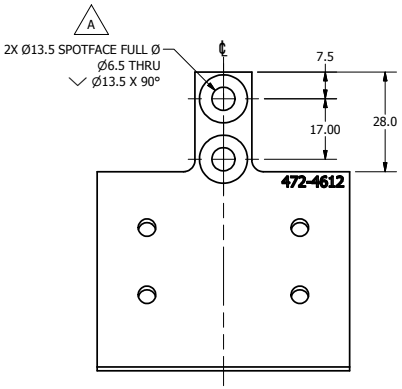


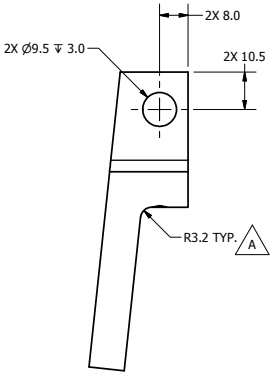
SCALE 1.000

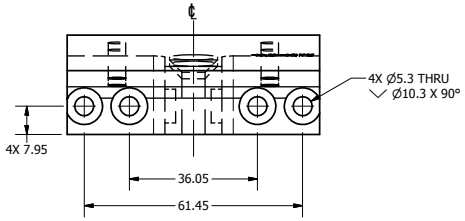












NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. STAMP OR ETCH PART NUMBER (3mm CHARACTERS) WHERE SHOWN. (OPTIONAL)
3. POWDER OR BEAD BLAST.
4. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.
5. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

472-4610	1	MATERIAL: 1018 STEEL	
NEXT ASSEMBLY	QTY	ITEM / TREAT:	
TOTAL QTY IN DUMMY	1	WEIGHT: SEE NOTES	

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6

REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:

DRAWN BY: B. KIMES — DATE: 9/6/2011

CHECKED BY: — DATE:

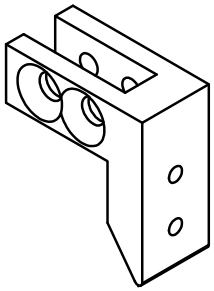
ENGINEER: J. WANG — DATE: 1/18/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

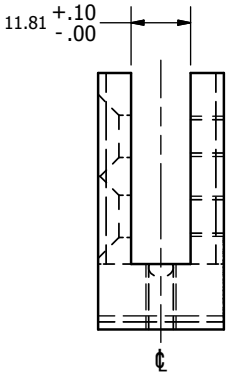
DESCRIPTION: THORACIC INSTR. BRACKET BASE PLATE

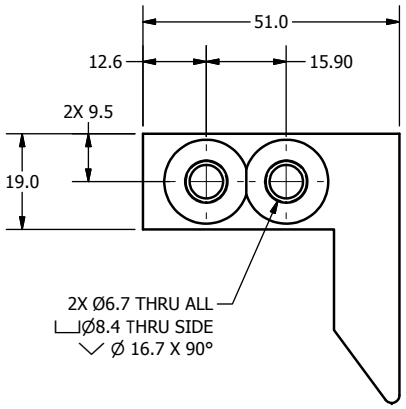
SIZE: A2 — SHEET 1 OF 1 — SCALE: 1.000 — DRAWING NO.: 472-4612 — REV: A

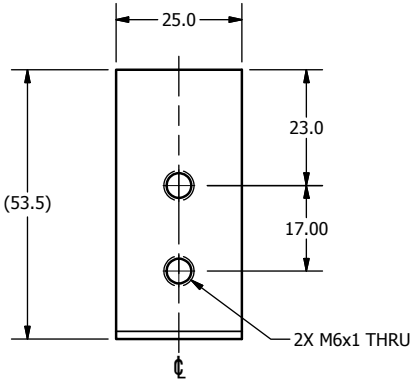
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1UAM110 R06 AND CONVERTED TO METRIC FOR THOR-M; ADD (OPTIONAL) TO NOTE 2, NOTES 1,3,5; FINISH WAS FLOUROCARBON COATING	9/6/2011	BK

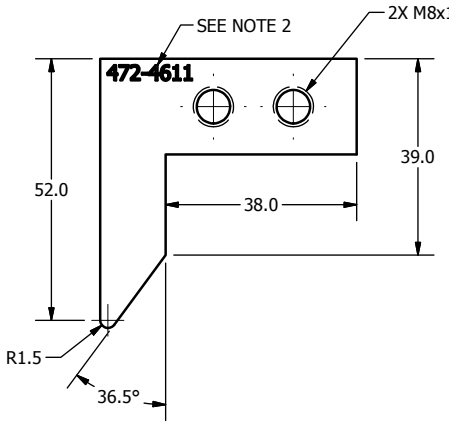


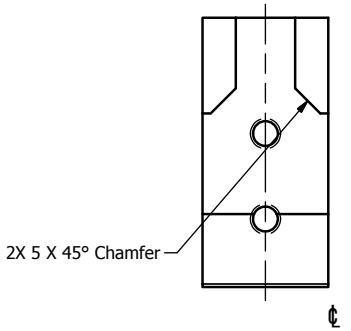
SCALE .750









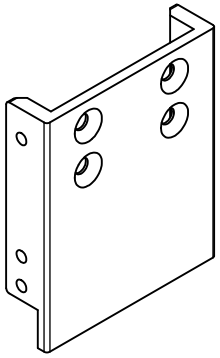


NOTES:

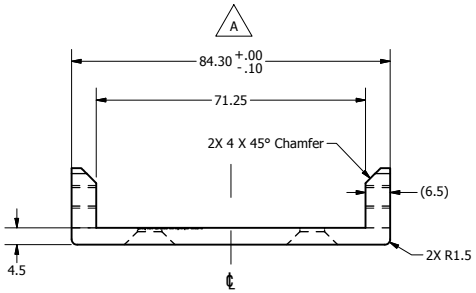
1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. (A) STAMP OR ETCH PART NUMBER (3mm CHARACTERS) WHERE SHOWN. (OPTIONAL)
3. POWDER OR BEAD BLAST.
4. (A) NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.
5. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

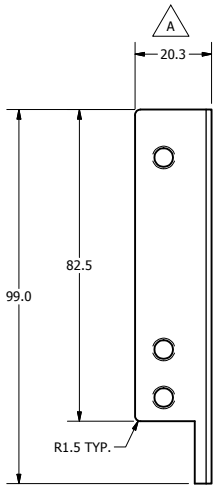
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION PROJECT NO.:	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
472-4610	1	MATERIAL: 1018 STEEL	DRAWN BY: B. KIMES DATE: 9/6/2011	DESCRIPTION: THORACIC INSTR. BRACKET, UPPER ABDOMEN	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET: 1 OF 1	DRAWING NO.: 472-4611 REV: A
TOTAL QTY IN DUMMY	1	FINISH: SEE NOTES	ENGINEER: J. WANG DATE: 1/18/2012	SCALE: 1.000	

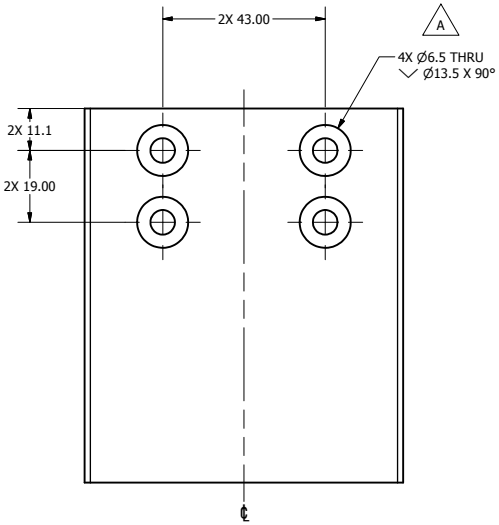
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1UAM113 R08 AND CONVERTED TO METRIC FOR THOR-M; 20.3 WAS 20.5±.2; 4X Ø6.5 C'SINK Ø13.5 WAS Ø6.6 C'SINK Ø12.6; 3X 12.70 WAS 3X 12.700±.100; 50.80 WAS 50.800±.100; 84.30 +.00/-.10 WAS 84.3	9/6/2011	BK

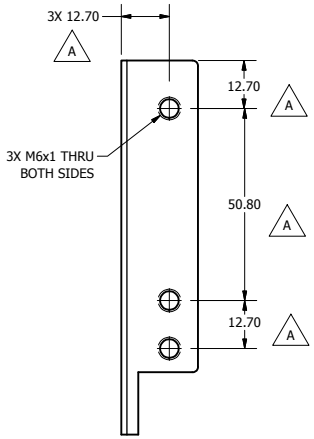


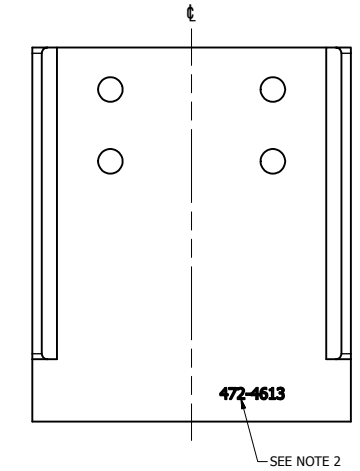
SCALE .750











NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. STAMP OR ETCH PART NUMBER (3mm CHARACTERS) WHERE SHOWN. (OPTIONAL)
3. POWDER OR BEAD BLAST.
4. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.
5. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

472-4610	1	MATERIAL: 1018 STEEL	
NEXT ASSEMBLY	QTY	HEAT TREAT:	
TOTAL QTY IN DUMMY	1	FINISH: SEE NOTES	

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.05. ANGLES ±0.5°. FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:

DRAWN BY: B. KIMES — DATE: 9/6/2011

CHECKED BY: — DATE:

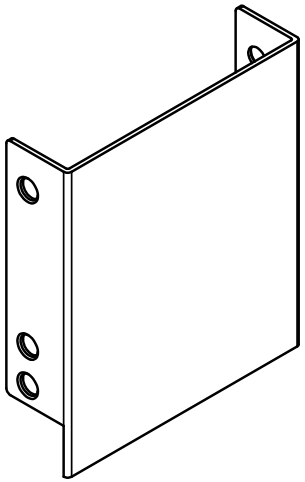
ENGINEER: J. WANG — DATE: 1/18/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

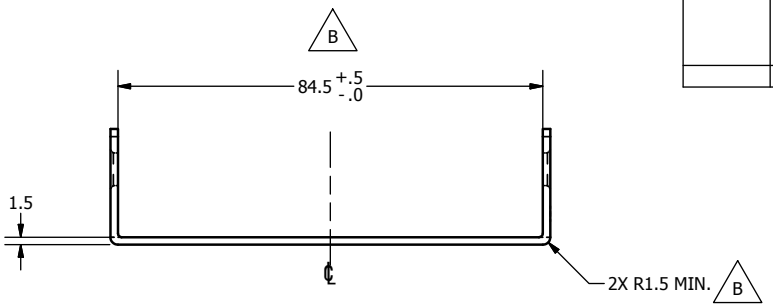
DESCRIPTION: UPPER ABDOMEN SPINAL MOUNT BRACKET

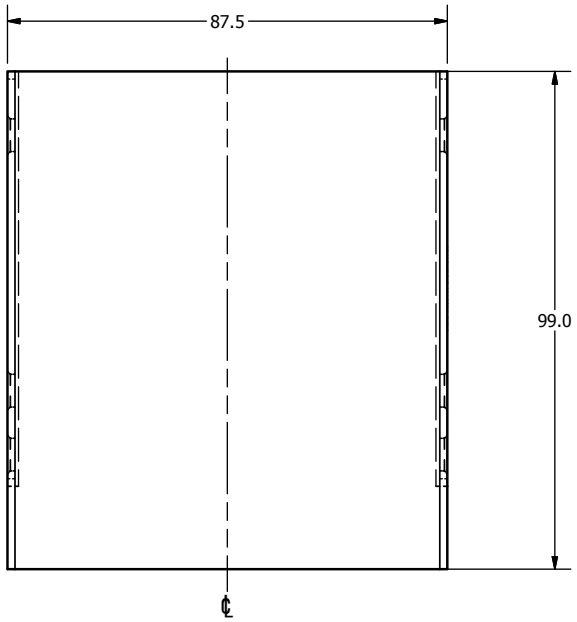
SIZE: C — SHEET: 1 OF 1 — SCALE: 1.000 — DRAWING NO.: 472-4613 — REV: A

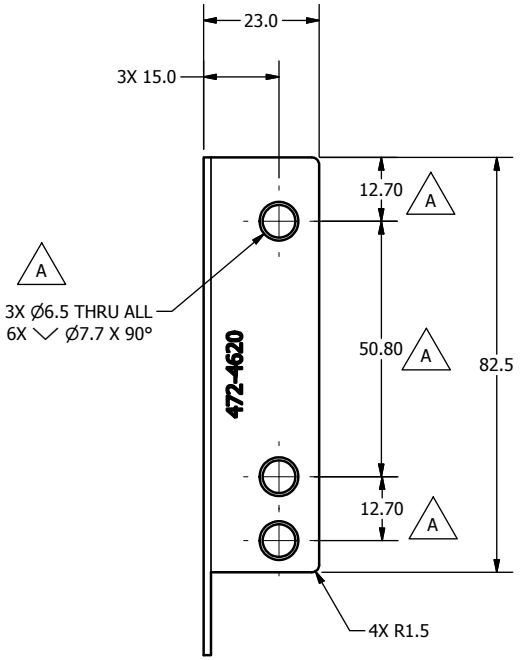
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1UAM113 R08 AND CONVERTED TO METRIC FOR THOR-M; ADD 12.70, 50.80, (OPTIONAL) TO NOTE 2; NOTES 1,3,5; FINISH WAS FLOUROCARBON COATING; 3X Ø6.5 C'SINK Ø7.7 X 90˚ WAS 3X Ø6.756±.100 C'SINK Ø7.7 X 82˚	9/6/2011	BK
	B	84.5+.5/-0 WAS +.1/-0; ADD "MIN." TO R1.5	6/14/2012	BK



SCALE .750





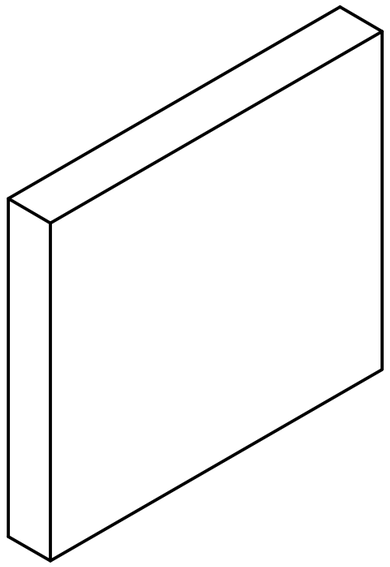


NOTES:

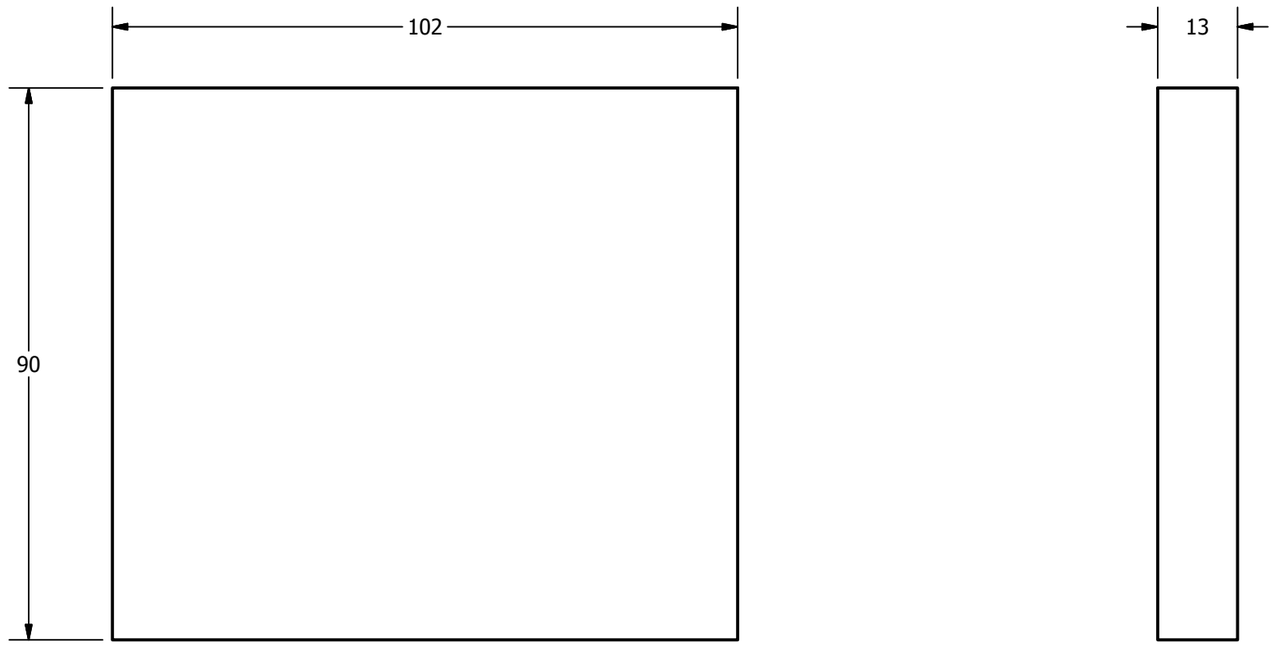
1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. STAMP OR ETCH PART NUMBER (3mm CHARACTERS) WHERE SHOWN. (OPTIONAL)
3. POWDER OR BEAD BLAST.
4. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.
5. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION		TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5˚; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: UPPER ABDOMEN INTERN. MOUNT PLATE FRONT	
472-4600	1	MATERIAL: 1018 STEEL	DRAWN BY: B. KIMES	DATE: 9/6/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1 DRAWING NO.: 472-4620 REV: B
TOTAL QTY IN DUMMY	1	FINISH: SEE NOTES	ENGINEER: J. WANG	DATE: 1/18/2012	SCALE: 1.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1UAM010 R03 FOR THOR-M	9/7/2011	BK
	B	IN NOTE #2 "QUALIFICATION" WAS "CERTIFICATION".	8/7/2017	DW



SCALE .750



NOTES:

1. MATERIAL: BUNA-N (SHORE 60A ±5)
   SAE J2000 SPECIFICATION: 2BG617B14K11 Z1Z2Z3
   2-GRADE 2
   BG-SWELL 405 @ CONSTANT TEMP 100°C
   6-DUROMETER 60
   17-17 MPA
   B14-COMPRESSION SET 22H @ 110°C < 50%
   K11-ADHESION > 1.4 MPA
   Z1-BUNA-N
   Z2-DUROMETER 55-65A
   Z3-PERFORMANCE SPECIFICATIONS TAKE PRECEDENCE OVER DUROMETER

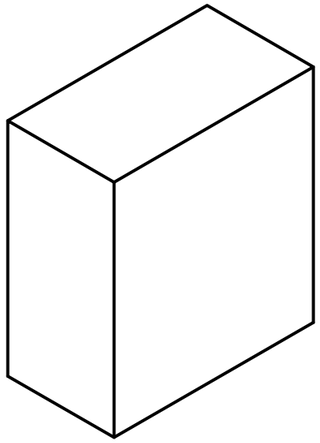
B 2. NOMINAL STIFFNESS @ 25% COMPRESSION: 900±50 KPA (130±7 PSI)
   REFER TO THOR QUALIFICATION MANUAL FOR DYNAMIC PERFORMANCE SPECIFICATIONS.

3. FOAM TOLERANCE ±1mm, UNLESS OTHERWISE NOTED.

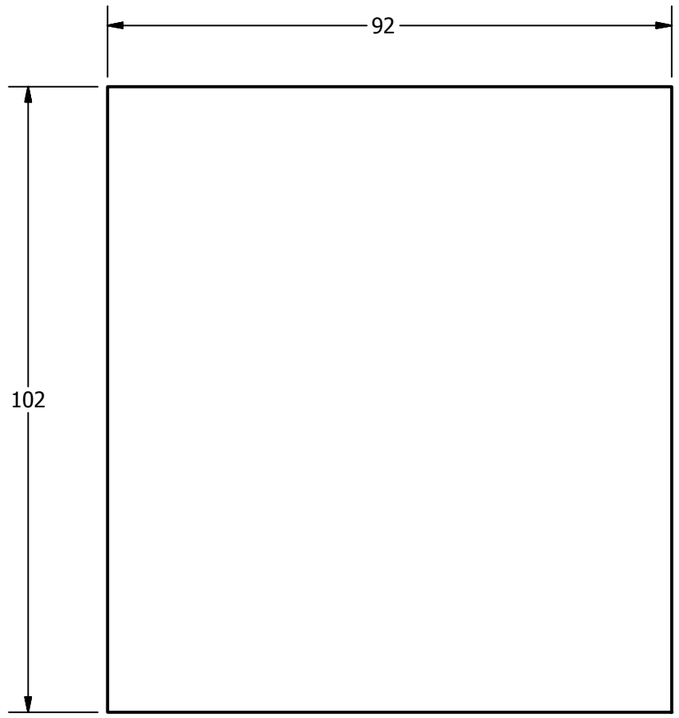
		PROJECT NO.:	DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
472-4600	1	MATERIAL: SEE NOTES	DRAWN BY: B. KIMES	DATE: 9/7/2011	DESCRIPTION: INTERNAL FOAM REAR LAYER
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-4621 REV: B
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/18/2012	SCALE: 1.000

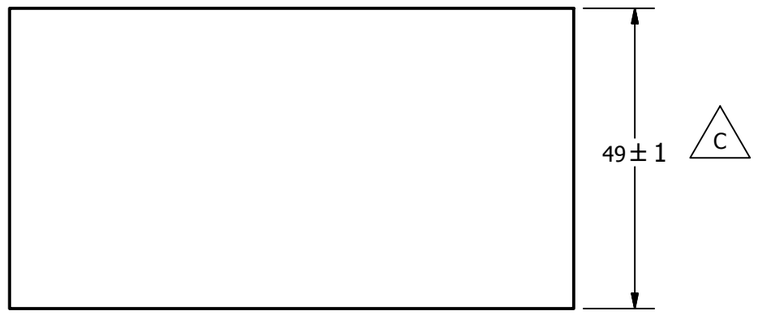
472-4621.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1UAM111 R03 FOR THOR-M	9/7/2011	BK
	B	REDESIGN TO ORIGINAL NHTSA DESIGN REV 2 (WITHOUT HOLES)	2/4/2012	BK
	C	UPDATED MATERIAL SPECIFICATION; IN NOTES "QUALIFICATION" WAS "CERTIFICATION"; DIMENSION 49 +/- WAS 51	2/9/2017	DW



SCALE .500





C NOTES:
THE FOAM MATERIAL IS BLENDED SPONGE RUBBBER
NEOPRENE / EPDM / SBR FOAM RUBBER
1-OPEN CELL FOAM
2-NON-OIL RESISTANT

S-COMPRESSION DEFLECTION 25% 60 ± 10 kPa

NOMINAL STIFFNESS @ 50% COMPRESSION: 148± 15 kPa
NOMINAL COMPRESSION @ 770 kPa 74.5%-82.5%

REFER TO THE THOR QUALIFICATION MANUAL FOR PERFORMANCE SPECIFICATION FOR THIS PART.

C

		PROJECT NO.:		
472-4600	1	MATERIAL: SEE NOTES	DRAWN BY: B. KIMES	DATE: 9/7/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/18/2012

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5' 1.6
X.X ± 0.2
X.XX ± 0.1
X.XXX ± 0.01
REMOVE BURRS & BREAK SHARP EDGES

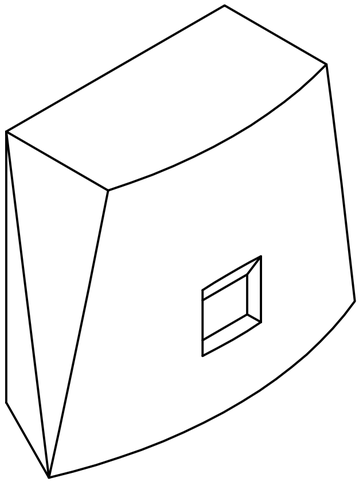
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: INTERNAL FOAM MIDDLE LAYER

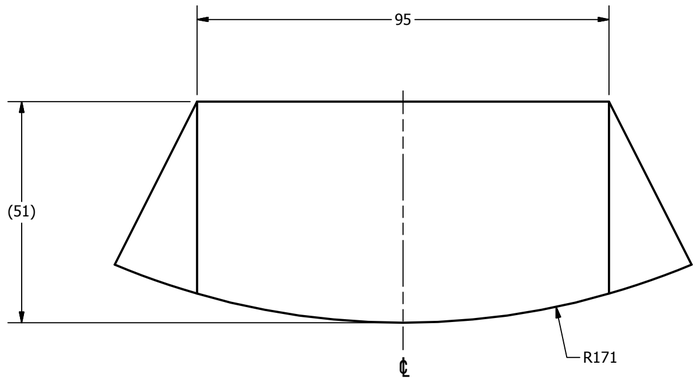
SIZE	SHEET	DRAWING NO.:	REV:
A3	1 OF 1	472-4622	C
SCALE: 1.000			

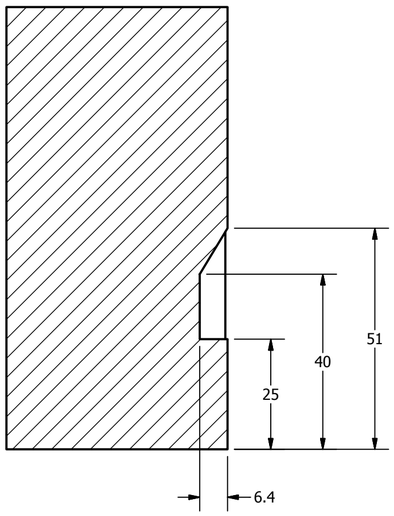
472-4622.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1UAM012 R04 FOR THOR-M; ADD NOTE 1 & 2	9/8/2011	BK
	B	REDESIGN TO ORIGINAL NHTSA DESIGN REV 3 (WITHOUT HOLES)	2/4/2012	BK
	C	IN NOTE 4 "QUALIFICATION" WAS "CERTIFICATION".	8/7/2017	DW

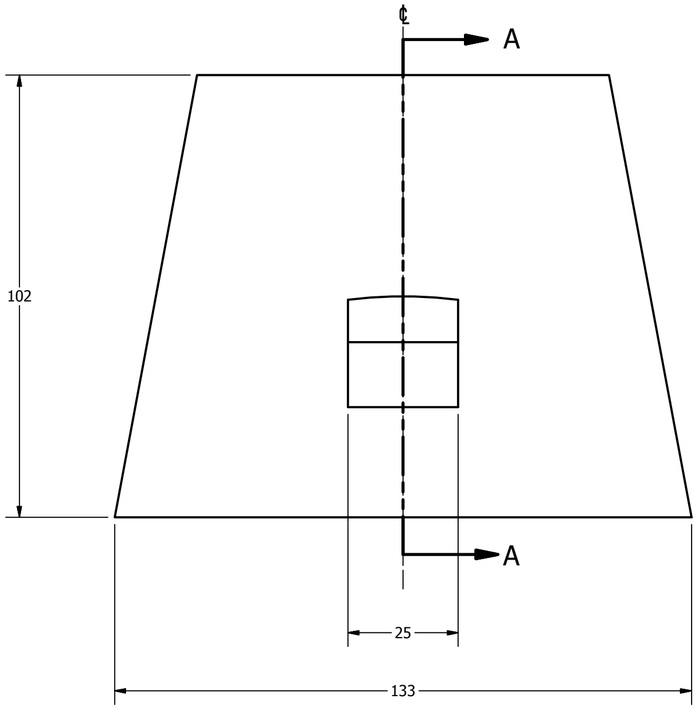


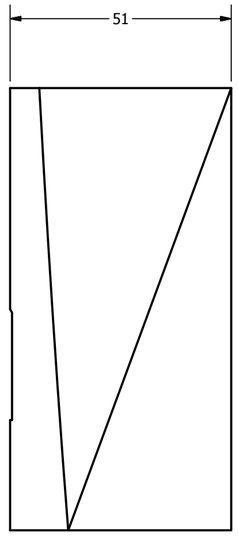
SCALE .750





SECTION A-A
SCALE 1.000





NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED
2. FOAM TOLERANCE ±1mm, UNLESS OTHERWISE NOTED.

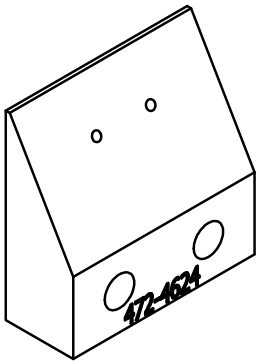
3. MATERIAL: CHARCOAL POLYESTER FOAM WITH NOMINAL DENSITY OF 6 LB/CU FT
   SAE J18 SPECIFICATION: 1A0
   1-OPEN CELL FOAM
   A-NON-OIL RESISTANT
   0-COMPRESSION DEFLECTION 25% 3.5-14 KPA (.5-2 PSI)

4. NOMINAL STIFFNESS @ 75% COMPRESSION:43±3 KPA (6.2±.5 PSI)
   @ 90% COMPRESSION: 430±30 KPA (62±5 PSI)
   REFER TO QUALIFICATION MANUAL FOR PERFORMANCE SPECIFICATIONS.

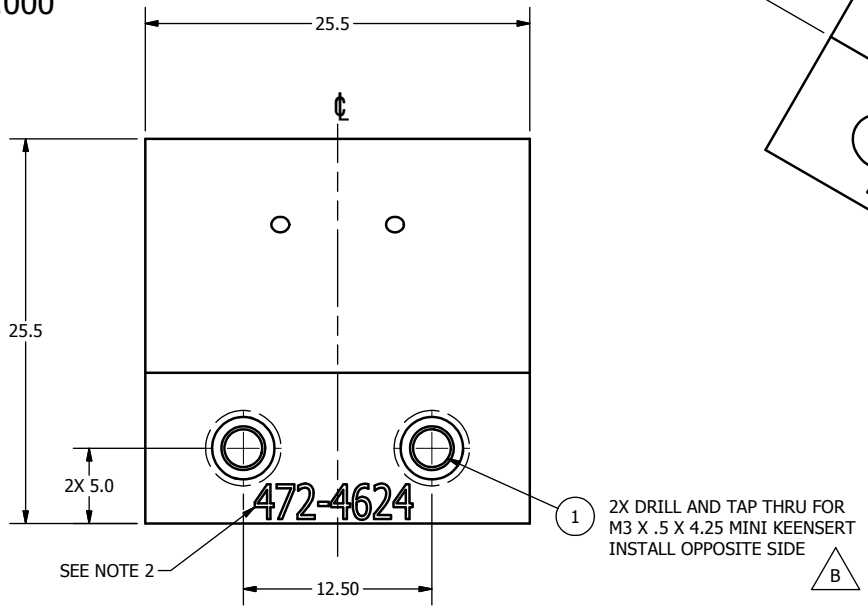
		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 XX ±0.2 XXX ±0.1 XXXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	
		PROJECT NO.:		DESCRIPTION: INTERNAL FOAM FRONT LAYER
472-4600	1	MATERIAL: SEE NOTES	DRAWN BY: B. KIMES DATE: 9/8/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A2 SHEET: 1 OF 1 DRAWING NO.: 472-4623 REV: C
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG DATE: 1/18/2012	SCALE: 1.000

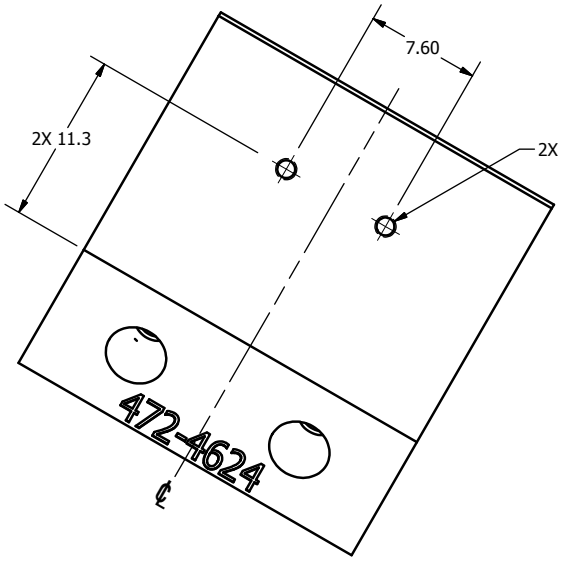
472-4623.ipt

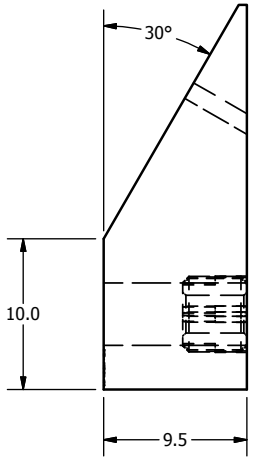
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1UAM015 R05 AND CONVERTED TO METRIC FOR THOR-M; ADD NOTE 1 AND (OPTIONAL) TO NOTE 2	9/7/2011	BK
	B	INSTALL KEENSERTS FROM OTHER SIDE; ADD NOTE	7/19/2012	BK



SCALE 2.000







NOTES:

B

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. STAMP OR ETCH PART NUMBER (3mm CHARACTERS) WHERE SHOWN. (OPTIONAL)

ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	5001107	M3 X 0.5 X 4.25 LG. MINI KEENSERT

PARTS LIST

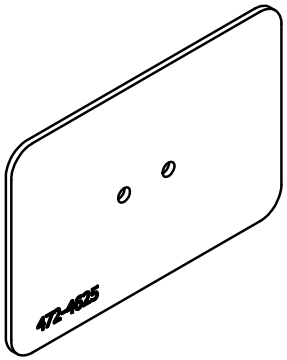
		PROJECT NO.:	DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES
472-4600	1	MATERIAL: 6061-T6 ALUMINUM	DRAWN BY: B. KIMES	DATE: 9/7/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:
TOTAL QTY IN DUMMY	1	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG	DATE: 1/18/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

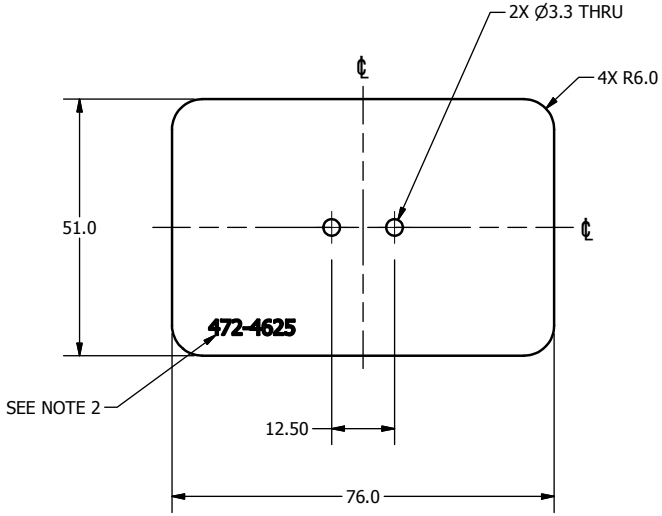
DESCRIPTION: ACCELEROMETER MOUNT, UPPER ABDOMEN

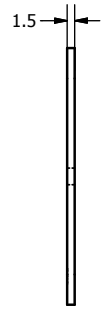
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 3.000 | DRAWING NO.: 472-4624 | REV: B

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1UAM013 R04 AND CONVERTED TO METRIC FOR THOR-M; ADD NOTE 1 AND (OPTIONAL) TO NOTE 2	9/7/2011	BK



SCALE 1.000





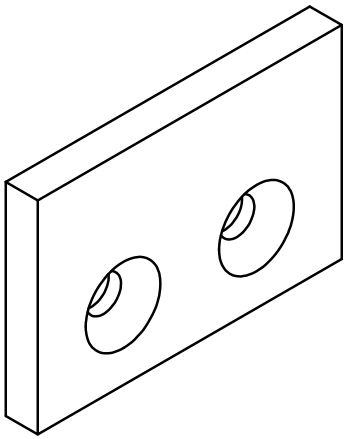
NOTES:

A

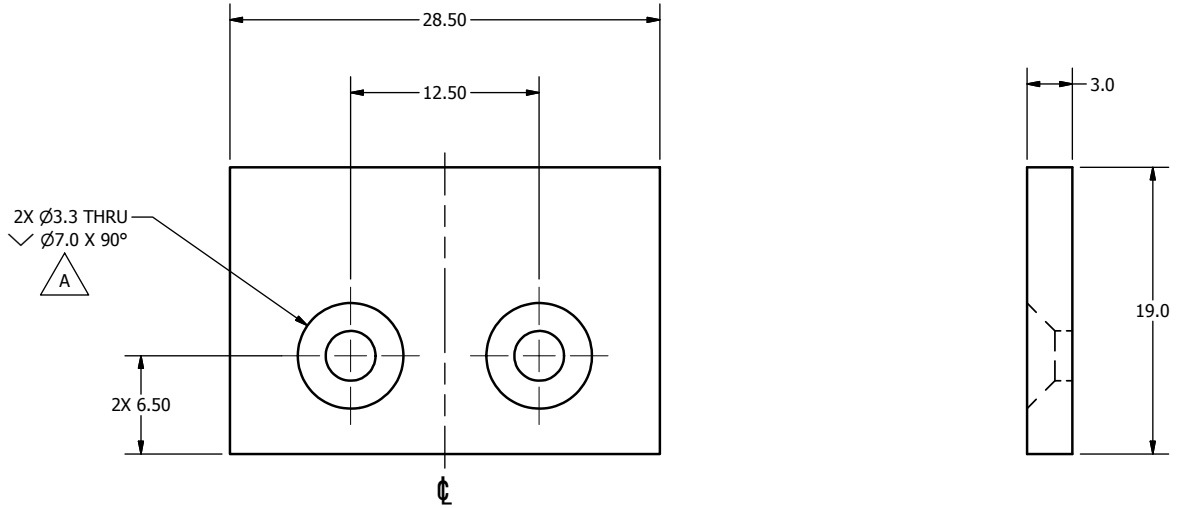
1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. STAMP OR ETCH PART NUMBER (3mm CHARACTERS) WHERE SHOWN. (OPTIONAL)

		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION PROJECT NO.:	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
472-4600	1	MATERIAL: High Density Polyethylene	DRAWN BY: B. KIMES DATE: 9/7/2011	DESCRIPTION: LOAD DISTRIBUTION PLATE	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET: 1 OF 1	DRAWING NO.: 472-4625 REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG DATE: 1/18/2012	SCALE: 1.000	

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1UAM014 R03 AND CONVERTED TO METRIC FOR THOR-M; ADD NOTE 1; Ø7.0 X 90˚ WAS Ø 6.9 X 82˚	9/7/2011	BK



SCALE 3.000

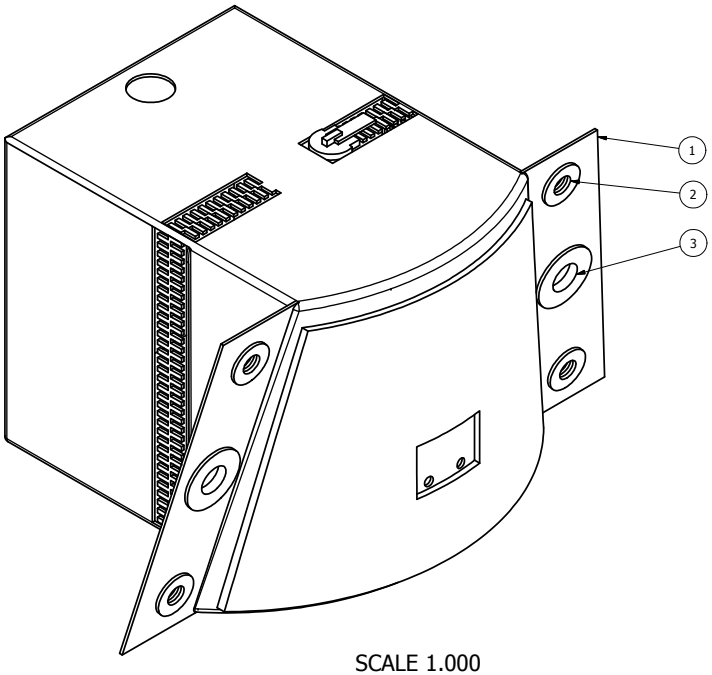


NOTES:

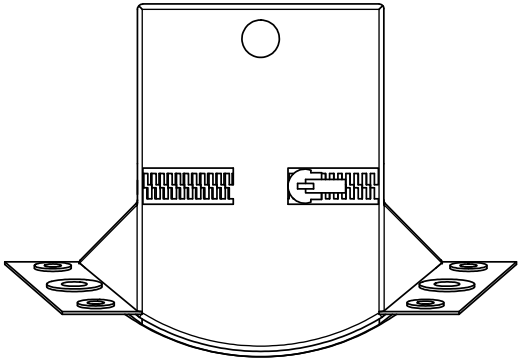
A 1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

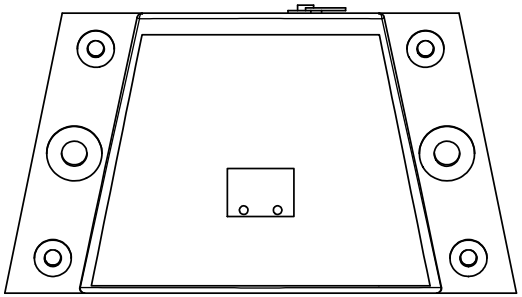
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5˚ FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: ACCELEROMETER MOUNT PLATE		
PROJECT NO.:		DRAWN BY: B. KIMES	DATE: 9/7/2011	SIZE: A3	SHEET 1 OF 1
MATERIAL: DELRIN BLACK	1	CHECKED BY:	DATE:	DRAWING NO.: 472-4626	REV: A
HEAT TREAT:	QTY	ENGINEER: J. WANG	DATE: 1/18/2012	SCALE: 3.000	
FINISH:					
472-4600					
NEXT ASSEMBLY					
TOTAL QTY IN DUMMY	1				

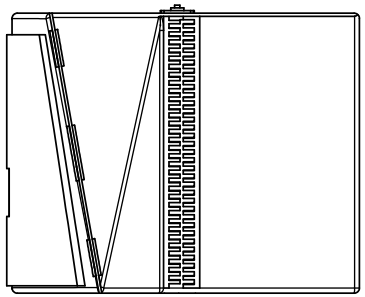
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1UAF301 R02 FOR THOR-M	9/12/2011	BK
	B	UPDATE TO SHOW PROBPER VELCRO LOCATION; ADD GROMMET TO DESC; REMOVE MATERIAL NOTES	4/2/2012	BK



SCALE 1.000







ITEM	QTY	PART NUMBER	DESCRIPTION
3	2	6002912	GROMMET, .375 I.D. X .815 O.D.
2	4	6002911	GROMMET, .250 I.D. X .545 O.D.
1	1	472-4650	BAG-SEWING ASSEMBLY, UPPER ABDOMEN

PARTS LIST

NOTES:

B

1. PUNCH GROMMET TO FLAPS OF COMPLETED ASSEMBLY USING GROMMET TOOL.

472-4600	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X.X ±0.2 ±0.5°
X.XX ±0.1
X.XXX ±0.01

REMOVE BURRS & BREAK SHARP EDGES

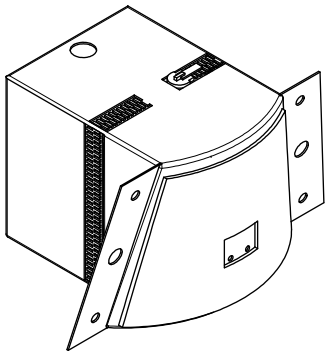
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PROJECT NO.:	
MATERIAL:	
HEAT TREAT:	
WEIGHT:	
DRAWN BY:	B. KIMES
DATE:	9/12/2011
CHECKED BY:	
DATE:	
ENGINEER:	J. WANG
DATE:	1/18/2012

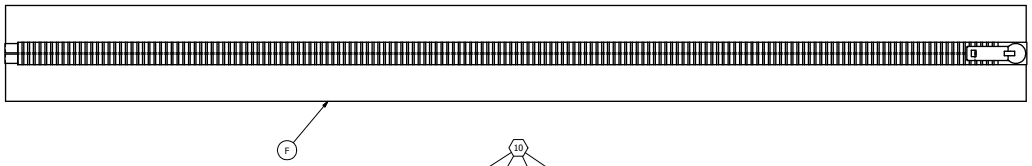
PROGRAM(S): GROMMET ASSEMBLY, UPPER ABDOMEN BAG

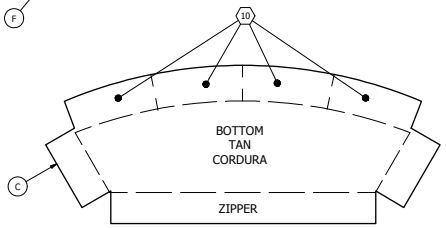
SIZE: A2 | SHEET: 1 OF 1 | SCALE: .750 | DRAWING NO.: 472-4627 | REV: B

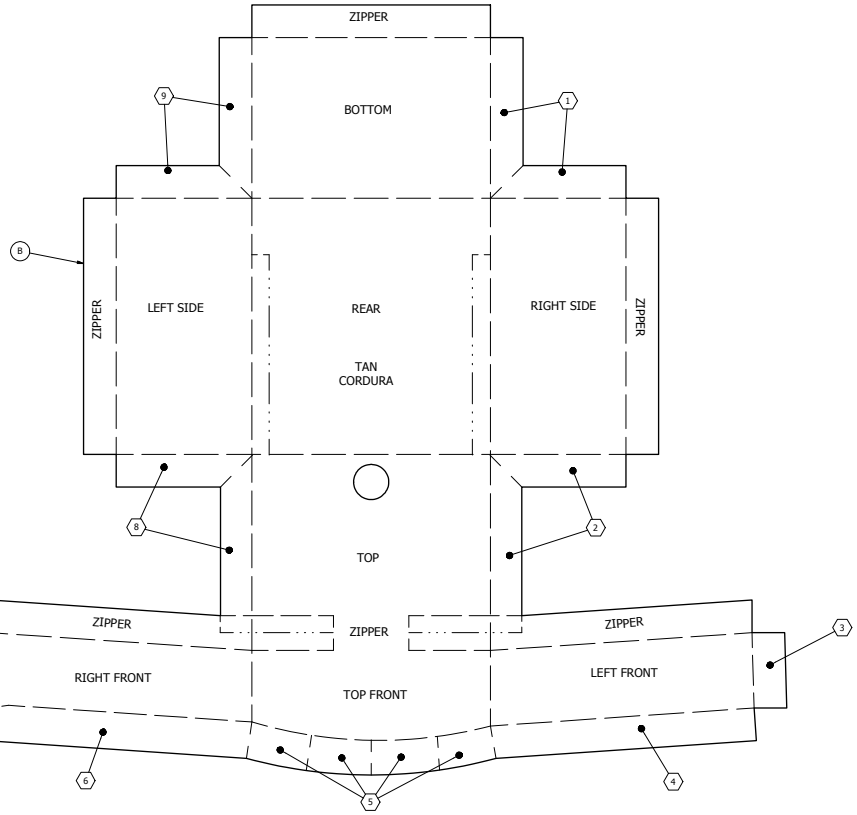
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1UAF300 R04 FOR THOR-M; ADD ISO VIEW	9/8/2011	BK
	B	SHOW VELCRO PATCH IN CORRECT POSITION; ADD HOLE DIMENSIONS, SEWING AND MATERIAL NOTES	4/3/2012	BK

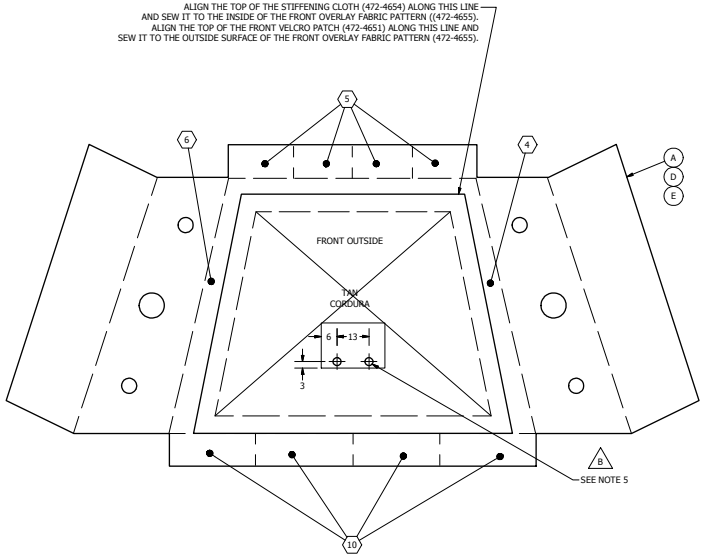


SCALE .750









LEGEND
- PATTERN EDGES
- STITCH LINES
- CUT LINES

NOTES:

1. THE NUMBERING SCHEME IS USED TO INDICATE WHICH PATTERN EDGES ARE SEWN TOGETHER TO CREATE THE UPPER ABDOMEN BAG.
2. STITCHES MUST BE CONSISTANT AND SECURE.
3. THE BAG IS STITCHED WITH KEVLAR THREAD (MINIMUM 3 STITCHES/CM).
4. FABRIC: CORDURA NYLON (TAN)
   ZIPPER: STIFFENED NYLON (WHITE)
   SIZE #10, LENGTH 406mm, BRASS, OPEN TOP, CLOSED BOTTOM
5. ADD 2X Ø3.2 HOLES AFTER SEWING.

ITEM	QTY	PART NUMBER	DESCRIPTION
F	1	472-4656	ZIPPER, UPPER ABDOMEN
E	1	472-4655	FRONT OVERLAY FABRIC PATTERN
D	1	472-4654	FRONT STIFFENING CLOTH
C	1	472-4653	BOTTOM FABRIC PATTERN
B	1	472-4652	TOP/SIDE REAR FABRIC PATTERN
A	1	472-4651	FRONT VELCRO PATCH

PARTS LIST

DO NOT SCALE DRAWING

TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH 125 ANGULAR: ± 0.5° X ± 0.1 XX ± 0.05 XXX ± 0.01

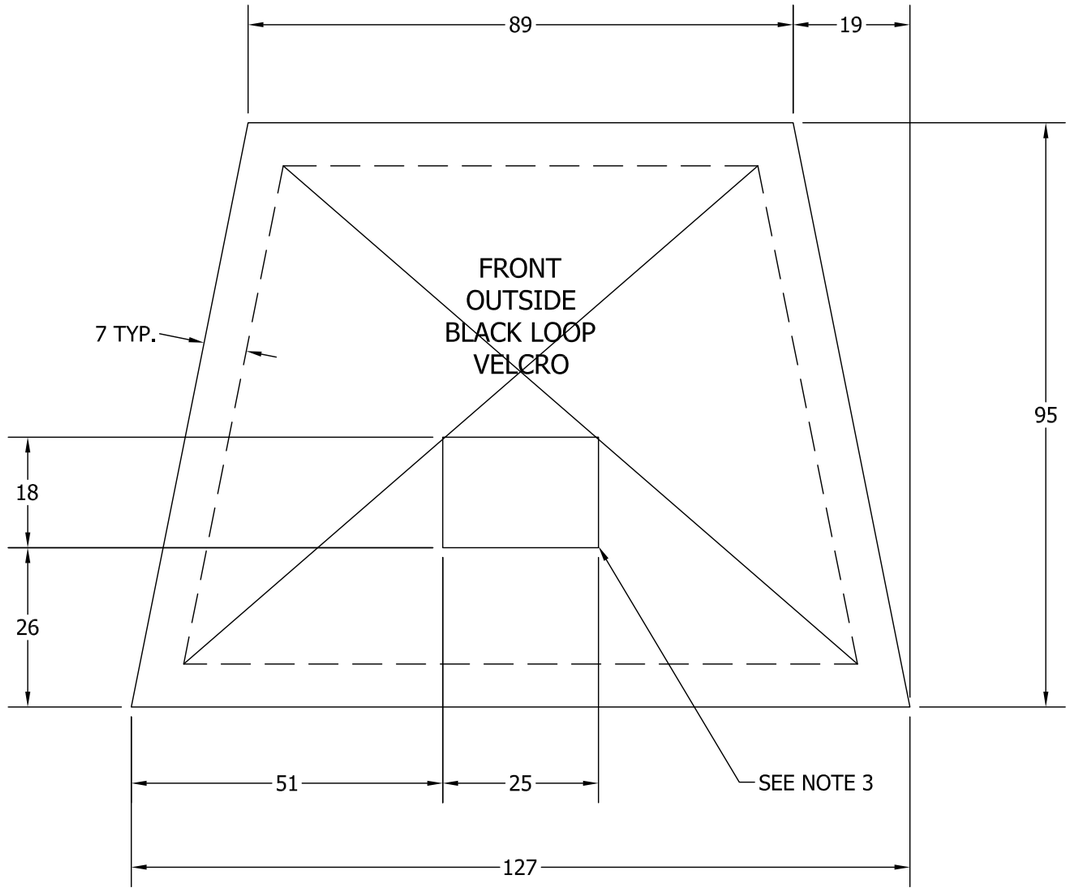
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

472-4627	1	B. KIMES	4/6/2011
NEXT ASSEMBLY	QTY	J. WANG	4/18/2012
TOTAL QTY IN DUMMY	1		

BAG-SEWING ASSEMBLY, UPPER ABDOMEN

A1 SIZE | 1 OF 1 | SCALE 1.000 | 472-4650 | B

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
78027	A	RENUMBERED FROM T1UAF310 R02 FOR THOR-M; ADD NOTE 2	9/9/2011	BK



LEGEND

PATTERN EDGES

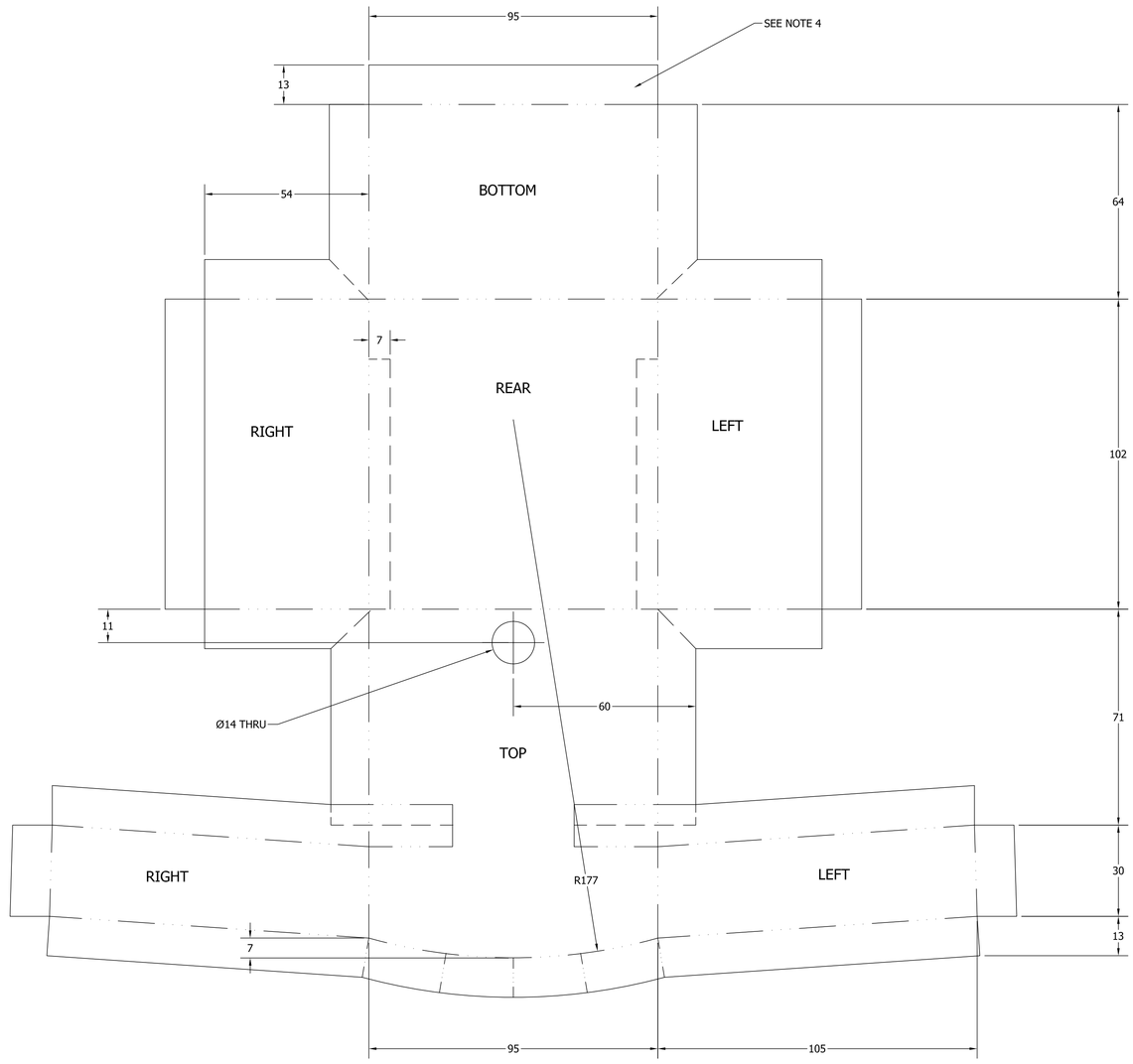
STITCH LINES

NOTES:

1. USE BLACK LOOP VELCRO MATERIAL AND SEW TO THE FRONT OF THE UPPER ABDOMEN FRONT OVERLAY FABRIC PATTERN (472-4655).
2. TOLERANCE ±1mm, UNLESS OTHERWISE NOTED.
3. PRINT SCALE AND USE AS PATTERN FOR CUTTING OUT MATERIAL.
4. CUT OUT ACCELEROMETER MOUNTING HOLE AFTER SEWING.

		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ± 0,5 ± 0,5 1,6 X,X ± 0,2 X,XX ± 0,1 X,XXX ± 0,01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
		PROJECT NO.:		DESCRIPTION: FRONT VELCRO PATCH
472-4650	1	MATERIAL: SEE NOTES	DRAWN BY: B. KIMES DATE: 9/9/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-4651 REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG DATE: 1/18/2012	SCALE: 1.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1UAF311 R04 FOR THOR-M; ADD NOTE 2	9/9/2011	BK



LEGEND

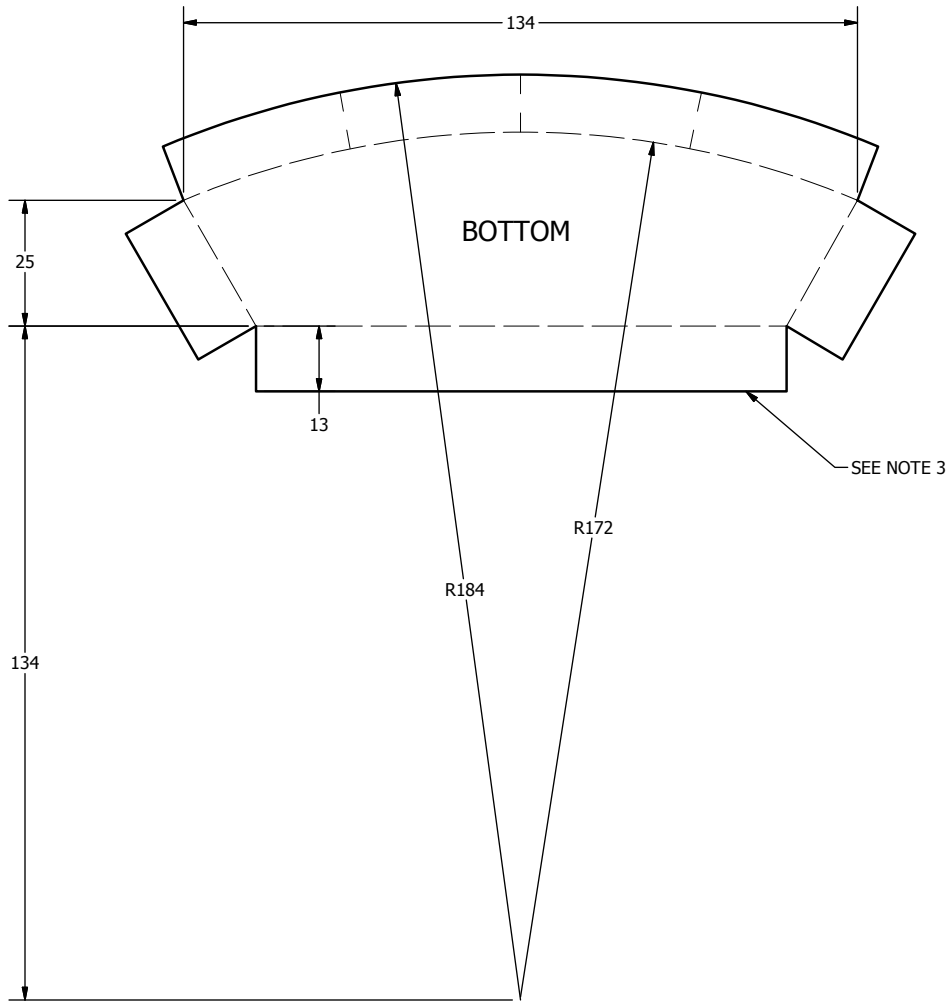
- PATTERN EDGES
- CUT LINES
- FOLD LINES

NOTES:

1. USE CORDURA NYLON FABRIC (1000 DENIER - 10 OZ/YD)
2. TOLERANCE ±1mm, UNLESS OTHERWISE NOTED.
3. PRINT TO SCALE AND USE AS A PATTERN FOR CUTTING OUT MATERIAL.
4. VIEW SHOWN IS THE OUTSIDE OF THE BAG.
5. SEE DRAWING 472-4650 FOR ASSEMBLY PROCEDURES.

DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGULAR FINISH X ±0.5 ± 0.5° 1.6 .XX ± 0.2 ∠ .XXX ± 0.1 .XXXX ± 0.05 REMOVE BURRS & BREAK SHARP EDGES		
PROJECT NO.:		DESCRIPTION: TOP/SIDE REAR FABRIC PATTERN	
472-4650	1	MATERIAL: SEE NOTES	DRAWN BY: B. KIMES DATE: 9/9/2011
NEXT ASSEMBLY	QTY	HEAT TREATS:	CHECKED BY: DATE:
TOTAL QTY IN DUMMY	1	FINISHS:	ENGINEER: J. WANG DATE: 1/18/2012
			SIZE: A1 SHEET: 1 OF 1 SCALE: 1.000 DRAWING NO.: 472-4652 REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1UAF312 R02 FOR THOR-M; ADD NOTE 2	9/9/2011	BK



LEGEND

PATTERN LINES

FOLD LINES

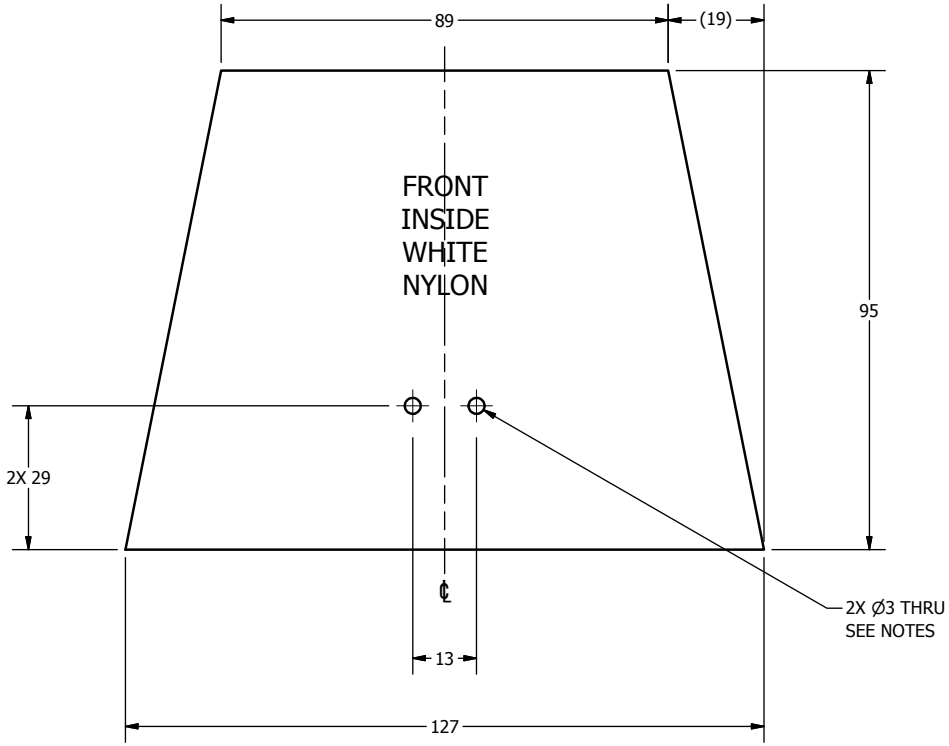
CUT LINES

NOTES:

1. USE CORDURA NYLON FABRIC (1000 DENIER 10 OZ/YD).
2. TOLERANCE ±1mm, UNLESS OTHERWISE NOTED.
3. PRINT TO SCALE AND USE AS PATTERN FOR CUTTING OUT MATERIAL.
4. SEE DRAWING 472-4650 FOR ASSEMBLY PROCEDURE.

		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: BOTTOM FABRIC PATTERN	
472-4650	1	MATERIAL: SEE NOTES	DRAWN BY: B. KIMES	DATE: 9/9/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/18/2012	SCALE: 1.000 DRAWING NO.: 472-4653 REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1UAF313 R03 FOR THOR-M; ADD NOTE 1 & 3	9/12/2011	BK



NOTES:

A 1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERSWISE NOTED.

2. MATERIAL: NYLON STIFFENING CLOTH (DUCK CLOTH)
(20 OZ.YD MEETS MIL-C-3953)

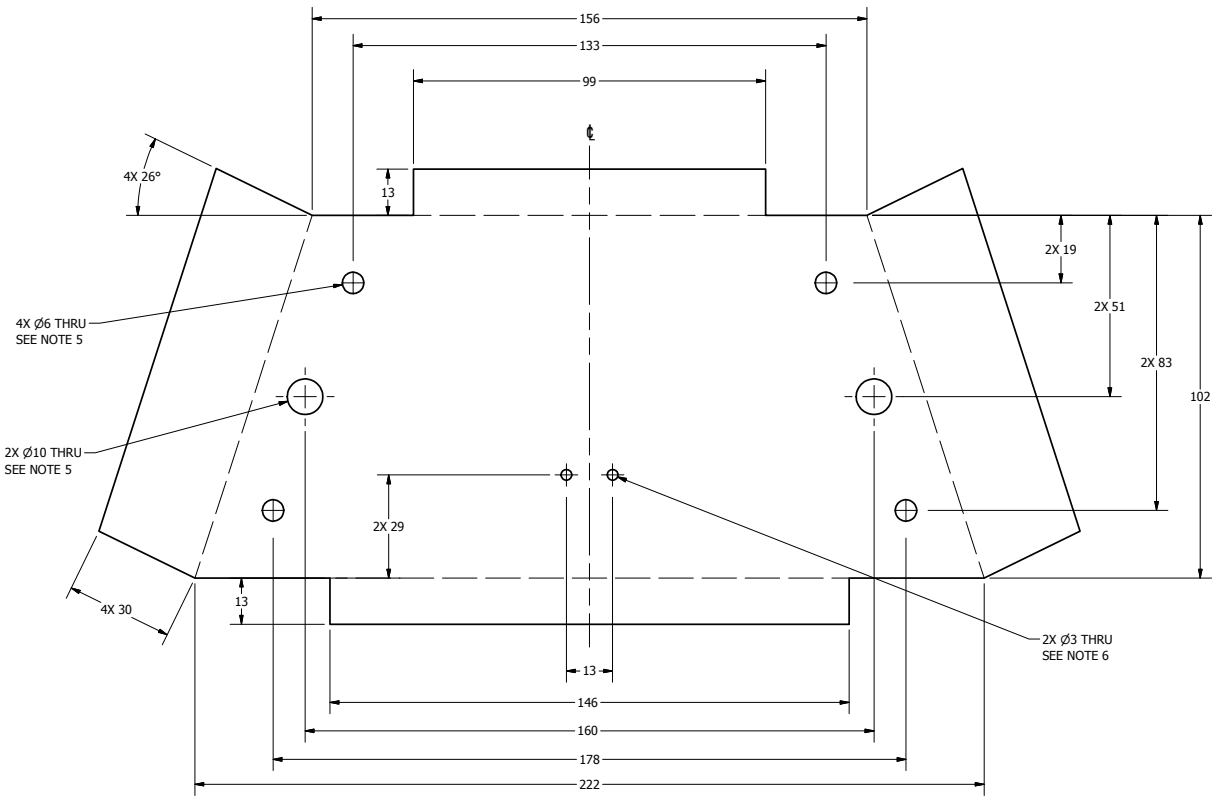
A 3. CLOTH TOLERANCE ±1mm, UNLESS OTHERWISE NOTED.

4. ADD ACCELEROMETER MOLNTING HOLES AFTER SEWING.

5. SEE DRAWING 472-4650 FOR ASSEMBLY PROCEDURE.

DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: FRONT STIFFENING CLOTH		
PROJECT NO.:		DRAWN BY: B. KIMES	DATE: 9/12/2011	SIZE: A3	SHEET 1 OF 1
472-4650	1	MATERIAL: SEE NOTES		DRAWING NO.: 472-4654	REV: A
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SCALE: 1.000
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/18/2012	

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1UAF314 R04 FOR THOR-M; ADD NOTES 1 & 3	9/12/2011	BK



LEGEND

PATTERN EDGES

FOLD LINES

NOTES:

A 1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERSWISE NOTED.

2. USE CORDURA NYLON FABRIC (1000DENIER 10 OZ/YD)

A 3. FABRIC TOLERANCE ±1mm, UNLESS OTHERWISE NOTED.

4. PRINT TO SCALE AND USE AS PATTERN FOR CUTTING MATERIAL.

5. PUNCH HOLES THROUGH FLAP AFTER SEWING.

6. CUT OUT ACCELEROMETER MOUNTING HOLES AFTER SEWING.

7. THE DRAWING AS SHOWN REPRESENTS THE FRONT VIEW OF THE BAG.
(AS IF VIEWING THE THOR FROM THE FRONT)

8. SEE DRAWING 472-4650 FOR ASSEMBLY PROCEDURE.

472-4650	1	Default
NEXT ASSEMBLY	QTY	ITEM TREND
TOTAL QTY IN DUMMY	1	WEIGHT:

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES — UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.3, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6

REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:

DRAWN BY: B. KIMES — DATE: 9/12/2011

CHECKED BY: — DATE:

ENGINEER: J. WANG — DATE: 1/18/2012

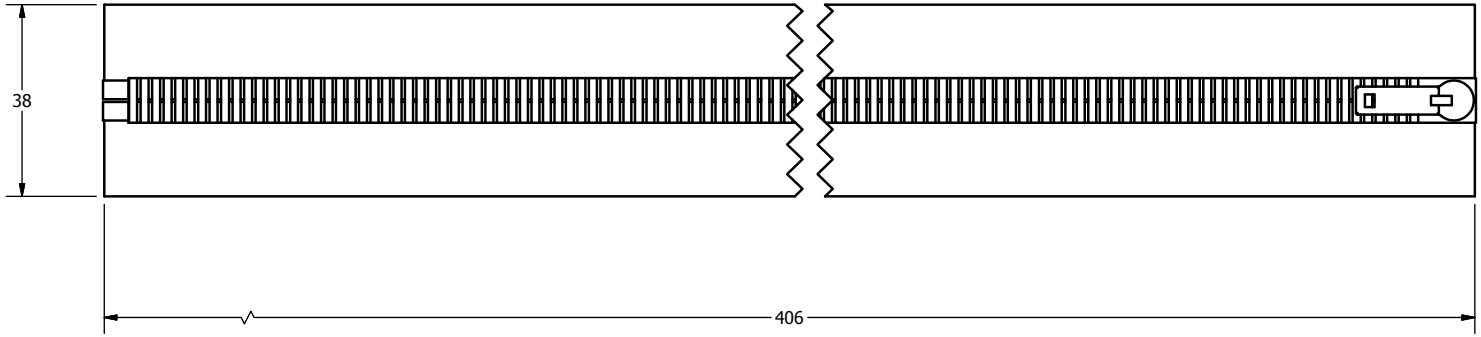
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: FRONT OVERLAY FABRIC PATTERN

SIZE: A2 — SHEET 1 OF 1 — SCALE: 1.000

DRAWING NO.: 472-4655 — REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1UAF315 R05 FOR THOR-M; ADD NOTE 3	9/12/2011	BK



NOTES:

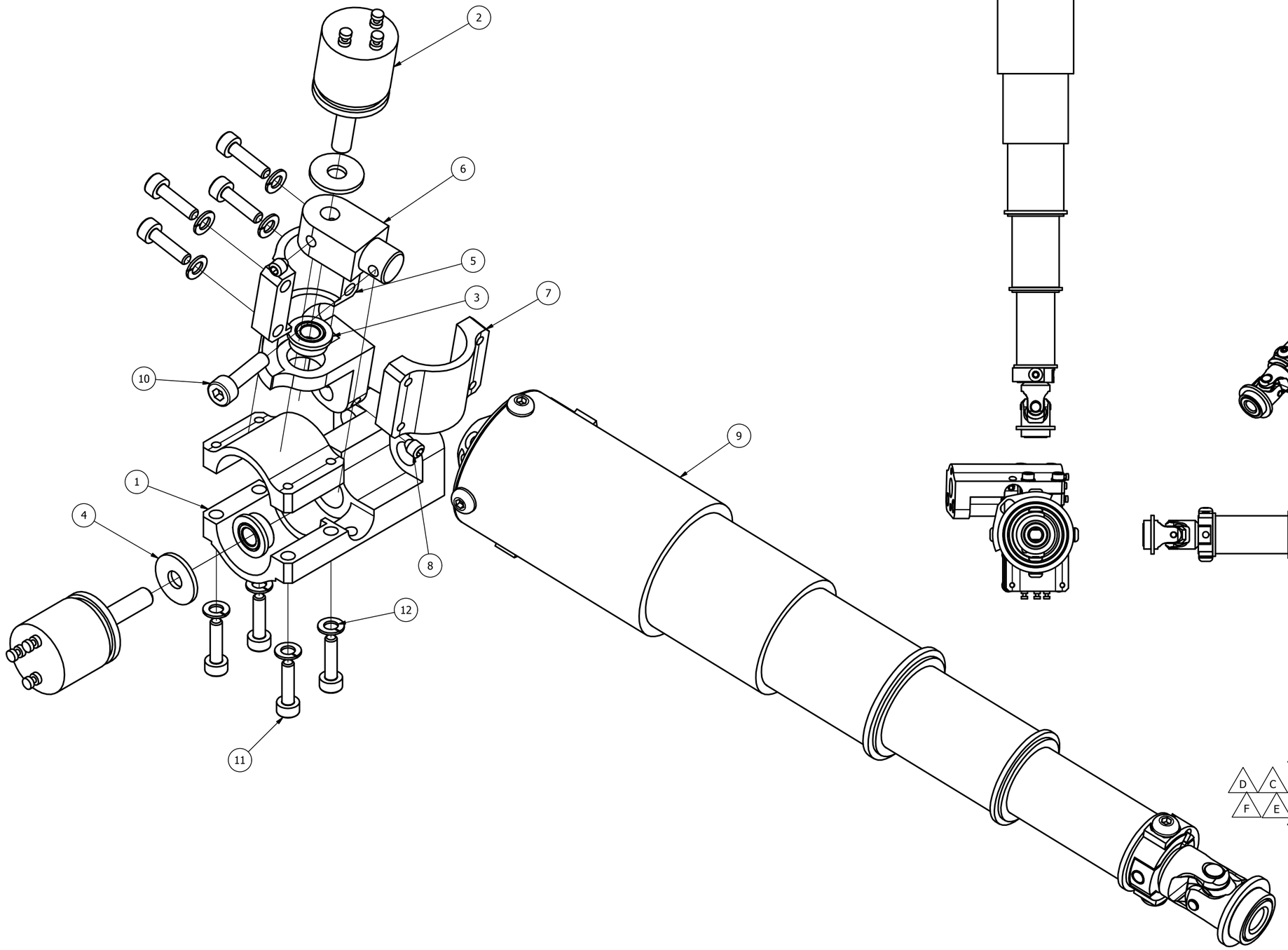
1. SIZE: #10, BROWN POLYESTER, METAL (BRASS)
   ZIPPER TYPE: OPEN TOP -CLOSED BOTTOM STYLE.

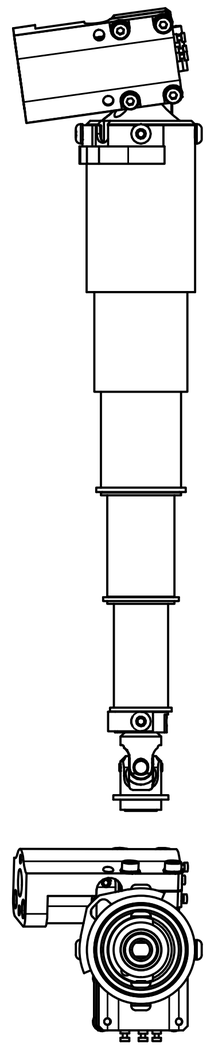
2. THE ENDS SHOULD BE SEWN TOGETHER TO PREVENT THE SLIDER FROM PULLING OFF THE TRACK.

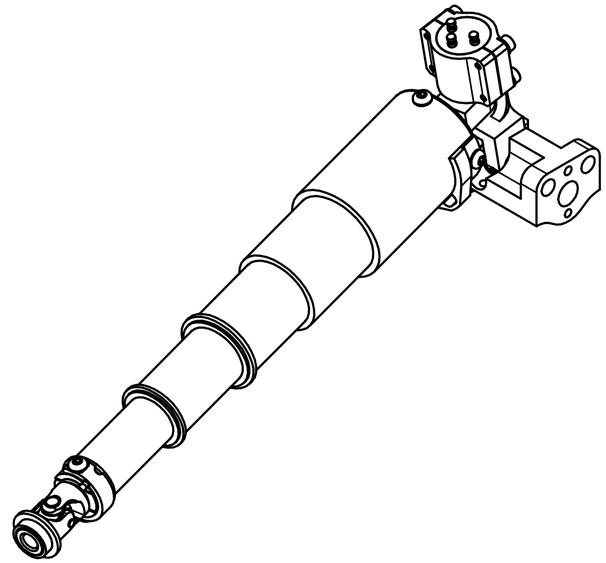
A 3. ZIPPER TOLERANCE ±1mm, UNLESS OTHERWISE NOTED.

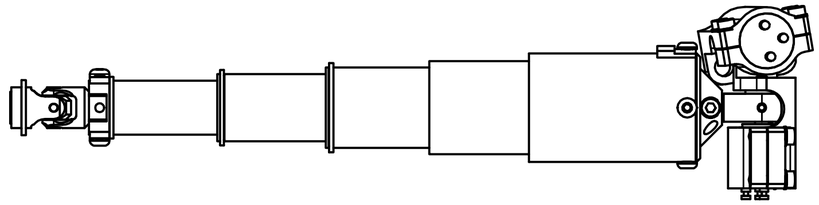
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: ZIPPER, UPPER ABDOMEN	
472-4650	1	MATERIAL: Default	DRAWN BY: B. KIMES 9/12/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET 1 OF 1	DRAWING NO.: 472-4656 REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG 1/18/2012	SCALE: 1.000	

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1IRM101 RB FOR THOR-M	10/7/2011	BK
	B	MADE ITEMS 2 AND 10 VISIBLE TO PARTS LIST	6/8/2012	JBH
	C	REDESIGN PARTS FOR NEW LOCATION; ADD 8X LOCK WASHERS; 8X M2 X 8 SHCS WERE M2 X 6 BHCS	10/11/2012	BK
	D	5000456 WAS 5000600	12/17/2012	BK
	E	REVISED ITEM #9 SA572-S117 - IRTRACC CHEST, THOR-M	5/30/2014	DW
	F	REVISED ITEM #1 - 472-3551 - UPPER IRTRACC BASE, & ITEM #9 - SA572-S117 - IRTRACC CHEST	2/14/2017	DW









SCALE 2.000

ITEM	QTY	PART NUMBER	DESCRIPTION
12	8	5001216	M2 SPLIT LOCK WASHER SS
11	8	5000083	M2 X 0.4 X 8 LG. SHCS
10	1	5000456	M2.5 X 0.45 X 10 LG. SHCS
9	1	SA572-S117	IRTRACC CHEST
8	2	5000578	M2.5 X 0.45 X 3 LG. SSCP
7	2	472-3554	CLAMP, IRTRACC
6	1	472-3553	ADAPTOR, SERVO/IRTRACC
5	1	472-3552	IRTRACC ARM MOUNTING BRACKET, RIGHT
4	2	5000378	M3 FLAT WASHER LARGE OD SS
3	2	9002201	FLANGE BEARING (1/4" O.D. x 1/8" I.D.)
2	2	SA572-S114	ROTARY POTENTIOMETER
1	1	472-3551	UPPER IRTRACC BASE

PARTS LIST

C
D C B
F E B
B
F

472-3000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01
ANGLES ± 0.5
FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

DRAWN BY: B. KIMES — DATE: 9/7/2012
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/10/2012

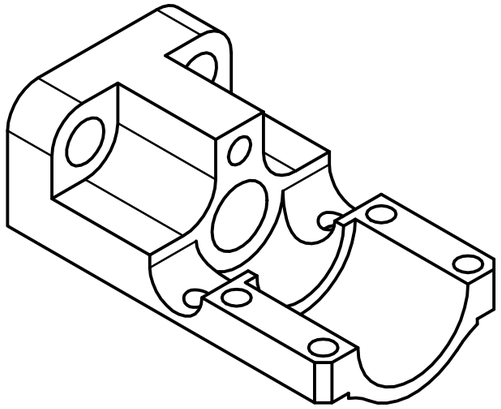
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: IRTRACC ASSEMBLY, UPPER LEFT

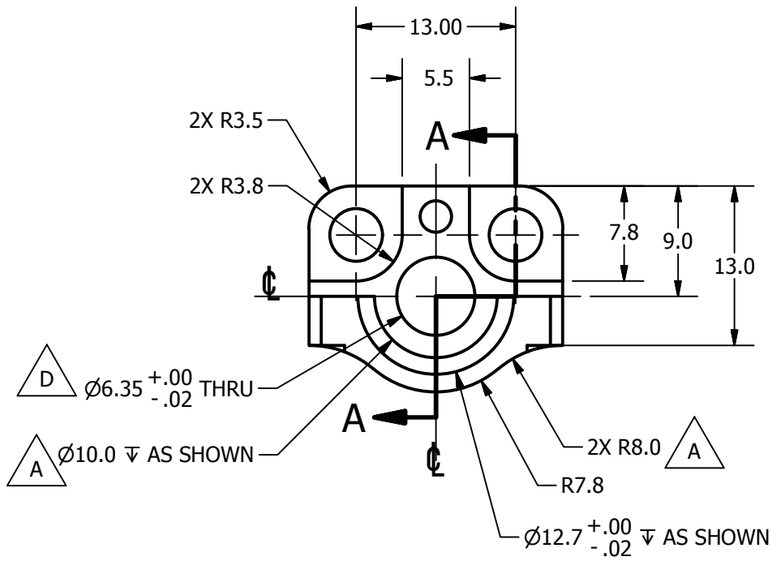
SIZE: A2 | SHEET 1 OF 1 | SCALE: 1.000 | DRAWING NO.: 472-3550 | REV: F

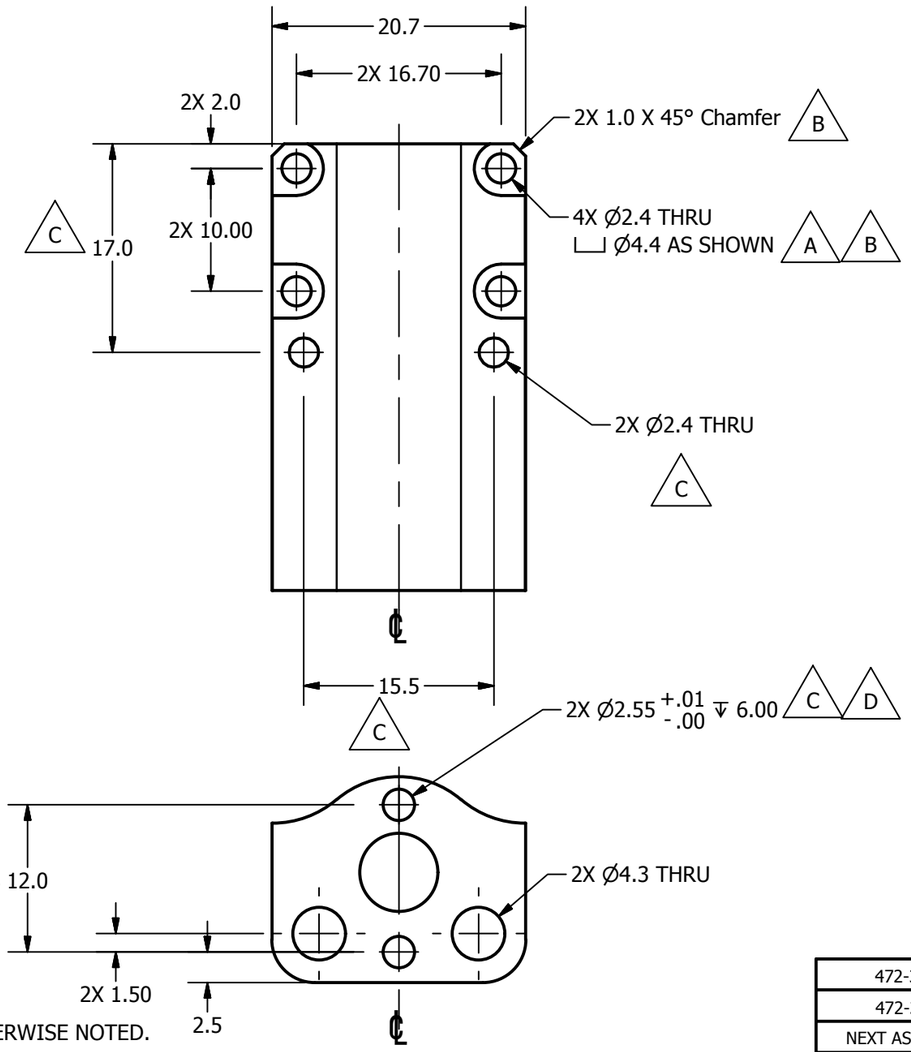
472-3550 Mod.iam

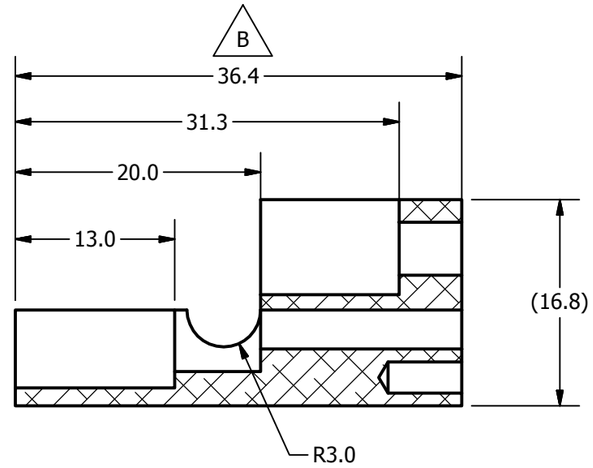
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1IRM110 R01 FOR THOR-M 2.3 DIA. HOLES WERE M2 THREADED; ADD 2.3 DIA. HOLE; 2X R8.0 WAS 4.8; Ø9.5 WAS Ø9.53; FINISH WAS RED ANODIZE	10/5/2011	BK
	B	ADD 2X 1.0 X 45° CHAMFERS; 36.4 WAS 26.0, 31.3 WAS 24.0; C'BORE Ø 4.8 WAS Ø4.3	10/11/12	BK
	C	ADDED 2X Ø2.4 THRU and HOLE 2X Ø2.55 +.10/-.00 ↧6.00	7/6/2017	DW
	D	DIMENSION Ø6.35 +.00/-.02 THRU WAS Ø6.35 +.00/+.02 THRU AND 2X Ø2.55 +.01/-.00 ↧ 6.00 WAS 2X Ø2.55 +.10/-.00 ↧ 6.00	2/5/2018	DW



SCALE 2.000







SECTION A-A
SCALE 2.000

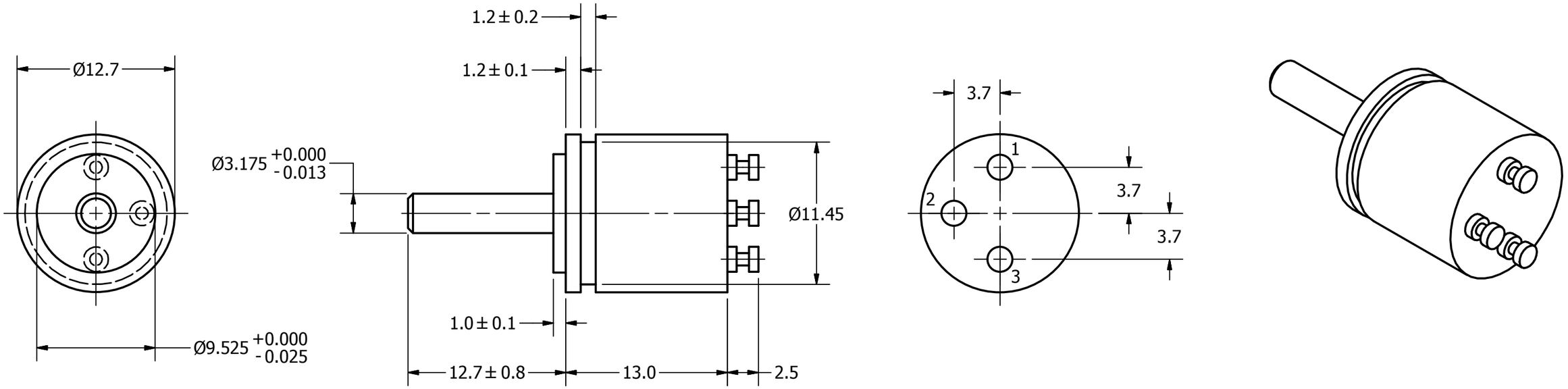
NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

472-3560	1	PROJECT NO.:	DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES — UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
472-3550	1	MATERIAL: 7075-T6 ALUMINUM	DRAWN BY: B. KIMES	DATE: 9/7/2012	DESCRIPTION: UPPER IRTRACC BASE
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 — DRAWING NO.: 472-3551 — REV: D
TOTAL QTY IN DUMMY	2	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG	DATE: 1/10/2012	SCALE: 2.000

472-3551.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	INDEPENDENT LINEARITY (TEA) WAS ±0.25%	9/17/2015	DW



SPECIFICATIONS

SHAFT GUIDING: BALL BEARINGS
A INDEPENDENT LINEARITY (TEA): ±0.5%
OHMIC VALUES: 1000 OHMS
ACTUAL ELECTRICAL ANGLE 330°: ±5%
MAXIMUM POWER RATING @ 70°C: 0.2 WATTS
WEIGHT: 5±2g (LESS CABLES)
OPERATING TEMPERATURE RANGE: -55°C TO +125°C
MAXIMUM SPEED ROTATION: 600

PIN DESIGNATION

1 = -EXCITATION
2 = +SIGNAL
3 = +EXCITATION

REFERENCE: VISHAY SFERNICE #ECO-50-ESC-102

UNLESS OTHERWISE SPECIFIED:
ALL MACHINED SURFACES 1.60 OR BETTER.

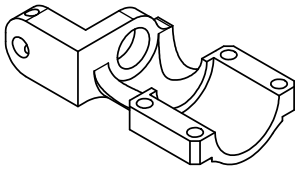
PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES
ANGLES ±.5°
DECIMALS
X ±1 mm
X.X ±0.1 mm
* DO NOT SCALE DRAWING *
THIRD ANGLE PROJECTION

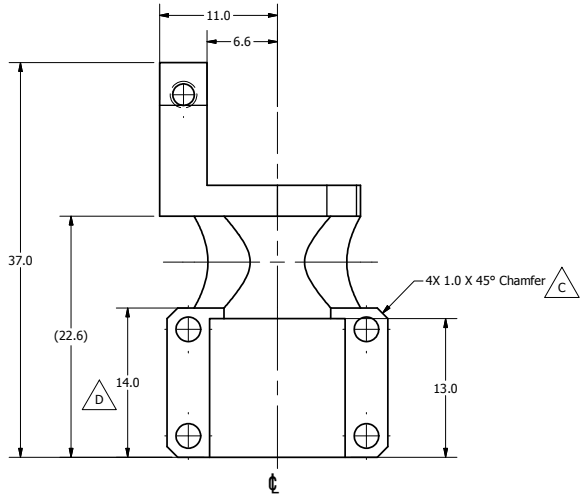
ENGINEERED: C Torchala	DATE: 4/21/2010	MATERIAL:	DEPARTMENT OF TRANSPORTATION NHTSA
DRAWN: C Torchala	DATE: 6/15/2010	FINISH:	
CHECKED: M Salloum	DATE: 8/10/2010	HEAT TREAT:	
DEBUR AND BREAK ALL SHARP EDGES		QTY./ASSEMBLY: 2	DRAWING TITLE: ROTARY POTENTIOMETER
SCALE: 3 : 1	SIZE: A3	REVISION: A	QTY./DUMMY: 4
DRAWING NUMBER: SA572-S114			Page: 1 of 1

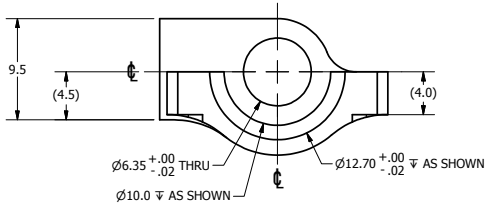
50ES.ipt

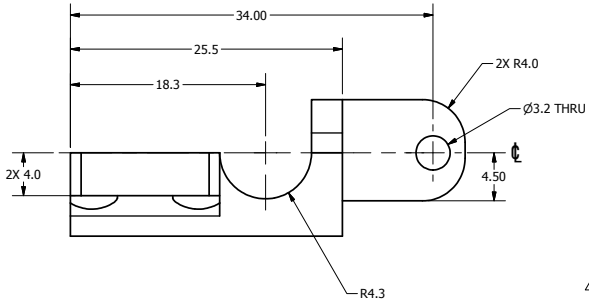
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1IRM113 R01 FOR THOR-M 2.3 DIA. HOLES WERE M2 THREADED; 2X R8.0 WAS 3.0; ADD VIEW, R3.0 DIMENSION; FINISH WAS RED ANODIZE	10/5/2011	BK
	B	REMOVE CUT OUT, R3.0	3/22/2012	BK
	C	ADD 4X 1.0 X 45° CHAMFER; C'BORE Ø4.8 WAS Ø4.3	10/11/2012	BK
	D	CORRECT DIMENSIONING ERROR; REDIMENSION 4X COUNTERBORE SLOTS	12/12/2012	BK

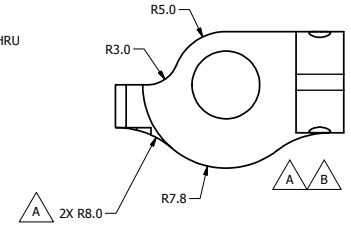


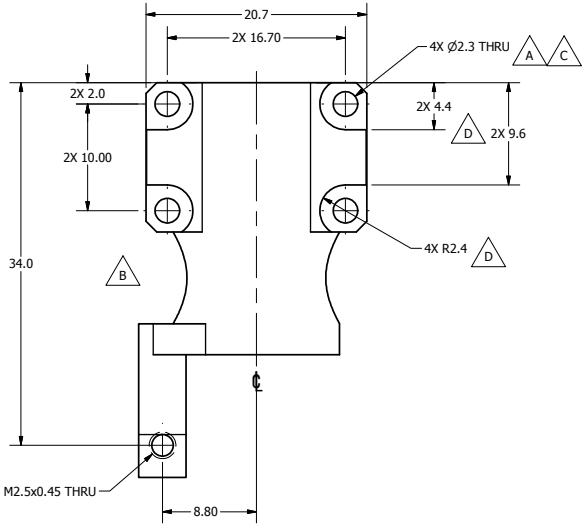
SCALE 2.000









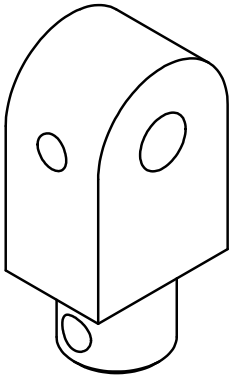


NOTES:

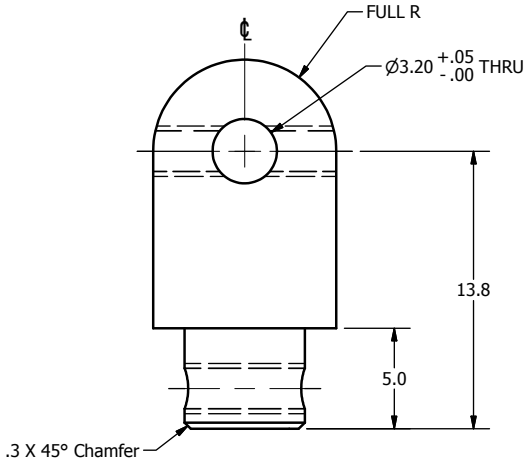
1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

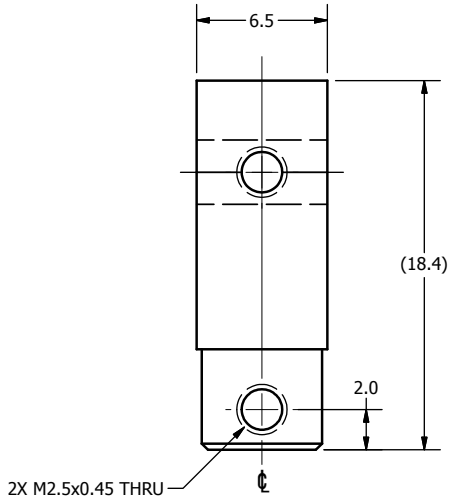
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
		REMOVE BURRS & BREAK SHARP EDGES	IRTRACC ARM MOUNTING BRACKET, RIGHT
472-3550	1	7075-T6 ALUMINUM	B. KIMES 9/7/2012
NEXT ASSEMBLY	QTY		
TOTAL QTY IN DUMMY	1	CLEAR ANODIZE	J. WANG 1/11/2012
		SIZE: A2 SCALE: 3.000	SHEET 1 OF 1
		DRAWING NO.: 472-3552	REV: D

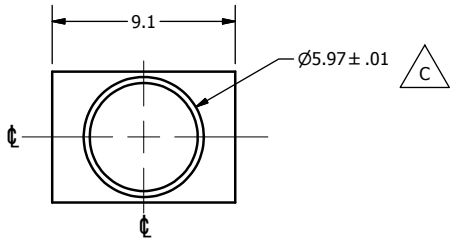
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1IRM115 R01 FOR THOR-M	10/6/2011	BK
	B	REMOVE Ø1.143 THRU HOLE	2/7/2012	BK
	C	Ø5.97±.01 WAS Ø5.80	11/9/2012	BK



SCALE 4.000





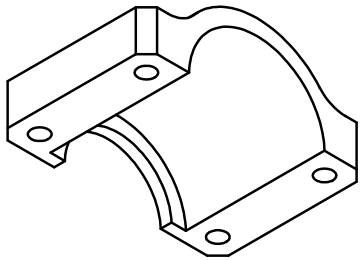


NOTES:

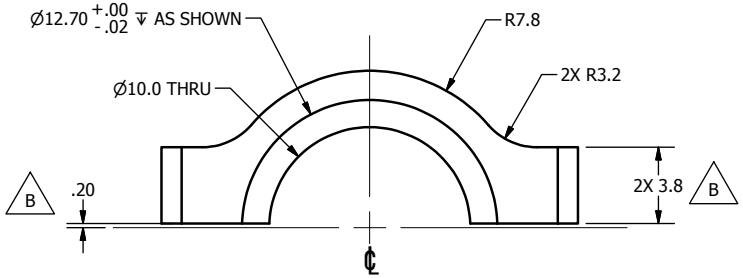
1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

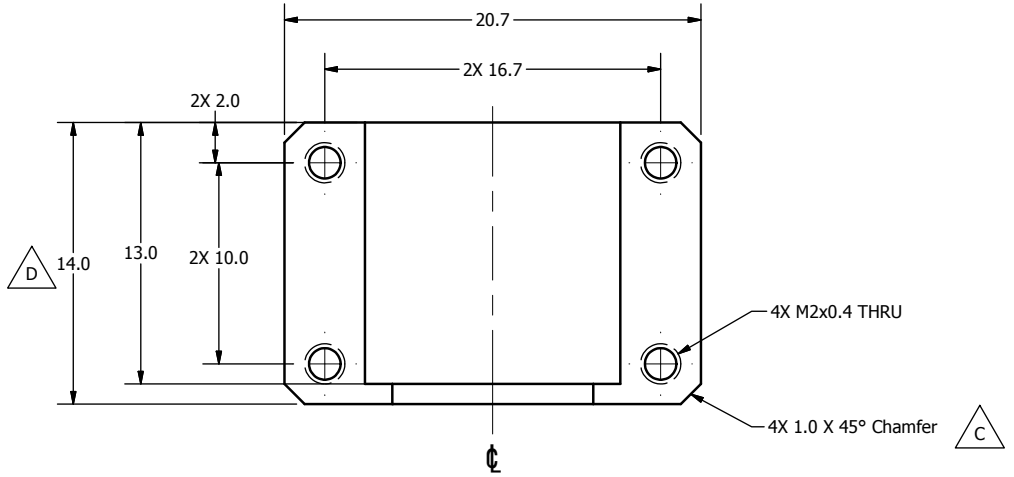
472-3570	1	DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
472-3560	1	THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6		
472-3550	1	PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: ADAPTOR, SERVO/IRTRACC	
NEXT ASSEMBLY	QTY	MATERIAL: 303 STAINLESS STEEL	DRAWN BY: B. KIMES DATE: 10/6/2011		
TOTAL QTY IN DUMMY	3	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET 1 OF 1	DRAWING NO.: 472-3553 REV: C
		FINISH:	ENGINEER: J. WANG DATE: 1/11/2012	SCALE: 4.000	

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1IRM112 R01 FOR THOR-M CHANGE 2.2 DIA. HOLES TO M2 THREADED; REMOVE BURR NOTE; FINISH WAS RED ANODIZE	10/6/2011	BK
	B	REMOVE .20 FROM BOTTOM OF PART; 2X 3.8 WAS 4.0; ADD NEXT ASSY, TOTAL QTY 4 WAS 3	3/15/2012	BK
	C	ADD 4X 1.0 X 45° CHAMFERS	10/11/2012	BK
	D	CORRECT DIMENSIONING ERROR	12/12/2012	BK



SCALE 3.000



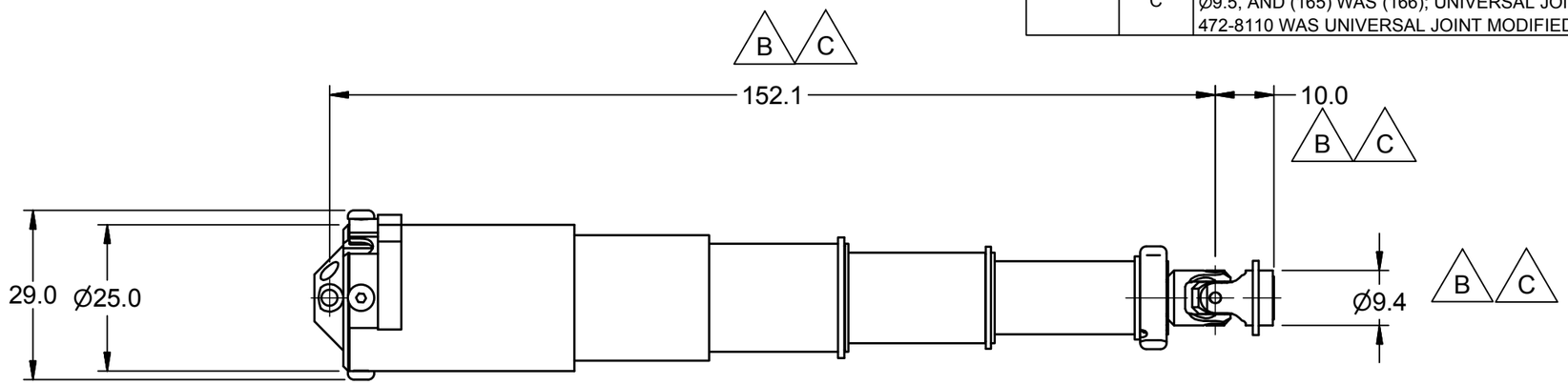


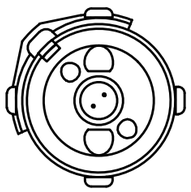
NOTES:

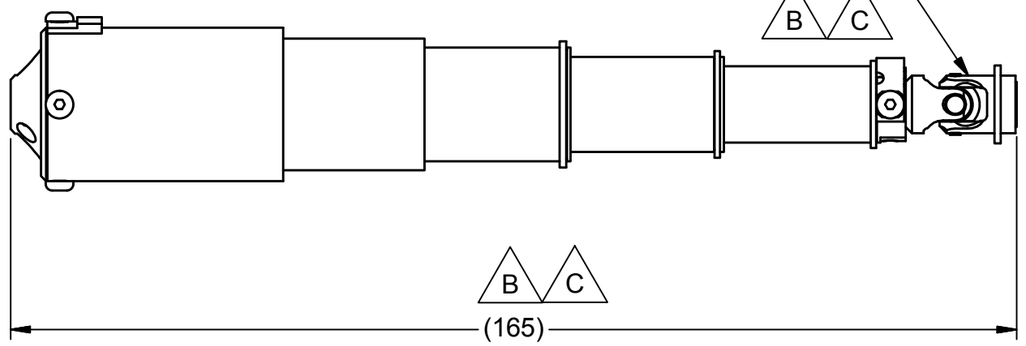
A 1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

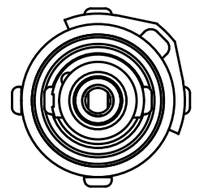
472-3580	1	DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
472-3570	1	THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	
472-3560	1	PROJECT NO.:		DESCRIPTION: CLAMP, IRTRACC
472-3550	1	MATERIAL: 7075-T6 ALUMINUM	DRAWN BY: B. KIMES DATE: 9/7/2012	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-3554 REV: D
TOTAL QTY IN DUMMY	4	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG DATE: 1/11/2012	SCALE: 4.000

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	RELEASED TO PRODUCTION	7/3/2012	BK
	B	UNIVERSAL JOINT MODIFIED - 472-8115 WAS UNIVERSAL JOINT MODIFIED - 472-8110; REMOVED EXTERNAL RETAINING RING; DIMENSION 153.2 WAS 152.2, 12.1 WAS 10.0, Ø9.5 WAS Ø9.4, (166) WAS (165)	5/30/2014	DW
	C	DIMENSION 152.1 WAS 153.2, 10.0 WAS 12.1, Ø9.4 WAS Ø9.5, AND (165) WAS (166); UNIVERSAL JOINT ASSEMBLY 472-8110 WAS UNIVERSAL JOINT MODIFIED 472-8115	2/14/2017	DW









WIRE ASSIGNMENTS		
WIRE #1	WIRE COLOR	FUNCTION
1	RED	+EXC
2	GREEN	+SIG
3	ORANGE	ID
4	SHIELD	GROUND
5	WHITE	-SIG
6	BLACK	-EXC
7	NONE	GUIDE

LINEARITY SPECIFICATIONS:

MAXIMUM DISPLACEMENT:	90mm
LINEARTY:	2% FS
MAXIMUM ERROR:	2% FS
INPUT VOLTAGE:	5V @20mA
OUTPUT VOLTAGE:	0V to 1.7V

NOTES:
THE IRTRACC IS AN INHERENTLY NON-LINEAR TRANSDUCER. AN IRTRACCS RAW VOLTAGE VALUES MUST BE ADJUSTED BY THE APPLICATION OF A LINEARIZATION EXPONENT APPLIED THROUGH POST TEST PROCESSING SOFTWARE IN ORDER TO ACHIEVE ACCURATE DISPLACEMENT DATA.

NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	4

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5°
X.X ±.2
X.XX ±.1
X.XXX ±.01
ASME Y14.5M – 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. Kimes	7/3/2012
CHECKED	
ENG	
APPROVED J. WANG	7/3/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

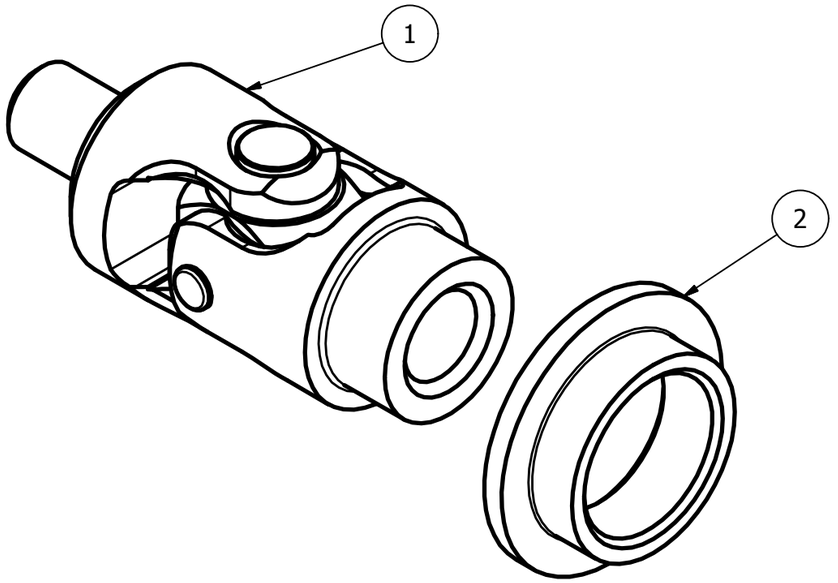
IRTRACC CHEST

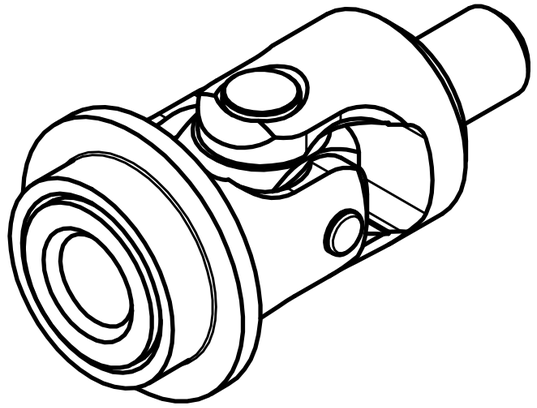
THOR–50M

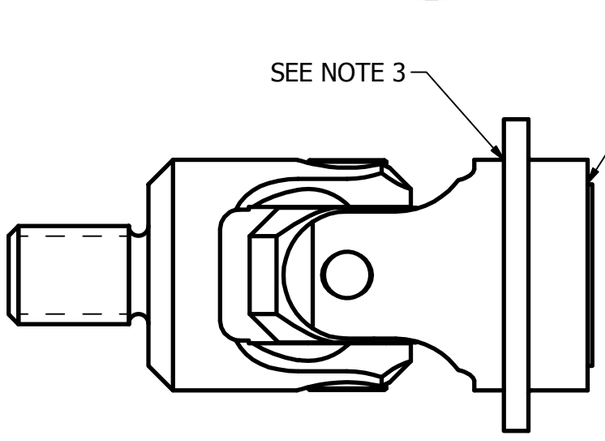
SIZE	DRAWING NUMBER	REV
A3	SA572–S117	C

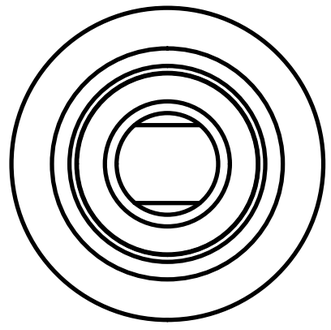
SCALE: SHEET 1 OF 1

SA572-S117 Mod.iam









NOTES:
1. BOND BALL JOINT BUSHING (472-8213) TO MODIFIED UNIVERSAL JOINT (472-8214) WITH THREADLOCKER AS SHOWN.
2. MINIMUM AXIAL LOAD ON BUSHING FOR THREADLOCKER = 500N.
3. ENSURE LARGE BUSHING FACE IS PRESSED COMPLETELY TO THE MATING FACE ON THE MODIFIED UNIVERSAL JOINT.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-8213	BALL JOINT BUSHING
1	1	472-8214	UNIVERSAL JOINT, MODIFIED

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT

FINISH

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

APPROVALS	DATE
DRAWN Dave Walker	2/14/2017
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

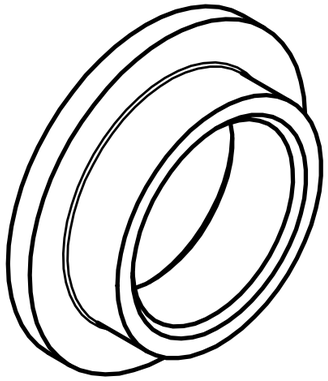
UNIVERSAL JOINT ASSEMBLY
THOR-50M

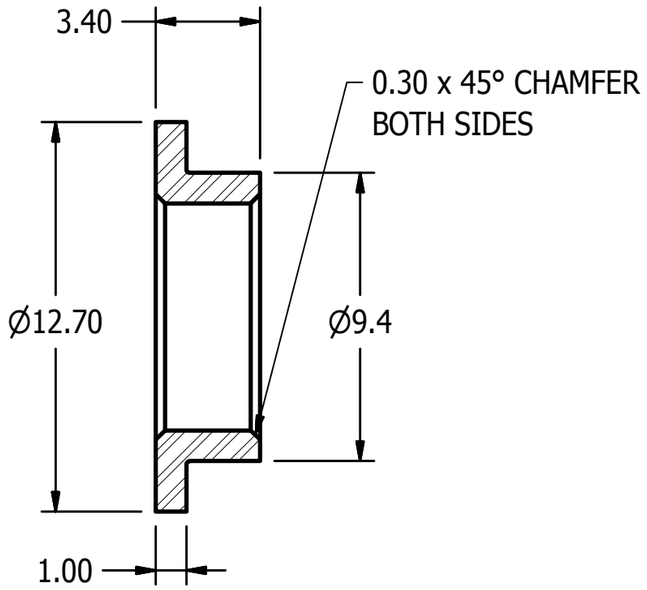
THIRD ANGLE PROJECTION

SIZE **A3** | DRAWING NUMBER 472-8110 | REV

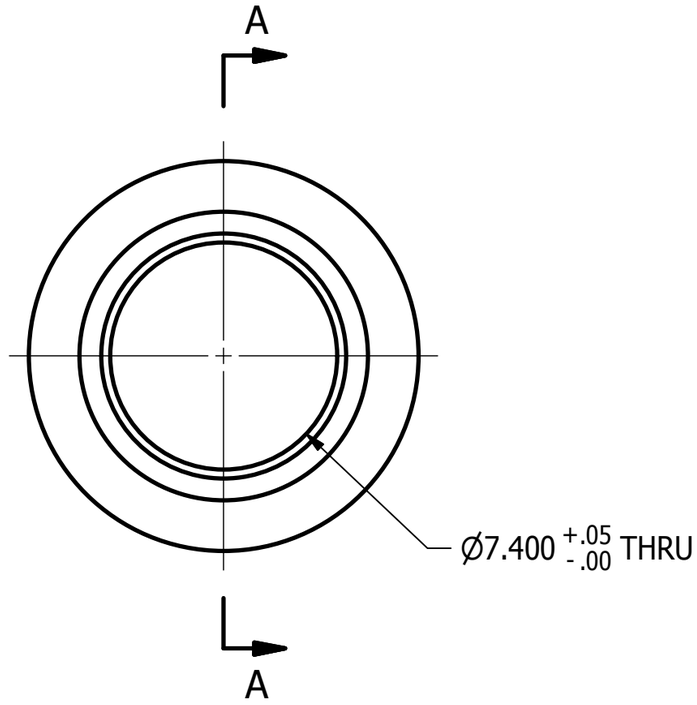
SCALE: 4 : 1 | SHEET 1 OF 1

472-8110.iam





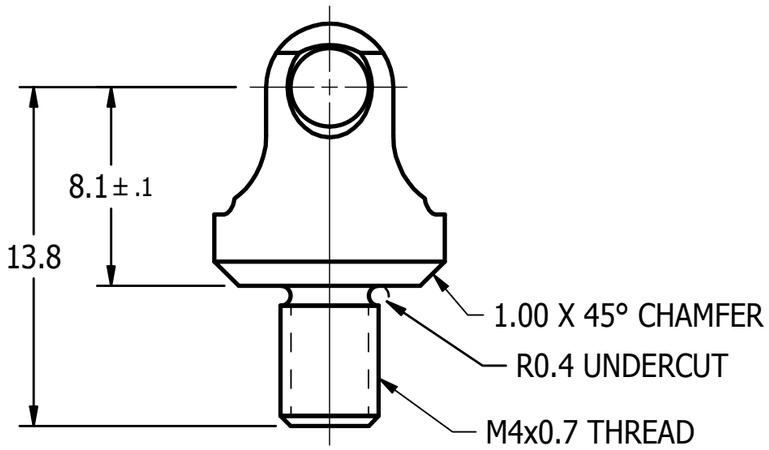
SECTION A-A

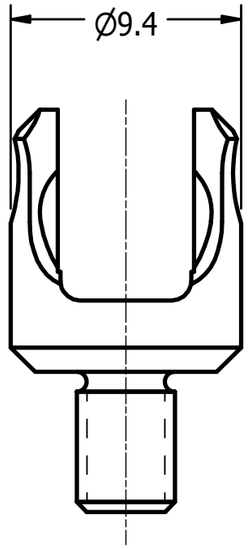


UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6, ANGLES ±.5° ASME Y14.5M - 1994 **DO NOT SCALE DRAWING**	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER	**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION**
	APPROVALS / DATE	BALL JOINT BUSHING THOR-50M
	DRAWN: Dave Walker — 2/14/2017	
MATERIAL: 303 STAINLESS STEEL	CHECKED	SIZE: A3 — DRAWING NUMBER: 472-8213 — REV
HEAT TREAT	ENG	
FINISH	APPROVED	THIRD ANGLE PROJECTION — SCALE: 5 : 1 — SHEET: 1 OF 1

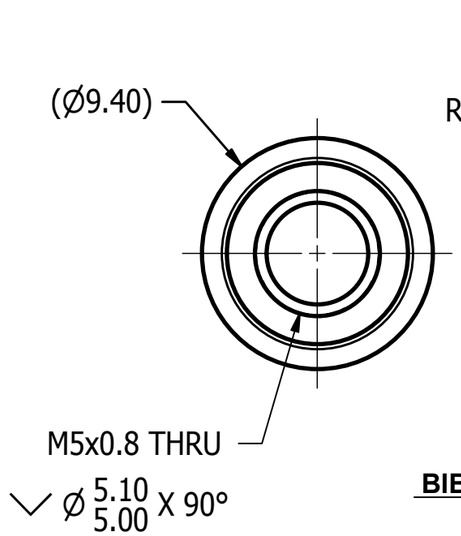
472-8213.ipt

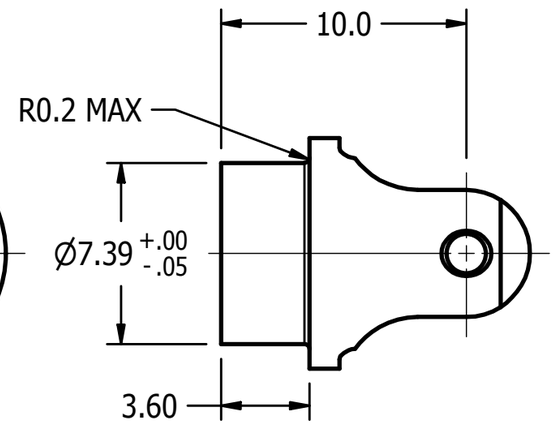
REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	IN NOTE 1 #9002659V WAS #90002659V	7/13/2018	DW



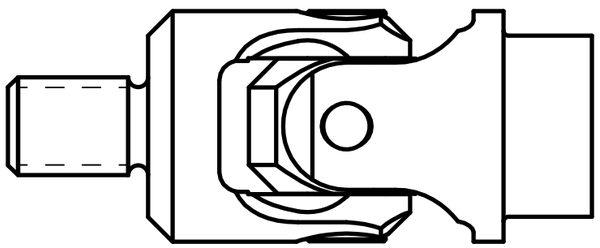


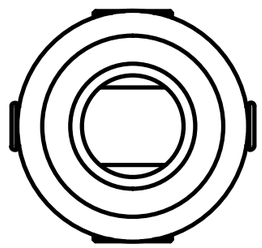
IR-TRACC SEGMENT

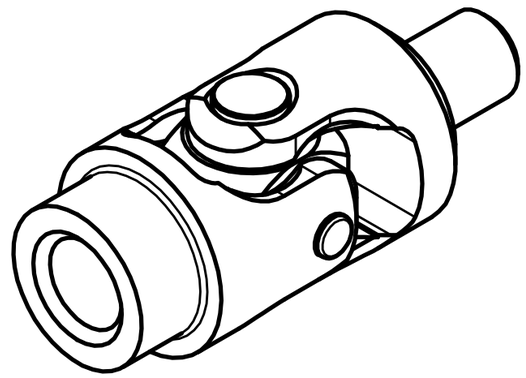




BIB SEGMENT





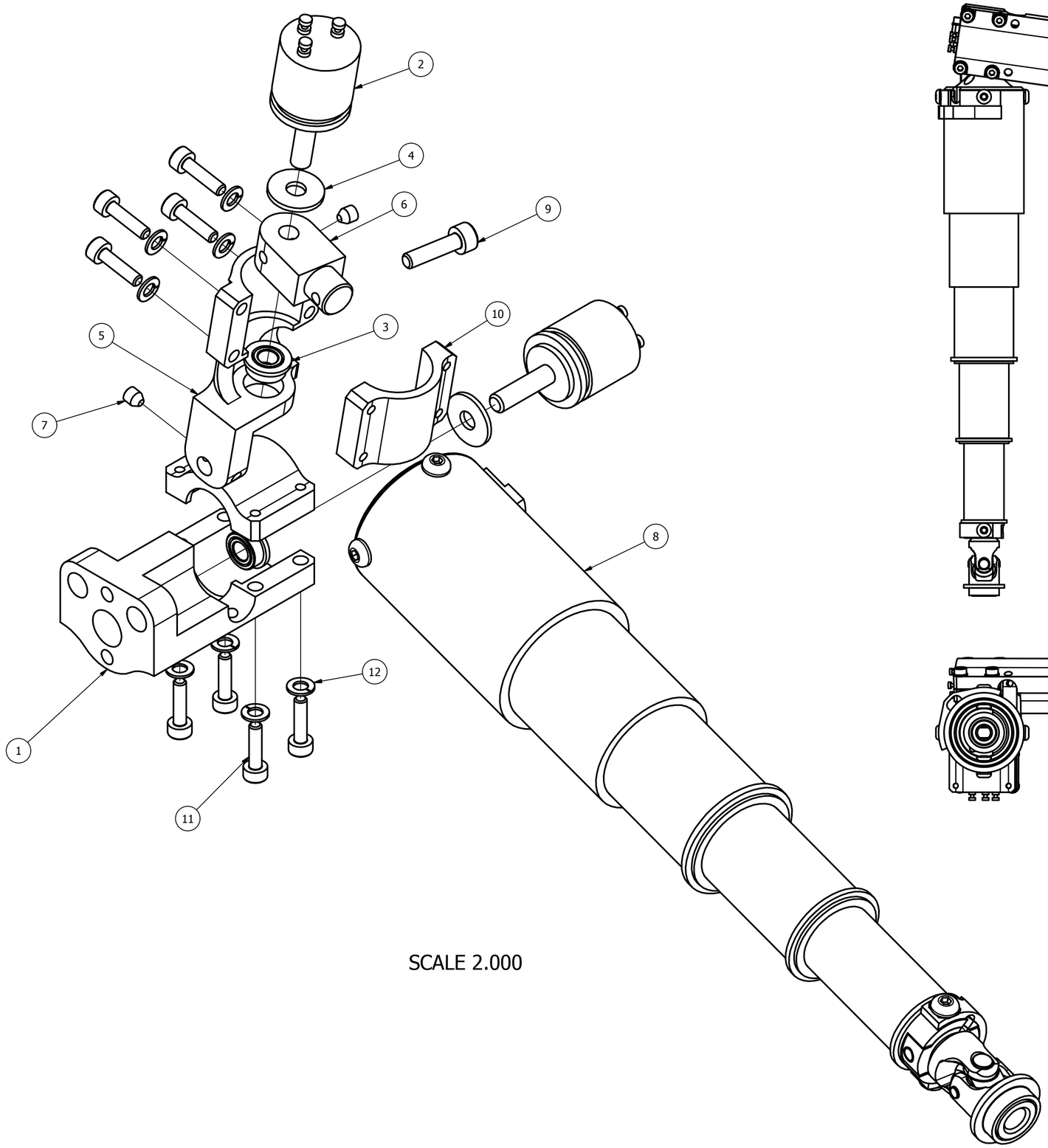


NOTES:
1. MAKE FROM SINGLE JOINT UNIVERSAL JOINT #9002659V, MODIFY AS SHOWN.

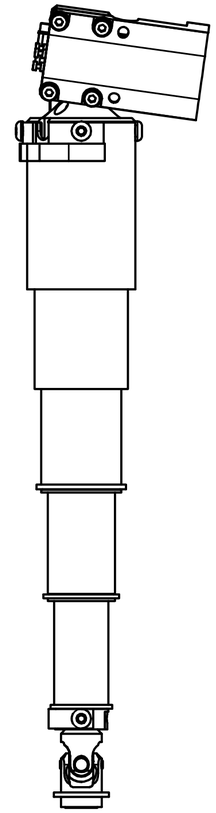
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED 1.6, ANGLES ±.5° ASME Y14.5M - 1994 **DO NOT SCALE DRAWING**	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER	**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION**
	APPROVALS / DATE	UNIVERSAL JOINT, MODIFIED THOR-50M
	DRAWN: Dave Walker 2/14/2017	
MATERIAL	CHECKED	
HEAT TREAT	ENG	SIZE: A3 / DRAWING NUMBER: 472-8214 / REV: A
FINISH	APPROVED	THIRD ANGLE PROJECTION / SCALE: 4 : 1 / SHEET: 1 OF 1

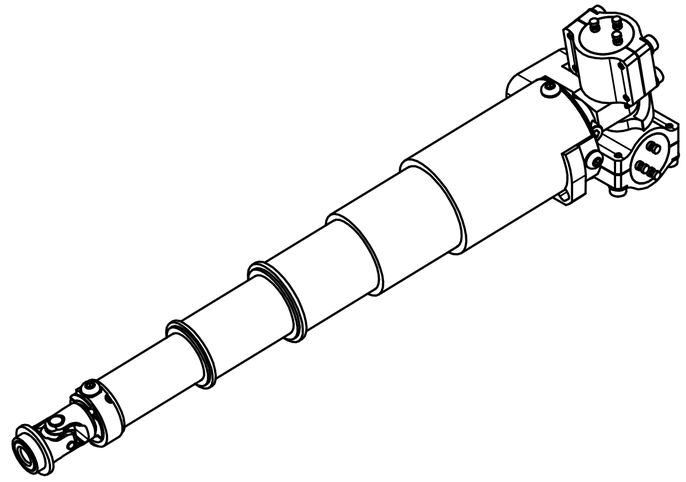
472-8214.iam

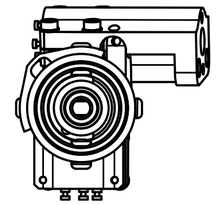
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1IRM102 RB FOR THOR-M	10/7/2011	BK
	B	MADE ITEMS 8 AND 2 VISIBLE IN PARTS LIST	6/8/2012	JBH
	C	REDESIGN PARTS FOR NEW LOCATION; ADD 8X LOCK WASHERS; 8X M2 X 8 SHCS WERE M2 X 6 BHCS	10/11/2012	BK
	D	5000456 WAS 5000600	12/17/2012	BK
	E	REVISED ITEM #8 SA572-S117 - IRTRACC CHEST, THOR-M	6/2/2014	DW
	F	REVISED ITEM #1 - 472-3551 - UPPER IRTRACC BASE, & ITEM #8 - SA572-S117 - IRTRACC CHEST	2/14/2017	DW

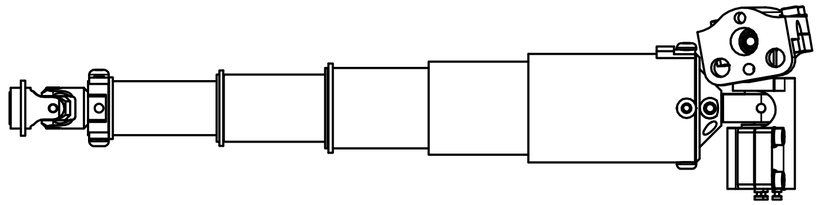


SCALE 2.000









ITEM	QTY	PART NUMBER	DESCRIPTION
12	8	5001216	M2 SPLIT LOCK WASHER SS
11	8	5000083	M2 X 0.4 X 8 LG. SHCS
10	2	472-3554	CLAMP, IRTRACC
9	1	5000456	M2.5 X 0.45 X 10 LG. SHCS
8	1	SA572-S117	IRTRACC CHEST
7	2	5000578	M2.5 X 0.45 X 3 LG. SSCP
6	1	472-3553	ADAPTOR, SERVO/IRTRACC
5	1	472-3562	IRTRACC ARM MOUNTING BRACKET, LEFT
4	2	5000378	M3 FLAT WASHER LARGE OD SS
3	2	9002201	FLANGE BEARING (1/4" O.D. x 1/8" I.D.)
2	2	SA572-S114	ROTARY POTENTIOMETER
1	1	472-3551	UPPER IRTRACC BASE

C D F E B B F

PARTS LIST

472-3000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ±0.3, X.X ±0.1, X.XX ±0.05, X.XXX ±0.01
ANGLES ±0.5°
FINISH 1.6

REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
DRAWN BY: B. KIMES — DATE: 9/10/2012
HEAT TREAT:
CHECKED BY: — DATE:
FINISH:
ENGINEER: J. WANG — DATE: 1/11/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: IRTRACC ASSEMBLY, UPPER RIGHT THOR-50M

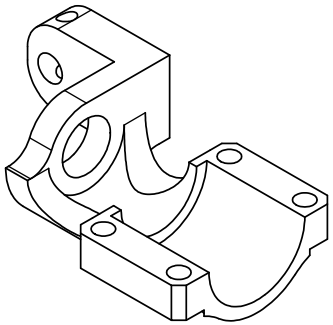
SIZE: A2 — SHEET: 1 OF 1 — SCALE: 1.000

DRAWING NO.: 472-3560

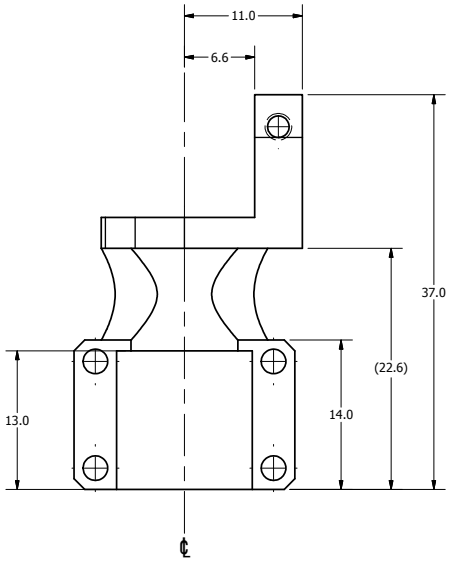
REV: F

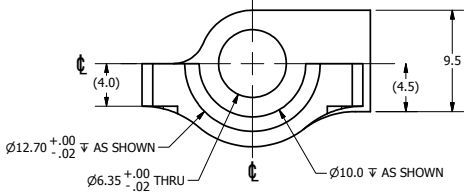
472-3560 Mod.iam

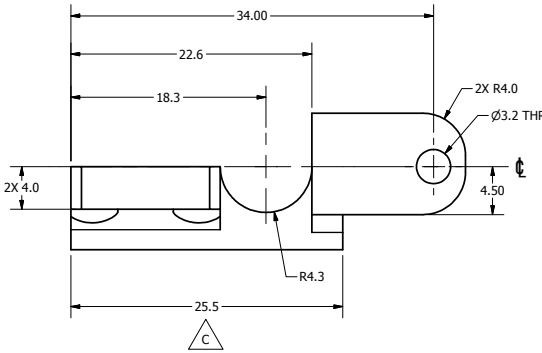
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1IRM114 R01 FOR THOR-M 2.3 DIA. HOLES WERE M2 THREADED; 2X R8.0 WAS 3.0; ADD VIEW, R3.0 DIMENSION; FINISH WAS RED ANODIZE	10/6/2011	BK
	B	REMOVE CUT OUT, R3.0	3/22/2012	BK
	C	ADD DIMENSION	4/3/2012	BK
	D	ADD 4X 1.0 X 45° CHAMFER; C'BORE Ø4.8 WAS Ø4.3	10/11/2012	BK
	E	REDIMENSION 4X COUNTERBORE SLOTS	12/12/2012	BK

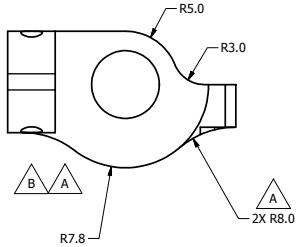


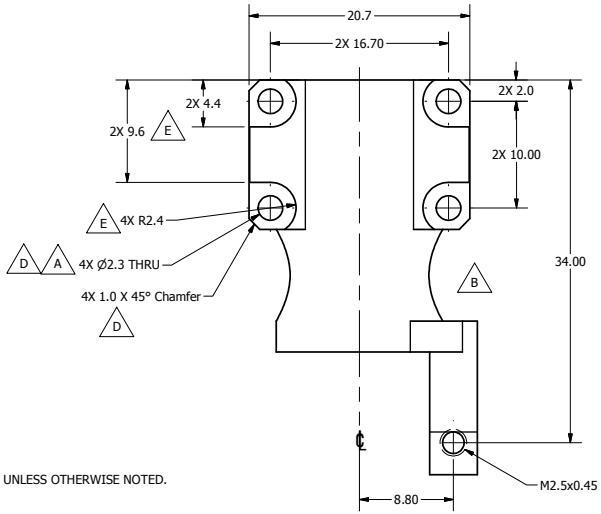
SCALE 3.000









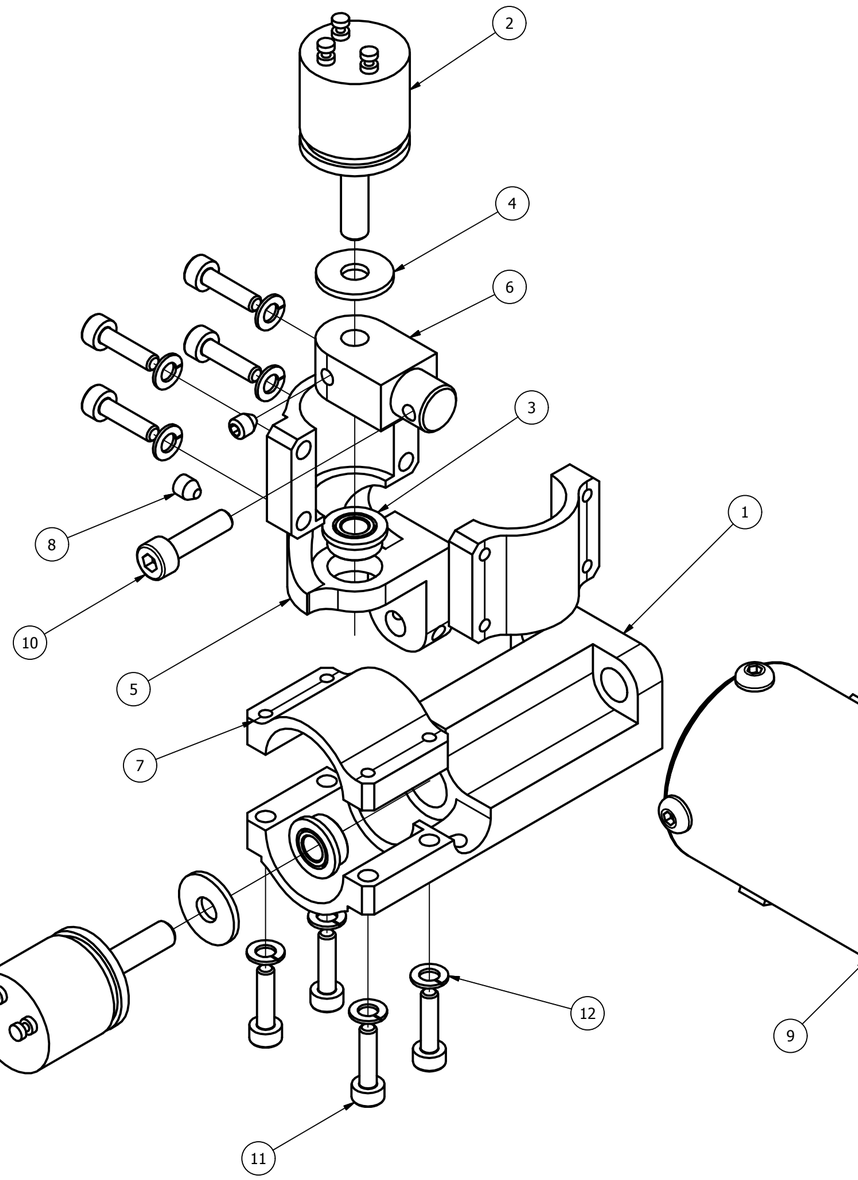


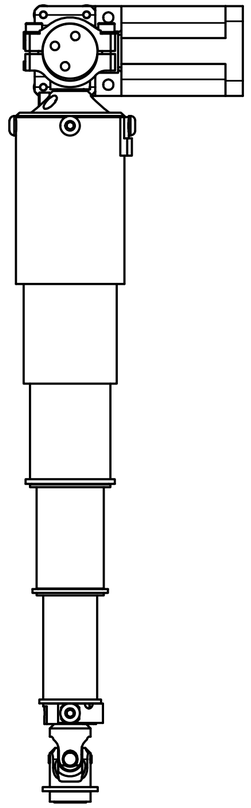
NOTES:

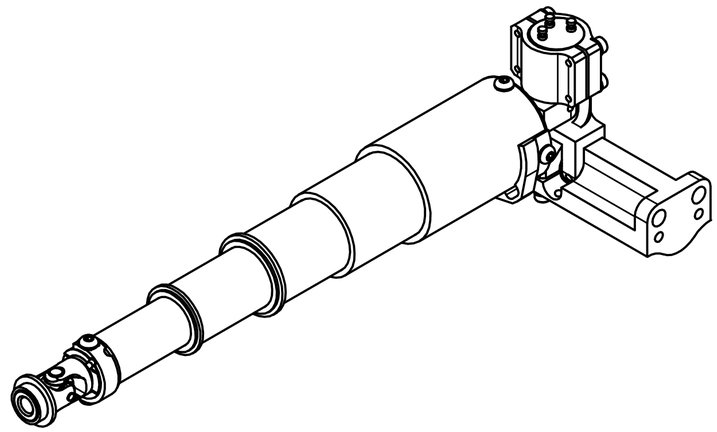
1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

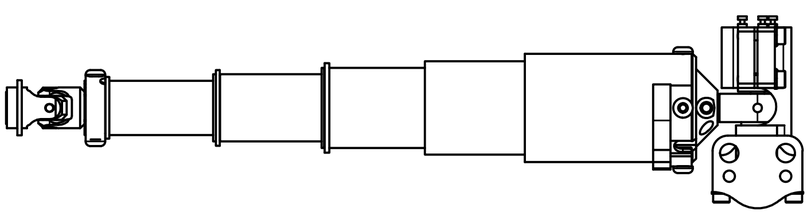
DO NOT SCALE DRAWING			TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
			REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: IRTRACC ARM MOUNTING BRACKET, LEFT	
472-3560	1	MATERIAL: 7075-T6 ALUMINUM	DRAWN BY: B. KIMES	DATE: 9/10/2012	
NEXT ASSEMBLY	QTY	ITEM TRACK:	CHECKED BY:	DATE:	SIZE: A2 / SHEET: 1 OF 1 / DRAWING NO.: 472-3562 / REV: E
TOTAL QTY IN DUMMY	1	WEIGHT: CLEAR ANODIZE	ENGINEER: J. WANG	DATE: 1/11/2012	SCALE: 3.000

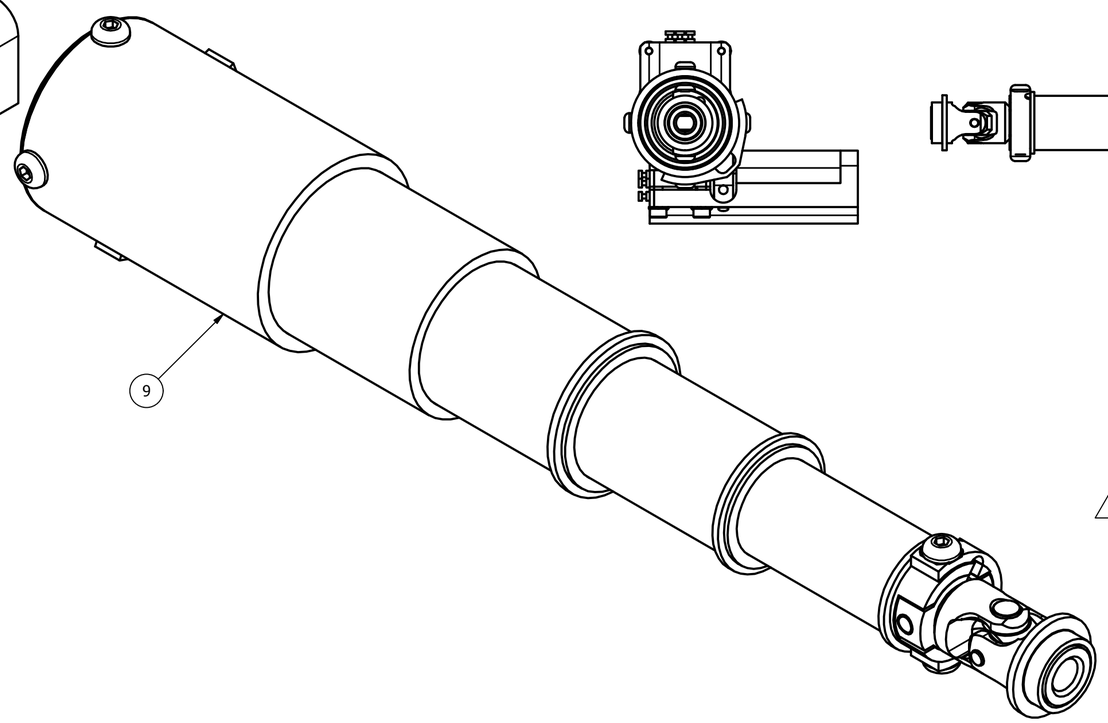
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1IRM103 RB FOR THOR-M	10/7/2011	BK
	B	MADE ITEMS 9 AND 2 VISIBLE IN PARTS LIST	6/8/2011	JBH
	C	REDESIGN PARTS FOR NEW LOCATION; ADD 8X LOCK WASHERS; 8X M2 X 8 SHCS WERE M2 X 6 BHCS	10/11/2012	BK
	D	5000456 WAS 5000600	12/17/2012	BK
	E	REVISED ITEM #9 SA572-S114 - IRTRACC CHEST, THOR-M	6/2/2014	DW
	F	REVISED ITEM #1 - 472-3571 - LOWER IRTRACC BASE, & ITEM #9 - SA572-S114 - IRTRACC CHEST	2/14/2017	DW











SCALE 2.000

ITEM	QTY	PART NUMBER	DESCRIPTION
12	8	5001216	M2 SPLIT LOCK WASHER SS
11	8	5000083	M2 X 0.4 X 8 LG. SHCS
10	1	5000456	M2.5 X 0.45 X 10 LG. SHCS
9	1	SA572-S117	IRTRACC CHEST
8	2	5000578	M2.5 X 0.45 X 3 LG. SSCP
7	2	472-3554	CLAMP, IRTRACC
6	1	472-3553	ADAPTOR, SERVO/IRTRACC
5	1	472-3552	IRTRACC ARM MOUNTING BRACKET, RIGHT
4	2	5000378	M3 FLAT WASHER LARGE OD SS
3	2	9002201	FLANGE BEARING (1/4" O.D. x 1/8" I.D.)
2	2	SA572-S114	ROTARY POTENTIOMETER
1	1	472-3571	LOWER IRTRACC BASE

PARTS LIST

C D E B B

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ±0.5	±0.5°	1.6
X.X ±0.2		
X.XX ±0.1		
X.XXX ±0.01		

REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

472-3000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

PROJECT NO.:

MATERIAL:

DRAWN BY: B. KIMES — DATE: 10/7/2011

HEAT TREAT:

CHECKED BY: — DATE:

FINISH:

ENGINEER: J. WANG — DATE: 1/11/2012

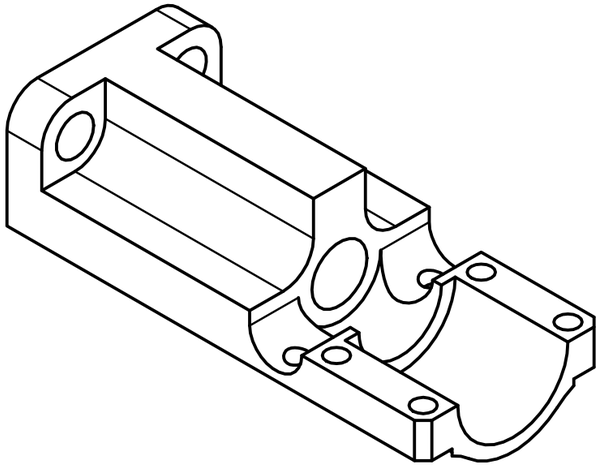
DESCRIPTION: IRTRACC ASSEMBLY, LOWER RIGHT THOR-50M

SIZE: A2 — SHEET 1 OF 1 — DRAWING NO.: 472-3570 — REV: F

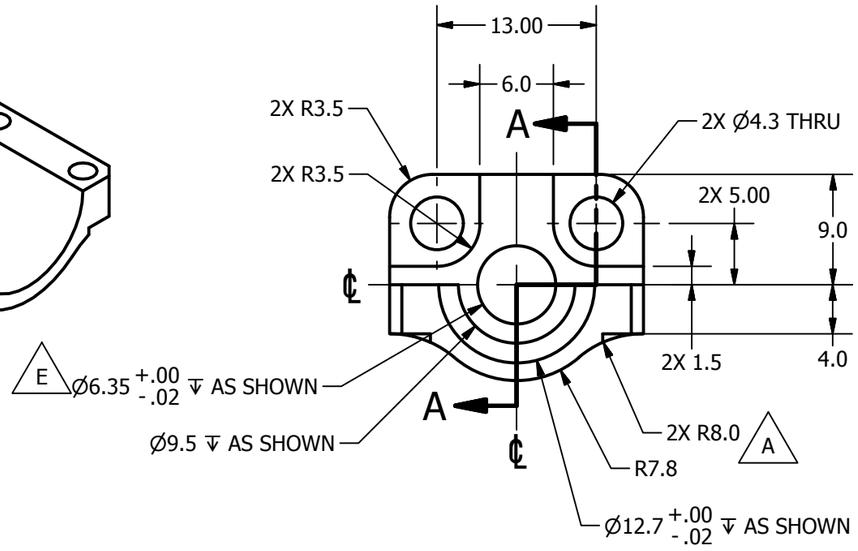
SCALE: 1.000

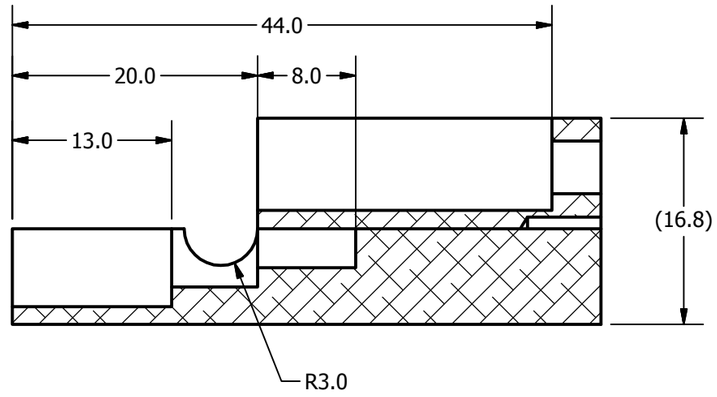
472-3570 Mod.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1IRM111 R01 FOR THOR-M 2.3 DIA. HOLES WERE M2 THREADED; 2X R8.0 WAS R4.8; FINISH WAS RED ANODIZE	10/6/2011	BK
	B	Ø4.8 WAS Ø4.3; ADD 2X 1.0 X 45° CHAMFERS	10/11/2012	BK
	C	CORRECT DIMENSIONING ERROR; REDIMENSION 4X COUNTERBORE SLOTS	12/12/2012	BK
	D	ADDED VIEW B-B, HOLE Ø2.55 +.10/-.00 ↧ 6.00, & 2X Ø2.4 THRU; TITLE WAS UPPER IRTACC BASE	7/6/2017	DW
	E	DIMENSION Ø6.35 +.00/-.02 THRU WAS Ø6.35 +.00/+.02 THRU; DIMENSION 2X Ø2.55 +.01/-.00 ↧ 6.0 WAS 2X Ø2.55 +.10/-.00 ↧ 6.0	2/22/2018	DW

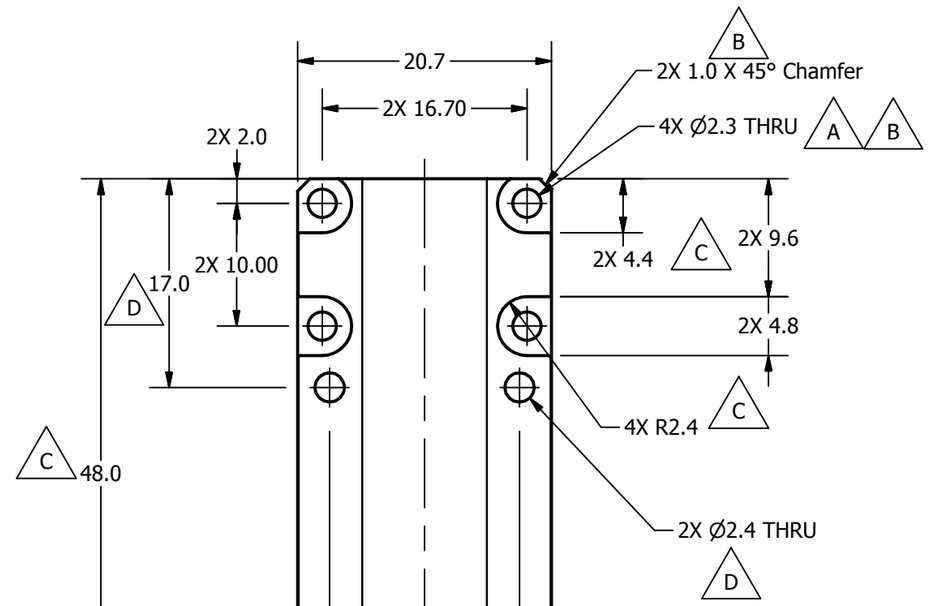


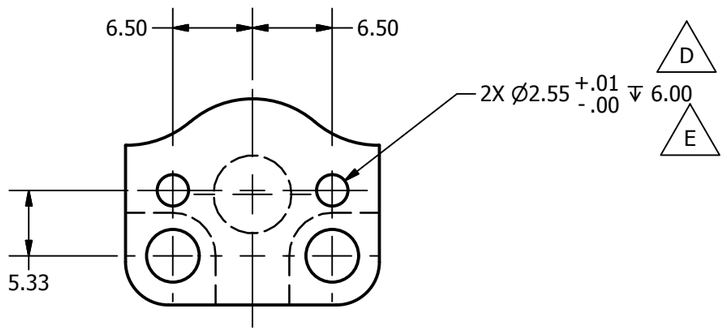
SCALE 2.0





SECTION A-A
SCALE 2.0





D VIEW B-B
SCALE 2.0

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE OTHERWISE NOTED.

472-3560	1	PROJECT NO.:	DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01 ANGLES ± 0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES
472-3550	1	MATERIAL: 7075-T6 ALUMINUM	DRAWN BY: B. KIMES	DATE: 10/6/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:
TOTAL QTY IN DUMMY	2	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG	DATE: 1/11/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

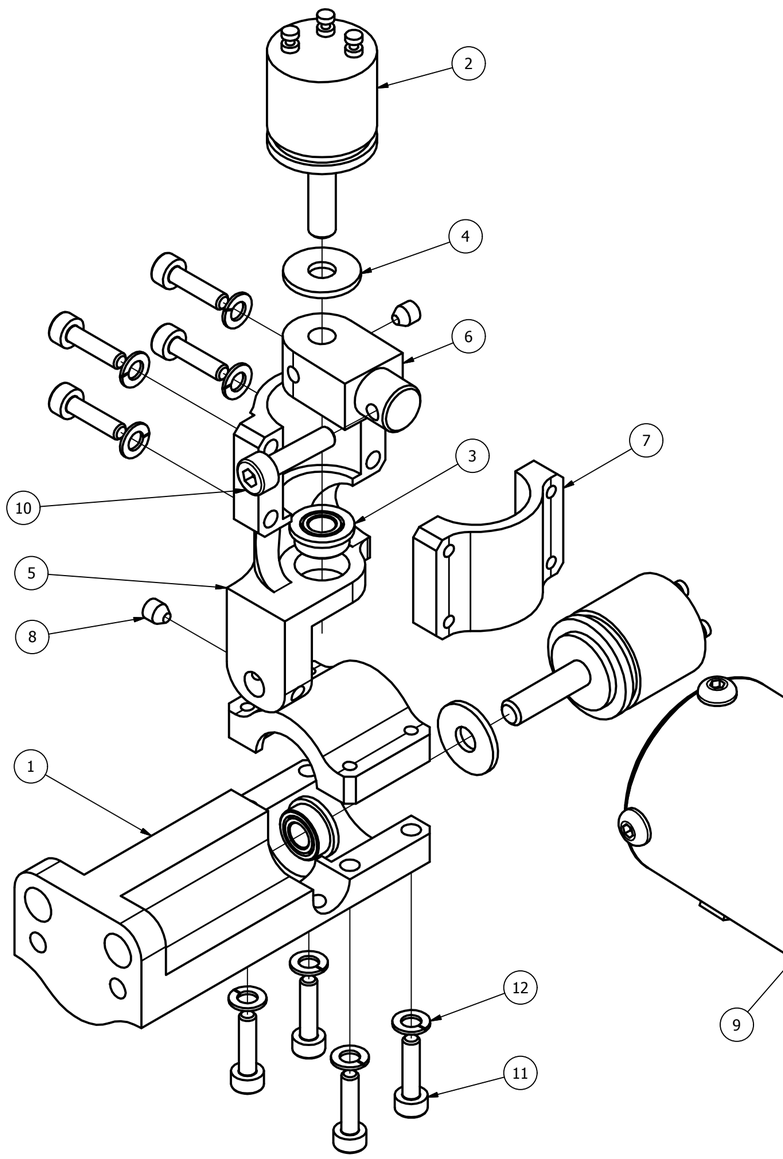
DESCRIPTION: LOWER IRTRACC BASE

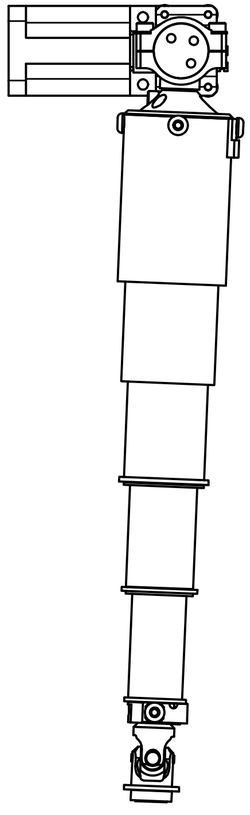
SIZE: A3 | SHEET: 1 OF 1 | DRAWING NO.: 472-3571 | REV: E

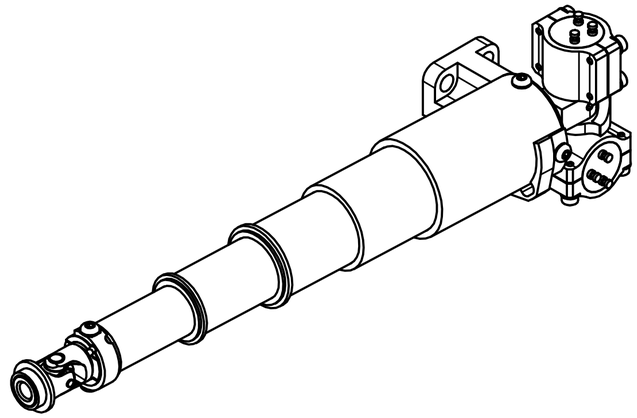
SCALE: 2.000

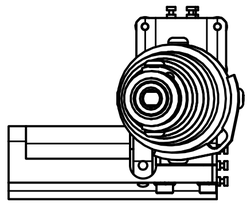
472-3571.ipt

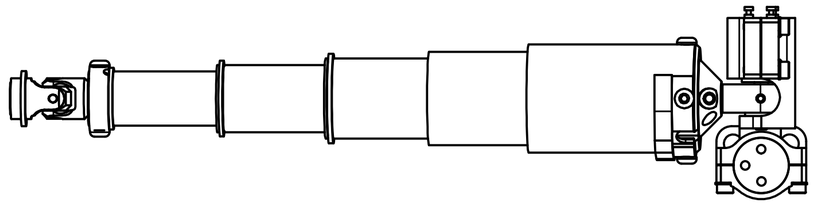
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1IRM104 RA FOR THOR-M	10/27/2011	BK
	B	MADE ITEMS 9 AND 2 VISIBLE IN PARTS LIST	6/8/2012	JBH
	C	REDESIGN PARTS FOR NEW LOCATION; ADD 8X LOCK WASHERS; 8X M2 X 8 SHCS WERE M2 X 6 BHCS	10/11/2012	BK
	D	5000456 WAS 5000600	12/17/2012	BK
	E	REVISED ITEM #9 SA572-S117 - IRTRACC CHEST, THOR-M	6/2/2014	DW
	F	REVISED ITEM #1 - 472-3571 - LOWER IRTRACC BASE, & ITEM #9 - SA572-S117 - IRTRAC CHEST	2/14/2017	DW











SCALE 2.000

ITEM	QTY	PART NUMBER	DESCRIPTION
12	8	5001216	M2 SPLIT LOCK WASHER SS
11	8	5000083	M2 X 0.4 X 8 LG. SHCS
10	1	5000456	M2.5 X 0.45 X 10 LG. SHCS
9	1	SA572-S117	IRTRACC CHEST
8	2	5000578	M2.5 X 0.45 X 3 LG. SSCP
7	2	472-3554	CLAMP, IRTRACC
6	1	472-3553	ADAPTOR, SERVO/IRTRACC
5	1	472-3562	IRTRACC ARM MOUNTING BRACKET, LEFT
4	2	5000378	M3 FLAT WASHER LARGE OD SS
3	2	9002201	FLANGE BEARING (1/4" O.D. x 1/8" I.D.)
2	2	SA572-S114	ROTARY POTENTIOMETER
1	1	472-3571	LOWER IRTRACC BASE

PARTS LIST

472-3000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01
ANGLES ± 0.5
FINISH 1.6

REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:

MATERIAL:

HEAT TREAT:

FINISH:

DRAWN BY: B. KIMES — DATE: 10/27/2011

CHECKED BY: — DATE:

ENGINEER: J. WANG — DATE: 1/11/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

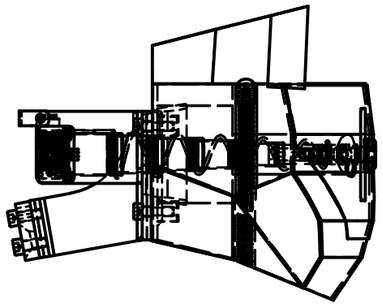
DESCRIPTION: IRTRACC ASSEMBLY, LOWER LEFT THOR-50M

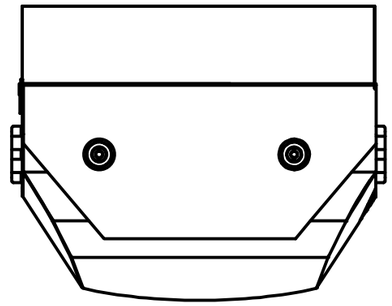
SIZE: A2 | SHEET: 1 OF 1 | DRAWING NO.: 472-3580 | REV: F

SCALE: 1.000

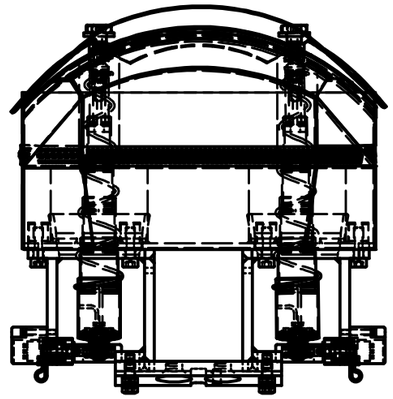
472-3580 Mod.iam

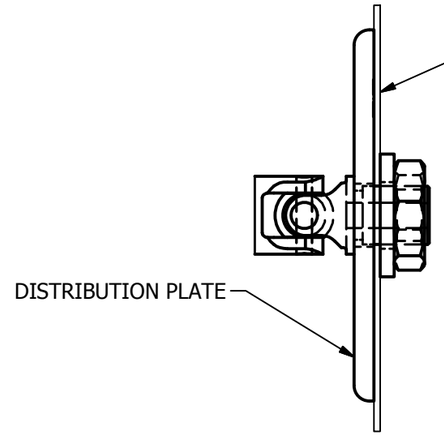
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	ADDED NOTE TO ATTACH FOAMS USING DOUBLE SIDED TAPE	8/23/2011	DW
	B	UPDATED TO SHOW PROPER VELCRO LOCATIONS	4/23/2012	BK
	C	ADD VIEW Z	6/25/2012	BK
	D	5000081 WAS 5000457	7/19/2012	BK
	E	ADD 5001415 QTY 2; UPDATE VIEW	2/14/2013	BK
	F	REMOVED ITEM 18 - PART #5001415	8/14/2014	DW
	G	ADDED NOTE TO ATTACH FOAMS USING DOUBLE SIDED TAPE	8/25/2015	DW
	H	QTY. FOR ITEM #7, 500103 WAS 12	5/9/2017	DW



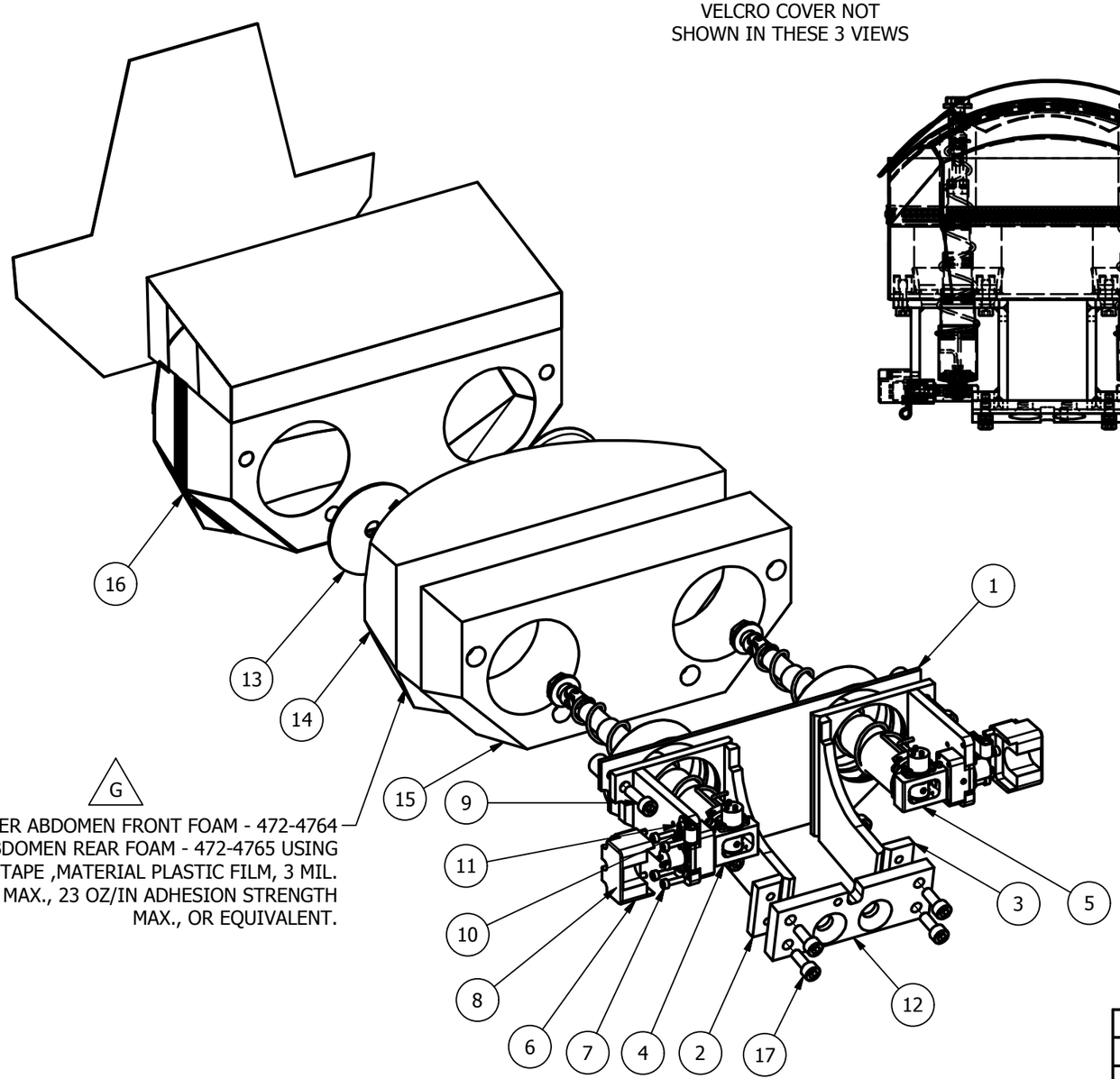


VELCRO COVER NOT SHOWN IN THESE 3 VIEWS





VIEW Z
SCALE 1.000



G

ATTACH LOWER ABDOMEN FRONT FOAM - 472-4764 TO LOWER ABDOMEN REAR FOAM - 472-4765 USING DOUBLE SIDED TAPE ,MATERIAL PLASTIC FILM, 3 MIL. THICKNESS MAX., 23 OZ/IN ADHESION STRENGTH MAX., OR EQUIVALENT.

ITEM	QTY	PART NUMBER	DESCRIPTION
17	4	5000081	SCREW, SHCS M6x1 x 16
16	1	472-4763	LOWER ABDOMEN BAG, SEWING ASSEMBLY
15	1	472-4765	LOWER ABDOMEN REAR FOAM LAYER
14	1	472-4764	LOWER ABDOMEN FRONT FOAM LAYER
13	2	472-4762	LOWER ABDOMEN DISTRIBUTION PLATE
12	1	472-4761	REAR ATTACHMENT PLATE
11	2	5000388	M3 X 0.5 X 8 LG. SHCS
10	2	6004191	3/16 CABLE CLAMP
9	4	5000001	M6 X 1 X 20 LG. SHCS
8	6	5000312	M3 X 0.5 X 20 LG. SHCS
7	8	5001103	M3 X 0.5 X 12 LG. SHCS
6	2	472-4760	POTENTIOMETER COVER
5	1	472-4730-2	3D IRTRACC ASS'Y, RIGHT, THOR-50M ABDOMEN
4	1	472-4730-1	3D IRTRACC ASS'Y, LEFT, THOR-50M ABDOMEN
3	1	472-4720-2	ATTACH BRACKET WELD ASS'Y. RIGHT
2	1	472-4720-1	ATTACH BRACKET WELD ASS'Y, LEFT
1	1	472-4710	INTERNAL MOUNTING WELD ASSEMBLY

PARTS LIST

472-3000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5' 1.6
X.X ± 0.2
X.XX ± 0.1
X.XXX ± 0.01
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:
DRAWN BY: dwashenko DATE: 8/23/2011
CHECKED BY: DATE:
ENGINEER: J. WANG DATE: 1/11/2012

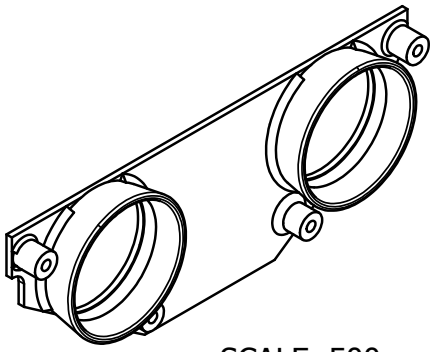
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: LOWER ABDOMEN MECHANICAL ASS'Y THOR-50M

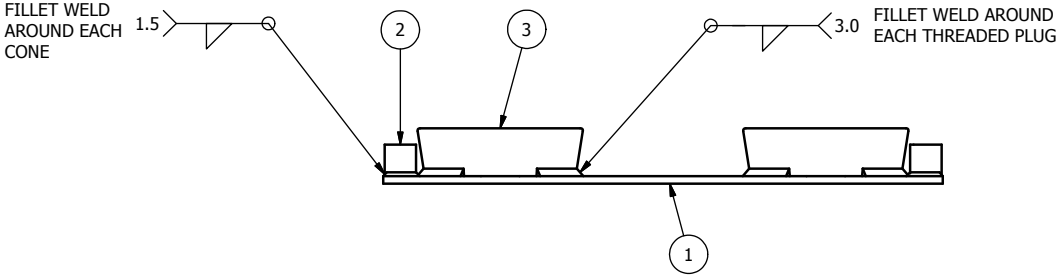
SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-4700 REV: H
SCALE: .750

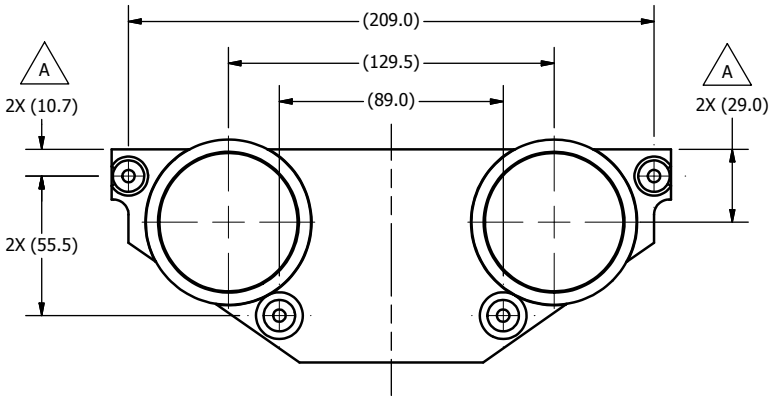
472-4700.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1LAM080 R04 AND CONVERTED TO METRIC FOR THOR-M; ADD NOTES 4 & 6; 2X (10.7) WAS 9.7, 2X (29.0) WAS 28.0	8/22/2011	DW

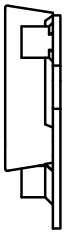


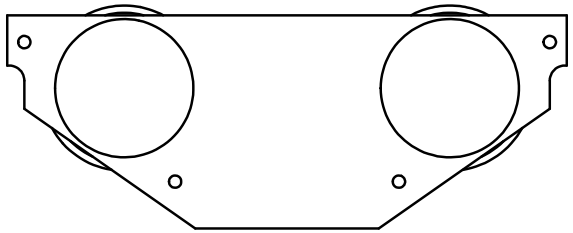
SCALE .500





DIMENSIONS SYMMETRIC ABOUT CENTERLINE





NOTES:

1. 472-4713 PARTS WILL OVERHANG 472-4711 PLATE SLIGHTLY IN SEVERAL PLACES.
2. USE M6 BOLTS TO AFFIX 472-4712 PARTS TO 472-4711 PLATE DURING WELDING.
3. CLEAR ALL HOLES OF EXCESS WELD MATERIAL.
4. (A) POWDER OR BEAD BLAST.
5. NICKEL PLATE 0.003mm-0.008mm MAX. AFTER MACHINING.
6. (A) DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

ITEM	QTY	PART NUMBER	DESCRIPTION
3	2	472-4713	FLARED OVERLOAD CONE
2	4	472-4712	THREADED PLUG
1	1	472-4711	INTERNAL PLATE

PARTS LIST

472-4700	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01. ANGLES ±0.5°. FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH: SEE NOTES

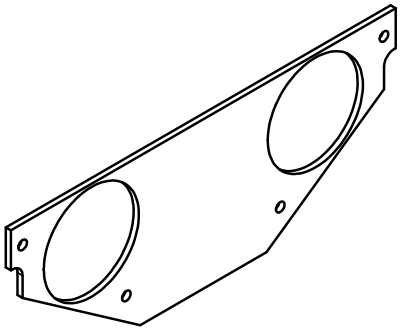
DRAWN BY: dwashenko — DATE: 8/22/2011
CHECKED BY: — DATE:
ENGINEER: D. WASHENKO — DATE: 1/11/2012

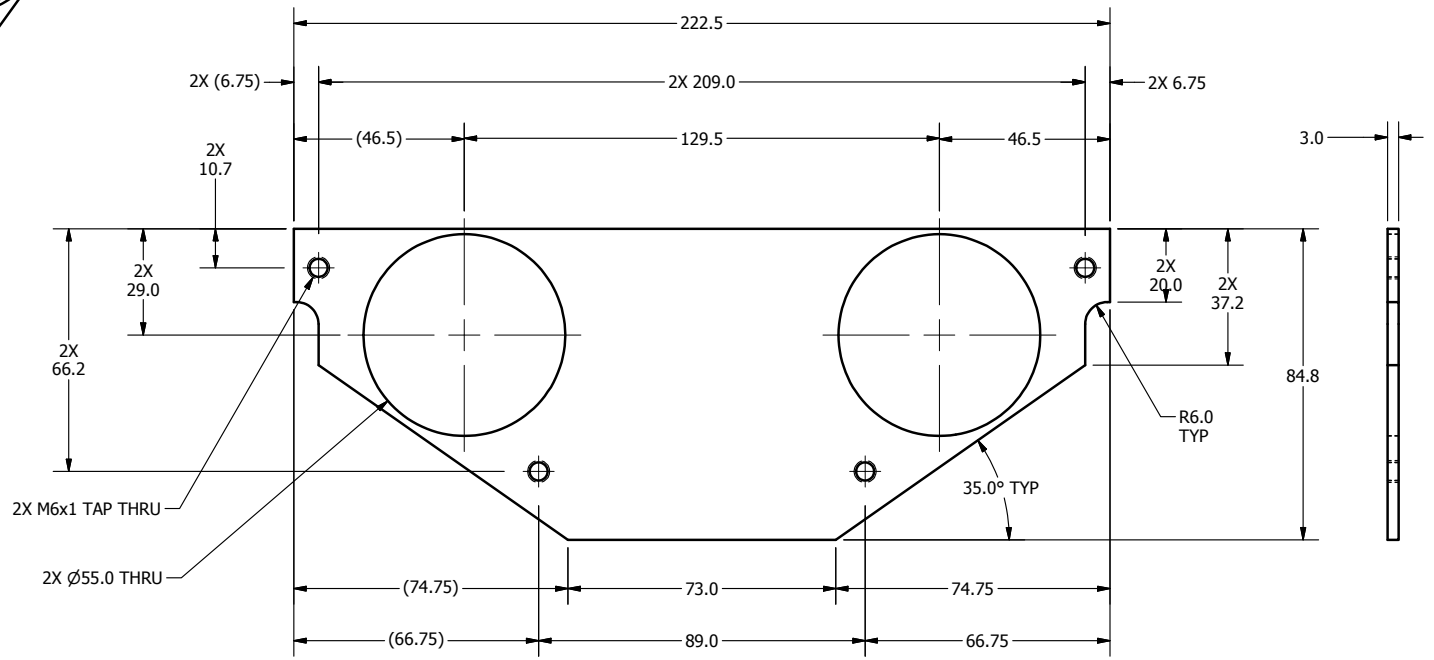
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: INTERNAL MOUNTING WELD ASSEMBLY

SIZE: A3 | SHEET: 1 OF 1 | SCALE: .500 | DRAWING NO.: 472-4710 | REV: A

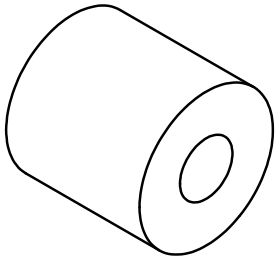
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1LAM081 R07 AND CONVERTED TO METRIC FOR THOR-M	8/22/2011	DW



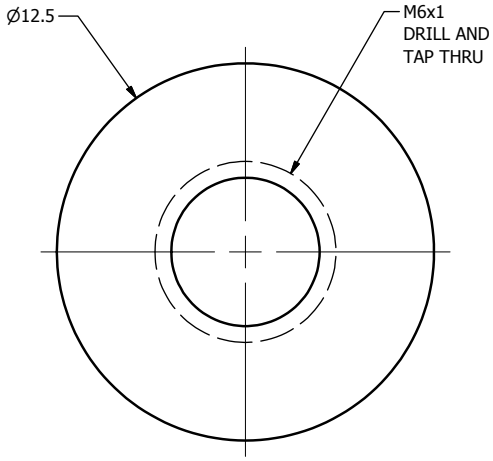


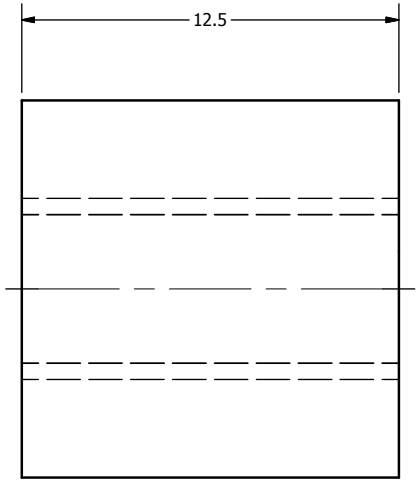
		DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION:	INTERNAL PLATE
472-4710	1	MATERIAL: 1018 STEEL	DRAWN BY: dwashenko	DATE: 8/22/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: B; SHEET: 1 OF 1; DRAWING NO.: 472-4711; REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: D.WASHENKO	DATE: 1/11/2012	SCALE: 0.750

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1LAM083 R02 AND CONVERTED TO METRIC FOR THOR-M	8/22/2011	DW



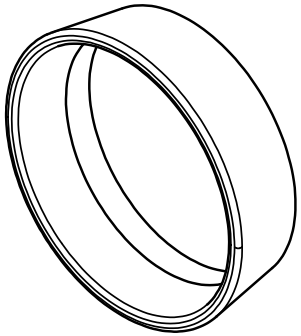
SCALE 3.0



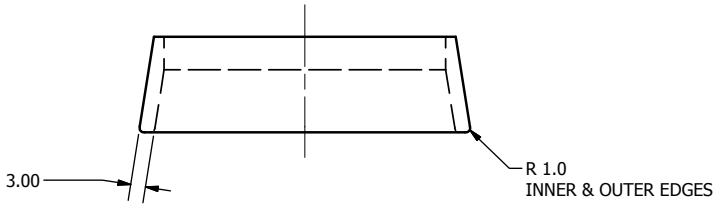


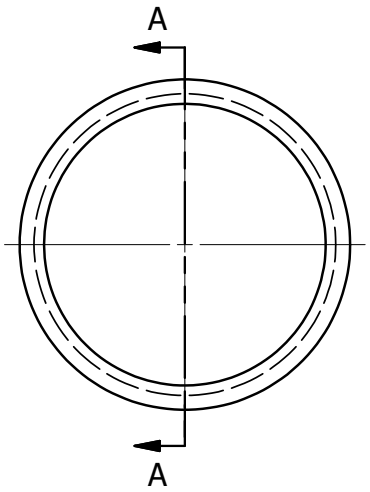
		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6		
		PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: THREADED PLUG	
472-4710	4	MATERIAL: 1018 STEEL	DRAWN BY: dwashenko	DATE: 8/22/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	4	FINISH:	ENGINEER: D. WASHENKO	DATE: 1/11/2012	SCALE: 6.000 DRAWING NO.: 472-4712 REV: A

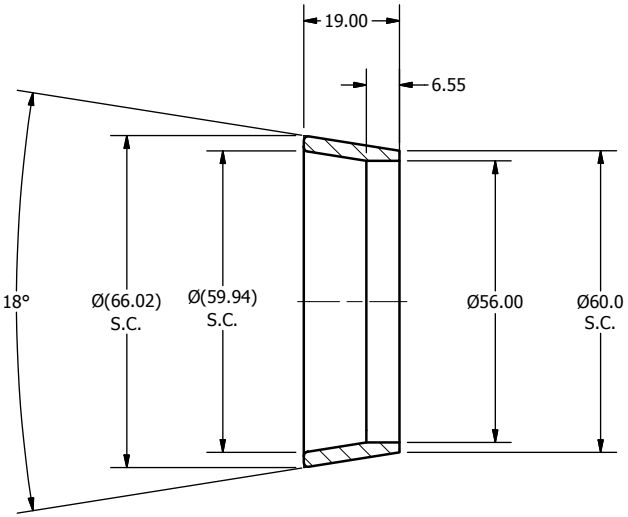
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1LAM082 R6 AND CONVERTED TO METRIC FOR THOR-M	08/30/11	DW



SCALE 1.000



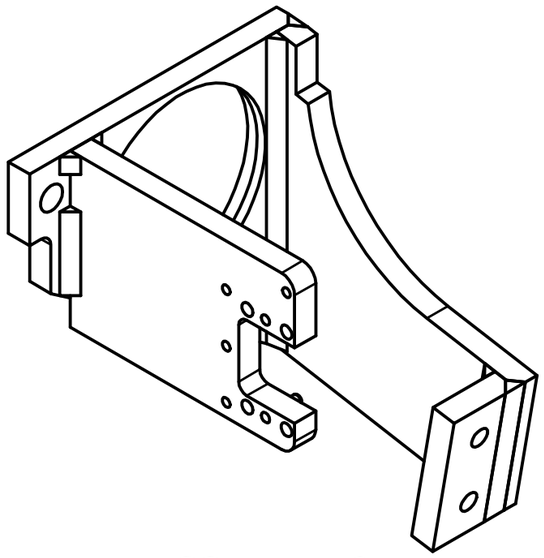




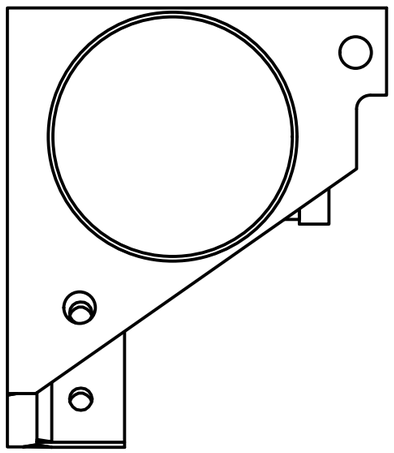
SECTION A-A
SCALE 1.000

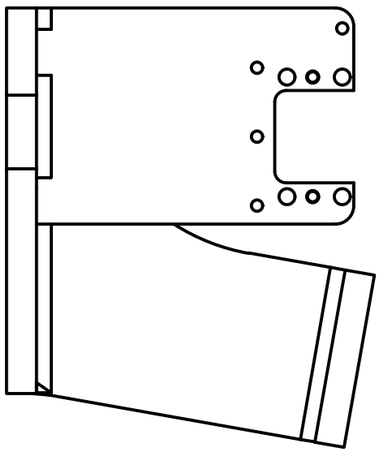
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: FLARED OVERLOAD CONE		
PROJECT NO.:		DRAWN BY: dwashenko	DATE: 6/16/2010		
472-4710	2	MATERIAL: 1018 STEEL	CHECKED BY:	DATE:	
NEXT ASSEMBLY	QTY	HEAT TREAT:	ENGINEER: D. WASHENKO	DATE: 1/11/2012	SIZE: A3 SHEET 1 OF 1 SCALE: 1.000 DRAWING NO.: 472-4713 REV: A
TOTAL QTY IN DUMMY	2	FINISH:			

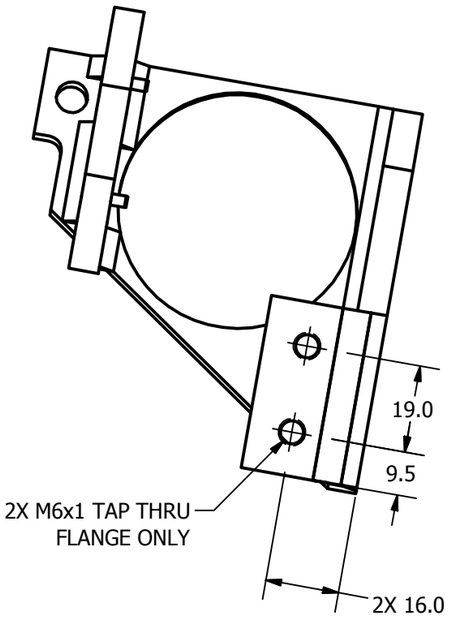
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1LAW040 R09 AND CONVERTED TO METRIC FOR THOR-M; ADD 57.0; ADD NOTES 3, 4, 5	8/22/2011	DW
	B	ADDED NOTCH TO PART #472-4721 - DGSP MOUNT	8/13/2015	DW
	C	REMOVED NOTCH FROM PART #472-4721 - DGSP MOUNT AND ADDED ITEM #5 – 5000869 – PIN, DOWEL M2.5 x 8 LG.	5/9/2017	DW

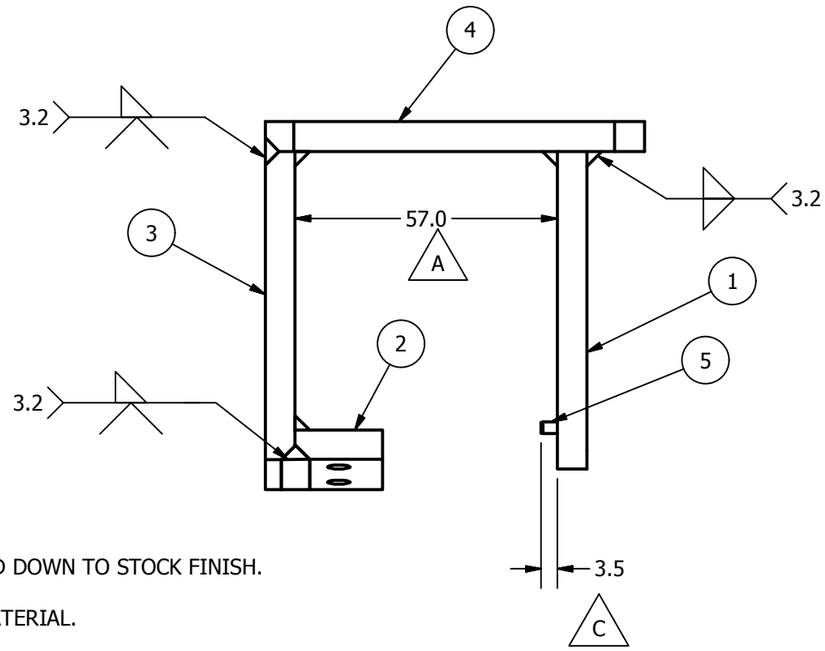


SCALE .750









NOTES:

1. EXTERIOR BUTT WELDS TO BE GROUND DOWN TO STOCK FINISH.
2. CLEAR ALL HOLES OF EXCESS WELD MATERIAL.
3. POWDER OR BEAD BLAST.
4. NICKEL PLATE 0.003mm-0.008mm MAX. AFTER MACHINING.
5. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

ITEM	QTY	PART NUMBER	DESCRIPTION
5	2	5000869	PIN, DOWEL M2.5 X 8 LG.
4	1	472-4724-1	SIDE ATTACH BRACKET FRONT LEFT PLATE
3	1	472-4723-1	SIDE BRACKET PLATE, LEFT
2	1	472-4722	SIDE BRACKET REAR FLANGE
1	1	472-4721	DGSP MOUNT

PARTS LIST

472-4700	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS: X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01. ANGLES ± 0.5°. FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH: SEE NOTES

DRAWN BY: dwashenko — DATE: 8/22/2011
CHECKED BY: — DATE:
ENGINEER: D. WASHENKO — DATE: 1/1/2012

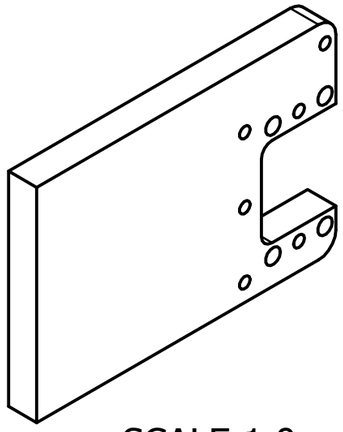
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: ATTACH BRACKET WELD ASS'Y, LEFT

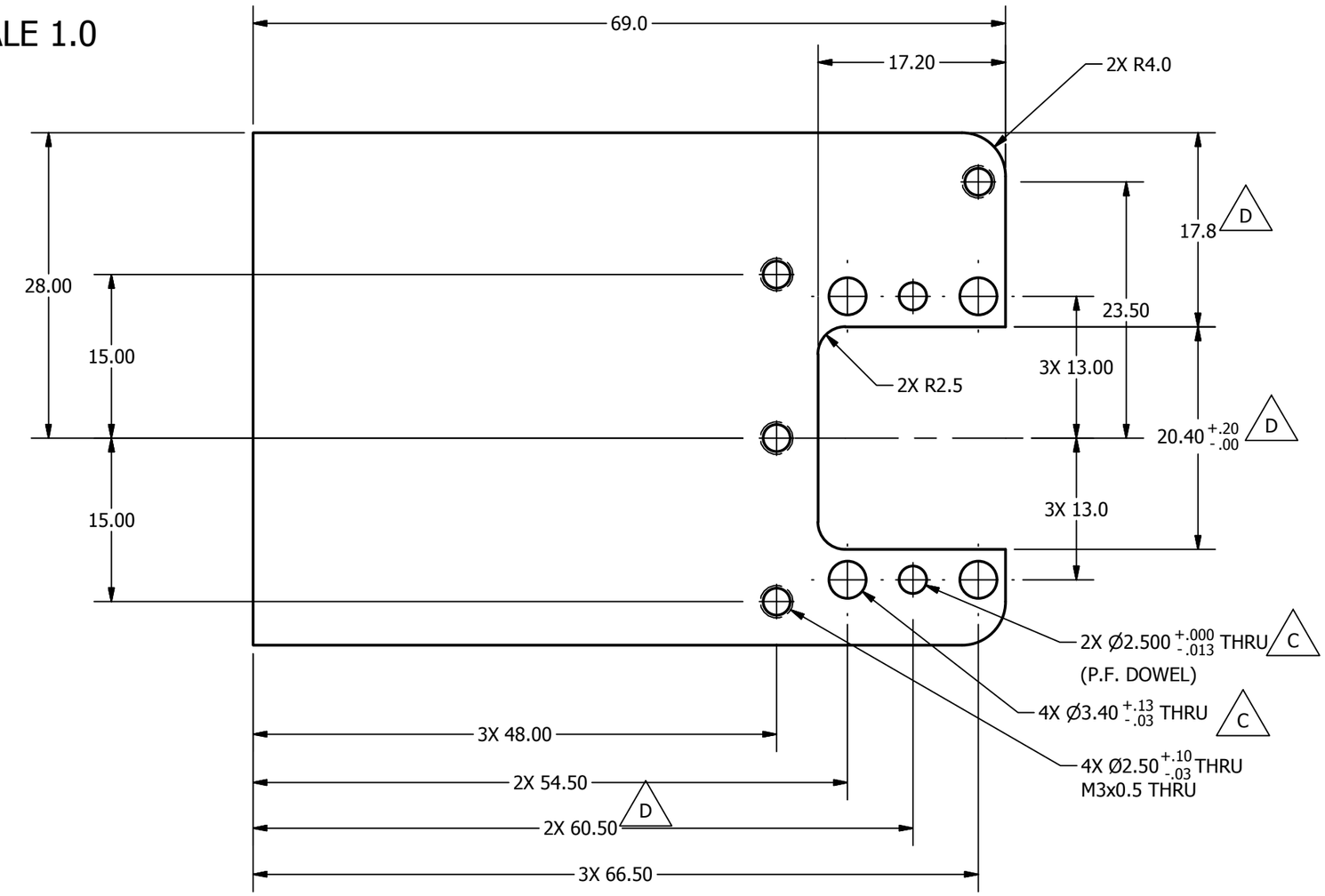
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 0.750 | DRAWING NO.: 472-4720-1 | REV: C

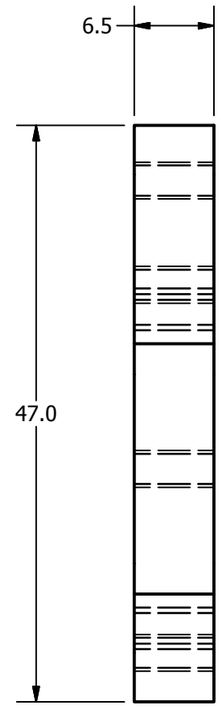
472-4720-1.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1LAM044 R3 FOR THOR-M; 18.0 WAS 17.95; 20.10 +.20/-.00 WAS 20.10 +.05/-.00; Ø3.4 WAS Ø3.18; 4X M3x.5 WAS 4X #4-40	8/22/2011	DW
	B	ADDED NOTCH IN BOTTOM	9/4/2015	DW
	C	RE-DIMENSIONED; REMOVED NOTCH IN LOWER LEFT CORNER; 4X Ø3.40 +.13/-.03 THRU WAS 6X Ø3.40 +.13/-.03 THRU: ADDED 2X Ø2.500 +.000/-.013 THRU (P.F. DOWEL)	8/7/2017	DW
	D	DIMENSION 2X 60.50 WAS 2X 60.05, 20.40 +.20/-.00 WAS 20.10 +.20/-.00, & 17.8 WAS 18.0	1/25/2018	DW



SCALE 1.0

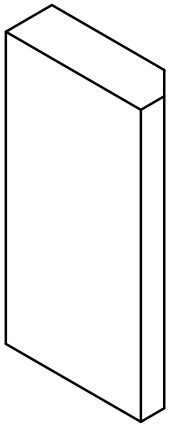




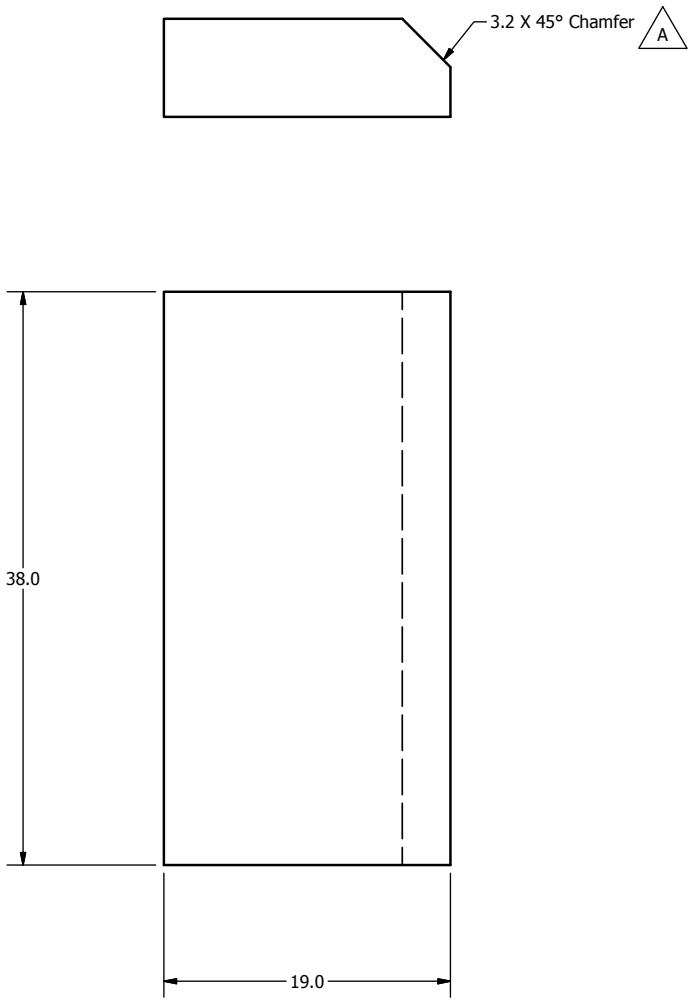
472-4720-2	1	DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
472-4720-1	1	THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01; ANGLES ± 0.5°; FINISH 1.6	DESCRIPTION: DGSP MOUNT	
NEXT ASSEMBLY	QTY	PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES		
TOTAL QTY IN DUMMY	2	MATERIAL: 1018 CRS	DRAWN BY: dwashenko; DATE: 8/22/2011	SIZE: A3; SHEET: 1 OF 1; DRAWING NO.: 472-4721; REV: D	
		HEAT TREAT:	CHECKED BY: ; DATE:		
		FINISH:	ENGINEER: D. WASHENKO; DATE: 1/12/2012	SCALE: 2.000	

472-4721.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1LAM041 R1 FOR THOR-M; ADD CHAMFER	8/31/2011	DW



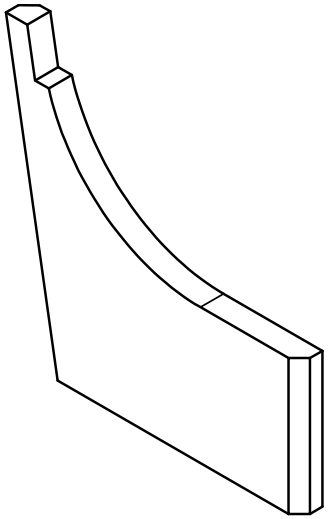
SCALE 2.000



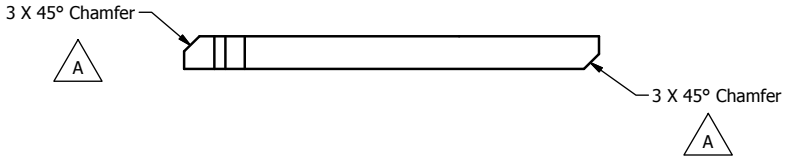
472-4720-2	1	DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
472-4720-1	1	PROJECT NO.:	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: SIDE BRACKET REAR FLANGE	
NEXT ASSEMBLY	QTY	MATERIAL: 1018 STEEL	DRAWN BY: dwashenko	DATE: 8/31/2011	
TOTAL QTY IN DUMMY	2	HEAT TREAT:	CHECKED BY:	DATE:	
		FINISH:	ENGINEER: D. WASHENKO	DATE: 1/12/2012	SIZE: A3 SHEET 1 OF 1 SCALE: 3.000 DRAWING NO.: 472-4722 REV: A

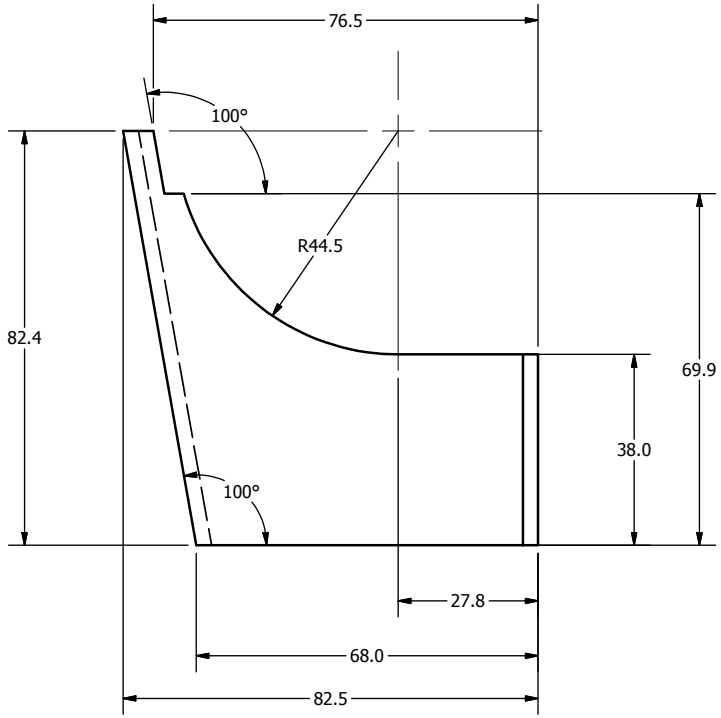
THIRD ANGLE PROJECTION

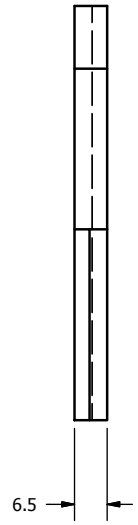
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM TILAM042 R4 FOR THOR-M; ADD CHAMFERS TO CREATE LEFT SIDE	8/31/2011	DW



SCALE 1.000

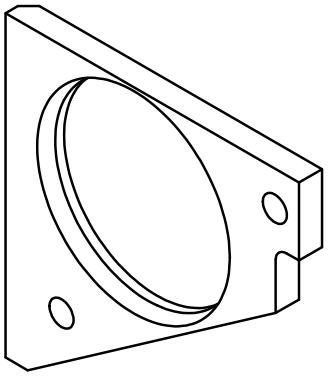




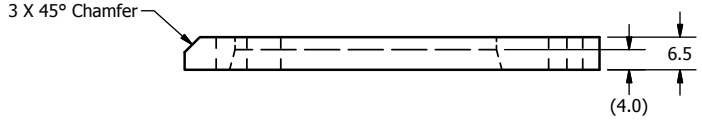


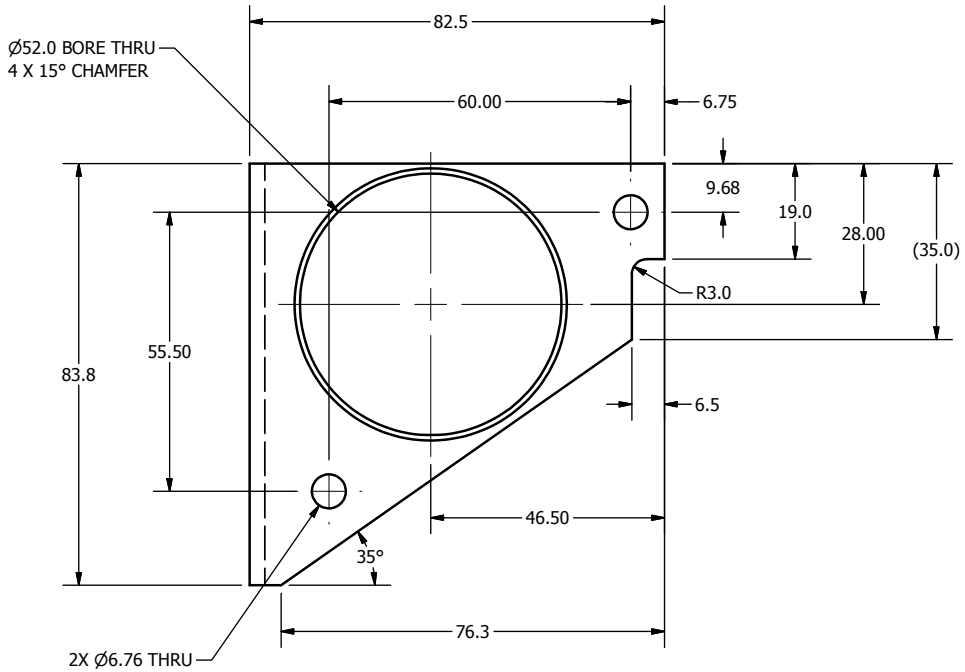
		DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: SIDE BRACKET PLATE, LEFT	
472-4720-1	1	MATERIAL: 1018 STEEL	DRAWN BY: dwashenko 8/31/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET: 1 OF 1	DRAWING NO.: 472-4723-1 REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: D. WASHENKO 1/12/2012	SCALE: 1.000	

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1LAM043L R07 FOR THOR-M	8/31/2011	DW



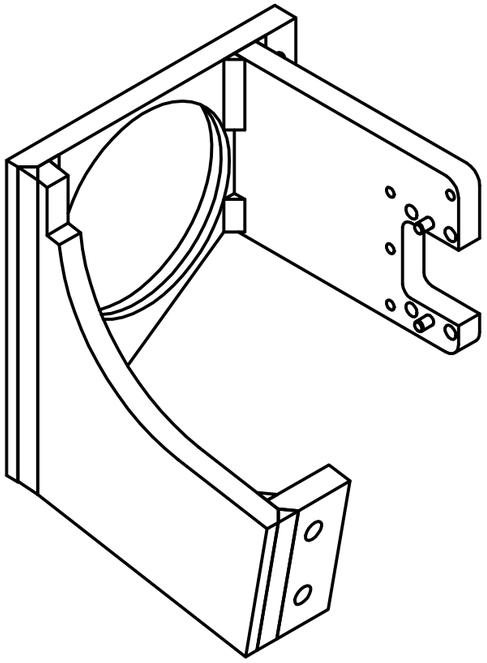
SCALE 1.000



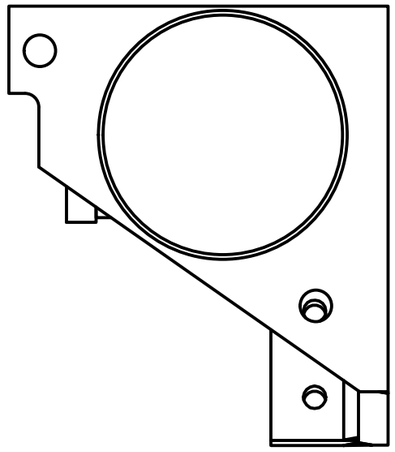


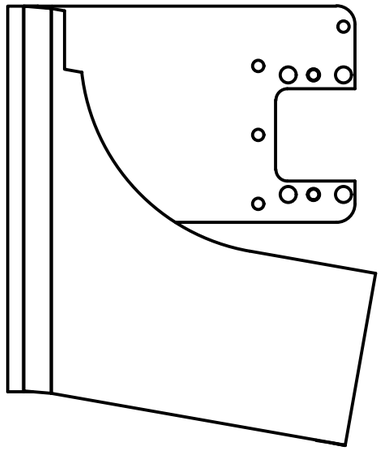
		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6		
		PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: SIDE ATTACH BRACKET FRONT LEFT PLATE	
472-4720-1	1	MATERIAL: 1018 Steel	DRAWN BY: dwashenko DATE: 8/31/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET 1 OF 1	DRAWING NO.: 472-4724-1 REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: D. WASHENKO DATE: 1/12/2012	SCALE: 1.000	

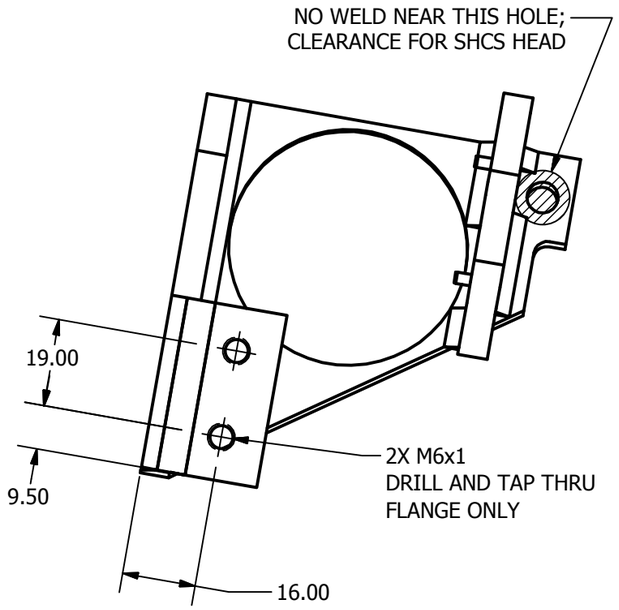
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1LAW060 R9 FOR THOR-M; ADD NOTES 3, 4, 5	8/22/2011	DW
	B	ADDED NOTCH TO PART #472-4721 - DGSP MOUNT	8/13/2015	DW
	C	RE-DIMENSIONED; REMOVED NOTCH IN LOWER LEFT CORNER; 4X Ø3.40 +.13/-.03 THRU WAS 6X Ø3.40 +.13/-.03 THRU: ADDED 2X Ø2.55 +.01/-.00 THRU	2/10/2017	DW

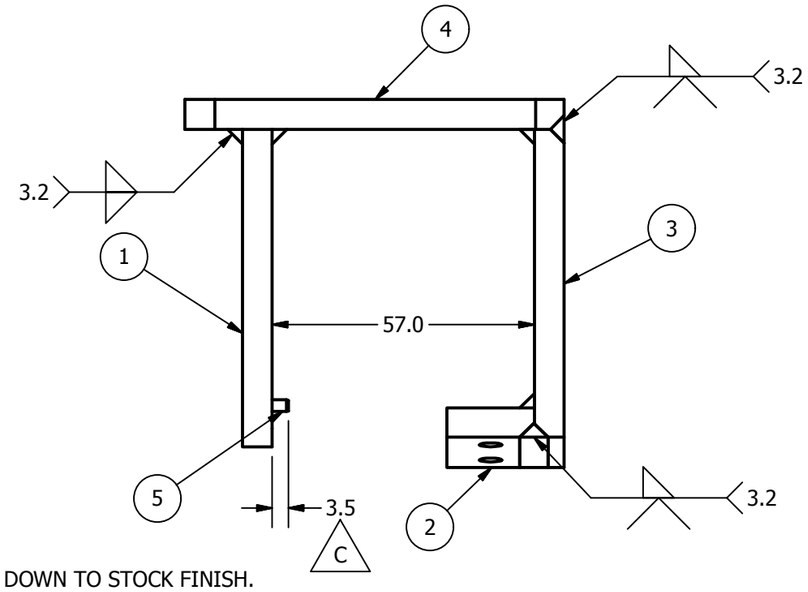


SCALE .750









NOTES:

1. EXTERIOR BUTT WELDS TO BE GROUND DOWN TO STOCK FINISH.
2. CLEAR ALL HOLES OF EXCESS WELD MATERIAL.
3. POWDER OR BEAD BLAST.
4. NICKEL PLATE 0.003mm-0.008mm MAX. AFTER MACHINING.
5. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

ITEM	QTY	PART NUMBER	DESCRIPTION
5	2	5000869	PIN, DOWEL M2.5 X 8 LG.
4	1	472-4724-2	SIDE ATTACH BRACKET FRONT RIGHT PLATE
3	1	472-4723-2	SIDE BRACKET PLATE, RIGHT
2	1	472-4722	SIDE BRACKET REAR FLANGE
1	1	472-4721	DGSP MOUNT

PARTS LIST

472-4700	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01 — ANGLES ± 0.5° — FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH: SEE NOTES

DRAWN BY: dwashenko — DATE: 8/22/2011
CHECKED BY: — DATE:
ENGINEER: D. WASHENKO — DATE: 1/11/2012

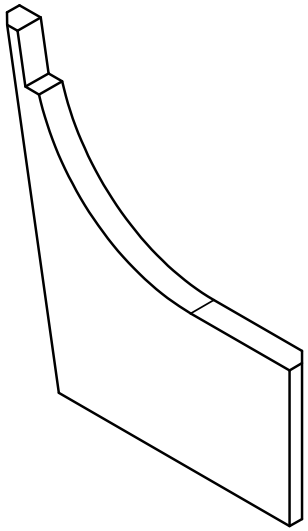
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: ATTACH BRACKET WELD ASS'Y. RIGHT

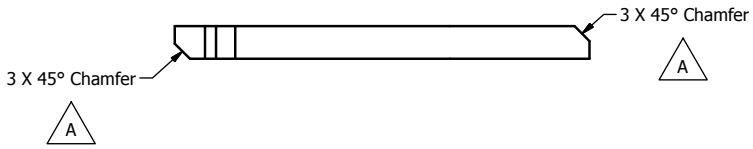
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 0.750 | DRAWING NO.: 472-4720-2 | REV: C

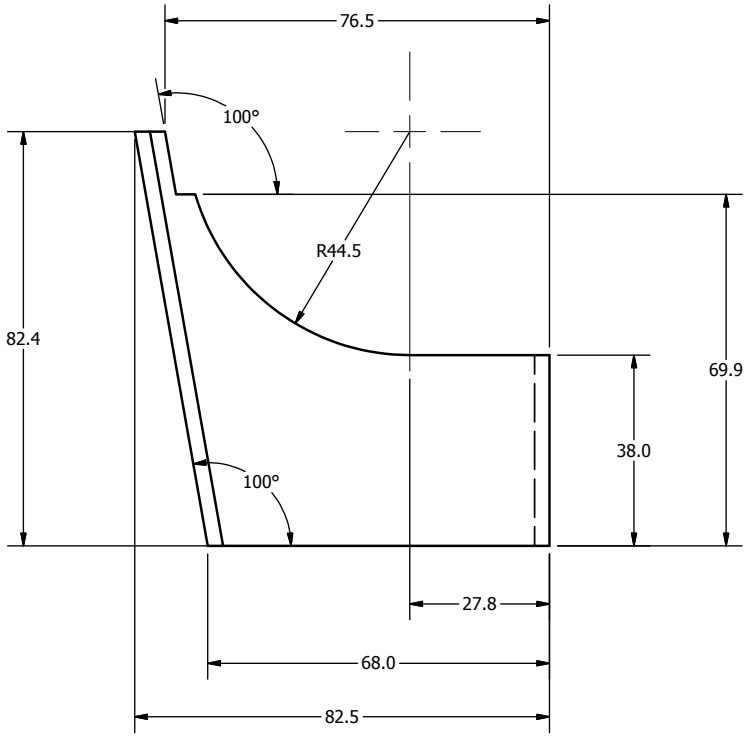
472-4720-2.iam

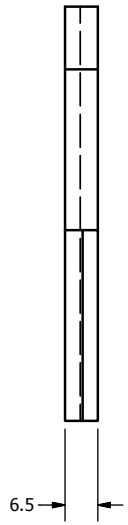
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM TILAM042 R4 FOR THOR-M; ADD CHAMFERS TO CREATE RIGHT SIDE	8/31/2011	DW



SCALE 1.000

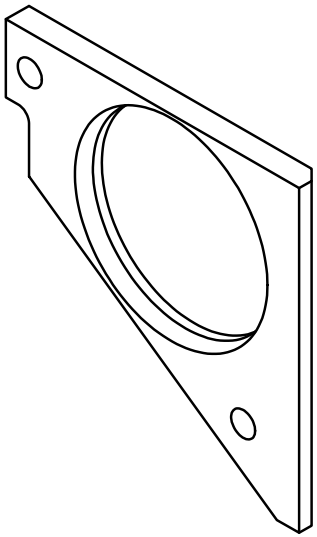




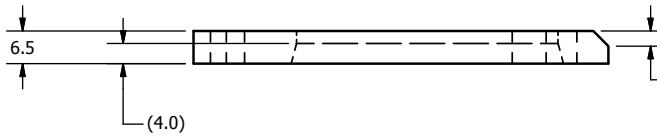


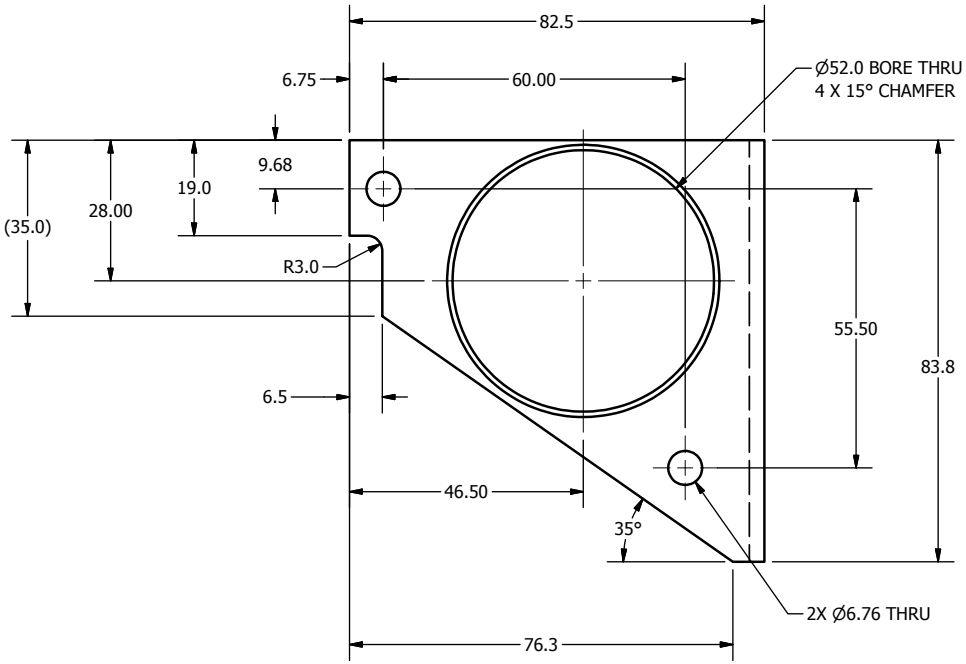
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: SIDE BRACKET PLATE, RIGHT		
PROJECT NO.:		DRAWN BY: dwashenko	DATE: 8/31/2011	SIZE: A3	DRAWING NO.: 472-4723-2
472-4720-2	1	MATERIAL: 1018 STEEL	CHECKED BY:	DATE:	SHEET 1 OF 1
NEXT ASSEMBLY	QTY	HEAT TREAT:	ENGINEER: D. WASHENKO	DATE: 1/12/2012	SCALE: 1.000
TOTAL QTY IN DUMMY	1	FINISH:			REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1LAM043R R7 FOR THOR-M	9/1/11	DW



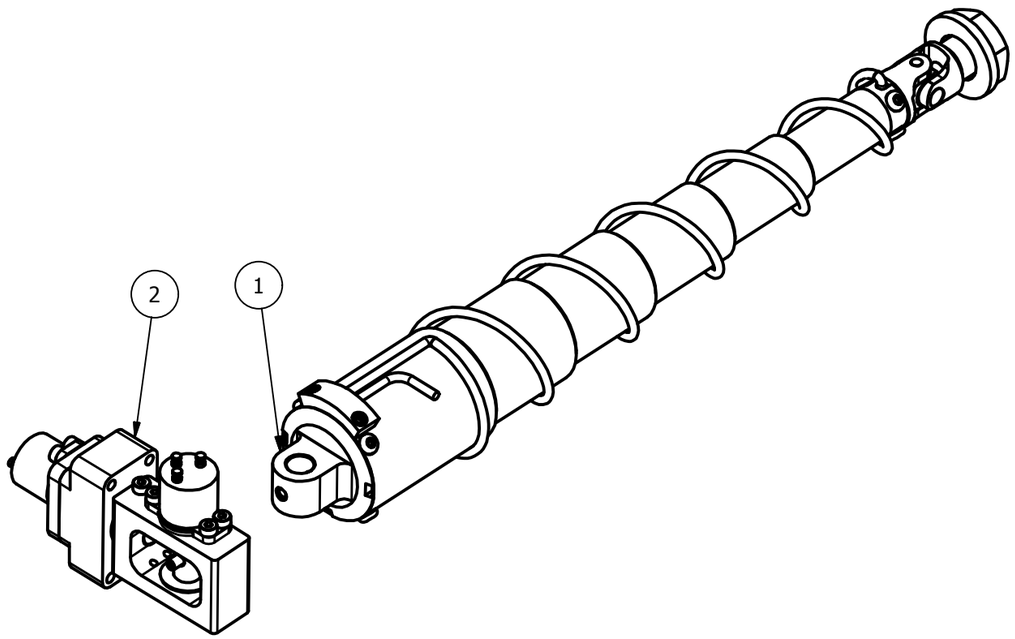
SCALE 1.000



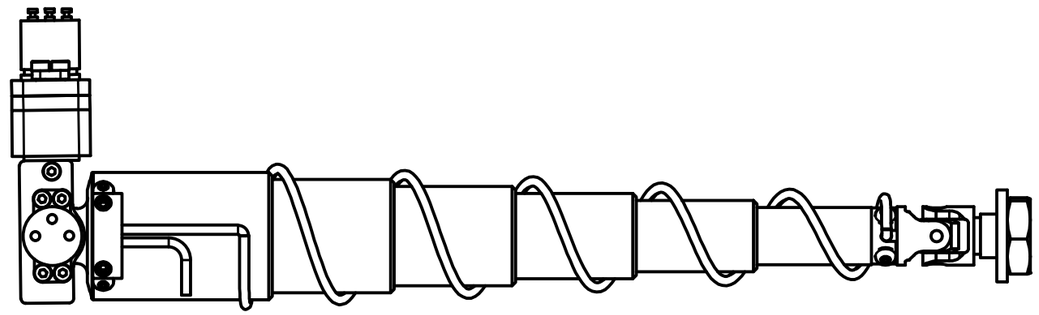


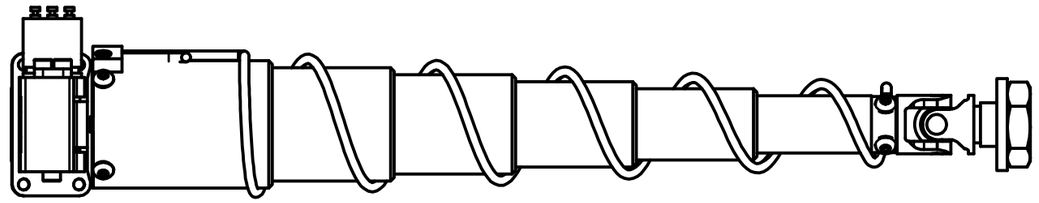
DO NOT SCALE DRAWING		TOLERANCES		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6			
PROJECT NO.:		REMOVE BURRS & BREAK SHARP EDGES		DESCRIPTION: SIDE ATTACH BRACKET FRONT RIGHT PLATE	
472-4720-2	1	MATERIAL: 1018 STEEL	DRAWN BY: d washenko	DATE: 7/2/2010	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: D. WASHENKO	DATE: 1/12/2012	SCALE: 1.000 DRAWING NO.: 472-4724-2 REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED AS NEW ASSEMBLY FOR THOR-M	8/23/2011	DW
	B	MADE PARTS UNTESTED	6/8/2012	JBH



SCALE .750





NOTES:

1. ASSEMBLE IRTRACC TO PIVOT ASSEMBLY AS SHOWN.

2. PROVIDE INDIVIDUAL CERT SHEETS FOR IRTRACC AND (2) POTENTIOMETERS.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-4740-1	PIVOT ASSEMBLY, LEFT
1	1	SA572-S121	120mm IRTRACC ASSEMBLY - METRIC

B

PARTS LIST

472-4700	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5°	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:

MATERIAL:

HEAT TREAT:

FINISH:

DRAWN BY: dwashenko DATE: 8/23/2011

CHECKED BY: DATE:

ENGINEER: D. WASHENKO DATE: 1/12/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: 3D IRTRACC ASS'Y, LEFT, THOR-50M ABDOMEN

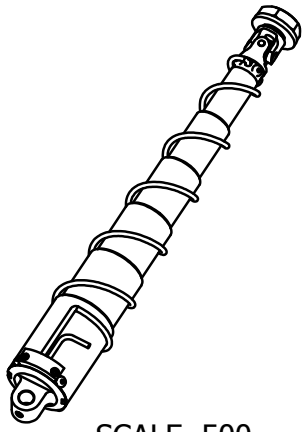
SIZE: A3 SHEET 1 OF 1 SCALE: .750

DRAWING NO.: 472-4730-1

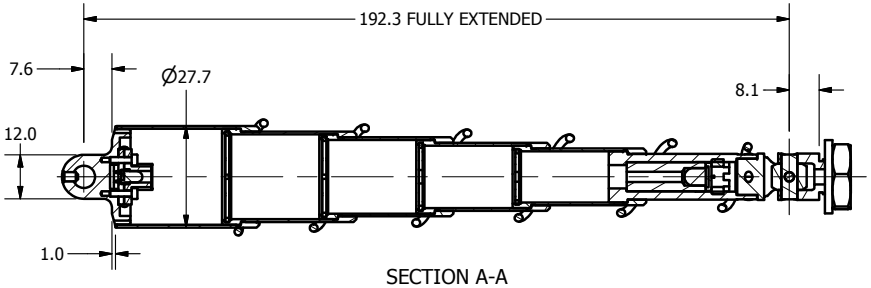
REV: B

472-4730-1.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC FOR THOR-M; MECHANICAL TRAVEL WAS 120mm; ADD COLLAPSED VIEW AND SEC B-B	8/23/2011	DW

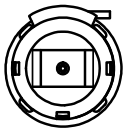


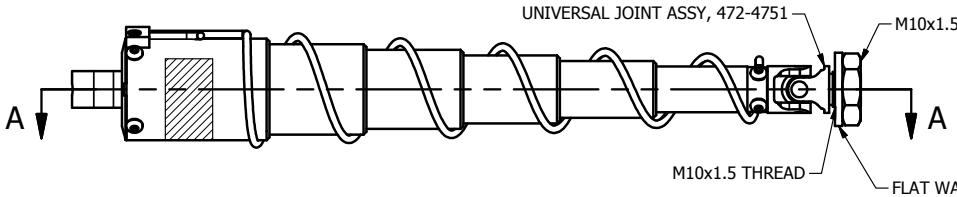
SCALE .500

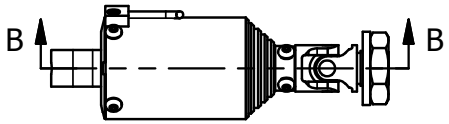


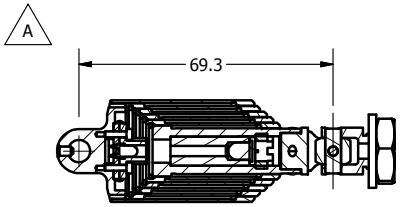
SECTION A-A
FULLY EXTENDED
SCALE 0.75

WIRE COLOR	FUNCTION
RED	+EXC
GREEN	+SIG
ORANGE	ID
SHIELD	GND
WHITE	-SIG
BLACK	-EXC









SECTION B-B
FULLY COLLAPSED
SCALE 0.75

SPECIFICATIONS:

MECHANICAL TRAVEL:	123 mm (A)
MEASURED RANGE:	105 mm
PRE/POST TRAVEL:	7.5 mm
MAXIMUM ERROR:	± 3%
INPUT VOLTAGE:	5 VOLTS (± 1%) @20mA
OUTPUT RANGE:	0 TO 4.0 VOLTS
WEIGHT:	163 g (.36 LBS) LESS MAIN CABLE

NONLINEARITY: (LINEARIZED DATA) < 2% FULL SCALE
SEE CALIBRATION REPORT FOR LINEARITY CONASTANT FIGURE.
DIMENSIONS NOT SHOWN TO BE MANUFACTURER'S STANDARDS.

NOTES:
THE IRTRACC IS AN INHERENTLY NON-LINEAR DISPLACEMENT TRANDUSCER.
AN IRTRACC'S RAW VOLTAGE VALUES MUST BE ADJUSTED BY THE APPLICATION
OF A LINEARIZTION EXPONENT APPLIED THROUGH POST TEST PROCESSING SOFTWARE IN
ORDER TO ACHIEVE ACCURATE DISPLACEMENT DATA.

472-4730-2	1	
472-4730-1	1	
NEXT ASSEMBLY	QTY	
TOTAL QTY IN DUMMY	2	

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION
PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

TOLERANCES
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01
ANGLES ±0.5°
FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

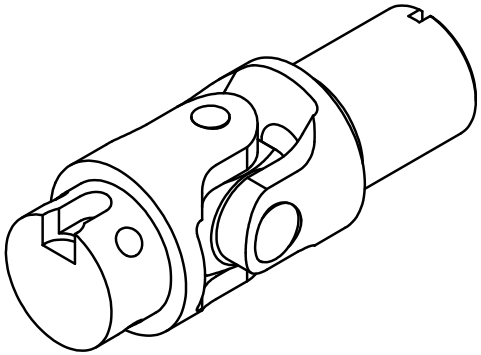
DRAWN BY: dwashenko — DATE: 8/23/2011
CHECKED BY: — DATE:
ENGINEER: D. WASHENKO — DATE: 1/12/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

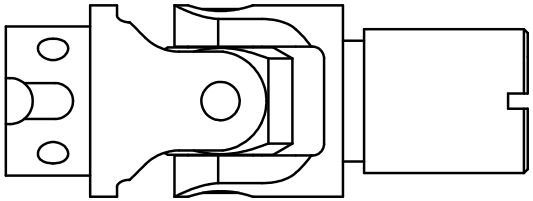
DESCRIPTION: 120mm IRTRACC ASSEMBLY - METRIC

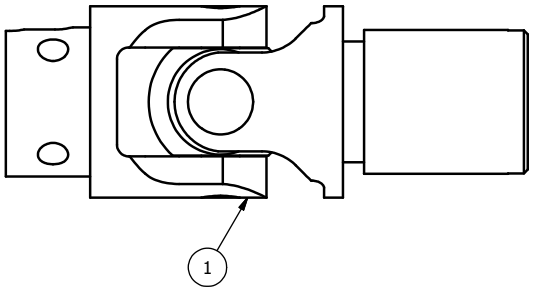
SIZE: B | SHEET: 1 OF 1 | SCALE: 0.750 | DRAWING NO.: SA572-S121 | REV: A

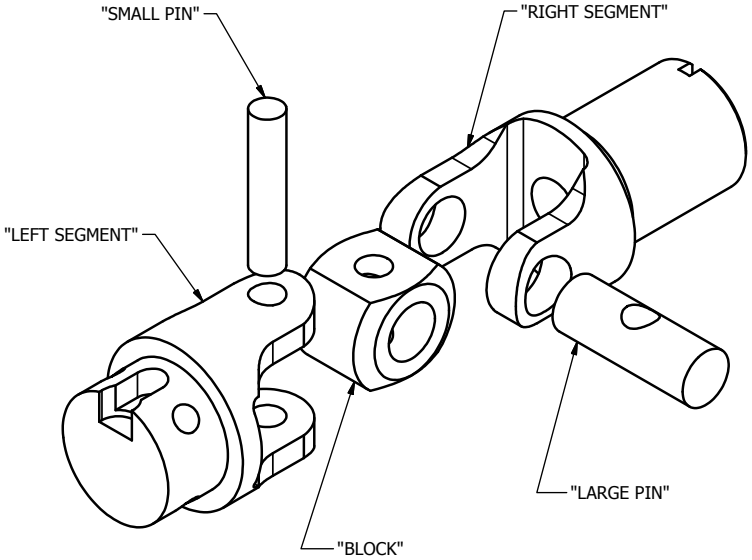
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RELEASE TO PRODUCTION; NEW VERSION BASED ON 9900	8/23/2011	DW
	B	ADD SHEET 3 WITH LEFT SEGMENT DIMENSIONS	3/8/2012	DW
	C	REMOVED PLATING; ITEM WAS UJ500	6/18/2012	MCO
	D	CHANGE UNDERCUT; Ø8.0 WAS Ø 8.5, 1.4±.13 WAS 1.0 (SHT 2)	1/10/2013	BK
	E	20.4 WAS 16.8; 12.24 WAS 8.64 (SHT 2)	2/14/2013	BK



SCALE 3.000







NOTES:

1. UNIVERSAL JOINT ASSEMBLY IS PURCHASED IN KIT FORM.
2. MODIFY "RIGHT SEGMENT" AS SHOWN ON SHEET 2.
3. MODIFY "LEFT SEGMENT" AS SHOWN ON SHEET 3.
4. NICKEL PLATE "RIGHT SEGMENT" AFTER MACHINING. 0.008mm MAXIMUM PER SIDE.
5. PREASSEMBLE UNIVERSAL JOINT WITHOUT GREASE TO VERIFY SMOOTH AND CORRECT MOVEMENT. REMOVE NICKEL PLATE MATERIAL FROM I.D. OF RIGHT SEGMENT, AS NECESSARY.
6. DISASSEMBLE JOINT ASSEMBLY. LIGHTLY GREASE AL BEARING AND CONTACT SURFACES.
7. INSTALL THE LARGE PIN THRU THE RIGHT SEGMENT AND BLOCK WITH CENTER HOLES ALIGNED.
8. ORIENT LEFT SEGMENT OVER BLOCK WITH CENTER HOLES ALIGNED AND INSTALL SMALL PIN THRU LEFT SEGMENT, BLOCK , & LARGE PIN.
9. PLACE THE ASSEMBLED JOINT ON A FLAT, HARD SURFACE AND PEEN THE ENDS OF THE SMALL PIN WITH A PUNCH AND HAMMER.

(CAUTION: DO NOT CRUSH THE YOKE OR OVER PEEN THE PIN.)

10. CHECK THE ASSEMBLY FOR CORRECT MOVEMENT. THE SMALL PIN SHOULD NOT HAVE ANY SIDE TO SIDE MOVEMENT.

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6004070	UJ500 U-JOINT KIT 1/2 OD

PARTS LIST

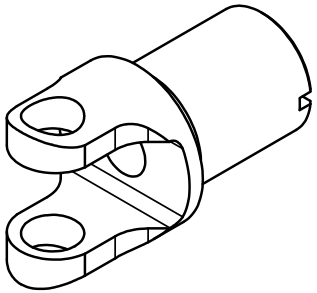
DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

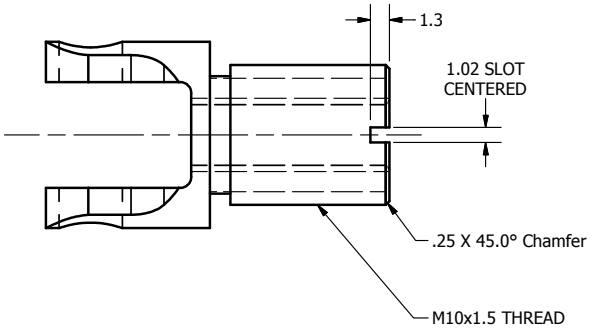
TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS — DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 — ANGLES ±0.5° — FINISH 1.6 — REMOVE BURRS & BREAK SHARP EDGES

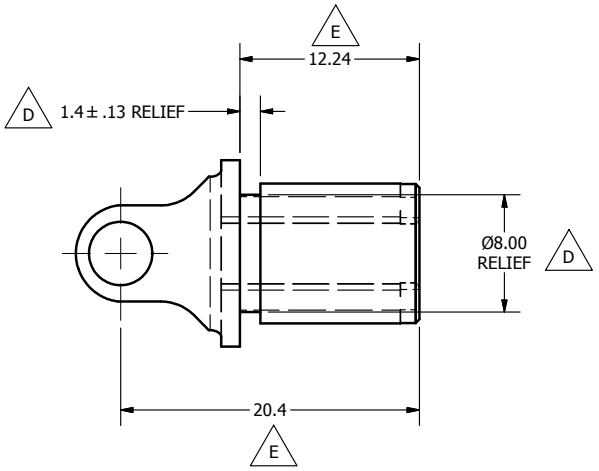
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

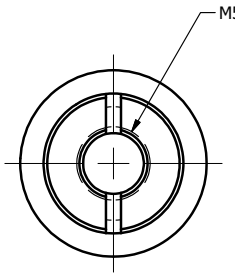
DESCRIPTION: UNIVERSAL JOINT ASSEMBLY

		PROJECT NO.:	DRAWN BY: dwashenko	DATE: 8/23/2011	
SA572-S121	1	MATERIAL:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 3 — DRAWING NO.: 472-4751 — REV: E
NEXT ASSEMBLY	QTY	HEAT TREAT:			
TOTAL QTY IN DUMMY	2	FINISH: SEE NOTES	ENGINEER: D. WASHENKO	DATE: 1/12/2012	SCALE: 3.0



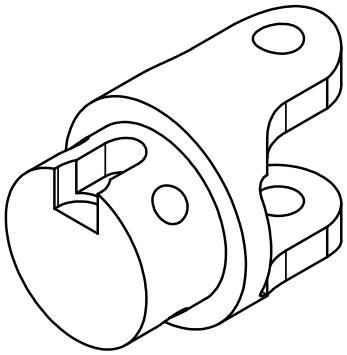


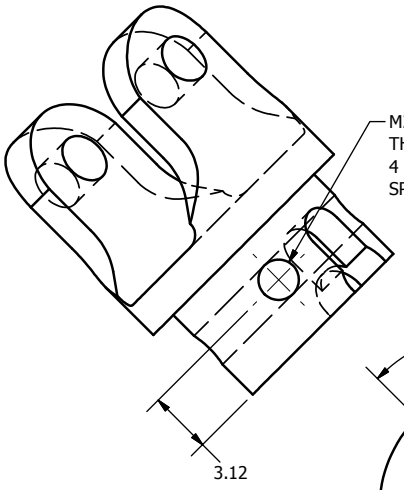


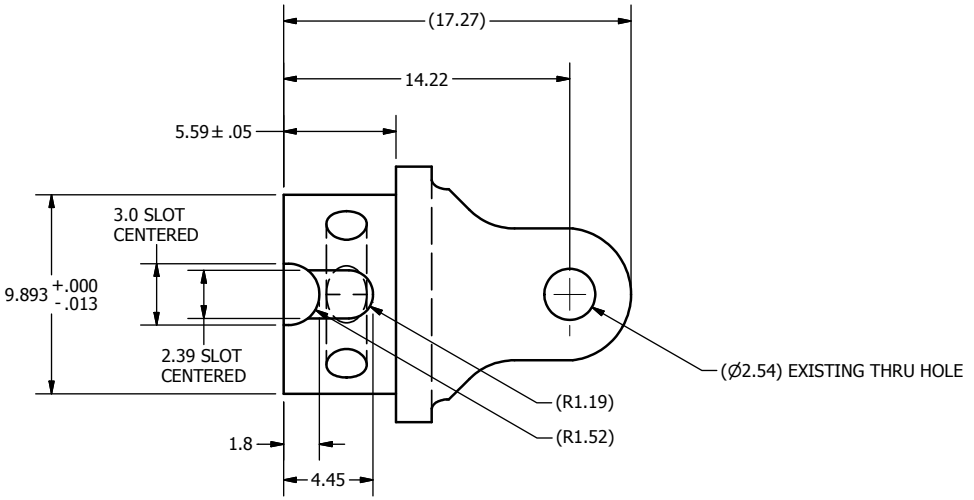


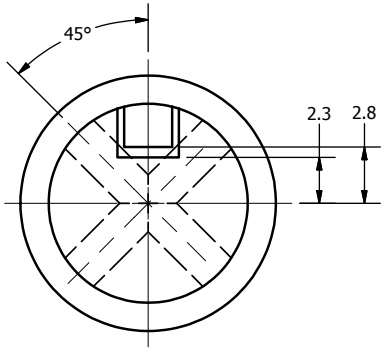
RIGHT SEGMENT

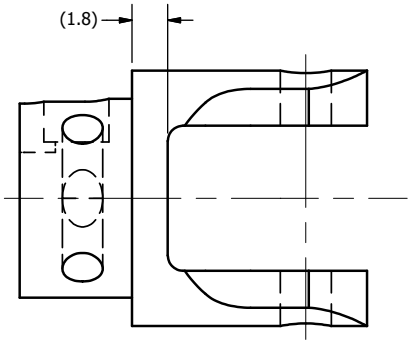
		DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES — UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: UNIVERSAL JOINT ASSEMBLY	
SA572-S121	1	MATERIAL:	DRAWN BY: dwashenko — DATE: 8/23/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: — DATE:	SIZE: B — SHEET: 2 OF 3 — DRAWING NO.: 472-4751 — REV: E	
TOTAL QTY IN DUMMY	2	FINISH: SEE NOTES	ENGINEER: D.WASHENKO — DATE:	SCALE: 3.0	







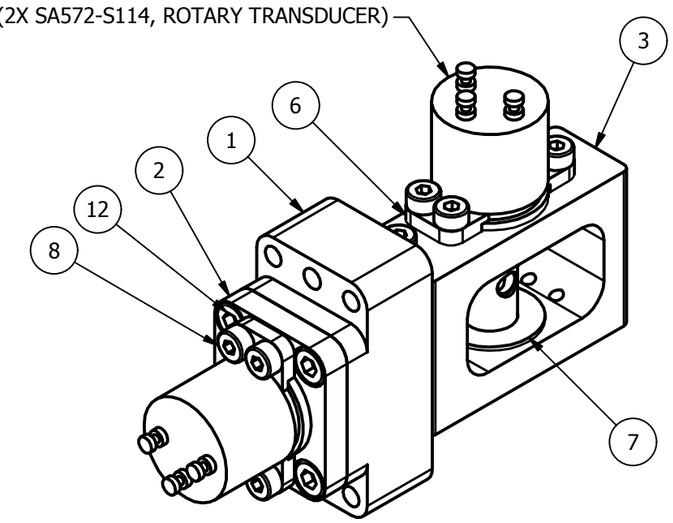




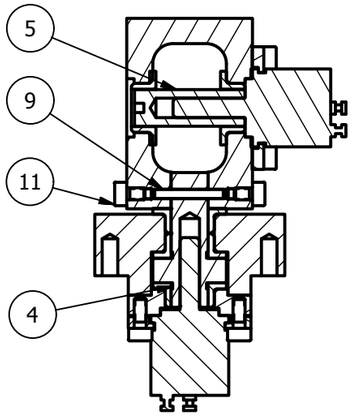
LEFT SEGMENT

DO NOT SCALE DRAWING	THIRD ANGLE PROJECTION	TOLERANCES	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
PROJECT NO.:				DESCRIPTION: UNIVERSAL JOINT ASSEMBLY
SA572-S121	1	MATERIAL:	DRAWN BY: dwashenko	DATE: 8/23/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:
TOTAL QTY IN DUMMY	2	FINISH: SEE NOTES	ENGINEER: D. WASHENKO	DATE:
			SIZE: A3 SHEET 3 OF 3 SCALE: 3.0	DRAWING NO.: 472-4751 REV: E

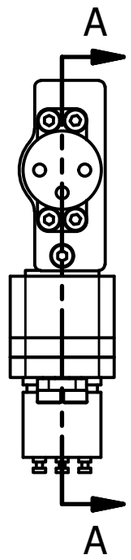
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM TIRM200 R00 AND CONVERTED TO METRIC FOR THOR-M; CREATE LEFT SIDE	8/22/2011	DW
	B	ITEM #8 QTY. WAS 12; ADDED ITEM #12	3/14/2017	DW

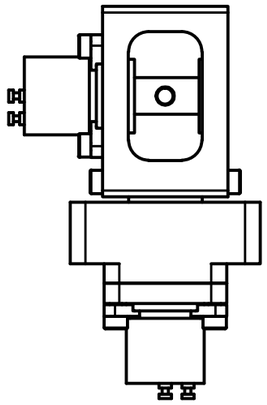


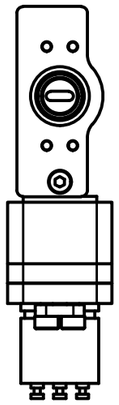
SCALE 1.50

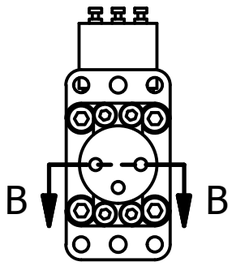


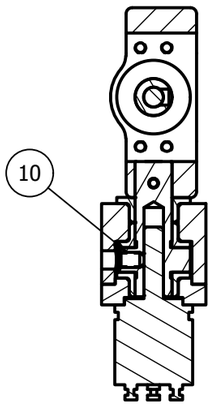
SECTION A-A
SCALE 1.0











SECTION B-B

ITEM	QTY	PART NUMBER	DESCRIPTION
12	4	5000641	SCREW, SHCS M2.5 x 0.45 x 5
11	2	5001136	M2 X 0.4 X 3 LG. SHCS
10	1	5001043	M2.5 X 0.45 X 4 LG. SSSCP SS
9	1	5000514	M1.5 X 12 LG. DOWEL SS
8	8	5001079	M2 X 0.4 X 5 LG. SHCS
7	5	5000949	FLANGE BEARING 6 X 8 X 4 LG.
6	4	472-4746	CLAMP POT
5	1	472-4745	SHAFT VERTICAL
4	1	472-4744	SHAFT HORIZONTAL
3	1	472-4743	BLOCK PIVOT
2	1	472-4742	COVER
1	1	472-4741	BLOCK MOUNTING

PARTS LIST

472-4730-1	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01
ANGLES ±0.5'
FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.: THOR-50M
MATERIAL:
HEAT TREAT:
FINISH:
DRAWN BY: dwashenko DATE: 8/22/2011
CHECKED BY: DATE:
ENGINEER: D. WASHENKO DATE: 1/12/2012

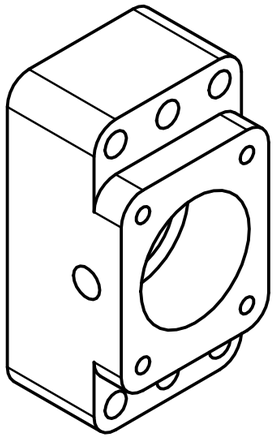
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: PIVOT ASSEMBLY, LEFT

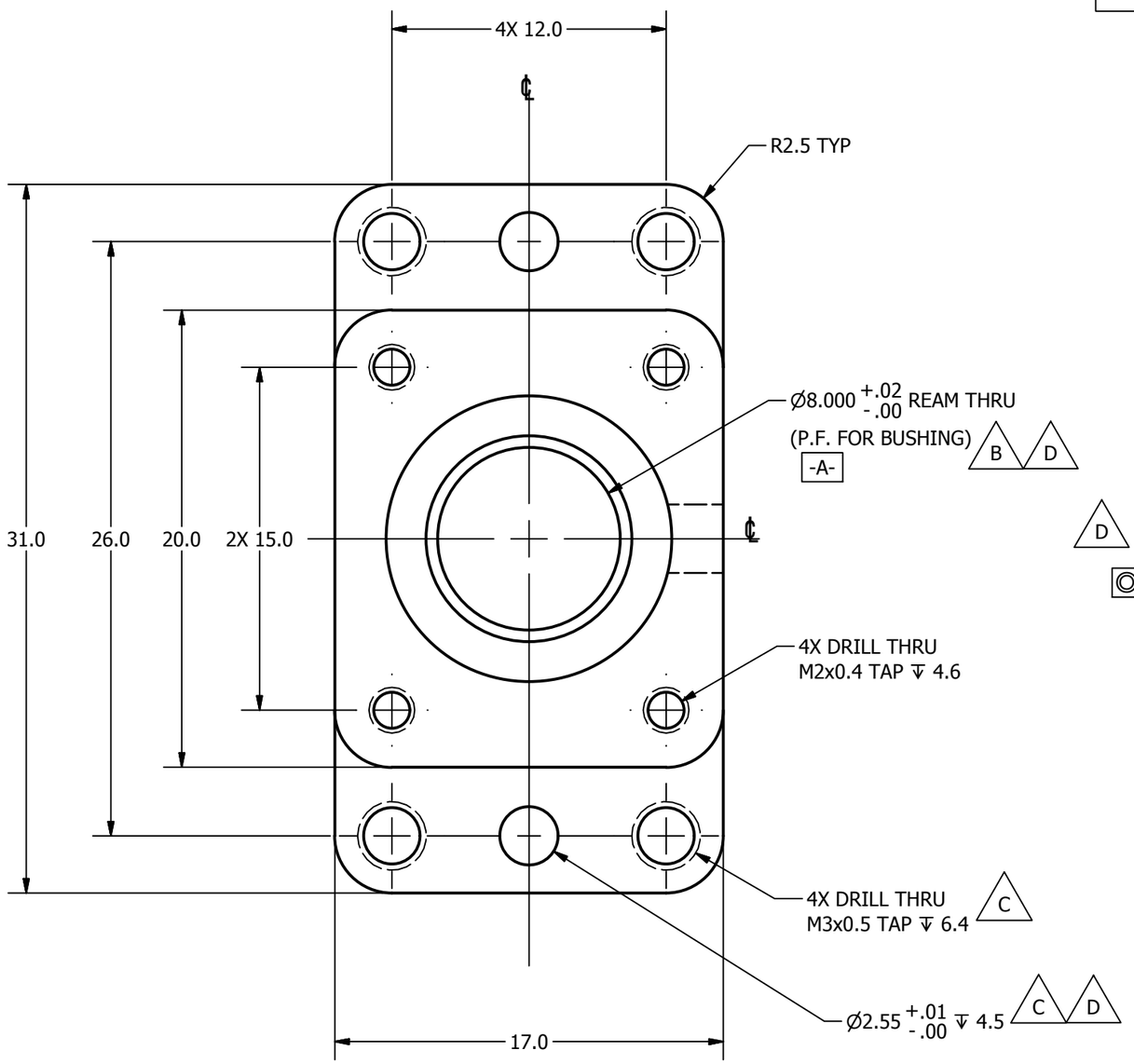
SIZE: A3 SHEET 1 OF 1 SCALE: 1.000
DRAWING NO.: 472-4740-1
REV: B

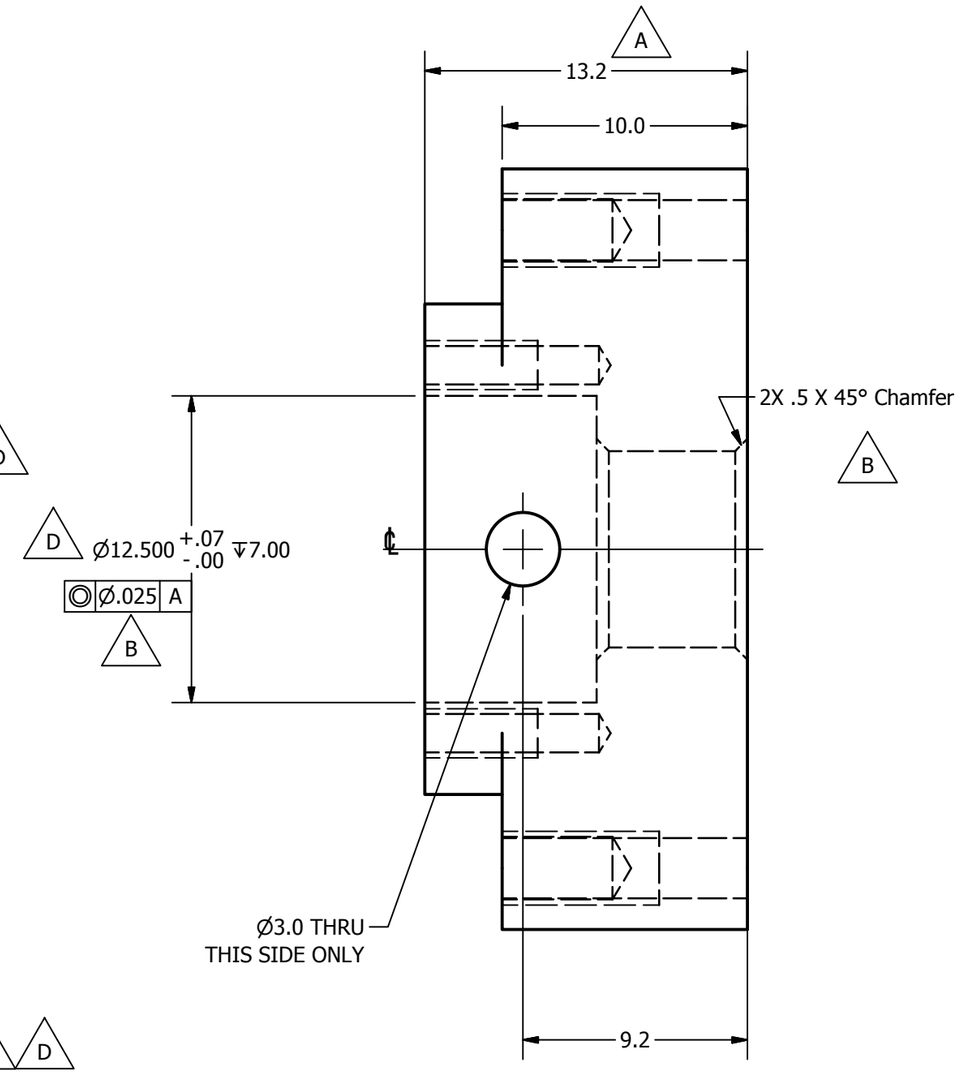
472-4740-1.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1TRM201 FOR THOR-M; 13.2 WAS 13.15	8/22/2011	DW
	B	ADD TOLERANCES, GD&T BOX, MISSING DIMENSION, AND NOTE	8/1/2012	BK
	C	4X DRILL THRU M3x0.5 TAP ↧6.4 WAS 6X DRILL THRU M3x0.5 TAP ↧6.4; ADDED 2X Ø2.55 +.01/-.00 ↧6.0	7/7/2017	DW
	D	CORRECTED DIMENSION 12.500 +.07/-.00 ↧7.00 ORIGINS AND DIMENSION WAS 13.000 +.000/-.025 ↧7.00; HOLE DIMENSION Ø8.000 +.02/-.00 REAM THRU (P.F. FOR BUSHING) WAS Ø8.000 +.000/+.015 REAM THRU (P.F. FOR BUSHING); HOLE DIMENSION Ø2.55 +.01/-.00 ↧4.5 WAS Ø2.55 +.01/-.00 ↧6.0	2/26/2018	DW



SCALE 2.000





NOTES:

B

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

472-4740-2	1	PROJECT NO.: THOR-50M	DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES
472-4740-1	1	MATERIAL: 303 S.S. OR EQUIVALENT	DRAWN BY: dwashenko	DATE: 8/22/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: D. WASHENKO	DATE: 1/12/2012

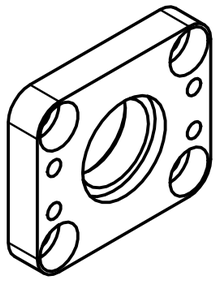
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: BLOCK MOUNTING

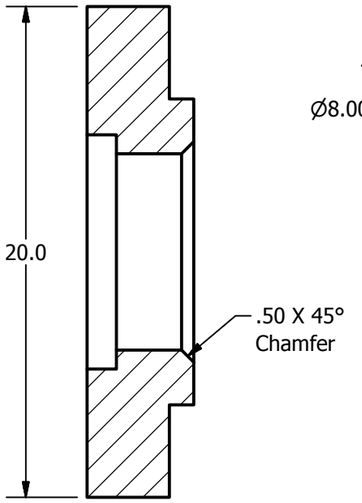
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 4.000 | DRAWING NO.: 472-4741 | REV: D

472-4741.ipt

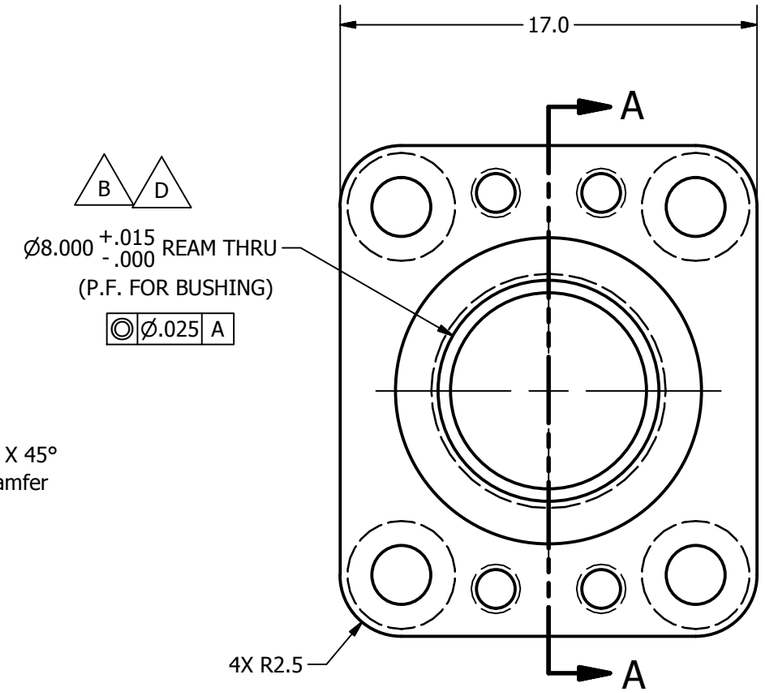
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1IRM202 R00 FOR THOR-M	8/22/2011	DW
	B	ADD TOLERANCES, GD&T BOXES; Ø12.475 WAS Ø12.48	8/1/2012	BK
	C	HOLE DIMENSION 4X Ø3.00 THRU ⌴ Ø4.75 2.50 WAS 4X Ø2.40 THRU ⌴ Ø4.40 ↧2.20	3/14/2017	DW
	D	HOLE DIMENSION Ø8.000 +.015/-.000 REAM THRU (P.F. FOR BUSHING) WAS Ø8.000 +.000/+.015 REAM THRU (P.F. FOR BUSHING), AND 4X Ø2.40 +.10/-.03 THRU ⌴Ø4.40 +.10/-.03 ↧ 2.20 WAS 4X Ø3.00 THRU ⌴ Ø4.75 ↧ 2.50	2/26/2018	DW

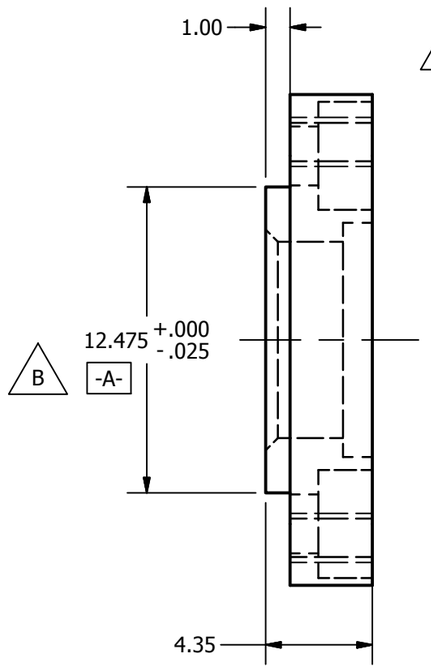


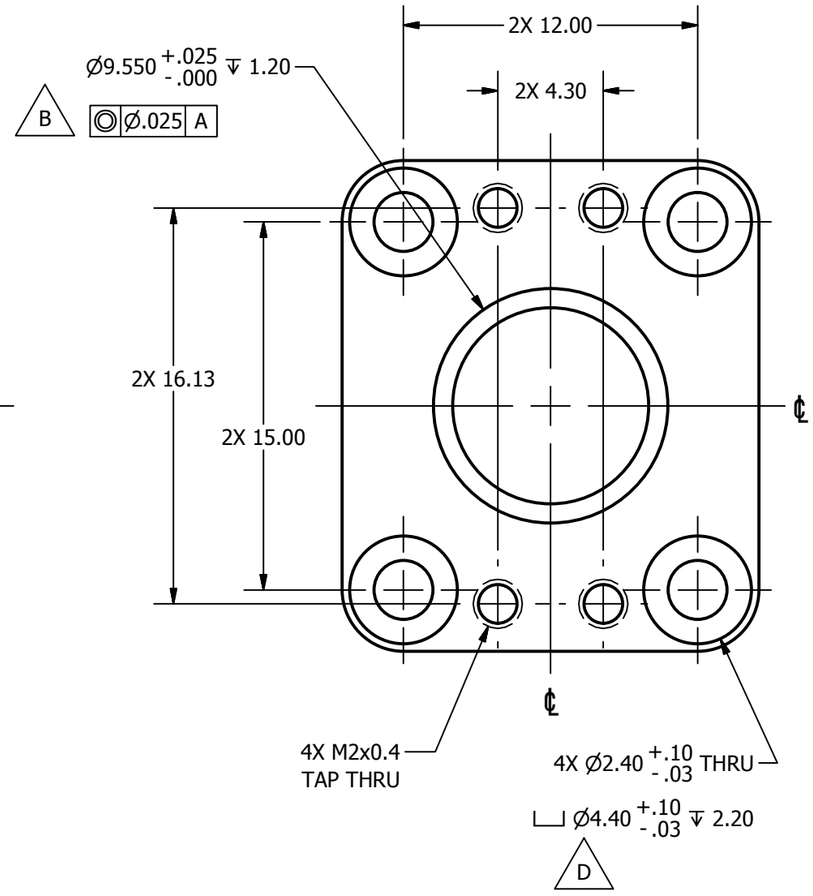
SCALE 2.000



SECTION A-A



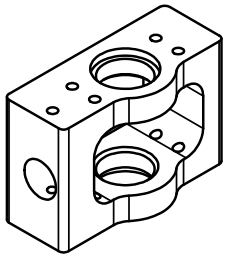




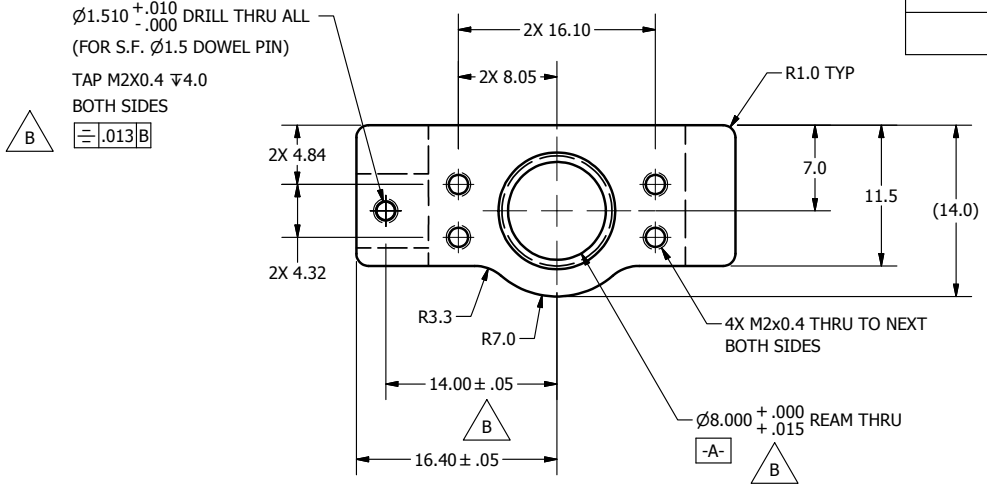
472-4740-2	1	PROJECT NO.: THOR-50M	DO NOT SCALE DRAWING; THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
472-4740-1	1	MATERIAL: 303 S.S. OR EQUIVALENT	DRAWN BY: dwashenko	DATE: 8/22/2011	DESCRIPTION: COVER
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3; SHEET 1 OF 1; DRAWING NO.: 472-4742; REV: D
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: D. WASHENKO	DATE: 1/12/2012	SCALE: 4.000

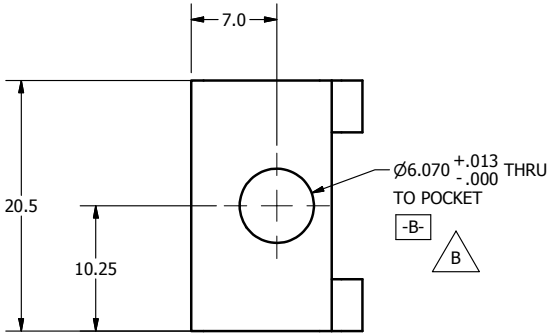
472-4742.ipt

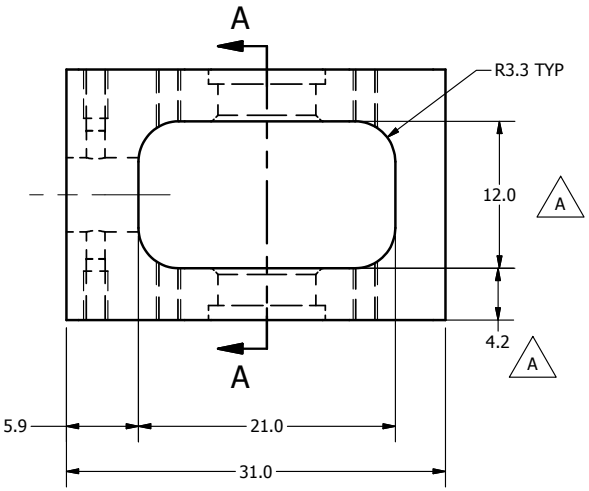
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1IRM203 R00 FOR THOR-M; 12.0 WAS 12.02; 4.2 WAS 4.24	8/22/2011	DW
	B	ADD ADD TOLERANCES, GD&T BOXES, MISSING DIMENSIONS; ADD CHAMFER	8/1/2012	BK

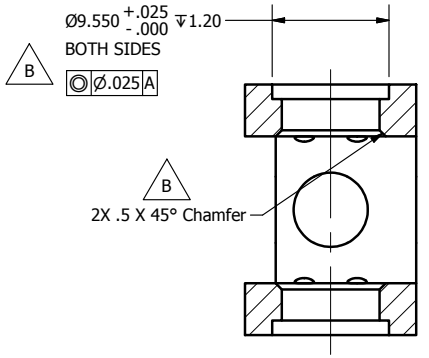


SCALE 1.50





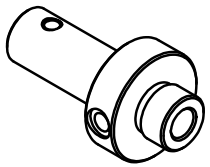




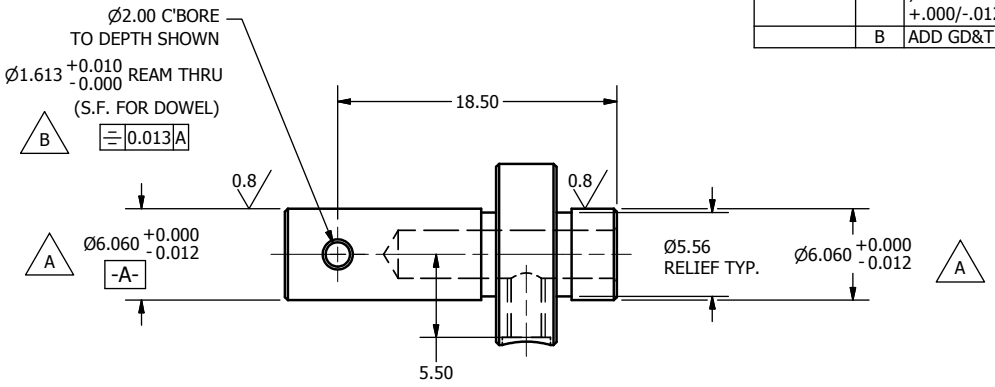
SECTION A-A

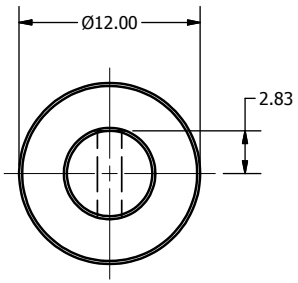
472-4740-2	1	DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
472-4740-1	1	THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: BLOCK PIVOT	
NEXT ASSEMBLY	QTY	PROJECT NO.:	DRAWN BY: dwashenko	DATE: 8/22/2011	
TOTAL QTY IN DUMMY	2	MATERIAL: 7075-T6 Aluminun	CHECKED BY:	DATE:	
		HEAT TREAT:	ENGINEER: D. WASHENKO	DATE: 1/12/2012	SIZE: B; SHEET: 1 OF 1; SCALE: 2.5; DRAWING NO.: 472-4743; REV: B
		FINISH: CLEAR ANODIZE			

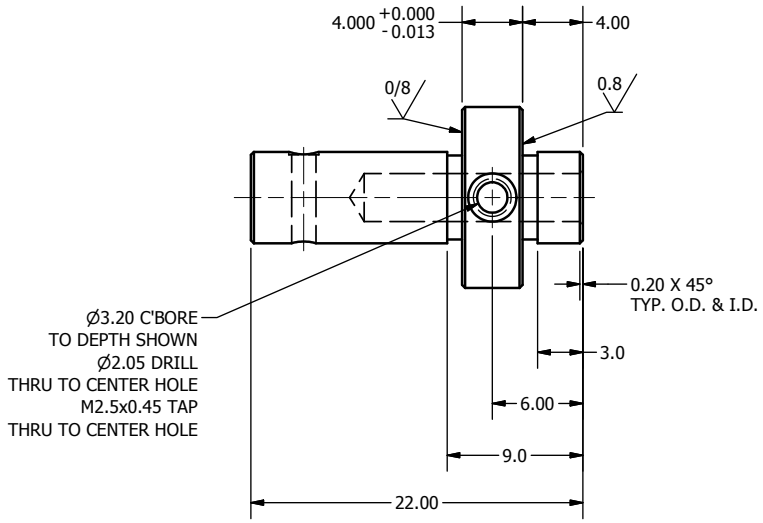
REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1IRM204 R00 FOR THOR-M; Ø1.613 +.010/-.000 WAS Ø1.613; Ø6.060 +.000/-.012 WAS Ø6.060 +.000/-.013	9/1/11	DW
	B	ADD GD&T BOX	8/1/2012	BK

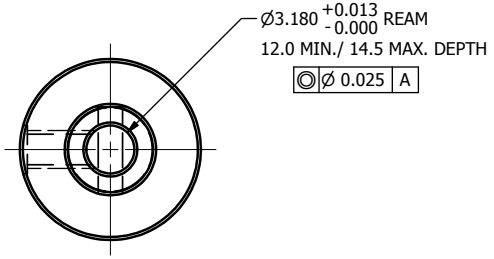


SCALE 2.000



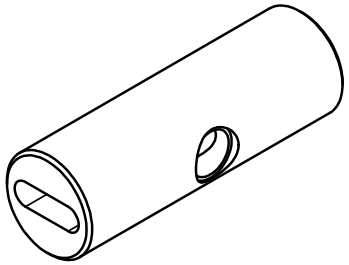




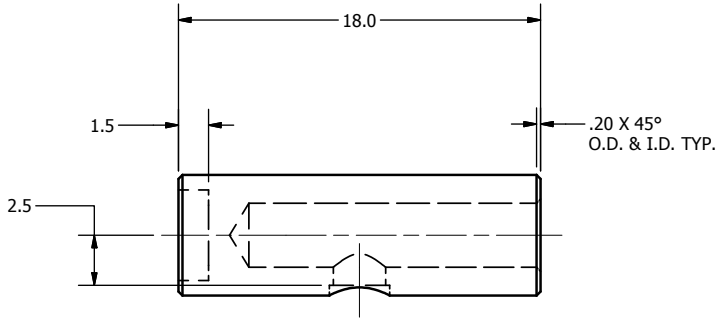


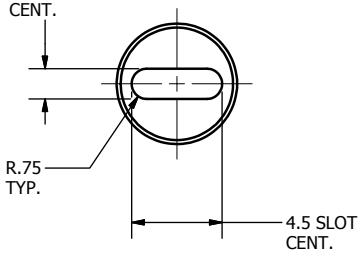
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: SHAFT HORIZONTAL		
472-4740-2	1	PROJECT NO.:	DRAWN BY: ctorchala	DATE: 6/17/2010	
472-4740-1	1	MATERIAL: 303 S.S. OR EQUIVALENT	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1
NEXT ASSEMBLY	QTY	HEAT TREAT:	ENGINEER: D. WASHENKO	DATE: 1/12/2012	SCALE: 3.000
TOTAL QTY IN DUMMY	2	FINISH:			DRAWING NO.: 472-4744 REV: B

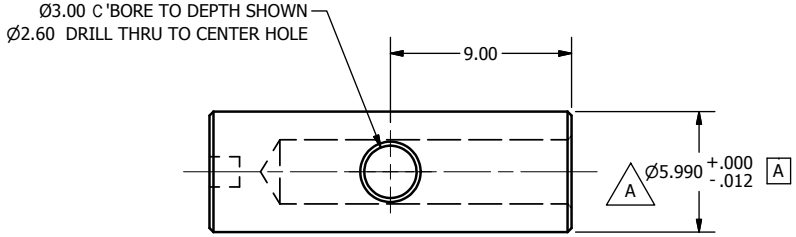
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1IRM205 R00 FOR THOR-M; Ø5.990+.000/-.012 WAS Ø5.990+.000/-.013	9/1/11	DW

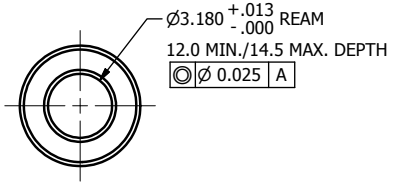


SCALE 4.000



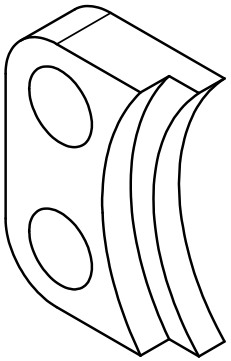




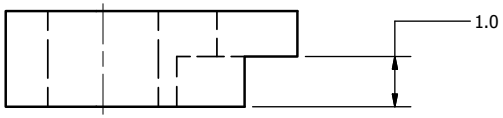


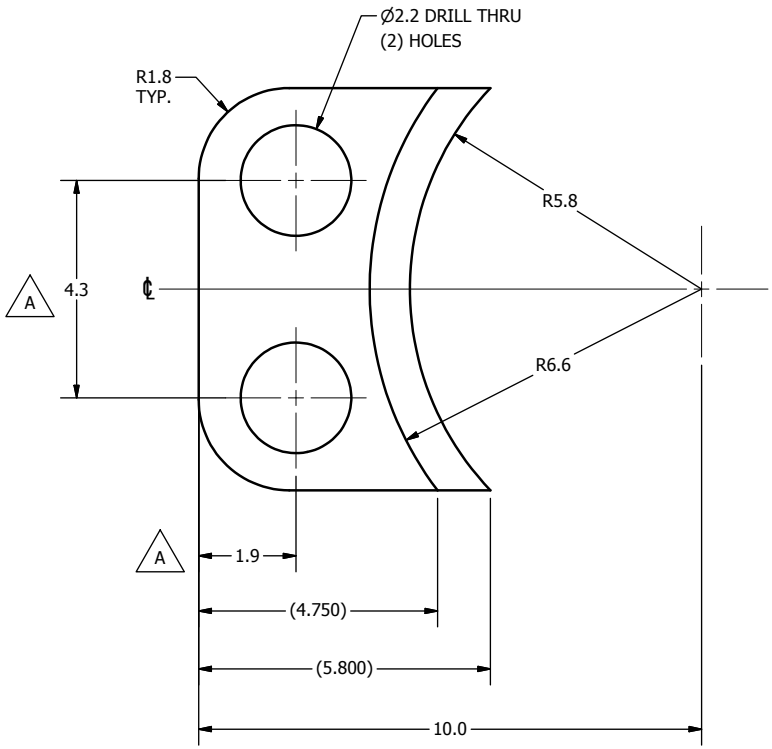
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES			
472-4740-2	1	PROJECT NO.:			DESCRIPTION: SHAFT VERTICAL
472-4740-1	1	MATERIAL: 303 S.S. OR EQUIVALENT	DRAWN BY: ctorchala	DATE: 6/18/2010	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-4745 REV: A
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: D. WASHENKO	DATE: 1/12/2012	SCALE: 4.000

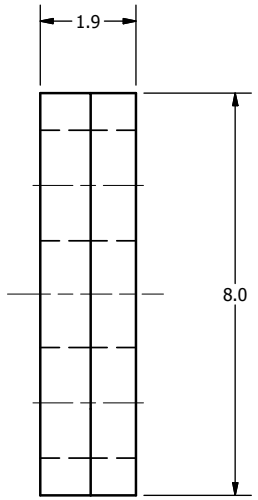
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1IRM206 R00 FOR THOR-M; 4.3 EAS 4.32; 1.9 WAS 1.93	9/1/11	DW



SCALE 8.000

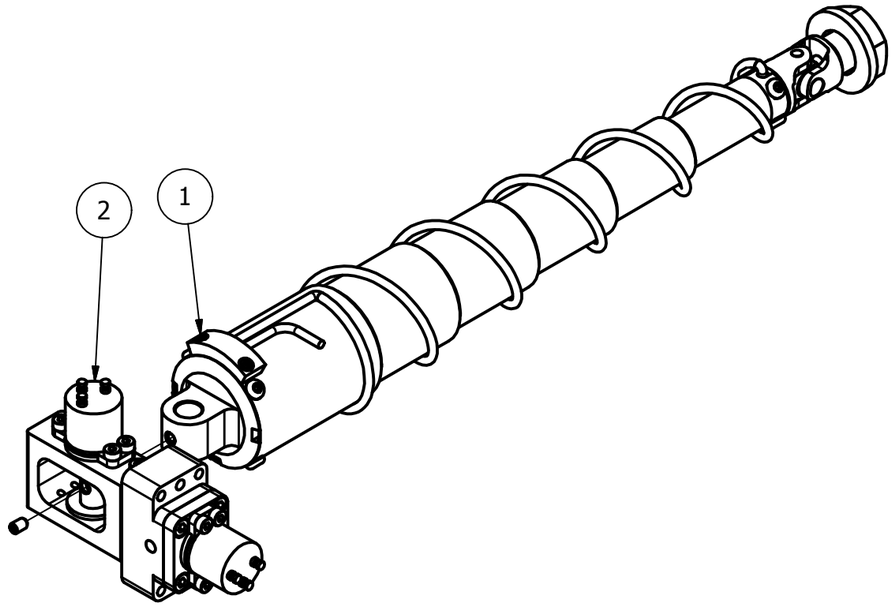


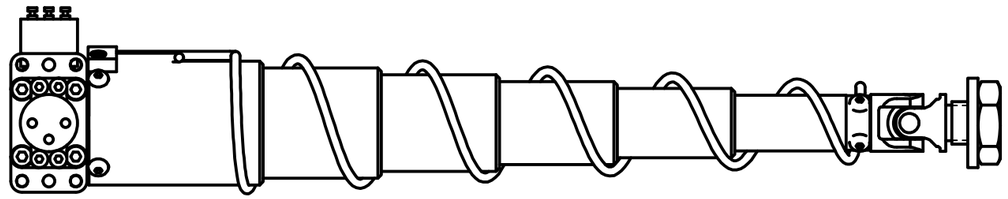


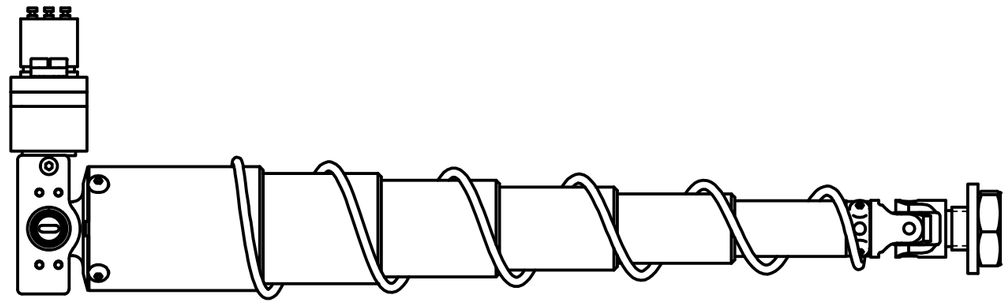


DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6; X.X ±0.2; X.XX ±0.1; X.XXX ±0.01; REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: CLAMP POT		
472-4740-2	4	PROJECT NO.:	DRAWN BY: ctorchala	DATE: 6/18/2010	
472-4740-1	4	MATERIAL: Aluminum-6061	CHECKED BY:	DATE:	SIZE: A3 SHEET: 1 OF 1 DRAWING NO.: 472-4746 REV: A
NEXT ASSEMBLY	QTY	HEAT TREAT:	ENGINEER: D. WASHENKO	DATE: 1/12/2012	SCALE: 10.000
TOTAL QTY IN DUMMY	8	FINISH: CLEAR ANODIZE			

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED AS NEW ASSEMBLY FOR THOR-M	8/23/2011	DW
	B	MADE PARTS UNTESTED	6/8/2012	JBH







NOTES:

1. ASSEMBLE IRTRACC TO PIVOT ASSEMBLY AS SHOWN.

2. PROVIDE INDIVIDUAL CERT SHEETS FOR IRTRACC AND (2) POTENTIOMETERS.

B

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-4740-2	PIVOT ASSEMBLY, RIGHT
1	1	SA572-S121	120mm IRTRACC ASSEMBLY - METRIC

PARTS LIST

472-4700	1	PROJECT NO.:	
NEXT ASSEMBLY	QTY	MATERIAL:	
TOTAL QTY IN DUMMY	1	HEAT TREAT:	
		FINISH:	

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES — UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 — ANGLES ±0.5° — FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

DRAWN BY: dwashenko	DATE: 8/23/2011	
CHECKED BY:	DATE:	
ENGINEER: D. WASHENKO	DATE: 1/12/2012	

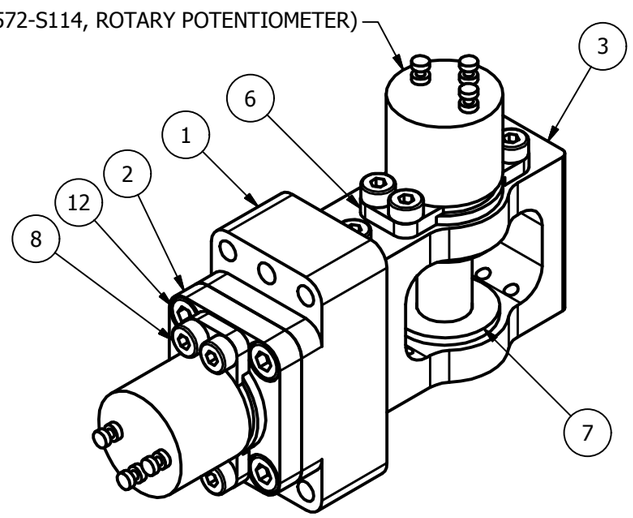
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: 3D IRTRACC ASS'Y, RIGHT, THOR-50M ABDOMEN

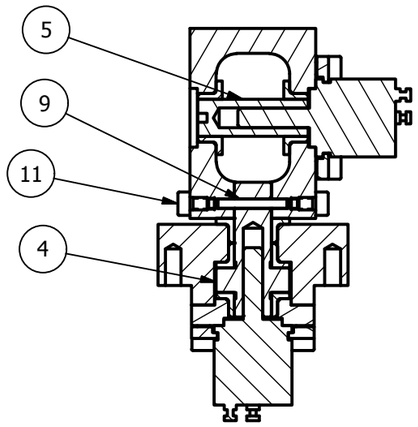
SIZE: B | SHEET: 1 OF 1 | SCALE: .750 | DRAWING NO.: 472-4730-2 | REV: B

472-4730-2.iam

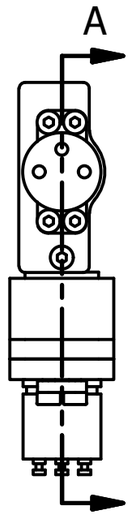
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1IRM202 R00 AND CONVERTED TO METRIC FOR THOR-M; CREATE RIGHT SIDE	8/22/2011	DW
	B	ITEM #8 QTY. WAS 12; ADDED ITEM #12	3/14/2017	DW

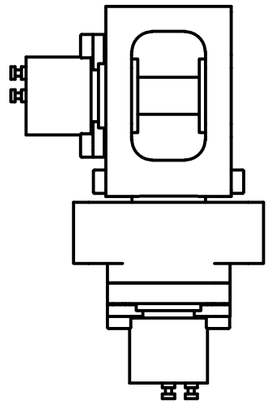


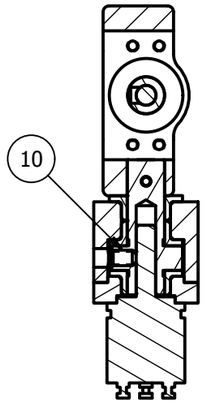
SCALE 1.50



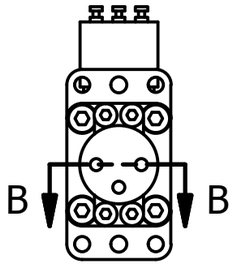
SECTION A-A
SCALE 1.0







SECTION B-B



	ITEM	QTY	PART NUMBER	DESCRIPTION
B	12	4	5000641	SCREW, SHCS M2.5 x 0.45 x 5
	11	2	5001136	M2 X 0.4 X 3 LG. SHCS
	10	1	5001043	M2.5 X 0.45 X 4 LG. SSSCP SS
	9	1	5000514	M1.5 X 12 LG. DOWEL SS
B	8	8	5001079	M2 X 0.4 X 5 LG. SHCS
	7	5	5000949	FLANGE BEARING 6 X 8 X 4 LG.
	6	4	472-4746	CLAMP POT
	5	1	472-4745	SHAFT VERTICAL
	4	1	472-4744	SHAFT HORIZONTAL
	3	1	472-4743	BLOCK PIVOT
	2	1	472-4742	COVER
	1	1	472-4741	BLOCK MOUNTING

PARTS LIST

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION

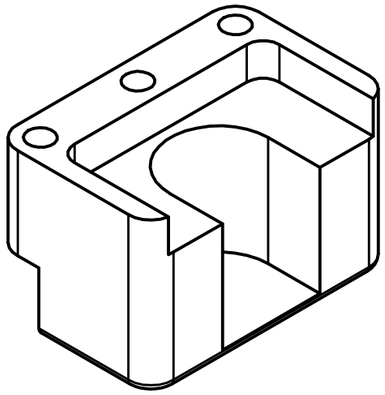
TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01
ANGLES ±0.5°
FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

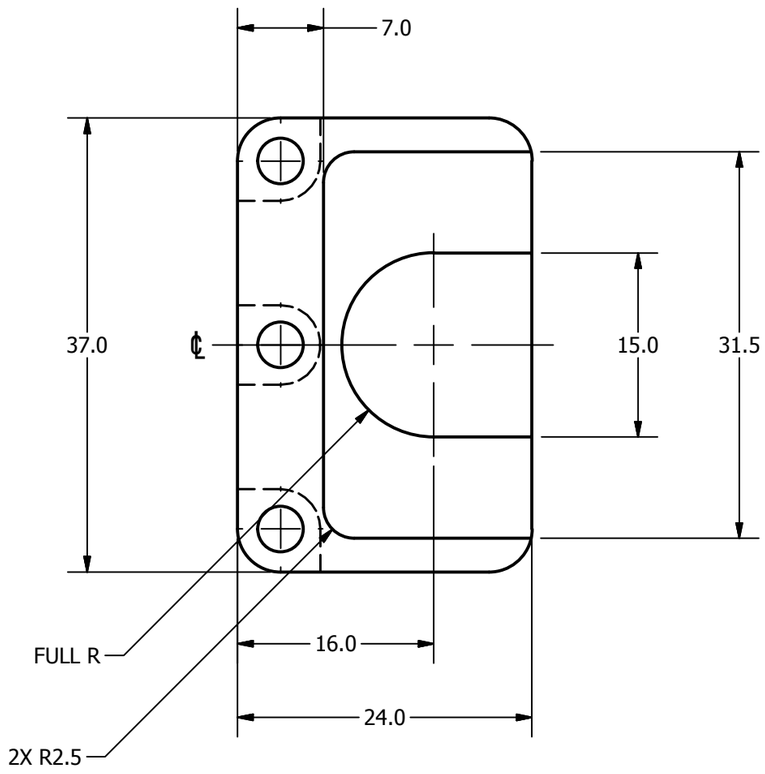
		PROJECT NO.:		DESCRIPTION:	PIVOT ASSEMBLY, RIGHT
472-4730-2	1	MATERIAL:	DRAWN BY: dwashenko	DATE: 8/22/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 — DRAWING NO.: 472-4740-2 — REV: B
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: D. WASHENKO	DATE: 1/12/2012	SCALE: 1.000

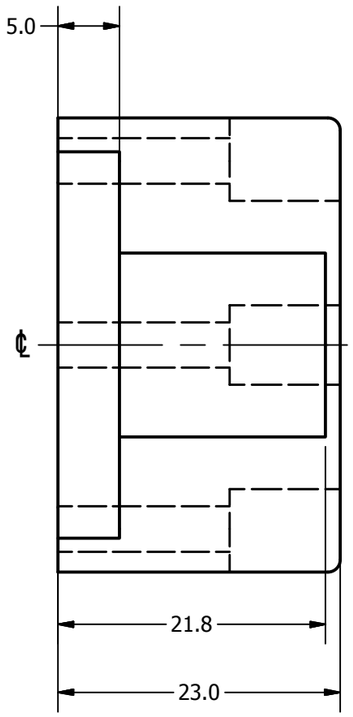
472-4740-2.iam

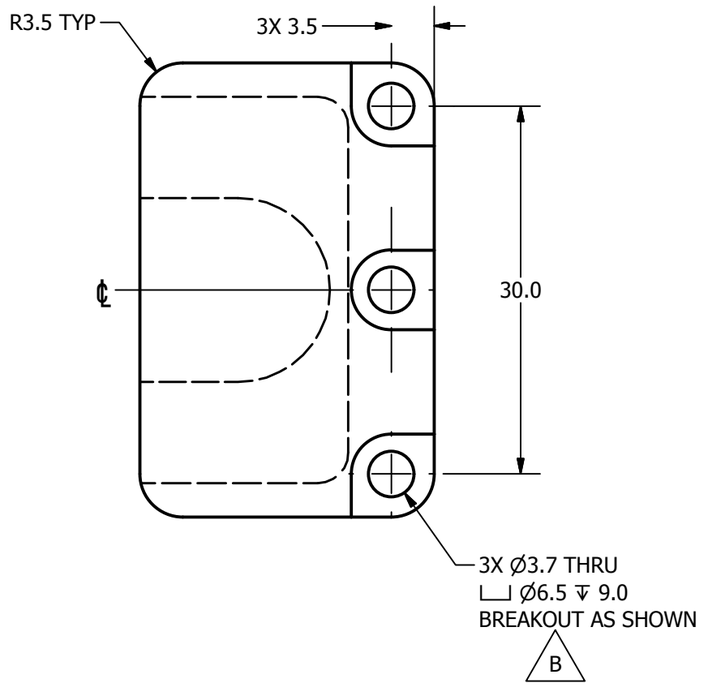
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1LAM018 R2 FOR THOR-M; ADD NOTE 1	8/22/2011	DW
	B	ADDED BREAKOUT TO COUNTERBORE	8/14/2014	DW



SCALE 1.5







NOTES:

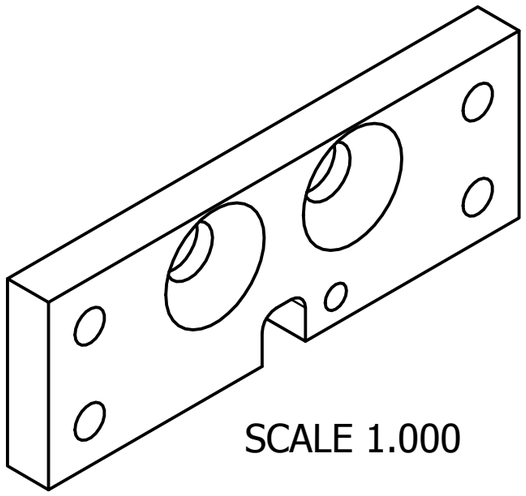
A

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

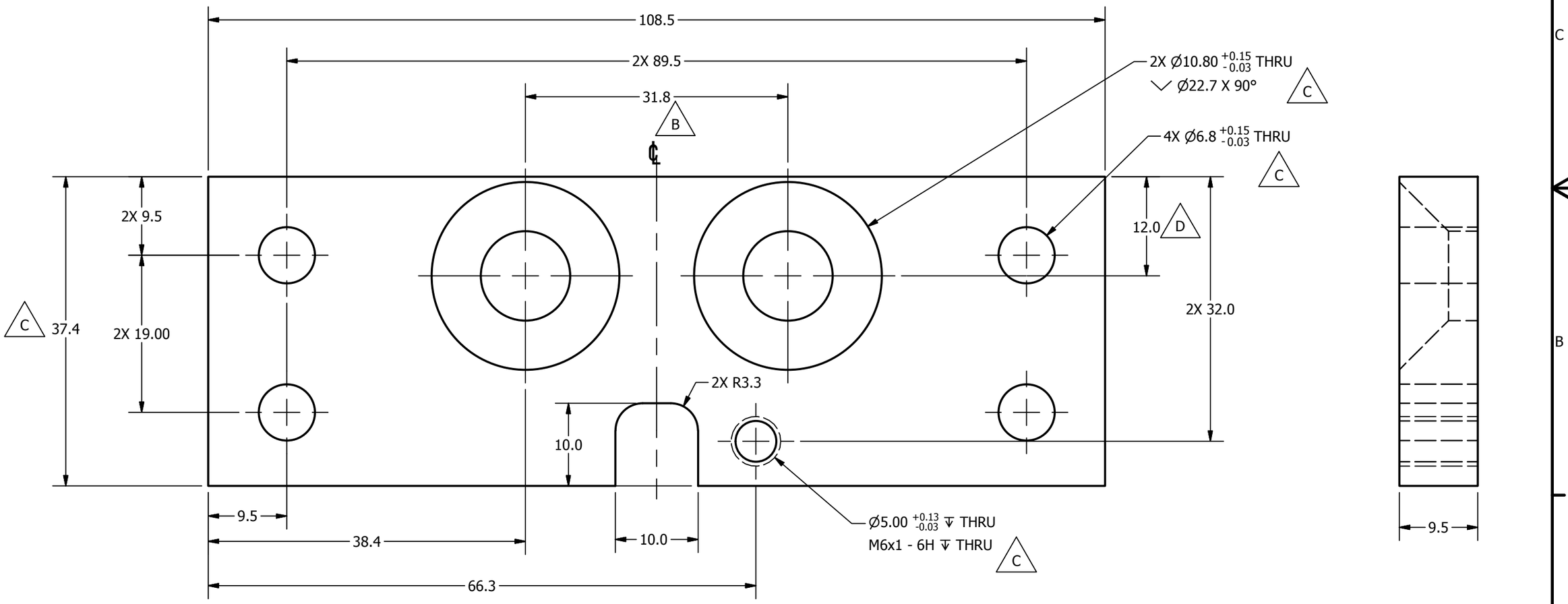
		DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5'; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: POTENTIOMETER COVER THOR-50M	
472-4700	2	MATERIAL: Nylon-6/6	DRAWN BY: dwashenko	DATE: 8/22/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: D. WASHENKO	DATE: 1/12/2012	SIZE: A3 · SHEET: 1 OF 1 · SCALE: 2.000 · DRAWING NO.: 472-4760 · REV: B

472-4760.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1LAM010 R03 AND CONVERTED TO METRIC FOR THOR-M	9/1/2011	DW
	B	DIMENSION 31.8 WAS 31.75	2/24/2016	DW
	C	DIMENSION 37.4 WAS 38.0; REDIMENSIONED FROM TOP OF PLATE; HOLE DIM. 2X Ø10.80 +0.15/-0.03 THRU C.SINK Ø22.7 X 90˚ WAS 2X Ø10.8 +0.15/-0.03 THRU C.SINK Ø22.7 X 90˚, 4X Ø6.8 +0.15/-0.03 THRU WAS 5X Ø6.8 THRU, Ø5.00 +0.13/-0.03 THRU M6x1 -6H THRU WAS M6x1 - 6H DEPTH 10.0	2/24/2017	DW
	D	DIMENSION 12.0 WAS 12.6	1/25/2018	DW



SCALE 1.000



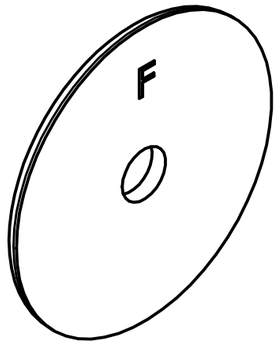
NOTES:

1. POWDER OR BEAD BLAST.
2. NICKEL PLATE 0.003mm-0.008mm MAX. AFTER MACHINING.
3. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

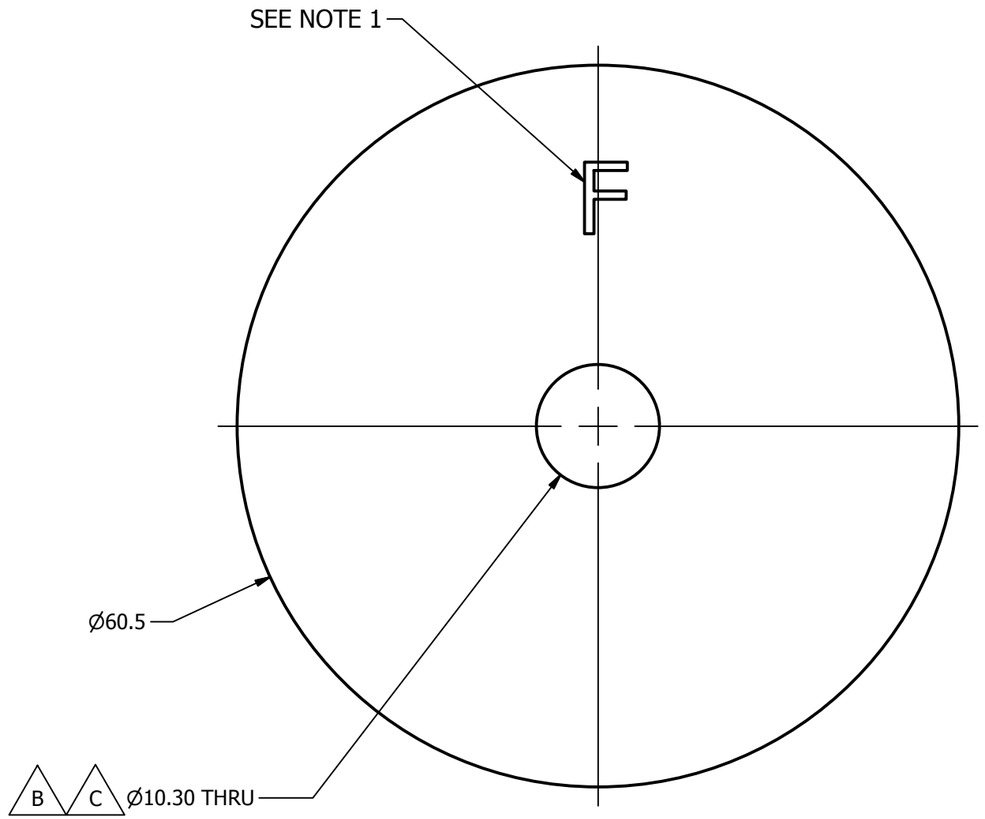
		DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
		PROJECT NO.:		DESCRIPTION: REAR ATTACHMENT PLATE THOR-50M
472-4700	1	MATERIAL: 1018 STEEL	DRAWN BY: dwashenko	DATE: 9/1/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:
TOTAL QTY IN DUMMY	1	FINISH: SEE NOTES	ENGINEER: D. WASHENKO	DATE: 1/12/2012
			SIZE: A3	SHEET: 1 OF 1
			SCALE: 2.000	DRAWING NO.: 472-4761
				REV: D

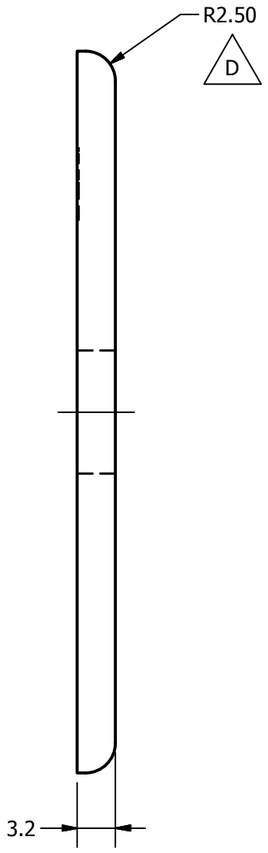
472-4761.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1LAM014 R1 FOR THOR-M	9/1/2011	DW
	B	Ø10.3 THRU C'BORE Ø14.0 WAS Ø12.7 THRU C'BORE Ø19.05	6/20/2012	BK
	C	REMOVE C'BORE FROM HOLE	2/14/2013	BK
	D	ADDED R2.5 AND NOTE 1	4/29/2014	DW



SCALE 1.000





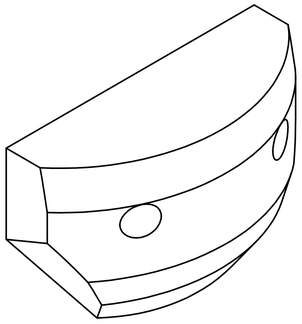
NOTES:

D 1. STAMP OR ETCH "F" AS SHOWN.

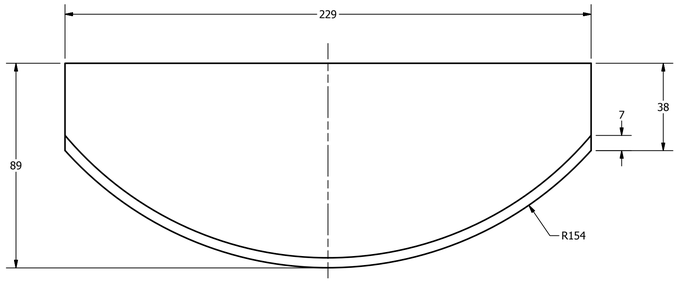
		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5 FINISH 1.6		
		PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: LOWER ABDOMEN DISTRIBUTION PLATE	
472-4700	2	MATERIAL: Acetal Resin, Black	DRAWN BY: dwashenko DATE: 9/1/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: B SHEET 1 OF 1	DRAWING NO.: 472-4762 REV: D
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: D. WASHENKO DATE: 1/12/2012	SCALE: 2.000	

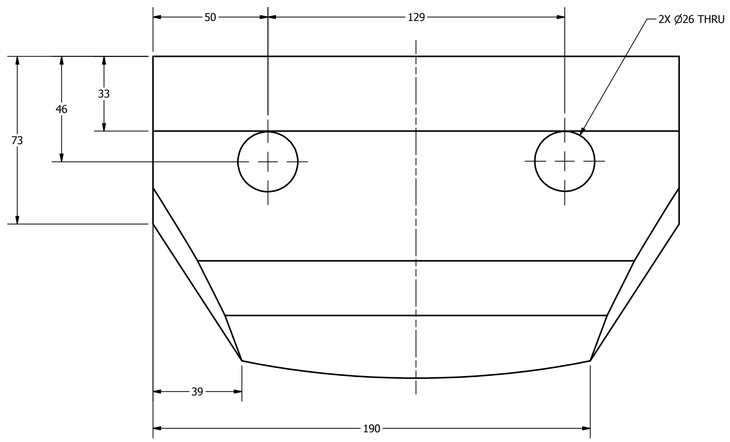
472-4762.ipt

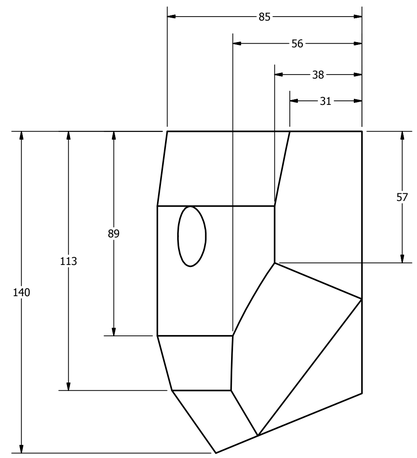
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	5	CONVERTED FROM ENGLISH TO METRIC EXCLUDING FASTENERS	9/20/2006	C. SPADE
	A	RENUMBERED FROM T1LAM012 R05 FOR THOR-M	12/8/2011	BK
	B	IN NOTE #2 "QUALIFICATION" WAS "CERTIFICATION".	8/7/2017	DW

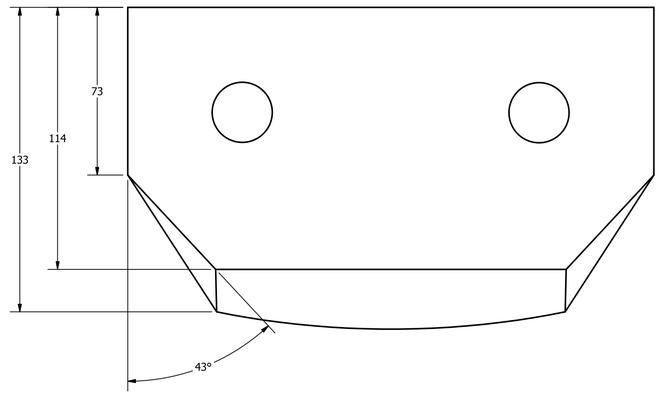


SCALE .500









NOTES:

1. MATERIAL: CHARCOAL POLYESTER FOAM WITH NOMINAL DENSITY OF 6 LBS/CU FT
   SAE J18 SPECIFICATION: 1AO
   1- OPEN CELL
   A- NONOIL RESISTANT
   O- COMPRESSION DEFLECTION 25% 3.5-14 KPA (0.5-2 PSI)

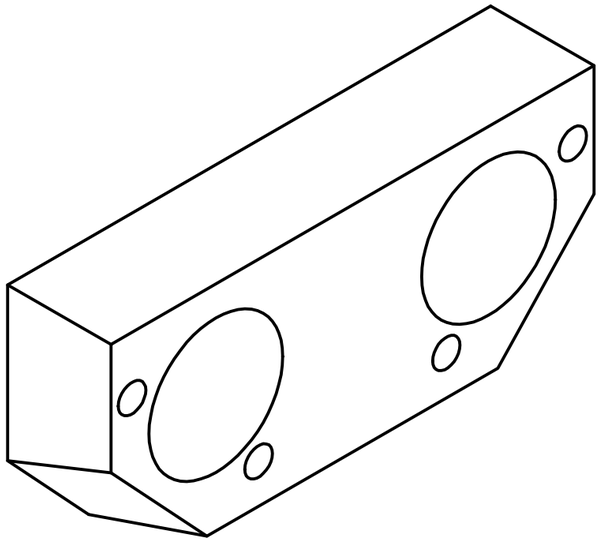
2. NOMINAL STIFFNESS @ 75% COMPRESSION: 43+3 KPA (6.2+0.5 PSI)
   @ 90% COMPRESSION: 420+30 KPA (62+0.5 PSI)
   REFER TO QUALIFICATION MANUAL FOR PERFORMANCE SPECIFICATIONS FOR THIS PART.

△B

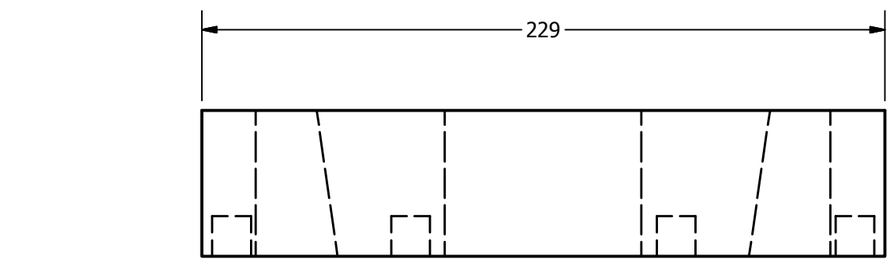
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION		UNLESS NOTED OTHERWISE: DECIMAL ± ANGLES ± FINISH: X ±0.5 ±0.5 125 XX ±0.2 XXX ±0.1 XXXX ±0.05		
PROJECT NO.:		REMOVE BURRS & BREAK SHARP EDGES	DOCUMENT: LOWER ABDOMEN FRONT FOAM LAYER	
472-4700	1	MATERIAL: SEE NOTES	DRAWN: B. KIMES 12/8/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A1 SHEET: 1 OF 1 DRAWING NO.: 472-4764 REV: B
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: D. WASHENKO 1/12/2012	SCALE: .750

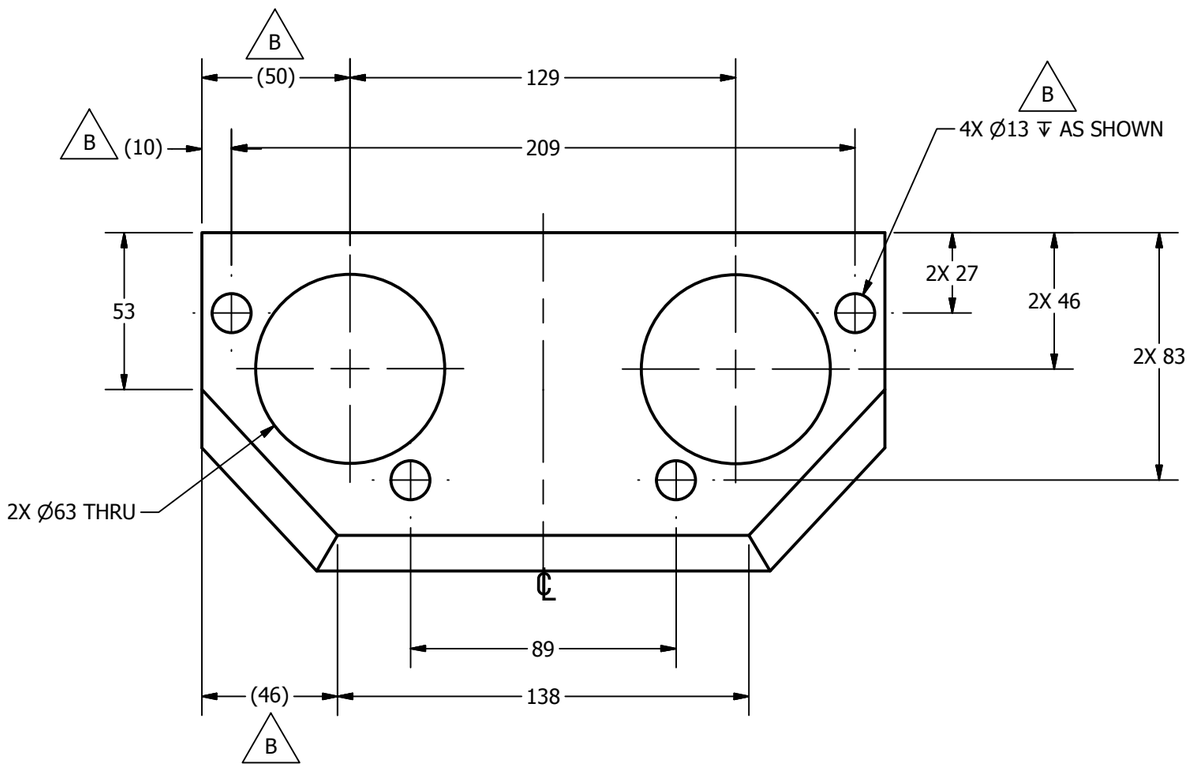
472-4764.ipt

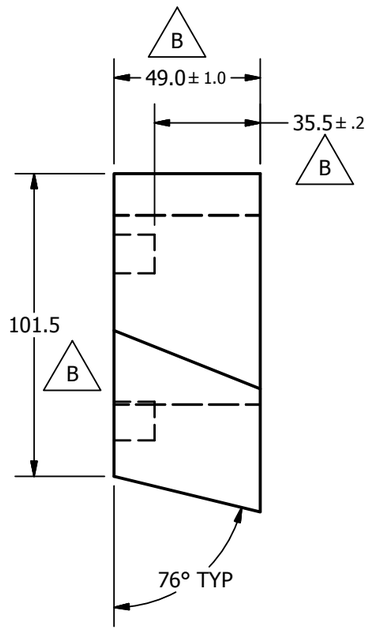
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1LAM013 R5 FOR THOR-M	9/1/2011	DW
	B	HOLE DIM. 4X Ø13 DEPTH AS SHOWN WAS 4X Ø13 DEPTH 12.5; DIMENSION (50) WAS 50, (10) WAS 10, (46) WAS 46, 101.5 WAS 102, 49 +/- 1.0 WAS 51, ADDED DIM. 35.5 +/-.2, REMOVED 70 DIM.; REVISED MATERIAL NOTE; ADDED DIMENSIONS SYMMETRIC NOTE AND DIMENSION TOLERANCE NOTE.	2/10/2017	DW



SCALE .500







B NOTES:
THE FOAM MATERIAL IS BLENDED SPONGE RUBBER
NEOPRENE / EPDM / SBR FOAM RUBBER
1-OPEN CALL FOAM
2-NON-OIL RESISTANT

S-COMPRESSION DEFLECTION 25% 60 ± 10 kPa

NOMINAL STIFFNESS @50% COMPRESSION: 148 ± 15 kPa
NOMINAL COMPRESSION @ 770 kPa 74.5%-82.5%

REFER TO THE THOR 50M QUALIFICATION MANUAL FOR PREFORMANCE SPECIFICATION FOR THIS PART.

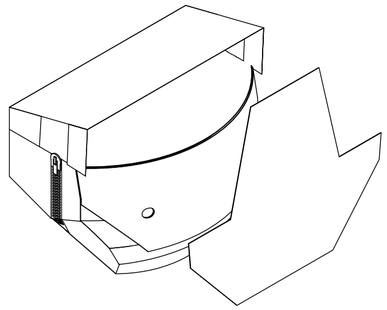
B DIMENSIONS SYMMETRIC ACROSS ℄ UNLESS OTHERWISE NOTED.

B ALL DIMENSIONS ± 0.5mm UNLESS OTHERWISE NOTED.

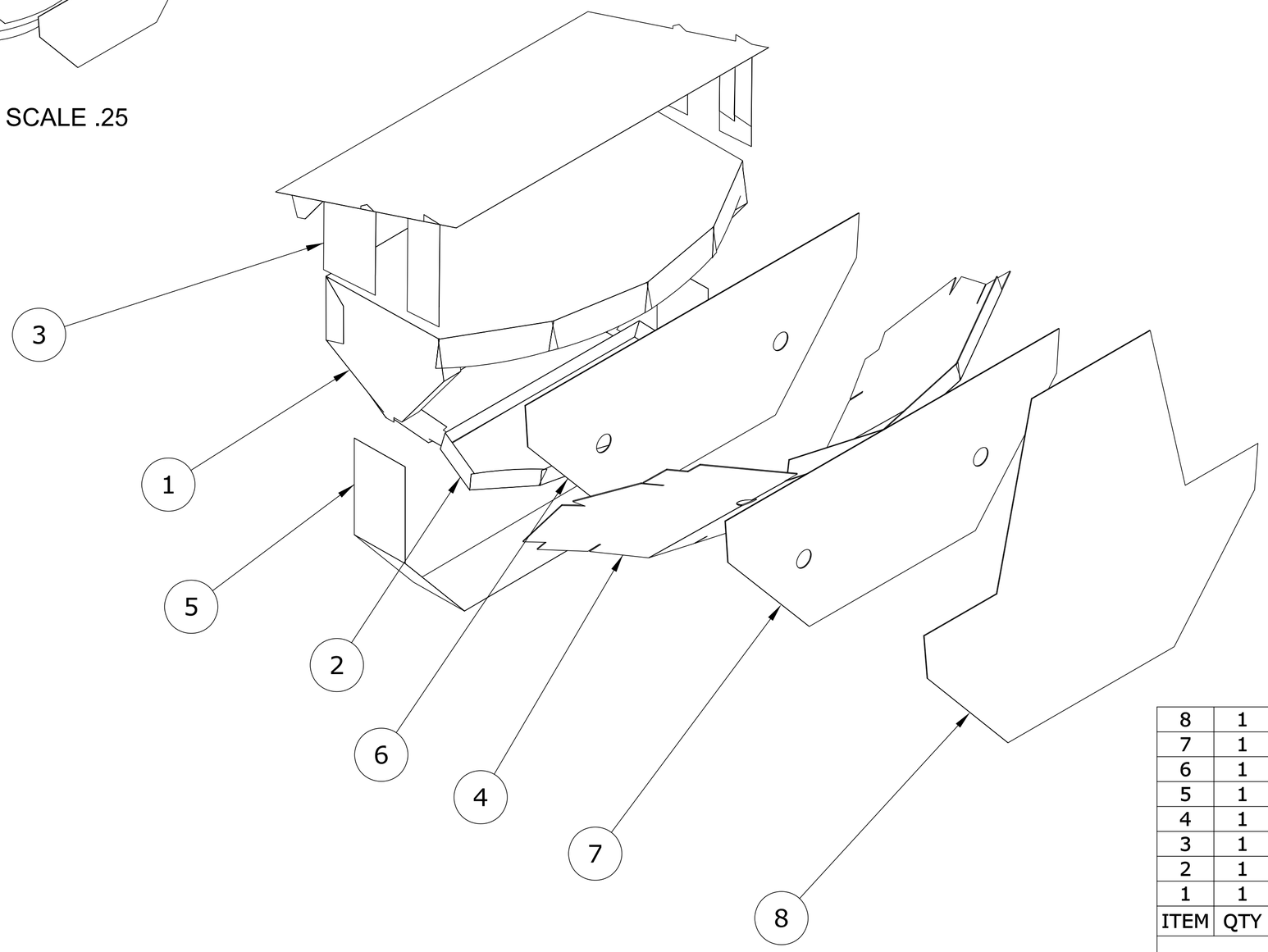
		DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS ANGLES FINISH; X ±0.5 ±0.5 1.6; X.X ±0.2; X.XX ±0.1; X.XXX ±0.01. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
		PROJECT NO.:		DESCRIPTION: LOWER ABDOMEN REAR FOAM LAYER
472-4700	1	MATERIAL: SEE NOTES	DRAWN BY: dwashenko; DATE: 9/1/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: ; DATE:	SIZE: B; SHEET: 1 OF 1; DRAWING NO.: 472-4765; REV: B
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: D. WASHENKO; DATE: 1/12/2012	SCALE: .500

472-4765.ipt

REVISION RECORD				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1LAF101 R1 FOR THOR-M	1/12/2017	DW
	B	SHOW VELCRO PATCH AND COVER IN CORRECT LOCATION; ADD NOTE 4	4/3/2012	BK



SCALE .25



ITEM	QTY	PART NUMBER	DESCRIPTION
8	1	472-4763-8	UPPER AND LOWER ABDOMEN VELCRO COVER
7	1	472-4763-7	LOWER ABDOMEN OUTSIDE VELCRO PATCH
6	1	472-4763-6	LOWER ABDOMEN STIFFENER CLOTH
5	1	472-4763-5	LOWER ABDOMEN ZIPPER
4	1	472-4763-4	LOWER ABDOMEN FRONT PATTERN
3	1	472-4763-3	LOWER ABDOMEN TOP POCKET PATTERN
2	1	472-4763-2	LOWER ABDOMEN BOTTOM BAG PATTERN
1	1	472-4763-1	LOWER ABDOMEN TOP/SIDE/REAR PATTERN

PARTS LIST

NOTES:

1. EXPLODED VIEW SHOWS SOME COMPONENTS IN PARTIALLY FOLDED STATE.
2. ISO VIEW SHOWS COMPONENTS IN IDEAL STATE.
3. STITCH ALL ADJACENT TABS TO FORM SEWN ASSEMBLY AS SHOWN. SEE INDIVIDUAL PATTERN DRAWINGS FOR MORE INFORMATION.
4. (B) 472-4738-8 ASSEMBLES BETWEEN THE LOWER AND UPPER ABDOMEN AT THORAX ASSEMBLY.

472-4700	1
NEXT ASSEMBLY	QTY.
TOTAL QTY. IN DUMMY	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN dwashenko	9/8/2011
CHECKED	
ENG D. WASHENKO	1/12/2012
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LOWER ABDOMEN SEWING ASSEMBLY

THIRD ANGLE PROJECTION

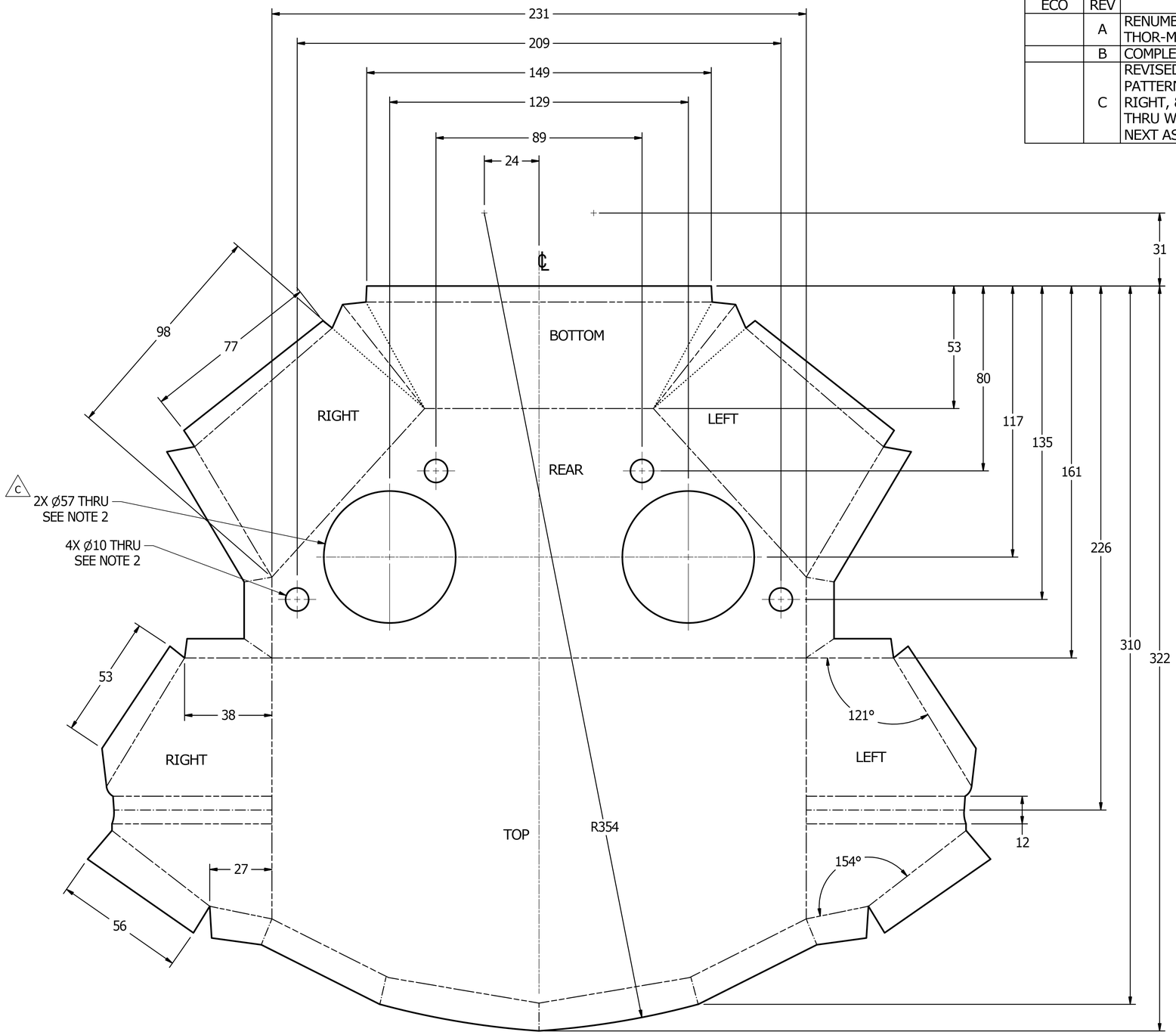
SIZE A2 | DRAWING NUMBER 472-4763 | REV B
SCALE: .25 | SHEET 1 OF 1

472-4763.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1LAF110 R1 FOR THOR-M	9/8/2011	DW
	B	COMPLETE REDESIGN	10/26/2015	DW
	C	REVISED NOTE 2; ADDED LABELS TO PATTERN, I.E. TOP, BOTTOM, REAR, RIGHT, & LEFT: DIMENSION 2X Ø57 THRU WAS 2X Ø64 THRU; ADDED NEXT ASSEMBLY	1/17/2017	DW

LEGEND

- PATTERN EDGE
- FOLD LINES
- CUT LINES
- STITCH LINES



VIEW IS OF OUTSIDE OF BAG

NOTES:

C 1. USE CORDURA NYLON FABRIC (1000 DENIER NYLON - 10 OZ/YD)
2. CUT HOLES AFTER BAG ASSEMBLY.
3. PRINT TO SCALE AND USE AS PATTERN FOR CUTTING OUT MATERIAL.
4. PATTERN IS SYMMETRICAL ABOUT CENTERLINE.

C

472-4763	1
NEXT ASSEMBLY	QTY.
TOTAL QTY IN DUMMY	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN Dave Walker	10/26/2015
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LOWER ABDOMEN
TOP/SIDES/REAR PATTERN
THOR-50M

THIRD ANGLE PROJECTION

SIZE A1 | DRAWING NUMBER 472-4763-1 | REV C
SCALE: 1:1 | SHEET 1 OF 1

472-4763-1-Orig.ipt

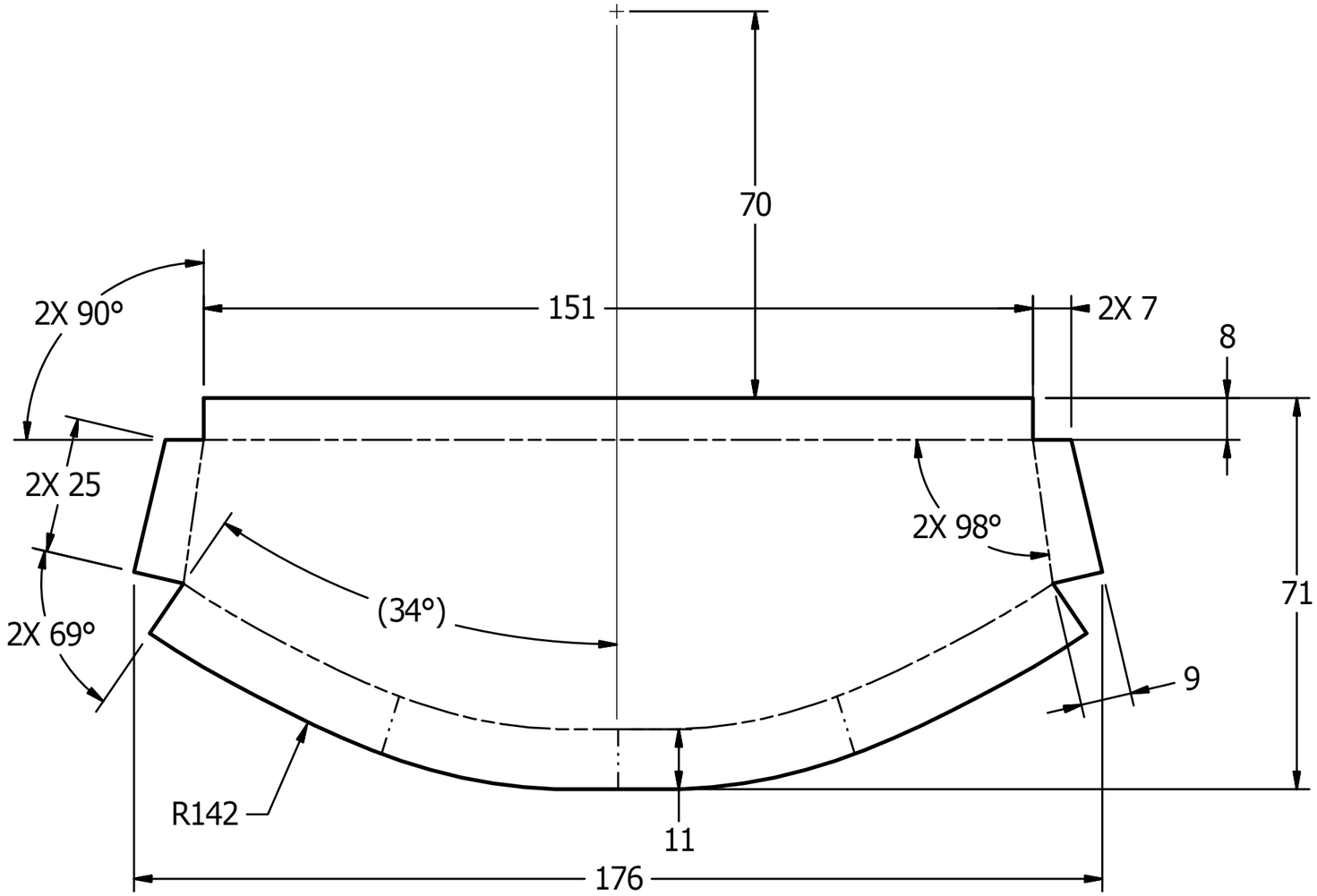
REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	RENIMBERED FROM T1LAF111 R1 FOR THOR-M	9/8/2011	DW
	B	COMPLETE REDESIGN	11/13/2015	DW
	C	ADDED NEXT ASSEMBLY	1/9/2017	DW

LEGEND

PATTERN EDGE

FOLD LINES

CUT LINES



NOTES:

1. USE CORDURA NYLON FABRIC (1000 DENIER NYLON - 10 OZ/YD)
2. PRINT TO SCALE AND USE AS PATTERN FOR CUTTING OUT MATERIAL.
3. PATTERN IS SYMMETRICAL ABOUT CENTERLINE.

	C
472-4763	1
NEXT ASSEMBLY	QTY.
TOTAL QTY IN DUMMY	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

APPROVALS	DATE
DRAWN dwashenko	9/8/2011
CHECKED	
ENG D. WASHENKO	1/12/2012
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LOWER ABDOMEN BOTTOM BAG PATTERN
THOR-50M

THIRD ANGLE PROJECTION

SIZE A3 | DRAWING NUMBER 472-4763-2 | REV C

SCALE: 1 : 1 | SHEET 1 OF 1

472-4763-2.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1LAF112 R1 FOR THOR-M; 6 WAS 7; 95° WAS 94°	9/8/2011	DW
	B	DIEMENSION (367) WAS (362), 234 WAS 235, 7 WAS 13 TYP. FOR ALL TABS, 50 WAS 53, 57 WAS 51, 33 WAS 25, 28 WAS 24, 41 WAS 39, 4 WAS 6, 25 WAS 27, 111 WAS105, 132 WAS 130, & 144 WAS 143; ADDED DIMENSIONS 240 AND 58	11/16/2015	DW
	C	ADDED NEXT ASSEMBLY	1/9/2017	DW

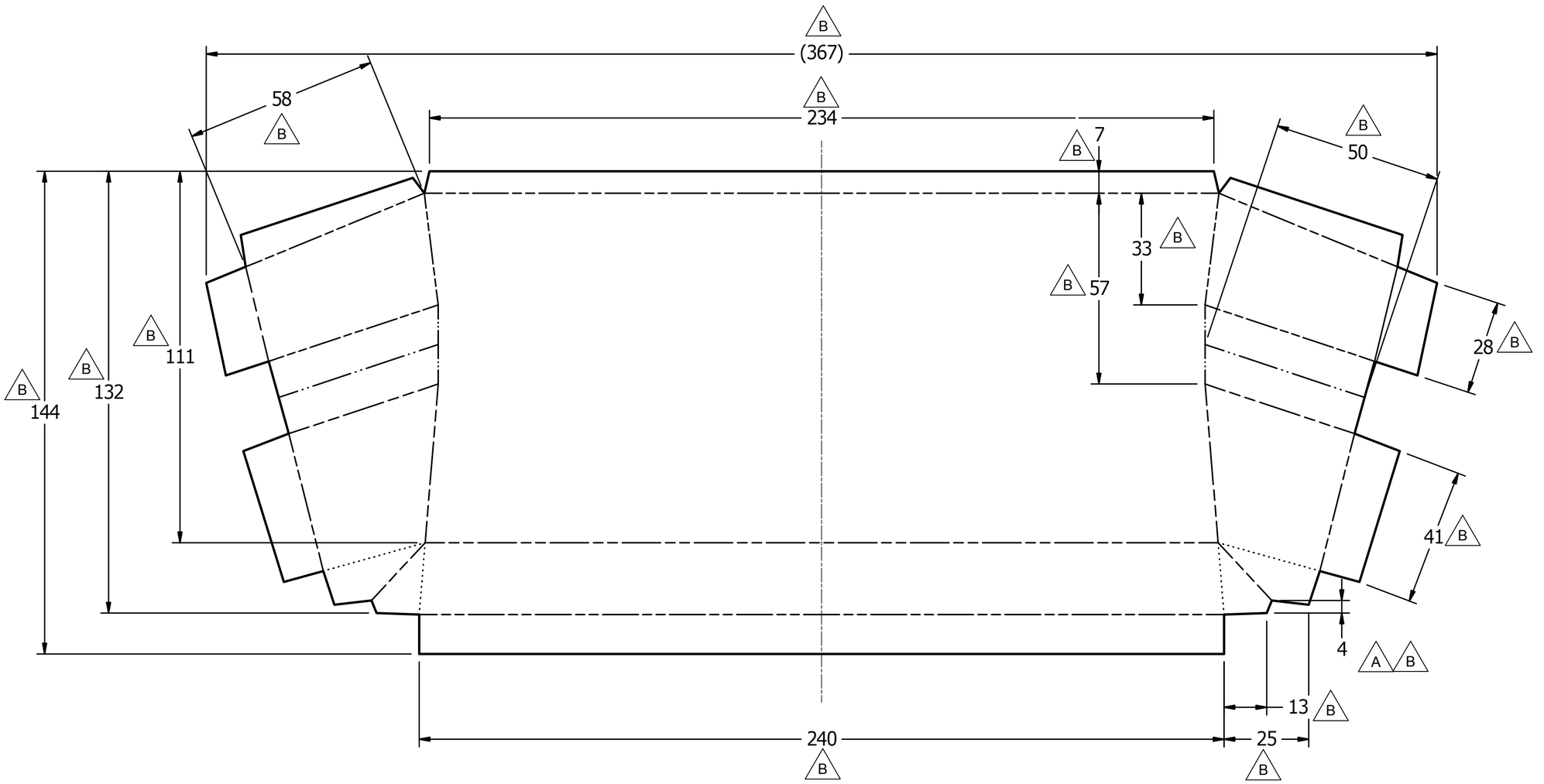
LEGEND

PATTERN EDGE

FOLD LINES

CUT LINES

STITCH LINES



NOTES:

1. USE CORDURA NYLON FABRIC (1000 DENIER NYLON - 10 OZ/YD)
2. PRINT TO SCALE AND USE AS PATTERN FOR CUTTING OUT MATERIAL.
3. PATTERN IS SYMMETRICAL ABOUT CENTERLINE.

472-4763	1
NEXT ASSEMBLY	QTY.
TOTAL QTY IN DUMMY	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN dwashenko	9/8/2011
CHECKED	
ENG D WASHENKO	1/12/2012
APPROVED	

DEPARTMENT OF TRANSPORTATION UNITED STATES OF AMERICA

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LOWER ABDOMEN TOP POCKET PATTERN
THOR-50M

THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 472-4763-3 | REV: C

SCALE: 1 : 1 | SHEET: 1 OF 1

472-4763-3-Orig.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1LAF113 R1 FOR THOR-M ADD NOTE 4; 44 WAS 45, 148 WAS 150, (14) WAS 15	9/8/2011	DW
	B	DIMENSION 54 WAS FROM EDGE OF MATERIAL	8128/2014	DW
	C	COMPLETE REDESIGN; DIMENSION 248 WAS 254, 57 WAS 61, 7 WAS 13 TYP. FOR ALL TABS, 79 WAS 84, 157 WAS 161, (19) WAS (14), 71 WAS 66, 51 WAS 44, 27 WAS 25, 112° WAS 26°, & 105° WAS 93°; ADDED DIMENSIONS 271, 100, 70, 7, 52, & 10	11/17/2015	DW
	D	DIMENSION (46) WAS 54; REVISED NOTE 2; ADDED TOP & BOTTOM LABELS TO PATTERN; ADDED NEXT ASSEMBLY	12/21/2016	DW

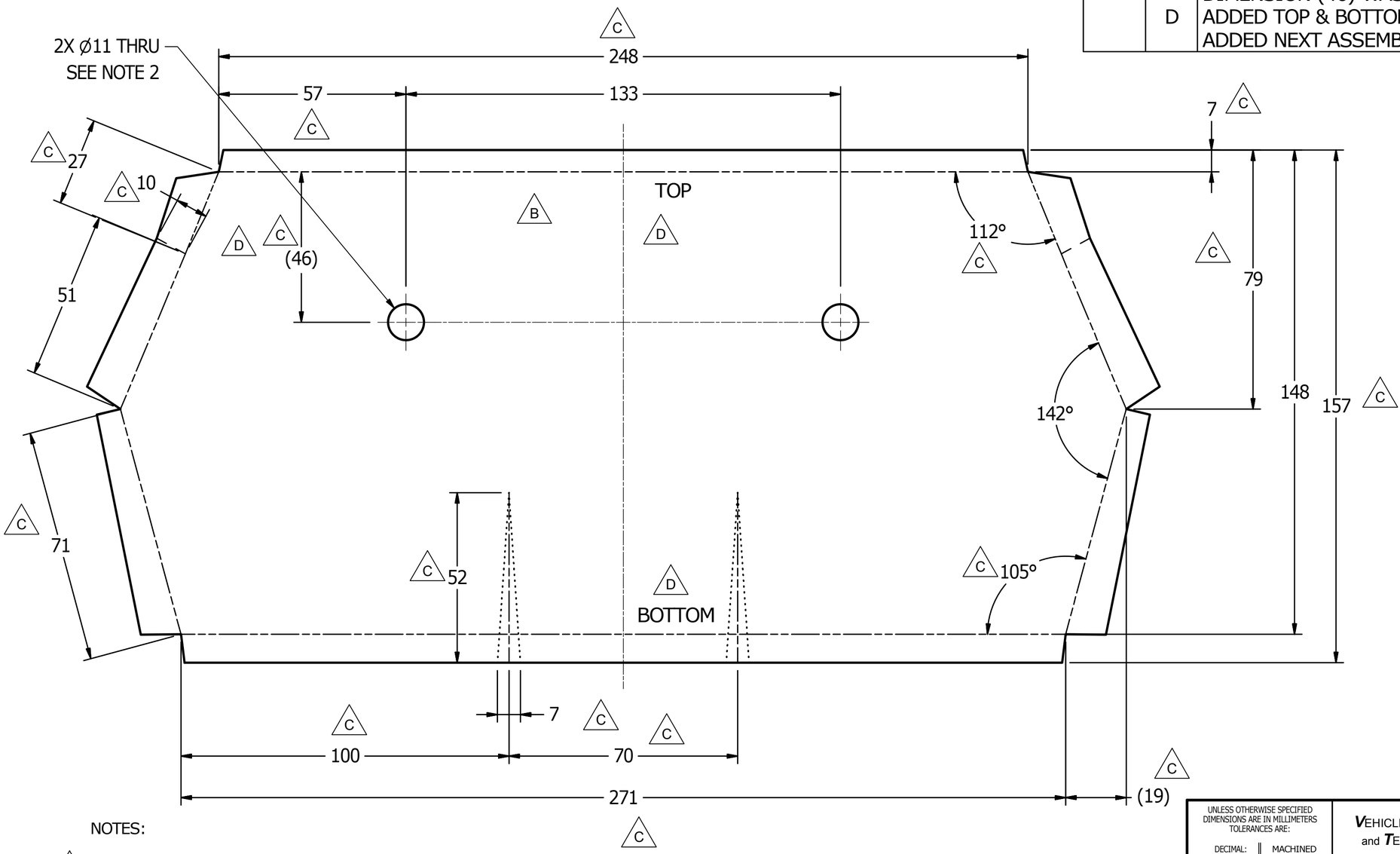
LEGEND

PATTERN EDGE

FOLD LINES

CUT LINES

STITCH LINES



NOTES:

1. MATERIAL: CORUDRA NYLON FABRIC (1000 DENIER NYLON - 10 OZ/YD)
2. CUT HOLES AFTER BAG ASSEMBLY.
3. PRINT TO SCALE AND USE AS PATTERN FOR CUTTING OUT MATERIAL.
4. DIMENSIONS ARE SYMMETRIC ABOUT CENTERLINE.

472-4763	1
NEXT ASSEMBLY	QTY.
TOTAL QTY IN DUMMY	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: dwashenko	9/8/2011
CHECKED:	
ENG: D. WASHENKO	1/12/2012
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LOWER ABDOMEN FRONT PATTERN
THOR-50M

THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 472-4763-4 | REV: D

SCALE: 1 : 1 | SHEET: 1 OF 1

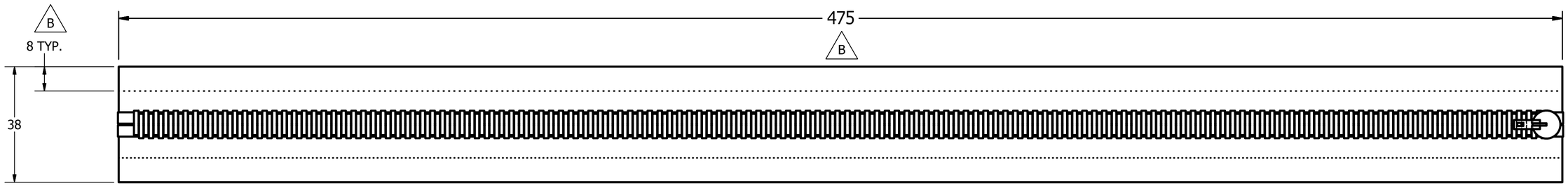
472-4763-4.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1LAF114 R2 FOR THOR-M	9/8/2011	DW
	B	DIMENSION 475 WAS 406; ADDED STITCH LINES; ADDED NEXT ASSEMBLY	1/9/2017	DW

LEGEND

PATTERN EDGE

STITCH LINE



NOTES:

1. ZIPPER SHOWN AS EXTERNAL SHAPE ONLY.
2. SIZE #10, LENGTH: 406mm, MATERIAL: BROWN POLYESTER METAL (BRASS), ZIPPER TYP: OPEN TOP-CLOSED BOTTOM STYLE.
3. THE END SHOULD BE SEWN TOGETHER TO PREVENT THE SLIDER FROM PULLING OFF THE TRACK.

B

472-4763	1
NEXT ASSEMBLY	QTY.
TOTAL QTY IN DUMMY	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994

DO NOT SCALE DRAWING

MATERIAL: SEE NOTES

HEAT TREAT:

FINISH:

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

APPROVALS	DATE
DRAWN dwashenko	9/8/2011
CHECKED	
ENG D WASHENKO	1/12/2012
APPROVED	

DEPARTMENT OF TRANSPORTATION · UNITED STATES OF AMERICA

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LOWER ABDOMEN ZIPPER

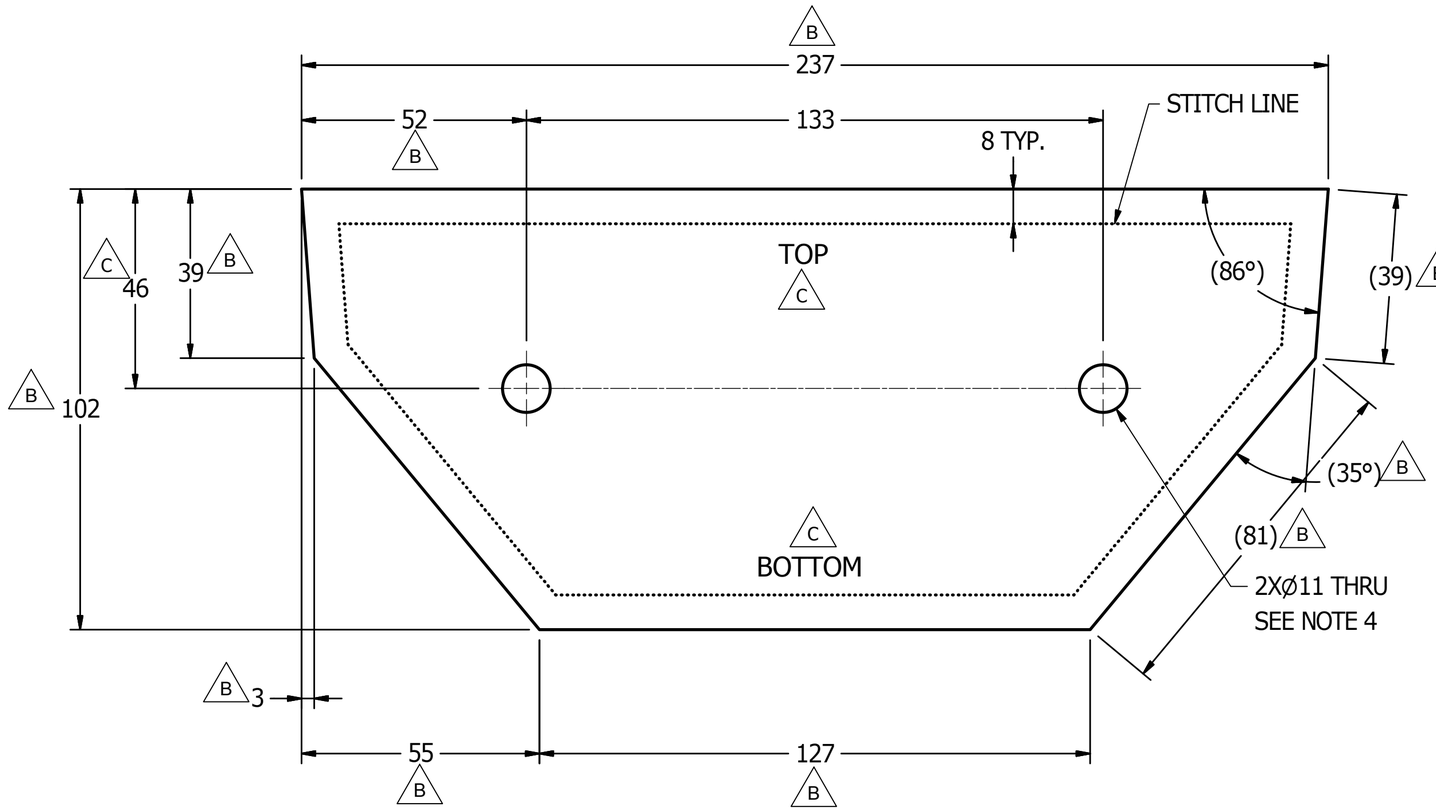
THIRD ANGLE PROJECTION

SIZE A2 | DRAWING NUMBER 472-4763-5 | REV B

SCALE: 1.00 | SHEET 1 OF 1

472-4763-5_Flat.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1LAF115 R11 FO THOR-M	9/8/2011	DW
	B	DIMENSION 237 WAS 251, 52 WAS 59, (39) WAS (28), (35˚) WAS (36˚), 127 WAS 125, 55 WAS 63, 3 WAS 2, 39 WAS 28, & 102 WAS 100	9/8/2011	DW
	C	DIMENSION 46 WAS 54; ADDED TOP & BOTTOM LABELS TO PATTERN; ADDED NOTE 4 AND NEXT ASSEMBLY	1/10/2017	DW



NOTES:

1. USE NYLON STIFFENING CLOTH (DUCT CLOTH) (20 OZ/TD; MEETS MIL-C-3953) SEW TO INSIDE OF PATTERN 472-4763-4
2. PRINT TO SCALE AND USE AS PATTERN FOR CUTTING OUT MATERIAL.
3. PATTERN IS SYMMETRICAL ABOUT CENTERLINE.
C 4. CUT HOLES AFTER BAG ASSEMBLY.

472-4763	1
NEXT ASSEMBLY	QTY.
TOTAL QTY IN DUMMY	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN dwashenko	9/8/2011
CHECKED	
ENG D. WASHENKO	1/12/2012
APPROVED	

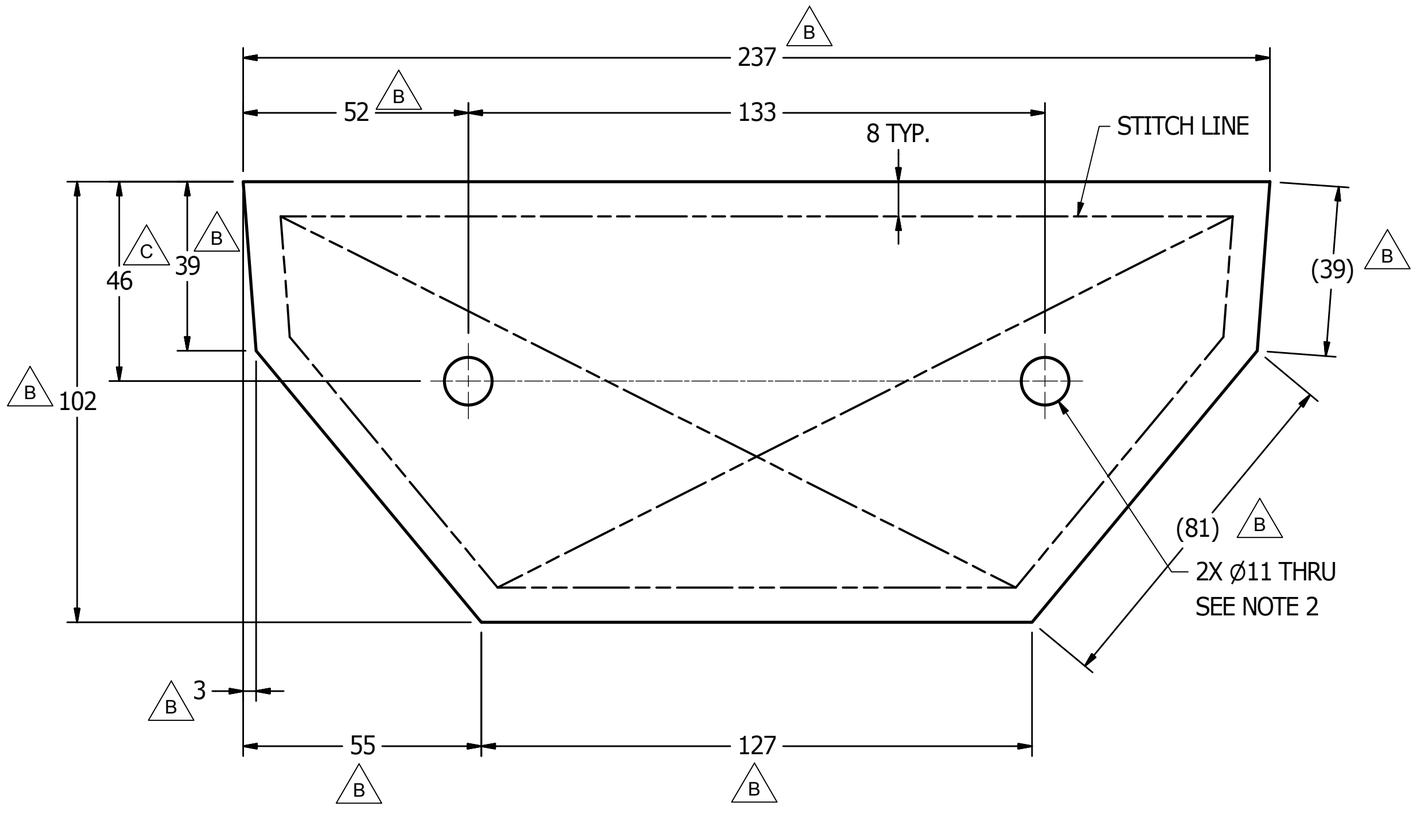
DEPARTMENT OF TRANSPORTATION UNITED STATES OF AMERICA
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LOWER ABDOMEN STIFFENING CLOTH
THOR-50M

THIRD ANGLE PROJECTION
SIZE: A2 | DRAWING NUMBER: 472-4763-6 | REV: C
SCALE: 1 : 1 | SHEET: 1 OF 1

472-4763-6.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1LAF116 R2 FOR THOR-M	9/8/2011	DW
	B	DIMENSION 237 WAS 251, 52 WAS 59,(39) WAS (28), (81) WAS (94), 127 WAS 125, 55 WAS 63, 3 WAS 2, 39 WAS 28, & 102 WAS 100	9/8/2011	DW
	C	DIMENSION 46 WAS 54; REVISED NOTE 2; ADDED NEXT ASSEMBLY	1/10/2017	DW



NOTES:

C 1. MATERIAL: BLACK LOOP VELCRO. SEW TO FRONT OF THE FRONT PATTERN 472-4763-4.
2. CUT HOLES AFTER BAG ASSEMBLY.
3. PRINT TO SCALE AND USE AS PATTERN FOR CUTTING OUT MATERIAL.

472-4763	1
NEXT ASSEMBLY	QTY.
TOTAL QTY IN DUMMY	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN dwashenko	9/8/2011
CHECKED	
ENG D. WASHENKO	1/12/2012
APPROVED	

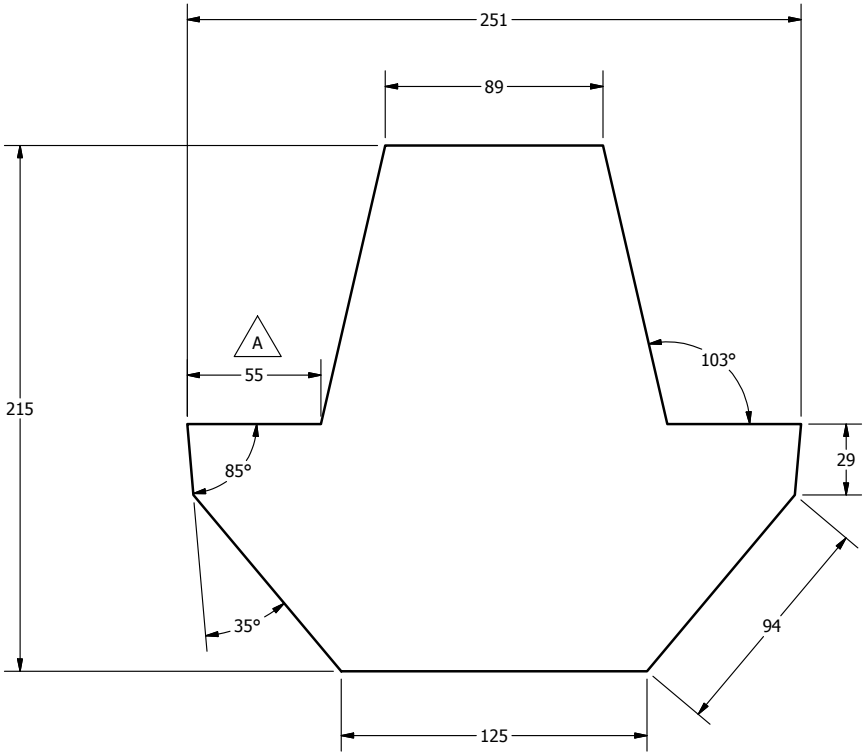
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LOWER ABDOMEN OUTSIDE VELCRO PATCH
THOR-50M

THIRD ANGLE PROJECTION
SIZE A2 | DRAWING NUMBER 472-4763-7 | REV C
SCALE: 1 : 1 | SHEET 1 OF 1

472-4763-7.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1LAF117 R1 FOR THOR-M; 55 WAS 56	9/8/2011	DW

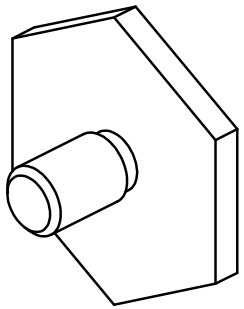


NOTES:

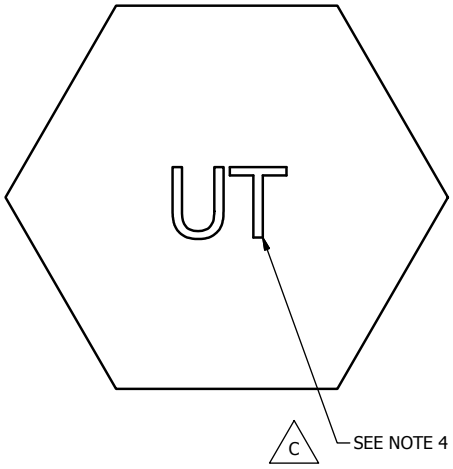
1. MATERIAL: BLACK VELCRO - HOOK SIDE
2. VELCRO COVER ATTACHES TO MATCHING FRONT VELCRO PATCH OF UPPER ABDOMEN BAG (472-4627)
3. PRINT TO SCALE AND USE AS PATTERN FOR CUTTING OUT MATERIAL.

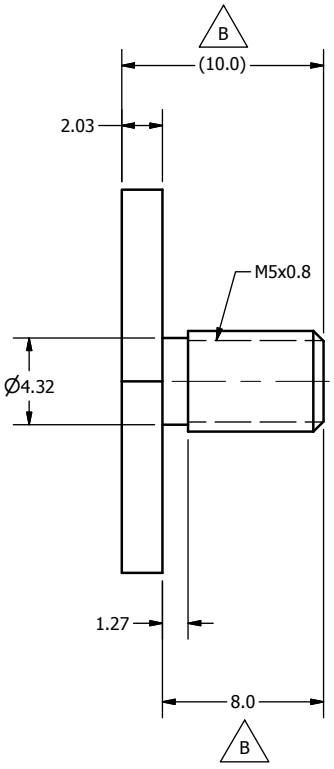
		PROJECT NO.:	DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
472-4763	1	MATERIAL: SEE NOTES	DRAWN BY: dwashenko	DATE: 9/8/2011	DESCRIPTION: UPPER AND LOWER ABDOMEN VELCRO COVER
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: B; SHEET: 1 OF 1; DRAWING NO.: 472-4763-8; REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: D. WASHENKO	DATE: 1/12-2012	SCALE: 1.000

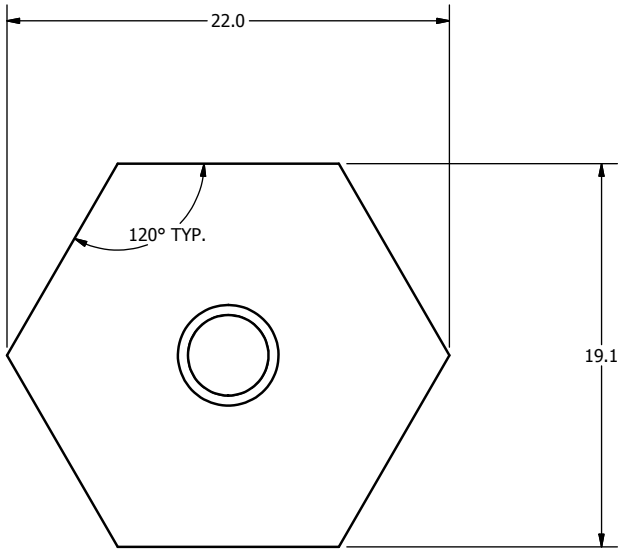
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1CXM010 R2 AND CONVERTED TO METRIC FOR THOR-M; ADD NOTES	9/23/2011	TKN
	B	8.0 WAS 10.49; 10.0 WAS 12.52; QTY 2 WAS 4	7/25/2012	BK
	C	CHANGE DESC, "UPPER THORAX" WAS "THORAX"; STAMP "UT" ON PART AND ADD NOTE 4; ADD VIEW	7/11/2013	BK



ISO VIEW
SCALE 3.000







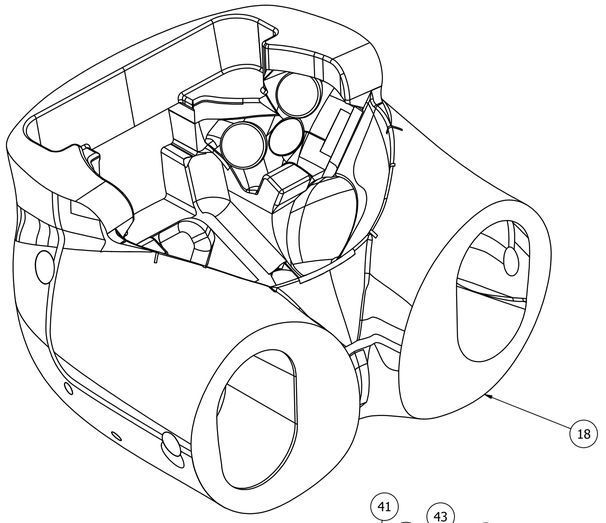
A NOTES:

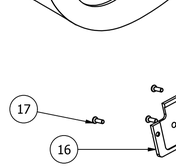
1. POWDER OR BEAD BLAST.
2. NICKEL PLATE 0.003mm - 0.008mm MAX. AFTER MACHINING.
3. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.

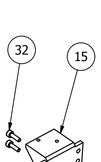
C 4. STAMP OR ETCH "UT" (3mm MIN. CHARACTERS) WHERE SHOWN.

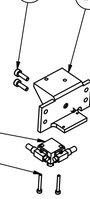
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES			
PROJECT NO.:			DESCRIPTION: IRTRACC CONNECTING BOLT, UPPER THORAX		
472-3000	2	MATERIAL: 1018 STEEL HEX	DRAWN BY: Thanh	DATE: 9/23/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	2	FINISH: SEE NOTES	ENGINEER: J. WANG	DATE: 1/18/2012	SCALE: 4.000
					DRAWING NO.: 472-3518 REV: C

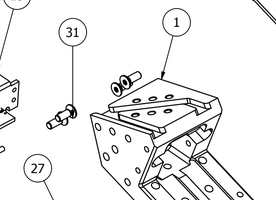
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLS000 R02 AND CONVERTED TO METRIC FOR THOR-M	8/15/2011	JSJ
	B	ADD 5000604 QTY. 6, 5000646 QTY. 4; 5000023 QTY 9 WAS 13	6/27/2012	BK
	C	472-4375 WAS 472-4373; REMOVED 5000416	9/18/2014	DW
	D	REVISED 472-4380-2 RIGHT WING ASSEMBLY AND 472-4380-1 LEFT WING ASSEMBLY; ADDED PART #SA572-S119 A.S.I.S. LOAD CELL (OPTIONAL), SA572-S129 ACETABULAR LOAD CELL ASS'Y., RIGHT, & SA572-S128 ACETABULAR LOAD CELL ASS'Y., LEFT	9/3/2015	DW
	E	ADDED ITEMS, 41 – 9002655 – WIRE CLAMP, NYLON 1/8 DIA, 42 – 5001111V – WASHER, SPRING LOCK M3, 43 – 9009248V – NUT, HEX M3-0.5	2/24/2016	DW
	F	ADDED C.G. VIEW AND NOTES 2 & 3; WEIGHT WAS 10.60; ADDED ITEM #44, 45, & 46	9/19/2017	DW
	G	ITEM #29 QTY. WAS 12; ITEM #33 QTY. WAS 9; ITEM #37 QTY. WAS 4; ITEM #44 WAS PART #9010566V DESCRIPTION – SCREW, SHCS M6 x 22 LOW PROFILE, ITEM #6 WAS PART #5000084 DESCRIPTION – SCREW, FHCS M5x0.8 x 10; ADDED ITEM #47 - QTY. 4 - PART #5000285 - DESCRIPTION: SCREW, FHCS M6x1 x 18	2/26/2018	DW

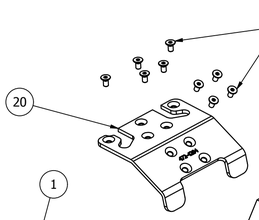


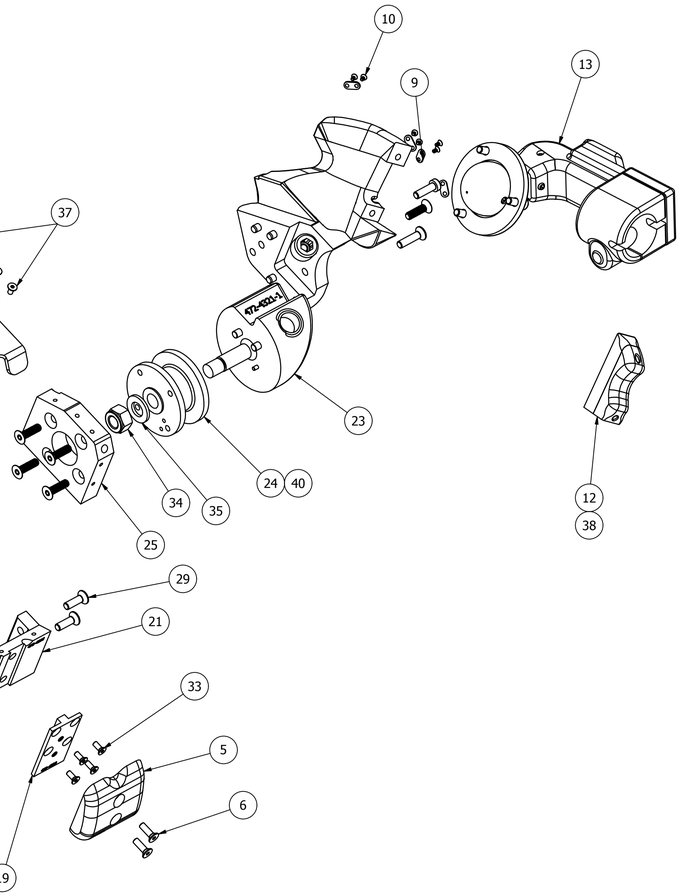


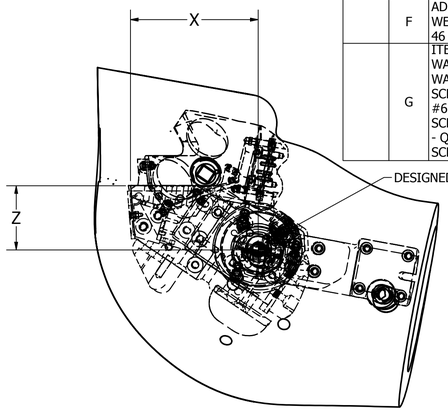




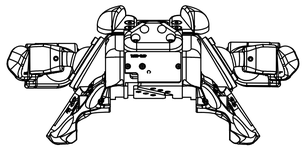


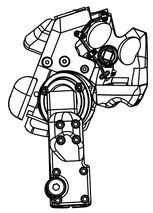


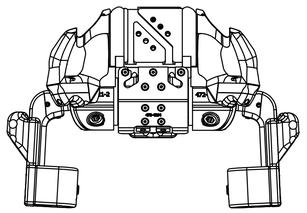


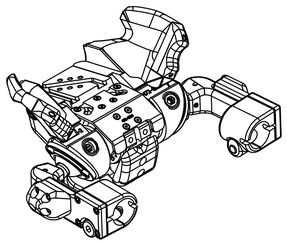


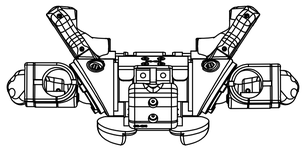
C.G. LOCATION











FLESH REMOVED IN THESE VIEWS

G	47	4	5000285	SCREW, FHCS M6x1 x 18
F	46	2	5000985	M2 X 0.4 X 16 LG. SHCS
F	45	1	472-4203	TRI-PACK ACCEL. ASSY.
G	44	2	5001316	SCREW, SHCS M6 x 20 LOW PROFILE
E	43	1	9009248V	NUT, HEX M3-0.5
E	42	1	5001111V	WASHER, SPRING LOCK M3
E	41	1	9002655	WIRE CLAMP,NYLON 1/8 DIA.
D	40	1	SA572-S128	ACETABULAR LOAD CELL ASS'Y., LEFT
D	39	1	SA572-S129	ACETABULAR LOAD CELL ASS'Y., RIGHT
D	38	2	SA572-S119	A.S.I.S. LOAD CELL (OPTIONAL)
G B	37	9	5000646	SCREW, FHCS M4-0.7 x 8
B	36	6	5000604	SCREW, SHCS M6-1 x 14 mm
	35	2	5000267	M12 FLAT WASHER PLAIN ZINC
B	34	2	5000462	M12 X 1.75 HEX LOCK NUT ZINC
G	33	4	5000023	SCREW, FHCS M4x0.7 x 10
	32	4	5000119	M3 X 0.5 X 10 LG. SHCS
	31	4	5000090	SCREW, FHCS M6-1 x 16
	30	4	5000281	M6 X 1 X 12 LG. SHCS
G	29	8	5001089	SCREW, FHCS M6x1 X 20
	28	8	5000135	SCREW, FHCS M6-1 x 25
	27	1	472-4325-2	PELVIS LOAD CELL MTG. PLATE (RIGHT)
	26	1	472-4321-2	PELVIS SOCKET ADAPTER (RIGHT)
	25	1	472-4325-1	PELVIS LOAD CELL MTG. PLATE LEFT
	24	2	472-4323	ACETABULAR LOAD CELL STRUCTURAL REPLACEMENT
	23	1	472-4321-1	PELVIS SOCKET ADAPTOR (LEFT)
	22	2	472-4310	FRICTION ADJUSTMENT SET SCREW ASSEMBLY
	21	1	472-4205	PELVIS, REAR PLATE
	20	1	472-4204	PELVIS TOP PLATE
	19	1	472-4330	PELVIS FRONT PLATE
	18	1	472-4100	PELVIS FLESH, MOLDED
	17	3	5000203	SCREW, FHCS M3-0.5 x 10
	16	1	472-4371	PELVIS ACCELEROMETER COVER
	15	1	472-4361	PELVIS TRI-PACK MOUNTING BRKT.
	14	1	472-4800-2	RIGHT FEMUR BALL JOINT ASS'Y
	13	1	472-4800-1	LEFT FEMUR BALL JOINT ASS'Y
C	12	2	472-4375	S.R. THOR A.S.I.S.
	11	10	5000572	SCREW, FHCS M6-1 x 22
	10	16	5000723	SCREW, FHCS M2.5-0.45 x 5
D	9	8	472-4372	ILIAC CABLE COVER, PELVIS
D	8	1	472-4380-1	LEFT ILIAC ASSEMBLY
D	7	1	472-4380-2	ILIAC WING, RIGHT
G	6	2	5000467	SCREW, FHCS M5 x 0.8 x 16
	5	1	472-4370	MACHINED FRONT PELVIC CASTING
	4	1	472-4350	PELVIS COCCYX
	3	1	472-4340-2	PELVIS RIGHT D-PT
	2	1	472-4340-1	PELVIS LEFT D-PT
	1	1	472-4211	PELVIS BASE MODULE
ITEM	QTY	PART NUMBER	DESCRIPTION	

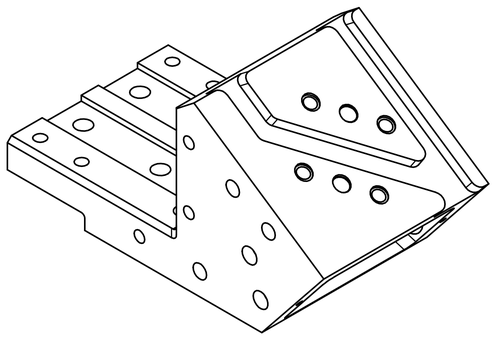
PARTS LIST

NOTES:
1. WEIGHT OF ASSEMBLY TO BE 15.24 ±.25kg.
2. REFER TO DRAWING 472-0000 SHT. 5 OF 5 FOR C.G. AND WEIGHT SPECIFICATIONS.
3. THE C.G. ORIGIN IS THE TOP OF THE PELVIS BASE MODULE AND THE COORDINATE SYSTEM IS ORIENTATED WITH THE "X" DIMENSION PARALLEL TO THE PELVIS BASE MODULE.

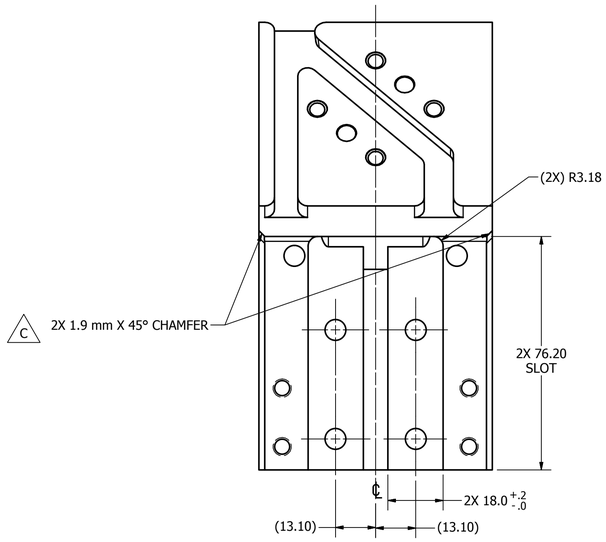
DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS X ± .5 ANGLES ±1° X.X ± .05 X.XX ± .02 X.XXX ± .010 X.XXX ± 0.01 REMOVE BURRS & BREAK SHARP EDGES	DOCUMENT: PELVIS ASSEMBLY	
PROJECT NO:			
MATERIAL: 472-0000	1		
NEXT ASSEMBLY	QTY	HEAT TREAT:	
TOTAL QTY IN DUMMY	1	FINISH:	
DRAWN: HORCHLER 8/15/2011	CHECKED BY:	DATE:	
ENGINEER: J. WANG	DATE: 1/20/2012	SIZE: A1 SHEET: 1 OF 1	DRAWING NO: 472-4000 REV: G
		SCALE: 1:2.5	

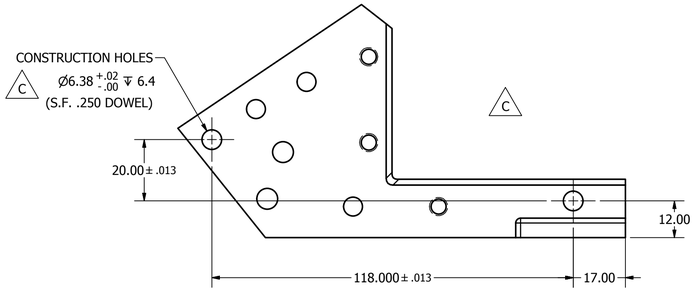
472-4000.iam

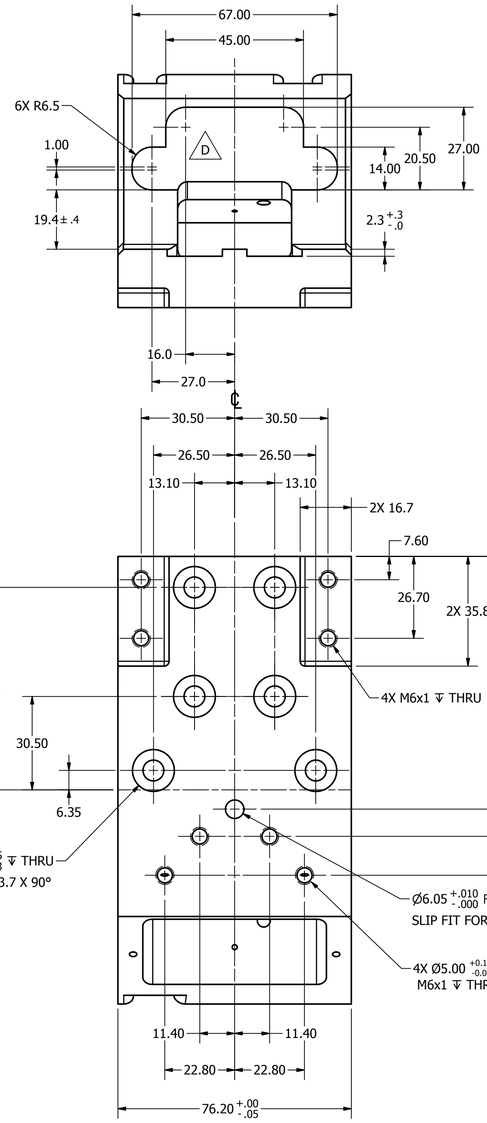
REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM010-03 AND CONVERTED TO METRIC FOR THOR-M	8/18/2011	JSJ
	B	NICKEL PLATE FINISH WAS TEFLON	12/22/2011	TMV
	C	ADD VIEW TO SHOW ADDED CONSTRUCTION HOLES; 2X M3 WAS M2.5 (sht 2); 1.9 WAS 1.91	6/27/2012	BK
	D	RE-DIMENSIONED; REMOVED MATERIAL (CENTER VIEW) TO REMOVE WEIGHT; MATERIAL WAS 1018 STEEL	2/7/2017	DW

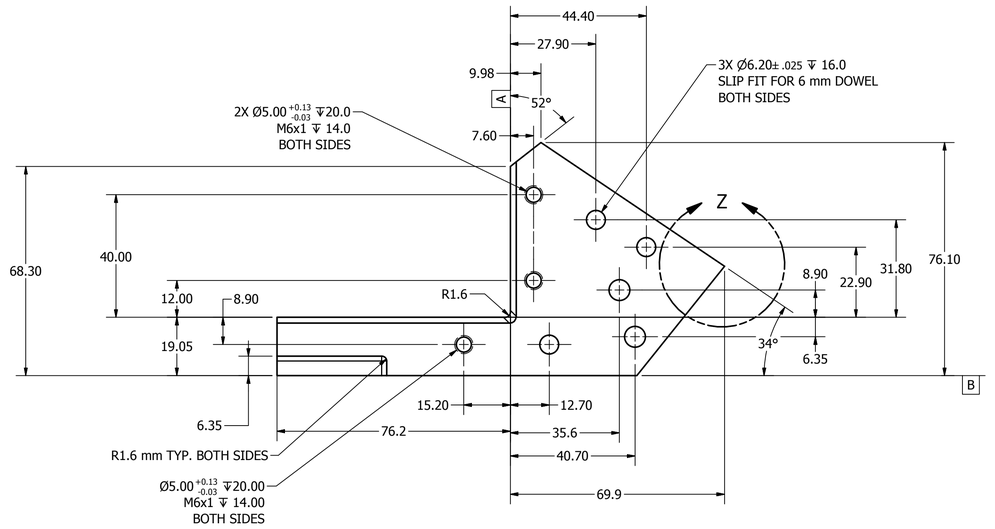


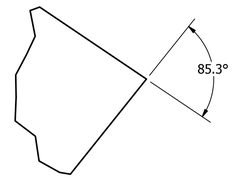
SCALE 1.000











DETAIL Z
SCALE 2 : 1

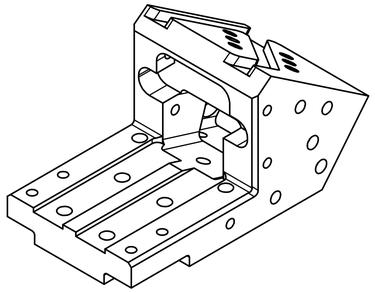
		DO NOT SCALE DRAWING	TOLERANCES
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: 3.2 X .X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES
		PROJECT: THOR-50M	
472-4210	1	MATERIAL: 4140 STEEL	DRAWN: DLW 8/10/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED: TMV 12/22/2011
TOTAL QTY IN DUMMY	1	FINISH: ELECTROLESS NICKEL PLATE .008 MAX	ENGINEER: J. WANG DATE: 1/19/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

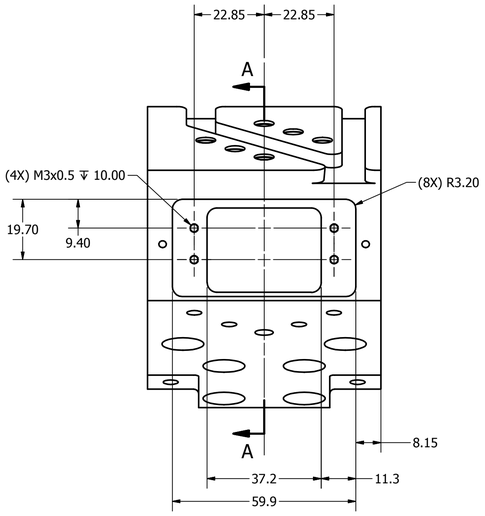
ASSEMBLY: PELVIS BASE MODULE

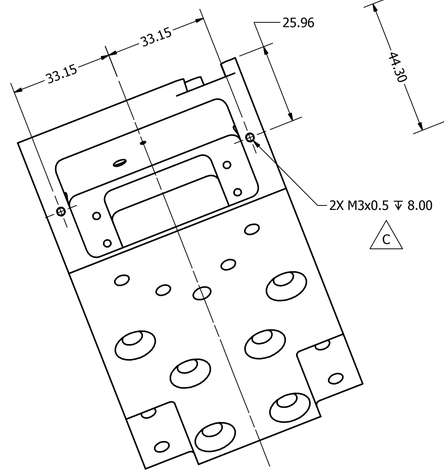
SIZE: A1 | SHEET: 1 OF 2 | SCALE: 1:1 | DRAWING NO.: 472-4211 | REV: C

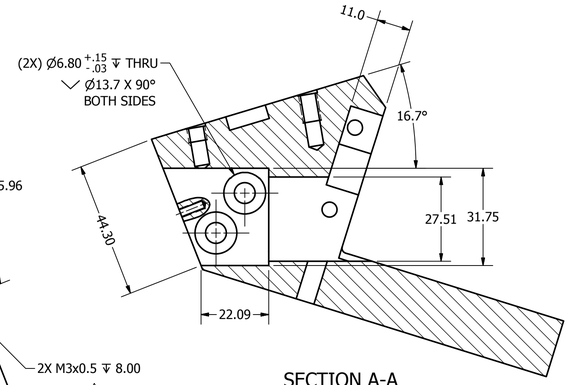
472-4211.ipt



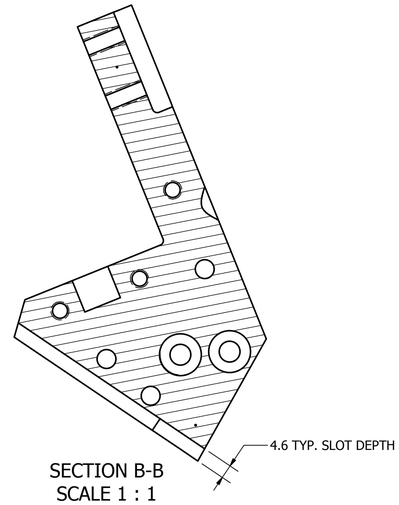
SCALE .750



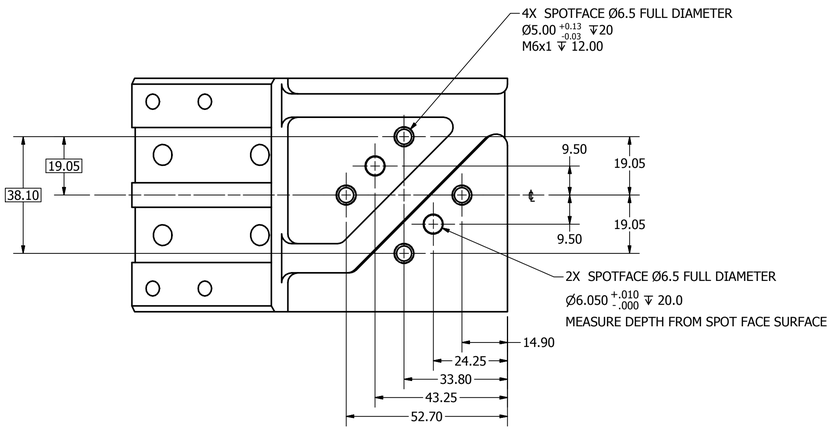


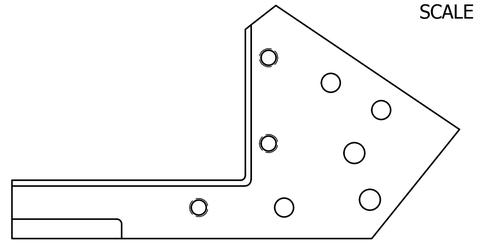


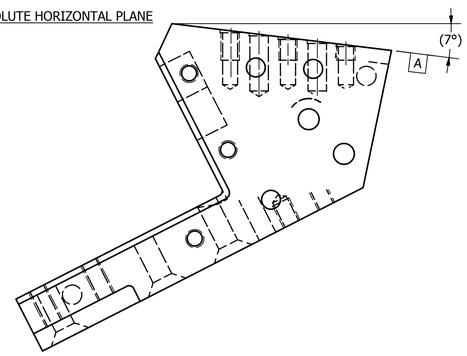
SECTION A-A
SCALE 1 : 1

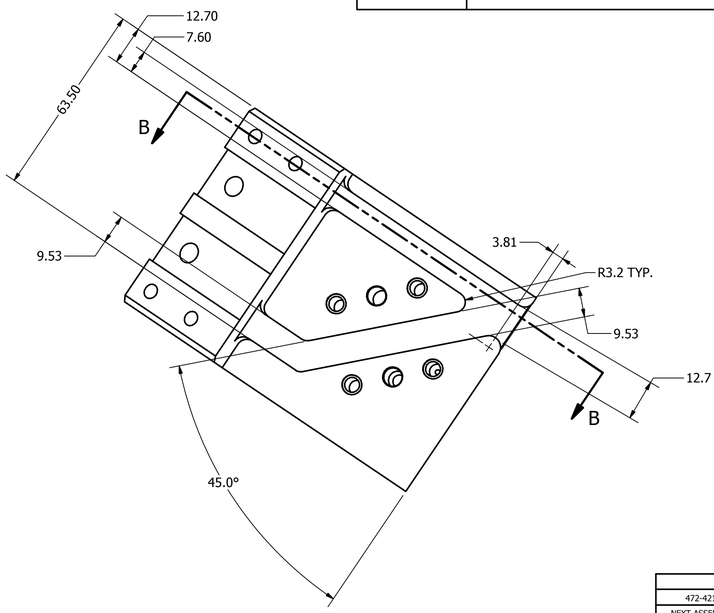


SECTION B-B
SCALE 1 : 1





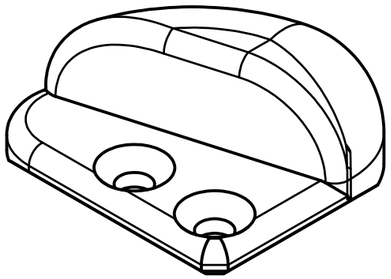


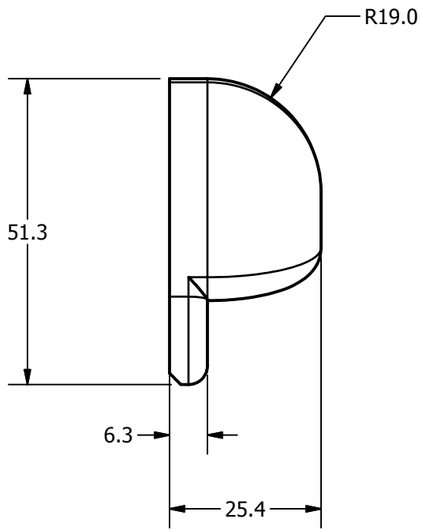


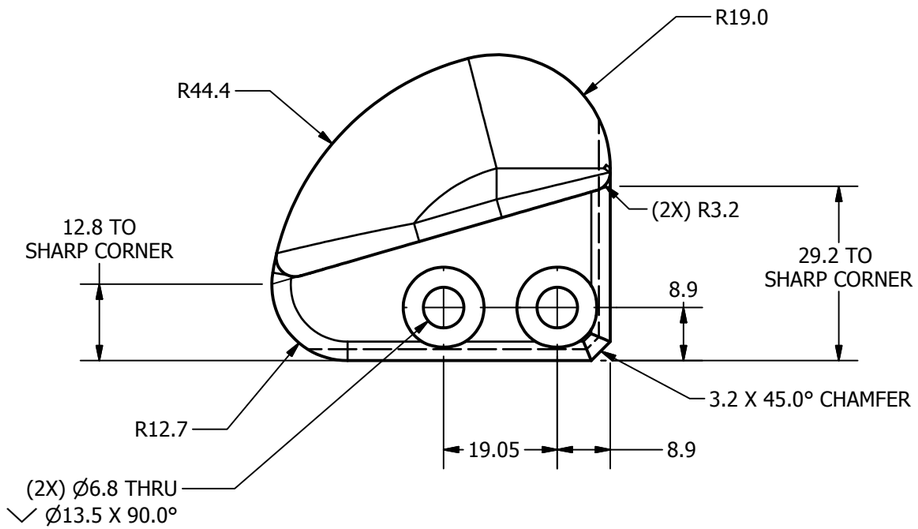
		DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.1, X.XX ±0.05; ANGLES ±1°; FINISH 1.6	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		MATERIAL: THOR-50M	REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: PELVIS BASE MODULE	
472-4210	1	PART NUMBER: 4140 STEEL	DRAWN: DLW 8/10/2011		
NEXT ASSEMBLY	QTY	PART FINISH:	CHECKED BY: TMV 12/22/2011	SIZE: A	SHEET: 12 OF 2
TOTAL QTY IN DUMMY	1	FINISH: ELECTROLESS NICKEL PLATE .008 MAX	ENGINEER: J. WANG 1/19/2012	SCALE: 1:1	DRAWING NO.: 472-4211 REV: C

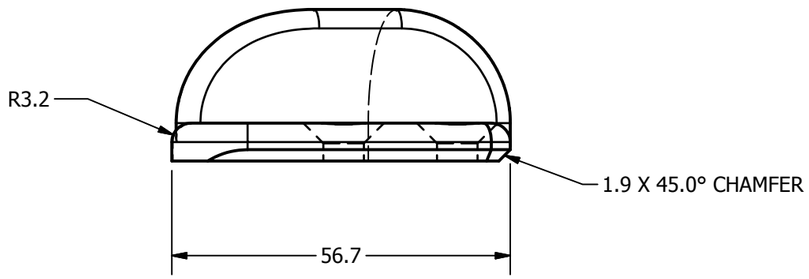
472-4211.ipt

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM014 R3 AND CONVERTED TO METRIC FOR THOR-M	8/24/2011	JSJ



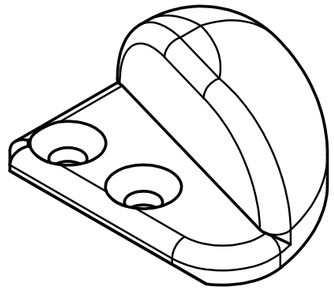


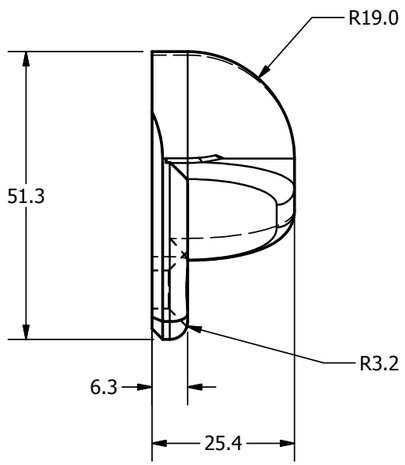


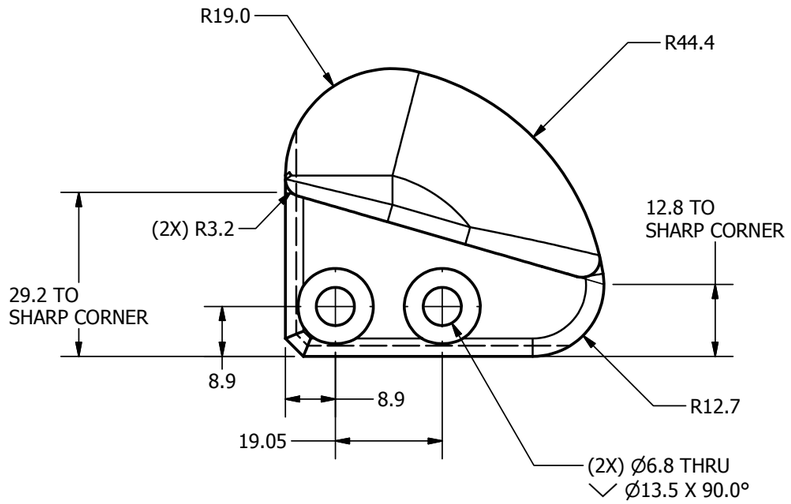


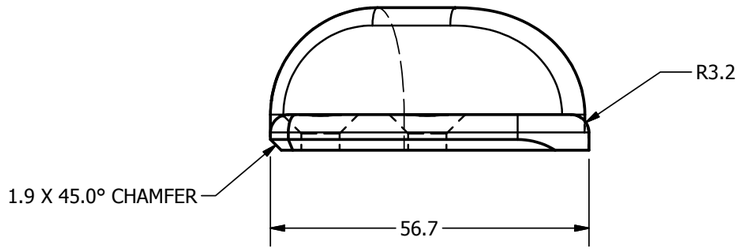
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: PELVIS LEFT D-PT	
472-4000	1	MATERIAL: Aluminum-6061	DRAWN BY: jjordan / DATE: 8/24/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV / DATE: 10/26/2011	SIZE: B / SHEET: 1 OF 1 / DRAWING NO.: 472-4340-1	REV: A
TOTAL QTY IN DUMMY	1	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG / DATE: 1/23/2012	SCALE: 1:1	

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM015 R3 AND CONVERTED TO METRIC FOR THOR-M	8/24/2011	JSJ









		PROJECT NO.:	DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES — UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES
472-4000	1	MATERIAL: Aluminum-6061	DRAWN BY: jjordan	DATE: 8/24/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV	DATE: 10/26/2011
TOTAL QTY IN DUMMY	1	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG	DATE: 1/23/2012

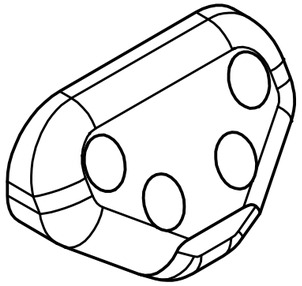
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: PELVIS RIGHT D-PT

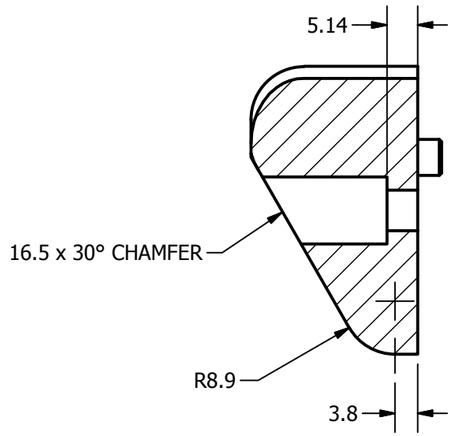
SIZE: A3 | SHEET: 1 OF 1 | DRAWING NO.: 472-4340-2 | REV: A

SCALE: 1:1

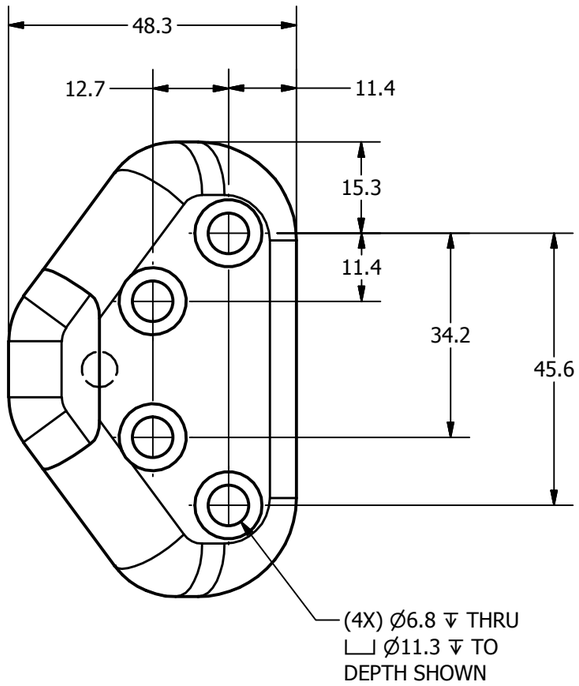
REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM013-04 AND CONVERTED TO METRIC FOR THOR-M	8/23/2011	JSJ
	B	ITEM #1 PART NUMBER WAS 5000570	6/29/2017	DW

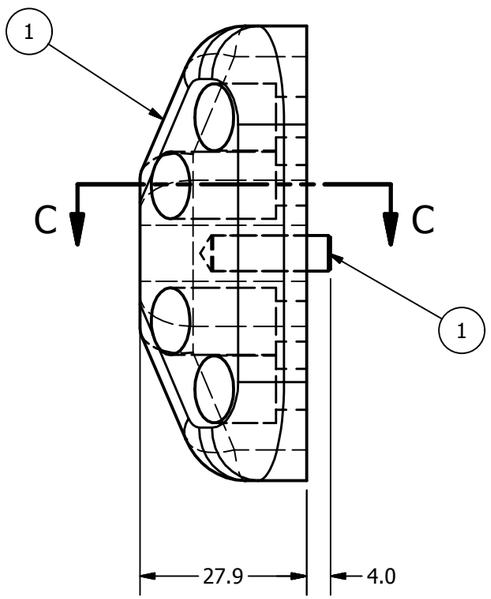


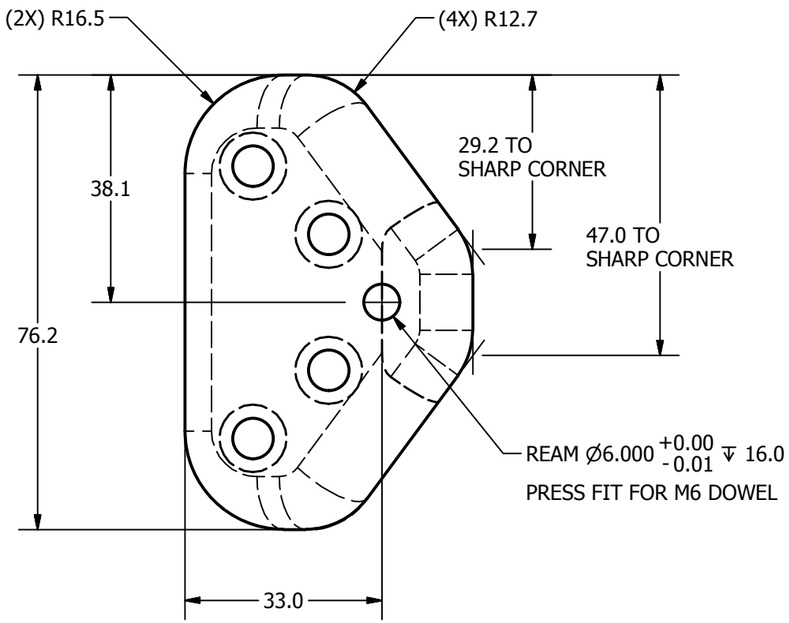
SCALE .750



SECTION C-C
SCALE 1 : 1







ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5001218	PIN, DOWEL M6 X 20 mm

Parts List

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

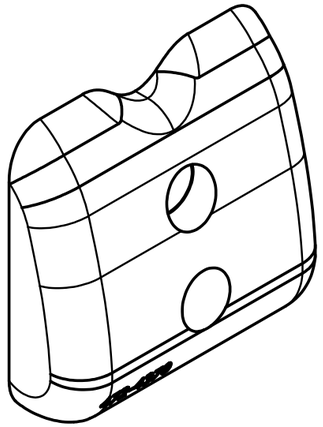
REMOVE BURRS & BREAK SHARP EDGES

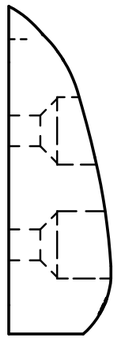
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

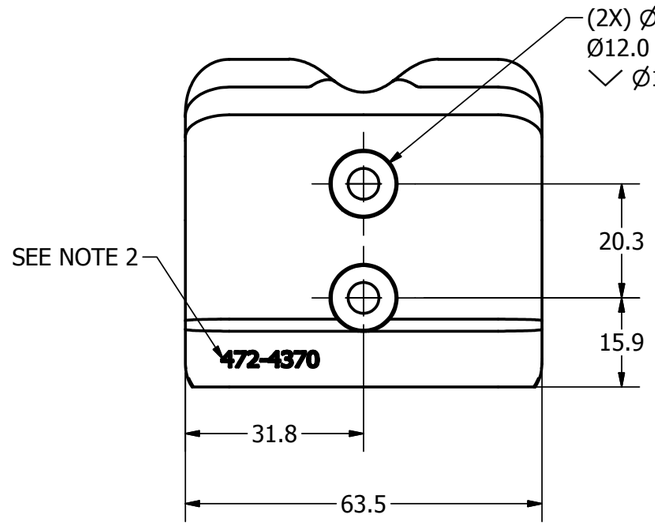
		PROJECT NO.:		DESCRIPTION:	PELVIS COCCYX
472-4000	1	MATERIAL: Aluminum-6061	DRAWN BY: jjordan	DATE: 8/23/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV	DATE: 10/28/2011	SIZE: B / SHEET: 1 OF 1 / DRAWING NO.: 472-4350 / REV: B
TOTAL QTY IN DUMMY	1	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG	DATE: 1/23/2012	SCALE: 1:1

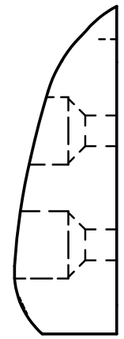
472-4350.ipt

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM219 R05 AND CONVERTED TO METRIC FOR THOR-M; ADD (OPTIONAL) TO NOTE 2; REMOVE VENDOR REFERENCE FROM NOTE 3; REMOVE NOTE 4	8/22/2011	JSJ







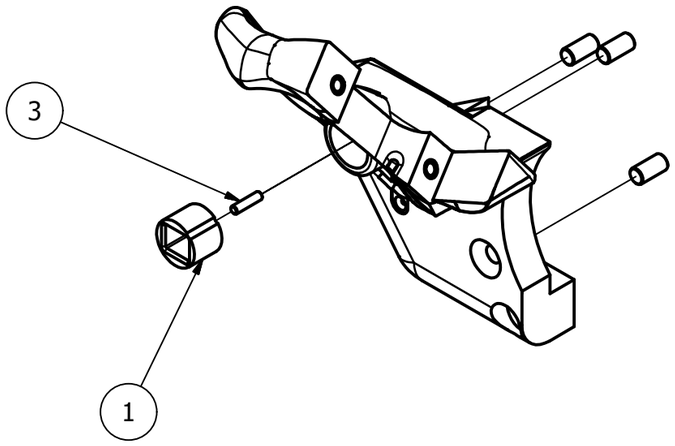


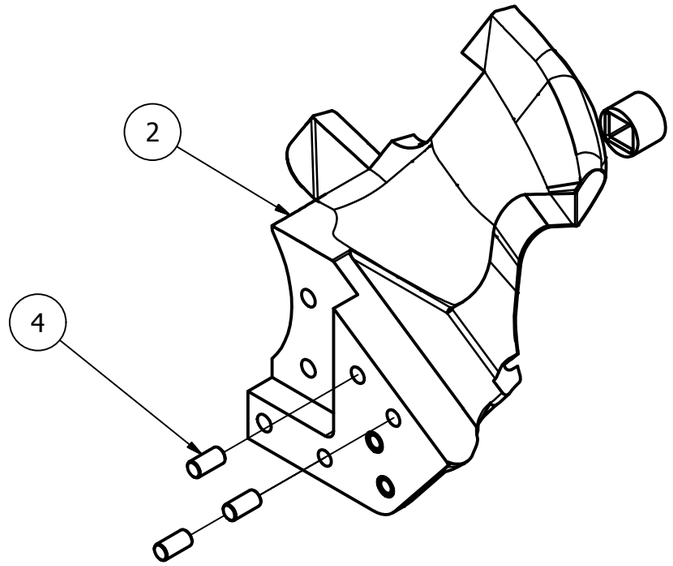
NOTES:
1. FRONT PELVIC CASTING IS A CONTOURED CAST PART WHICH REPRESENTS THE CURVATURE AT THE FRONT OF THE PELVIS.
2. ENGRAVE DWG. # 472-4370 ON THE SPECIFIED AREA ABOVE. (OPTIONAL)
3. THE FRONT PELVIC CASTING IS A URETHANE CASTING, THE CASTING MATERIAL IS CIBI-GIEGY RP6430 URETHANE (75 ± 3 D)

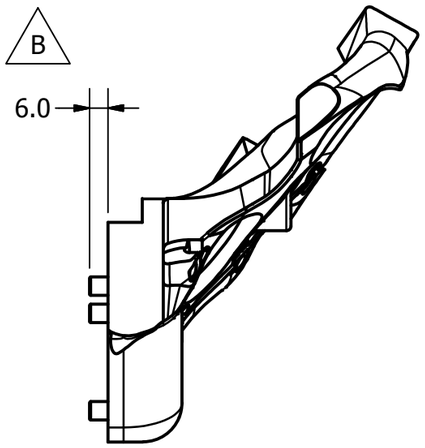
A

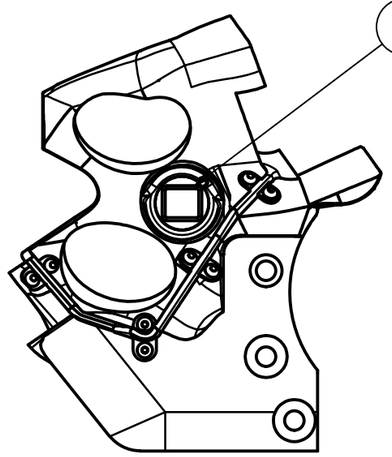
		PROJECT NO.:	DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES — UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
472-4000	1	MATERIAL: Thermoplastic Resin	DRAWN BY: DLW	DATE: 8/10/2011	DESCRIPTION: MACHINED FRONT PELVIC CASTING
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV	DATE: 10/25/2011	SIZE: A3 · SHEET: 1 OF 1 · DRAWING NO.: 472-4370 · REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/23/2012	SCALE: 1:1

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM402 R0 AND CONVERTED TO METRIC FOR THOR-M	8/18/2011	JSJ
	B	ADDED VIEW WITH PIN HEIGHT DIMENSION	7/24/2012	TMV
	C	REVISED PART #472-4382-2 PELVIS WING MACHINING (RIGHT)	8/25/2015	DW
	D	REVISED ITEM #1 PART #472-4381 AND ADDED DETAIL A	4/28/2016	DW
	E	REVISED ITEM #1, 472-4381, PELVIS H-PT. TOOL BEARING & ITEM #2, 472-4382-2, PELVIS WING, RIGHT; REMOVED DETAIL A.	2/9/2017	DW









1 TO BE INSTALLED AS SHOWN
LONGER DIMENSION OF OPENING
IS TO BE HORIZONTAL

ITEM	QTY	PART NUMBER	DESCRIPTION
4	3	5000433	PIN, DOWEL M6 X 12 mm
3	1	5000183	PIN, DOWEL M3 X 12 mm
2	1	472-4382-2	PELVIS WING, RIGHT
1	1	472-4381	PELVIS H-PT. TOOL BEARING

Parts List

472-4000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5° 1.6
X.X ± 0.2
X.XX ± 0.1
X.XXX ± 0.01
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:
DRAWN BY: S. RICE DATE: 8/10/2011
CHECKED BY: TMV DATE: 9/21/2011
ENGINEER: J. WANG DATE: 1/24/2012

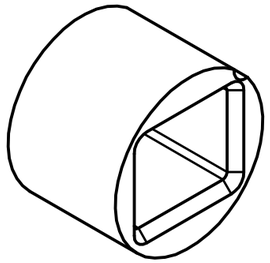
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: ILIAC WING, RIGHT

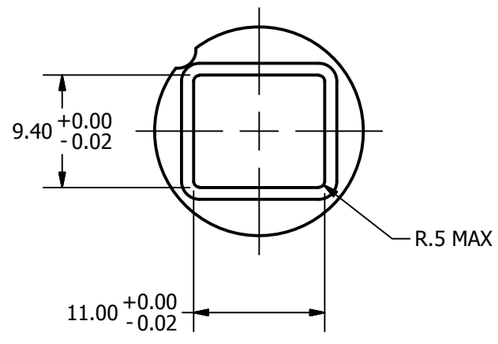
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 1:2
DRAWING NO.: 472-4380-2
REV: E

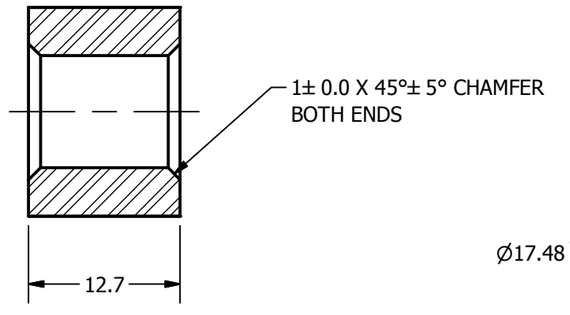
472-4380-2.iam

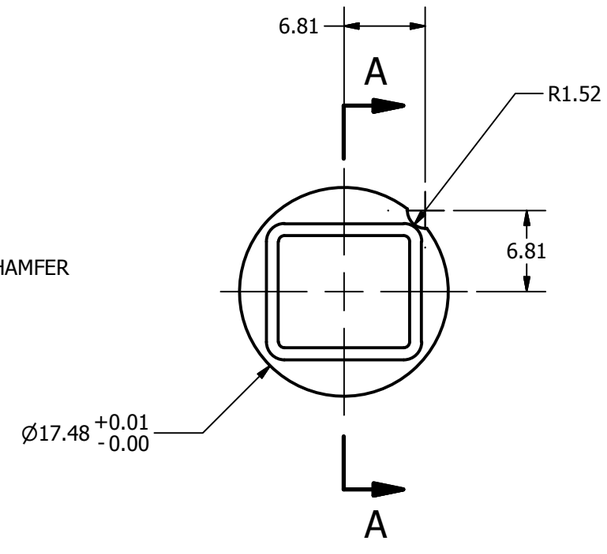
REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM019 R1 AND CONVERTED TO METRIC FOR THOR-M; R1.5 WAS R1.6	8/23/2011	JSJ
	B	COMPLETE REDESIGN, CHANGED FROM RECTANGULAR THRU HOLE TO TAPERED THRU HOLE	4/28/2016	DW
	C	REDESIGNED TO ACCOMMODATE NEW RECTANGULAR H-POINT TOOL DESIGN; DIM. Ø17.48 +0.01/-0.00 WAS Ø17.48 +0.02/-0.00, 6.81 WAS 2X 6.81 +/-0.05, R1.52 WAS R1.5	2/9/2017	DW



SCALE 2.000







SECTION A-A

472-4380-2	1	PROJECT NO.:			
472-4380-1	1	MATERIAL: 440C STAINLESS STEEL	DRAWN BY: jjordan	DATE: 8/23/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT: RC 44-48	CHECKED BY: TMV	DATE: 10/26/2011	
TOTAL QTY IN DUMMY	2	FINISH: ELECTROLESS NICKEL PLATE .008 MAX	ENGINEER: J. WANG	DATE: 1/23/2012	

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ±0.5 ±0.5 1.6
X.X ± 0.2
X.XX ± 0.1
X.XXX ± 0.01
REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

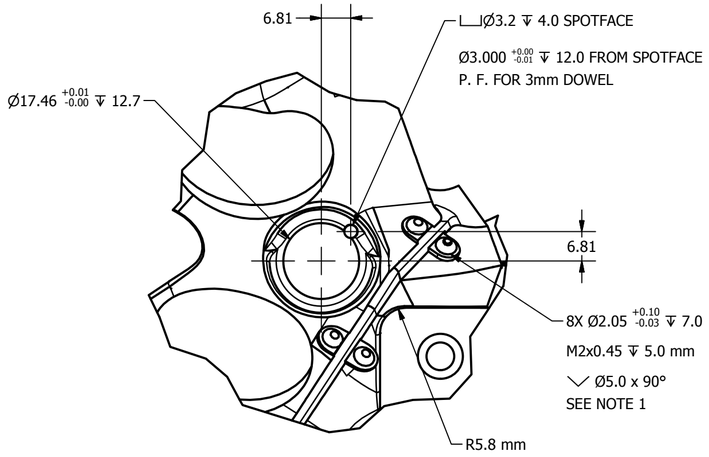
DESCRIPTION: PELVIS H-PT. TOOL BEARING THOR-50M

SIZE: B | SHEET: 1 OF 1 | SCALE: 2:1

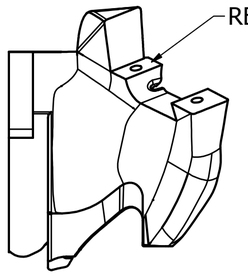
DRAWING NO.: 472-4381 | REV: C

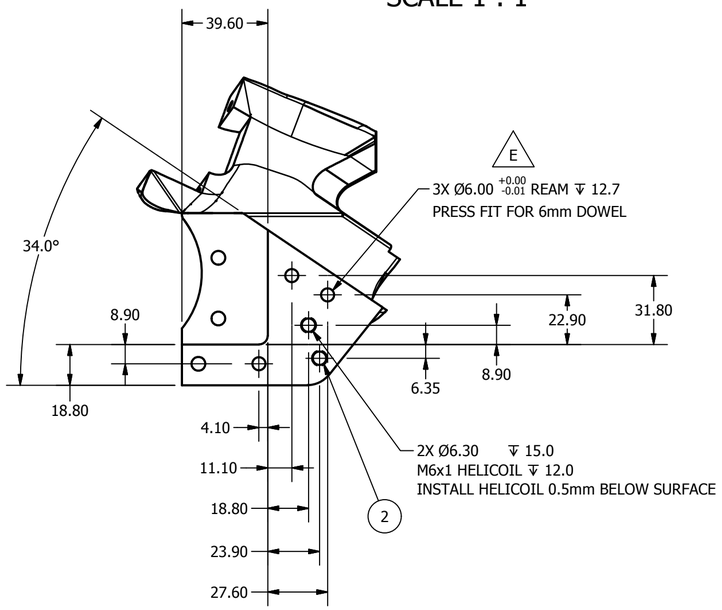
472-4381.ipt

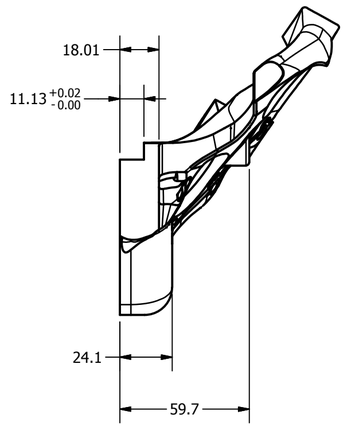
REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM012-05 AND CONVERTED TO METRIC FOR THOR-M; 30.04 WAS 30.48; R40.1 WAS 40.6; 28.20 WAS 27.94; 52.06 WAS 52.32	8/26/2011	JSJ
	B	Ø2.99 +.00/-.01 WAS +.01/-.00 12.7 DEEP WAS 16.00	5/3/2012	TMV
	C	REDESIGNED TO STRENGTHEN PART, MATERIAL WAS ALUMINUM CAST 357-T6, ADDED HOLE Ø28.00 mm THRU; DIM. 30.48 mm WAS 30.04 mm, R40.64 mm WAS R40.1 mm, 27.94 mm WAS 28.20 mm, AND 52.32 mm WAS 52.06 mm	8/26/2015	DW
	D	RE-DIMENSIONED, REMOVED Ø28.00 THRU HOLE, REDESIGNED TO ADD MATERIAL TO STRENGTHEN, REROUTED CABLE SLOT; REMOVED DETAIL A	2/9/2017	DW
	E	HOLE DIMENSION 3X Ø6.00 +00/-0.01 REAM ↧ 12.7 PRESS FIT FOR 6mm DOWEL WAS 3X Ø6.000 +000^ -0.001 REAM ↧12.7 PRESS FIT FOR 6mm DOWEL, Ø6.4 +0.15/-0.03 THRU ⌵ Ø13.7 x 90˚ WAS Ø6.4 +0.15/+0.03 THRU ⌵ Ø13.7 x 90˚; ADDED HOLE NOTE Ø6.40 +0.15/-0.03 THRU ⌴ Ø10.40 +0.15/-0.03 ↧ 3.0	2/6/2018	DW

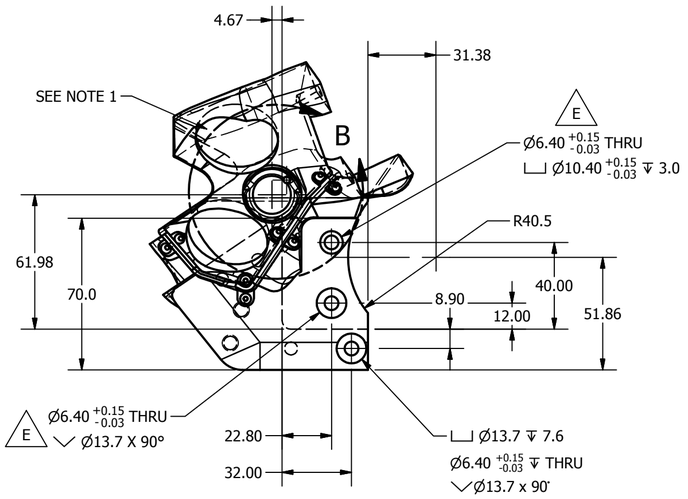


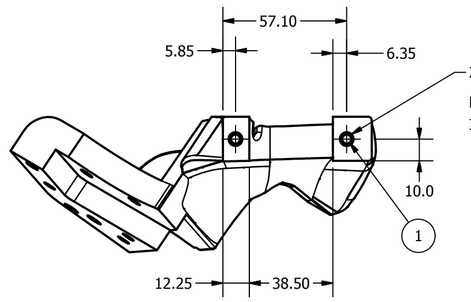
DETAIL B
SCALE 1 : 1











DETAIL C
SCALE 1/2

NOTES:
1. USE CAD GEOMETRY TO DETERMINE LOCATION OF COUNTERBORES, TRAJECTORY AND LOCATION OF CABLE SLOT, AND HOLES FOR CABLE COVERS, AND PART GEOMETRY, ± 0.2mm.
2. LIGHT MATTE FINISH (BEAD BLAST POSSIBLE).

ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	5000088	HELICOIL, M6 X 1 X 9mm
1	2	5000086	HELICOIL, M5 X 0.8 X 7.5

Parts List

472-4380-2	1	7075-T6 ALUMINUM	
NEXT ASSEMBLY	QTY		
TOTAL QTY IN DUMMY	1		

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION
TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01; ANGLES ± 0.5; FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES
PROJECT NO.:
MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT:
FINISH:
DRAWN BY: jjordan — DATE: 8/26/2011
CHECKED BY: TMV — DATE: 9/13/2011
ENGINEER: shawnr — DATE: 1/25/2012

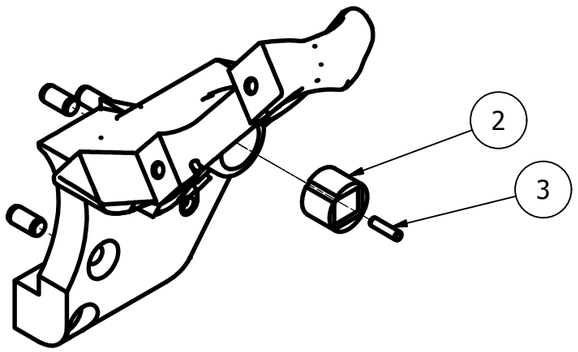
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

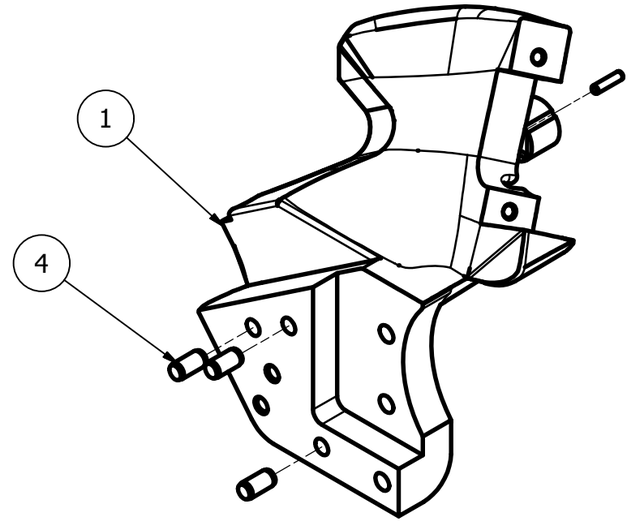
DESCRIPTION: ILIAC WING RIGHT

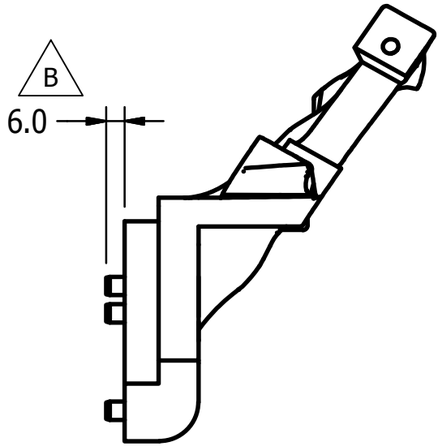
SIZE: A2 | SHEET 1 OF 1 | SCALE: 1:1 | DRAWING NO.: 472-4382-2 | REV: E

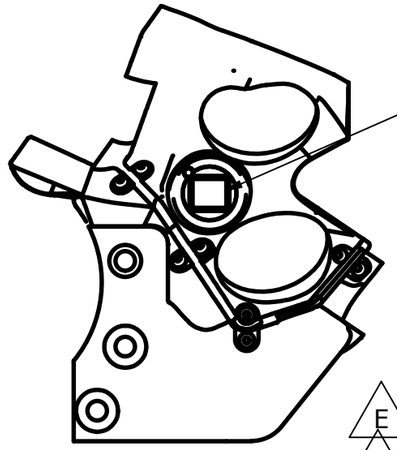
472-4382-2.ipt

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM401-00 AND CONVERTED TO METRIC FOR THOR-M	8/18/2011	JSJ
	B	ADDED VIEW WITH PIN HEIGHT DIMENSION.	7/24/201	TMV
	C	REVISED PART #472-4382-1 PELVIS WING MACHINING (LEFT).	8/25/2015	DW
	D	REVISED ITEM #2 PART #472-4381 AND ADDED DETAIL A.	4/28/2016	DW
	E	ITEM #1 DESCRIPTION WAS PELVIS WING MACHINING (LEFT); REVISED ITEM #1, 472-4382-1, ILIAC WING ASSEMBLY, LEFT & ITEM #2, 472-4381, PELVIS H-PT. TOOL BEARING; REMOVED DETAIL A.	2/9/2017	DW









2 TO BE INSTALLED AS SHOWN
LONG DIMENSION OF OPENING
IS TO BE HORIZONTAL

E D
E C

ITEM	QTY	PART NUMBER	DESCRIPTION
4	3	5000433	PIN, DOWEL M6 X 12
3	1	5000183	PIN, DOWEL M3 x 12
2	1	472-4381	PELVIS H-PT. TOOL BEARING
1	1	472-4382-1	ILIAC WING, LEFT

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

APPROVALS	DATE
DRAWN Dave Walker	2/9/2017
CHECKED	
ENG	
APPROVED	

MATERIAL
HEAT TREAT
FINISH

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LEFT ILIAC ASSEMBLY

THOR-50M

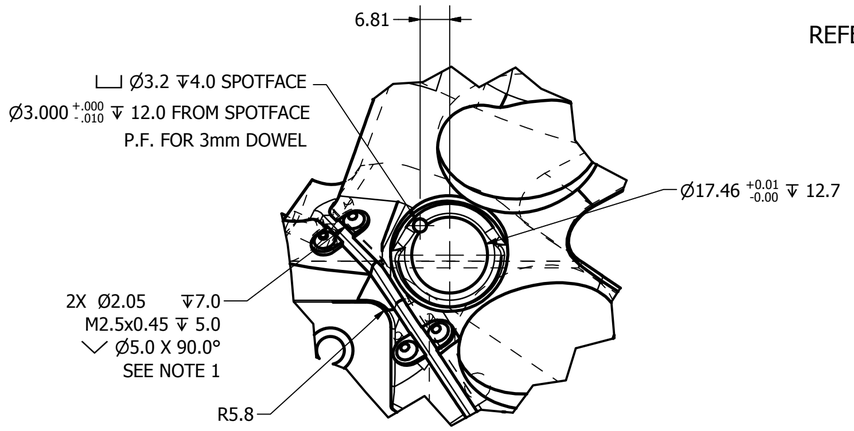
THIRD ANGLE PROJECTION

SIZE **A3** | DRAWING NUMBER 472-4380-1 | REV E

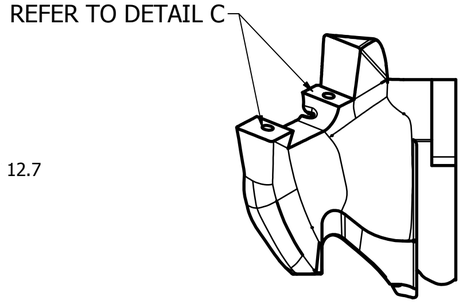
SCALE: 1 / 2 | SHEET 1 OF 1

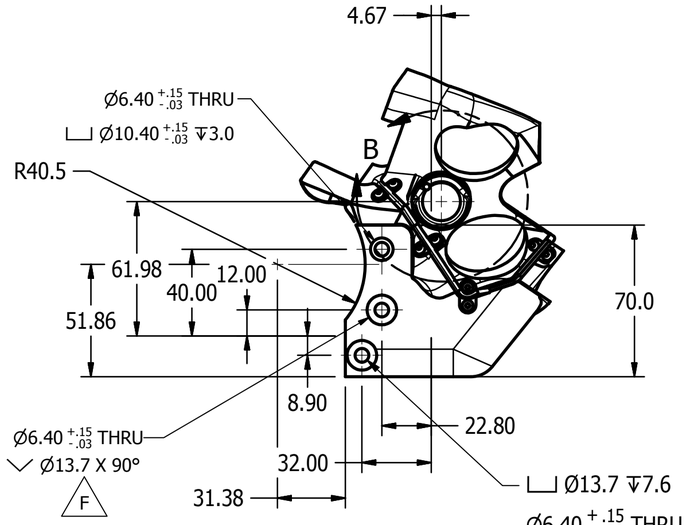
472-4380-1.iam

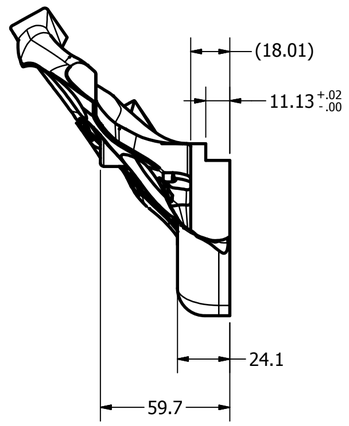
REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM011-05 AND CONVERTED TO METRIC FOR THOR-M	8/25/2011	JSJ
	B	Ø2.99 +.00/-.01 WAS +.01/-.00, 12.7 DEEP WAS 16.00	5/3/2012	TMV
	C	C'BORE Ø13.50 WAS Ø6.8	1/31/2013	BK
	D	REDESIGNED TO STRENGTHEN PART, MATERIAL WAS ALUMINUM CAST 357-T6, ADDED HOLE 28.00mm THRU	8/25/2015	DW
	E	RE-DIMENSIONED, REMOVED Ø28.00 THRU HOLE, REDESIGNED TO ADD MATERIAL TO STRENGTHEN, REROUTE CABLE SLOT; REMOVED DETAIL A	2/9/2017	DW
	F	DRAWING TITLE WAS PELVIS WING MACHINING (LEFT); HOLE NOTE Ø6.40 +.15/-.03 THRU ⌵ Ø13.7 x 90° WAS Ø6.40 THRU ⌵ Ø13.70 x 90°, AND 3X Ø6.00 +0.00/-0.01 REAM ↧12.7 PRESS FIT FOR 6mm DOWEL WAS 3X Ø6.000 +0.000/-0.010 REAM ↧12.7 PRESS FIT FOR 6mm DOWEL	12/7/2017	DW

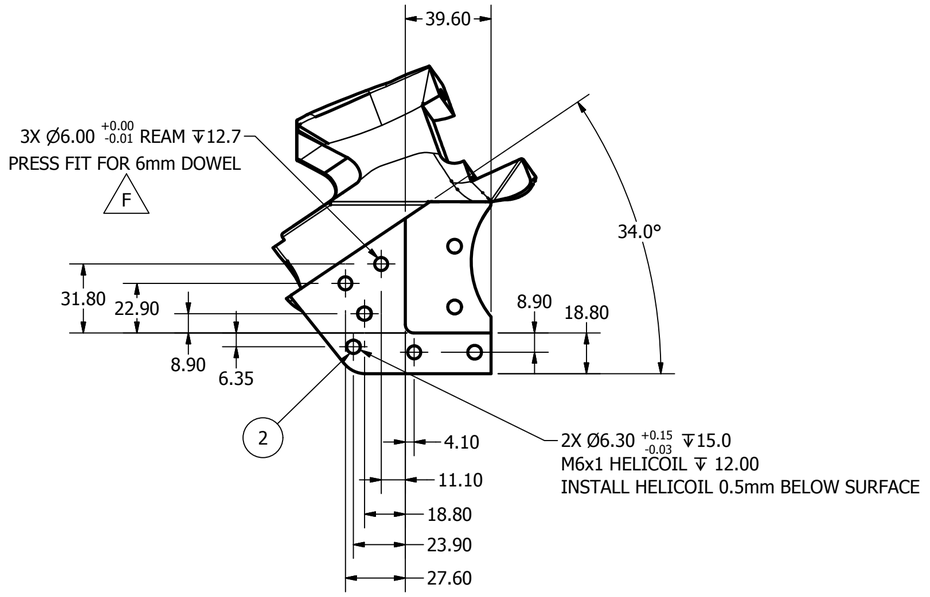


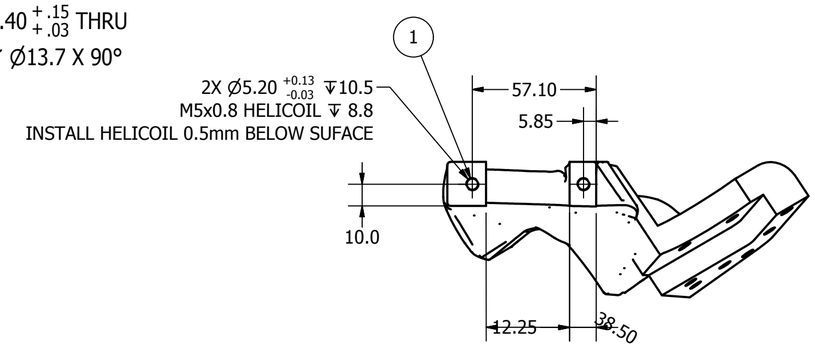
DETAIL B
SCALE 1 : 1











DETAIL C

NOTES:
1. USE CAD GEOMETRY TO DETERMINE LOCATION OF COUNTERBORES, TRAJECTORY AND LOCATION OF CABLE SLOT, HOLES FOR CABLE COVERS, AND PART GEOMETRY, ± 0.2mm
2. LIGHT MATTE FINISH (BEAD BLAST POSSIBLE).

ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	5000088	HELICOIL, M6x1 X 9
1	2	5000086	HELICOIL, M5x0.8 X 7.5

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: SEE NOTE 2

	APPROVALS	DATE
DRAWN	Dave Walker	2/8/2017
CHECKED		
ENG		
APPROVED		

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

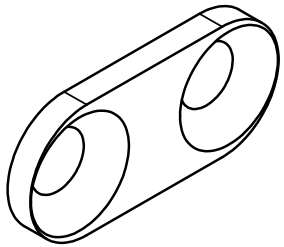
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

ILIAC WING, LEFT
THOR-50M

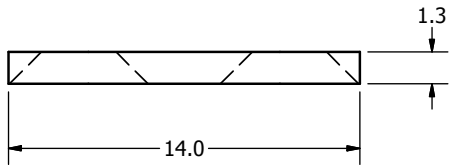
THIRD ANGLE PROJECTION
SIZE: **A2**
DRAWING NUMBER: 472-4382-1
REV: F
SCALE: 1 / 2
SHEET: 1 OF 1

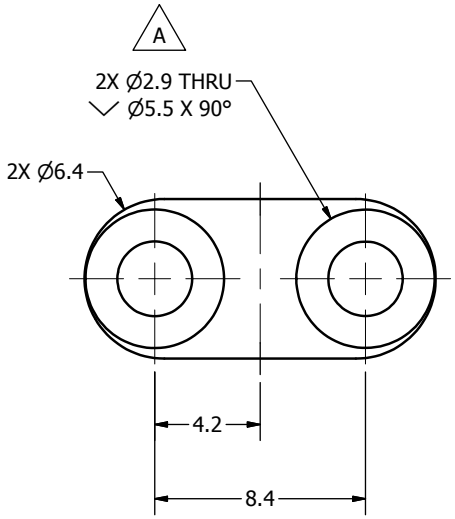
472-4382-1.ipt

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM020 FOR THOR-M; 2X Ø2.9 THRU C'SINK Ø5.5 X 90° WAS Ø2.3 THRU C'SINK Ø5.1 X 82°	8/18/2011	JSJ



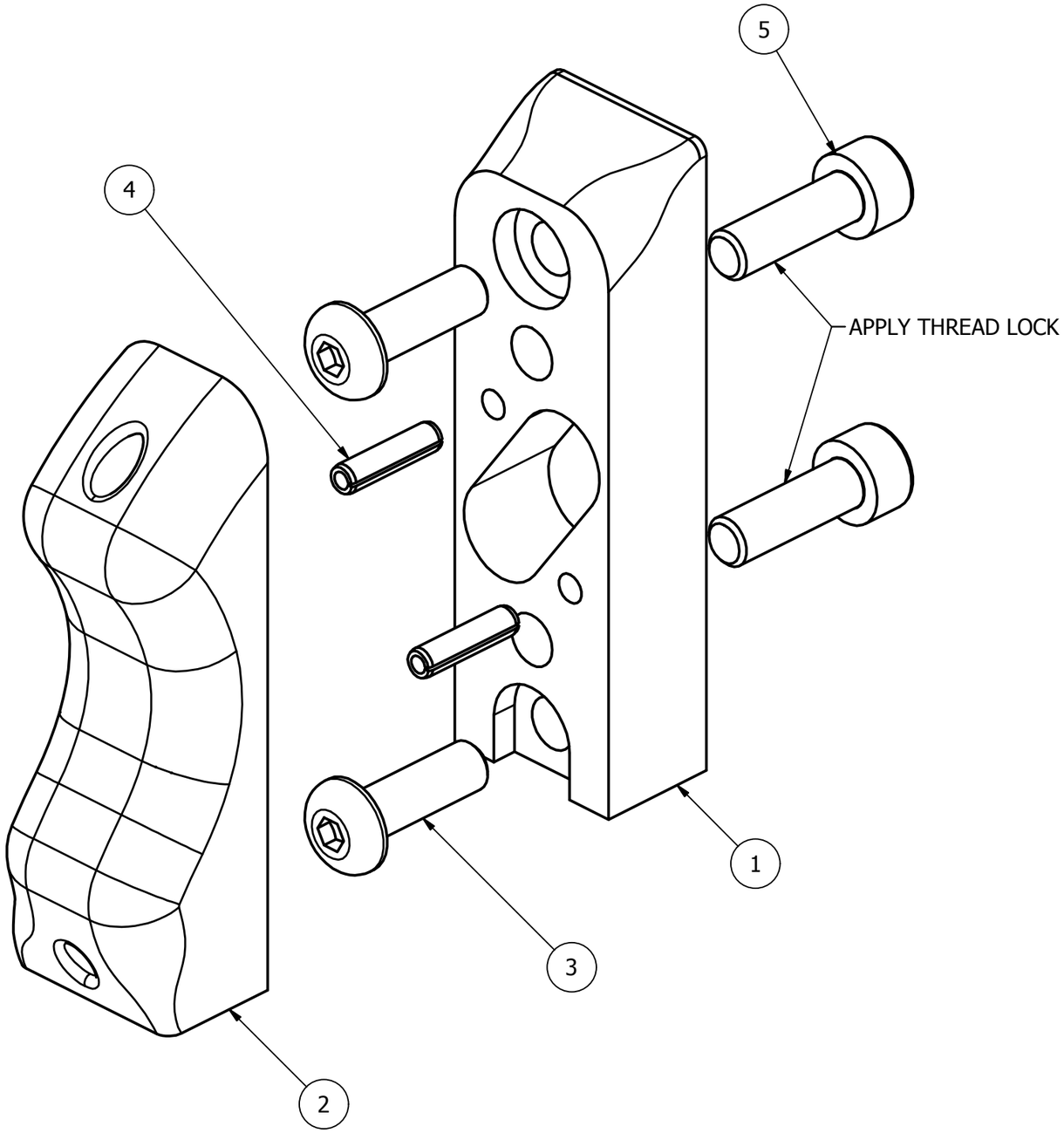
SCALE 5.000

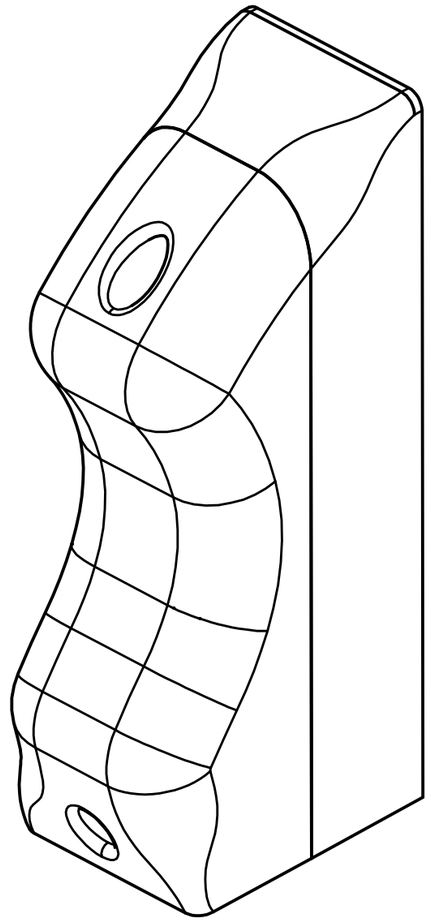


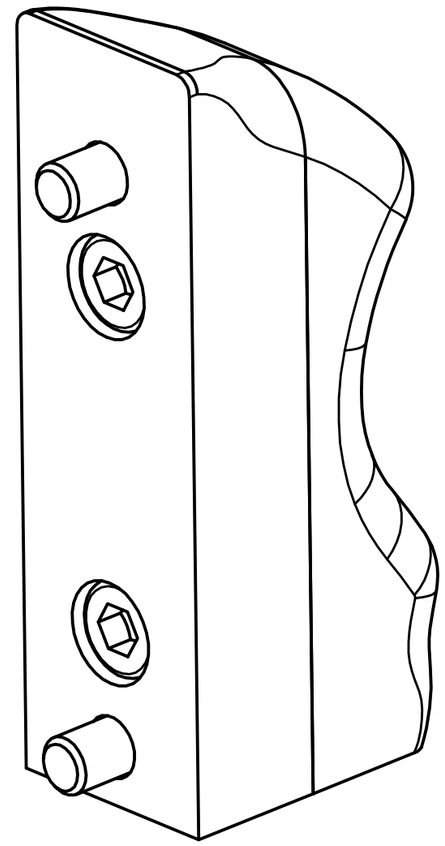


		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: ILIAC CABLE COVER, PELVIS	
472-4000	8	MATERIAL: Acetal Resin, White	DRAWN BY: DLW 8/10/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV 9/8/2011	SIZE: A3 SHEET: 1 OF 1	DRAWING NO.: 472-4372 REV: A
TOTAL QTY IN DUMMY	8	FINISH:	ENGINEER: J. WANG 1/24/2012	SCALE: 5.000	

REVISION HISTORY				
ECO#	REV	DESCRIPTION	BY	DATE
71753	1	RELEASE TO PROTOTYPE	JGG	10/8/2013
	A	REVISED ITEM #1 - 472-4376 - S.R. THOR A.S.I.S. - BACK AND ITEM #2 - 472-4377 - S.R. THOR A.S.I.S. - FRONT	DW	2/8/2017







ASSEMBLY INSTRUCTIONS

1. PRESS THE M3 ROLL PINS INTO PART #472-4376 AS SHOWN.
2. PLACE THE M5 X 0.8 X 16MM LG. BHCS IN THE CLEARANCE HOLES.
3. PRESS PART #472-4377 ONTO THE ROLL PINS AS SHOWN.
4. FASTEN THE TWO SIDES TOGETHER USING M5 X 0.8 X 16MM LG SHCS WITH THREAD LOCK AS SHOWN. TORQUE TO 7 Nm [60 IN-LBF].

ITEM	QTY	PART NUMBER	DESCRIPTION
5	2	5000020	SCREW, SHCS M5 x 0.8 x 16 LG.
4	2	5000166	PIN, ROLL M3 x 12 LG.
3	2	5000416	M5 X 0.8 X 16 LG. BHCS
2	1	472-4377	S.R. THOR A.S.I.S. - FRONT
1	1	472-4376	S.R. THOR A.S.I.S. - BACK

PARTS LIST

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

PROJECT NO.:

MATERIAL:

HEAT TREAT:

FINISH:

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5°	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

REMOVE BURRS & BREAK SHARP EDGES
DIMENSION LIMITS HELD AFTER PLATING

DRAWN BY: jgardynik DATE: 10/8/2013

CHECKED BY: DATE:

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: S.R. THOR A.S.I.S.

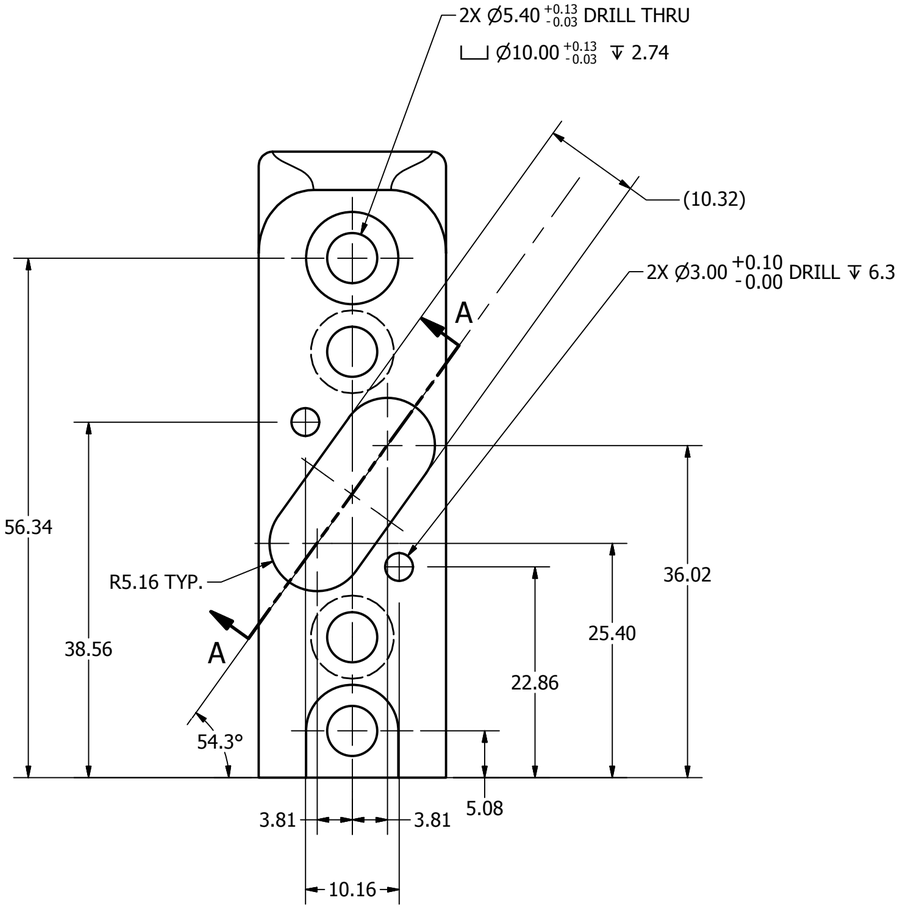
SIZE: A3 SHEET 1 OF 1 SCALE: 2:1

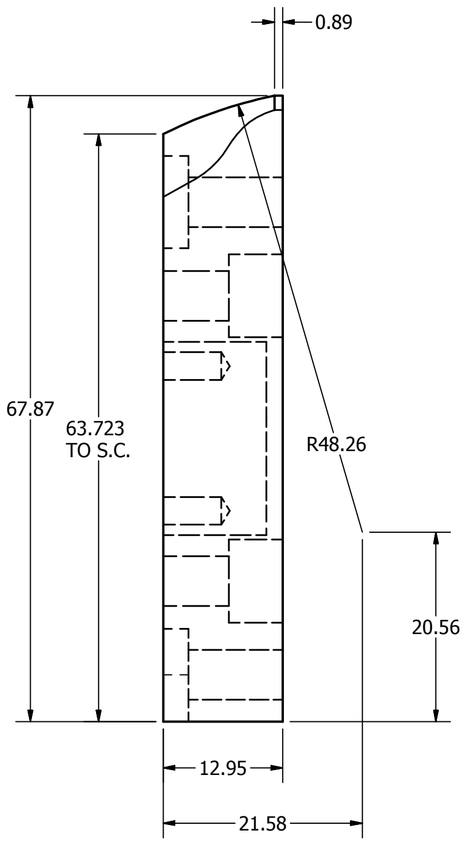
DRAWING NO.: 472-4375

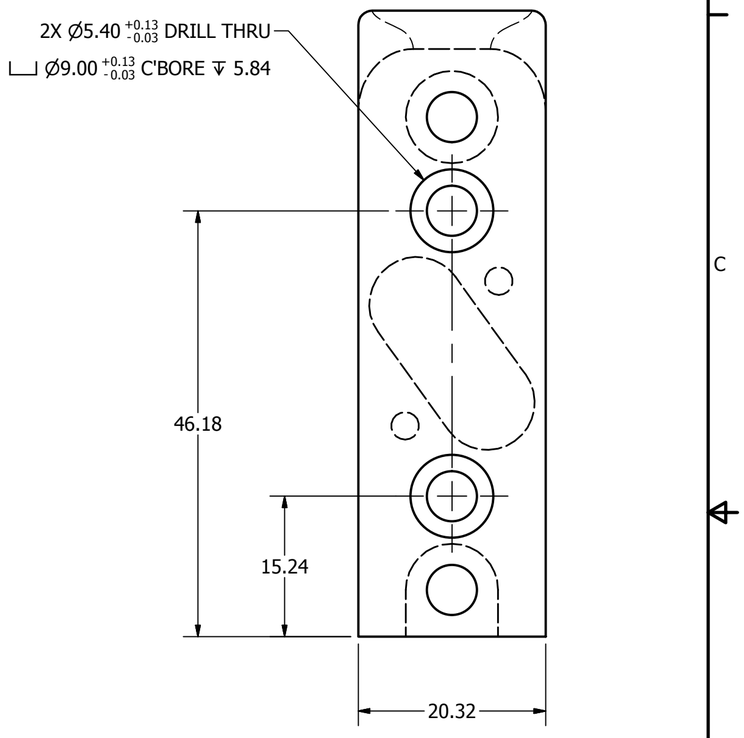
REV: A

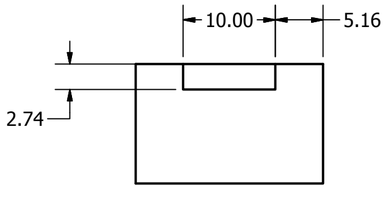
472-4375.iam

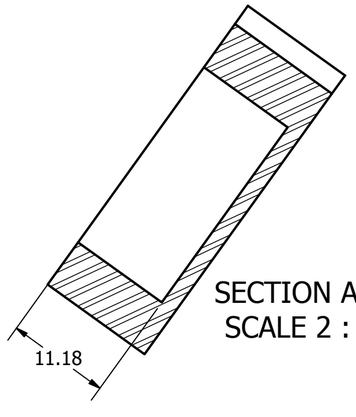
REVISION HISTORY				
ECO#	REV	DESCRIPTION	BY	DATE
71753	1	RELEASE TO PROTOTYPE	JGG	10/8/2013
71929	2	WAS REAMED DOWEL HOLE; UPDATE TOLERANCE	JGG	11/19/2013
71929	3	UPDATE DIMENSIONS AND DATUM B; WAS POS. TOL. 0.10 & 0.05 ON 5.40 HOLES	JGG	11/21/2013
	A	RE-DIMENSIONED; DIM. 56.34 WAS 56.34, 38.56 WAS 38.56, 10.16 WAS 10.16, 5.08 WAS 5.08, 22.86 WAS 22.86, 21.58 WAS 22.77, 20.56 WAS 20.81, 63.723 TO S.C. WAS 63.363 TO S.C., 46.18 WAS 46.18, 15.24 WAS 15.24, 2X R6.0 TO R1.5 (EXACT DIMENSIONS FROM CAD) WAS R1.5 TYP.	DW	2/8/2017



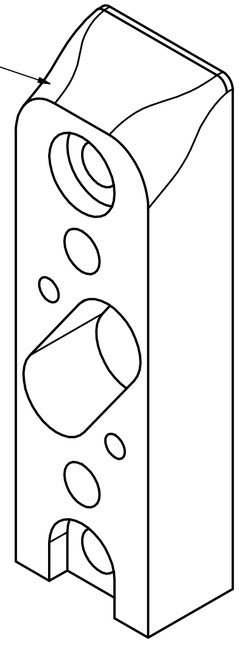








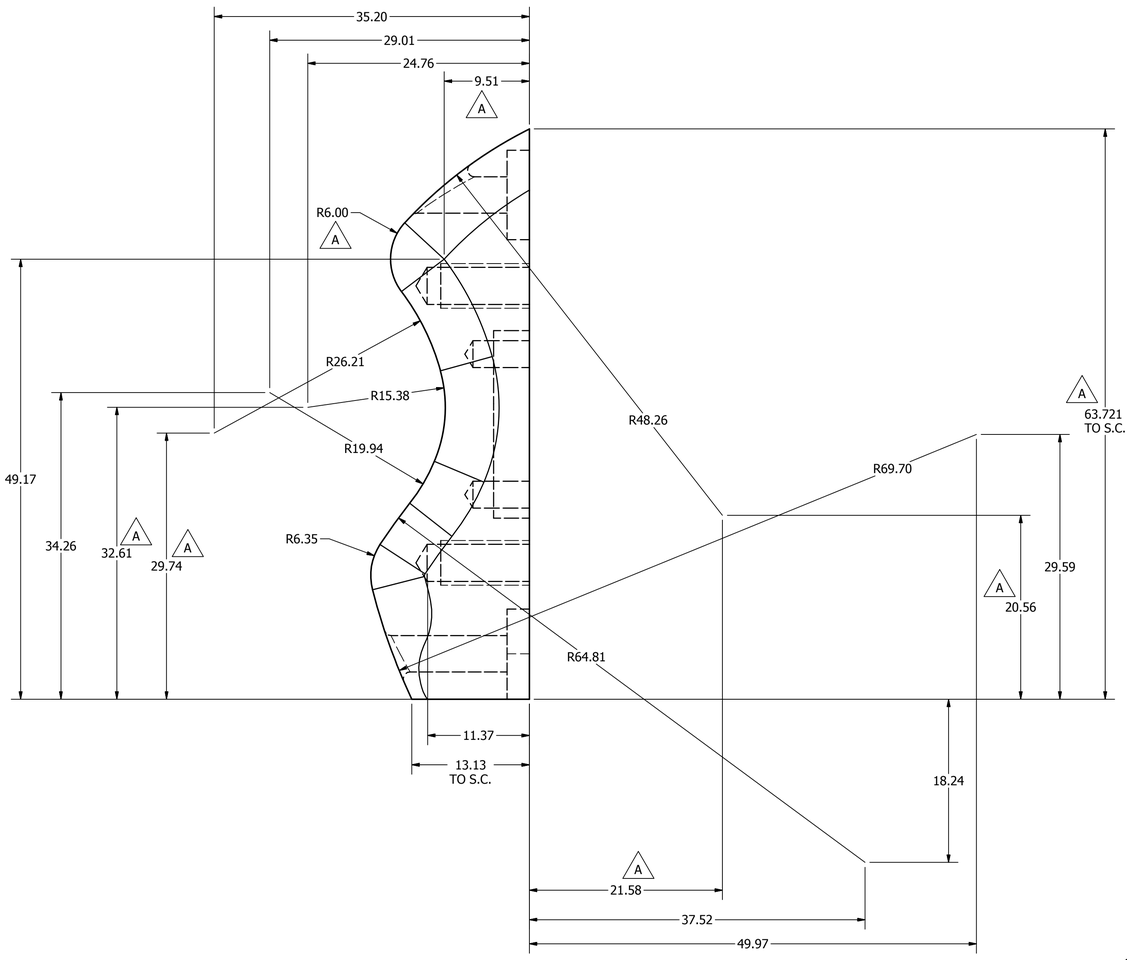
SECTION A-A
SCALE 2 : 1

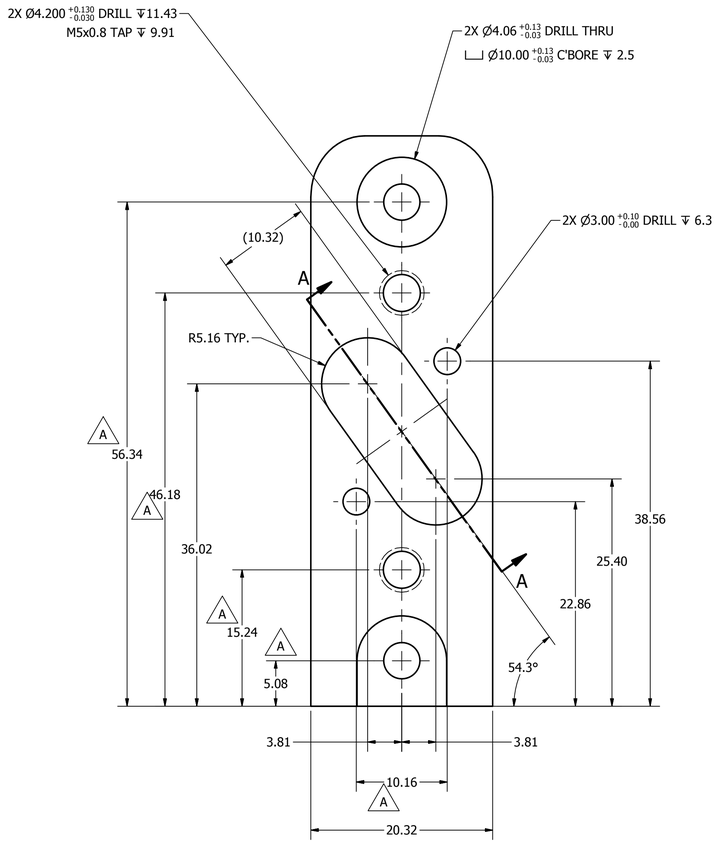


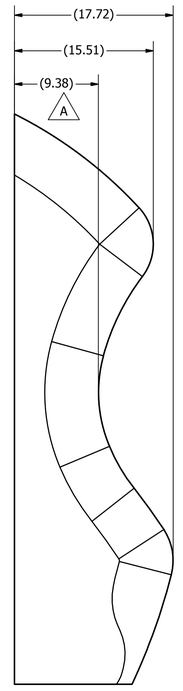
DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01. ANGLES ±0.5°. FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES. DIMENSION LIMITS HOLD AFTER PLATING.	DESCRIPTION: S.R. THOR A.S.I.S. - BACK
PROJECT NO.:		
MATERIAL: 1018 STEEL	DRAWN BY: jgardynik	DATE: 10/8/2013
HEAT TREAT:	CHECKED BY:	DATE:
FINISH: 0.007 ELECTROLESS NICKEL PLATE PER SIDE	SIZE: C	SHEET: 1 OF 1
	SCALE: 2:1	DRAWING NO.: 472-4376
		REV: A

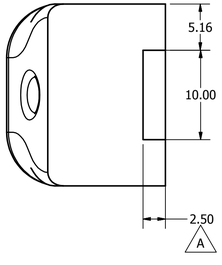
472-4376.ipt

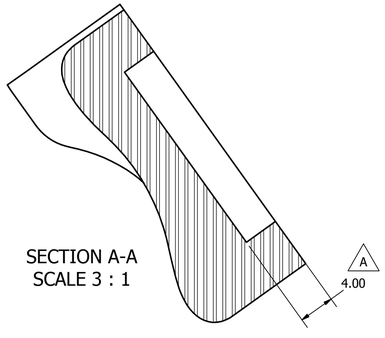
REVISION HISTORY				
ECO#	REV	DESCRIPTION	BY	DATE
71753	1	RELEASE TO PROTOTYPE	JGG	10/8/2013
71929	2	WAS REAMED DOWEL HOLE	JGG	11/19/2013
71929	3	UPDATE DIMENSIONS AND DATUM WAS POS. TOL 0.05 ON M5 HOLES	JGG	11/21/2013
	A	RE-DIMENSIONED; ADDED 2X R6.0 TO R1.5 (EXACT DIMENSIONS FROM CAD); DIM. 2X R6.0 TYP. WAS R1.5 TYP., 9.51 WAS 13.16, R6.00 WAS R2.49, 32.61 WAS 32.91, 29.74 WAS 30.81, 21.58 WAS 22.77, 20.56 WAS 20.81, 63.721 TO S.C. WAS 63.363 TO S.C., 2.50 WAS 2.54, 4.00 WAS 7.11, 56.34 WAS 56.34, 46.18 WAS 46.18, 15.24 WAS 15.24, 5.08 WAS 5.08, 10.16 WAS 10.16, & (9.38) WAS (9.20)	DW	2/8/2017



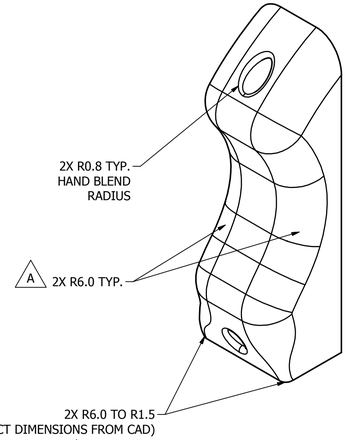


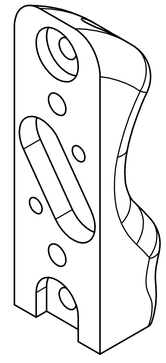






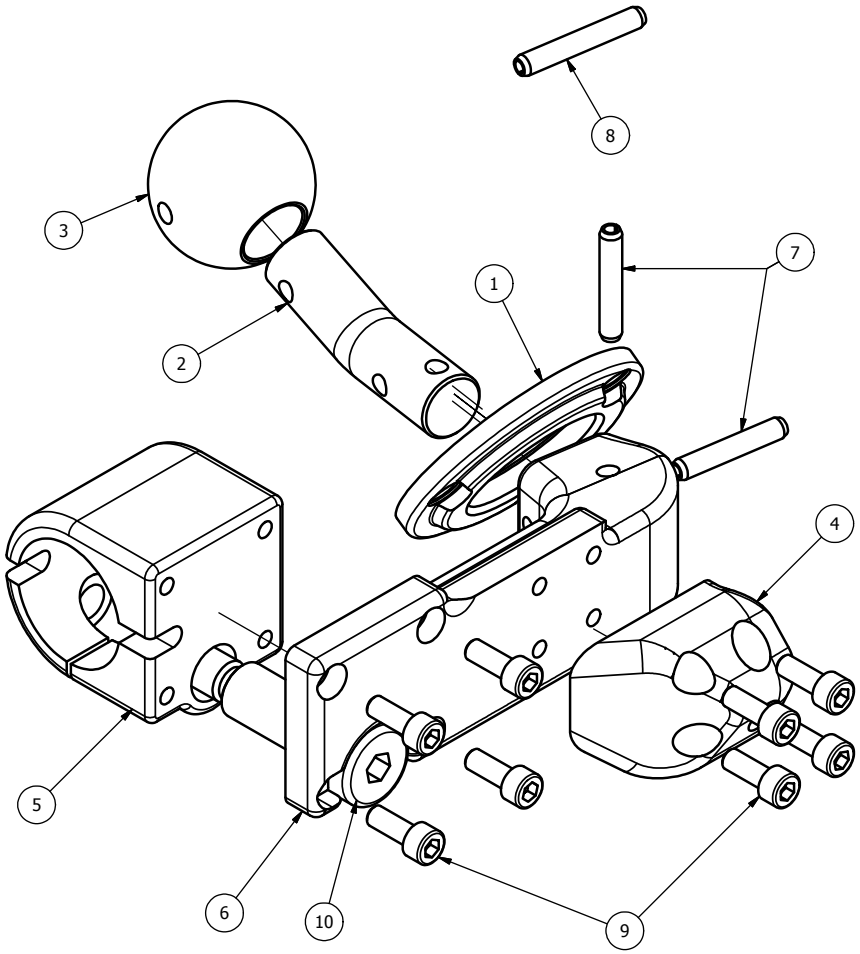
SECTION A-A
SCALE 3 : 1



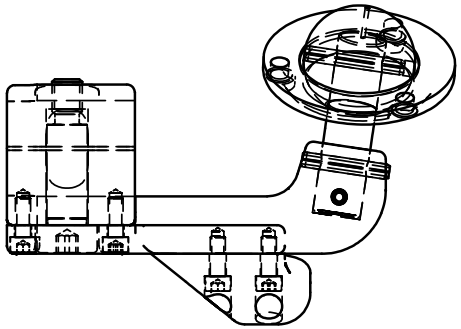


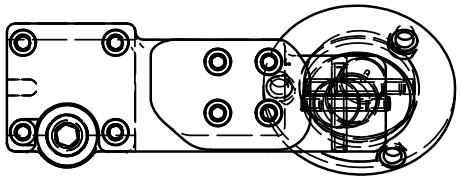
DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION	UNLESS NOTED OTHERWISE DIMENSIONS ARE IN MILLIMETERS ANGLES ± 0.5° TOL X ± 0.5 4 PLACE ± 0.05 .XX ± 0.1 3 PLACE ± 0.02 .XXX ± 0.05 2 PLACE ± 0.01 REMOVE BURRS AND BREAK SHARP EDGES REMOVE ALL BURRS AND BREAK SHARP EDGES		
PROJECT NO.:		DESCRIPTION: S.R. THOR A.S.I.S. - FRONT	
MATERIAL: 1018 STEEL	DRAWN BY: jgardynik	DATE: 10/8/2013	
HEAT TREAT:	CHECKED BY:	DATE:	
FINISH: 0.007 ELECTROLESS NICKEL PLATE PER SIDE		SIZE: D SHEET: 1 OF 1 SCALE: 3:1	DRAWING NO.: 472-4377 REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM100 R2 FOR THOR-M	8/17/2011	TKN
	B	ADD 5000298	7/19/2012	BK



ISO VIEW
SCALE 3/4





B				
	10	1	5000298	M16 X 40 LG. SHSS
	9	8	5000081	M6 X 1 X 16 LG. SHCS
	8	1	5001118	M6 X 40mm ROLL PIN
	7	2	5001119	M6 X 35mm ROLL PIN
	6	1	472-4815-1	HIP ARM, LEFT
	5	1	472-4814-1	HIP CYLINDER, LEFT
	4	1	472-4812-1	TROCHANTER, LEFT
	3	1	472-4820	FEMUR BALL
	2	1	472-4819	HIP SHAFT
	1	1	472-4830	FEMUR RETAINING RING
	ITEM	QTY	PART NUMBER	DESCRIPTION

Parts List

472-4000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ±0.5 ±0.5° 1.6
X.X ±0.2
X.XX ±0.1
X.XXX ±0.01
REMOVE BURRS & BREAK SHARP EDGES

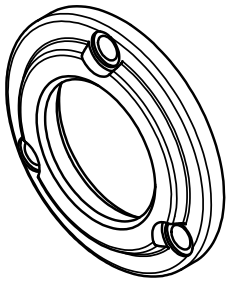
PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:
DRAWN BY: Thanh DATE: 8/17/2011
CHECKED BY: DATE:
ENGINEER: J. WANG DATE: 1/23/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

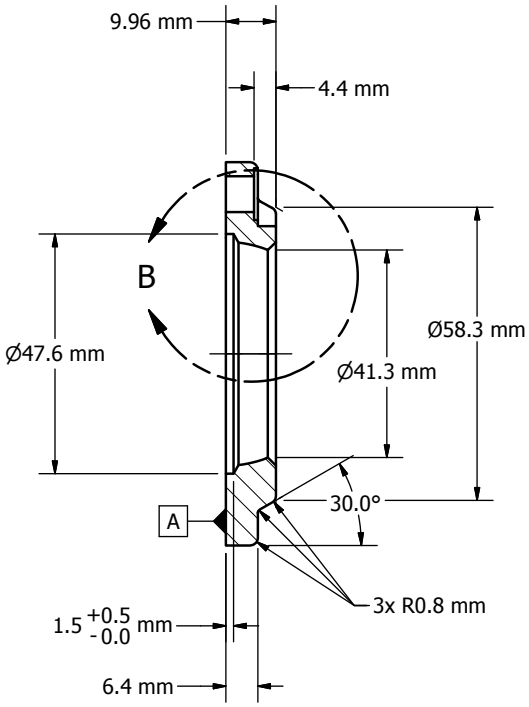
DESCRIPTION: LEFT FEMUR BALL JOINT ASS'Y

SIZE: A3 SHEET 1 OF 1
SCALE: 1:2
DRAWING NO.: 472-4800-1
REV: B

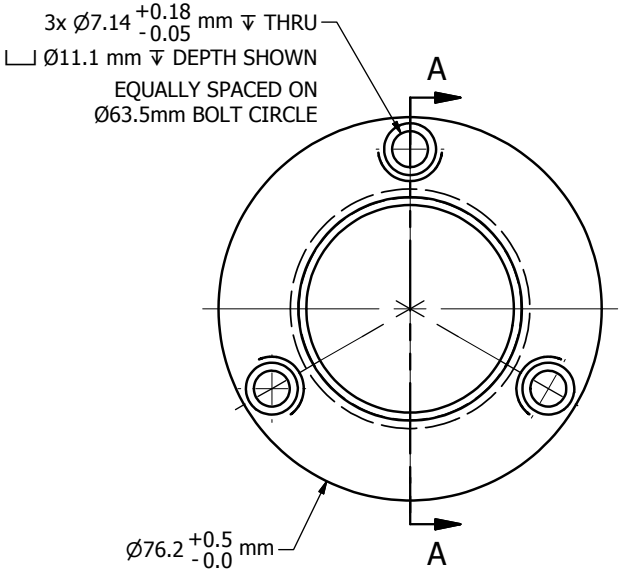
REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM130 R4 FOR THOR-M; REMOVE NOTES	8/22/2011	JSJ

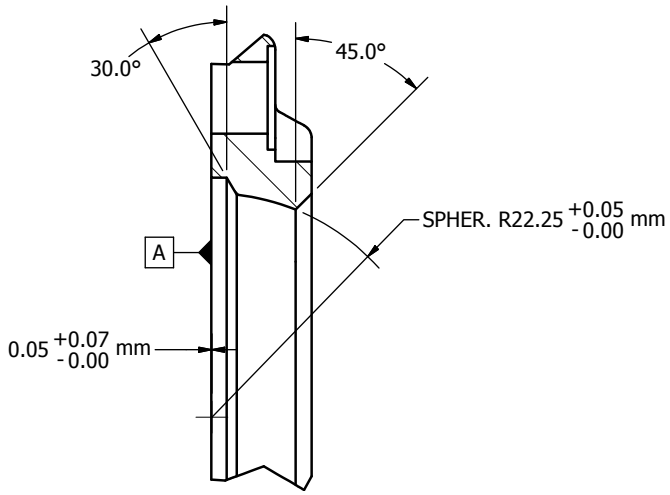


SCALE .750



SECTION A-A
SCALE 1 : 1

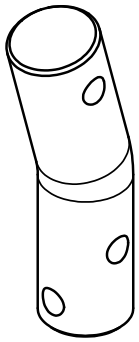


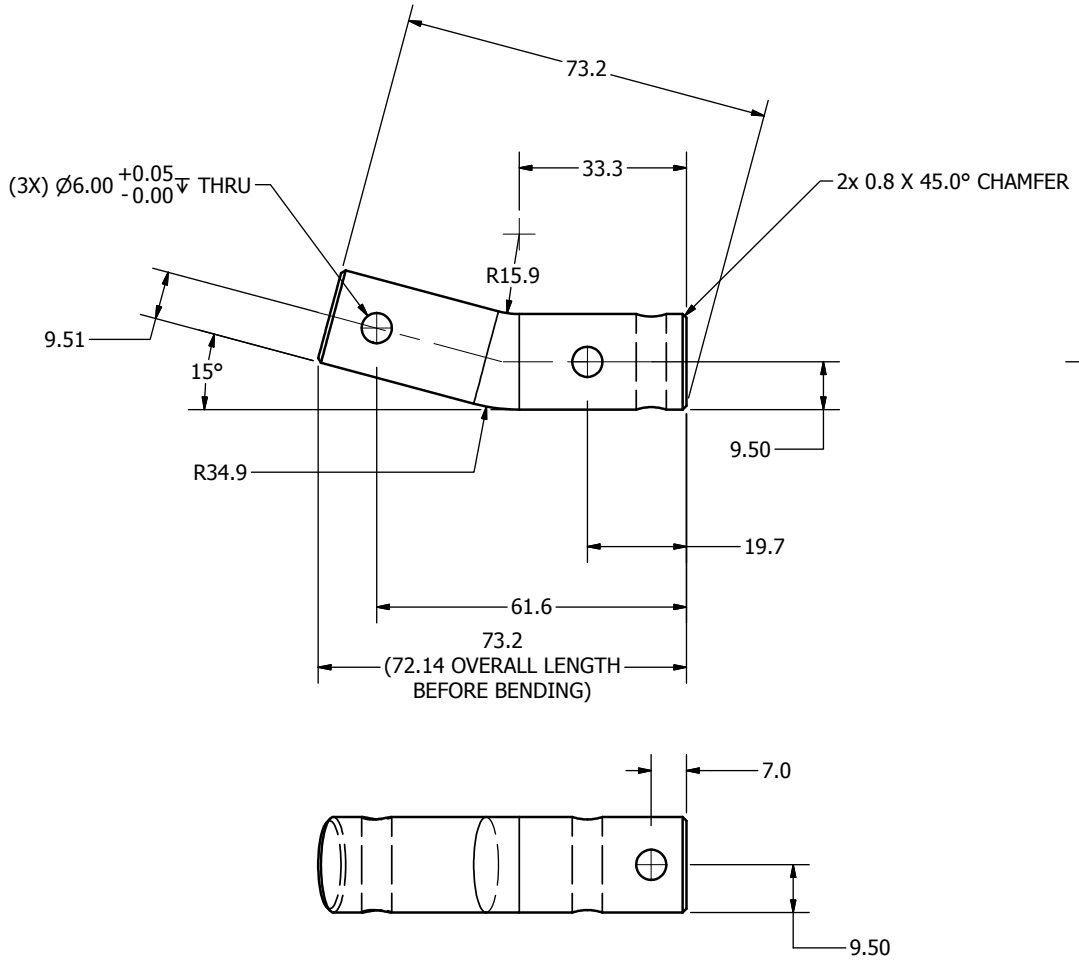


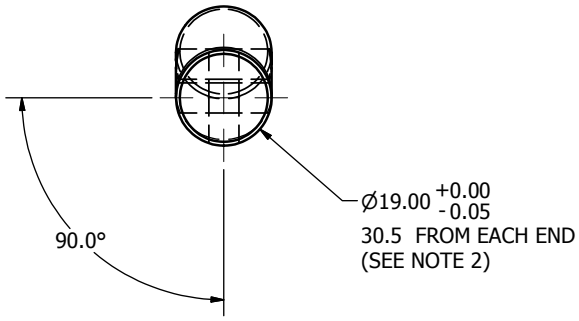
DETAIL B
SCALE 2 : 1

DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES			
472-4800-2	1	PROJECT NO.:	DESCRIPTION: FEMUR RETAINING RING		
472-4800-1	1	MATERIAL: Brass, Soft Yellow	DRAWN BY: HORCHLER	DATE: 8/17/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV	DATE: 9/8/2011	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-4830 REV: A
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/25/2012	SCALE: 1:1

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM119 AND CONVERTED TO METRIC FOR THOR-M; MATERIAL WAS 1018 STEEL; HEAT TREAT WAS Rc 44-47; FINISH WAS ELECTROLESS NICKEL .0003 MA.X	8/18/2011	JSJ





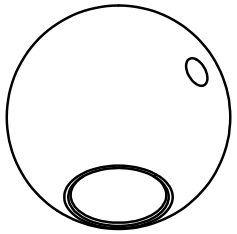


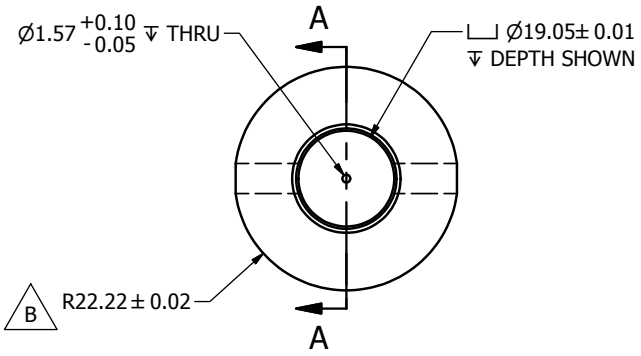
NOTES:

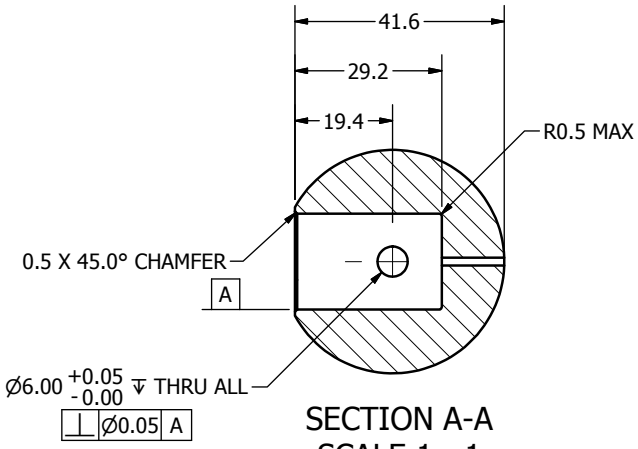
1. ONCE THE SHAFT IS BENT TO 15º, THE DIAMETER NEAR THE BEND WILL NEED REMACHINING.

DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES			
472-4800-2	1	PROJECT NO.:		DESCRIPTION: HIP SHAFT	
472-4800-1	1	MATERIAL: 4130 STEEL	DRAWN BY: HORCHLER	DATE: 8/17/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 44-48	CHECKED BY: TMV	DATE: 10/26/2011	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	2	FINISH: ELECTROLESS NICKEL .008 MAX	ENGINEER: J. WANG	DATE: 1/25/2012	SCALE: 1:1 DRAWING NO.: 472-4819 REV: A

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM120 R3 FOR THOR-M	8/18/2011	JSJ
	B	R22.22 +/-.02 WAS R22.23 +/-.02	7/13/2012	TMV



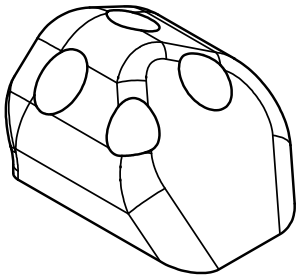


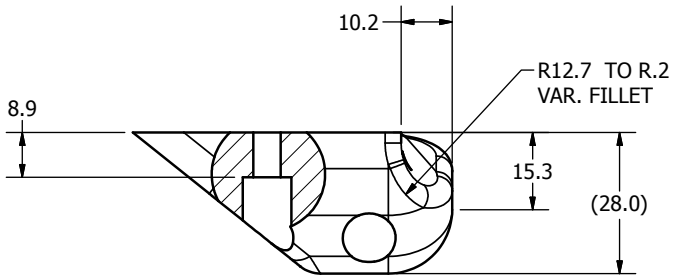


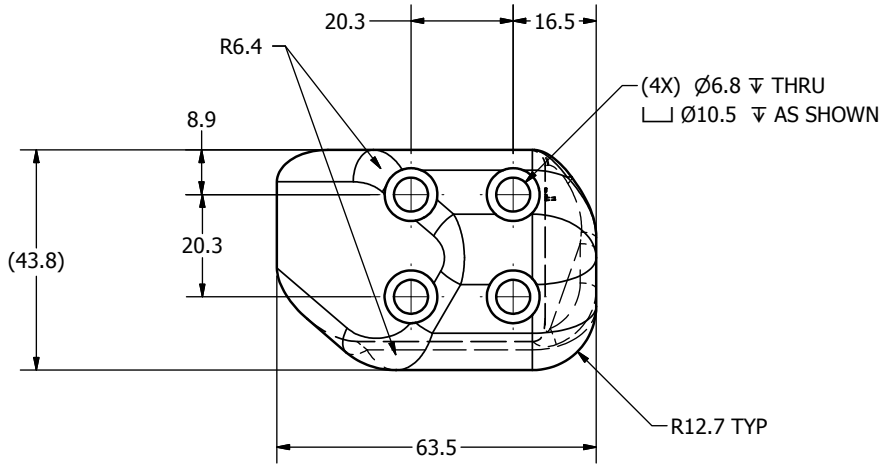
SECTION A-A
SCALE 1 : 1

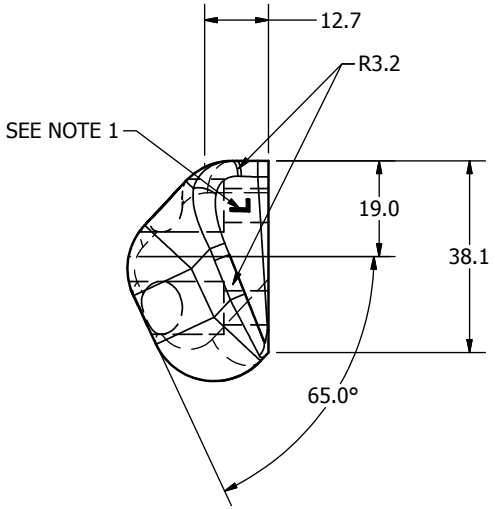
		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES		
472-4800-2	1	PROJECT NO.:		DESCRIPTION: FEMUR BALL	
472-4800-1	1	MATERIAL: aluminum bronze	DRAWN BY: HORCHLER	DATE: 8/17/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV	DATE: 10/27/2011	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/25/2012	SCALE: 1:1
				DRAWING NO.: 472-4820	REV: B

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM112 R2 THOR-M	8/18/2011	JSJ





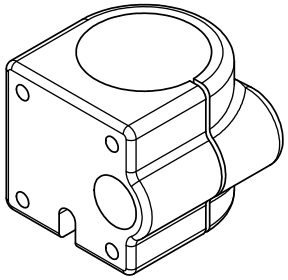


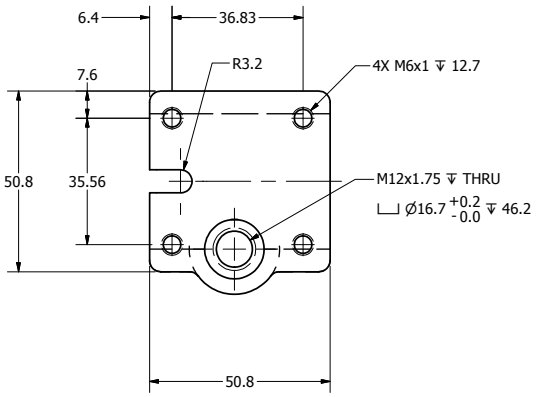


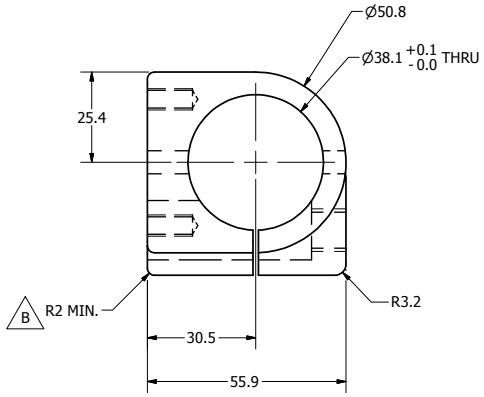
NOTES:
1. ENGRAVE THE LETTER "L"

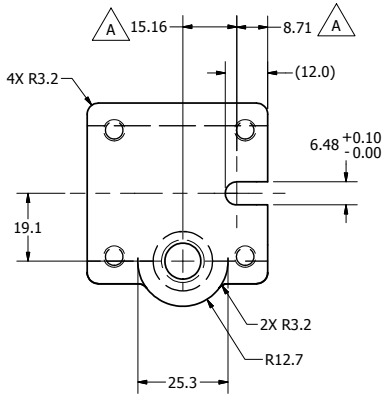
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: TROCHANTER, LEFT		
PROJECT NO.:					
472-4800-1	1	MATERIAL: Acetal Resin, White	DRAWN BY: HORCHLER	DATE: 8/17/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV	DATE: 10/25/2011	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/25/2012	SCALE: 1:1 DRAWING NO.: 472-4812-1 REV: A

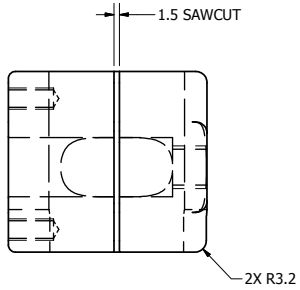
REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM114 R4 FOR THOR-M; 15.16 WAS 15.14, 8.71 WAS 8.76	8/18/2011	JSJ
	B	ADD R2 WAS R1.6	4/24/2012	BK





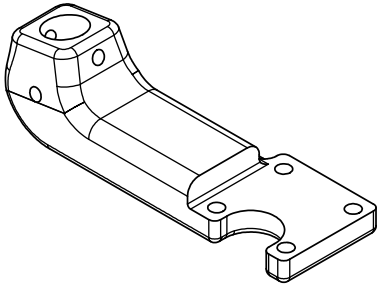


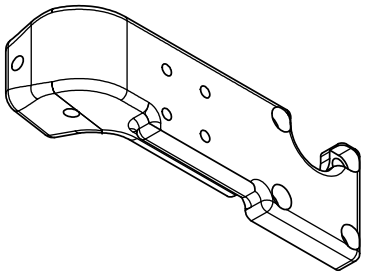


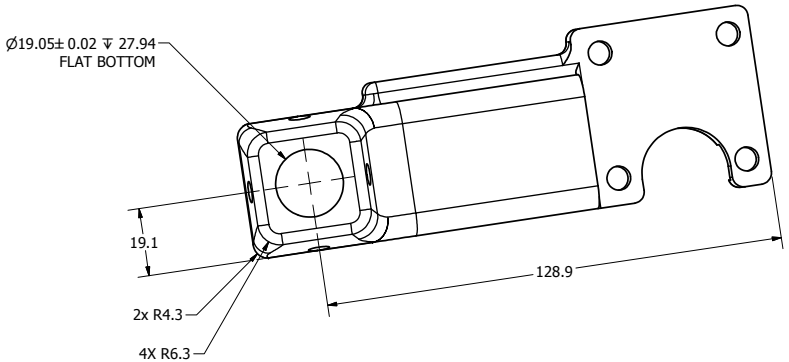


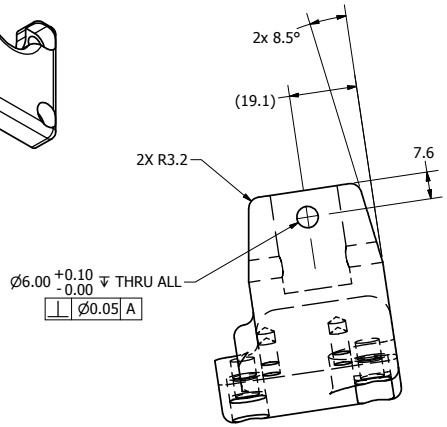
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X.X ±0.3 ±0.5° X.XX ±0.1 X.XXX ±0.01		
PROJECT NO.:		REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: HIP CYLINDER, LEFT	
472-4800-1	1	MATERIAL: 1018 STEEL	DRAWN BY: HORCHLER DATE: 8/17/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A2 SHEET 1 OF 1 DRAWING NO.: 472-4814-1 REV: B
TOTAL QTY IN DUMMY	1	WEIGHT: ELECTROLESS NICKEL .008 MAX	ENGINEER: J. WANG DATE: 1/25/2012	SCALE: 1:1

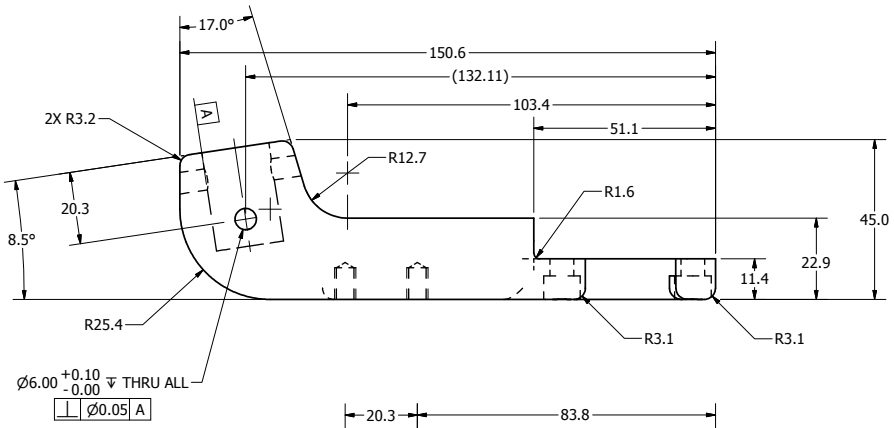
REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM115 R5 AND CONVERTED TO METRIC FOR THOR-M; FINISH WAS ELECTROLESS NICKEL .0003 MAX.	8/18/2011	JSJ
	B	Ø25.4 WAS Ø22.9; ADD "AS SHOWN"	7/18/2012	BK

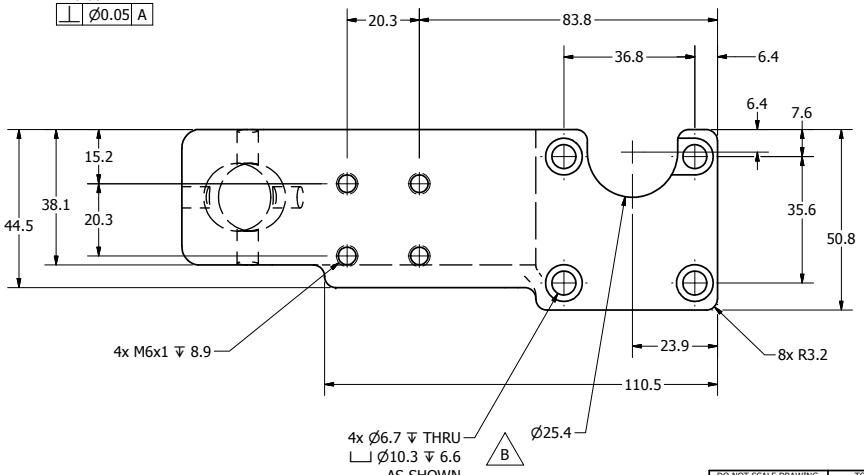


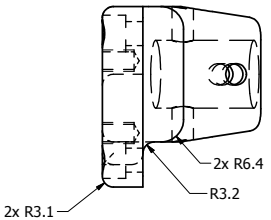








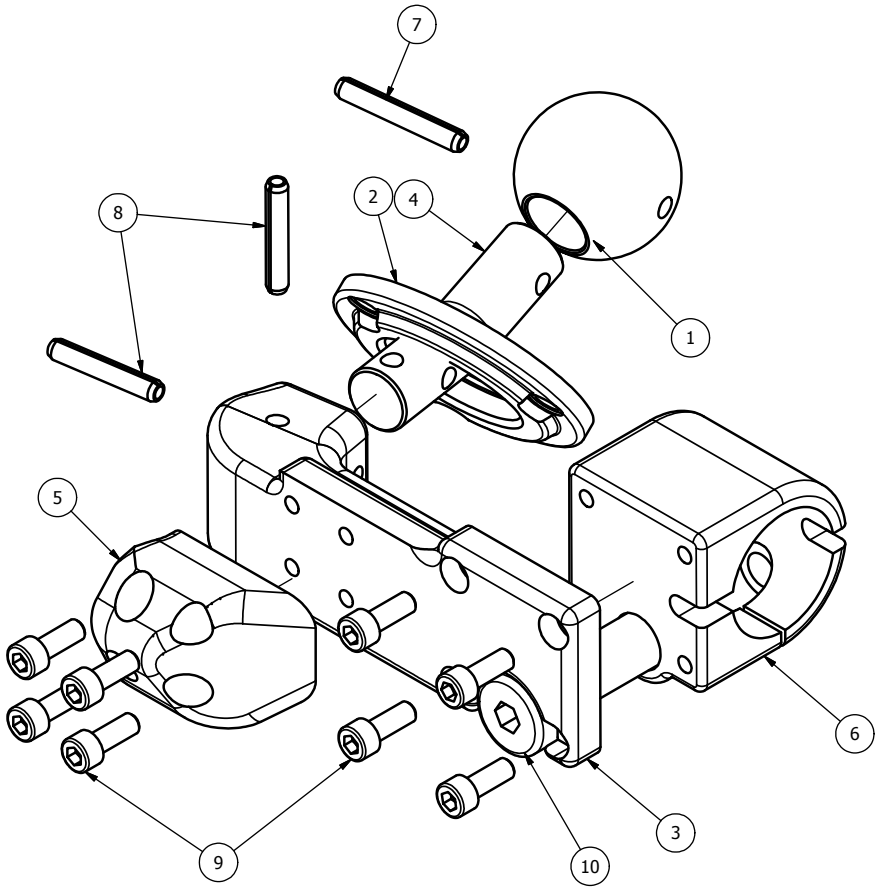




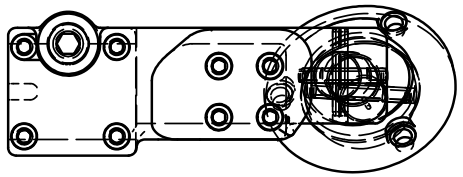
NOTES:
1. BREAK ALL SHARP EDGES.
2. PLUG Ø19.05 AND M6x1 HOLES BEFORE APPLYING SURFACE FINISH.

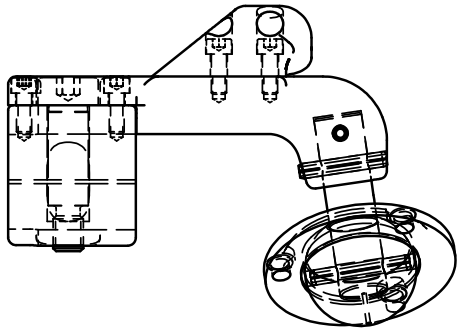
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6		
PROJECT NO.:		REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: HIP ARM, LEFT	
472-4800-1	1	MATERIAL: 1018 STEEL	DRAWN BY: HORCHLER	DATE: 8/17/2011
NEXT ASSEMBLY	QTY	ITEM / TREAT:	CHECKED BY:	DATE:
TOTAL QTY IN DUMMY	1	WEIGHT: ELECTROLESS NICKEL .008 MAX	ENGINEER: J. WANG	DATE: 1/25/2012
			SIZE: A2 SHEET 1 OF 1 SCALE: 1:1	DRAWING NO.: 472-4815-1 REV: B

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM101 R2 AND CONVERTED TO METRIC FOR THOR-M	8/19/2011	TKN
	B	ADD 5000298	7/19/2012	BK



ISO VIEW
SCALE 3/4





B

ITEM	QTY	PART NUMBER	DESCRIPTION
10	1	5000298	M16 X 40 LG. SHSS
9	8	5000081	M6 X 1 X 16 LG. SHCS
8	2	5001119	M6 X 35mm ROLL PIN
7	1	5001118	M6 X 40mm ROLL PIN
6	1	472-4814-2	HIP CYLINDER, RIGHT
5	1	472-4812-2	TROCHANTER, RIGHT
4	1	472-4819	HIP SHAFT
3	1	472-4815-2	HIP ARM, RIGHT
2	1	472-4830	FEMUR RETAINING RING
1	1	472-4820	FEMUR BALL

Parts List

472-4000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5° 1.6
X.X ± 0.2
X.XX ± 0.1
X.XXX ± 0.01
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

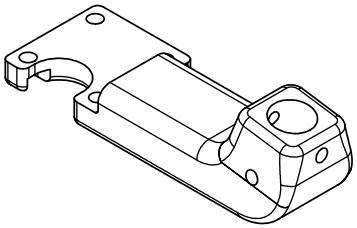
DRAWN BY: THANH DATE: 8/17/2011
CHECKED BY: DATE:
ENGINEER: J. WANG DATE: 1/23/2012

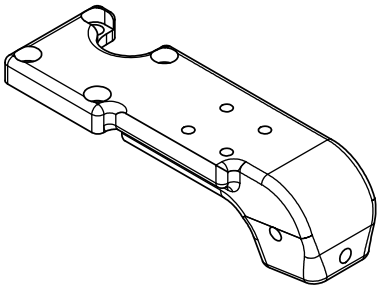
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

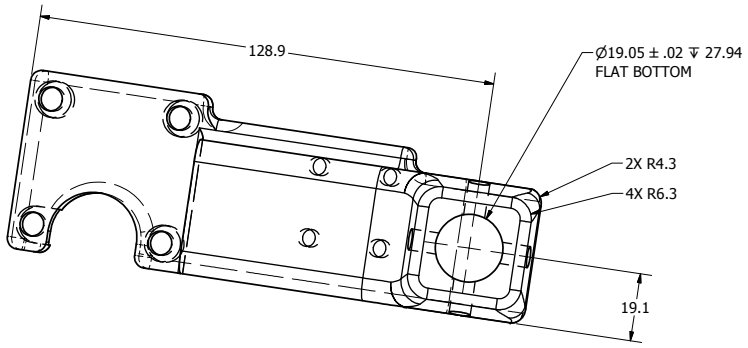
DESCRIPTION: RIGHT FEMUR BALL JOINT ASS'Y

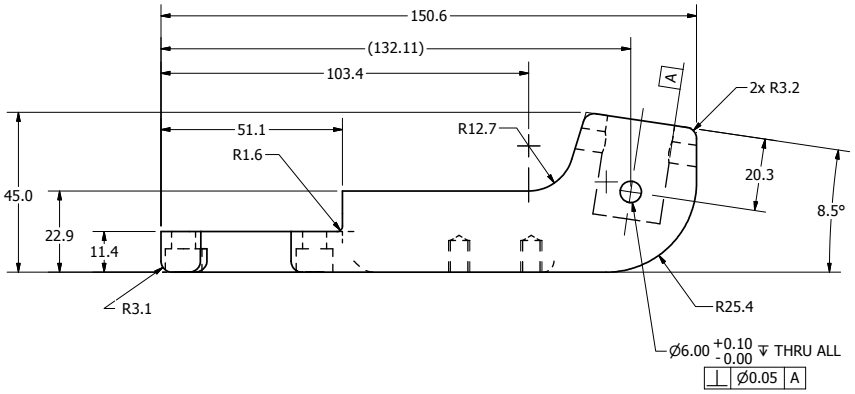
SIZE: A3 SHEET: 1 OF 1 SCALE: 1:2
DRAWING NO.: 472-4800-2 REV: B

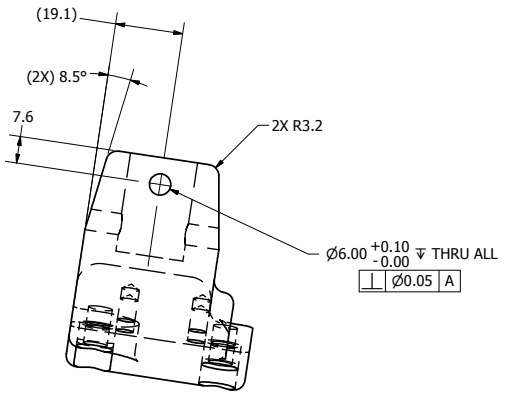
REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM117 R5 AND CONVERTED TO METRIC FOR THOR-M	8/18/2011	JSJ
	B	Ø25.4 WAS Ø22.9; ADD "AS SHOWN"	7/18/2012	BK

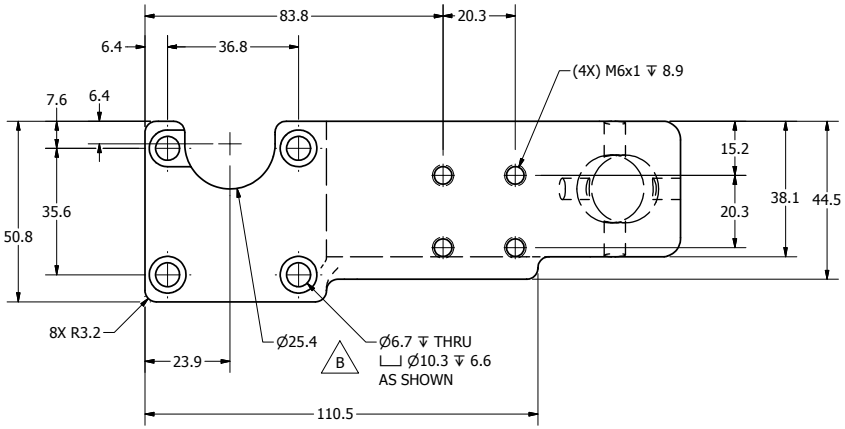


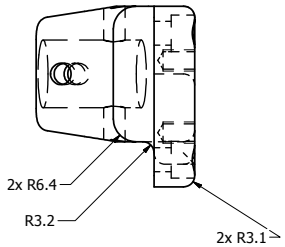








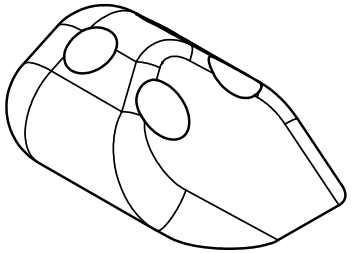


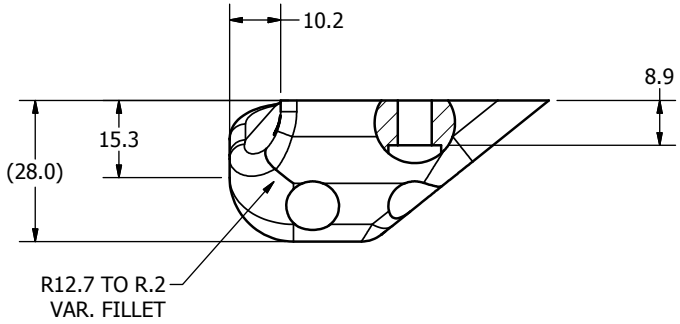


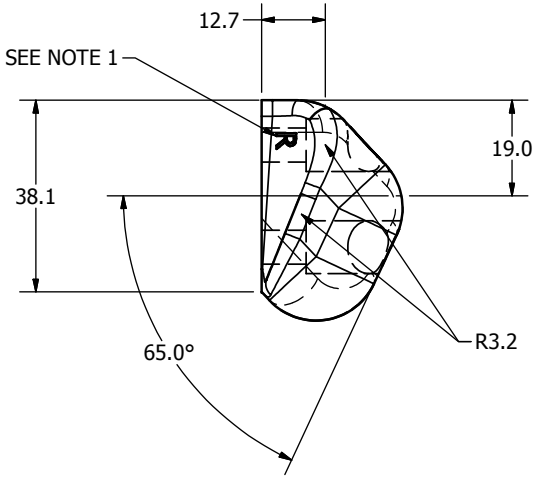
NOTES:
1. BREAK ALL SHARP EDGES
2. PLUG Ø19.05 AND M6x1 HOLES BEFORE APPLYING SURFACE FINISH.

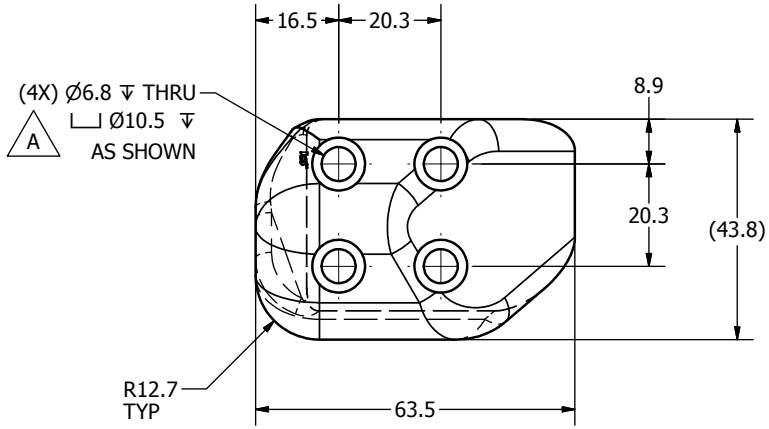
		DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
		PROJECT NO.:		DESCRIPTION: HIP ARM, RIGHT
472-4800-2	1	MATERIAL: 1018 STEEL	DRAWN BY: HORCHLER 8/17/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A2 SHEET 1 OF 1 DRAWING NO.: 472-4815-2 REV: B
TOTAL QTY IN DUMMY	1	WEIGHT: ELECTROLESS NICKEL .008 MAX	ENGINEER: J. WANG DATE: 1/25/2012	SCALE: 1:1

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM113 R2 FOR THOR-M; C'BORE Ø10.5 WAS Ø9.8	8/18/2011	JSJ





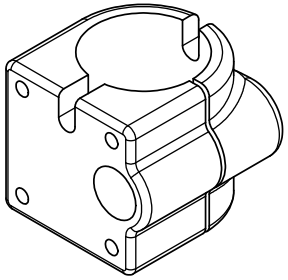




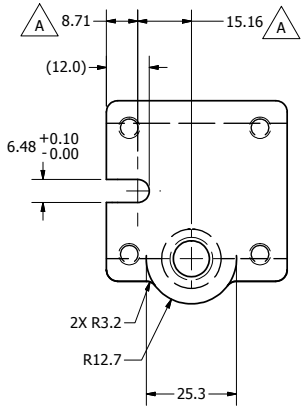
NOTES:
1. ENGRAVE THE LETTER "R"

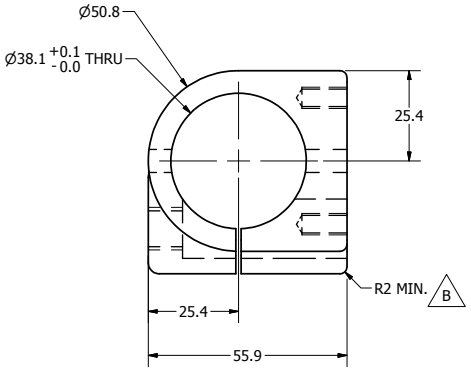
		PROJECT NO.:	DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
472-4800-2	1	MATERIAL: Acetal Resin, White	DRAWN BY: HORCHLER	DATE: 8/17/2011	DESCRIPTION: TROCHANTER, RIGHT
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV	DATE: 10/25/2011	SIZE: A3 SHEET: 1 OF 1 DRAWING NO.: 472-4812-2 REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/25/2012	SCALE: 1:1

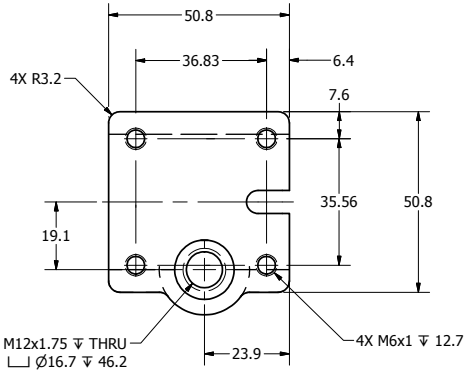
REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM116 R03 FOR THOR-M; 15.16 WAS 15.14, 8.71 WAS 8.76	8/18/2011	JSJ
	B	ADD R2 WAS R1.6	4/24/2012	BK

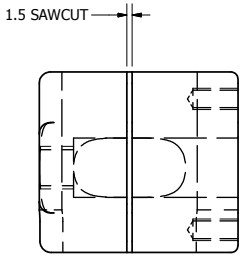


SCALE 1.000



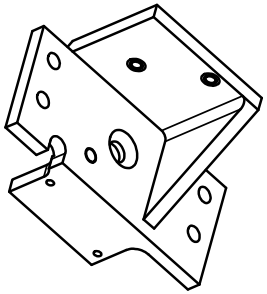


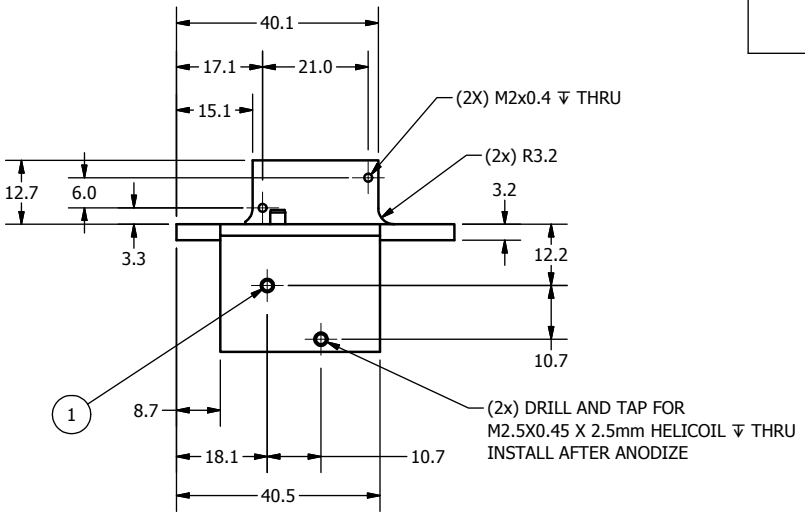


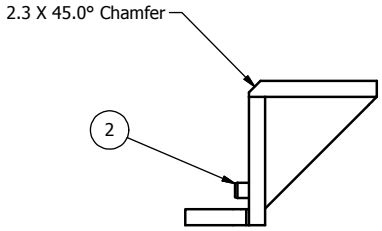


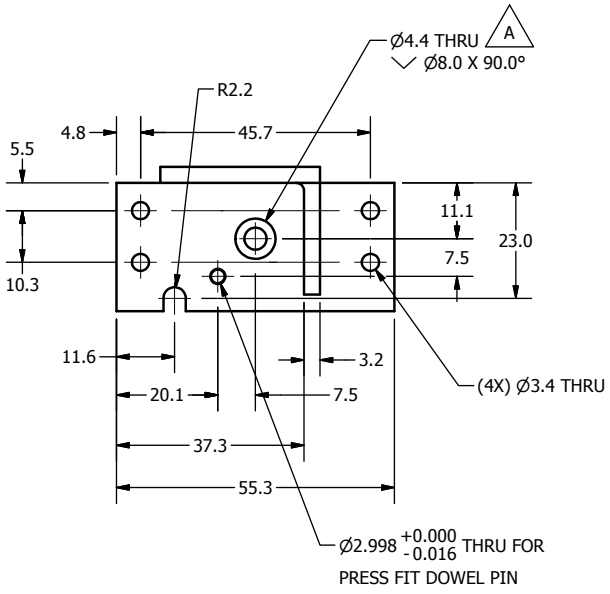
DO NOT SCALE DRAWING		TOLERANCES		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.3, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6		DESCRIPTION: HIP CYLINDER, RIGHT	
	PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES			
472-4800-2	1	MATERIAL: 1018 STEEL	DRAWN BY: HORCHLER	DATE: 8/17/2011	
NEXT ASSEMBLY	QTY	ITEM / TREAT:	CHECKED BY:	DATE:	SIZE: A2 SHEET 1 OF 1
TOTAL QTY IN DUMMY	1	WEIGHT: ELECTROLESS NICKEL .008 MAX	ENGINEER: J. WANG	DATE: 1/25/2012	SCALE: 1:1 DRAWING NO.: 472-4814-2 REV: B

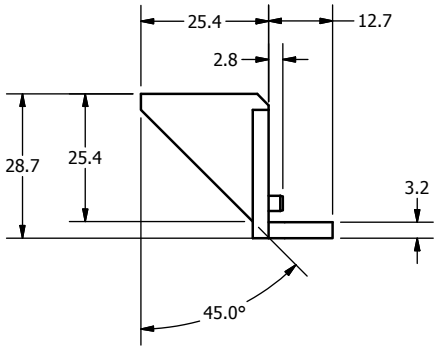
REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM112 R07 AND CONVERTED TO METRIC FOR THOR-M; Ø4.4 WAS 2X Ø4.0	8/23/2011	JSJ











ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	5000385	M3 X 6 LG. DOWEL PIN
1	2	5000451	HELICOIL, M2.5x0.45 X 2.5 mm

Parts List

472-4000	1	MATERIAL: 6061-T6 ALUMINUM	DRAWN BY: jjordan 8/23/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV 10/26/2011
TOTAL QTY IN DUMMY	1	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG 1/23/2012

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES

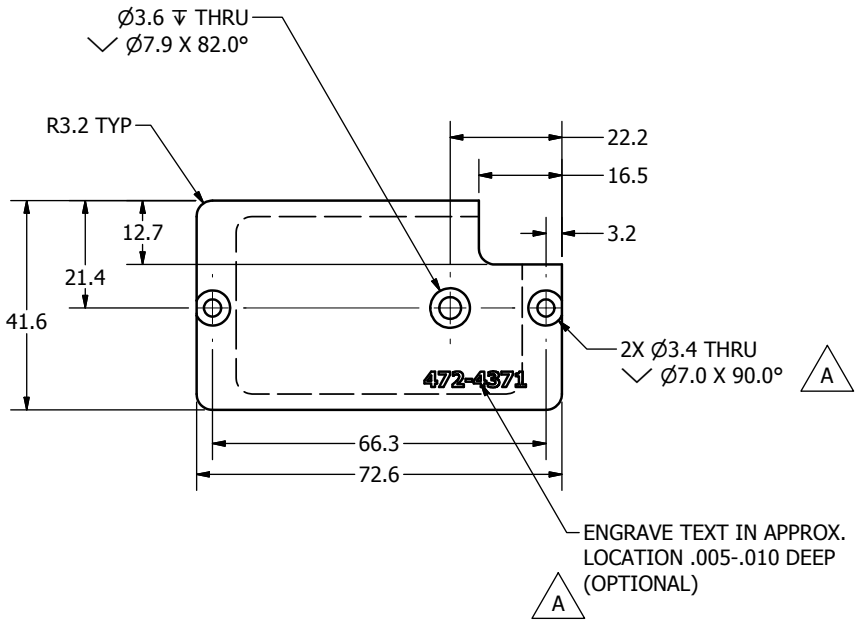
PROJECT NO.:

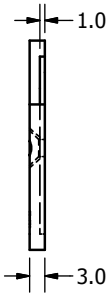
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

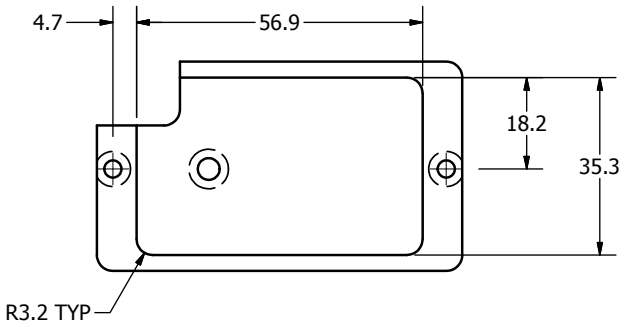
DESCRIPTION: PELVIS TRI-PACK MOUNTING BRKT.

SIZE: A3 | SHEET: 1 OF 1 | SCALE: 1:1 | DRAWING NO.: 472-4361 | REV: A

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM111 R03 FOR THOR-M; Ø3.4 THRU C'SINK Ø7.0 X 90˚ WAS Ø3.0 THRU C'SINK Ø6.6 X 82˚; ADD (OPTIONAL) TO NOTE	8/18/2011	JSJ

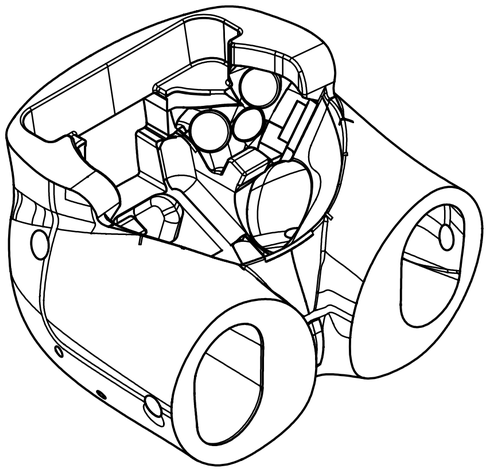




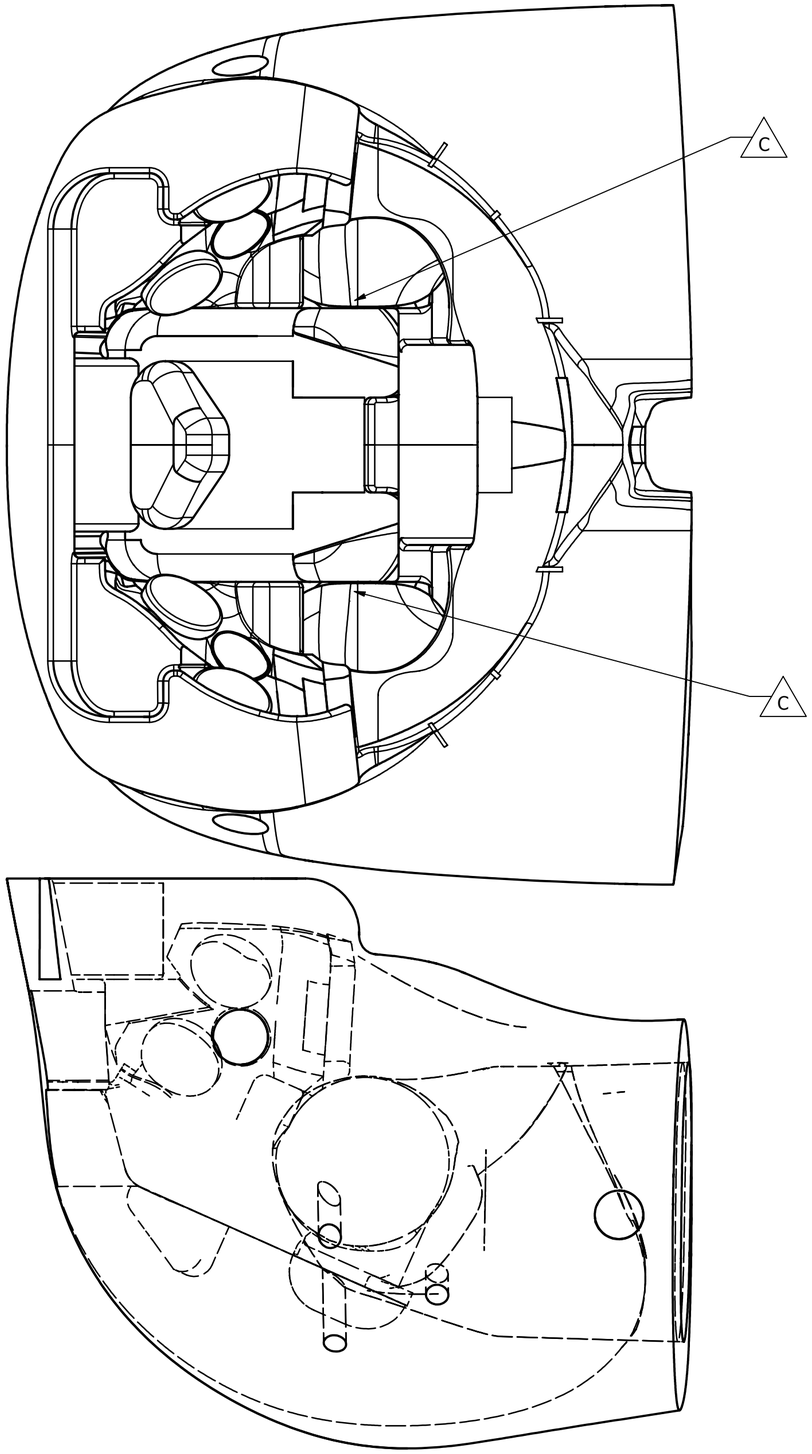


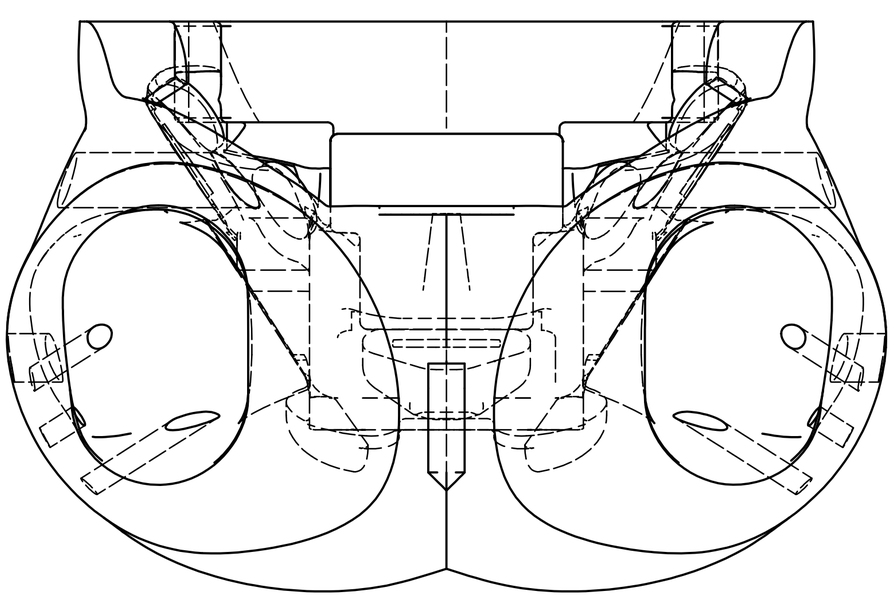
DO NOT SCALE DRAWING	THIRD ANGLE PROJECTION	TOLERANCES	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5˚ FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
PROJECT NO.:		DRAWN BY: KHS	DATE: 8/10/2011	DESCRIPTION: PELVIS ACCELEROMETER COVER	
472-4000	1	MATERIAL: Aluminum-6061-T6			
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV	DATE: 9/11/2011	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	1	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG	DATE: 1/23/2012	SCALE: 1:1
				DRAWING NO.: 472-4371	REV: A

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLS010 AND CONVERTED TO METRIC FOR THOR-M	8/15/2011	JSJ
	B	REMOVED FLAP OVER THE LEFT & RIGHT D-PT CAVITIES	6/7/2017	DW
	C	ADDED FLAP OVER THE LEFT & RIGHT D-PT CAVITIES BACK	8/6/2018	DW



SCALE .250





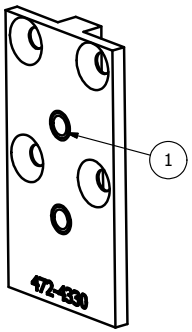
NOTE:

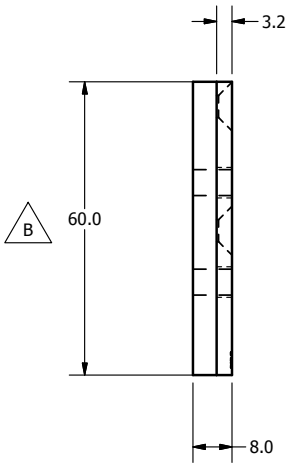
1. OUTER SKIN MATERIAL IS VINYL AND THE FILLER MATERIAL IS 3 LB/IN^3 EXPANDABLE POLYURETHANE FOAM.

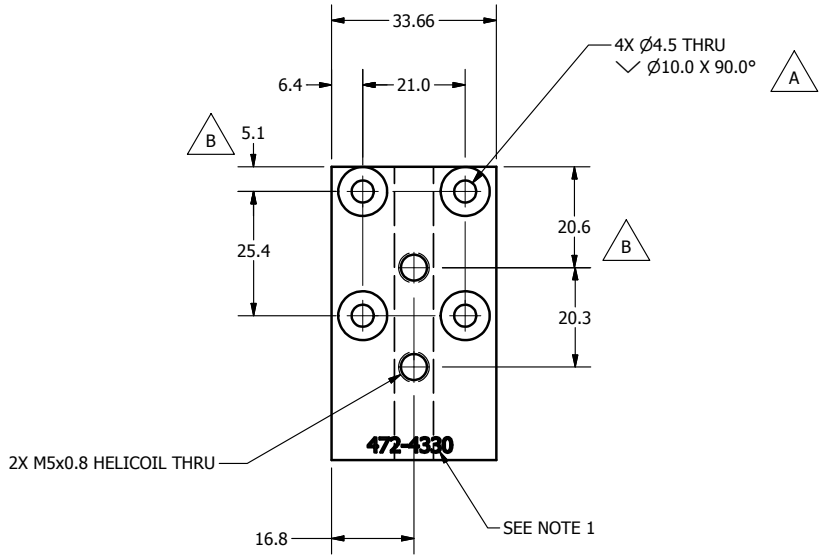
2. MOLDED PART WEIGHT IS TO BE 3.2 KG ± .15 KG

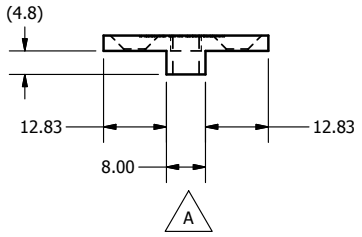
DO NOT SCALE DRAWING			TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION			UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01 ANGLES ± 0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: PELVIS FLESH, MOLDED	
		PROJECT NO.:			
472-4000	1	MATERIAL: SEE NOTES	DRAWN BY: S. RICE DATE: 8/15/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV DATE: 9/13/2011	SIZE: A2 SHEET 1 OF 1	DRAWING NO.: 472-4100 REV: C
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG DATE: 1/18/2012	SCALE: .500	

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM215 R02 AND CONVERTED TO METRIC FOR THOR-M; ADD (OPTIONAL) TO NOTE 1; ADD KEY TO BOTTOM OF PLATE; Ø4.5 THRU C'SINK Ø10.0 X 90˚ WAS Ø5.2 THRU C'SINK Ø10.2 X 82˚	8/23/2011	JSJ
	B	60.0 WAS 63.8; 5.1 WAS 8.9; 20.6 WAS 24.5	11/9/2012	BK









NOTES:

1. ENGRAVE 472-4330 ON THE AREA SPEC'D ABOVE. (OPTIONAL) A

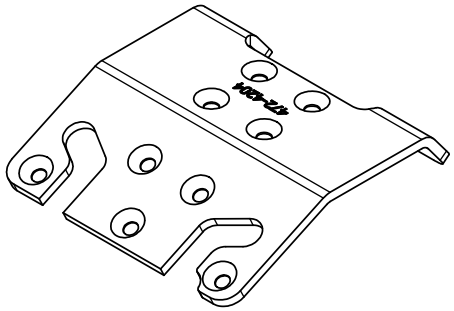
2. INSTALL HELICOILS AFTER ANODIZE.

ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	5000351	HELICOIL, M5 X .8 X 5

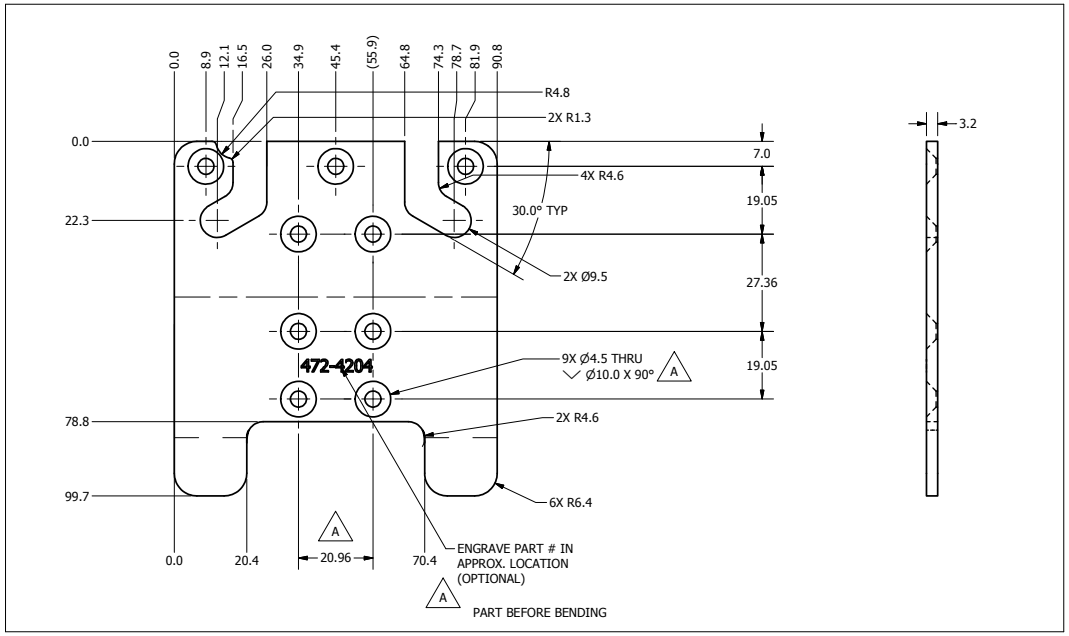
Parts List

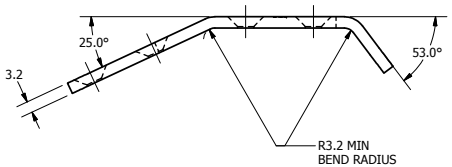
		PROJECT NO.:	DO NOT SCALE DRAWING / THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5˚; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
472-4000	1	MATERIAL: Aluminum-6061-T6	DRAWN BY: jjordan	DATE: 8/23/2011	DESCRIPTION: FRONT PELVIC PLATE
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV	DATE: 10/27/2011	SIZE: B; SHEET: 1 OF 1; DRAWING NO.: 472-4330; REV: B
TOTAL QTY IN DUMMY	1	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG	DATE: 1/23/2012	SCALE: 1:1

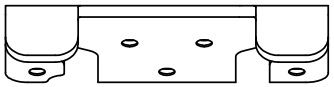
REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM213 R05 AND CONVERTED TO METRIC FOR THOR-M; Ø4.5 THRU C'SINK Ø10.0 x 90° WAS Ø5.2 THRU C'SINK Ø10.2 X 82°; ADD SLOT TO BOTTOM; (OPTIONAL) TO NOTE	8/25/2011	JSJ

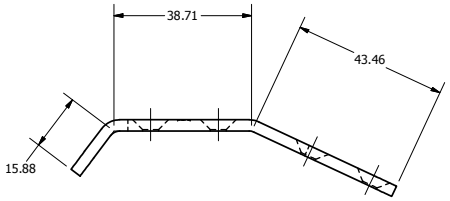


SCALE 1.000



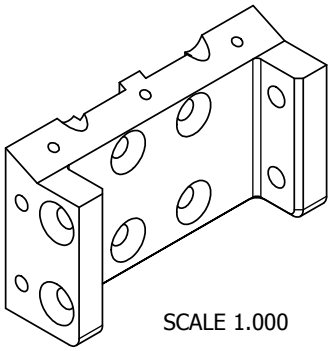




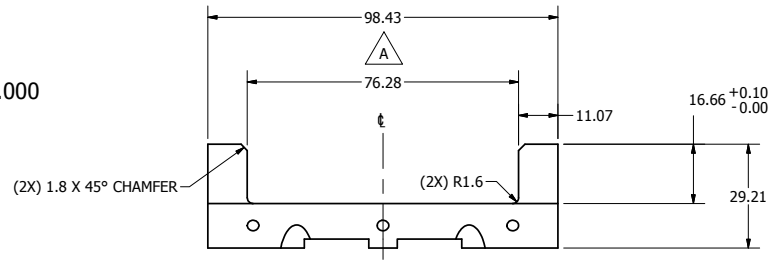


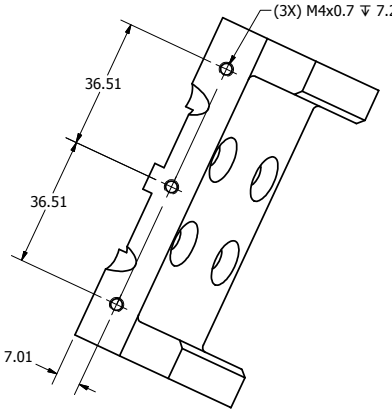
DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X.X ±0.2 ±0.5 X.XX ±0.1 X.XXX ±0.01		
PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: PELVIS TOP PLATE	
472-4300 / 1 / MATERIAL: Aluminum-6061-T6	DRAWN BY: jjordan DATE: 9/25/2011		
NEXT ASSEMBLY / QTY / BOM ITEM#:	CHECKED BY: TMV DATE: 10/27/2011	SIZE: A2 SHEET 1 OF 1	DRAWING NO.: 472-4204 REV: A
TOTAL QTY IN DUMMY / 1 / WEIGHT: CLEAR ANODIZE	ENGINEER: J. WANG DATE: 1/18/2012	SCALE: 1:1	

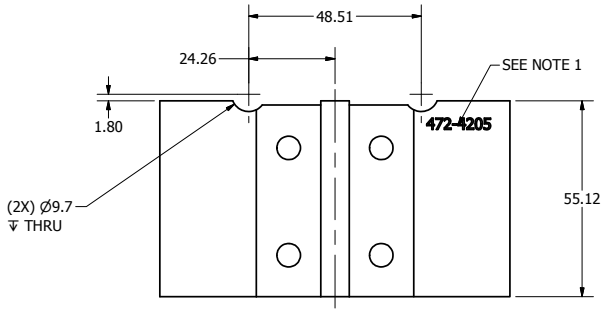
REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM214 R05 AND CONVERTED TO METRIC FOR THOR-M; 98.43 WAS 98.43+.00/-.05; 76.28 WAS 76.28+.05/-.00; Ø6.60 WAS Ø6.8; C'SINK Ø13.50 X 90˚ WAS Ø13.5 X 82˚; Ø6.6 WAS Ø6.8, C'SINK Ø13.5 X 90˚ WAS 12.5 X 82˚; ADD (OPTIONAL)TO NOTE 1	8/24/2011	JSJ

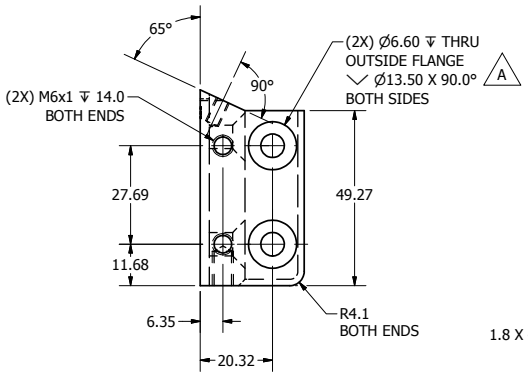


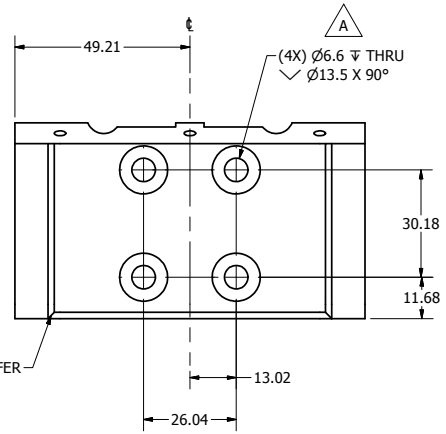
SCALE 1.000

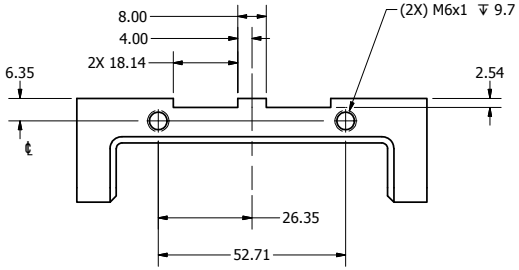








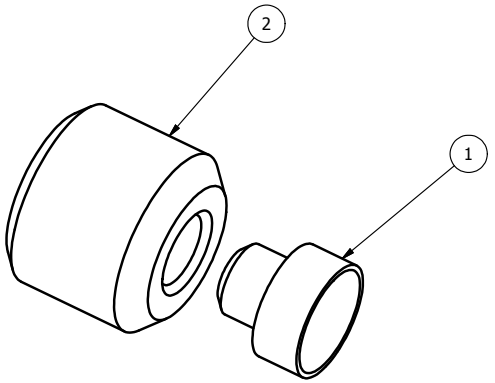




NOTE:
1. ENGRAVE DWG. #472-4205 AT APPROXIMATE LOCATION SHOWN. (OPTIONAL) A

DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH ⌵		
PROJECT NO.:		REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: PELVIS, REAR PLATE	
472-4300	1	MATERIAL: 1018 STEEL	DRAWN BY: jjordan DATE: 8/24/2011	
NEXT ASSEMBLY	QTY	ITEM / PART#:	CHECKED BY: TMV DATE: 10/26/2011	SIZE: A2 SHEET 1 OF 1 DRAWING NO.: 472-4205 REV: A
TOTAL QTY IN DUMMY	1	WEIGHT: ELECTROLESS NICKEL PLATE .008 MAX	ENGINEER: J. WANG DATE: 1/18/2012	SCALE: 1:1

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM300-02 AND CONVERTED TO METRIC FOR THOR-M	8/24/2011	JSJ



ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-4312	FRICTION ADJUSTMENT SET SCREW
1	1	472-4311	FRICTION ADJUSTMENT NYLON TIP

Parts List

472-4000	2
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	2

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

PROJECT NO.:

MATERIAL:

HEAT TREAT:

FINISH:

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ±0.5	±0.5°	1.6
X.X ±0.2		
X.XX ±0.1		
X.XXX ±0.01		

REMOVE BURRS & BREAK SHARP EDGES

DRAWN BY:	jjordan	DATE: 8/24/2011
CHECKED BY:	TMV	DATE: 9/13/2011
ENGINEER:	J. WANG	DATE: 1/20/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

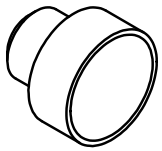
DESCRIPTION: FRICTION ADJUSTMENT SET SCREW ASSEMBLY

SIZE: B | SHEET: 1 OF 1 | SCALE: 2:1

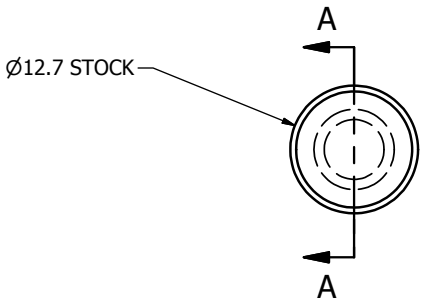
DRAWING NO.: 472-4310

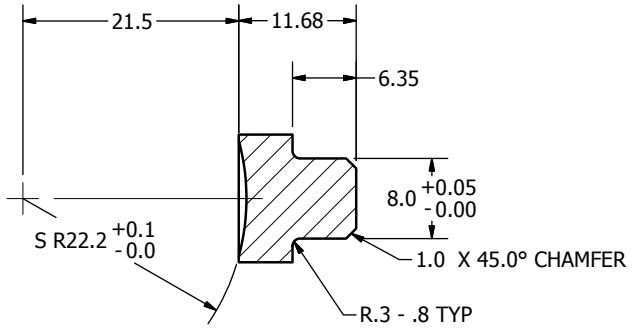
REV: A

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM311 R1 FOR THOR-M; REMOVE NOTES	8/24/2011	JSJ



SCALE 2.000

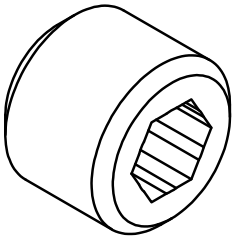


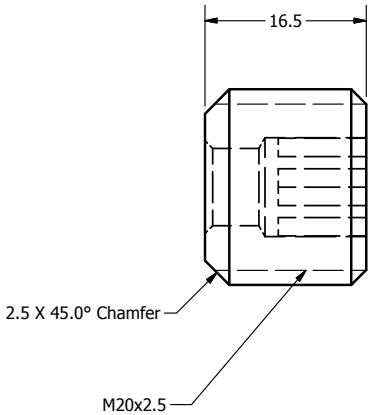


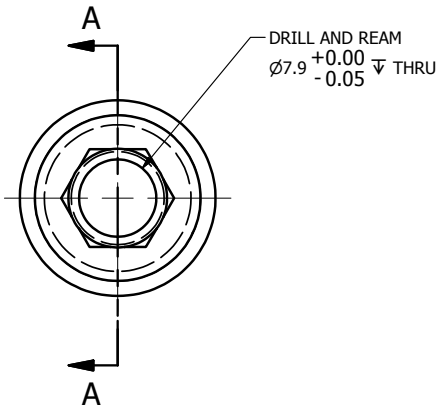
SECTION A-A
SCALE 2.000

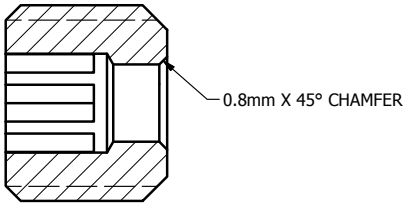
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION			
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES			DESCRIPTION: FRICTION ADJUSTMENT NYLON TIP	
PROJECT NO.:		DRAWN BY: jjordan	DATE: 8/24/2011			
472-4310	1	MATERIAL: Nylon-6/6	CHECKED BY: TMV	DATE: 9/13/2011	SIZE: A3 SHEET 1 OF 1	DRAWING NO.: 472-4311 REV: A
NEXT ASSEMBLY	QTY	HEAT TREAT:	ENGINEER: J. WANG	DATE: 1/23/2012	SCALE: 2.000	
TOTAL QTY IN DUMMY	2	FINISH:				

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM310-02 AND CONVERTED TO METRIC FOR THOR-M	8/24/2011	JSJ









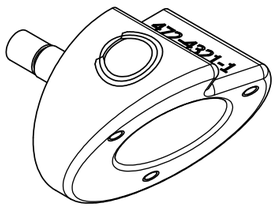
SECTION A-A
SCALE 2 : 1

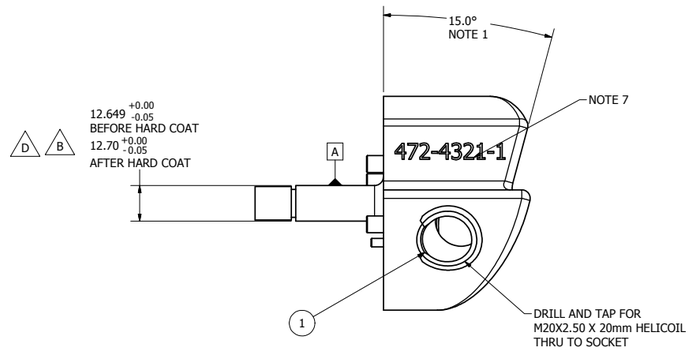
NOTES:

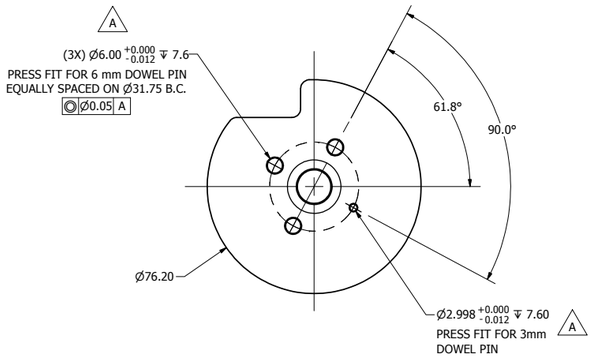
1. MAKE FROM 5000508 (M20 X 2.5 X 20 CUP POINT SET SCREW), MODIFY AS SHOWN

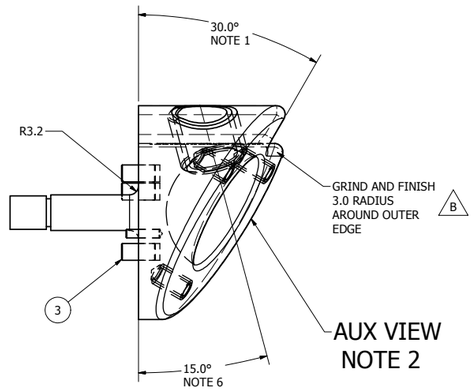
		DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:			DESCRIPTION: FRICTION ADJUSTMENT SET SCREW
472-4310	1	MATERIAL: SEE NOTES	DRAWN BY: jjordan — DATE: 8/24/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV — DATE: 9/9/2011	SIZE: B	SHEET: 1 OF 1
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG — DATE: 1/23/2012	SCALE: 2:1	DRAWING NO.: 472-4312 — REV: A

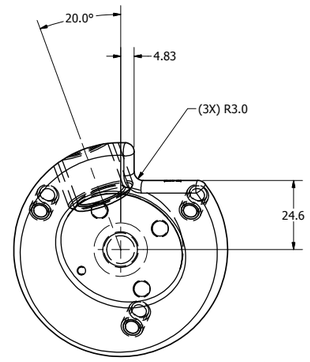
REVISION HISTORY				
REV	ZONE	DESCRIPTION	DATE	BY
A	GLOBAL	RENUMBERED FROM T1PLM217-10 AND CONVERTED TO METRIC FOR THOR-M; Ø45.35 WAS Ø44.45; Ø6.00 +.000/-.012 WAS Ø6.4, Ø31.75 B.C. WAS Ø31.8 B.C.; 1.6 THREAD RELIEF WAS .8; ADD 2.998+.000/-.012 DOWEL HOLE	8/25/2011	JSJ
B	GLOBAL	INCREASE BALL SOCKET SIZE TO 44.51 FROM 44.35. REVISED AND ADDED DIMENSIONS/NOTE FOR BEFORE AND AFTER HARD COAT. ADD 3mm RADIUS TO OUTER EDGE.	5/24/2012	JSJ
C	A,3 GLOBAL	CORRECTED TOP TWO M6 HOLE LOCATIONS TO BE PARALLEL WITH CUT OUT	7/2/2012	JSJ
D	B,3	Ø12.70 +.00/-.05 WAS +.00/-.01	7/12/2012	TMV

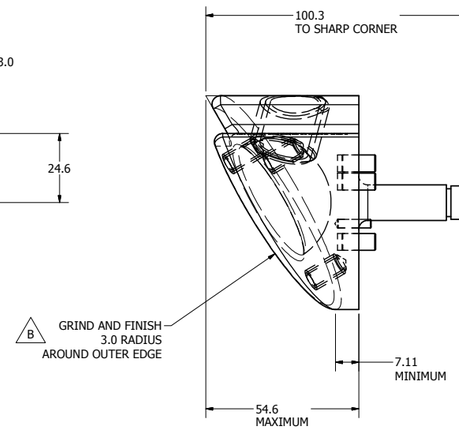


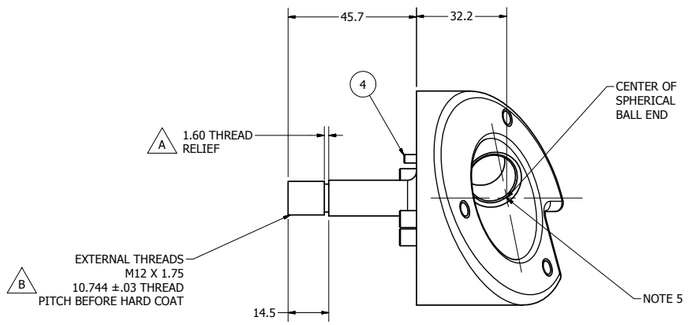


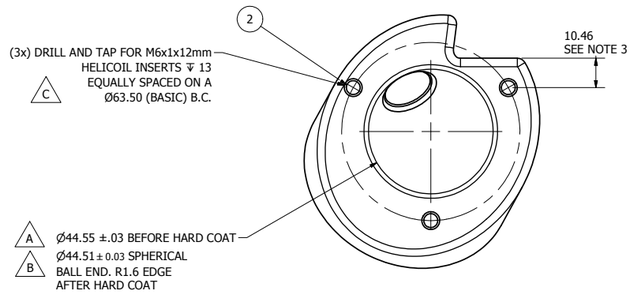












NOTES:
1. BEGIN BY MACHINING THE 15° PLANE. MACHINE 30° PLANE FROM 15° TOP VIEW PLANE
2. AUX VIEW IS PERPENDICULAR TO THE RESULTING SURFACE.
C 3. THE TOP TWO M6X 1.00 HOLES ARE ON A LINE PARALLEL WITH THE CUTOUT.
4. THE EXTRA LINES ARE THE REPRESENTATION OF THE COMPUTERS CURVED CONTOURS; THEY ARE NOT MACHINED.
5. THE SPHERICAL BALL IS CENTERED ON THE Ø76.2 CROSS-SECTION, AND DRILLED PERPENDICULAR TO THE 15°/30° SURFACE.
6. THE CENTER LINE OF THE M20X2.50 THREADS PASSES THROUGH THE CENTER OF THE SPHERICAL SOCKET.
7. ENGRAVE DWG # 472-4321-1 AT THE LOCATION SPECIFIED.
8. MASK PIN HOLES AND SHAFT PRIOR TO HARD COAT ANODIZING.
9. HARD COAT ANODIZE PART UPON COMPLETION - CLEAN UP AS NECESSARY AND ADD HELICOILS. HARD COAT THICKNESS IS .025mm PER SIDE ± 20%
B 10. DIMENSIONAL LIMITS AND THREADED HOLES APPLY AFTER FINISH

ITEM	QTY	PART NUMBER	DESCRIPTION
4	1	5000183	PIN, DOWEL M3 X 12 mm
3	3	5000433	PIN, DOWEL M6 X 12 mm
2	3	5000422	HELICOIL, M6x1x12mm
1	1	5000430	HELICOIL M20x2.5 X 20 mm

Parts List

472-4000	1	7075-T6 ALUMINUM	
NEXT ASSEMBLY	QTY	N/A	
TOTAL QTY IN DUMMY	1	SEE NOTE 9	

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS .X ±0.2, .XX ±0.1, .XXX ±0.05, ANGLES ±1°. FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES

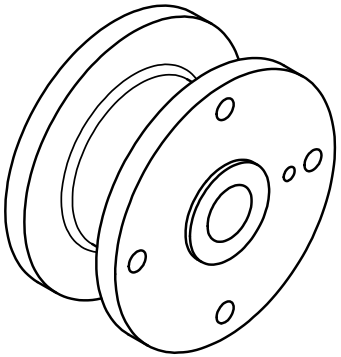
DRAWN: Jordan 8/25/2011
CHECKED: TMV 7/2/2012
ENGINEER: J. WANG 11/23/2012

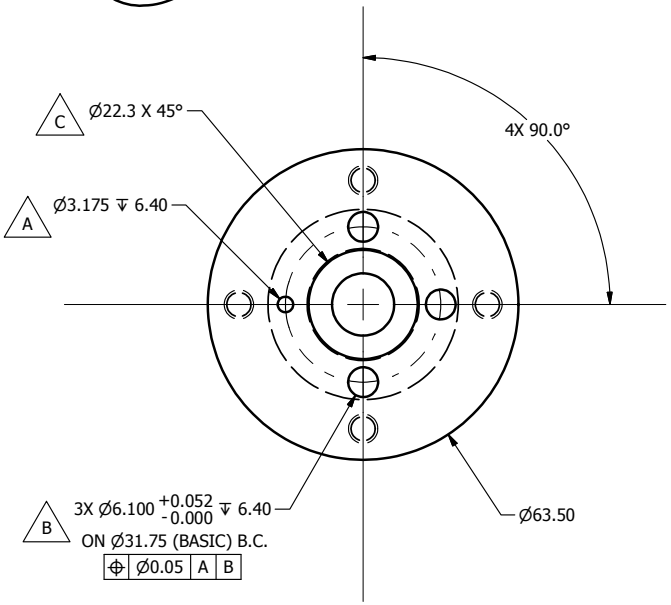
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

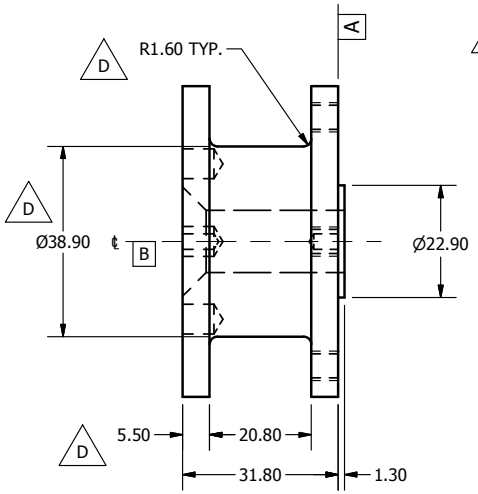
DRAWING TITLE: PELVIS SOCKET ADAPTOR (LEFT)

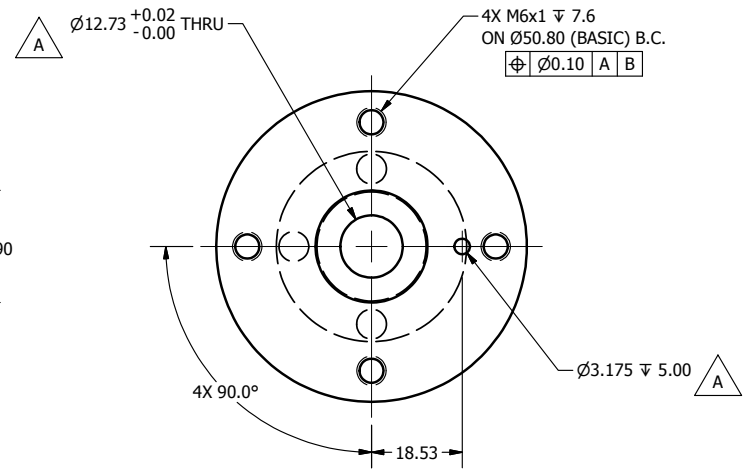
SIZE: A1 | SHEET: 1 OF 1 | SCALE: 1:1 | DRAWING NO.: 472-4321-1 | REV: D

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM220 R03 AND CONVERTED TO METRIC FOR THOR-M; ADD Ø3.175 ↓ 6.40, Ø3.175 ↓ 5.00; Ø12.73 +.02/-.00 WAS 12.73 +.008/-.000	8/23/2011	JSJ
	B	Ø6.10+.05/-0 WAS Ø6.042+.052/-0	4/25/2012	BK
	C	ADD Ø22.3 X 45° CHAMFER TO HOLE	6/21/2012	BK
	D	MODIFIED PART TO ACHIEVE LOAD CELL WEIGHT	7/12/2012	JSJ



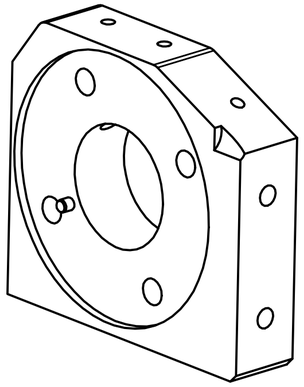


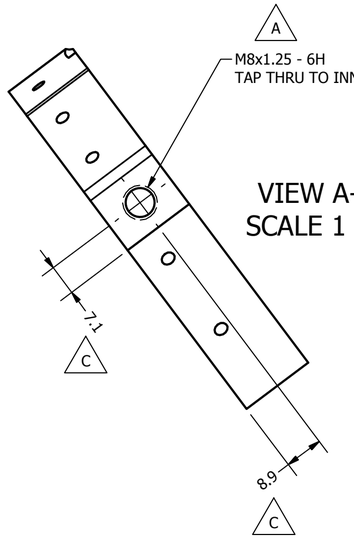




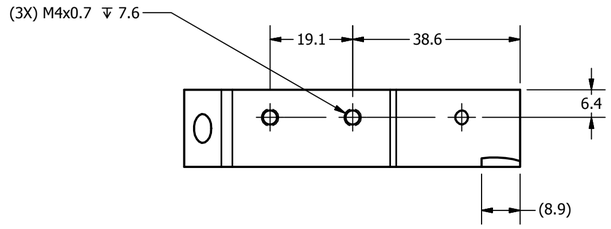
		DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: ACETABULAR LOAD CELL STRUCTURAL REPLACEMENT	
472-4000	2	MATERIAL: 1018 STEEL	DRAWN BY: jjordan	DATE: 10/20/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: B; SHEET: 1 OF 1; DRAWING NO.: 472-4323; REV: D
TOTAL QTY IN DUMMY	2	FINISH: NICKEL PLATE .008 MAX	ENGINEER: J. WANG	DATE: 1/23/2012	SCALE: 1:1

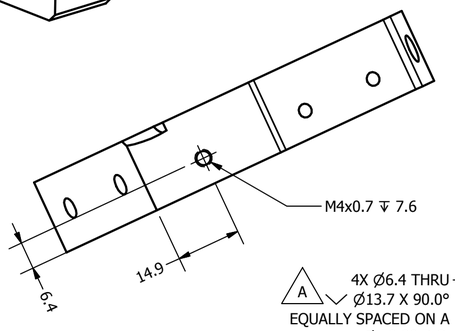
REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM211-03 AND CONVERTED TO METRIC FOR THOR-M; Ø6.6 WAS Ø6.8, C'SINK Ø13.5 X 90° WAS Ø13.2 X 82°; ADD Ø2.998 +.000/-.012 ↧ 5.0, M8x1.25 TAP HOLE	8/22/2011	JSJ
	B	NICKEL PLATE WAS TEFLON (ECO 10179)	10/17/2011	TMV
	C	ADDED DIMENSIONS TO VIEW A-A	8/7/2017	DW

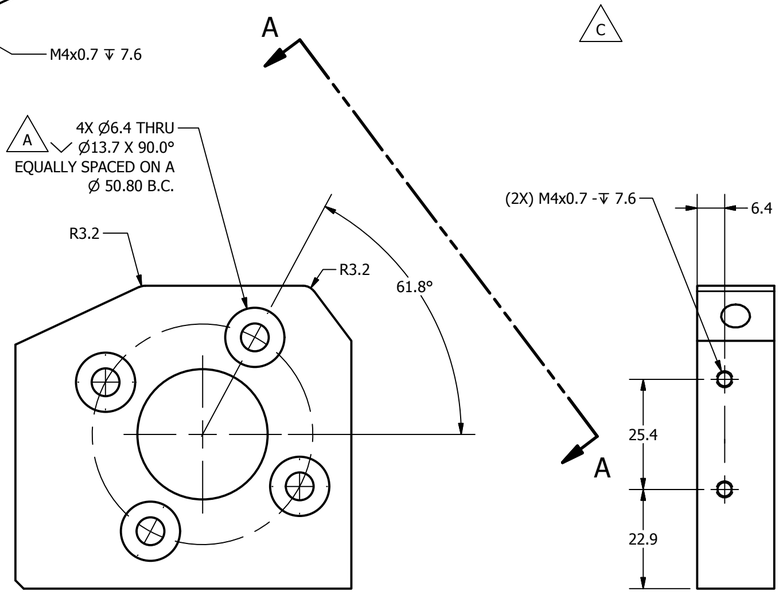


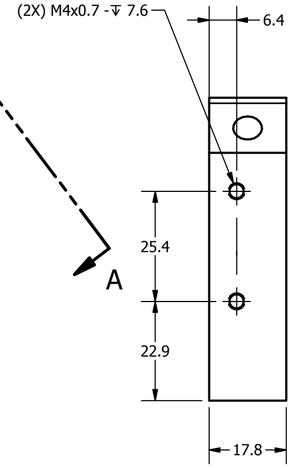


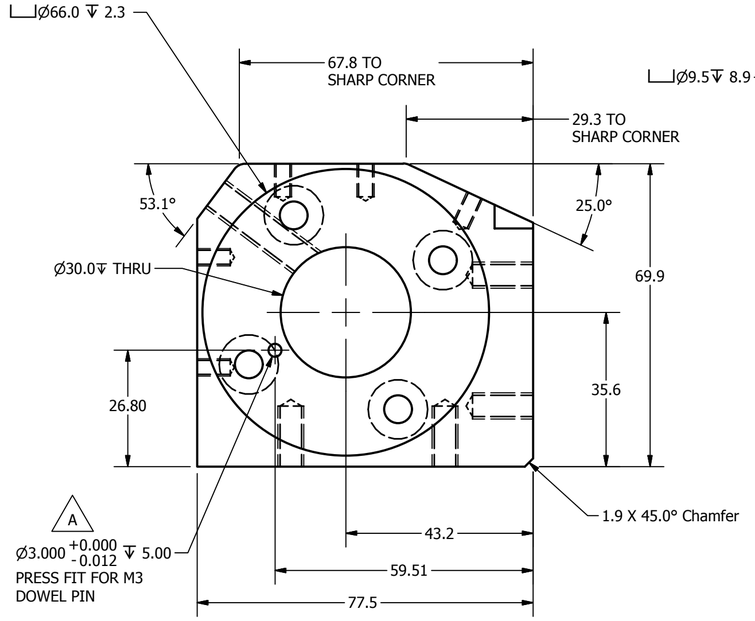
VIEW A-A
SCALE 1 : 1

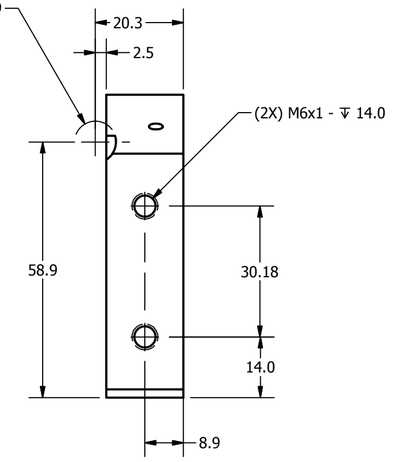


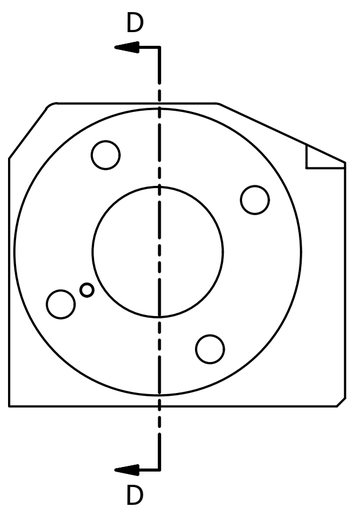


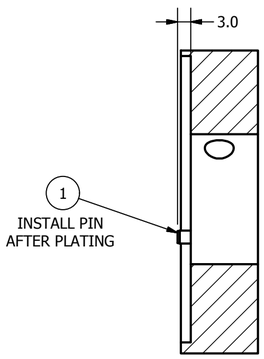




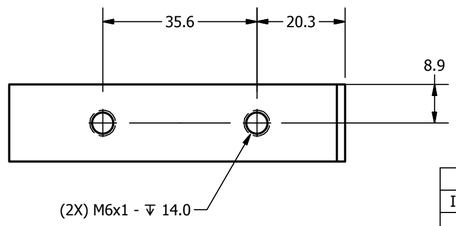








SECTION D-D
SCALE 1 : 1



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5000384	PIN, DOWEL M3 x 8

Parts List

472-4000	1	1018 STEEL			
NEXT ASSEMBLY	QTY	HEAT TREAT:			
TOTAL QTY IN DUMMY	1	FINISH: ELECTROLESS NICKEL PLATE .008 MAX.			

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

PROJECT NO.:

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ±0.3, X.X ±0.1, X.XX ±0.05, X.XXX ±0.01
ANGLES ±0.5°
FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

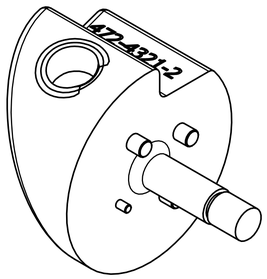
DRAWN BY: jjordan — DATE: 8/22/2011
CHECKED BY: TMV — DATE: 10/31/2011
ENGINEER: J. WANG — DATE: 1/23/2012

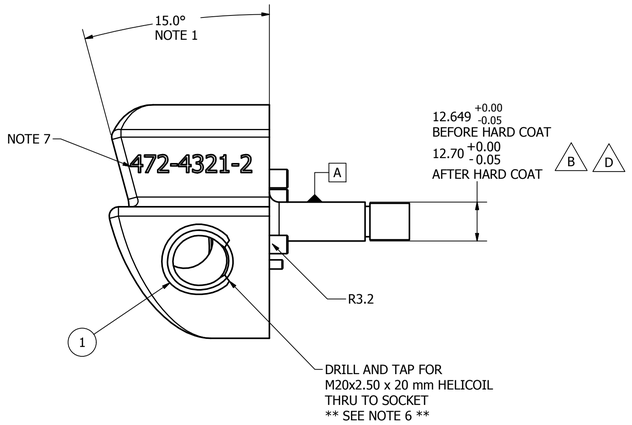
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

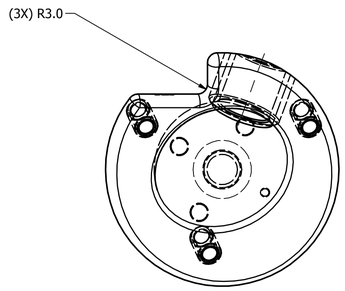
DESCRIPTION: PELVIS LOAD CELL MTG PLATE LEFT

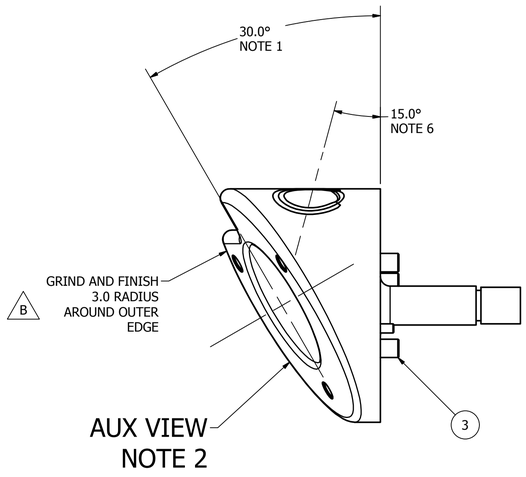
SIZE: A2 | SHEET: 1 OF 1 | SCALE: 1:1 | DRAWING NO.: 472-4325-1 | REV: C

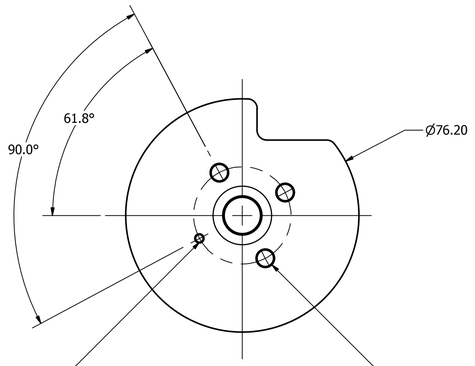
REVISION HISTORY				
REV	ZONE	DESCRIPTION	DATE	BY
A	GLOBAL	RENUMBERED FROM T1PLM218-10 AND CONVERTED TO METRIC FOR THOR-M; Ø45.35 WAS Ø44.45; Ø6.00 +.000/-.012 WAS Ø6.4, Ø31.75 B.C. WAS Ø31.8 B.C.; 1.6 THREAD RELIEF WAS .8; ADD 2.998+.000/-.012 DOWEL HOLE	8/25/2011	JSJ
B	GLOBAL	INCREASE BALL SOCKET SIZE TO 44.51 FROM 44.35. REVISED AND ADDED DIMENSIONS/NOTE FOR BEFORE AND AFTER HARD COAT. ADD 3mm RADIUS TO OUTER EDGE.	5/24/2012	JSJ
C	A,4 GLOBAL	CORRECTED TOP TWO M6 HOLE LOCATIONS TO BE PARALLEL WITH CUT OUT	7/2/2012	JSJ
D	B,2	Ø12.70 +.00/-.05 WAS +.00/-.01	7/12/2012	TMV

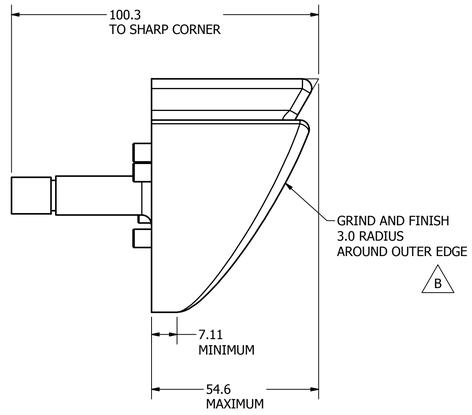


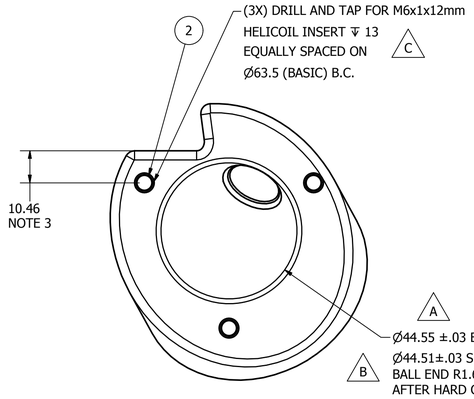


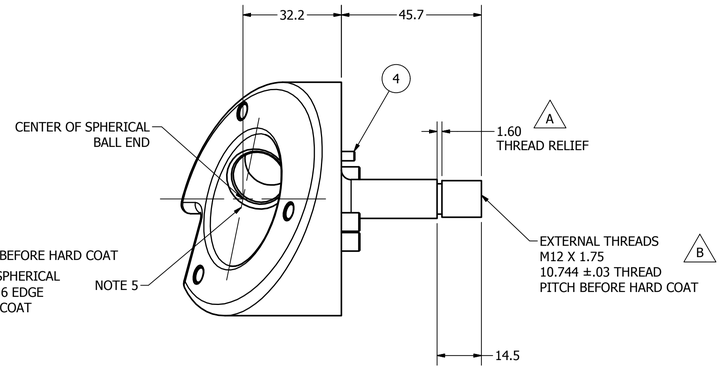












NOTES:
1. BEGIN BY MACHINING THE 15° PLANE. MACHINE 30° PLANE FROM 15° TOP VIEW PLANE
2. AUX VIEW IS PERPENDICULAR TO THE RESULTING SURFACE.
3. THE TOP TWO M6x1 HOLES ARE ON A LINE PARALLEL WITH THE CUTOUT.
4. THE EXTRA LINES ARE THE REPRESENTATION OF THE COMPUTERS CURVED CONTOURS; THEY ARE NOT MACHINED
5. THE SPHERICAL BALL IS CENTERED ON THE Ø76.2 CROSS-SECTION, AND DRILLED PERPENDICULAR TO THE 15°/30° SURFACE
6. THE CENTER LINE OF THE M20x2.50 THREAD PASSES THROUGH THE CENTER OF THE SPHERICAL SOCKET.
7. ENGRAVE DWG# 472-4321-2 AT THE LOCATION SPECIFIED
8. MASK PIN HOLES AND SHAFT PRIOR TO HARD COAT ANODIZING
9. HARD COAT ANODIZE PART UPON COMPLETION - CLEAN UP AS NECESSARY AND ADD HELICOILS. HARD COAT THICKNESS IS .025mm PER SIDE ± 20%
B 10. DIMENSIONAL LIMITS AND THREADED HOLES APPLY AFTER FINISH.

ITEM	QTY	PART NUMBER	DESCRIPTION
4	1	5000183	PIN, DOWEL M3 X 12 mm
3	3	5000433	PIN, DOWEL M6 X 12 mm
2	3	5000422	HELICOIL, M6 X 1 X 12
1	1	5000430	HELICOIL M20x2.5 X 20 mm

Parts List

472-4000	1	MATERIAL: 7075-T6 ALUMINUM	DRAWN: Jordan 8/25/2011
NEXT ASSEMBLY	QTY	MATERIAL: N/A	CHECKED: TMV 7/3/2012
TOTAL QTY IN DUMMY	1	FINISH: SEE NOTE 9	ENGINEER: J. WANG 1/23/2012

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION — PROJECT NO.:

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. X ±0.5; XX ±0.1; XXX ±0.05; ANGLES ±1.0°; FINISH 3.2. REMOVE BURRS & BREAK SHARP EDGES

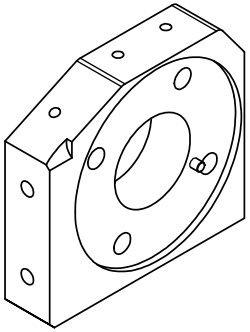
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

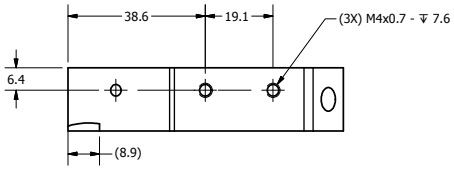
DOCUMENT TITLE: PELVIS SOCKET ADAPTER (RIGHT)

SIZE: A1 | SHEET: 1 of 1 | DRAWING NO.: 472-4321-2 | REV: D | SCALE: 1:1

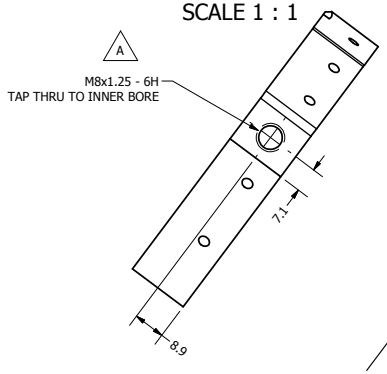
472-4321-2.iam

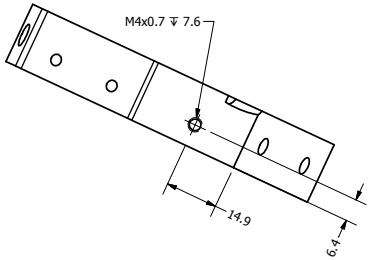
REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1PLM211-03 AND CONVERTED TO METRIC FOR THOR-M; • 6.6 WAS • 6.8, C'SINK Ø13.5 X 90˚ WAS Ø13.2 X 82˚; ADD Ø2.998 +.000/-.012 ↧ 5.0, M8x1.25 TAP HOLE	8/23/2011	JSJ
	B	NICKEL PLATE FINISH WAS TEFLON (ECO 10181)	10/18/2011	TMV

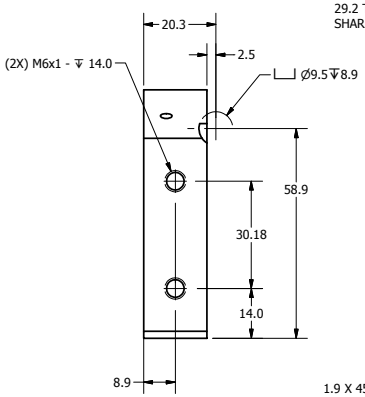


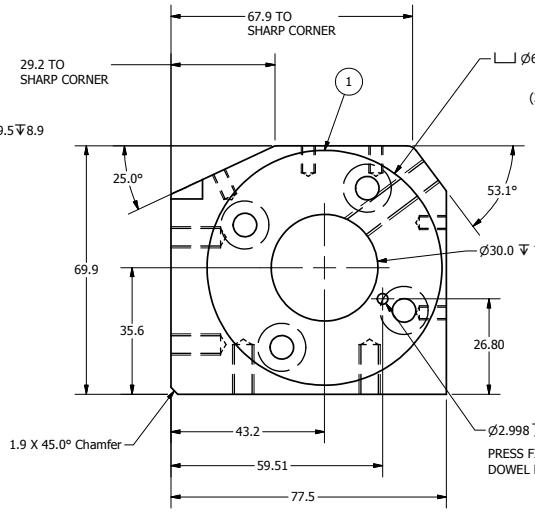


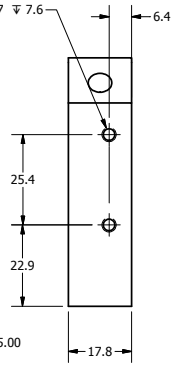
VIEW A-A
SCALE 1 : 1

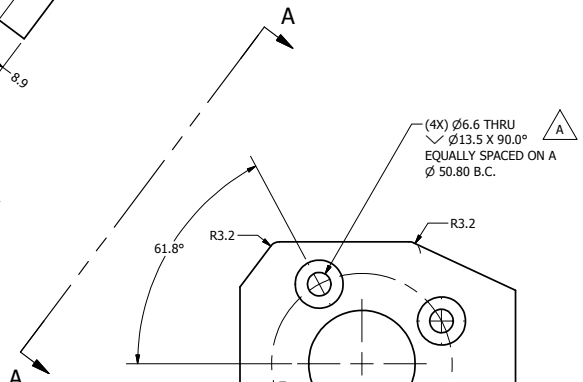


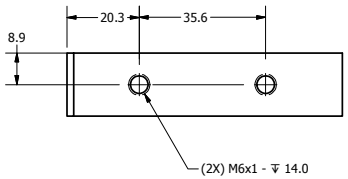


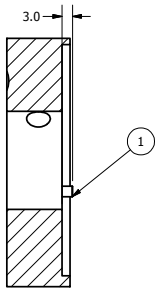




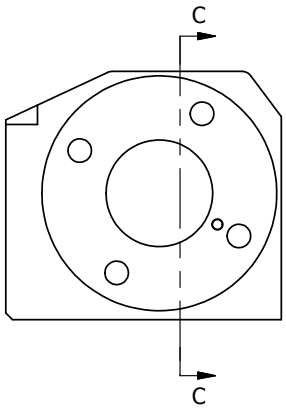








SECTION C-C
SCALE 1 : 1



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5000384	M3 x 8mm DOWEL PIN

Parts List

472-4000	1	MATERIAL: 1018 STEEL	DRAWN BY: jjordan 8/23/2011
NEXT ASSEMBLY	QTY	BOM ITEM#:	CHECKED BY: TMV 10/31/2011
TOTAL QTY IN DUMMY	1	WEIGHT: ELECTROLESS NICKEL PLATE .008 MAX.	ENGINEER: J. WANG 1/23/2012

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6

REMOVE BURRS & BREAK SHARP EDGES

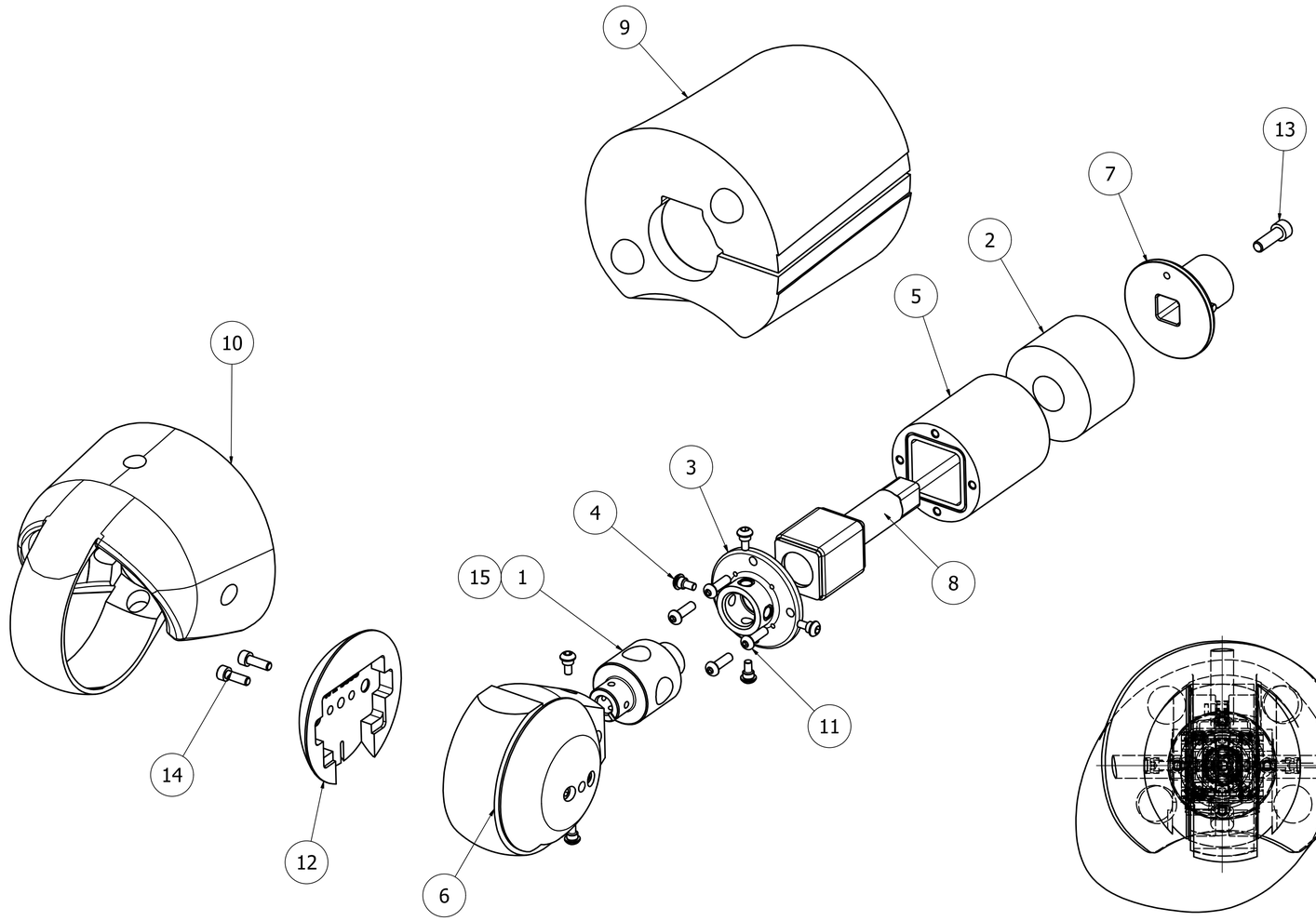
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: PELVIS LOAD CELL MTG. PLATE (RIGHT)

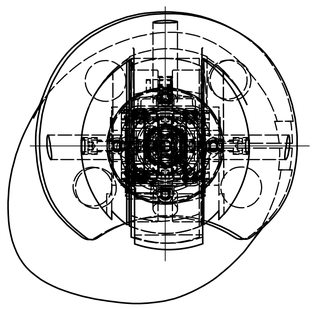
SIZE: A2 | SHEET: 1 OF 1 | DRAWING NO.: 472-4325-2 | REV: B

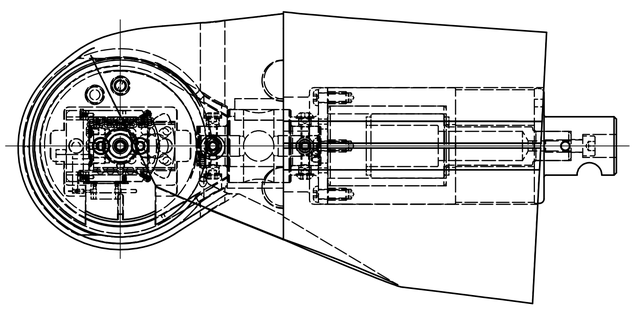
SCALE: 1:1

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM000-04 AND CONVERTED TO METRIC FOR THOR-M; REMOVED LEFT FEMUR BALL JOINT ASSY FROM ASSY (T1FMM100-02)		TKN
	B	ADD 472-5353 AND 9005217	2/14/2012	KHS
	C	ADDED PART #SA572-S120 - FEMUR LOAD CELL (OPTIONAL)	9/3/2015	DW



ISO VIEW
SCALE 1 / 2





ITEM	QTY	PART NUMBER	DESCRIPTION
15	1	SA572-S120	FEMUR LOAD CELL (OPTIONAL)
14	4	9005217	SHCS M6 X 18 mm
13	1	5000037	SCREW, SHCS M8-1.25 X 25mm
12	2	472-5353	KNEE COVER
11	4	5000438	SCREW, BHCS M6-1 X 20mm
10	1	472-5502	KNEE FLESH LEFT/RIGHT
9	1	472-5503-1	THIGH FLESH - LEFT
8	1	472-5420	FEMUR PLUNGER ASSY.
7	1	472-5410	FEMUR BALL ATTACHMENT PLATE ASS'Y.
6	1	472-5300	KNEE CAP ASSY., LEFT
5	1	472-5200	FEMUR BUSHING ASSY.
4	8	W50-61042	MODIFIED BHSS M6 THREAD
3	1	472-5203	END CAP - FEMUR
2	1	472-5206	COMPRESSION ELEMENT-UPPER LEG
1	1	W50-51060	UNIVERSAL LEG L.C. STRUCTURAL REPLACEMENT

Parts List

472-5000-1	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS; SURFACE FINISH: 125 RMS; X ±0.5, .X ±0.2, .XX ±0.1, .XXX ±0.05; REMOVE BURRS & BREAK SHARP EDGES

DRAWN: THANH 8/29/2011
ENGINEER: J. WANG 1/26/2012

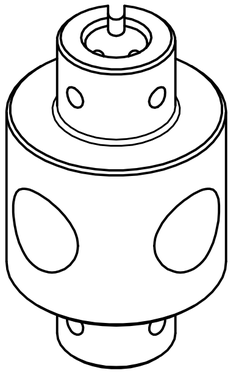
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

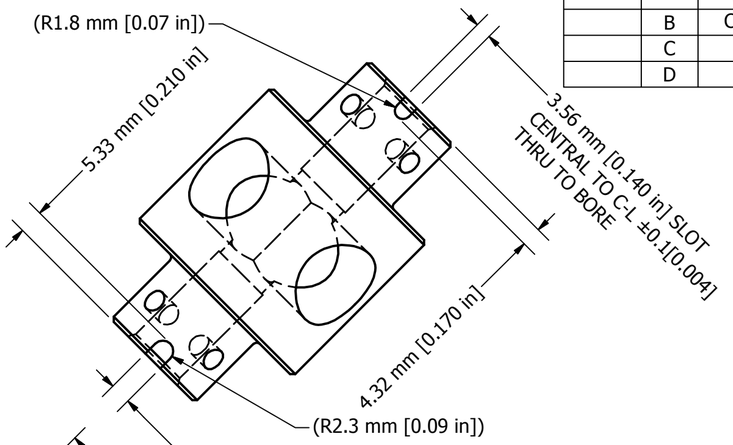
DESCRIPTION: LEFT UPPER LEG ASSY.

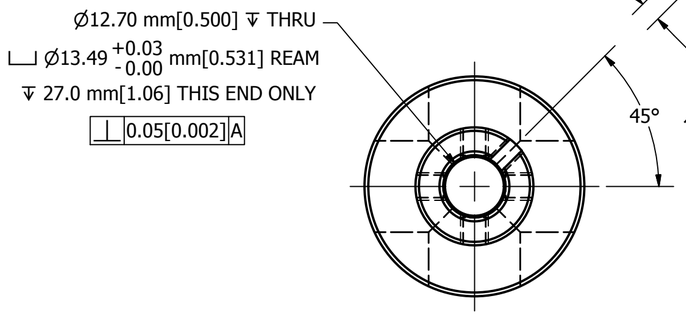
SIZE: A1 SHEET 1 OF 1 SCALE: 1:2
DRAWING NO: 472-5100-1 REV: C

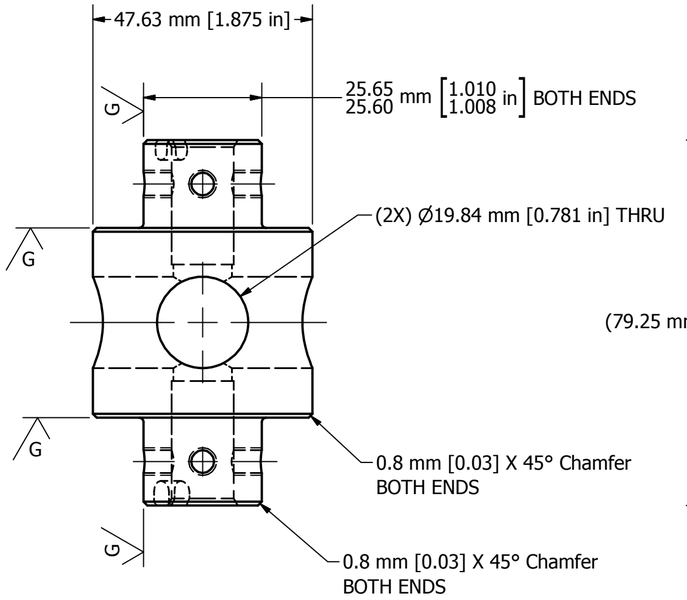
472-5100-1.iam

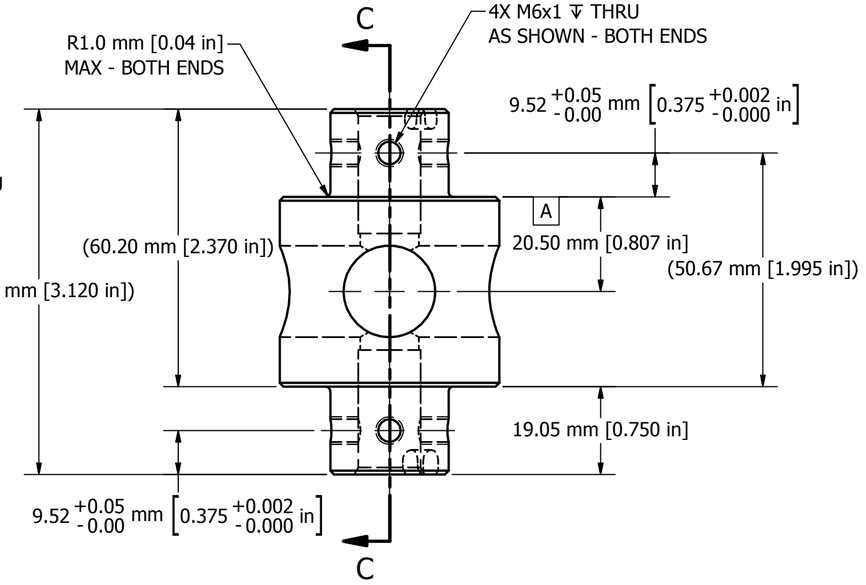
REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	REM CONNECTION HOLES; CHANGE MASS; CHANGE HOLE DIAMETER	23SEP02	N/A
	B	CHANGE TO BORE, ONE END ONLY	22OCT02	N/A
	C	CENTERS ADDED	11DEC02	TORCH
	D	REDRAWN IN INVENTOR	3/22/2007	BB

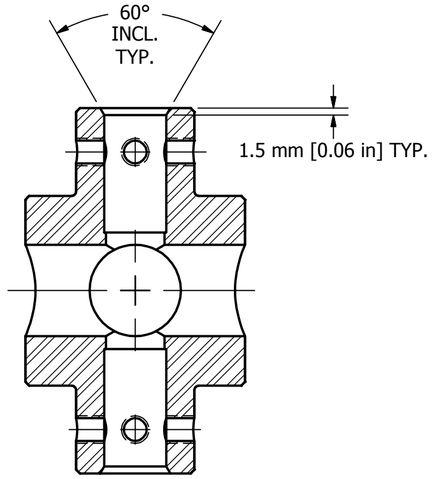












SECTION C-C
SCALE 1 : 1

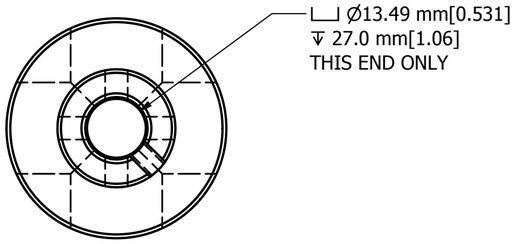


TABLE "A"			
Metric Tolerances		Inch Tolerances	
XX.	±0.50mm	XX.	±.020"
XX.X	±0.10mm	XX.X	±.004"
XX.XX	±0.05mm	XX.XX	±.002"

MASS: .467 Kg [1.06 lbs.]

UNLESS OTHERWISE SPECIFIED:
1. ALL DIMENSIONS ARE IN INCHES.
2. BREAK ALL SHARP EDGES.
3. ALL MACHINED SURFACES 125 OR BETTER.

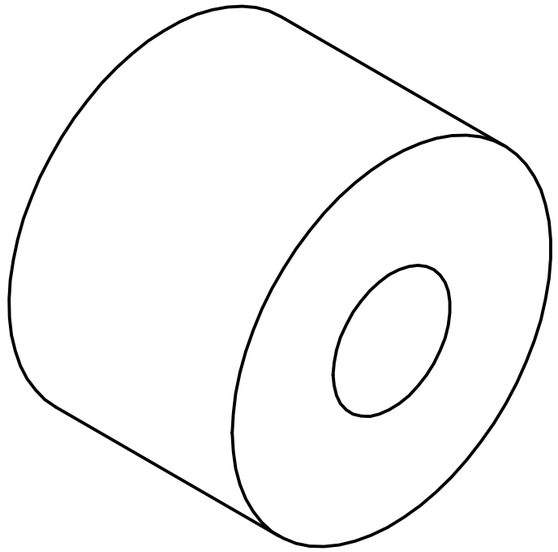
DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION
PROJECT NO.:
MATERIAL: 4140 STEEL
HEAT TREAT: N/A
FINISH: .0003 ELECTROLESS NICKEL PLATE

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
DECIMALS ANGLES FINISH
XX. ±0.1 ± 1° 125
X.XX ±0.01
X.XXX ±0.005 FRACTIONS ±1/64
REMOVE BURRS & BREAK SHARP EDGES
DRAWN BY: BRYAN B DATE: 1/18/2007
CHECKED BY: KSG DATE: 3/22/2007
ENGINEER: DATE:

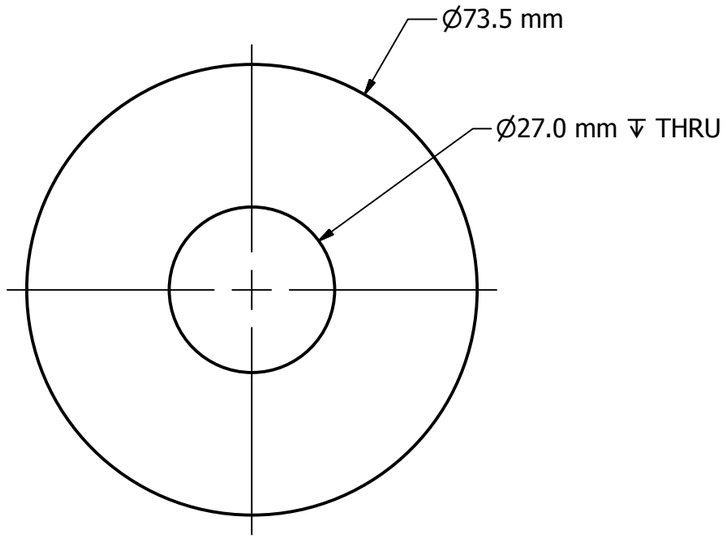
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
DESCRIPTION: UNIVERSAL LEG L.C. STRUCTURAL REPLACEMENT
SIZE: C SHEET: 1 OF 1 DRAWING NO.: W50-51060 REV: D
SCALE: 1:1

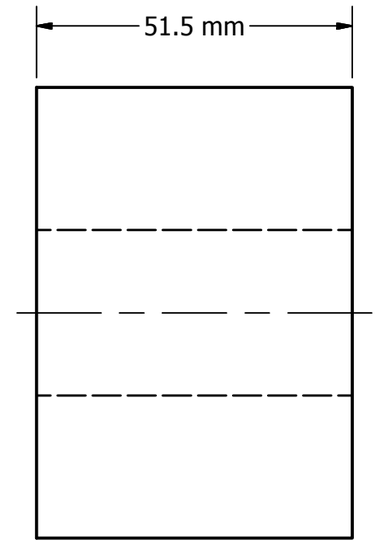
W50-51060.ipt

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM206 R0 AND CONVERTED TO METRIC FOR THOR-M	8/18/2011	JSJ



SCALE 1.000





NOTES:

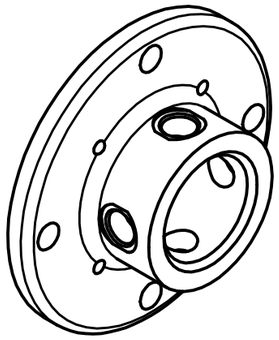
1.MATERIAL: NATURAL RUBBER, 60 ± 5 SHORE "A"
ADJUST DUROMETER TO MEET DYNAMIC PERFORMANCE

2. TOLERANCE ± 0.5 mm ALL DIMENSIONS

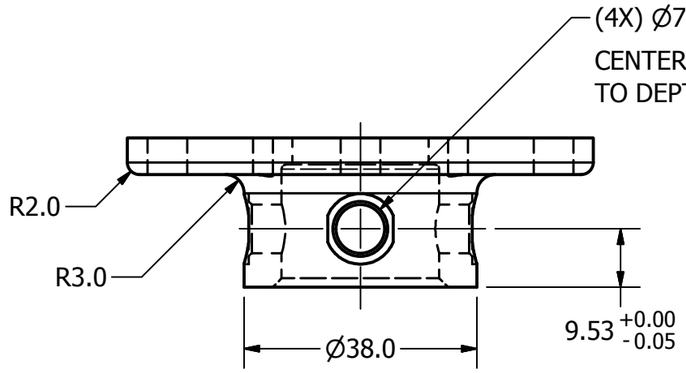
472-5100-2	1	PROJECT NO.:	DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
472-5100-2	1	MATERIAL: SEE NOTES	DRAWN BY: KHS — DATE: 8/17/2011		DESCRIPTION: COMPRESSION ELEMENT-UPPER LEG
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV — DATE: 9/12/2011	SIZE: A3 — SHEET: 1 OF 1 — DRAWING NO.: 472-5206 — REV: A	
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG — DATE: 1/26/2012	SCALE: 1:1	

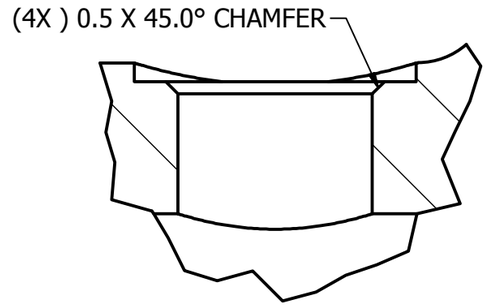
472-5206.ipt

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM203 R0 AND CONVERTED TO METRIC FOR THOR-M	8/18/2011	JSJ

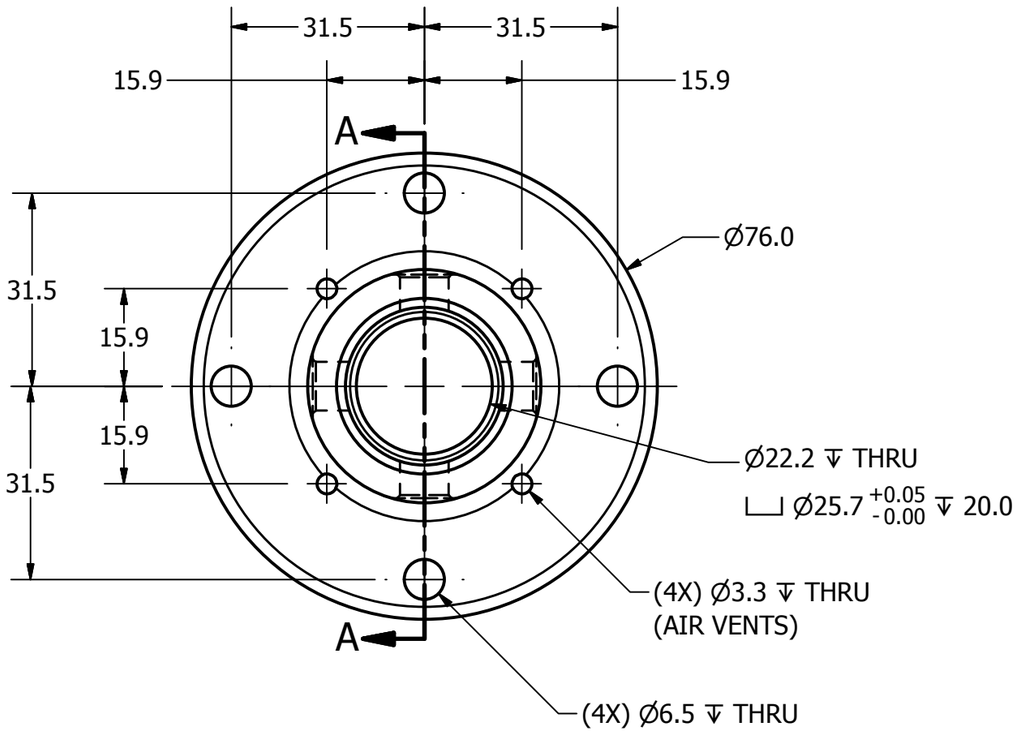


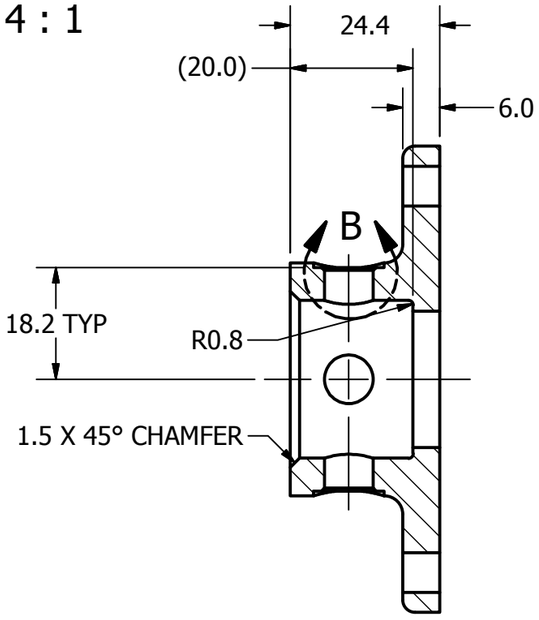
SCALE .750





DETAIL B
SCALE 4 : 1

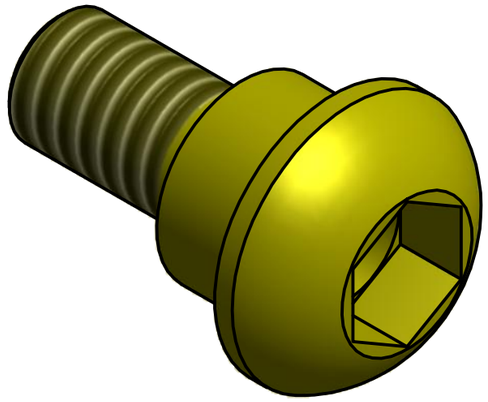


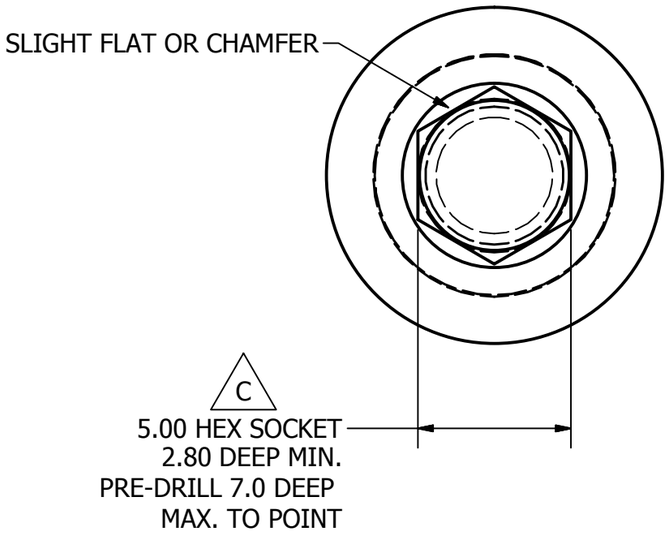


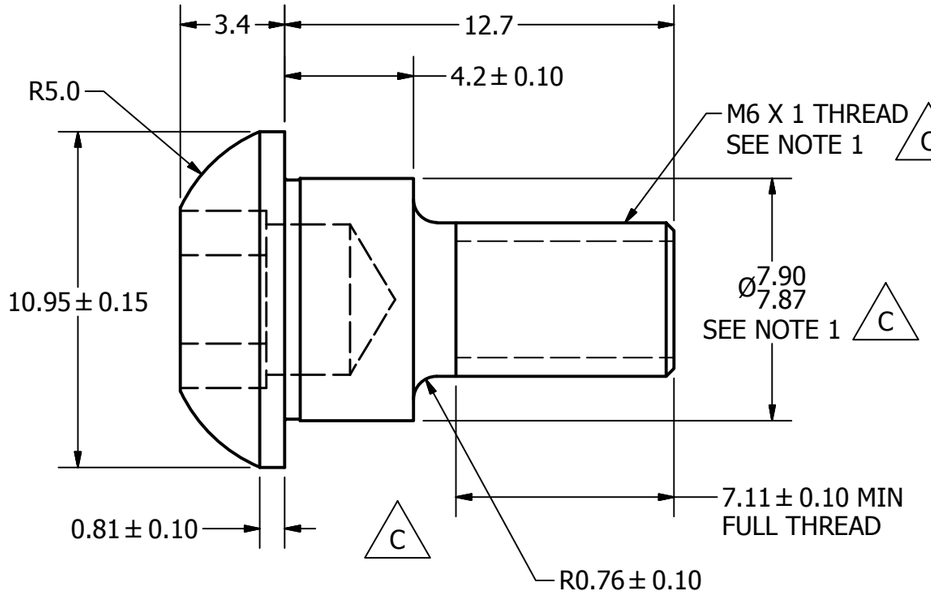
SECTION A-A

472-5100-2	1	DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
472-5100-1	1	MATERIAL: Aluminum-7075-T6	DRAWN BY: KHS — DATE: 8/17/2011	DESCRIPTION: END CAP - FEMUR	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV — DATE: 9/9/2011	SIZE: A3 — SHEET: 1 OF 1 — DRAWING NO.: 472-5203 — REV: A	
TOTAL QTY IN DUMMY	2	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG — DATE: 1/26/2012	SCALE: 1:1	

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	A	RELEASE TO PRODUCTION	SP	JWANG	5/24/05
5708	B	CHANGE APPLICATION QTY FROM 16 TO 4	RN		10/31/05
70730	C	REDRAWN IN INVENTOR. .25 RADIUS WAS MIN. UNDERCUT. 2.80 DEEP MIN WAS 3.5 DEEP MIN. ADD REF TO CONCENTRICITY NOTE. REMOVE 'USED ON' TABLE, SCALE WAS 4 : 1, DISCONTINUE DN/FT TITLE BLOCK DRAWINGS, RE-RELEASE AS HUMANETICS TITLE BLOCK, NO DN/FT SUFFIX (THIS DWG WAS FT)	GMB		1/14/2013





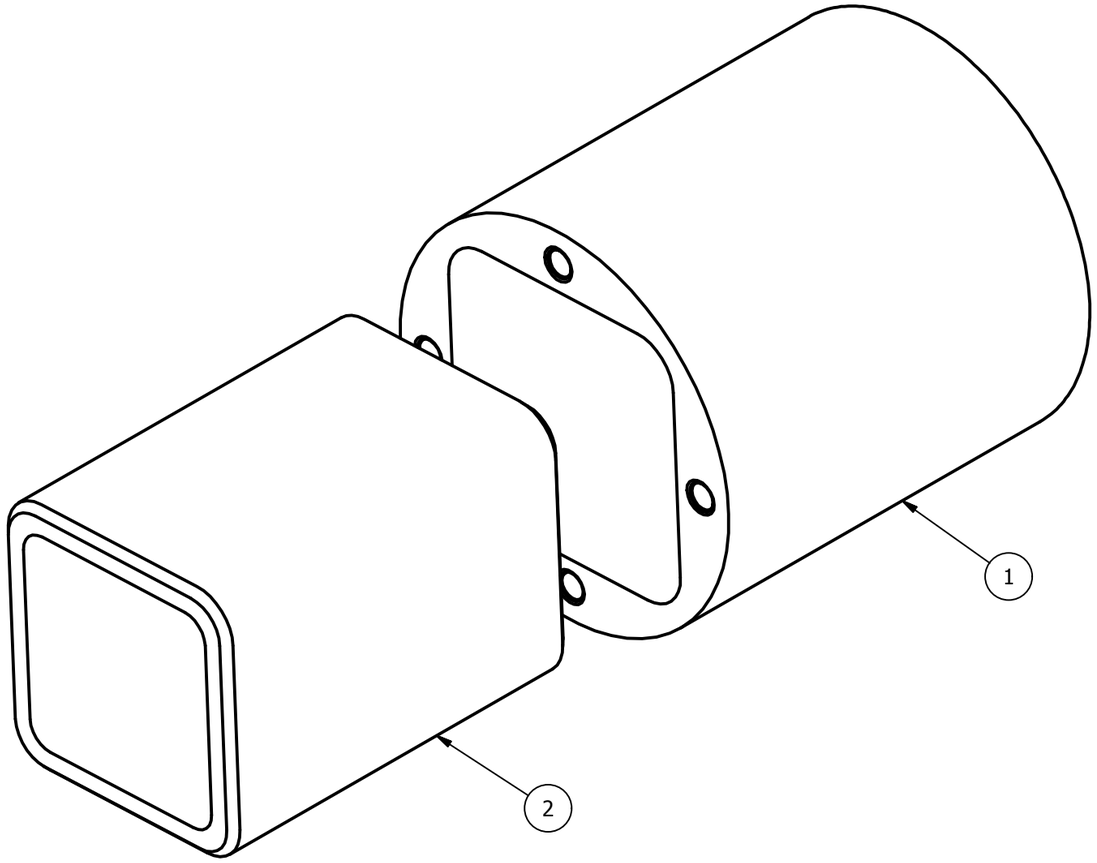


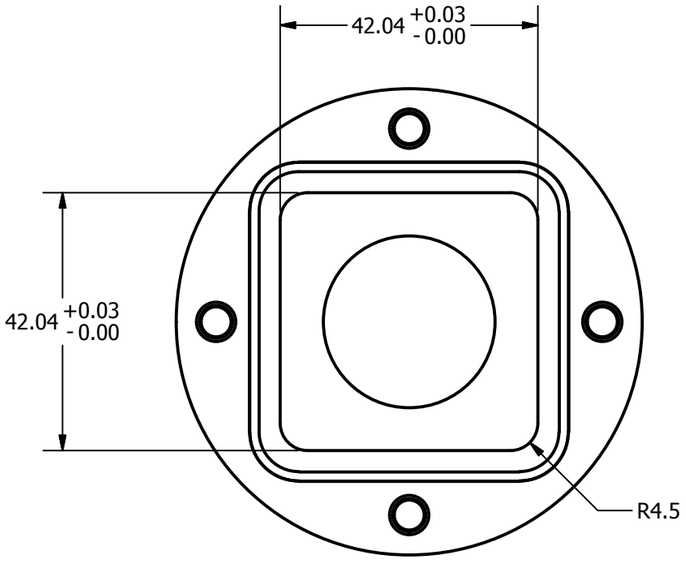
NOTES:

1. SHOULDER TO BE CONCENTRIC TO AXIS OF THREAD WITHIN .02 MM TOTAL INDICATOR READING.
2. REMOVE BURRS AND BREAK SHARP EDGES
3. FINISH: .002 - .008 ZINC PER SIDE YELLOW DICHROMATE
4. DIMENSONAL LIMITS AND THREAD SIZES APPLY AFTER FINISH

DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES DECIMALS ANGLES FINISH X.X ± 0.1 ± 1° 125 X.XX ± 0.01 X.XXX ± 0.005 FRACTIONS ±1/64 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
PROJECT NO.:		DESCRIPTION: MODIFIED BHSS M6 THREAD	
MATERIAL: 4140 STEEL	DRAWN BY: gbrock / DATE: 1/14/2013		
HEAT TREAT: Rc 36-42	CHECKED BY: / DATE:	SIZE: A3 / SHEET 1 OF 1 / DRAWING NO.: W50-61042 / REV: C	
FINISH: SEE NOTES	ENGINEER: J. WANG / DATE: 11/9/2005	SCALE: 5 : 1	

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM200 R00 AND CONVERTED TO METRIC FOR THOR-M	8/22/2011	JSJ





MACHINE AFTER ASSEMBLY

NOTES:
1. BOND ITEM 1 TO ITEM 2 BEFORE FINAL MACHINING.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-5202	FEMUR BUSHING
1	1	472-5201	FEMUR CUP ASSY.

472-5100-2	1
472-5100-1	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	2

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5°	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

DRAWN BY: DLW — DATE: 8/17/2011
CHECKED BY: TMV — DATE: 9/13/2011
ENGINEER: J. WANG — DATE: 1/26/2012

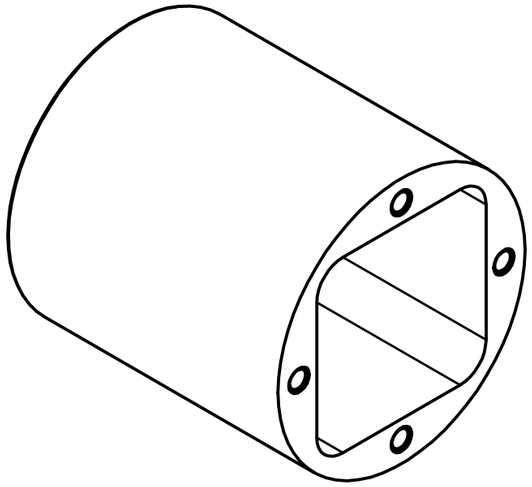
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: FEMUR BUSHING ASSY.

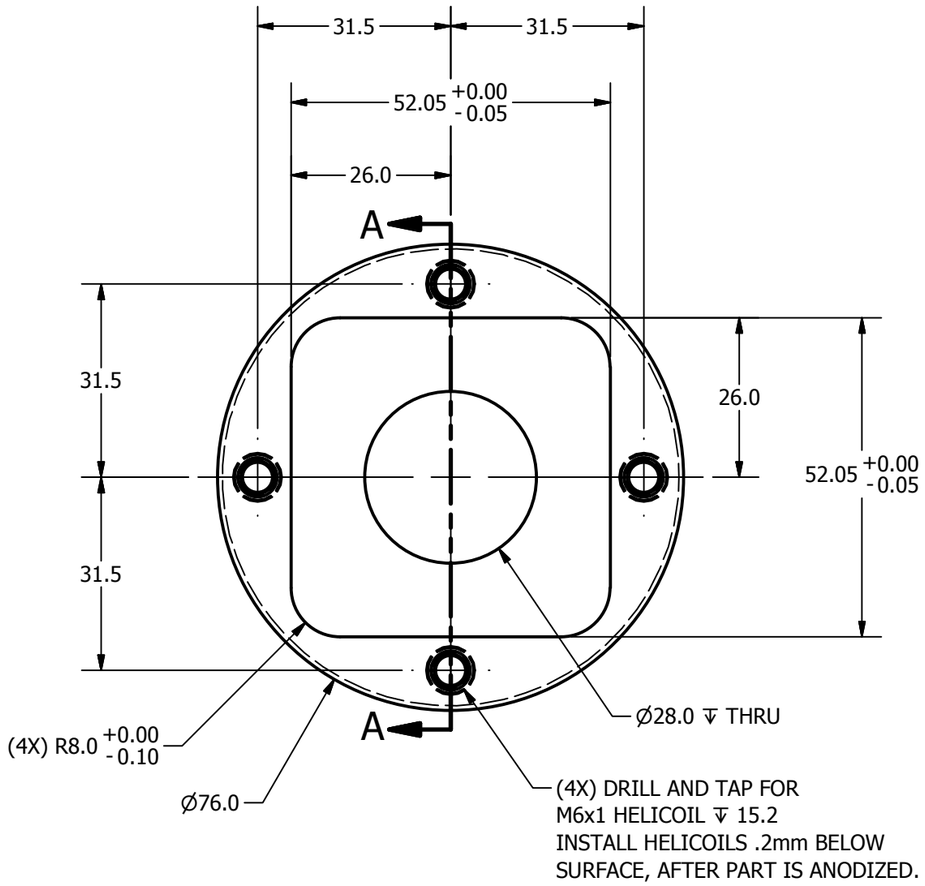
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 1:1 | DRAWING NO.: 472-5200 | REV: A

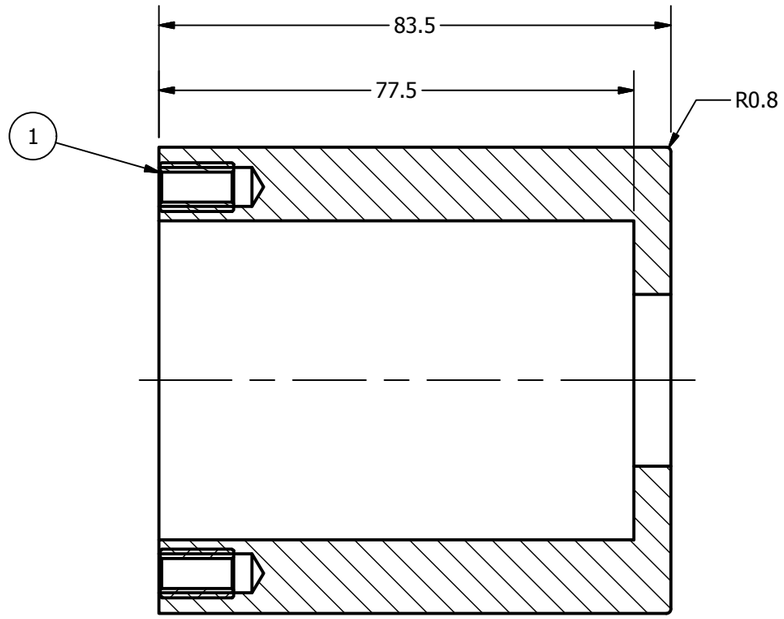
472-5200.iam

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM201 AND CONVERTED TO METRIC FOR THOR-M	8/18/2011	JSJ



SCALE .750





SECTION A-A

ITEM	QTY	PART NUMBER	DESCRIPTION
4	4	5000422	HELICOIL, M6 X 1 X 12

Parts List

		PROJECT NO.:				
472-5200	1	MATERIAL: 7076-T6 ALUMINUM	DRAWN BY: KHS	DATE: 8/17/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV	DATE: 9/12/2011	SIZE: A3	SHEET 1 OF 1
TOTAL QTY IN DUMMY	2	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG	DATE: 1/26/2012	SCALE: 1:1	DRAWING NO.: 472-5201 REV: A

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5° 1.6
X.X ± 0.2
X.XX ± 0.1
X.XXX ± 0.01

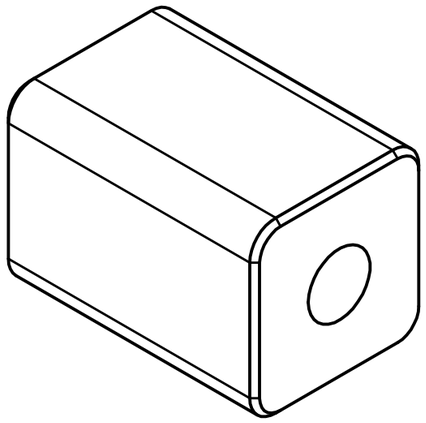
REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

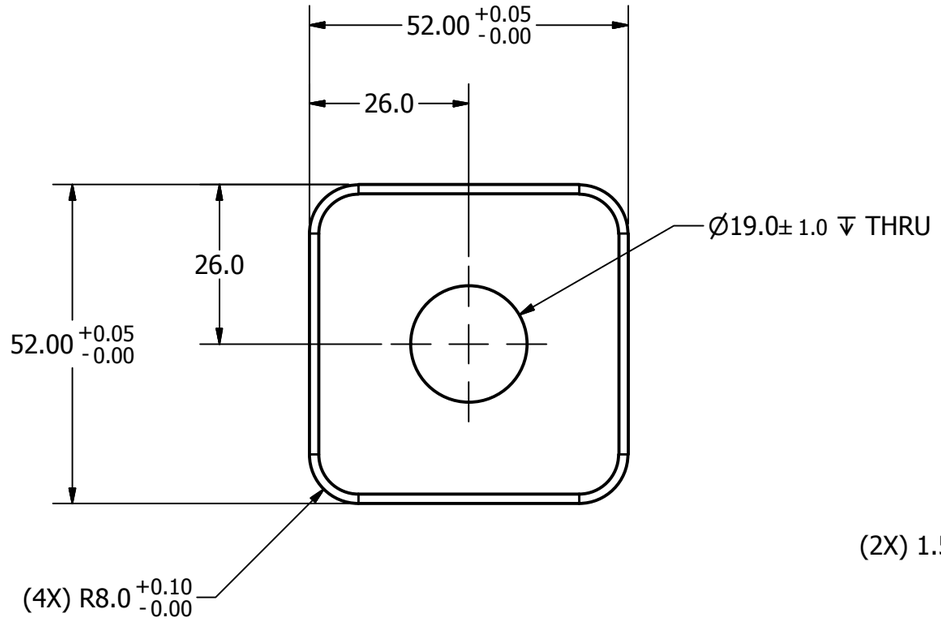
DESCRIPTION: FEMUR CUP ASSY.

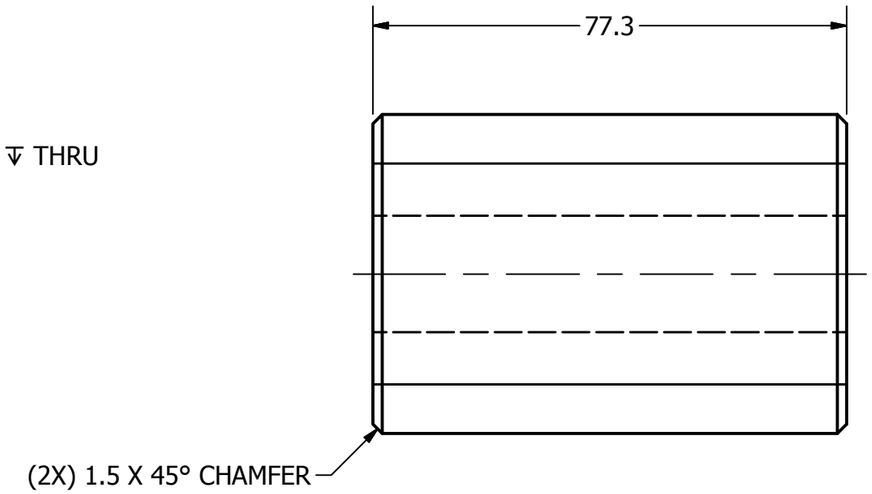
472-5201.iam

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM202 AND CONVERTED TO METRIC FOR THOR-M	8/18/2011	JSJ



SCALE .750





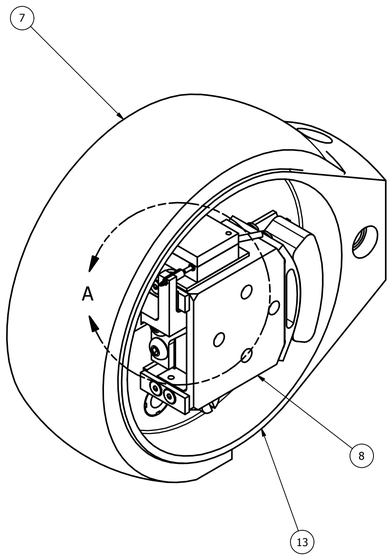
NOTES:

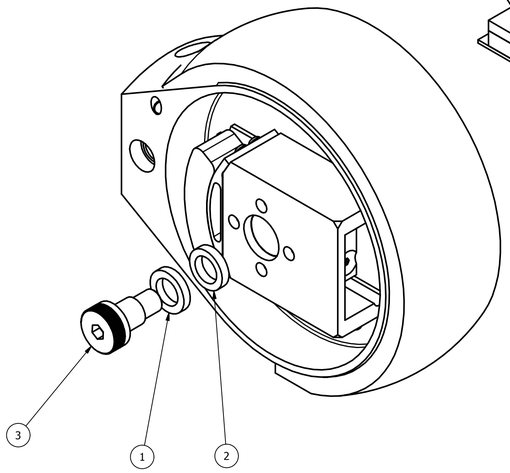
1. MUST BE ACETAL HOMOPOLYMER, PTFE FILLED, MIN. COMPRESSIVE STRENGTH 80 Mpa. COLOR BROWN

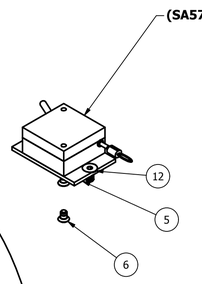
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5' FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: FEMUR BUSHING	
472-5200	1	MATERIAL: SEE NOTES	DRAWN BY: KHS DATE: 8/17/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV DATE: 9/9/2011	SIZE: A3 SHEET: 1 OF 1	DRAWING NO.: 472-5202 REV: A
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG DATE: 1/26/2012	SCALE: 1:1	

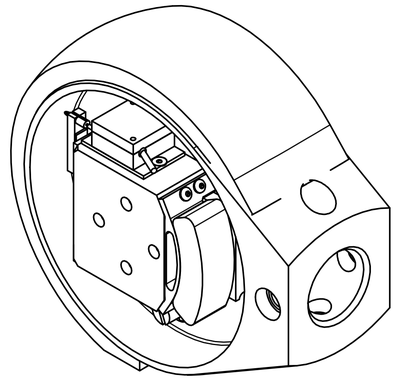
472-5202.ipt

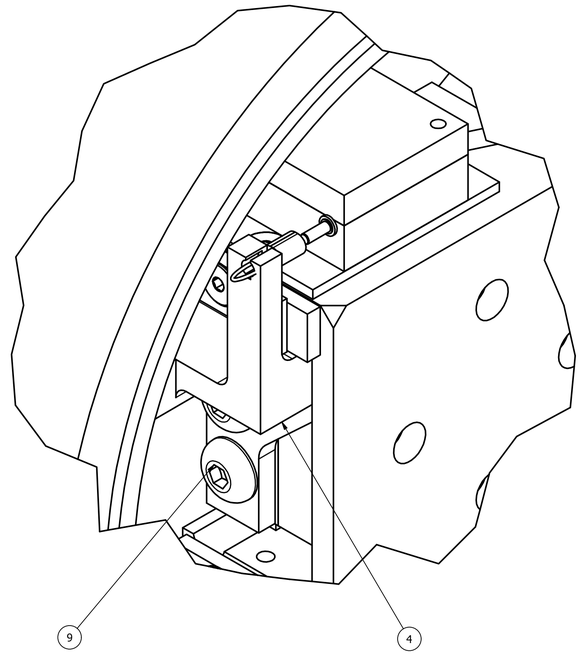
REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM209 R0 AND CONVERTED TO METRIC FOR THOR-M	8/19/2011	JSJ
	B	5000723 WAS 5000595	7/19/2012	BK
	C	CORRECTED SIDE VIEWS	9/29/2015	DW



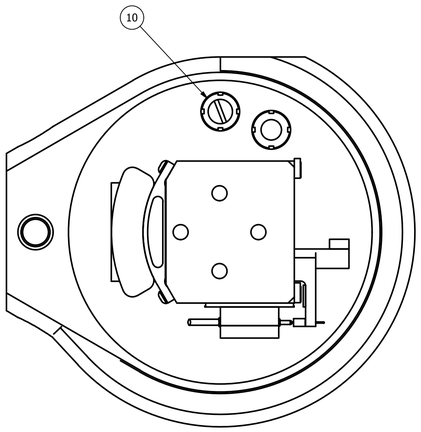








DETAIL A
SCALE 3 : 1



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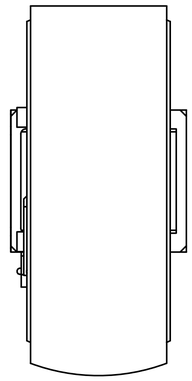
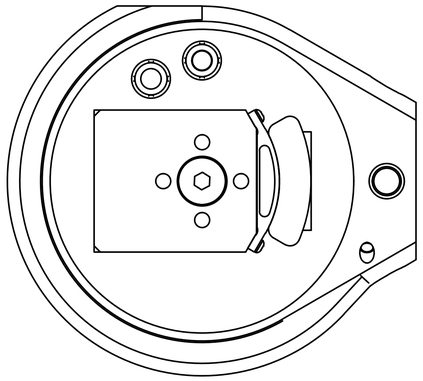




C

ITEM	QTY	PART NUMBER	DESCRIPTION
12	2	5000723	SCREW, FHCS M2.5-0.45 x 5
11	1	472-5350	KNEE CAP ASSEMBLY
10	1	472-5763	PIN, KNEE STOP
9	2	5001075	BHCS, M4 X .7 X 6
8	1	472-5310	ASS'Y, INBOARD/OUTBOARD SLIDER
7	1	472-5301	KNEE FLESH INSERT-MOLDED
6	2	9004003	SCREW, FHCS #2-56 X 1/8" PHILLIPS HEAD
5	1	472-5305	PLATE, MOUNT
4	1	472-5306	ASSEMBLY, POT STRING HOLDER (LEFT)
3	1	472-5302	BOLT, SHOULDER
2	1	472-5304	WASHER, COMPRESSION
1	1	472-5303	WASHER, SLIDING KNEE

B

Parts List

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS
SURFACE FINISH: 125 RMS
X ±0.5 ANGLES ±1°
XX ±0.2
XXX ±0.1
XXXX ±0.01
REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

472-5100-1	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

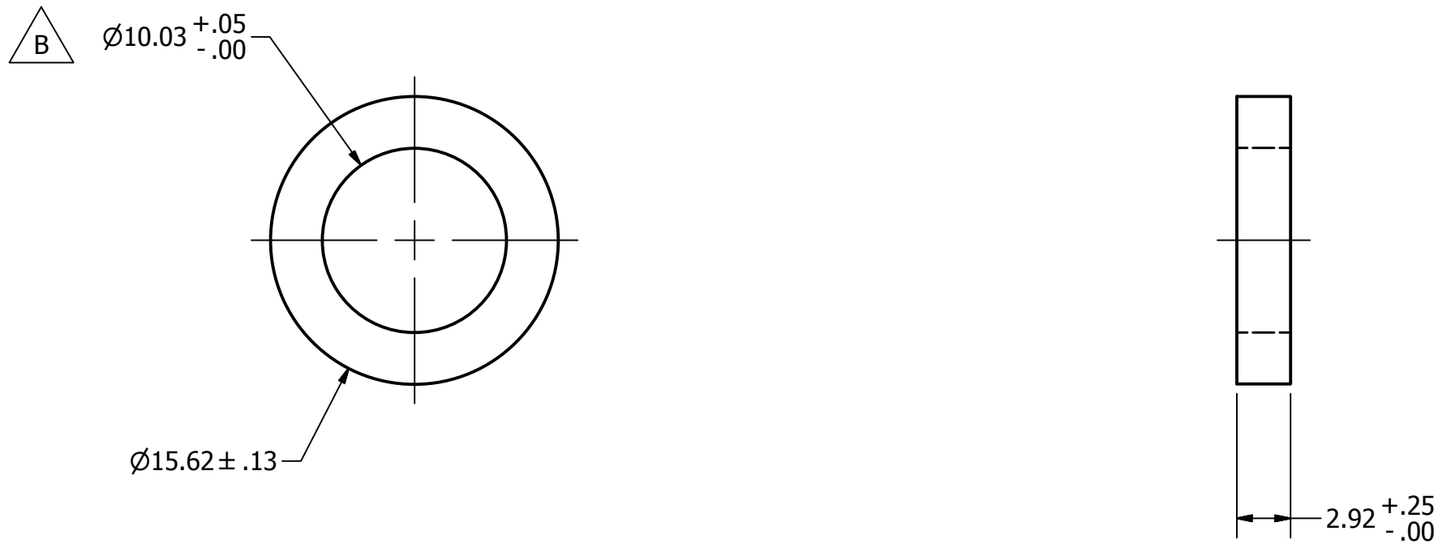
PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

DRAWN BY: HORCHLER DATE: 8/17/2011
CHECKED BY: DATE:
ENGINEER: J. WANG DATE: 1/26/2012

DESCRIPTION: KNEE CAP ASSY., LEFT
SIZE: A1 SHEET 1 OF 1
SCALE: 1:1
DRAWING NO.: 472-5300
REV: C

472-5300-Sept 2015 DRAFT.iam

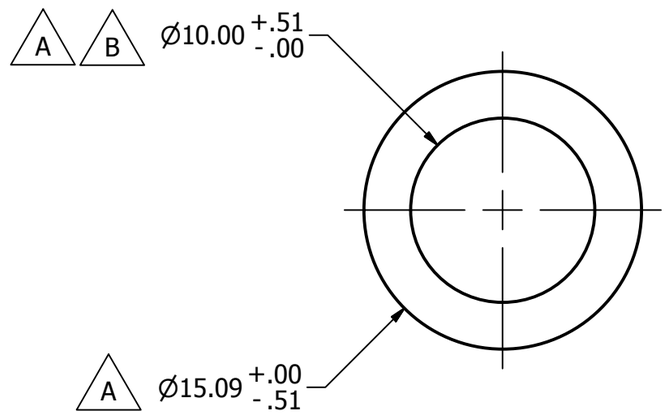
REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM 78051-32 REV A AND CONVERTED TO METRIC FOR THOR-M; MATERIAL WAS 416 S.S.	8/19/2011	JSJ
	B	Ø10.03 WAS Ø9.55	7/19/2012	BK

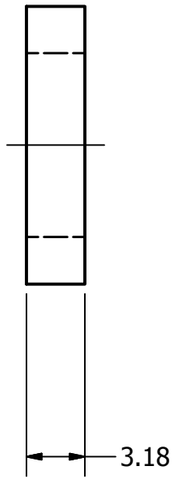


472-5700	1	PROJECT NO.:	DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01 ANGLES ± 0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
472-5300	1	MATERIAL: 304 Stainless Steel	DRAWN BY: KSG	DATE: 8/17/2011	DESCRIPTION: WASHER, SLIDING KNEE
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 — DRAWING NO.: 472-5303 — REV: B
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WAMG	DATE: 1/26/2012	SCALE: 3.000

472-5303.ipt

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM 78051-33 REV - AND CONVERTED TO METRIC FOR THOR-MØ9.53+.51/-.00 WAS Ø10.31, 15.09+.00/-.51 WAS Ø14.28	8/19/2011	JSJ
	B	Ø10.00 WAS Ø9.53	7/19/2012	BK





NOTE:

1. DATA SOURCE
   MP950
   HI-TUFF THERMOSET PRODUCTS

   MECHANICAL PROPERTY:

DUROMETER (± 5)	95A
TENSILE PSI	6000-7000
ELONGATION %	300-350
ELONGATION SET	9
TEAR DIE B (#/IN)	550-650
TEAR DIE C (#/IN)	450-550
MODULUS #@ 300%	4500-5500
COMPSET %	1.0
BASE	ETHER

472-5700	1	PROJECT NO.:	DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ± 0.5 ± 0.5' 1.6 X.X ± 0.2 X.XX ± 0.1 X.XXX ± 0.01 REMOVE BURRS & BREAK SHARP EDGES
472-5300	1	MATERIAL: SEE NOTES	DRAWN BY: KSG	DATE: 8/17/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/26/2012

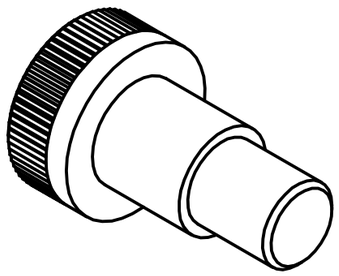
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: WASHER, COMPRESSION

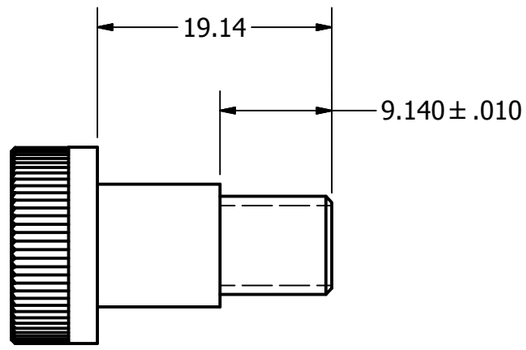
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 3.000 | DRAWING NO.: 472-5304 | REV: B

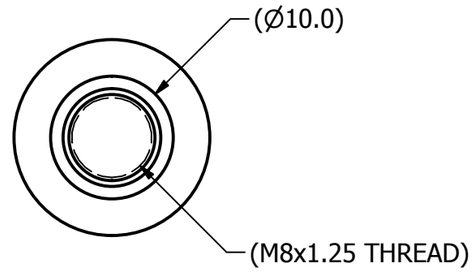
472-5304.ipt

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM 79051-30 REV -AND CONVERTED TO METRIC FOR THOR-M	8/19/2011	JSJ



SCALE 2.000





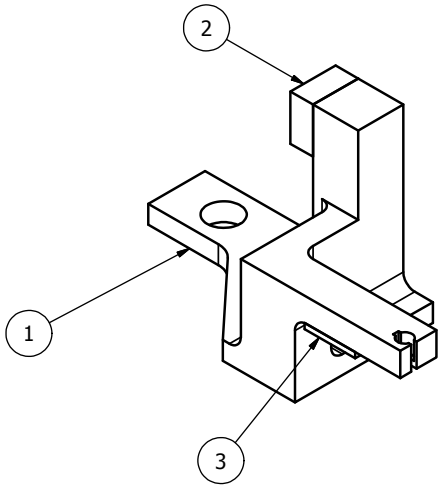
NOTE:

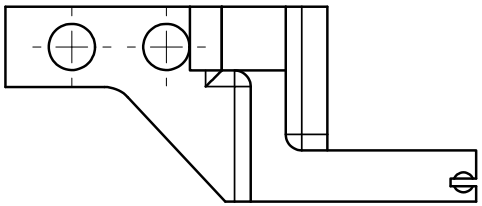
1. MAKE FROM 5000588, M10 X 12 (M8 THREAD) SOCKET HEAD SHOULDER SCREW, MODIFY AS SHOWN.

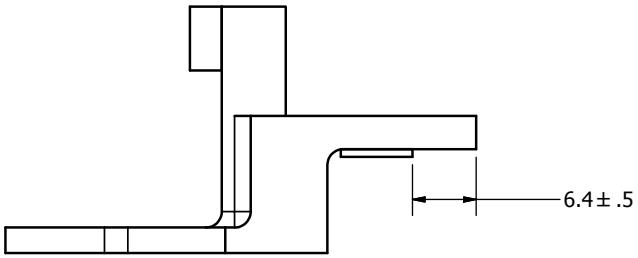
472-5700	1	DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
472-5300	1	THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: BOLT, SHOULDER	
NEXT ASSEMBLY	QTY	PROJECT NO.:	DRAWN BY: TOM F	DATE: 8/17/2011	
TOTAL QTY IN DUMMY	2	MATERIAL: SEE NOTES	CHECKED BY: TMV	DATE: 9/14/2011	
		HEAT TREAT:	ENGINEER: J. WANG	DATE: 1/26/2012	
		FINISH:	SIZE: A3	SHEET 1 OF 1	DRAWING NO.: 472-5302 REV: A
			SCALE: 2:1		

472-5302.ipt

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM 880995-1650-2 REV E AND CONVERTED TO METRIC FOR THOR-M	8/19/2011	JSJ







NOTES:
BONDING INSTRUCTIONS:
1. SAND SURFACES TO BE BONDED.
2. CLEAN SURFACES WITH MEK.
3. CLEAN SURFACES WITH ALCOHOL.
4. APPLY LOCTITE 411, OR EQUIVALENT, TO ONE SURFACE.
5. PRESS PARTS TOGETHER AND APPLY PRESSURE FOR 30 SECONDS AFTER ADHESIVE BECOMES TACKY.

ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	472-5736	BUMPER, RETURN STOP
2	1	472-5735	BUMPER, EXTENSION STOP
1	1	472-5737-1	HOLDER, POT STRING (LEFT)

Parts List

472-5300	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION
PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

TOLERANCES
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01
ANGLES ± 0.5°
FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

DRAWN BY: KSG — DATE: 8/17/2011
CHECKED BY: TMV — DATE: 9/14/2011
ENGINEER: J. WANG — DATE: 1/27/2012

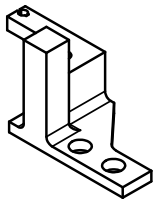
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: ASSEMBLY, POT STRING HOLDER (LEFT)

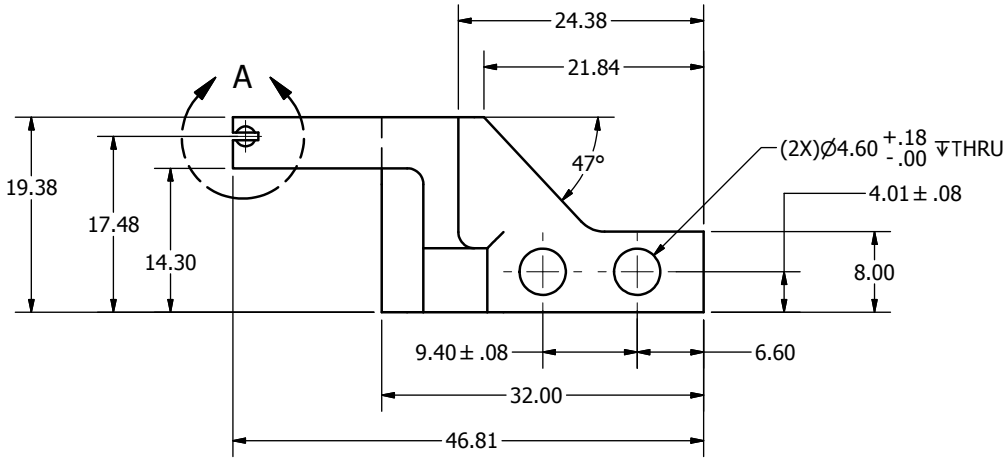
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 2:1

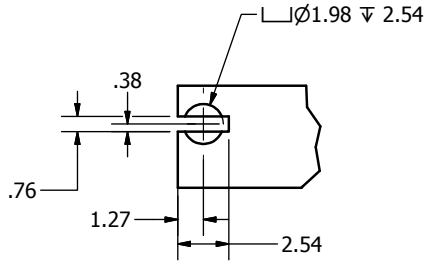
DRAWING NO.: 472-5306 | REV: A

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM 880995-1648-1 REV F AND CONVERTED TO METRIC FOR THOR-M; FINISH WAS ELECTROLESS NICKEL PLATE .0003 MAX.	8/19/2011	JSJ

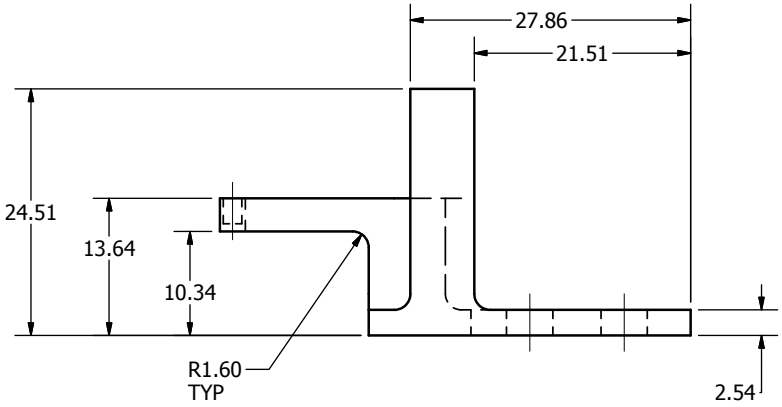


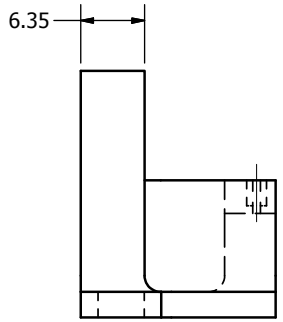
SCALE 1.000





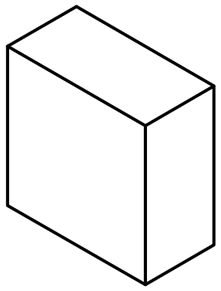
DETAIL A
SCALE 4 : 1

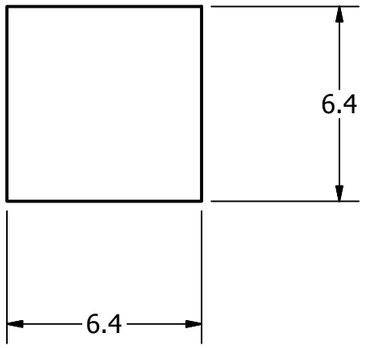


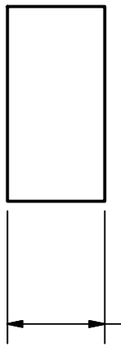


DO NOT SCALE DRAWING	THIRD ANGLE PROJECTION	TOLERANCES	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
	PROJECT NO.:			DESCRIPTION:	HOLDER, POT STRING (LEFT)
472-5306	1	MATERIAL: 4140 STEEL	DRAWN BY: KSG	DATE: 8/17/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 42-48	CHECKED BY: TMV	DATE: 9/12/2011	SIZE: A3 SHEET: 1 OF 1 DRAWING NO.: 472-5737-1 REV: A
TOTAL QTY IN DUMMY	1	FINISH: ELECTROLESS NICKEL PLATE .008 MAX	ENGINEER: J. WANG	DATE: 1/278/2012	SCALE: 2:1

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM 880995-1646 REV B AND CONVERTED TO METRIC FOR THOR-M	8/19/2011	JSJ







NOTES:

1. MATERIAL: NEOPRENE RUBBER SHORE A 70 ±5.

2. RUBBER DIMENSIONS ±0.5mm, UNLESS OTHERWISE NOTED.

472-5307	1			
472-5306	1			
NEXT ASSEMBLY	QTY			
TOTAL QTY IN DUMMY	2			

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

PROJECT NO.:

MATERIAL: SEE NOTES

HEAT TREAT:

FINISH:

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5°	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

REMOVE BURRS & BREAK SHARP EDGES

DRAWN BY: KSG	DATE: 8/17/2011	
CHECKED BY: TMV	DATE: 9/9/2011	
ENGINEER: J. WANG	DATE: 1/27/2012	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

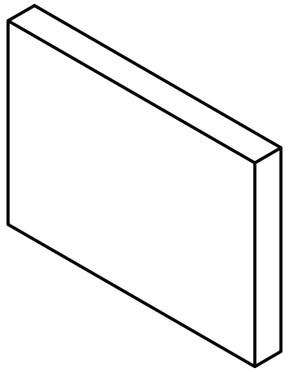
DESCRIPTION: BUMPER, EXTENSION STOP

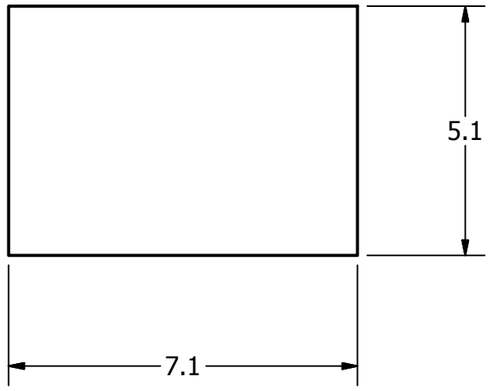
SIZE:	SHEET	DRAWING NO.:	REV:
A3	1 OF 1	472-5735	A

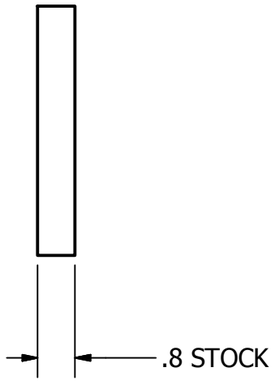
SCALE: 5.000

472-5735.ipt

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM 880995-1647 REV D AND CONVERTED TO METRIC FOR THOR-M	8/19/2011	JSJ







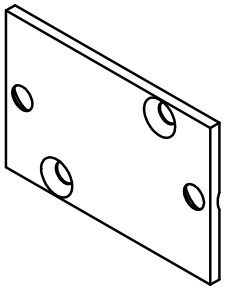
NOTES:

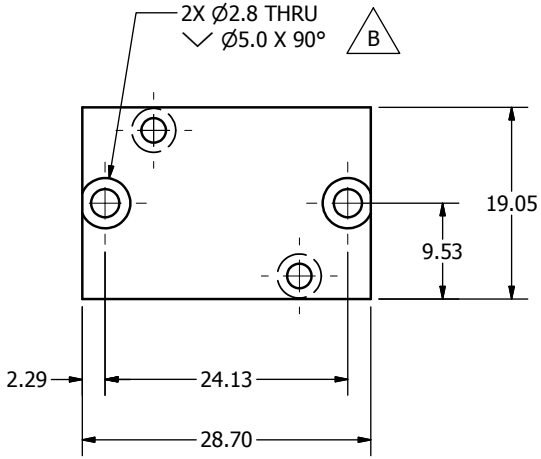
1. MATERIAL: NEOPRENE RUBBER SHORE A 70 ±5.
2. RUBBER DIMENSIONS ±0.5mm, UNLESS OTHERWISE NOTED.

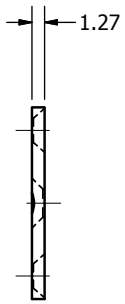
472-5307	1	DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
472-5306	1	THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: BUMPER, RETURN STOP	
NEXT ASSEMBLY	QTY	PROJECT NO.:	DRAWN BY: KSG	DATE: 8/17/2011	
TOTAL QTY IN DUMMY	2	MATERIAL: SEE NOTES	CHECKED BY: TMV	DATE: 9/9/2011	
		HEAT TREAT:	ENGINEER: J. WANG	DATE: 1/27/2012	
		FINISH:	SIZE: A3	SHEET 1 OF 1	DRAWING NO.: 472-5736 REV: A
			SCALE: 8:1		

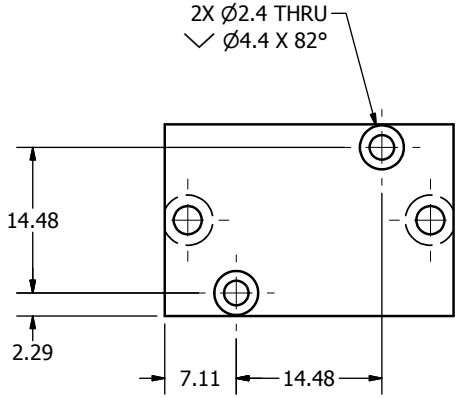
472-5736.ipt

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM 880995-1638-1 REV G AND CONVERTED TO METRIC FOR THOR-M; ADD FINISH: CLEAR ANODIZE	8/17/2011	JSJ
	B	Ø2.8 C'SINK Ø5.0 WAS Ø2.39 C'SINK Ø4.39	7/19/2012	BK



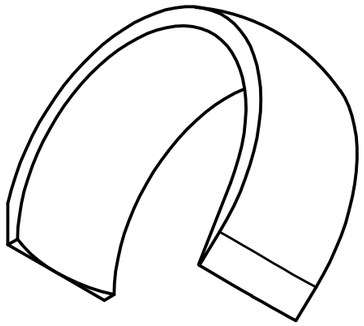


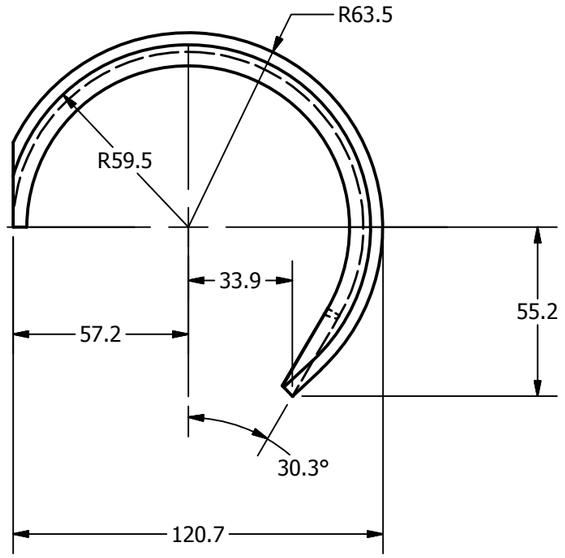


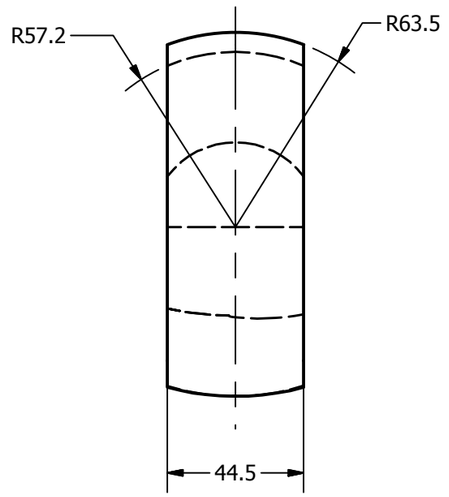


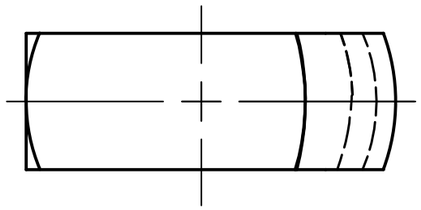
DO NOT SCALE DRAWING		TOLERANCES		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES		DESCRIPTION: PLATE, MOUNT	
PROJECT NO.:		DRAWN BY: KSG	DATE: 8/17/2011		
472-5300	1	MATERIAL: Aluminum-6061-T6		SIZE: A3	SHEET 1 OF 1
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	DRAWING NO.: 472-5305
TOTAL QTY IN DUMMY	1	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG	DATE: 1/26/2012	SCALE: 2:1

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM 78051-27 REV A AND CONVERTED TO METRIC FOR THOR-M	8/29/2011	JSJ









NOTE:

1. MATERIAL IS PER SAE J200/ASTM D 2000
   BUTYL 45 DUR.
   4AA725A13 B13K11Z1Z2Z3
   Z1= BUTYL
   Z2= 40 TO 50 DUROMETER
   Z3= KNEE IMPACT TEST

472-5700	1	
472-5300	1	
NEXT ASSEMBLY	QTY	
TOTAL QTY IN DUMMY	2	

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5° 1.6
X.X ± 0.2
X.XX ± 0.1
X.XXX ± 0.01
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL: Rubber
HEAT TREAT:
FINISH:

DRAWN BY: jjordan DATE: 8/29/2011
CHECKED BY: TMV DATE: 9/9/2011
ENGINEER: J. WANG DATE: 1/26/2012

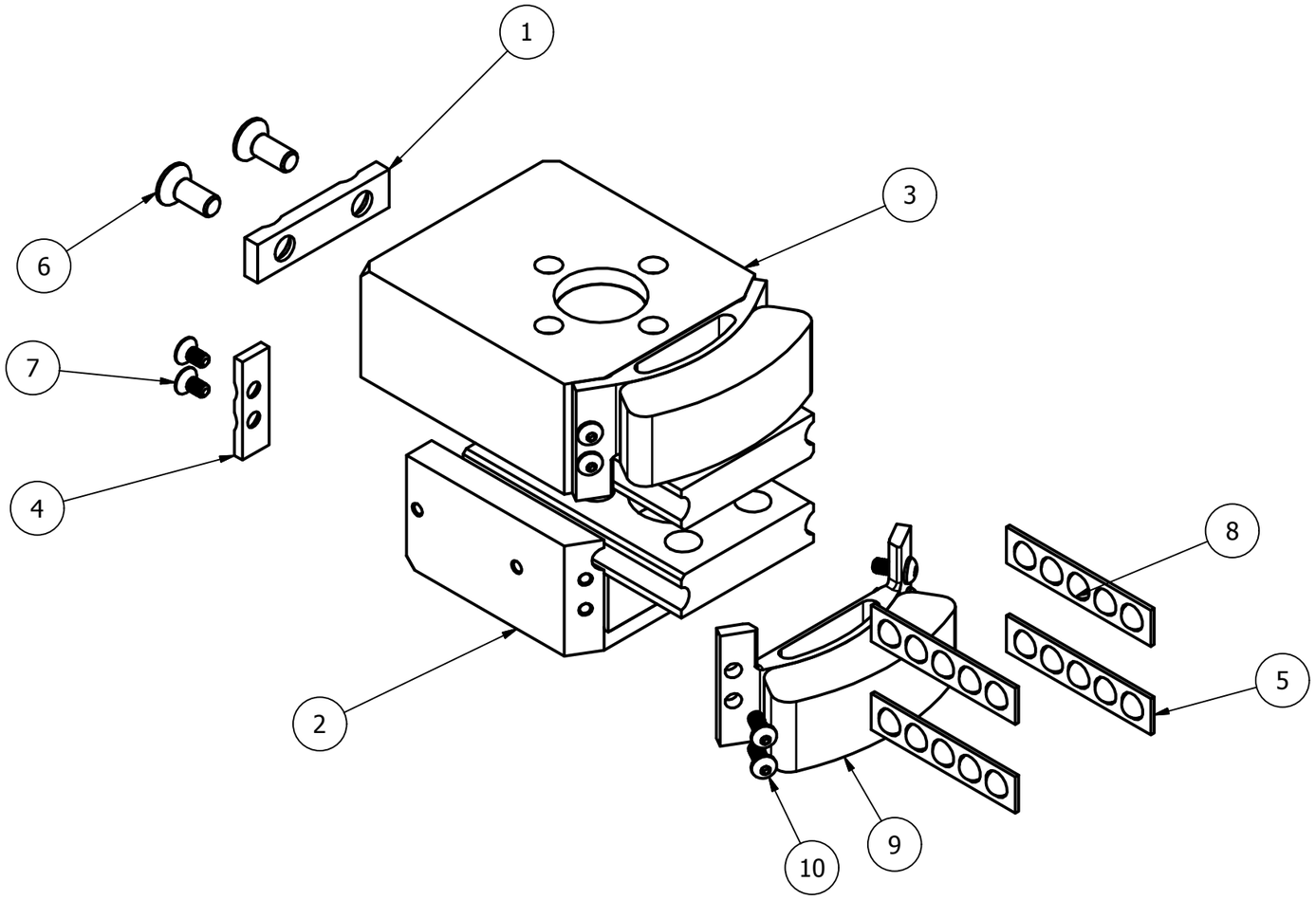
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

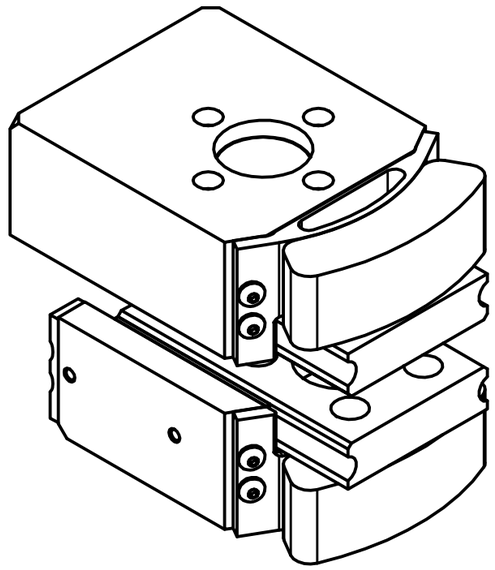
DESCRIPTION: KNEE FLESH INSERT-MOLDED

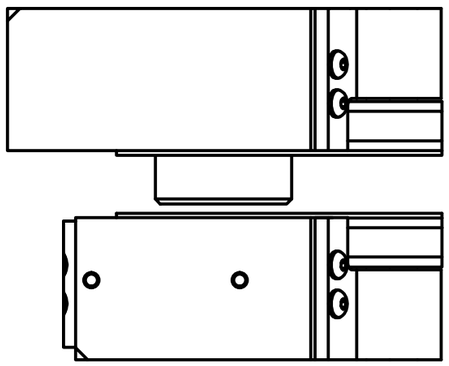
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 1:2 | DRAWING NO.: 472-5301 | REV: A

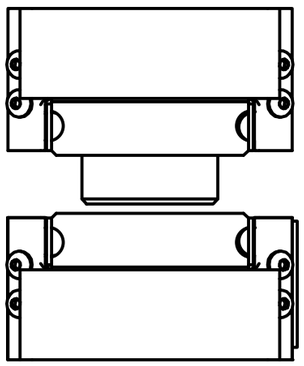
472-5301.ipt

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM214 REV A AND CONVERTED TO METRIC FOR THOR-M	8/19/2011	JSJ
	B	REMOVED472-5750, 5000003, 472-5738; 5000723 QTY 4 WAS 12; ADDED 472-5358 AND 9010681	2/14/12	KHS
	C	9002186 WAS 472-5355	8/17/2011	BK









ITEM	QTY	PART NUMBER	DESCRIPTION
10	8	9010681	BHCS M2.5 x 6
9	2	472-5358	KNEE SLIDER STOP ASSY.
8	20	9002186	BALL 4.76mm DIA.
7	4	5000723	FHCS M2.5X5mm
6	2	5000023	FHCS M4X10mm
5	4	472-5733	BRONZE SEPARATOR
4	2	472-5738	STOP, BALL
3	1	472-5330	OUTBOARD SLIDER, MOLDED
2	1	472-5320	INBOARD SLIDER, MOLDED
1	1	472-5740	BALL SLIDER BALL STOP

Parts List

472-5700	
472-5300	
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	2

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ±0.5 ±0.5° 1.6
X.X ±0.2
X.XX ±0.1
X.XXX ±0.01
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

DRAWN BY: HORCHLER DATE: 8/17/2011
CHECKED BY: DATE:
ENGINEER: J. WANG DATE: 1/27/2012

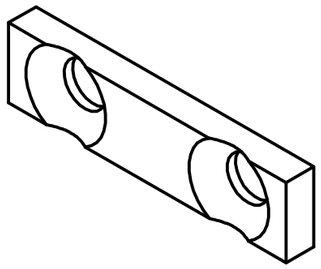
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: ASS'Y, INBOARD/OUTBOARD SLIDER

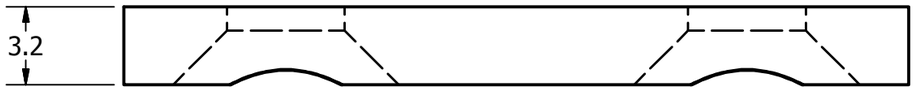
SIZE: A3 SHEET 1 OF 1 SCALE: 1:1
DRAWING NO.: 472-5310
REV: C

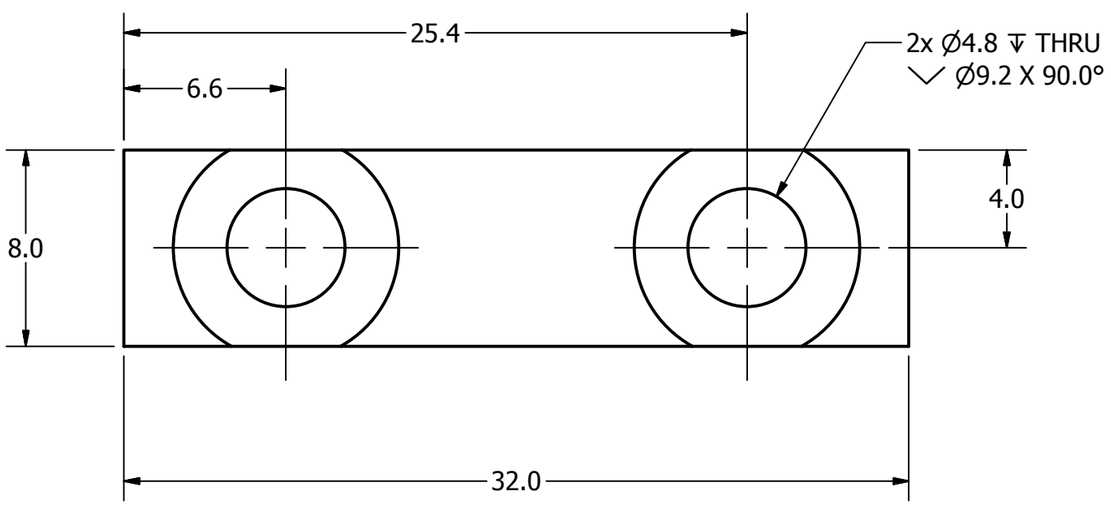
472-5310.iam

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM216 R0 AND CONVERTED TO METRIC FOR THOR-M; FINISH WAS ELECTROLESS NICKEL .0003 MAX.	8/19/2011	JSJ



SCALE 2.000

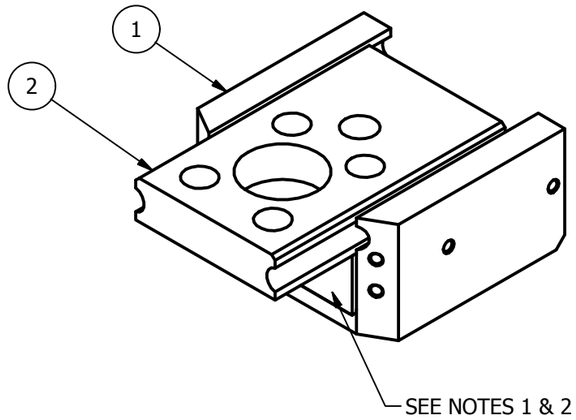


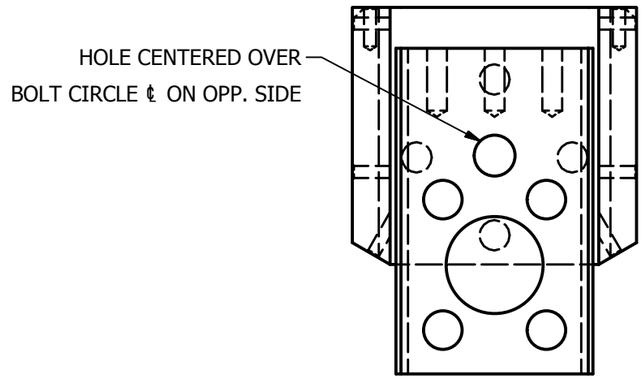


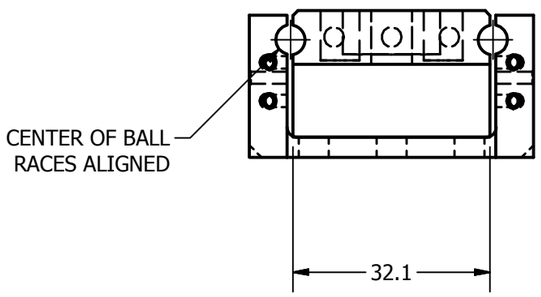
		PROJECT NO.:	DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES — UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
472-5310	1	MATERIAL: 1095 STEEL	DRAWN BY: HORCHLER	DATE: 8/17/2011	DESCRIPTION: BALL SLIDER BALL STOP
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 44-48	CHECKED BY: TMV	DATE: 4/23/2010	SIZE: A3 SHEET: 1 OF 1 — DRAWING NO.: 472-5740 — REV: A
TOTAL QTY IN DUMMY	2	FINISH: ELECTROLESS NICKEL .008 MAX	ENGINEER: J. WANG	DATE: 1/28/2012	SCALE: 4:1

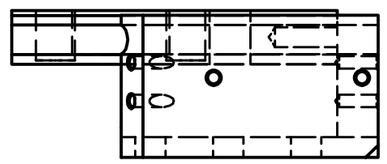
472-5740.ipt

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM212 R0 AND CONVERTED TO METRIC FOR THOR-M	8/19/2011	JSJ









NOTES:
1. RUBBER DUROMETER OF 30±5 SHORE "A"
2. ADJUST DUROMETER FOR DYNAMIC PERFORMANCE.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-5322	RACE, INNER
1	1	472-5321	RACE, OUTER

Parts List

472-5310	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	2

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01
ANGLES ±0.5°
FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

DRAWN BY: HORCHLER — DATE: 8/17/2011
CHECKED BY: TMV — DATE: 9/19/2011
ENGINEER: J. WANG — DATE: 1/27/2012

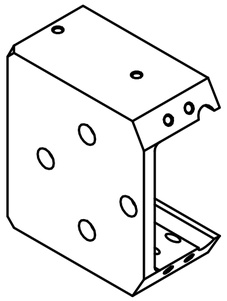
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

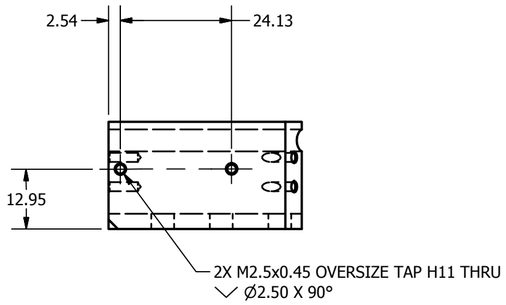
DESCRIPTION: INBOARD SLIDER, MOLDED

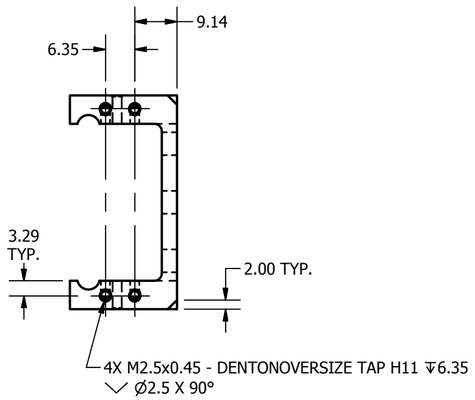
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 1:1 | DRAWING NO.: 472-5320 | REV: A

472-5320.iam

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM 880995-1639 REV D AND CONVERTED TO METRIC FOR THOR-M	8/19/2011	JSJ
	B	ADD HEAT TREAT NOTE; 6.35 WAS THRU	4/12/2012	BK







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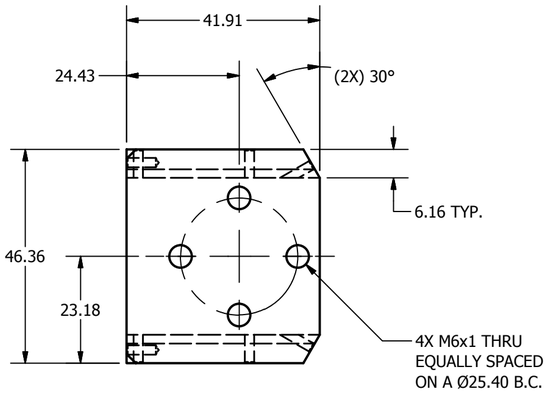
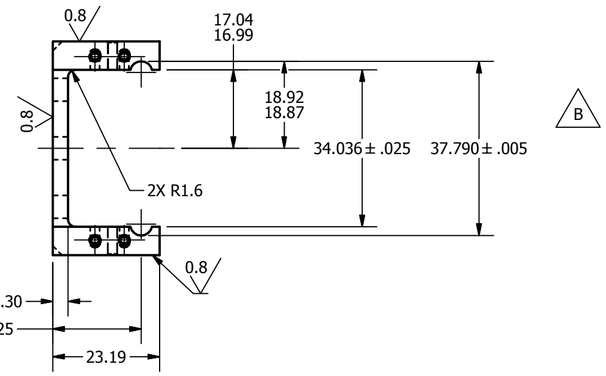
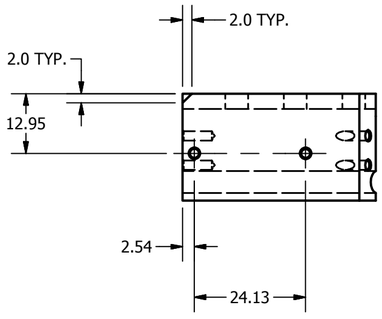
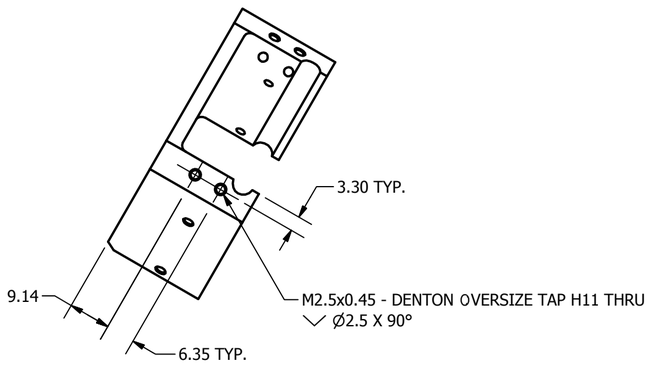




B





NOTES:

1. HEAT TREAT:
   - MASK ENTIRE PART EXCEPT THE PATHWAYS
   - CARBURIZE PART @ 1700°F FOR 6 HOURS
   - FURNACE COOL, DO NOT QUENCH
   - REHARDEN @ 1520°F AND OIL QUENCH
   - TEMPER @ 350°F FOR 2 HOURS
   - SURFACE HARDNESS IN PATHWAYS SHOULD BE Rc 60-65

B

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

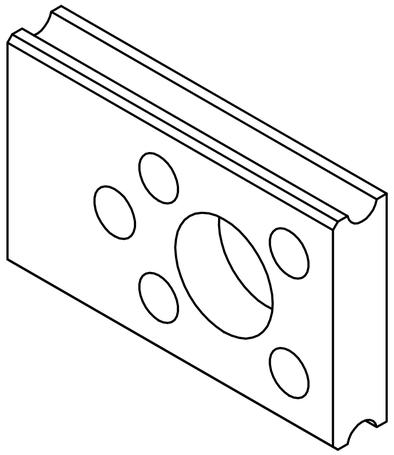
TOLERANCES: UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS; DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES

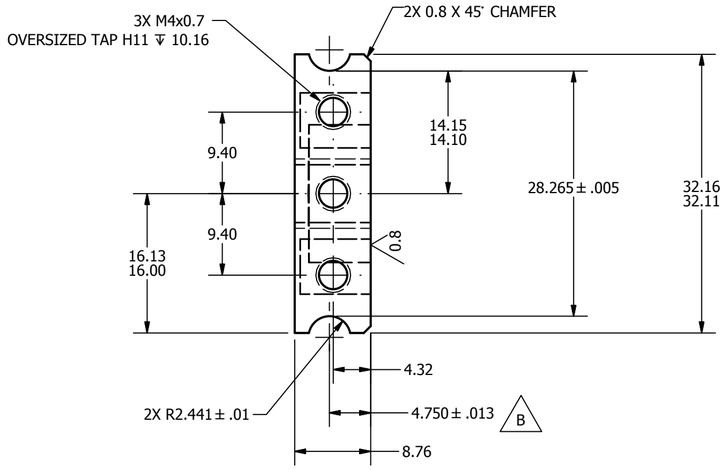
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

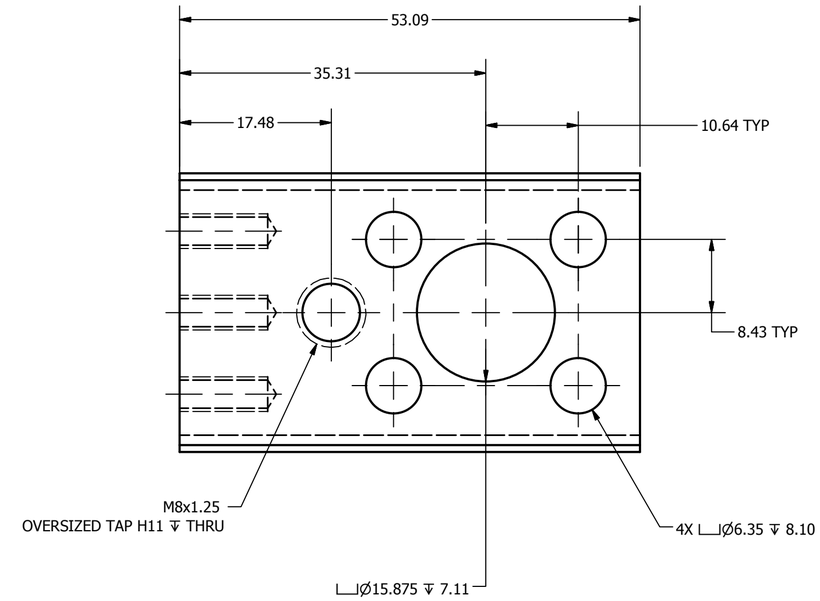
PROJECT NO.:		DESCRIPTION:	RACE, OUTER
472-5320	1	MATERIAL: 4140 STEEL	DRAWN BY: KSG — DATE: 8/17/2011
NEXT ASSEMBLY	QTY	HEAT TREAT: SEE NOTES	CHECKED BY: — DATE:
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG — DATE: 1/27/2012
SIZE: C	SHEET: 1 OF 1	SCALE: 1:1	DRAWING NO.: 472-5321 — REV: B

472-5321.ipt

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM 880995-1640 REV F AND CONVERTED TO METRIC FOR THOR-M	8/19/2011	JSJ
	B	ADD HEAT TREAT NOTE; 4.750±.013 WAS 4.75±.03	4/12/2012	BK







NOTES:

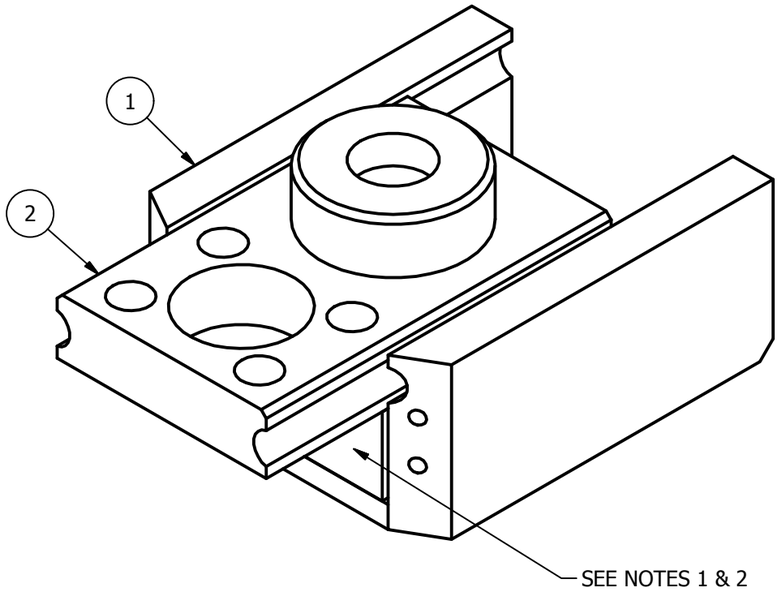
B

1. HEAT TREAT:
   - MASK ENTIRE PART EXCEPT THE PATHWAYS
   - CARBURIZE PART @ 1700°F FOR 6 HOURS
   - FURNACE COOL, DO NOT QUENCH
   - REHARDEN @ 1520°F AND OIL QUENCH
   - TEMPER @ 350°F FOR 2 HOURS
   - SURFACE HARDNESS IN PATHWAYS SHOULD BE Rc 60-65

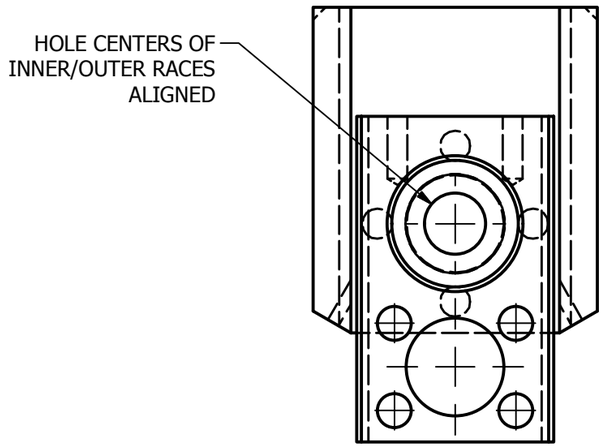
		DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01; ANGLES ± 0.5˚; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: RACE, INNER	
472-5320	1	MATERIAL: 4140 STEEL	DRAWN BY: KSG 8/17/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT: SEE NOTES	CHECKED BY: DATE:	SIZE: A2 SHEET: 1 OF 1	DRAWING NO.: 472-5322 REV: B
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG DATE: 1/27/2012	SCALE: 2:1	

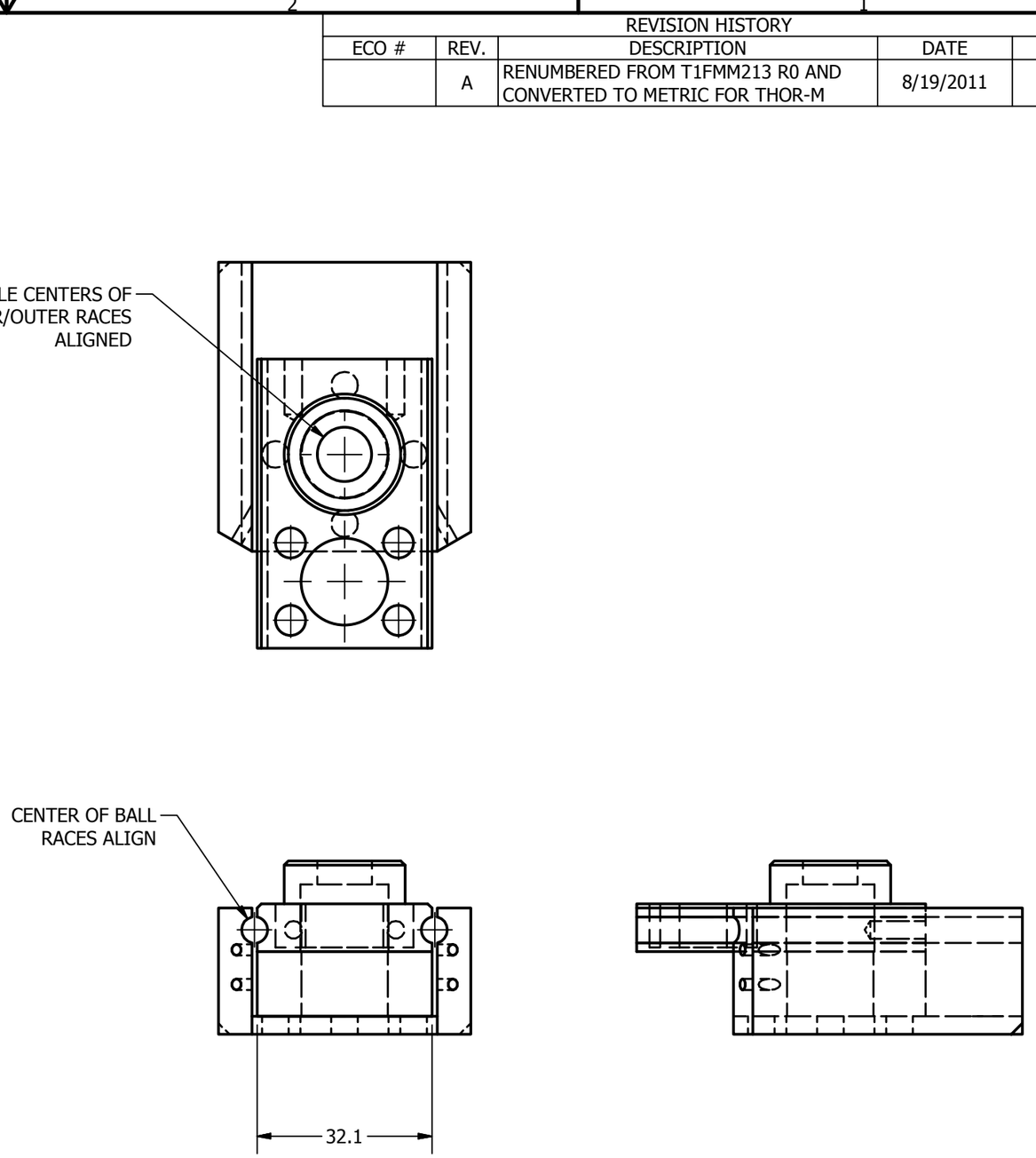
472-5322.ipt

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM213 R0 AND CONVERTED TO METRIC FOR THOR-M	8/19/2011	JSJ



SCALE 1.500





NOTES:
1. RUBBER DUROMETER OF 30±5 SHORE "A"
2. ADJUST DUROMETER FOR DYNAMIC PERFORMANCE.

2	1	472-5332	OUTBOARD SLIDER, INNER RACE
1	1	472-5331	RACE, OUTER
ITEM	QTY	PART NUMBER	DESCRIPTION

Parts List

472-5310	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	2

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

PROJECT NO.:

MATERIAL:

HEAT TREAT:

FINISH:

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5°	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

REMOVE BURRS & BREAK SHARP EDGES

DRAWN BY: HORCHLER	DATE: 8/17/2011	
CHECKED BY: TMV	DATE: 9/20/2011	
ENGINEER: J. WANG	DATE: 1/27/2012	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

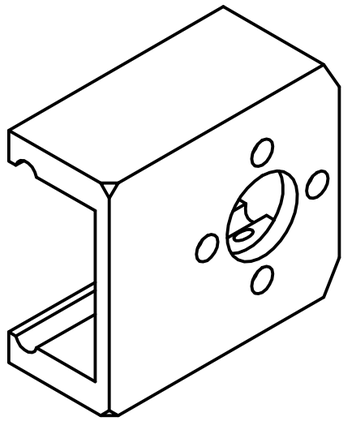
DESCRIPTION: OUTBOARD SLIDER, MOLDED

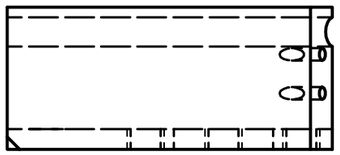
SIZE:	SHEET	DRAWING NO.:	REV:
A3	1 OF 1	472-5330	A

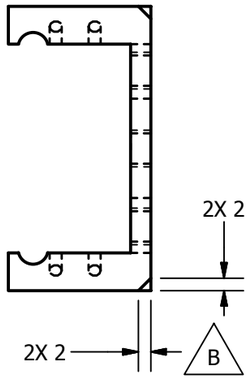
SCALE: 1:1

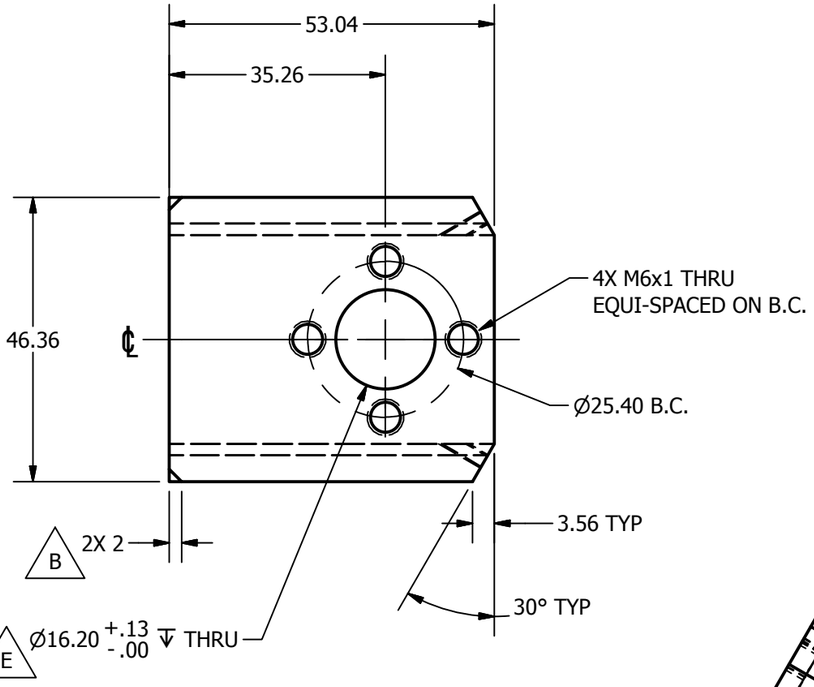
472-5330.iam

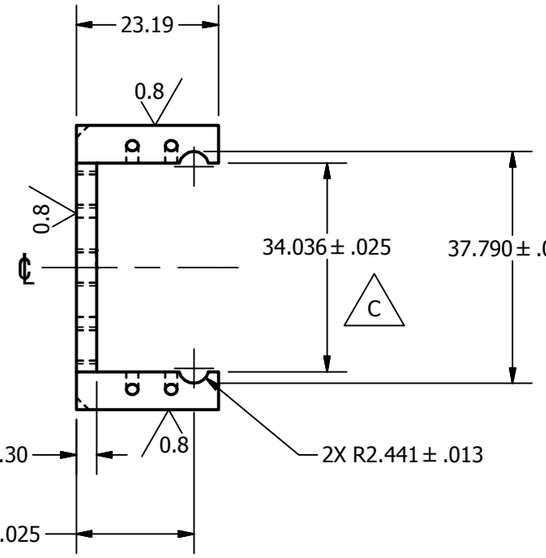
REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM 880995-1642 REV D AND CONVERTED TO METRIC FOR THOR-M; 19.177±.025 WAS 19.177	8/19/2011	JSJ
	B	CHANGE DEPTH FROM THRU TO 4.0 MM FOR M2.5X0.45, DIM 2 WAS 2.03	2/1/12	ZJW
	C	REDIMENSION PART/SLOT FEATURE ACROSS CL; REMOVE DIMENSIONS TO CL; ADD NOTE	2/22/2012	BK
	D	ADD HEAT TREAT NOTE; REMOVE Ø4.85 HOLE	4/12/2012	BK
	E	Ø16.20 WAS Ø15.88	7/23/2012	BK

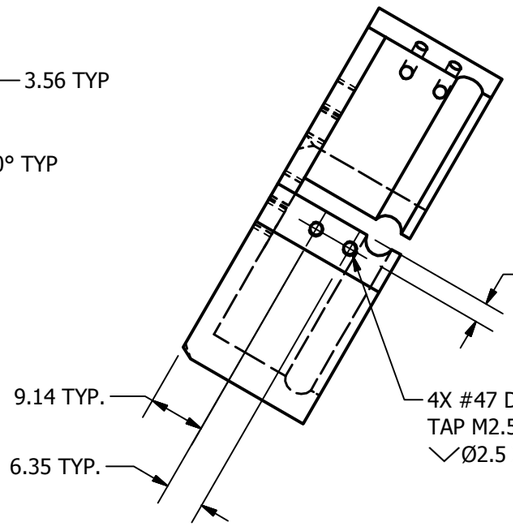












NOTES:

C

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. HEAT TREAT:

D

- MASK ENTIRE PART EXCEPT THE PATHWAYS
- CARBURIZE PART @ 1700°F FOR 6 HOURS
- FURNACE COOL, DO NOT QUENCH
- REHARDEN @ 1520°F AND OIL QUENCH
- TEMPER @ 350°F FOR 2 HOURS
- SURFACE HARDNESS IN PATHWAYS SHOULD BE Rc 60-65

		PROJECT NO.:	DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES
472-5330	1	MATERIAL: 4140 STEEL	DRAWN BY: KSG	DATE: 8/17/2011
NEXT ASSEMBLY	QTY	HEAT TREAT: SEE NOTES	CHECKED BY:	DATE:
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 2/1/2012

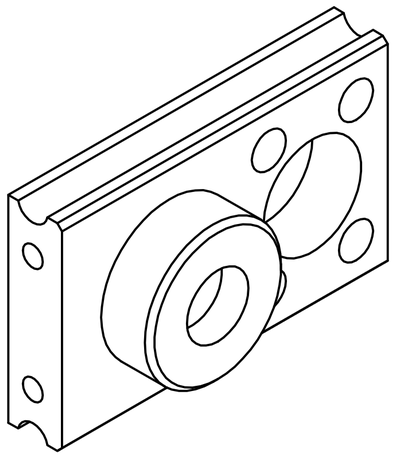
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

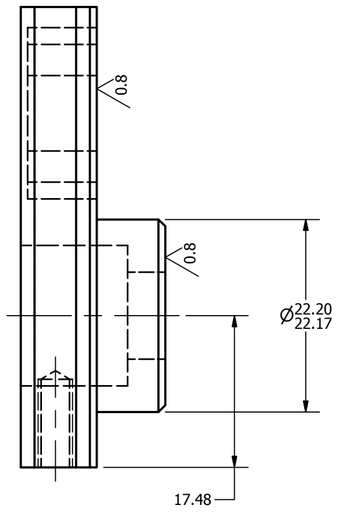
DESCRIPTION: RACE, OUTER

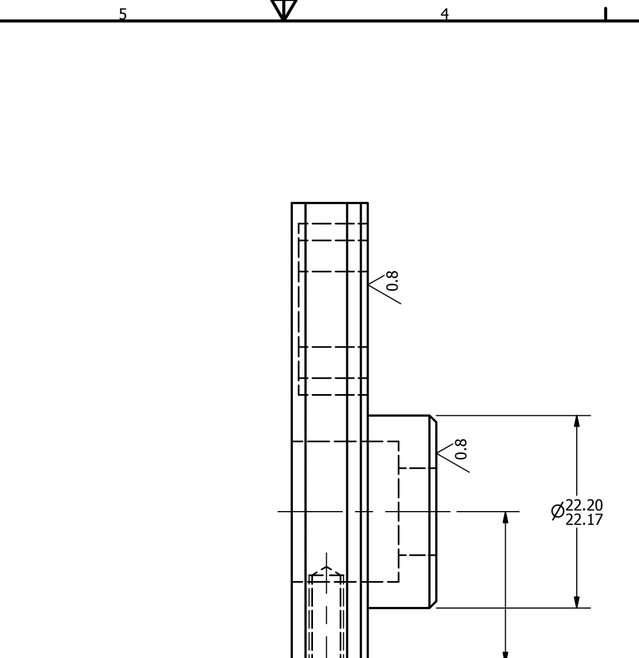
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 1:1 | DRAWING NO.: 472-5331 | REV: E

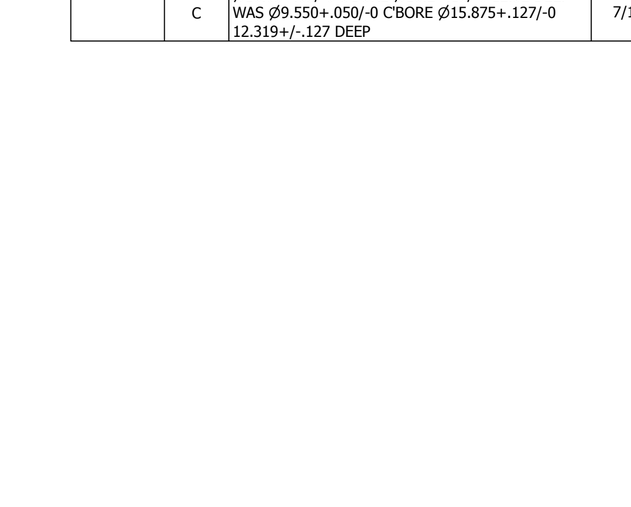
472-5331.ipt

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM880995-1643 REV F AND CONVERTED TO METRIC FOR THOR-M	8/19/2011	JSJ
	B	ADD HEAT TREAT NOTE; ADD 2X 4.775+/-.050	4/12/2012	BK
	C	Ø10.03+.05/-0 C'BORE Ø16.2+.13/-0 12.32 DEEP WAS Ø9.550+.050/-0 C'BORE Ø15.875+.127/-0 12.319+/-.127 DEEP	7/19/2012	BK









NOTES:

1. HEAT TREAT:
   - MASK ENTIRE PART EXCEPT THE PATHWAYS
   - CARBURIZE PART @ 1700°F FOR 6 HOURS
   - FURNACE COOL, DO NOT QUENCH
   - REHARDEN @ 1520°F AND OIL QUENCH
   - TEMPER @ 350°F FOR 2 HOURS
   - SURFACE HARDNESS IN PATHWAYS SHOULD BE Rc 60-65

B

472-5330	1	4140 STEEL			
NEXT ASSEMBLY	QTY	SEE NOTES			
TOTAL QTY IN DUMMY	2				

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

PROJECT NO.:

MATERIAL: 4140 STEEL

HEAT TREAT: SEE NOTES

FINISH:

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS X ± 0.5 | X.X ± 0.2 | X.XX ± 0.1 | X.XXX ± 0.01
ANGLES ± 0.5
FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

DRAWN BY: KSG — DATE: 8/17/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/27/2012

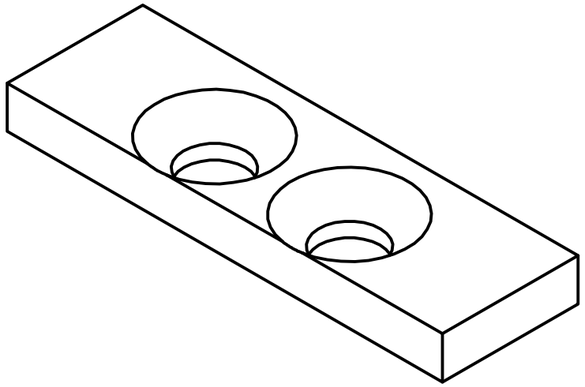
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

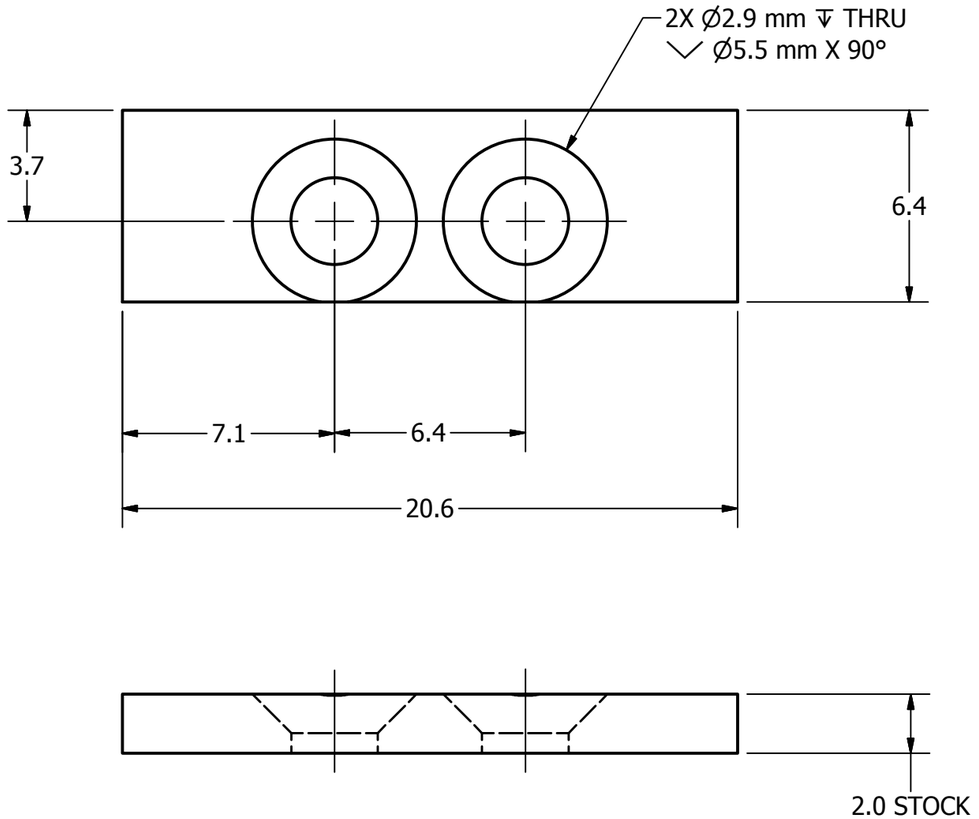
DESCRIPTION: OUTBOARD SLIDER, INNER RACE

SIZE: A2 | SHEET 1 OF 1 | SCALE: 2 : 1 | DRAWING NO.: 472-5332 | REV: C

472-5332.ipt

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM 880995-1636 AND CONVERTED TO METRIC FOR THOR-M; FINISH WAS .0003 ELECTROLESS NICKEL OR EQUIVALENT	8/19/2011	JSJ

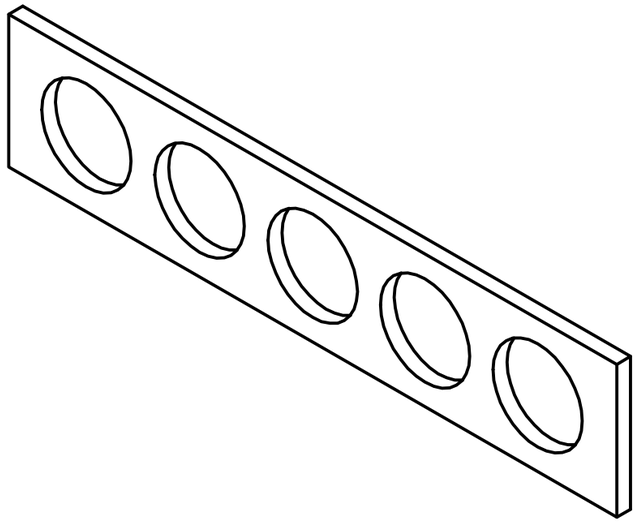


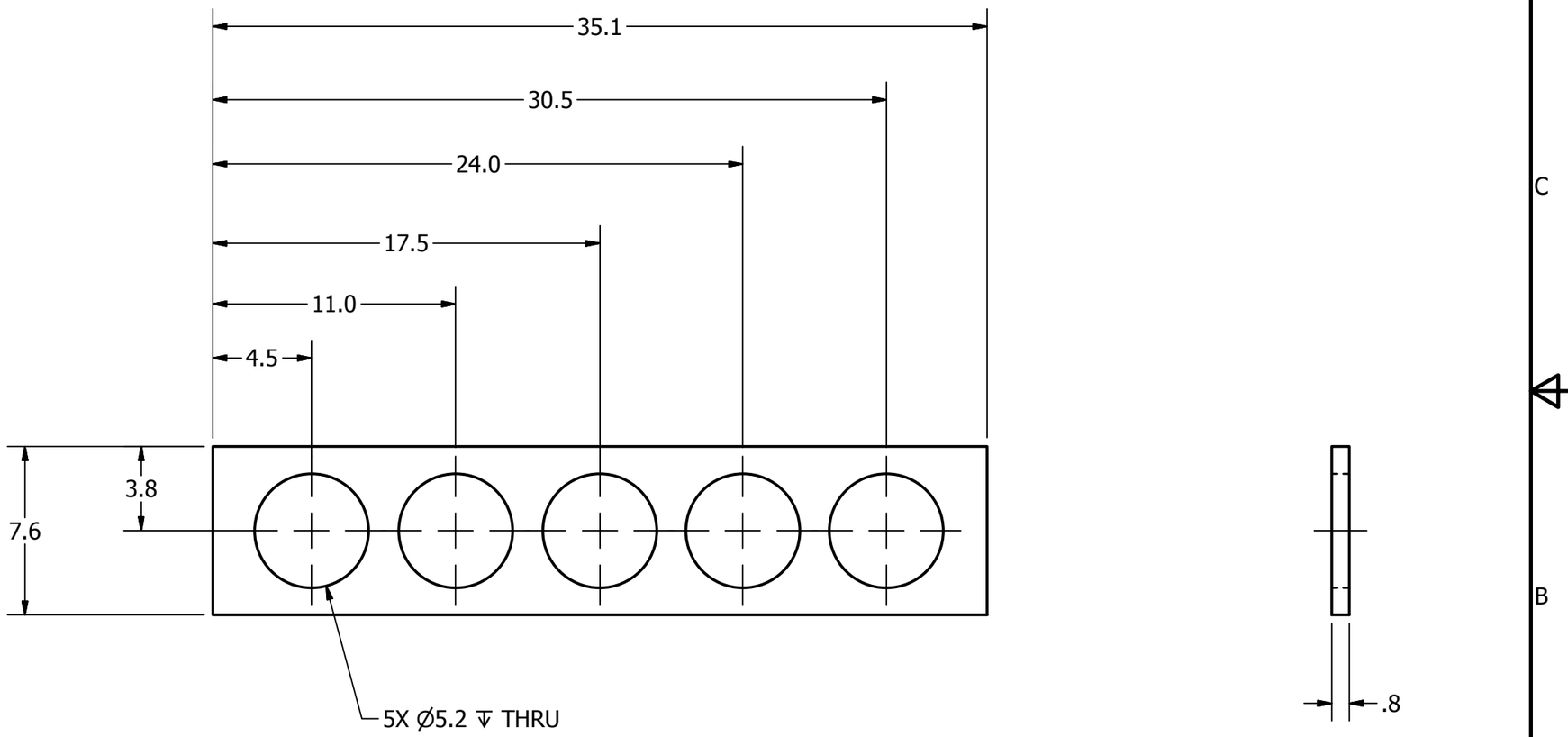


		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ± 0.2 X.XX ± 0.1 X.XXX ± 0.01 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: STOP, BALL	
		PROJECT NO.:			
472-5310	6	MATERIAL: C1075 ANNEALED	DRAWN BY: KSG DATE: 8/17/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 44-50	CHECKED BY: TMV DATE: 9/12/2011	SIZE: B SHEET 1 OF 1	DRAWING NO.: 472-5738 REV: A
TOTAL QTY IN DUMMY	12	FINISH: .008 ELECTROLESS NICKEL	ENGINEER: J. WANG DATE: 1/28/2012	SCALE: 4:1	

472-5738.ipt

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM 880995-1635 REV C AND CONVERTED TO METRIC FOR THOR-M	8/19/2011	JSJ

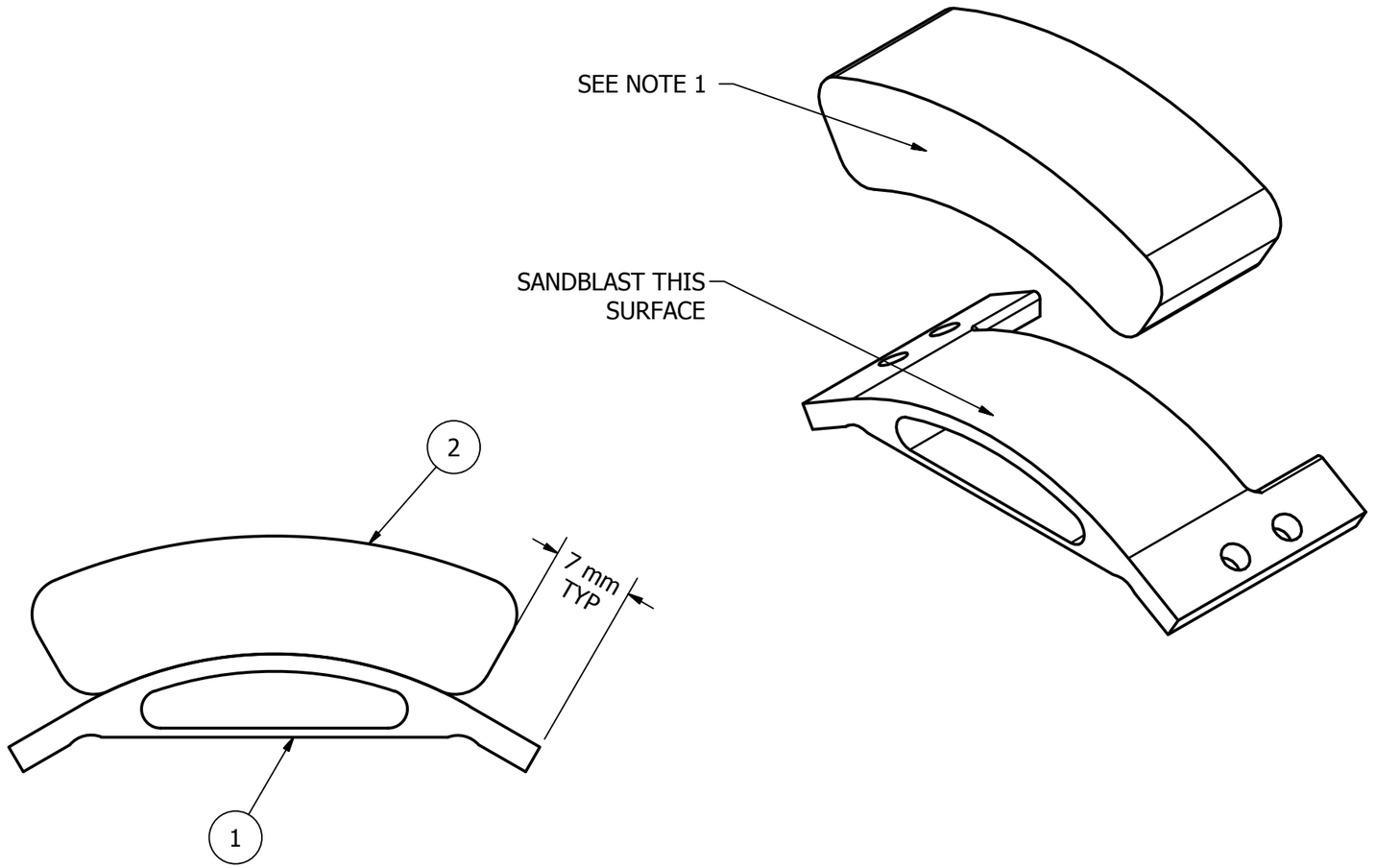




		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: BRONZE SEPARATOR	
		PROJECT NO.:			
472-5310	4	MATERIAL: PHOSPHORUS BRONZE	DRAWN BY: KSG	DATE: 8/17/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV	DATE: 9/12/2011	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-5733 REV: A
TOTAL QTY IN DUMMY	8	FINISH:	ENGINEER: J. WANG	DATE: 1/27/2012	SCALE: 4:1

472-5733.ipt

REVISION HISTORY				
REV	ECO	DESCRIPTION	DATE	BY
A		RELEASE TO PRODUCTION	1/12/12	KHS



NOTES:

1. BOND ITEM 2 TO ITEM 1 USING CYANOACRYLATE

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-5357	BUMPER - SLIDER
1	1	472-5356	STOP - SLIDER

Parts List

		PROJECT NO.:	DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES — UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES
472-5310	1	MATERIAL:	DRAWN BY: KHS	DATE: 1/12/2012
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/23/2012

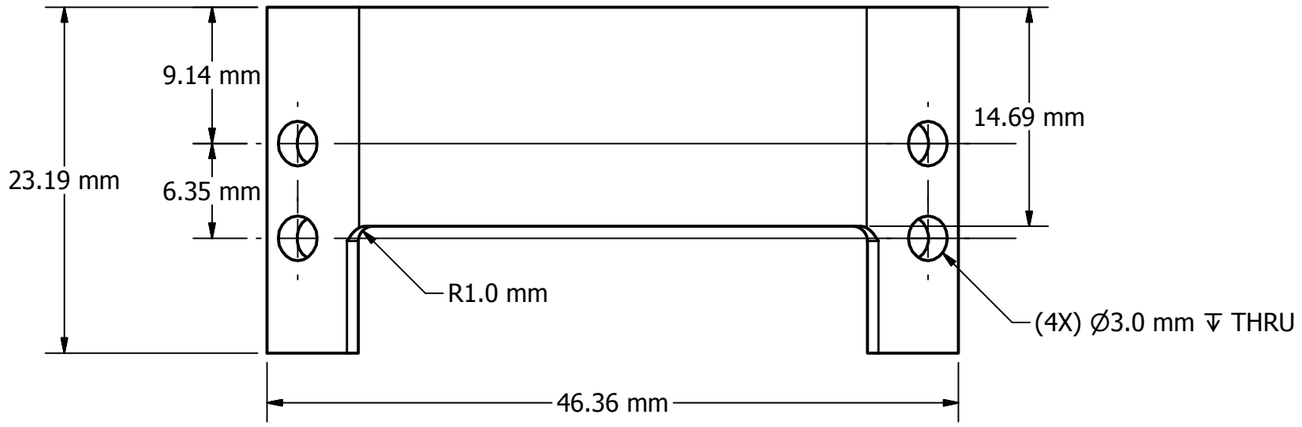
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

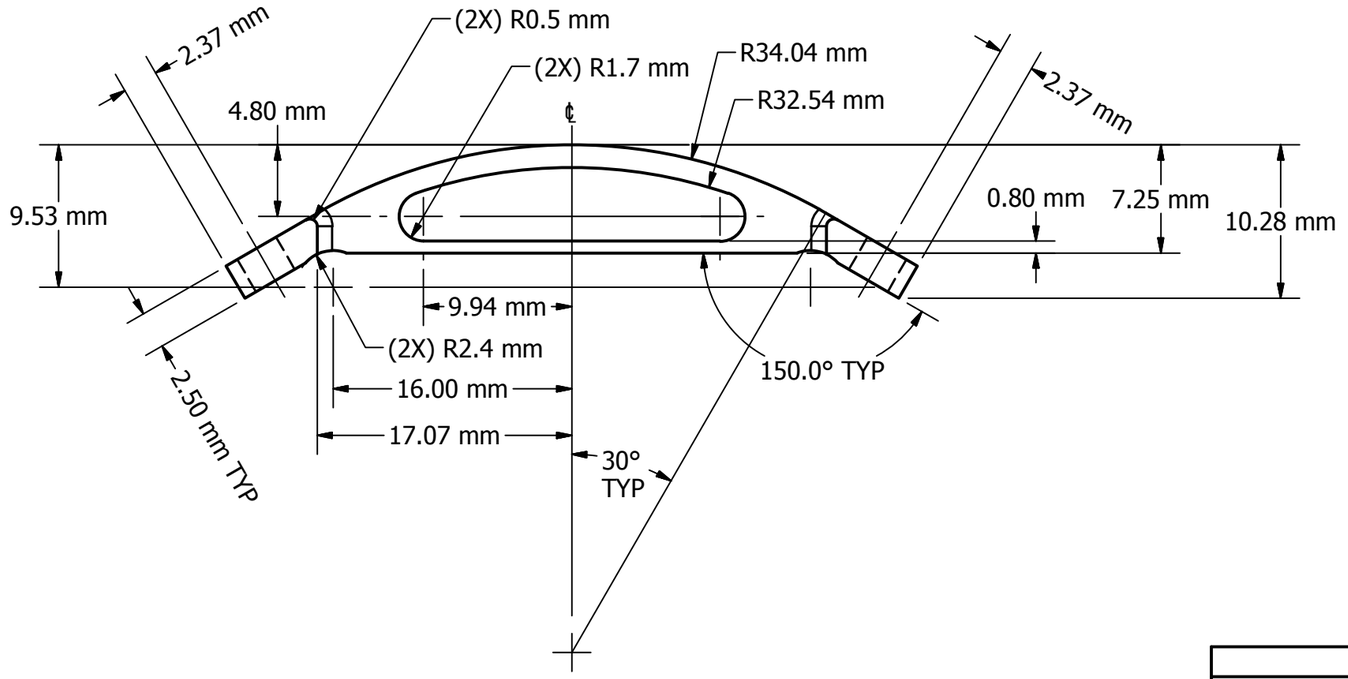
DESCRIPTION: KNEE SLIDER STOP ASS'Y.

SIZE: B | SHEET: 1 OF 1 | SCALE: 2:1 | DRAWING NO.: 472-5358 | REV: A

472-5358.iam

REVISION HISTORY				
REV	ZONE	DESCRIPTION	DATE	BY
A	GLOBAL	HEAT TREAT WAS Rc 42 +/- 5	2/14/2012	KHS





PART IS SYMMETRIC ABOUT CENTERLINE

A

		PROJECT NO.:	DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES
472-5358	1	MATERIAL: 4140 STEEL	DRAWN BY: KHS	DATE: 1/12/2012
NEXT ASSEMBLY	QTY	HEAT TREAT: N/A	CHECKED BY: TMV	DATE: 2/16/2012
TOTAL QTY IN DUMMY	1	FINISH: ELECTROLESS NICKEL .008 MAX.	ENGINEER: J. WANG	DATE: 1/26/2012

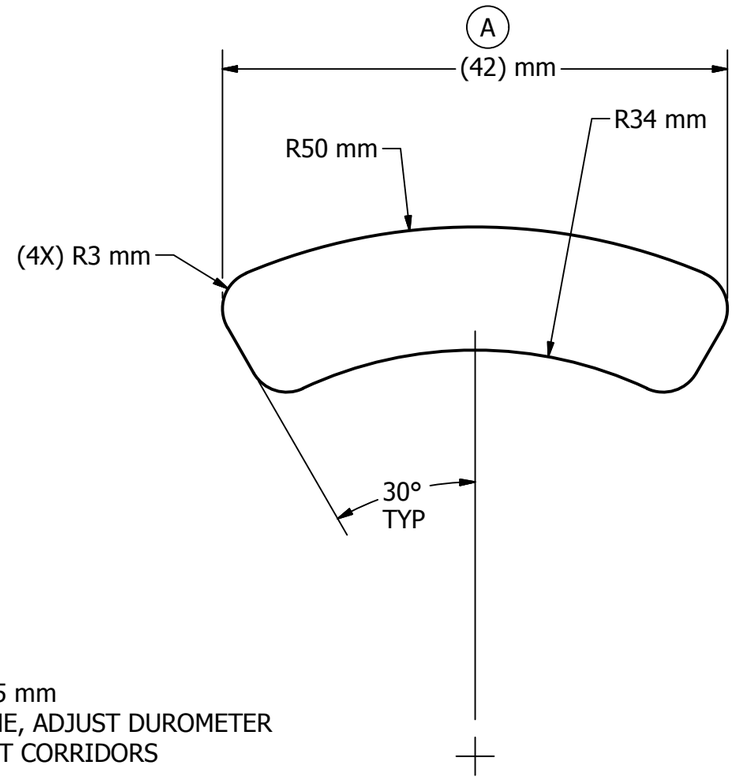
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: STOP - SLIDER

SIZE: B | SHEET: 1 OF 1 | SCALE: 2.5:1 | DRAWING NO.: 472-5356 | REV: A

472-5356.ipt

REVISION HISTORY				
REV	ZONE	DESCRIPTION	DATE	BY
A	GLOBAL	ADDED NOTES; MATERIAL WAS RUBBER; (42) mm WAS (48) mm	2/14/2012	KHS

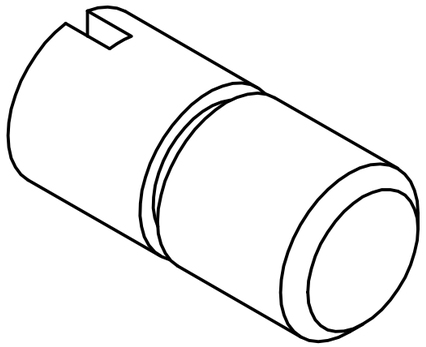


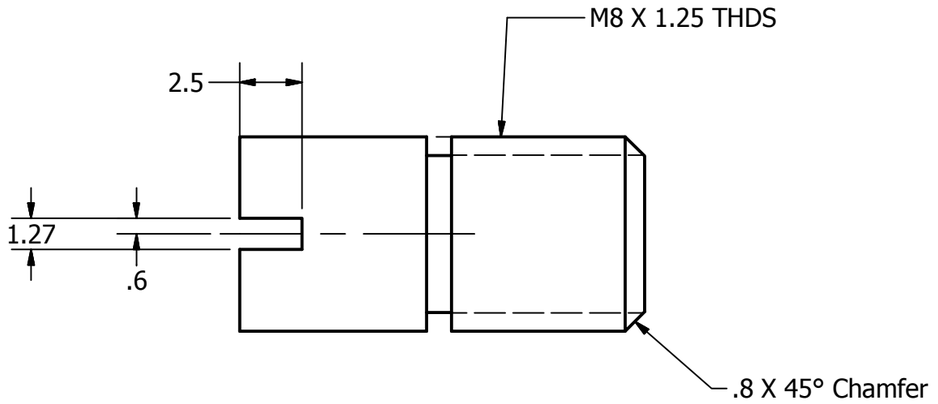
(A) TOLERANCE ALL DIMENSIONS: ±1.5 mm
MATERIAL: 40 SHORE "A" URETHANE, ADJUST DUROMETER TO MEET DYNAMIC TEST CORRIDORS
COLOR: BLACK

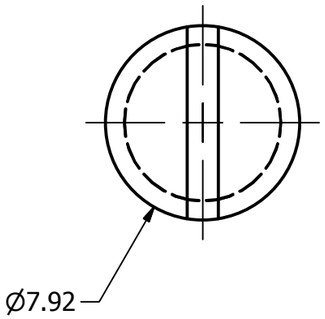
		DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5 FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: BUMPER - SLIDER	
472-5358	1	MATERIAL: SEE NOTES	DRAWN BY: KHS DATE: 1/12/2012		
NEXT ASSEMBLY	QTY	HEAT TREAT: N/A	CHECKED BY: TMV DATE: 2/16/2012	SIZE: B SHEET: 1 OF 1	DRAWING NO.: 472-5357 REV: A
TOTAL QTY IN DUMMY	1	FINISH: N/A	ENGINEER: J. WANG DATE: 1/26/2012	SCALE: 2:1	

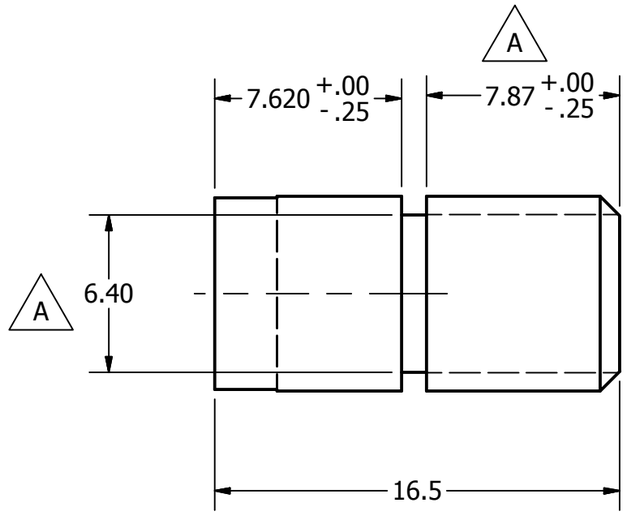
472-5357.ipt

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM EX593-122 AND CONVERTED TO METRIC FOR THOR-M; ADD THREAD RELIEF	9/6/2011	JSJ
	B	FINISH ELECTROLESS NICKEL PLATE WAS BLACK OXIDE	1/30/2012	BK









472-5700	1	PROJECT NO.:		
472-5300	1	MATERIAL: 4140 STEEL	DRAWN BY: KSG	DATE: 9/6/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV	DATE: 9/21/2011
TOTAL QTY IN DUMMY	2	FINISH: ELECTROLESS NICKEL PLATE .008 MAX.	ENGINEER: J. WANG	DATE: 1/28/2012

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5°	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

REMOVE BURRS & BREAK SHARP EDGES

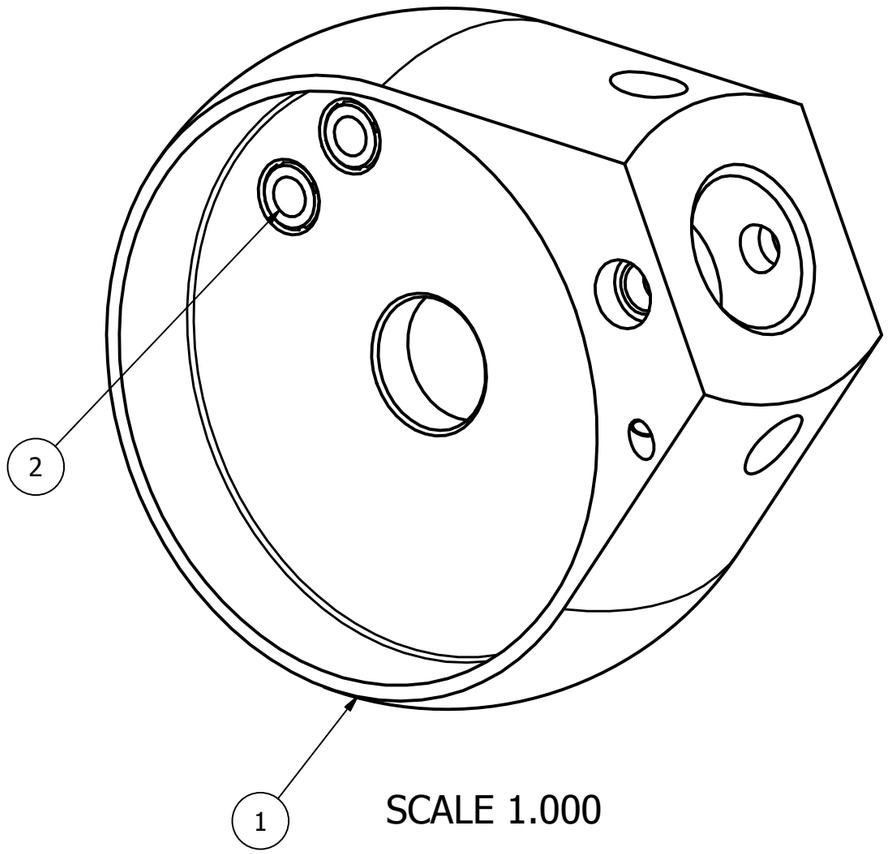
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: PIN, KNEE STOP

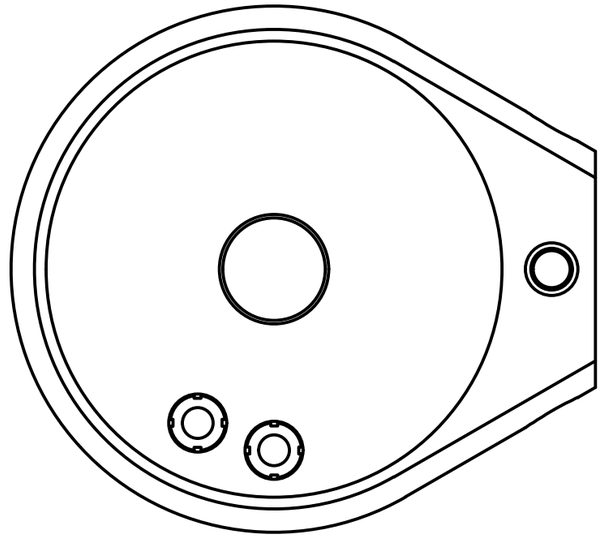
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 4:1 | DRAWING NO.: 472-5763 | REV: B

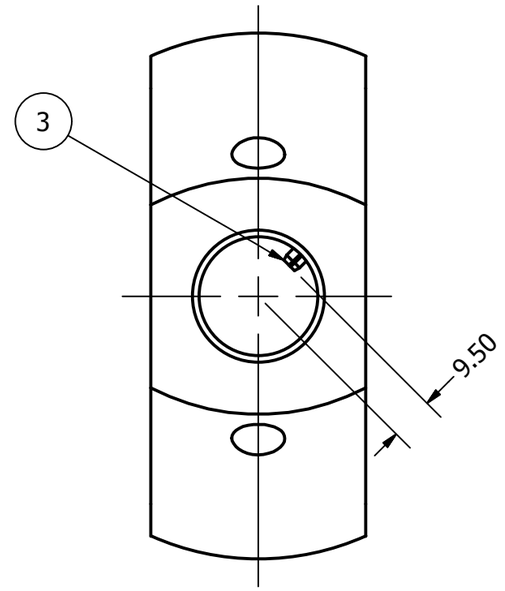
472-5763.ipt

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM220 R00 AND CONVERTED TO METRIC FOR THOR-M	9/20/2011	JSJ
	B	REVISED M12X1.75 TO M12X1.25 THREAD. ADDED M4X10 ROLL PIN.	5/22/2012	JSJ



SCALE 1.000





B

ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	5000182	PIN, ROLL M4 X 10mm
2	2	472-5762	THREADED INSERT, MODIFIED
1	1	472-5351	KNEE CAP

Parts List

472-5700	1
472-5300	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	2

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5' 1.6
X.X ± 0.2
X.XX ± 0.1
X.XXX ± 0.01

REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

DRAWN BY: jjordan — DATE: 9/20/2011
CHECKED BY: TMV — DATE: 5/23/2012
ENGINEER: J. WANG — DATE: 1/27/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: KNEE CAP ASS'Y.

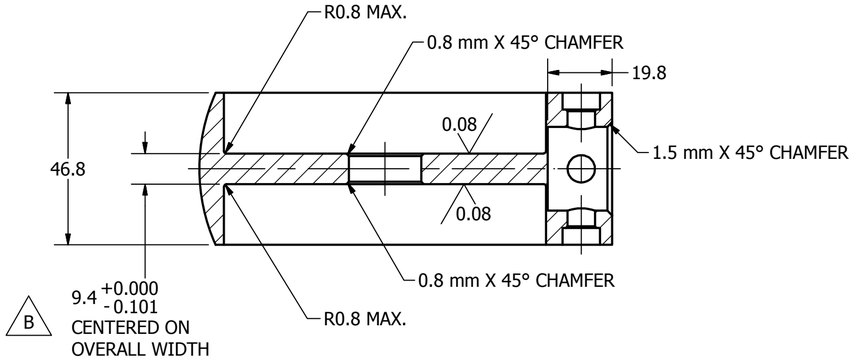
SIZE: A3 | SHEET: 1 OF 1 | SCALE: .750

DRAWING NO.: 472-5350

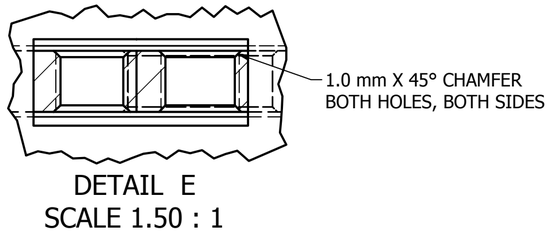
REV: B

472-5350.iam

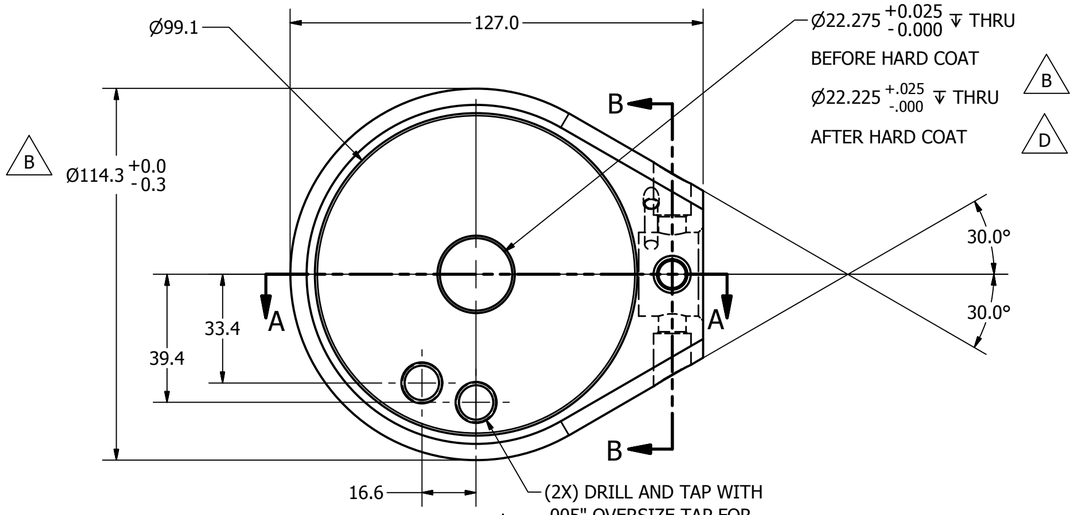
REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
78027	A	RENUMBERED FROM T1FMM208 R0 AND CONVERTED TO METRIC FOR THOR-M	8/19/2011	JSJ
10483	B	REVISED/ADDED DIMENSIONS	5/16/2012	JSJ
10490	C	REVISED M12X1.75 TO M12X1.25 THREAD	5/22/2012	JSJ
10532	D	INCREASED PRECESION ON DIMENSIONS TO 3 PLACE	7/2/2012	JSJ
70244	E	Ø8.4 WAS Ø7.92 +0.05 / -0.00	12/18/2012	DW

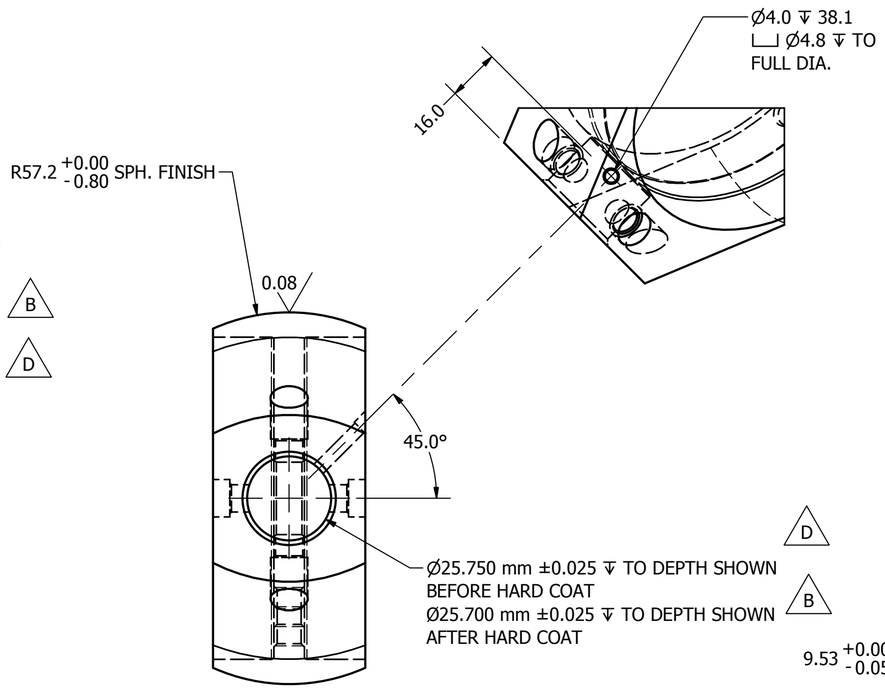


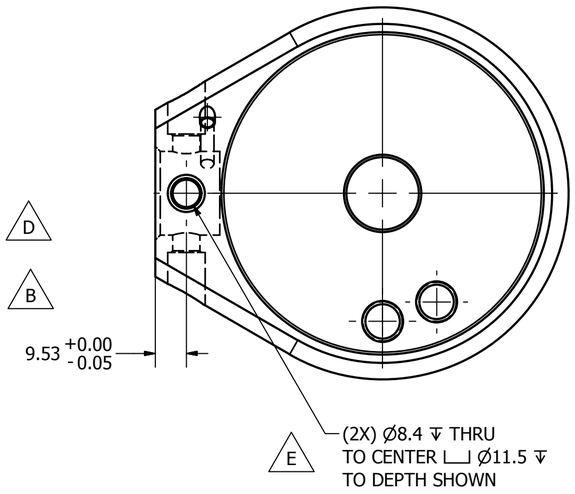
SECTION A-A

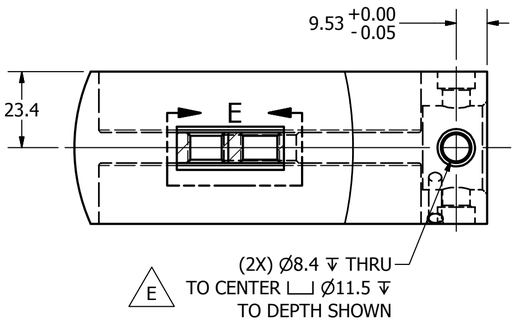


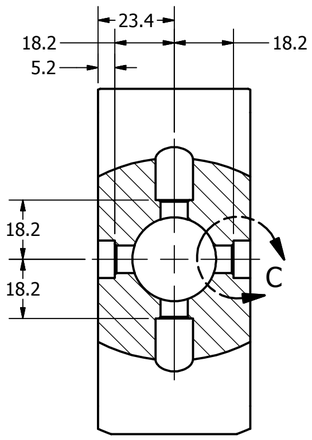
DETAIL E
SCALE 1.50 : 1



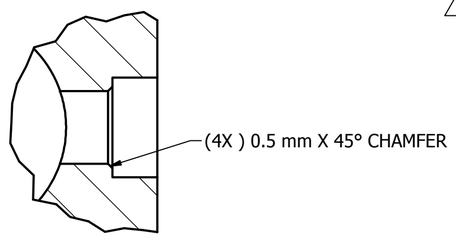








SECTION B-B



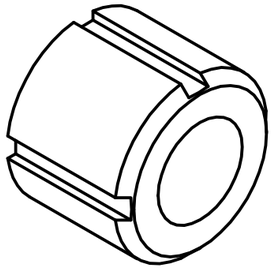
DETAIL C
SCALE 2 : 1

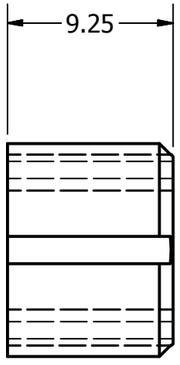
NOTES:
1. ALL DIMENSIONS AFTER HARDCOAT EXCEPT WHERE NOTED.

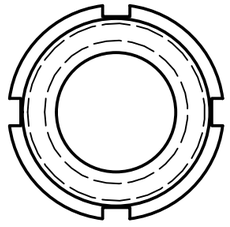
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: KNEE CAP		
PROJECT NO.:		DRAWN BY: KHS	DATE: 8/16/2011		
472-5350	1	MATERIAL: Aluminum-7075-T6	CHECKED BY: TMV	DATE: 7/10/2012	SIZE: A2
NEXT ASSEMBLY	QTY	HEAT TREAT:	ENGINEER: J. WANG	DATE: 1/27/2012	SHEET 1 OF 1
TOTAL QTY IN DUMMY	2	FINISH: HARDCOAT ANODIZE		SCALE: 3:4	DRAWING NO.: 472-5351 REV: E

472-5351.ipt

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM 79051-22-1 REV A AND CONVERTED TO METRIC FOR THOR-M	9/2/2011	JSJ







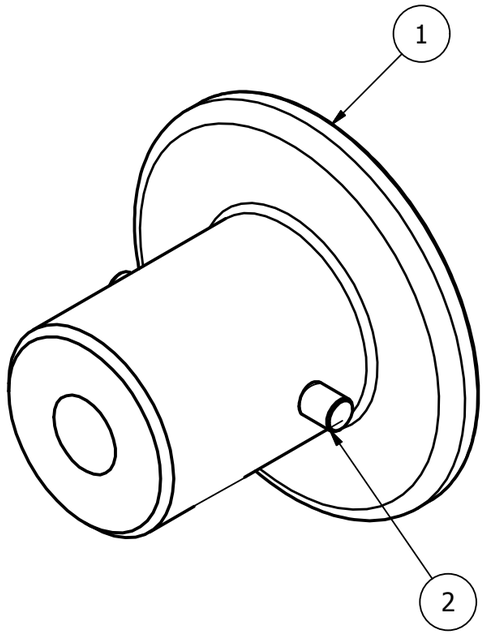
NOTE:

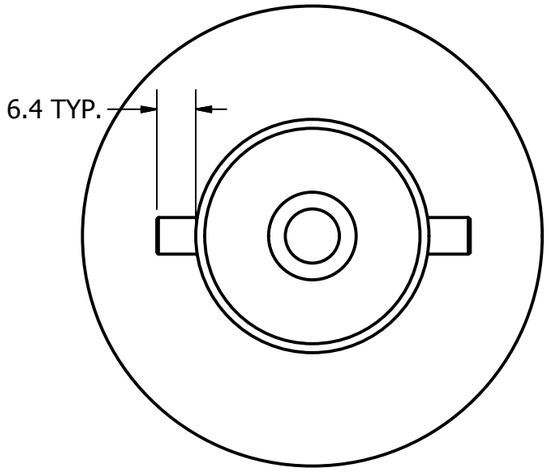
1. MAKE FROM M8 X 1.25 X 12 LIGHTWEIGHT KEENSERT (5000585), MODIFY AS SHOWN.

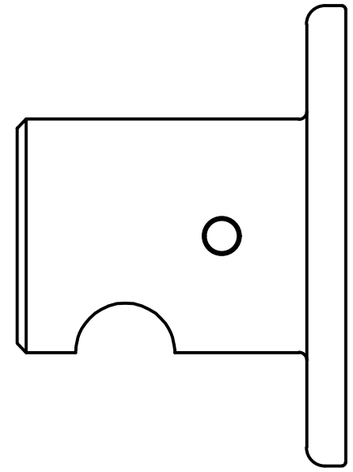
		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: THREADED INSERT, MODIFIED	
		PROJECT NO.:			
472-5350	2	MATERIAL: SEE NOTES	DRAWN BY: jjordan DATE: 9/2/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV DATE: 9/14/2011	SIZE: B SHEET: 1 OF 1	DRAWING NO.: 472-5762 REV: A
TOTAL QTY IN DUMMY	4	FINISH:	ENGINEER: J. WANG DATE: 1/28/2012	SCALE: 3:1	

472-5762.ipt

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM211 R0 AND CONVERTED TO METRIC FOR THOR-M	8/19/2011	JSJ







ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	5000433	PIN, DOWEL M6 X 12 mm
1	1	472-5411	FEMUR BALL JOINT ATTACHMENT PLATE

Parts List

472-5100-2	1
472-5100-1	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	2

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5°	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PROJECT NO.:

MATERIAL:

HEAT TREAT:

FINISH:

DRAWN BY: KHS — DATE: 8/17/2011

CHECKED BY: TMV — DATE: 9/14/2011

ENGINEER: J. WANG — DATE: 1/27/2012

DESCRIPTION: FEMUR BALL ATTACHMENT PLATE ASS'Y.

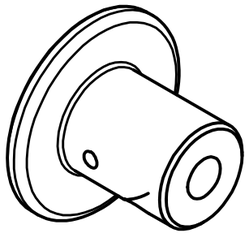
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 1:1

DRAWING NO.: 472-5410

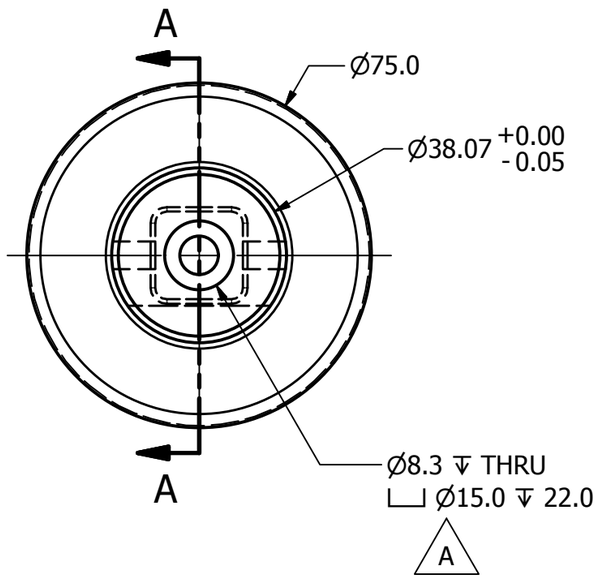
REV: A

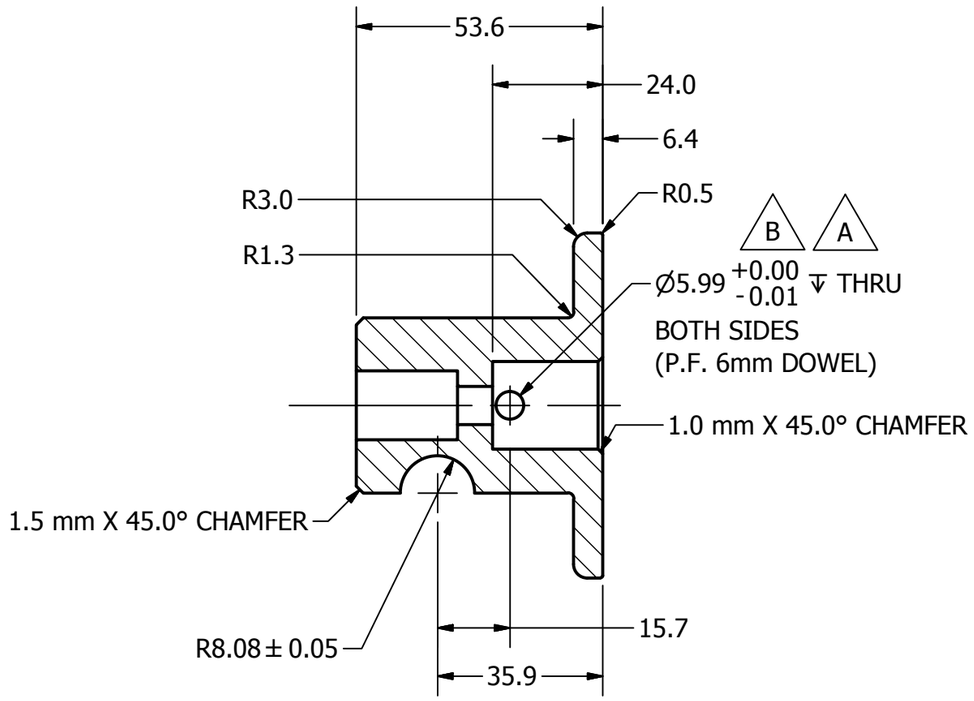
472-5410.iam

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM205 R0 AND CONVERTED TO METRIC FOR THOR-M; Ø8.3 WAS Ø8.2, C'BORE Ø15.0 WAS Ø13.0; Ø6.000 WAS Ø6.337	8/19/2011	JSJ
	B	Ø5.99+0/-.01 WAS Ø6.000+/-.005	5/29/2012	KHS

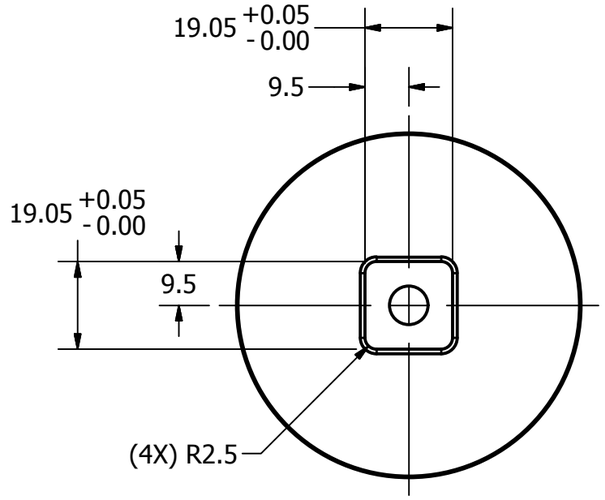


SCALE .500





SECTION A-A



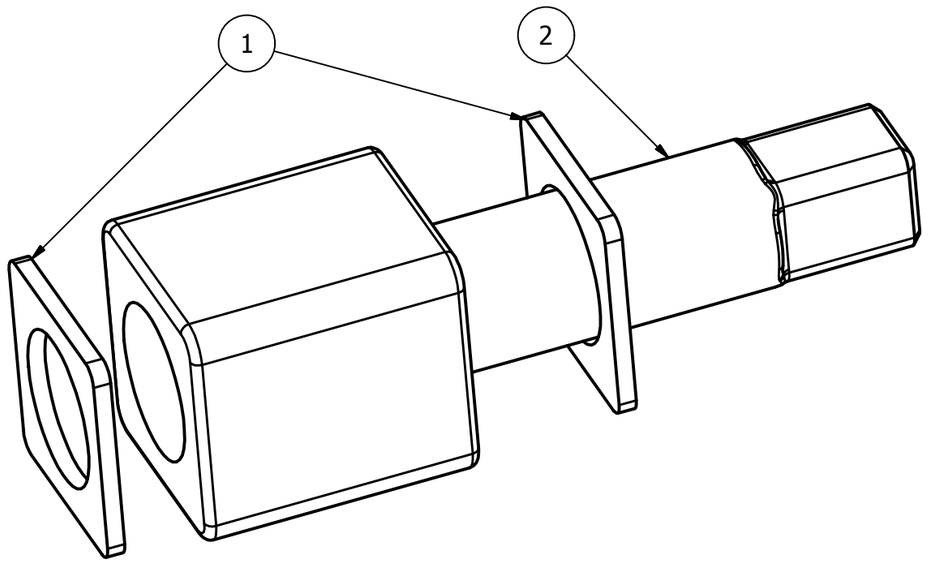
NOTES:

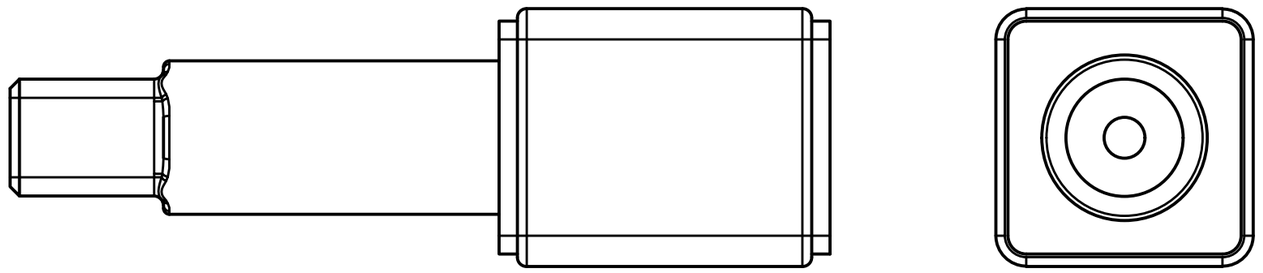
1. ALL DIMENSIONS APPLY AFTER NICKEL PLATE.

		PROJECT NO.:	DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES — UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS: X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01. ANGLES ± 0.5°. FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
472-5410	1	MATERIAL: 4140 STEEL	DRAWN BY: KHS	DATE: 8/17/2011	DESCRIPTION: FEMUR BALL JOINT ATTACHMENT PLATE
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV	DATE: 9/12/2011	SIZE: A3 · SHEET: 1 OF 1 · DRAWING NO.: 472-5411 · REV: B
TOTAL QTY IN DUMMY	2	FINISH: ELEC. NICKEL .008 MAX.	ENGINEER: J. WANG	DATE: 1/27/2012	SCALE: 1:1

472-5411.ipt

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM210 R0 AND CONVERTED TO METRIC FOR THOR-M	8/22/2011	JSJ
	B	ADD GLUE SPEC	4/3/2012	BK





NOTES:

1. BOND ITEM 1 TO ITEM 2 USING LOCTITE 401 OR EQUIVALENT.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-5422	PLUNGER - FEMUR
1	2	472-5421	END STOP

Parts List

472-5100-2	1
472-5100-1	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	2

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5° 1.6
X.X ± 0.2
X.XX ± 0.1
X.XXX ± 0.01
REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:

MATERIAL:

HEAT TREAT:

FINISH:

DRAWN BY: DLW DATE: 8/17/2011

CHECKED BY: TMV DATE: 9/14/2011

ENGINEER: J. WANG DATE: 1/27/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: FEMUR PLUNGER ASSY.

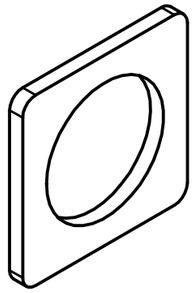
SIZE: A3 SHEET 1 OF 1 SCALE: 1:1

DRAWING NO.: 472-5420

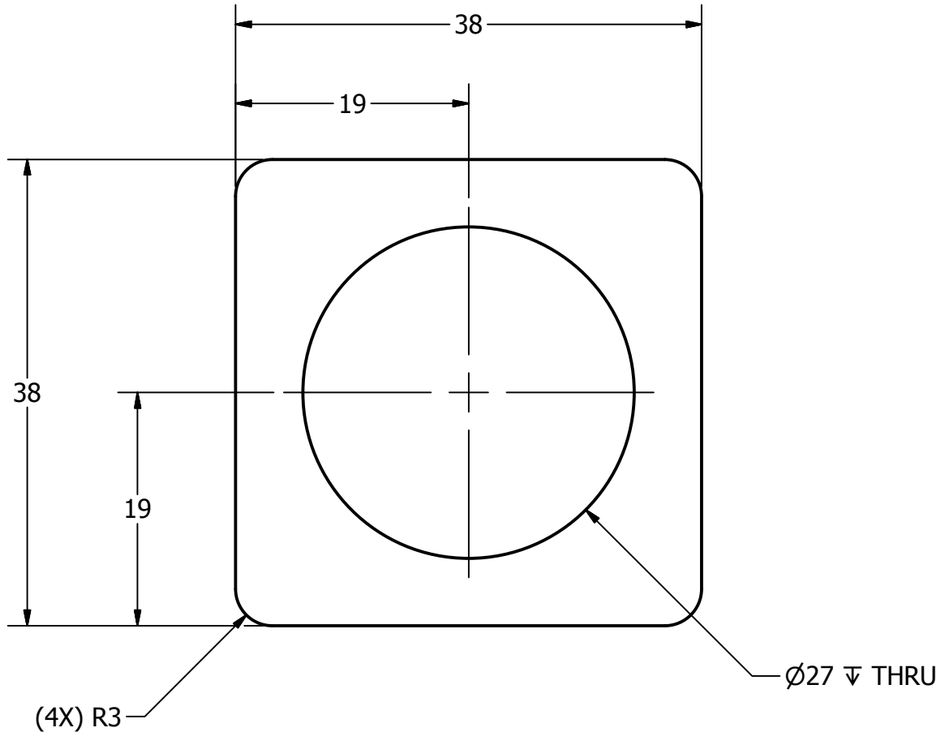
REV: B

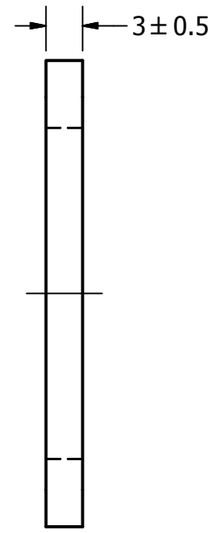
472-5420.iam

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM204 R0 AND CONVERTED TO METRIC FOR THOR-M	8/19/2011	JSJ



SCALE 1.000



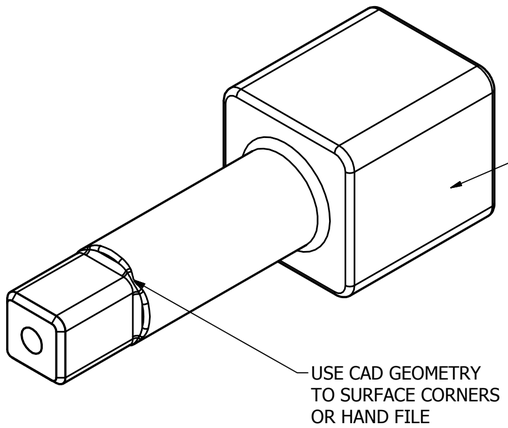


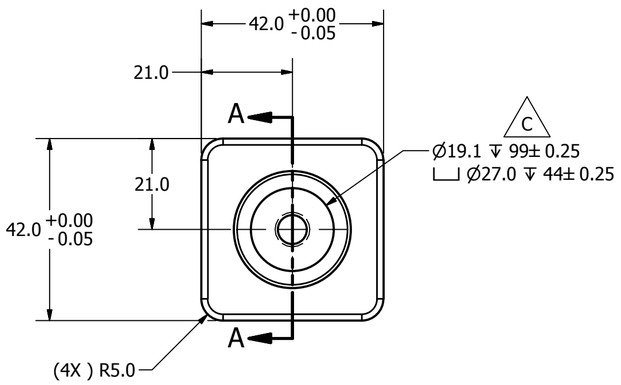
MATERIAL: URETHANE, 42±5 SHORE "A"
COLOR: BLACK

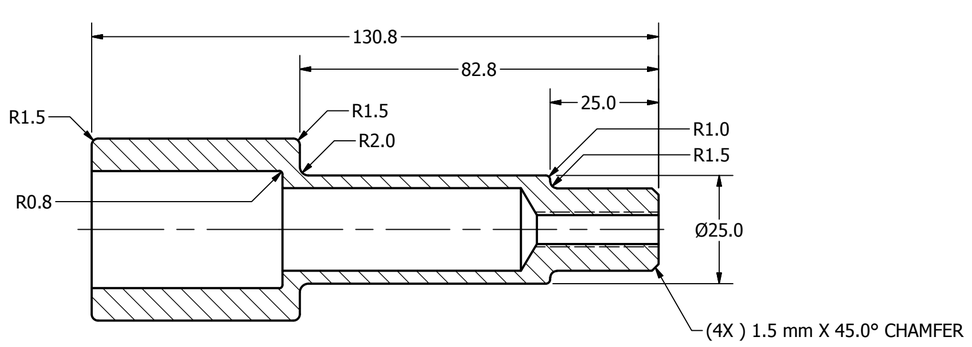
		DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS: X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01; ANGLES ± 0.5'; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		PROJECT NO.:		DESCRIPTION: END STOP	
472-5420	2	MATERIAL: BJB F-42 URETHANE	DRAWN BY: KHS — DATE: 8/17/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: TMV — DATE: 9/9/2011	SIZE: A3 — SHEET: 1 OF 1 — DRAWING NO.: 472-5421 — REV: A	
TOTAL QTY IN DUMMY	4	FINISH:	ENGINEER: J. WANG — DATE: 1/27/2012	SCALE: 2:1	

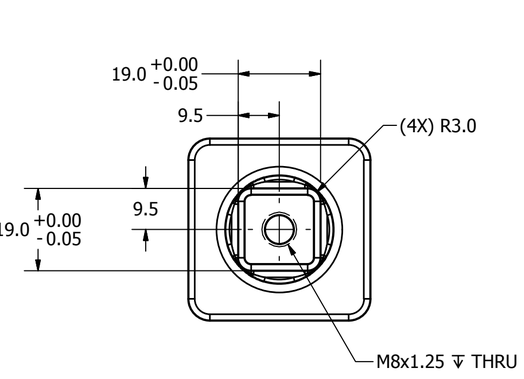
472-5421.ipt

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM207 R0 AND CONVERTED TO METRIC FOR THOR-M	8/19/2011	JSJ
	B	ADD HARDNESS CHECK NOTE	3/20/2012	SKK
	C	99 DEPTH WAS 102	11/26/2012	BK







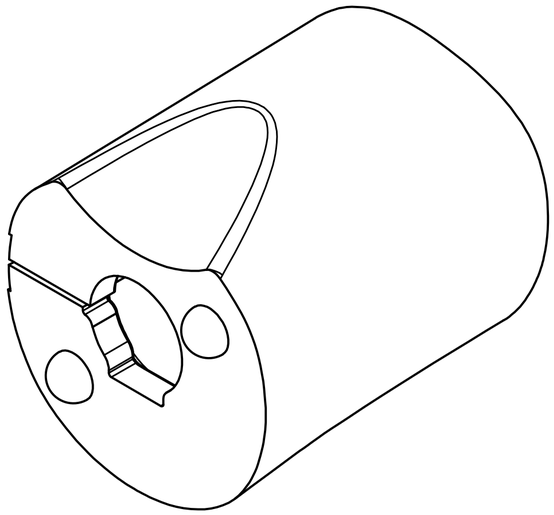


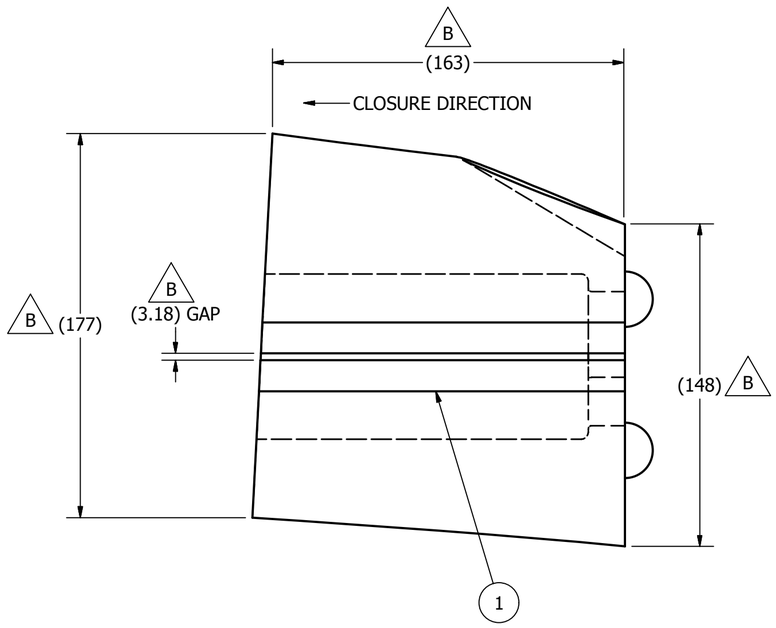
SECTION A-A

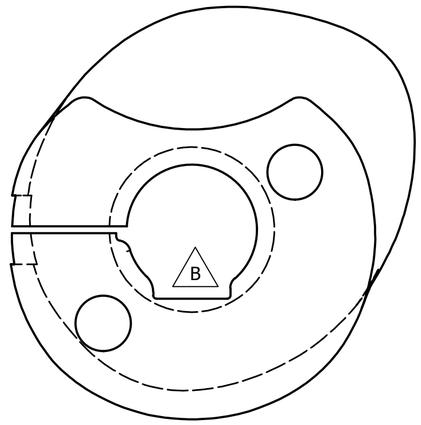
		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: PLUNGER - FEMUR	
		PROJECT NO.:			
472-5420	1	MATERIAL: Stainless Steel, 440C	DRAWN BY: KHS DATE: 8/17/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 57 +/- 5	CHECKED BY: TMV DATE: 9/9/2011	SIZE: A2 SHEET 1 OF 1	DRAWING NO.: 472-5422 REV: C
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG DATE: 1/27/2012	SCALE: 1:1	

472-5422.ipt

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMS011 R2 AND CONVERTED TO METRIC FOR THOR-M; ADD NOTE 5	8/22/2011	JSJ
	B	REVISED NOTES; ADDED REFERENCE DIMENSIONS AND ITEM #1 – 472-5504 – THIGH FLESH ZIPPER ASSEMBLY; ADDED NOTCH FOR INSTRUMENTATION CABLE CLEARANCE	9/15/2017	DW







B NOTES:

1. MATERIALS:
   DUROMETER: 52 ± 3 SHORE “A”
   FILLER MATERIAL IS POLYURETHANE EXPANDABLE FOAM
2. REMOVE ALL MOLD FLASHING.
3. ALL MOLD DIMENSION TOLERANCE +1%/-4%
   BUT NO SMALLER THAN 1mm
4. FEMUR SKIN IS SPLIT ALONG THE SIDE AS SHOWN AND A BONDED ZIPPER IS APPLIED ON THE OUTSIDE.
5. WEIGHT: 1.0 ±0.05 kg.

B

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	472-5504	THIGH FLESH ZIPPER ASSEMBLY

Parts List

472-5100-1	1	SEE NOTES	S. RICE	8/17/2011	
NEXT ASSEMBLY	QTY		TMV	9/13/2011	
TOTAL QTY IN DUMMY	1		J. WANG	1/27/2012	

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01. ANGLES ± 0.5°. FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PROJECT NO.:

DESCRIPTION: THIGH FLESH - LEFT

MATERIAL:

HEAT TREAT:

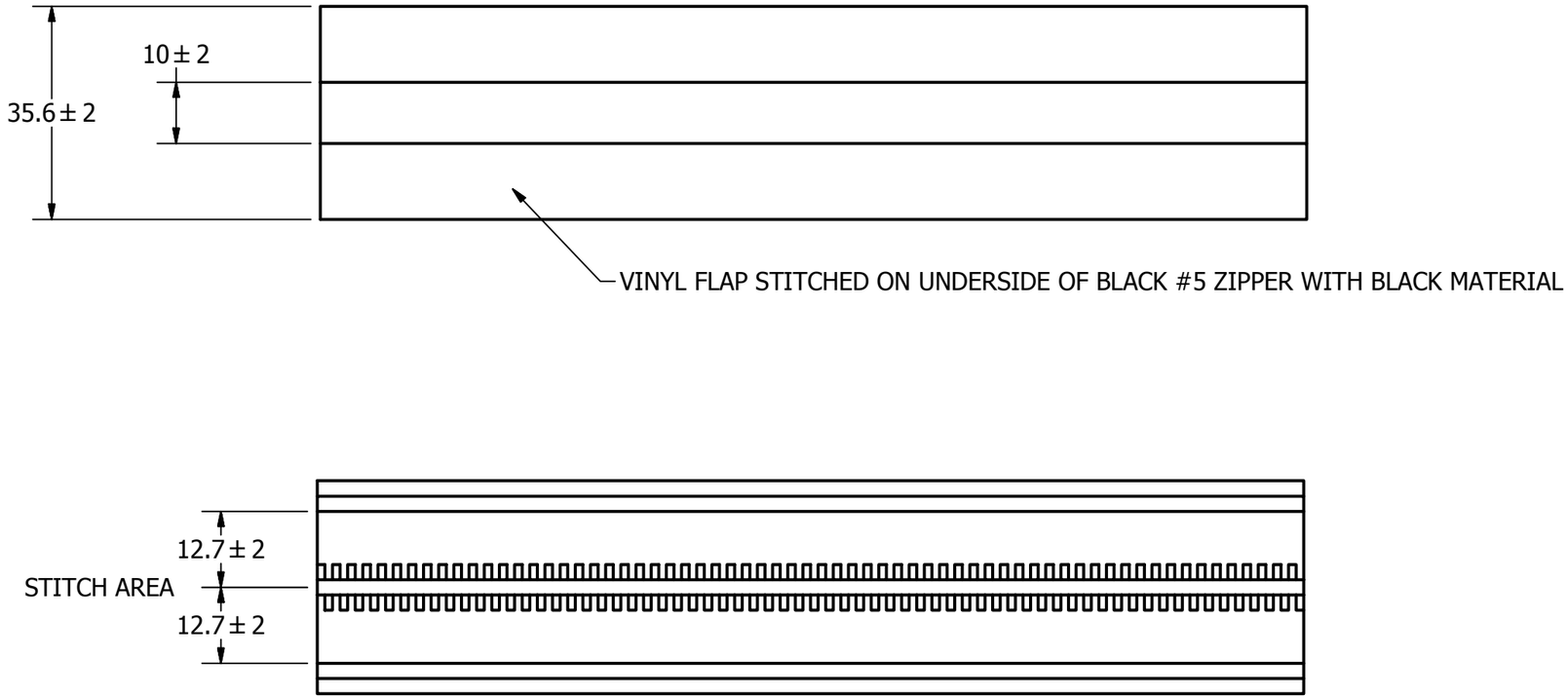
FINISH:

ENGINEER:

SIZE: A2 | SHEET 1 OF 1 | SCALE: .500

DRAWING NO.: 472-5503-1 | REV.: B

472-5503-1.ipt



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	472-5504 ZIPPER	#5 YKK ZIPPER
2	2	472-5504 VINYL	REINFORCED VINYL STRIP

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN srice	11/15/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

THIGH FLESH ZIPPER ASSEMBLY

THOR-50M

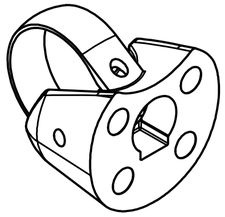
THIRD ANGLE PROJECTION

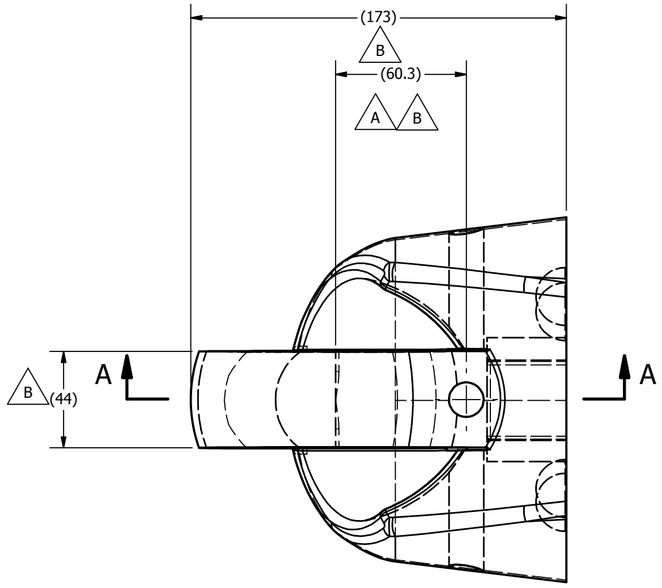
SIZE **A3** | DRAWING NUMBER 472-5504 | REV

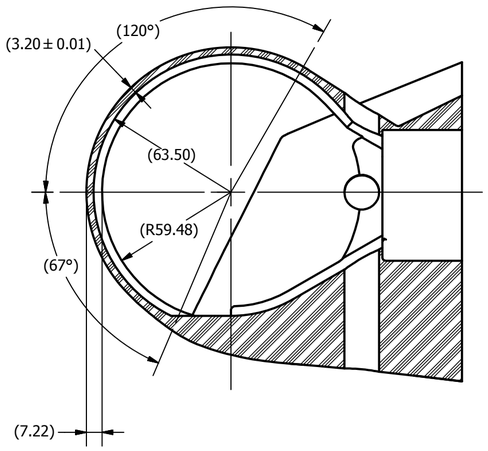
SCALE: 1 : 1 | SHEET 1 OF 1

472-5504.iam

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1KNS010 R7 AND CONVERTED TO METRIC FOR THOR-M; 60.3 WAS 60	8/23/2011	JSJ
	B	DIMENSIONS (60.3) WERE 60.3 AND (Ø16.00) THRU TYP. WAS Ø16.00 THRU TYP.; ADDED DIMENSIONS (44), (173), & (168); ADD SECTION A-A; REVISED NOTES.	9/14/2017	DW

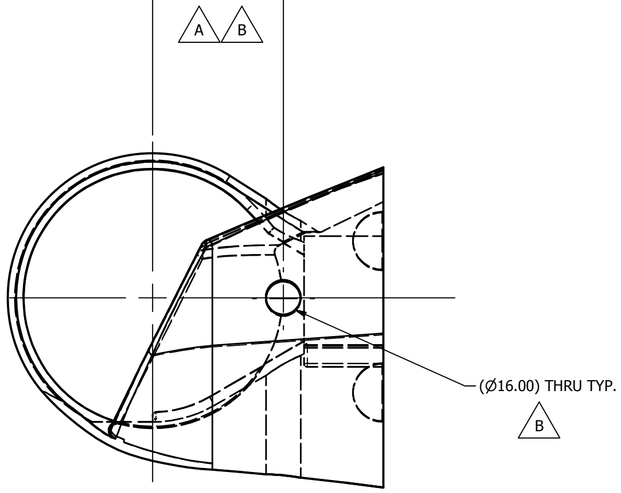


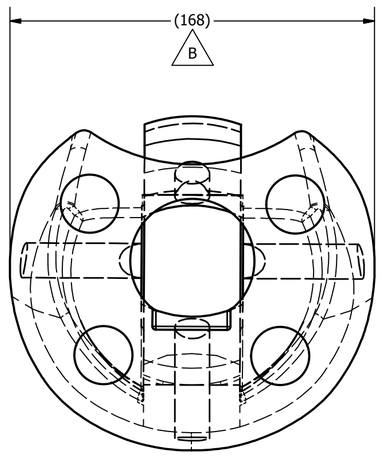




SECTION A-A

B





B NOTES:

1. MATERIAL: PVC
   FILLER MATERIAL IS POLYURETHANE EXPANDABLE FOAM
   DUROMETER: 52 ± 3 SHORE "A"
2. REMOVE ALL MOLD FLASHING.
3. ALL MOLD DIMENSION TOLERANCE +1%/-4%.
   BUT NO SMALLER THAN 1mm.
4. WEIGHT: .64 kg - .73 kg.

472-5100-2	1		
472-5100-1	1	MATERIAL: SEE NOTES	
NEXT ASSEMBLY	QTY	HEAT TREAT:	
TOTAL QTY IN DUMMY	2	FINISH:	

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

PROJECT NO.:

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS — DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6 ✓

REMOVE BURRS & BREAK SHARP EDGES

DRAWN BY: jjordan — DATE: 8/23/2011

CHECKED BY: TMV — DATE: 9/19/2011

ENGINEER: J. WANG — DATE: 1/27/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

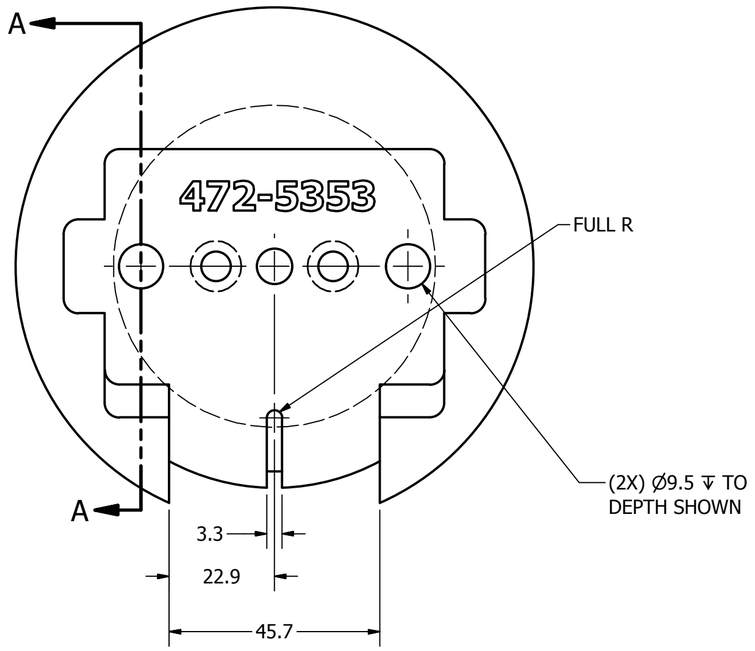
DESCRIPTION: KNEE FLESH LEFT/RIGHT

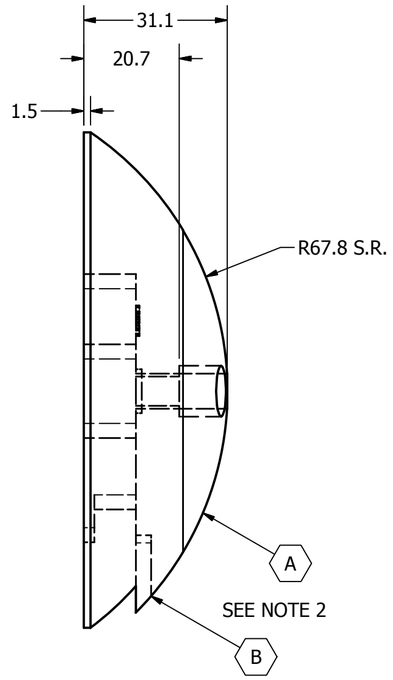
SIZE: A2 — SHEET: 1 OF 1 — SCALE: 1:2

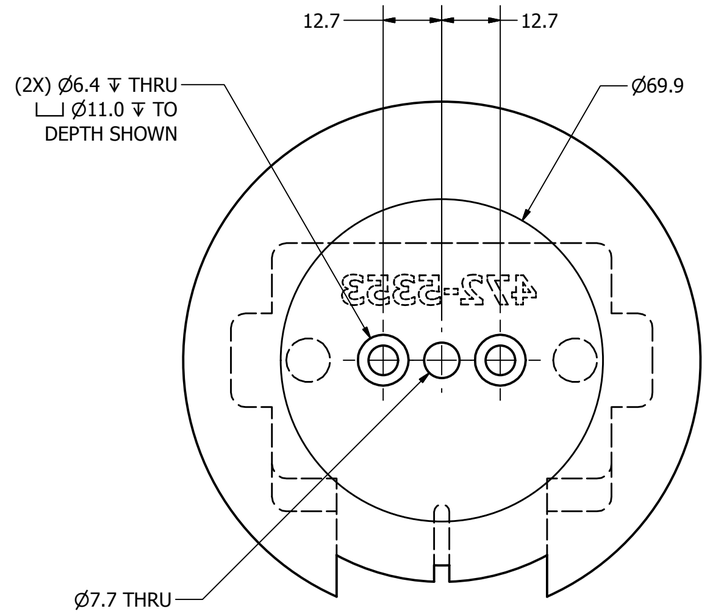
DRAWING NO.: 472-5502 — REV: B

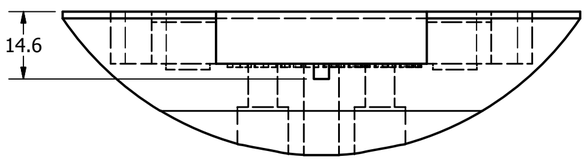
472-5502-6.ipt

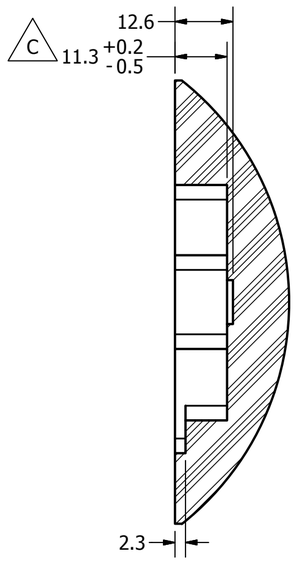
REVISION HISTORY				
REV	ZONE	DESCRIPTION	DATE	BY
A	GLOBAL	REPLACES T1KNM011, 012, 013 AND 014 FOR THOR-M	9/7/2011	KHS
B	GLOBAL	MATERIAL A WAS 37 +/- 3; MATERIAL B WAS 75 +/- 3	4/20/12	KHS
C	70812	ADDED TOLERANCE TO 11.3 mm DIMENSION	1/22/13	KHS









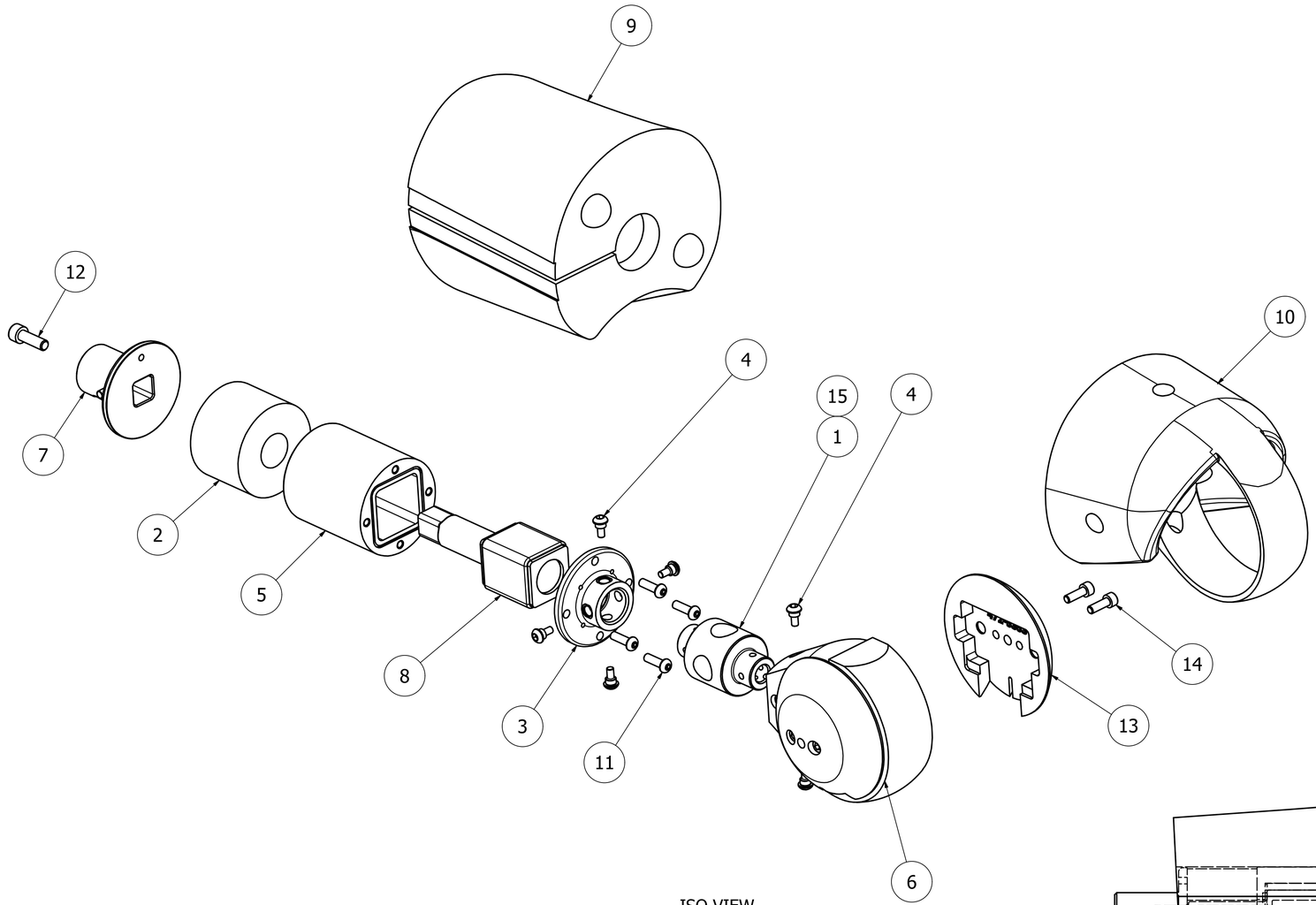


SECTION A-A

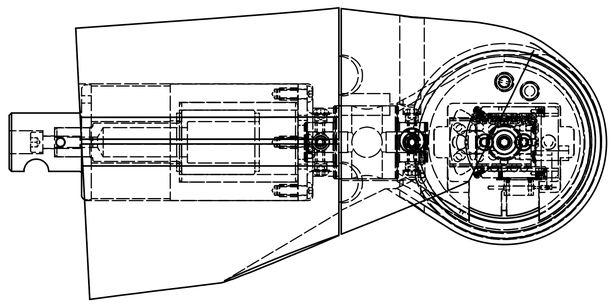
NOTE:
1. TOLERANCE ALL DIMENSIONS: ±.5 mm
(B) 2. MATERIAL A: URETHANE 37 ± 5 SHORE A
MATERIAL B: URETHANE 65 ± 5 SHORE D

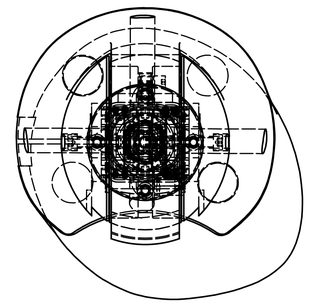
472-5600	2	DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
472-5000	2	PROJECT NO.:	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 XX ±0.2 XXX ±0.1 XXXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: KNEE COVER	
NEXT ASSEMBLY	QTY	MATERIAL: SEE NOTES	DRAWN BY: KHS DATE: 9/7/2011		
TOTAL QTY IN DUMMY	4	HEAT TREAT:	CHECKED BY: DATE:	SIZE: C SHEET 1 OF 1	DRAWING NO.: 472-5353 REV: C
		FINISH:	ENGINEER: J. WANG DATE: 1/26/2012	SCALE: 1:1	

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMM001 R0 FOR THOR-M; ADD THIGHT FLESH 472-5503-2) AND KNEE FLESH (472-5502); REMOVED FEMUR BALL JOINT ASSY (472-4800-2)	8/29/2011	TKN
	B	ADD 472-5353 AND 9005217	2/14/2012	KHS
	C	ADDED PART #SA572-S120 - FEMUR LOAD CELL (OPTIONAL)	9/3/2015	DW



ISO VIEW
SCALE 1 : 2





ITEM	QTY	PART NUMBER	DESCRIPTION
15	1	SA572-S120	FEMUR LOAD CELL (OPTIONAL)
14	4	9005217	SHCS M6 X 18 mm
13	2	472-5353	KNEE COVER
12	1	5000037	M8 X 1.25 X 25 LG. SHCS
11	4	5000438	SCREW, BHCS M6-1 X 20mm
10	1	472-5502	KNEE FLESH LEFT/RIGHT (MODIFIED)
9	1	472-5503-2	THIGH FLESH - RIGHT
8	1	472-5420	FEMUR PLUNGER ASSY.
7	1	472-5410	FEMUR BALL ATTACHMENT PLATE ASS'Y.
6	1	472-5700	KNEE CAP ASSY.,RIGHT
5	1	472-5200	FEMUR BUSHING ASSY.
4	8	W50-61042	MODIFIED BHSS M6 THREAD
3	1	472-5203	END CAP - FEMUR
2	1	472-5206	COMPRESSION ELEMENT-UPPER LEG
1	1	W50-51060	UNIVERSAL LEG L.C. STRUCTURAL REPLACEMENT

Parts List

472-5000-2	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION
PROJECT NO.:
MATERIAL:
PART TREAT:
FINISH:

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5° 1.6
X.X ± 0.1
X.XX ± 0.01
X.XXX ± 0.05
REMOVE BURRS & BREAK SHARP EDGES

DRAWN: THNAH 8/29/2011
CHECKED BY:
ENGINEER: J. WANG
DATE: 1/26/2012

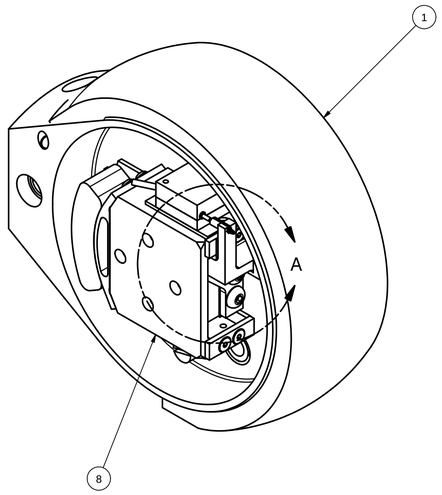
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

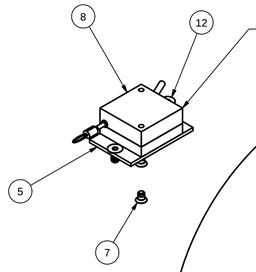
DESCRIPTION: RIGHT UPPER LEG ASSY.

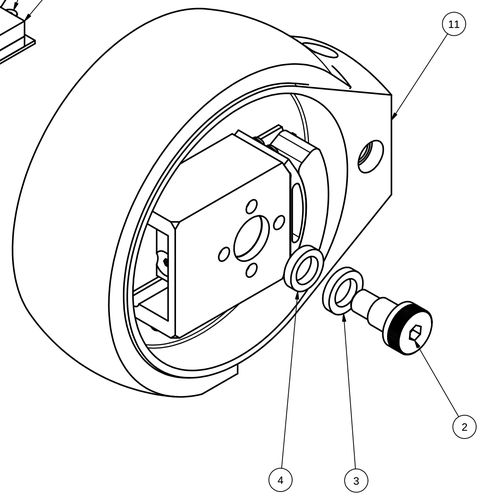
SIZE: A1 | SHEET: 1 OF 1 | SCALE: 1:2 | DRAWING NO.: 472-5100-2 | REV: C

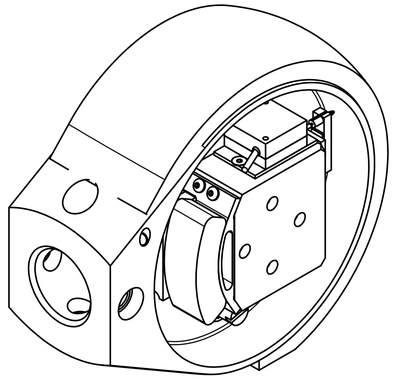
472-5100-2.iam

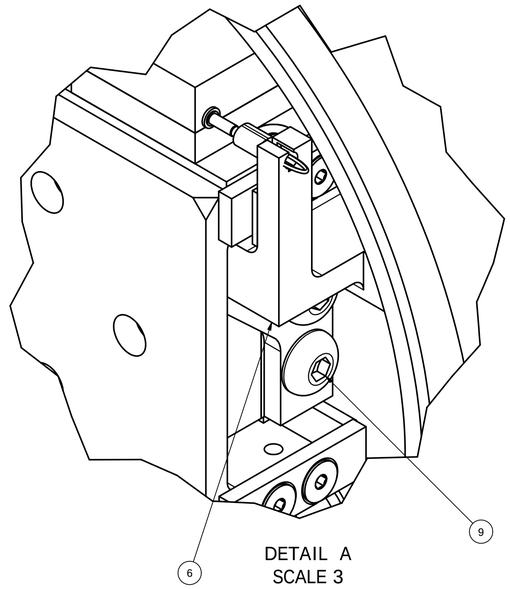
REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	REMUNBERED FROM T1FMM215 R0 AND CONVERTED TO METRIC FOR THOR-M	8/19/2011	JSJ
	B	5000723 WAS 5000595	7/19/2012	BK
	C	CORRECTED SIDE VIEWS	9/29/2015	DW



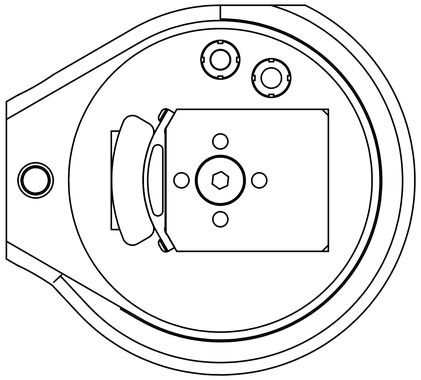




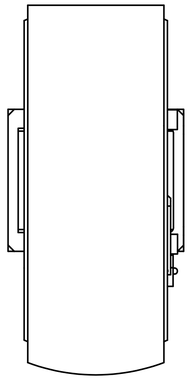


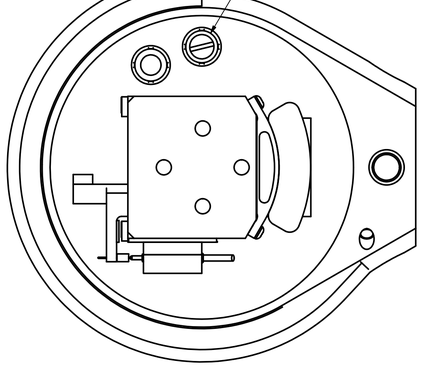


DETAIL A
SCALE 3



C





C

ITEM	QTY	PART NUMBER	DESCRIPTION
12	2	5000723	SCREW, FNCS M2.5-0.45 x 5
11	1	472-5350	KNEE CAP ASSY
10	1	472-5763	PIN, KNEE STOP
9	2	5001075	BHCS, M4 X .7 X 6
8	1	472-5310	ASS'Y, INBOARD/OUTBOARD SLIDER
7	2	9004003	SCREW, FHCS #2-56 X 1/8" PHILLIPS HEAD
6	1	472-5307	ASSEMBLY, POT STRING HOLDER (RIGHT)
5	1	472-5308	PLATE, MOUNT
4	1	472-5304	WASHER, COMPRESSION
3	1	472-5303	WASHER, SLIDING KNEE
2	1	472-5302	BOLT, SHOULDER
1	1	472-5301	KNEE FLESH INSERT-MOLDED

B

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5°
X.X ± 0.2 1.6
X.XX ± 0.1
X.XXX ± 0.01

REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PROJECT NO:			
472-5100-2	1	MATERIAL:	
NEXT ASSEMBLY	QTY	ANY HEAT:	
TOTAL QTY IN DUMMY	1	FINISH:	

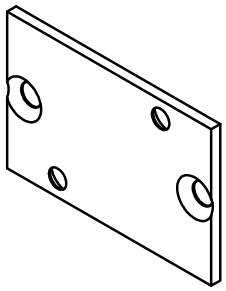
DRAWN BY: HORCHLER 8/17/2011
CHECKED BY: DATE:
ENGINEER: J. WANG DATE: 1/27/2012

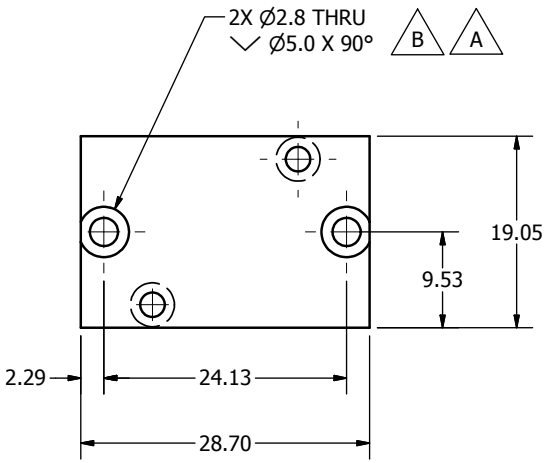
DESCRIPTION: KNEE CAP ASSY.,RIGHT

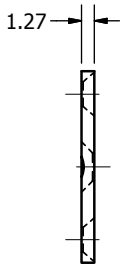
SIZE: A1 SHEET 1 OF 1
SCALE: 1:1
DRAWING NO: 472-5700
REV: C

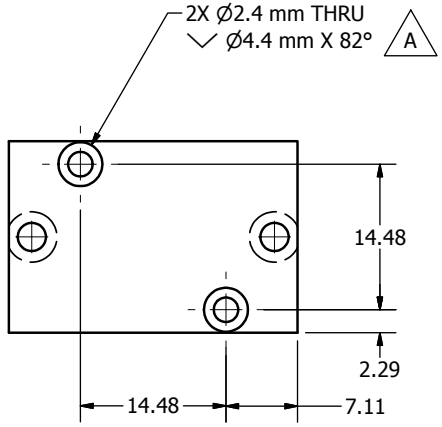
472-5700.iam

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM 880995-1638-2 REV F AND CONVERTED TO METRIC FOR THOR-M; DIMENSION Ø2.39 THRU C'SINK Ø4.39 X 90° WAS Ø2.26 ↓ THRU C'SINK Ø4.06 X 82°; Ø2.4 THRU C'SINK Ø4.4 X 82° WAS Ø2.26 ↓ THRU C'SINK Ø4.06 X 82°; FINISH WAS BLUE ANNODIZED (OPTIONAL)	8/19/2011	JSJ
	B	Ø2.8 C'SINK Ø5.0 WAS Ø2.39 C'SINK Ø4.39	7/19/2012	BK



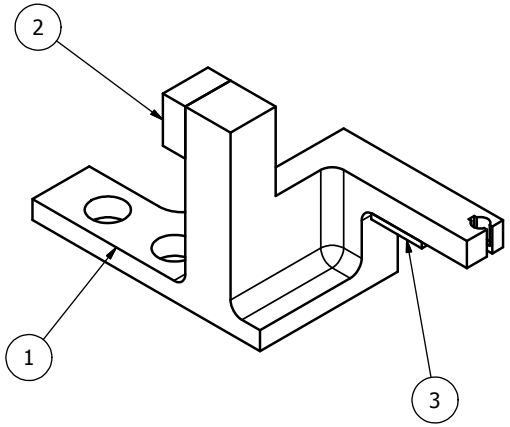


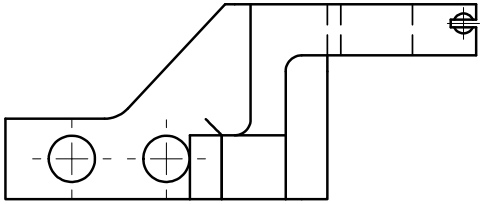


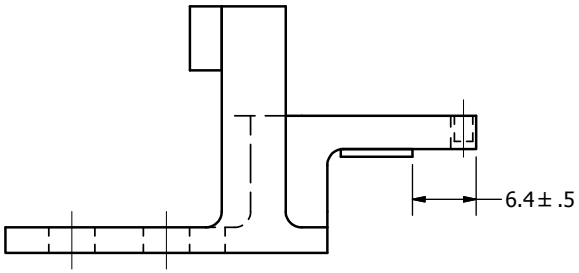


		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6		
		PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: PLATE, MOUNT	
472-5700	1	MATERIAL: Aluminum-6061-T6	DRAWN BY: KSG DATE: 8/17/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET 1 OF 1	DRAWING NO.: 472-5308 REV: B
TOTAL QTY IN DUMMY	1	FINISH: CLEAR ANODIZE	ENGINEER: J. WANG DATE: 1/27/2012	SCALE: 2:1	

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM 880995-1650-1 REV G AND CONVERTED TO METRIC FOR THOR-M; ADD NOTES 1, 2, 3, 5; ADDOR EQUIVALENT TO NOTE 4	8/19/2011	JSJ







NOTES:
BONDING INSTRUCTIONS:
1. SAND SURFACES TO BE BONDED.
2. CLEAN SURFACES WITH MEK.
3. CLEAN SURFACES WITH ALCOHOL.
4. APPLY LOCTITE 411, OR EQUIVALENT, TO ONE SURFACE.
5. PRESS PARTS TOGETHER AND APPLY PRESSURE FOR 30 SECONDS AFTER ADHESIVE BECOMES TACKY.

△A

ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	472-5736	BUMPER, RETURN STOP
2	1	472-5735	BUMPER, EXTENSION STOP
1	1	472-5737-2	HOLDER, POT STRING (RIGHT)

Parts List

472-5700	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION
PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

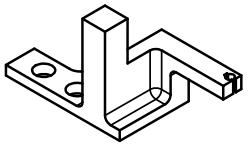
TOLERANCES
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01
ANGLES ±0.5°
FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

DRAWN BY: KSG — DATE: 8/17/2011
CHECKED BY: TMV — DATE: 9/18/2011
ENGINEER: J. WANG — DATE: 1/27/2012

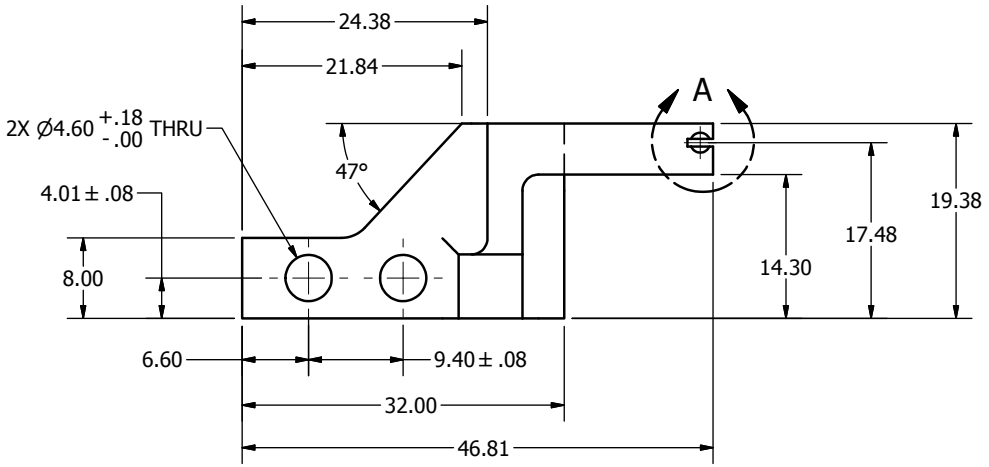
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

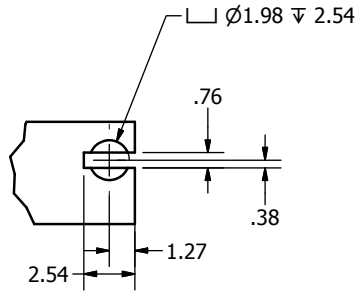
DESCRIPTION: ASSEMBLY, POT STRING HOLDER (RIGHT)
SIZE: A3 | SHEET: 1 OF 1 | SCALE: 2:1
DRAWING NO.: 472-5307 | REV: A

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM 880995-1648-2 REV G AND CONVERTED TO METRIC FOR THOR-M; FINISH WAS ELECTROLESS NICKEL PLATE .0003 MAX.	8/19/2011	JSJ

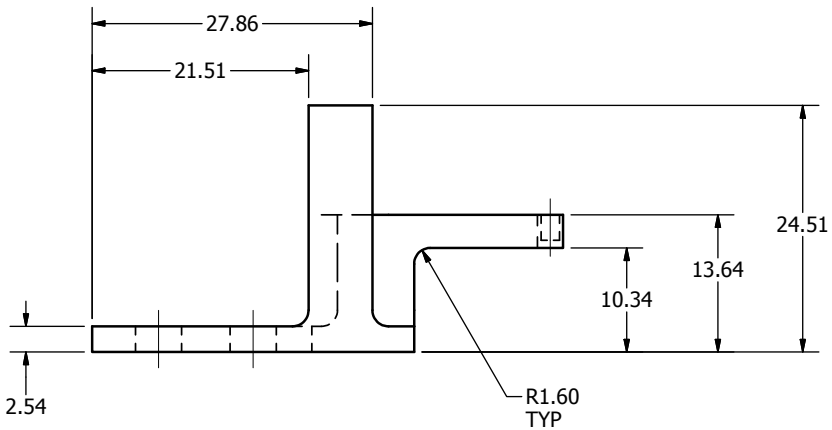


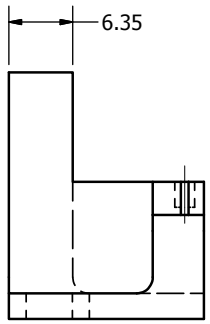
SCALE 1.000





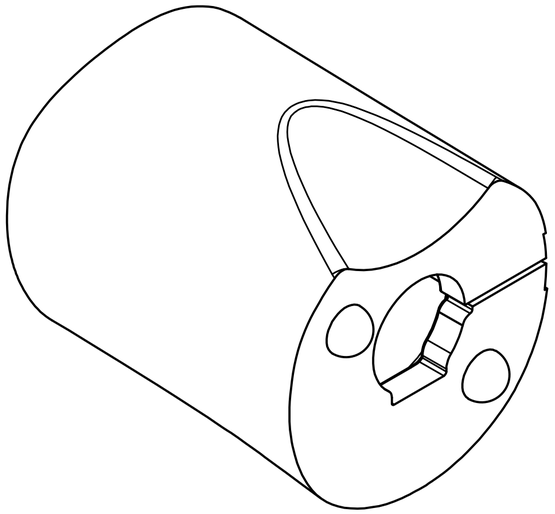
DETAIL A
SCALE 4 : 1

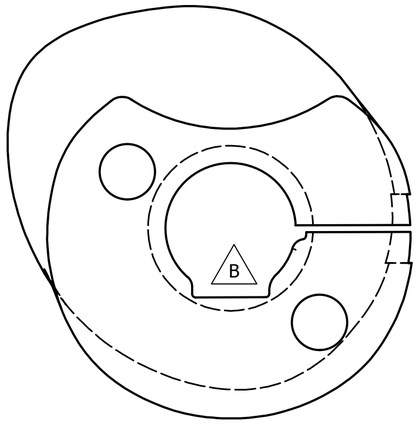


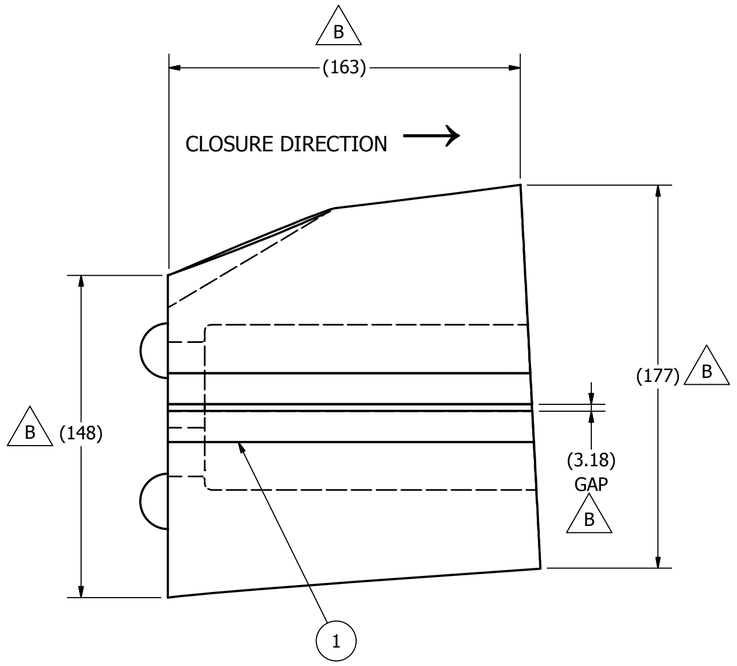


DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: HOLDER, POT STRING (RIGHT)		
PROJECT NO.:		DRAWN BY: KSG	DATE: 8/17/2011		
472-5307	1	MATERIAL: 4140 STEEL	CHECKED BY: TMV	DATE: 9/11/2011	SIZE: A3 SHEET: 1 OF 1
NEXT ASSEMBLY	QTY	HEAT TREAT: Rc 42-48	ENGINEER: J. WANG	DATE: 1/28/2012	SCALE: 2:1
TOTAL QTY IN DUMMY	1	FINISH: ELECTROLESS NICKEL PLATE .008 MAX			DRAWING NO.: 472-5737-2 REV: A

REVISION HISTORY				
ECO #	REV.	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1FMS010 R2 AND CONVERTED TO METRIC FOR THOR-M	8/22/2011	JSJ
	B	REVISED NOTES; ADDED REFERENCE DIMENSIONS AND ITEM #1 - 472-5504 - THIGH FLESH ZIPPER ASSEMBLY; ADDED NOTCH FOR INSTRUMENTATION CABLE CLEARANCE	9/15/2017	DW







B NOTES:

1. MATERIALS:

   DUROMETER: 52 ± 3 SHORE “A”

   FILLER MATERIAL IS POLYURETHANE EXPANDABLE FOAM
2. REMOVE ALL MOLD FLASHING.
3. ALL MOLD DIMENSION TOLERANCE +1%/-4%
   BUT NO SMALLER THAN 1mm
4. FEMUR SKIN IS SPLIT ALONG THE SIDE AS SHOWN AND A BONDED ZIPPER IS APPLIED ON THE OUTSIDE.
5. WEIGHT: 1.0 ± 0.05 kg.

B

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	472-5504	THIFGH FLESH ZIPPER ASSEMBLY

Parts List

472-5100-2	1	SEE NOTES
NEXT ASSEMBLY	QTY	
TOTAL QTY IN DUMMY	2	

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01; ANGLES ± 0.5°; FINISH 1.6; REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:

MATERIAL:

HEAT TREAT:

FINISH:

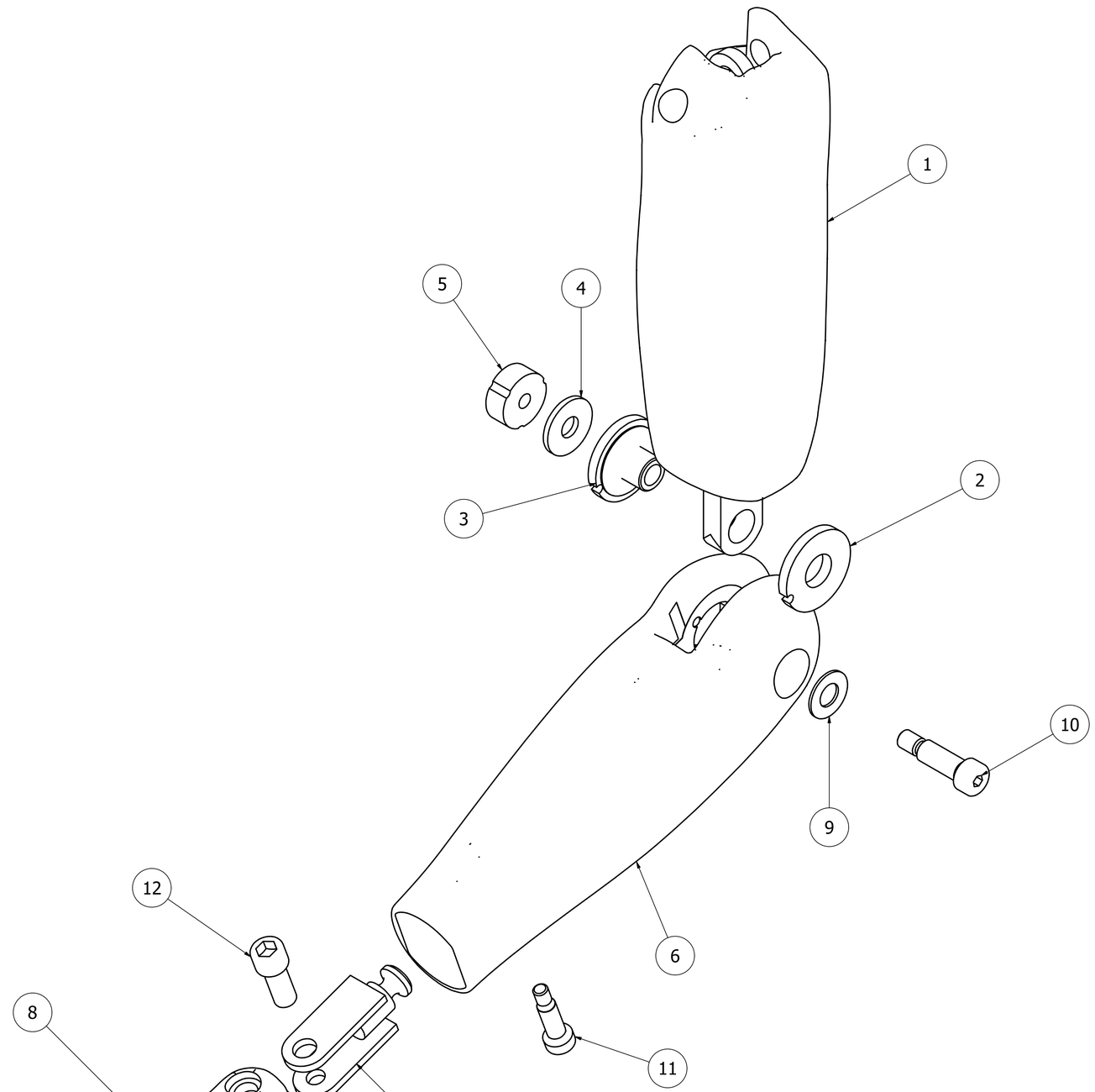
DRAWN BY: S. RICE	DATE:	8/17/2011
CHECKED BY: TMV	DATE:	9/13/2011
ENGINEER: J. WANG	DATE:	1/27/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: THIGH FLESH - RIGHT

SIZE: A2 | SHEET: 1 OF 1 | SCALE: .500 | DRAWING NO.: 472-5503-2 | REV: B

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1APM000 R2 AND CONVERTED TO METRIC FOR THOR-M	10/5/2011	TKN
	B	ITEM #1 PART NUMBER AXAMM000 - SD3 UPPER HUMERUS ASSEMBLY WAS 472-6120 - UPPER ARM ASSEMBLY, MOLDED; REMOVED PART NUMBER 472-6300 - STRUCTURAL ASS'Y. UPPER ARM LOWER PART THOR-M AND PART NUMBER 5000857 - M10 x 35 LG. SHSS	3/24/2014	DW
	C	472-6200 WAS AXAMM000 AND DESCRIPTION WAS "SD3 UPPER HUMERUS ASSEMBLY"	9/15/2014	DW



ITEM	QTY	PART NUMBER	DESCRIPTION
12	1	5000441	M12 X 1.75 X 30 LG. SHCS
11	1	5000492	M10 X 25 LG. SHSS
10	1	5000506	M12 X 30 LG. SHSS
9	1	9001260	WASHER, 1.06 OD x .53 ID x .06 THK.
8	1	472-6900-1	HAND ASM MOLDED, LEFT
7	1	472-6700	LOWER WRIST ROTATION ASSY.
6	1	472-6520	LOWER ARM MOLDED
5	1	472-6610	NUT - ELBOW PIVOT
4	1	472-6950	WASHER-SHOULDER JOINT SPRING
3	1	472-6590	BUSHING, UPPER ARM AND ELBOW PIVOT
2	1	472-6600	WASHER - UPPER ARM & ELBOW PIVOT
C 1	1	472-6200	UPPER HUMERUS ASSEMBLY

PARTS LIST

DO NOT SCALE DRAWING

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. X ±0.5 ±0.02 ±1°; XX ±0.1 ±0.01; XXX ±0.05; REMOVE BURRS & BREAK SHARP EDGES

THIRD ANGLE PROJECTION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

472-0000	1	PROJECT NO.:	
NEXT ASSEMBLY	QTY	MATERIAL:	
TOTAL QTY IN DUMMY	1	HEAT TREAT:	
		FINISH:	

DRAWN: Dave Walker 10/5/2011
PROVED BY:
ENGINEER: J. WANG DATE: 1/28/2012

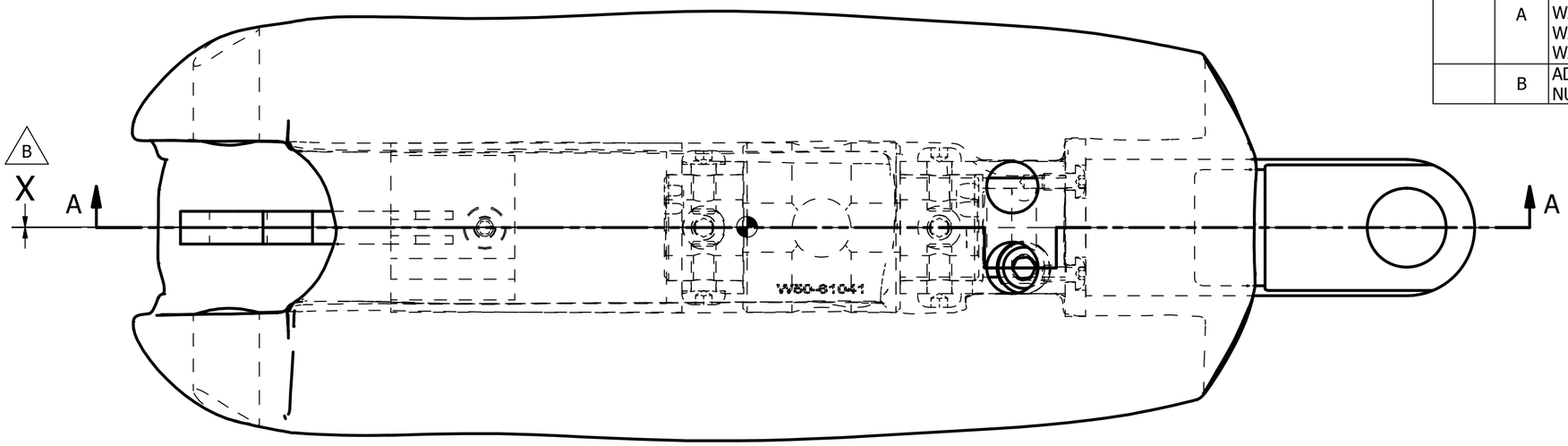
COMMENTS: LEFT ARM ASSEMBLY THOR-50M

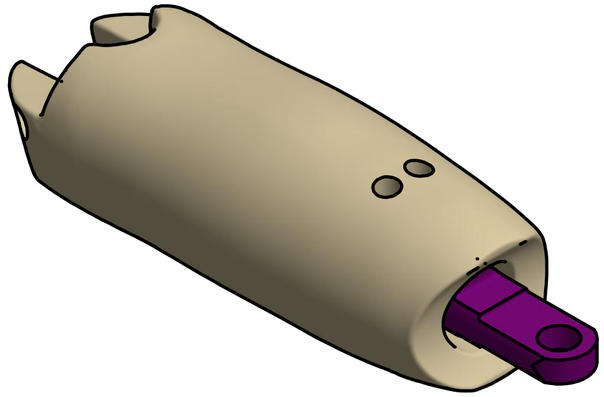
SIZE A1 SHEET 1 of 1 SCALE: 3:4

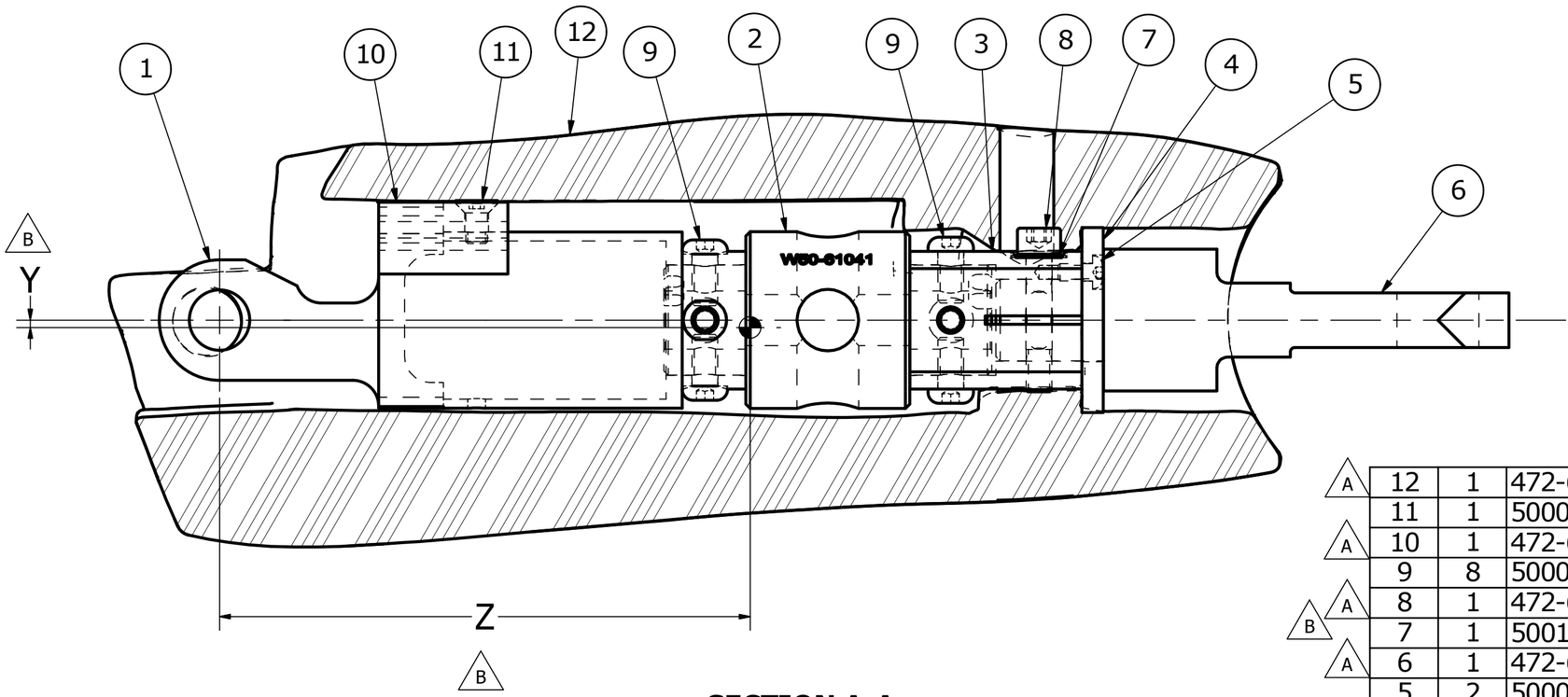
DRAWING NO.: 472-6000-1 REV: C

Left Arm Assembly.iam

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXAMM000, TITLE WAS "SD3 UPPER HUMERUS ASSEMBLY", IN PARTS LIST 472-6210 WAS AXAMM010, 472-6220 WAS AXAMM001, 472-6230 WAS AXAMM002, 472-6240 WAS AXAMM003, 472-6250 WAS AXAMM014, 472-6260 & 472-6270 WAS AXAMM004	9/15/2014	DW
	B	ADDED C.G. DIMENSIONS AND NOTES; ITEM #7 PART NUMBER WAS 5001176V	9/18/2017	DW







SECTION A-A
SCALE 1 : 1

Please note that portions of these drawings are covered by U.S. Patent Nos. 9,514,659 and 9,799,234, assigned to Humanetics Innovative Solutions, Inc. (Humanetics) of Plymouth, Michigan, USA.

B

NOTES:

1. ALL OF THE PARTS AND ASSEMBLIES LISTED ARE TO BE INCLUDED IN THE WEIGHT AND C.G. DETERMINATION.
2. REFER TO DRAWING 472-0000 SHT. 5 OF 5 FOR C.G. AND WEIGHT SPECIFICATIONS.
3. THE C.G. ORIGIN IS THE BOTTOM OF THE REAR ATTACHMENT PLATE AND THE COORDINATE SYSTEM IS ORIENTATED WITH THE "Z" DIMENSION PERPENDICULAR TO THE BOTTOM OF THE REAR ATTACHMENT PLATE.

	ITEM	QTY	PART NUMBER	DESCRIPTION
A	12	1	472-6270	UPPER ARM FLESH
	11	1	5000084	SCREW, FHCS M5 x 0.8 x 10
A	10	1	472-6260	ARM FLESH SPACER
	9	8	5000356	SCREW, BHCS M6 x 1 x 12
A	8	1	472-6250	SCREW, SHCS, M6 (MODIFIED)
B	7	1	5001170V	SPRING DISC WASHER, 12.5 x 6.2 x 0.5
A	6	1	472-6240	UPPER ARM, LOWER SECTION
	5	2	5000103	SCREW, BHCS M4 x 0.7 x 8
A	4	1	472-6230	ARM END PLATE
A	3	1	472-6220	LOWER LOADCELL INTERFACE
	2	1	W50-61041	STRUCTURAL REPLACEMENT
A	1	1	472-6210	UPPER HUMERUS WELDMENT

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5 X.X ±.2 X.XX ±.1 ANGLES: ±.5 MACHINED:
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/12/2013
CHECKED	
ENG	
APPROVED	

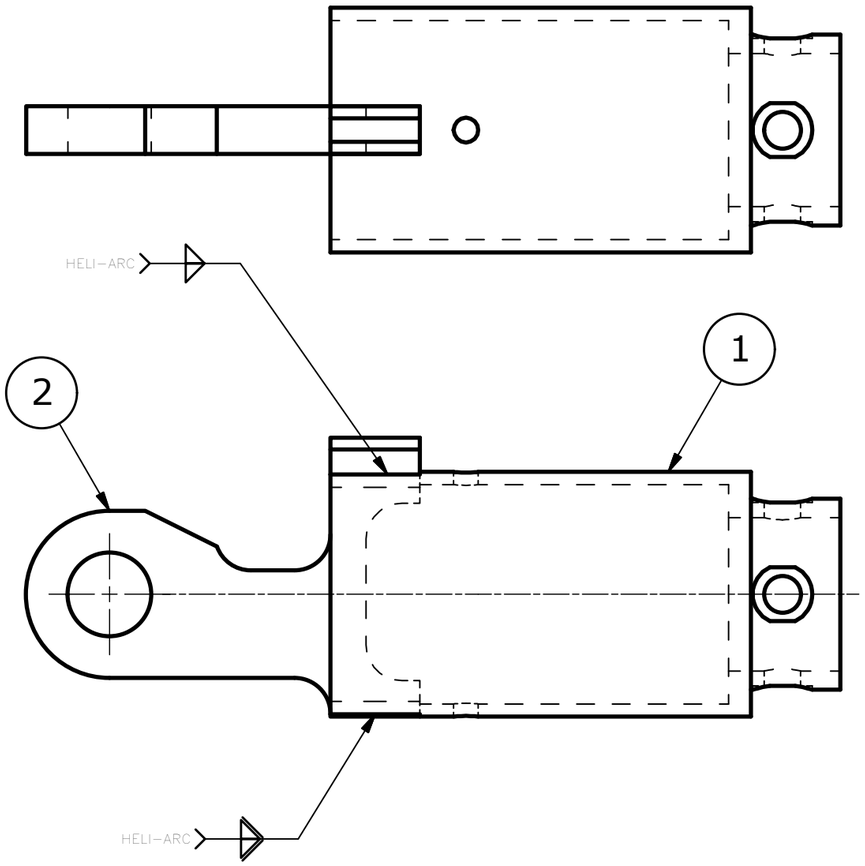
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

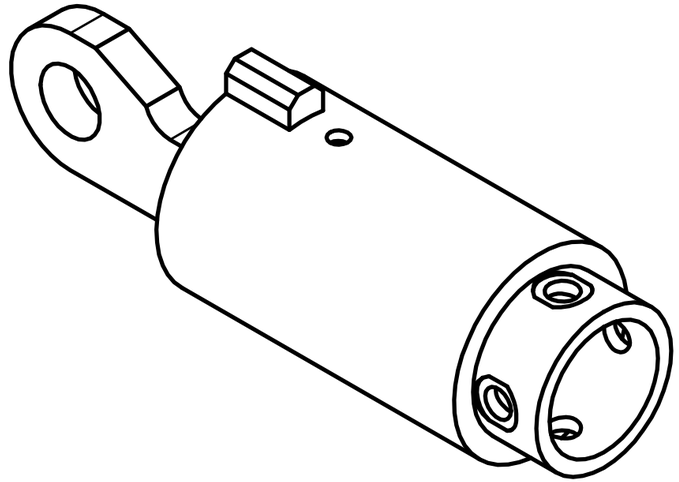
UPPER HUMERUS ASSEMBLY

SIZE C | DRAWING NUMBER 472-6200 | REV B
SCALE: 1:1 | SHEET 1 OF 1

Upper Humerus Complete Assy.iam

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXAMM010, IN PARTS LIST 472-6211 WAS AXAMM012, 472-6212 WAS AXAMM011	9/15/2014	DW





ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-6212	UPPER ARM MOUNT
1	1	472-6211	UPPER ARM TUBE

PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
ANGLES: ±.5
MACHINED: 1.6
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Steel, Mild, Welded
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/20/2013
CHECKED	
ENG	
APPROVED	

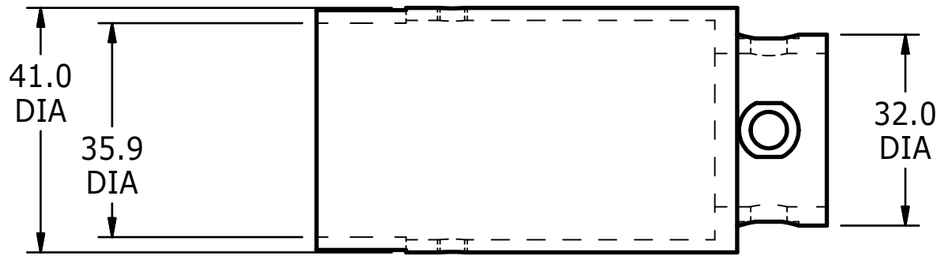
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

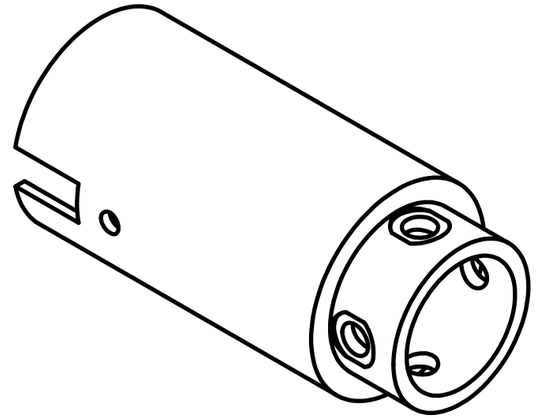
UPPER HUMERUS WELDMENT

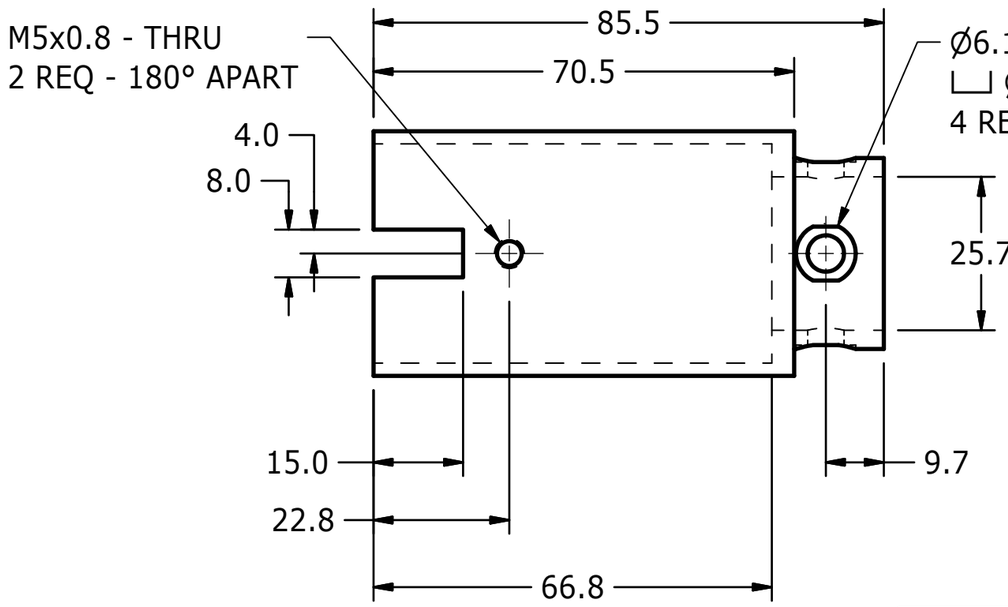
SIZE: B | DRAWING NUMBER: 472-6210 | REV: A
SCALE: 1:1 | SHEET: 1 OF 1

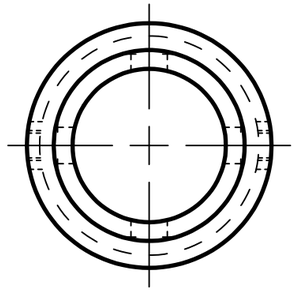
Upper Humerus Assy.iam

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	DESI
	A	DRAWING NUMBER WAS AXAMM012	9/15/2014	DW









UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	1018 STEEL
HEAT TREAT	
FINISH	

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/20/2013
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

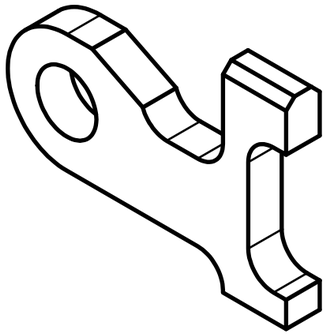
UPPER ARM TUBE

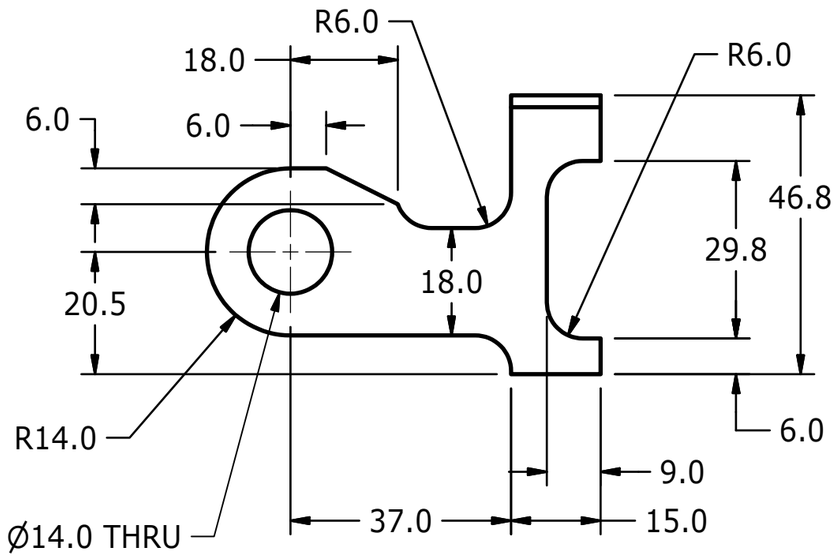
SIZE	DRAWING NUMBER	REV
B	472–6211	A

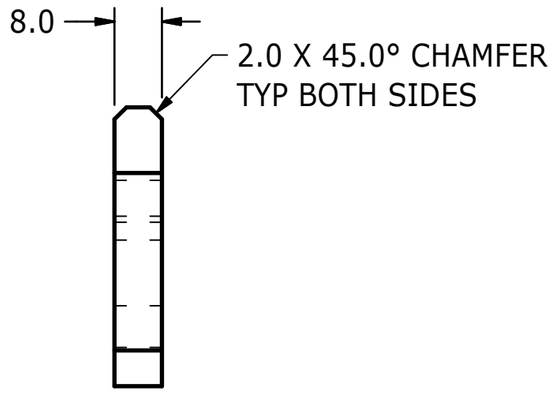
SCALE: 1:1 SHEET 1 OF 1

Upper ArmTube-Sept 2015 DRAFT.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXAMM011	9/15/2014	DW







UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
ANGLES: ±.5
MACHINED: 1.6

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	1018 STEEL
HEAT TREAT	
FINISH	

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/20/2013
CHECKED	
ENG	
APPROVED	

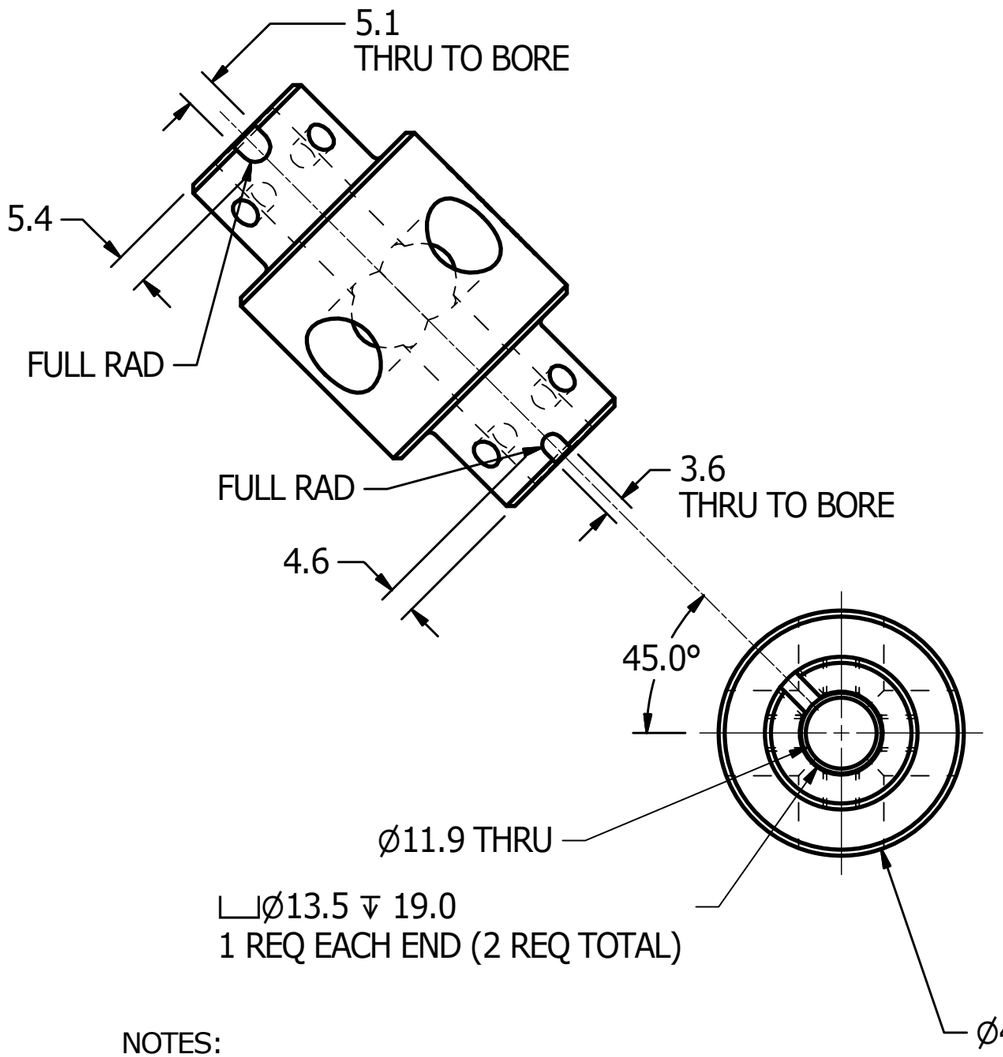
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

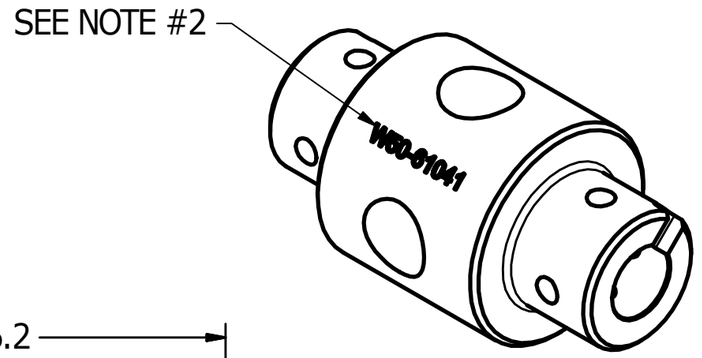
UPPER ARM MOUNT

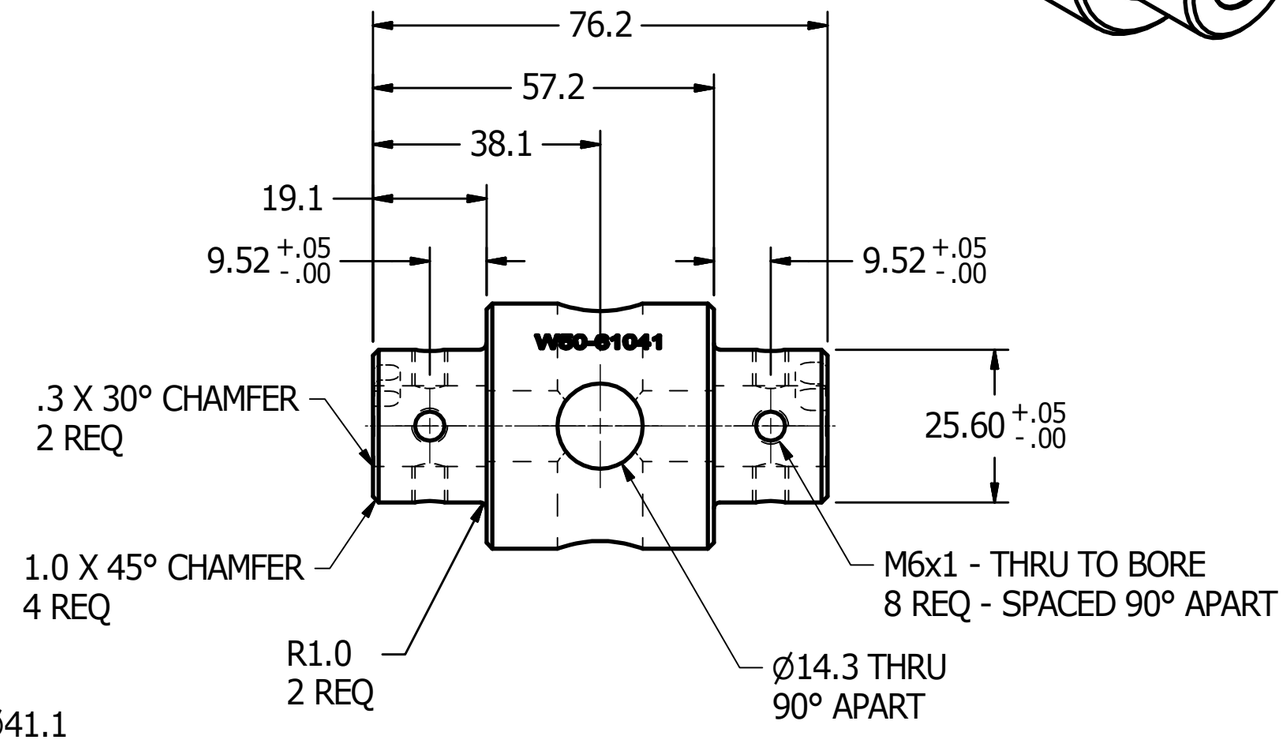
SIZE	DRAWING NUMBER	REV
B	472-6212	A

SCALE: 1:1 SHEET 1 OF 1

Upper Arm Mount-Sept 2015 DRAFT.ipt







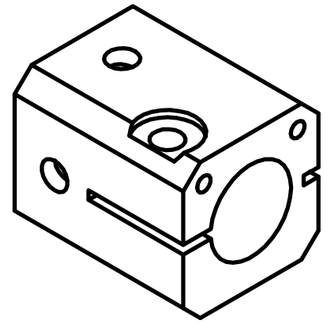
NOTES:

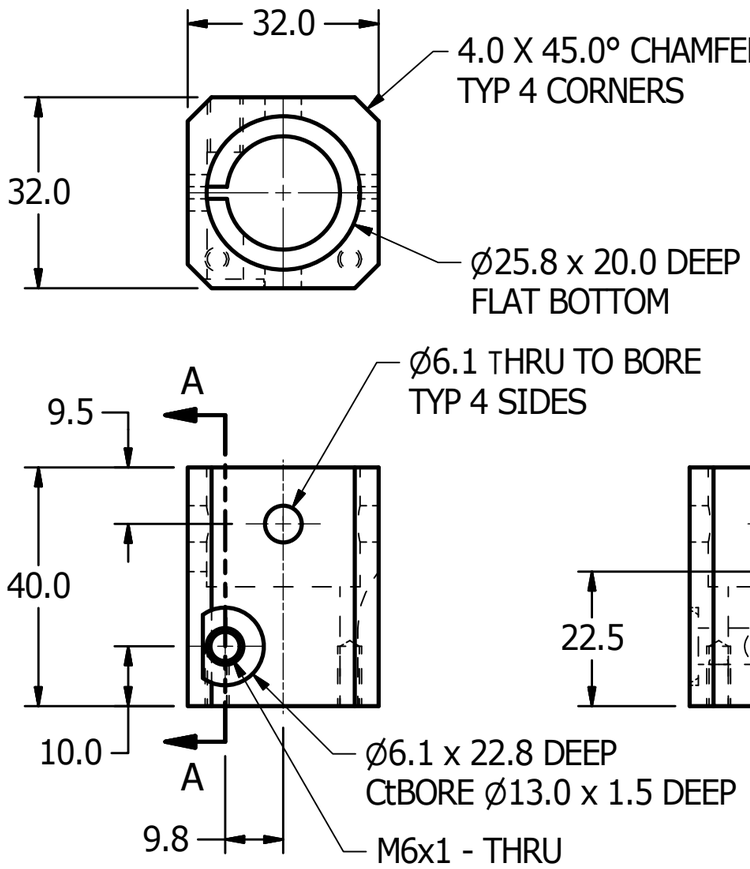
1. REMOVE BURRS AND BREAK SHARP EDGES
2. STAMP OR ETCH PART NUMBER AS SHOWN
3. NICKEL PLATE .012 MAX. AFTER MACHINING
4. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH

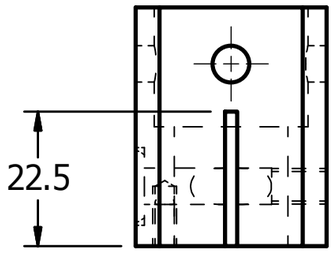
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; ANGLES: ±.5; MACHINED: 1.6	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ASME Y14.5M - 1994 DO NOT SCALE DRAWING	APPROVALS	DATE	STRUCTURAL REPLACEMENT LEG LOAD CELL
	DRAWN JIM CLEVENGER	12/4/2013	
	CHECKED		
MATERIAL Steel	ENG		SIZE B; DRAWING NUMBER W50–61041; REV
HEAT TREAT	APPROVED		
FINISH NICKEL PLATE			SCALE: ; SHEET 1 OF 1

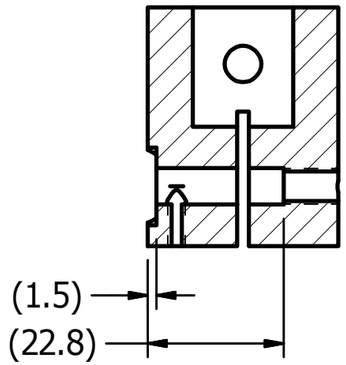
W50-61041.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXAMM001	9/15/2014	DW

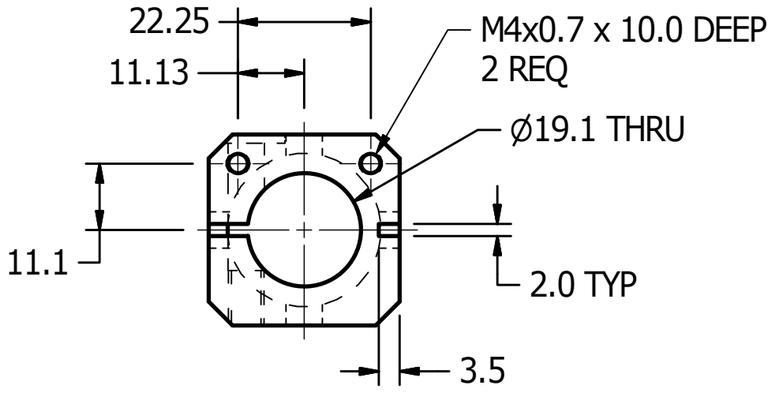








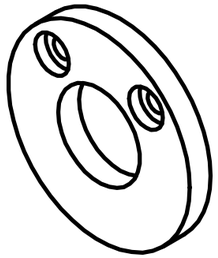
SECTION A–A
SCALE 1 : 1

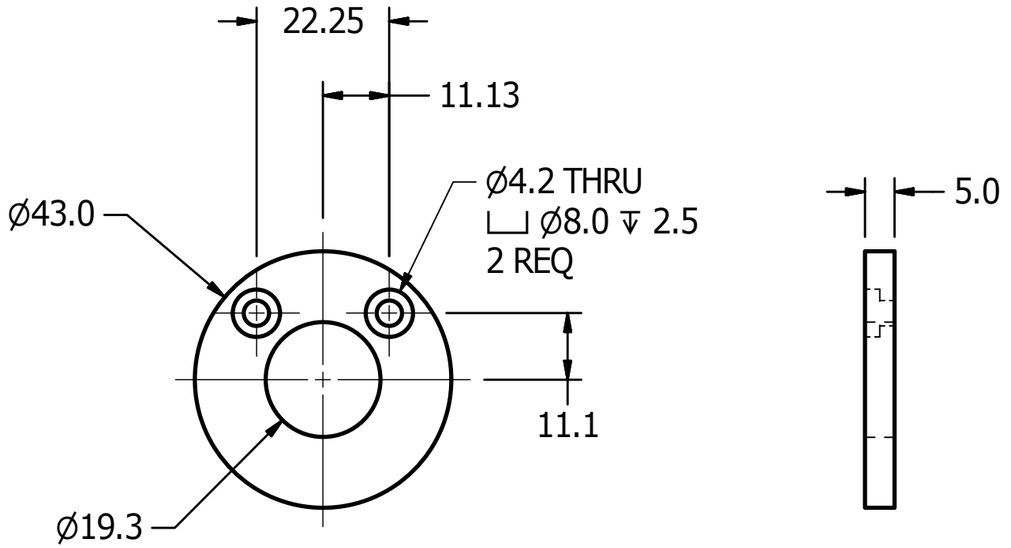


UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; ANGLES: ±.5; MACHINED: 1.6 ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	LOWER LOADCELL INTERFACE
	DRAWN JIM CLEVENGER 8/20/2013	
	CHECKED	
MATERIAL Aluminum 6061	ENG	SIZE B; DRAWING NUMBER 472-6220; REV A
HEAT TREAT	APPROVED	SCALE: 1:1; SHEET 1 OF 1
FINISH ANODIZE		

Loadcell Interface Lower.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXAMM002	9/15/2014	DW





UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Aluminum 6061
HEAT TREAT:
FINISH: ANODIZE

***V**EHICLE **R**ESEARCH and **T**EST **C**ENTER*

APPROVALS	DATE
DRAWN: JIM CLEVENGER	8/20/2013
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

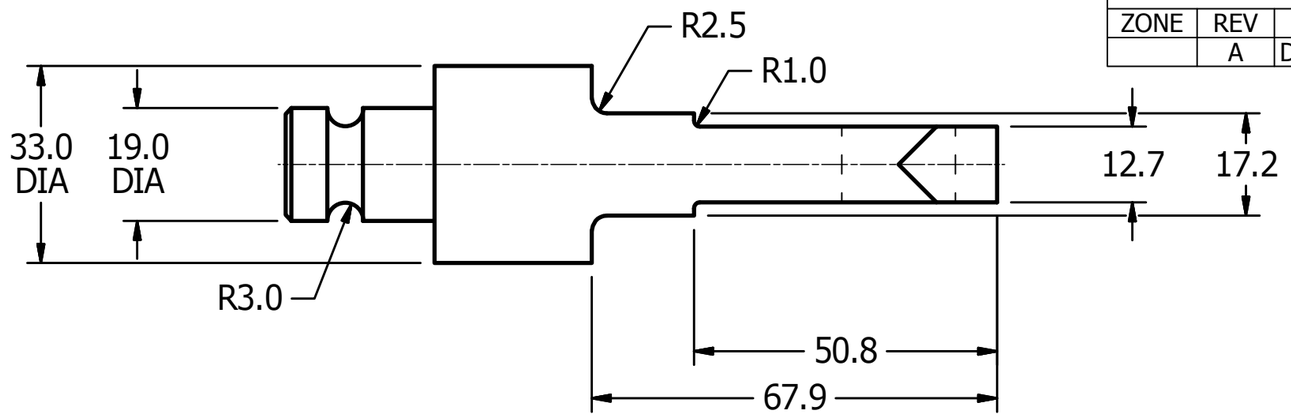
ARM END PLATE

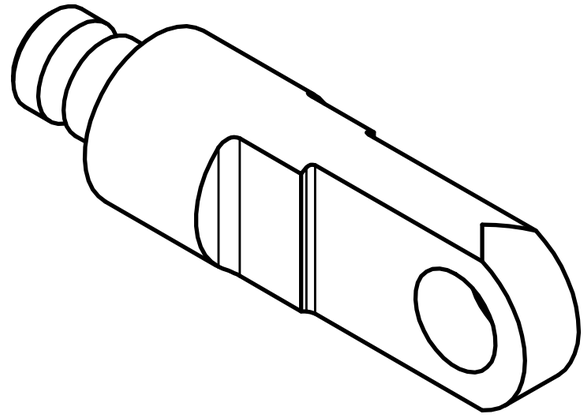
SIZE	DRAWING NUMBER	REV
B	472-6230	A

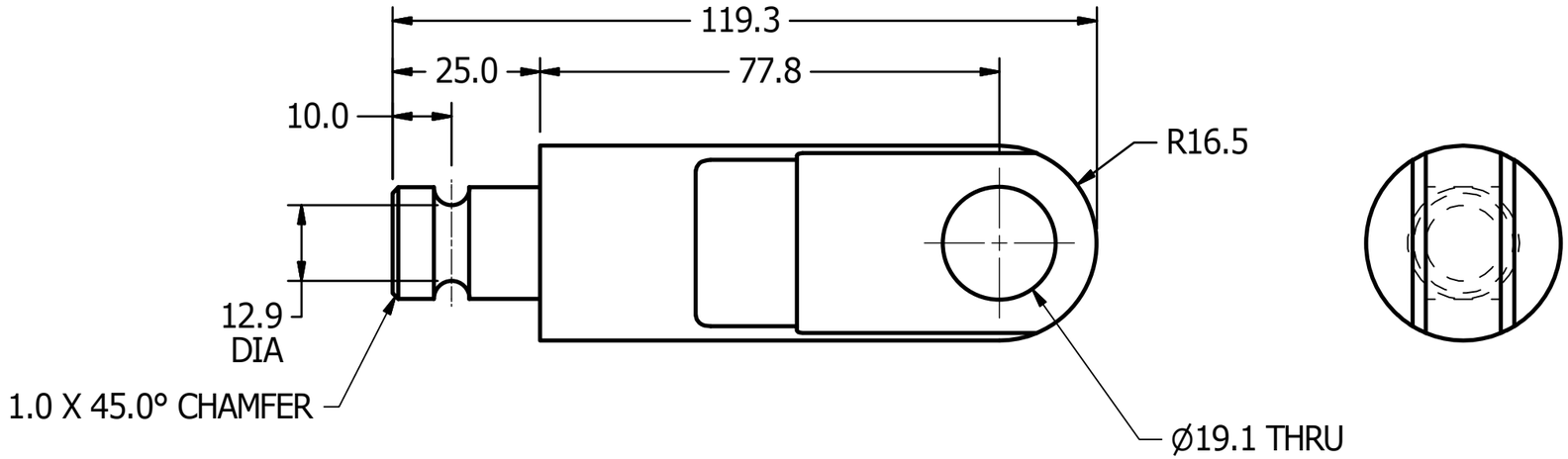
SCALE: 1:1 SHEET 1 OF 1

End Plate, Arm.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXAMM003	9/15/2014	DW



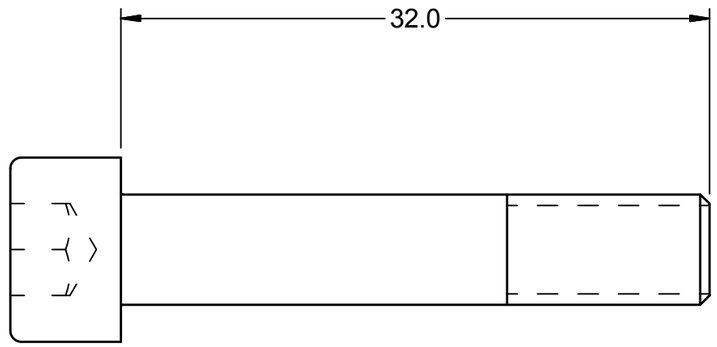




UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; ANGLES: ±.5; MACHINED: 1.6 ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
	APPROVALS	DATE	UPPER ARM, LOWER SECTION	
	DRAWN JIM CLEVENGER	8/20/2013		
	CHECKED			
MATERIAL Aluminum 6061	ENG			
HEAT TREAT	APPROVED			
FINISH ANODIZE			SIZE B / DRAWING NUMBER 472-6240 / REV A	
			SCALE: 1:1	SHEET 1 OF 1

Upper Arm Lower Section.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXAMM014	9/15/2014	DW



NOTE:

1. MAKE FROM PART # 5000016V SCREW, SHCS M6-1 x 45 mm.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5°
X.X ±.2
X.XX ±.1
X.XXX ±.01
ASME Y14.5M – 1994
DO NOT SCALE DRAWING

MATERIAL: Steel, Mild
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: Dave Walker	3/24/2014
CHECKED:	
ENG:	
APPROVED:	

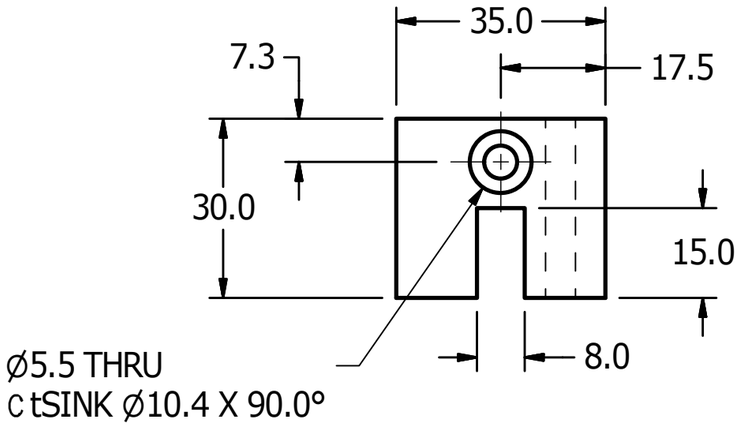
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

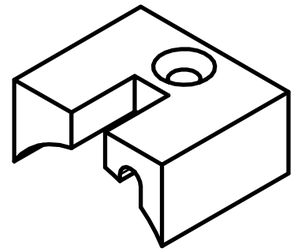
SCREW, SHCS, M6 (MODIFIED)

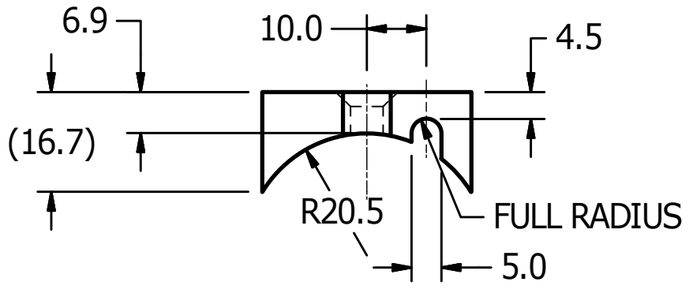
SIZE: A3 | DRAWING NUMBER: 472-6250 | REV: A
SCALE: 3:1 | SHEET: 1 OF 1

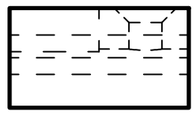
Modified M6.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXAMM005	9/15/2014	DW









UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5
X.X ±.2
X.XX ±.1

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Acetal Resin, Black
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/20/2013
CHECKED	
ENG	
APPROVED	

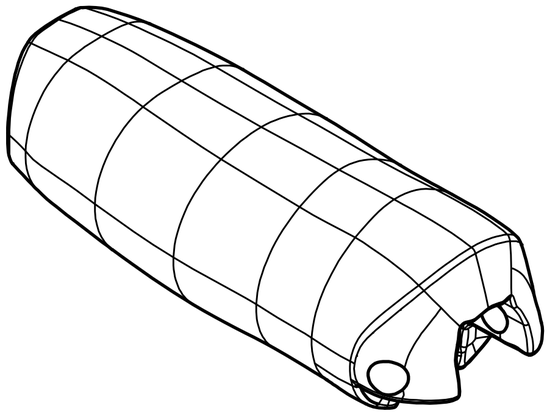
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

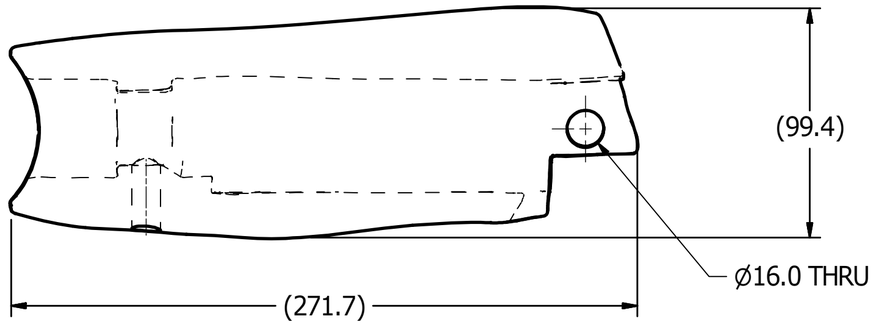
ARM FLESH SPACER

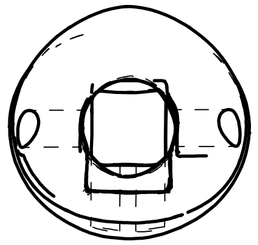
SIZE: B | DRAWING NUMBER: 472-6260 | REV: A
SCALE: 1:1 | SHEET: 1 OF 1

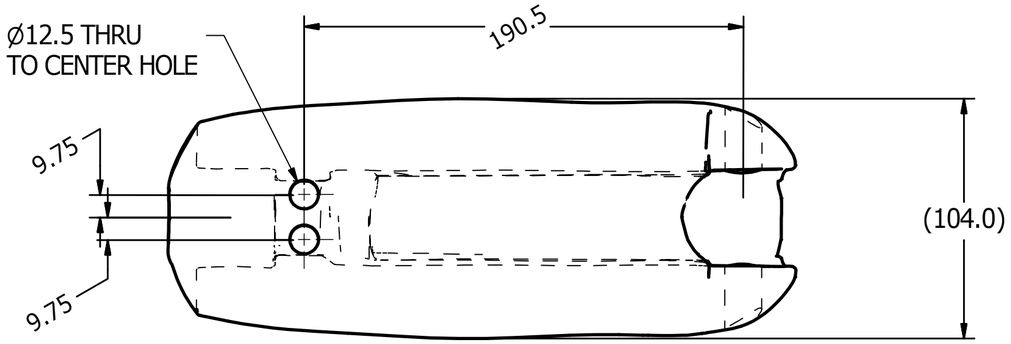
Arm Flesh Spacer.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING NUMBER WAS AXAMM004	9/15/2014	DW









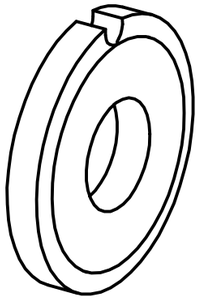
NOTE:

A 3-D FILE IS AVAILIBLE
FOR REFERENCE FROM NHTSA

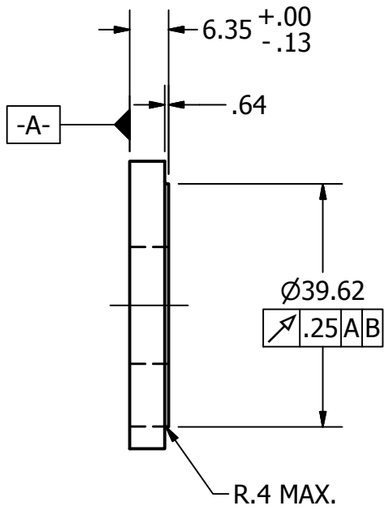
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; ANGLES: ±.5; MACHINED: 16 ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	UPPER ARM FLESH
	DRAWN JIM CLEVENGER	10/29/2013	
	CHECKED		
MATERIAL Polystyrene	ENG		SIZE C; DRAWING NUMBER 472-6270; REV A
HEAT TREAT	APPROVED		SCALE: 1/2; SHEET 1 OF 1
FINISH			

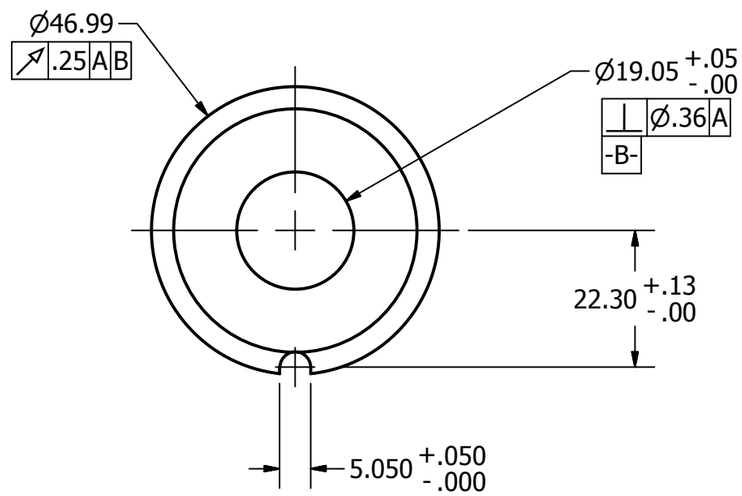
Arm Flesh.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REFERENCE DWG #7805-200 AND CONVERTED TO METRIC FOR THOR-M	9/30/2011	TKN



ISO VIEW
SCALE 1 : 1





472-6000-2	1	PROJECT NO.:			
472-6000-1	1	MATERIAL: Delrin, White	DRAWN BY: Thanh	DATE: 9/30/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/30/2012	

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5' 1.6
X.X ± 0.2
X.XX ± 0.1
X.XXX ± 0.01
REMOVE BURRS & BREAK SHARP EDGES

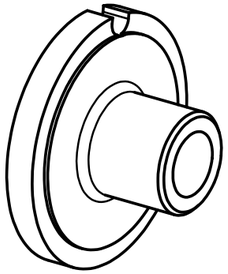
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION:
WASHER - UPPER ARM & ELBOW PIVOT
THOR-50M

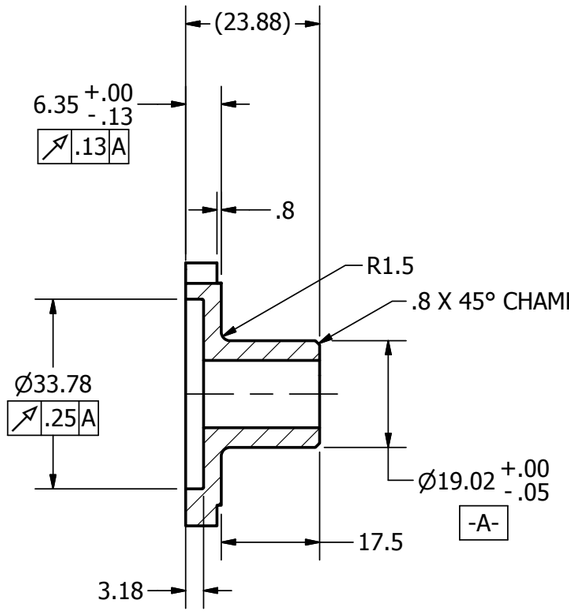
SIZE: A3 | SHEET 1 OF 1 | DRAWING NO.: 472-6600 | REV: A
SCALE: FULL

472-6600.ipt

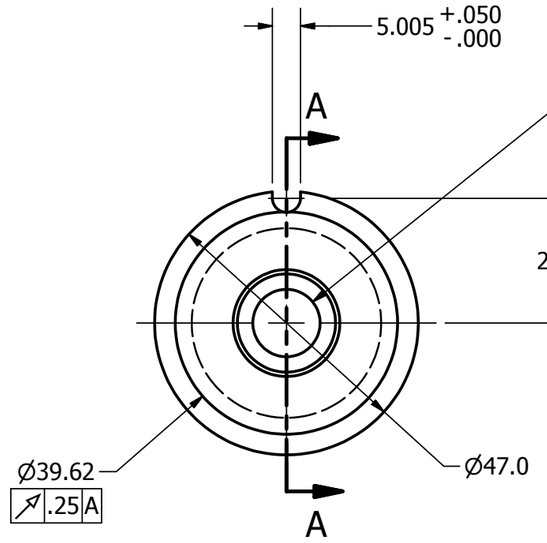
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REFERENCE DWG #78051-199 AND CONVERTED TO METRIC FOR THOR-M	9/30/2011	TKN



ISO VIEW
SCALE 1 : 1



SECTION A-A
SCALE 1 : 1

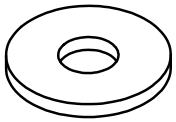


NOTES:

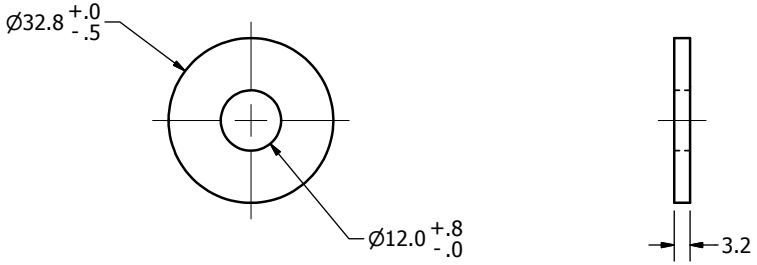
1. MATERIAL: DELRIN 500 ACETAL RESIN ® DUPONT

472-6000-2	1	DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
472-6000-1	1	PROJECT NO.:	DRAWN BY: Thanh	DATE: 9/30/2011	DESCRIPTION: BUSHING, ELBOW PIVOT
NEXT ASSEMBLY	QTY	MATERIAL: SEE NOTES	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 — DRAWING NO.: 472-6590 — REV: A
TOTAL QTY IN DUMMY	2	HEAT TREAT:	ENGINEER: J. WANG	DATE: 1/30/2012	SCALE: FULL
		FINISH:			

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REFERENCE DWG #78051-249 AND CONVERTED TO METRIC FOR THOR-M	10/4/2011	TKN

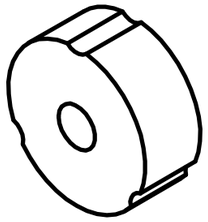


ISO VIEW
SCALE 1 : 1

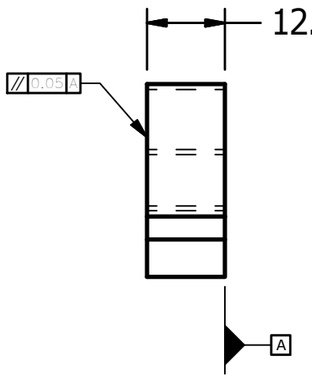


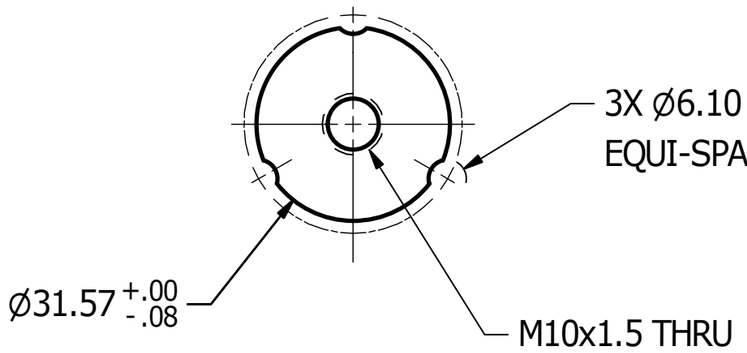
472-6000-2	1	DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
472-6000-1	1	THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: WASHER-SHOULDER JOINT SPRING	
NEXT ASSEMBLY	QTY	PROJECT NO.:	DRAWN BY: Thanh DATE: 10/4/2011		
TOTAL QTY IN DUMMY	2	MATERIAL: URETHANE 95A	CHECKED BY: DATE:	SIZE: A3 SHEET 1 OF 1	DRAWING NO.: 472-6950 REV: A
		HEAT TREAT:	ENGINEER: J. WANG DATE: 1/30/2012	SCALE: FULL	
		FINISH:			

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	REFERENCE DWG #78051-202 AND CONVERTED TO METRIC FOR THOR-M	10/4/2011	TKN



ISO VIEW
SCALE 1 : 1





UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL:	MACHINED
X ±.5	1.6
X.X ±.2	ANGLES
X.XX ±.1	±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	Thanh	10/4/2011
CHECKED		
ENG	J. WANG	1/30/2012
APPROVED		

MATERIAL: 303 STAINLESS STEEL
HEAT TREAT:
FINISH:

NUT - ELBOW PIVOT

THOR-50M

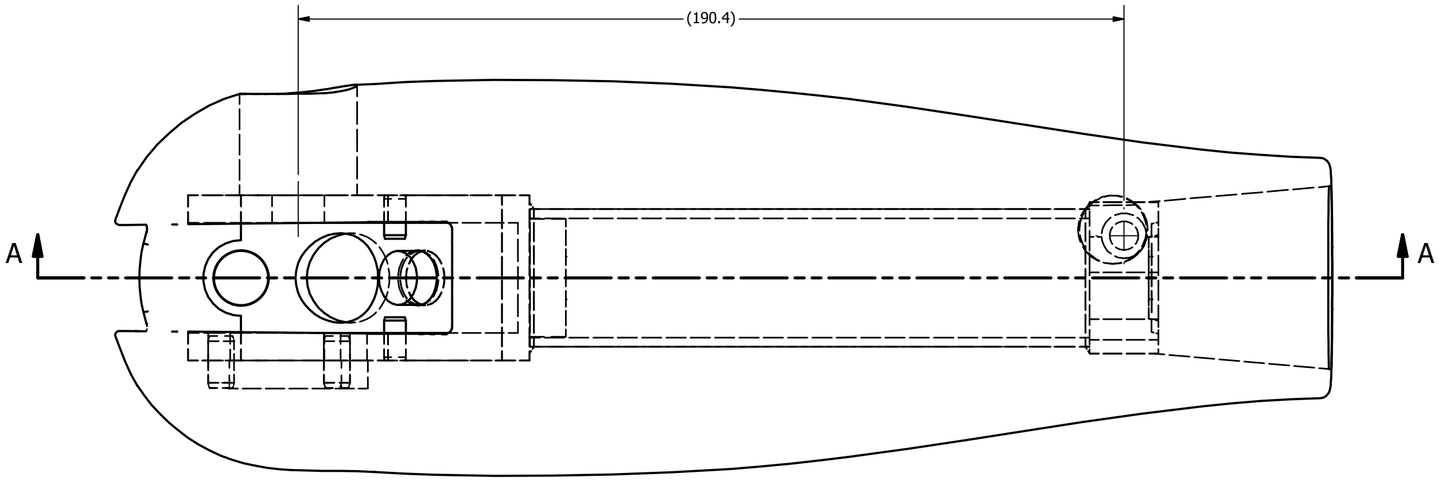
THIRD ANGLE PROJECTION

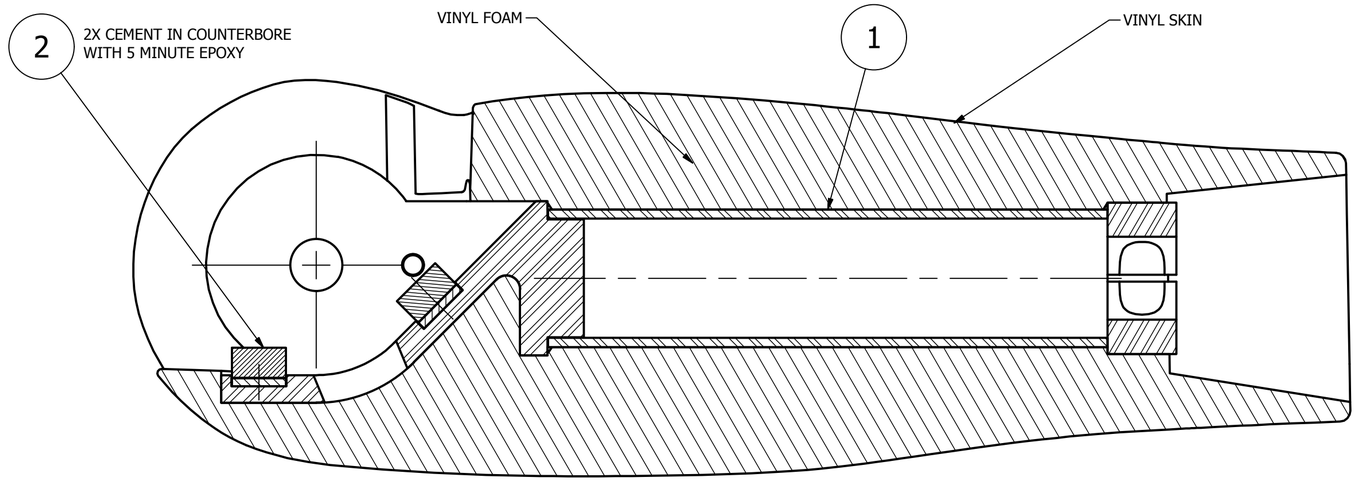
SIZE	DRAWING NUMBER	REV
A3	472-6610	A

SCALE: 1 : 1
SHEET 1 OF 1

472-6610.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REFERENCE DWG #78051-194 AND CONVERTED TO METRIC FOR THOR-M	10/3/2011	TKN





SECTION A-A
SCALE 1 : 1

NOTES:

1. PART WEIGHT: 1.29 Kg ± .05 Kg (2.85 LBS ± .10 LBS)

ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	472-6570	STOP ASM-LOWER ARM
1	1	472-6530	STRUCTURAL ASSY. LOWER ARM - UPPER PART

PARTS LIST

472-6000-2	1
472-6000-1	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	2

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01
ANGLES ±0.5°
FINISH 1.6

REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:
DRAWN BY: Thanh — DATE: 10/3/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/30/2012

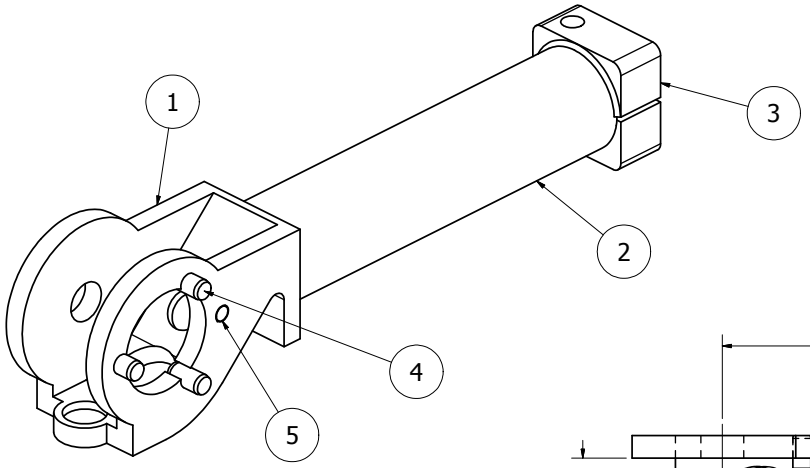
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: LOWER ARM MOLDED

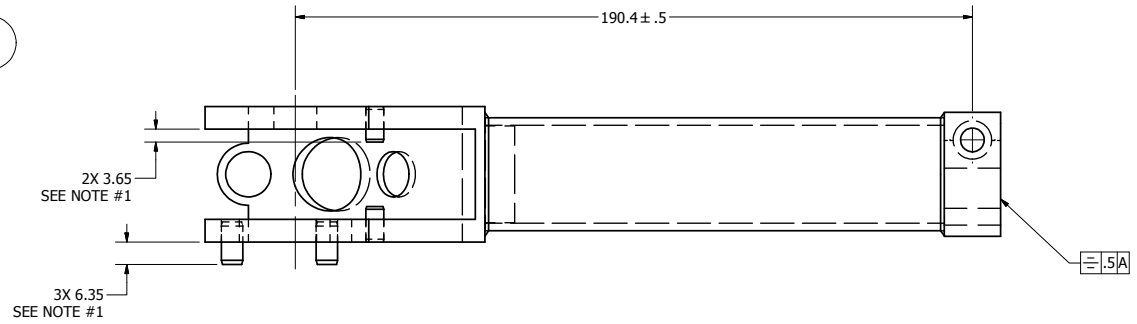
SIZE: A2 | SHEET 1 OF 1 | SCALE: FULL | DRAWING NO.: 472-6520 | REV: A

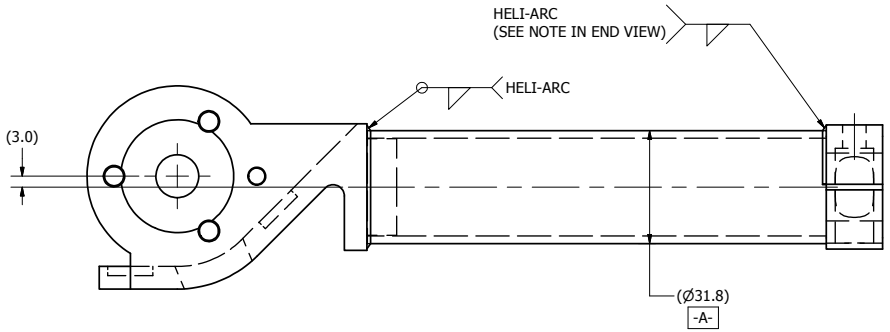
472-6520.iam

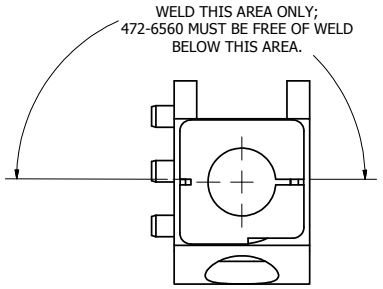
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REFERENCE DWG #78051-195 AND CONVERTED TO METRIC FOR THOR-M	10/3/2011	TKN



ISO VIEW
SCALE 1 : 1







NOTES:

1. INSTALL DOWEL PINS AFTER NICKEL PLATE.

ITEM	QTY	PART NUMBER	DESCRIPTION
5	2	5000280	M5 X 10 LG. DOWEL PIN
4	3	5000433	M6 X 12 LG. DOWEL PIN
3	1	472-6560	CLAMP - WRIST ROTATION
2	1	472-6550	TUBE - LOWER ARM
1	1	472-6540	ELBOW YOKE

PARTS LIST

472-6520	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	2

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6

REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:

MATERIAL: ELECTROLESS NICKEL PLATE .008 MAX.

HEAT TREAT:

WEIGHT:

DRAWN BY: Thanh — DATE: 10/3/2011

CHECKED BY:

ENGINEER: J. WANG — DATE: 1/30/2012

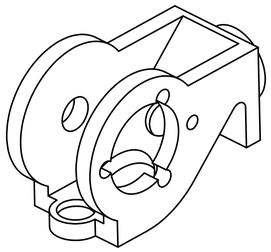
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: STRUCTURAL ASSY. LOWER ARM - UPPER PART

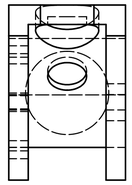
SIZE: A2 — SHEET 1 OF 1 — SCALE: FULL

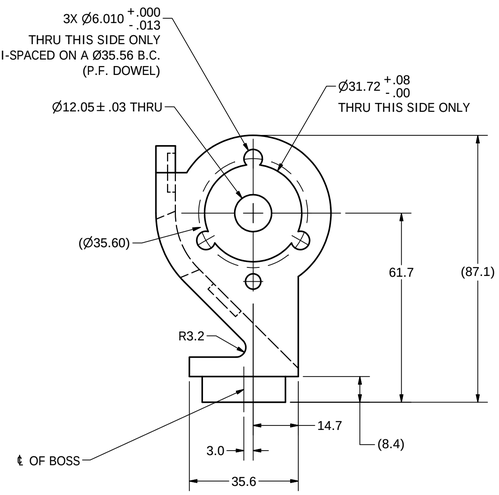
DRAWING NO.: 472-6530 — REV: A

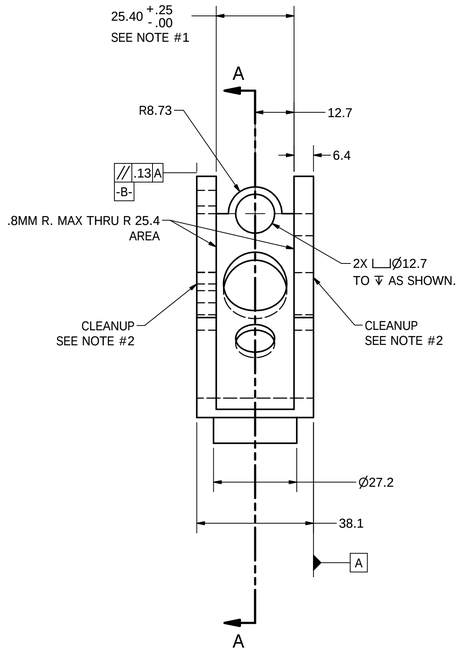
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REFERENCE DWG# 78051-138 AND CONVERTED TO METRIC FOR THOR-M	9/30/2011	TKN

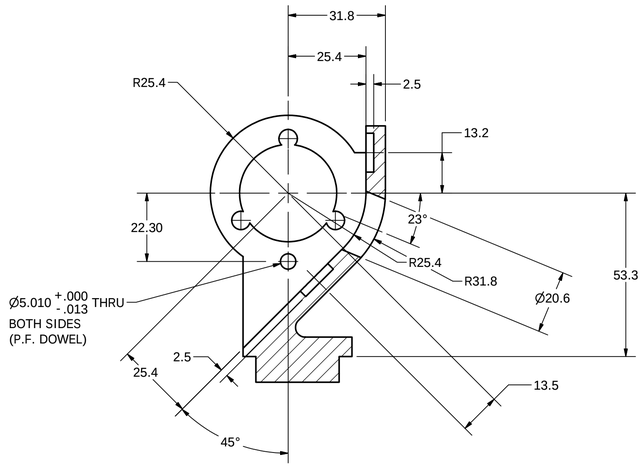


ISO VIEW
SCALE 1 : 1









SECTION A-A
SCALE 1 : 1

NOTES:

1. PART MAY REQUIRE STRAIGHTENING TO MEET 25.4 +.25/-.00 DIM BEFORE MACHINING.
2. FIRST MACHINE OPERATION.

		DO NOT SCALE DRAWING	TOLERANCES
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±1 ± 1° X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES
		PROJECT NO:	
472-6530	1	MATERIAL: 1018 STEEL	DRAWN BY: Thanh DATE: 9/30/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG DATE: 1/30/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

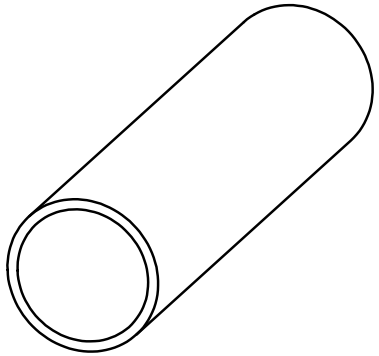
DESCRIPTION: ELBOW YOKE

SIZE: A | SHEET: 1 OF 1 | DRAWING NO.: 472-6540 | REV: A

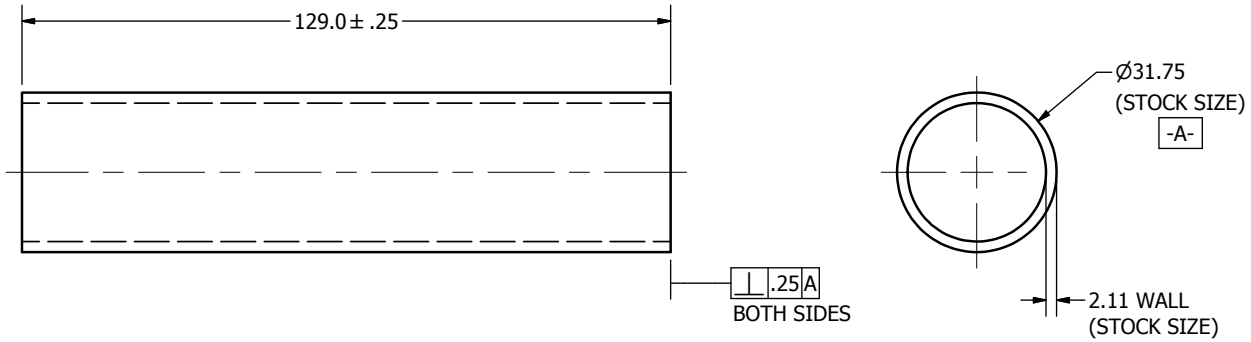
DATA: FULL

472-6540-Sept 2015 DRAFT.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REFERENCE DWG# 78051-196 AND CONVERTED TO METRIC FOR THOR-M	10/3/2011	TKN



ISO VIEW
SCALE 1 : 1

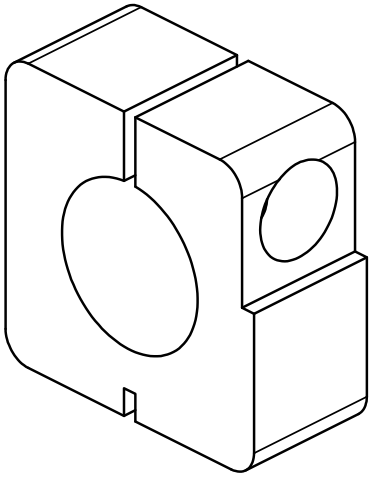


NOTES:

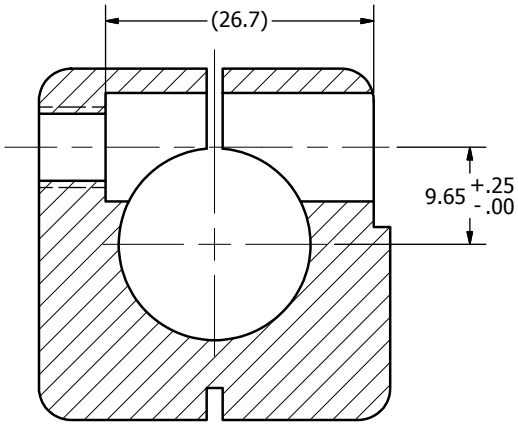
1. MATERIAL: SEAMLESS STEEL MECHANICAL TUBING SAE 1018.
   (Ø1¼" 14 ga. WALL)

		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6	DESCRIPTION: TUBE - LOWER ARM	
		PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES		
472-6530	1	MATERIAL: SEE NOTE	DRAWN BY: Thanh DATE: 10/3/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A3 SHEET 1 OF 1	DRAWING NO.: 472-6550 REV: A
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG DATE: 1/30/2012	SCALE: FULL	

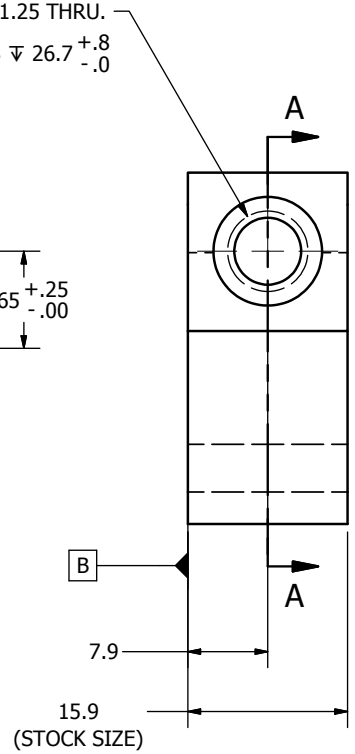
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REFERENCE DWG #78051-197 AND CONVERTED TO METRIC FOR THOR-M	10/3/2011	TKN

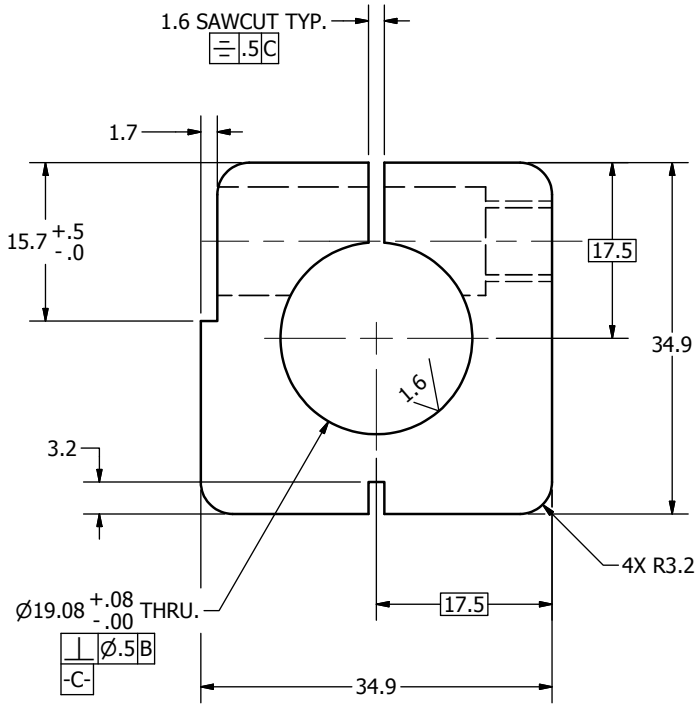


ISO VIEW
SCALE 2:1



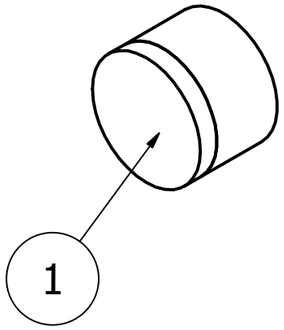
SECTION A-A
SCALE 2:1



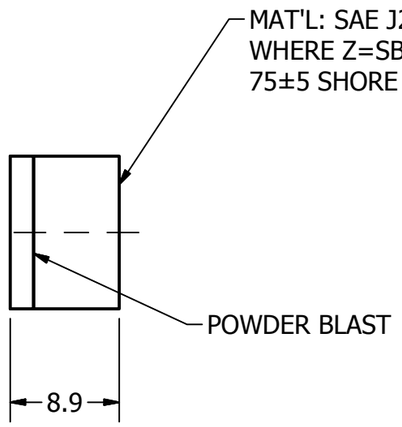


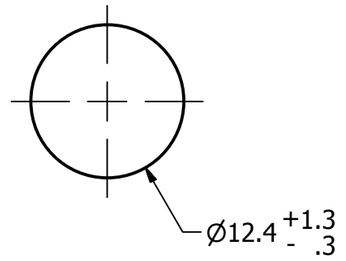
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES			
PROJECT NO.:			DESCRIPTION: CLAMP - WRIST ROTATION		
472-6530	1	MATERIAL: 1018 STEEL	DRAWN BY: Thanh	DATE: 10/3/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/30/2012	SCALE: 2:1 DRAWING NO.: 472-6560 REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REFERENCE DWG #78051-198 AND CONVERTED TO METRIC FOR THOR-M	10/5/2011	TKN



ISO VIEW
SCALE 2:1





ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	472-6580	STOP, BACKING, LOWER ARM

PARTS LIST

472-6520	2
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	4

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5° 1.6
X.X ± 0.2
X.XX ± 0.1
X.XXX ± 0.01
REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

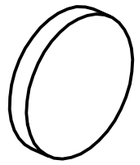
DRAWN BY: Thanh — DATE: 10/5/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/30/2012

DESCRIPTION:
STOP ASM-LOWER ARM
THOR-50M

SIZE: A3 | SHEET 1 OF 1 | DRAWING NO.: 472-6570 | REV: A
SCALE: 2:1

472-6570.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REFERENCE DWG #78051-321 AND CONVERTED TO METRIC FOR THOR-M	10/5/2011	TKN
70563	B	ADD PLATE FINISH TO SATIN FLASH CHROME .008mm MAX THICKNESS.	01/29/2013	AB



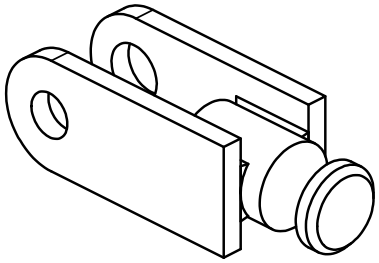
ISO VIEW
SCALE 2:1

NOTE:
1. SATIN FLASH CHROME .008mm MAX AFTER MACHINING.

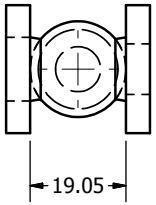
		PROJECT NO.:	DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
472-6570	1	MATERIAL: 1018 STEEL	DRAWN BY: Thanh	DATE: 10/5/2011	DESCRIPTION: STOP, BACKING, LOWER ARM
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 / SHEET: 1 OF 1 / DRAWING NO.: 472-6580 / REV: B
TOTAL QTY IN DUMMY	4	FINISH: SEE NOTES	ENGINEER: J. WANG	DATE: 1/30/2012	SCALE: 2:1

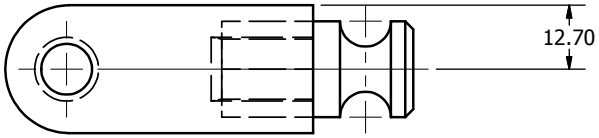
472-6580.ipt

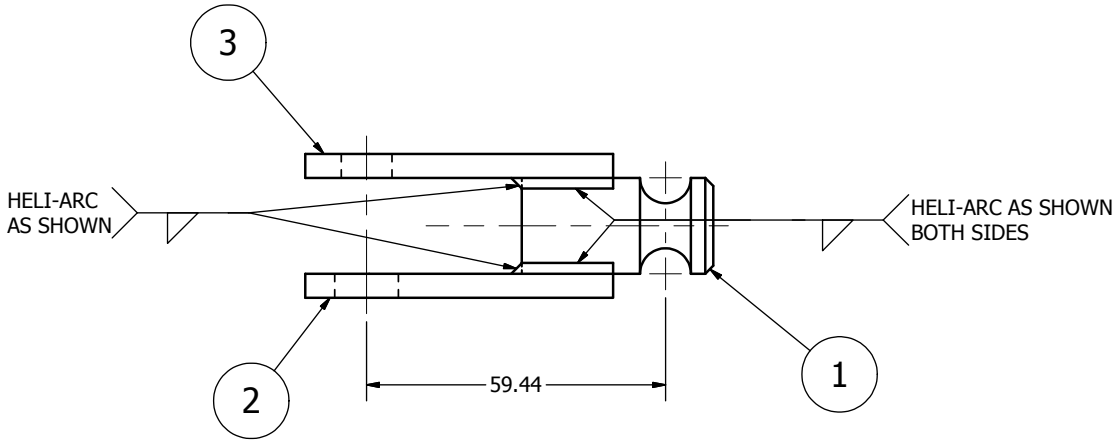
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REFERENCE DWG #78051-204 AND CONVERTED TO METRIC FOR THOR-M	10/4/2011	TKN



ISO VIEW
SCALE 1 : 1







ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	472-6720	LUG - WRIST, LOWER
2	1	472-6710	LUG - WRIST, UPPER
1	1	472-6730	SHAFT - WRIST ROTATION

PARTS LIST

472-6000-2	1
472-6000-1	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	2

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION
PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH: ELECTROLESS NICKEL PLATE .008 MAX.

TOLERANCES
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01
ANGLES ±0.5°
FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

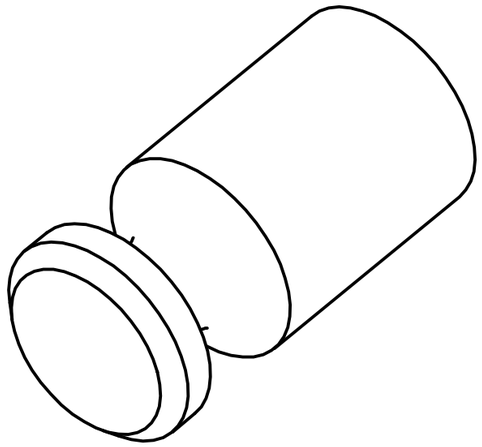
DRAWN BY: Thanh — DATE: 10/4/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/30/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

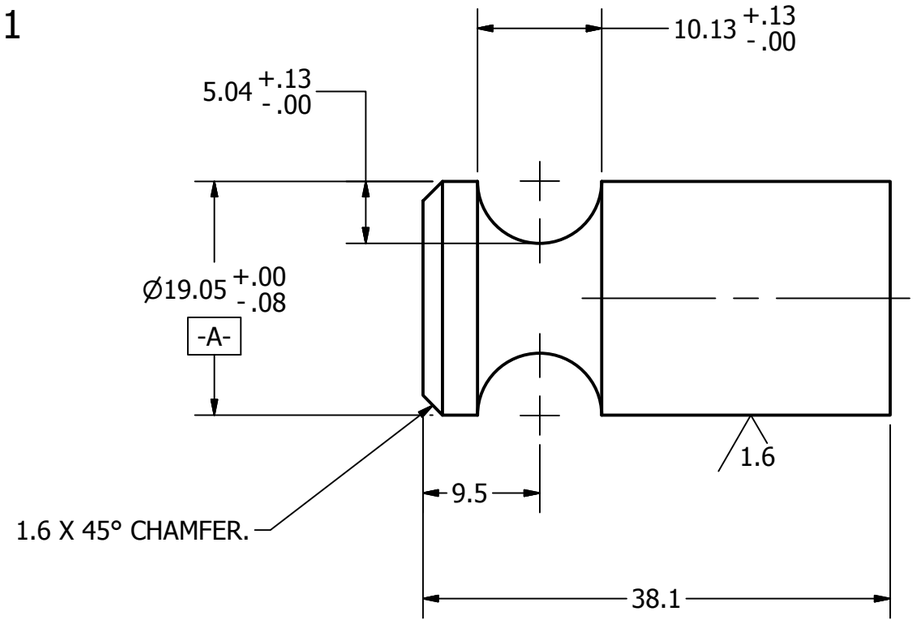
DESCRIPTION: LOWER WRIST ROTATION ASSY.

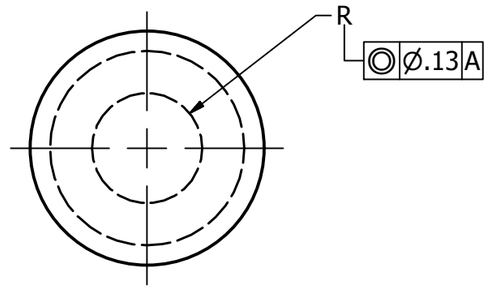
SIZE: A3 | SHEET: 1 OF 1 | SCALE: | DRAWING NO.: 472-6700 | REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REFERENCE DWG #78051-207 AND CONVERTED TO METRIC FOR THOR-M	10/3/2011	TKN



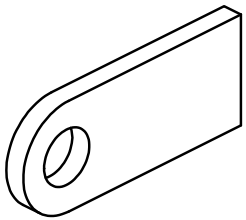
ISO VIEW
SCALE 2:1



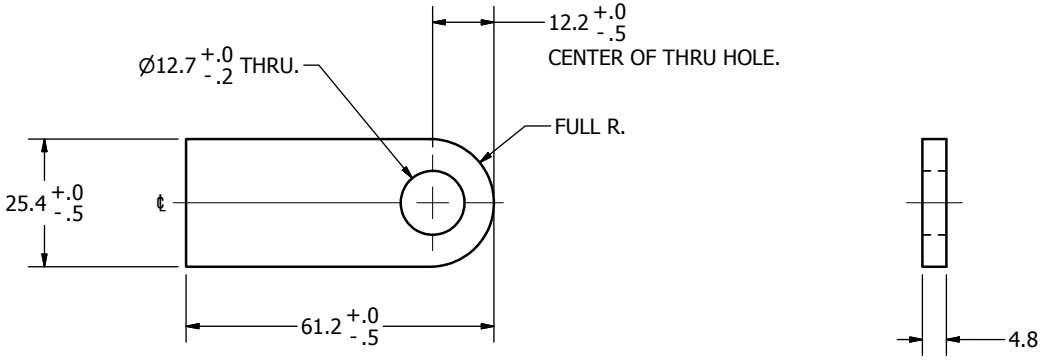


		PROJECT NO.:	DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ± 0.5 ± 0.5° 1.6 X.X ± 0.2 X.XX ± 0.1 X.XXX ± 0.01 REMOVE BURRS & BREAK SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
472-6700	1	MATERIAL: 1018 STEEL	DRAWN BY: Thanh	DATE: 10/3/2011	DESCRIPTION: SHAFT - WRIST ROTATION
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1 DRAWING NO.: 472-6730 REV: A
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/30/2012	SCALE: 2:1

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REFERENCE DWG #78051-205 AND CONVERTED TO METRIC FOR THOR-M	10/4/2011	TKN

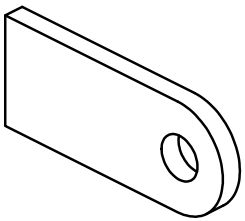


ISO VIEW
SCALE 1 : 1

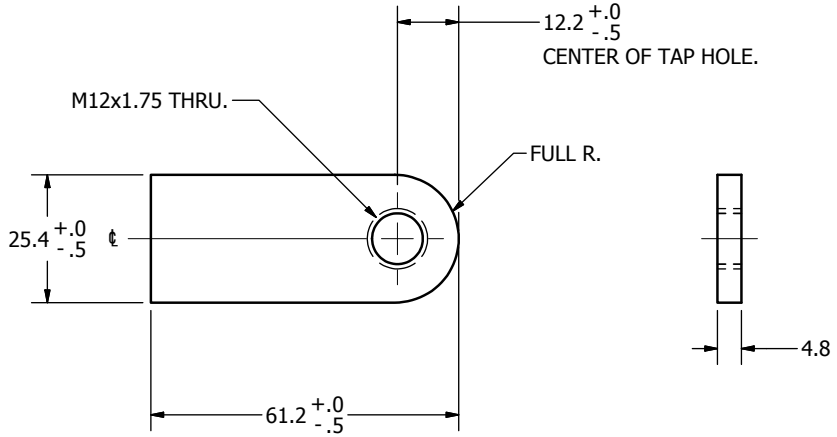


DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: LUG - WRIST, UPPER		
PROJECT NO.:		DRAWN BY: Thanh	DATE: 10/4/2011		
472-6700	1	MATERIAL: 1018 STEEL	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1
NEXT ASSEMBLY	QTY	HEAT TREAT:	ENGINEER: J. WANG	DATE: 1/30/2012	SCALE: FULL
TOTAL QTY IN DUMMY	2	FINISH:			DRAWING NO.: 472-6710 REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REFERENCE DWG #78051-206 AND CONVERTED TO METRIC FOR THOR-M	10/4/2011	TKN

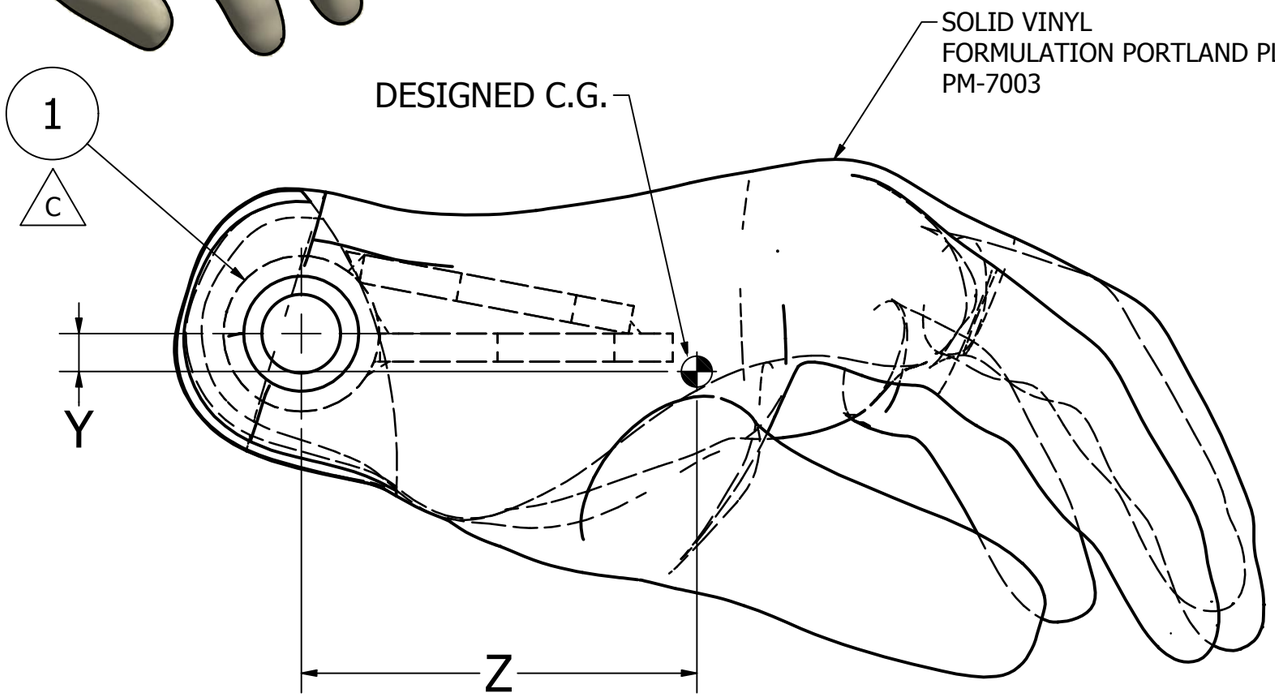


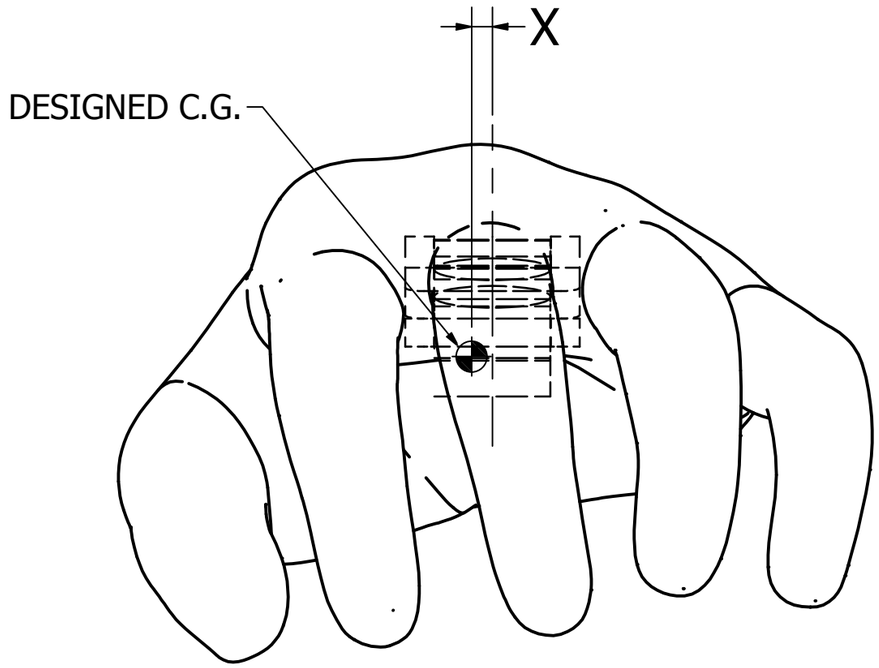
ISO VIEW
SCALE 1 : 1



DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES			
PROJECT NO.:			DESCRIPTION: LUG - WRIST, LOWER		
472-6700	1	MATERIAL: 1018 STEEL	DRAWN BY: Thanh	DATE: 10/4/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/30/2012	SCALE: FULL
					DRAWING NO.: 472-6720 REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REFERENCE DWG #78051-208 AND CONVERTED TO METRIC FOR THOR-M	10/4/2011	TKN
	B	ADDED C.G. DIMENSIONS; REVISED NOTE 2 AND ADDED NOTE 3	9/18/2017	DW
	C	REORIENTED STRUCTURAL ASM., HAND 472-6910 AND CAVITY IN HAND FLESH MODEL.	8/14/2018	DW





NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   PIECE MARK USING PART NUMBER AND REVISION LETTER. SERIALIZE

B 2. REFER TO DRAWING 472-0000 SHT. 5 OF 5 FOR C.G. AND WEIGHT SPECIFICATION.

B 3. THE C.G. ORIGIN IS THE HOLE CENTER IN THE OUTER HAND HUB OD THE HAND STRUCTURAL ASSEMBLY AND THE COORDINATE SYSTEM IS ORIENTATED WITH THE "X" DIMENSION PARALLEL WITH THE OUTER HAND PLATE OF THE HAND STRUCTURAL ASSEMBLY.

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	472-6910	STRUCTURAL ASS'Y-HAND

PARTS LIST

472-6000-1	1	PROJECT NO.:	DRAWN BY: Thanh	DATE: 10/4/2011	
NEXT ASSEMBLY	QTY	MATERIAL:	CHECKED BY:	DATE:	
TOTAL QTY IN DUMMY	1	HEAT TREAT:	ENGINEER: J. WANG	DATE: 1/30/2012	
		FINISH:			

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01
ANGLES ±0.5°
FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

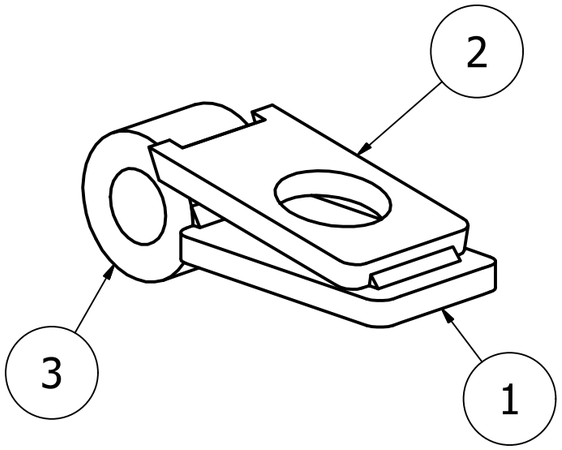
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: HAND ASM. MOLDED, LEFT
THOR-50M

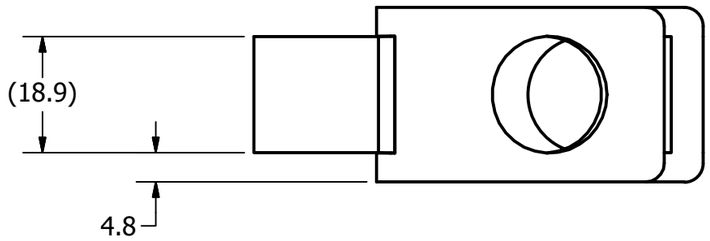
SIZE: A3 | SHEET: 1 OF 1 | SCALE: FULL | DRAWING NO.: 472-6900-1 | REV: C

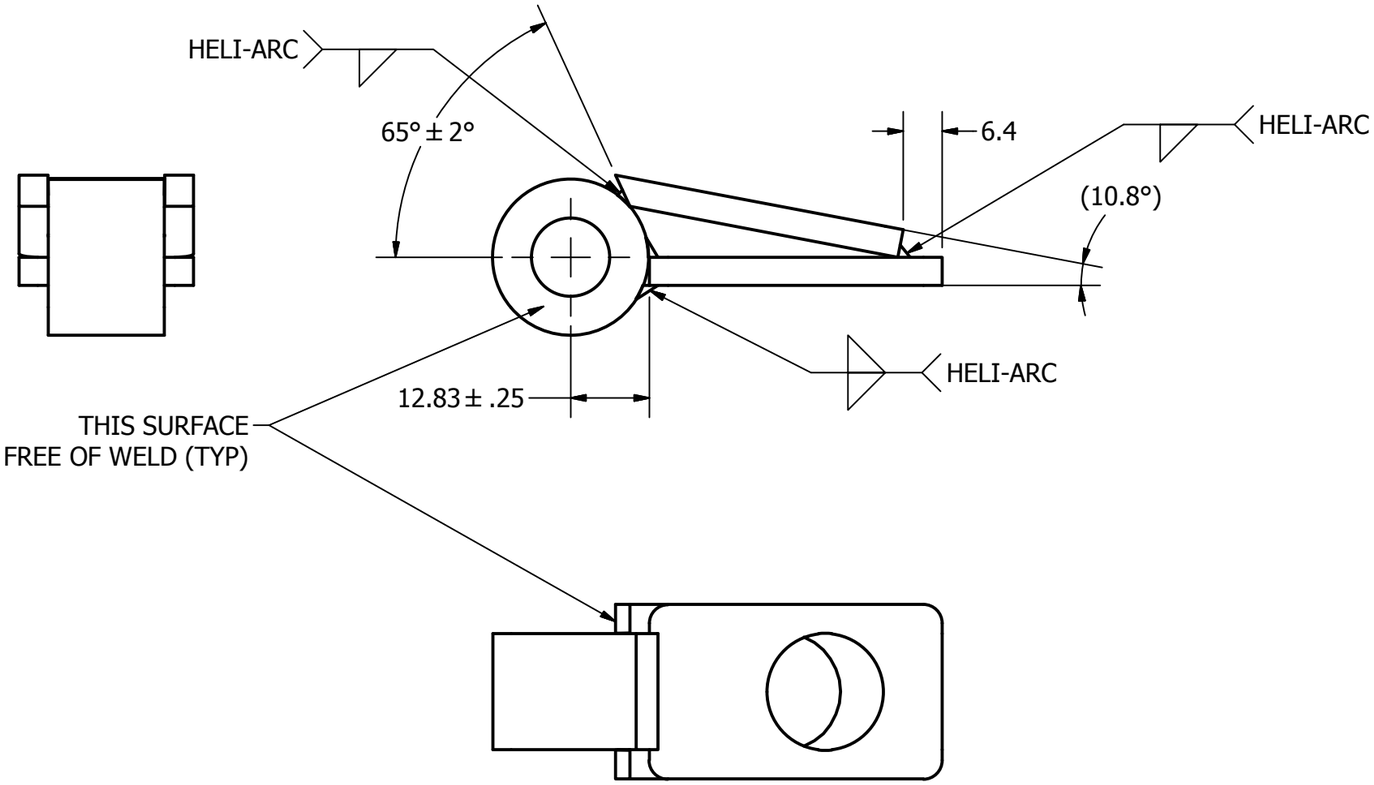
472-6900-1_New.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REFERENCE DWG #78051-210 AND CONVERTED TO METRIC FOR THOR-M	10/4/2011	TKN



ISO VIEW
SCALE 1 : 1





ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	472-6920	HUB, HAND
2	1	472-6930	PLATE - HAND, INNER
1	1	472-6940	HAND PLATE - OUTER

PARTS LIST

472-6900-2	1
472-6900-1	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	2

DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5° 1.6
X.X ± 0.2
X.XX ± 0.1
X.XXX ± 0.01
REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH: ELECTROLESS NICKEL PLATE .008 MAX.

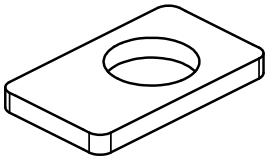
DRAWN BY: Thanh DATE: 10/4/2011
CHECKED BY: DATE:
ENGINEER: J. WANG DATE: 1/30/2012

DESCRIPTION:
STRUCTURAL ASS'Y-HAND
THOR-50M

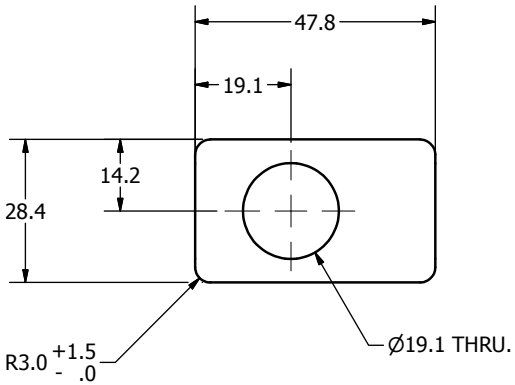
SIZE: A3 SHEET 1 OF 1
DRAWING NO.: 472-6910
REV: A
SCALE: FULL

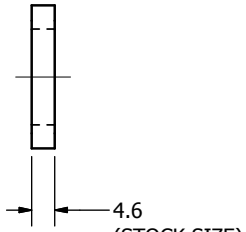
472-6910.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REFERENCE DWG #78051-213 AND CONVERTED TO METRIC FOR THOR-M	10/4/2011	TKN



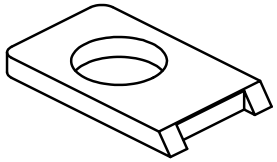
ISO VIEW
SCALE 1 : 1



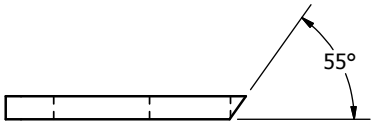


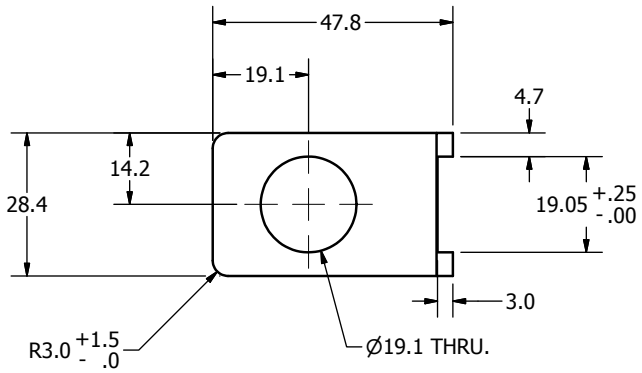
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: HAND PLATE - OUTER		
PROJECT NO.:		DRAWN BY: Thanh	DATE: 10/4/2011	SIZE: A3	SHEET 1 OF 1
472-6910	1	MATERIAL: 1018 STEEL	CHECKED BY:	DATE:	DRAWING NO.: 472-6940
NEXT ASSEMBLY	QTY	HEAT TREAT:	ENGINEER: J. WANG	DATE: 1/30/2012	REV: A
TOTAL QTY IN DUMMY	2	FINISH:			SCALE: FULL

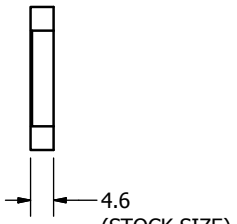
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REFERENCE DWG #78051-212 AND CONVERTED TO METRIC FOR THOR-M	10/4/2011	TKN



ISO VIEW
SCALE 1 : 1

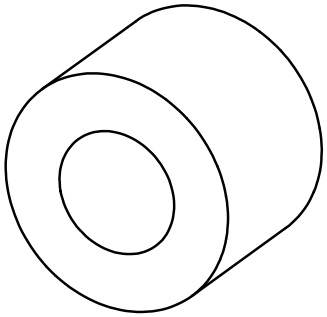




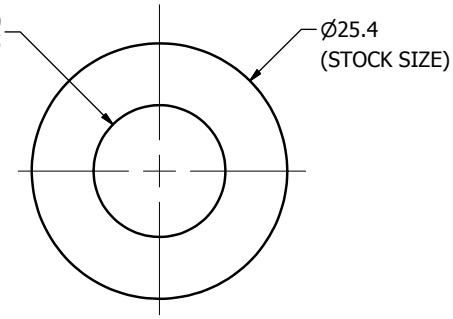


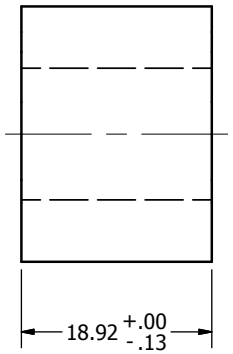
DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6			
PROJECT NO.:		REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: PLATE - HAND, INNER		
472-6910	1	MATERIAL: 1018 STEEL	DRAWN BY: Thanh	DATE: 10/4/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/30/2012	SCALE: FULL
			DRAWING NO.: 472-6930		REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REFERENCE DWG #78051-211 AND CONVERTED TO METRIC FOR THOR-M	10/4/2011	TKN
	B	CHANGED Ø13.1 +.0/-.2 TO Ø13-1 +.20/-.05	10/4/2011	JSJ



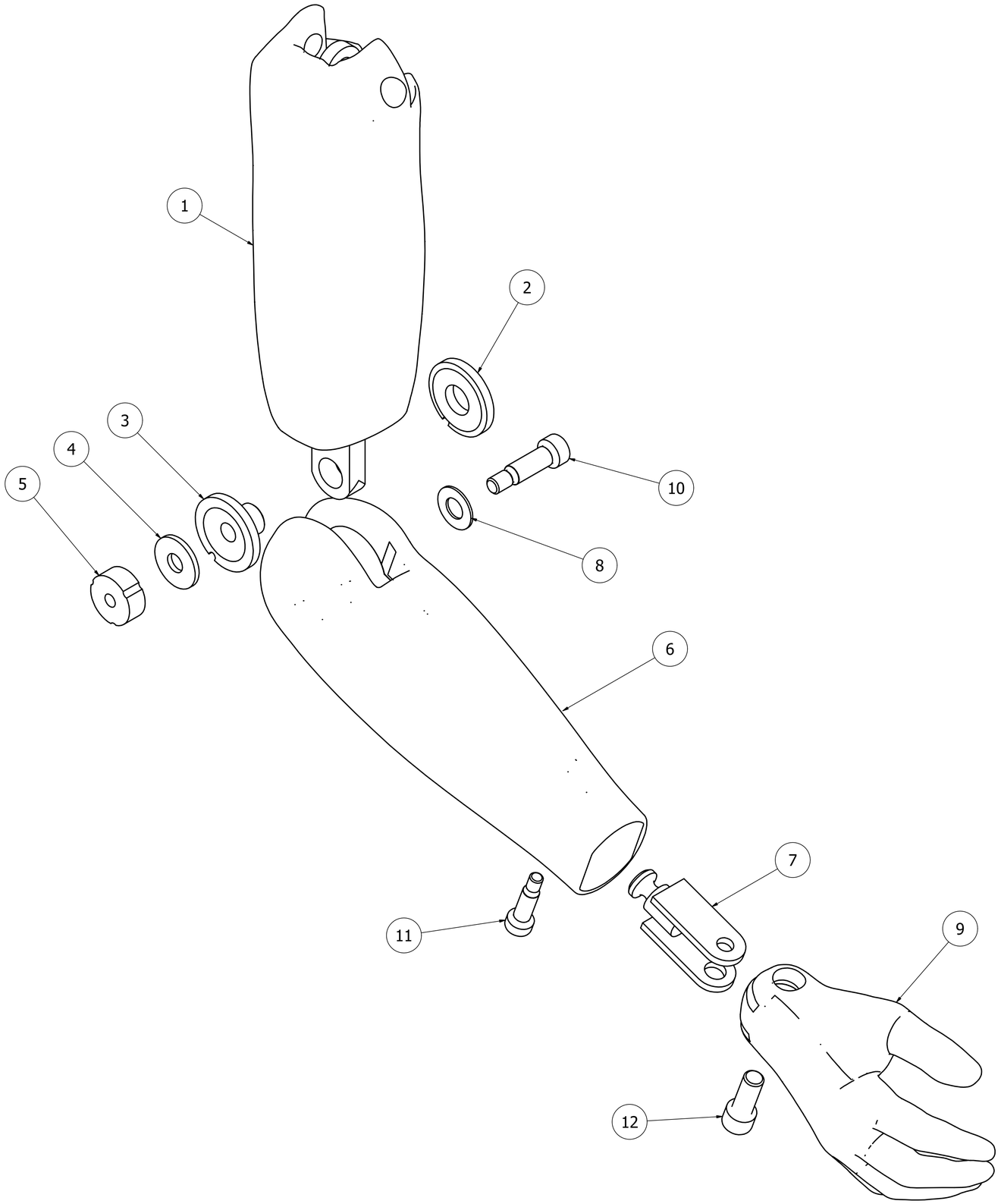
ISO VIEW
SCALE 2:1





		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ±0.5 ±0.5° 1.6 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: HUB, HAND	
		PROJECT NO.:	DRAWN BY: Thanh DATE: 10/4/2011		
472-6910	1	MATERIAL: 1018 STEEL	CHECKED BY: DATE:	SIZE: A3 SHEET 1 OF 1	DRAWING NO.: 472-6920 REV: B
NEXT ASSEMBLY	QTY	HEAT TREAT:	ENGINEER: J. WANG DATE: 1/30/2012	SCALE: 2:1	
TOTAL QTY IN DUMMY	2	FINISH:			

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1APM000 AND CONVERTED TO METRIC FOR THOR-M	10/5/2011	TKN
	B	ITEM NUMBER 1 - PART #AXAMM000 - SD3 UPPER HUMERUS ASSEMBLY WAS PART #472-6120 - UPPER ARM ASSEMBLY, MOLDED; REMOVED PARTS #472-6300 - STRUCTURAL ASS'Y. UPPER ARM LOWER PART THOR-M AND PART #5000857 - M10 x 35 LG. SHSS	3/27/2014	DW
	C	ITEM NUMBER 1 - PART #472-6200 - UPPER HUMERUS ASSEMBLY WAS PART #AXAMM000 - SD3 UPPER HUMERUS ASSEMBLY	9/15/2014	DW



ITEM	QTY	PART NUMBER	DESCRIPTION
12	1	5000441	M12 X 1.75 X 30 LG. SHCS
11	1	5000492	M10 X 25 LG. SHSS
10	1	5000506	M12 X 30 LG. SHSS
9	1	472-6900-2	HAND ASM MOLDED, RIGHT
8	1	9001260	WASHER, 1.06 OD x .53 ID x .06 THK.
7	1	472-6700	LOWER WRIST ROTATION ASSY.
6	1	472-6520	LOWER ARM MOLDED
5	1	472-6610	NUT - ELBOW PIVOT
4	1	472-6950	WASHER-SHOULDER JOINT SPRING
3	1	472-6590	BUSHING, UPPER ARM AND ELBOW PIVOT
2	1	472-6600	WASHER - UPPER ARM & ELBOW PIVOT
1	1	472-6200	UPPER HUMERUS ASSEMBLY

C B

PARTS LIST

DO NOT SCALE DRAWING

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
X DECIMALS ANGLES FINISH
X.X ±0.2 ±0.5°
X.XX ±0.1
X.XXX ±0.05
REMOVE BURRS & BREAK SHARP EDGES

THIRD ANGLE PROJECTION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

		MATERIAL: THOR-50M	
472-0000	1	MFG APPROVED: Thanh	10/5/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG

DESCRIPTION: RIGHT ARM ASSEMBLY THOR-50M

DATE: 1/28/2012

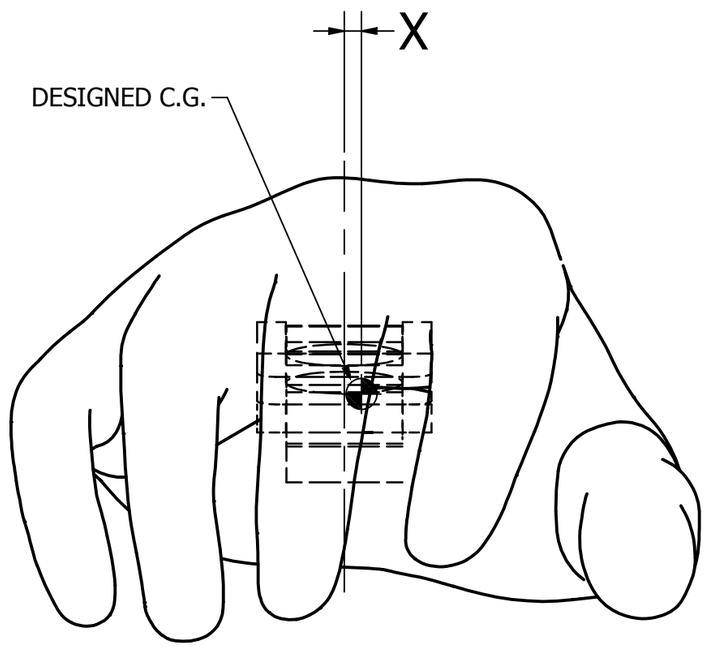
SIZE: A1 SHEET: 1 of 1 SCALE: 3:4

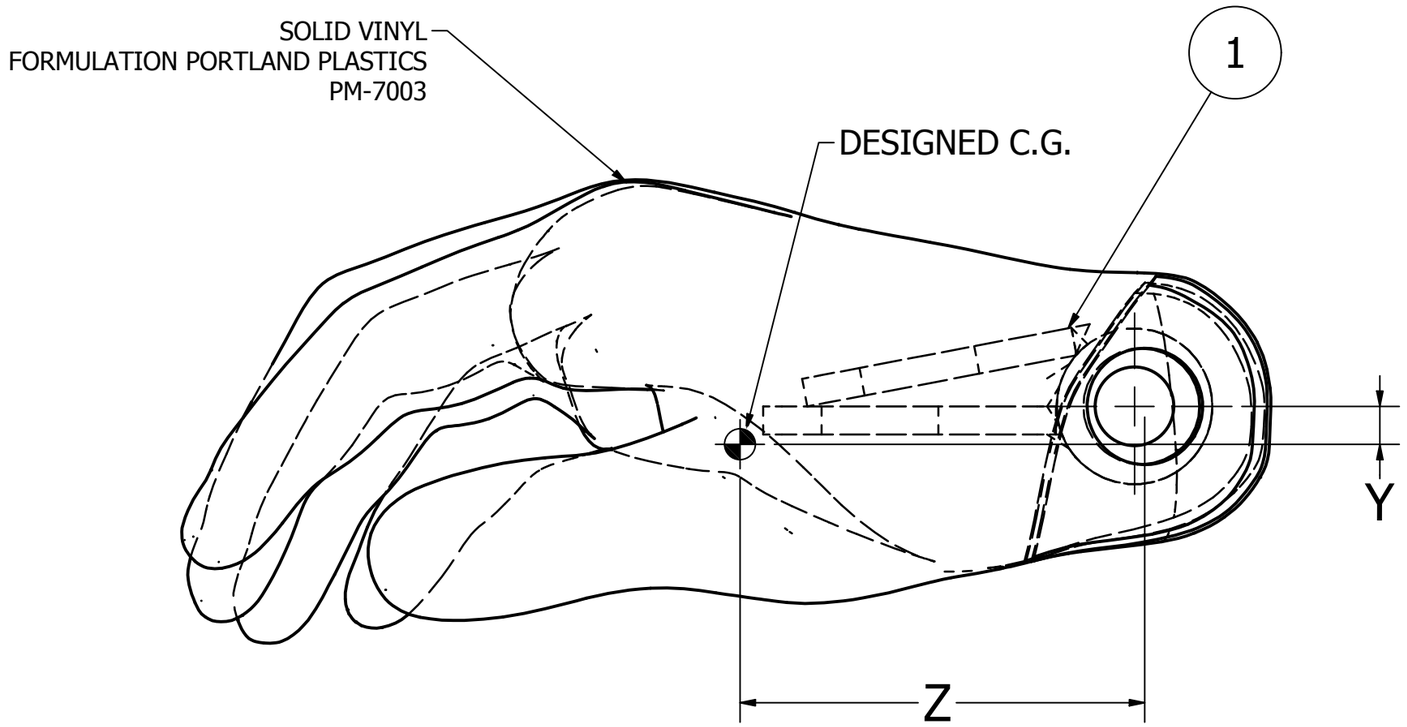
DRAWING NO: 472-6000-2

REV: C

472-Right Arm Assembly.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REFERENCE DWG #78051-209 AND CONVERTED TO METRIC FOR THOR-M	10/4/2011	TKN
	B	ADDED C.G. DIMENSIONS; REVISED NOTE 2 AND ADDED NOTE 3	9/19/2017	DW





NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   PIECE MARK USING PART NUMBER AND REVISION LETTER. SERIALIZE

B 2. REFER TO DRAWING 472-0000 SHT. 5 OF 5 FOR C.G. AND WEIGHT SPECIFICATIONS.

B 3. THE C.G. ORIGIN IS THE HOLE CENTER IN THE OUTER HAND HUB OF THE HAND STRUCTURAL ASSEMBLY AND THE COORDINATE SYSTEM IS ORIENTATED WITH THE "X" DIMENSION PARALLEL WITH THE OUTER HAND PLATE OF THE HAND STRUCTURAL ASSEMBLY.

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	472-6910	STRUCTURAL ASS'Y-HAND

PARTS LIST

472-6000-2	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5°	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:
DRAWN BY: Thanh — DATE: 10/4/2011
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/30/2012

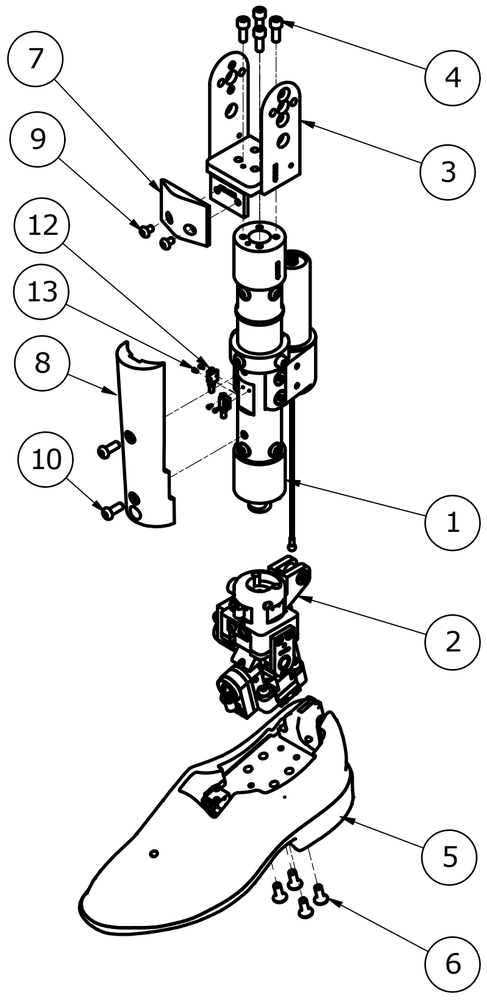
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: HAND ASM MOLDED, RIGHT THOR-50M

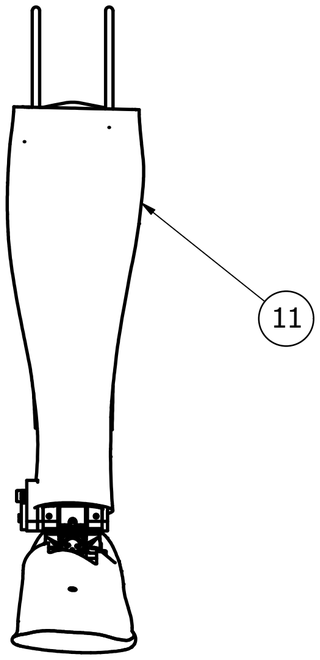
SIZE: A3 | SHEET: 1 OF 1 | SCALE: FULL | DRAWING NO.: 472-6900-2 | REV: B

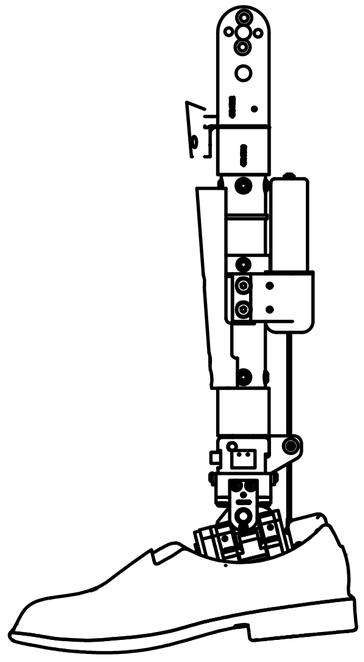
472-6900-2.iam

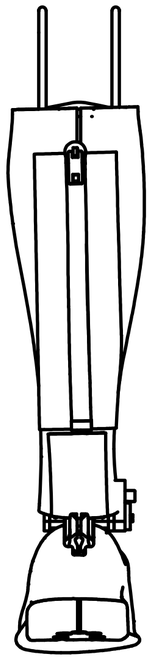
REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	CHANGED TO METRIC DIMENSIONS	12/5/2008	BLW
	B	ADDED ITEM #11	7/14/2015	DW
	C	472-7800-1 MOLDED SHOE ASS'Y. - LEFT WAS 472-7700-1 FOOT ASS'Y. - LEFT	8/8/2016	DW
	D	ADDED ITEM #12, SA572-S4 UNIAXIAL PIEZORESISTIVE ACCELEROMETER AND ITEM #13, 9010407 SCREW, SHCS M1.4x0.3 x 3; ADDED EXPLODED VIEW AND MOVED BALLOON CALLOUTS TO EXPLODED VIEW	5/12/2017	DW
	E	ITEM #9 WAS PART #9003042 - SCREW, BHCS M5 x 10	7/10/2018	DW



LEG FLESH NOT SHOWN FOR CLARITY







ITEM	QTY	PART NUMBER	DESCRIPTION
13	4	9010407	SCREW, SHCS M1.4x0.3 x 3
12	2	SA572-S4	UNIAXIAL PIEZORESISTIVE ACCELEROMETER
11	1	481-7370-1	LOWER LEG FLESH, LEFT
10	2	9010453	SCREW, BHCS M6x1.0 x 16
9	2	5000216V	SCREW, BHCS M5x0.8 x 8
8	1	472-7115	TIBIA GUARD
7	1	472-7110	KNEE BUMPER, MOLDED
6	4	9000826	SCREW, FHCS M6x1.0 X 16
5	1	472-7800-1	MOLDED SHOE ASSY. - LEFT
4	4	9000852	SCREW, SHCS M6 x 1.0 X 16mm LONG
3	1	472-7200	KNEE CLEVIS WELDMENT
2	1	472-7500-1	ANKLE ASSEMBLY, LEFT
1	1	472-7300	LOWER LEG MECHANICAL ASSEMBLY

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN B. WADE	12/5/2008
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

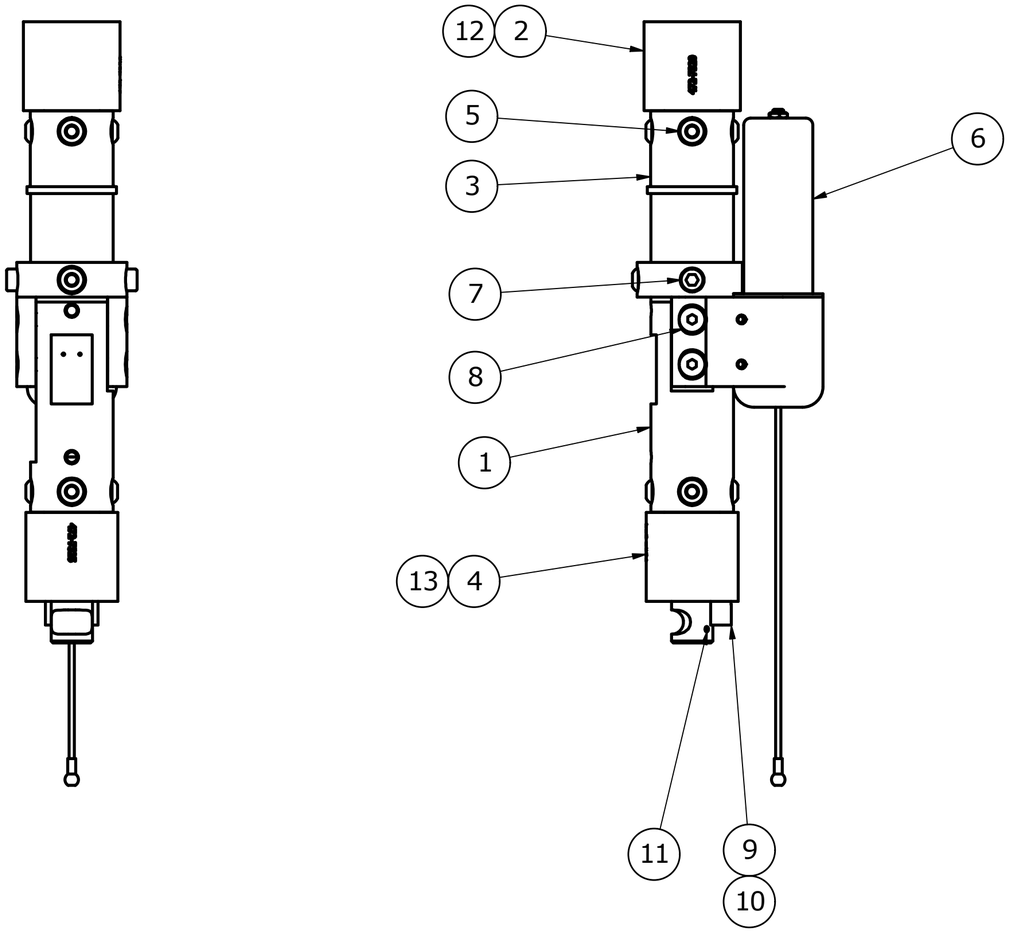
LOWER LEG ASSEMBLY, COMPLETE - LEFT
THOR-50M

THIRD ANGLE PROJECTION

SIZE: C
DRAWING NUMBER: 472-7000-1
REV: E
SCALE:
SHEET: 1 OF 1

Model File:
472-7000-1 Lower Leg Assembly, Complete - Left.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CHANGED TO METRIC DIMENSIONS	12/5/2008	BLW
	B	DRAWING NO. WAS 472-7300-1: REMOVED LOWER LEG FLESH, LEFT 472-7370-1; ADDED PART #SA572-S32 - FIVE CHANNEL UPPER TIBIA LOAD CELL (OPTIONAL), & #SA572-S33 - FIVE CHANNEL LOWER TIBIA LOAD CELL (OPTIONAL)	9/3/2009	DW
	C	ITEM #11 PART #9010109V DESCRIPTION SCREW, SSFP M3 x 0.5 x 3 WAS PART #9010447 DESCRIPTION SCREW, SHCS M3 x 0.5 x 3	7/17/2018	DW



	ITEM	QTY	PART NUMBER	DESCRIPTION
A	13	1	SA572-S33	FIVE CHANNEL LOWER TIBIA LOAD CELL (OPTIONAL)
A	12	1	SA572-S32	FIVE CHANNEL UPPER TIBIA LOAD CELL (OPTIONAL)
C	11	1	9010109V	SCREW, SSFP, M3X0.5 X 3
	10	1	9000058	SCREW, SHCS M3-0.5 x 12
	9	1	472-7330	Z ROTATION WEDGE ASSY
	8	5	9001445	SCREW, FHCS M6-1 x 12
	7	2	472-7335	PLUNGER RETAINING BOLT
	6	1	472-7350	ACHILLES SPRING TUBE MECHANICAL ASS'Y.
	5	9	W50-61042	MODIFIED BHSS M6 THREAD
	4	1	472-7325	LOWER TIBIA LOAD CELL BLANK
	3	1	472-7315	TIBIA COMPLIANT BUSHING ASSS'Y.
	2	1	472-7320	UPPER TIBIA LOAD CELL BLANK
	1	1	472-7310	LOWER TIBIA TUBE ASSY

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 125 | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. WADE	12/5/2008
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LOWER LEG MECHANICAL ASSEMBLY

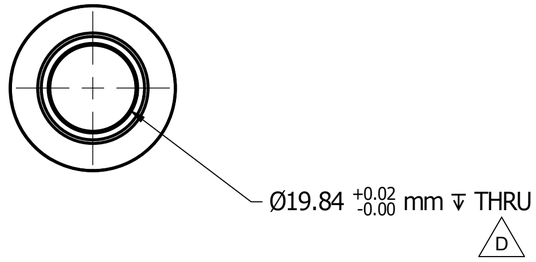
THOR-50M

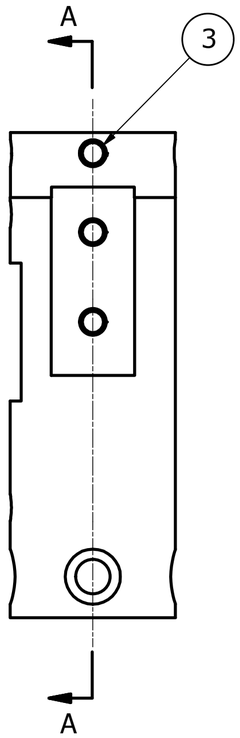
THIRD ANGLE PROJECTION

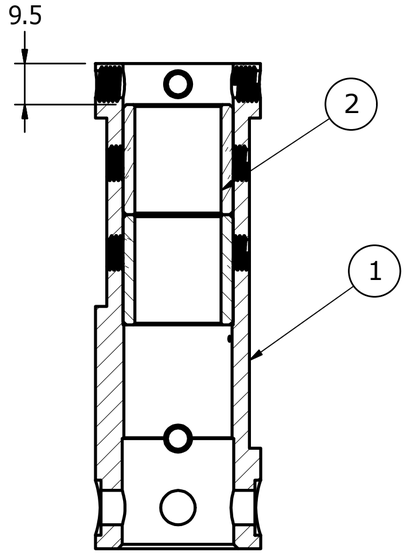
SIZE	DRAWING NUMBER	REV
A2	472-7300	C

SCALE: | SHEET 1 OF 1

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	REMOVED NOTES 4, 5 , & 6; REMOVED DIMENSION; .38 WAS .375; ADD MACHINING ASSEMBLY NOTES	7/30/2008	KHS
	B	CHANGE TO METRIC HELICOILS	10/14/2008	BLW
	C	CHANGE TO METRIC DIMENSIONING	11/16/2008	BLW
	D	THRU HOLE WAS 76mm DEEP	11/19/2008	DW







SECTION A-A
SCALE 1 : 1

MACHINING/ASSEMBLY NOTES:

1. FOR HELICOILS INSTALLED INTO FLATS ON PART, REMOCE 2 3/4 TREADS PRIOR TO INSTALLATION.
2. FOR HELICOILS INSTALLED INTO ROUNDS OF PART, REMOVE 5/8 OF A THREAD PRIOR TO INSTALLATION.
3. HELICOILS MUST NOT PROTRUDE INTO 25.4mm HOLE IN TOP CENTER OF PART.
4. INSTALL BEARING AFTER INSTALLATION OF HELICOILS.
5. REAM CENTER OF BEARING TO SPECIFIED DIMENSION.

ITEM	QTY	PART NUMBER	DESCRIPTION
3	10	9010437	HELICOIL, M6 x 1 x 6
2	2	9010423	IGUS IGLIDE J BEARING, 1" OD x 3/4" ID x 1" LG (PART #JSI-1216-16)
1	1	472-7311	LOWER TIBIA TUBE

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN B. WADE	11/19/2008
CHECKED	
ENG	
APPROVED	

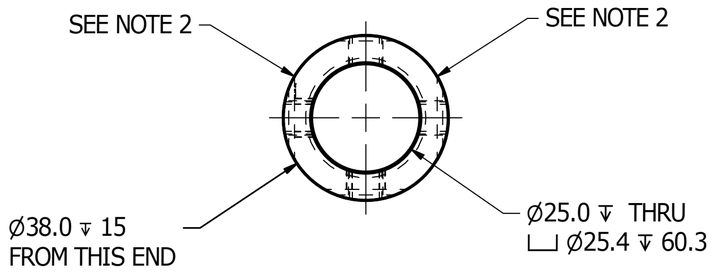
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

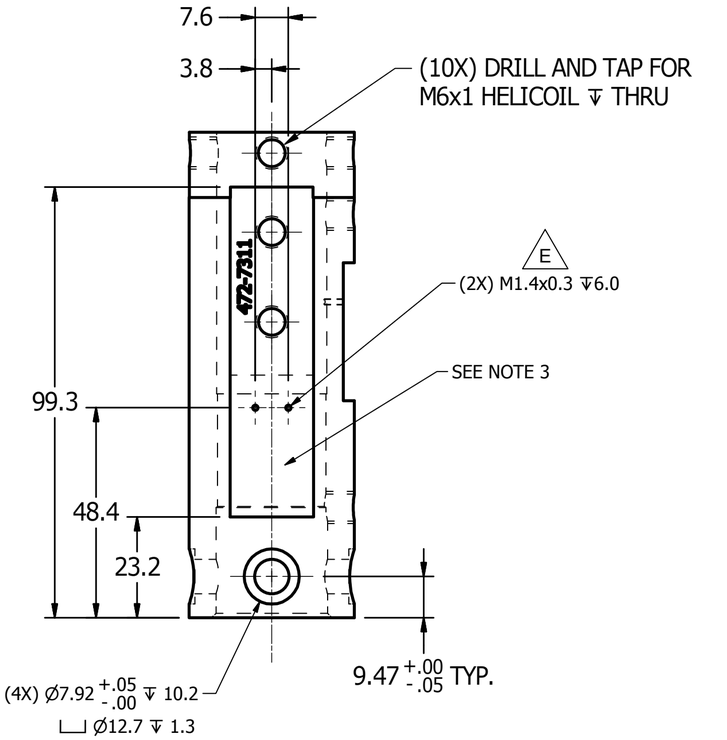
LOWER TIBIA TUBE ASSY
THOR-50M

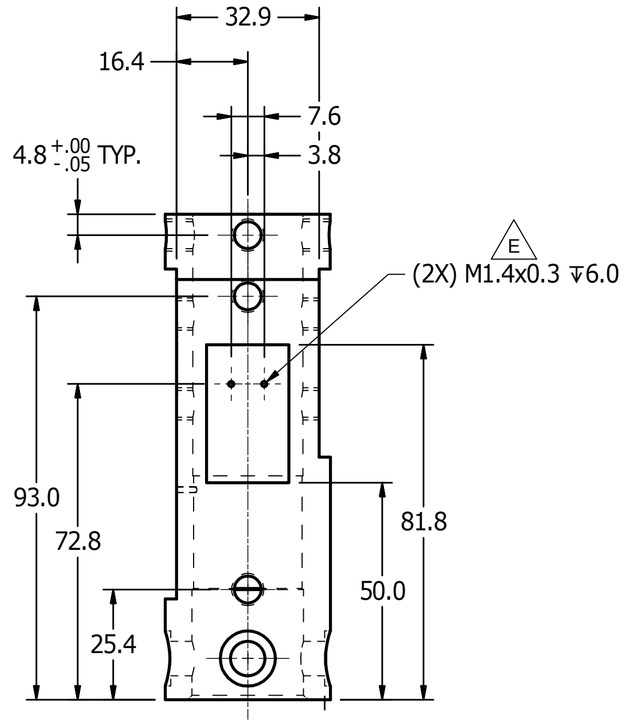
THIRD ANGLE PROJECTION
SIZE A2 | DRAWING NUMBER 472-7310 | REV D
SCALE:
SHEET 1 OF 1

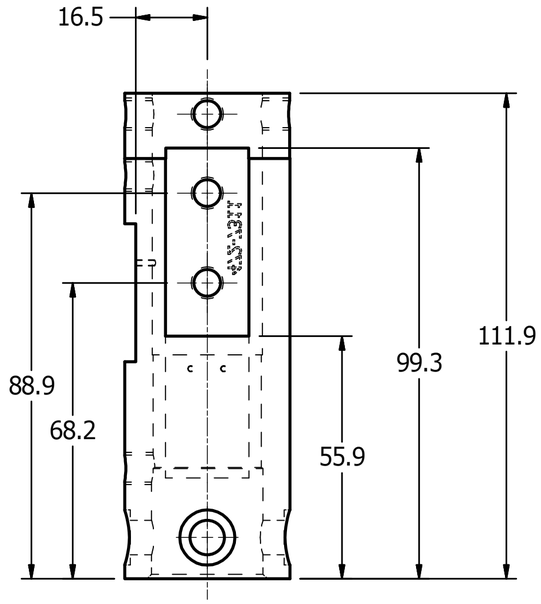
472-7310
Lower Tibia
Tube

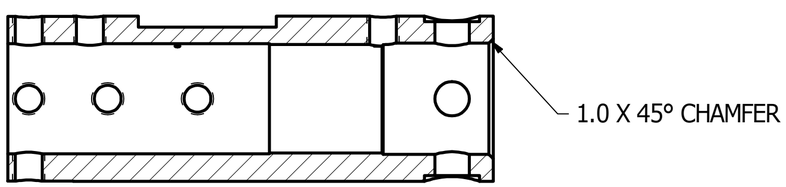
REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	HOLE WAS .984 THRU; 1.500 +.005/-.000 WAS 1.500	7/29/2008	KHS
	B	.373-.000/ -.001 TYP WAS .375 TYP; ADDED VIEW SECTION A-A, DETAIL B AND SECTION C-C; ADDED CHAMFER; .188+.000/ -.002 TYPWAS .188 TYP; HOLES WERE .257 THRU C.B. .313 DOWN .220 C.B. .500 DOWN .050	8/28/2008	KHS
	C	CHANGE TO METRIC HARDWARE	10/14/2008	BLW
	D	CHANGE TO METRIC DIMENSIONING, REMOVE .06 X 23 CHAMFER, SECTION A-A, DETAIL B	11/20/208	BLW
	E	ADDED DIMENSION 16.5, AND HOLE DIMENSION (4X) Ø7.92 +.05/-.00 ↧10.2 ⌴Ø12.7 ↧1.3; HOLE DIMENSIONS (2X)M1.4x0.3↧6.0 WAS (2X)M1.2X0.25 ↧3.2	7/14/2015	DW



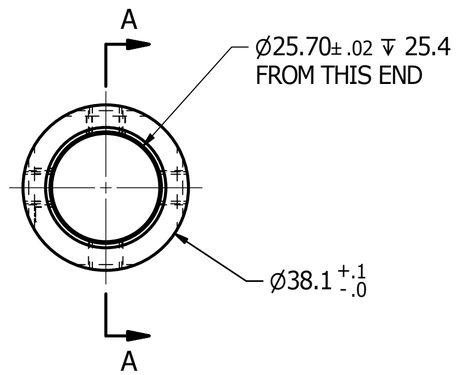








SECTION A-A
SCALE 1 : 1



UNLESS OTHERWISE NOTED:
1. BREAK ALL SHARP EDGES
2. BREAK EDGES OF MILLED FLAT AREA TO BLEND WITH TUBE
3. INDICATED SURFACES MUST BE FLAT AND DEBURRED FOR INSTRUMENTATION MOUNTING.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Aluminum-7075-T6
HEAT TREAT:
FINISH: BLUE ANNODIZE

VEHICLE RESEARCH and TEST CENTER

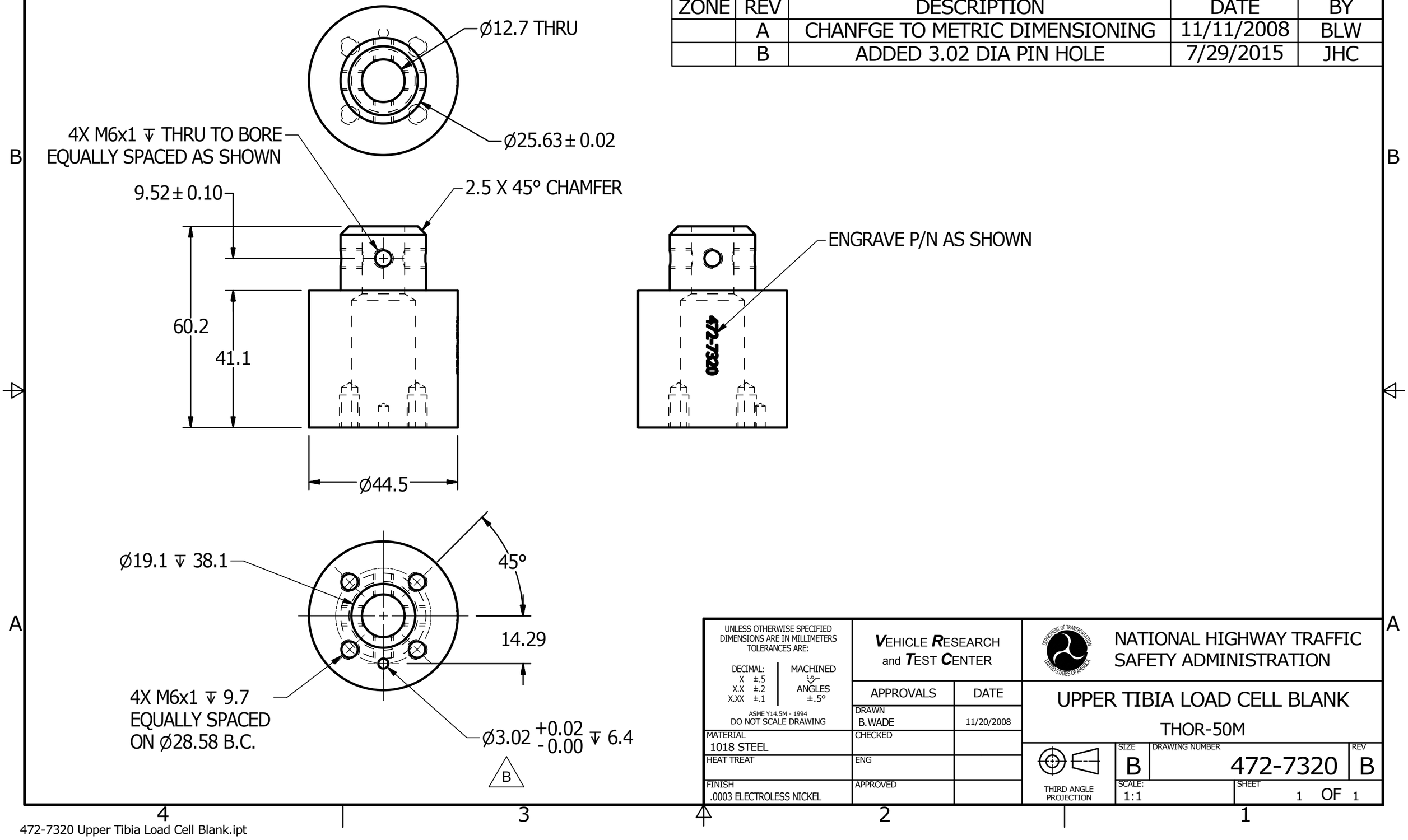
APPROVALS	DATE
DRAWN B. WADE	11/20/2008
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LOWER TIBIA TUBE
THOR-50M

THIRD ANGLE PROJECTION
SIZE: A2 | DRAWING NUMBER: 472-7311 | REV: E
SCALE: | SHEET: 1 OF 1

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	CHANFGE TO METRIC DIMENSIONING	11/11/2008	BLW
	B	ADDED 3.02 DIA PIN HOLE	7/29/2015	JHC



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	1018 STEEL	
HEAT TREAT		
FINISH	.0003 ELECTROLESS NICKEL	

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN B.WADE	11/20/2008
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

UPPER TIBIA LOAD CELL BLANK

THOR-50M

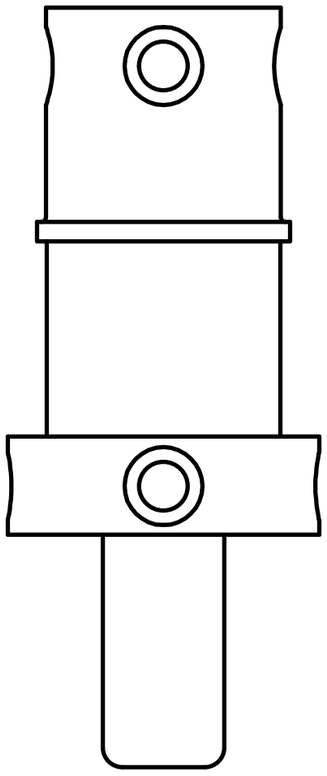
THIRD ANGLE PROJECTION

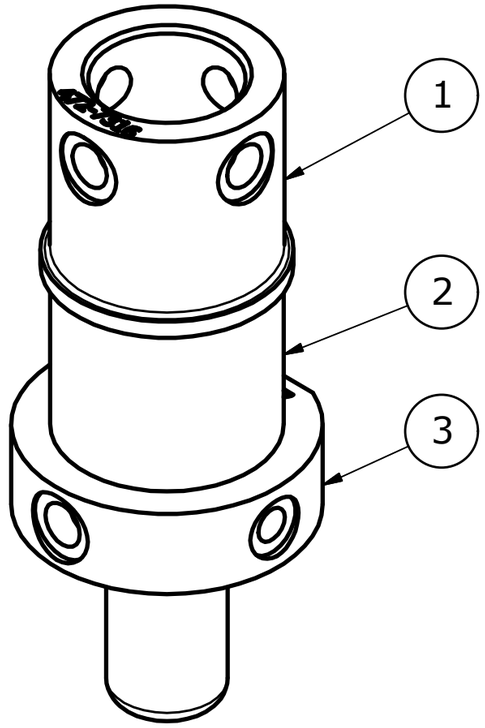
SIZE	DRAWING NUMBER	REV
B	472-7320	B

SCALE:	SHEET
1:1	1 OF 1

472-7320 Upper Tibia Load Cell Blank.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	A	CHANGE TO METRIC DIMENSIONING	11/20/2008	BLW





ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	472-7317	LOWER FLANGE
2	1	472-7318	BUSHING, COMPLIANT
1	1	472-7316	PLUNGER- COMPLIANT BUSHING

PARTS LIST

UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.
2. BOND ASSEMBLY WITH LORD 305 ADHESIVE, HOLE IN ITEM 1 MUST HAVE SAME ANGULAR ORIENTATION ABOVE CENTER AXIS HOLES IN ITEM 3.
3. METAL AND RUBBER SURFCES MUST BE SANDBLASTED & CLEANED WITH SOLVENT PRIOR TO BONDING
4. CYCLE ASSEMBLY THROUGH TEN 50% COMPRESSION LOADING CYCLES PRIOR TO ASSEMBLY TO LEG.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT

FINISH

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN B.WADE	11/20/2008
CHECKED TMV	12/12/2008
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

TIBIA COMPLIANT BUSHING ASSS'Y.
THOR-50M

THIRD ANGLE PROJECTION

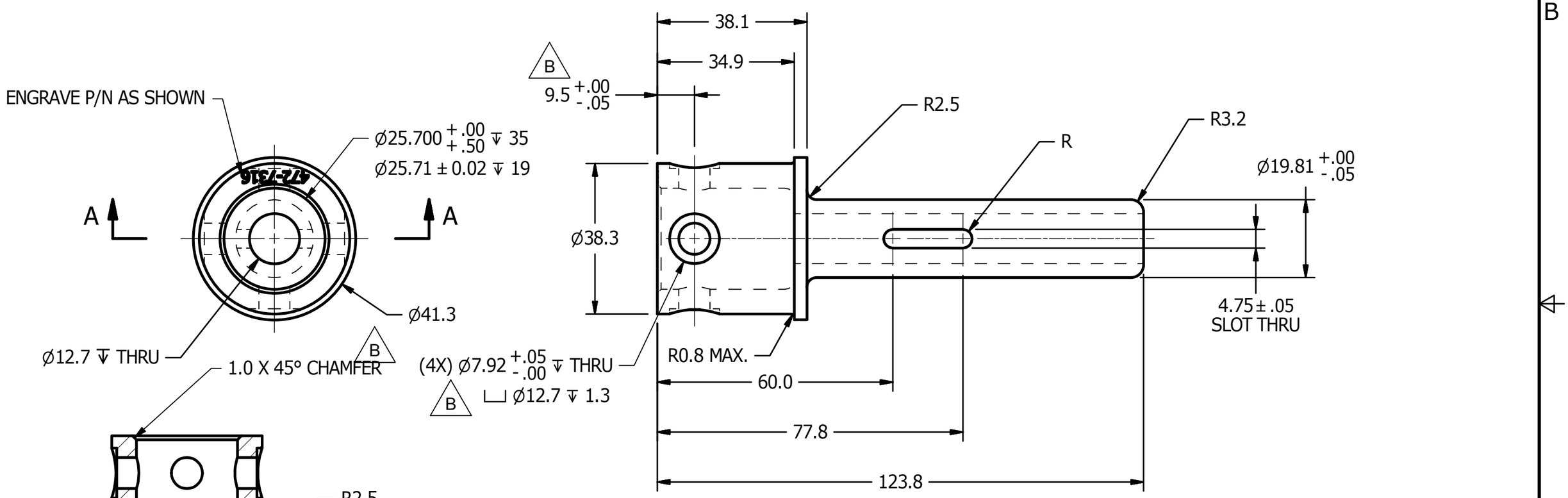
SIZE A3 | DRAWING NUMBER 472-7315 | REV A

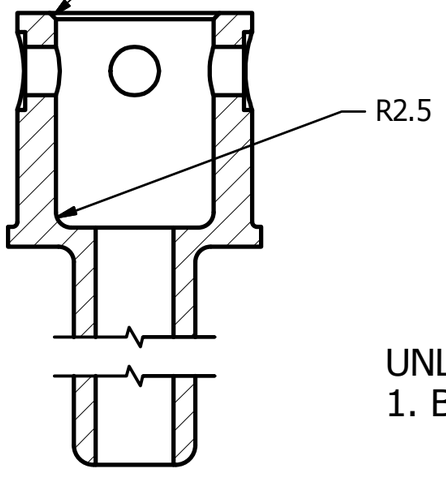
SCALE: 1:1

SHEET 1 OF 1

472-7315 Tibia Compliant Bushing.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	A	.188 +/-.002 WAS .188 SLOT	7/25/2008	BLW
E00609	B	.373 +.000/-.002 WAS .375; HOLES WERE .257 THRU C.B. .313 DOWN .220 C.B. .500 DOWN .050; ADDED CHAMFER	8/29/2008	KHS
E00609	C	CHANGED TO METRIC DIMENSIONING	11/20/2008	BLW





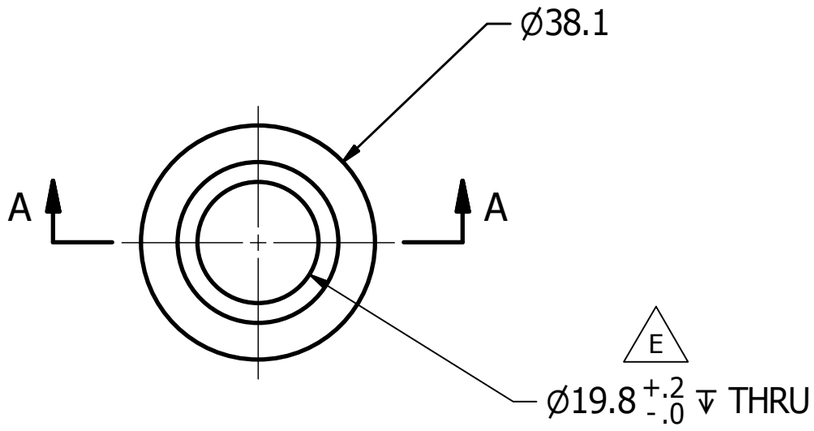
SECTION A-A
SCALE 1 : 1

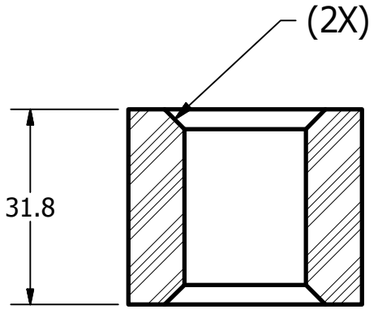
UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	PLUNGER- COMPLIANT BUSHING
	DRAWN B. WADE / 11/20/2008	THOR-50M
MATERIAL Stainless Steel, 440C	CHECKED TMV	SIZE A3 / DRAWING NUMBER 472-7316 / REV C
HEAT TREAT Rc 57 +/-5	ENG	
FINISH N/A	APPROVED	THIRD ANGLE PROJECTION / SCALE: 1:1 / SHEET 1 OF 1

472-7316
Plunger.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	C	REDRAWN IN INVENTOR	7/19/2007	KSG
	D	CHANGED TO METRIC DIMENSIONING	11/20/2008	BLW
	E	DIMENSION WAS Ø19.1 ↧THRU; REVISED NOTES	7/14/2015	DW





SECTION A-A
SCALE 1 : 1

STATIC COMPRESSION ON TEST RESULTS (0.5 mm/sec)

COMPRESSION (mm)	FORCE RANGE (N)
7.9 (25%)	1270-1550
15.9 (50%)	2750-3370

PREFORM (3) BREAK IN TESTS AT 50% COMPRESSION
FLAT RIGID SURFACES ON BOTH SIDES. ALL TESTING IS 50% COMPRESSION.
DATA FOR 25% COMPRESSION IS TO BE TAKEN FROM GRAPH OF 50% TESTING.
A MINIMUM RECOVERY TIME OF 1 HOUR MUST BE ALLOWED BETWEEN TESTS.

E UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES
2. MATERIAL: NEOPRENE RUBBER 65 ±3 SHORE A (MEASURED ON CUT END OF CYLINDER)
3. DUROMETER CAN BE SUPERCEDED BY STATIC OR DYNAMIC TEST RESULTS.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE 2
HEAT TREAT:
FINISH:

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN B. WADE	7/14/2015
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

BUSHING, COMPLIANT

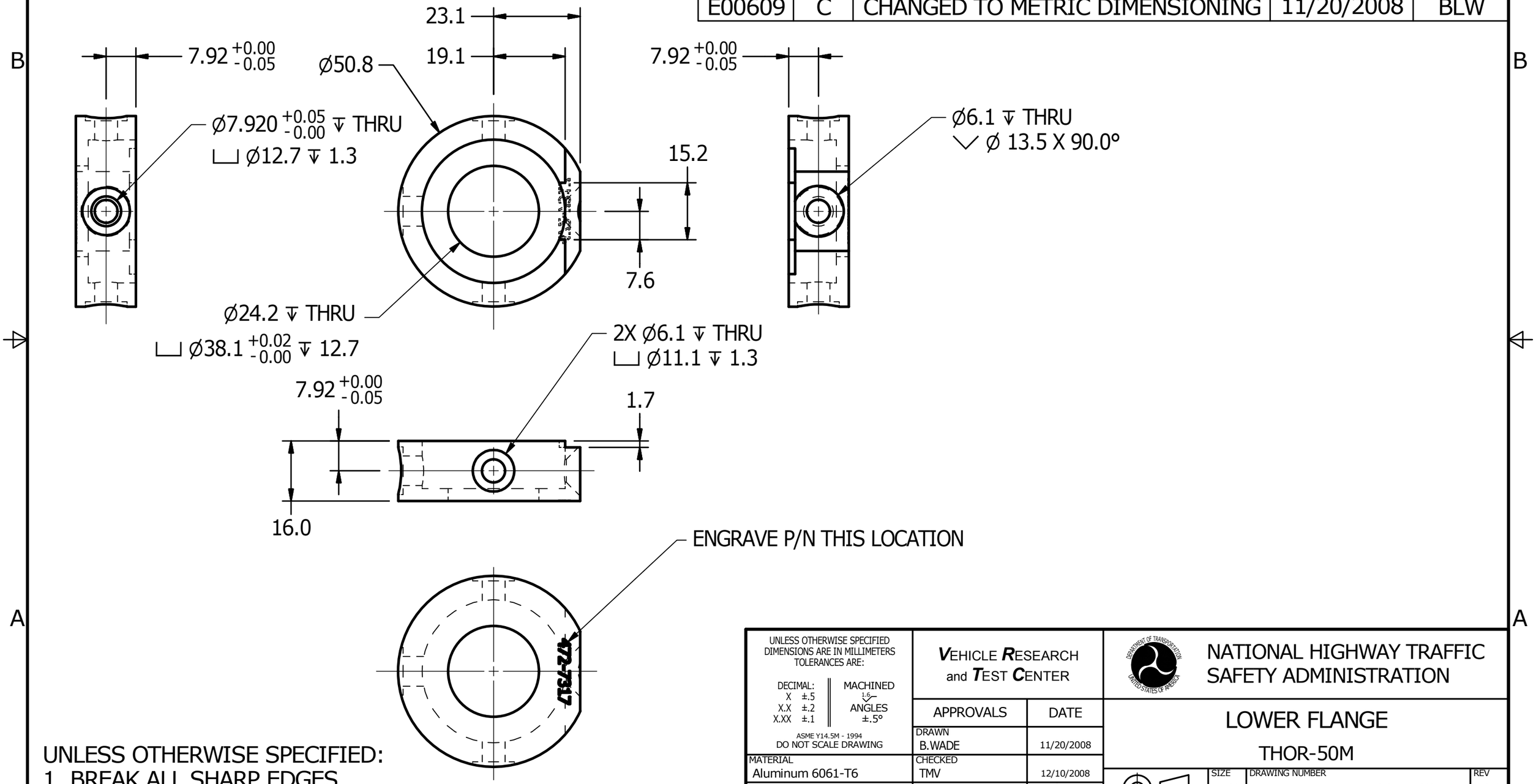
THOR-50M

THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 472-7318 | REV: E
SCALE:
SHEET: 1 OF 1

472-7318 Compliant Bushing.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	A	HOLE WAS .257 THRU C.B. .313 DOWN .220 C.B. .500 DOWN .050; .312 +.000/-.002 WAS .312	8/29/2008	KHS
E00609	B	REVISE FOR METRIC HARDWARE	10/16/2008	BLW
E00609	C	CHANGED TO METRIC DIMENSIONING	11/20/2008	BLW

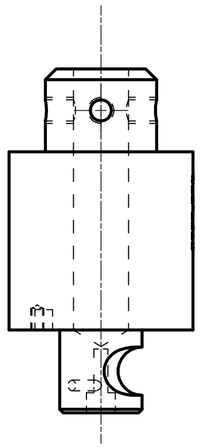


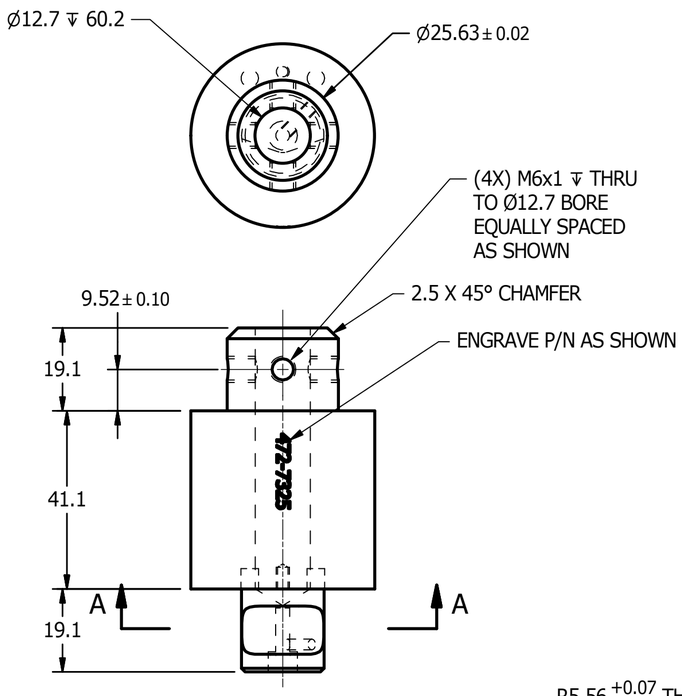
UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

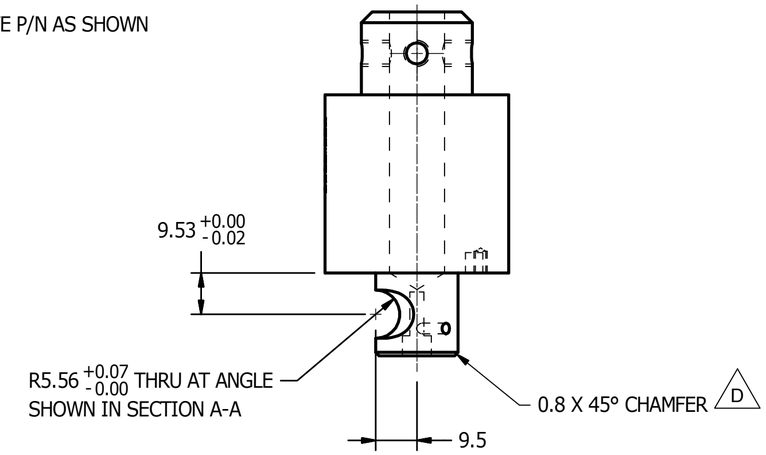
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	LOWER FLANGE THOR-50M
MATERIAL: Aluminum 6061-T6	DRAWN: B.WADE — 11/20/2008	
HEAT TREAT: N/A	CHECKED: TMV — 12/10/2008	SIZE: A3 — DRAWING NUMBER: 472-7317 — REV: C
FINISH: BLUE ANODIZE	ENG / APPROVED	THIRD ANGLE PROJECTION — SCALE: 1:1 — SHEET: 1 OF 1

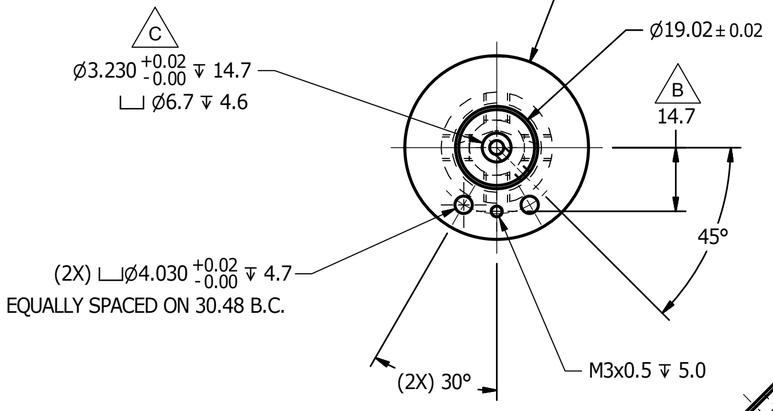
472-7317
Lower
Flange.ipt

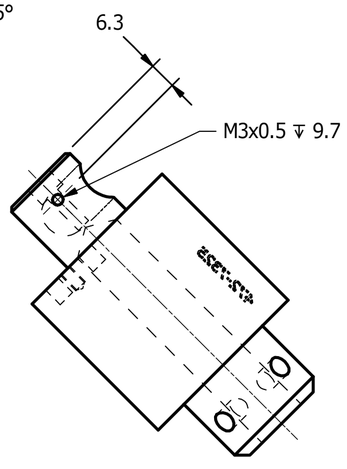
REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	A	CHANGE TO METRIC DIMENSIONING	11/20/2008	BLW
8918	B	14.7 WAS 15.2	4/30/2009	BLW
E00609	C	ADD C'BORE, INCREASE HOLE DEPTH	5/1/2009	BLW
9096	D	ADDED CHAMFER	9/21/2009	BLW

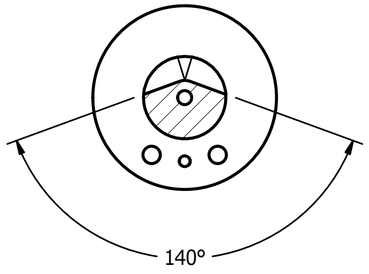












SECTION A-A
SCALE 1 : 1

UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 1018 STEEL	DRAWN: B. WADE	11/20/2008
HEAT TREAT: N/A	CHECKED: TMV	9/22/2009
FINISH: .0003 ELECTROLESS NICKEL	ENG:	
	APPROVED:	

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

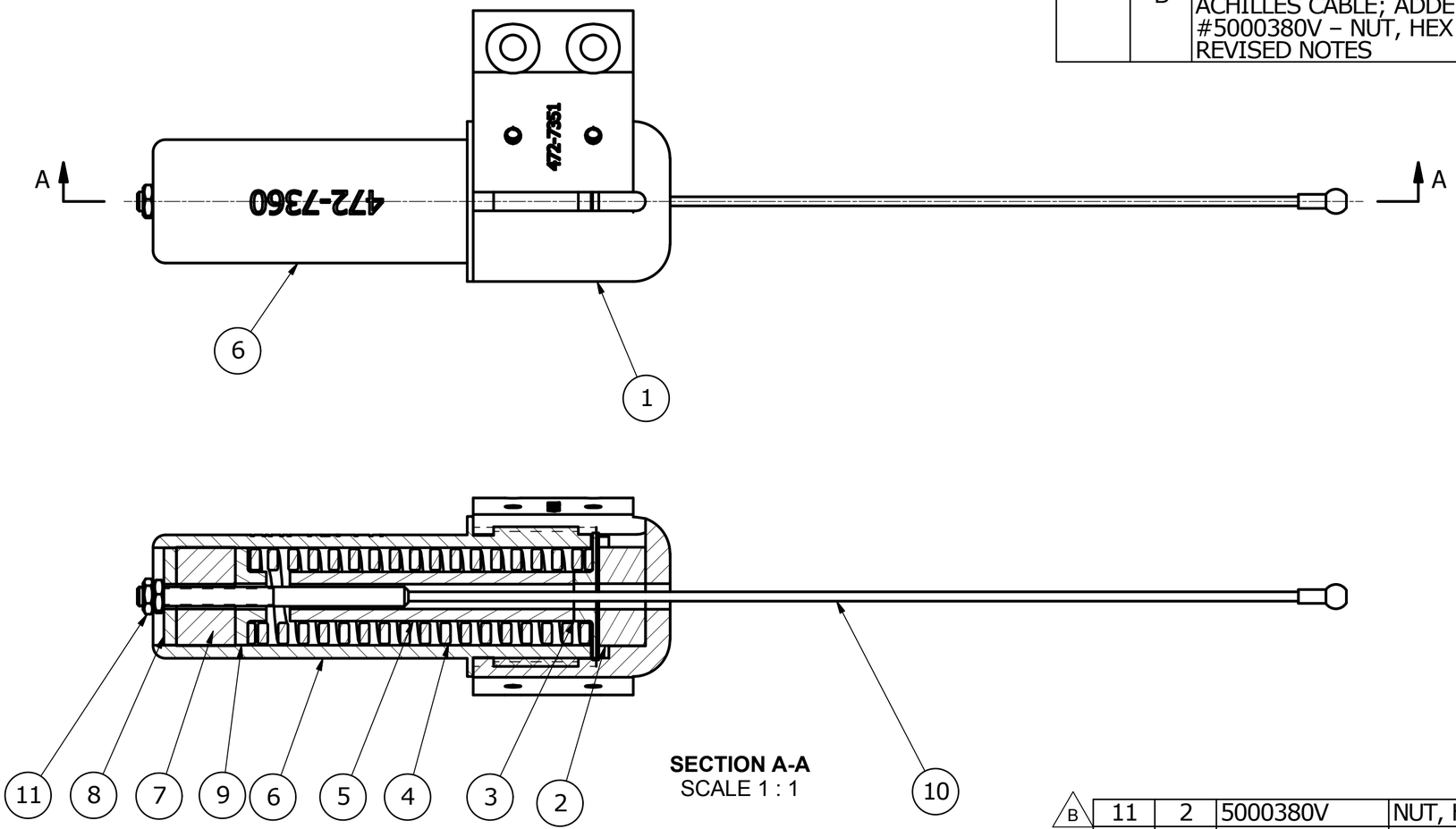
LOWER TIBIA LOAD CELL BLANK

THOR-50M

THIRD ANGLE PROJECTION | SIZE: A2 | DRAWING NUMBER: 472-7325 | REV: D | SCALE: 1:1 | SHEET: 1 OF 1

472-7325 Lower Tibia Load Cell Blank.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	CHANGED TO METRIC DIMENSIONING	11/21/2008	BLW
	B	REMOVED PART #9010447 – SCREW, SET M3 X 0.5 X 3, AND PART #472-7353 – RETAINING NUT, ACHILLES CABLE; ADDED PART #5000380V – NUT, HEX JAM M5; REVISED NOTES	7/14/2015	DW



SECTION A-A
SCALE 1 : 1

ITEM	QTY	PART NUMBER	DESCRIPTION
11	2	5000380V	NUT, HEX JAM M5
10	1	472-7352	ACHILLES CABLE ASSEMBLY
9	1	472-7355	SPRING CAP, ACHILLES
8	1	472-7354	WASHER, ACHILLES PRIMARY
7	1	472-7358	FOAM COMPRESSION ELEMENT
6	1	472-7360	TUBE, ACHILLES SPRING
5	1	472-7357	ELASTOMERIC SPRING ELEMENT
4	1	9000540	COMPRESSION SPRING
3	1	472-7356	SPRING BASE CAP, ACHILLES
2	1	472-7359	ACHILLES LOAD CELL BLANK
1	1	472-7351	TUBE BASE, ACHILLES SPRING

PARTS LIST

B UNLESS OTHERWISE SPECIFIED:
1. ADJUST NUT AS DESCRIBED IN THOR-LX/HYBRID III VERSION 2.0 USER'S MANUAL
2. SPRING RATE LISTED AT NOMINAL 24 N/mm
   NOMINAL SPRING RATE IS SUPERCEDED BY STATIC TESTING REQUIERMENTS:
   SPRING RATE: 25.0 ±1.3 N/mm
   MAX DEFLECTION TO SOLID HEIGHT MUST EXCEED 46 mm.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

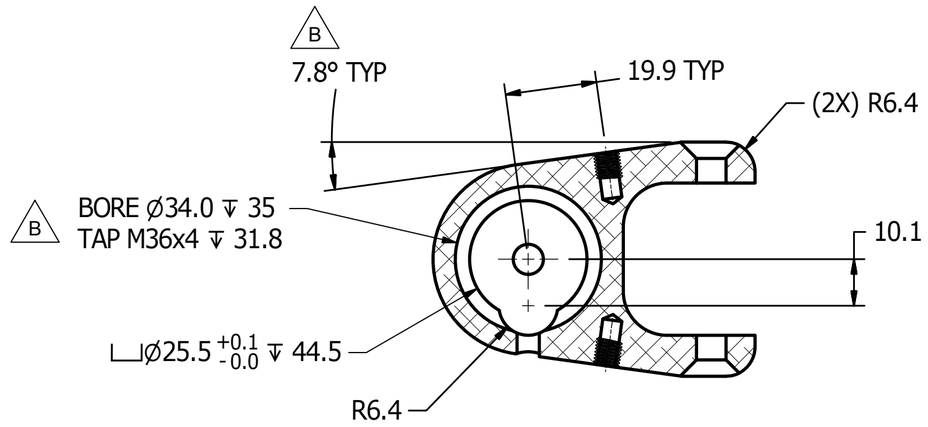
APPROVALS	DATE
DRAWN B. WADE	11/21/2008
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

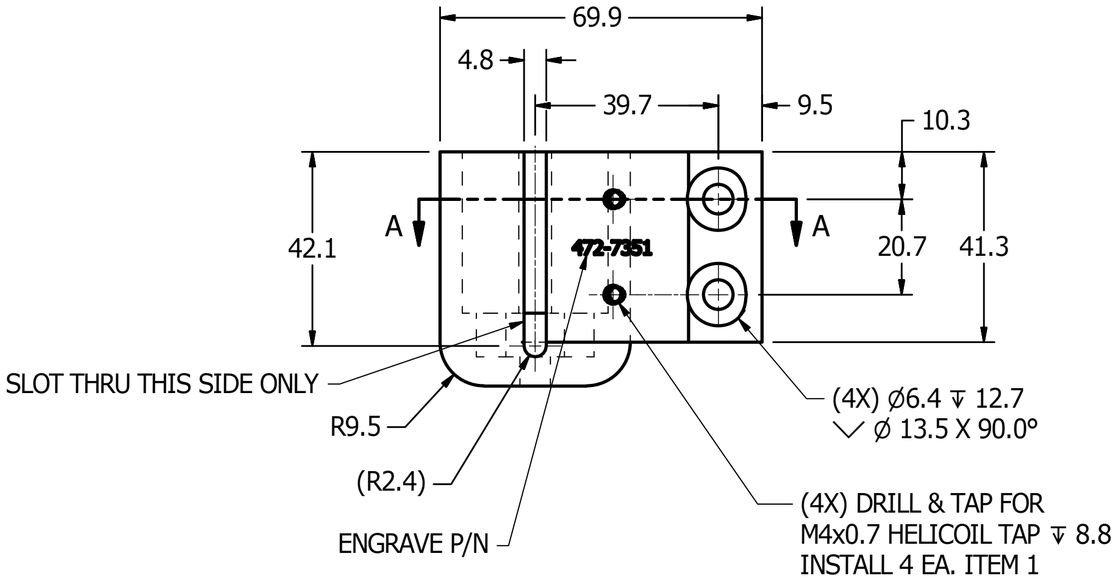
ACHILLES SPRING TUBE MECHANICAL ASS'Y.
THOR-50M

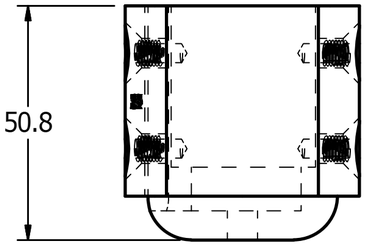
THIRD ANGLE PROJECTION
SIZE A2 | DRAWING NUMBER 472-7350 | REV B
SCALE:
SHEET 1 OF 1

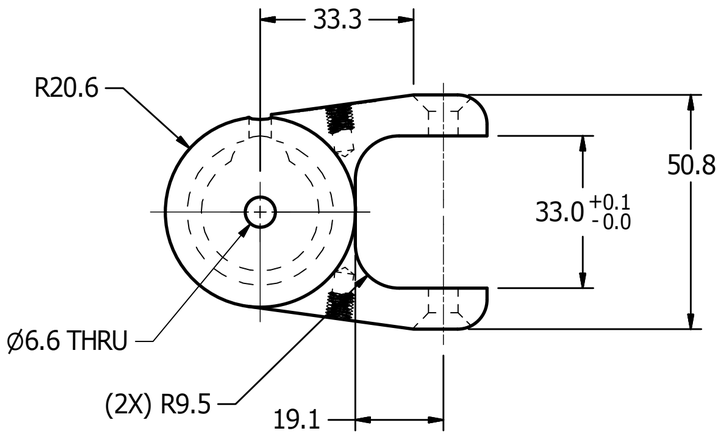
REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CHANGE TO METRIC DIMESIONING	11/21/2008	BLW
	B	M36X2 WAS M36X4, CORRECTED ANGLE DIM WAS 8.1°	7/20/2015	JHC



SECTION A-A
SCALE 1 : 1







ITEM	QTY	PART NUMBER	DESCRIPTION
2	4	9009073	M4 x .7 x 6mm HELICOIL

PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT:
FINISH: BLUE ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B WADE	11/21/2008
CHECKED	
ENG	
APPROVED	

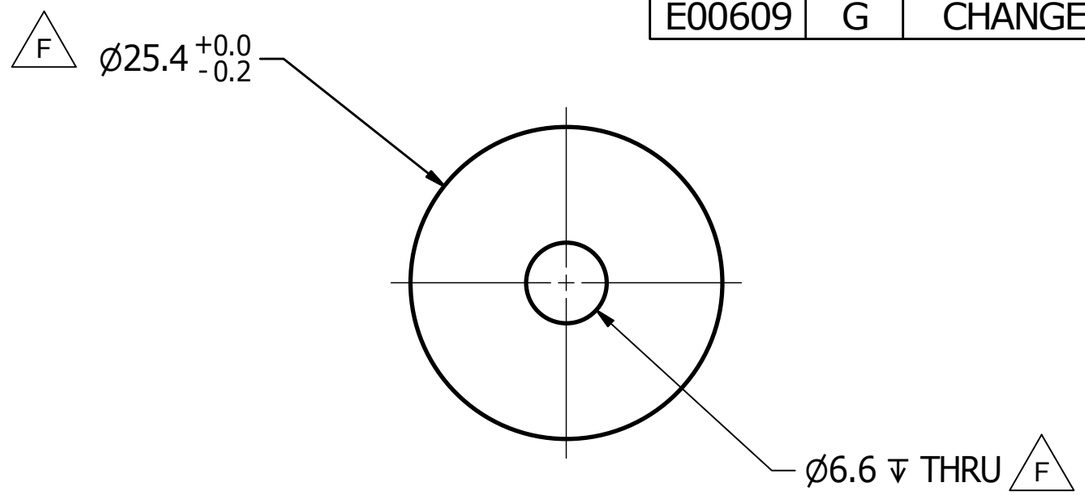
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

TUBE BASE, ACHILLES SPRING

THIRD ANGLE PROJECTION

SIZE: C | DRAWING NUMBER: 472-7351 | REV: B
SCALE: FULL | SHEET: 1 OF 1

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	E	REDRAWN IN INVENTOR	7/19/2007	KSG
8288	F	1.000 WAS .850, .261 WAS .25, .475 WAS .350	6/26/2008	TF
E00609	G	CHANGE TO METRIC DIMENSIONING	12/1/2008	BLW

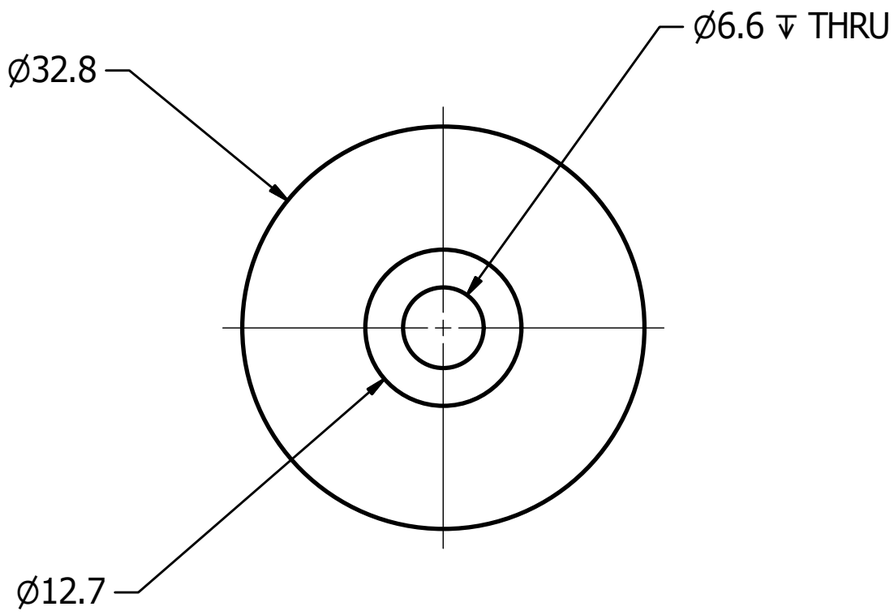


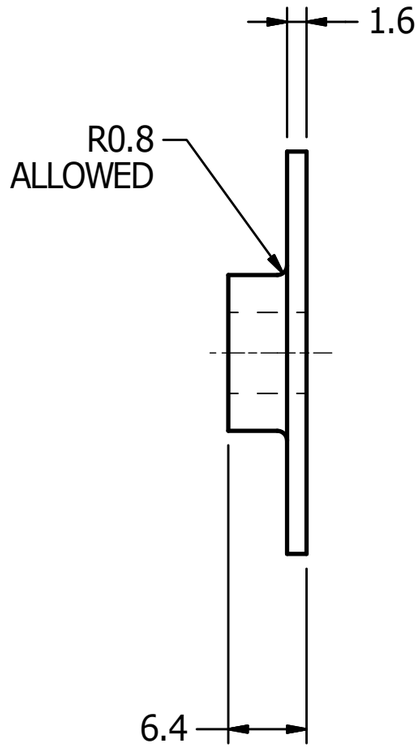
UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED 1.6 / ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	ACHILLES LOAD CELL BLANK
	DRAWN B. WADE / 12/1/2008	THOR-50M
MATERIAL Aluminum 6061-T6	CHECKED TMV / 12/10/2008	SIZE A3 · DRAWING NUMBER 472-7359 · REV G
HEAT TREAT N/A	ENG	
FINISH BLUE ANODIZE	APPROVED	THIRD ANGLE PROJECTION · SCALE: 2:1 · SHEET 1 OF 1

472-7359 Achilles Load Cell Blank.ipt

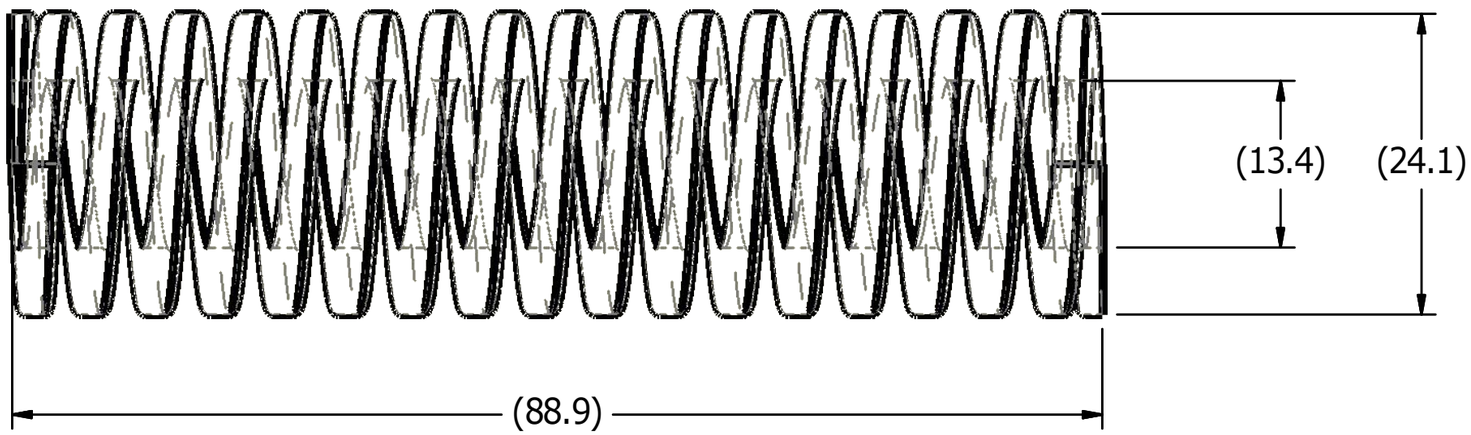
REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	B	REDRAWN IN INVENTOR	7/19/2007	KSG
8292	C	.261 WAS .250	6/17/2008	TF
E00609	D	CHANGE TO METRIC DIMENSIONING	12/1/2008	BLW





UNKLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	SPRING BASE CAP, ACHILLES
	DRAWN B. WADE 10/19/2007	THOR-50M
MATERIAL Stainless Steel, 440C	CHECKED TMV 12/10/2008	SIZE A3 · DRAWING NUMBER 472-7356 · REV D
HEAT TREAT 57 +/- Rc	ENG	
FINISH N/A	APPROVED	THIRD ANGLE PROJECTION · SCALE: 2:1 · SHEET 1 OF 1



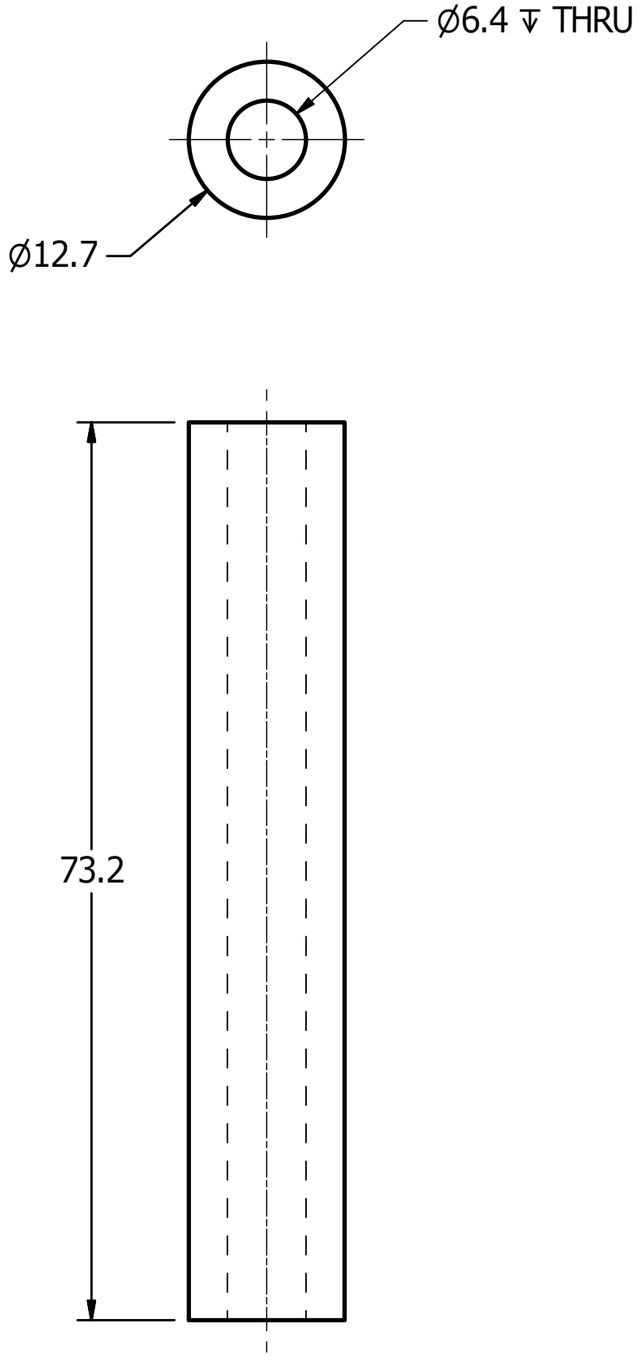
SPRING RATE: 24 N/mm

UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED 1.6, ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	COMPRESSION SPRING THOR-50M
MATERIAL Steel	DRAWN B. WADE	1/9/2009	
HEAT TREAT N/A	CHECKED		
FINISH N/A	ENG		
	APPROVED		THIRD ANGLE PROJECTION
			SIZE A3 / DRAWING NUMBER 9000540 / REV
			SCALE: / SHEET 1 OF 1

9000540 Compression Spring.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	B	REDRAWN IN INVENTOR	7/19/2007	KSG
E00609	C	CHANGE TO METRIC DIMENSIONING	12/1/2008	BLW



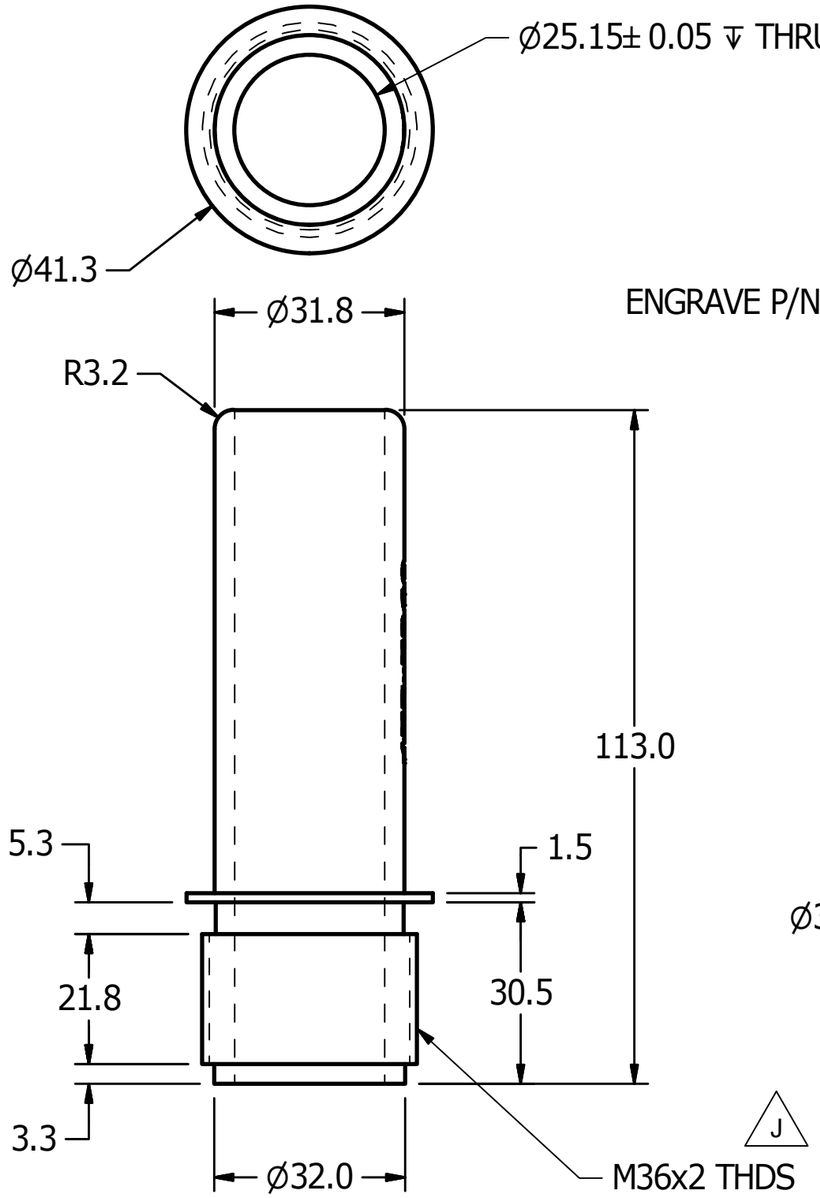
MATERIAL: BUNA-N/SBR RUBBER HOSE (1/2" OD X 1/4" ID)

UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED 1.6 / ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	ELASTOMERIC SPRING ELEMENT
	DRAWN B. WADE 12/1/2008	THOR-50M
MATERIAL SEE ABOVE	CHECKED TMV 12/10/2008	SIZE A3 / DRAWING NUMBER 472-7357 / REV C
HEAT TREAT N/A	ENG	
FINISH N/A	APPROVED	THIRD ANGLE PROJECTION / SCALE: 2:1 / SHEET 1 OF 1

472-7357 Elastomeric Spring Element.ipt

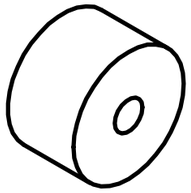
REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	F	REDRAWN IN INVENTOR	7/19/2007	KSG
	G	REDRAWN TO PREVIOUS NHTSA REVISION	6/16/2008	TF
	H	CHANGE TO METRIC DIMENSIONING	12/1/2008	BLW
	J	M36x2 WAS M36 X 4	7/20/2015	JHC

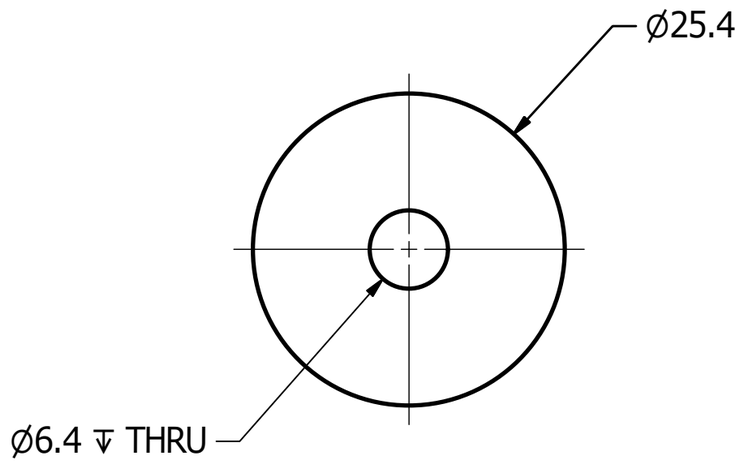


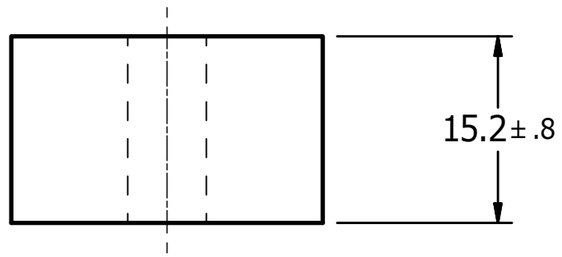
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	TUBE, ACHILLES SPRING THOR M
	DRAWN B. WADE / 12/1/2009	
MATERIAL: Aluminum 6061-T6	CHECKED	SIZE: B · DRAWING NUMBER: 472-7360 · REV: J
HEAT TREAT	ENG	
FINISH: BLUE ANODIZE	APPROVED	THIRD ANGLE PROJECTION · SCALE: FULL · SHEET: 1 OF 1

472-7360 Tube, Achilles Spring.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00690	C	REDRAWN IN INVENTOR	7/9/2007	KSG
8290	D	ADDED +/-.03	6/7/2008	TF
E06009	E	CHANGE TO METRIC DIMENSIONING	12/1/2008	BLW







UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: POLYURETHANE FOAM	CHECKED: TMV	12/10/2008
HEAT TREAT: N/A	ENG:	
FINISH: N/A	APPROVED:	

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS | DATE
DRAWN: B. WADE | 12/1/2008

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

FOAM COMPRESSION ELEMENT

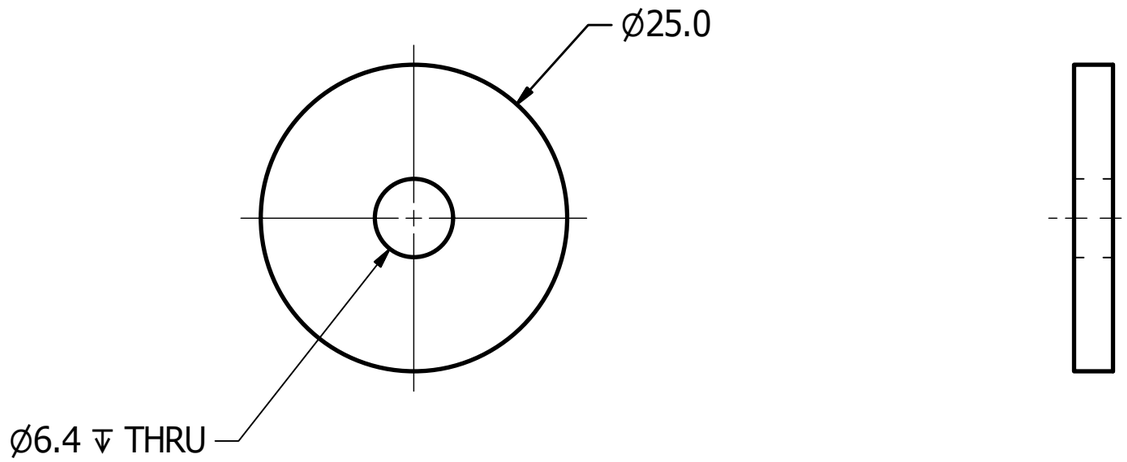
THOR-50M

THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 472-7358 | REV: E
SCALE: 2:1 | SHEET: 1 OF 1

472-7358 Foam Compression Element.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	A	REDRAWN IN INVENTOR	7/19/2007	KSG
E00609	B	CHANGE TO METRIC DIMENSIONING	12/1/2008	BLW

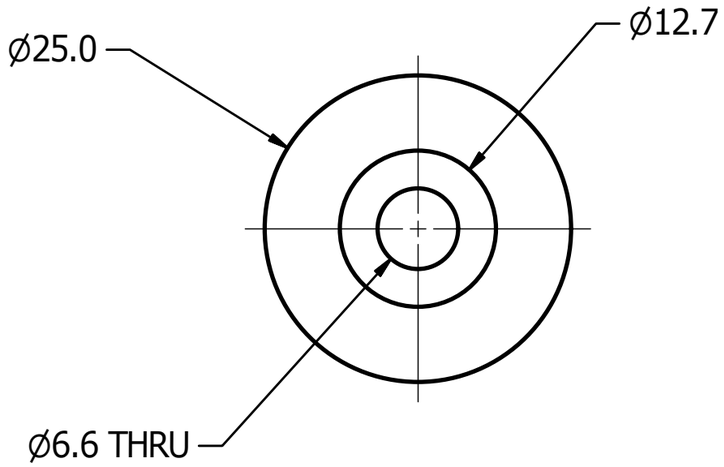


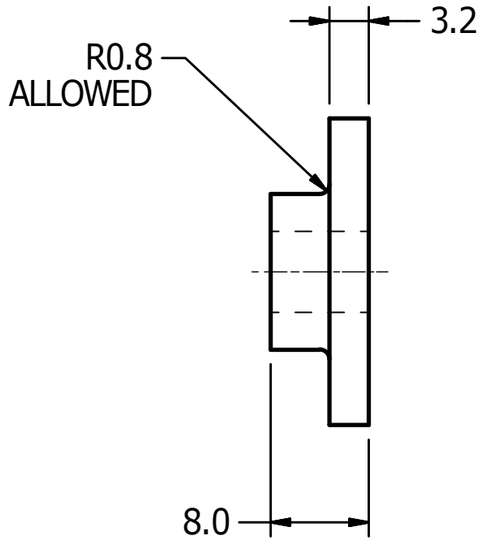
UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	WASHER, ACHILLES PRIMARY
DRAWN B. WADE	12/1/2008	THOR-50M
MATERIAL Delrin, White	CHECKED	
HEAT TREAT N/A	ENG	SIZE A3 | DRAWING NUMBER 472-7354 | REV B
FINISH N/A	APPROVED	THIRD ANGLE PROJECTION | SCALE: 2:1 | SHEET 1 OF 1

472-7354 Washer, Achilles Primary.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	A	REDRAWN IN INVENTOR	7/19/2007	KSG
E00609	B	CHANGE TO METRIC DIMENSIONS	12/1/2008	BLW





UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. WADE	12/1/2008
CHECKED TMV	12/11/2008
ENG	
APPROVED	

MATERIAL: Delrin, White
HEAT TREAT: N/A
FINISH: N/A

SPRING CAP, ACHILLES

THOR-50M

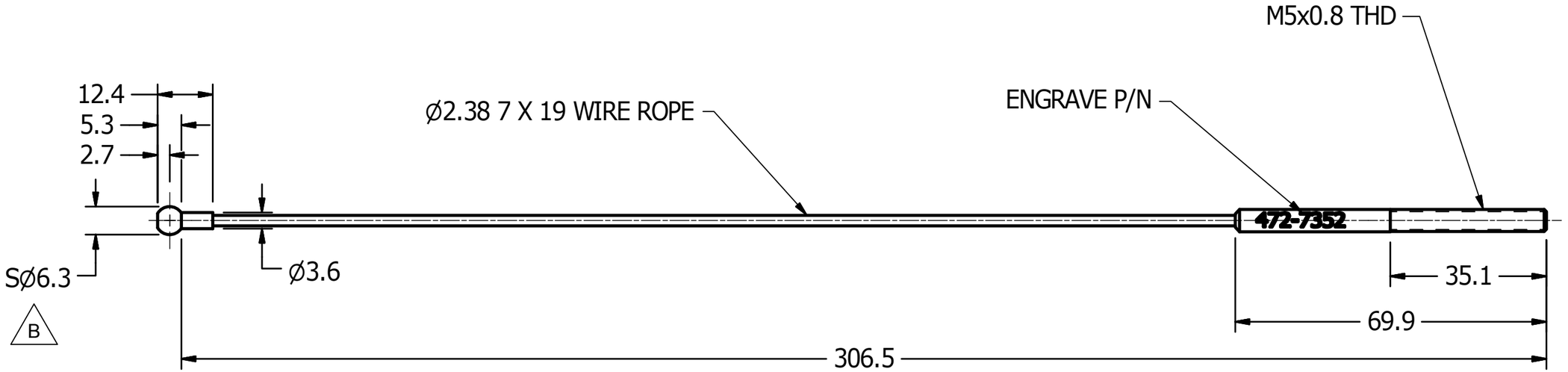
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 472-7355 | REV: B

SCALE: 2:1 | SHEET: 1 OF 1

472-7355 Spring Cap, Achilles.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CHANGE TO METRIC SIZE & DIMENSIONING	11/21/2008	BLW
	B	REVISE BALL DIAMETER	3/26/2009	BLW



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN B. WADE	11/21/2008
CHECKED	
ENG	
APPROVED	

MATERIAL

HEAT TREAT

FINISH

DEPARTMENT OF TRANSPORTATION UNITED STATES OF AMERICA

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

ACHILLES CABLE ASSEMBLY

THOR-50M

THIRD ANGLE PROJECTION

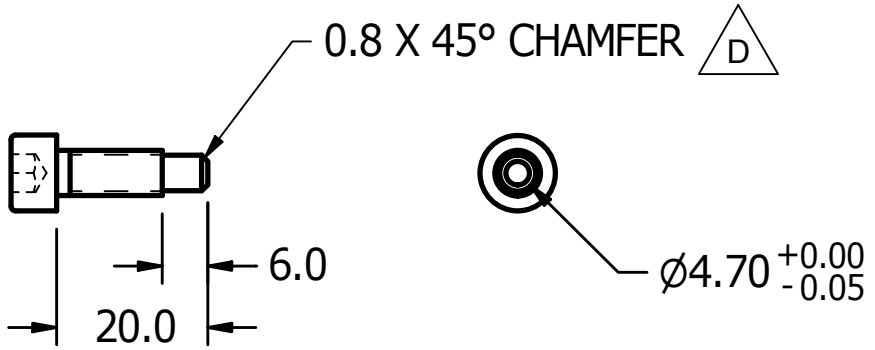
SIZE	DRAWING NUMBER	REV
B	472-7352	B

SCALE:

SHEET 1 OF 1

472-7352 Achilles Cable Assembly.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	.185 +.000/-.002 WAS .186	7/25/2008	KHS
	B	CHANGE TO METRIC HARDWARE	10/10/2008	BLW
	C	CHANGE TO METRIC DIMENSIONING	11/21/2008	BLW
	D	ADD MISSING DIMENSION	7/21/2015	JHC
	E	ADDED, (PART #9005101), MODIFY AS SHOWN, TO NOTE	7/16/2018	DW



E NOTE: MAKE FROM M6X1.0 X 20mm SHCS (PART #9005101), MODIFY AS SHOWN.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. WADE	11/21/2008
CHECKED	
ENG	
APPROVED	

MATERIAL: SEE NOTE
HEAT TREAT:
FINISH:

PLUNGER RETAINING BOLT

THOR-50M

THIRD ANGLE PROJECTION

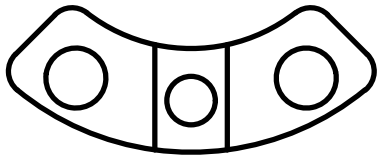
SIZE: A | DRAWING NUMBER: 472-7335 | REV: E

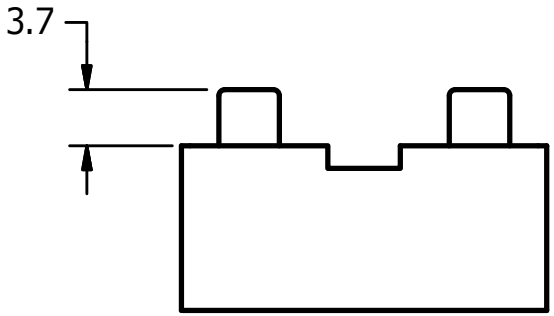
SCALE:

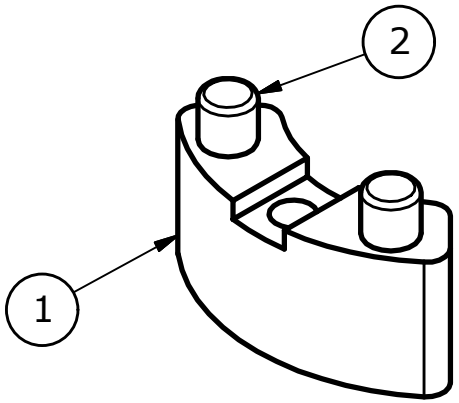
SHEET: 1 OF 1

472-7335 Plunger Retaining Bolt.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CHANGE TO METRIC DIMENSIONING	11/20/2008	BLW
	B	PIN LENGTH DESCRIPTION WAS 18mm	7/21/2015	JHC







ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	9010459	DOWEL PIN, 4mm X 10mm
1	1	472-7331	Z ROTATION WEDGE

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. WADE	11/20/2008
CHECKED	
ENG	
APPROVED	

MATERIAL

HEAT TREAT

FINISH

Z ROTATION WEDGE ASSY

THOR-50M

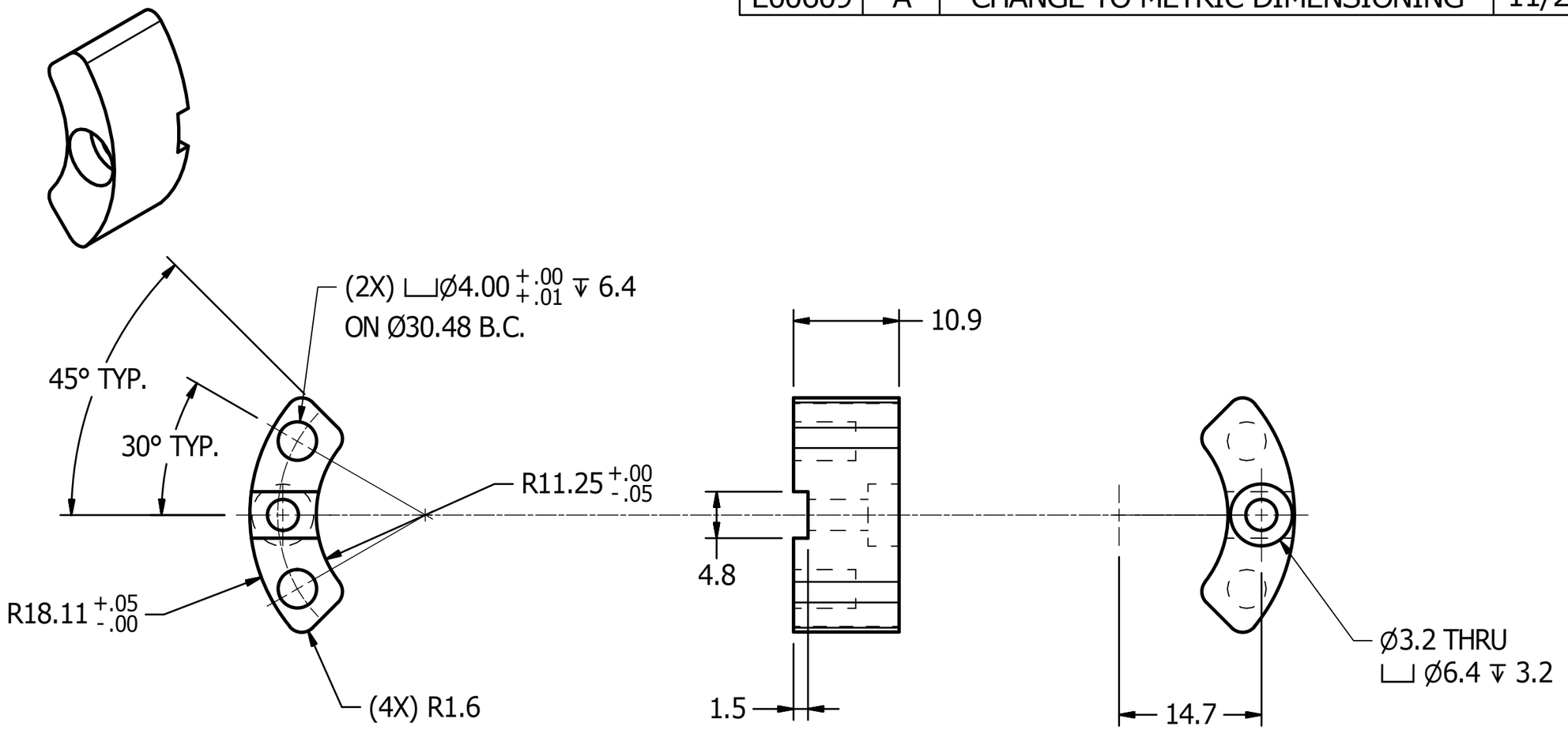
THIRD ANGLE PROJECTION

SIZE A | DRAWING NUMBER 472-7330 | REV B

SCALE: 2:1 | SHEET 1 OF 1

472-7330 Z Rotation Wedge Assy.iam

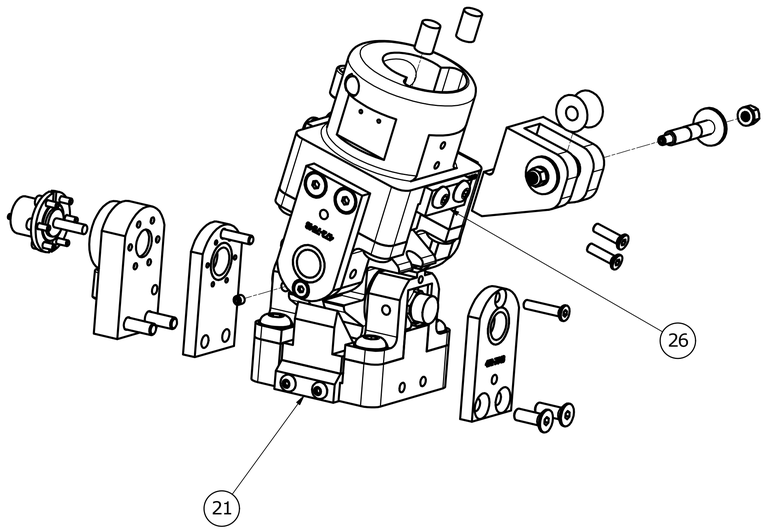
REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	A	CHANGE TO METRIC DIMENSIONING	11/20/2008	BLW

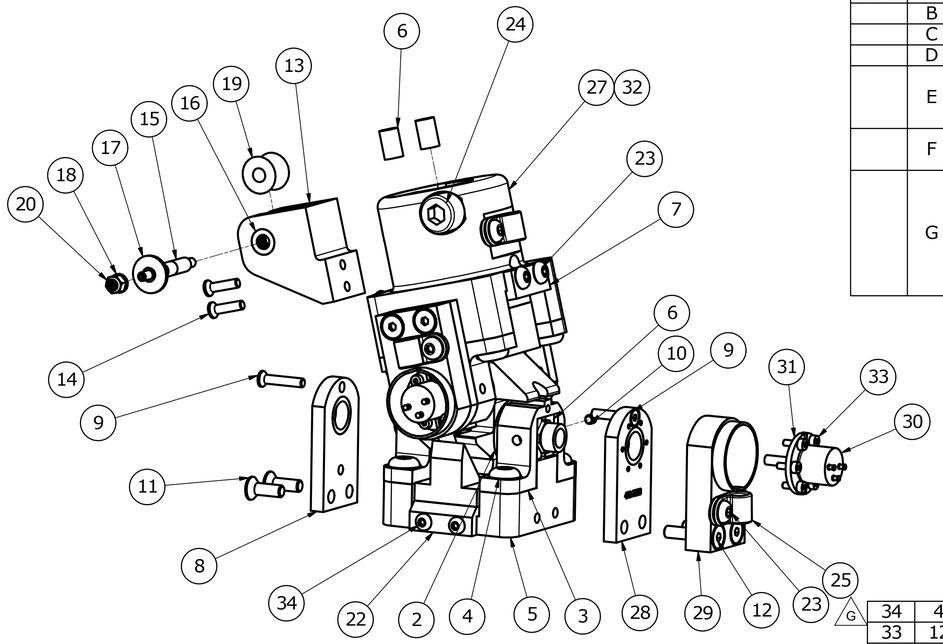


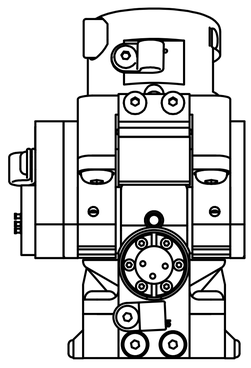
UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

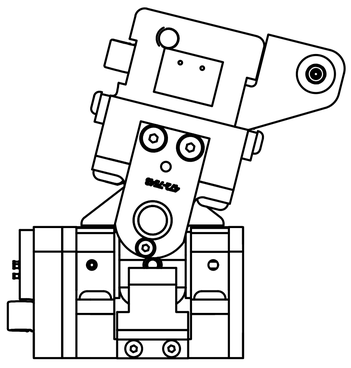
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED 1.6 / ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	Z ROTATION WEDGE
	DRAWN B. WADE 11/20/2008	THOR-50M
MATERIAL Alum. Bronze	CHECKED TMV 12/11/2008	SIZE A3 / DRAWING NUMBER 472-7331 / REV A
HEAT TREAT	ENG	
FINISH	APPROVED	THIRD ANGLE PROJECTION / SCALE: / SHEET 1 OF 1

472-7331 Z Rotation Wedge.ipt









REVISION HISTORY

ZONE	REV	DESCRIPTION	DATE	BY
	B	REDRAWN IN INVENTOR	7/25/2007	KSG
	C	CHANGE TO METRIC HARDWARE	10/14/08	BLW
	D	CHANGE TO METRIC DIMENSIONING	12/5/2008	BLW
	E	QTY OF ITEM 7 WAS 2, ADD ITEM 27, REDESIGN POT MOUNTING, POT PART NUMBER WAS 472-7550	7/27/2015	JHC
	F	DESCRIPTION OF ITEM 26 WAS STOP ASSEMBLY, REAR DORSI	3/22/2016	DW
	G	CORRECTED ITEM NUMBERS IN BOM, ITEM #21 WAS SKIPPED; CORRECTED DESCRIPTION OF ITEM #23 PART #5000103, WAS *Varies* AND QTY. WAS 11; ADDED ITEM #34 PART 5000410	8/8/2017	DW

ITEM	QTY	PART NUMBER	DESCRIPTION
34	4	5000410	SCREW, BHCS M3X0.5 X 8
33	12	9010560	SCREW, SHCS M2X0.4 X 6
32	6	9010559	SCREW, SHCS M2X0.2 X 4
31	3	472-7581	POTENTIOMETER CLAMP
30	3	SA572-S114	POTENTIOMETER
29	2	472-7585	RETAINER, POTENTIOMETER
28	2	472-7582	ANKLE BUSHING PLATE ASSEMBLY - POT END
27	1	472-7580	BASE, TORQUE - ANKLE TOP
26	1	472-7527	STOP ASSEMBLY, PLANTAR
25	3	9005135	CLAMP, NYLON LOOP
24	1	472-7563	BOLT & SLEEVE ASSEMBLY, ANKLE
23	7	5000103	SCREW, BHCS M4 x 0.7 x 8
22	1	472-7534	STOP ASSEMBLY - INVERSION
21	1	472-7533	STOP ASSEMBLY - EVERSION
20	2	9010450	NUT, NYLOCK M3X0.5
19	1	472-7562	PULLEY, ACHILLES CABLE
18	2	9000510	FLATWASHER, #4 TYPE B NARROW
17	2	9000508	ACHILLES WASHER
16	2	9000509	NEEDLE ROLLER BEARING
15	1	472-7561	SHAFT, ACHILLES CABLE PULLEY
14	2	9010449	SCREW, FHCS M3 x 12
13	1	472-7560	BRACKET, ACHILLES PULLEY
12	4	9010448	SCREW, FHCS M4X0.7 X 20
11	4	9000873	SCREW, FHCS M4-0.7 x 12
10	2	9010447	SCREW, SHSS, M3X0.5 X 3
9	4	9010446	SCREW, FHCS M3X0.5 X 16
8	2	472-7540	ANKLE BUSHING PLATE ASSEMBLY - FREE END
7	1	472-7530	STOP ASSEMBLY - DORSI
6	18	472-7524	TORQUE CYLINDER
5	1	472-7523	BASE, TORQUE - BOTTOM
4	8	5000356	SCREW, BHCS M6 x 1 x 12
3	4	472-7522	CAP, BASE TORQUE
2	4	472-7515	RETAINING WASHER
1	1	472-7510	ANKLE CENTER BLOCK ASS'Y.

PARTS LIST

ASSEMBLY INSTRUCTIONS
1. SAND 4 EA OF ITEM 2 TO ACHIEVE SNUG ASSEMBLY

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED \|- ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. WADE	12/8/2008
CHECKED	
ENG	
APPROVED	

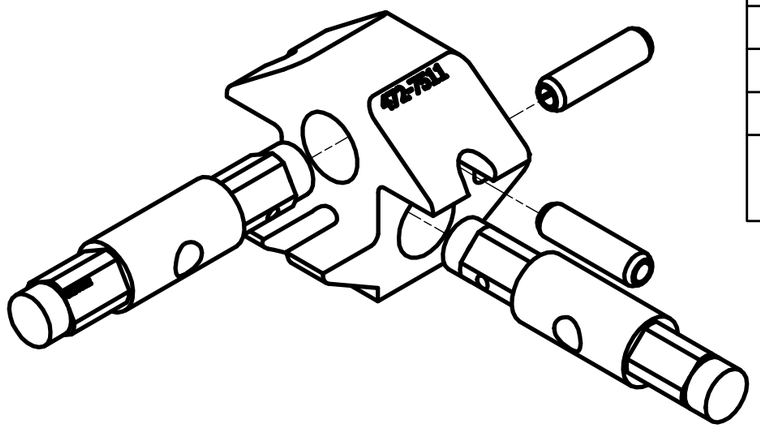
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

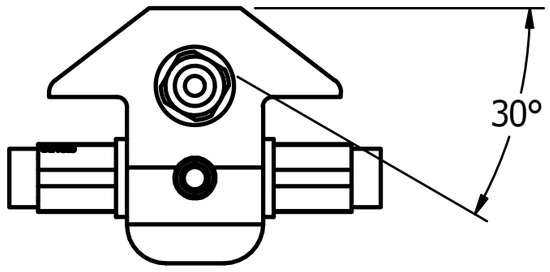
ANKLE ASSEMBLY, LEFT
THOR-50M

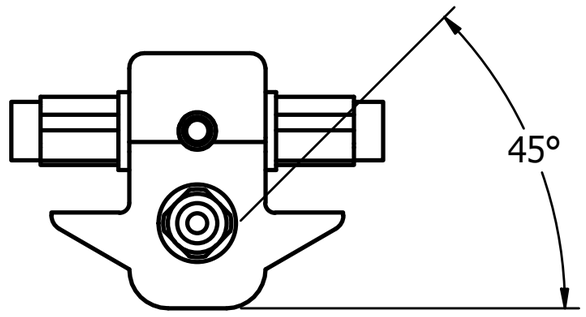
THIRD ANGLE PROJECTION
SIZE: D
DRAWING NUMBER: 472-7500-1
REV: G
SCALE: 1:1
SHEET: 1 OF 1

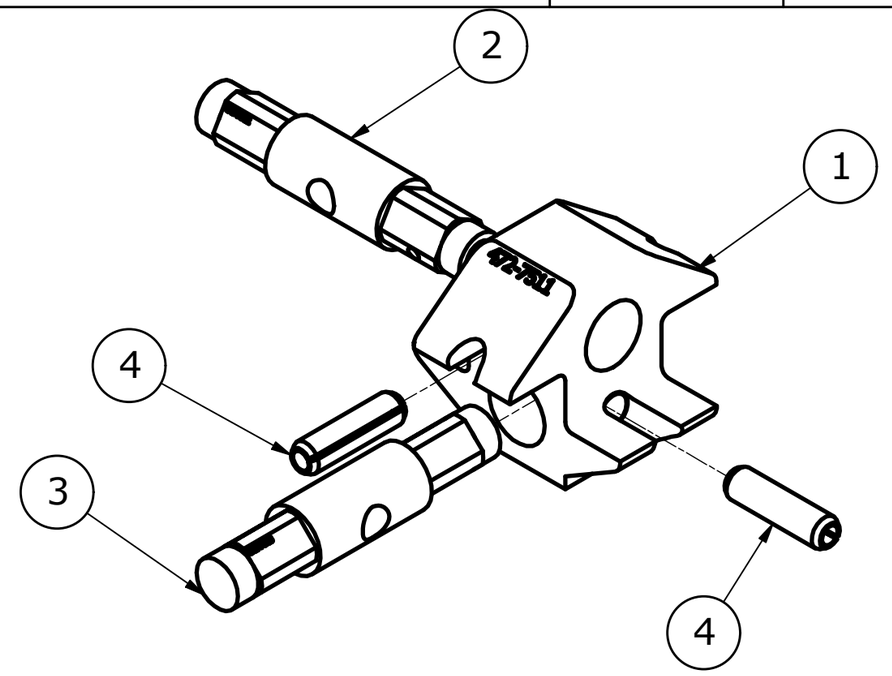
472-7500-1 Ankle Assembly, Left.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	B	REDRAWN IN INVENTOR	7/23/2007	KSG
E00609	C	INCORPORATED METRIC HARDWARE	10/6/2008	BLW
E00609	D	CHANGE TO METRIC DIMENSIONING	12/1/2008	BLW
8894	E	CREATE EXPLODED VIEWS	4/30/2009	BLW
	F	IN TITLE BLOCK THOR-50M WAS THOR-M	7/18/2018	DW









ITEM	QTY	PART NUMBER	DESCRIPTION
4	2	9010444	PIN, SPRING 6mm x 20mm
3	1	472-7513	TORQUE SHAFT, LOWER
2	1	472-7512	TORQUE SHAFT, UPPER
1	1	472-7511	CENTER BLOCK, ANKLE

PARTS LIST

UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT: N/A

FINISH: N/A

APPROVALS	DATE
DRAWN B. WADE	12/1/2008
CHECKED TMV	4/30/2009
ENG	
APPROVED	

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

ANKLE CENTER BLOCK ASS'Y.

THOR-50M

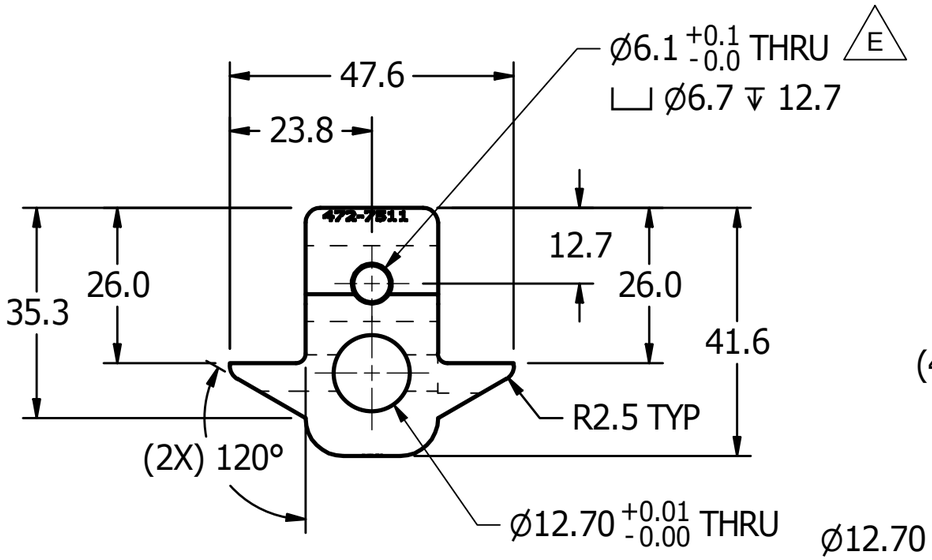
THIRD ANGLE PROJECTION

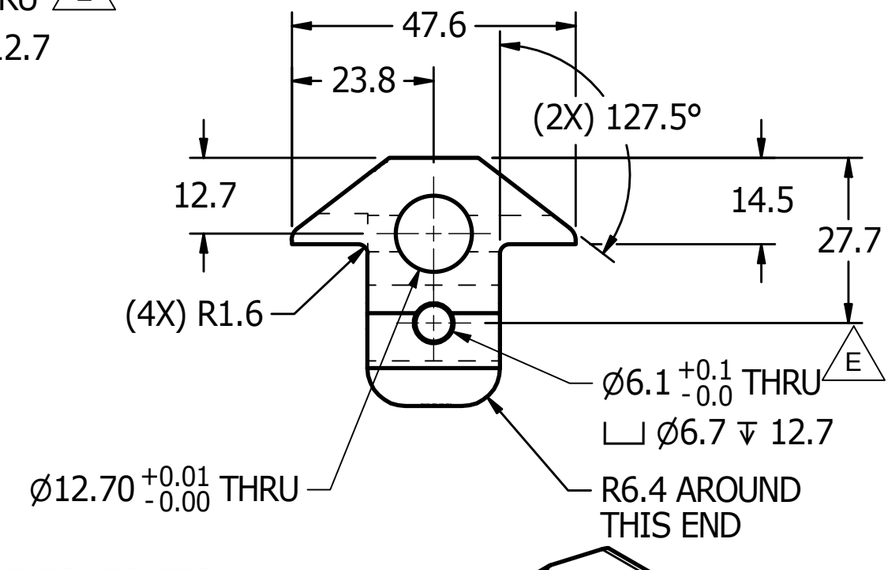
SIZE: A3 | DRAWING NUMBER: 472-7510 | REV: F

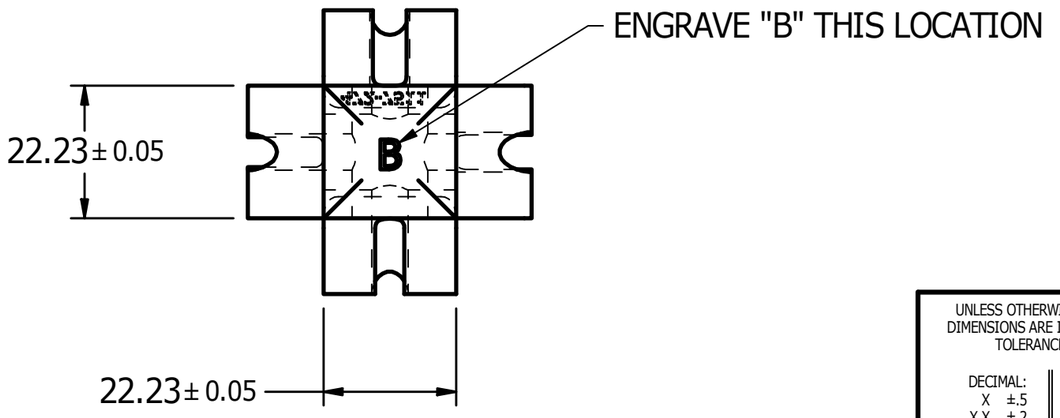
SCALE: 1:1 | SHEET: 1 OF 1

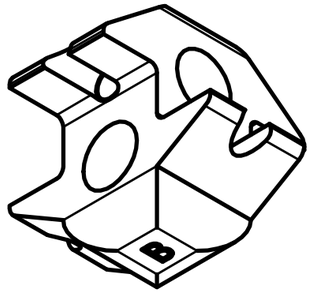
472-7510 Center Block Assembly, Ankle.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	B	REDRAWN IN INVENTOR	7/23/2007	KSG
	C	REDIM FOR METRIC HARDWARE	10/2/2008	BLW
	D	CHANGE TO METRIC DIMENSIONING	12/1/2008	BLW
	E	ADDED C'BORE, REVISE HOLE DIA	7/22/2015	JHC
	F	IN TITLE BLOCK THOR-50M WAS THOR-M	7/18/2018	DW





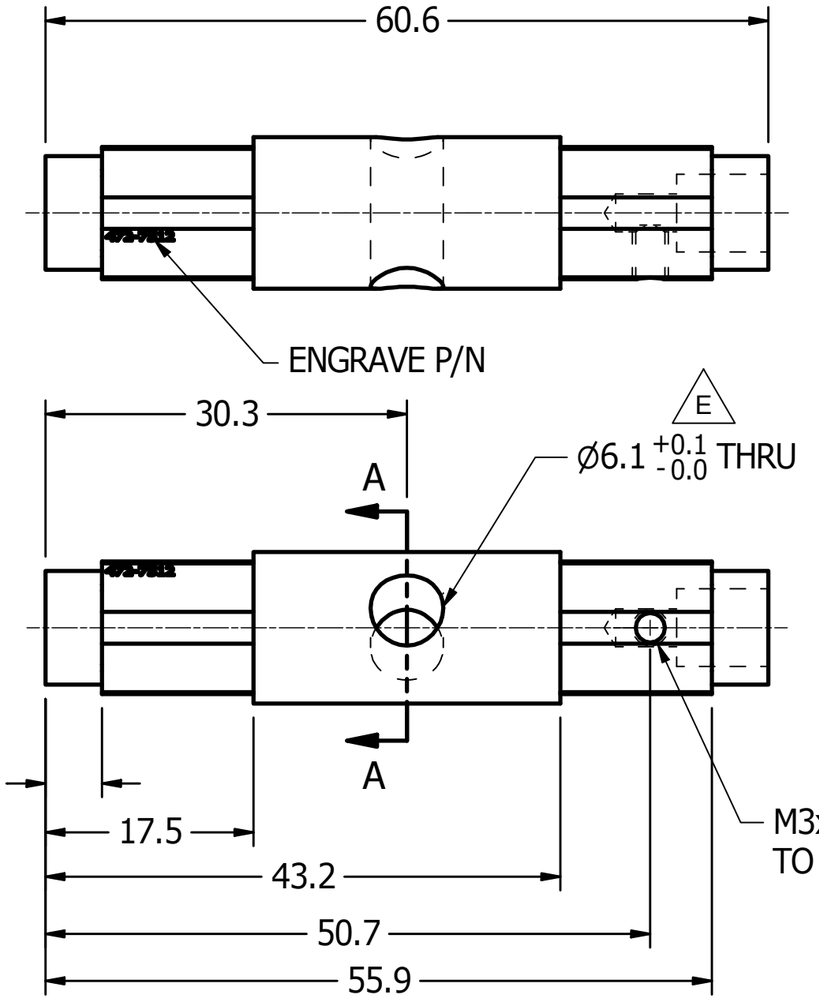


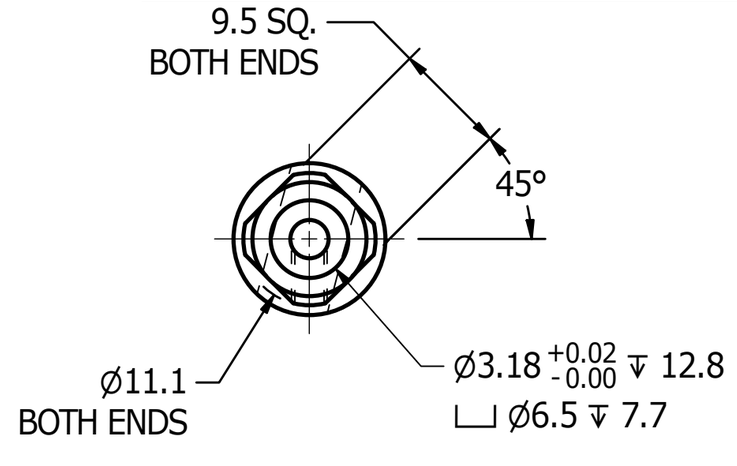


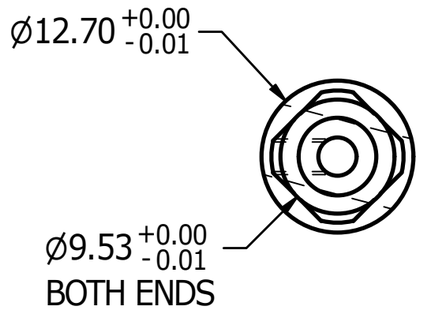
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	CENTER BLOCK, ANKLE THOR-50M
MATERIAL: Aluminum 6061	DRAWN: B. WADE	12/1/2008	SIZE: B; DRAWING NUMBER: 472-7511; REV: F
HEAT TREAT	CHECKED		THIRD ANGLE PROJECTION; SCALE: 1:1; SHEET: 1 OF 1
FINISH: BLUE ANODIZE	ENG		
	APPROVED		

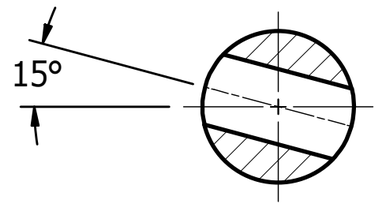
472-7511 Center Block.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	B	REDRAWN IN INVENTOR	7/23/2007	KSG
	C	REDIM FOR METRIC HARDWARE	10/6/2008	BLW
	D	CHANGE TO METRIC DIMENSIONING	12/2/2008	BLW
	E	6.1 WAS 6.0	7/22/2015	JHC
	F	IN TITLE BLOCK THOR-50M WAS THOR M	7/18/2018	DW









SECTION A-A
SCALE 2 : 1

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL:	MACHINED
X ±.5	1.6
X.X ±.2	ANGLES ±.5°
X.XX ±.1	

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. WADE	12/2/2008
CHECKED	
ENG	
APPROVED	

MATERIAL: Stainless Steel, 440C
HEAT TREAT: 57-61 Rc
FINISH:

TORQUE SHAFT, UPPER

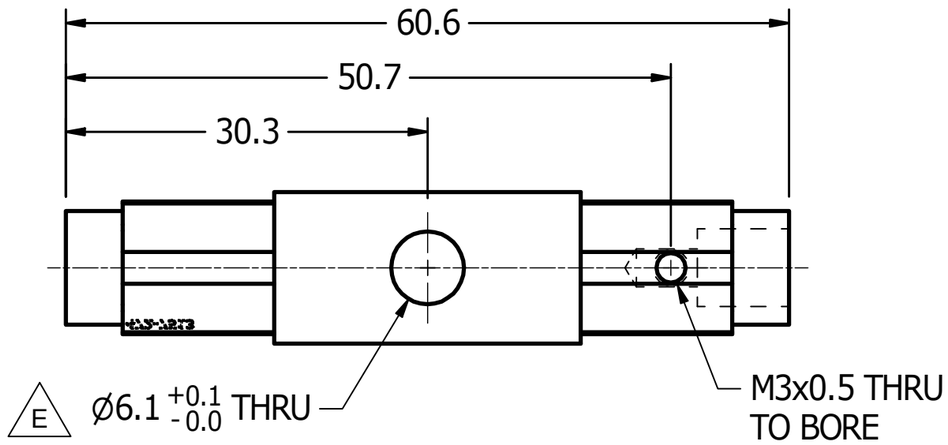
THOR-50M

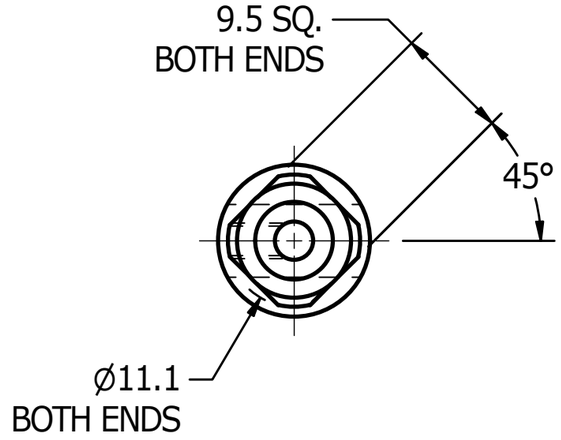
THIRD ANGLE PROJECTION

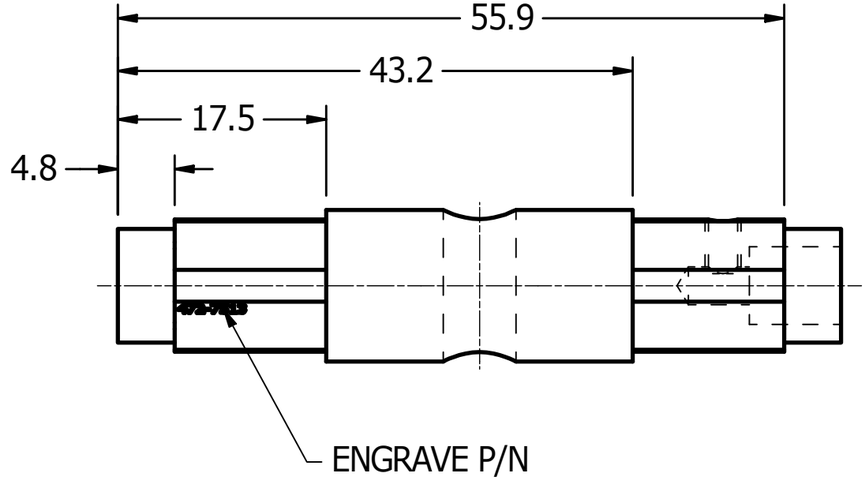
SIZE: B | DRAWING NUMBER: 472-7512 | REV: F
SCALE: 2:1 | SHEET: 1 OF 1

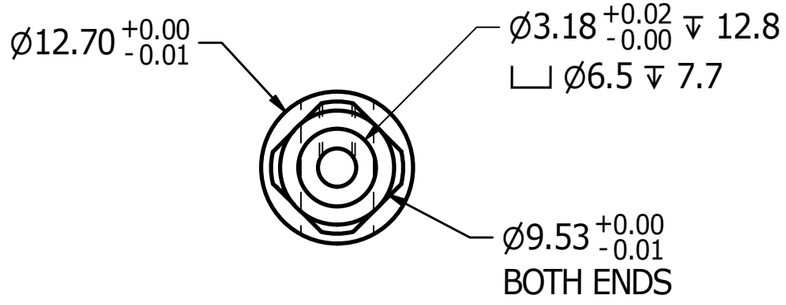
472-7512 Upper Ankle Torque Shaft.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	B	REDRAWN IN INVENTOR	7/23/2007	KSG
	C	REDIM FOR METRIC HARDWARE	10/6/2008	BLW
	D	CHANGE TO METRIC DIMENSIONING	12/2/2008	BLW
	E	6.1 WAS 6.0	7/22/2015	JHC
	F	IN TITLE BLOCK THOR-50M WAS THOR M	7/18/2018	DW









UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL:	MACHINED
X ±.5	1.6
X.X ±.2	ANGLES ±.5°
X.XX ±.1	

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. WADE	12/2/2008
CHECKED	
ENG	
APPROVED	

MATERIAL: Stainless Steel, 440C
HEAT TREAT: 57-61 Rc
FINISH:

TORQUE SHAFT, LOWER

THOR-50M

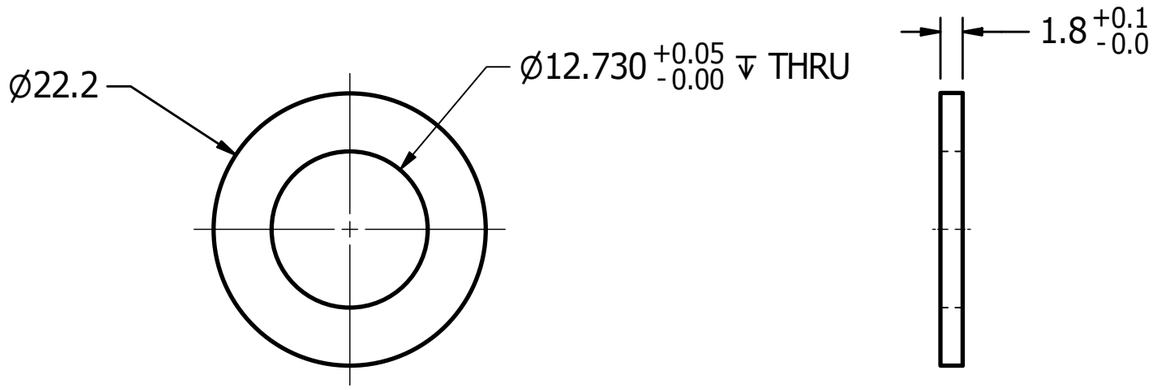
THIRD ANGLE PROJECTION

SIZE: B | DRAWING NUMBER: 472-7513 | REV: F

SCALE: 2:1 | SHEET: 1 OF 1

472-7513 Lower Ankle Torque Shaft.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	A	REDRAWN IN INVENTOR	7/23/2007	KSG
E00609	B	REVISE THICKNESS	10/6/2008	BLW
E00609	C	CHNAGE TO METRIC DIMENSIONING	12/2/2008	BLW
	D	IN TITLE BLOCK THOR-50M WAS THOR M	7/18/2018	DW

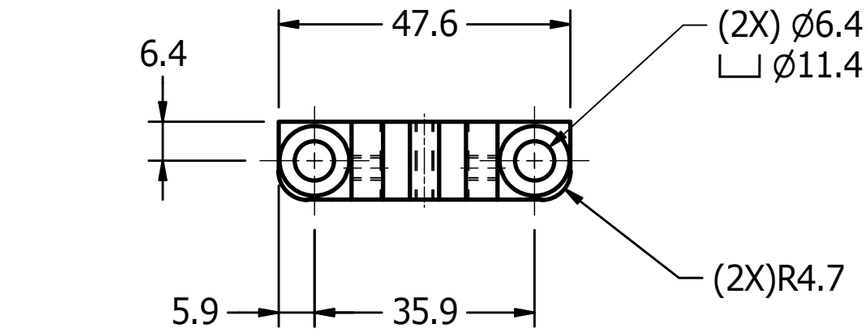


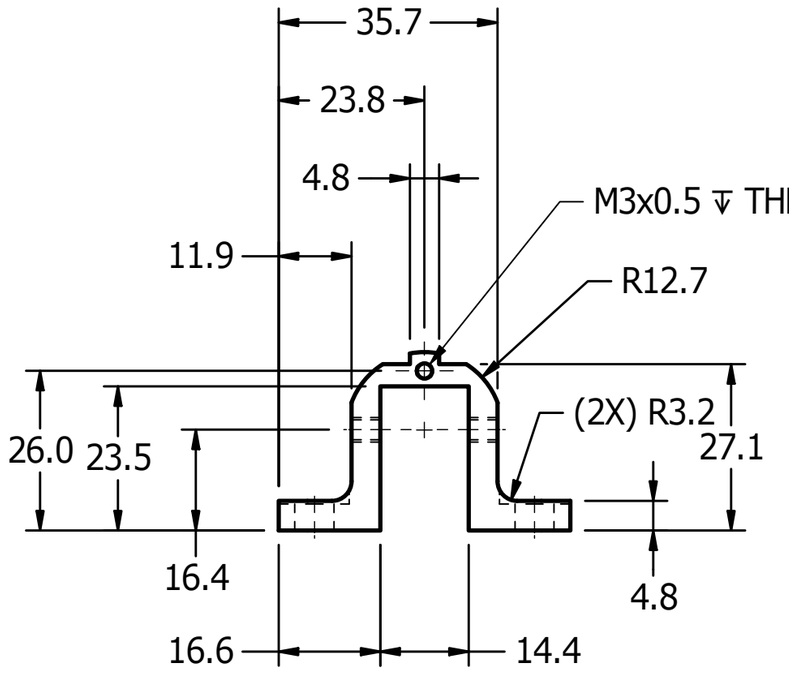
UNLESS OTHERWISE SPECIFIED:
1 BBREAK ALL SHARP EDGES.

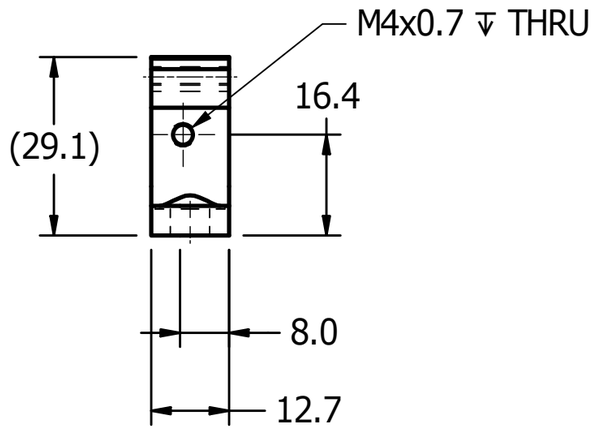
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	RETAINING WASHER THOR-50M
MATERIAL: Delrin, White	DRAWN: B. WADE	12/2/2008	
HEAT TREAT: N/A	CHECKED: TMV	12/11/2008	SIZE: A3 · DRAWING NUMBER: 472-7515 · REV: D
FINISH: N/A	ENG:		THIRD ANGLE PROJECTION · SCALE: 2:1 · SHEET: 1 OF 1
	APPROVED:		

472-7515 Washer, Retaining.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	B	REDRAWN IN INVENTOR	7/23/2007	KSG
E00609	C	REDIM FOR METRIC HARDWARE	10/2/2008	BLW
E00609	D	CHNAGE TO METRIC DIMENSIONING	12/3/2008	BLW
	E	IN TITLE BLOCK THOR-50M WAS THOR M	7/18/2018	DW







UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Aluminum 6061-T6	CHECKED: TMV	12/11/2008
HEAT TREAT: N/A	ENG:	
FINISH: BLUE ANODIZE	APPROVED:	

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B.WADE	12/3/2008

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

CAP, BASE TORQUE
THOR-50M

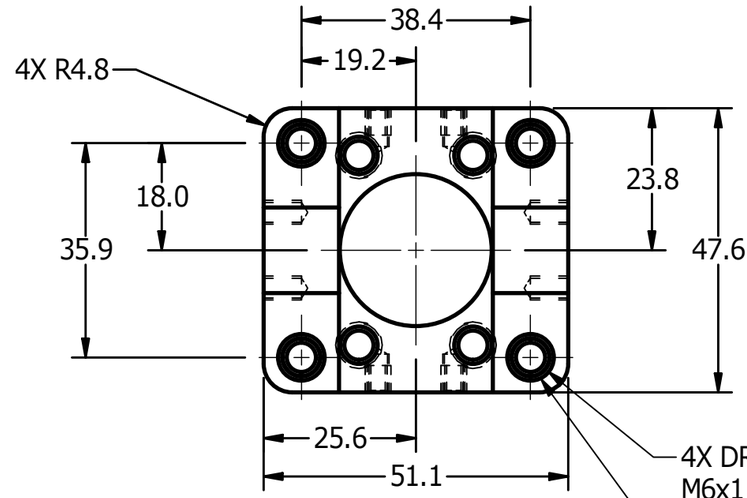
THIRD ANGLE PROJECTION

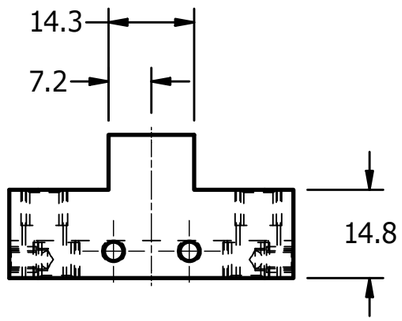
SIZE	DRAWING NUMBER	REV
A3	472-7522	E

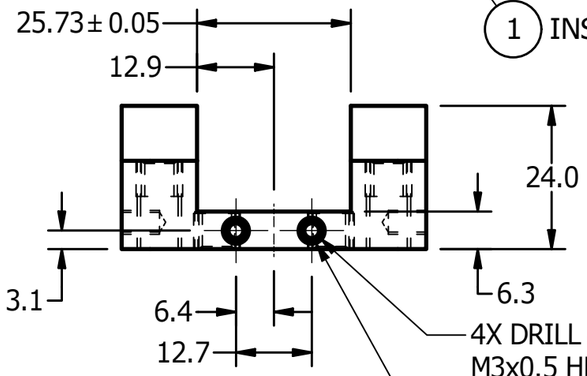
SCALE: 1:1 | SHEET: 1 OF 1

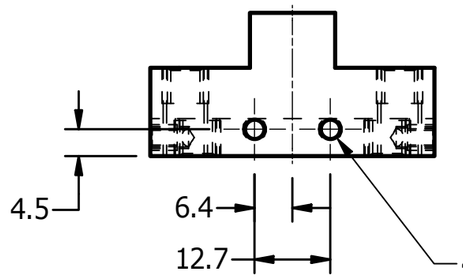
472-7522 Cap, Torque Base.ipt

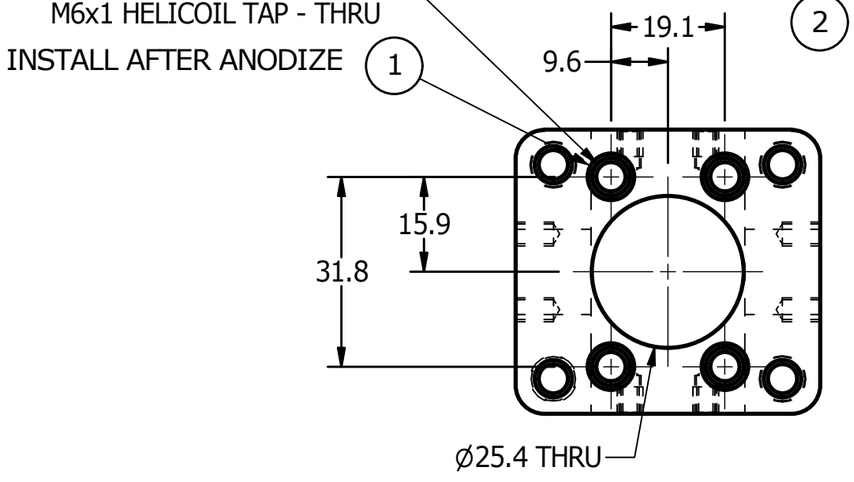
REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	C	REDRAWN IN INVENTOR; DRILL & TAP FOR 6-32 HELICOIL WAS 6.32 TAP	7/23/2007	KSG
	D	CHANGE TO METRIC HARDWARE, REV DIM	9/30/2008	BLW
	E	CHANGE TO METRIC DIMENSIONING	12/3/2008	BLW
	F	CHANGE TO 4.5MM LG HELICOIL	3/27/2009	JHC
	G	IN TITLE BLOCK THOR-50M WAS THOR M	7/19/2018	DW











ITEM	QTY	PART NUMBER	DESCRIPTION
2	4	9010508	M3X0.5 X 4.5mm Helicoil
1	8	9010437	M6X1 X 6mm Helicoil

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6 ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: ALUMINUM 6061-T6
HEAT TREAT:
FINISH: BLUE ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. WADE	12/3/2008
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

BASE, TORQUE - BOTTOM

THOR-50M

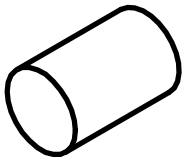
THIRD ANGLE PROJECTION

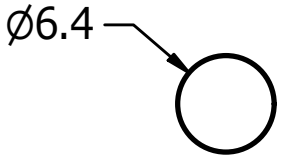
SIZE: B | DRAWING NUMBER: 472-7523 | REV: G

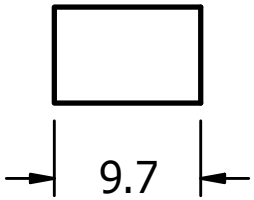
SCALE: 1:1 | SHEET: 1 OF 1

472-7523 Base, Torque - Bottom.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	B	REDRAWN IN INVENTOR	7/23/2007	KSG
	C	CHANGED TO METRIC DIMENSIONING	12/3/2008	BLW
	D	MADE DUROMETER REFERENCE, ADDED TEST REQUIREMENT NOTE	7/22/2015	JHC
	E	IN TITLE BLOCK THOR-50M WAS THOR M	7/19/2018	DW







MATERIAL:

NATURAL RUBBER (70 ±5 SHORE A)
DUROMETER MAY BE SUPERCEDED BY
DYNAMIC TEST REQUIREMENTS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:

DECIMAL:	MACHINED
X ±.5	1.6
X.X ±.2	ANGLES
X.XX ±.1	±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. WADE	12/3/2008
CHECKED	
ENG	
APPROVED	

MATERIAL: SEE ABOVE
HEAT TREAT
FINISH

TORQUE CYLINDER

THOR-50M

THIRD ANGLE PROJECTION

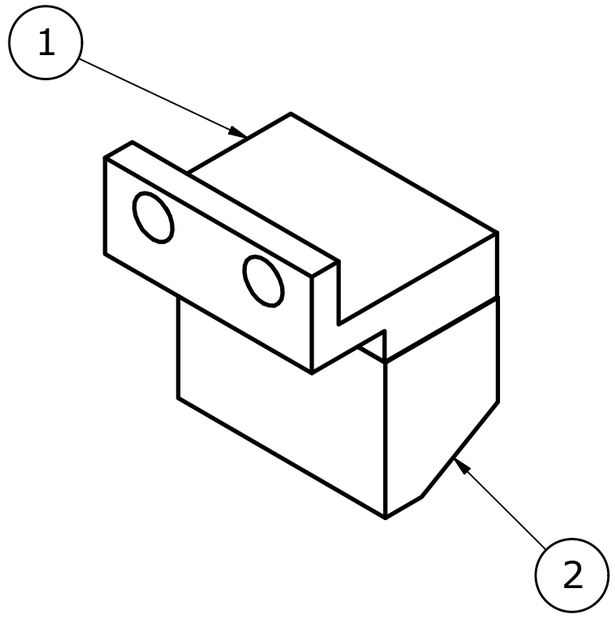
SIZE	DRAWING NUMBER	REV
A	472-7524	E

SCALE: 2:1

SHEET 1 OF 1

472-7524 Torque Cylinder.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	A	CHANGE TO METRIC DIMENSIONING	12/3/2008	BLW
	B	IN TITLE BLOCK THOR-50M WAS THOR M	7/19/2018	DW



UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.
2. SANDBLAST ITEM 1 & CLEAN WITH MEK.
3. ABRADE ITEM 2 WITH SANDPAPER & CLEAN WITH MEK & ALCOHOL.
4. BOND PARTS UNDER PRESSURE USING LORD 305 EPOXY ADHESIVE.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-7532	FRONT STOP, SOFT-DORSI/PLANTAR
1	1	472-7531	BRACKET, FRONT STOP-DORSI/PLANTAR

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT: N/A

FINISH: N/A

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN B. WADE	12/3/2008
CHECKED TMV	12/12/2008
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

STOP ASSEMBLY - DORSI

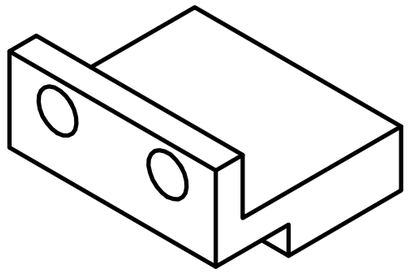
THOR-50M

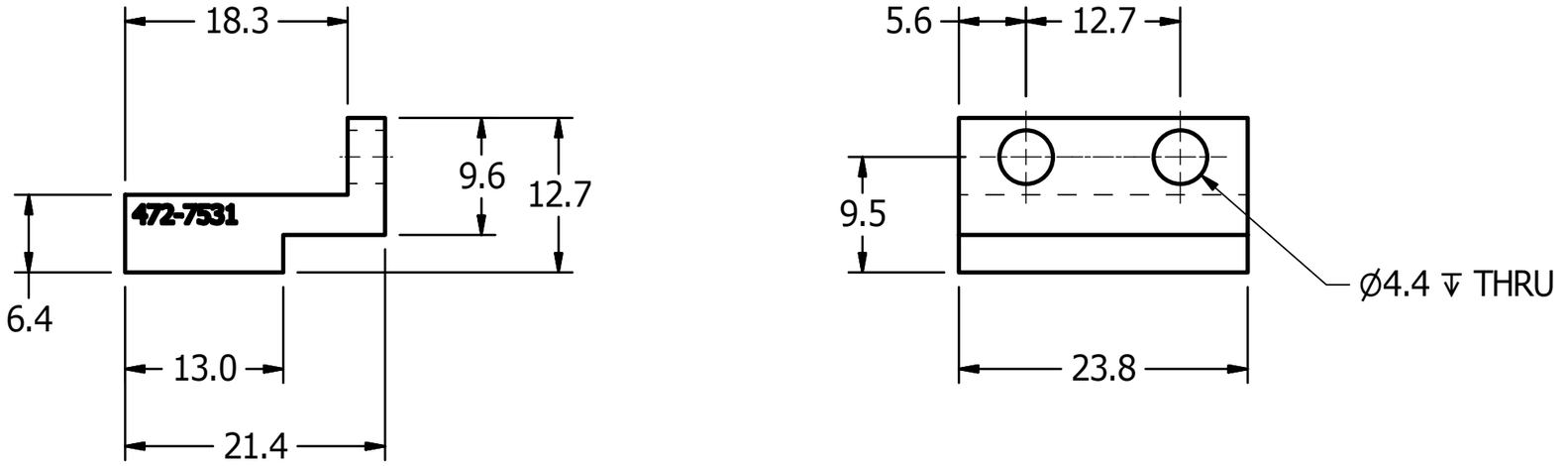
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 472-7530 | REV: B

SCALE: 2:1 | SHEET: 1 OF 1

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	A	REDIM FOR METRIC HARDWARE	10/2/2008	BLW
E00609	B	CHANGE TO METRIC DIMENSIONING	12/3/2008	BLW



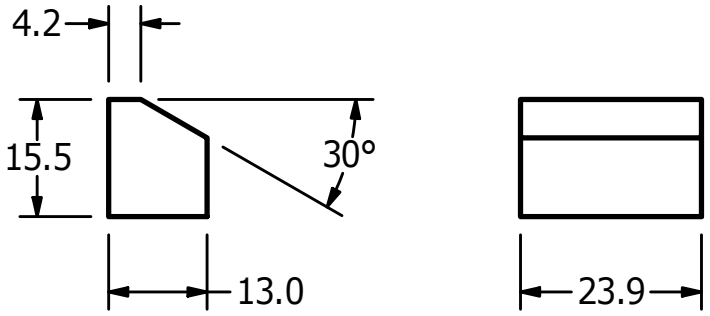


UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED 1.6 / ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	BRACKET, FRONT STOP-DORSI/PLANTAR THOR-50M
	DRAWN B. WADE	12/3/2008	
MATERIAL Aluminum 6061-T6	CHECKED TMV	12/10/2008	
HEAT TREAT N/A	ENG		SIZE A3 / DRAWING NUMBER 472-7531 / REV B
FINISH BLUE ANODIZED	APPROVED		THIRD ANGLE PROJECTION / SCALE: 2:1 / SHEET 1 OF 1

472-7531 Bracket, Dorsi-Plantar.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CHANGE TO METRIC DIMENSIONING	12/3/2008	BLW
	B	MADE DUROMETER REFERENCE, ADDED TEST REQUIREMENT NOTE	7/22/2015	JHC
	C	IN TITLE BLOCK THOR-50M WAS THOR M	7/19/2018	DW



MATERIAL: NEOPRENE (84 ± SHORE A)

DUROMETER MAY BE SUPERCEDED BY DYNAMIC TEST REQUIREMENTS.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. WADE	12/3/2008
CHECKED	
ENG	
APPROVED	

MATERIAL: SEE ABOVE
HEAT TREAT:
FINISH:

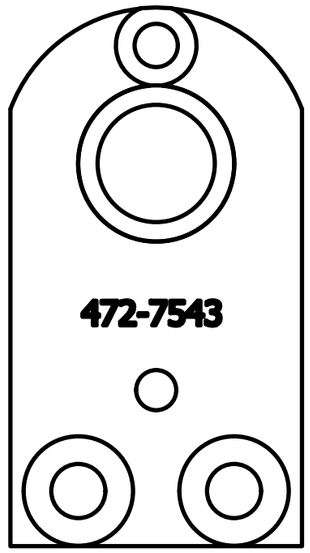
FRONT STOP, SOFT-DORSI/PLANTAR THOR-50M

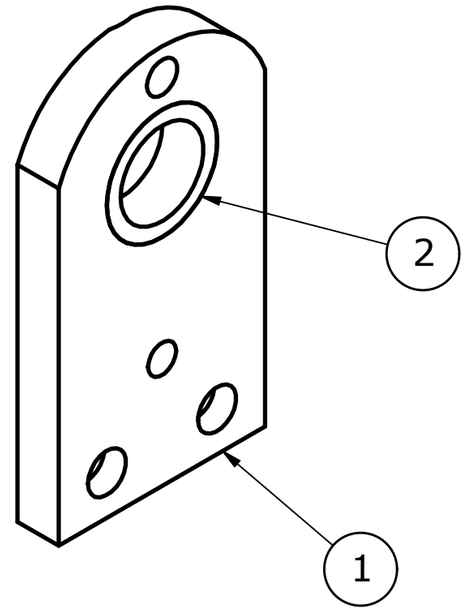
THIRD ANGLE PROJECTION

SIZE: A | DRAWING NUMBER: 472-7532 | REV: C
SCALE:
SHEET: 1 OF 1

472-7532 Stop, Dorsi-Plantar.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	A	REDRAWN IN INVENTOR	7/23/2008	KSG
E00609	B	CHANGED TO METRIC DIMENSIONING	12/3/2008	BLW
	C	IN TITLE BLOCK THOR-50M WAS THOR M	7/19/2018	DW





UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-7542	BUSHING, ANKLE
1	1	472-7543	BUSHING PLATE, FREE END

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT: N/A

FINISH: N/A

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN B. WADE	12/3/2008
CHECKED TMV	12/12/2008
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

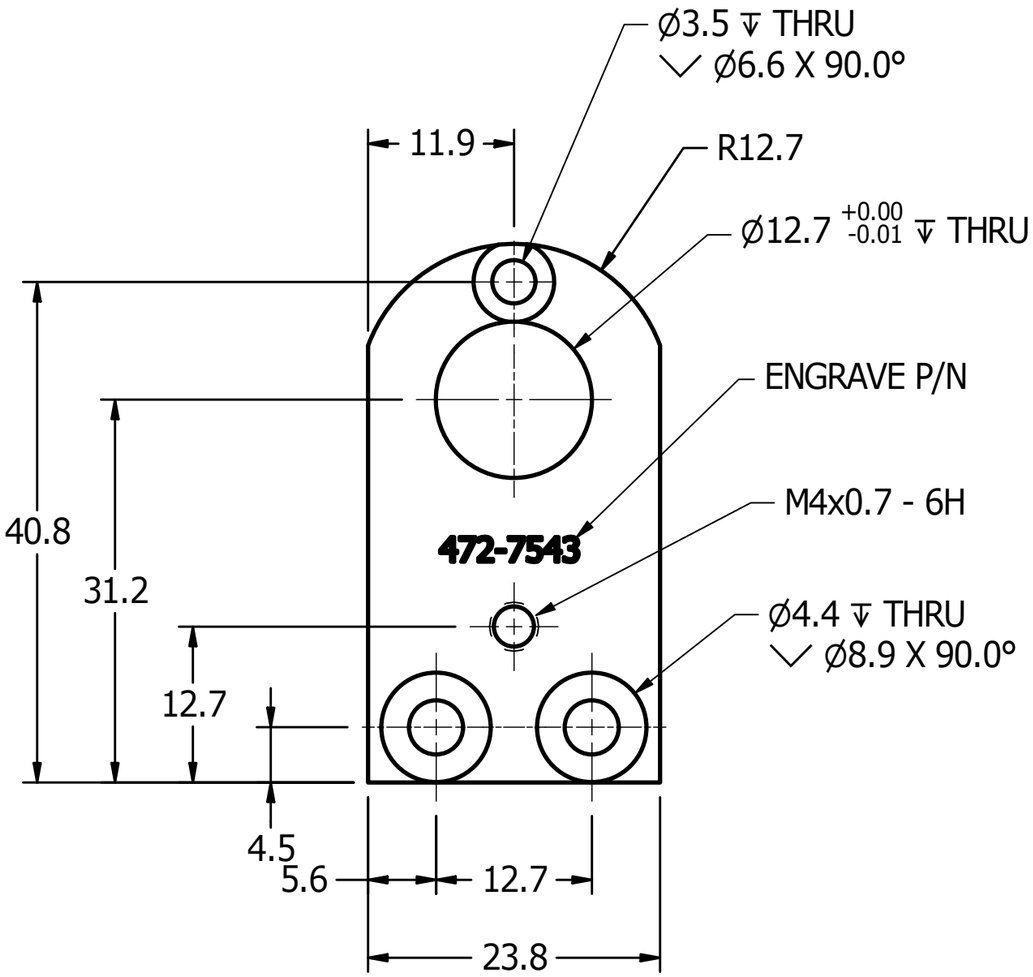
ANKLE BUSHING PLATE ASSEMBLY - FREE END
THOR-50M

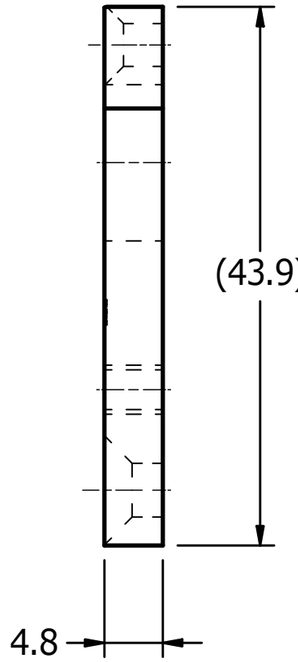
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 472-7540 | REV: C

SCALE: 2:1 | SHEET: 1 OF 1

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	B	REDRWN IN INVENTOR	7/23/208	KSG
E00609	C	REDIM FOR METRIC HRDWARE	10/1/2008	BLW
E00609	D	CHANGED TO METRIC DIMENSIONING	12/4/2008	BLW
	E	IN TITLE BLOCK THOR-50M WAS THOR M	7/19/2018	DW



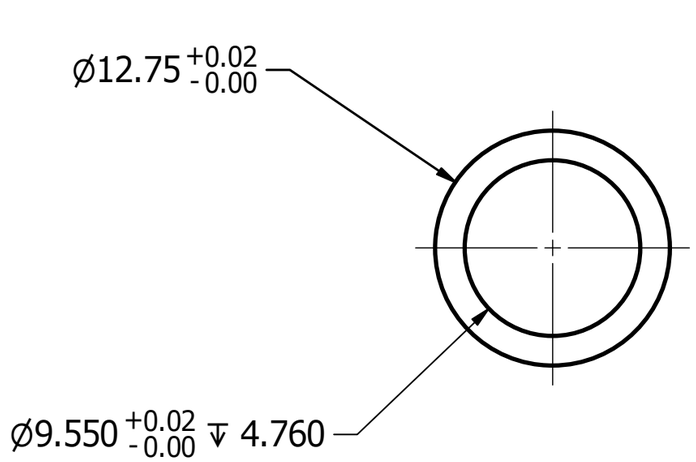


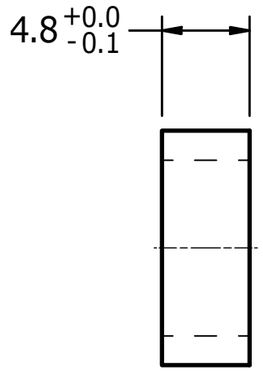
UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	BUSHING PLATE, FREE END THOR-50M
MATERIAL: Aluminum 6061	DRAWN: B. WADE 12/4/2008	
HEAT TREAT: N/A	CHECKED: TMV 12/10/2008	
FINISH: BLUE ANODIZED	ENG / APPROVED	THIRD ANGLE PROJECTION
		SIZE: A3 · DRAWING NUMBER: 472-7543 · REV: E
		SCALE: 2:1 · SHEET: 1 OF 1

472-7543 Ankle Bushing Plate, Free End.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	B	REDRAWN IN INVENTOR	7/23/2007	KSG
E00609	C	REV DIMS TO MATCH RAW MATERIAL	10/2/2008	BLW
E00609	D	CHANGED TO METRIC DIMENSIONING	12/3/2008	BLW
	E	IN TITLE BLOCK THOR-50M WAS THOR M	7/19/2018	DW





UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHAR EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 841 BRONZE	CHECKED: TMV	12/11/2008
HEAT TREAT: N/A	ENG:	
FINISH: N/A	APPROVED:	

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN: B. WADE	12/3/2008

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

BUSHING, ANKLE

THOR-50M

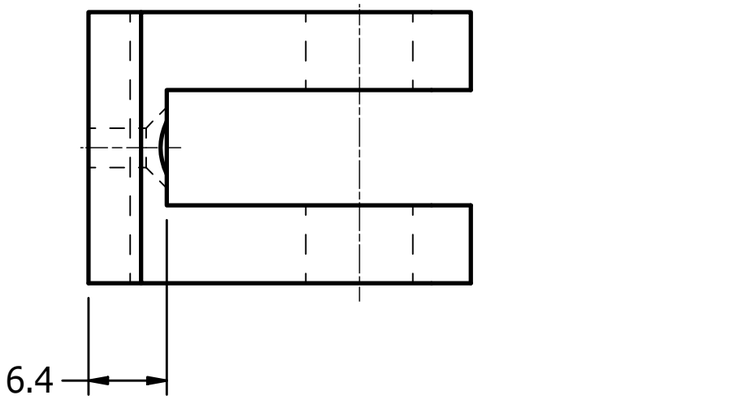
THIRD ANGLE PROJECTION

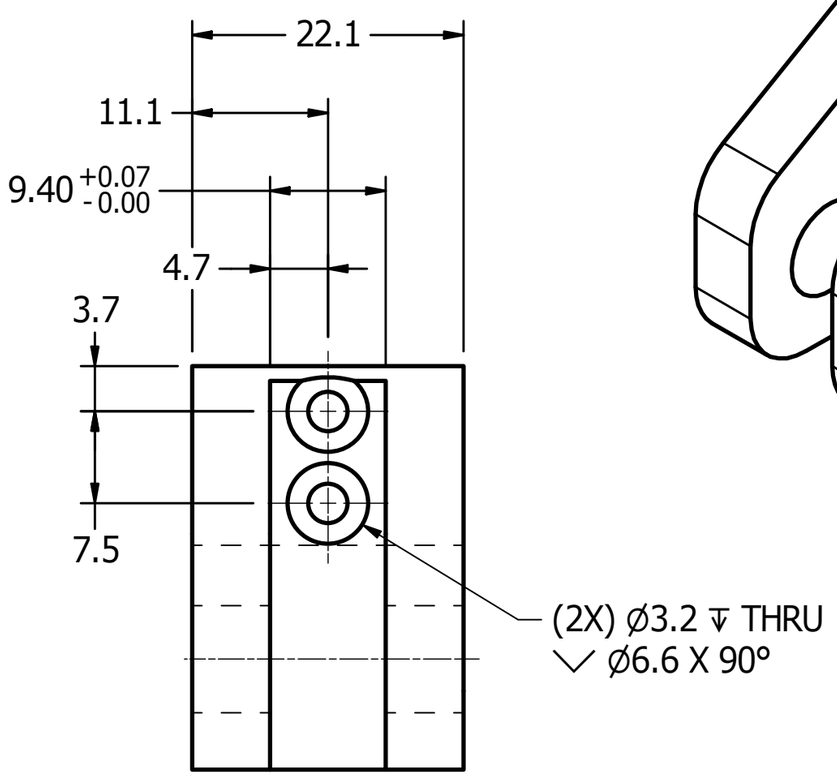
SIZE	DRAWING NUMBER	REV
A3	472-7542	E

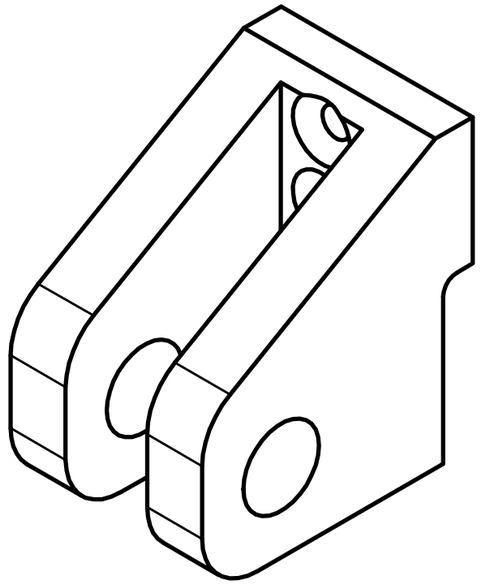
SCALE: 3:1 | SHEET: 1 OF 1

472-7542 Ankle Bushing.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	A	CHANGE TO METRIC DIMENSIONING	12/4/2008	BLW
	B	IN TITLE BLOCK THOR-50M WAS THOR M	7/19/2018	DW







UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6 ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	B. WADE	12/4/2008
CHECKED	TMV	12/18/2008
ENG		
APPROVED		

MATERIAL	Aluminum-7075-T6
HEAT TREAT	N/A
FINISH	BLUE ANODIZED

BRACKET, ACHILLES PULLEY

THOR-50M

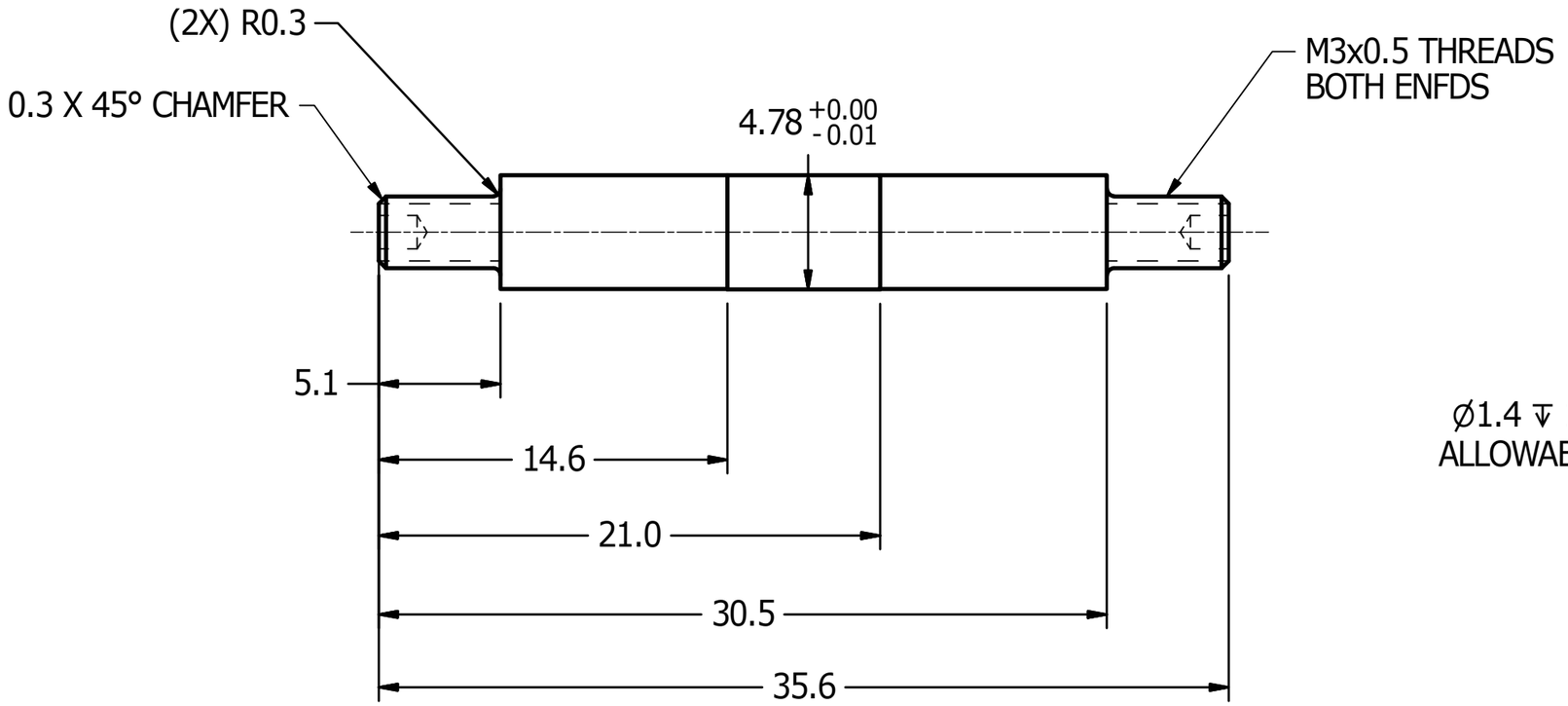
THIRD ANGLE PROJECTION

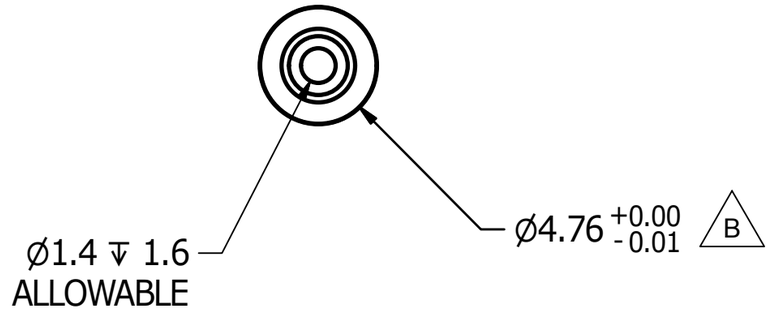
SIZE	DRAWING NUMBER	REV
A3	472-7560	B

SCALE:	SHEET
2:1	1 OF 1

472-7560 Achilles Pulley Bracket.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	A	CHANGED TO METRIC DIMENSIONING	12/4/2008	BLW
	B	DIMENSION 4.76 +0.00/-0.01 WAS 4.79 +0.00/-0.01	9/28/2015	DW





UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: ETD 150 Steel
HEAT TREAT: N/A
FINISH: N/A

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN B.WADE	12/4/2008
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

SHAFT, ACHILLES CABLE PULLEY

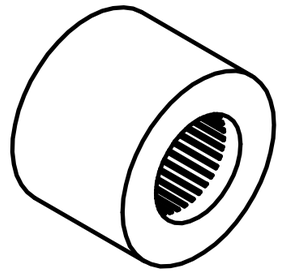
THOR-50M

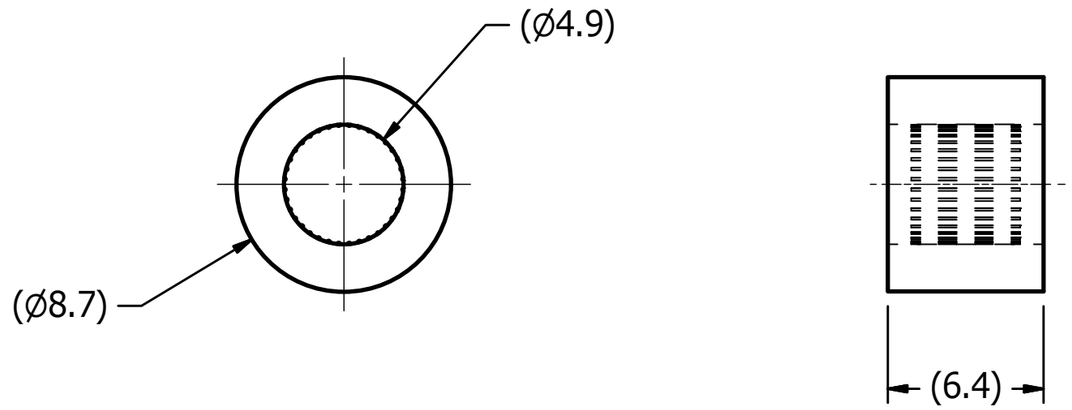
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 472-7561 | REV: B

SCALE: 4:1 | SHEET: 1 OF 1

472-7561 Achilles Pulley Shaft.ipt

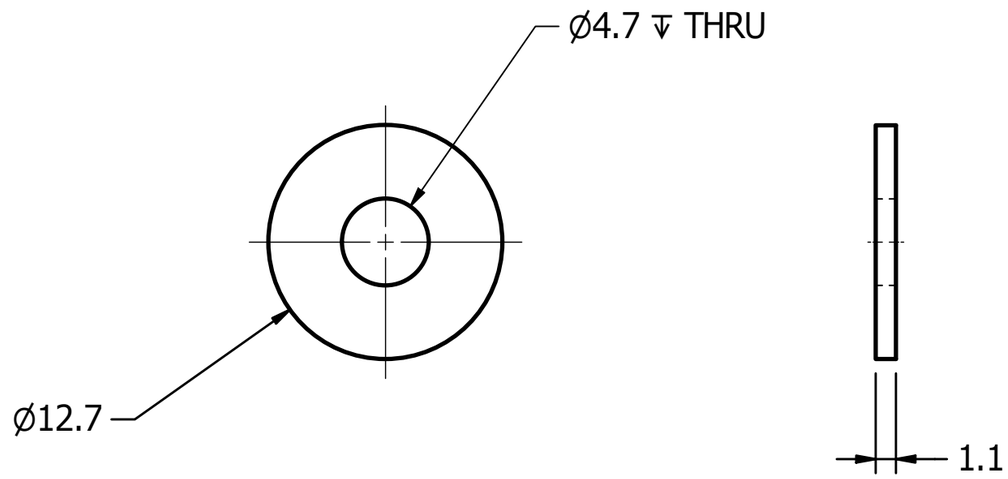




UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	NEEDLE ROLLER BEARING THOR-50M
	DRAWN B. WADE / 1/9/2009	
MATERIAL Steel, Alloy	CHECKED	
HEAT TREAT N/A	ENG	
FINISH N/A	APPROVED	THIRD ANGLE PROJECTION SIZE A3 · DRAWING NUMBER 9000509 · REV SCALE: · SHEET 1 OF 1

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	IN TITLE BLOCK THOR-50M WAS FLX LEG	7/19/2018	DW

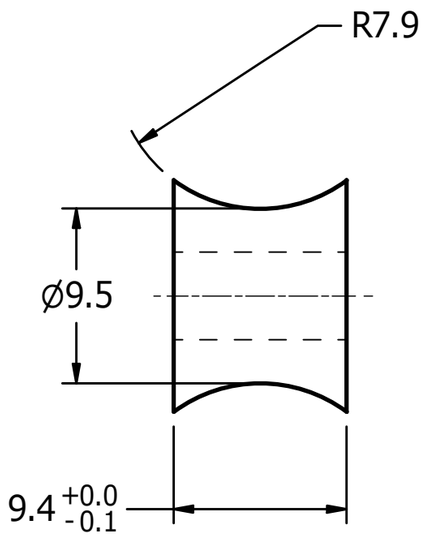


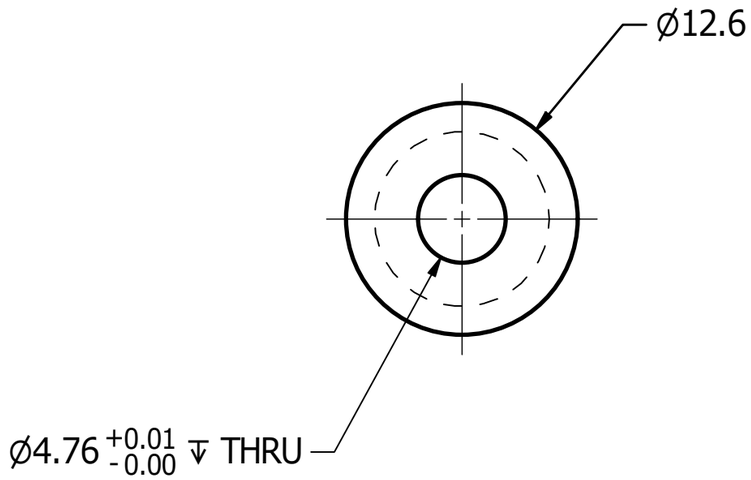
UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	ACHILLES WASHER THOR-50M
	DRAWN B. WADE	9/28/2015	
MATERIAL PTFE TEFLON	CHECKED		
HEAT TREAT N/A	ENG		
FINISH N/A	APPROVED		THIRD ANGLE PROJECTION
			SIZE A3 · DRAWING NUMBER 9000508 · REV A
			SCALE: 3:1 · SHEET 1 OF 1

9000508 Achilles Washer.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	B	REDRAWN IN INVENTOR	7/10/2007	BLW
E00609	C	CHANGED TO METRIC DIMENSIONING	12/4/2008	BLW
	D	IN TITLE BLOCK THOR-50M WAS THOR M	7/23/2018	DW





UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	Bronze, Cast	
HEAT TREAT	N/A	
FINISH	N/A	
APPROVALS		DATE
DRAWN	B. WADE	12/4/2008
CHECKED		
ENG		
APPROVED		

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PULLEY, ACHILLES CABLE

THOR-50M

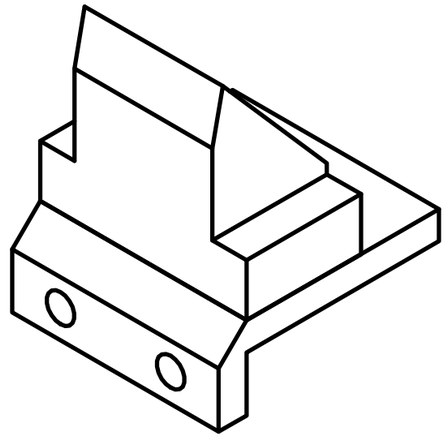
THIRD ANGLE PROJECTION

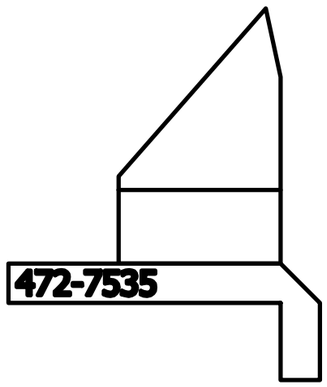
SIZE	DRAWING NUMBER	REV
A3	472-7562	D

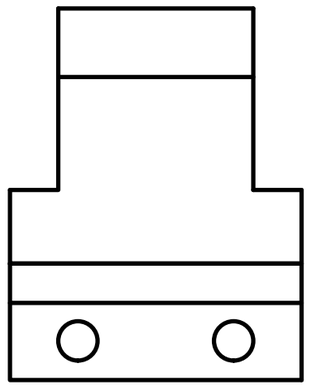
SCALE:	SHEET
3:1	1 OF 1

472-7562 Achilles Pulley.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	A	CHANGE TO METRIC DIMENSIONING	12/3/2008	BLW
	B	IN TITLE BLOCK THOR-50M WAS THOR M	7/19/2018	DW







UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.
2. SANDBLAST ITEM 1 & CLEAN WITH MEK.
3. ABRADE ITEM 2 WITH SANDPAPER & CLEAN WITH MEK & ALCOHOL.
4. BOND PARTS UNDER PRESSURE USING LORD 305 EPOXY ADHESIVE.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-7536	STOP, EVERSION
1	1	472-7535	BRACKET, SOFT STOP - LOWER

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT: N/A

FINISH: N/A

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN B. WADE	12/3/2008
CHECKED TMV	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

STOP ASSEMBLY - EVERSION

THOR 50M

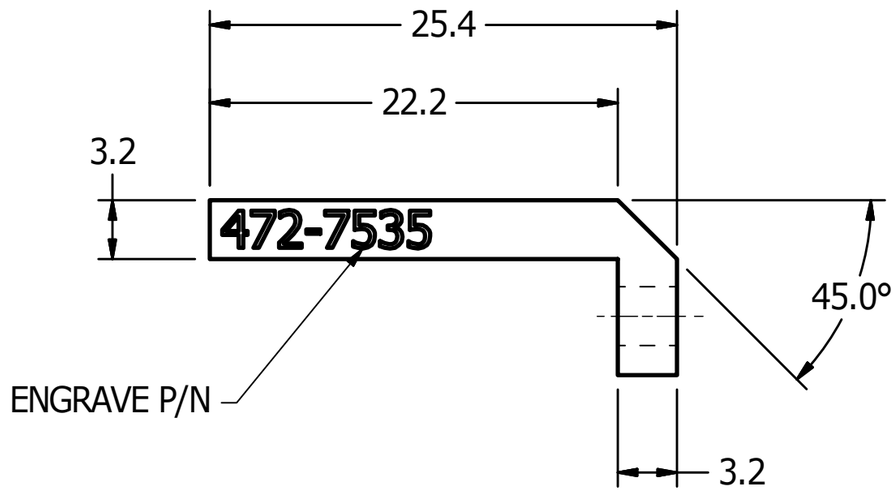
THIRD ANGLE PROJECTION

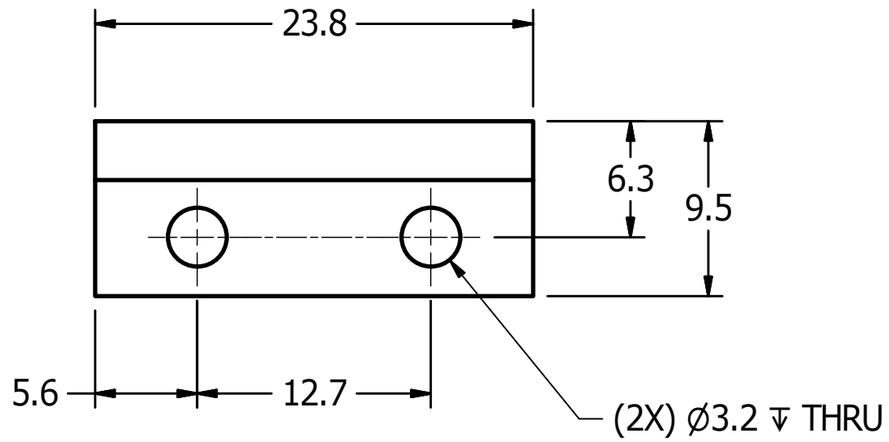
SIZE: A3 | DRAWING NUMBER: 472-7533 | REV: B

SCALE: 2:1 | SHEET: 1 OF 1

472-7533 Stop Assembly - Eversion.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	A	REDIM FOR METRIC HARDWARE	10/2/2008	BLW
E00609	B	CHANGED TO METRIC DIMENSIONING	12/3/2008	BLW



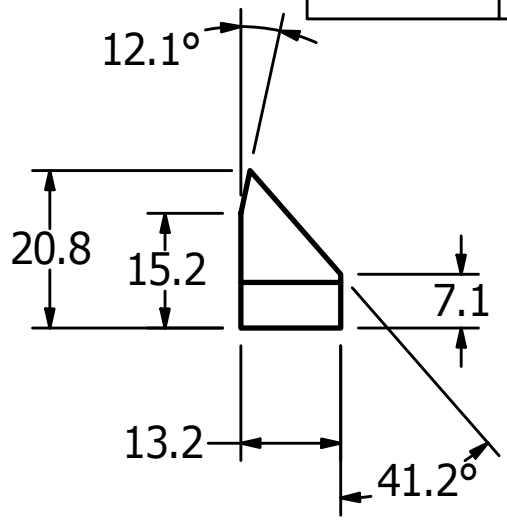


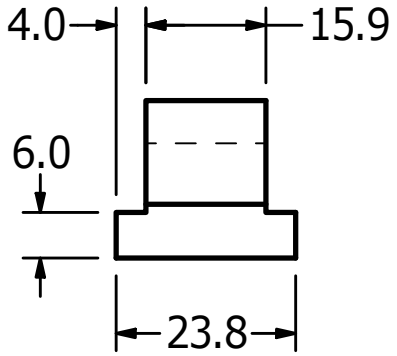
UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

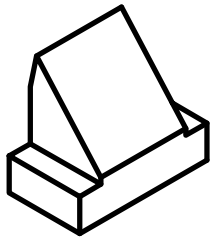
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED ANGLES ±.5° / ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	BRACKET, SOFT STOP - LOWER THOR-50M
MATERIAL: Aluminum 6061-T6	DRAWN: B. WADE — 12/3/2008	
HEAT TREAT: N/A	CHECKED: TMV — 12/10/2008	SIZE: A3 — DRAWING NUMBER: 472-7535 — REV: B
FINISH: BLUE ANODIZED	ENG / APPROVED	THIRD ANGLE PROJECTION — SCALE: 3:1 — SHEET: 1 OF 1

472-7535 Bracket, Invers-Evers.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	ADDED DUROMETER SPEC	10/8/2008	BLW
	B	CHANGE TO METRIC DIMENSIONING	12/3/2008	BLW
	C	ADDED DYNAMIC TEST NOTE	7/23/2015	JHC
	D	IN TITLE BLOCK THOR-50M WAS THOR M	7/23/2018	DW







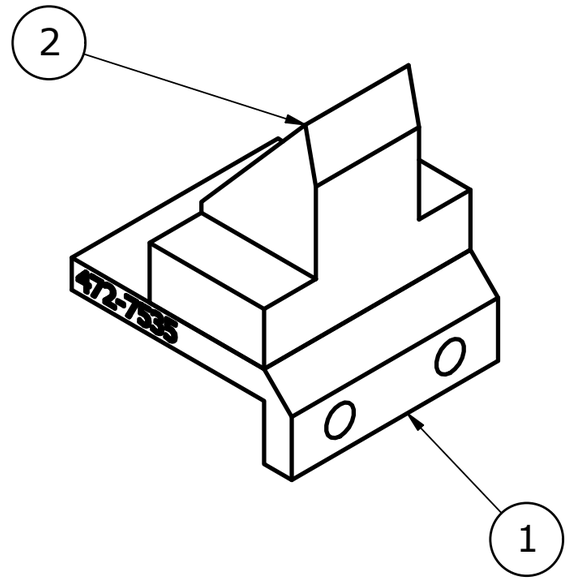
MATERIAL: NEOPRENE (75-85 SHORE A)

DUROMETER MAY BE SUPERCEDED BY
DYNAMIC TEST REQUIREMENTS.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	STOP, EVERSION THOR-50M
	DRAWN B. WADE	12/3/2008	
MATERIAL SEE ABOVE	CHECKED		
HEAT TREAT	ENG		
FINISH	APPROVED		
THIRD ANGLE PROJECTION	SIZE A	DRAWING NUMBER 472-7536	REV D
	SCALE:	SHEET 1 OF 1	

472-7536 Stop, Eversion.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	A	CHANGED TO METRIC DIMENSIONING	12/3/2008	BLW
	B	IN TITLE BLOCK THOR-50M WAS THOR M	7/23/2018	DW



UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.
2. SANDBLAST ITEM 1 & CLEAN WITH MEK.
3. ABRADE ITEM 2 WITH SANFDPAPER & CLEAN WITH MEK & ALCOHOL.
4. BOND PARTS UNDER PRESSURE USING LORD 305 EPOXY ADHESIVE.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-7537	STOP, INVERSION
1	1	472-7535	BRACKET, SOFT STOP - LOWER

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT: N/A

FINISH: N/A

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN B. WADE	12/3/2008
CHECKED TMV	12/12/2008
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

STOP ASSEMBLY - INVERSION

THOR-50M

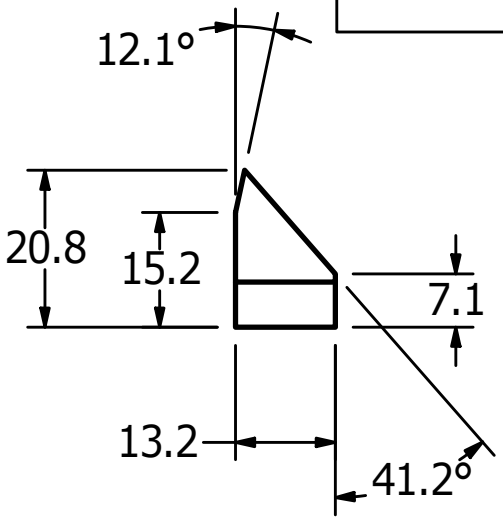
THIRD ANGLE PROJECTION

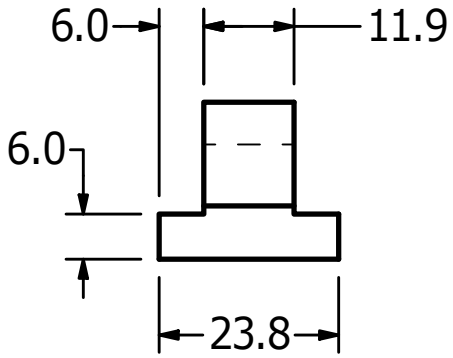
SIZE: A3 | DRAWING NUMBER: 472-7534 | REV: B

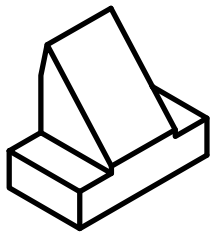
SCALE: 2:1 | SHEET: 1 OF 1

472-7534 Stop Assembly - Inversion.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	ADDED DUROMETER SPEC	10/8/2008	BLW
	B	CHANGE TO METRIC DIMENSIONING	12/3/2008	BLW
	C	MADE DUROMETER REFERENCE, ADD TEST REQUIREMENT NOTE	7/23/2015	JHC
	D	IN TITLE BLOCK THOR-50M WAS THOR M	7/23/2018	DW







MATERIAL: NEOPRENE (65-75 SHORE A)

DUROMETER MAY BE SUPERCEDED BY DYNAMIC TEST REQUIREMENTS.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL:	MACHINED
X ±.5	1.6
X.X ±.2	ANGLES
X.XX ±.1	±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. WADE	12/3/2008
CHECKED	
ENG	
APPROVED	

MATERIAL: SEE ABOVE
HEAT TREAT:
FINISH:

STOP, INVERSION

THOR-50M

THIRD ANGLE PROJECTION

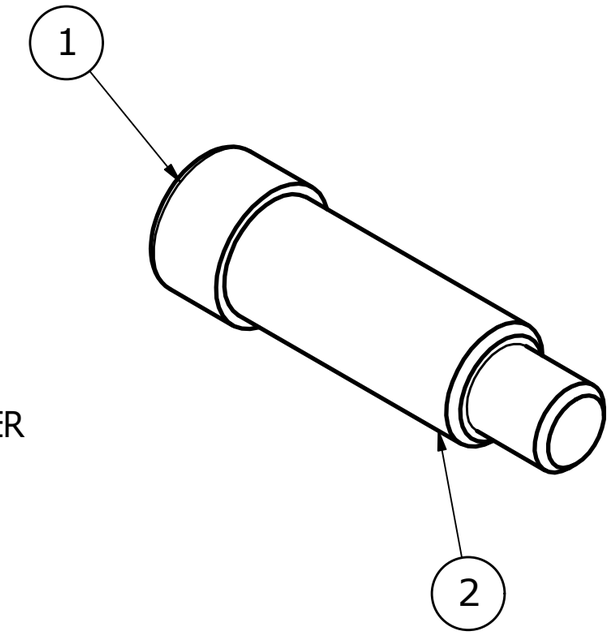
SIZE: A | DRAWING NUMBER: 472-7537 | REV: D

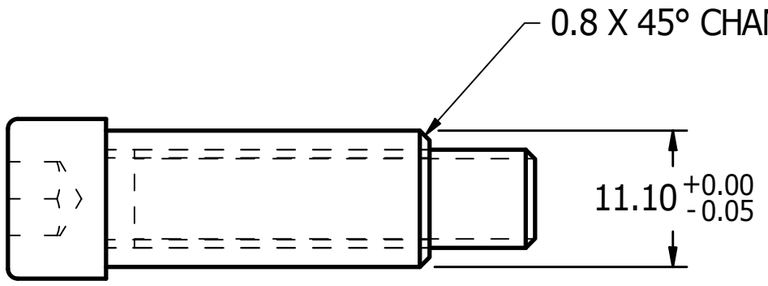
SCALE:

SHEET: 1 OF 1

472-7537 Stop, Inversion.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	B	REDRAWN IN INVENTOR	7/23/2007	KSG
E00609	C	CHANGE TO METRIC SCREW	10/6/2008	BLW
E00609	D	CHANGED TO METRIC DIMENSIONING	12/4/2008	BLW
	E	IN TITLE BLOCK THOR-50M WAS THOR M	7/23/2018	DW





UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.
2. REMOVE OIL FROM ITEM 2 WITH SOLVENT.
3. APPLY LOCTITE 262 TO THREADS AND ASSEMBLY ITEMS 1 & 2.
4. MACHINE OD AND CHAMFER AS NOTED.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-7564	SLEEVE, BOLT - ANKLE
1	1	9010164	SCREW, SHCS M8-1.25 x 35

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT: N/A

FINISH: N/A

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN B. WADE	12/4/2008
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

BOLT & SLEEVE ASSEMBLY, ANKLE THOR 50M

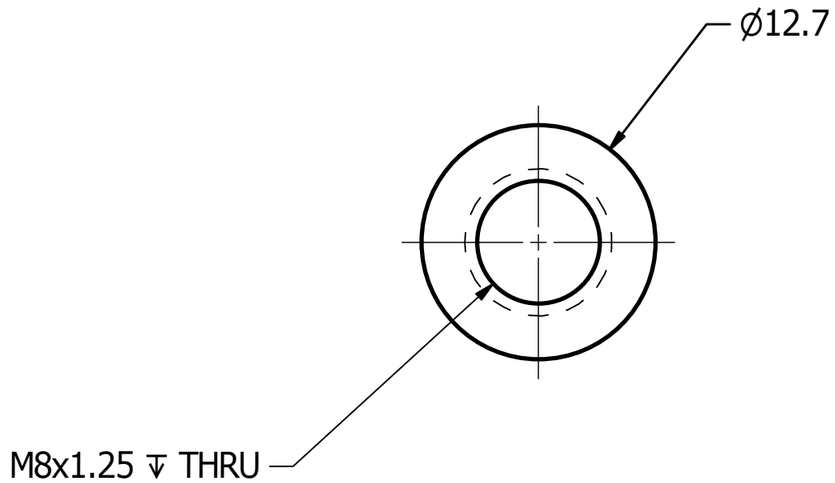
THIRD ANGLE PROJECTION

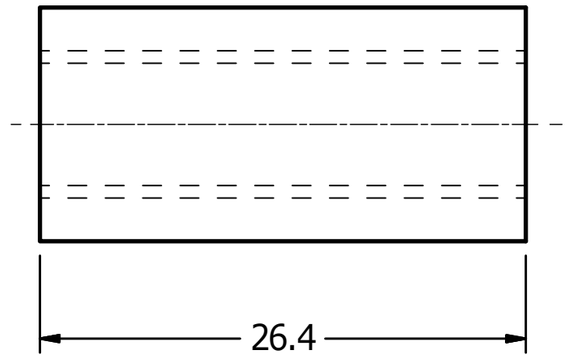
SIZE: A3 | DRAWING NUMBER: 472-7563 | REV: E

SCALE: 2:1 | SHEET: 1 OF 1

472-7563 Ankle Bolt Assy.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	B	REDRAWN IN INVENTOR	7/23/2007	KSG
E00609	C	REDIM FOR METRIC HARDWARE	10/6/2008	BLW
E00609	D	CHANGE TO METRIC DIMENSIONING	12/4/2008	BLW





UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Delrin, White
HEAT TREAT: N/A
FINISH: N/A

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN B. WADE	12/4/2008
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

SLEEVE, BOLT - ANKLE

THOR-50M

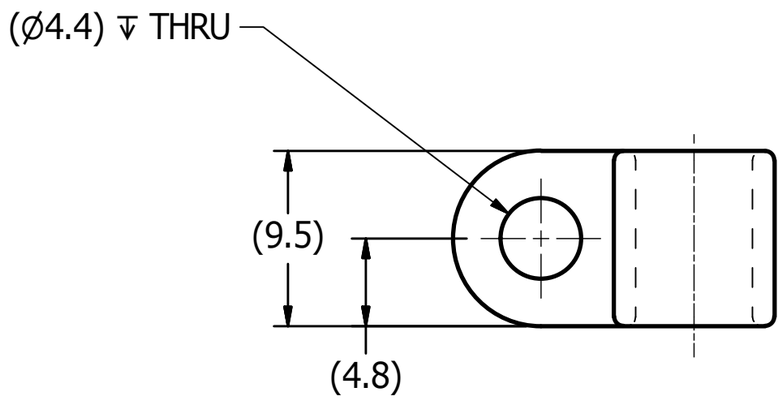
THIRD ANGLE PROJECTION

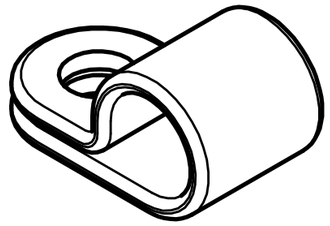
SIZE: A3 | DRAWING NUMBER: 472-7564 | REV: D

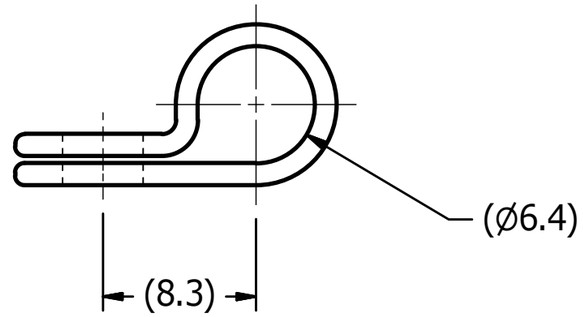
SCALE: 3:1 | SHEET: 1 OF 1

472-7564 Ankle Bolt Sleeve.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	REMOVED MCMASTER P/N AND ADDED DIMENSIONS	9/29/2015	DW





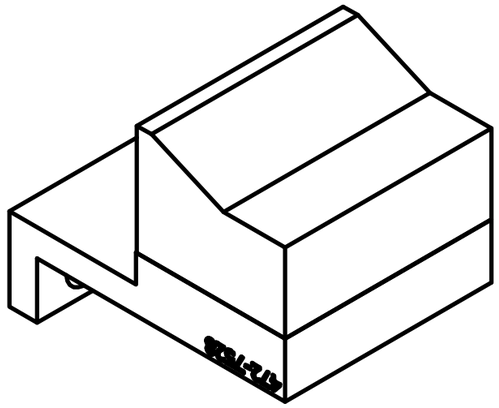


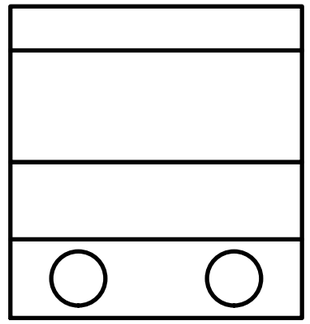
UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

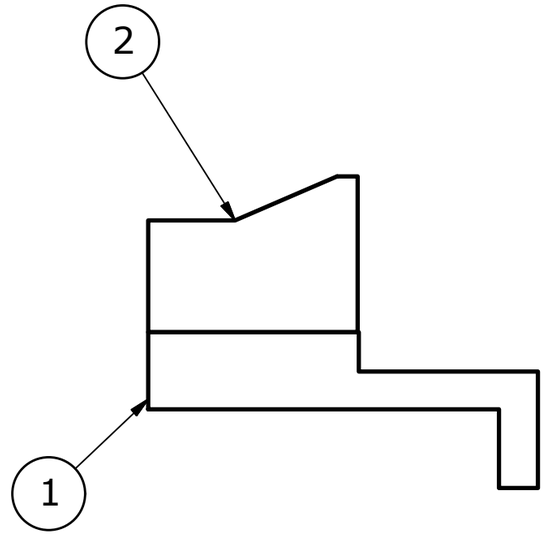
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED 1.6 / ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	CLAMP, NYLON LOOP
	DRAWN B. WADE / 1/12/2009	THOR-50M
MATERIAL Nylon 6/6	CHECKED	
HEAT TREAT N/A	ENG	THIRD ANGLE PROJECTION
FINISH N/A	APPROVED	SIZE A3 / DRAWING NUMBER 9005135 / REV A / SCALE: 3:1 / SHEET 1 OF 1

9005135 Clamp, Nylon Loop.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	DRAWING TITLE WAS STOP ASSEMBLY, REAR DORSI	3/22/2016	DW







ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-7529	DORSI/PLANTAR SOFT STOP
1	1	472-7528	STOP BRACKET, REAR DORSI/PLANTAR

PARTS LIST

UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.
2. SANDBLAST ITEM 1 & CLEAN WITH MEK.
3. ABRADE ITEM 2 WITH SANDPAPER & CLEAN WITH MEK & ALCOHOL.
4. BOND PARTS UNDER PRESSURE USING LORD 305 EPOXY ADHESIVE.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT: N/A

FINISH: N/A

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN B. WADE	5/11/2009
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

STOP ASSEMBLY, PLANTAR

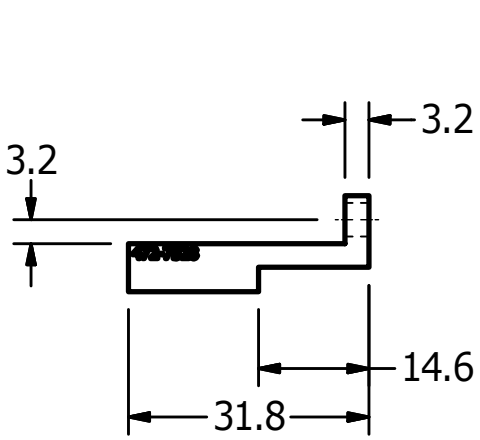
THOR-50M

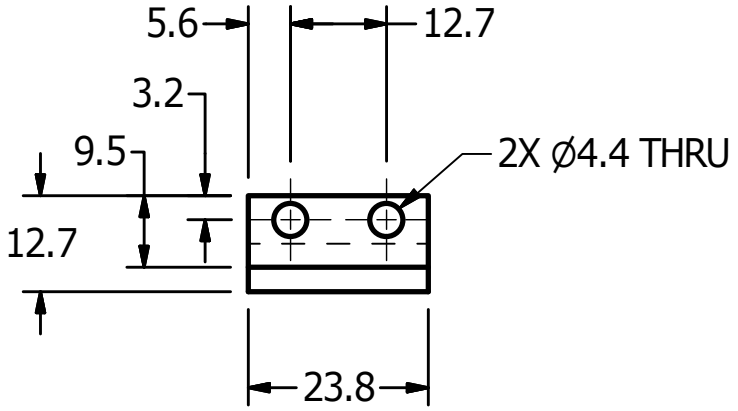
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 472-7527 | REV: A

SCALE: 2:1 | SHEET: 1 OF 1

472-7527 Stop Assembly - Rear Dorsi.iam





UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL:	MACHINED
X ±.5	1.6
X.X ±.2	ANGLES
X.XX ±.1	±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN JIM CLEVENGER	7/30/2015
CHECKED	
ENG	
APPROVED	

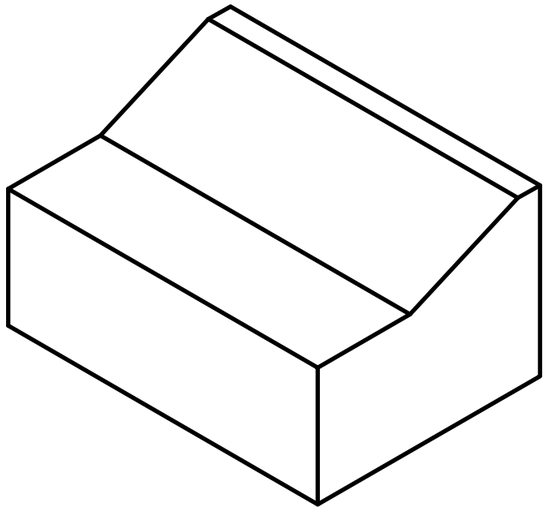
MATERIAL: Aluminum 6061
HEAT TREAT:
FINISH: BLUE ANODIZE

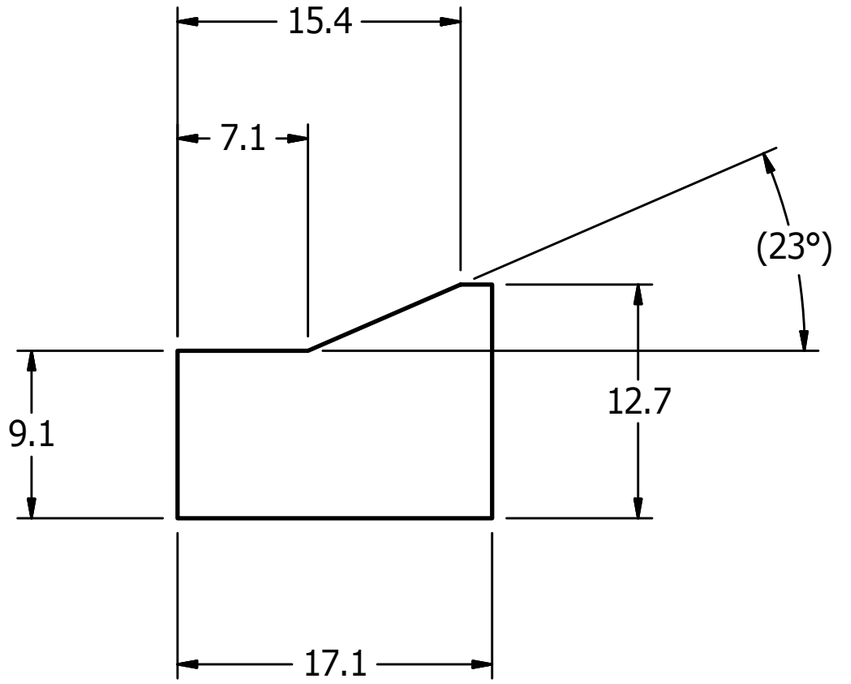
STOP BRACKET, REAR DORSI/PLANTAR
THOR-50M

THIRD ANGLE PROJECTION

SIZE: A
DRAWING NUMBER: 472-7528
REV:
SCALE: 1:1
SHEET: 1 OF 1

472-7528 Bracket, Rear Dorsi-Plantar.ipt

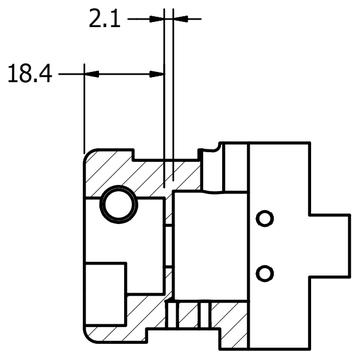




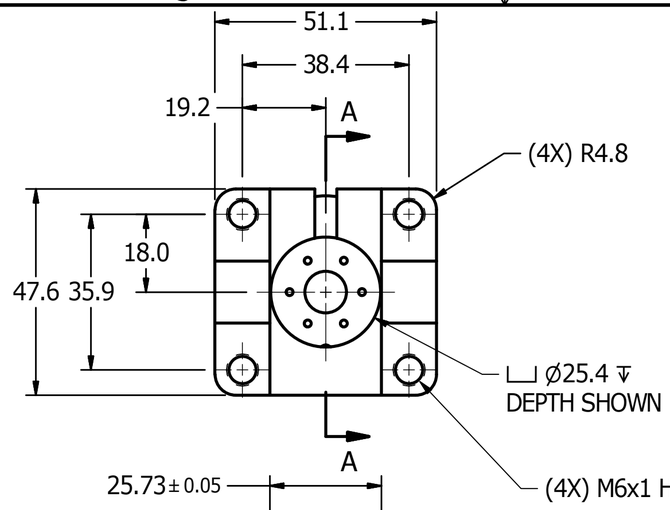
UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

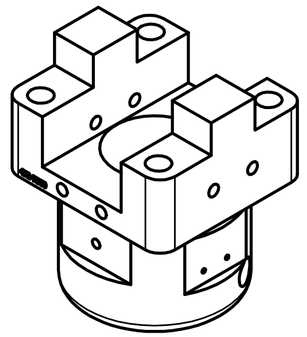
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED 1.6 / ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	DORSI/PLANTAR SOFT STOP THOR-50M
MATERIAL: NEOPRENE 78 ±5 SHORE A	DRAWN: B. WADE / 5/11/2009	
HEAT TREAT: N/A	CHECKED	
FINISH: N/A	ENG	
	APPROVED	
THIRD ANGLE PROJECTION	SIZE: A3	DRAWING NUMBER: 472-7529 REV:
	SCALE: 3:1	SHEET: 1 OF 1

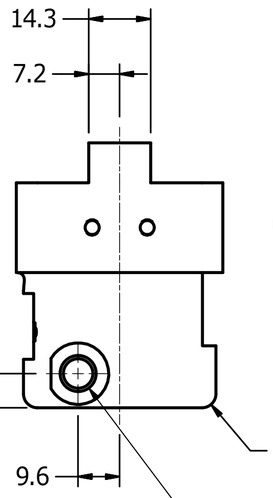
472-7529 Rear Stop, Soft.ipt

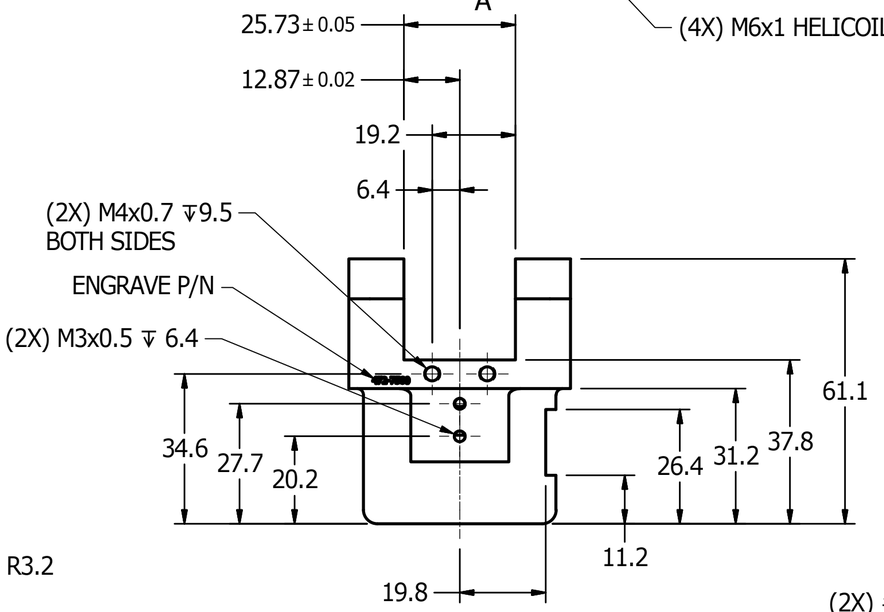


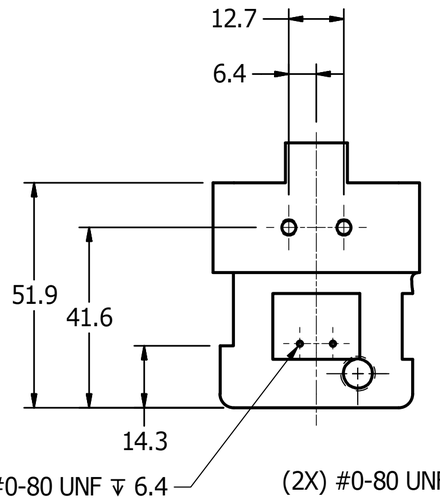
SECTION A–A
SCALE 1 : 1

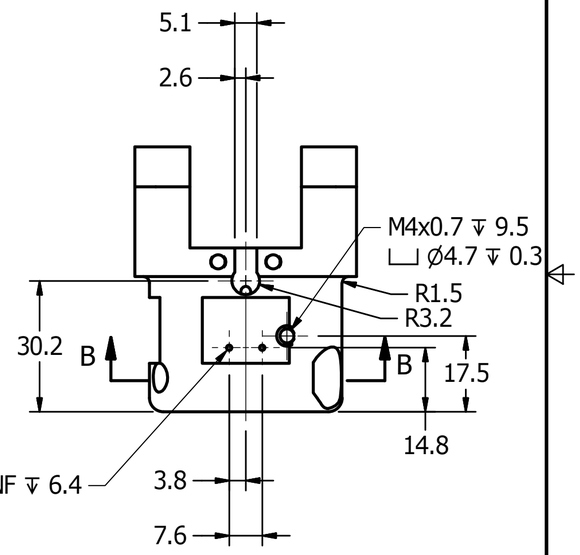


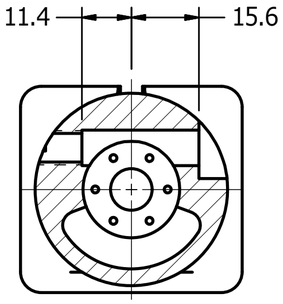




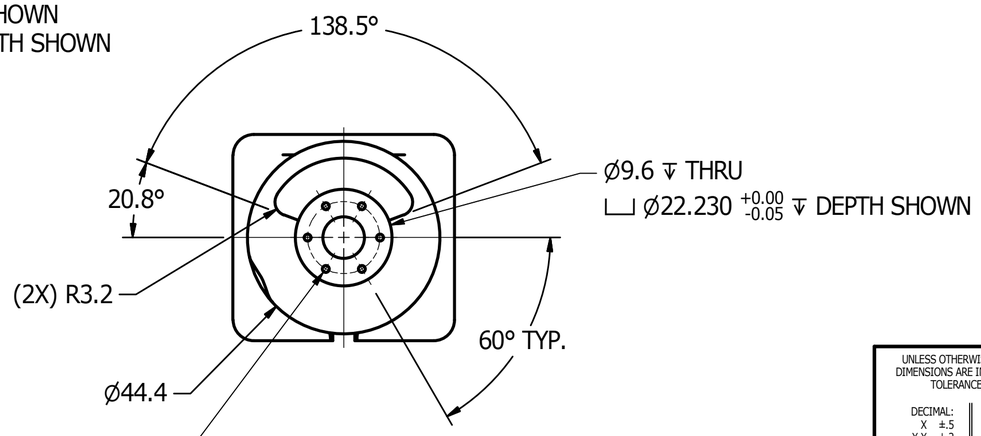






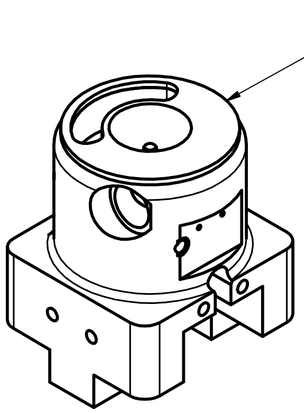


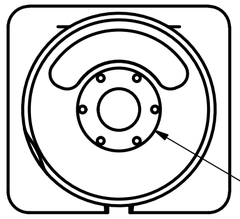
SECTION B–B
SCALE 1 : 1



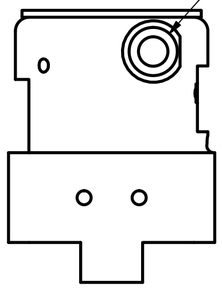
UNLESS OTHERWISE NOTE:
1. BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	BASE, TORQUE - ANKLE TOP
MATERIAL: Aluminum 6061	DRAWN: B. WADE	12/16/2009	THOR-50M
HEAT TREAT: N/A	CHECKED: TMV	2/2/2010	SIZE: A2 DRAWING NUMBER: 472-7580 REV:
FINISH: BLUE ANODIZE	ENG		THIRD ANGLE PROJECTION SCALE: 1:1 SHEET: 1 OF 2
	APPROVED		

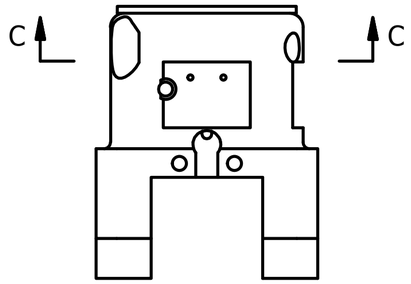


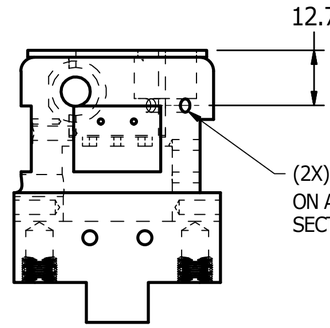


⌴ Ø19.050± 0.01 ↧ 19.700

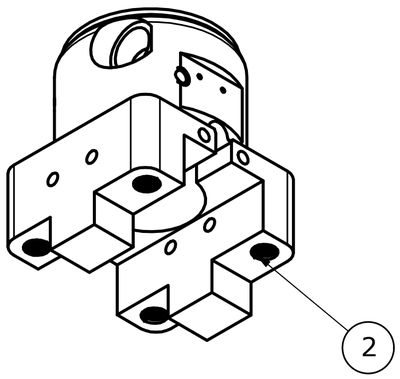


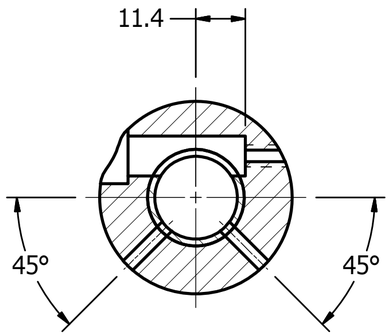
⌴ Ø11.100± 0.02 ↧ DEPTH
SHOWN IN SECTION C-C





(2X) Ø3.1 ↧ TO BORE
ON ANGLES SHOWN IN
SECTION C-C





SECTION C–C
SCALE 1 : 1

NOTES:
1. AFTER ANODIZE, INSTALL ITEM 1 WITH LOCTITE 262, AND ITEM 2.
2. MACHINE HOLES AS INDICATED.

UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	4	9010437	HELICOIL, M6 x 1 x 6
1	1	472-7521	THRUST BUSHING

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6 ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT: N/A

FINISH: BLUE ANODIZE

***V**EHICLE **R**ESEARCH and **T**EST **C**ENTER*

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: B. WADE	12/16/2009
CHECKED: TMV	2/2/2010
ENG	
APPROVED	

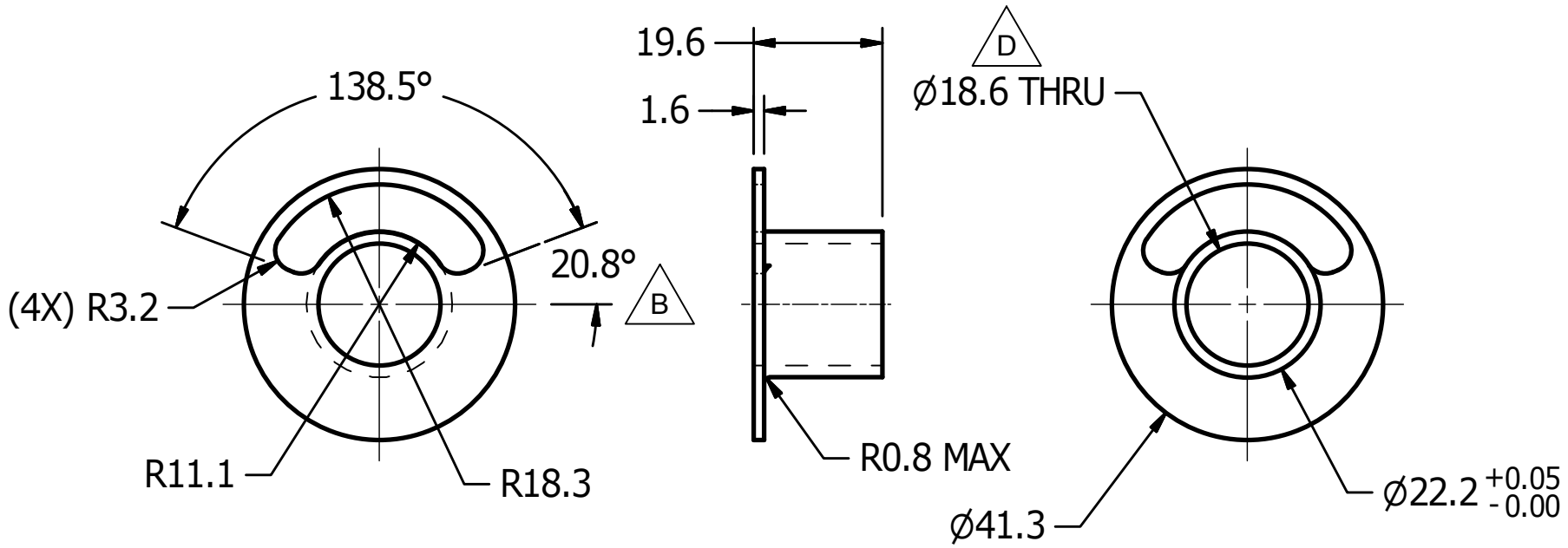
BASE, TORQUE - ANKLE TOP
THOR 50M

THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 472-7580 | REV:

SCALE: 1:1 | SHEET: 2 OF 2

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	REDRAWN IN INVENTOR	7/23/2007	KSG
	B	ADDED SLOT	10/3/2008	BLW
	C	CHANGE TO METRIC DIMENSIONING	12/3/2008	BLW
	D	REVISE ID, WAS 19.1 +.02/-.00	7/22/2015	JHC



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL:	MACHINED
X ±.5	1.6
X.X ±.2	ANGLES
X.XX ±.1	±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. WADE	12/3/2008
CHECKED	
ENG	
APPROVED	

MATERIAL: Delrin, White
HEAT TREAT:
FINISH:

THRUST BUSHING

THOR-50M

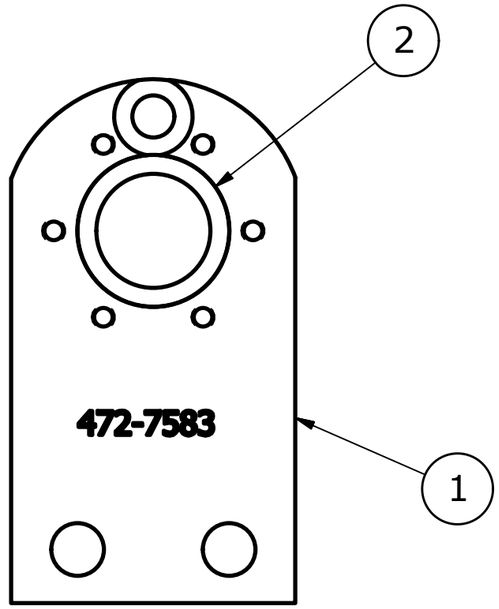
THIRD ANGLE PROJECTION

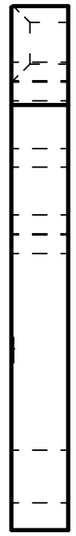
SIZE: A | DRAWING NUMBER: 472-7521 | REV: D

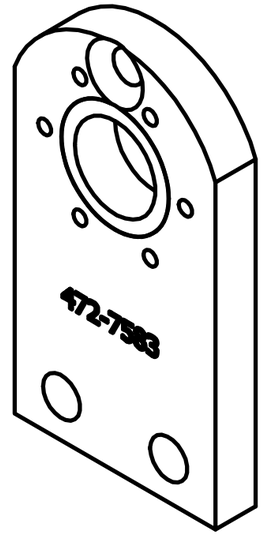
SCALE:

SHEET: 1 OF 1

472-7521 Thrust Bushing.ipt







ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-7542	BUSHING, ANKLE
1	1	472-7583	PLATE, ANKLE BUSHING

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT

FINISH

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	7/22/2015
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

ANKLE BUSHING PLATE ASSEMBLY - POT END
THOR-50M

THIRD ANGLE PROJECTION

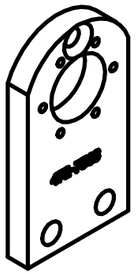
SIZE B | DRAWING NUMBER 472-7582 | REV

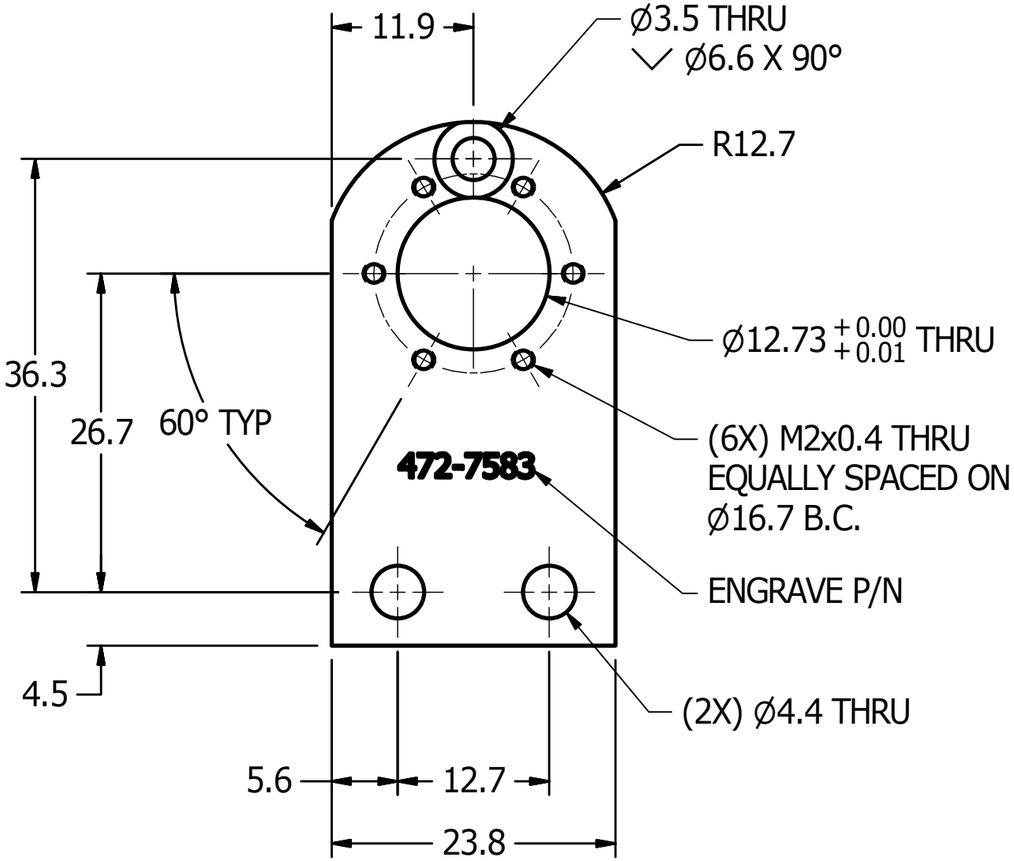
SCALE:

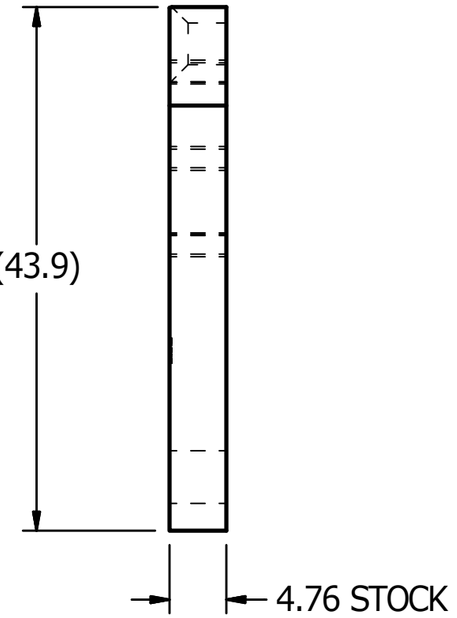
SHEET 1 OF 1

472-7582 Ankle Bushing Plate Assembly - Pot End.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CHANGED TITLE BLOCK	8/3/2015	JHC







UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Aluminum 6061
HEAT TREAT:
FINISH: BLUE ANODIZE

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN: B. WADE	12/16/2009
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PLATE, ANKLE BUSHING

THOR-50M

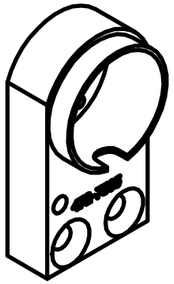
THIRD ANGLE PROJECTION

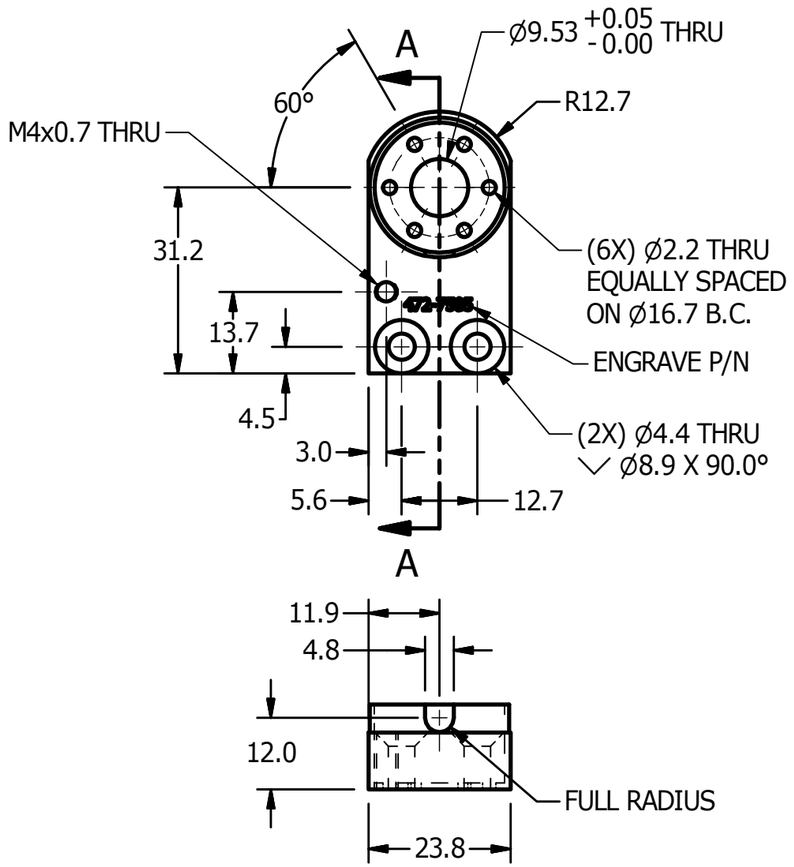
SIZE: B | DRAWING NUMBER: 472-7583 | REV: A

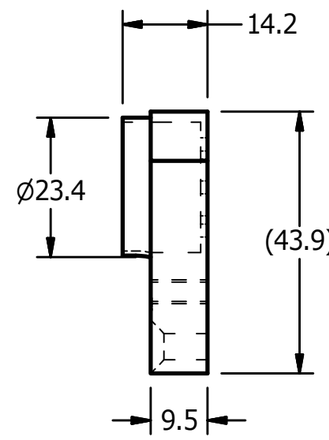
SCALE: 2:1 | SHEET: 1 OF 1

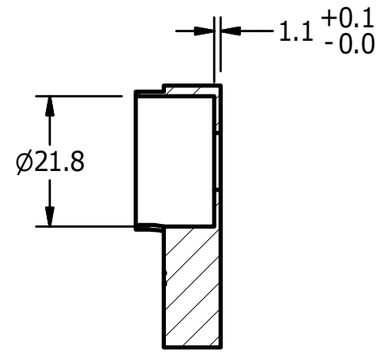
472-7583 Ankle Bushing Plate, Pot End.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	CHANGED TITLE BLOCK	8/3/2015	JHC









SECTION A-A
SCALE 1 : 1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Delrin, White	CHECKED	
HEAT TREAT	ENG	
FINISH	APPROVED	

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. WADE	12/16/2009

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

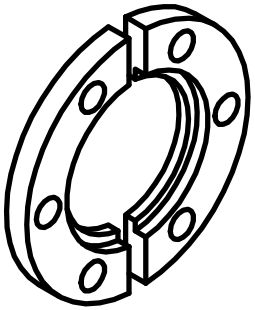
RETAINER, POTENTIOMETER

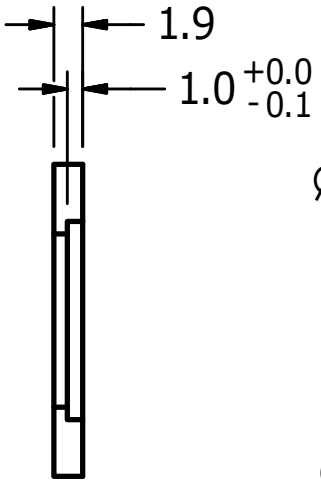
THOR-50M

THIRD ANGLE PROJECTION

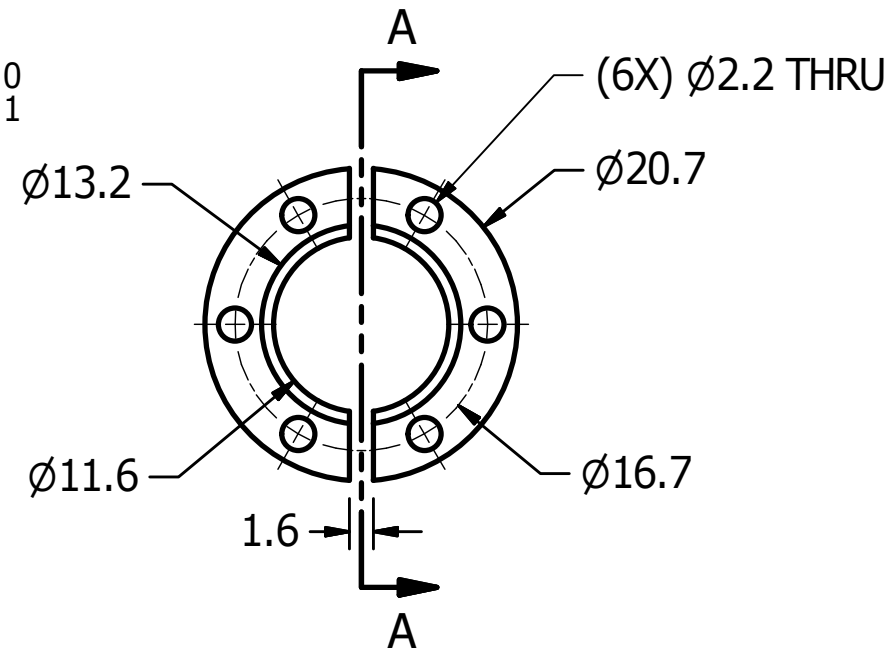
SIZE	DRAWING NUMBER	REV
B	472-7585	A
SCALE: 1:1	SHEET 1 OF 1	

472-7585 Retainer, Potentiometer.ipt





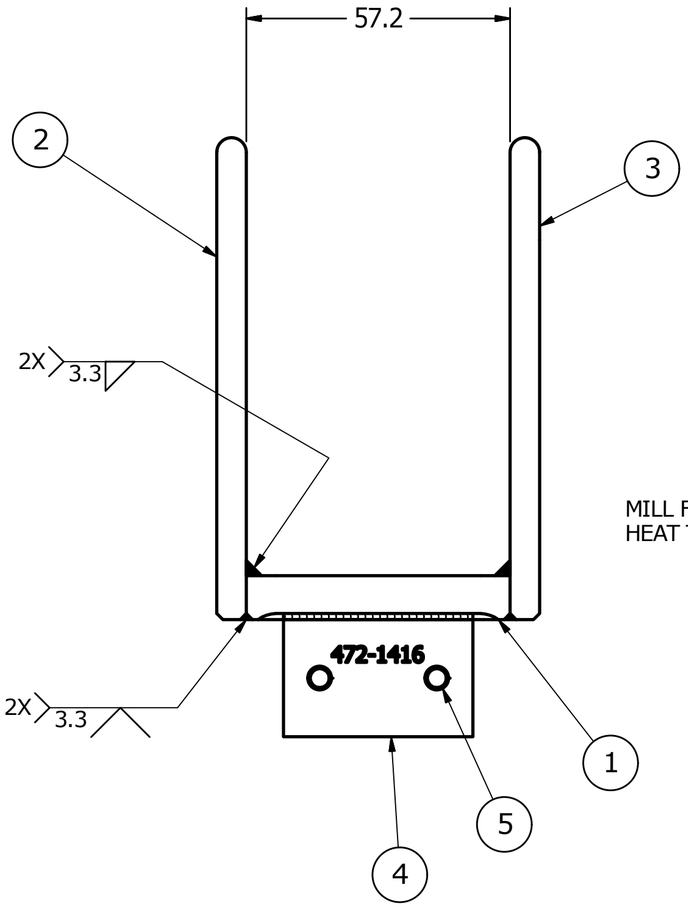
SECTION A-A
SCALE 2 : 1

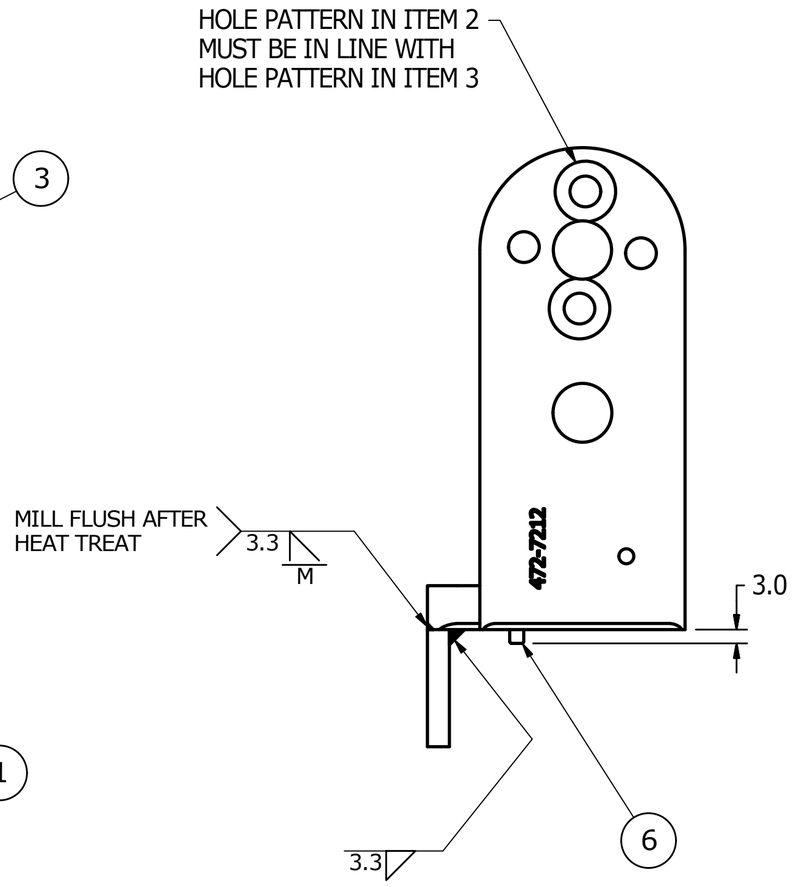


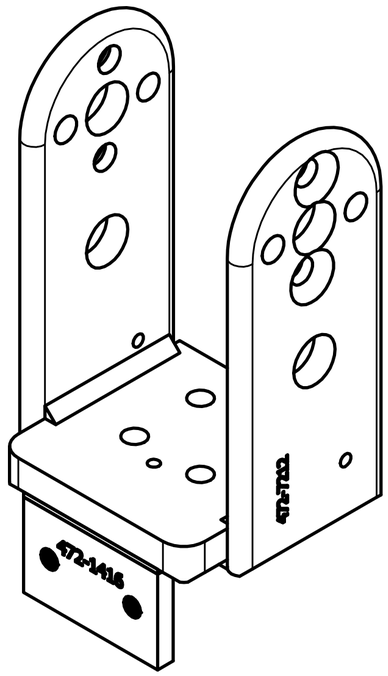
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	POTENTIOMETER CLAMP
	DRAWN: JIM CLEVENGER / 7/22/2015	THOR-50M
MATERIAL: Aluminum 6061	CHECKED	
HEAT TREAT	ENG	SIZE: A — DRAWING NUMBER: 472-7581 — REV
FINISH: BLUE ANODIZE	APPROVED	THIRD ANGLE PROJECTION — SCALE: 2:1 — SHEET: 1 OF 1

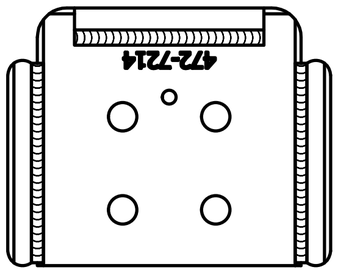
472-7581 Clamp, Potentiometer.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	CHANGE TO METRIC DIMENSIONING	11/19/2008	BLW
	B	ADDED ITEM 6 DOWEL PIN	7/29/2015	JHC









NOTES

1. HEAT TREAT AFTER WELDING
2. ANODIZE AFTER HEAT TREAT
3. INSTALL ITEM 5 & 6 AFTER ANODIZE

ITEM	QTY	PART NUMBER	DESCRIPTION
6	1	9010688	PIN, DOWEL M3 X 8
5	2	9010040	M5 x .8 x 5mm HELICOIL
4	1	472-7216	STIFFENER, KNEE BUMPER
3	1	472-7212	CLEVIS, KNEE - LEFT
2	1	472-7210	CLEVIS, KNEE - RIGHT
1	1	472-7214	BOTTOM PLATE, KNEE CLEVIS

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT: T6

FINISH: HARDCOAT ANODIZE

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

APPROVALS	DATE
DRAWN: B. WADE	11/19/2008
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

KNEE CLEVIS WELDMENT

THOR-50M

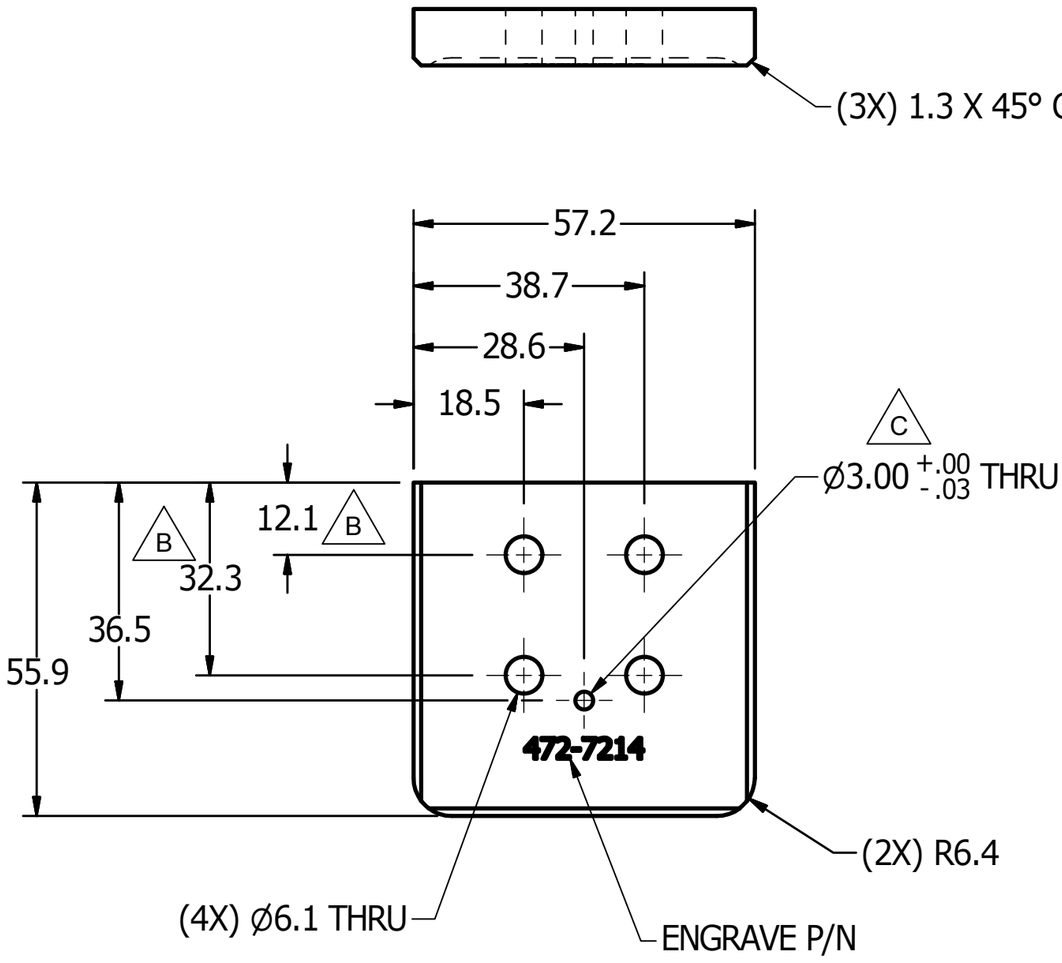
THIRD ANGLE PROJECTION

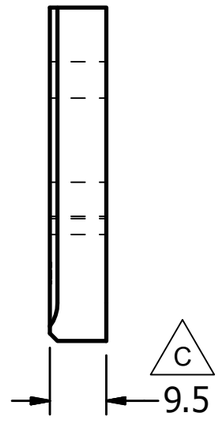
SIZE: C | DRAWING NUMBER: 472-7200 | REV: B

SCALE: 1:1 | SHEET: 1 OF 1

472-7200
Knee Clevis
Weldment.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CHANGE TO METRIC DIMENSIONING	11/19/2008	BLW
	B	DIMENSION 12.1 WAS 17.8 AND 32.3 WAS 38.0	9/15/2014	DW
	C	DIM 9.5 WAS 9.7, ADDED 3.00 HOLE	7/23/2015	JHC





UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL:	MACHINED
X ±.5	1.6
X.X ±.2	ANGLES ±.5°
X.XX ±.1	

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. WADE	11/19/2008
CHECKED	
ENG	
APPROVED	

MATERIAL: Aluminum-6061-T6
HEAT TREAT:
FINISH:

BOTTOM PLATE, KNEE CLEVIS

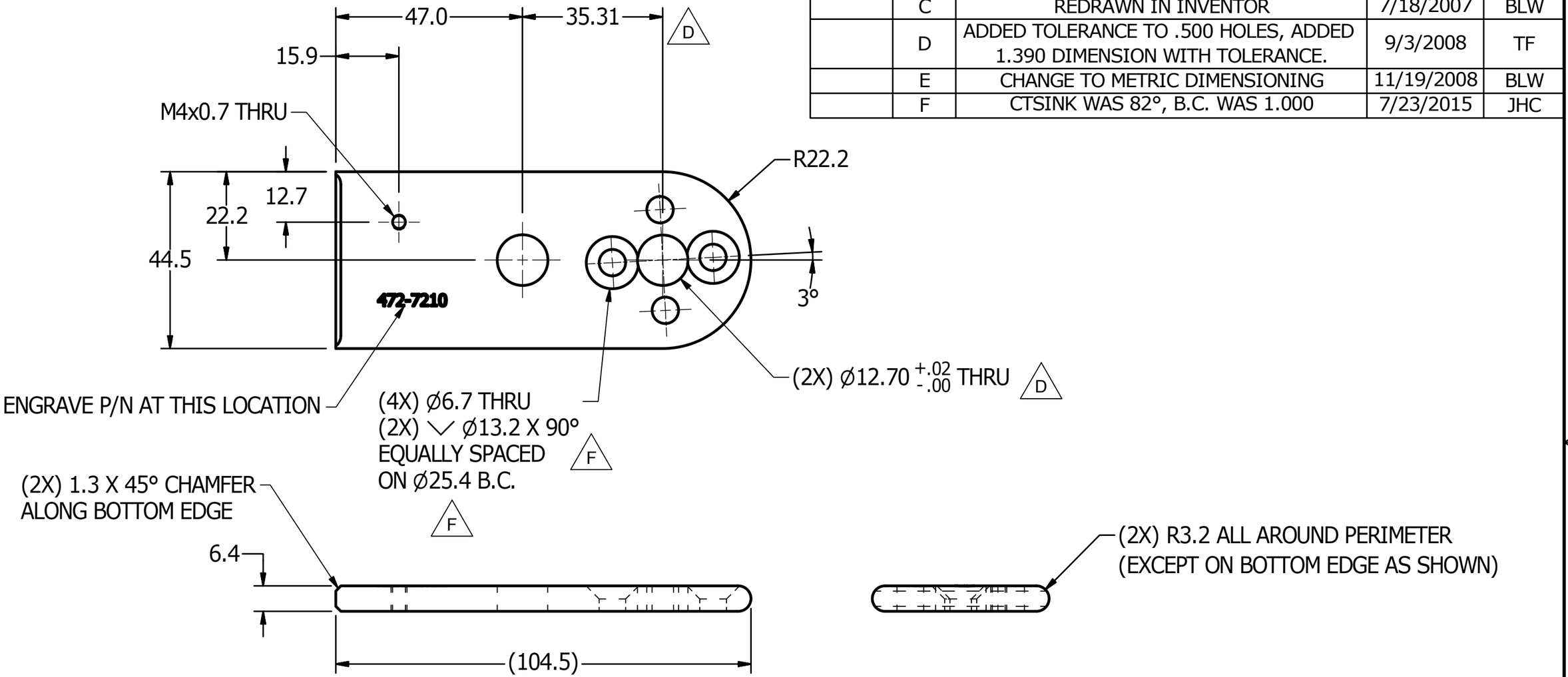
THOR-50M

THIRD ANGLE PROJECTION

SIZE: B | DRAWING NUMBER: 472-7214 | REV: C

SCALE: 1:1 | SHEET: 1 OF 1

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	C	REDRAWN IN INVENTOR	7/18/2007	BLW
	D	ADDED TOLERANCE TO .500 HOLES, ADDED 1.390 DIMENSION WITH TOLERANCE.	9/3/2008	TF
	E	CHANGE TO METRIC DIMENSIONING	11/19/2008	BLW
	F	CTSINK WAS 82°, B.C. WAS 1.000	7/23/2015	JHC



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL:	MACHINED
X ±.5	1.6
X.X ±.2	ANGLES ±.5°
X.XX ±.1	

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	APPROVALS	DATE
Aluminum-6061-T6	DRAWN B. WADE	11/19/2008
HEAT TREAT	CHECKED	
FINISH	ENG	
	APPROVED	

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

CLEVIS, KNEE - RIGHT

THOR-50M

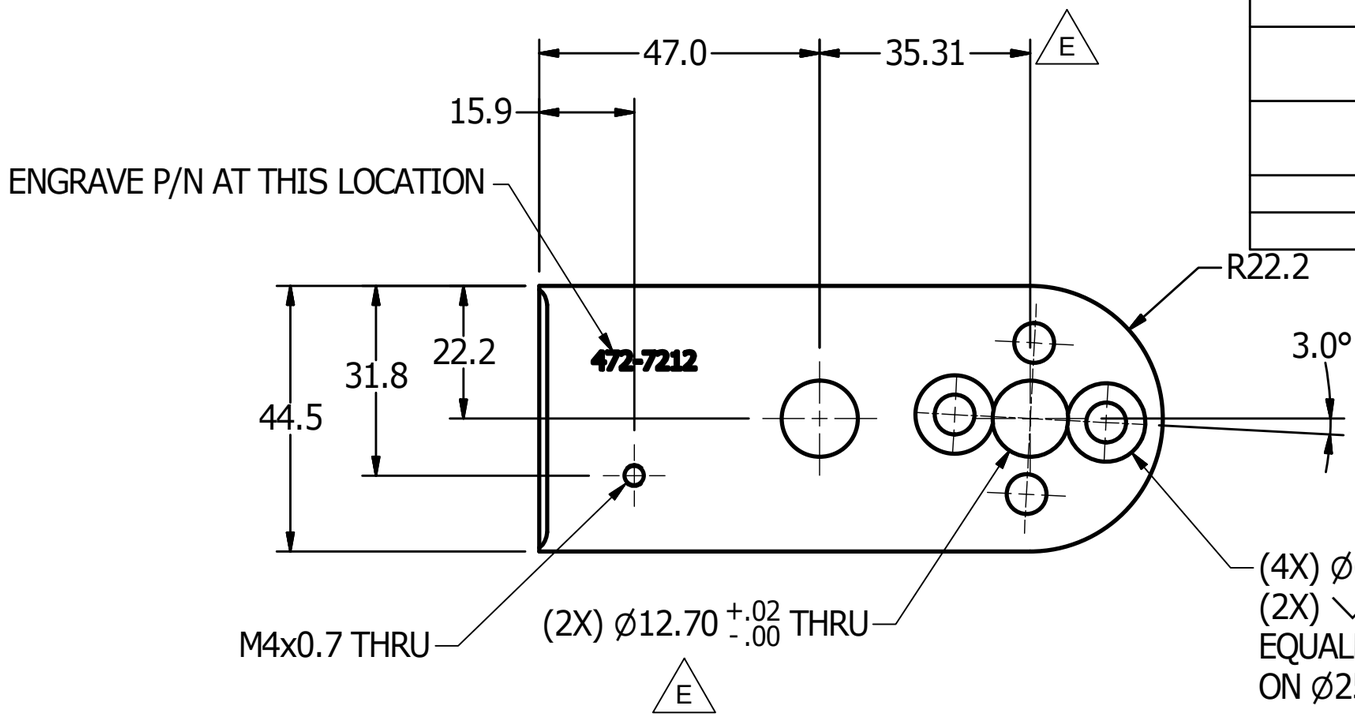
THIRD ANGLE PROJECTION

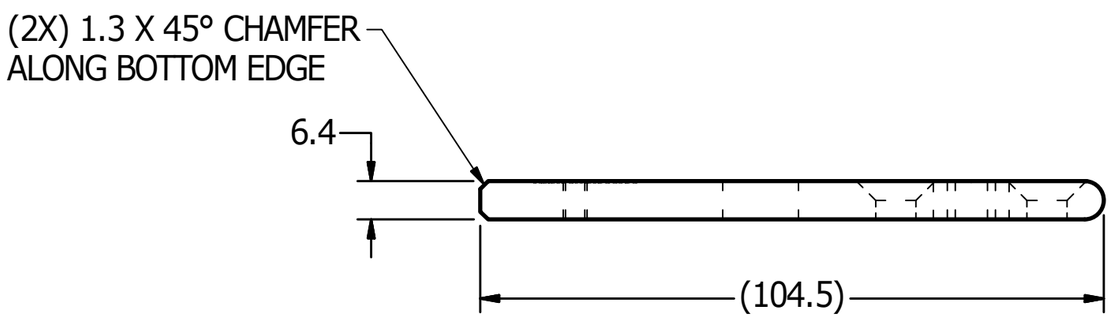
SIZE	DRAWING NUMBER	REV
B	472-7210	F

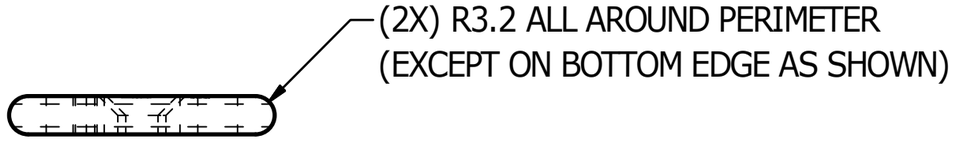
SCALE:	SHEET
1:1	1 OF 1

472-7210 Clevis, Knee - Right.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	C	REDRAWN IN INVENTOR	7/18/2007	KSG
	D	ADDED CHAMFER TO BOTTOM, R.125 AROUND PERIMETER, .520 HOLE WAS .438	6/11/2008	TF
	E	ADDED TOLERANCE TO .500 HOLES, ADDED 1.390 DIMENSION WITH TOLERANCE.	9/3/2008	TF
	F	CHANGE TO METRIC DIMENSIONING	11/19/2008	BLW
	G	CTSINK WAS 82°, B.C. WAS 1.000	7/23/2015	JHC







UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL:	MACHINED
X ±.5	1.6
X.X ±.2	ANGLES ±.5°
X.XX ±.1	

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. WADE	11/19/2008
CHECKED	
ENG	
APPROVED	

MATERIAL: Aluminum-6061-T6
HEAT TREAT:
FINISH:

CLEVIS, KNEE - LEFT

THOR-50 M

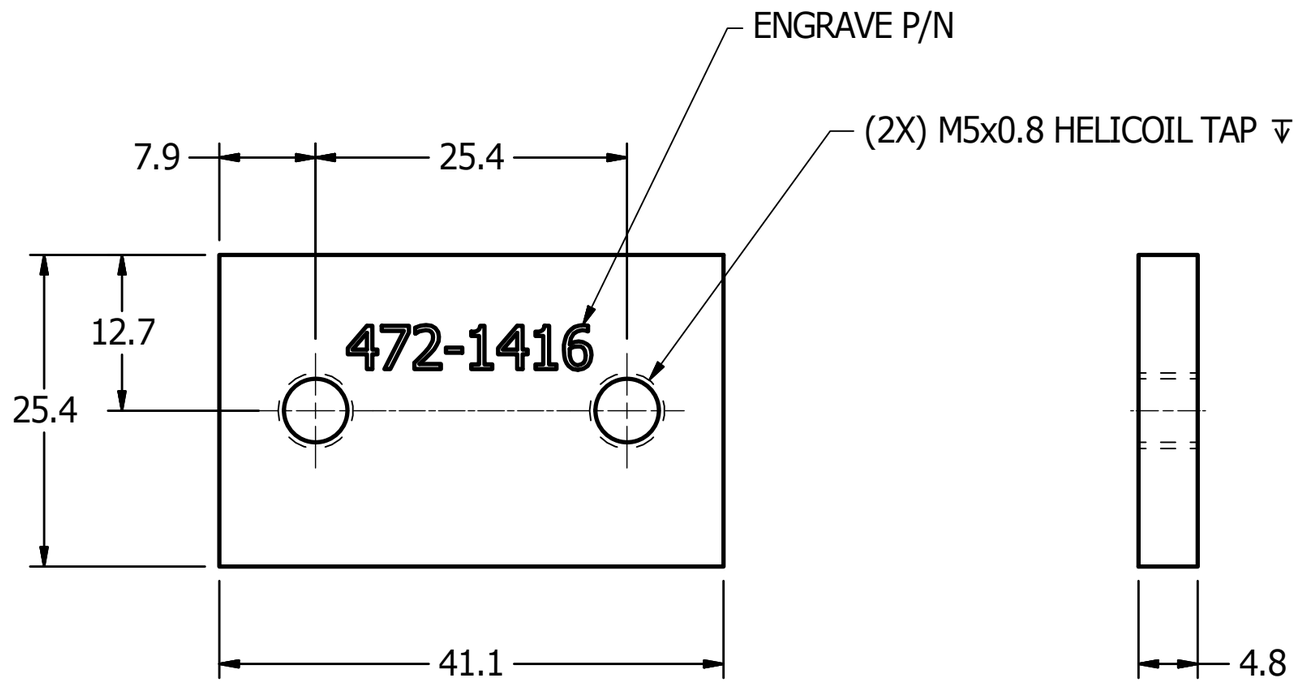
THIRD ANGLE PROJECTION

SIZE: B | DRAWING NUMBER: 472-7212 | REV: G

SCALE: 1:1 | SHEET: 1 OF 1

472-7212 Clevis, Knee - Left.ipt

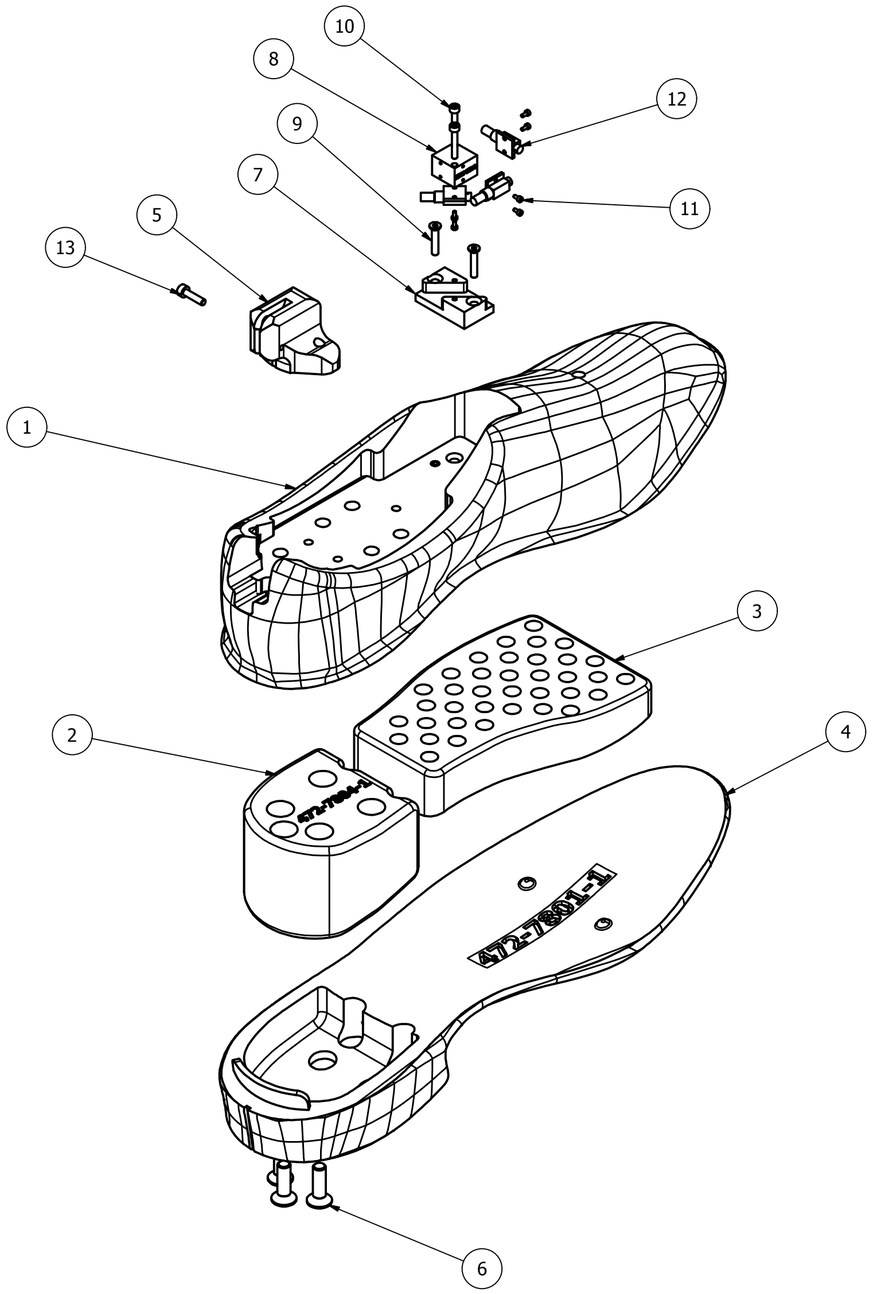
REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	A	CHANGED TO METRIC DIMENSIONING	11/19/2008	BLW

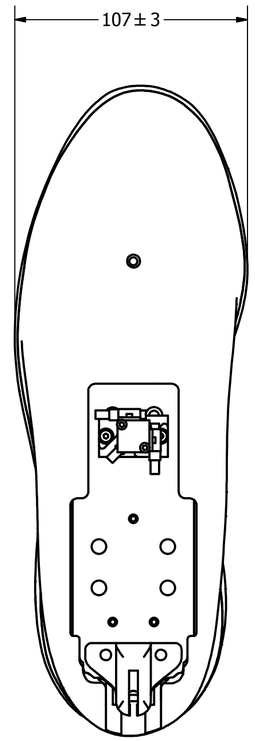


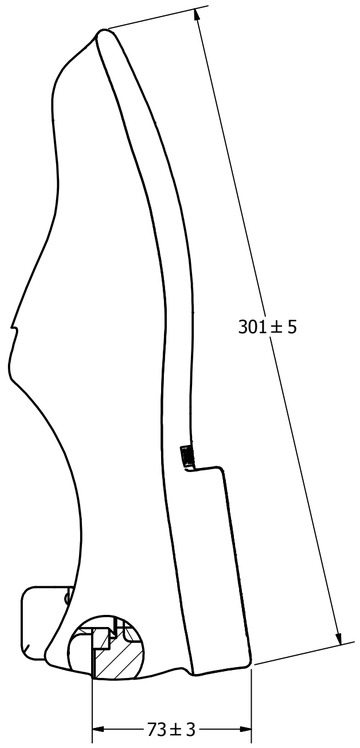
UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6, ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	STIFFENER, KNEE BUMPER
DRAWN B. WADE 11/19/2008		THOR-50M
MATERIAL Aluminum-6061-T6	CHECKED TMV 12/11/2008	SIZE A3 · DRAWING NUMBER 472-7216 · REV A
HEAT TREAT N/A	ENG	
FINISH N/A	APPROVED	THIRD ANGLE PROJECTION · SCALE: 2:1 · SHEET 1 OF 1

472-7216 Stiffener, Knee Bumper.ipt







ITEM	QTY	PART NUMBER	DESCRIPTION
13	1	9000058	SCREW, SHCS M3-0.5 x 12
12	3	SA572-S4	UNIAXIAL PIEZORESISTIVE ACCELEROMETER
11	6	9010407	SCREW, SHCS M1.4 x 0.3 x 3 LG.
10	2	9000863	SCREW, SHCS M2.5X0.45 X 16
9	2	9010446	SCREW, FHCS M3X0.5 X 16
8	1	SA572-S80M	TRI-PACK BLOCK
7	1	472-7710	PLATE MOUNTING, TRI PACK ACCEL
6	3	5001089	SCREW, FHCS M6X1 X 20
5	1	472-7744	MOUNTING POST, LOWER ACHILLES
4	1	472-7801-1	SHOE SOLE - LEFT
3	1	472-7803-1	BALL OF FOOT PAD MOLDED - LEFT
2	1	472-7804-1	HEEL PAD MOLDED - LEFT
1	1	472-7802-1	SHOE UPPER - LEFT

PARTS LIST

NOTES:

1. BOND ITEMS 1, 2, 3, AND 4.
2. MASS OF ALL PARTS SHOWN IN PARTS LIST 1.26kg ± 0.05kg

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE PARTS LIST
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN KHS	5/5/2014
CHECKED	
ENG	
APPROVED	

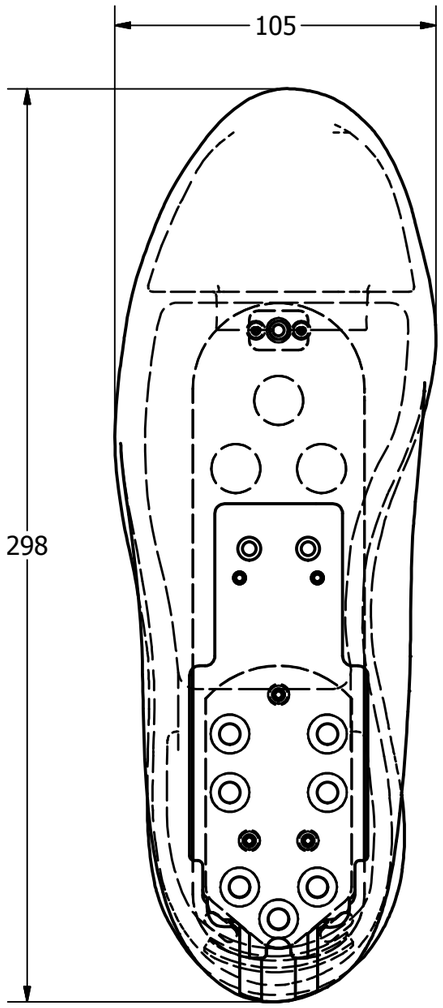
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

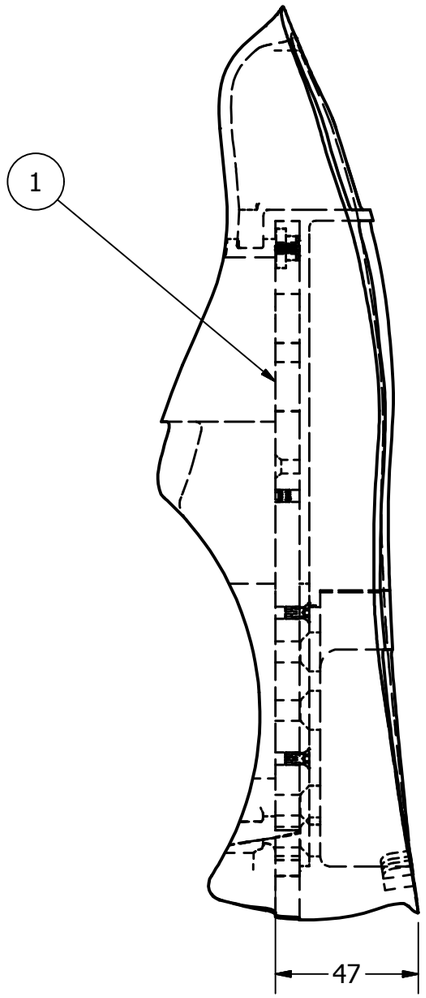
MOLDED SHOE ASSY. - LEFT

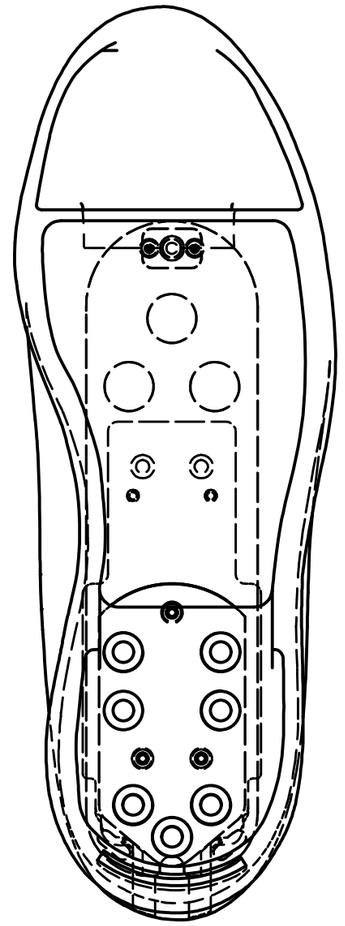
THIRD ANGLE PROJECTION

SIZE A2 | DRAWING NUMBER 472-7800-1 | REV

SCALE: 1:2 | SHEET 1 OF 1







NOTES:
1. COLOR: BLACK
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE THERMOPLASTIC MOLDING

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	472-7750	FOOT BONE ASSEMBLY

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

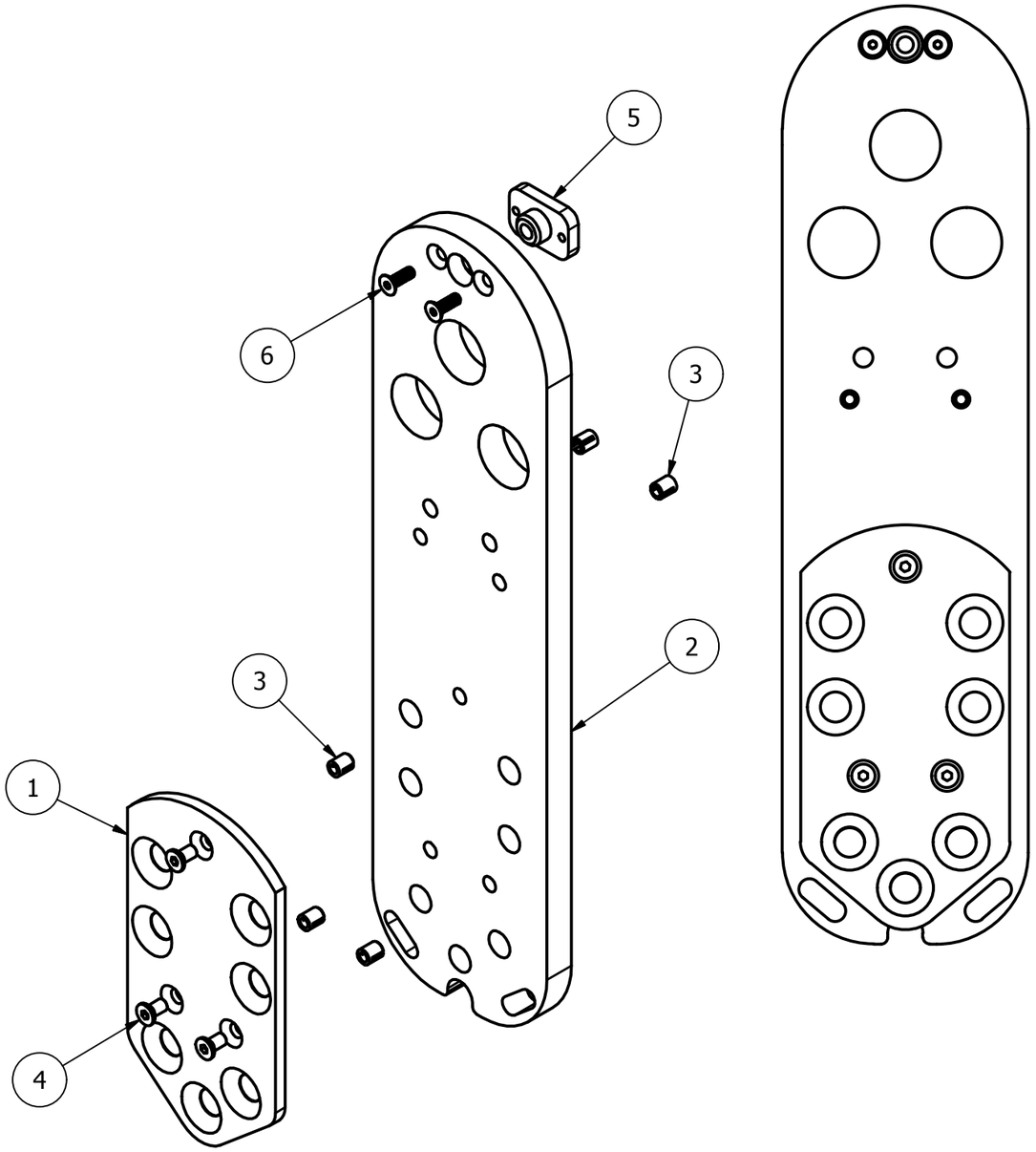
APPROVALS	DATE
DRAWN KHS	5/5/2014
CHECKED	
ENG	
APPROVED	

MATERIAL: Thermoplastic Resin
HEAT TREAT: N/A
FINISH: N/A

SHOE UPPER - LEFT

THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 472-7802-1 | REV:
SCALE: 1 : 2 | SHEET: 1 OF 1



ITEM	QTY	PART NUMBER	DESCRIPTION
6	2	9010679	FHCS M2.5 X 8mm
5	1	472-7752	INSERT - ACHILLES TENSION
4	3	9005126	SCREW, FHCS M3x0.5 x 6
3	5	9010451	INSERT, M3 KNURLED THREADED PRESS
2	1	472-7742	FOOT BONE
1	1	472-7743	MOUNTING BRKT HEEL/ACHILLES

Parts List

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN KHS	6/14/2010
CHECKED	
ENG	
APPROVED	

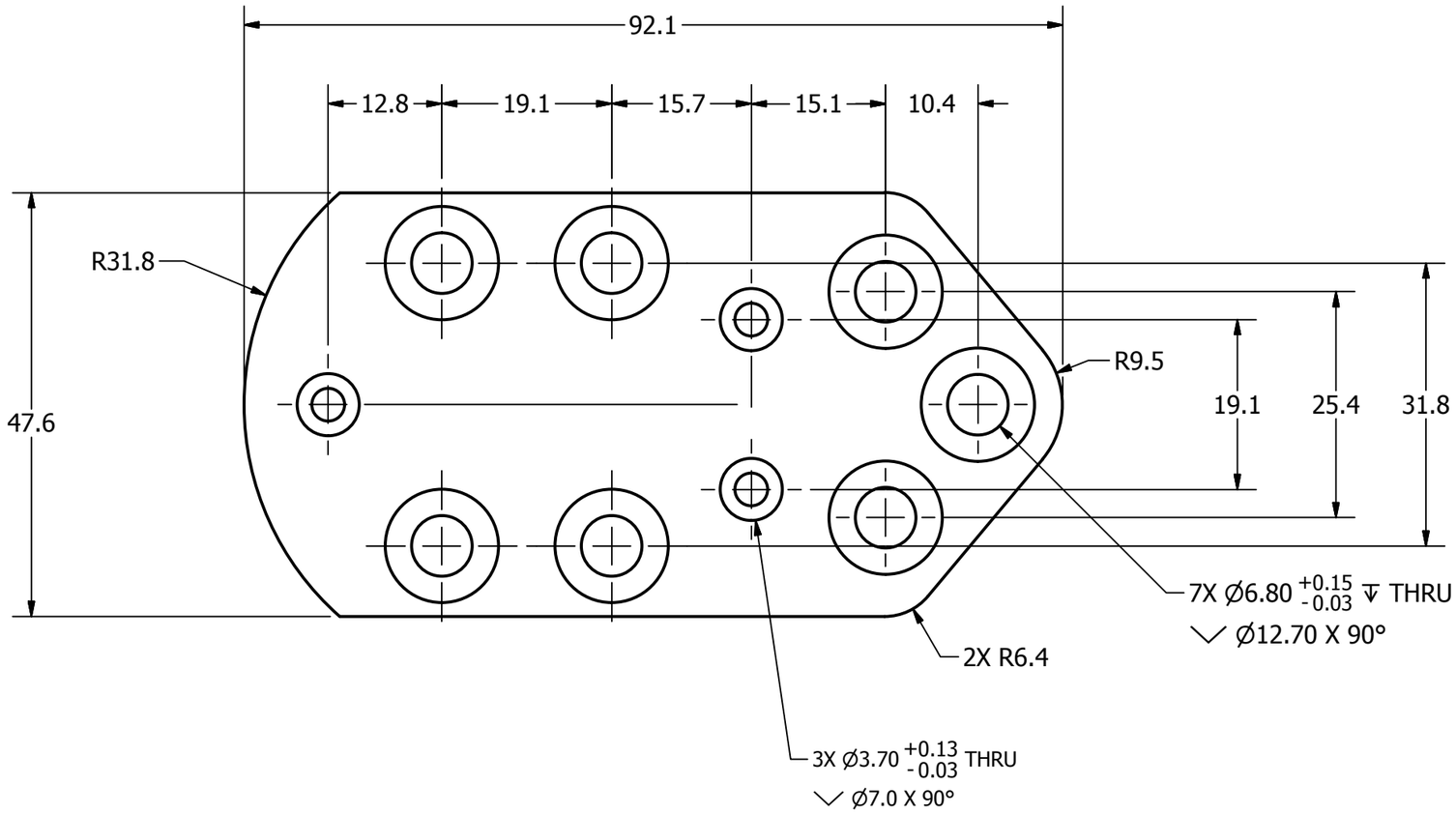
MATERIAL
HEAT TREAT
FINISH

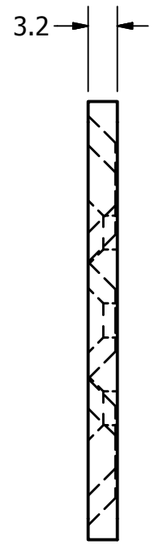
FOOT BONE ASSEMBLY

THIRD ANGLE PROJECTION

SIZE A3 | DRAWING NUMBER 472-7750 | REV

SCALE: 3:4 | SHEET 1 OF 1





UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Aluminum-6061-T6

HEAT TREAT: N/A

FINISH: CLEAR ANODIZE

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

APPROVALS	DATE
DRAWN KHS	8/24/2009
CHECKED	
ENG	
APPROVED	

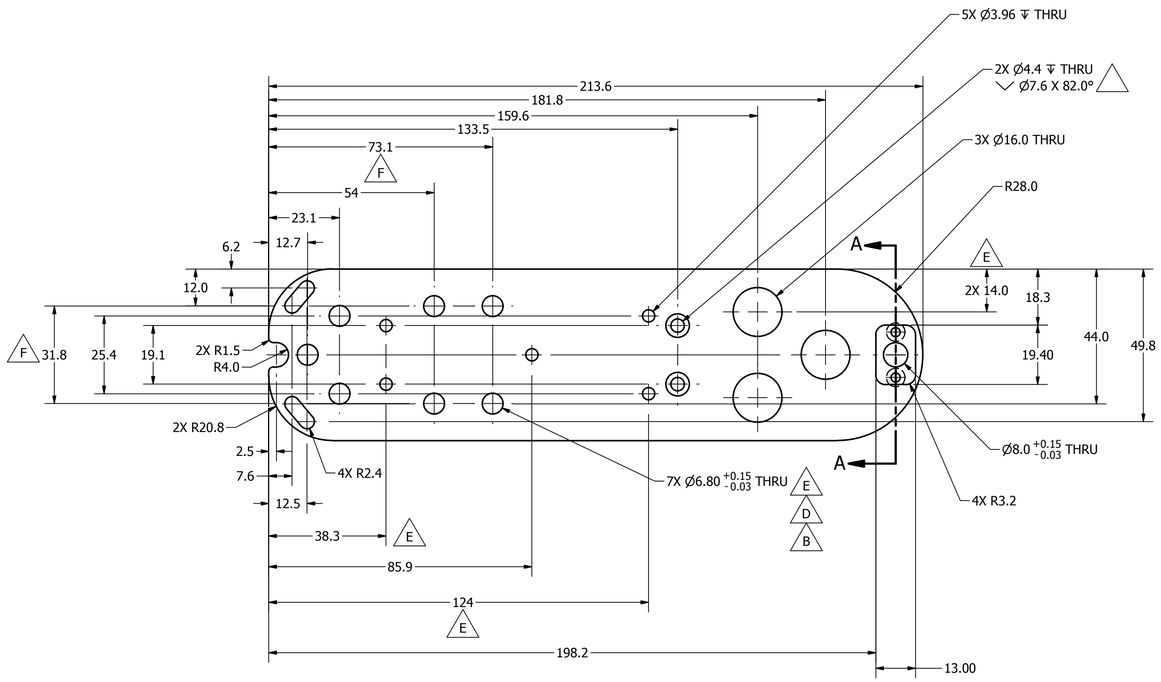
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

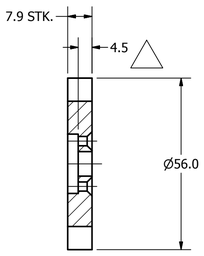
MOUNTING BRKT HEEL/ACHILLES

THIRD ANGLE PROJECTION

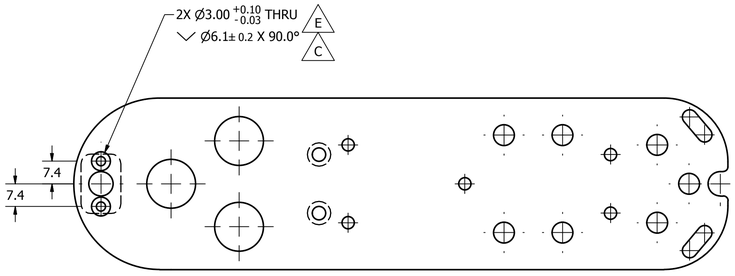
SIZE: A3 | DRAWING NUMBER: 472-7743 | REV:

SCALE: 3 : 2 | SHEET: 1 OF 1





SECTION A-A
SCALE 1 : 1

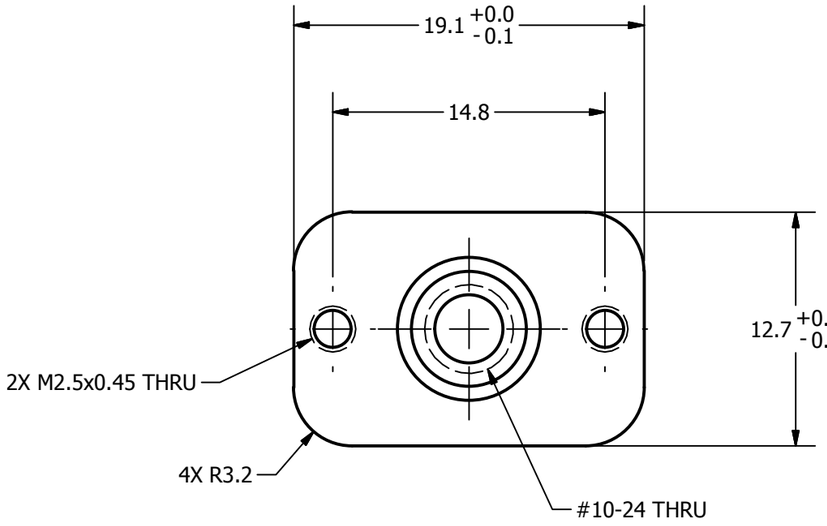


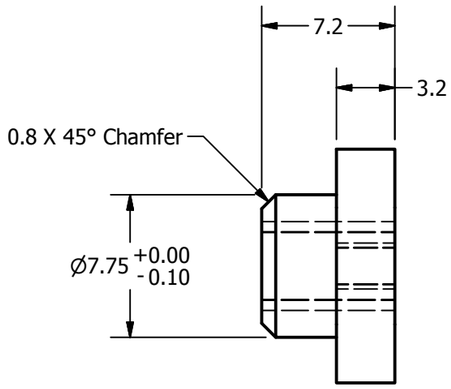
NOTE: STOCK HAS BEVELED CORNERS THAT MUST BE CUT OFF, THEN CUT STOCK TO SIZE PLUS MATERIAL FOR CLEANUP.

NOTES:

1. MATERIAL: CARBON FIBER SHEET 7.9 mm THICK.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL X ±.5 X.X ±.2 X.XX ±.1 MACHINED ∠ ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	FOOT BONE
MATERIAL SEE NOTE	DRAWN KHS	8/24/2009	
HEAT TREAT N/A	CHECKED		SIZE A1 DRAWING NUMBER 472-7742 REV A
FINISH N/A	ENG		THIRD ANGLE PROJECTION SCALE: 1:1 SHEET 1 OF 1
	APPROVED		





UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ±.5, ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 1018 STEEL
HEAT TREAT: N/A
FINISH: .008mm MAX. ELECTROLESS NICKEL PLATE PER SIDE

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

APPROVALS	DATE
DRAWN: KHS	12/5/2011
CHECKED	
ENG	
APPROVED	

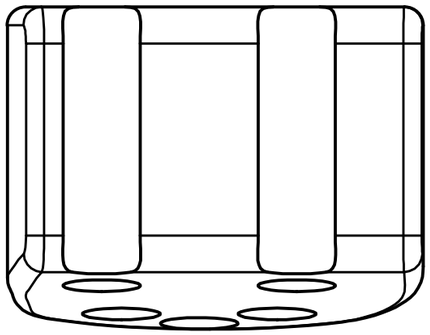
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

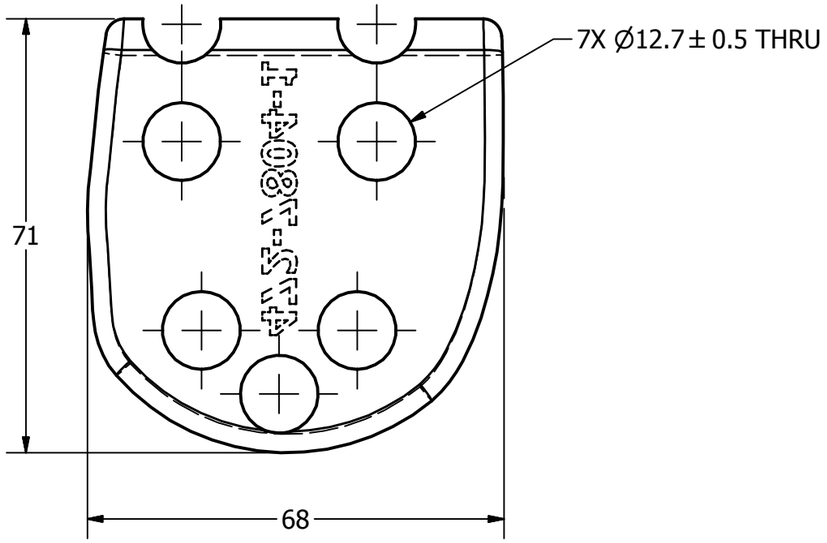
INSERT - ACHILLES TENSION

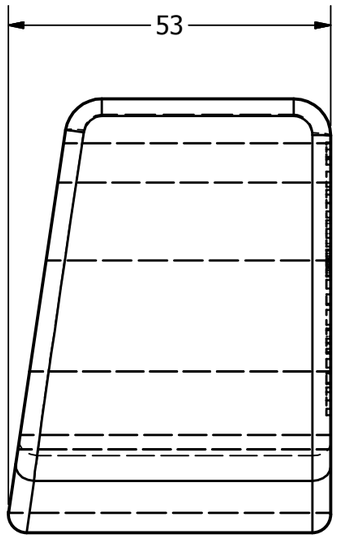
THIRD ANGLE PROJECTION

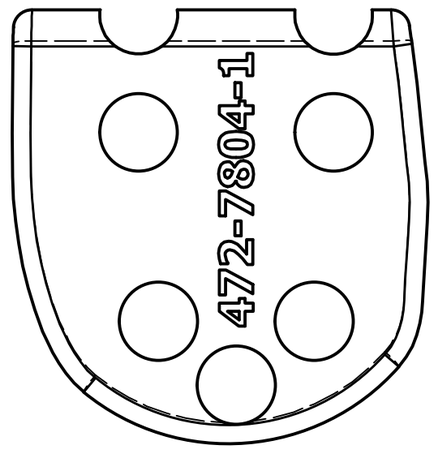
SIZE: A3 | DRAWING NUMBER: 472-7752 | REV:

SCALE: 3:1 | SHEET: 1 OF 1



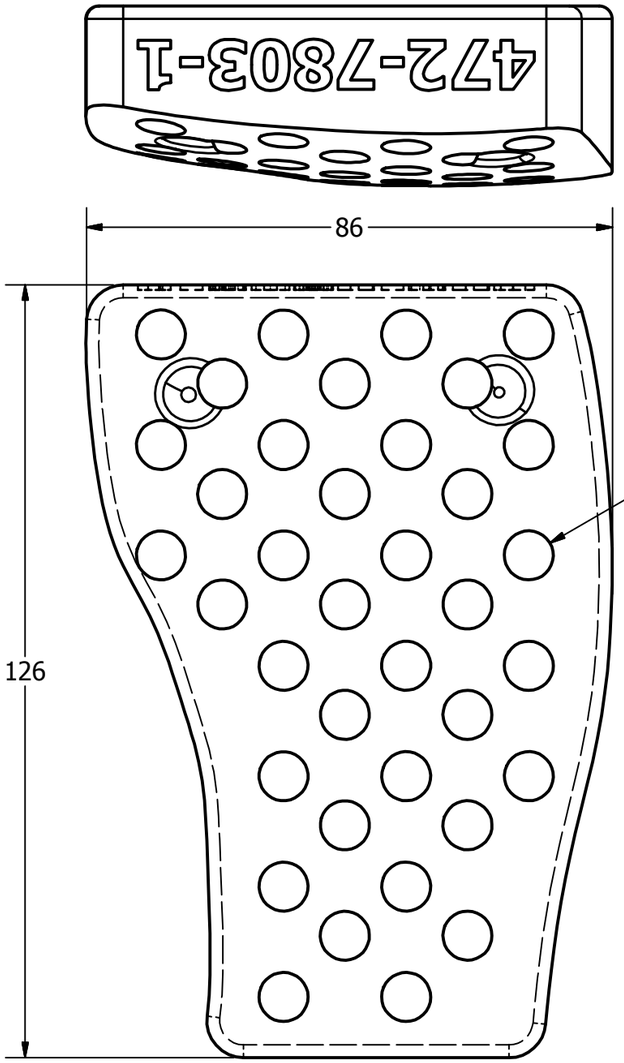


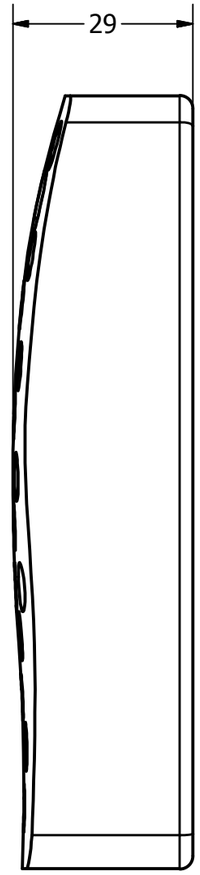




NOTES:
1. COLOR: BLACK
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE URETHANE MOLDING

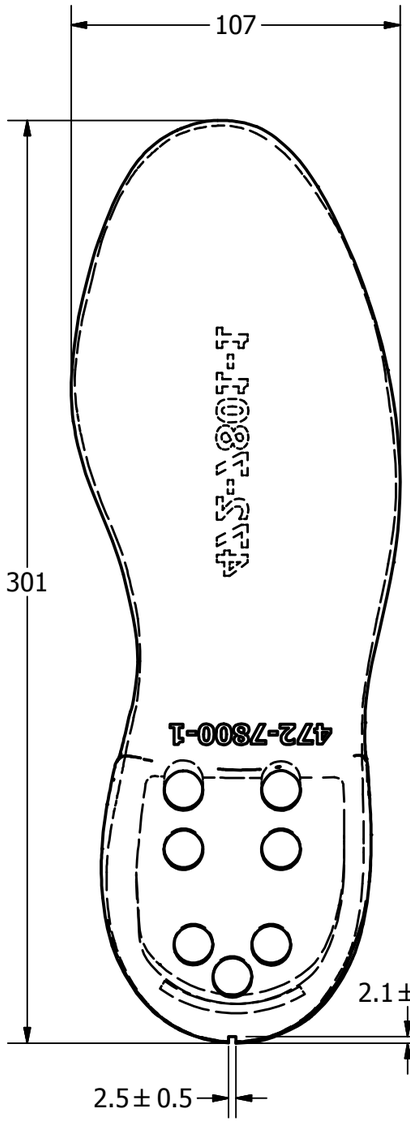
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED ±1°, ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	HEEL PAD MOLDED - LEFT
	DRAWN KHS 5/5/2014	
MATERIAL POLYURETHANE	CHECKED	
HEAT TREAT N/A	ENG	
FINISH N/A	APPROVED	THIRD ANGLE PROJECTION
		SIZE A3 · DRAWING NUMBER 472-7804-1 · REV
		SCALE: 1:1 · SHEET 1 OF 1

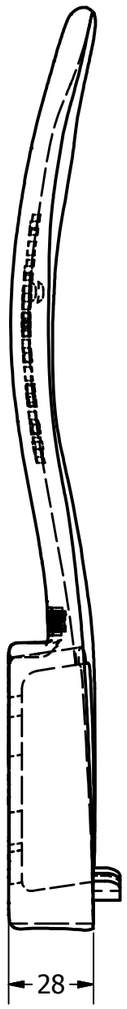




NOTES:
1. COLOR: AMBER
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE URETHANE MOLDING

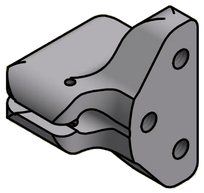
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED √ ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	BALL OF FOOT PAD MOLDED - LEFT
	DRAWN KHS	5/5/2014	
MATERIAL POLYURETHANE	CHECKED		
HEAT TREAT N/A	ENG		
FINISH N/A	APPROVED		
THIRD ANGLE PROJECTION	SIZE A3	DRAWING NUMBER 472-7803-1	REV
	SCALE: 1:1	SHEET 1 OF 1	

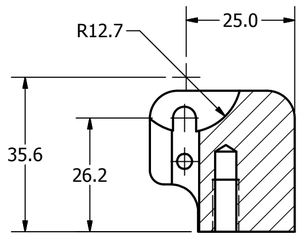




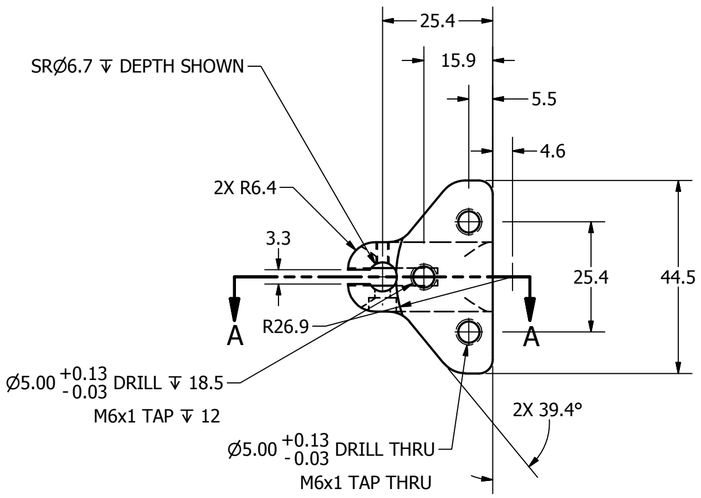
NOTES:
1. COLOR: BLACK
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE THERMOPLASTIC MOLDING

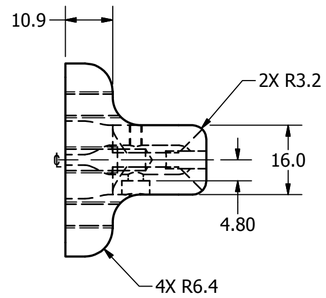
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED √; ANGLES ±.5°	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ASME Y14.5M - 1994 DO NOT SCALE DRAWING	APPROVALS	DATE	SHOE SOLE - LEFT
	DRAWN KHS	7/15/2016	
MATERIAL Thermoplastic Resin	CHECKED		
HEAT TREAT N/A	ENG		
FINISH N/A	APPROVED		
	THIRD ANGLE PROJECTION	SIZE A3 / DRAWING NUMBER 472-7801-1 / REV	
		SCALE: 1:2	SHEET 1 OF 1

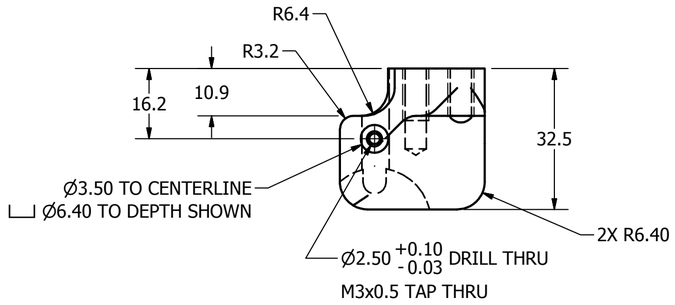


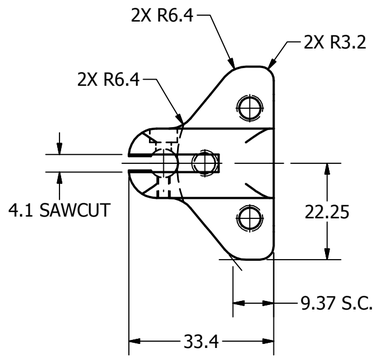


SECTION A-A
SCALE 1 : 1









UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Aluminum-6061-T6
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN tvara	8/19/2011
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

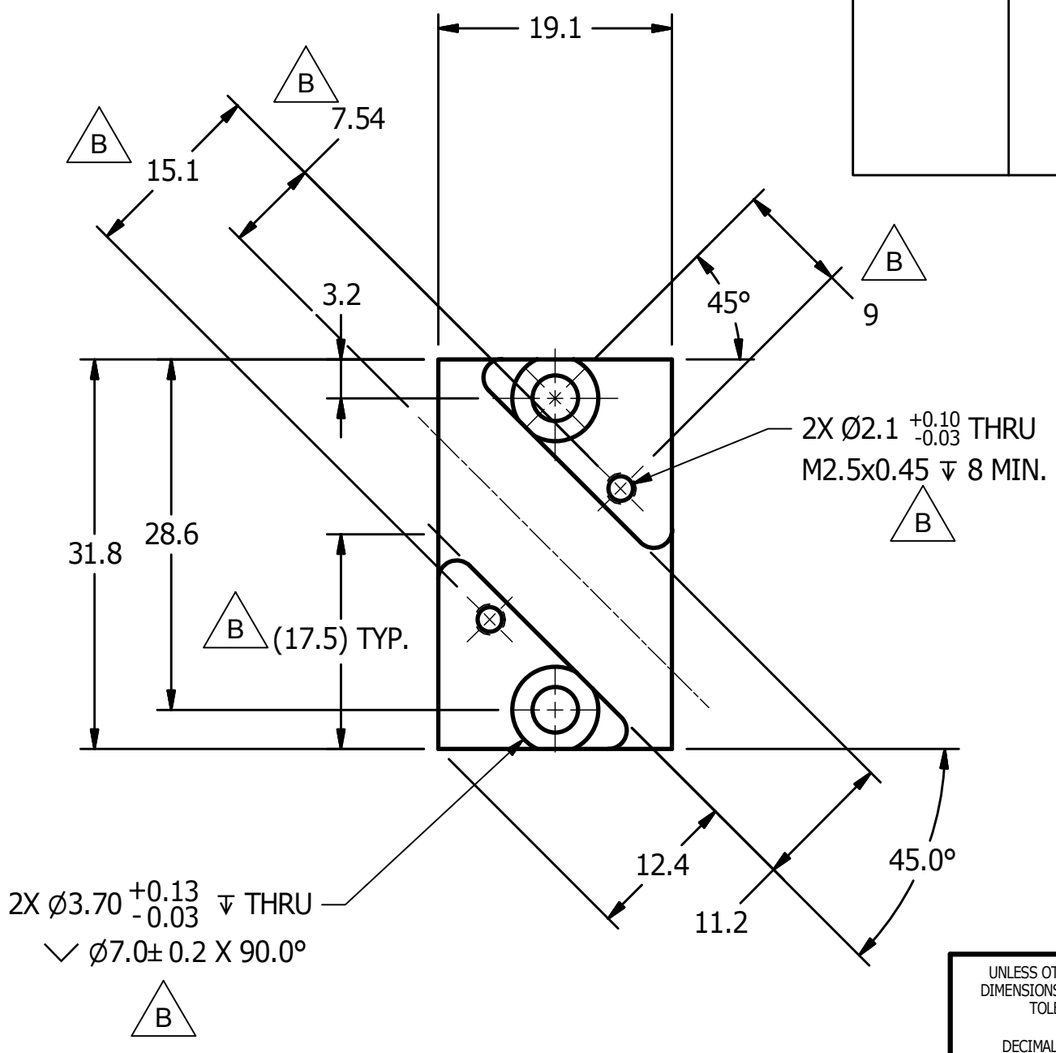
MOUNTING POST, LOWER ACHILLES

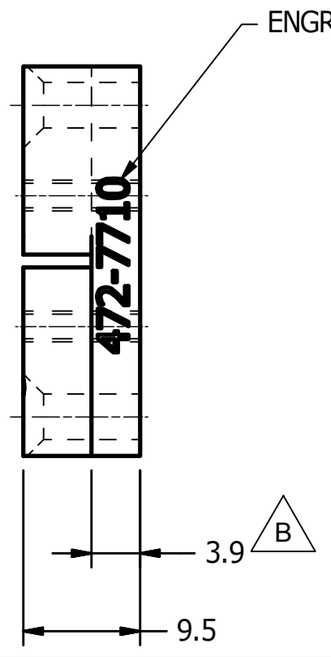
THIRD ANGLE PROJECTION

SIZE A2 | DRAWING NUMBER 472-7744 | REV

SCALE: 1 : 1 | SHEET 1 OF 1

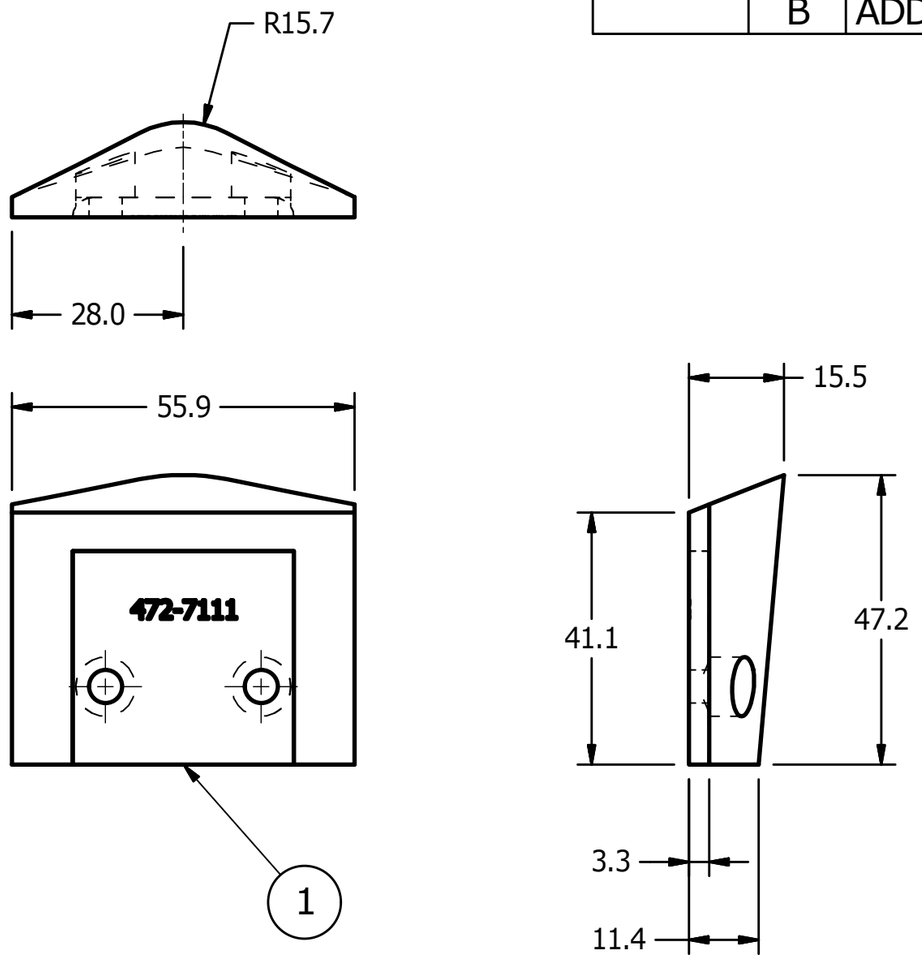
REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	A	CHANGED TO METRIC DIMENSIONING	12/4/2008	BLW
	B	2X Ø3.70 $^{+0.13}_{-0.03}$ THRU M2.5x0.45 TAP ↧ 8 MIN. WAS (2X) M2.5x0.45 ↧ THRU, & 3.9 WAS 4.4; 2X Ø3.70 ↧ THRU Ø7.0 ± 0.2 x 90° WAS (2X) Ø3.5 THRU ⌵ Ø6.4 x 90.0°; REMOVED 9.5, 4.2, 10.5, 21.2, & 14.9; ADDED (17.5) TYP., 45°, 9, 7.54, & 15.1; CLEAR ANODIZED WAS BLUE ANODIZED	8/8/2016	DW





UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	PLATE MOUNTING, TRI PACK ACCEL THOR-50M
	DRAWN B. WADE	12/4/2008	
MATERIAL Aluminum 6061-T6	CHECKED TMV	12/10/2008	
HEAT TREAT N/A	ENG		
FINISH CLEAR ANODIZED	APPROVED		THIRD ANGLE PROJECTION; SIZE A3; DRAWING NUMBER 472-7710; REV B; SCALE: 2:1; SHEET 1 OF 1

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	A	CHAMGED TO METRIC DIMENSIONING	11/19/2008	BLW
	B	ADDED PARTS LIST	8/9/2016	DW



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	472-7111	BACK PLATE, MOLDED BUMPER

PARTS LIST

UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.
2. MATERIAL: URETHANE 37 ±5 SHORE A.
3. SANDBLAST AND CLEAN WITH SOLVENT SIDE OF ITEM 1 TO BE BONDED TO URETHANE.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE 2
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. WADE	11/19/2008
CHECKED TMV	12/12/2008
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

KNEE BUMPER, MOLDED

THOR-50M

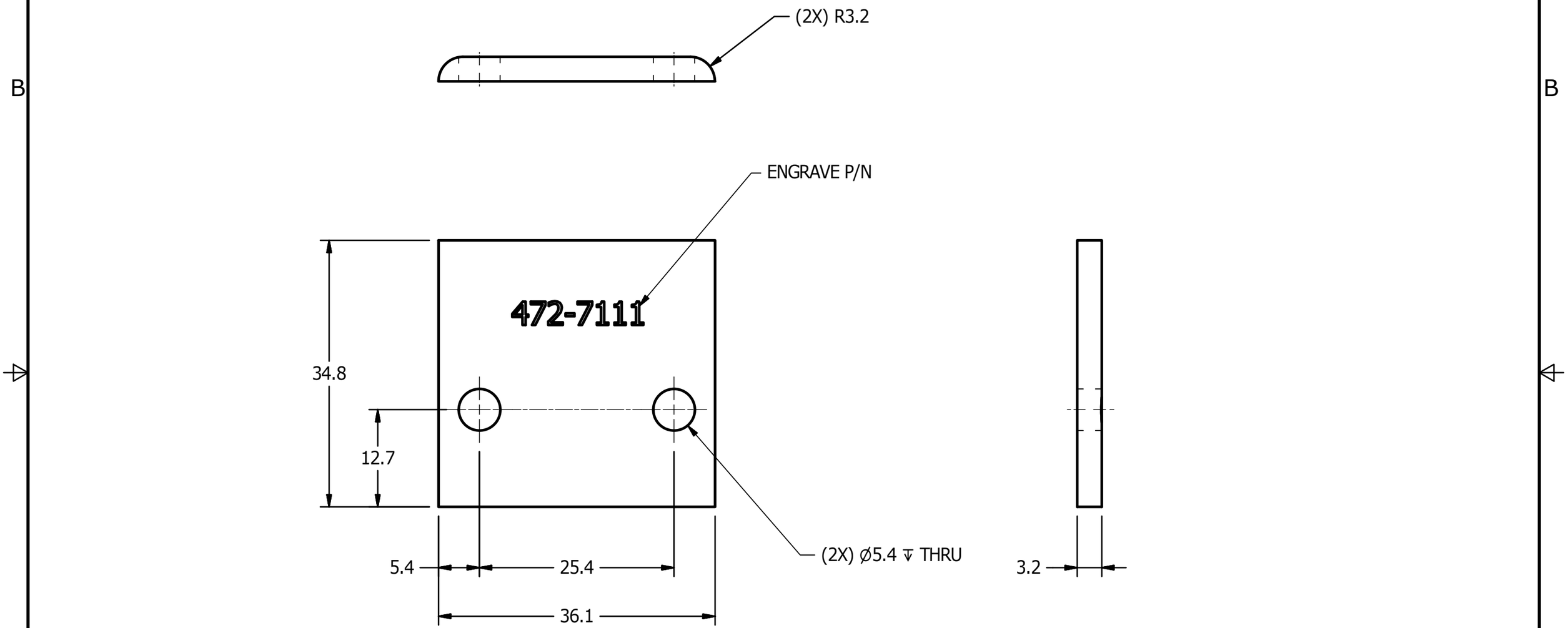
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 472-7110 | REV: B

SCALE: 1:1 | SHEET: 1 OF 1

472-7110 Knee Bumper, Molded.iam

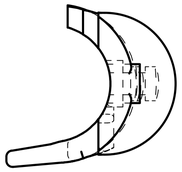
REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	A	CHANGED TO METRIC DIMENSIONING	11/19/2008	BLW

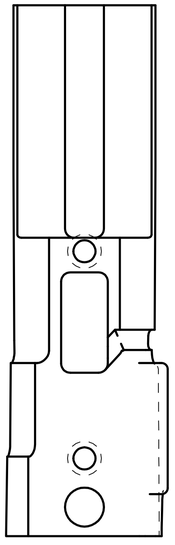


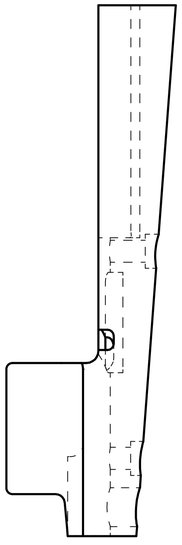
UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.

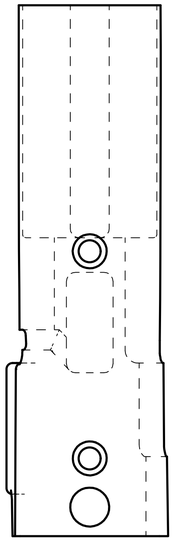
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	BACK PLATE, MOLDED BUMPER
	DRAWN B. WADE 11/19/2008	THOR-50M
MATERIAL 1018 STEEL	CHECKED TMV 12/11/2008	SIZE A3 | DRAWING NUMBER 472-7111 | REV A
HEAT TREAT N/A	ENG	
FINISH N/A	APPROVED	THIRD ANGLE PROJECTION | SCALE: 2:1 | SHEET 1 OF 1

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
E00609	A	CHNGED TO METRIC DIMENSIONING	12/5/2008	BLW







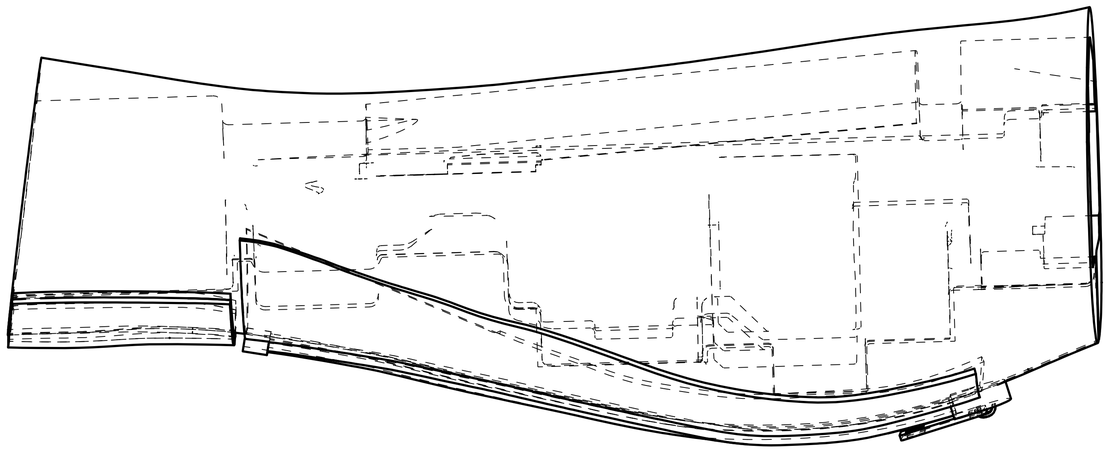


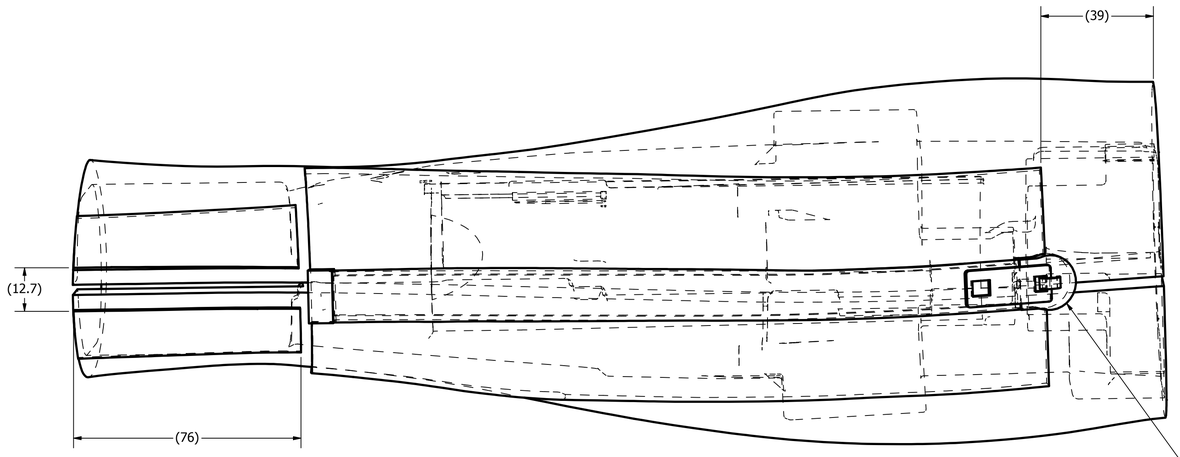
UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES.
2. MATERIAL: URETHANE 85 ±5 SHORE A.
3. GEOMETRY SPECIFIED BY 3-D MODEL NO. 472-7115.

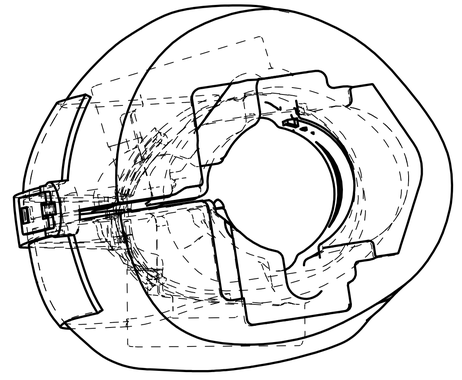
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED ANGLES ±.5°; ASME Y14.5M - 1994; DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	TIBIA GUARD
	DRAWN B. WADE	12/5/2008	THOR-50M
MATERIAL RP 6442 URETHANE	CHECKED TMV	12/10/2008	
HEAT TREAT N/A	ENG		SIZE A1 · DRAWING NUMBER 472-7115 · REV A
FINISH N/A	APPROVED		THIRD ANGLE PROJECTION · SCALE: 1:1 · SHEET 1 OF 1

472-7115 Tibia Guard.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	COMPLETELY REVISED INTERNAL CAVITY; ADDED ZIPPER ASSEMBLY (472-4475), VELCRO HOOK (8004627), & VELCRO SHEET LOOP (8004650); ADDED NOTES AND PARTS LIST	9/11/2018	DW







VELCRO LOOP REMOVED

NOTES:

1. FINISHED WEIGHT WITH ZIPPER AND VELCRO: .63 ± .05 KG.
2. ATTCH ZIPPER (9000748V) TO CLOSE FLESH AT BACK.
3. HEAT SEAL ZIPPER ASSEMBLY TO LEG FLESH AS SHOWN.
4. CUT VELCRO HOOK (8004627) TO (2) 25.4 mm x 76 mm;
   CUT VELCRO LOOP (8004650) TO 76 mm x 76 mm.
5. BOND (2X) VELCRO HOOK TO FLESH AS SHOWN.
6. ALL MOLD DIMENSION TOLERANCE +1%/-4% BUT NOT NOT SMALLER THAN 1mm.

ITEM	QTY	PART NUMBER	DESCRIPTION
4	1	8004650	VELCRO SHEET LOOP
3	1	8004627	VELCRO HOOK 1.00" WIDE
2	1	9000748V	ZIPPER ASSEMBLY
1	1	472-5580-1	LOWER LEG FLESH, LEFT

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. WADE	10/1/2015
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

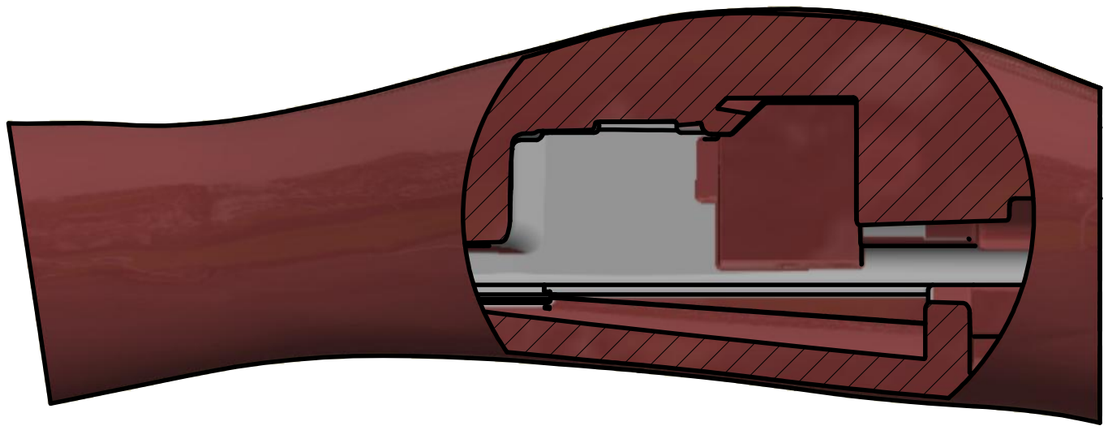
LOWER LEG FLESH ASS'Y., LEFT

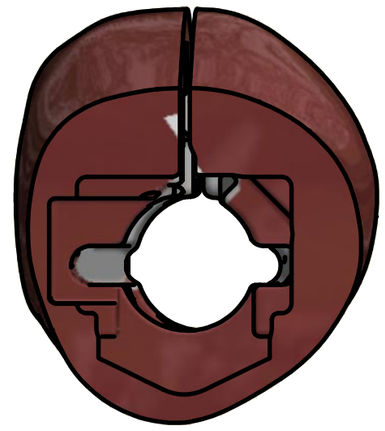
THOR-50M

THIRD ANGLE PROJECTION

SIZE: A1 | DRAWING NUMBER: 472-7370-1 | REV: A

SCALE: 1:1 | SHEET: 1 OF 1





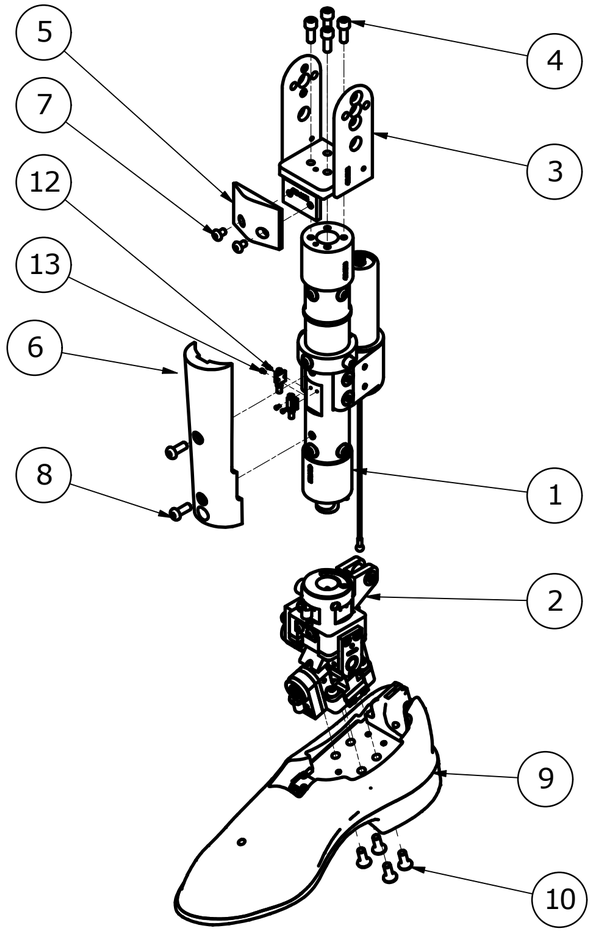
NOTE:

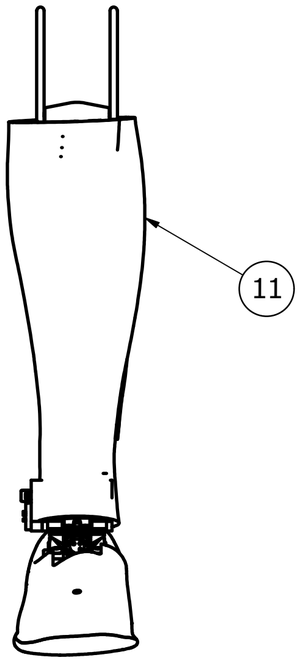
1. MATERIAL: PVC, DUROMETER: 52 ± 3 SHORE "D"
   AND URETHANE FOAM
2. REMOVE ALL MOLD FLASHING.
3. EXTERNAL SHAPE DEFINED BY UMTRI 50TH PERCENTILE LOWER LEG.
4. ALL MOLD DIMENSION TOLERANCE +1%/-4% BUT NOT NOT SMALLER THAN 1mm.

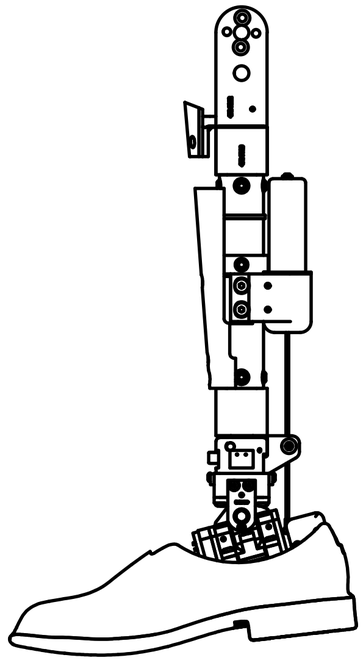
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6, ANGLES ±.5° ASME Y14.5M - 1994 **DO NOT SCALE DRAWING**	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER		**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION**
	APPROVALS	DATE	LOWER LEG FLESH, LEFT THOR-50M
	DRAWN Dave Walker	9/24/2018	
MATERIAL SEE NOTES	CHECKED		SIZE A3 · DRAWING NUMBER 472-5580-1 · REV
HEAT TREAT	ENG		
FINISH	APPROVED		THIRD ANGLE PROJECTION · SCALE: 1 / 2 · SHEET 1 OF 1

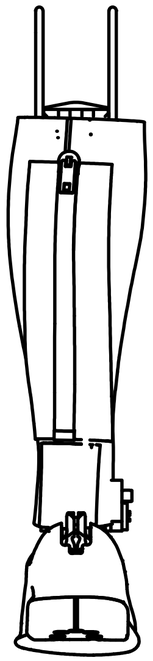
Lower Leg Flesh, Left.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	CHANGED TO METRIC DIMENSIONS	12/5/2008	BLW
	B	ADDED ITEM #11	7/14/2015	DW
	C	472-7800-2 MOLDED SHOE ASS'Y. - RIGHT WAS 472-7700-2 FOOT ASS'Y. - RIGHT	12/5/2008	DW
	D	ADDED ITEM #12, SA572-S4 UNIAXIAL PIEZORESISTIVE ACCELEROMETER AND ITEM #13, 9010407 SCREW, SHCS M1.4x0.3 x 3; ADDED EXPLODED VIEW AND MOVED BALLOON CALLOUTS TO EXPLODED VIEW	5/22/2017	DW
	E	ITEM #7 WAS PART #9003042 - SCREW, BHCS M5 x 10	8/10/2018	DW









ITEM	QTY	PART NUMBER	DESCRIPTION
13	4	9010407	SCREW, SHCS M1.4x0.3 x 3
12	2	SA572-S4	UNIAXIAL PIEZORESISTIVE ACCELEROMETER
11	1	472-7370-2	LOWER LEG FLESH, RIGHT
10	4	9000826	SCREW, FHCS M6x1.0 X 16
9	1	472-7800-2	MOLDED SHOE ASS'Y. - RIGHT
8	2	9010453	SCREW, BHCS M6x1.0 x 16
7	2	5000216V	SCREW, BHCS M5x0.8 x 8
6	1	472-7115	TIBIA GUARD
5	1	472-7110	KNEE BUMPER, MOLDED
4	4	9000852	SCREW, SHCS M6 x 1.0 X 16mm LONG
3	1	472-7200	KNEE CLEVIS WELDMENT
2	1	472-7500-2	ANKLE ASSEMBLY, RIGHT
1	1	472-7300	LOWER LEG MECHANICAL ASSEMBLY

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6 ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN B. WADE	12/5/2008
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

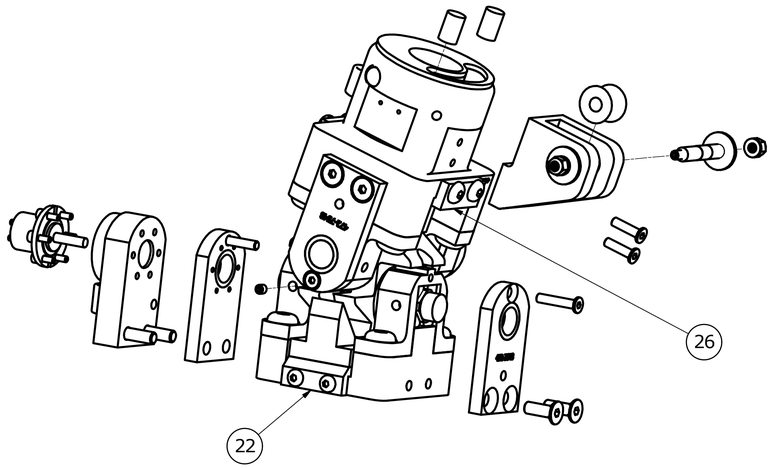
LOWER LEG ASSEMBLY, COMPLETE - RIGHT THOR-50M

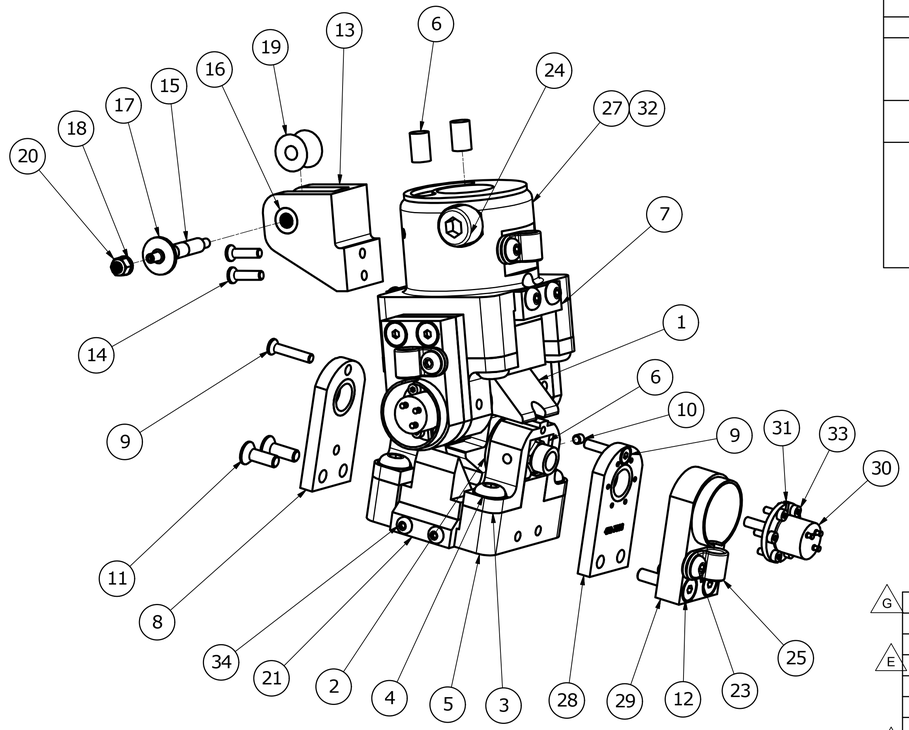
THIRD ANGLE PROJECTION

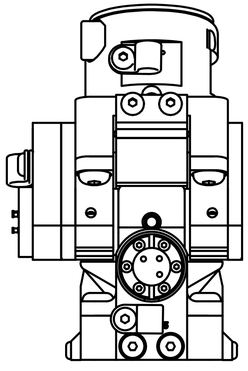
SIZE: C
DRAWING NUMBER: 472-7000-2
REV: E
SCALE: 1:4
SHEET: 1 OF 1

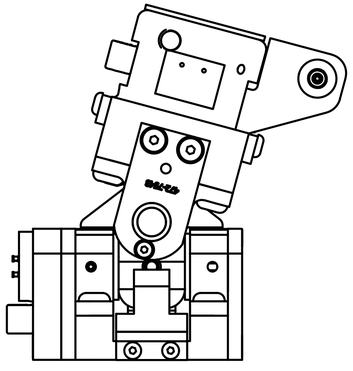
Model File:
472-7000-2 Lower Leg Assembly, Complete - Right.iam

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	B	REDRAWN IN INVENTOR	7/25/2007	KSG
	C	CHANGE TO METRIC HARDWARE	10/14/08	BLW
	D	CHANGE TO METRIC DIMENSIONING	12/5/2008	BLW
	E	QTY OF ITEM 7 WAS 2, ADD ITEM 27, REDESIGN POT MOUNTING, POT PART NUMBER WAS 472-7550	7/28/2015	JHC
	F	DESCRIPTION OF ITEM 26 WAS STOP ASSEMBLY, REAR DORSI	3/22/2016	DW
	G	CORRECTED ITEM NUMBERS IN BOM, ITEM #21 WAS SKIPPED; CORRECTED DESCRIPTION OF ITEM #23 PART #5000103, WAS *Varies* AND QTY. WAS 11; ADDED ITEM #34 PART 5000410	8/8/2017	DW









ASSEMBLY INSTRUCTIONS
1. SAND 4 EA OF ITEM 2 TO ACHIEVE SNUG ASSEMBLY

ITEM	QTY	PART NUMBER	DESCRIPTION
G 34	4	5000410	SCREW, BHCS M3X0.5 X 8
33	12	9010560	SCREW, SHCS M2X0.4 X 6
32	6	9010559	SCREW, SHCS M2X0.2 X 4
E 31	3	472-7581	POTENTIOMETER CLAMP
30	3	SA572-S114	POTENTIOMETER
29	2	472-7585	RETAINER, POTENTIOMETER
28	2	472-7582	ANKLE BUSHING PLATE ASSEMBLY - POT END
E 27	1	472-7580	BASE, TORQUE - ANKLE TOP
F 26	1	472-7527	STOP ASSEMBLY, PLANTAR
25	3	9005135	CLAMP, NYLON LOOP
G 24	1	472-7563	BOLT & SLEEVE ASSEMBLY, ANKLE
23	7	5000103	SCREW, BHCS M4 x 0.7 x 8
22	1	472-7534	STOP ASSEMBLY - INVERSION
21	1	472-7533	STOP ASSEMBLY - EVERSION
20	2	9010450	NUT, NYLOCK M3X0.5
19	1	472-7562	PULLEY, ACHILLES CABLE
18	2	9000510	FLATWASHER, #4 TYPE B NARROW
17	2	9000508	ACHILLES WASHER
16	2	9000509	NEEDLE ROLLER BEARING
15	1	472-7561	SHAFT, ACHILLES CABLE PULLEY
14	2	9010449	SCREW, FHCS M3 x 12
13	1	472-7560	BRACKET, ACHILLES PULLEY
12	4	9010448	SCREW, FHCS M4X0.7 X 20
11	4	9000873	SCREW, FHCS M4-0.7 x 12
10	2	9010447	SCREW, SHSS, M3X0.5 X 3
9	4	9010446	SCREW, FHCS M3X0.5 X 16
8	2	472-7540	ANKLE BUSHING PLATE ASSEMBLY - FREE END
E 7	1	472-7530	STOP ASSEMBLY - DORSI
6	18	472-7524	TORQUE CYLINDER
5	1	472-7523	BASE, TORQUE - BOTTOM
4	8	5000356	SCREW, BHCS M6 x 1 x 12
3	4	472-7522	CAP, BASE TORQUE
2	4	472-7515	RETAINING WASHER
1	1	472-7510	ANKLE CENTER BLOCK ASS'Y.

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

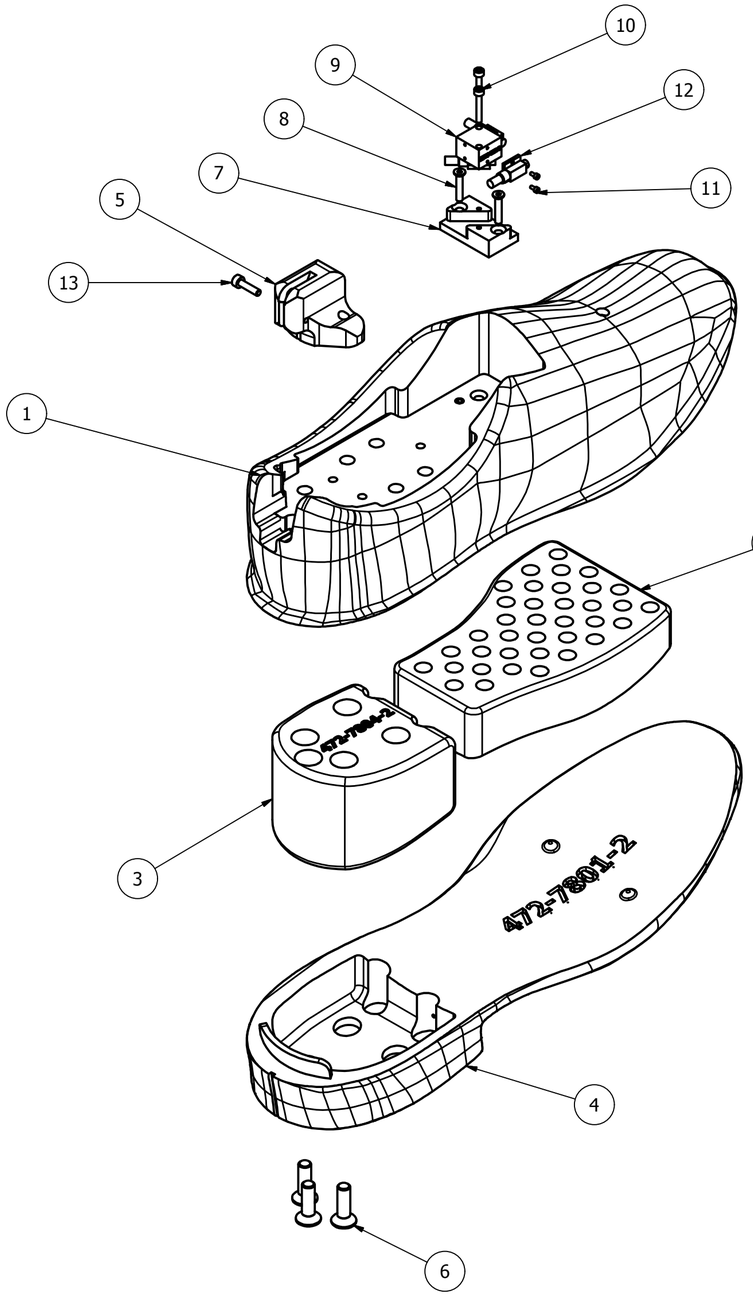
APPROVALS	DATE
DRAWN B. WADE	12/8/2008
CHECKED	
ENG	
APPROVED	

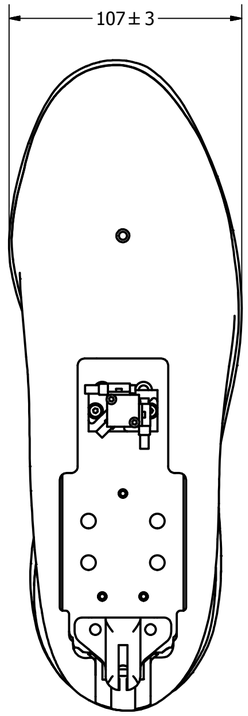
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

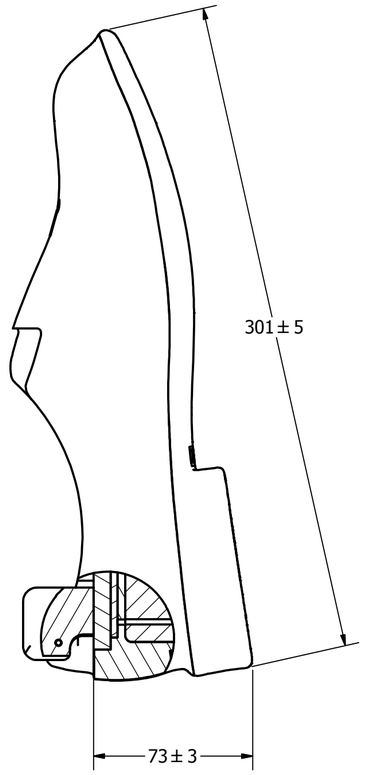
ANKLE ASSEMBLY, RIGHT
THOR-50M

THIRD ANGLE PROJECTION
SIZE D | DRAWING NUMBER 472-7500-2 | REV G
SCALE:
SHEET 1 OF 1

472-7500-2 Ankle Assembly, Right.iam







ITEM	QTY	PART NUMBER	DESCRIPTION
13	1	9000058	SCREW, SHCS M3-0.5 x 12
12	3	SA572-S4	UNIAXIAL PIEZORESISTIVE ACCELEROMETER
11	6	9010407	SCREW, SHCS M1.4 x 0.3 x 3 LG.
10	2	9000863	SCREW, SHCS M2.5X0.45 X 16
9	1	SA572-S80M	TRI-PACK BLOCK
8	2	9010446	SCREW, FHCS M3X0.5 X 16
7	1	472-7710	PLATE MOUNTING, TRI PACK ACCEL
6	3	5001089	SCREW, FHCS M6X1 X 20
5	1	472-7744	MOUNTING POST, LOWER ACHILLES
4	1	472-7801-2	SHOE - SOLE
3	1	472-7804-2	HEEL PAD MOLDED - RIGHT
2	1	472-7803-2	BALL OF FOOT PAD MOLDED- RIGHT
1	1	472-7802-2	SHOE UPPER - RIGHT

PARTS LIST

NOTES:

1. BOND ITEMS 1, 2, 3, AND 4.
2. MASS OF ALL PARTS SHOWN IN PARTS LIST 1.26kg ± 0.05kg

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE PARTS LIST
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. HARRIS	5/14/2015
CHECKED	
ENG	
APPROVED	

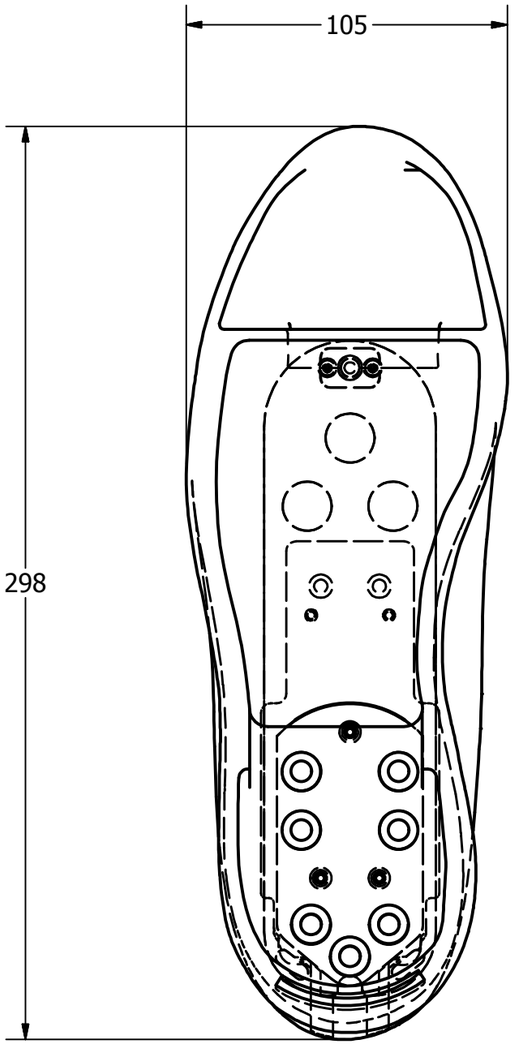
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

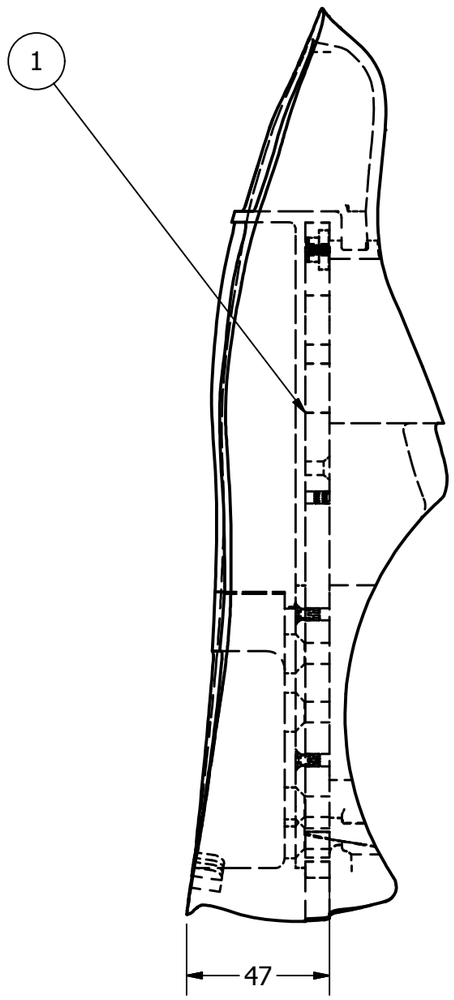
MOLDED SHOE ASS'Y. - RIGHT

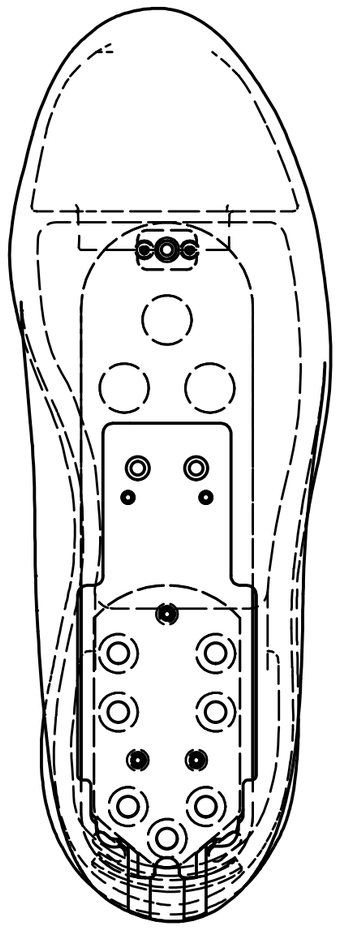
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 472-7800-2 | REV:

SCALE: 1 : 2 | SHEET: 1 OF 1







NOTES:
1. COLOR: BLACK
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE THERMOPLASTIC MOLDING

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	472-7750	FOOT BONE ASSEMBLY

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED √
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

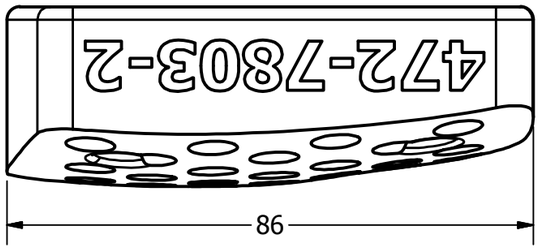
APPROVALS	DATE
DRAWN B. HARRIS	5/13/2015
CHECKED	
ENG	
APPROVED	

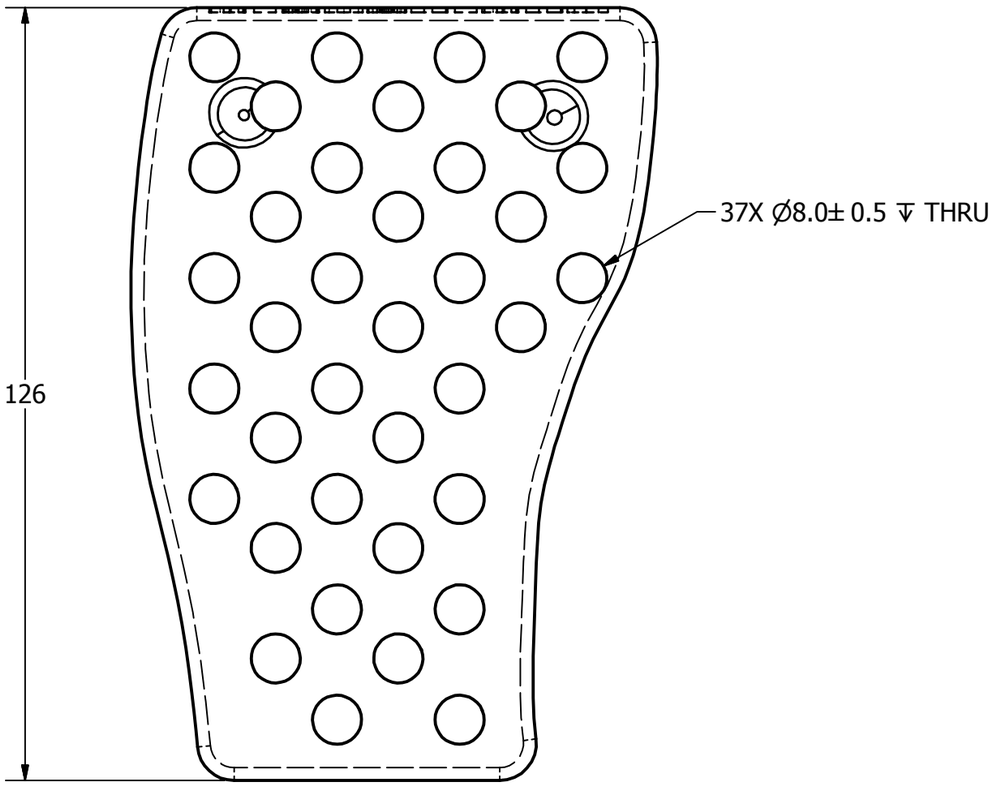
MATERIAL: Thermoplastic Resin
HEAT TREAT: N/A
FINISH: N/A

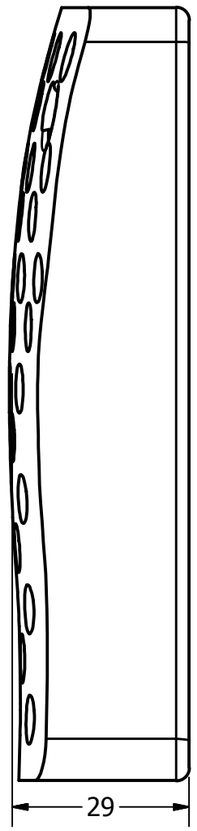
SHOE UPPER - RIGHT

THIRD ANGLE PROJECTION

SIZE: A3
DRAWING NUMBER: 472-7802-2
REV:
SCALE: 1 : 2
SHEET: 1 OF 1

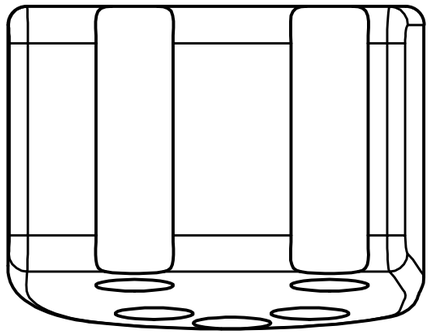


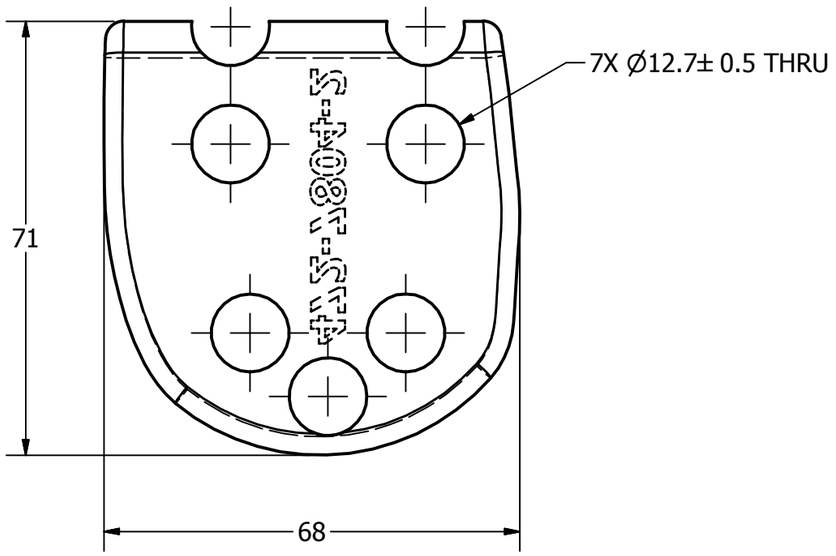


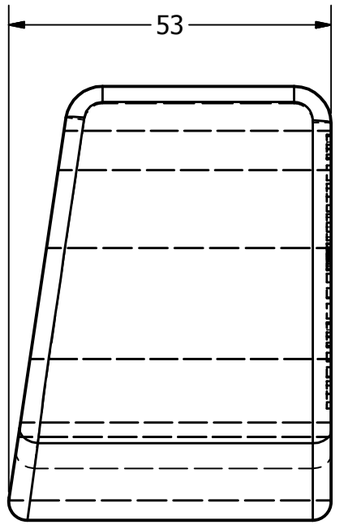


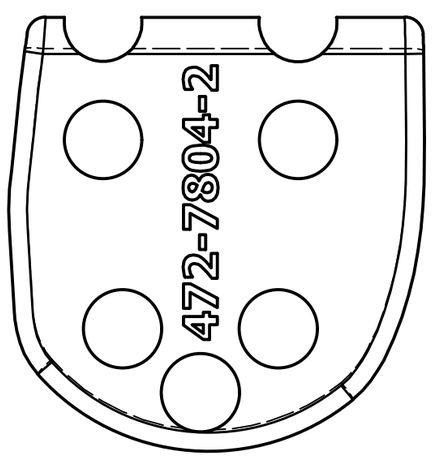
NOTES:
1. COLOR: AMBER
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE URETHANE MOLDING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	BALL OF FOOT PAD MOLDED- RIGHT
MATERIAL: POLYURETHANE	DRAWN: B. HARRIS 7/15/2016	
HEAT TREAT: N/A	CHECKED	
FINISH: N/A	ENG	
	APPROVED	
THIRD ANGLE PROJECTION	SIZE: A3	DRAWING NUMBER: 472-7803-2 REV:
	SCALE: 1 : 1	SHEET: 1 OF 1









NOTES:
1. COLOR: BLACK
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE URETHANE MOLDING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED √ ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	APPROVALS	DATE
		DRAWN B. HARRIS	5/13/2015
MATERIAL POLYURETHANE		CHECKED	
HEAT TREAT N/A		ENG	
FINISH N/A		APPROVED	

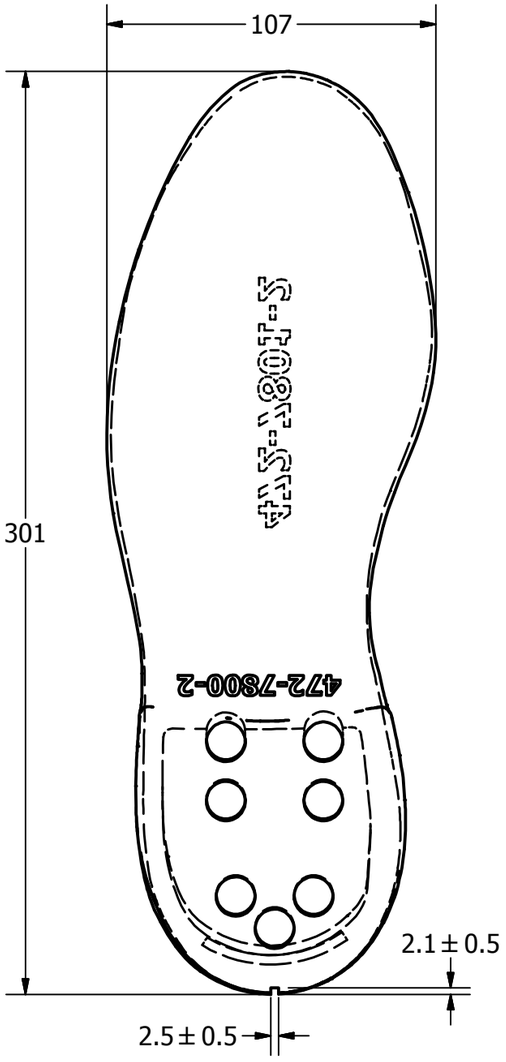
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

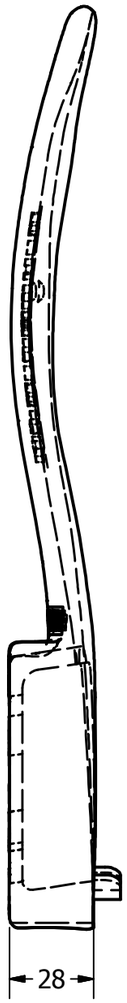
HEEL PAD MOLDED - RIGHT

THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A3	472-7804-2	

SCALE:	SHEET
1 : 1	1 OF 1





NOTES:
1. COLOR: BLACK
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE THERMOPLASTIC MOLDING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: THERMOPLASTIC RESIN
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. HARRIS	5/13/2015
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

SHOE SOLE - RIGHT

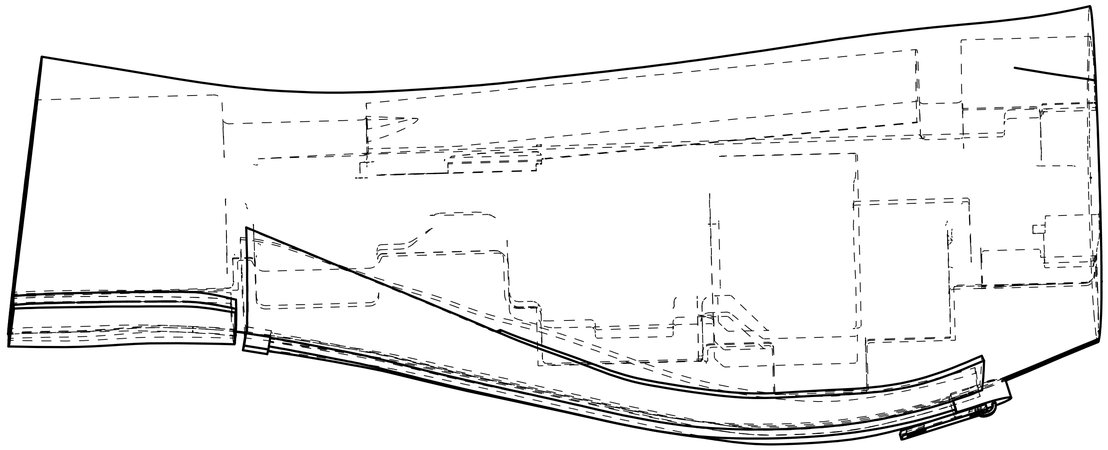
THIRD ANGLE PROJECTION

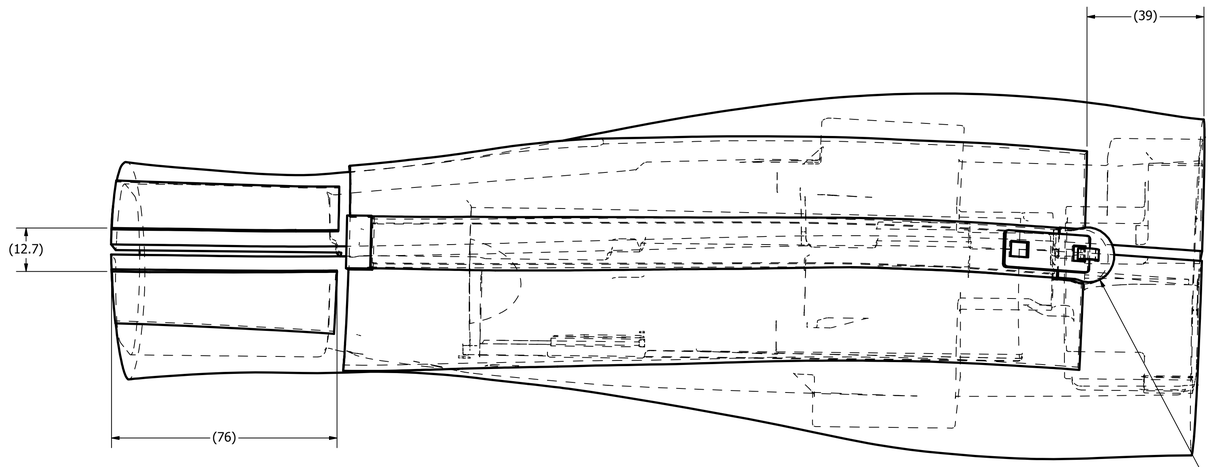
SIZE A3 | DRAWING NUMBER 472-7801-2 | REV

SCALE: 1 : 2

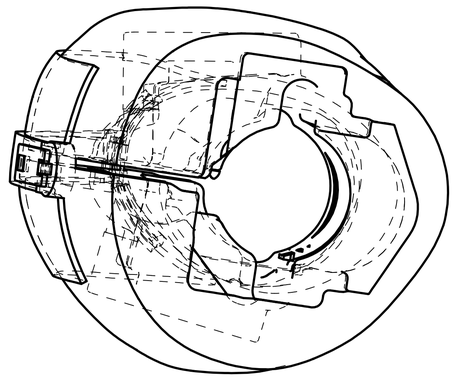
SHEET 1 OF 1

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	COMPLETELY REVISED INTERNAL CAVITY; ADDED ZIPPER ASSEMBLY (472-4475), VELCRO HOOK (8004627), & VELCRO SHEET LOOP (8004650); ADDED NOTES AND PARTS LIST	9/11/2018	BLW





VELCRO LOOP REMOVED



NOTES:

1. FINISHED WEIGHT WITH ZIPPER AND VELCRO: .63 ± .05 KG.
2. ATTCH ZIPPER (9000748V) TO CLOSE FLESH AT BACK.
3. HEAT SEAL ZIPPER ASSEMBLY TO LEG FLESH AS SHOWN.
4. CUT VELCRO HOOK (8004627) TO (2) 25.4 mm x 76 mm;
   CUT VELCRO LOOP (8004650) TO 76 mm x 76 mm.
5. BOND (2X) VELCRO HOOK TO FLESH AS SHOWN.
6. ALL MOLD DIMENSION TOLERANCE +1%/-4% BUT NOT NOT SMALLER THAN 1mm.

ITEM	QTY	PART NUMBER	DESCRIPTION
4	1	8004627	VELCRO HOOK 1.00" WIDE
3	1	8004650	VELCRO SHEET LOOP
2	1	9000748V	ZIPPER ASSEMBLY
1	1	472-5580-2	LOWER LEG FLESH, RIGHT

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT: N/A
FINISH: N/A

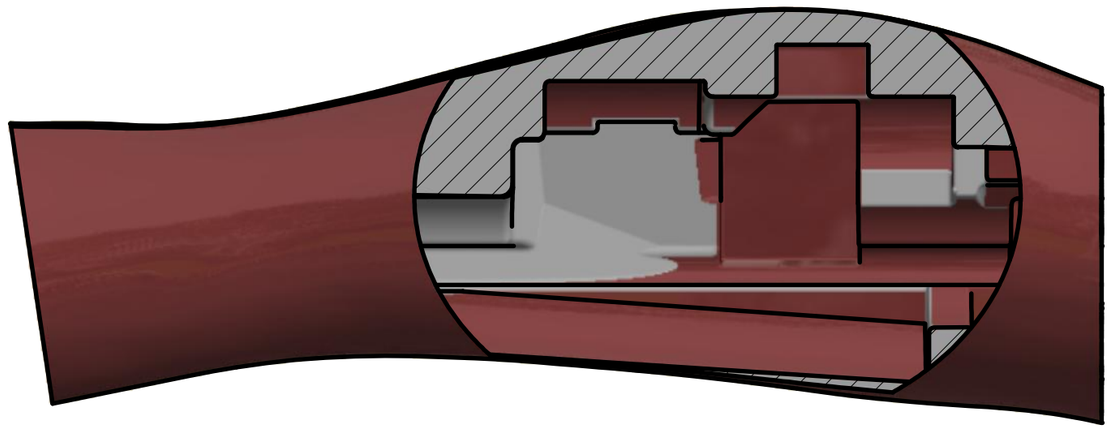
VEHICLE RESEARCH and TEST CENTER

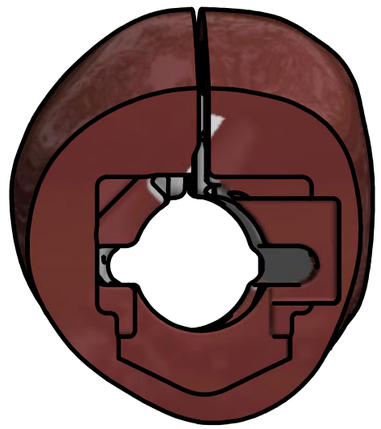
APPROVALS	DATE
DRAWN: B. WADE	1/19/2009
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LOWER LEG FLESH ASS'Y., RIGHT
THOR-50M

THIRD ANGLE PROJECTION
SIZE: A1 | DRAWING NUMBER: 472-7370-2 | REV: A
SCALE: 1:1 | SHEET: 1 OF 1





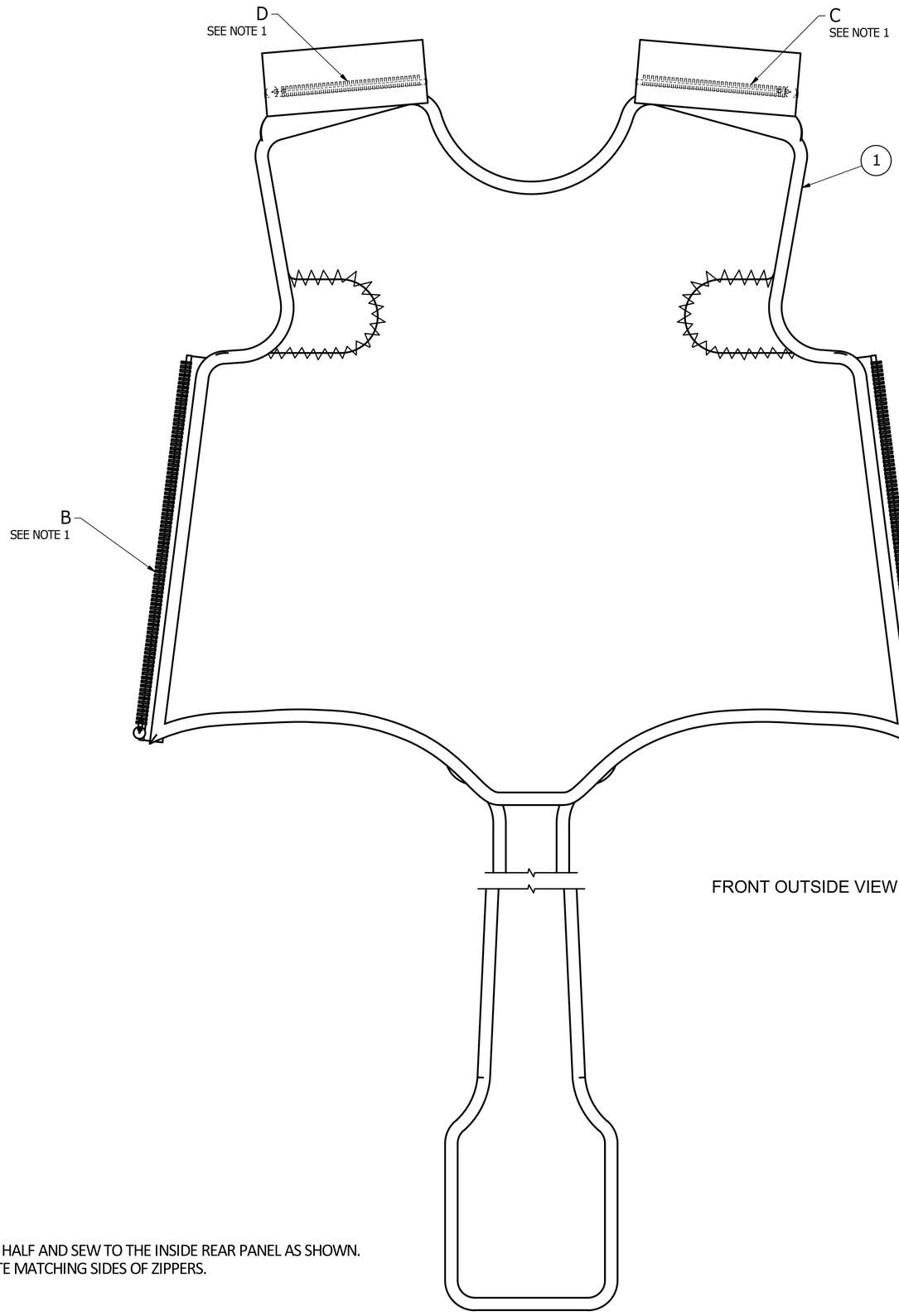
NOTE:

1. MATERIAL: PVC, DUROMETER: 52 ± 3 SHORE "D"
   AND URETHANE FOAM
2. REMOVE ALL MOLD FLASHING.
3. EXTERNAL SHAPE DEFINED BY UMTRI 50TH PERCENTILE LOWER LEG.
4. ALL MOLD DIMENSION TOLERANCE +1%/-4% BUT NOT NOT SMALLER THAN 1mm.

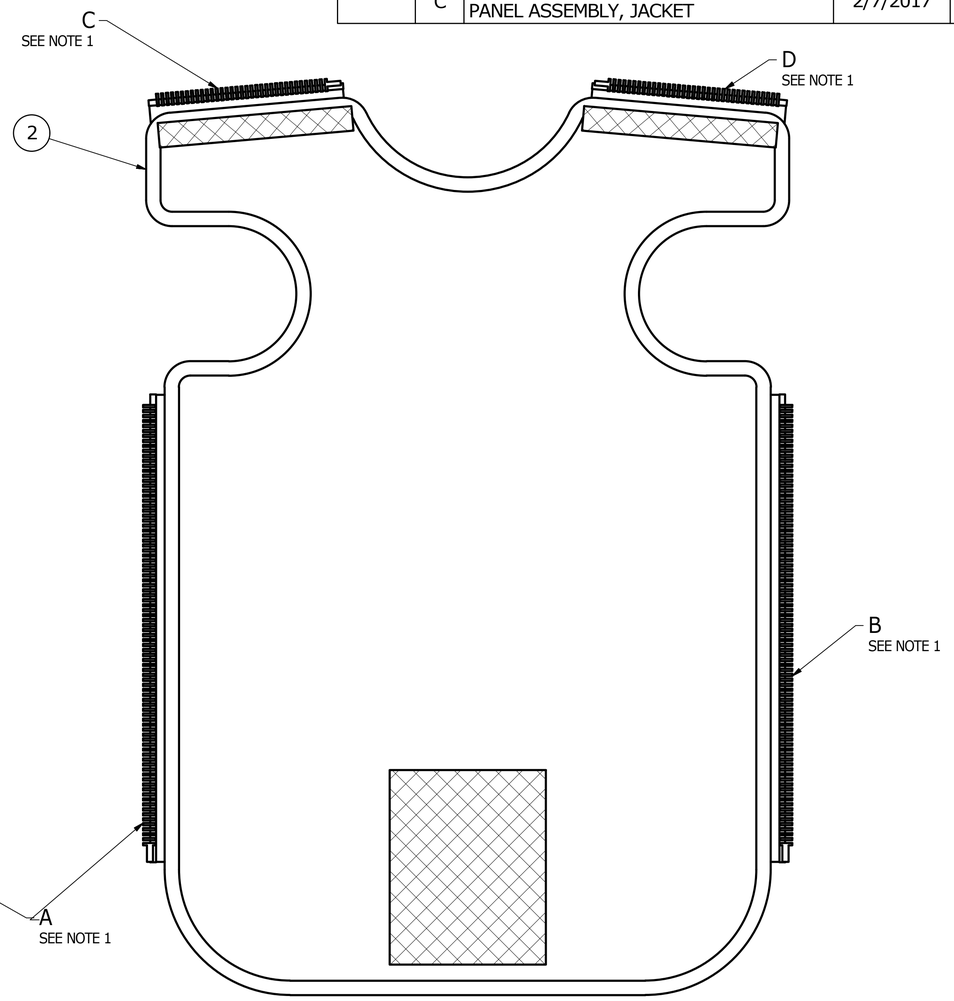
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6, ANGLES ±.5° ASME Y14.5M - 1994 **DO NOT SCALE DRAWING**	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION**
	APPROVALS / DATE	LOWER LEG FLESH, RIGHT THOR-50M
MATERIAL: SEE NOTES	DRAWN: Dave Walker — 9/24/2018	
HEAT TREAT	CHECKED	
FINISH	ENG	
	APPROVED	THIRD ANGLE PROJECTION
		SIZE: A3 — DRAWING NUMBER: 472-5580-2 — REV
		SCALE: 1 / 2 — SHEET: 1 OF 1

Lower Leg Skin, Right.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF000 RB 1 AND CONVERTED TO METRIC FOR THOR-M	12/13/2011	BK
	B	UPDATED VIEWS TO SHOW CORRECTED ZIPPER DIRECTION	6/21/2012	BK
	C	REVISED ITEM #1 472-3910 - FRONT PANEL ASSEMBLY, JACKET	2/7/2017	DW



FRONT OUTSIDE VIEW



REAR OUTSIDE VIEW

NOTES:

1. REMOVE ZIPPER HALF AND SEW TO THE INSIDE REAR PANEL AS SHOWN. LETTERS INDICATE MATCHING SIDES OF ZIPPERS.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-3951	REAR PANEL ASSEMBLY, JACKET
1	1	472-3910	FRONT PANEL ASSEMBLY, JACKET

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN Dave Walker	12/13/2011
CHECKED	
ENG J. WANG	1/11/2012
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

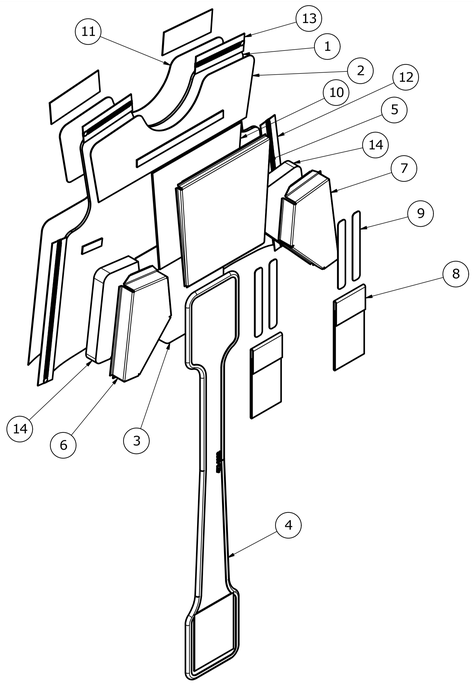
FRONT/REAR PANEL ASSEMBLY, JACKET

THIRD ANGLE PROJECTION

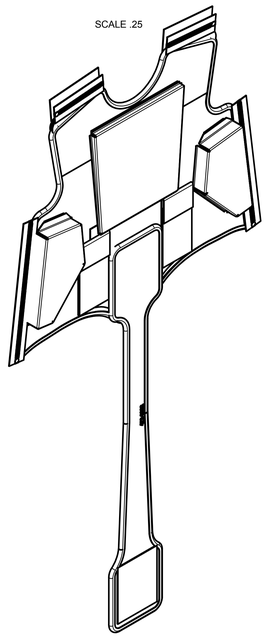
SIZE A1 | DRAWING NUMBER 472-3900 | REV C
SCALE: .50 | SHEET 1 OF 1

472-3951-Rear Panel Assembly with Zipper Halves.iam

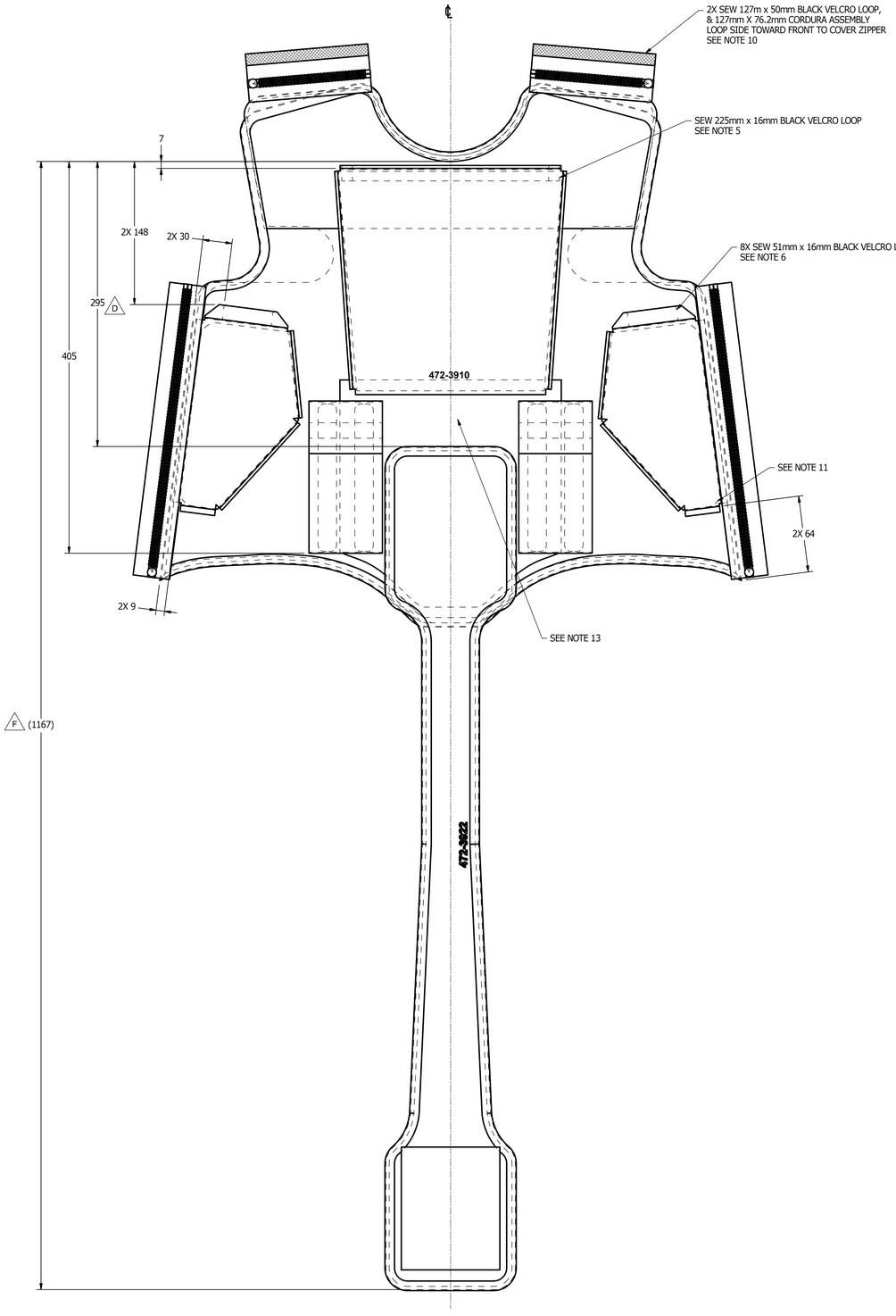
REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF100 RB1 AND CONVERTED TO METRIC FOR THOR-M	12/12/2011	BK
	B	REMOVED 472-3919-1/-2 ADD 472-3919, QTY 2	2/8/2012	BK
	C	SHOW SIDE ZIPPERS DIRECTION ZIPPING TO DOWNWARD DIRECTION	6/15/2012	BK
	D	REVISED 472-3911, 472-393922, & 472-3912; DIMENSION 295 WAS 305	1/28/2016	DW
	E	DIMENSION 2X 148 WAS 2X 158; ADDED DIMENSION 1167; ADDED "EXCEPT ARM PIT AREA; THIS IS TO BE TRIMMED WITH 25mm WIDE ELASTIC SEAM TAPE." TO NOTE 8; NOTE 10 WAS "SEW VELCRO FLAPS AS NOTED"; ADDED NOTES 12, 13, & 14	2/7/2017	DW
	F	REMOVED NOTE 14; DIMENSION (1167) WAS 1167 SEE NOTE 14	2/26/2018	DW



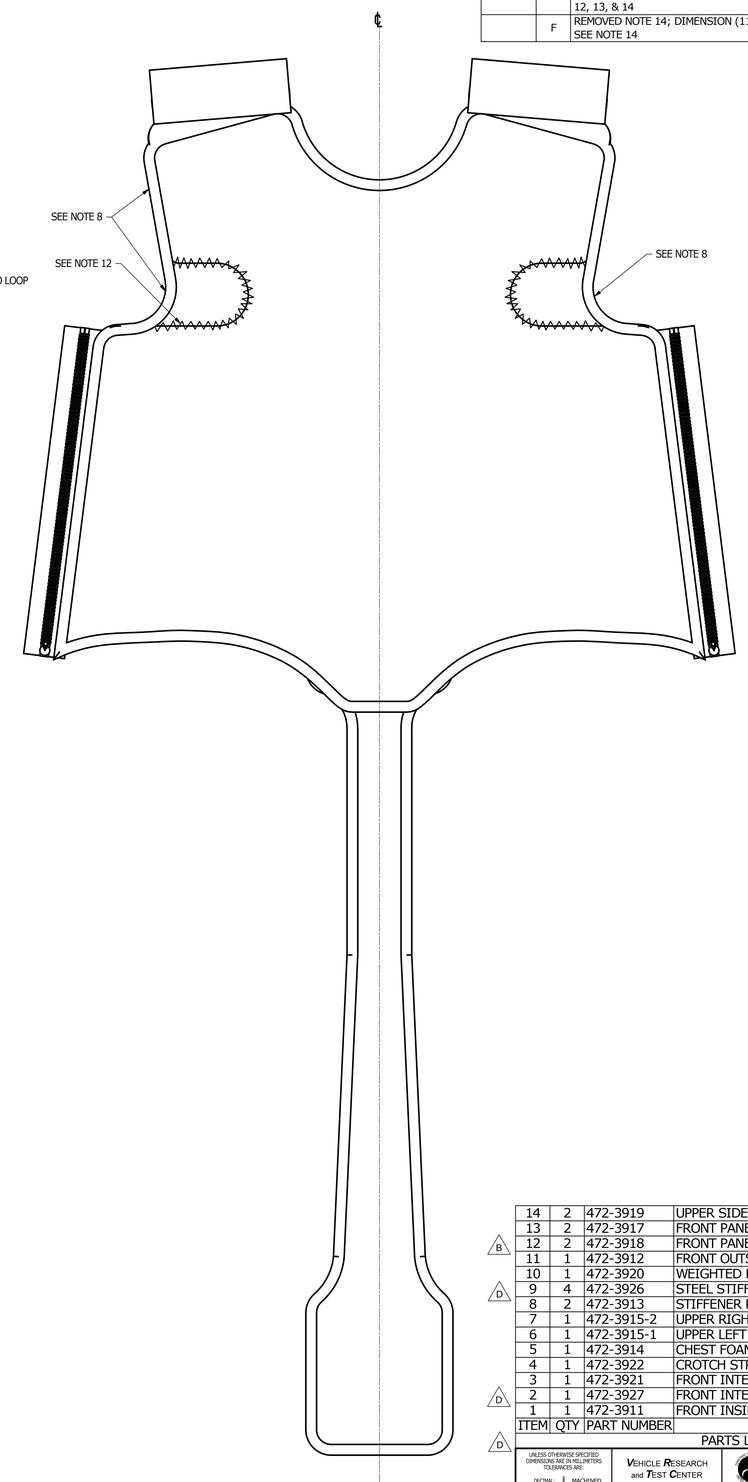
SCALE .25



SCALE .25



INNER VIEW



OUTER VIEW

NOTES:

1. SEW COMPONENTS TO NEOPRENE WITH THE BLACK SIDE UP.
2. CORDURA COMPONENTS ARE SEWN WITH THE LAMINATED SIDE FACE DOWN.
3. SEW ABDOMEN IN PLACE ALIGNED WITH BOTTOM EDGE AND CENTER, STRETCH NEOPRENE TO FIT IF NECESSARY.
4. SEW SHOULDER PATCH IN PLACE; STRETCH NEOPRENE TO FIT IF NECESSARY.
5. SEW VELCRO INTO PLACE AS NOTED; CENTERED ACROSS ℄ .
6. SEW CHEST POCKET, LEFT & RIGHT FOAM POCKETS, AND LEFT & RIGHT STIFFENER POCKETS INTO PLACE AS SHOWN.
7. SEW ASSEMBLED NEOPRENE TO FRONT CORDURA PANEL, STRETCH NEOPRENE WHERE NECESSARY.
8. TRIM EDGES WITH BIAS TAPE EXCEPT ARM PIT AREA; THIS IS TO BE TRIMMED WITH 25mm WIDE ELASTIC SEAM TAPE.
9. SEW ZIPPERS THRU ENTIRE ASSEMBLY MAKING SURE ZIPPER CLOSURE DIRECTION IS DOWNWARD.
10. STITCH VELCRO AND CORDURA ASSEMBLY ALONG SHOULDER EDGE OF JACKET WITH VELCRO FACING UP.
11. INSERT SIDE FOAM, STEEL STIFFENERS, AND WEIGHTED BIB.
12. STITCH THROUGH BOTH PANELS 5mm ZIG ZAG STITCH AROUND CORDURA EDGES AS SHOWN.
13. PART MARK WHERE SHOWN USING INDELIBLE INK.

F

ITEM	QTY	PART NUMBER	DESCRIPTION
14	2	472-3919	UPPER SIDE FOAM
13	2	472-3917	FRONT PANEL SHOULDER ZIPPER, JACKET
B 12	2	472-3918	FRONT PANEL ZIPPER, JACKET
11	1	472-3912	FRONT OUTSIDE PANEL PATTERN (CORDURA)
10	1	472-3920	WEIGHTED BIB, JACKET
D 9	4	472-3926	STEEL STIFFENER, JACKET
8	2	472-3913	STIFFENER POCKET, JACKET
7	1	472-3915-2	UPPER RIGHT FOAM POCKET
6	1	472-3915-1	UPPER LEFT FOAM POCKET
5	1	472-3914	CHEST FOAM POCKET
4	1	472-3922	CROTCH STRAP ASSEMBLY, JACKET
3	1	472-3921	FRONT INTERIOR ABDOMEN PATCH, JACKET
D 2	1	472-3927	FRONT INTERIOR SHOULDER PATCH
1	1	472-3911	FRONT INSIDE PANEL PATTERN (NEOPRENE)

D PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ½° ANGLES ±.5°
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	12/12/2011
CHECKED	
ENG: J. WANG	1/12/2012
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

FRONT PANEL ASSEMBLY, JACKET

THIRD ANGLE PROJECTION | SIZE A0 | DRAWING NUMBER 472-3910 | REV F | SCALE .500 | SHEET 1 OF 1

472-3910-Front Panel Assembly.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF111 RB11 AND CONVERTED TO METRIC FOR THOR-M; ADD TOLERANCE AND SYMETRIC NOTE; MODIFIED 3mm SMALLER THAN CORDURA PANEL, SIDE 6mm SMALLER	12/9/2011	BK
	B	BLACK WAS WINE, REMOVED, REMOVED COLOR NUMBER IN NEOPRENE MATERIALS	6/28/2012	BK
	C	REVISED SIDE SLOTS; REMOVED "WITH 2 SIDES OF NYLON (N-2-S). COLORS BLACK AND RED" FROM MATERIAL NOTE; REMOVED NOTE 4 AND RENUMBERED.	3/16/2016	DW
	D	DIMENSION (578) WAS 578, 98 WAS 97; REVISED SIDE SLOTS.	2/6/2017	DW

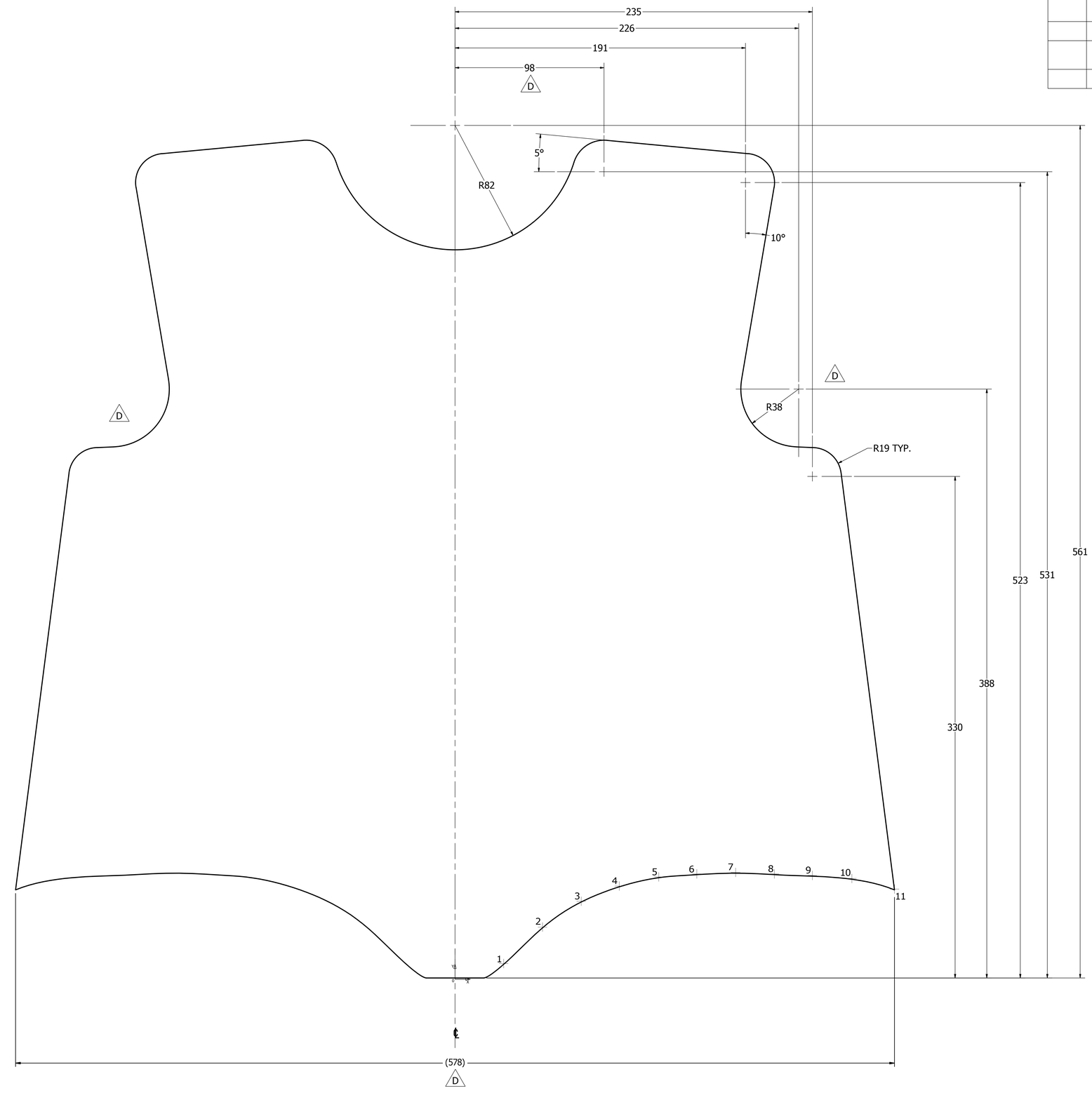


TABLE 1		
POINT	X (+/-0.5mm)	Y (+/-0.5mm)
1	32	9
2	57.5	33
3	83	50
4	108	60
5	134	66
6	159	68
7	184.5	69
8	210	68
9	235	67
10	261	65
11	289	58

NOTES:
1. MATERIAL: NEOPRENE G-231-N 3/16" (4.8mm) THICK.
2. PATTERN IS SYMETRIC ABOUT .
3. TOLERANCE ±3mm, UNLESS OTHERWISE NOTED.
4. MARK PART NUMBER WITH PERMANENT MARKER ON RED COLOR SIDE.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: .X ±.5, .XX ±.2, .XXX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	12/9/2011
CHECKED:	
ENG: J. WANG	1/11/2012
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

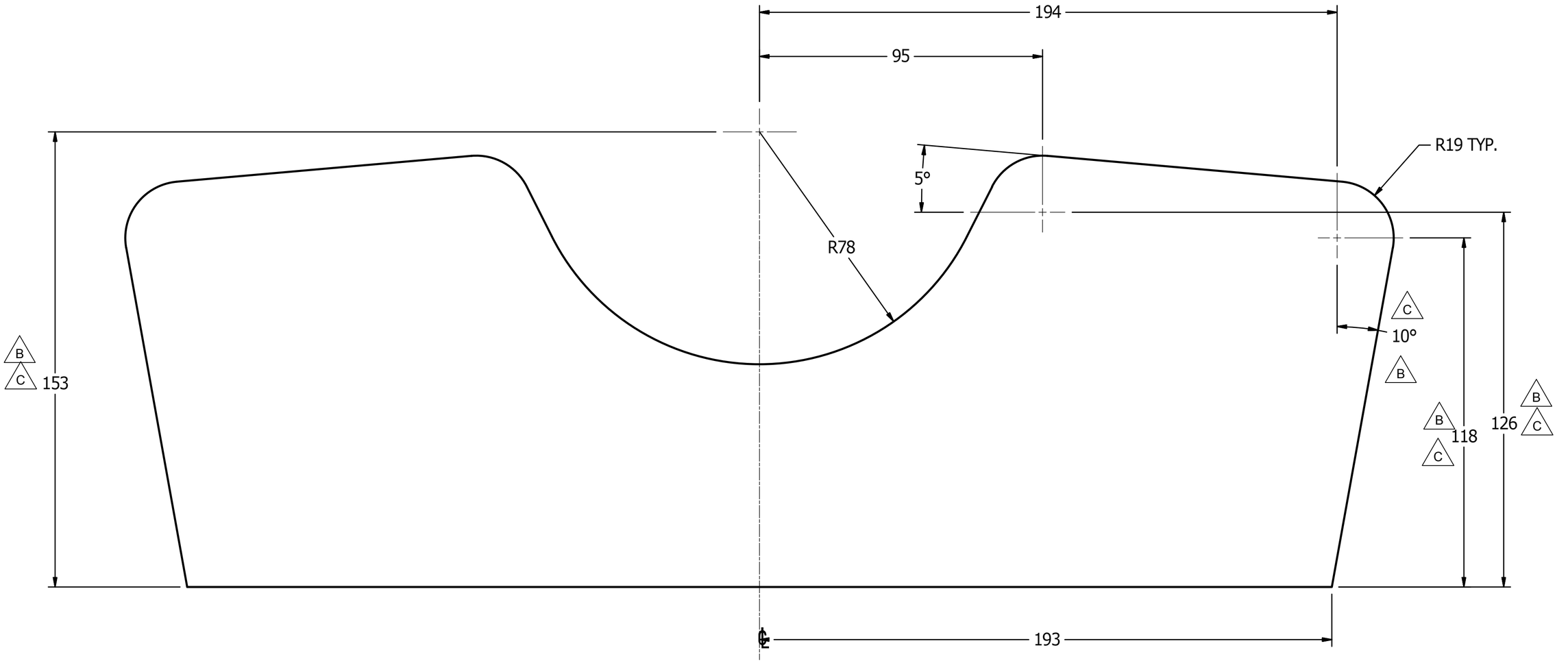
FRONT INSIDE PANEL PATTERN (NEOPRENE)

THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A0	472-3911	D
SCALE: 1 : 1	SHEET 1 OF 1	

472-3911-Front Inside Panel Pattern-Neoprene.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RELEASED FOR PRODUCTION	12/9/2011	BK
	B	DIMENSION 137 WAS 153, 110 WAS 126, 11° WAS 10°, AND 101 WAS 0°	1/21/2016	DW
	C	DIMENSION 153 WAS 137, 126 WAS 110, 118 WAS 101, & 10° WAS 11°	2/6/2017	DW



NOTES:
1. MATERIAL: CORDURA (1000 DENIER) NYLON, RED .

2. PATTERN IS SYMETRIC ABOUT ℄ .

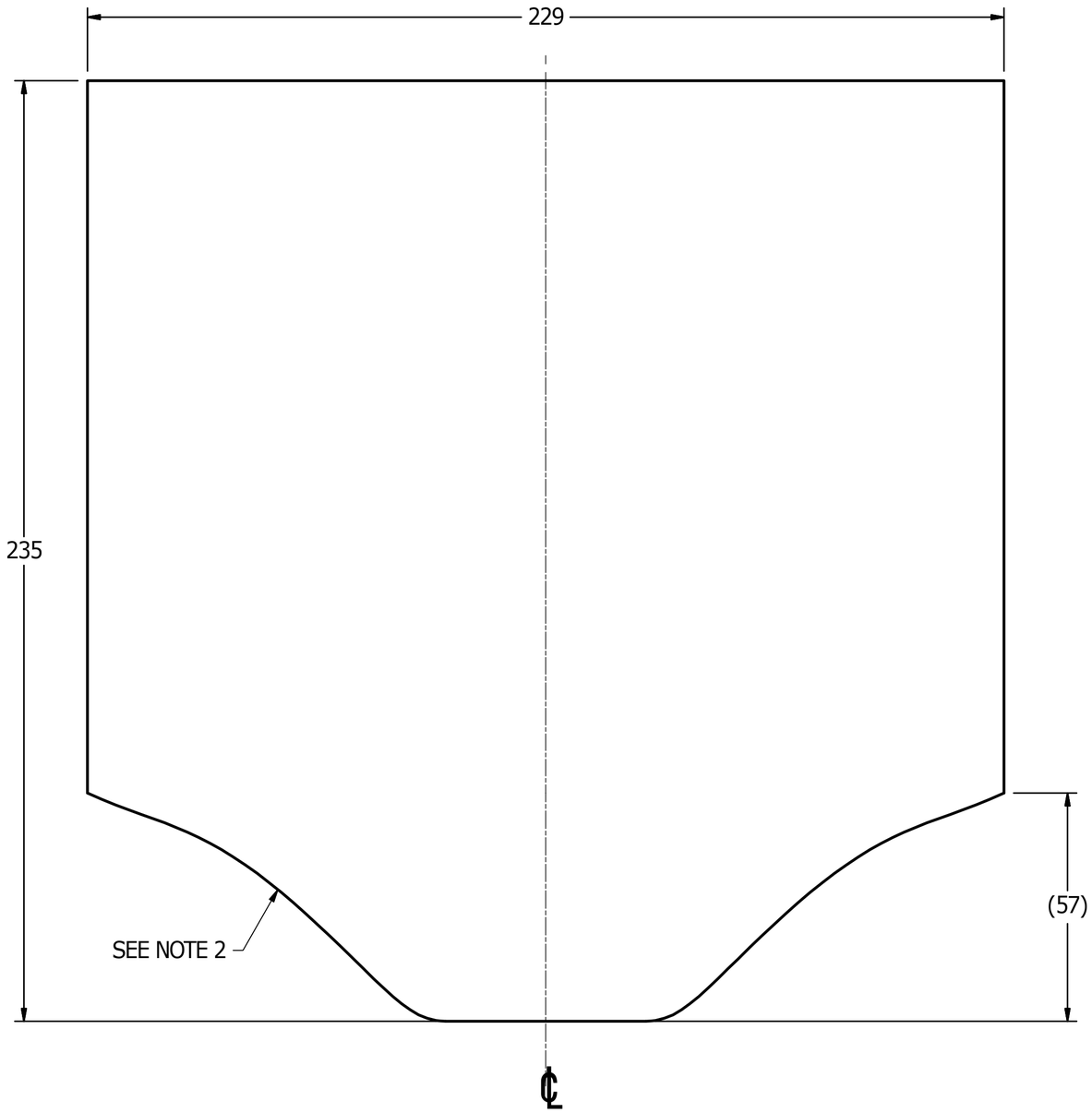
3. TOLERANCE ±3mm, UNLESS OTHERWISE NOTED.

4. CUT THIS PATTERN WITH THE RED COLOR SURFACE FACING UPWARDS.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED ANGLES ±.5° — ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	FRONT INTERIOR SHOULDER PATCH
MATERIAL: SEE NOTES	DRAWN: B. KIMES	12/9/2011	
HEAT TREAT	CHECKED		SIZE: A2 — DRAWING NUMBER: 472-3927 — REV: C
FINISH	ENG: J. WANG	1/11/2012	THIRD ANGLE PROJECTION — SCALE: 1 : 1 — SHEET: 1 OF 1
	APPROVED		

472-3927-Front Interior Shoulder Patch.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF120 RB1 AND CONVERTED TO METRIC FOR THOR-M; ADD NOTE 3	11/30/2011	BK



NOTES:
1. MATERIAL: CORDURA (1000 DENIER) NYLON, RED LAMINATED ON ONE SIDE.

2. SEE DRAWING 472-3912, TABLE 1, FOR RADIUS OF CURVATURE.

3. TOLERANCE ±3mm, UNLESS OTHERWISE NOTED.

A

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	11/30/2011
CHECKED:	
ENG: J. WANG	1/11/2012
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

FRONT INTERIOR ABDOMEN PATCH, JACKET

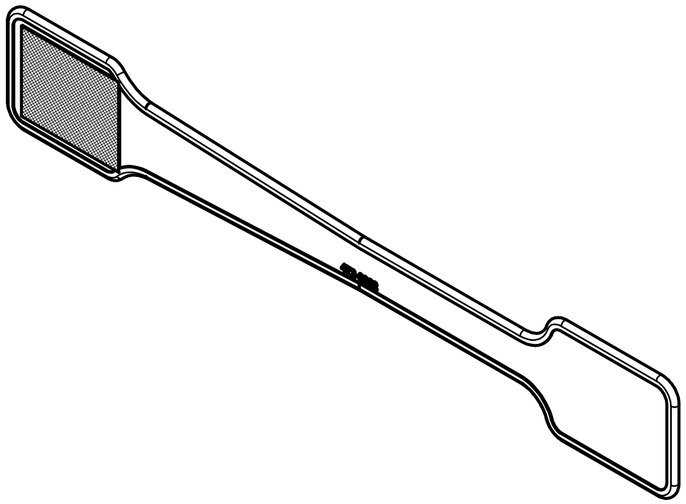
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A2	472-3921	A

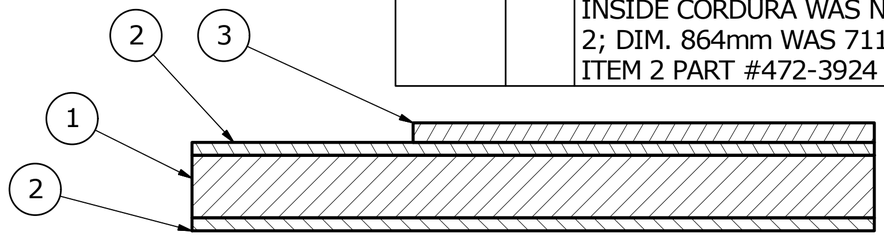
SCALE: 1 : 1 | SHEET 1 OF 1

472-3921-Front Interior Abdomen Patch.ipt

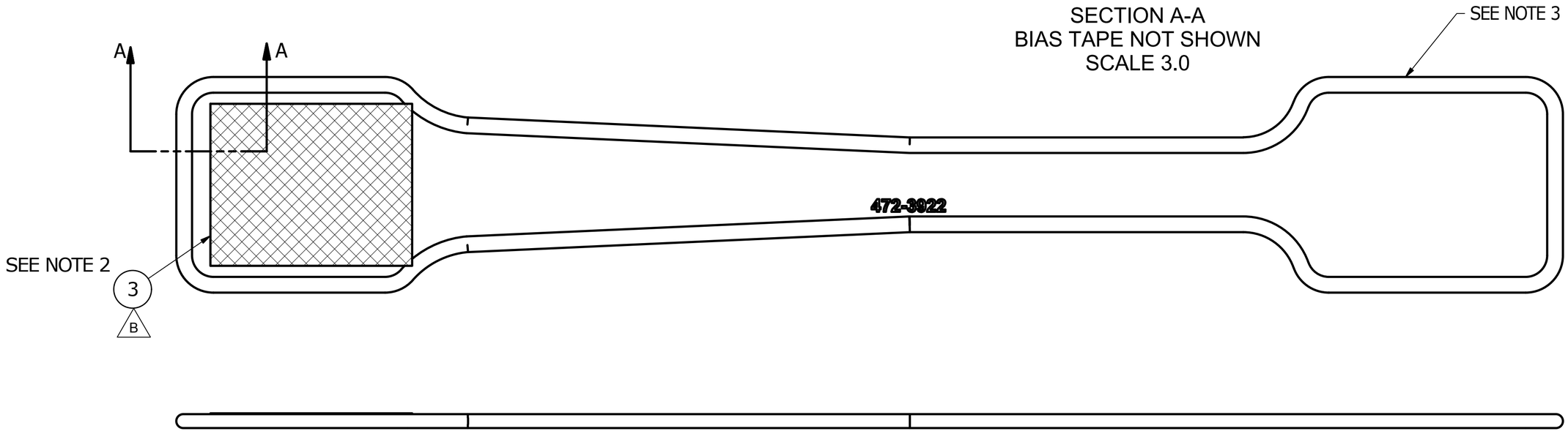
REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERD FROM T1JKF130 RB1 AND CONVERTED TO METRIC FOR THOR-M; REMOVE NOTE 4, 5 AND RENUMBER	11/29/2011	BK
	B	MOVED VELCRO TO OPPOSITE END AND LENGTHED STRAP; BLACK BIAS TAPE WAS RED BIAS TAPE IN NOTE 3; REMOVED "NEOPRENE IS TO BE STRETCHED TO 711mm DURING SEWING" FROM NOTE 3; (CORDURA) WAS (NEOPRENE) IN NOTE 1; INSIDE CORDURA WAS NEOPRENE IN NOTE 2; DIM. 864mm WAS 711mm; QTY. OF ITEM 2 PART #472-3924 WAS 1.	1/16/2016	DW



SCALE .250



SECTION A-A
BIAS TAPE NOT SHOWN
SCALE 3.0



NOTES:
1. PATTERN IS SHOWN WITH INSIDE (CORDURA) UP. (B)
2. SEW VELCRO LOOP, CENTERED AT AREA SHOWN, DIRECTLY TO INSIDE CORDURA ONLY. (B)
3. CORDURA AND NEOPRENE LAYERS ARE SEWN TOGETHER AND LINED WITH BLACK BIAS TAPE. (B)
4. MARK PART NUMBER (6.4mm CHARACTERS MIN.) WITH PERMANENT MARKER, WHERE SHOWN. (A)

ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	472-3925	REAR CROTCH STRAP HOOK VELCRO
2	2	472-3924	OUTER CROTCH STRAP PATTERN, JACKET
1	1	472-3923	INNER CROTCH STRAP PATTERN, JACKET

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	11/29/2011
CHECKED	
ENG J. WANG	1/11/2012
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

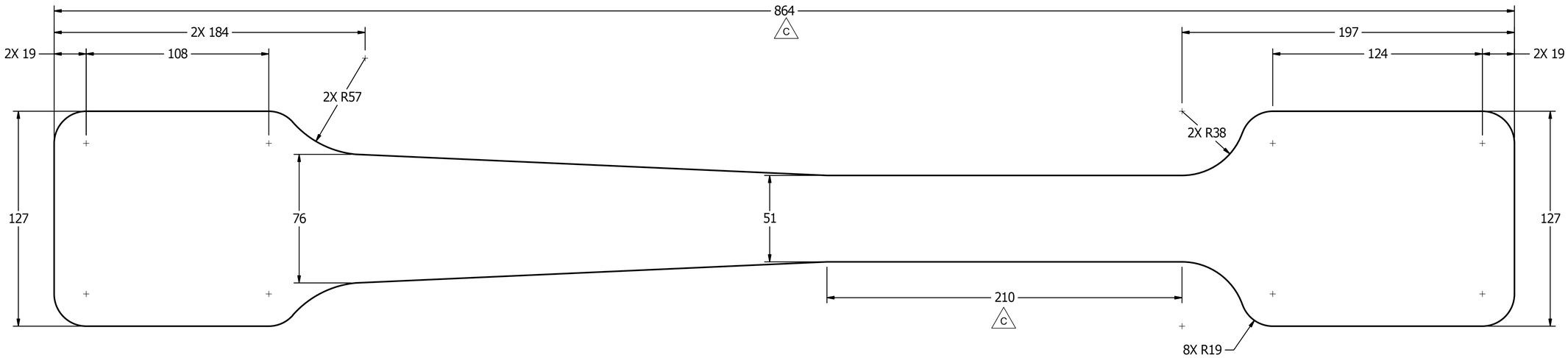
CROTCH STRAP ASSEMBLY, JACKET

THIRD ANGLE PROJECTION

SIZE A2 | DRAWING NUMBER 472-3922 | REV B
SCALE: .5 : 1 | SHEET 1 OF 1

472-3922-Crotch Strap Assembly.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF131 RB1 AND CONVERTED TO METRIC FOR THOR-M; ADD NOTE 2	11/29/2011	BK
	B	BLACK WAS WINE, REMOVE COLOR NUMBER IN NEOPRENE MATERIALS	6/12/2012	BK
	C	DIMENSION 864 WAS 762 AND 210 WAS 108;REMOVED "WITH 2 SIDES OF NYLON (N-2-S) COLORS BLACK AND RED" FROM NOTE 1	3/16/2016	DW



NOTES:

1. MATERIAL: NEOPRENE G-23-N 3/16" (4.8mm) THICKNESS.

B

2. TOLERANCE ±3mm, UNLESS OTHERWISE NOTED.

A

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	11/29/2011
CHECKED:	
ENG: J. WANG	1/11/2012
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

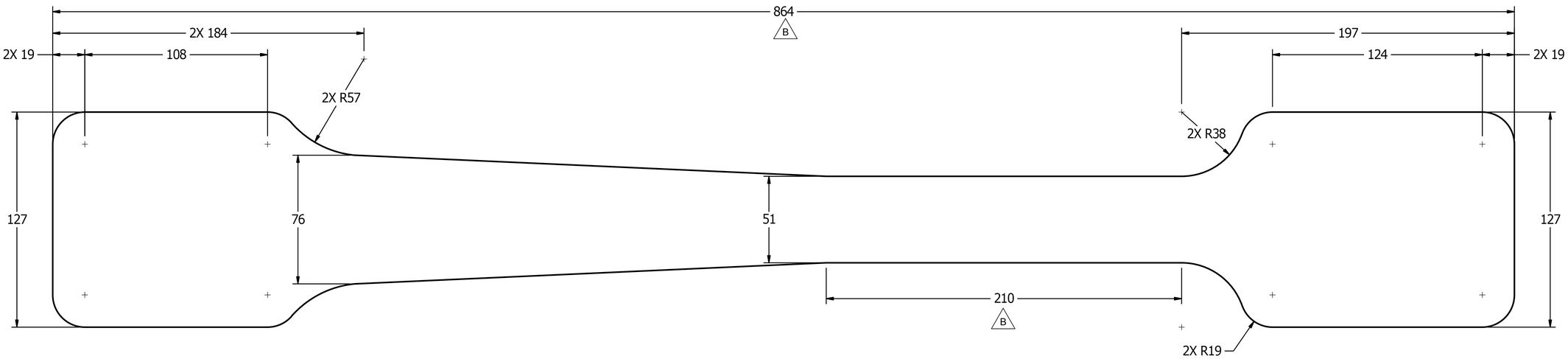
INNER CROTCH STRAP PATTERN, JACKET

THIRD ANGLE PROJECTION

SIZE: A1 | DRAWING NUMBER: 472-3923 | REV: C
SCALE: .75 : 1 | SHEET: 1 OF 1

472-3923-Inner Crotch Strap Pattern.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF132 RB1 AND CONVERTED TO METRIC FOR THOR-M; ADD NOTE 2	11/29/2011	BK
	B	DIMENSION 864 WAS 762 AND 210 WAS 108	1/21/2016	DW



NOTES:

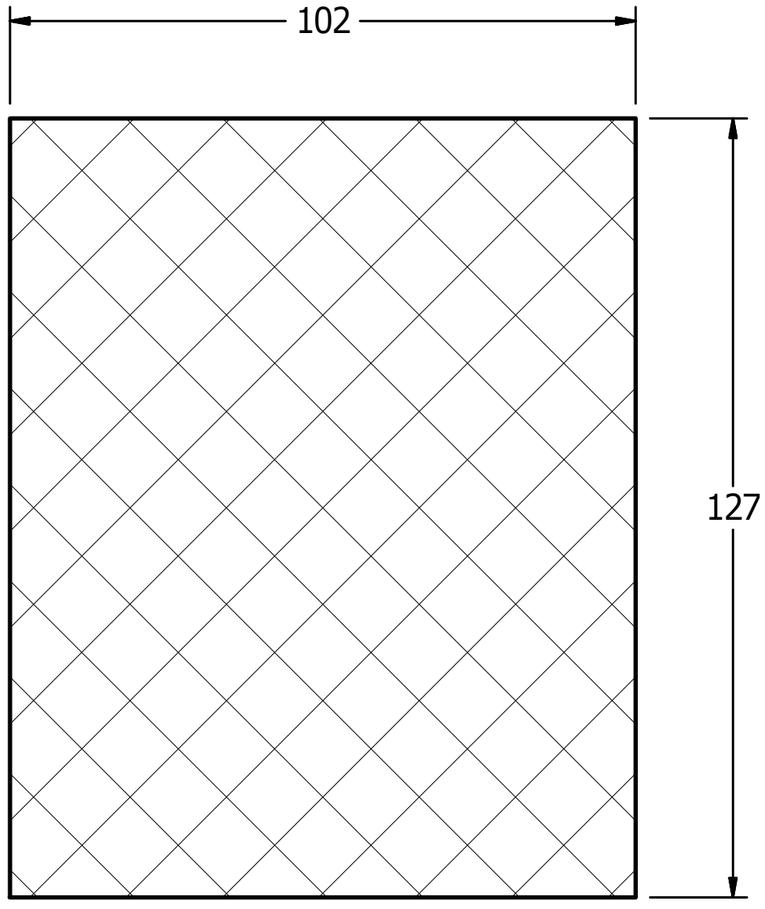
1. MATERIAL: CORDURA (1000 DENIER) NYLON, RED, LAMINATED ON ONE SIDE.

A 2. TOLERANCE ±3mm, UNLESS OTHERWISE NOTED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED ANGLES ±.5°; ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
	APPROVALS	DATE	OUTER CROTCH STRAP PATTERN, JACKET
	DRAWN B. KIMES	11/29/2011	
MATERIAL SEE NOTES	CHECKED		
HEAT TREAT	ENG J. WANG	1/11/2012	
FINISH	APPROVED		THIRD ANGLE PROJECTION
			SIZE A1 · DRAWING NUMBER 472-3924 · REV B
			SCALE: .75 : 1 · SHEET 1 OF 1

472-3924-Outer Crotch Strap Pattern.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF133 RB0 AND CONVERTED TO METRIC FOR THOR-M; ADD NOTE 2	11/29/2011	BK



NOTES:

1. MATERIAL: BLACK NYLON LOOP VELCRO, SHEAR STRENGTH 17 PSI.

2. TOLERANCE 3mm, UNLESS OTHERWISE NOTED.

A

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN B. KIMES	11/29/2011
CHECKED	
ENG J. WANG	1/11/2012
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

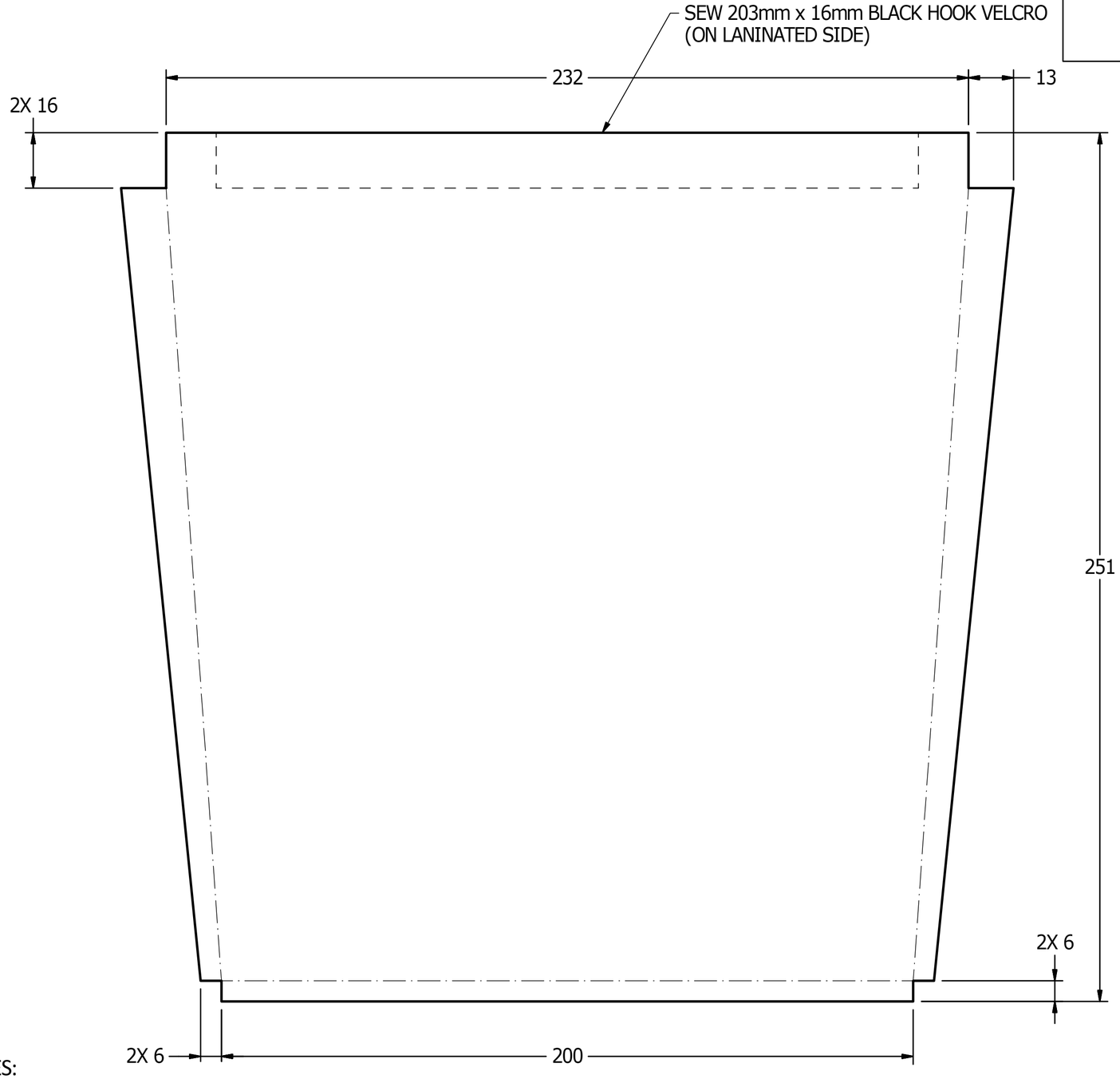
REAR CROTCH STRAP HOOK VELCRO

THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 472-3925 | REV: A
SCALE: 1 : 1 | SHEET: 1 OF 1

472-3925-Rear Crotch Strap Hook Velcro.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF113 RB1 AND CONVERTED TO METRIC FOR THOR-M; REMOVED 2X VELCRO PATCH; 251 WAS 270 (TO MATCH ACTUAL PART)	11/30/2011	BK



FOLD LINE – · — · — · — · —

NOTES:

1. MATERIAL: CORDURA (1000 DENIER) NYLON, LAMINATED ON ONE SIDE.

2. TOLERANCE ±3mm, UNLESS OTHERWISE NOTED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	11/30/2011
CHECKED:	
ENG: J. WANG	1/11/2012
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

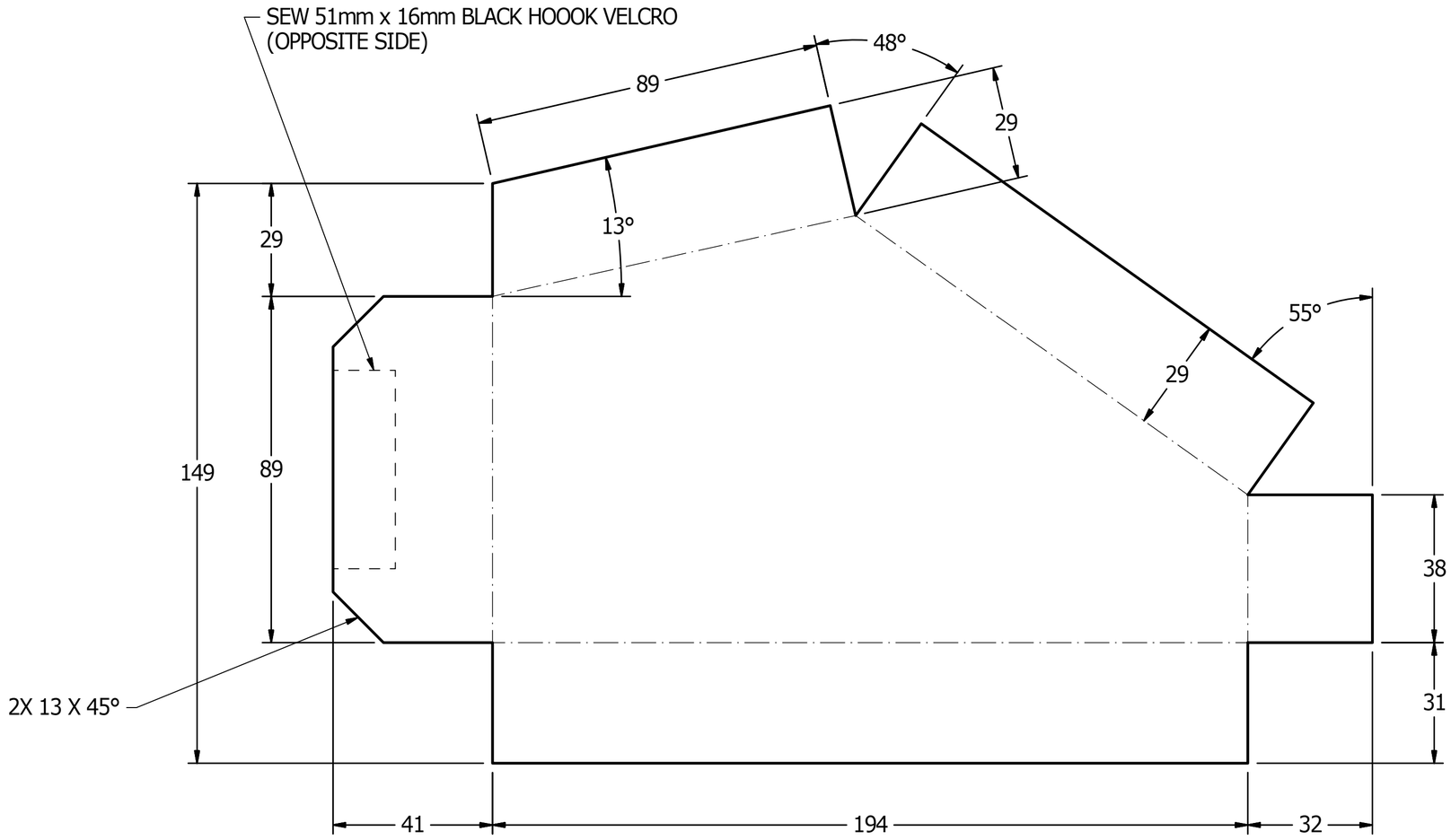
CHEST FOAM POCKET

THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 472-3914 | REV: A
SCALE: 1 : 1 | SHEET: 1 OF 1

472-3914-Chest Foam Pocket-Flat.iam

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF115 RB1 AND CONVERTED TO METRIC FOR THOR-M; ADD NOTE 3	11/30/2011	BK
	B	DIMENSION 48° WAS 46°	1/21/2016	DW



FOLD LINE

NOTES:

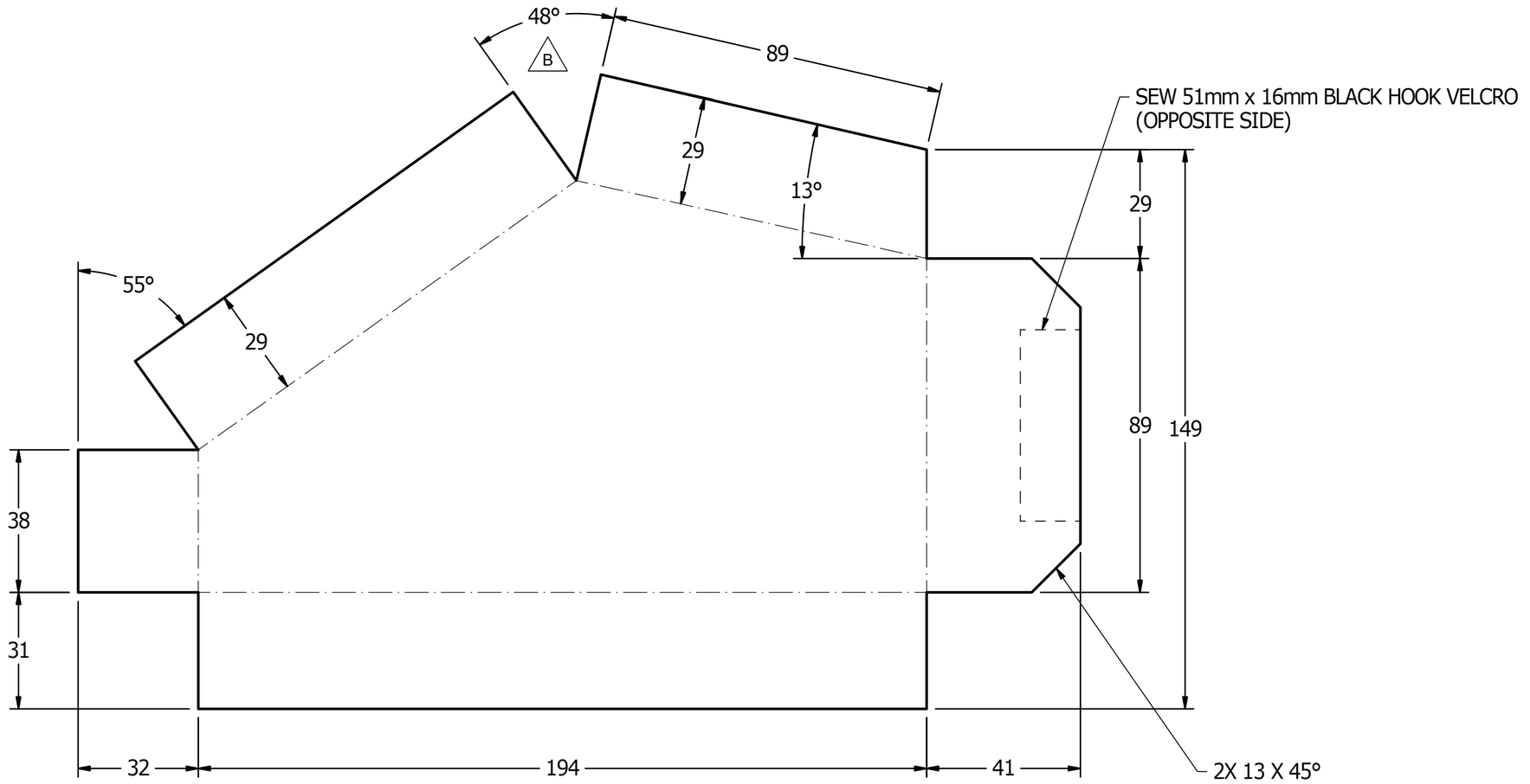
1. MATERIAL: CORDURA (1000 DENIER) NYLON, LAMINATED ON ONE SIDE.

A 2. CUT WIRTH LAMINATED SIDE DOWNWARD.

3. TOLERANCE ±3mm, UNLESS OTHERWISE NOTED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED 1.6; ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	UPPER LEFT FOAM POCKET
MATERIAL: SEE NOTES	DRAWN: B. KIMES 11/30/2011	
HEAT TREAT	CHECKED	
	ENG: J. WANG 1/11/2012	
FINISH	APPROVED	
THIRD ANGLE PROJECTION	SIZE: A2 · DRAWING NUMBER: 4172-3915-1 · REV: B · SCALE: 1 : 1 · SHEET: 1 OF 1	

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF114 RB1 AND CONVERTED TO METRIC FOR THOR-M; ADD NOTE 2	11/30/2011	BK
	B	DIMENSION 48° WAS 46°	1/21/2016	DW



FOLD LINE

NOTES:

1. MATERIAL: CORDURA (1000 DENIER) NYLON, LAMINATED ON ONE SIDE.

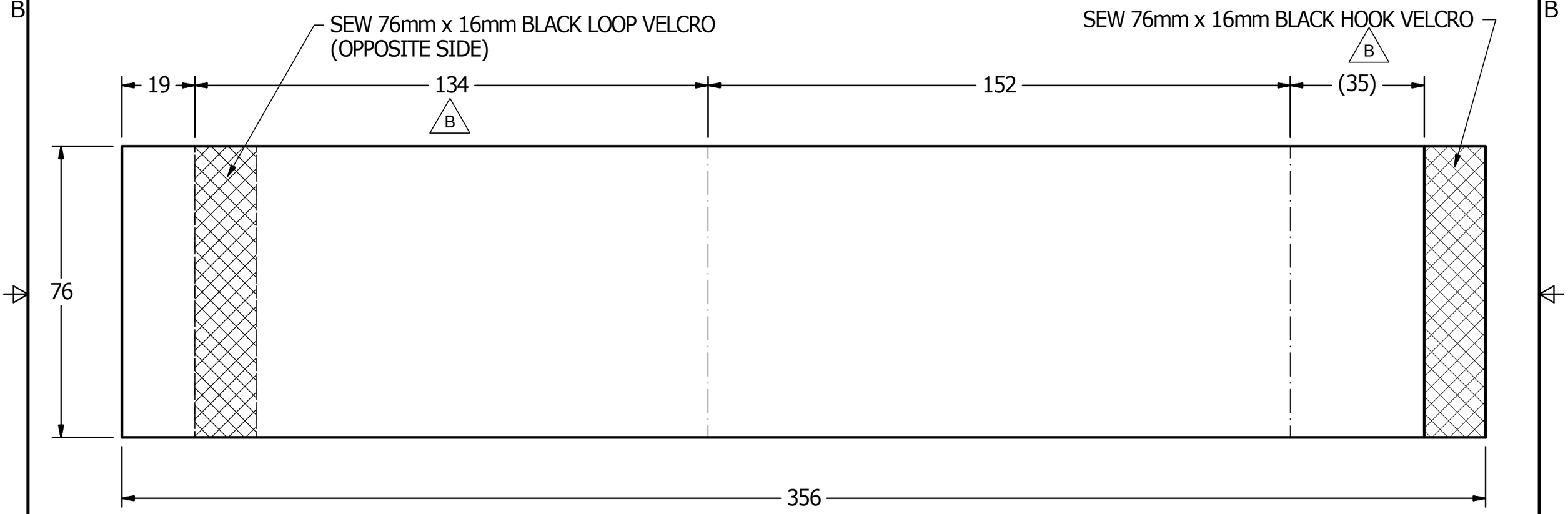
A 2. CUT WIRTH LAMINATED SIDE DOWNWARD.

3. TOLERANCE ±3mm, UNLESS OTHERWISE NOTED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	UPPER RIGHT FOAM POCKET
MATERIAL: SEE NOTES	DRAWN: B. KIMES	11/30/2011	
HEAT TREAT	CHECKED		SIZE: A2 | DRAWING NUMBER: 4172-3915-2 | REV: B
FINISH	ENG: J. WANG	1/11/2012	THIRD ANGLE PROJECTION | SCALE: 1 : 1 | SHEET: 1 OF 1
	APPROVED		

472-3915-2 Upper Right Foam Pocket.iam

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF112 RB0 AND CONVERTED TO METRIC FOR THOR-M; ADDED NOTES 2	11/30/2011	BK
	B	NOTE: SEW 76mm x 16mm x BLACK HOOK VELCRO WAS SEW 76mm x 16mm BLACK LOOP VELCRO, DIM. 134 WAS 133	1/21/2016	DW



FOLD LINE

NOTES:

1. MATERIAL: CORDURA (1000 DENIER) NYLON, LAMINATED ON ONE SIDE.

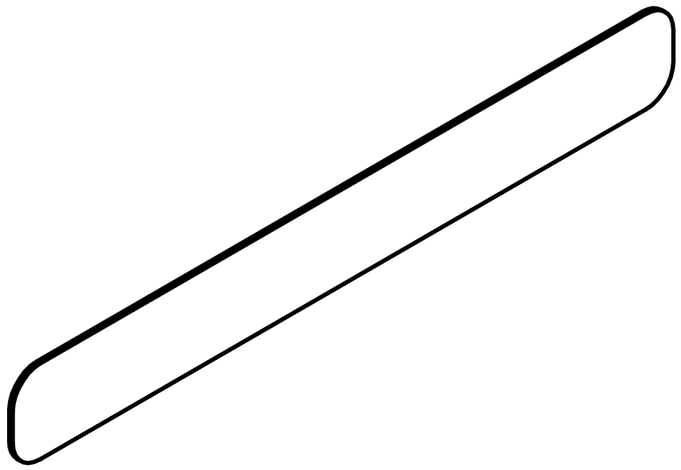
2. TOLERANCE ±3mm, UNLESS OTHERWISE NOTED.

A

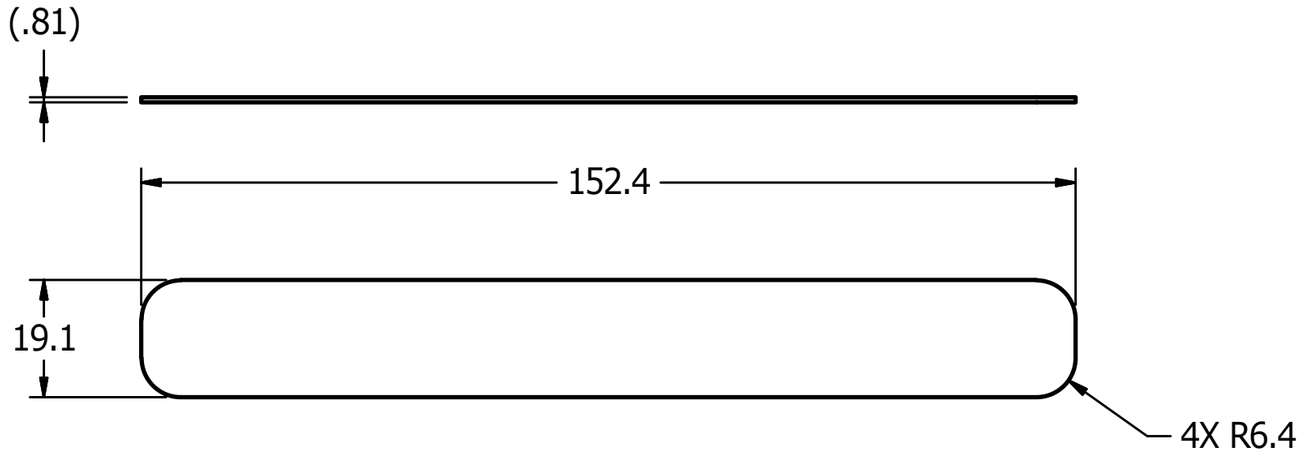
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED 1.6, ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	STIFFENER POCKET, JACKET
	DRAWN B. KIMES	11/30/2011	
MATERIAL SEE NOTES	CHECKED		
HEAT TREAT	ENG B. KIMES	1/11/2012	
FINISH	APPROVED		THIRD ANGLE PROJECTION
			SIZE A3 · DRAWING NUMBER 472-3913 · REV B
			SCALE: 1 : 1 · SHEET 1 OF 1

472-3913-Stiffener Pocket-Flat.iam

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF110 R2 AND CONVERTED TO METRIC FOR THOR-M; REMOVED NOTES 2, 3 AND RENUMBERED	11/29/2011	BK



SCALE 1.00



NOTES:

1. MATERIAL: BLUE TEMPERED SPRING STEEL SHIM STOCK (GRADE 1095 Rc 48-51).

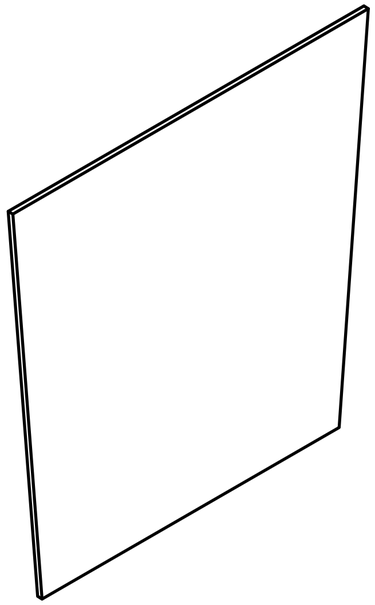
2. APPLY POLYOLEFIN THIN WALLED TUBING (SHRINK WRAP) AROUND SHIM. (I.D. 12.7mm)

A

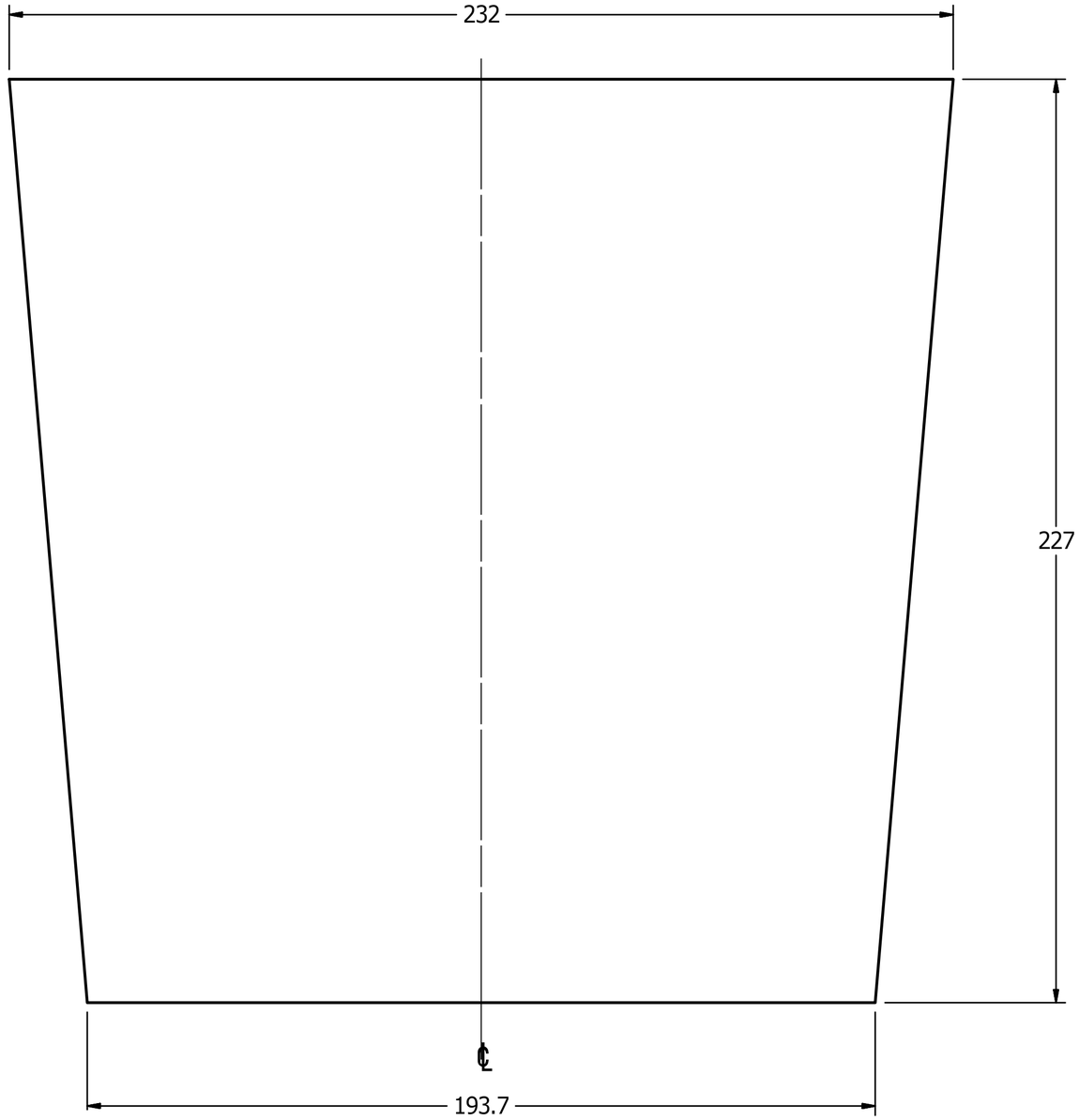
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6, ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	STEEL STIFFENER, JACKET
MATERIAL: SEE NOTES	DRAWN: B. KIMES	11/29/2011	
HEAT TREAT	CHECKED		SIZE: A3 | DRAWING NUMBER: 472-3926 | REV: A
FINISH	ENG: J. WANG	1/11/2012	THIRD ANGLE PROJECTION | SCALE: 1 : 1 | SHEET: 1 OF 1
	APPROVED		

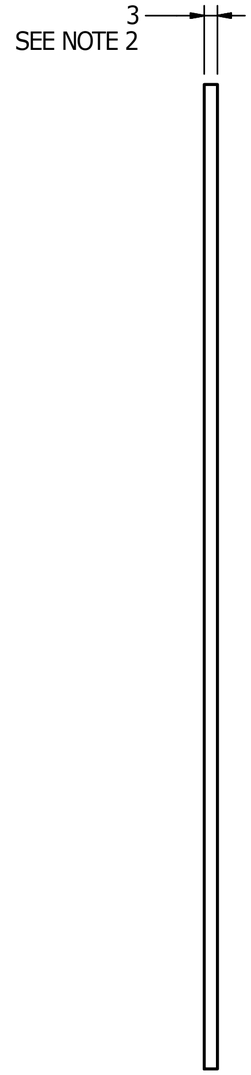
472-3926-Steel Siffener, Jacket.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF119 RB2 AND CONVERTED TO METRIC FOR THOR-M; 227 WAS 231 (TO MATCH ACTUAL PART); ADD NOTE 3	11/29/2011	BK



SCALE .50





NOTES:

1. MATERIAL: WEIGHTED ACOUSTICAL SOUND CONTROL MATTING.
   3.2 ± .5mm (1/8") THICK WITH 6.4mm THICK OPEN CELL FOAM BACKING.

2. REMOVE AND DISCARD 6.4mm FOAM BACKING FROM MATTING.

A 3. TOLERANCE IS 3mm, UNLESS OTHERWISE NOTED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	11/29/2011
CHECKED	
ENG J. WANG	1/11/2012
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

WEIGHTED BIB, JACKET

THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 472-3920 | REV: A
SCALE: 1 : 1 | SHEET: 1 OF 1

472-3920-Weighted Bib.ipt

REVISION HISTORY				
ECO	RE	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF111 RB1 AND CONVERTED TP METRIC FOR THOR-M; ADD TOLERANCE AND SYMETRY NOTE	11/30/2011	BK
	B	REVISED SIDE SLOTS	1/21/2016	DW

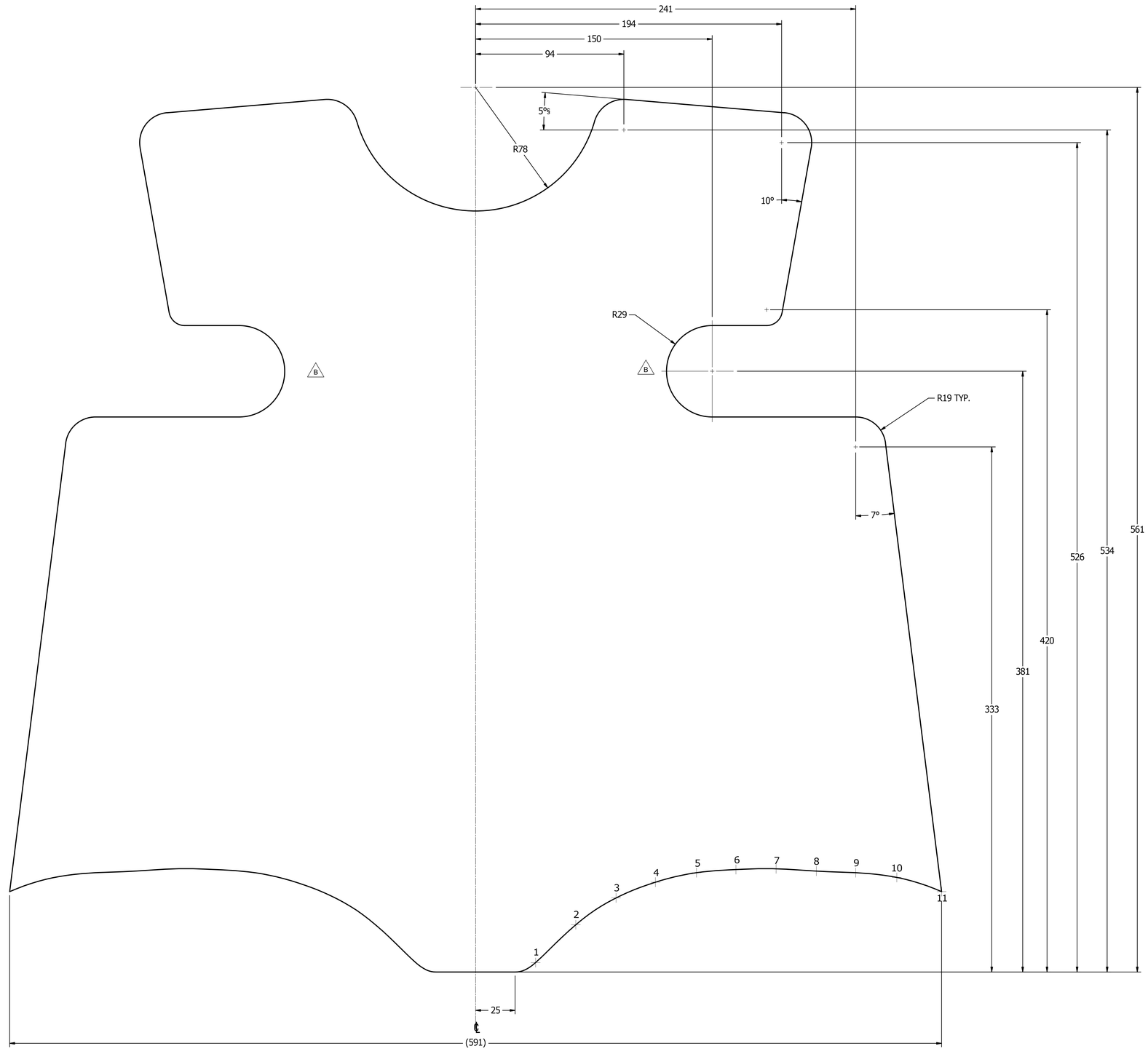


TABLE 1		
POINT	X (+/-0.5mm)	Y (+/-0.5mm)
1	38	6
2	63.5	30
3	89	47
4	114	57
5	140	63
6	165	65
7	190.5	65.5
8	216	64
9	241	63
10	267	60
11	295	51

NOTES:

1. MATERIAL: CORDURA (1000 DENIER) NYLON, RED, LAMINATED ON ONE SIDE.
2. PATTERN IS SYMETRIC ABOUT ℄.
3. TOLERANCE IS ±3mm, UNLESS OTHERWISE NOTED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, .XX ±.2, .XXX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	11/30/2011
CHECKED	
ENG J. WANG	1/11/2012
APPROVED	

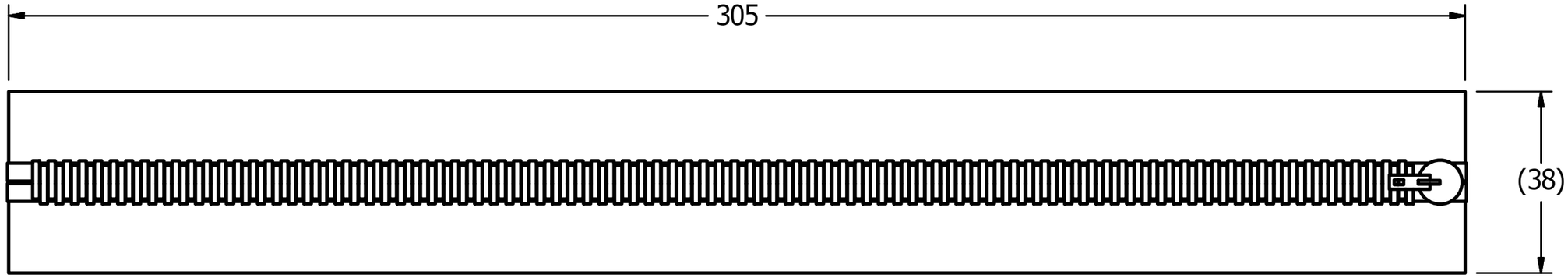
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

FRONT OUTSIDE PANEL PATTERN (CORDURA)

THIRD ANGLE PROJECTION | SIZE A0 | DRAWING NUMBER 472-3912 | REV B | SCALE 1 : 1 | SHEET 1 OF 1

472-3912-Front Outside Panel Pattern.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF117 RB2 AND CONVERTED TP METRIC FOR THOR-M; ADD NOTE 2	11/30/2011	BK



NOTES:

1. 304.0 (5”), BLACK, BRASS ZIPPER
   YKK, MODEL #MGM0L-106 DA G 3/4 OR EQUIVALENT.

A 2. TOLERANCE ±3mm, UNLESS OTHERWISE NOTED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN B. KIMES	11/30/2011
CHECKED	
ENG J. WANG	1/11/2012
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

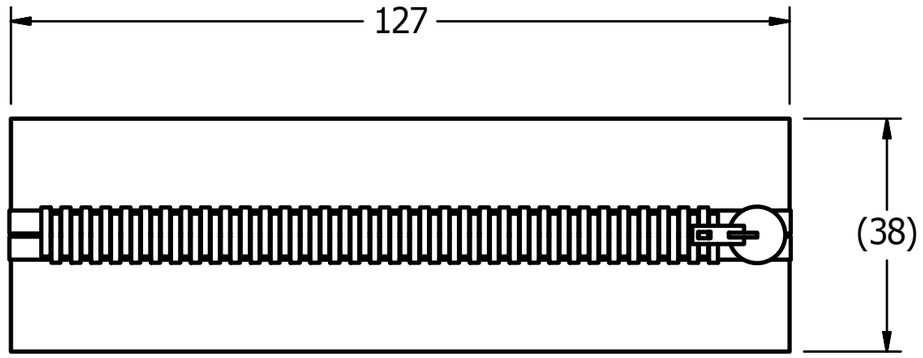
FRONT PANEL ZIPPER, JACKET

THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 472-3918 | REV: A
SCALE: 1 : 1 | SHEET: 1 OF 1

472-3918-Front Panel Zipper.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF116 RB2 AND CONVERTED TP METRIC FOR THOR-M; ADD NOTE 2	11/30/2011	BK



NOTES:

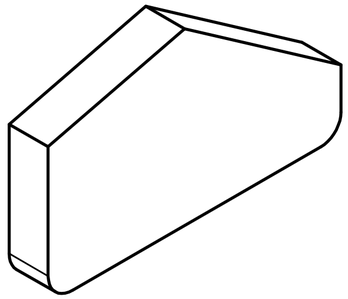
1. 127.0 (5”), BLACK, BRASS ZIPPER
   YKK, MODEL #MGM0L-106 DA G 3/4 OR EQUIVALENT.

A 2. TOLERANCE ±3mm, UNLESS OTHERWISE NOTED.

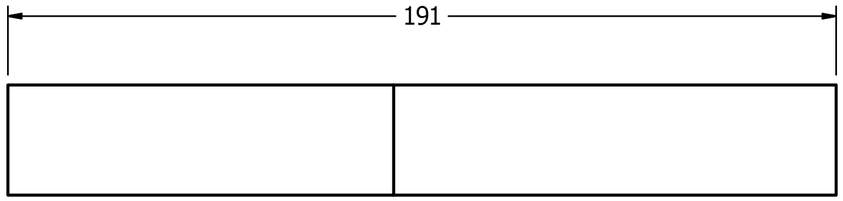
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	FRONT PANEL SHOULDER ZIPPER, JACKET
MATERIAL: SEE NOTES	DRAWN: B. KIMES 11/30/2011	
HEAT TREAT	CHECKED	
FINISH	ENG: J. WANG 1/11/2012	
	APPROVED	
THIRD ANGLE PROJECTION	SIZE: A3 / DRAWING NUMBER: 472-3917 / REV: A	
	SCALE: 1 : 1 / SHEET: 1 OF 1	

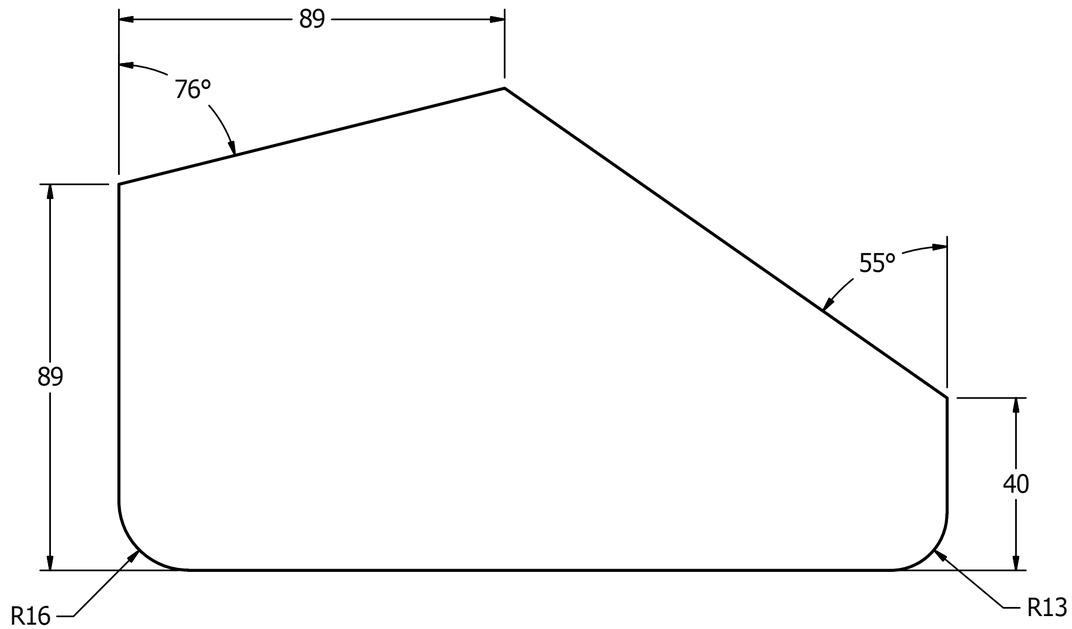
472-3917-Front Panel Shoulder Zipper.ipt

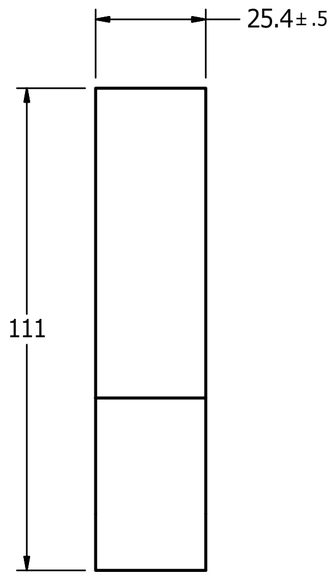
REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FOM T1JKF118 RB2 AND CONVERTED TO METRIC FOR THOR-M; REMOVED RADIUS AND OBSOLETE - 1 1/2 VERSION; ADD NOTE 2	2/8/2012	BJ



SCALE .50







NOTES:

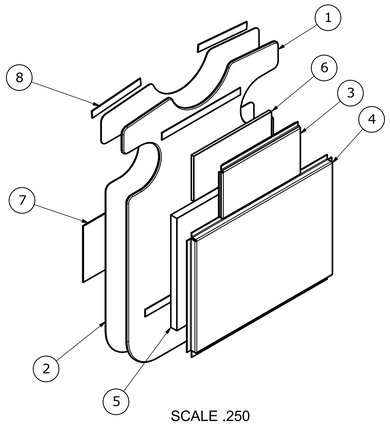
1. MATERIAL: #6 CHARCOAL POLYESTER FOAM OR EQUIVALENT.

A 2. TOLERANCE ±3mm, UNLESS OTHERWISE NOTED.

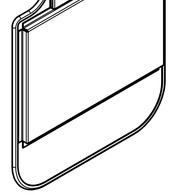
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	UPPER SIDE FOAM
MATERIAL: SEE NOTES	DRAWN: B. JIMES	2/8/2012	
HEAT TREAT:	CHECKED:		SIZE: A2 / DRAWING NUMBER: 472-3919 / REV: A
FINISH:	ENG: J. WANG	1/11/2011	THIRD ANGLE PROJECTION / SCALE: 1 : 1 / SHEET: 1 OF 1
	APPROVED:		

472-3919-Upper Side Foam.ipt

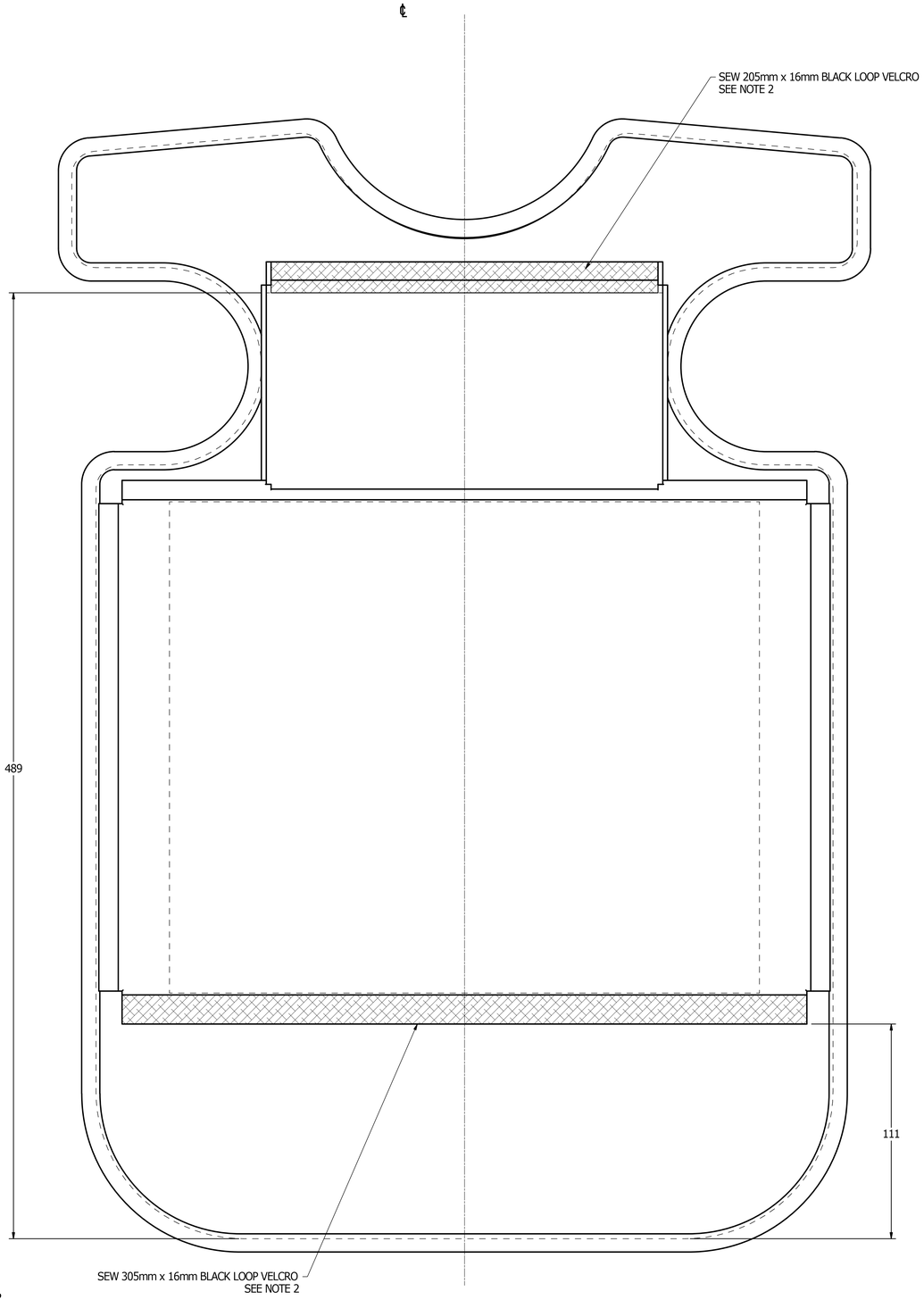
REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FRON T1JKF201 RB3 AND CONVERTED TO METRIC FOR THOR-M	12/5/2011	BK



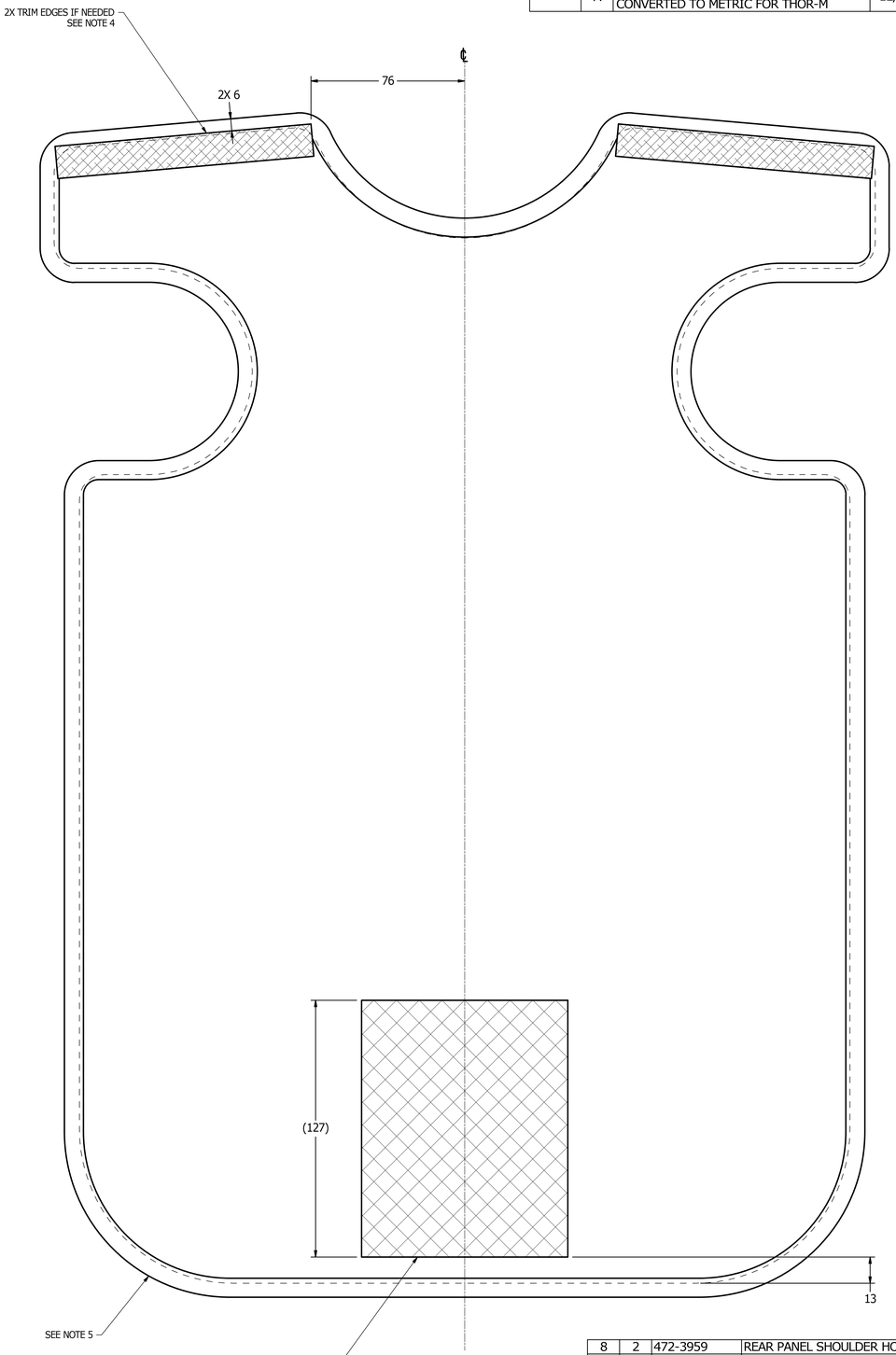
SCALE .250



SCALE .250



REAR VIEW



FRONT VIEW

NOTES:

1. JACKET PATTERNS SHOWN WITH INSIDE (DARK SIDE) FACING UP.
2. SEW INSIDE VELCRO STRIPS AS NOTED.
3. SEW POCKETS AS SHOWN, WITH LAMINATED SIDE FACING DOWN.
4. SEW VELCRO TO FRONT CORDURA PANEL BEFORE SEWING PANEL TO NEOPRENE.
5. AFTER SEWING VELCRO AND POCKETS, ASSEMBLE OUTSIDE CORDURA PANEL ON THE OUTER SURFACE (BRIGHT RED) OF THE NEOPRENE WITH LAMINATED SIDE DOWN, STRETCH NEOPRENE TO COUDURA PROFILE, AND SEW ALONG EDGE WITH RED BIAS TAPE.
6. DIMENSIONS ARE BEFORE BIAS TAPE IS SEWN IN, FROM NEOPRENE PANEL.
7. AFTER SEWING, INSERT FOAM PANELS INTO POCKETS.

ITEM	QTY	PART NUMBER	DESCRIPTION
8	2	472-3959	REAR PANEL SHOULDER HOOK VELCRO
7	1	472-3958	REAR PANEL LOOP VELCRO
6	1	472-3956	UPPER BACK FOAM
5	1	472-3957	MID BACK FOAM
4	1	472-3955	MID BACK FOAM POCKET
3	1	472-3954	UPPER BACK FOAM POCKET
2	1	472-3953	OUTSIDE REAR PANEL PATTERN
1	1	472-3952	INSIDE REAR PANEL PATTERN

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, .XX ±.2, .XXX ±.1
MACHINED ANGLES ±.5°
ISO/R 1101:1969
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	12/5/2011
CHECKED	
ENG J. WANG	1/11/2012
APPROVED	

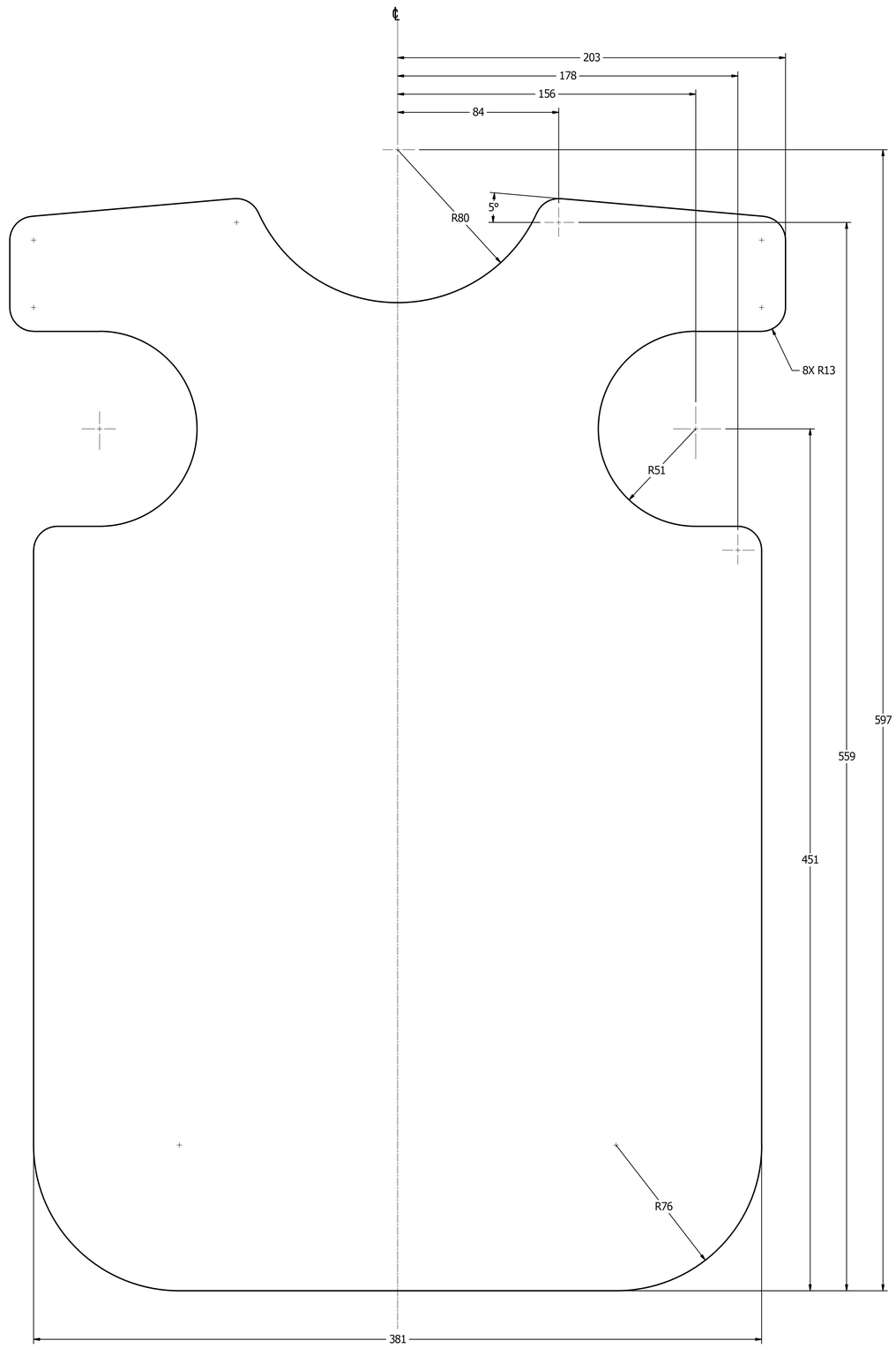
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

REAR PANEL ASSEMBLY, JACKET

THIRD ANGLE PROJECTION
SIZE A0 | DRAWING NUMBER 472-3951 | REV A
SCALE 1 : 1 | SHEET 1 OF 1

472-3951-Rear Panel Assembly.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF210 RB1 AND CONVERTED TO METRIC FOR THOR-M; ADD TOLERANCE AND SYMETRY NOTE	11/30/2011	BK
	B	BLACK WAS WINE, REMOVED COLOR NUMBER IN NEOPRENE MATERIALS	6/12/2012	BK
	C	REMOVED "WITH 2 SIDES OF NYLON (N-2-S). COLORS BLACK AND RED" FROM MATERIAL NOTE; REMOVED NOTE 4 AND RENUMBERED.	1/16/2016	DW



NOTES:

B 1. MATERIAL: NEOPRENE G-23-N 4.8mm THICJK.

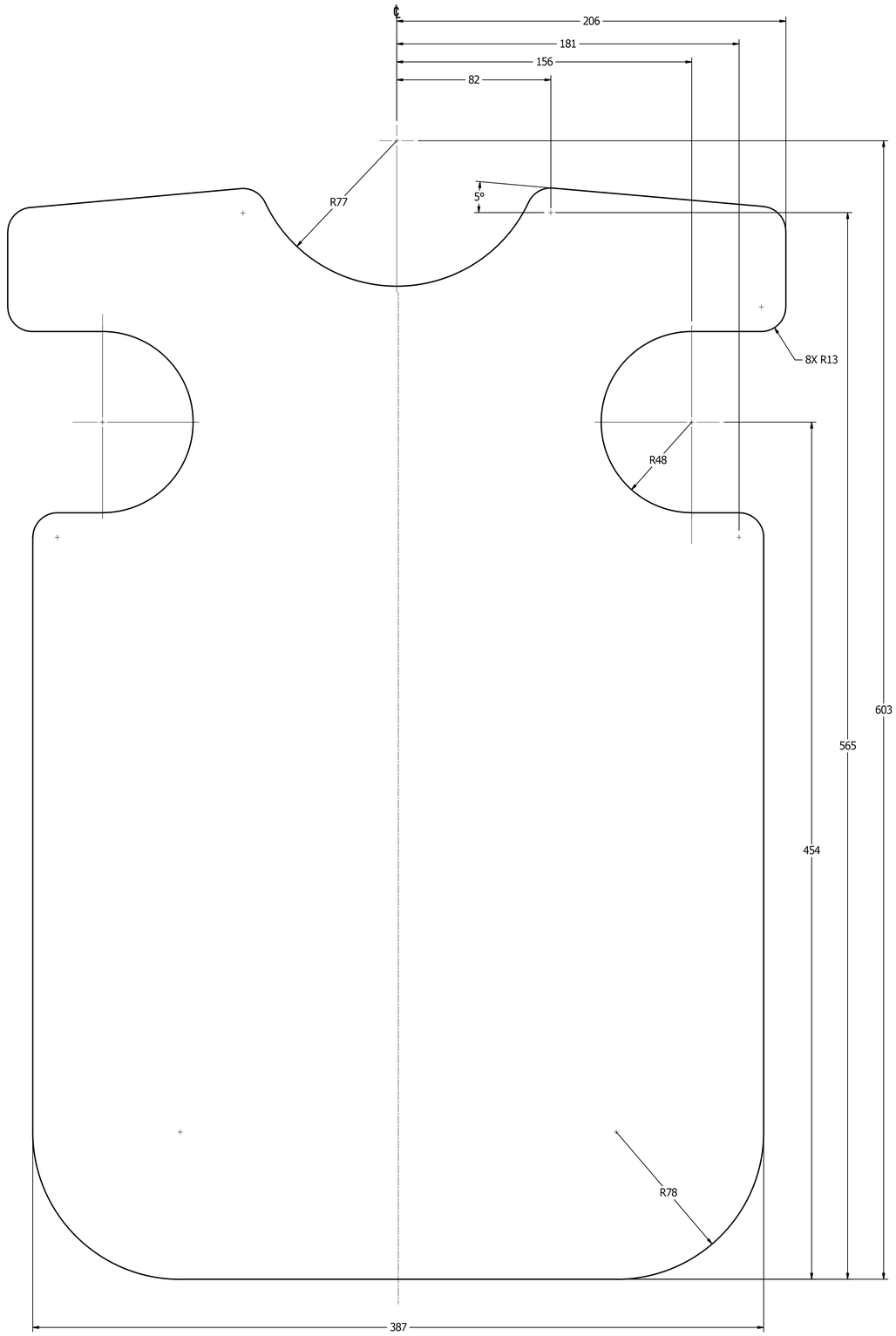
2. PATTERN IS CYMETRIC ABOUT ℄ .

3. TOLERANCE ±3mm, UNLESS OTHERWISE NOTED.

A C 4. MARK PART NUMBER WITH PERMANENT MARKER, ON LAMINATED SIDE.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, XX ±.2, XXX ±.1 / MACHINED 1/2° ANGLES ± .5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
MATERIAL SEE NOTES	APPROVALS / DATE	INSIDE REAR PANEL PATTERN
HEAT TREAT	DRAWN B. KIMES 11/30/2011	
FINISH	CHECKED	SIZE A0 DRAWING NUMBER 472-3952 REV C
	ENG J. WANG 1/11/2012	SCALE 1 : 1 SHEET 1 OF 1
	APPROVED	THIRD ANGLE PROJECTION

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF211 RB1 AND CONVERTED TO METRIC FOR THOR; ADD TOLERANCE AND SYMETRIC NOTE; CORRECTED MATERIAL & DIMENSIONS-M	12/6/2011	BK



NOTES:

1. MATERIAL: CORDURA (1000 DENIER) NYLON RED, LAMINATED ON ONE SIDE.

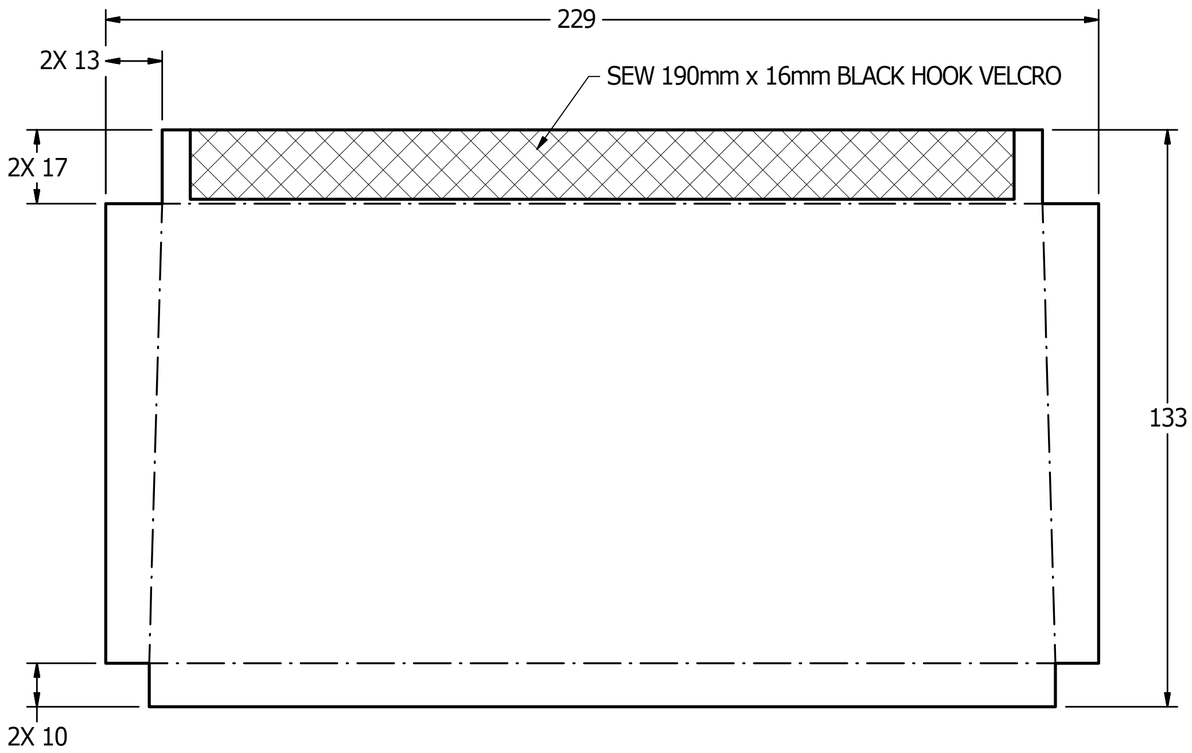
2. PATTERN IS CYMETRIC ABOUT ℄ .

△A 3. TOLERANCE ±3mm, UNLESS OTHERWISE NOTED.

4. MARK PART NUMBER WITH PERMANENT MARKER, ON LAMINATED SIDE.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED ∠± ANGLES ± .5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
MATERIAL: SEE NOTES	APPROVALS / DRAWN: B. KIMES — DATE: 12/6/2011	OUTSIDE REAR PANEL PATTERN
HEAT TREAT:	CHECKED:	
FINISH:	ENG: J. WANG — 1/11/2012; APPROVED:	SIZE: A0; DRAWING NUMBER: 472-3953; REV: A
THIRD ANGLE PROJECTION	SCALE: 1 : 1	SHEET 1 OF 1

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF212 RB1 AND CONVERTED TO METRIC FOR THOR-M; ADD NOTE 2	11/30/2011	BK



FOLD LINES — · —— · —— · —

NOTES:

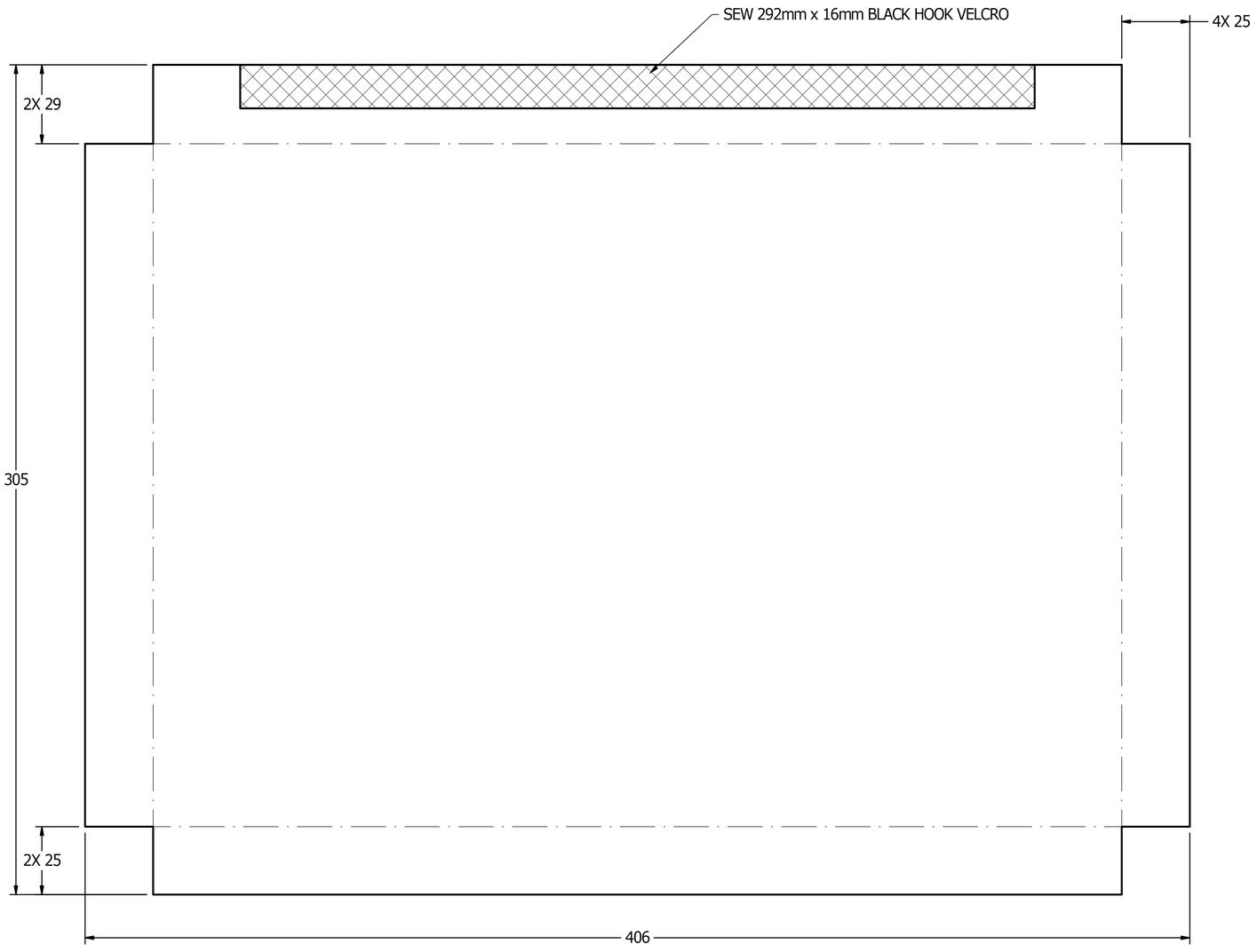
1. MATERIAL: CORDURA (1000 DENIER) NYLON RED, LAMINATED ON ONE SIDE.

A 2. TOLERANCE ±3mm, UNLESS OTHERWISE NOTED.

3. MARK PART NUMBER WITH PERMANENT MARKER, ON LAMINATED SIDE.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
MATERIAL: SEE NOTES	APPROVALS / DATE	UPPER BACK FOAM POCKET
HEAT TREAT	DRAWN: B. KIMES 11/30/2011	SIZE: A2 · DRAWING NUMBER: 472-3954 · REV: A
FINISH	CHECKED	SCALE: 1 : 1 · SHEET: 1 OF 1
	ENG: J. WANG 1/11/2012	THIRD ANGLE PROJECTION
	APPROVED	

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF213 RB2 AND CONVERTED TO METRIC FOR THOR-M; ADD NOTE 2	11/30/2011	BK



FOLD LINES

NOTES:

1. MATERIAL: CORDURA (1000 DENIER) NYLON RED, LAMINATED ON ONE SIDE.

A 2. TOLERANCE ±3mm, UNLESS OTHERWISE NOTED.

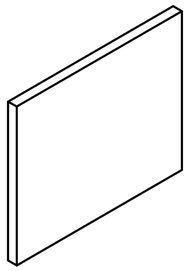
3. CUT PATTERN WITH LAMINATED SURFACE FACING DOWN.

4. MARK PART NUMBER WITH PERMANENT MARKER, ON LAMINATED SIDE.

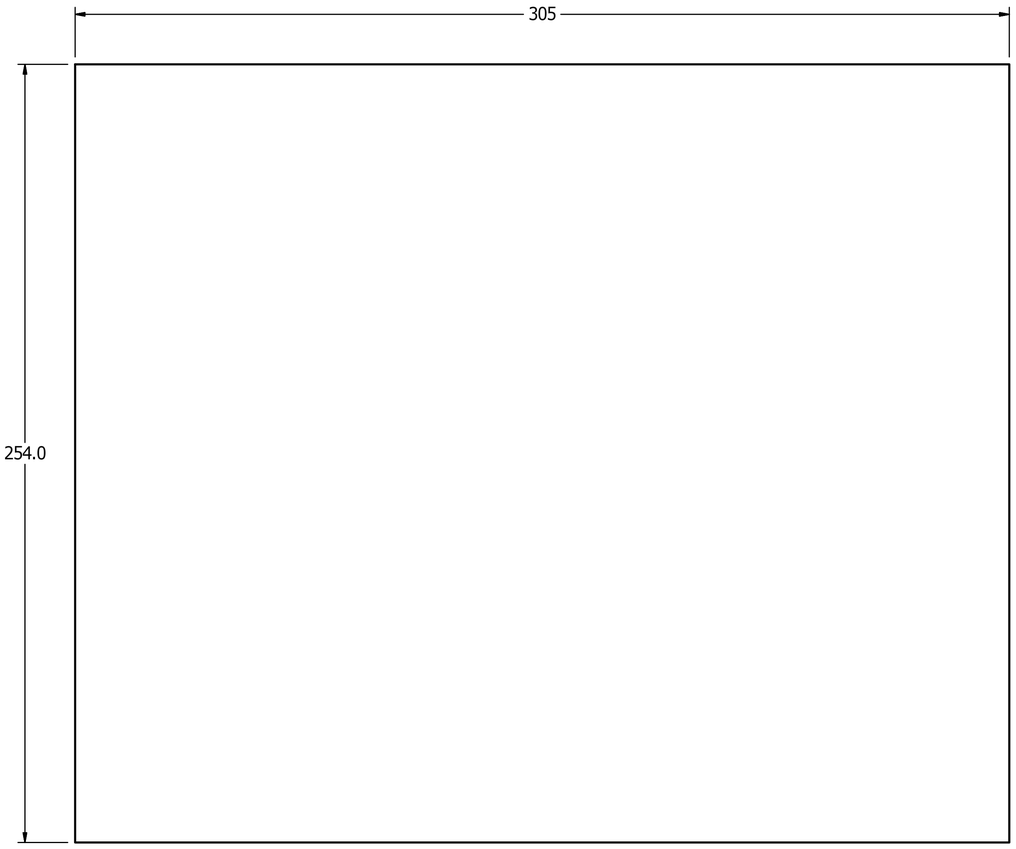
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED ∠ ANGLES ±.5°	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ASME Y14.5M - 1994 DO NOT SCALE DRAWING	APPROVALS / DATE	MID BACK FOAM POCKET
MATERIAL: SEE NOTES	DRAWN: B. KIMES 11/30/2011	
HEAT TREAT	CHECKED	SIZE: A1 DRAWING NUMBER: 472-3955 REV: A
FINISH	ENG: J. WANG 1/11/2012	SCALE: 1 : 1 SHEET: 1 OF 1
	APPROVED	THIRD ANGLE PROJECTION

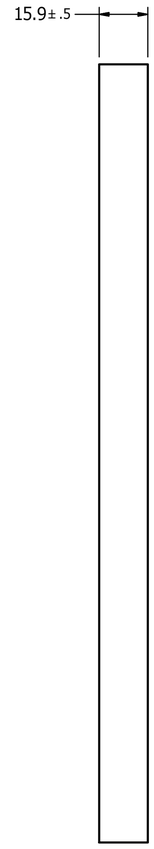
472-3955-Mid Back Foam Pocket.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF215 RB2 AND CONVERTED TO METRIC FOR THOR-M; ADD NOTE 2	11/29/2011	BK
	B	REMOVED R13 TYP.	3/15/2012	BK



SCALE .25





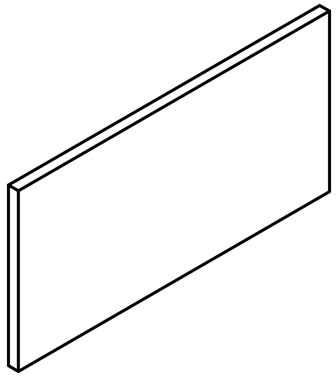
1. MATERIAL: #6 CHARCOAL POLYESTER FOAM.

A 2. TOLERANCE ±3mm, UNLESS OTHERWISE NOTED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	MID BACK FOAM
	DRAWN B. KIMES	11/29/2011	
MATERIAL SEE NOTES	CHECKED		SIZE A1 | DRAWING NUMBER 472-3957 | REV B
HEAT TREAT	ENG J. WANG	1/11/2011	THIRD ANGLE PROJECTION | SCALE: 1 : 1 | SHEET 1 OF 1
FINISH	APPROVED		

472-3957-Mid Back Foam.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF214 RB1 AND CONVERTED TO METRIC FOR THOR-M; ADD NOTE 2	11/29/2011	BK



SCALE .50

NOTES:

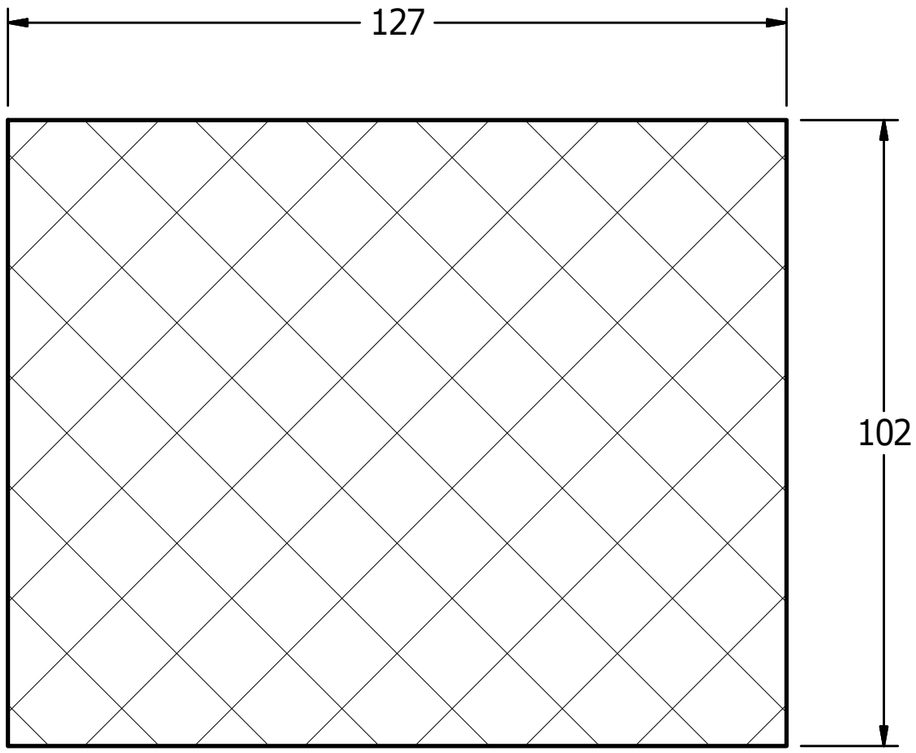
1. MATERIAL: #6 CHARCOAL POLYESTER FOAM.

A 2. TOLERANCE ±3mm, UNLESS OTHERWISE NOTED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	UPPER BACK FOAM
MATERIAL: SEE NOTES	DRAWN: B. KIMES	11/29/2011	
HEAT TREAT	CHECKED		SIZE: A2 / DRAWING NUMBER: 472-3956 / REV: A
FINISH	ENG: J. WANG	1/11/2012	THIRD ANGLE PROJECTION / SCALE: 1 : 1 / SHEET: 1 OF 1
	APPROVED		

472-3956-Upper Back Foam.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF216 RB0 AND CONVERTED TO METRIC FOR THOR-M; ADD NOTE 2	12/2/2011	BK



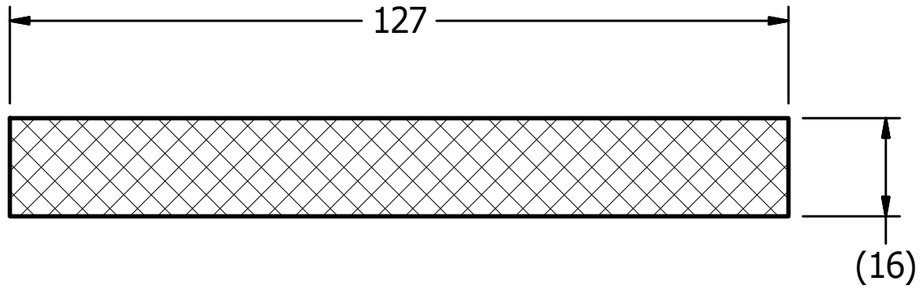
NOTES:

1. MATERIAL: BLACK POLYPROPYLENE HOOK VELCRO, SHEAR STRENGTH 17 PSI.
2. TOLERANCE ±3mm, UNLESS OTHERWISE NOTED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	REAR PANEL LOOP VELCRO
	DRAWN B KIMES	12/2/2011	
MATERIAL SEE NOTES	CHECKED		
HEAT TREAT	ENG J. WANG	1/11/2012	
FINISH	APPROVED		THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A3	472-3958	A
SCALE: 1 : 1	SHEET 1 OF 1	

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1JKF217 RB0 AND CONVERTED TO METRIC FOR THOR-M; ADD NOTE 2	12/2/2011	BK



NOTES:

1. MATERIAL: 16mm, BLACK POLYPROPYLENE HOOK VELCRO, SHEAR STRENGTH 17PSI.

A 2. TOLERANCE ±3mm, UNLESS OTHERWISE NOTED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN: B. KIMES	12/2/2011
CHECKED:	
ENG: J. WANG	1/11/2012
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

REAR PANEL SHOULDER HOOK VELCRO

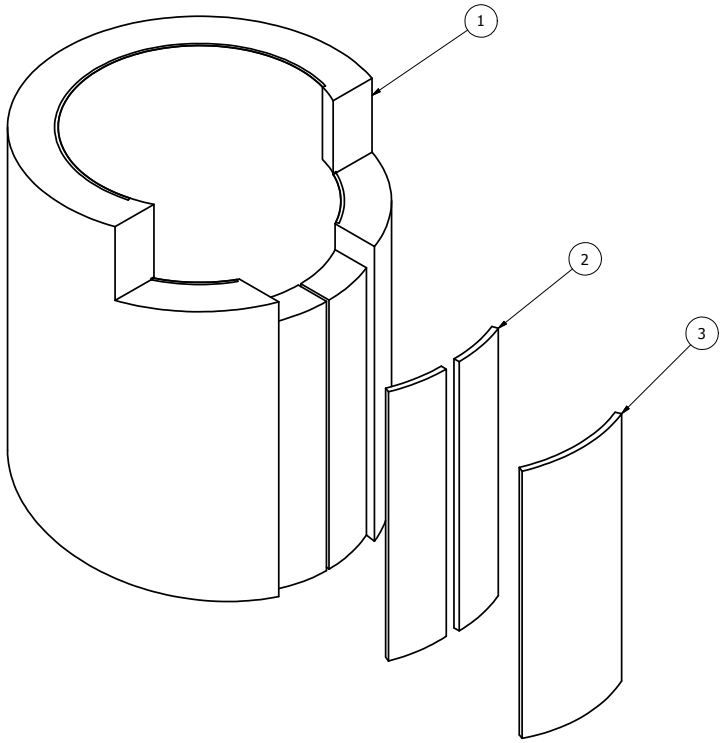
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 472-3959 | REV: A

SCALE: 1 : 1 | SHEET: 1 OF 1

472-3959-Rear Panel Shoulder Hook Velcro.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1NKS100 FOR THOR M	7/6/2012	BK
	C	UPDATE VIEWS TO SHOW REPOSITIONED MESH: REMOVE SEWING NOTES AND VIEW; ADD NOTE 3	10/3/2012	BK



NOTES:

C 1. THE VELCRO HOOK PIECES (472-2913) ARE GLUED TO THE OUTER FRONT EDGES OF THE FOAM SKIN USING A HIGH STRENGTH CONTACT CEMENT.

2. THE VELCRO LOOP (472-2914) IS USED TO SECURE THE NECK TOGETHER AFTER BEING PLACED AROUND THE NECK ASSEMBLY.

C 3. REVISION "B" SKIPPED.

ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	472-2914	VELCRO LOOP, NECK SKIN
2	2	472-2913	VELCRO HOOK, NECK SKIN
1	1	472-2910	NECK FOAM

PARTS LIST

472-0000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X.X ±0.3, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6

REMOVE BURRS & BREAK SHARP EDGES

DRAWN BY: B. Kimes — DATE: 7/6/2012

CHECKED BY: — DATE:

ENGINEER: J. WANG — DATE:

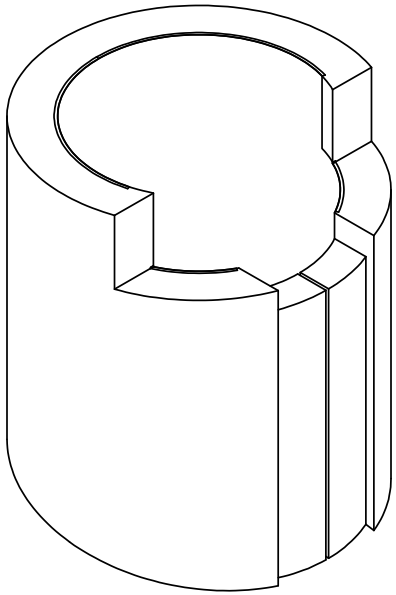
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: NECK FOAM ASSEMBLY

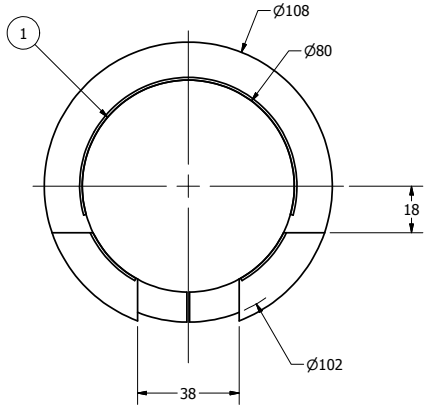
SIZE: A2 — SHEET 1 OF 1 — SCALE: 1:1

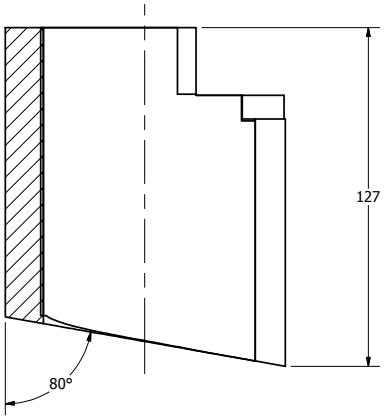
DRAWING NO.: 472-2900 — REV: C

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKS110 FOR THOR M	7/9/2012	BK
	C	REPOSITION REINFORCEMENT MESH PER MANUFACTURING PROCESS; 75g WAS 70 g; CHANGE DIMENSION DECIMAL PLACE TO 0; ADD NOTE 5	10/3/2012	BK

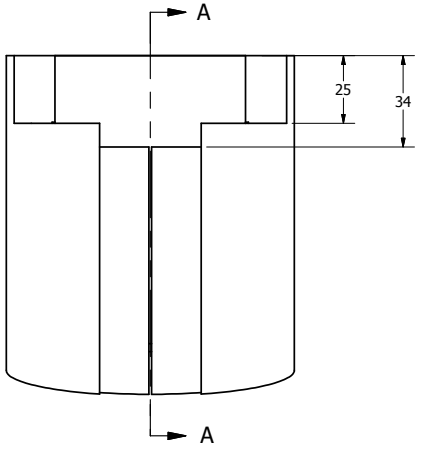


SCALE 1.000





SECTION A-A
SCALE .750



NOTES:

1. MATERIAL: 5lb/CU FT POLYURETHANE FOAM.
2. REINFORCEMENT MESH IS CAST INTO URETHANE FOAM.
C 3. PART WEIGHT: 75g ±10g
4. FOAM TOLERANCE: ±2mm.
C 5. REVISION "B" SKIPPED.

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	472-2912	FOAM REINFORCEMENT MESH

PARTS LIST

472-2900	1	
NEXT ASSEMBLY	QTY	
TOTAL QTY IN DUMMY	1	

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X.X ±0.3, X.XX ±0.1, X.XXX ±0.01. ANGLES ±0.5°. FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.: | MATERIAL: | HEAT TREAT: | WEIGHT:

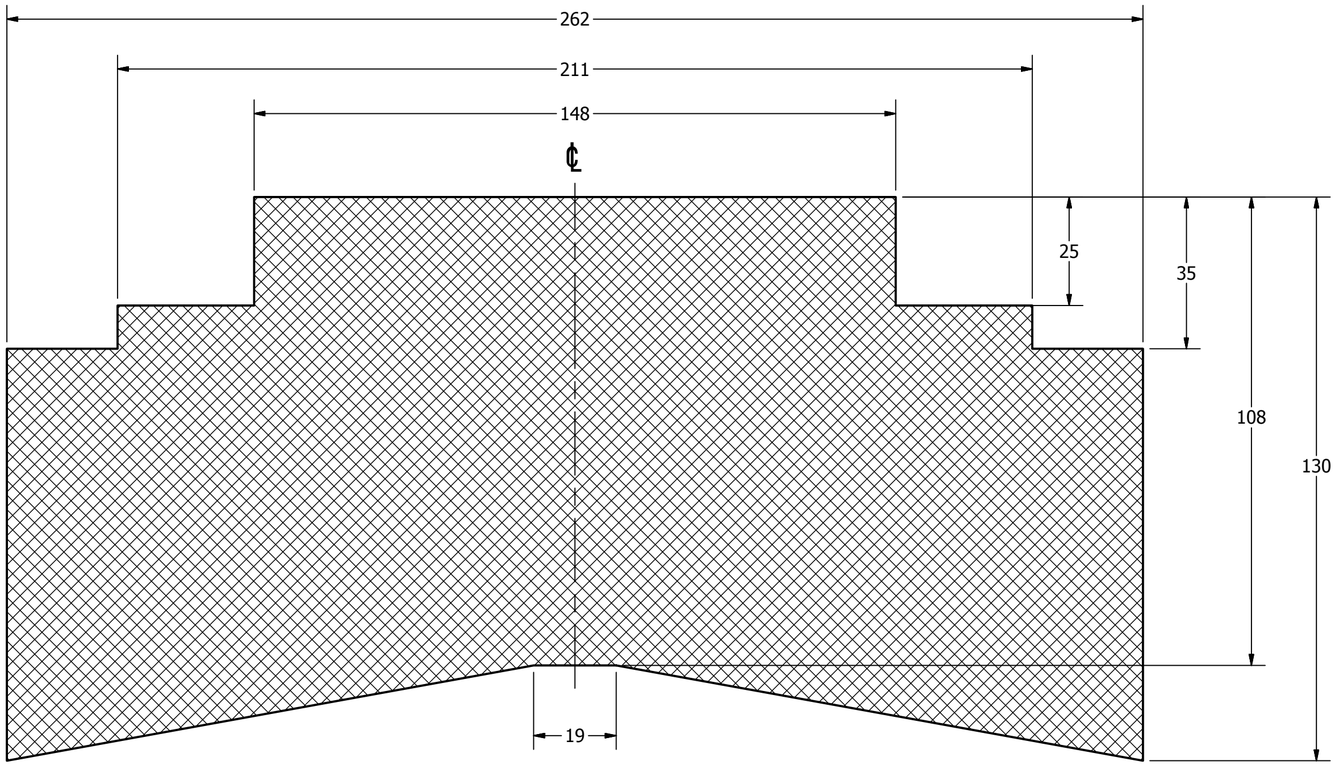
DRAWN BY: B. Kimes | DATE: 7/9/2012
CHECKED BY: | DATE:
ENGINEER: J. WANG | DATE:

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: NECK FOAM

SIZE: A2 | SHEET 1 OF 1 | SCALE: .750 | DRAWING NO.: 472-2910 | REV: C

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKS112 FOR THOR M	7/9/2012	BK
	B	REDESIGNED PART; DIMENSION DECIMAL PLACES TO 0	11/8/12	KHS

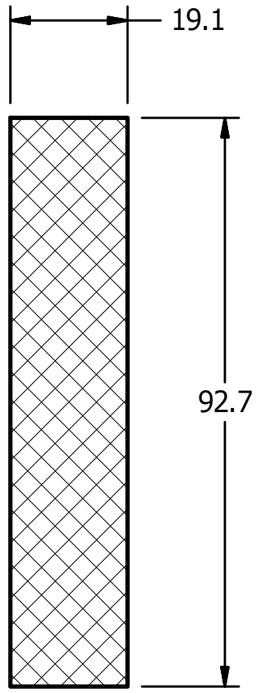


NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. TOLERANCE ±2mm.

DO NOT SCALE DRAWING		TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6	DESCRIPTION: FOAM REINFORCEMENT MESH		
		PROJECT NO.: REMOVE BURRS & BREAK SHARP EDGES			
472-2910	1	MATERIAL: COTTON MESH	DRAWN BY: B. Kimes	DATE: 7/9/2012	
NEXT ASSEMBLY	QTY	HEAT TREAT: N/A	CHECKED BY:	DATE:	SIZE: A2 SHEET 1 OF 1 — DRAWING NO.: 472-2912 — REV: B
TOTAL QTY IN DUMMY	1	FINISH: N/A	ENGINEER: J. WANG	DATE: 7/25/2012	SCALE: 1.000

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKS113 FOR THOR M; ADD NOTES	7/9/2012	BK



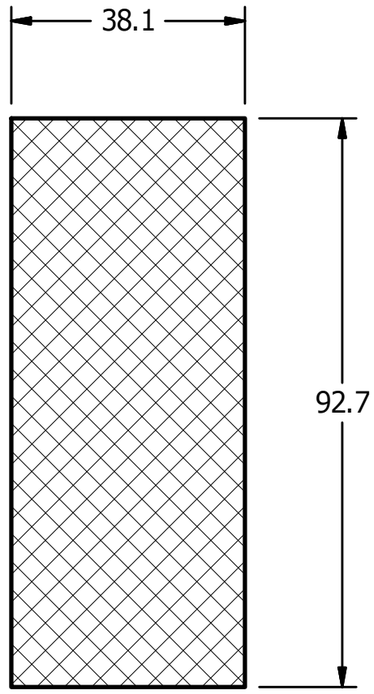
NOTES:

A
1. MAKE FROM BLACK HOOK VELCRO AND CUT AS SHOWN.
2. TOLERANCE ±2mm.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
MATERIAL: SEE NOTES	APPROVALS / DATE	VELCRO HOOK, NECK SKIN
HEAT TREAT	DRAWN: B. Kimes 7/9/2012	THOR-50M
FINISH	CHECKED	SIZE: A3 · DRAWING NUMBER: 472-2913 · REV: A
	ENG: J. WANG 7/25/2012	THIRD ANGLE PROJECTION
	APPROVED	SCALE: · SHEET: 1 OF 1

472-2913 Flat.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1NKS114 FOR THOR M; ADD NOTES	7/9/2012	BK



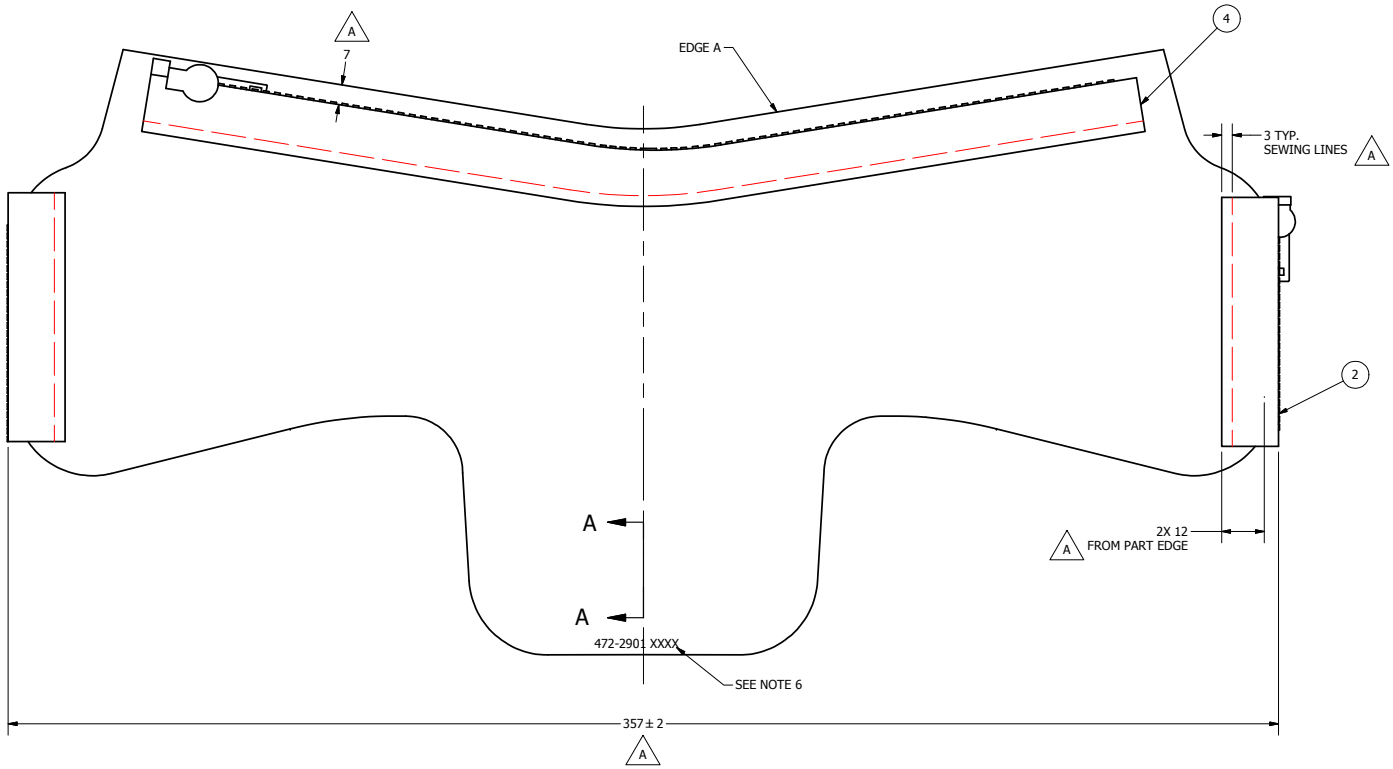
NOTES:

A
1. MAKE FROM BLACK LOOP VELCRO AND CUT AS SHOWN
2. TOLERANCE 2mm.

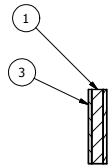
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	VELCRO LOOP, NECK SKIN THOR-50M
MATERIAL: SEE NOTES	DRAWN: B. Kimes — 7/9/2012	
HEAT TREAT	CHECKED	
FINISH	ENG: J. WANG — 7/25/2012	
	APPROVED	THIRD ANGLE PROJECTION
		SIZE: A3 · DRAWING NUMBER: 472-2914 · REV: A
		SCALE: · SHEET: 1 OF 1

472-2914-Flat.ipt

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1NKS200 AND CONVERT TO METRIC FOR THOR M; ADD 3 TYP., 2X 12, 7, 357±2; REVISE NOTES; ADD NOTE 5, 6, 8, SEC A-A	7/27/2012	BK



INSIDE FACE VIEW
SCALE 1.000



A SECTION A-A
SCALE 1.000

NOTES:

1. TRACE SEWING LINES 3mm OUTSIDE THE PROFILE OF THE NEOPRENE PATTERN ON THE INSIDE FACE OF THE CORDURA SKINS.
2. LAYER THE CORDURA SHEETS SO THE INNER FACES ARE FACING OUTWARD.
3. USING KEVLAR THREAD, SEW THE LAYERS TOGETHER ALONG THE TRACED SEWING LINE WITH THE EXCEPTION OF EDGE A.
4. TRIM THE EXCESS CORDURA LEAVING 3mm MATERIAL ALONG THE STITCHED LINE.
5. TURN THE LAYERS INSIDE OUT, INSERT THE NEOPRENE (472-2923), AND FOLD THE INNER AND OUTER CORDURA LAYER INSIDE, THEN SEW ALONG EDGE A.
6. MARK PART NUMBER AND SERIAL NUMBER AS SHOWN. (THIS WILL BECOME THE INNER FACE)
7. SEW THE ZIPPERS AS SHOWN WITH THE INSIDE FACE (WITH PART MARK) FACING UP.
8. TOLERANCE: ±2mm.

ITEM	QTY	PART NUMBER	DESCRIPTION
4	1	472-2920	NECK/HEAD SKIN ZIPPER
3	1	472-2922	NECK SKIN CORDURA PATTERN (OUTER/INNER)
2	1	472-2921	REAR ZIPPER, NECK
1	1	472-2923	NECK SKIN NEOPRENE PATTERN

PARTS LIST

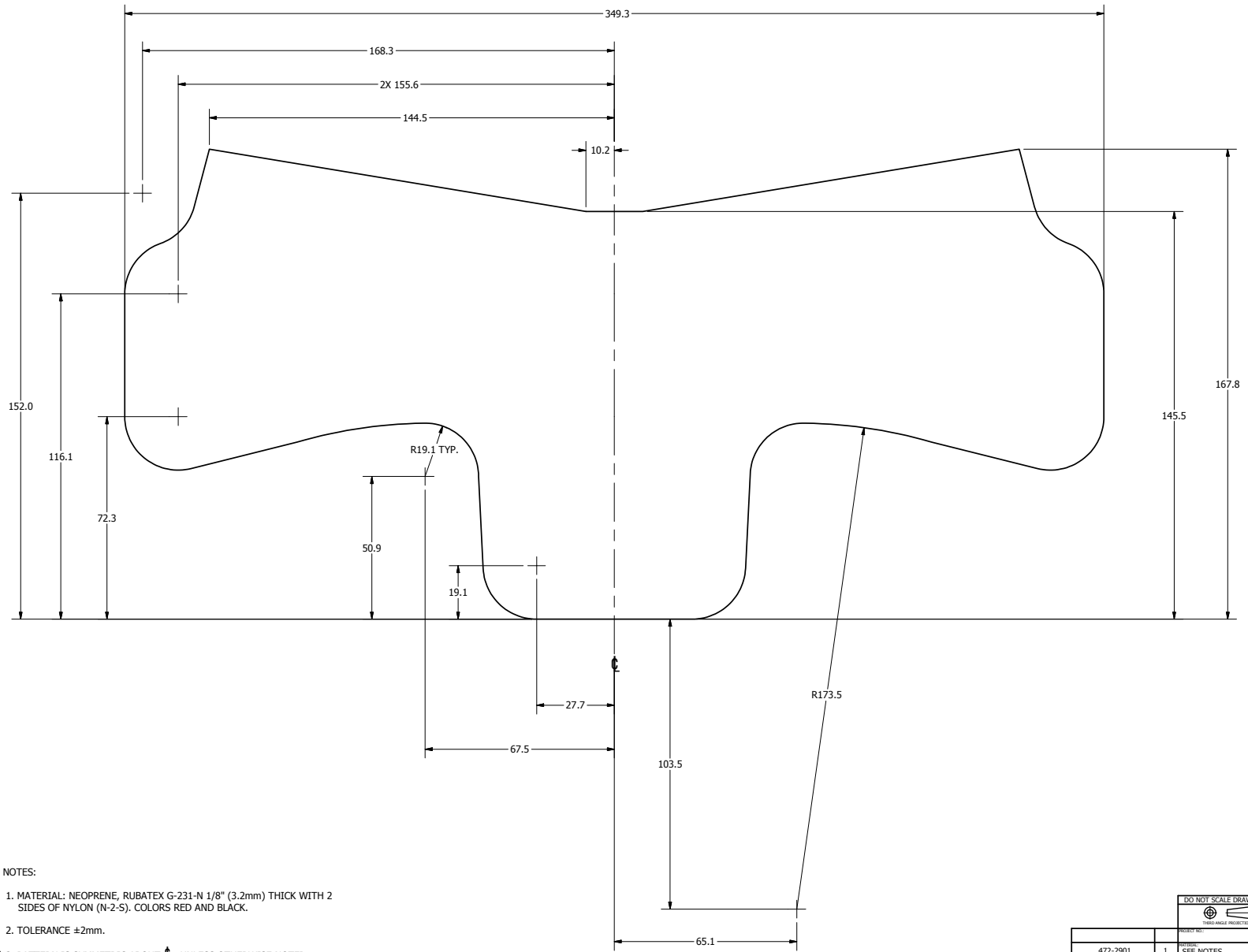
472-0000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION
TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS; DECIMALS X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES
DRAWN BY: B. Kimes — DATE: 7/27/2012
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 7/25/2012

NATIONAL HIGHWAY TRAFFIC SAFETY administration

DESCRIPTION: NECK SKIN ASSEMBLY
SIZE: A2 — SHEET: 1 OF 1 — DRAWING NO.: 472-2901 — REV: A
SCALE: 1.000

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED AND REDESIGNED FROM T1NKS214 FOR THOR M; ADD NOTES 2, 3; REMOVE PATTERN CUT NOTE	7/10/2012	BK



NOTES:

1. MATERIAL: NEOPRENE, RUBATEX G-231-N 1/8" (3.2mm) THICK WITH 2 SIDES OF NYLON (N-2-S). COLORS RED AND BLACK.
2. TOLERANCE ±2mm.
3. PATTERN IS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

472-2901	1	SEE NOTES	
NEXT ASSEMBLY	QTY		
TOTAL QTY IN DUMMY	1		

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X.X ±0.3, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6

REMOVE BURRS & BREAK SHARP EDGES

DRAWN BY: B. Kimes — DATE: 7/10/2012

CHECKED BY: — DATE:

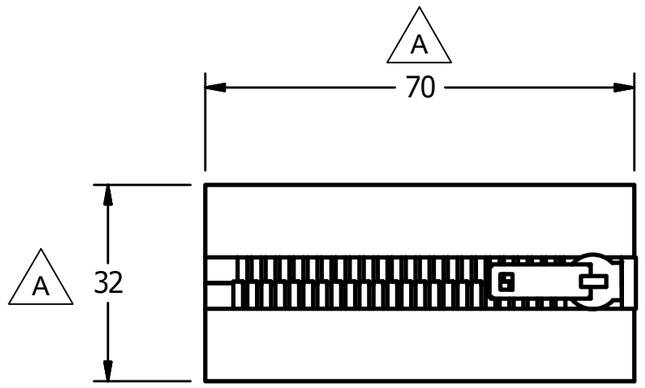
ENGINEER: J. WANG — DATE: 7/25/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: NECK SKIN NEOPRENE PATTERN

SIZE: A2 — SHEET: 1 OF 1 — SCALE: 1.000 — DRAWING NO.: 472-2923 — REV: A

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1NKS211 AND CONVERT TO METRIC FOR THOR M; 70 WAS 63.5; 32 WAS 38.1; ADD NOTE 2	7/10/2012	BK



NOTES:

1. #5 BLACK OXIDE BRASS ZIPPER
   STANDARD AUTOLOCK SLIDER
   TOP AND BOTTOM SEPERATING
   COLOR: BLACK
   (LENZIP)
A 2. TOLERANCE +/- 2mm.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

	APPROVALS	DATE
DRAWN	B. Kimes	7/10/2012
CHECKED		
ENG	J. WANG	7/25/2012
APPROVED		

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

NECK SKIN REAR ZIPPER

THOR-50M

THIRD ANGLE PROJECTION

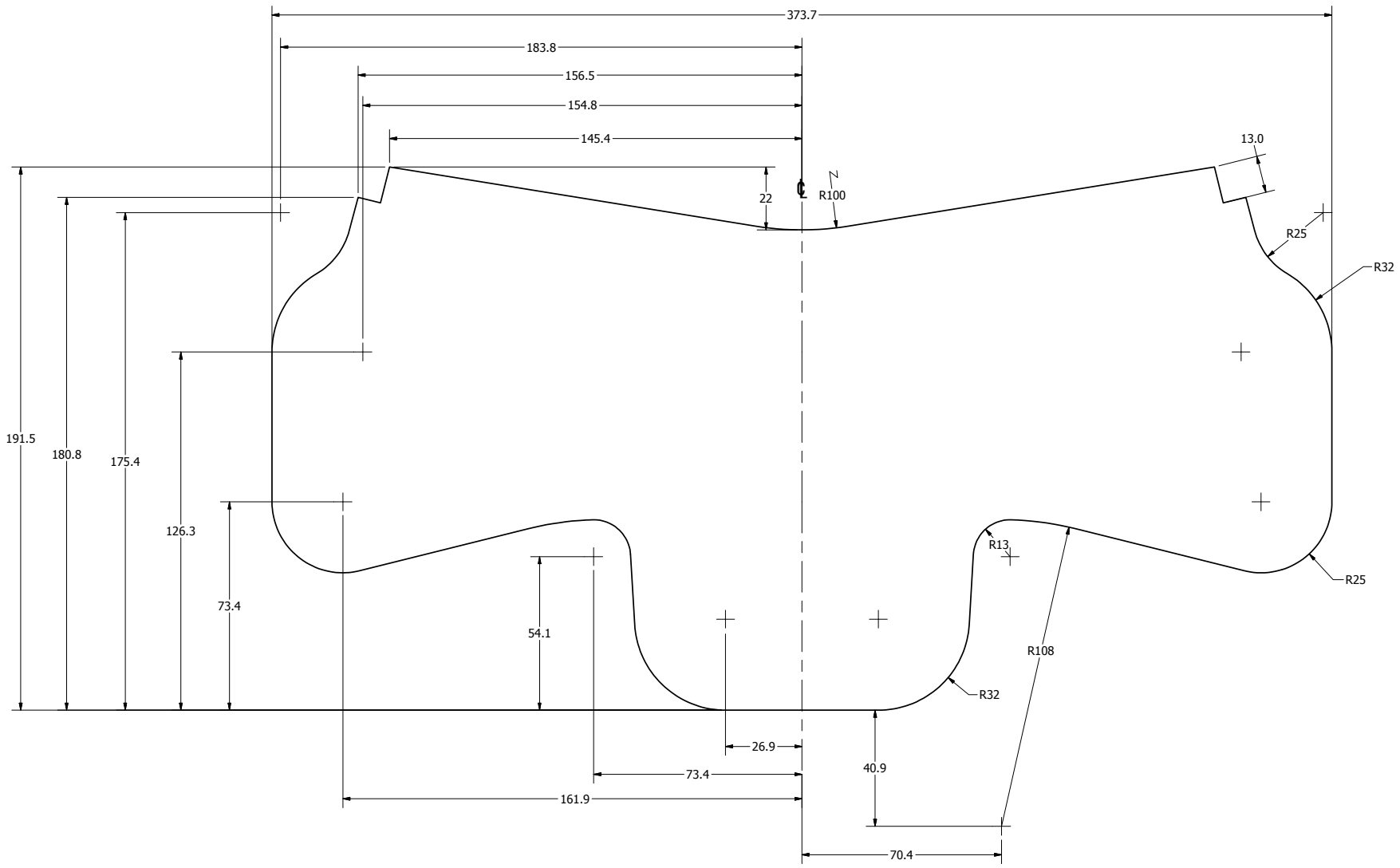
SIZE: A3 | DRAWING NUMBER: 472-2921 | REV: A

SCALE:

SHEET: 1 OF 1

472-2921 Neck Skin Rear Zipper.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RELEASE TO PRODUCTION	7/27/2012	BK



NOTES:

1. PATTERN IS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

2. TOLERANCE: ±2mm.

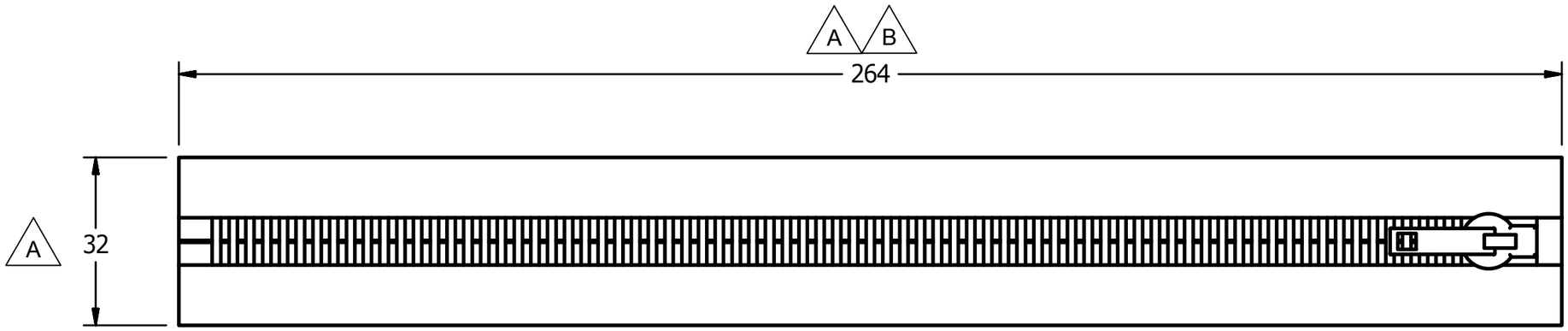
		DO NOT SCALE DRAWING	TOLERANCES
		PROJECT NO.:	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS. DECIMALS X.X ±0.3, X.XX ±0.1, X.XXX ±0.01. ANGLES ±0.5°. FINISH 1.6
			REMOVE BURRS & BREAK SHARP EDGES
472-2901	2	PATTERN: RED CORDURA	DRAWN BY: B. Kimes, DATE: 7/27/2012
NEXT ASSEMBLY	QTY	NEXT ITEM#:	CHECKED BY:
TOTAL QTY IN DUMMY	2	WEIGHT:	ENGINEER: J. WANG, DATE: 7/25/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: NECK SKIN CORDURA PATTERN (OUTER/INNER)

SIZE: A2 | SHEET: 1 OF 1 | SCALE: 1.000 | DRAWING NO.: 472-2922 | REV: A

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RENUMBER FROM T1NKS210 AND CONVERT TO METRIC FOR THOR M; 279 WAS 279.4; 32 WAS 31.8; ADD NOTE 2	7/10/2012	BK
	B	764 WAS 279	1/31/2013	BK



NOTES:

1. #5 BLACK OXIDE BRASS ZIPPER
   STANDARD AUTOLOCK SLIDER
   TOP AND BOTTOM SEPERATING
   COLOR: BLACK
   (LENZIP)
2. TOLERANCE: ±2mm.

A

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN B.Kimes	7/10/2012
CHECKED	
ENG J. WANG	7/25/2012
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

NECK/HEAD SKIN ZIPPER

THOR-50M

THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 472-2920 | REV: B

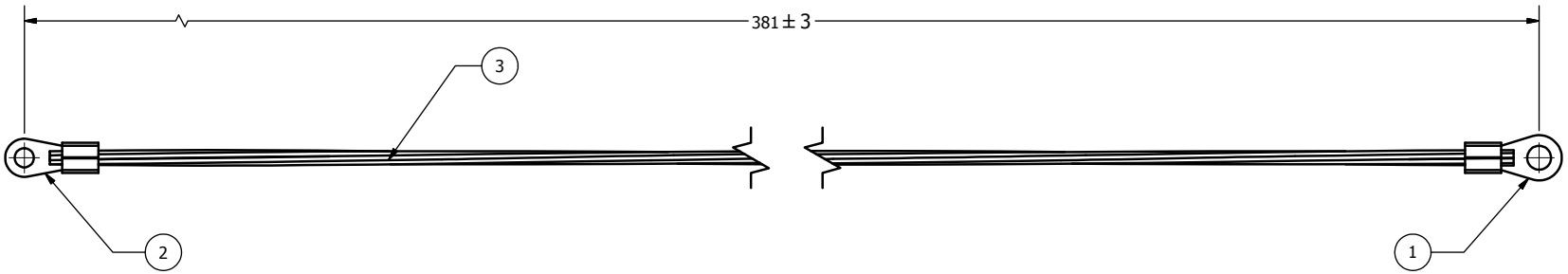
SCALE:

SHEET: 1 OF 1

472-2920-Flat.ipt

GROUNDING STRAPS

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1INM011 R1 AND CONVERTED TO METRIC FOR THOR-M	2/7/2012	SKK
	B	6002273 WAS 6002977	12/14/2012	BK



B

ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	6002273	BRAID, TINNED COPPER TUBULAR 1/8"
2	1	6002978	METRIC RING TERMINAL M4 NON-INSULATED
1	1	6002979	METRIC RING TERMINAL M5 NON-INSULATED

PARTS LIST

472-0000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5°	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:

MATERIAL:

HEAT TREAT:

FINISH:

DRAWN BY: skantola — DATE: 2/7/2012

CHECKED BY: — DATE:

ENGINEER: J. WANG — DATE: 1/23/2012

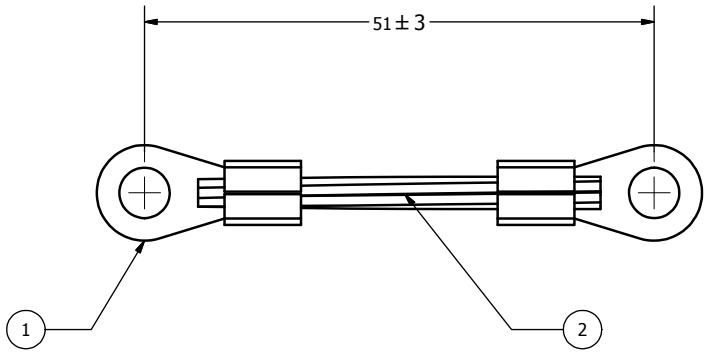
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: INSTRUMENT GROUND STRAP, HEAD/NECK

SIZE: A3 — SHEET: 1 OF 1 — SCALE: 1.000

DRAWING NO.: 472-8700 — REV: B

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1INMO12 R1 AND CONVERTED TO METRIC FOR THOR-M	2/7/2012	SKK
	B	6002273 WAS 6002977	12/14/2012	BK



B

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	6002273	BRAID, TINNED COPPER TUBULAR 1/8"
1	2	6002979	METRIC RING TERMINAL M5 NON-INSULATED

PARTS LIST

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5°	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

472-0000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

PROJECT NO.:

MATERIAL:

HEAT TREAT:

FINISH:

DRAWN BY: skantola DATE: 2/7/2012

CHECKED BY: DATE:

ENGINEER: J. WANG DATE: 1/23/2012

DESCRIPTION: INSTRUMENT GROUND STRAP, MID STERNUM MID STERNUM

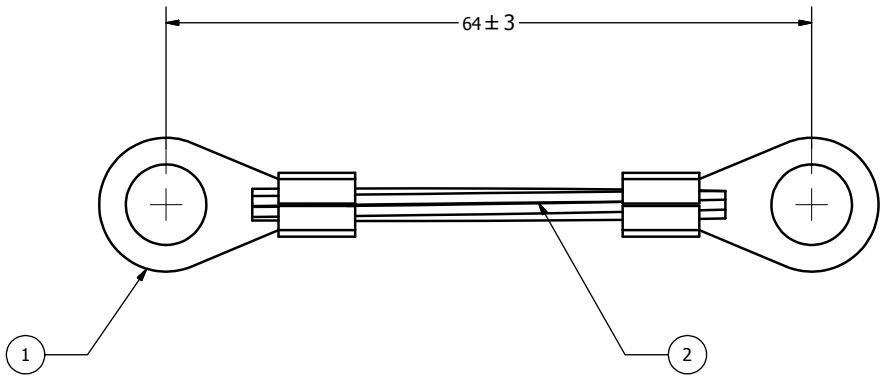
SIZE: A3 SHEET 1 OF 1

SCALE: 2.000

DRAWING NO.: 472-8701

REV: B

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1INM013 R1 AND CONVERTED TO METRIC FOR THOR-M	2/7/2012	SKK
	B	6002273 WAS 6002977	12/17/2012	BK



B

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	6002273	BRAID, TINNED COPPER TUBULAR 1/8"
1	2	6002981	METRIC RING TERMINAL M8 NON INSULATED

PARTS LIST

472-0000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5°	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:

MATERIAL:

HEAT TREAT:

FINISH:

DRAWN BY: skantola DATE: 2/7/2012

CHECKED BY: DATE:

ENGINEER: J. WANG DATE: 1/23/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: INSTRUMENT GROUND STRAP, THORACIC SPINE THORACIC SPINE

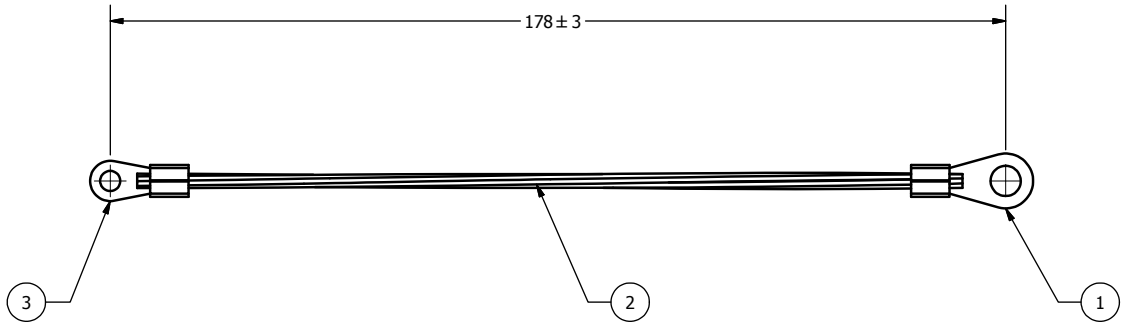
SIZE: A3 SHEET 1 OF 1

SCALE: 2.000

DRAWING NO.: 472-8702

REV: B

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1INM014 R 1 AND CONVERTED TO METRIC FOR THOR-M	2/7/2012	SKK
	B	6002273 WAS 6002977	12/17/2012	BK



B

ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	6002978	METRIC RING TERMINAL M4 NON-INSULATED
2	1	6002273	BRAID, TINNED COPPER TUBULAR 1/8"
1	1	6002980	METRIC RING TERMINAL M6 NON INSULATED

PARTS LIST

472-0000	1
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01
ANGLES ± 0.5°
FINISH 1.6

REMOVE BURRS & BREAK SHARP EDGES

PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:

DRAWN BY: skantola — DATE: 2/7/2012
CHECKED BY: — DATE:
ENGINEER: J. WANG — DATE: 1/23/2012

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

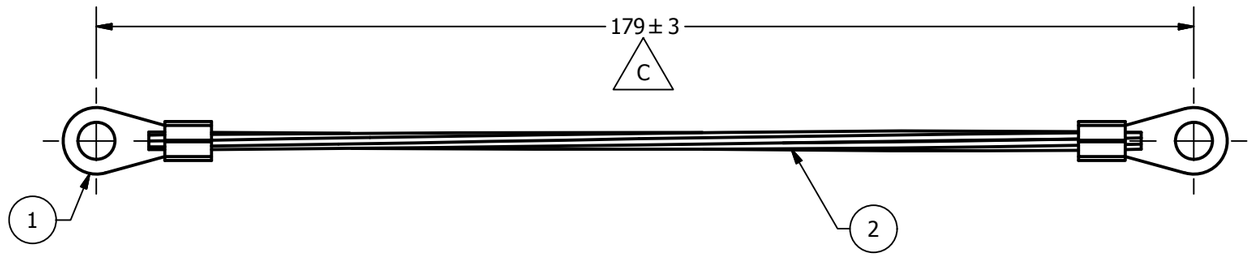
DESCRIPTION: INSTRUMENT GROUND STRAP, LUMBAR SPINE
LUMBAR SPINE

SIZE: A3 | SHEET: 1 OF 1 | SCALE: 1.000

DRAWING NO.: 472-8703

REV: B

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1INM015 R2 AND CONVERTED TO METRIC FOR THOR-M	2/7/2012	SKK
	B	6002273 WAS 6002977	12/17/2012	BK
	C	ITEM #1 PART #6002980 - METRIC RING TERMAL M6 NON INSULATED WAS PART #6002978 - METRIC RING TERMAL M4 NON INSULATED; DIM. 179 ±3 WAS 76 ±3	7/1/2015	DW



B
C

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	6002273	BRAID, TINNED COPPER TUBULAR 1/8"
1	2	6002980	METRIC RING TERMINAL M6 NON INSULATED

PARTS LIST

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

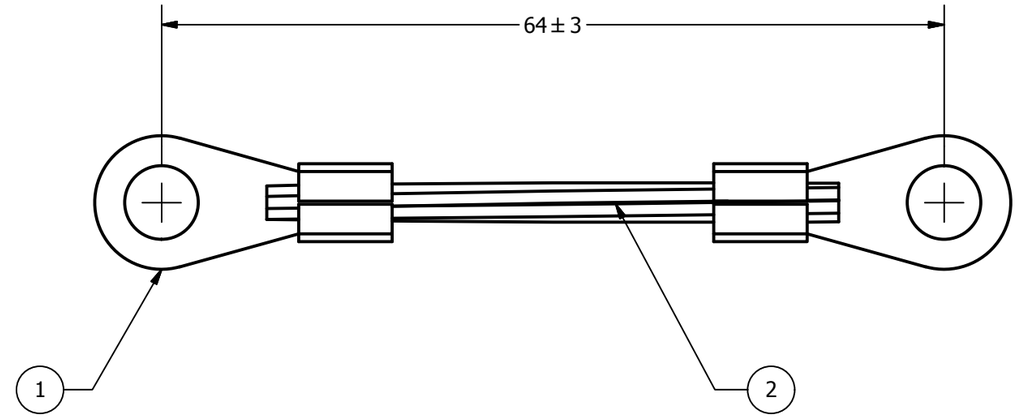
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5' 1.6
X.X ± 0.2
X.XX ± 0.1
X.XXX ± 0.01
REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

		PROJECT NO.:		DESCRIPTION: INSTRUMENT GROUND STRAP, FEMUR	
472-0000	2	MATERIAL:	DRAWN BY: skantola	DATE: 2/7/2012	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 / SHEET 1 OF 1 / DRAWING NO.: 472-8704 / REV: C
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: J. WANG	DATE: 1/23/2012	SCALE: 1.000

472-8704.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RENUMBERED FROM T1INM016 R1 AND CONVERTED TO METRIC FOR THOR-M	2/7/2012	SKK
	B	6002273 WAS 6002977	12/17/2012	BK



B

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	6002273	BRAID, TINNED COPPER TUBULAR 1/8"
1	2	6002980	METRIC RING TERMINAL M6 NON INSULATED

PARTS LIST

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5'	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PROJECT NO.:	
MATERIAL:	
HEAT TREAT:	
FINISH:	
DRAWN BY:	skantola
DATE:	2/7/2012
CHECKED BY:	
DATE:	
ENGINEER:	J. WANG
DATE:	1/23/2012

DESCRIPTION:
INSTRUMENT GROUND STRAP, TIBIA
TIBIA

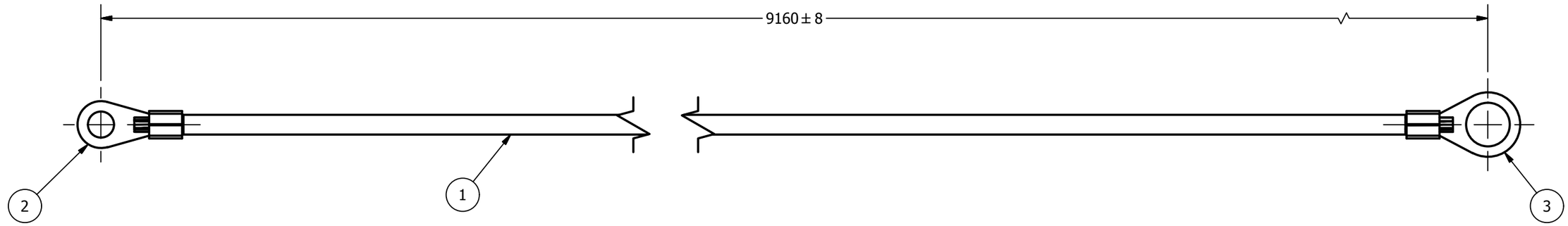
472-0000	2
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	2

SIZE: A3 | SHEET: 1 OF 1 | SCALE: 2.000

DRAWING NO.: 472-8705

REV: B

472-8705.iam



ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	6002990V	STANDARD RING TERMINAL 3/8" NON INSULATED
2	1	6002980	METRIC RING TERMINAL M6 NON INSULATED
1	1	6002272V	HIGH-FLEX GROUNDING WIRE, INSULATED, #10 AWG

PARTS LIST

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5' 1.6
X.X ± 0.2
X.XX ± 0.1
X.XXX ± 0.01
REMOVE BURRS & BREAK SHARP EDGES

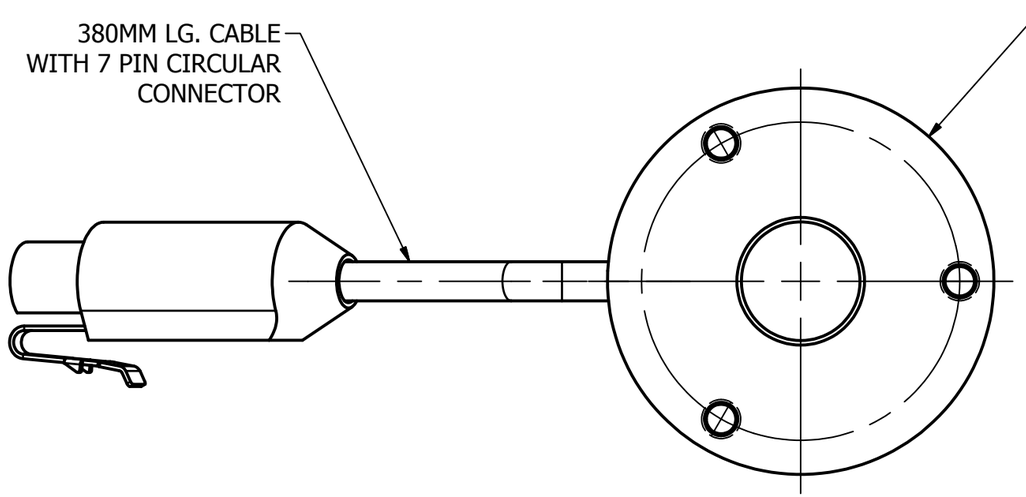
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

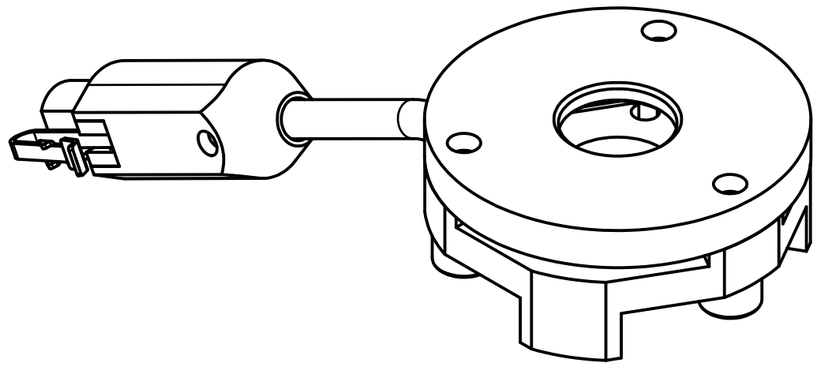
DESCRIPTION: INSTRUMENT GROUND STRAP, MAIN GROUND

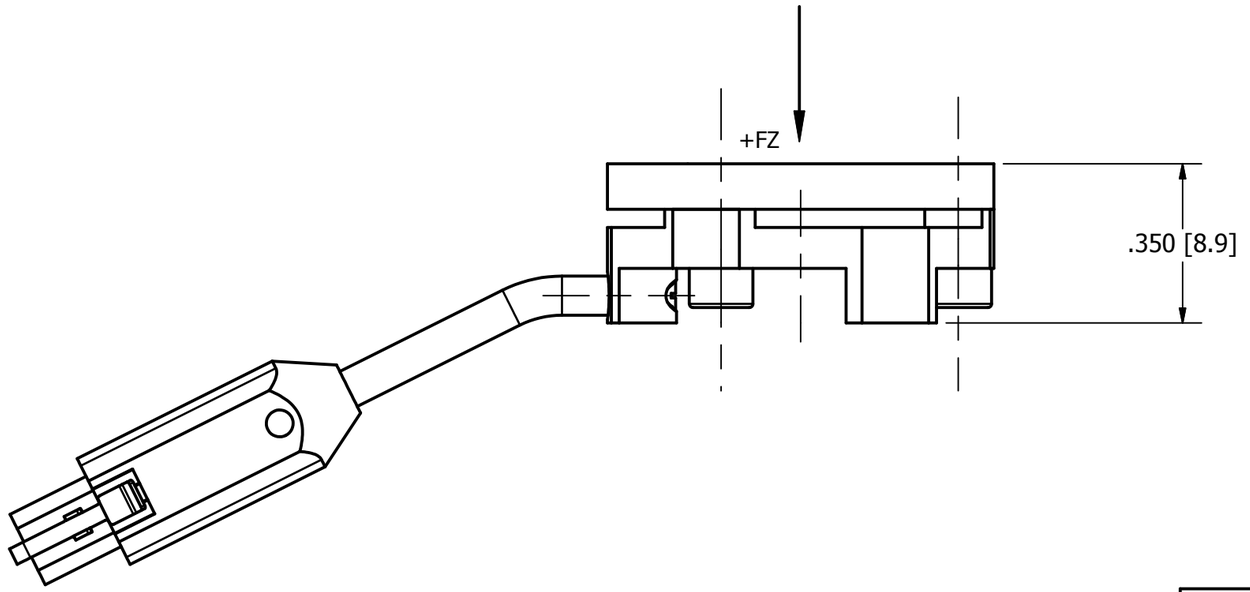
		PROJECT NO.:			
472-0000	1	MATERIAL:	DRAWN BY: Dave Walker	DATE: 2/7/2012	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY:	DATE:	SIZE: A3 / SHEET: 1 OF 1 / DRAWING NO.: 472-8706 / REV:
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG	DATE: 1/23/2012	SCALE: 1.000

472-8706.iam

INSTRUMENTATION







SPECIFICATIONS				
AXIS	CAPACITY (METRIC)	CAPACITY (ENGISH)	OUTPUT	BRIDGE RESISTANCE
FZ	4.45 KN	1000 LBF.	2.3 mV/V	1050 OHM

NON-LINEARITY	< 1% OF FULL SCALE
HYSTERESIS	< 1% OF FULL SCALE
EXCITATION	10 VDC NOMINAL 15 VDC MAX.
POLARITY	CONFORMS TO S.A.E. J-211
MASS	15 GRAMS ~ LESS CABLE

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5°	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

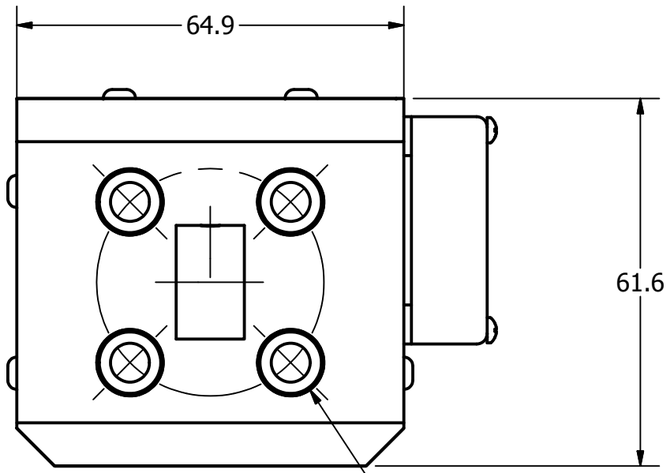
PROJECT NO.:			
MATERIAL:		DRAWN BY: M.FINK	DATE: 8/11/2011
HEAT TREAT:		CHECKED BY: CJT	DATE: 7/3/2012
FINISH:		ENGINEER: M.FINK	DATE: 7/3/12

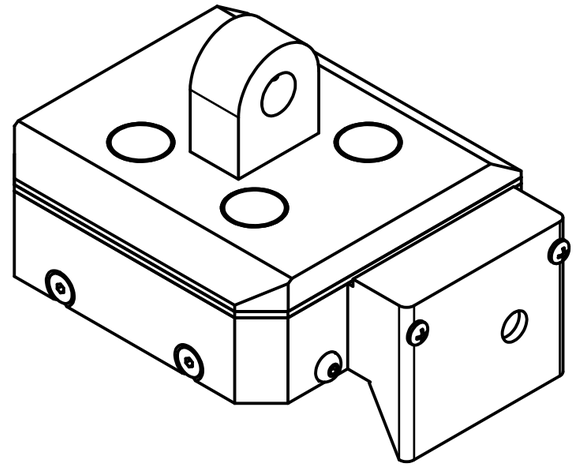
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	2

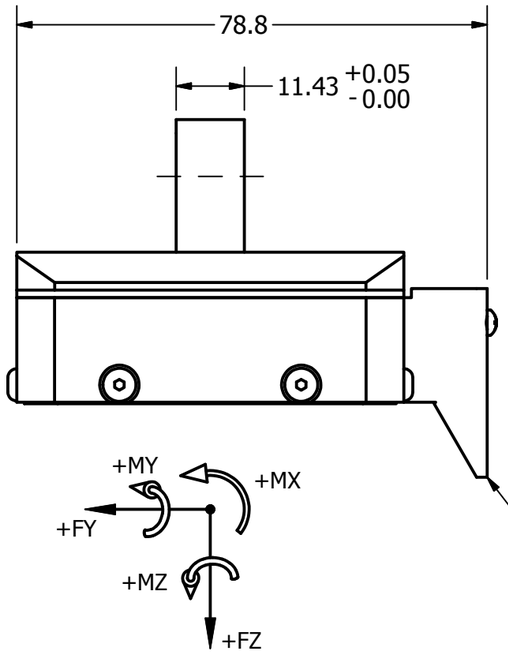
DESCRIPTION: Ø .850 SKULL SPRING LOAD CELL THOR (METRIC)

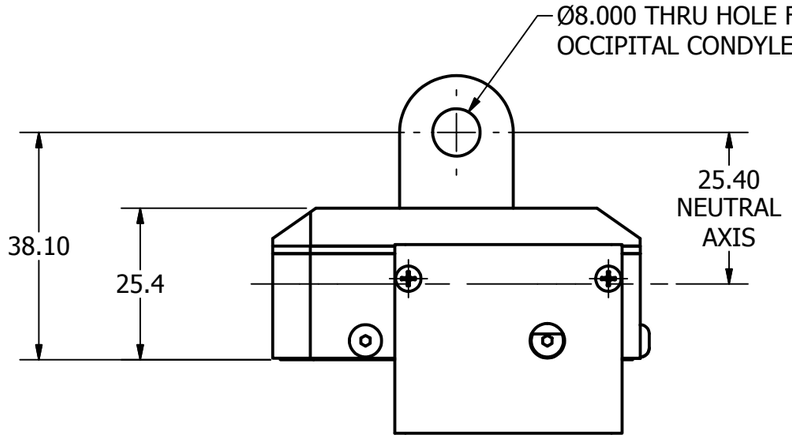
SIZE: B | SHEET: 1 OF 1 | SCALE: 3:1 | DRAWING NO.: SA572-S112 | REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RELEASE FOR PRODUCTION	9/16/11	TORCH









SPECIFICATIONS				
AXIS	CAPACITY (METRIC)	CAPACITY (ENGLISH)	OUTPUT	BRIDGE RESISTANCE
FX	8.9 kN	2000 LBF.	2.0 mV/V	350
FY	8.9 kN	2000 LBF.	2.0 mV/V	350
FZ	13.3 kN	3000 LBF.	1.2 mV/V	700
MX	282.4 Nm	2500 IN-LBF.	1.7 mV/V	350
MY	282.4 Nm	2500 IN-LBF.	1.7 mV/V	350
MZ	282.4 Nm	2500 IN-LBF.	2.7 mV/V	700

NON-LINEARITY	< 1% OF FULL SCALE
HYSTERESIS	< 1% OF FULL SCALE
CROSSTALK	< 5% OF FULL SCALE
EXCITATION	10 VDC NOMINAL 15 VDC MAX.
POLARITY	CONFORMS TO S.A.E. J-211
MASS	426 g (.94 LBS) LESS CABLE

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS

DECIMALS	ANGLES	FINISH
X ± 0.5	± 0.5°	1.6
X.X ± 0.2		
X.XX ± 0.1		
X.XXX ± 0.01		

REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PROJECT NO.:			
MATERIAL:	DRAWN BY: M.FINK	DATE: 8/22/2011	
HEAT TREAT:	CHECKED BY: C TORCHALA	DATE: 9/16/2011	
FINISH:	ENGINEER: M.FINK	DATE: 7/3/12	

DESCRIPTION: UPPER NECK LOAD CELL
THOR (METRIC)

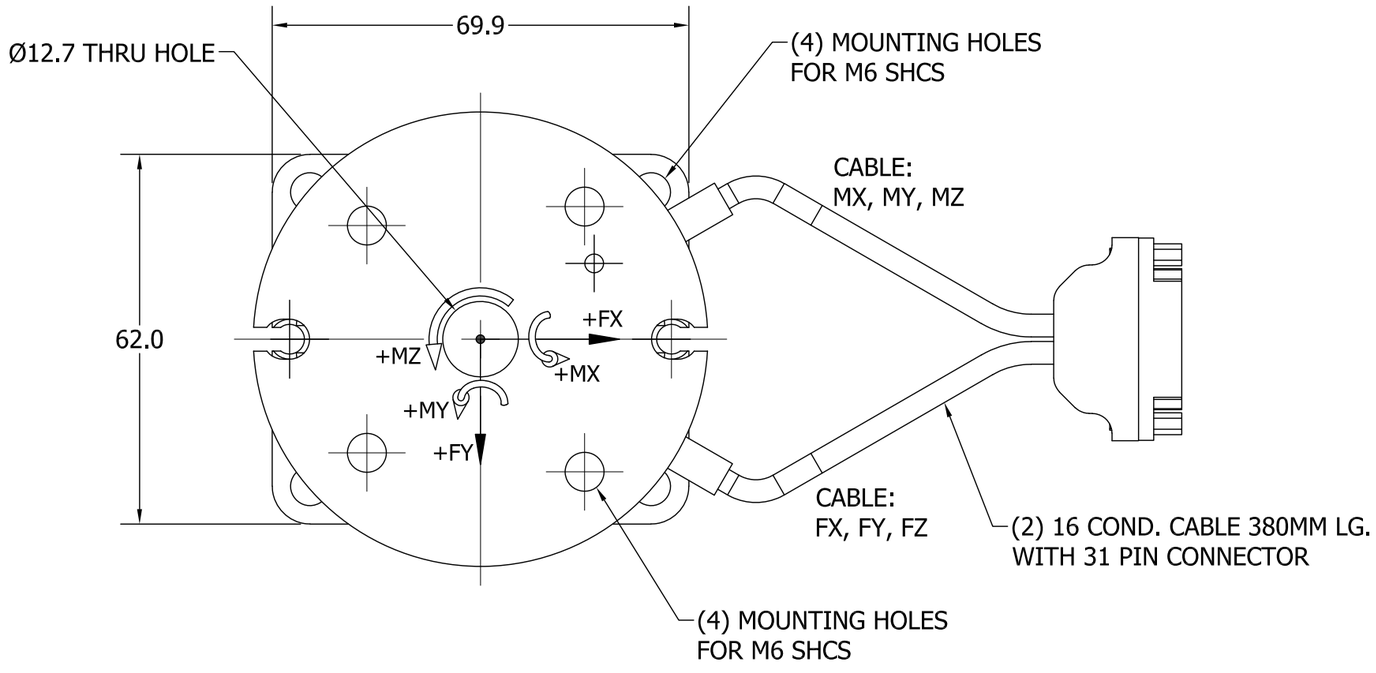
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

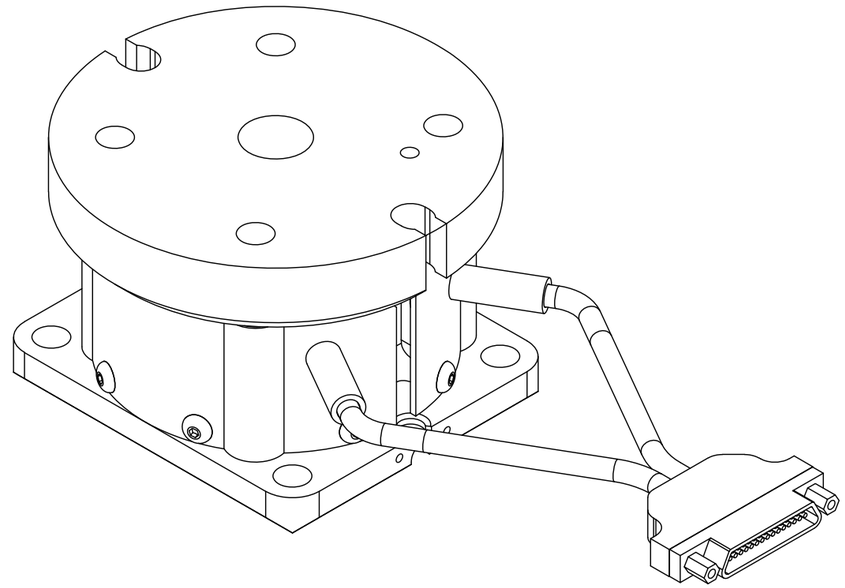
SIZE: B | SHEET: 1 OF 1 | SCALE: 1 : 1

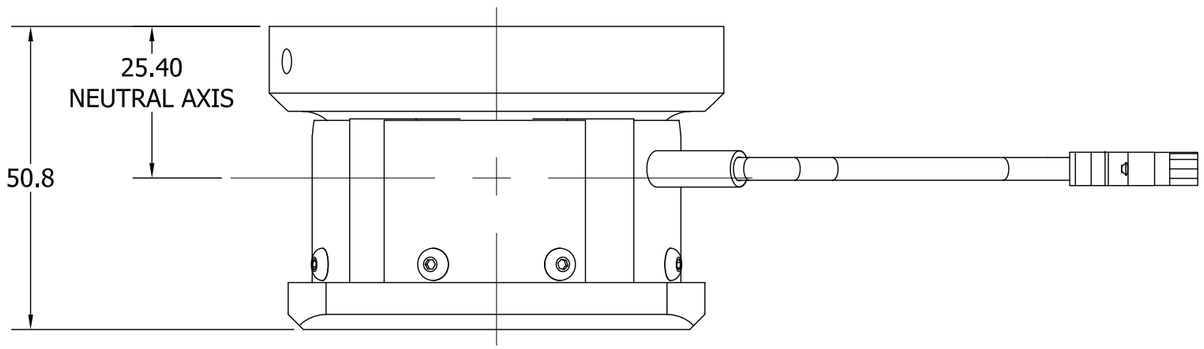
DRAWING NO.: SA572-S110

REV: A

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RELEASE FOR PRODUCTION	9/9/2011	TORCH







SPECIFICATIONS				
AXIS	CAPACITY (METRIC)	CAPACITY (ENGISH)	OUTPUT	BRIDGE RESISTANCE
FX	13.3 kN	3000 LBF.	2.3 mV/V	350
FY	13.3 kN	3000 LBF.	2.3 mV/V	350
FZ	13.3 kN	3000 LBF.	1.0 mV/V	700
MX	452.0 Nm	4000 IN-LBF.	1.8 mV/V	350
MY	452.0 Nm	4000 IN-LBF.	1.8 mV/V	350
MZ	226.0 Nm	2000 IN-LBF.	1.5 mV/V	700

NON-LINEARITY	< 1% OF FULL SCALE
HYSTERESIS	< 1% OF FULL SCALE
CROSSTALK	< 5% OF FULL SCALE
EXCITATION	10 VDC NOMINAL 15 VDC MAX.
POLARITY	CONFORMS TO S.A.E. J-211
MASS	800 GRAMS (1.76 LBS.)

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ± 0.5; X.X ± 0.2; X.XX ± 0.1; X.XXX ± 0.01
ANGLES ± 0.5
FINISH 1.6

REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

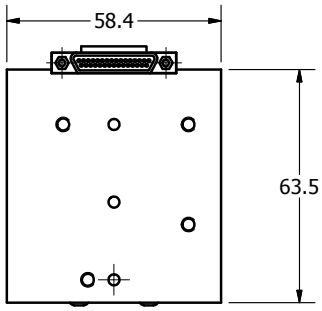
PROJECT NO.:			
MATERIAL:	DRAWN BY: M.FINK	DATE: 8/24/2011	
HEAT TREAT:	CHECKED BY: C TORCHALA	DATE: 9/9/2011	
FINISH:	ENGINEER: M.FINK	DATE: 7/3/12	

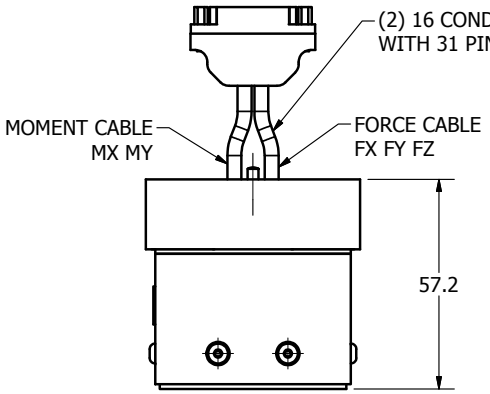
NEXT ASSEMBLY	QTY
TOTAL QTY IN DUMMY	1

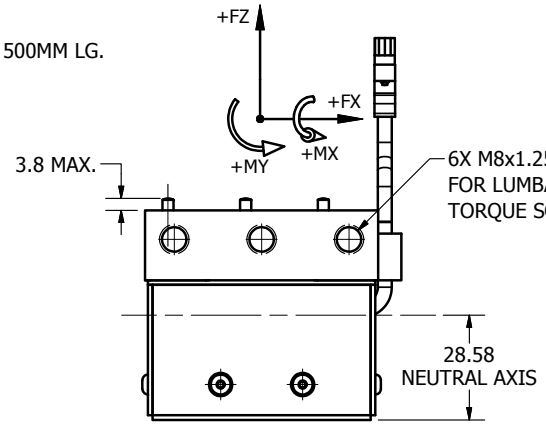
DESCRIPTION: LOWER NECK LOAD CELL
THOR-50M

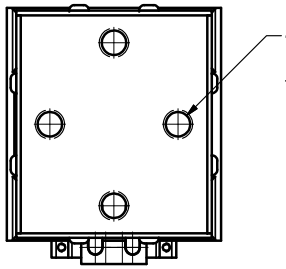
SIZE: B | SHEET: 1 OF 1 | SCALE: 1 : 1 | DRAWING NO.: SA572-S111 | REV: A

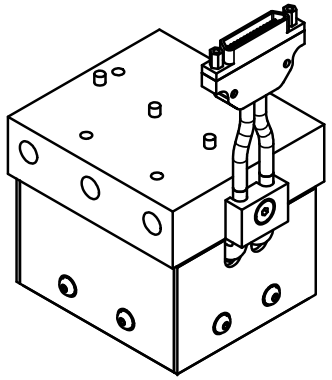
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RELEASE FOR PRODUCTION	9/13/11	TORCH











AXIS	CAPACITY (METRIC)	CAPACITY (ENGISH)	OUTPUT	BRIDGE RESISTANCE
FX	13.3 kN	3000 LBF.	1.9 mV/V	350
FY	13.3 kN	3000 LBF.	1.9 mV/V	350
FZ	17.8 kN	4000 LBF.	1.0 mV/V	700
MX	677.9 Nm	6000 IN-LBF.	1.4 mV/V	700
MY	903.9 Nm	8000 IN-LBF.	1.6 mV/V	700

NON-LINEARITY	< 1% OF FULL SCALE
HYSTERESIS	< 1% OF FULL SCALE
CROSSTALK	< 5% OF FULL SCALE
EXCITATION	10 VDC NOMINAL 15 VDC MAX.
POLARITY	CONFORMS TO S.A.E. J-211
MASS	1.03 kg (2.27 LBS) ~ LESS CABLES & CONNECTOR

NOTE: MOUNT LOAD CELL WITH CABLES TO REAR OF SPINE

		PROJECT NO.:	
		MATERIAL:	
NEXT ASSEMBLY	QTY	HEAT TREAT:	
TOTAL QTY IN DUMMY	1	FINISH:	

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
DECIMALS: X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 — ANGLES ±0.5° — FINISH 1.6
REMOVE BURRS & BREAK SHARP EDGES

DRAWN BY: M.FINK	DATE: 8/3/2011	
CHECKED BY: C TORCHALA	DATE: 9/15/2011	
ENGINEER: M.FINK	DATE: 7/3/12	

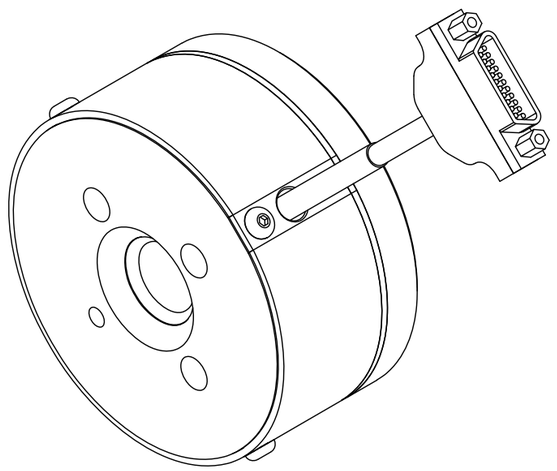
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

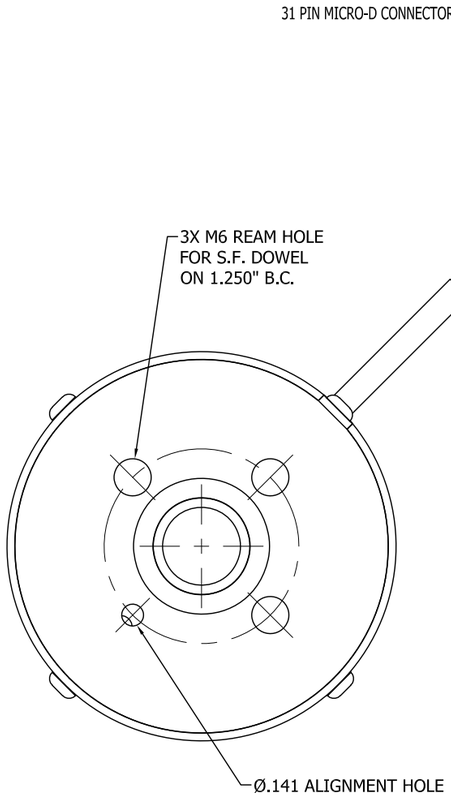
DESCRIPTION: THORACIC SPINE LOAD CELL
THOR (METRIC)

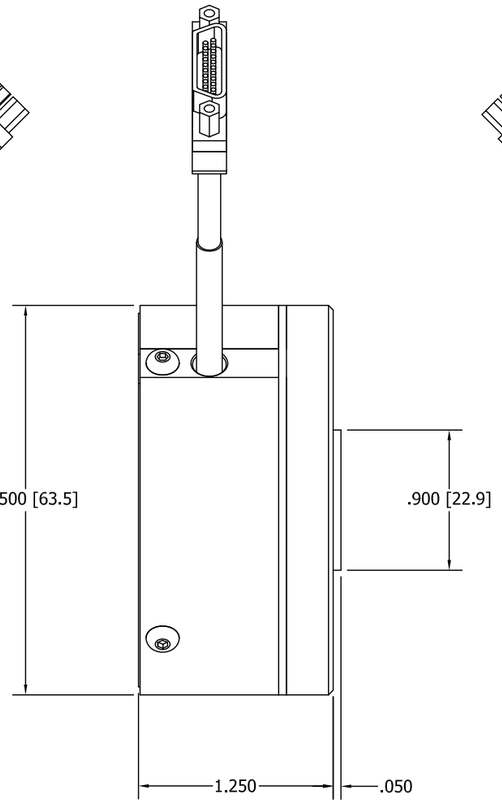
SIZE: B | SHEET: 1 OF 1 | DRAWING NO.: SA572-S127 | REV: A

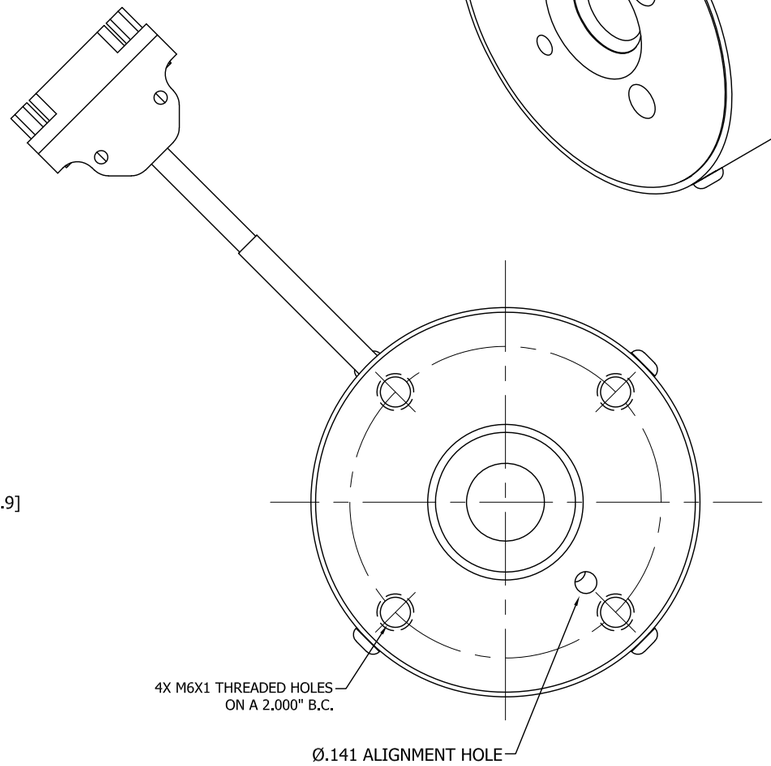
SCALE: NONE

REVISION HISTORY				
REV.	ZONE	DESCRIPTION	DATE	BY
A		REMOVED (RIGHT SIDE ONLY) FROM POLARITY SPECIFICATION	3/14/2017	DW









SPECIFICATIONS				
CH.	CAPACITY (METRIC)	CAPACITY (ENGLISH)	OUTPUT	BRIDGE RESISTA
FX	22.24 kN	5000 LBF.	2.4 mV/V	350
FY	13.34 kN	3000 LBF.	0.8 mV/V	700
FZ	13.34 kN	3000 LBF.	2.0 mV/V	350

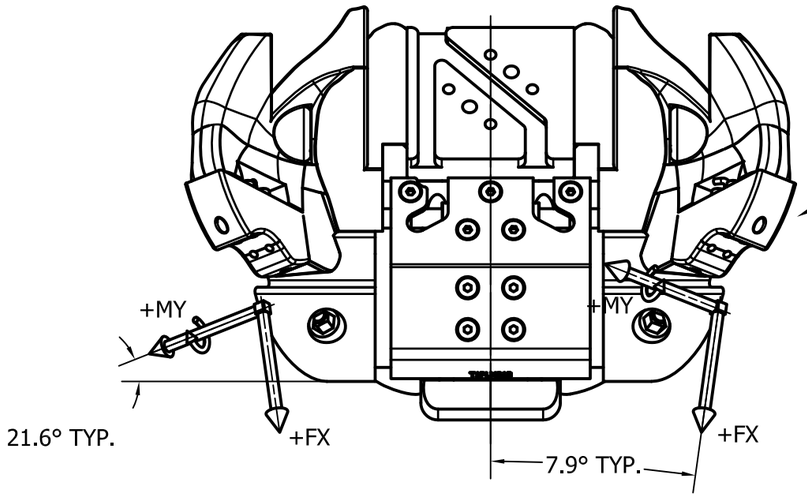
NON-LINEARITY	< 1% OF FULL SCALE
HYSTERESIS	< 1% OF FULL SCALE
CROSSTALK	< 5% OF FULL SCALE
EXCITATION	10 VDC NOMINAL 15 VDC MAX.
A POLARITY	CONFORMS TO S.A.E. J-211
MASS	0.94 LBS (426.3 g) LESS CABLE

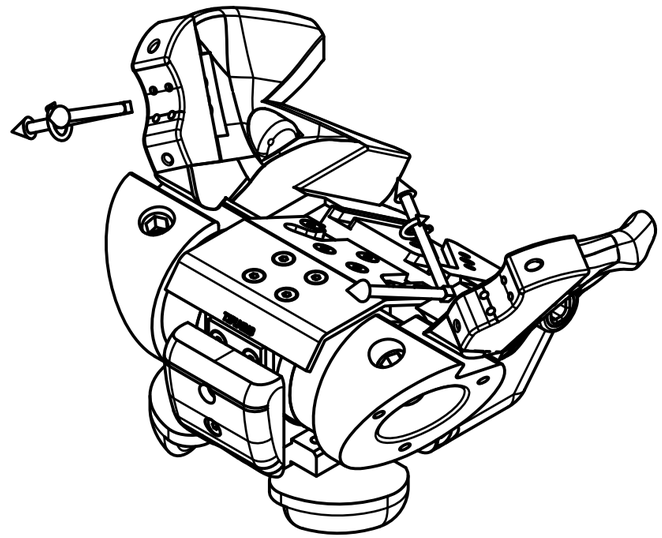
UNLESS OTHERWISE SPECIFIED:
ALL MACHINED SURFACES 1.60 OR BETTER.

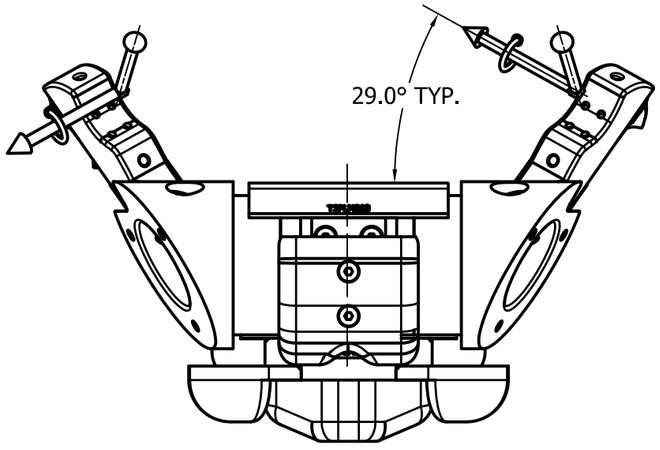
PARTS LIST

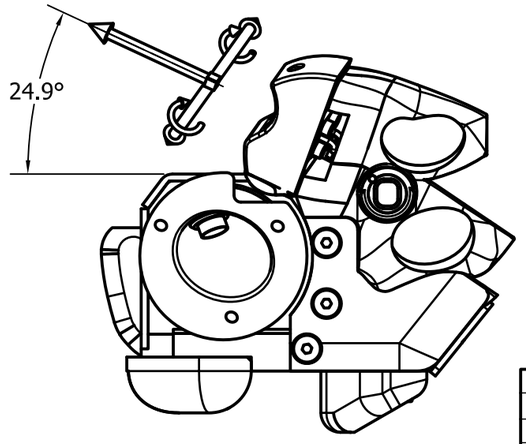
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES
ANGLES ±.5°
DECIMALS
X ±1 mm
X.X ±0.1 mm
* DO NOT SCALE DRAWING *
THIRD ANGLE PROJECTION

ENGINEERED: L.BENFANT	DATE: 10/18/2011	MATERIAL:	DEPARTMENT OF TRANSPORTATION NHTSA
DRAWN: L.BENFANT	DATE: 10/18/11	FINISH:	
CHECKED: M.FINK	DATE: 10/18/11	HEAT TREAT:	
DEBUR AND BREAK ALL SHARP EDGES		QTY./ASSEMBLY:	DRAWING TITLE: ACETABULUM LOAD CELL ASS'Y, LEFT
SCALE:	SIZE: A3 / REVISION: A	QTY./DUMMY: 1	DRAWING NUMBER: SA572-S128 / Page: 1 of1









THE MODEL 10387JI4 A.S.I.S. LOAD CELL IS DESIGNED TO PROVIDE A MEASUREMENT OF THE FORCE OF A LAP BELT AGAINST THE ILIAC SPINE OF THE PELVIS. THIS FORCE IS MEASURED AS FX AND IS INSENSITIVE TO THE POSITION OF THE BELT ON THE ILIAC. THE CHANNEL MY IS DESIGNED TO PROVIDE AN INDICATION OF THE POSITION OF THE BELT ON THE ILIAC. A READING OF ZERO OUTPUT WOULD OCCUR IF THE CENTER OF PRESSURE OF THE BELT IS ON THE LOAD CELL NEUTRAL AXIS. IF THE BELT IS ABOVE THE NEUTRAL AXIS A POSITIVE MOMENT READING WOULD OCCUR, AND A BELT POSITIONED BELOW THE NEUTRAL AXIS WOULD PRODUCE A NEGATIVE BENDING MOMENT OUTPUT.

SPECIFICATIONS				
AXIS	CAPACITY (METRIC)	CAPACITY (ENGISH)	OUTPUT	BRIDGE RESISTANCE
FX	13.0 KN	2922.5 LBF.	0.9 mV/V	350
MY	325.0 NM	2876.5 IN-LBF.	1.3 mV/V	700

NON-LINEARITY	< 2.0% OF FULL SCALE
HYSTERESIS	< 2.5% OF FULL SCALE
CROSSTALK	< 5.0% OF FULL SCALE
EXCITATION	10 VDC NOMINAL, 15 VDC MAXIMUM
POLARITY	CONFORMS TO S.A.E. J-211
MASS	211 GRAMS ~ LESS CABLES

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
DECIMALS ANGLES FINISH
X ± 0.5 ± 0.5° 1.6
X.X ± 0.2
X.XX ± 0.1
X.XXX ± 0.01
REMOVE BURRS & BREAK SHARP EDGES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

		PROJECT NO.:	
		MATERIAL:	
NEXT ASSEMBLY	QTY	HEAT TREAT:	
TOTAL QTY IN DUMMY		FINISH:	

DRAWN BY:	M.FINK	DATE: 8/5/2011
CHECKED BY:	CRM	DATE: 8/18/2011
ENGINEER:		DATE:

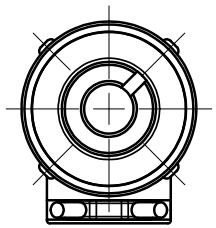
DESCRIPTION: A.S.I.S. LOAD CELL

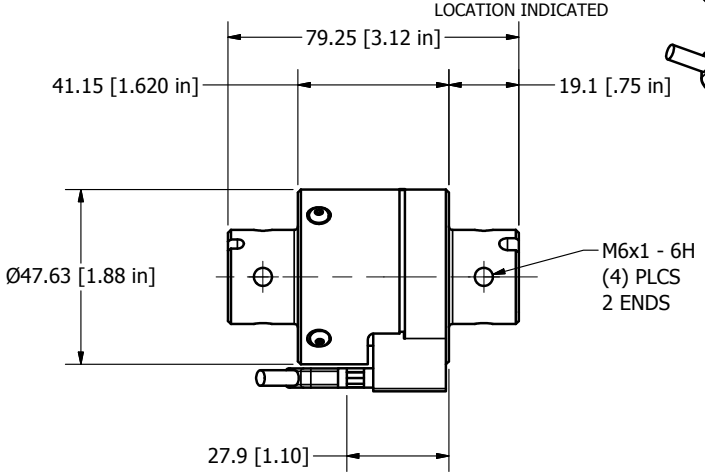
SIZE: B | SHEET: 1 OF 1 | SCALE:

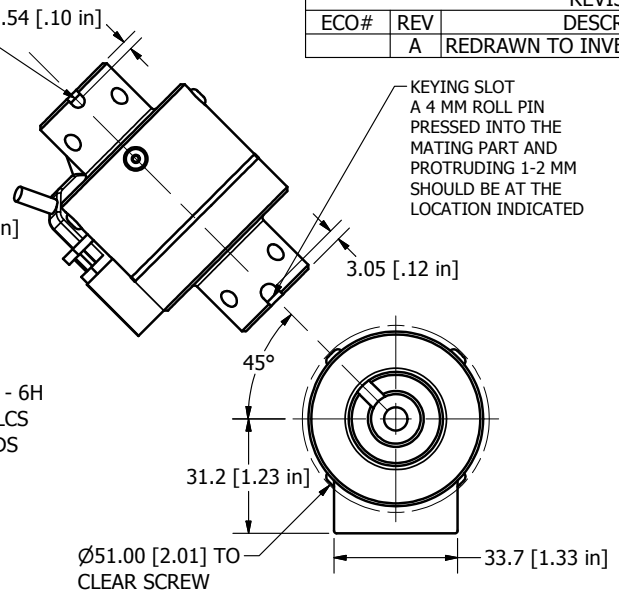
DRAWING NO.: SA572-S119

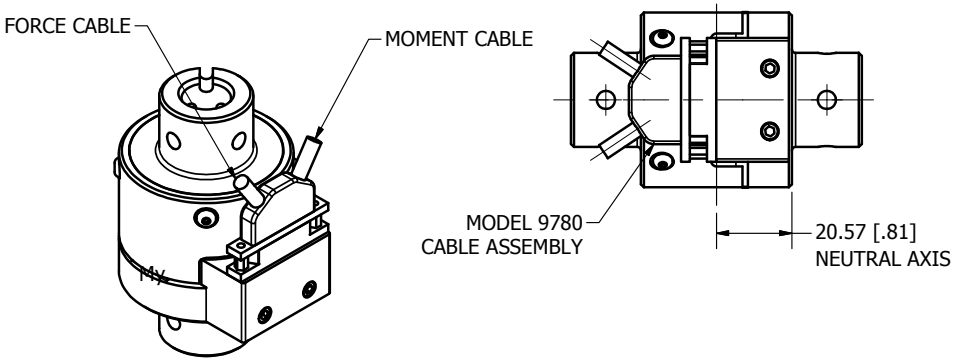
REV: C

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	REDRAWN TO INVENTOR	7/12/2011	MCO









SPECIFICATIONS				
AXIS	CAPACITY (METRIC)	CAPACITY (ENGISH)	OUTPUT	BRIDGE RESISTANCE
FX	15 KN	3400 LBF.	2.1 mV/V	350
FY	15 KN	3400 LBF.	2.1 mV/V	350
FZ	15 KN	3400 LBF.	1.0 mV/V	700
MX	350 NM	3100 IN-LBF.	2.3 mV/V	350
MY	350 NM	3100 IN-LBF.	2.3 mV/V	350
MZ	300NM	2700 IN-LBF.	2.7 mV/V	700

NON-LINEARITY	< 1% OF FULL SCALE
HYSTERESIS	< 1% OF FULL SCALE
CROSSTALK	< 5% OF FULL SCALE
EXCITATION	10 VDC NOMINAL 15 VDC MAX.
POLARITY	CONFORMS TO S.A.E. J-211
MASS	470g

DO NOT SCALE DRAWING — THIRD ANGLE PROJECTION

TOLERANCES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01; ANGLES ±0.5°; FINISH 1.6. REMOVE BURRS & BREAK SHARP EDGES

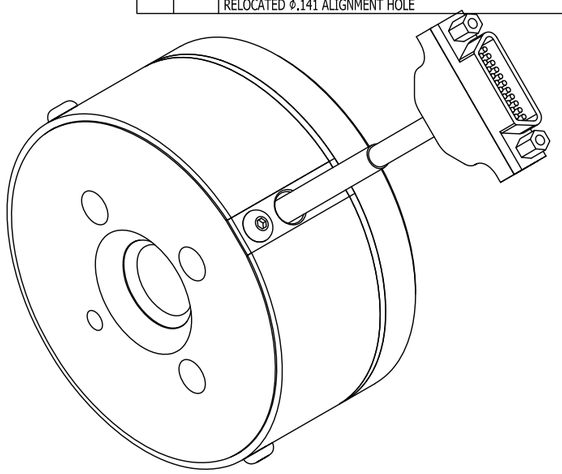
PROJECT NO.:
MATERIAL:
HEAT TREAT:
FINISH:
DRAWN BY: moconnor — DATE: 7/12/2011
CHECKED BY: — DATE:
ENGINEER: — DATE:

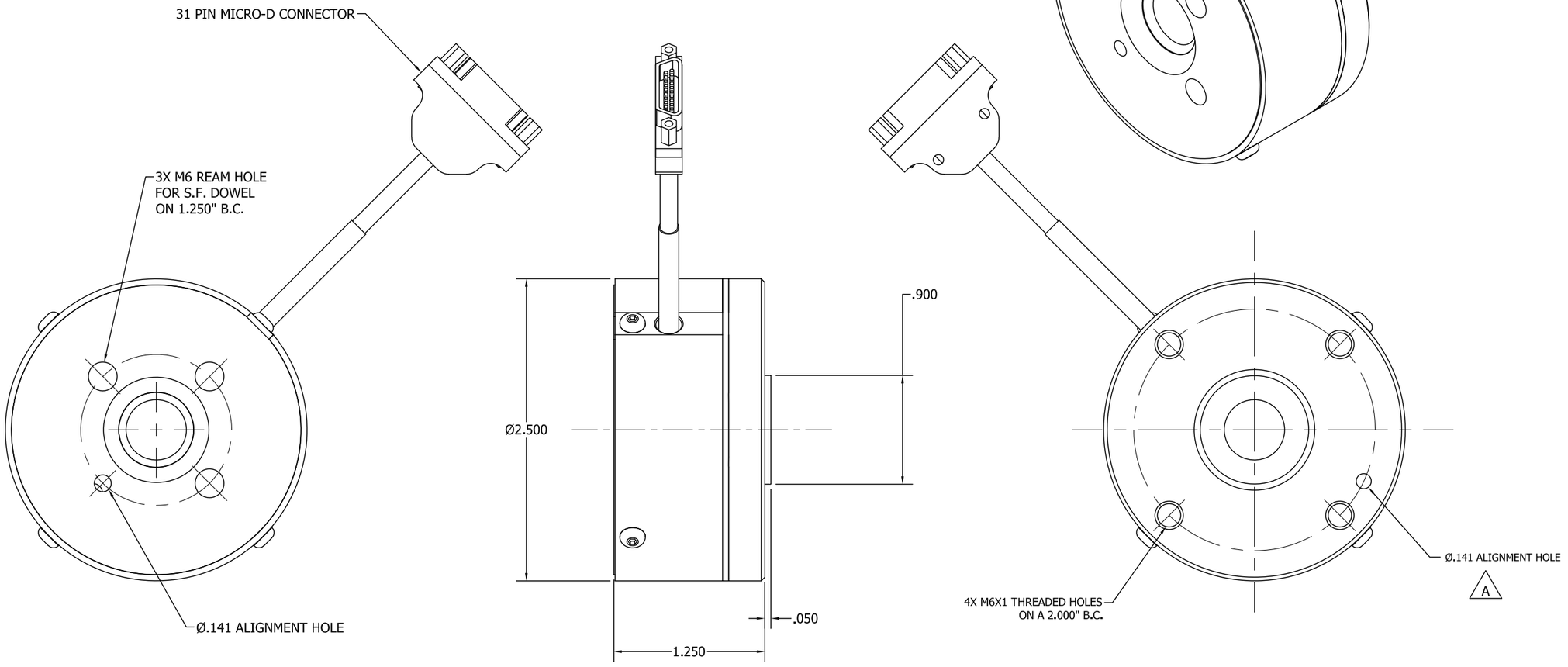
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: THOR FEMUR LOAD CELL

SIZE: B | SHEET: 1 OF 1 | SCALE: .75 : 1 | DRAWING NO.: SA572-S120 | REV: A

REVISION HISTORY				
REV.	ZONE	DESCRIPTION	DATE	BY
A		REMOVE (RIGHT SIDE ONLY) FROM POLARITY SPECIFICATION; RELOCATED ϕ.141 ALIGNMENT HOLE	3/14/2017	DW





SPECIFICATIONS				
CH.	CAPACITY (METRIC)	CAPACITY (ENGLISH)	OUTPUT	BRIDGE RESISTANCE
FX	22.24 kN	5000 LBF.	2.4 mV/V	350
FY	13.34 kN	3000 LBF.	0.8 mV/V	700
FZ	13.34 kN	3000 LBF.	2.0 mV/V	350

NON-LINEARIT	< 1% OF FULL SCALE
HYSTERESIS	< 1% OF FULL SCALE
CROSSTALK	< 5% OF FULL SCALE
EXCITATION	10 VDC NOMINAL 15 VDC MAX.
A POLARITY	CONFORMS TO S.A.E. J-211
MASS	0.94 LBS (426.3 g) LESS CABLE

UNLESS OTHERWISE SPECIFIED:
ALL MACHINED SURFACES 1.60 OR BETTER.

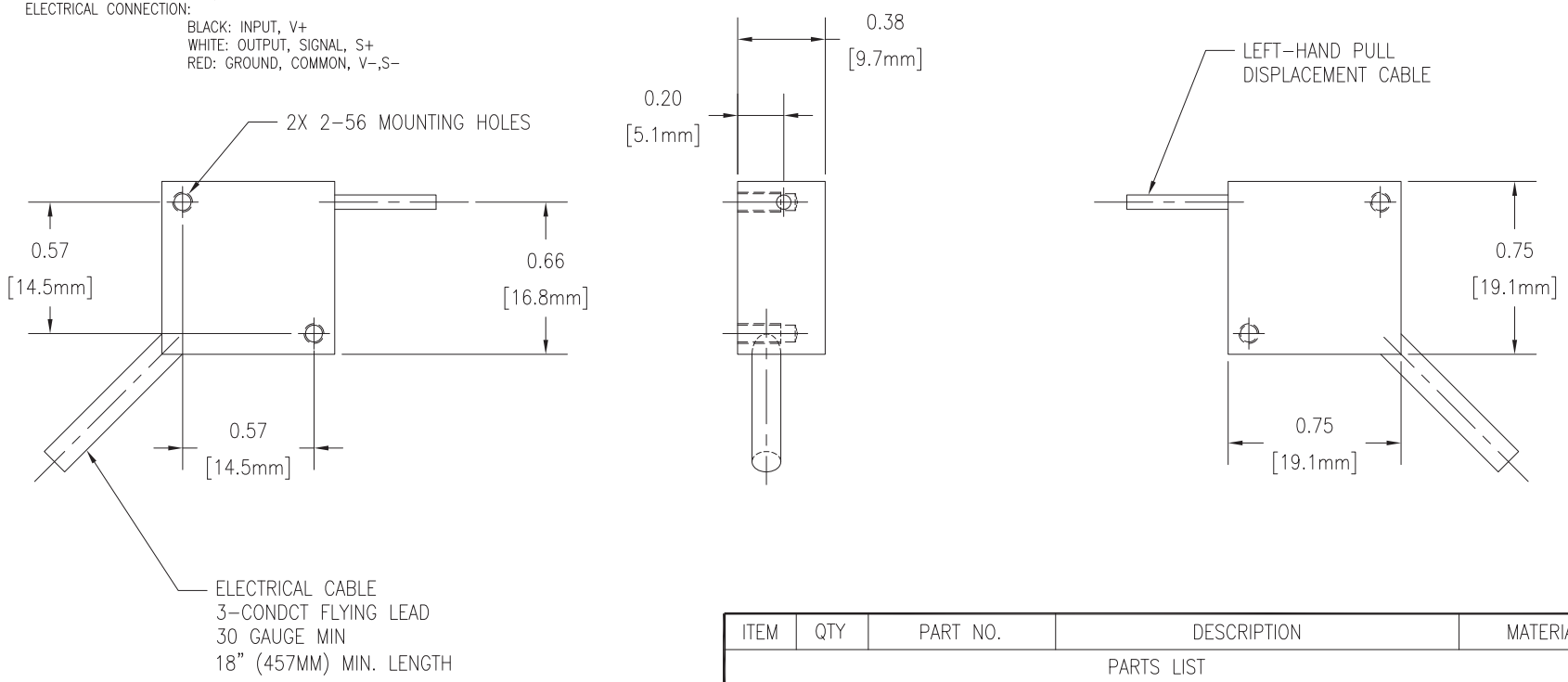
PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES
ANGLES ±.5°
DECIMALS
X ±1 mm
X.X ±0.1 mm
* DO NOT SCALE DRAWING *
THIRD ANGLE PROJECTION

ENGINEERED: L.BENFANT	DATE: 10/18/2011	MATERIAL:	DEPARTMENT OF TRANSPORTATION NHTSA
DRAWN: L.BENFANT	DATE: 10/19/2007	FINISH:	
CHECKED: M.FINK	DATE: 10/19/12	HEAT TREAT:	
DEBUR AND BREAK ALL SHARP EDGES		QTY./ASSEMBLY:	DRAWING TITLE: ACETABULUM LOAD CELL ASS'Y, RIGHT
SCALE:	SIZE: A3	REVISION: A	QTY./DUMMY: 1
			DRAWING NUMBER: SA572-S129
			Page: 1 of1

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY

POTENTIOMETER TYPE 1-TURN, PRECISION, CONDUCTIVE PLASTIC
RESISTANCE: 5K ohms ±10%
OUTPUT SIGNAL: ANALOG SIGNAL FROM 0 TO SUPPLY VOLTAGE (VOLTAGE DIVIDER CIRCUIT)
INDEPENDENT LINEARITY ERROR: ±1.0% MAX. PER VRCI-P-100A
OUTPUT SMOOTHNESS: 0.1% MAX.
NORMAL MASS: 0.5 oz. (15.0g)
CABLE TRAVEL: 1.5" (38mm) MAXIMUM TRAVEL
ELECTRICAL CONNECTION:
BLACK: INPUT, V+
WHITE: OUTPUT, SIGNAL, S+
RED: GROUND, COMMON, V-,S-



ITEM	QTY	PART NO.	DESCRIPTION	MATERIAL

PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS: ±1/64 DECIMALS: .X ±.1 .XX ±.01 .XXX ±.005 ANGLES: ±.5° MACHINED: 125
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

	APPROVALS	DATE
DRAWN	D. Walker	12/14/2010
CHECKED		
ENGINEER		
APPROVED		

MATERIAL
HEAT TREAT
FINISH

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

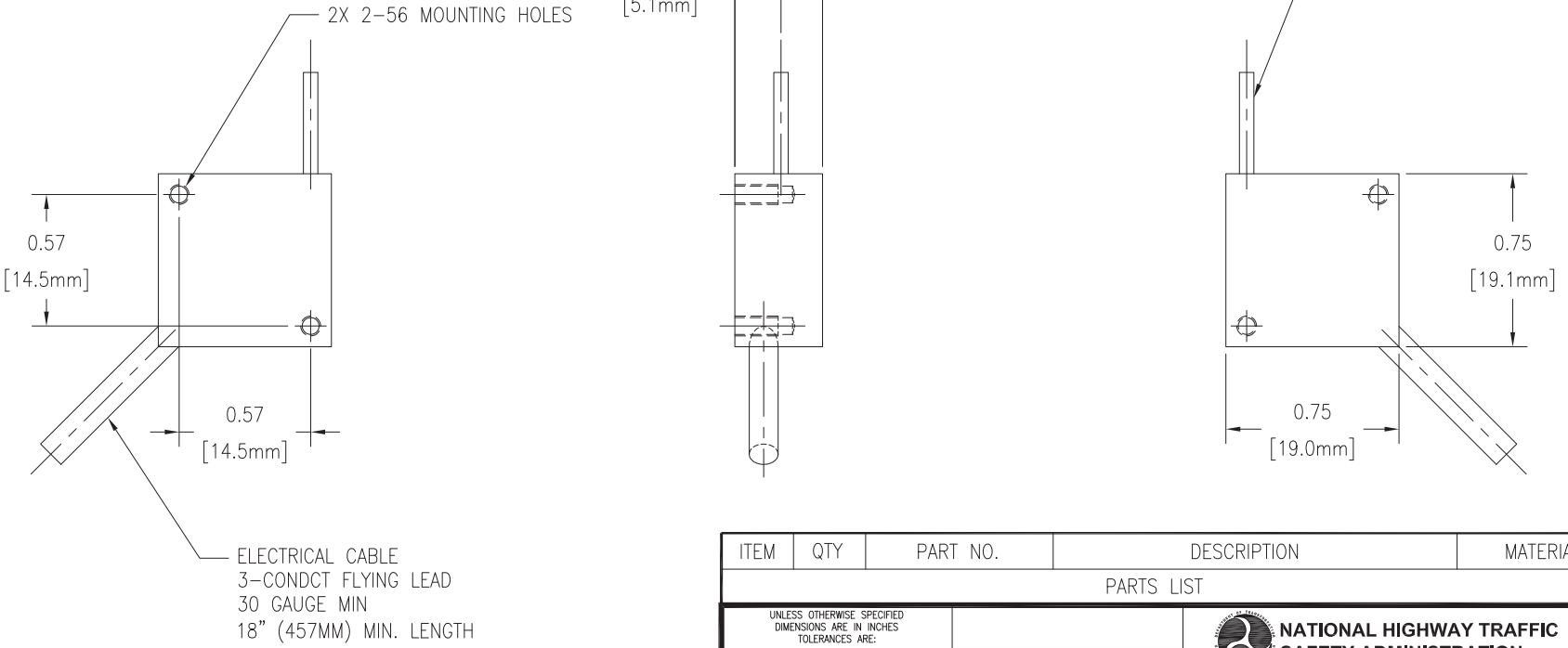
STRING POT,MINI (LEFT)

SIZE	DWG. NO.	REV.
B	SA572-S90-L	

SCALE 2:1 SHEET 1 OF 1

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY

POTENTIOMETER TYPE 1-TURN, PRECISION, CONDUCTIVE PLASTIC
RESISTANCE: 5K ohms ±10%
OUTPUT SIGNAL: ANALOG SIGNAL FROM 0 TO SUPPLY VOLTAGE (VOLTAGE DIVIDER CIRCUIT)
INDEPENDENT LINEARITY ERROR: ±1.0% MAX. PER VRCI-P-100A
OUTPUT SMOOTHNESS: 0.1% MAX.
NORMAL MASS: 0.5 oz. (15.0g)
CABLE TRAVEL: 1.5" (38mm) MAXIMUM TRAVEL
ELECTRICAL CONNECTION:
BLACK: INPUT, V+
WHITE: OUTPUT, SIGNAL, S+
RED: GROUND, COMMON, V-,S-



ITEM	QTY	PART NO.	DESCRIPTION	MATERIAL

PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS: ±1/64 DECIMALS: .X ±.1 .XX ±.01 .XXX ±.005 ANGLES: ±.5° MACHINED: 125
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

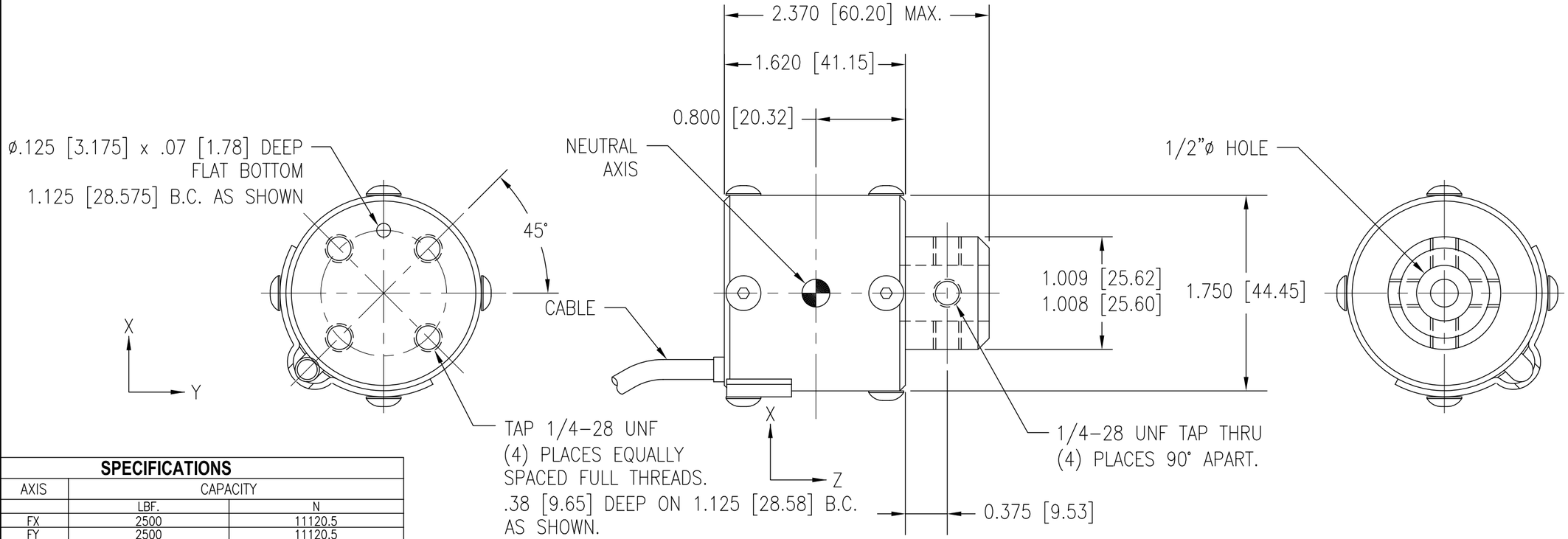
APPROVALS	DATE
DRAWN D. Walker	12/14/2010
CHECKED	
ENGINEER	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

STRING POT,MINI (RIGHT)

SIZE B | DWG. NO. SA572-S90-R | REV.
SCALE 2:1 | SHEET 1 OF 1

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY



SPECIFICATIONS

AXIS	CAPACITY	
	LBF.	N
FX	2500	11120.5
FY	2500	11120.5
FZ	2500	11120.5
	IN–LBF	Nm
MX	3500	395.5
MY	3500	395.5

OUTPUT AT CAPACITY: 1MV/V MINIMUM
NONLINEARITY < 1% OF FULL SCALE
CROSSTALK < 5% OF FULL SCALE
WEIGHT < 1.105LBS/.501 kg (CABLES NOT INCLUDED)

SIGNAL OUTPUT MUST BE COMPATIBLE WITH AND RECORDABLE IN A DATA CHANNEL AS DEFINED BY SAE J211.

FREE AIR RESONANT FREQUENCY: 5000 Hz FORCES MIN.
3000 Hz MOMENTS MIN.

OPERATING TEMPERATURE: 0° TO 200° F.
THERMAL SENSITIVITY: (60° TO 80°F) £.03% OF READING /F°

MATERIAL: THE LOAD BEARING STRUCTURE OF THE LOAD CELL, INCLUDING PROVISIONS FOR THE LOAD CELL MOUNTING, ARE OF METAL OR METAL ALLOYS. NON–LOAD BEARING PARTS OF THE LOAD CELL, INTERNALLY AND/OR EXTERNALLY, INCLUDING WIRES AND THEIR ATTACHMENTS, MAY BE MADE OF ANY MATERIAL PROVIDING THEY DO NOT INTERFERE WITH THE PERFORMANCE OF THE LOAD CELL OR THE TRANSMISSION OF THE LOAD CELL SIGNALS.

AXIS SHOW ILLUSTRATE THEIR ORIENTATION WITH RESPECT TO THE INSTRUMENTATION; THEY ARE NOT MEANT TO INDICATE DIRECTION OF POSITIVE POLARITY.

ITEM	QTY	PART NO.	DESCRIPTION	MATERIAL

PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS: ±1/64 DECIMALS: .X ±.1 .XX ±.01 .XXX ±.005 ANGLES: ±.5° MACHINED: 125
ASME Y14.5M – 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

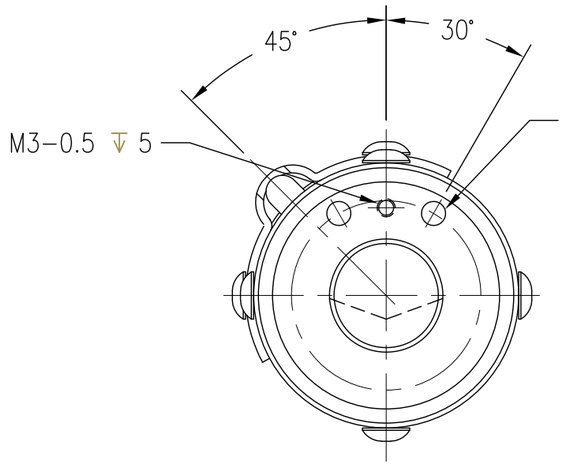
APPROVALS	DATE
DRAWN D. WALKER	1/10/2002
CHECKED	
ENGINEER H. Pritz	
APPROVED	

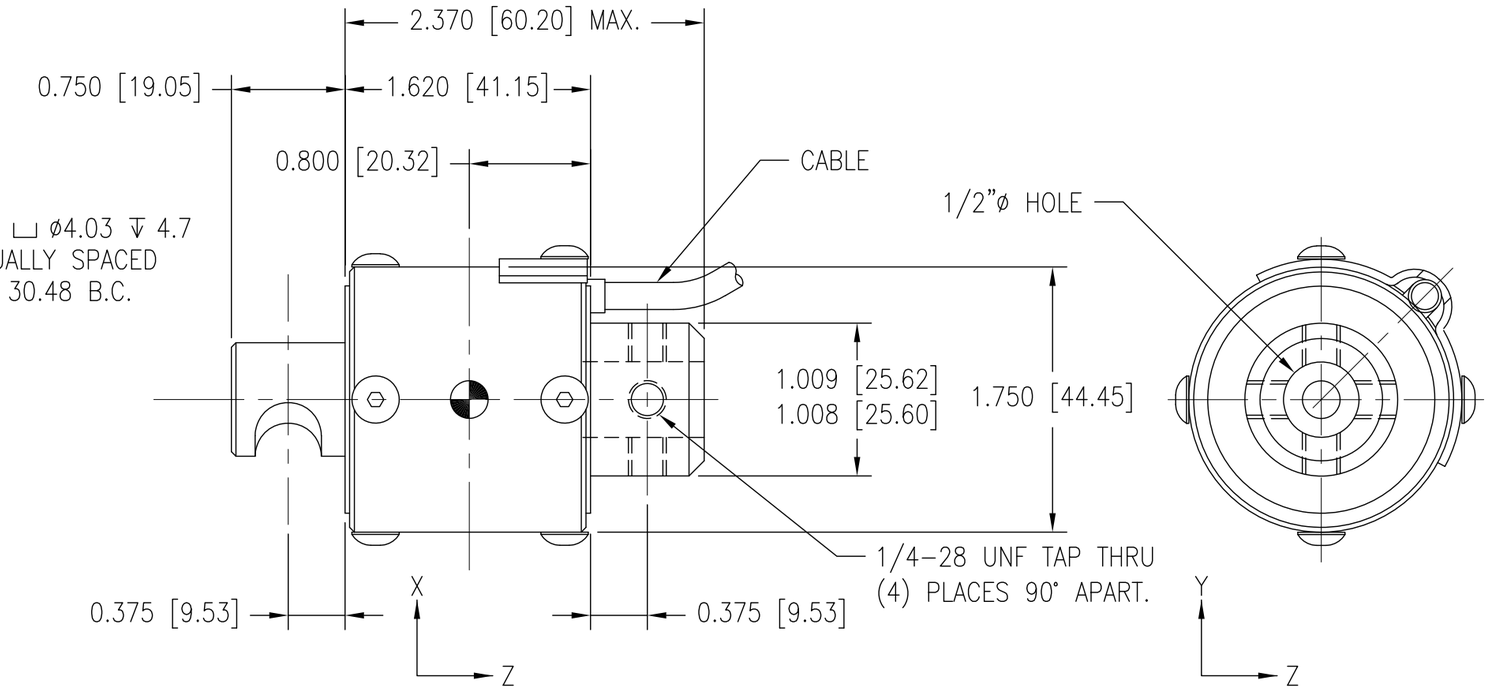
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

FIVE CHANNEL UPPER TIBIA LOAD CELL THOR–50M

SIZE B | DWG. NO. SA572–S32 | REV.
SCALE 1:1 | SHEET 1 OF 1

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY





SPECIFICATIONS

AXIS	CAPACITY	
	LBF.	N
FX	2500	11120.5
FY	2500	11120.5
FZ	2500	11120.5
	IN–LBF	Nm
MX	3500	395.5
MY	3500	395.5

OUTPUT AT CAPACITY: 1MV/V MINIMUM
NONLINEARITY < 1% OF FULL SCALE
CROSSTALK < 5% OF FULL SCALE
WEIGHT < 1.105LBS/.501 kg (CABLES NOT INCLUDED)

SIGNAL OUTPUT MUST BE COMPATIBLE WITH AND RECORDABLE IN A DATA CHANNEL AS DEFINED BY SAE J211.

FREE AIR RESONANT FREQUENCY: 5000 Hz FORCES MIN.
3000 Hz MOMENTS MIN.

OPERATING TEMPERATURE: 0° TO 200° F.
THERMAL SENSITIVITY: (60° TO 80°F) ≤ .03% OF READING /F°

MATERIAL: THE LOAD BEARING STRUCTURE OF THE LOAD CELL, INCLUDING PROVISIONS FOR THE LOAD CELL MOUNTING, ARE OF METAL OR METAL ALLOYS. NON–LOAD BEARING PARTS OF THE LOAD CELL, INTERNALLY AND/OR EXTERNALLY, INCLUDING WIRES AND THEIR ATTACHMENTS, MAY BE MADE OF ANY MATERIAL PROVIDING THEY DO NOT INTERFERE WITH THE PERFORMANCE OF THE LOAD CELL OR THE TRANSMISSION OF THE LOAD CELL SIGNALS.

AXIS SHOW ILLUSTRATE THEIR ORIENTATION WITH RESPECT TO THE INSTRUMENTATION; THEY ARE NOT MEANT TO INDICATE DIRECTION OF POSITIVE POLARITY.

ITEM	QTY	PART NO.	DESCRIPTION	MATERIAL

PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS: ±1/64 DECIMALS: .X ±.1 .XX ±.01 .XXX ±.005 ANGLES: ±.5° MACHINED: 125
ASME Y14.5M – 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

APPROVALS	DATE
DRAWN D. WALKER	1/14/2002
CHECKED	
ENGINEER H. Pritz	
APPROVED	

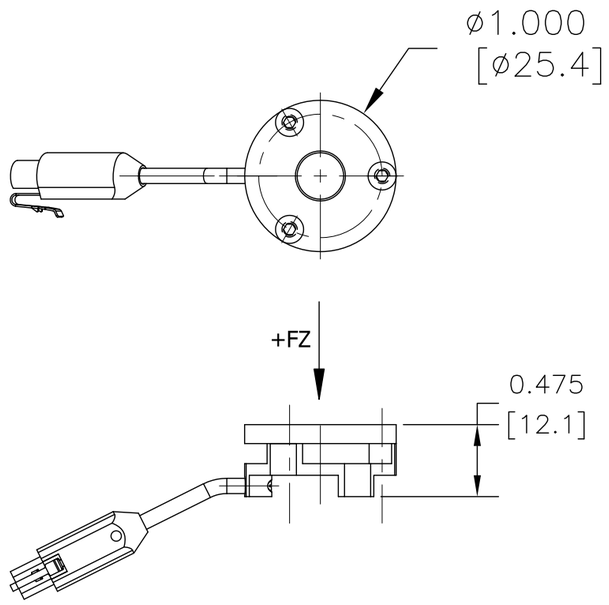
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

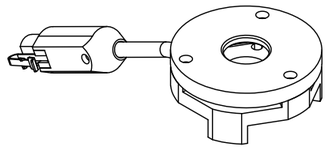
FIVE CHANNEL LOWER TIBIA LOAD CELL THOR–50M

SIZE	DWG. NO.	REV.
B	SA572–S33	

SCALE 1:1 SHEET 1 OF 1

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY





SPECIFICATIONS				
AXIS	CAPACITY (METRIC)	CAPACITY (ENGLISH)	OUTPUT	BRIDGE RESISTANCE
FZ	4.45 KN	1000 LBF.	1.0 mV/V	360 OHM

NON–LINEARITY	<1% OF FULL SCALE
HYSTERESIS	<1% OF FULL SCALE
POLARITY	CONFORMS TO S.A.E. J–211

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

FRACTIONS: ±1/64
DECIMALS: .X ±.1, .XX ±.01, XXX ±.005
ANGLES: ±.5°
MACHINED: 125
ASME Y14.5M – 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT

FINISH

APPROVALS	DATE
DRAWN D. WALKER	3/23/2016
CHECKED	
ENGINEER	
APPROVED	

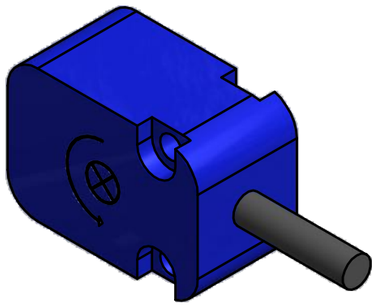
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

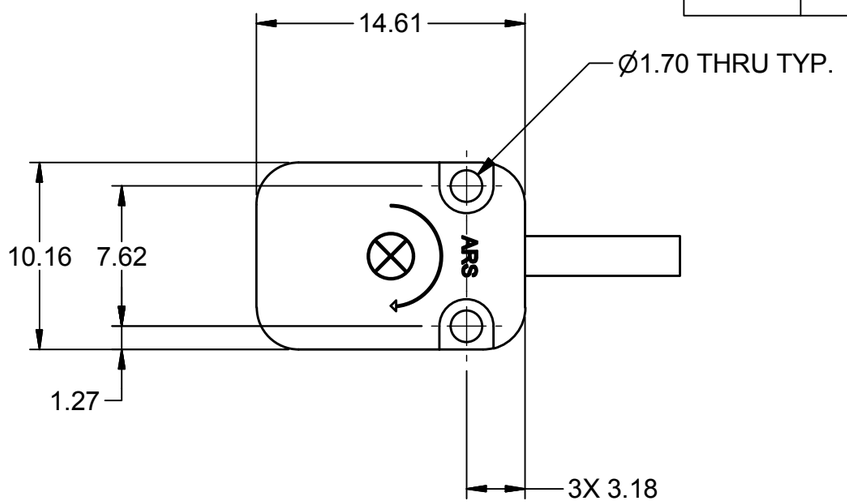
Ø1.0 ACHILLES LOAD CELL THOR–50M

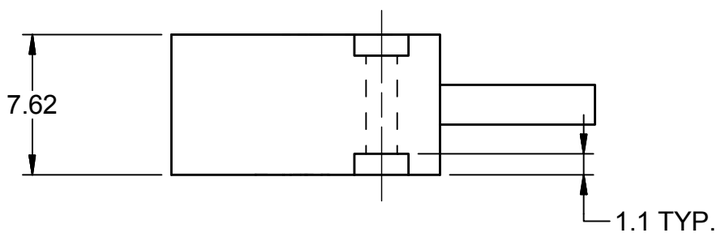
SIZE	DWG. NO.	REV.
B	SA572–S126	

SCALE .75:1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	A	RELEASED TO PRODUCTION	AB		04/30/2013
	B	ADDED NHTSA TITLE BLOCK, ADDED AXIS OF ROTATION SYMBOL	DW		5/20/2014
	C	MASS WAS 3g; BANDWITH WAS 0-300 Hz OR 0-600 Hz (DC RESPONSE); CURRENT WAS 6mA NOMINAL; NOISE WAS 0.15% (RMS FULL SCALE) ADDED PERFORMANCE SPECIFICATIONS	DW		3/31/2016







Test Procedure:
1) Mount the ARS unit to the shock anvil such that the axis of rotation of ARS is parallel to the axis of the imparted shock pulse.

2) Subject ARS to linear acceleration haversine pulse with peak between 500g and 550g and a pulse width less than 3.5ms, measured at 10% of peak acceleration, when filtered at SAE Class 1000.

3)Record ARS output and filter at SAE Class 180.

Performance requirements:
ARS output should be within ±100 deg/second.

SPECIFICATIONS:

C	MASS:	2.2g
	RANGE:	±8000 DEG/SEC
	BANDWIDTH:	0-2000 Hz (DC RESPONSE)
	NOISE:	<0.30% (RMS FULL SCALE)
	EXCITATION:	4.9-14.0 VDC
	CURRENT:	4mA NOMINAL
	ZERO OUTPUT:	±200mV
	FULL SCALE OUTPUT:	±2V NOMINAL

PERFORMANCE:

C	CROSS AXIS SENSITIVITY:	<1.0%
	NON-LINEARITY:	<0.5% FULL SCALE
	INFLUENCE OF LINEAR ACCELERATION:	<0.1 DEG/SEC/G TYPICAL
	THERMAL DRIFT:	-40 TP +80C
	ZERO:	±1 DEG/SEC
	SENSITIVITY:	±5%

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5° ✓
X.X ±.2
X.XX ±.1
X.XXX ±.01
ASME Y14.5M – 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN abarchock	5/1/2013
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

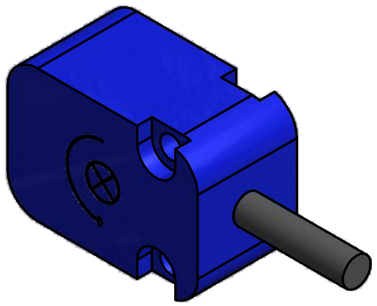
ANGULAR RATE SENSOR–8K

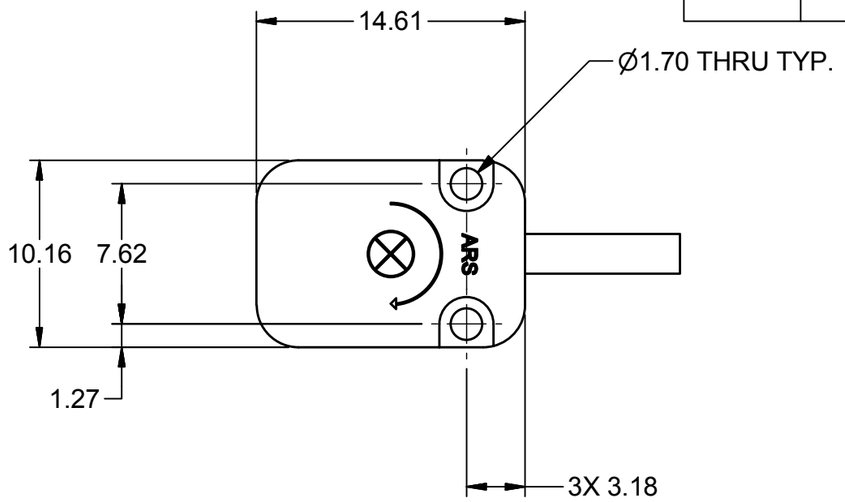
INSTRUMENTATION

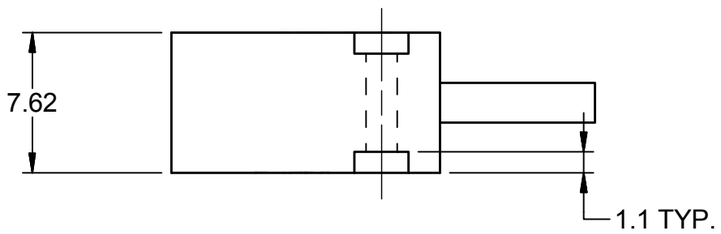
SIZE A3 | DRAWING NUMBER SA572–S56 | REV C
SCALE: 3:1 | SHEET 1 OF 1

ARS Sensor.ipt

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	A	RELEASED TO PRODUCTION	AB		04/30/2013
	B	ADDED NHTSA TITLE BLOCK, ADDED AXIS OF ROTATION SYMBOL	DW		5/21/2014
	C	MASS WAS 3g; BANDWITH WAS 0-16500 Hz (DC RESPONSE); CURRENT WAS 6mA NOMINAL; ADDED PERFORMANCE SPECIFICATIONS	DW		3/31/2016







Test Procedure:
1) Mount the ARS unit to the shock anvil such that the axis of rotation of ARS is parallel to the axis of the imparted shock pulse.

2) Subject ARS to linear acceleration haversine pulse with peak between 500g and 550g and a pulse width less than 3.5ms, measured at 10% of peak acceleration, when filtered at SAE Class 1000.

3)Record ARS output and filter at SAE Class 180.

Performance requirements:
ARS output should be within ±100 deg/second.

SPECIFICATIONS:

C	MASS:	2.2g
	RANGE:	±12000 DEG/SEC
	BANDWIDTH:	0-2000 Hz (DC RESPONSE)
	NOISE:	<0.25% (RMS FULL SCALE)
	EXCITATION:	4.9-14.0 VDC
	CURRENT:	4mA NOMINAL
	ZERO OUTPUT:	±200mV
	FULL SCALE OUTPUT:	±2V NOMINAL

PERFORMANCE:

C	CROSS AXIS SENSITIVITY:	<1.0%
	NON-LINEARITY:	<0.5% FULL SCALE
	INFLUENCE OF LINEAR ACCELERATION:	<0.1 DEG/SEC/G TYPICAL
	THERMAL DRIFT:	-40 TP +80C
	ZERO:	±1 DEG/SEC
	SENSITIVITY:	±2%

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5° ✓
X.X ±.2
X.XX ±.1
X.XXX ±.01
ASME Y14.5M – 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN abarchock	5/1/2013
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

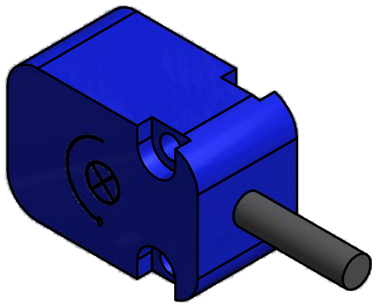
ANGULAR RATE SENSOR–12K

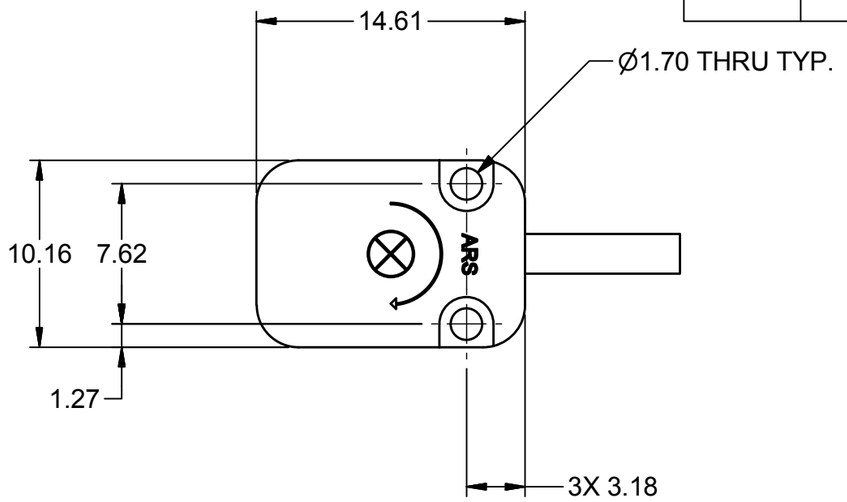
INSTRUMENTATION

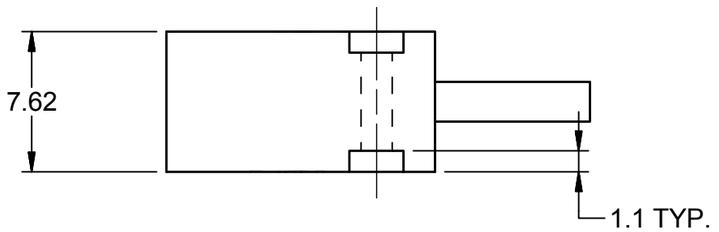
SIZE A3 | DRAWING NUMBER SA572–S57 | REV C
SCALE: 3:1 | SHEET 1 OF 1

ARS Sensor.ipt

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	A	RELEASED TO PRODUCTION	AB		04/30/2013
	B	ADDED NHTSA TITLE BLOCK, ADDED AXIS OF ROTATION SYMBOL	DW		5/21/2014
	C	MASS WAS 3g; BANDWITH WAS 0-300 Hz OR 0-2000 Hz (DC RESPONSE); NOISE WAS <1.5% DEG/SEC √Hz; CURRENT WAS 6mA NOMINAL; ADDED PERFORMANCE SPECIFICATIONS	DW		3/31/2016







Test Procedure:
1) Mount the ARS unit to the shock anvil such that the axis of rotation of ARS is parallel to the axis of the imparted shock pulse.

2) Subject ARS to linear acceleration haversine pulse with peak between 500g and 550g and a pulse width less than 3.5ms, measured at 10% of peak acceleration, when filtered at SAE Class 1000.

3)Record ARS output and filter at SAE Class 180.

Performance requirements:
ARS output should be within ±100 deg/second.

SPECIFICATIONS:

C	MASS:	2.2g
	RANGE:	±18000 DEG/SEC
	BANDWIDTH:	0-2000 Hz (DC RESPONSE)
	NOISE:	<0.35% (RMS FULL SCALE)
	EXCITATION:	4.9-14.0 VDC
	CURRENT:	4mA NOMINAL
	ZERO OUTPUT:	±200mV
	FULL SCALE OUTPUT:	±2V NOMINAL

PERFORMANCE:

C	CROSS AXIS SENSITIVITY:	<1.0%
	NON-LINEARITY:	<0.5% FULL SCALE
	INFLUENCE OF LINEAR ACCELERATION:	<0.1 DEG/SEC/G TYPICAL
	THERMAL DRIFT:	-40 TP +80C
	ZERO:	±5 DEG/SEC
	SENSITIVITY:	±2%

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5° ✓
X.X ±.2
X.XX ±.1
X.XXX ±.01
ASME Y14.5M – 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN abarchock	5/1/2013
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

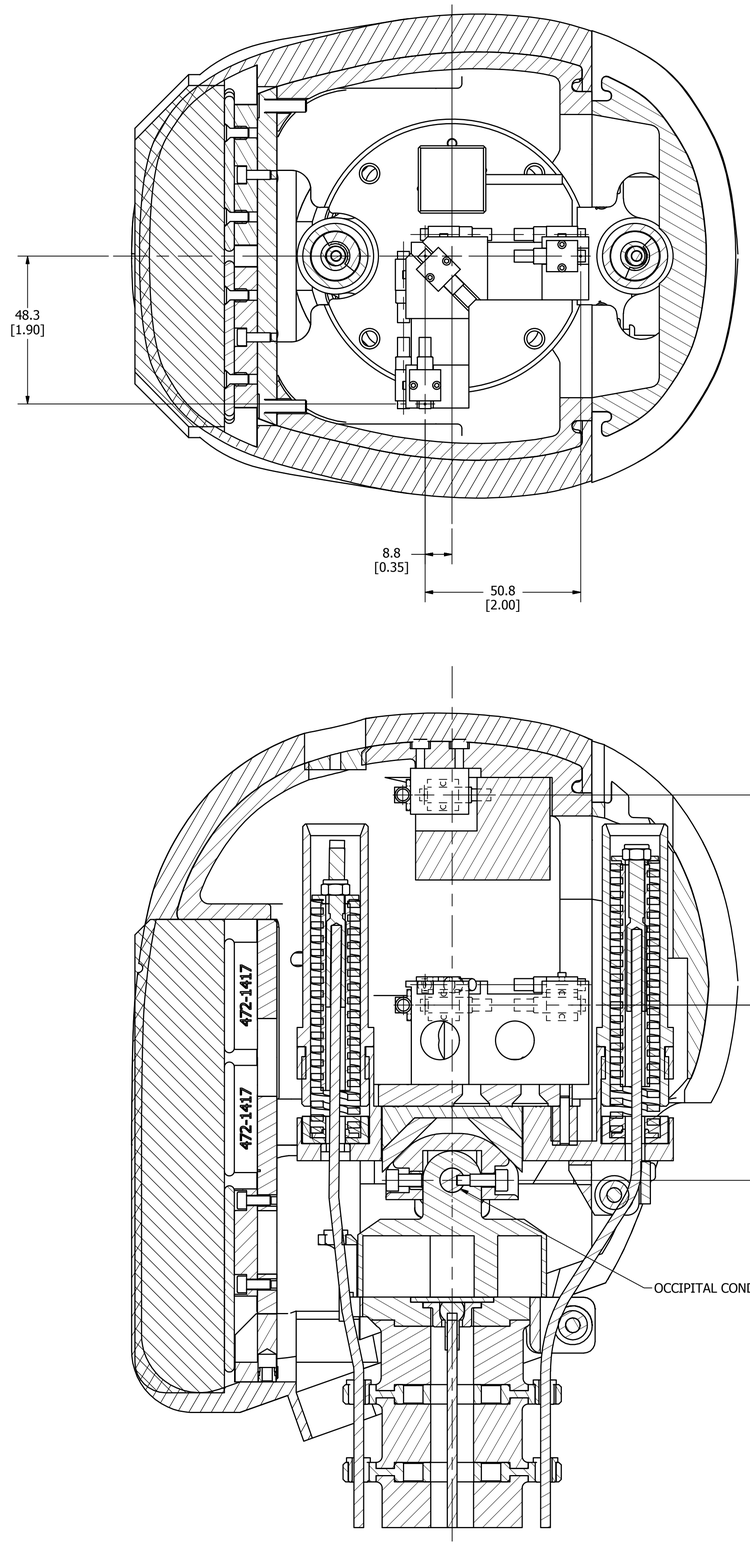
ANGULAR RATE SENSOR–18K

INSTRUMENTATION

SIZE	DRAWING NUMBER	REV
A3	SA572–S58	C

SCALE: 3:1 SHEET 1 OF 1

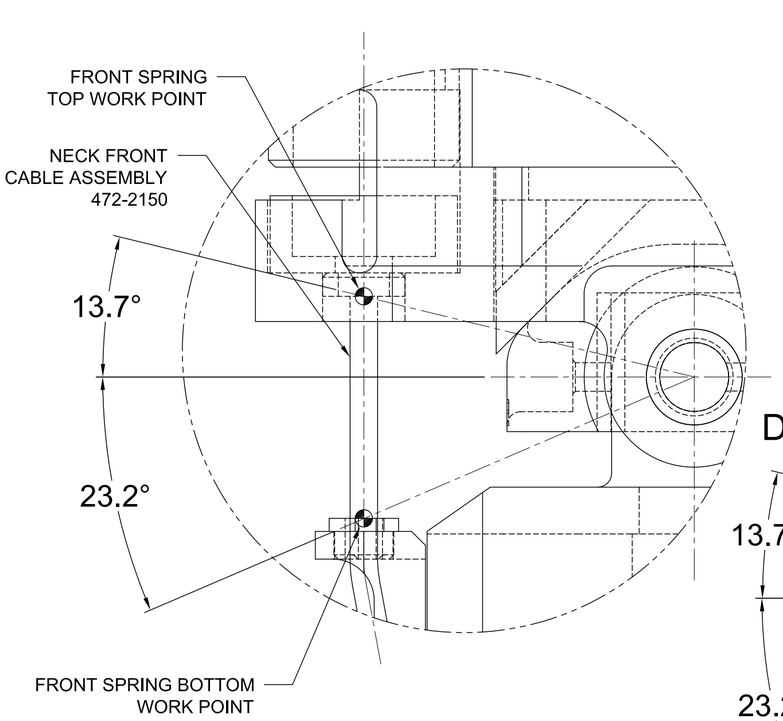
ARS Sensor.ipt



UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL ANGLES MACHINED: X ±.5 ~.57 X.x ±.2 X.XX ±.1 X.XXX ±.01 ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	ARRANGEMENT OF NINE ACCEL. ARRAY HEAD THOR-50M
	DRAWN Dave Walker	8/23/2013	
	CHECKED		
MATERIAL	QA		
HEAT TREAT	APPROVED		SIZE A1 DRAWING NUMBER 472-9520 REV
FINISH			SCALE DO NOT SCALE DRAWING SHEET 1 OF 1

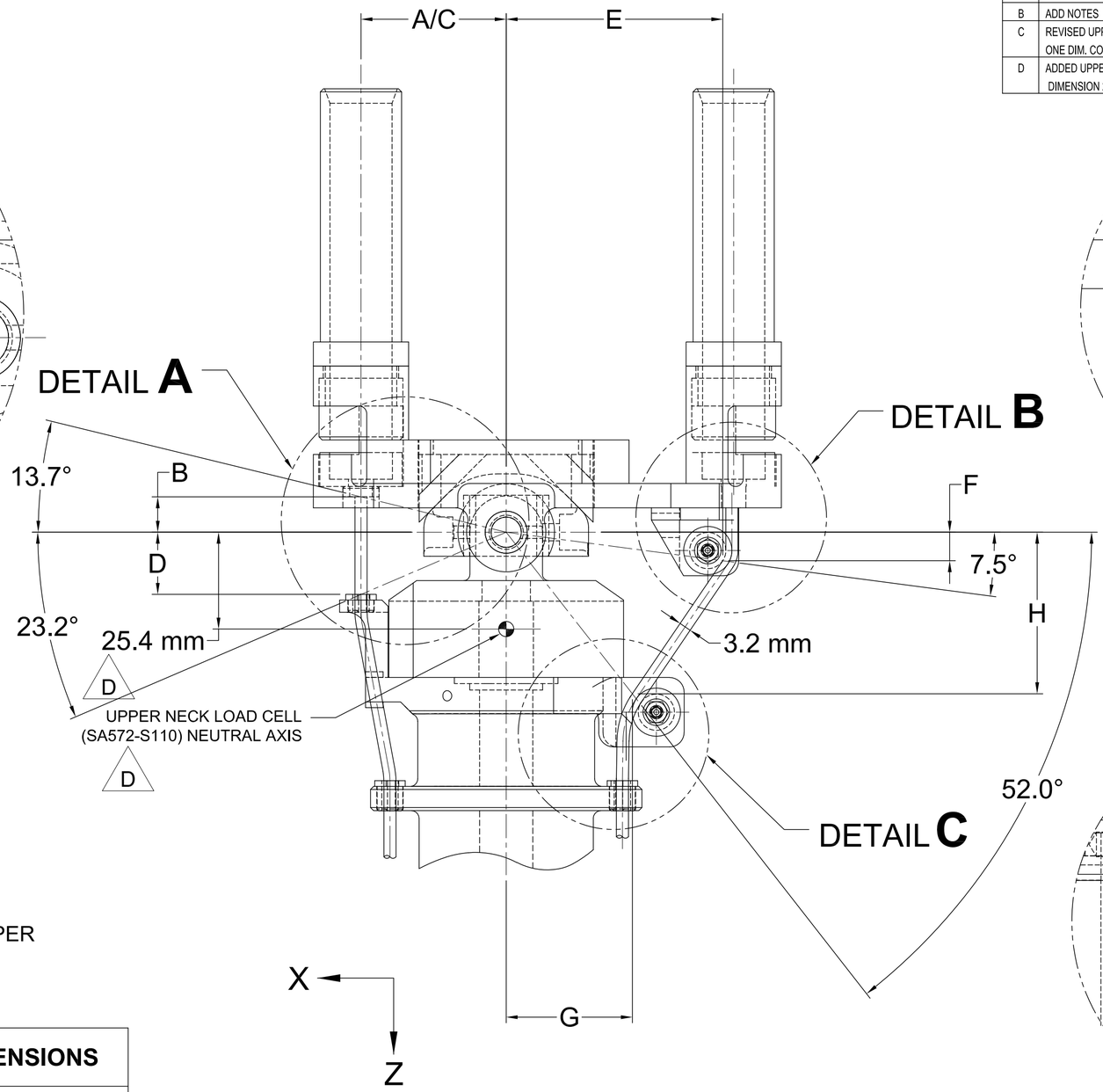
472-Head-Neck Assembly.iam

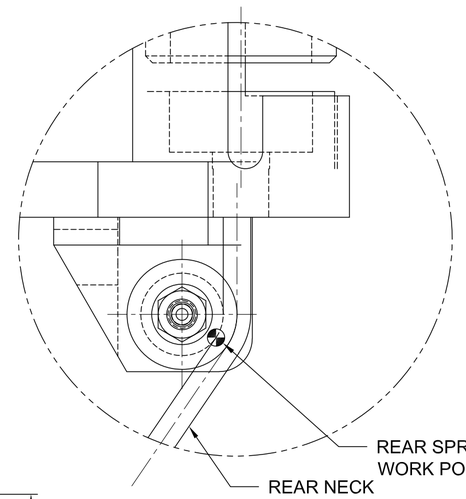
REVISION RECORD			
REV	DESCRIPTION	DATE	BY
A	REVISED DIMENSION TABLE	1-23-2014	DW
B	ADD NOTES	1-24-2014	DW
C	REVISED UPPER NECK INSTRUMENTATION SETUP DIMENSIONS TABLE TO SHOW ONE DIM. COLUMN	3-11-2014	DW
D	ADDED UPPER NECK LOAD CELL (SA572-S110) NEUTRAL AXIS AND DIMENSION 25.4 mm	12-17-2014	DW



DETAIL **A**

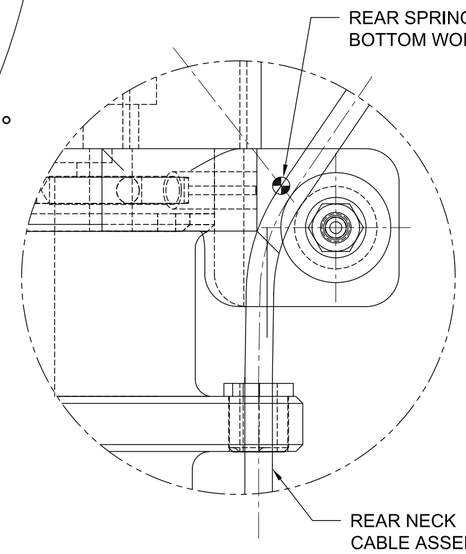
SCALE 1:2





DETAIL **B**

SCALE 1:2



DETAIL **C**

SCALE 1:2

B

NOTES:

THE NUMBERS TO BE USED TO PROCESS THE UPPER NECK ARE THE HIS DIMENSIONS

C

UPPER NECK INSTRUMENTATION SETUP DIMENSIONS		
	DIM.	**DESCRIPTION**
A	38.1mm	FRONT SPRING TOP X
B	-9.3mm	FRONT SPRING TOP Z
C	38.0mm	FRONT SPRING BOTTOM X
D	16.3mm	FRONT SPRING BOTTOM Z
E	-56.9mm	REAR SPRING TOP X
F	7.5mm	REAR SPRING TOP Z
G	-33.1mm	REAR SPRING BOTTOM X
H	42.4mm	REAR SPRING BOTTOM Z

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL ANGLES MACHINED
X ±.5 ±.5°
X.X ±.2
X.XX ±.1
X.XXX ±.01
ASME Y14.5M – 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT

FINISH

***V**EHICLE **R**ESEARCH and **T**EST **C**ENTER*

APPROVALS	DATE
DRAWN Dave Walker	8/21/2013
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

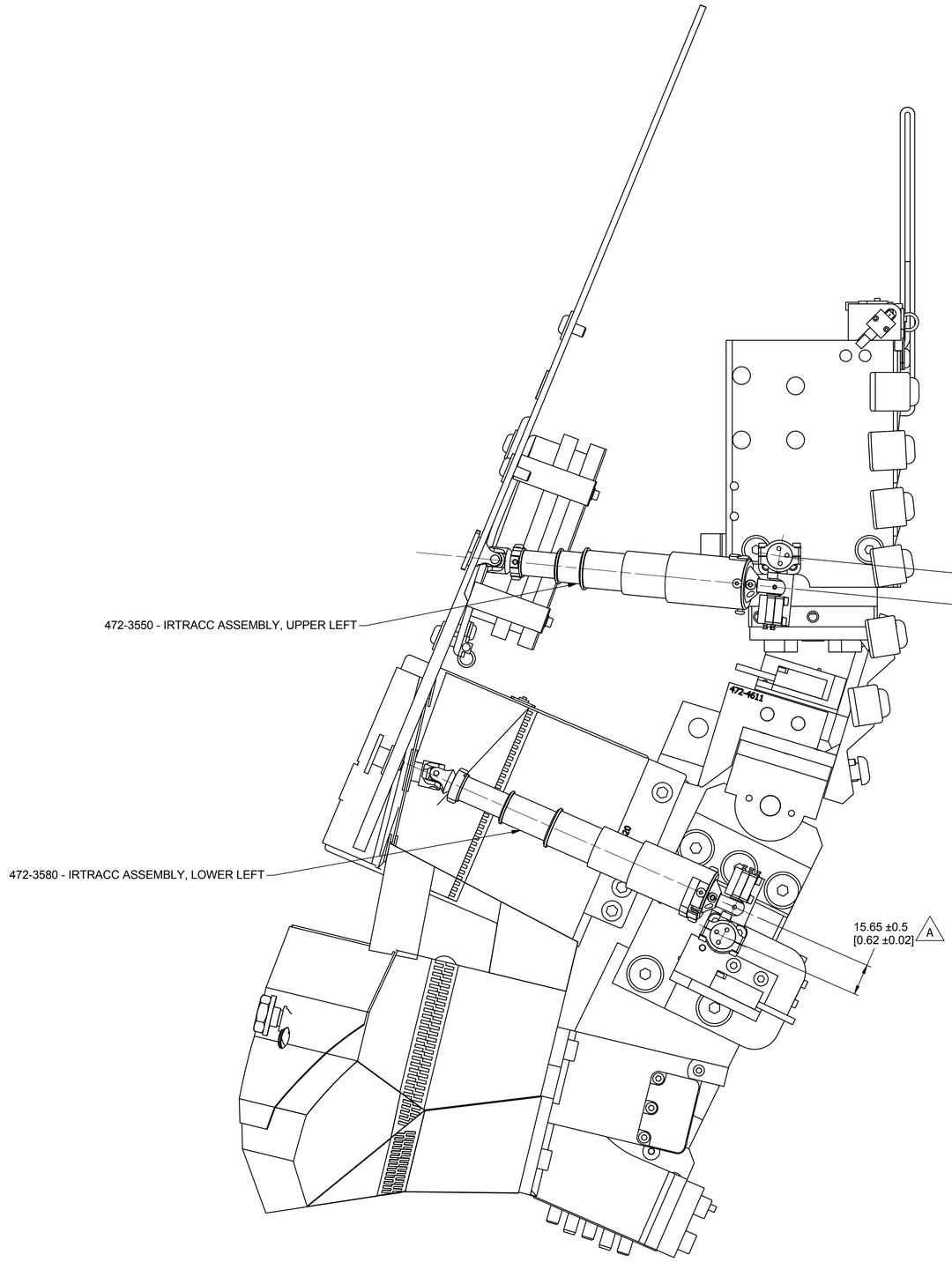
UPPER NECK ASSEMBLY – SETUP DIMENSIONS THOR–50M

SIZE A2 | DRAWING NUMBER 472–9500 | REV D

SCALE: | SHEET 1 OF 1

472-9500.dwg

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	DESIGNER
	A	DIMENSION 15.65 ±0.5 [0.62 ±0.02] WAS 15.4 [0.61]	7/25/2018	DW



UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL ANGLES MACHINED
X ±.5 ±.5°
X.X ±.2
X.XX ±.1
X.XXX ±.01
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

INTERP
MAT'L
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: Dave Walker	7/17/2013
CHECKED	
QA	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

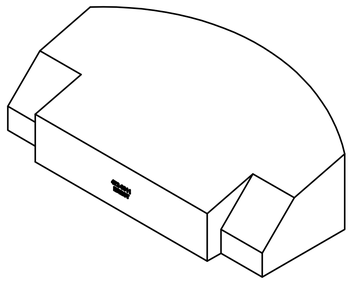
THORAX MECHANICAL ASSEMBLY
IRTRACC OFFSET
THOR-50M

SIZE A1 | DRAWING NUMBER 472-9510 | A
SCALE 0.5:1 | SHEET 1 OF 1

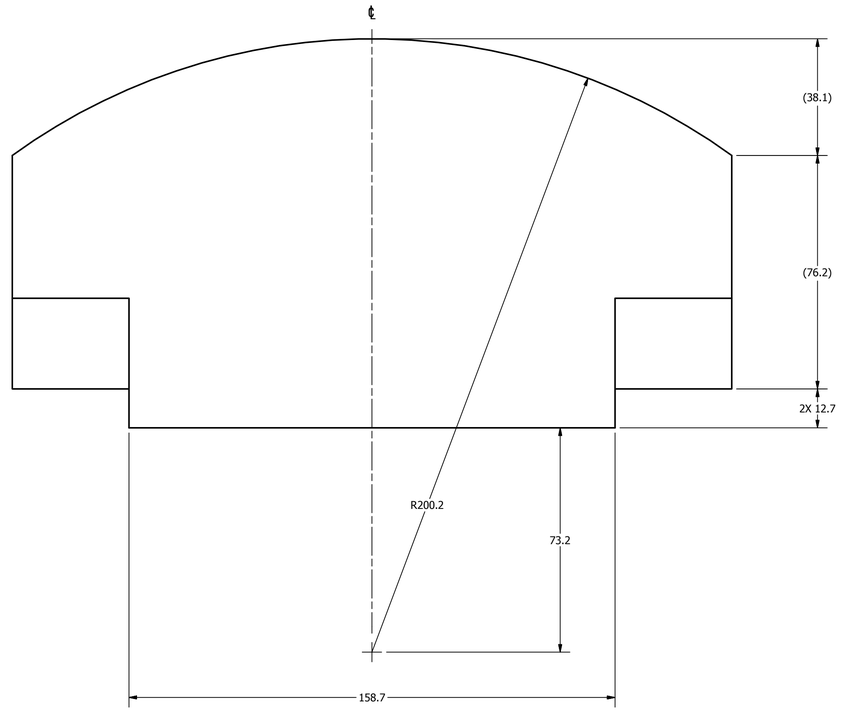
472-9510.iam

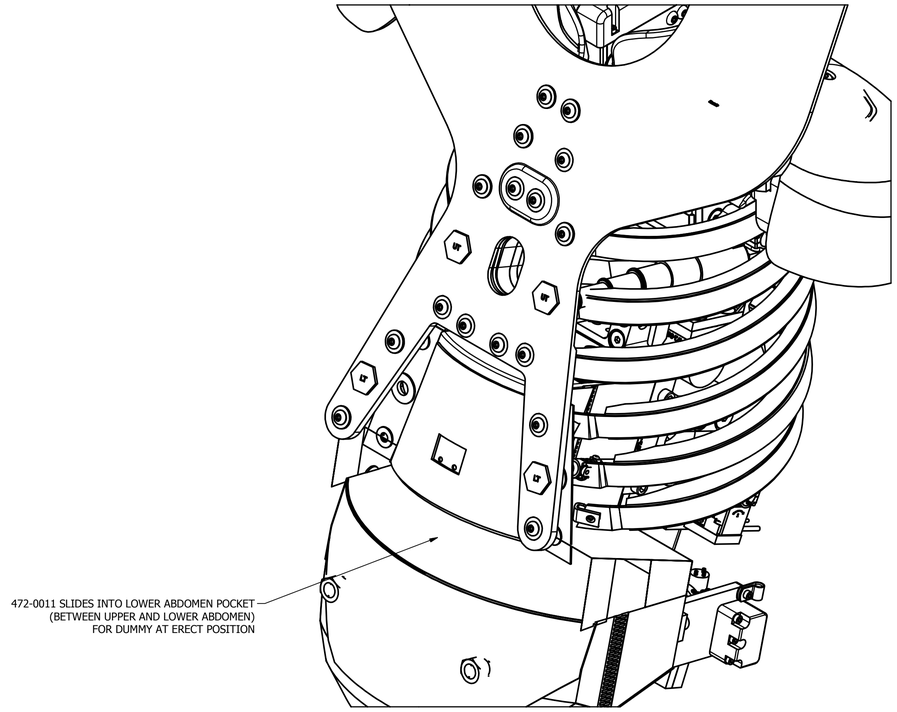
POSTURE FOAMS

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
70717	A	RENUMBERED FROM T1FDM011 AND CONVERTED TO METRIC FOR THOR M; ADD NOTE 3; REMOVE VENDOR DATA FROM NOTE 1; REDIMENSION ACROSS CL; ADD REFERENCE VIEW	BK	JW	1/28/2013

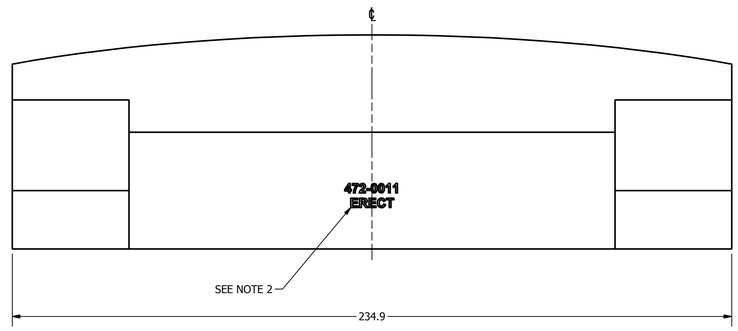


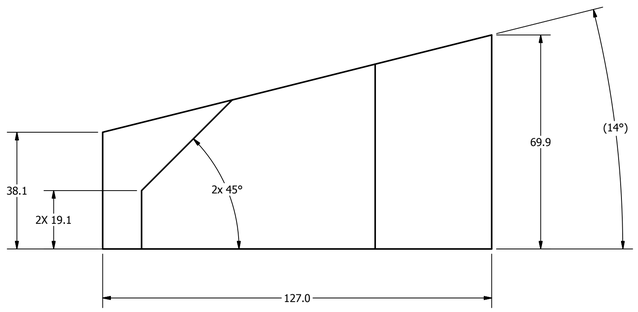
SCALE 1 / 2





△A FOAM LOCATION
REFERENCE VIEW
SCALE 1 / 2





NOTES:

△A 1. MATERIAL: 6 LB. CHARCOAL ESTER FOAM.

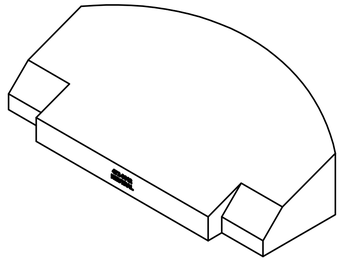
2. MARK PART NUMBER AND "ERECT" WHERE SHOWN.

△A 3. FOAM TOLERANCE:±1mm, UNLESS OTHERWISE NOTED.

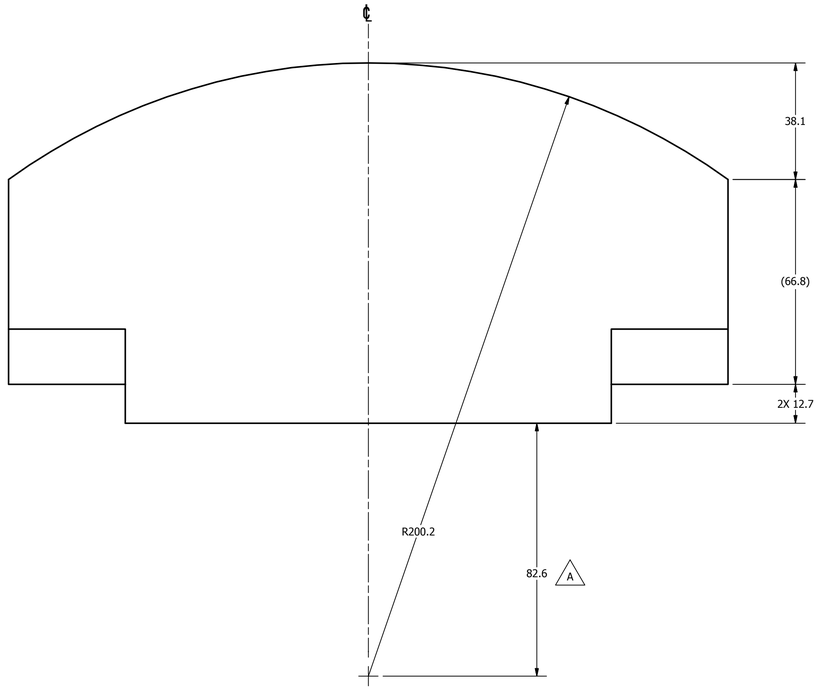
DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS X ±0.5 ±0.02 ±1° X.X ±0.1 ±0.01 X.XX ±0.05 X.XXX ±0.01 REMOVE BURRS & BREAK SHARP EDGES	DOCUMENT TITLE: LOWER ABDOMEN ERECT POSITION FOAM	
PROJECT NO.:			
MODEL: SEE NOTES	DRAWN: B. Kimes 1/28/2013		
NEXT ASSEMBLY QTY	HEAT TREAT:	PROVED BY: DATE:	SIZE: A1 SHEET: 1 of 1 DRAWING NO.: 472-0011 REV: A
TOTAL QTY IN DUMMY 1	FINISH:	ENGINEER: J. WANG DATE: 2/4/2013	SCALE: FULL

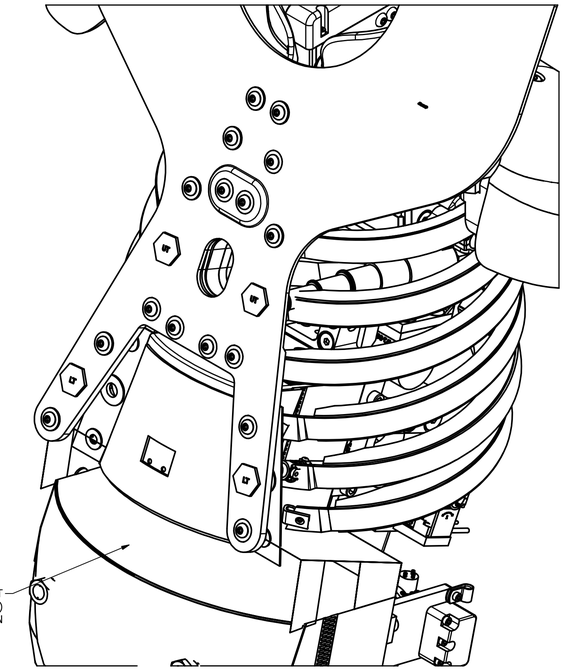
472-0011.ipt

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
70717	A	RENUMBERED FROM T1FDM012 AND CONVERTED TO METRIC FOR THOR M; ADD NOTE 3; REMOVE VENDOR DATA FROM NOTE 1; REDIMENSION ACROSS CL; ADD REFERENCE VIEW; 82.6 WAS 82.8	BK	JW	1/28/2013

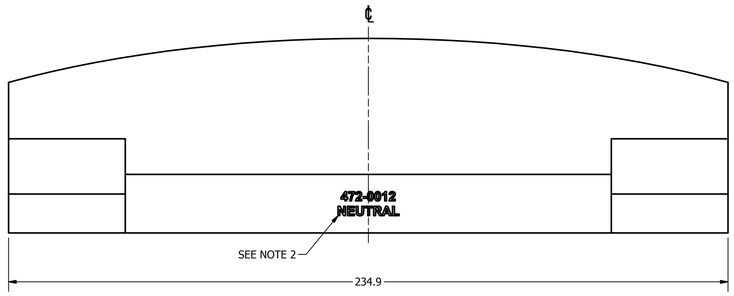


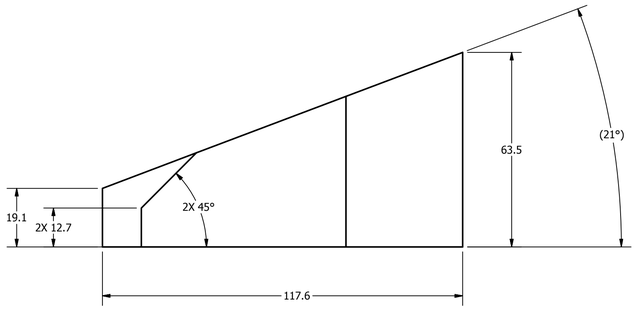
SCALE 1 / 2





A FOAM LOCATION
REFERENCE VIEW
SCALE 1 / 2





NOTES:

A 1. MATERIAL: 6 LB. CHARCOAL ESTER FOAM.

2. MARK PART NUMBER AND "NEUTRAL" WHERE SHOWN.

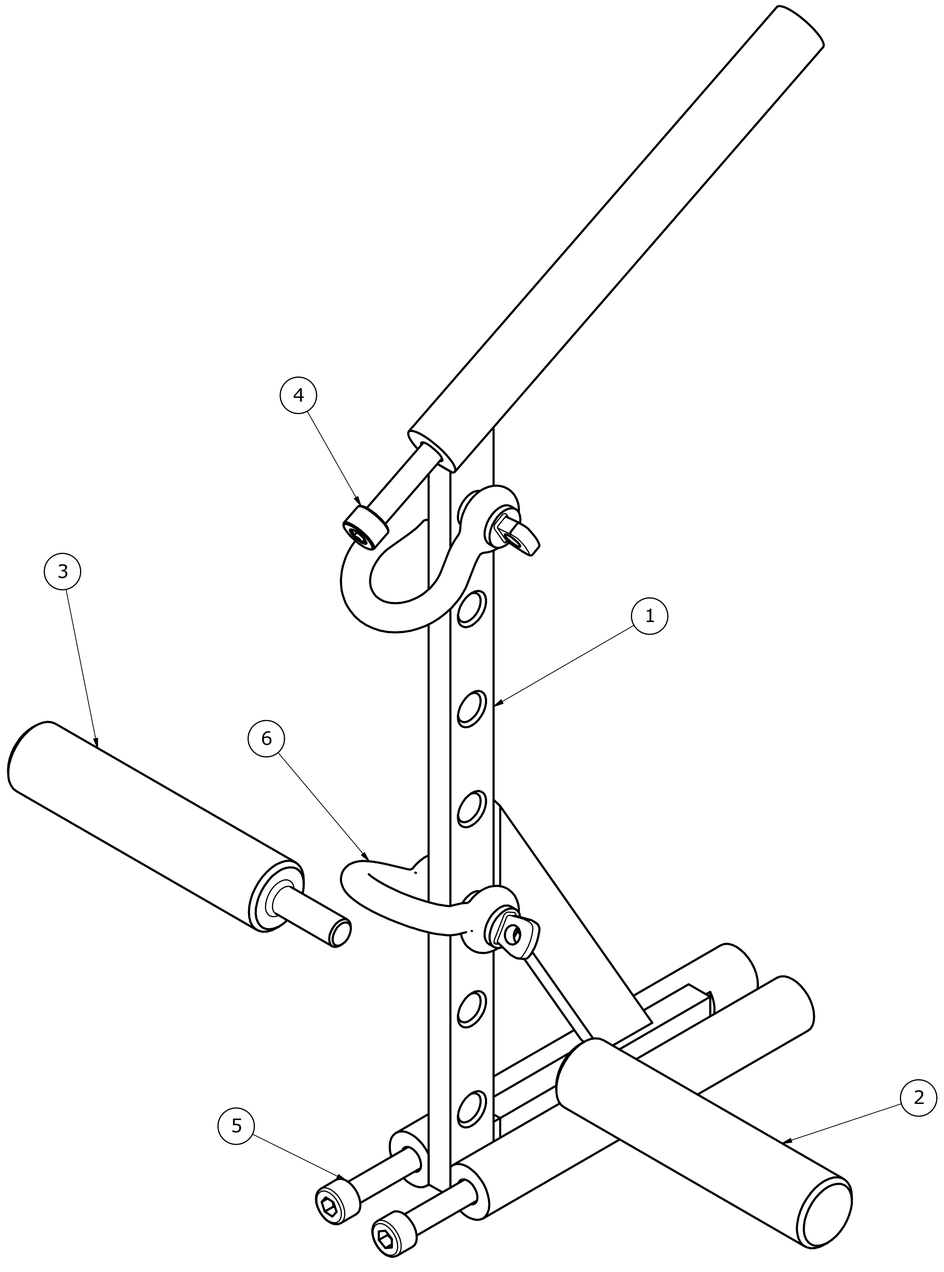
A 3. FOAM TOLERANCE:±1mm, UNLESS OTHERWISE NOTED.

		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS NOTED ON SHEET: DECIMAL ± ANGLES ± FINISH X .X ±0.5 ±0.5 125 X.X ±0.2 X.XX ±0.1 X.XXX ±0.05		
		PROJECT: NHTSA/VRTC	REMOVE BURRS & BREAK SHARP EDGES	DRAWING TITLE: LOWER ABDOMEN NEUTRAL POSITION FOAM	
		DRAWN: SEE NOTES	APPROVED: B. Kimes 1/28/2013		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: DATE:	SIZE: A1 SHEET: 1 OF 1	DRAWING NO.: 472-0012 REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: J. WANG DATE: 2/4/2013	SCALE: FULL	

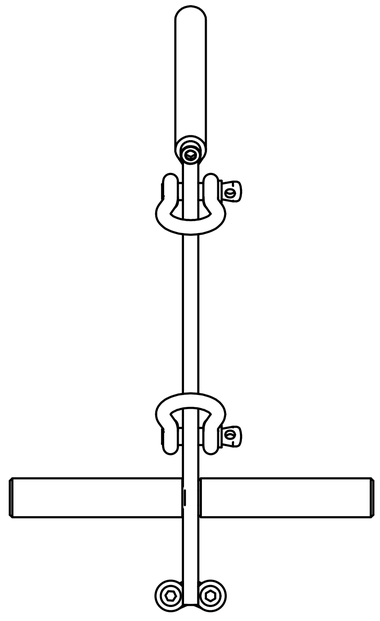
472-0012.ipt

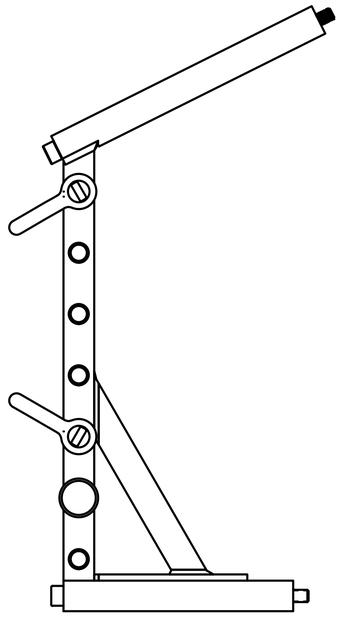
TOOLS

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RELEASED TO PRODUCTION	11/2/2011	DW
	B	MOVED HANDLE POSITION	12/16/2011	DW
	C	TITLE WAS LIFTING BRACKET ASSEMBLY; ITEM 1 DESCRIPTION WAS LIFTING BRACKET WELDMENT	3/7/2016	DW



SCALE 1 : 1





ITEM	QTY	PART NUMBER	DESCRIPTION
6	2	9002905	SHACKLE,w/ SCREW PIN 3/8"
5	2	5001120	SCREW, SHCS M8-1.25 x 160
4	1	5001121	SCREW, SHCS M8-1.25 x 200 LG.
3	1	W50-84106	HANDLE, THREADED ROD
2	1	W50-84104	HANDLE, THREADED HOLE
1	1	472-8101	STORAGE BRACKET WELDMENT

C

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN dwashenko	11/2/2011
CHECKED BJS	2/3/2012
ENG D. WASHENKO	2/10/2012
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

STORAGE BRACKET ASSEMBLY

THOR-50M

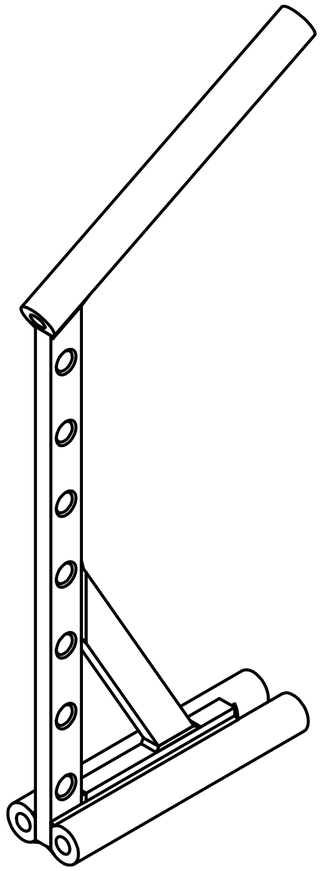
THIRD ANGLE PROJECTION

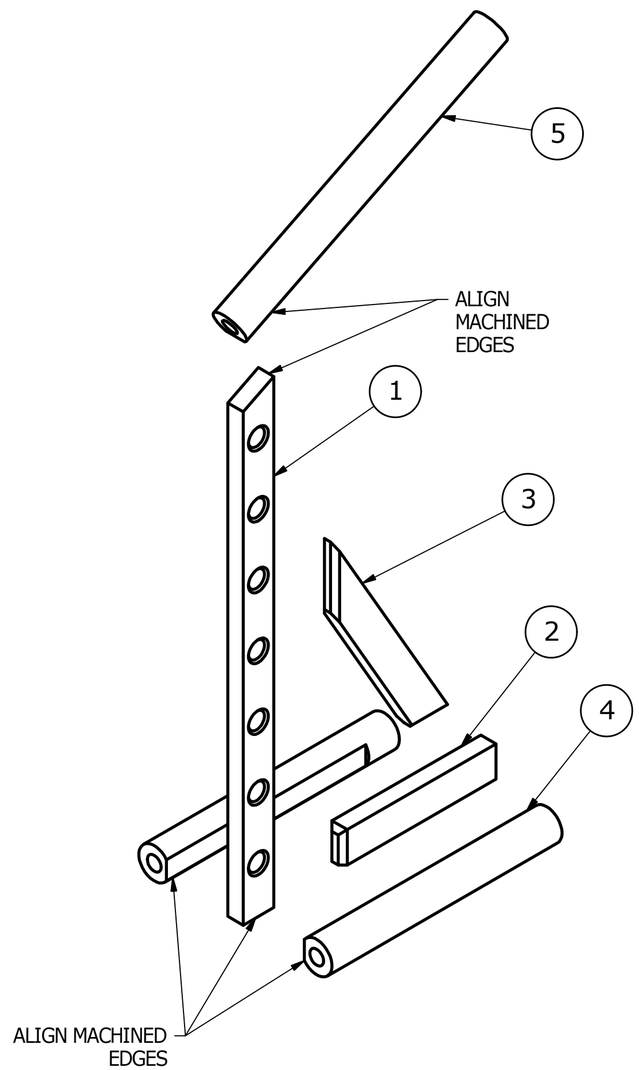
SIZE A1 | DRAWING NUMBER 472-8100 | REV C

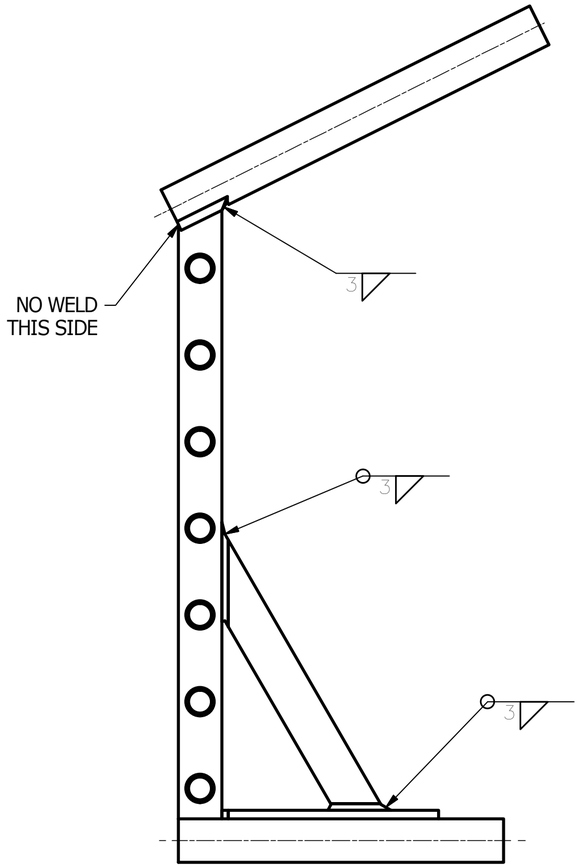
SCALE: 0.5:1 | SHEET 1 OF 1

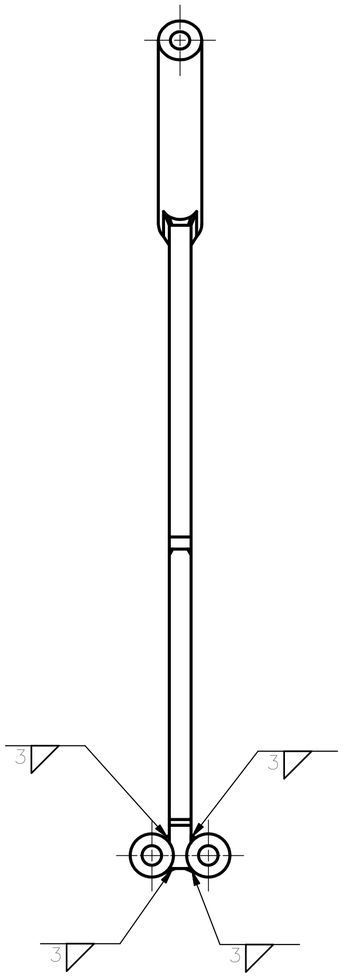
472-Storage Bracket Assembly.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RELEASED TO PRODUCTION	11/2/2011	DW
	B	TITLE WAS LIFTING BRACKET WELDMENT	3/7/2016	DW









ITEM	QTY	PART NUMBER	DESCRIPTION
5	1	472-8106	UPPER ROD
4	2	472-8105	LOWER ROD
3	1	472-8104	SUPPORT BAR
2	1	472-8103	LOWER BAR
1	1	472-8102	MAIN BAR

PARTS LIST

NOTES:

1. WELD ITEMS 1, 2, #3 TOGETHER FIRST, GRIND WELDS FLUSH.
2. WELD ITEMS 4 & 5 SECOND.
3. WELDS ARE "ALL AROUND" WITH EXCEPTION TO THE LOCATIONS NOTED.
4. FINISH: ELECTROLESS NICKEL .008 mm MAXIMUM PER SIDE.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Steel, Mild, Welded
HEAT TREAT:
FINISH: SEE NOTES

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

APPROVALS	DATE
DRAWN dwashenko	11/2/2011
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

STORAGE BRACKET WELDMENT

THOR-50M

THIRD ANGLE PROJECTION

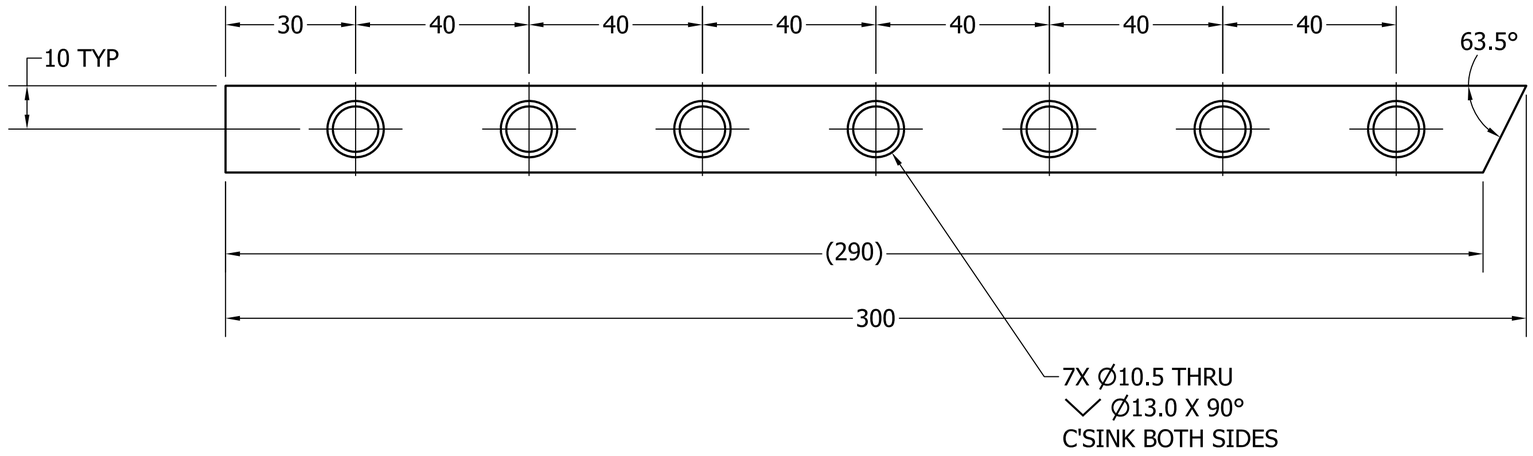
SIZE: A2 | DRAWING NUMBER: 472-8101 | REV: B

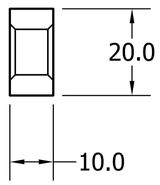
SCALE: .33:1 | SHEET: 1 OF 1

472-Storage Bracket Weldment.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RELEASE TO PRODUCTION	11/2/2011	DW

SCALE .250





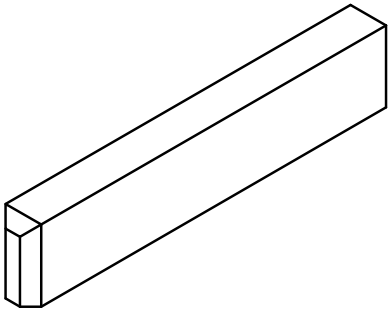
		PROJECT NO.:	DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS ANGLES FINISH X ± 0.5 ± 0.5° 1.6 X.X ± 0.2 X.XX ± 0.1 X.XXX ± 0.01 REMOVE BURRS & BREAK SHARP EDGES
472-8101	1	MATERIAL: 1018 STEEL	DRAWN BY: dwashenko	DATE: 11/2/2011
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: BJS	DATE: 11/2/2011
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: D. WASHENKO	DATE: 11/2/2011

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DESCRIPTION: MAIN BAR

SIZE: A2 | SHEET: 1 OF 1 | SCALE: .75 : 1 | DRAWING NO.: 472-8102 | REV: A

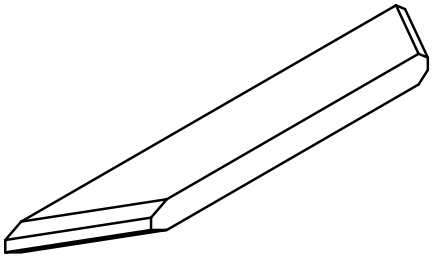
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RELEASE TO PRODUCTION	11/2/2011	DW



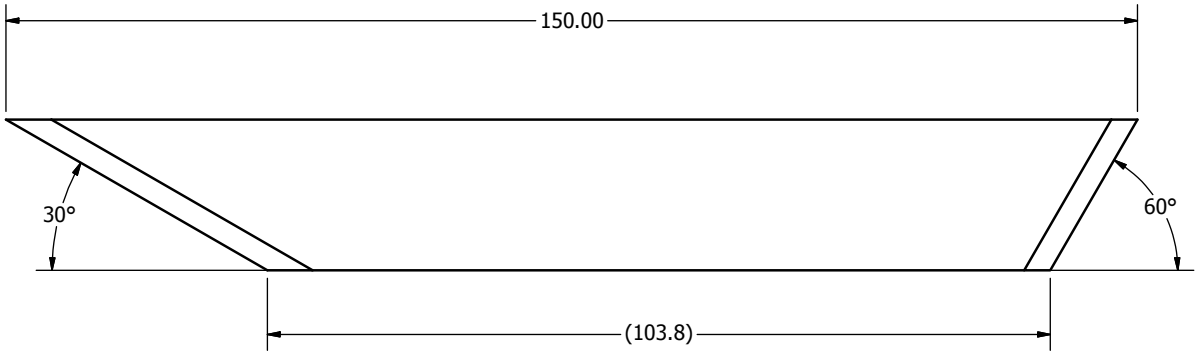
SCALE 1.000

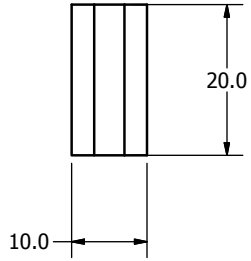
		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: LOWER BAR	
		PROJECT NO.:			
472-8101	1	MATERIAL: 1018 STEEL	DRAWN BY: dwashenko	DATE: 11/2/2011	
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: BJS	DATE: 11/2/2011	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: D. WASHENKO	DATE: 11/2/2011	SCALE: 2.0 : 1
				DRAWING NO.: 472-8103	REV: A

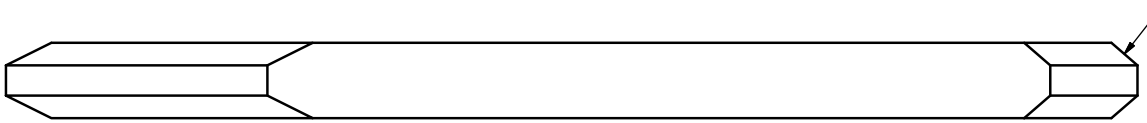
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RELEASE TO PRODUCTION	11/2/2011	DW



SCALE .750

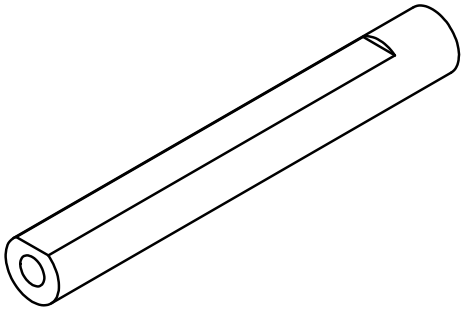




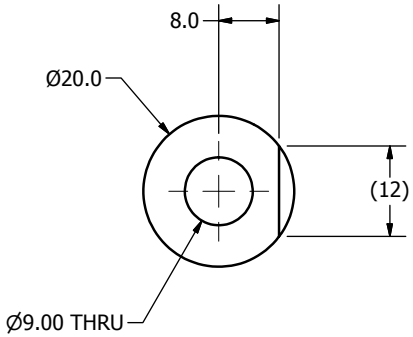


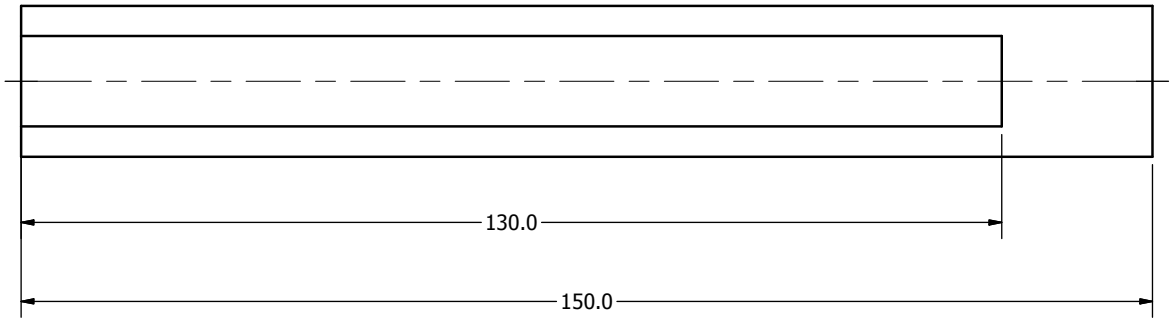
		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6		
		PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: SUPPORT BAR	
472-8101	1	MATERIAL: 1018 STEEL	DRAWN BY: dwashenko DATE: 11/2/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: BJS DATE: 11/2/2011	SIZE: A3 SHEET 1 OF 1	DRAWING NO.: 472-8104 REV: A
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: D. WASHENKO DATE: 11/2/2011	SCALE: 1.5 : 1	

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RELEASE TO PRODUCTION	11/2/2011	DW



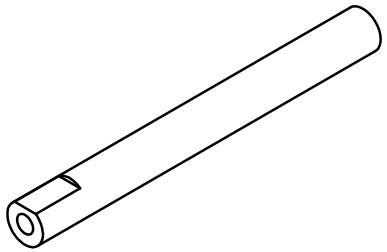
SCALE .750



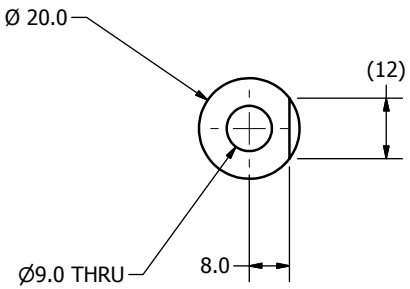


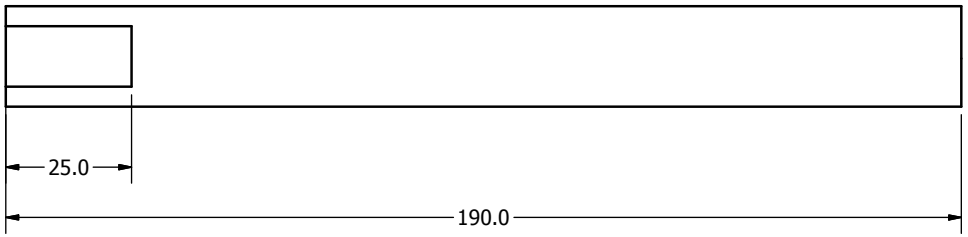
		DO NOT SCALE DRAWING	TOLERANCES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
		THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5, X.X ±0.2, X.XX ±0.1, X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6		
		PROJECT NO.:	REMOVE BURRS & BREAK SHARP EDGES	DESCRIPTION: LOWER ROD	
472-8101	2	MATERIAL: 1018 STEEL	DRAWN BY: dwashenko DATE: 11/2/2011		
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: BJS DATE: 11/2/2011	SIZE: A3 SHEET 1 OF 1	DRAWING NO.: 472-8105 REV: A
TOTAL QTY IN DUMMY	2	FINISH:	ENGINEER: D. WASHENKO DATE: 11/2/2011	SCALE: 1.5 : 1	

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RELEASE TO PRODUCTION	11/2/2011	DW



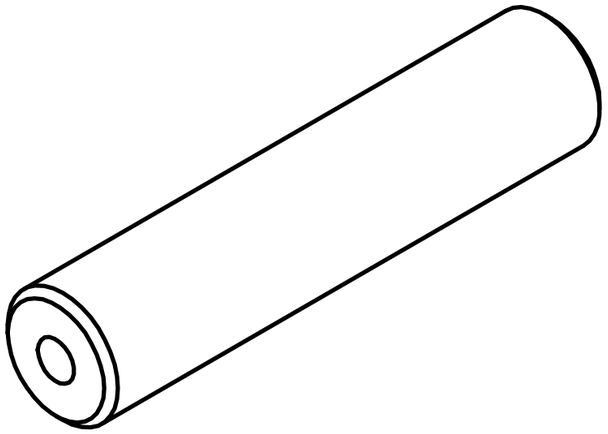
SCALE .500

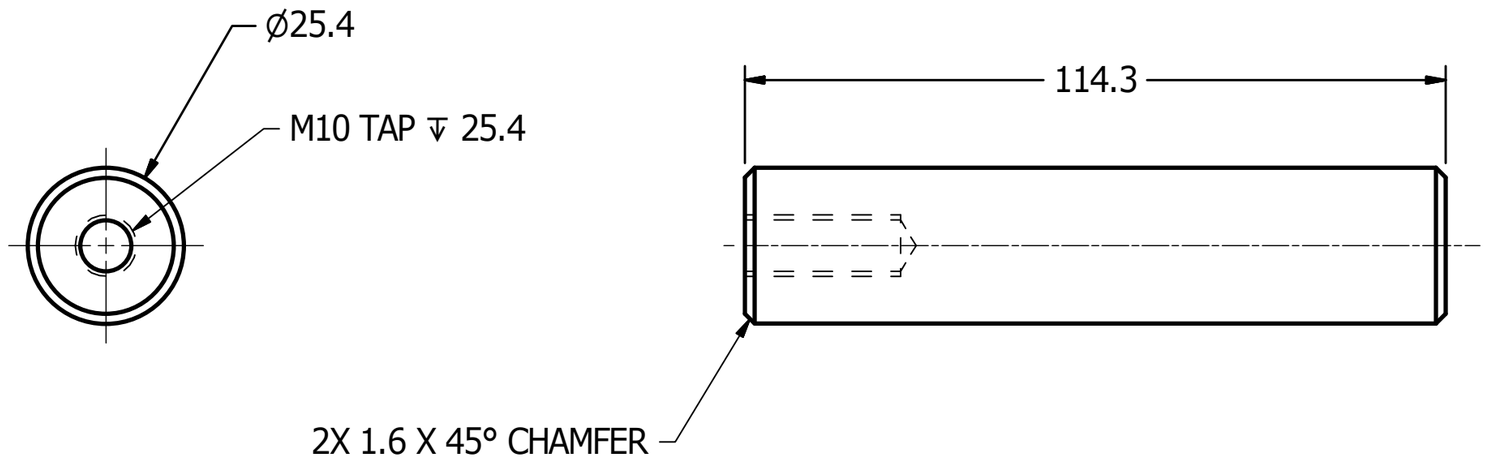




DO NOT SCALE DRAWING		TOLERANCES		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ±0.5 X.X ±0.2 X.XX ±0.1 X.XXX ±0.01 ANGLES ±0.5° FINISH 1.6 REMOVE BURRS & BREAK SHARP EDGES		DESCRIPTION: UPPER ROD	
PROJECT NO.:		DRAWN BY: dwashenko	DATE: 11/2/2011		
472-8101	1	MATERIAL: 1018 STEEL			
NEXT ASSEMBLY	QTY	HEAT TREAT:	CHECKED BY: BJS	DATE: 11/2/2011	SIZE: A3 SHEET 1 OF 1
TOTAL QTY IN DUMMY	1	FINISH:	ENGINEER: D. WASHENKO	DATE: 2/11/2011	SCALE: 1.0 : 1
				DRAWING NO.: 472-8106	REV: A

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RELEASED TO PRODUCTION	1/20/03	JS
80027	B	UPDATED TITLE BLOCK FOR MACHINE FINISH	8/9/2012	BTH



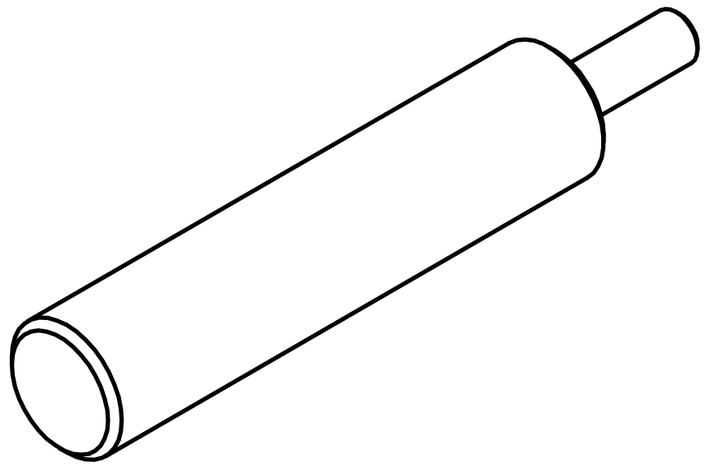


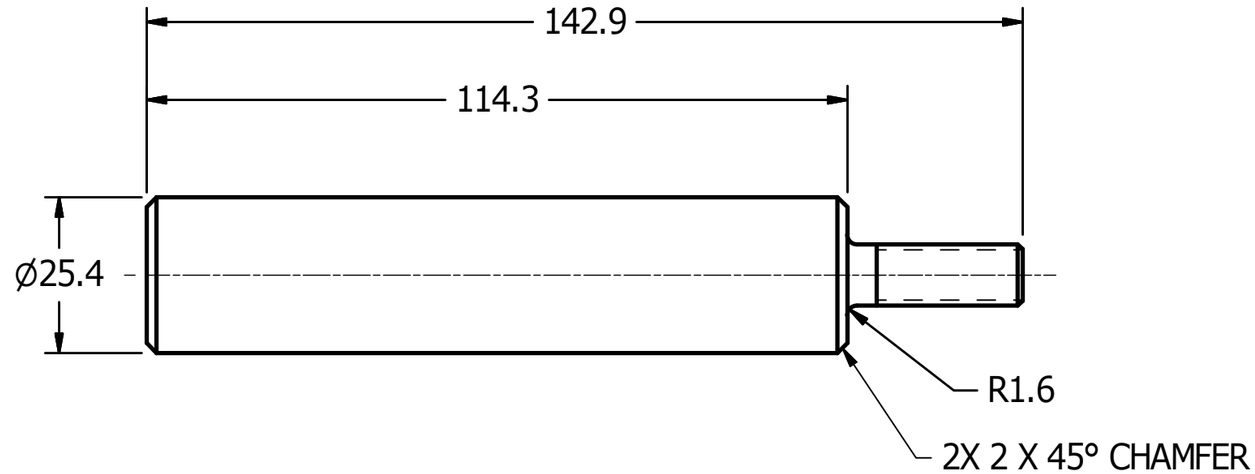
NOTES:

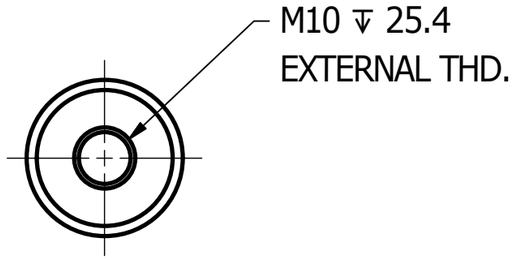
1. REMOVE BURRS AND BREAK SHARP EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	HANDLE, THREADED HOLE
	DRAWN Dave Walker	8/9/2012	
MATERIAL 1018 STEEL	CHECKED		
HEAT TREAT	ENG		
FINISH NICKEL PLATE	APPROVED		
THIRD ANGLE PROJECTION	SIZE A3	DRAWING NUMBER W50-84104	REV B
	SCALE: 1:1	SHEET 1 OF 1	

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RELEASED TO PRODUCTION	1/20/03	JS
80027	B	UPDATED TITLE FOR MACHINE FINISH	8/9/2012	BTH





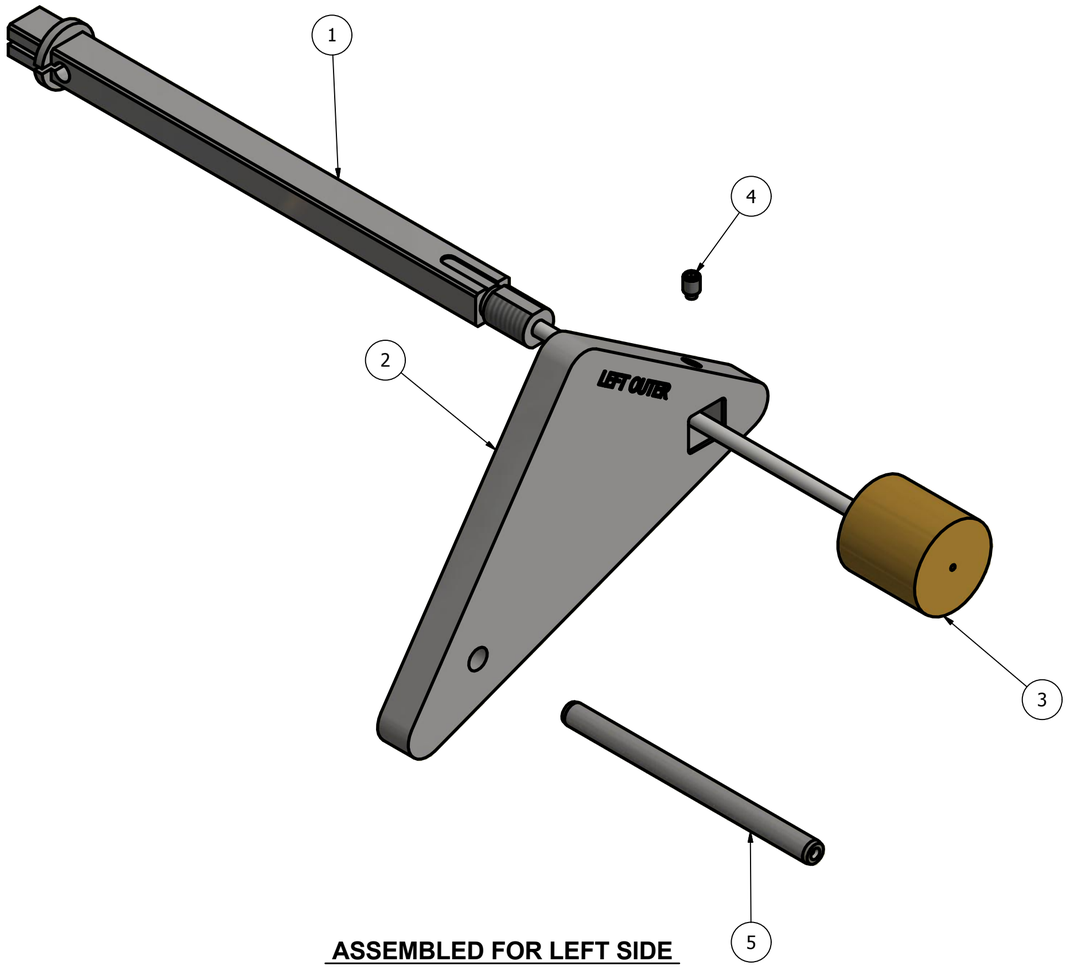


NOTES:

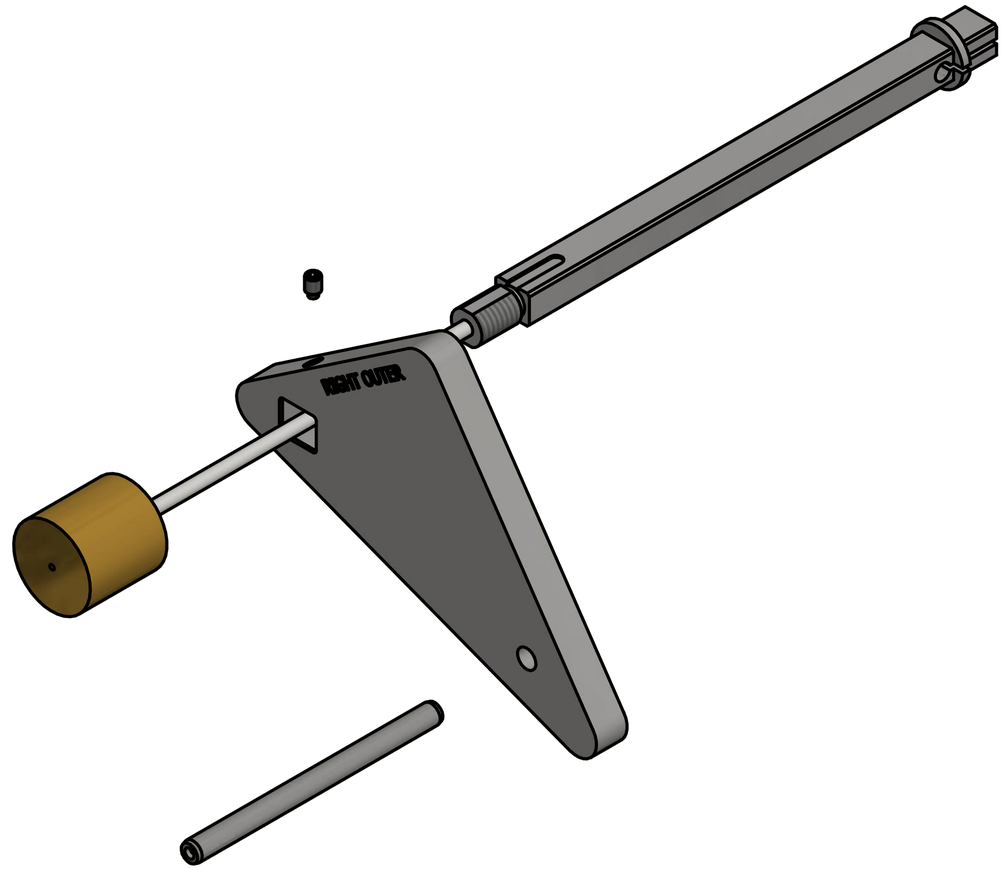
1. REMOVE BURRS AND BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED 1.6 / ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	HANDLE, THREADED ROD
	DRAWN J. WANG / 8/9/2012	
MATERIAL CRS 4140/4130	CHECKED	SIZE A3 / DRAWING NUMBER W50-84106 / REV B
HEAT TREAT	ENG	
FINISH NICKEL PLATE	APPROVED	THIRD ANGLE PROJECTION / SCALE: 1:1 / SHEET 1 OF 1

W50-Threaded Rod Handle.ipt



ASSEMBLED FOR LEFT SIDE



ASSEMBLED FOR RIGHT SIDE

ITEM	QTY	PART NUMBER	DESCRIPTION
5	1	472-8516-A	H-POINT PIN, OPTIONAL
4	1	5001472	SCREW, SSNP M4x0.7 x 6
3	1	472-8515-A	H-POINT TOOL, PIN ASSEMBLY
2	1	472-8512-A	H-POINT TOOL, PLATE, OPTIONAL
1	1	472-8511-A	H-POINT TOOL, EXPANDER

PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 125 ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	Dave Walker	6/22/2017
CHECKED		
ENG		
APPROVED		

MATERIAL
HEAT TREAT
FINISH

H-POINT TOOL, ASSEMBLY

THOR-50M

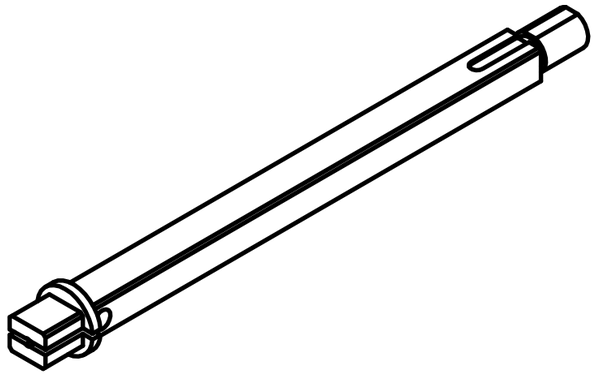
THIRD ANGLE PROJECTION

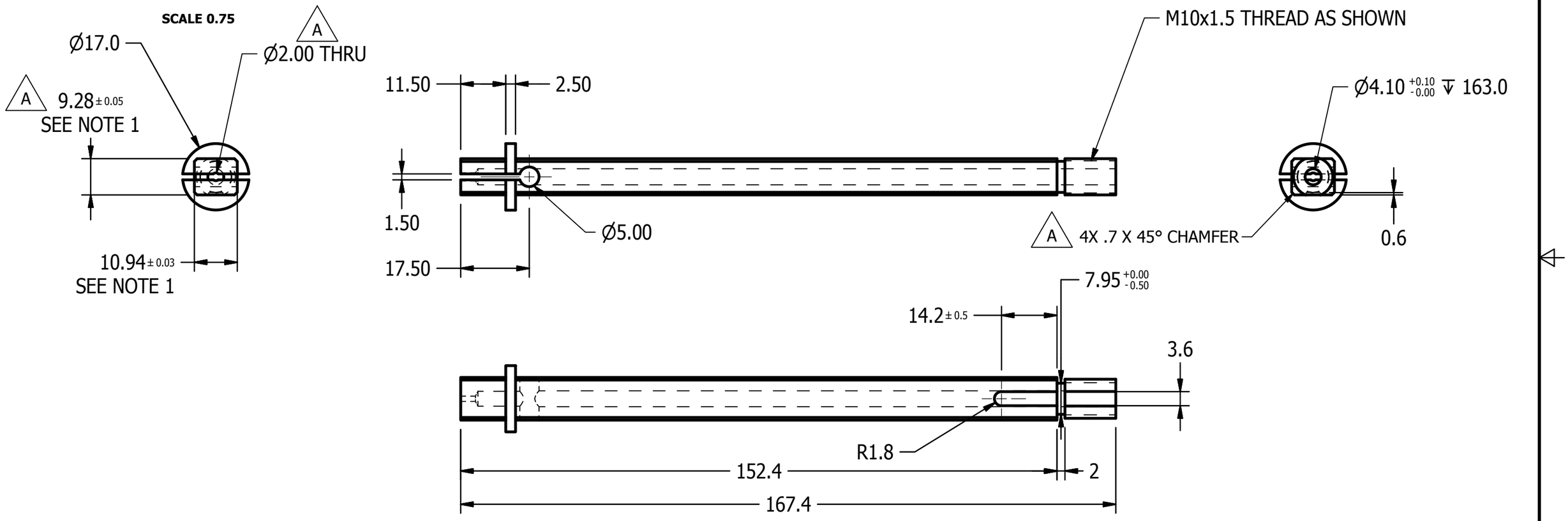
SIZE **A2** | DRAWING NUMBER 472-8510-A | REV

SCALE: 1 : 1 | SHEET 1 OF 1

472-8510-A-Left.iam

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	DIMENSION 9.28 ±0.05 SEE NOTE 1 WAS 9.28 ±0.02 SEE NOTE 1, Ø2.00 THRU WAS Ø2.000 THRU; ADDED DIMENSION 4X .7 x 45° CHAMFER	2/26/2018	DW





NOTES:

1. APPLY OUTSIDE SURFACE TOLERANCES FROM END OF PART TO SHOULDER AND IN THE AREA WITH 3.6mm CUTOUT, DIMENSIONS ARE ±0.2mm IN CENTER AREA.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6, ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	303 STAINLESS STEEL
HEAT TREAT	N/A
FINISH	N/A

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN Dave Walker	2/15/2017
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

H-POINT TOOL, EXPANDER

THOR-50M

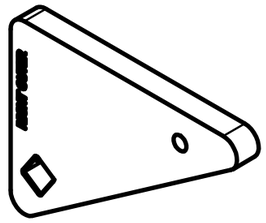
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A3	472-8511-A	A

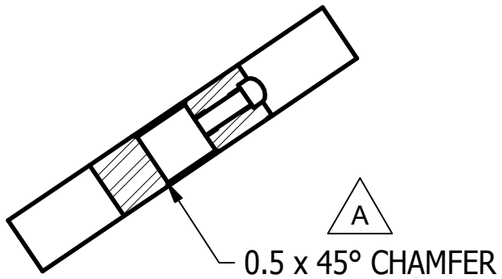
SCALE:	SHEET
1 : 1	1 OF 1

472-8511-A.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	ADDED SECTION A-A AND DIMENSION 0.5 x 45˚ CHAMFER TYP. ALL AROUND	2/15/2017	DW

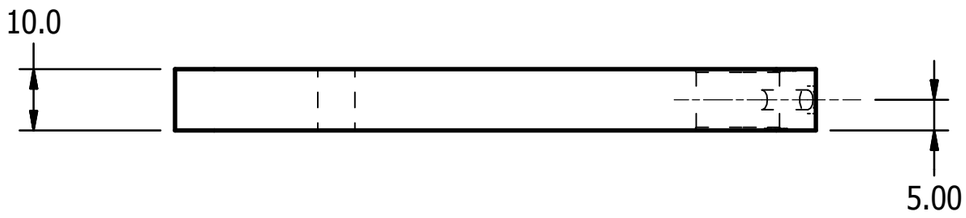


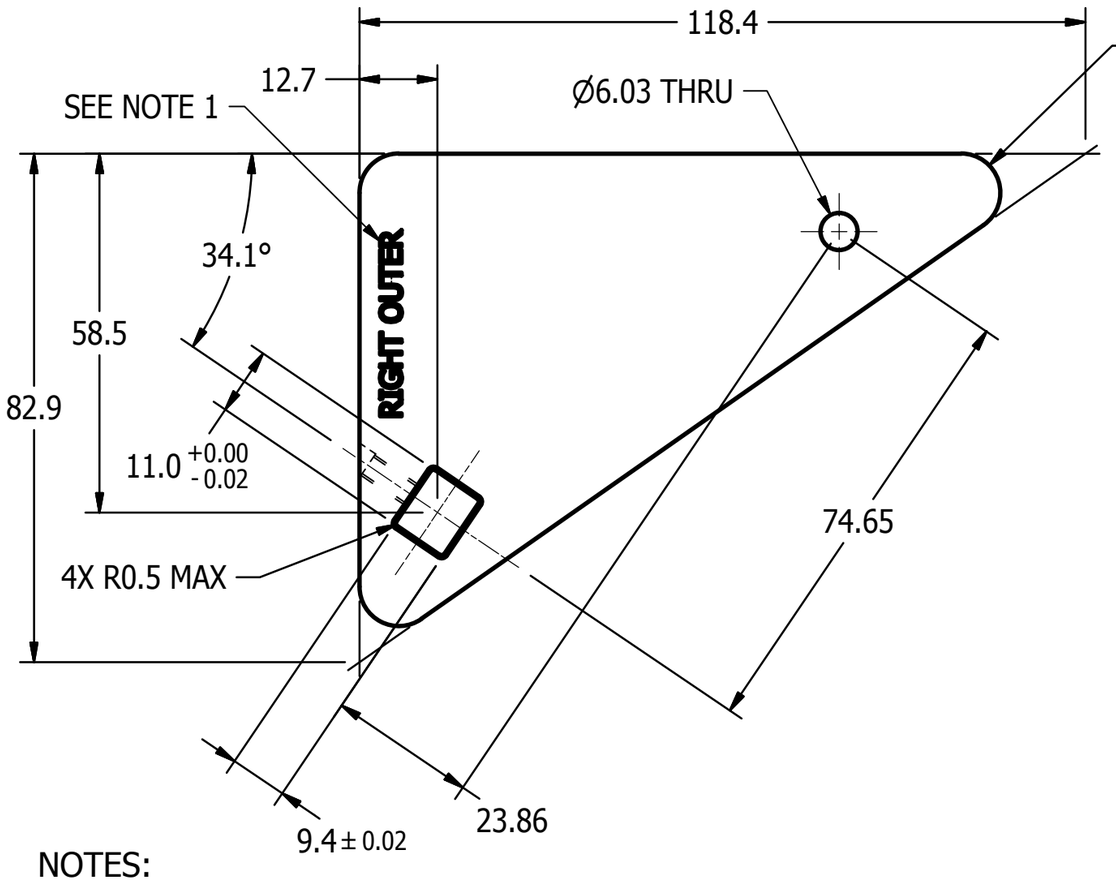
SCALE 1 / 2

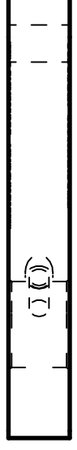


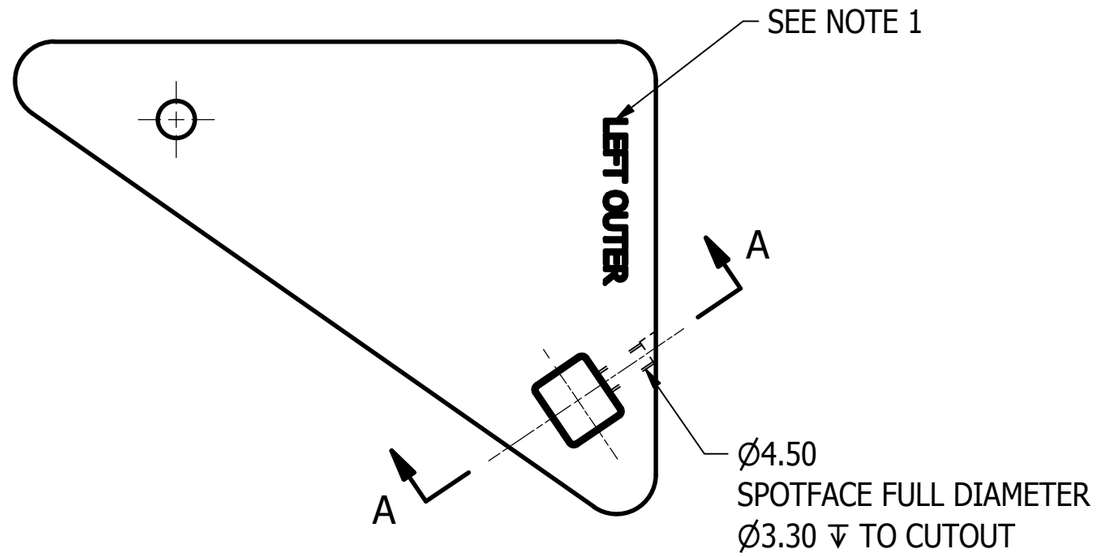
SECTION A-A

A







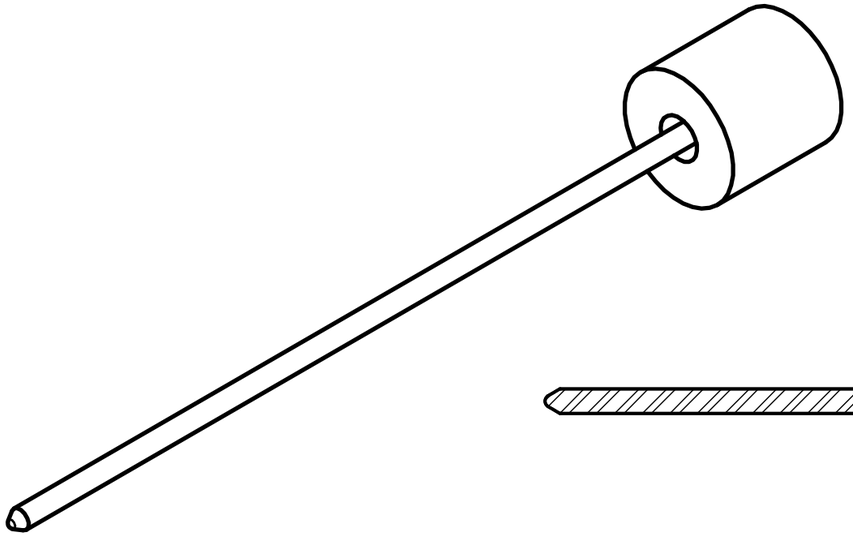


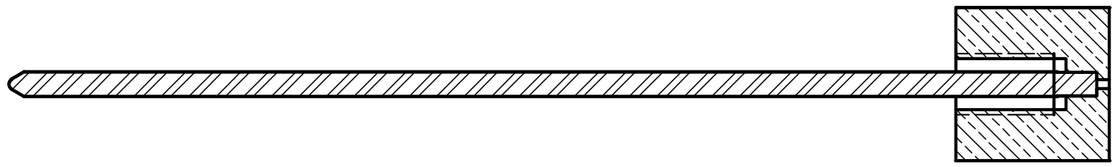
NOTES:

1. STAMP OR ENGRAVE AS SHOWN (3.5mm CHARACTERS).

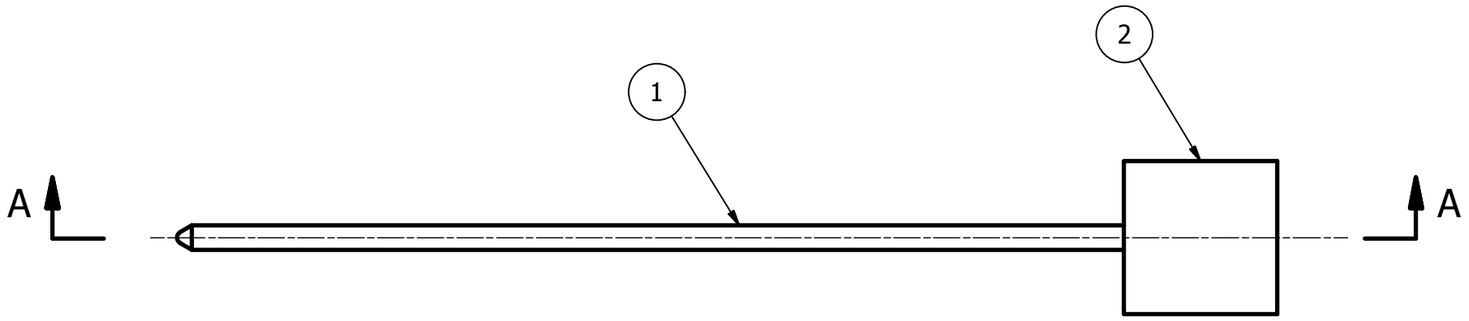
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED 1.6 / ANGLES ±.5° ASME Y14.5M - 1994 **DO NOT SCALE DRAWING**	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER		**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION**
	APPROVALS	DATE	H-POINT TOOL, PLATE, OPTIONAL THOR-50M
	DRAWN Dave Walker	2/15/2017	
MATERIAL 440C STAINLESS STEEL	CHECKED		
HEAT TREAT N/A	ENG		
FINISH N/A	APPROVED		THIRD ANGLE PROJECTION
			SIZE A3 · DRAWING NUMBER 472-8512-A · REV A · SCALE: 1 : 1 · SHEET 1 OF 1

472-8512-A.ipt





SECTION A-A



ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-8514-A	H-POINT TOOL, ENDCAP
1	1	472-8513-A	H-POINT TOOL, PIN

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN Dave Walker	2/15/2017
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

H-POINT TOOL, PIN ASSEMBLY

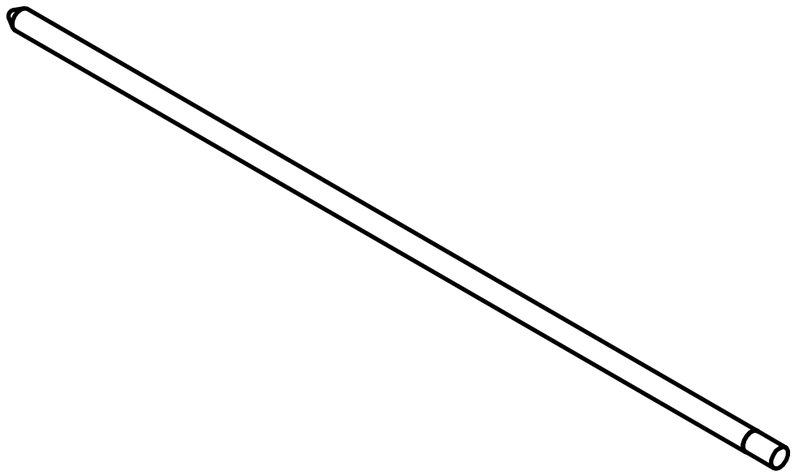
THOR-50M

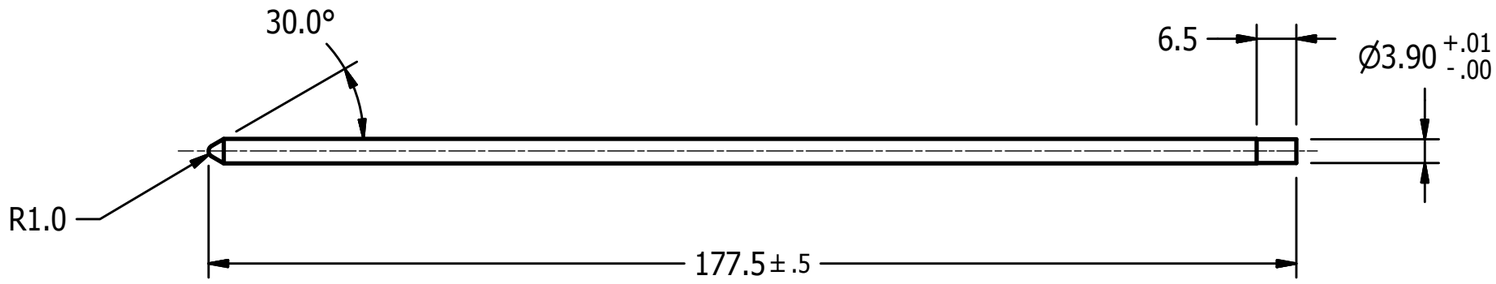
THIRD ANGLE PROJECTION

SIZE **A3** | DRAWING NUMBER 472-8515-A | REV

SCALE: 1 : 1 | SHEET 1 OF 1

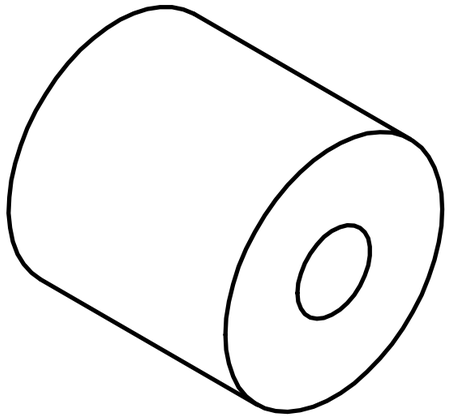
472-8515-A.iam



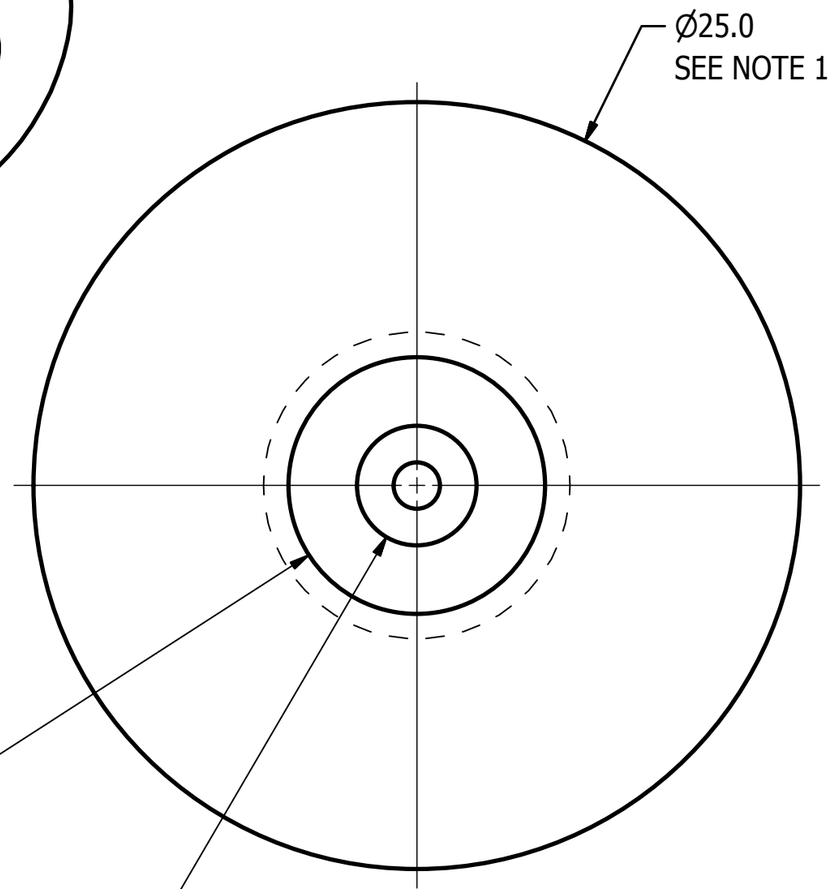


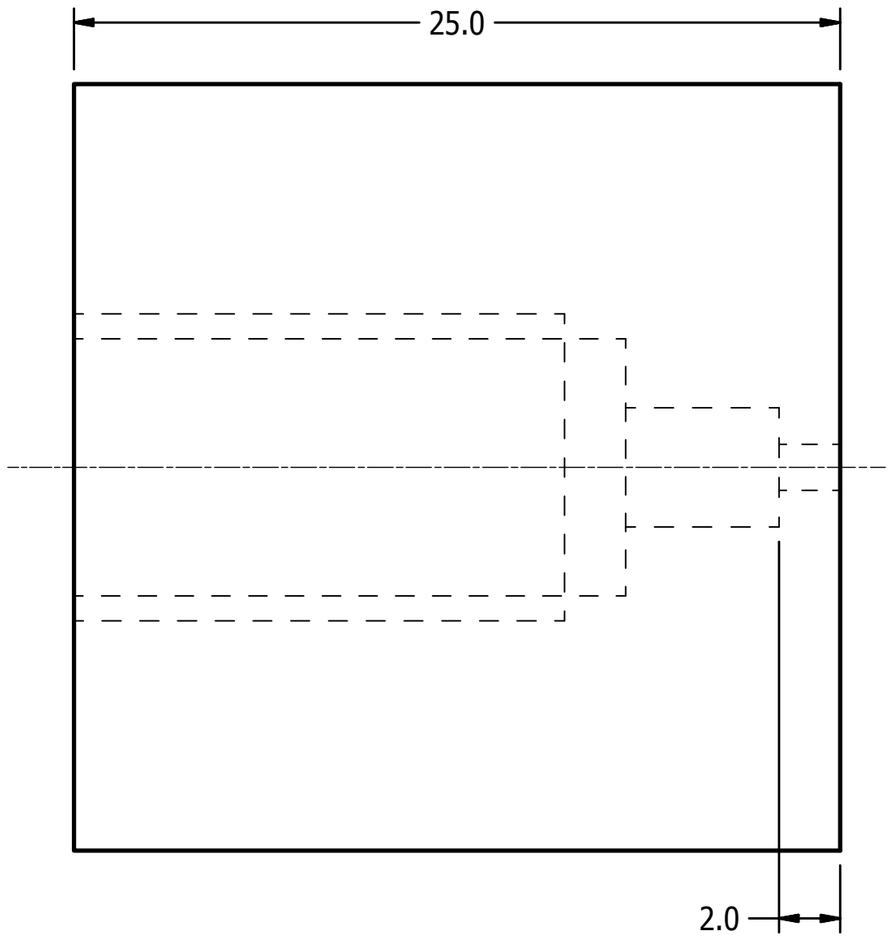
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6, ANGLES ±.5° ASME Y14.5M - 1994 **DO NOT SCALE DRAWING**	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER	**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION**
	APPROVALS / DATE	H-POINT TOOL, PIN THOR-50M
	DRAWN: Dave Walker — 2/15/2017	
MATERIAL: 4140 STEEL	CHECKED	
HEAT TREAT: N/A	ENG	
FINISH: NICKEL PLATE 0.008mm MAX.	APPROVED	THIRD ANGLE PROJECTION
		SIZE: A3 — DRAWING NUMBER: 472-8513-A — REV
		SCALE: 1 : 1 — SHEET: 1 OF 1

472-8513-A.ipt



SCALE 2 : 1



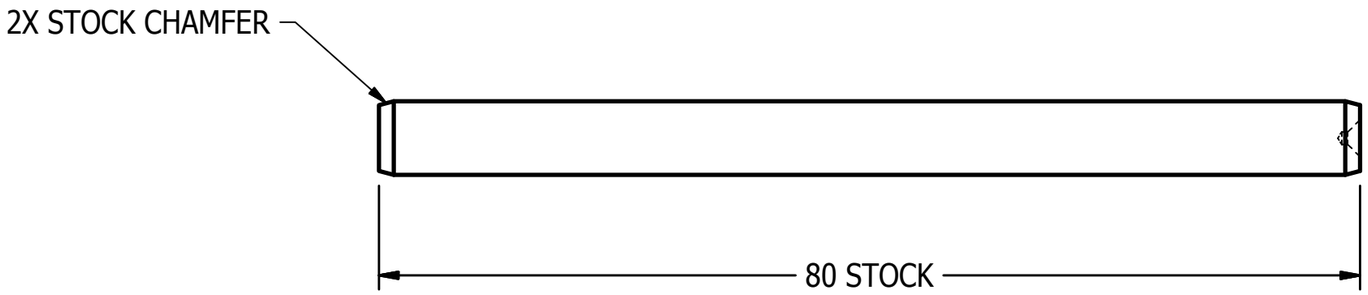


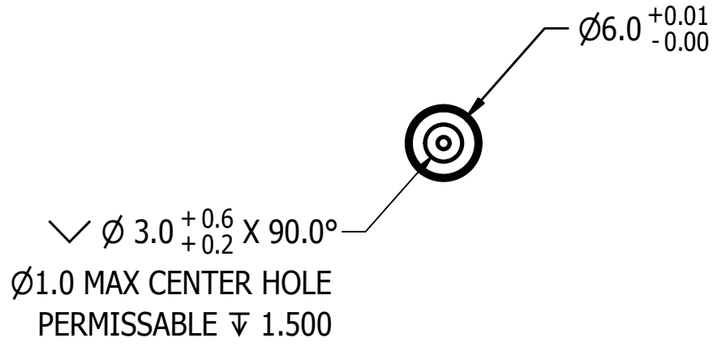
NOTES:

1. KNURL OUTSIDE SURFACE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 **DO NOT SCALE DRAWING**	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER	**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION**
	APPROVALS / DATE	H-POINT TOOL, ENDCAP THOR-50M
MATERIAL: Brass, Soft Yellow	DRAWN: Dave Walker — 2/14/2017	
HEAT TREAT	CHECKED	
FINISH	ENG	
	APPROVED	
THIRD ANGLE PROJECTION	SIZE: A3 — DRAWING NUMBER: 472-8514-A — REV	
	SCALE: 5 : 1 — SHEET: 1 OF 1	

472-8514-A.ipt





UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	Dave Walker	6/22/2017
CHECKED		
ENG		
APPROVED		

MATERIAL: Stainless Steel
HEAT TREAT:
FINISH:

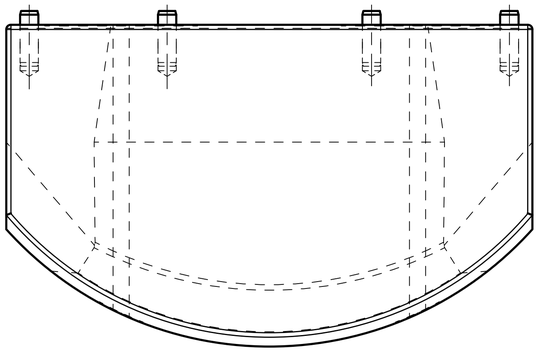
H-POINT PIN
THOR-50M

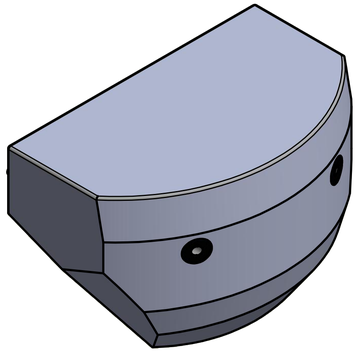
THIRD ANGLE PROJECTION

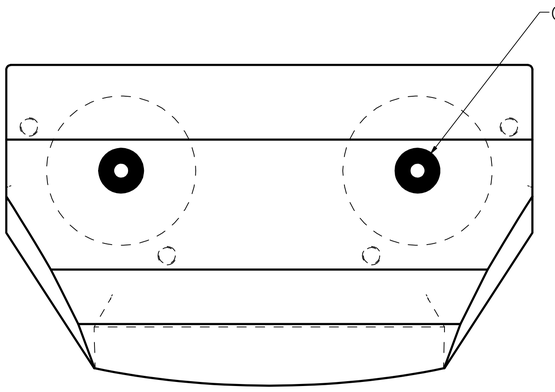
SIZE: **A3**
DRAWING NUMBER: 472-8516-A
REV:
SCALE: 2 : 1
SHEET: 1 OF 1

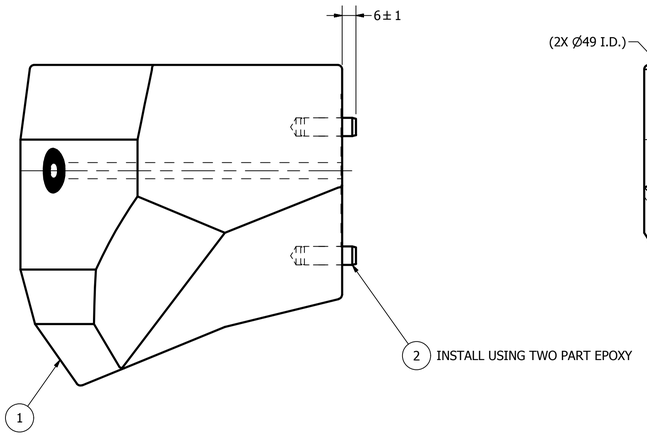
472-8516-A.ipt

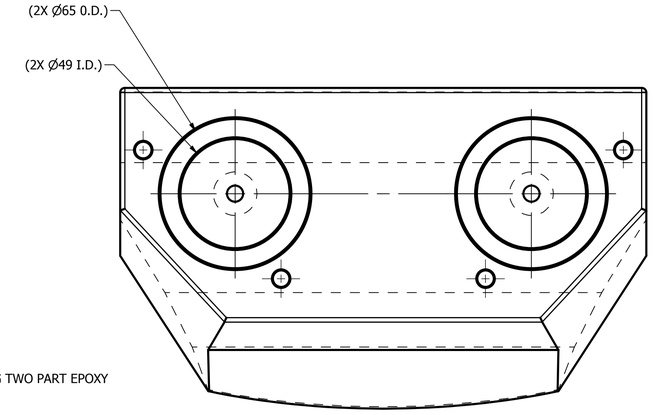
REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	UPDATED LOWER ABDOMEN BAG INSPECTOION PROCEDURE	4/11/2017	DW











A LOWER ABDOMEN BAG INSPECTION PROCEDURE

1. Assemble the LOWER ABDOMEN BAG INSPECTION MANDREL ASS'Y. - 472-8320 into the LOWER ABDOMEN SEWING ASSEMBLY - 472-4763, insuring that the four (4) M8 dowel pins (part # 5000448V) protrude through the 10 MM dia. holes in the rear of the Abdomen Bag.
   - Viewing the rear of the bag the 49 MM dia. circle scribed on the rear of the Mandrel should be completely visible through the 57 MM dia. hole in the rear of the bag. The 65 MM dia. circle scribed on the rear of the Mandrel should not be visible anywhere in the 57 MM dia. hole in the rear of the bag.
   - Viewing the front of the bag none of the mandrel surface outside of the 19 MM O.D. circle scribed on the mandrel should be visible within the 11 MM dia. hole in the front of the Abdomen Bag.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	4	5000448V	PIN, DOWEL M8 x 24
1	1	472-8321	LOWER ABDOMEN BAG INSPECTION MANDREL

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN Dave Walker	1/18/2017
CHECKED	
ENG	
APPROVED	

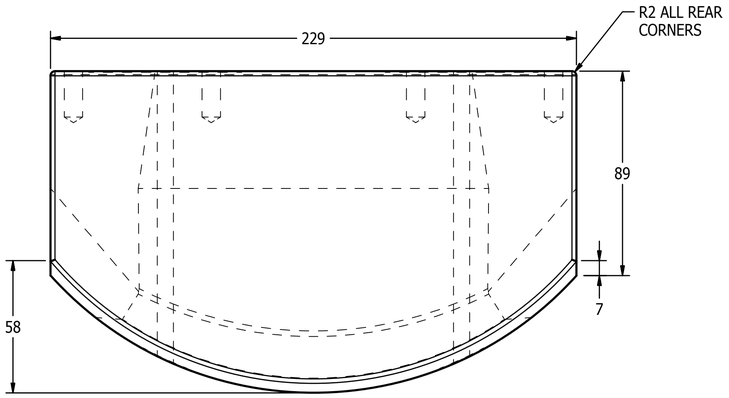
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

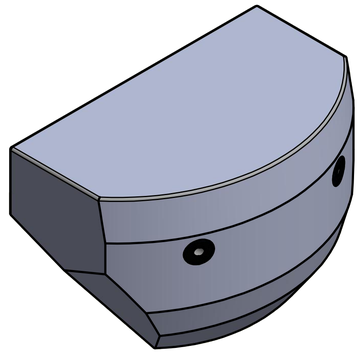
LOWER ABDOMEN BAG INSPECTION MANDREL ASS'Y.
THOR-50M

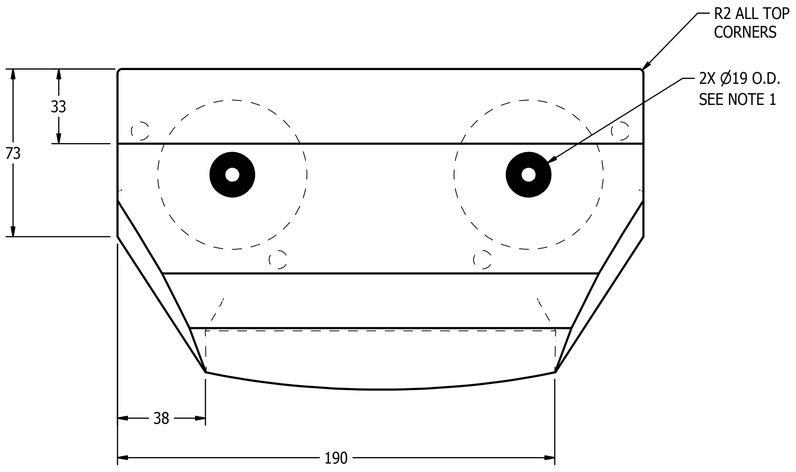
THIRD ANGLE PROJECTION

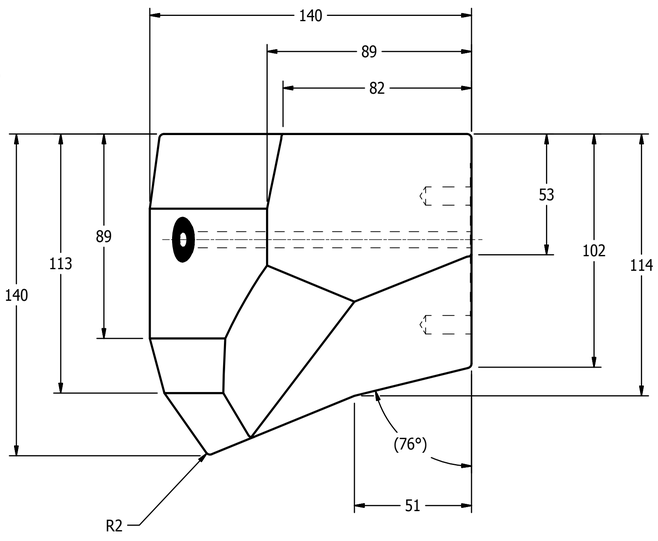
SIZE A1 | DRAWING NUMBER 472-8320 | REV A
SCALE: .75 | SHEET 1 OF 1

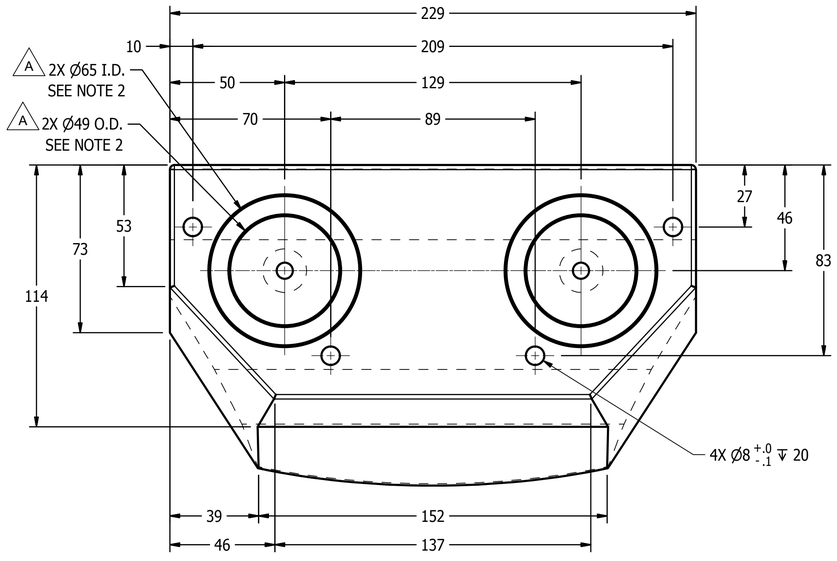
REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	DIM. 2X Ø65 I.D. WAS 2X Ø65 AND 2X Ø49 O.D. WAS 2X Ø49	4/11/2017	DW











NOTES:

1. SCRIBE A 19 mm O.D. CIRCLE IN A CONTRASTING COLOR TO THE MANDREL MATERIAL ON THEE FRONT SURFACE AS SHOWN, CENTERED ON THEE 7 mm THRU HOLE.

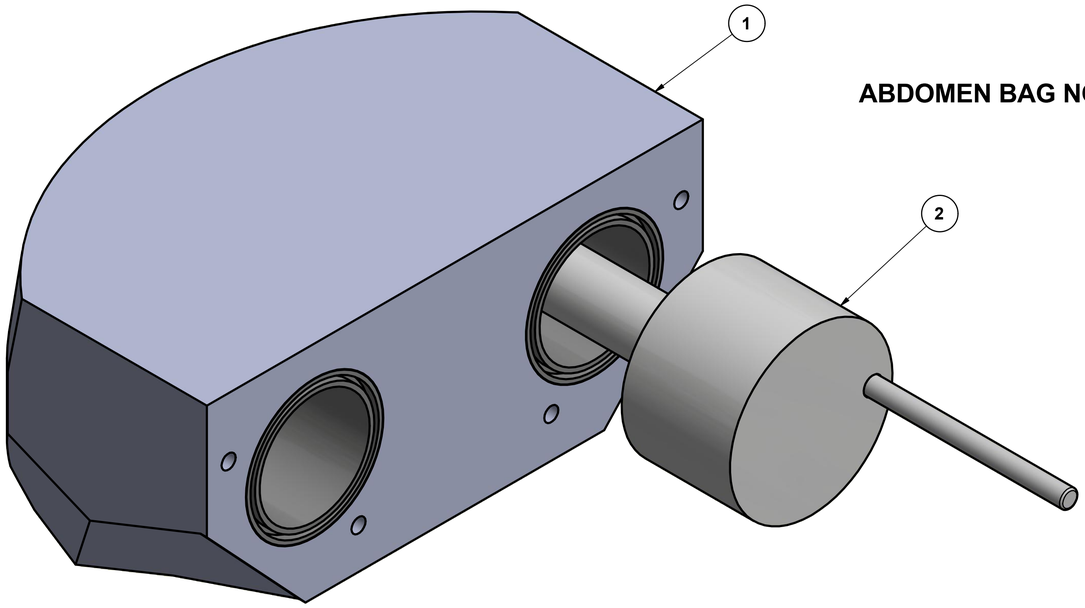
2. SCRIBE A 49 mm O.D. CIRCLE AND A 65 mm I.D. CIRCLE IN A CONTRASTING COLOR TO THE MANDREL MATERIAL ON THE REAR SURFACE AS SHOWN, CENTERED ON THE 7 mm DIA THRU HOLE.

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED ANGLES ±.5°; ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER
			APPROVALS / DATE
			DRAWN: Dave Walker 1/13/2017
472-8320	1	MATERIAL: ABS Plastic	CHECKED
NEXT ASSEMBLY	QTY.	HEAT TREAT	ENG
TOTAL QTY IN DUMMY	1	FINISH	APPROVED

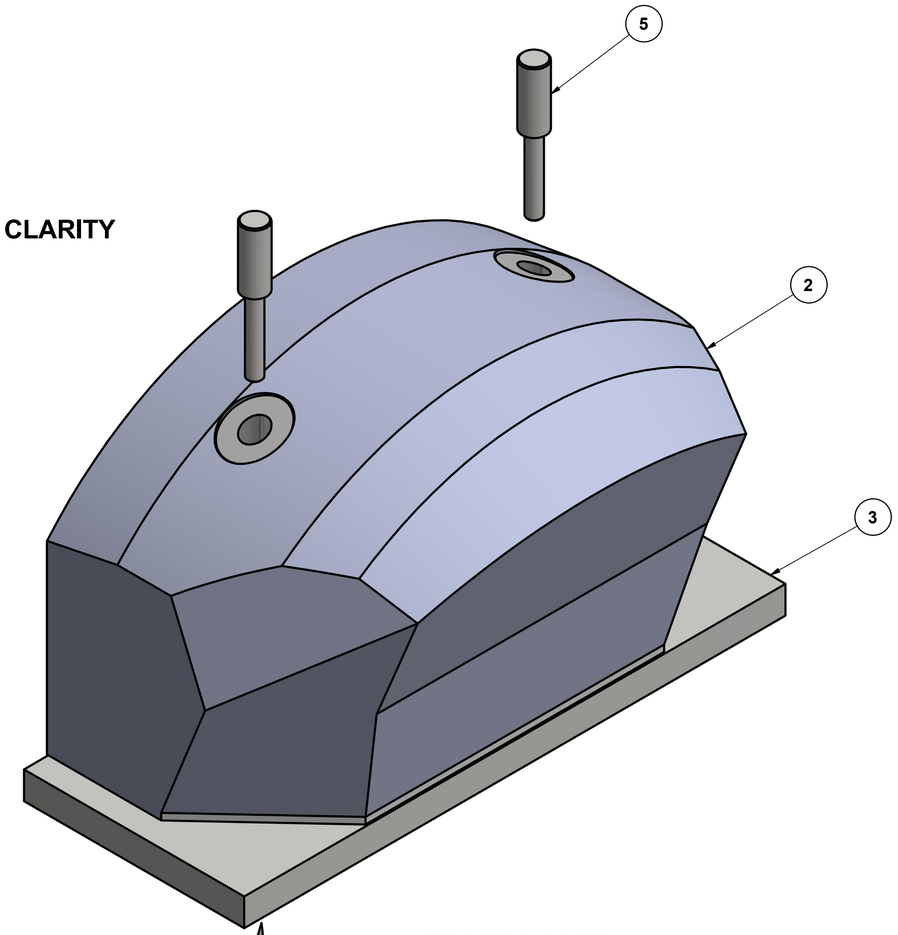
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LOWER ABDOMEN BAG INSPECTION MANDREL
THOR-50M

THIRD ANGLE PROJECTION | SIZE: A1 | DRAWING NUMBER: 472-8321 | REV: A | SCALE: .75 | SHEET 1 OF 1

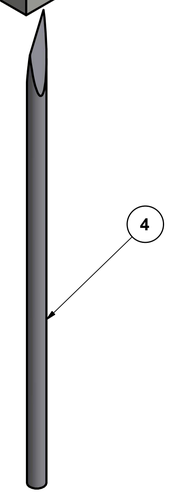


ABDOMEN BAG NOT SHOWN FOR CLARITY



REAR HOLES
SEE PROCEDURE A

FRONT HOLES
SEE PROCEDURE B



PROCEDURE A
PROCEDURE FOR CUTTING THE LARGE AND SMALL HOLES IN THE REAR PANEL OF THE ABDOMEN BAG

1. Assemble the **LOWER ABDOMEN FOAM MANDREL ASSEMBLY** - 472-8309 into the LOWER **ABDOMEN SEWING ASSEMBLY** - 472-4763.
2. Use knife to cut an opening near the center of the large hole.
3. Insert the **LARGE HOLE CUT FIXTURE ASSEMBLY** - 472-8356 into the mandrel.
4. Rotate the **LARGE HOLE CUT FIXTURE ASSEMBLY** so the razor knife cuts the hole.
5. The slot in the **ABDOMEN LARGE HOLE CUTTING GUIDE** - 472-8354 is to assist in the cutting.
6. Repeat steps 2 through 5 for the other large hole.
7. Mark the small holes with a marker and hand punch the small holes after removing the mandrel from the bag.

PROCEDURE B
PROCEDURE FOR CUTTING HOLES IN THE FRONT OF THE ABDOMEN BAG AFTER CUTTING THE REAR HOLES

1. Reassemble the **LOWER ABDOMEN FOAM MANDREL ASSEMBLY** - 472-8309 into the **LOWER ABDOMEN SEWING ASSEMBLY** - 472-4763.
2. Place assembly (**LOWER ABDOMEN FOAM MANDREL ASSEMBLY** - 472-8309 & **LOWER ABDOMEN SEWING ASSEMBLY** - 472-4763*)* onto the **LOWER ABDOMEN BAG PUNCH - ASSEMBLY** - 472-8350.
3. Insert the **FRONT HOLE PILOT KNIFE** - 472-8355 in the rear of the **LOWER ABDOMEN BAG PUNCH - ASSEMBLY** and pierce the front panel of the **LOWER ABDOMEN SEWING ASSEMBLY** - 472-4763 with the pilot knife.
5. Use the **LOWER ABDOMEN BAG PUNCH - PUNCH** - 472-8353 to create the front holes.

ITEM	QTY	PART NUMBER	DESCRIPTION
5	2	472-8353	OPTIONAL - LOWER ABDOMEN BAG PUNCH - PUNCH
4	1	472-8355	OPTIONAL - FRONT HOLE PILOT KNIFE
3	1	472-8350	OPTIONAL - LOWER ABDOMEN BAG PUNCH - ASS'Y.
2	1	472-8356	OPTIONAL -LARGE HOLE CUT FIXTURE ASSEMBLY
1	1	472-8309	OPTIONAL - LOWER ABDOMEN FOAM MANDREL ASS'Y.

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, XX ±.2, XXX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN Dave Walker	12/20/2016
CHECKED	
ENG	
APPROVED	

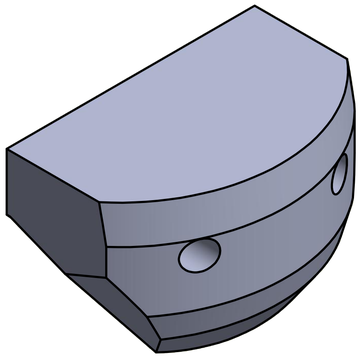
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

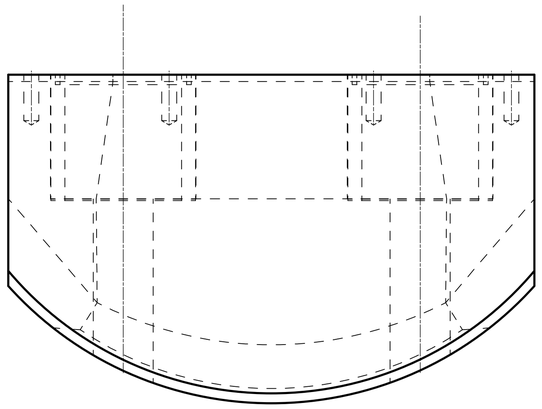
OPTIONAL - LOWER ABDOMEN BAG MANDREL AND PUNCH-ASS'Y.
THOR-50M

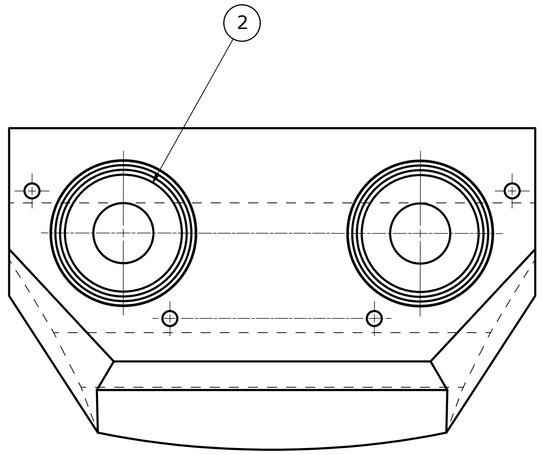
MATERIAL	
HEAT TREAT	
FINISH	
NEXT ASSEMBLY	QTY.
TOTAL QTY IN DUMMY	1

THIRD ANGLE PROJECTION
SIZE A1 | DRAWING NUMBER 472-8300 | REV
SCALE: 1 : 1 | SHEET 1 OF 1

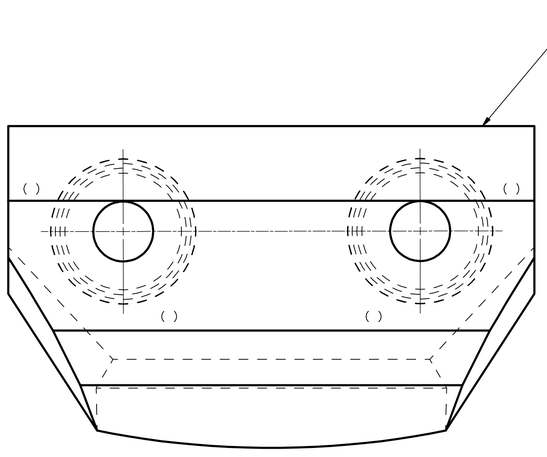
Lower Abdomen Bag Mandrel and Punch-Assembly-Rear Holes.iam

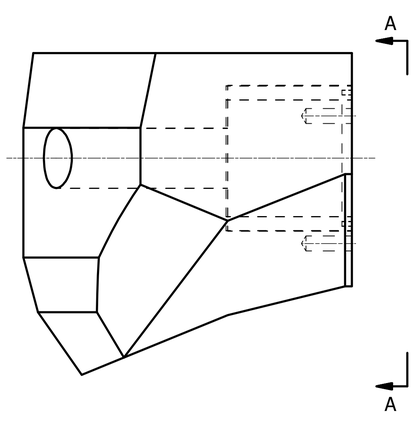






VIEW A-A





ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	472-8354	OPTIONAL - ABDOMEN LARGE HOLE CUTTING GUIDE
1	1	472-8310	OPTIONAL - LOWER ABDOMEN FOAM, MANDREL

PARTS LIST

472-8300	1
NEXT ASSEMBLY	QTY.
TOTAL QTY IN DUMMY	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

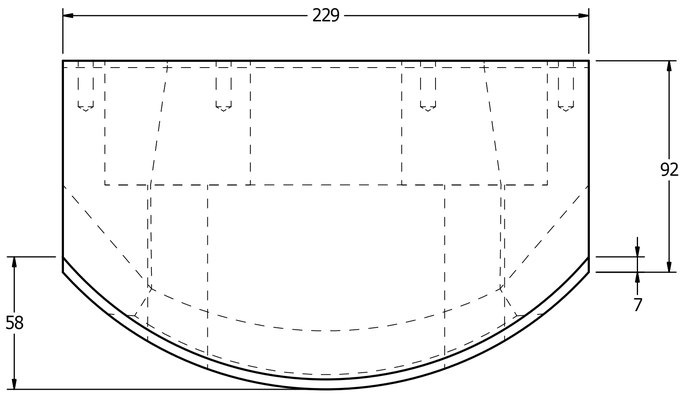
APPROVALS	DATE
DRAWN Dave Walker	12/16/2016
CHECKED	
ENG	
APPROVED	

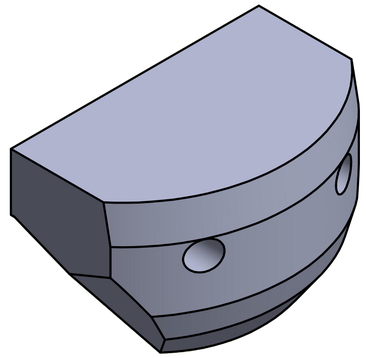
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

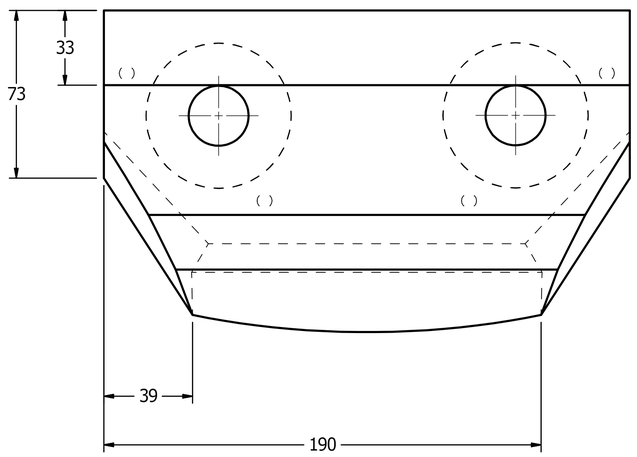
OPTIONAL - LOWER ABDOMEN FOAM MANDREL ASS'Y.
THOR-50M

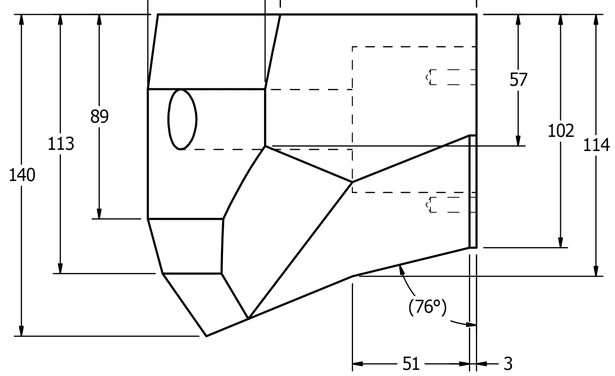
THIRD ANGLE PROJECTION | SIZE A1 | DRAWING NUMBER 472-8309 | REV | SCALE: .75 | SHEET 1 OF 1

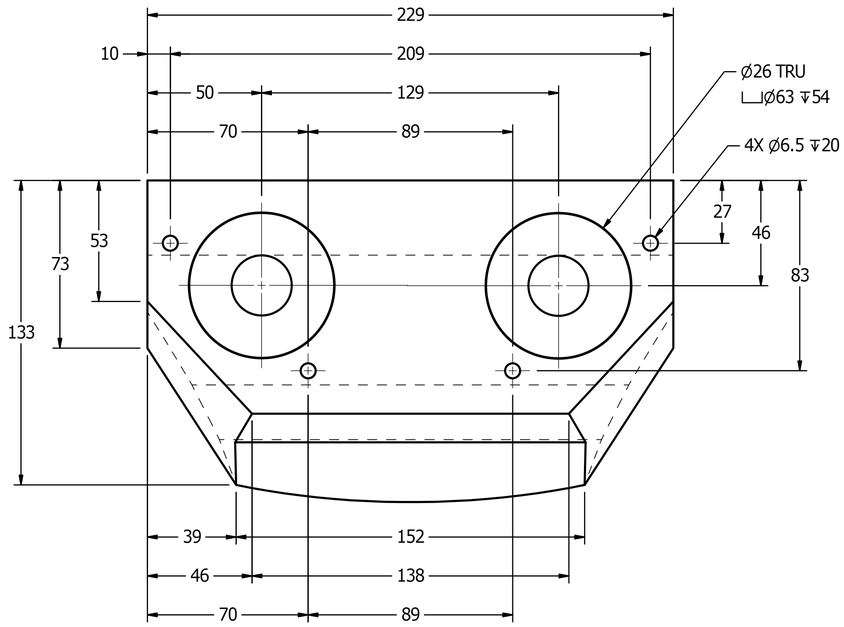
472-Lower Abdomen Foam Mandrel Assembly.iam











472-8309	1
NEXT ASSEMBLY	QTY.
TOTAL QTY IN DUMMY	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: ABS Plastic OR EQUIV.
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

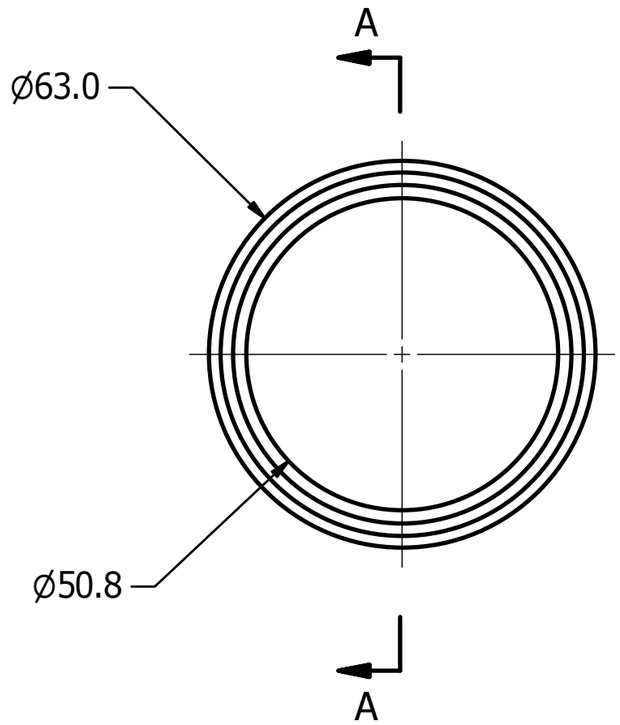
APPROVALS	DATE
DRAWN Dave Walker	10/23/2015
CHECKED	
ENG	
APPROVED	

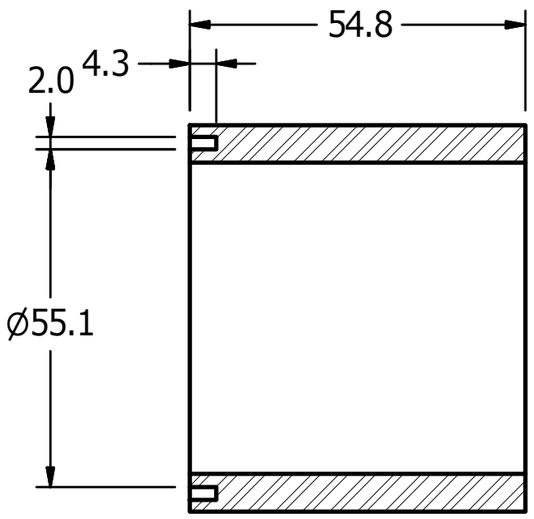
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

OPTIONAL - LOWER ABDOMEN FOAM, MANDREL
THOR-50M

THIRD ANGLE PROJECTION

SIZE: A1 | DRAWING NUMBER: 472-8310 | REV:
SCALE: 1:0.75 | SHEET: 1 OF 1

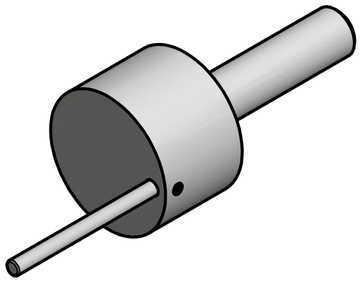


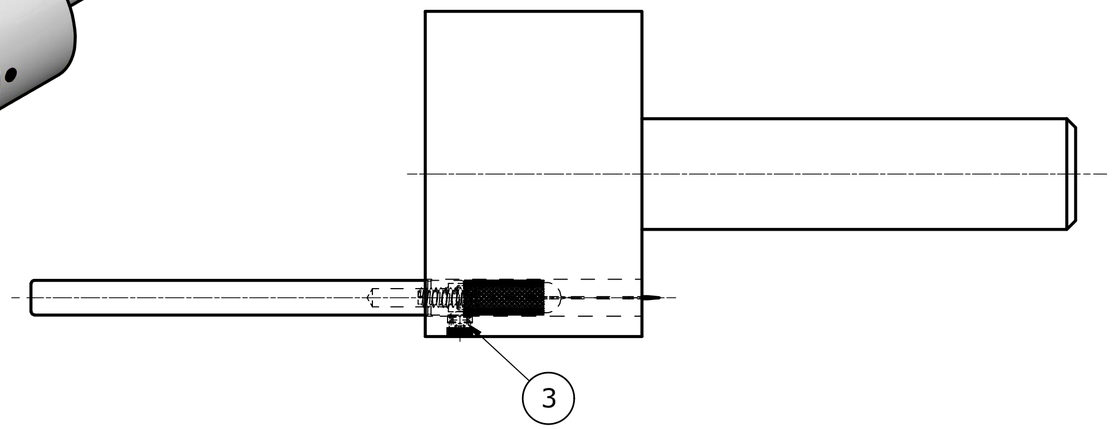


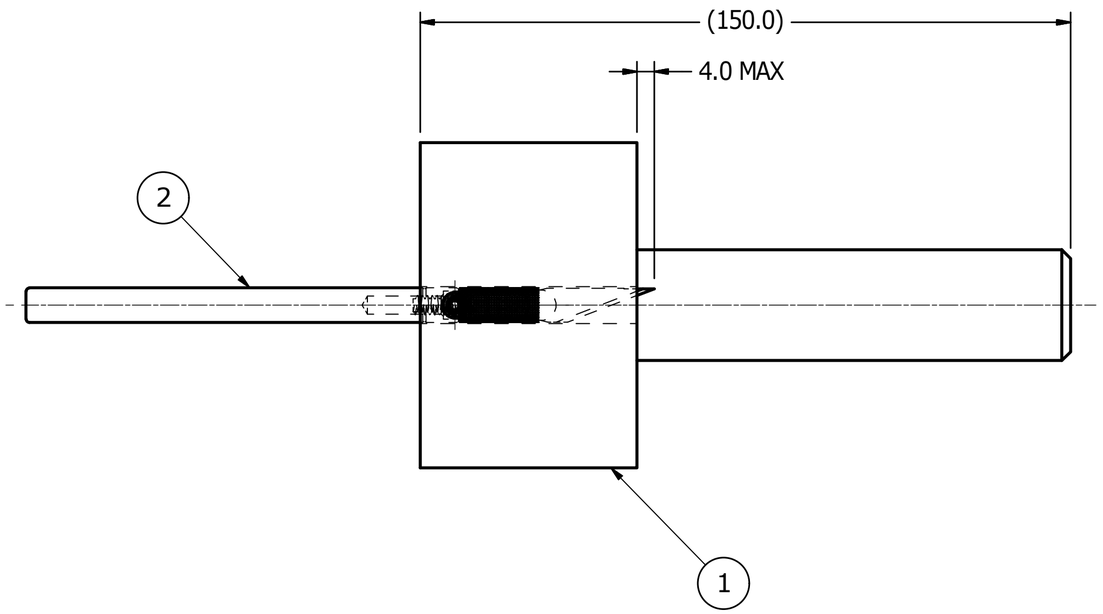
SECTION A-A

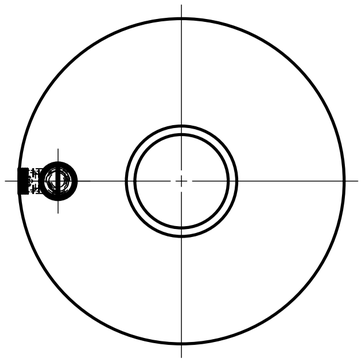
		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6, ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
			APPROVALS / DATE	OPTIONAL - ABDOMEN LARGE HOLE CUTTING GUIDE THOR-50M
			DRAWN Dave Walker / 12/16/2016	
472-8309	2	MATERIAL Steel	CHECKED	SIZE A3 / DRAWING NUMBER 472-8354 / REV
NEXT ASSEMBLY	QTY.	HEAT TREAT	ENG	
TOTAL QTY IN DUMMY	2	FINISH	APPROVED	THIRD ANGLE PROJECTION / SCALE: 1 : 1 / SHEET 1 OF 1

472-Lower Abdomen Large Hole Cutting Guide.ipt









ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	5000406	SCREW, SSCP M4 x 5
2	1	3000500V	PRECISION RAZOR KNIFE
1	1	472-8357	OPTIONAL - LARGE HOLE CUT FIXTURE BLOCK ASS'Y.

PARTS LIST

472-8300	1
NEXT ASSEMBLY	QTY.
TOTAL QTY IN DUMMY	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN Dave Walker	12/19/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

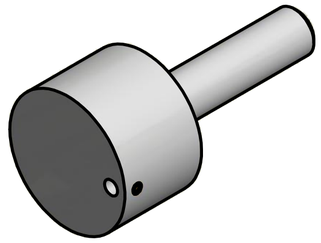
OPTIONAL -LARGE HOLE CUT FIXTURE ASSEMBLY
THOR-50M

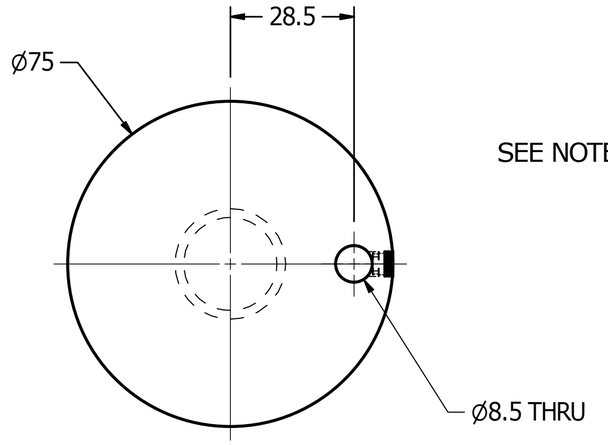
THIRD ANGLE PROJECTION

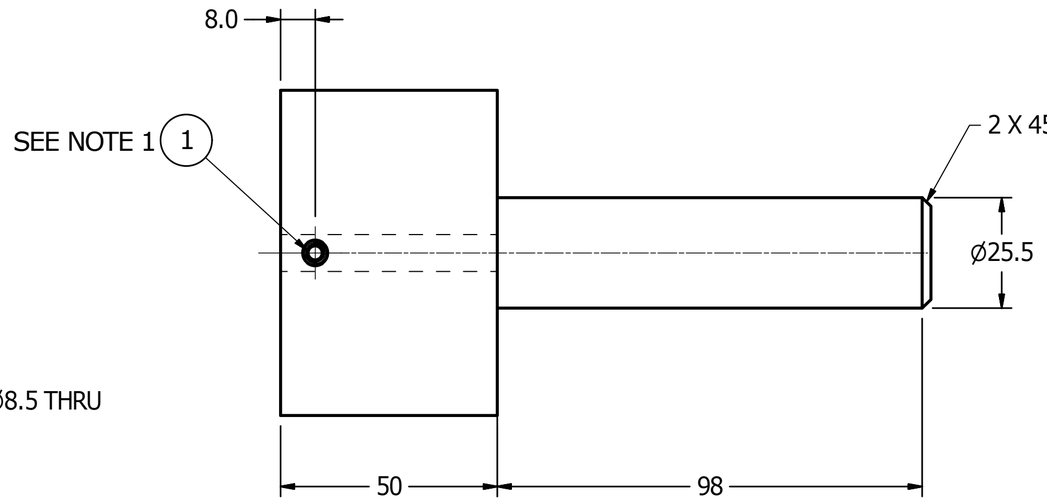
SIZE	DRAWING NUMBER	REV
A2	472-8356	

SCALE:	SHEET
1 : 1	1 OF 1

472-Large Hole Cut Fixture Assembly.iam







NOTES:

1. DRILL Ø5.94 - Ø5.74 TAPPERED HOLE ↧9.0, HEAT INSERT WITH SOLDER IRON AND INSERT FLUSH WITH SURFACE. (SEE MANUFACTURER INSTRUCTIONS)

ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL
1	1	5001114	INSERT, M4 X .7 X 4.7 (THERMOSET)	BRASS

PARTS LIST

472-8356	1
NEXT ASSEMBLY	QTY.
TOTAL QTY IN DUMMY	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: ACETAL, WHITE
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

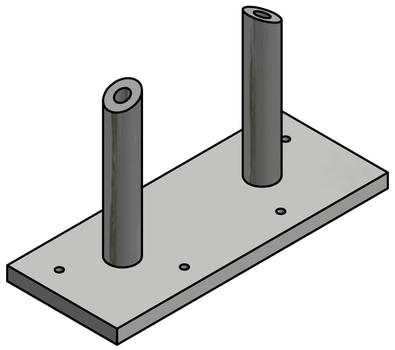
APPROVALS	DATE
DRAWN: Dave Walker	12/19/2016
CHECKED:	
ENG:	
APPROVED:	

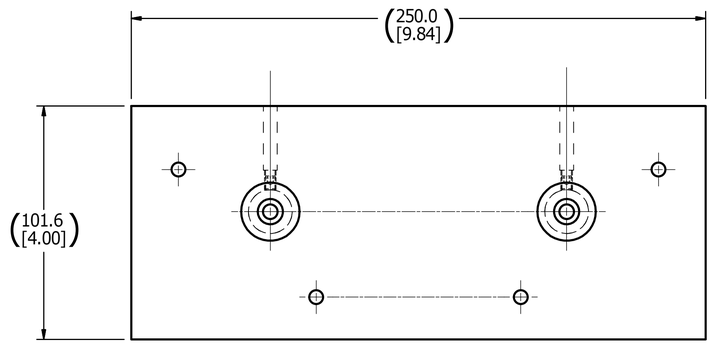
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

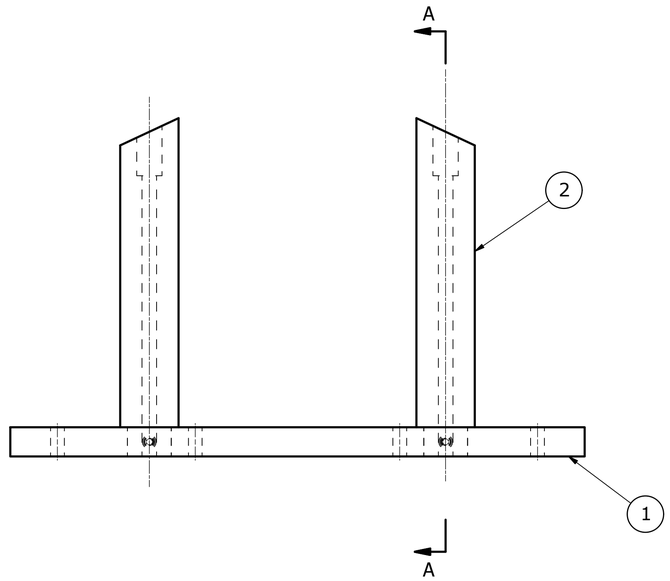
OPTIONAL - LARGE HOLE CUT FIXTURE BLOCK ASS'Y.
THOR-50M

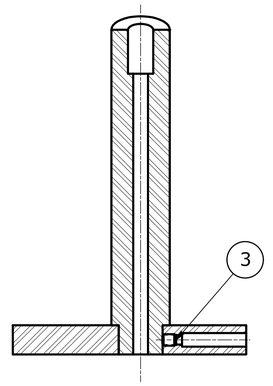
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 472-8357 | REV:
SCALE: 1 : 1 | SHEET: 1 OF 1









SECTION A-A

ITEM	QTY	PART NUMBER	DESCRIPTION
3	2	5000227V	SCREW, SSFP M5 x 6
2	2	472-8352	OPTIONAL - LOWER ABDOMEN BAG PUNCH - ROD
1	1	472-8351	OPTIONAL - LOWER ABDOMEN BAG PUNCH - BASE PLATE

PARTS LIST

472-8300	1
NEXT ASSEMBLY	QTY.
TOTAL QTY IN DUMMY	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN Dave Walker	10/23/2015
CHECKED	
ENG	
APPROVED	

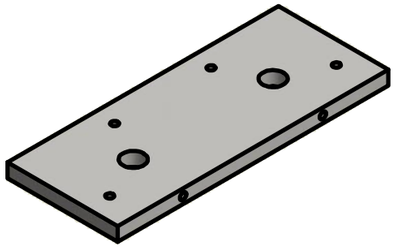
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

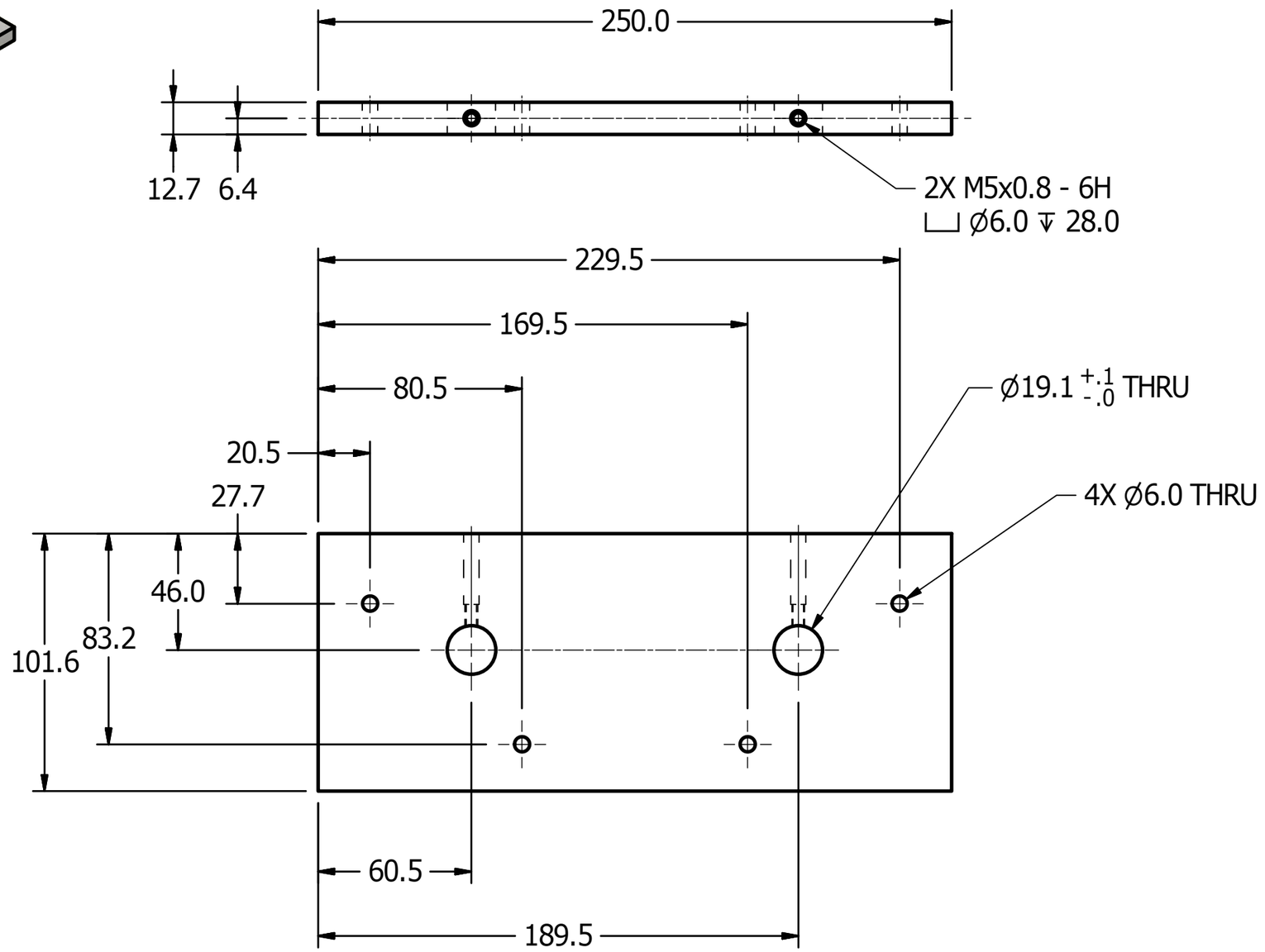
OPTIONAL - LOWER ABDOMEN BAG PUNCH - ASS'Y.
THOR-50M

THIRD ANGLE PROJECTION

SIZE A1 | DRAWING NUMBER 472-8350 | REV
SCALE: 1:1 | SHEET 1 OF 1

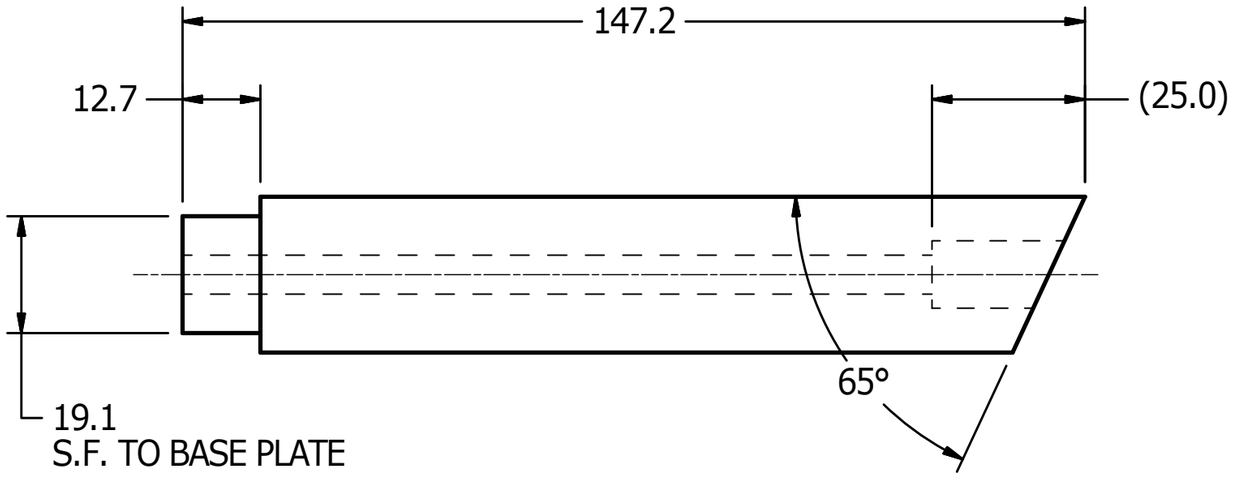
472-Lower Abdomen Bag Punch-Assembly.iam

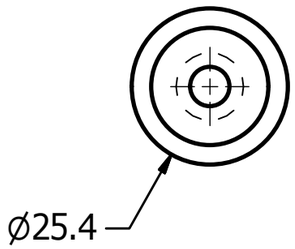


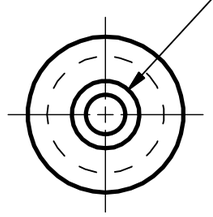


		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
			APPROVALS / DATE	OPTIONAL - LOWER ABDOMEN BAG PUNCH - BASE PLATE THOR-50M
472-8350	1	MATERIAL 1018 STEEL	DRAWN Dave Walker 10/23/2015	SIZE A3 · DRAWING NUMBER 472-8351 · REV
NEXT ASSEMBLY	QTY.	HEAT TREAT	CHECKED	THIRD ANGLE PROJECTION · SCALE: · SHEET 1 OF 1
TOTAL QTY IN DUMMY	1	FINISH	ENG / APPROVED	

472-Abdomen Bag Punch Base Plate.ipt







Ø6.4 +.1 -.0 THRU

⌴ Ø11.0 +.1 -.0 ↧ 25.00

MATCH TO BAG PUNCH
472-8353

472-8350	2
NEXT ASSEMBLY	QTY.
TOTAL QTY IN DUMMY	2

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: O-1 Steel
HEAT TREAT:
FINISH:

APPROVALS	DATE
DRAWN: Dave Walker	10/26/2015
CHECKED	
ENG	
APPROVED	

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

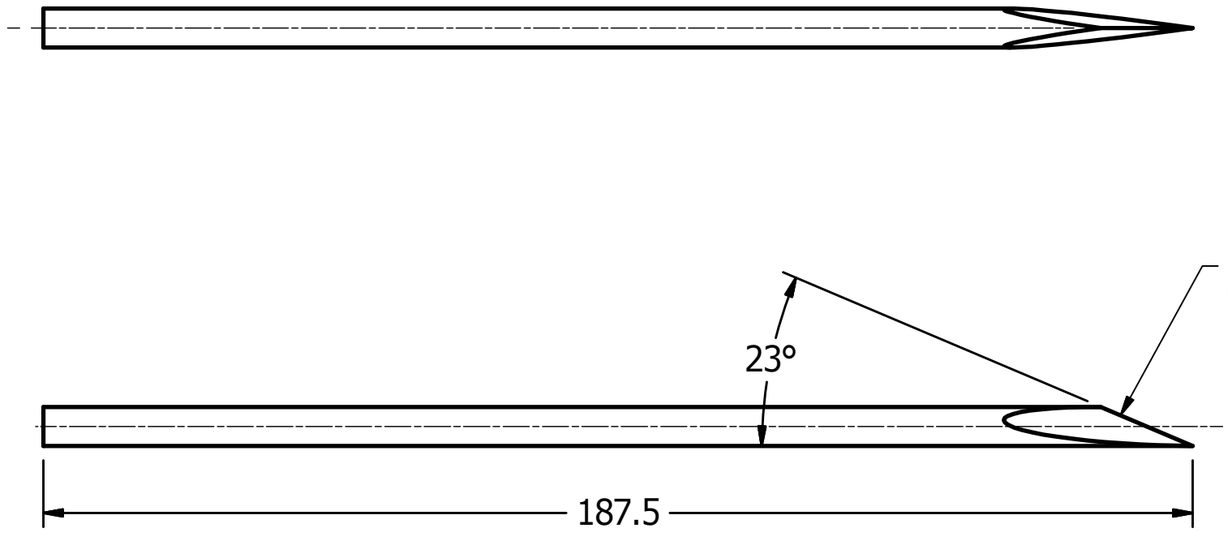
OPTIONAL - LOWER ABDOMEN BAG PUNCH - ROD
THOR-50M

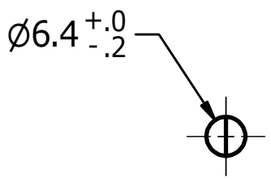
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 472-8352 | REV:

SCALE: 1:1 | SHEET: 1 OF 1

472-Lower Abdomen Bag Punch-Rod.ipt





472-8300	1
NEXT ASSEMBLY	QTY.
TOTAL QTY IN DUMMY	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN Dave Walker	12/16/2016
CHECKED	
ENG	
APPROVED	

MATERIAL: O-1 Steel
HEAT TREAT:
FINISH:

DEPARTMENT OF TRANSPORTATION — UNITED STATES OF AMERICA

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

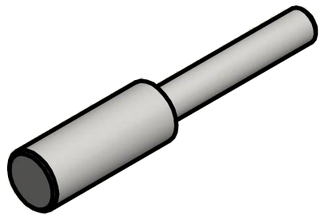
OPTIONAL - FRONT HOLE PILOT KNIFE
THOR-50M

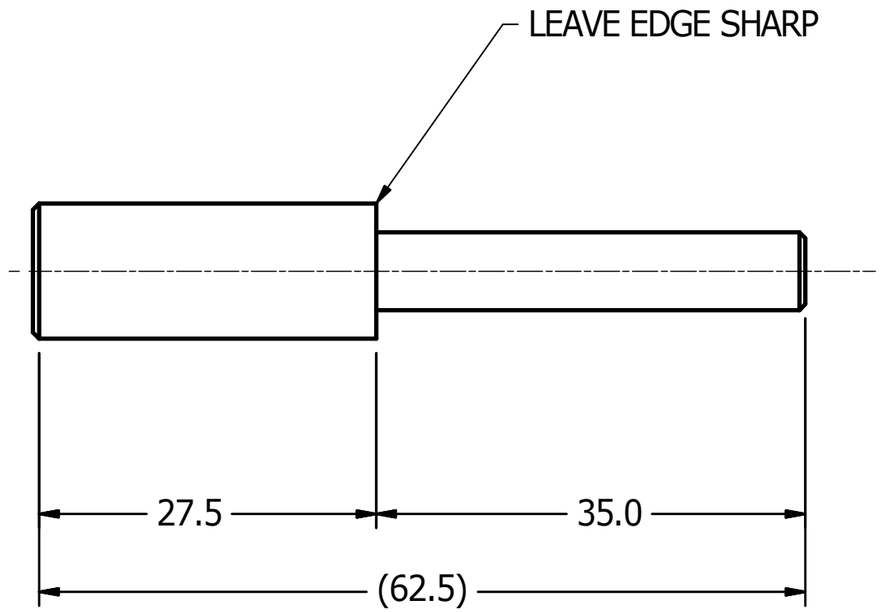
THIRD ANGLE PROJECTION

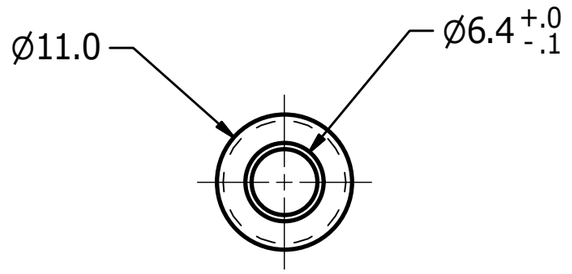
SIZE: A3 | DRAWING NUMBER: 472-8355 | REV:

SCALE: 1 : 1 | SHEET: 1 OF 1

Front hole pilot knife.ipt







472-8300	2
NEXT ASSEMBLY	QTY.
TOTAL QTY IN DUMMY	2

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 1018 STEEL
HEAT TREAT: HARDEN 60 - 63Rc
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN Dave Walker	10/26/2015
CHECKED	
ENG	
APPROVED	

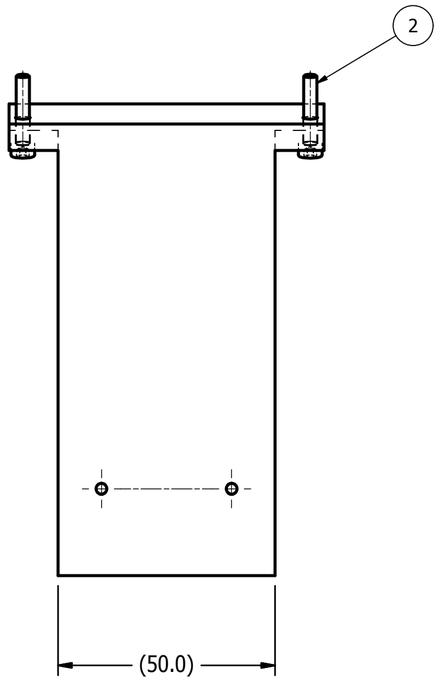
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

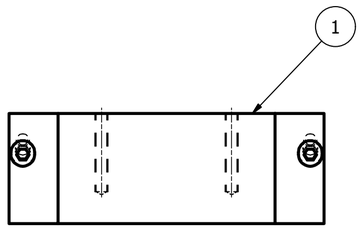
OPTIONAL - LOWER ABDOMEN BAG PUNCH - PUNCH
THOR-50M

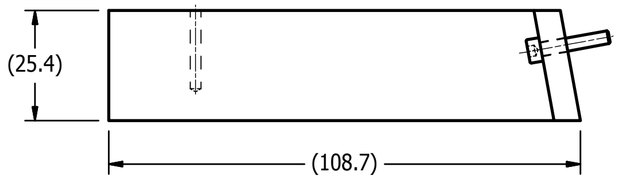
THIRD ANGLE PROJECTION

SIZE: A3
DRAWING NUMBER: 472-8353
REV:
SCALE: 2:1
SHEET: 1 OF 1

472-LowerAbdomen Bag Punch-Punch.ipt







ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	5000437	SCREW, SHCS M3x0.5 x 16
1	1	DL472-9010	PELVIS STANDOFF BLOCK

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 125 | ANGLES ±.5°

ASME Y14.5M - 1994

DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT

FINISH

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

APPROVALS	DATE
DRAWN Dave Walker	5/4/2017
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PELVIS STANDOFF BLOCK ASS'Y.

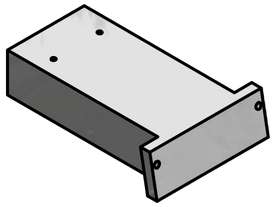
THOR-50M

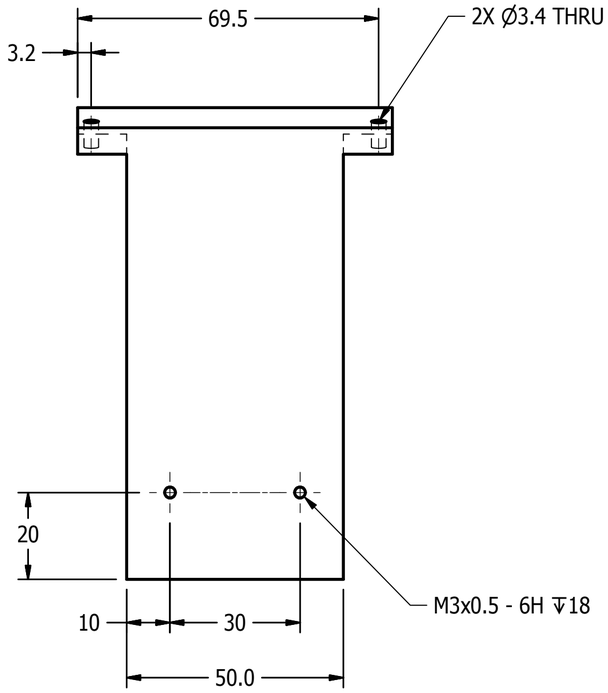
THIRD ANGLE PROJECTION

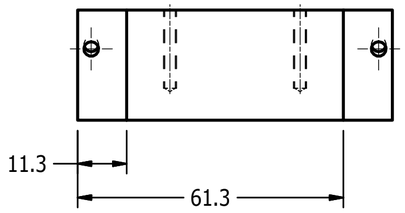
SIZE **A2** | DRAWING NUMBER DL472-9009 | REV

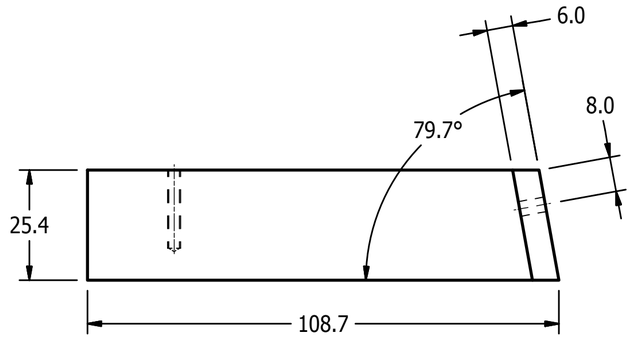
SCALE: 1 : 1 | SHEET 1 OF 1

DL472-9009.iam







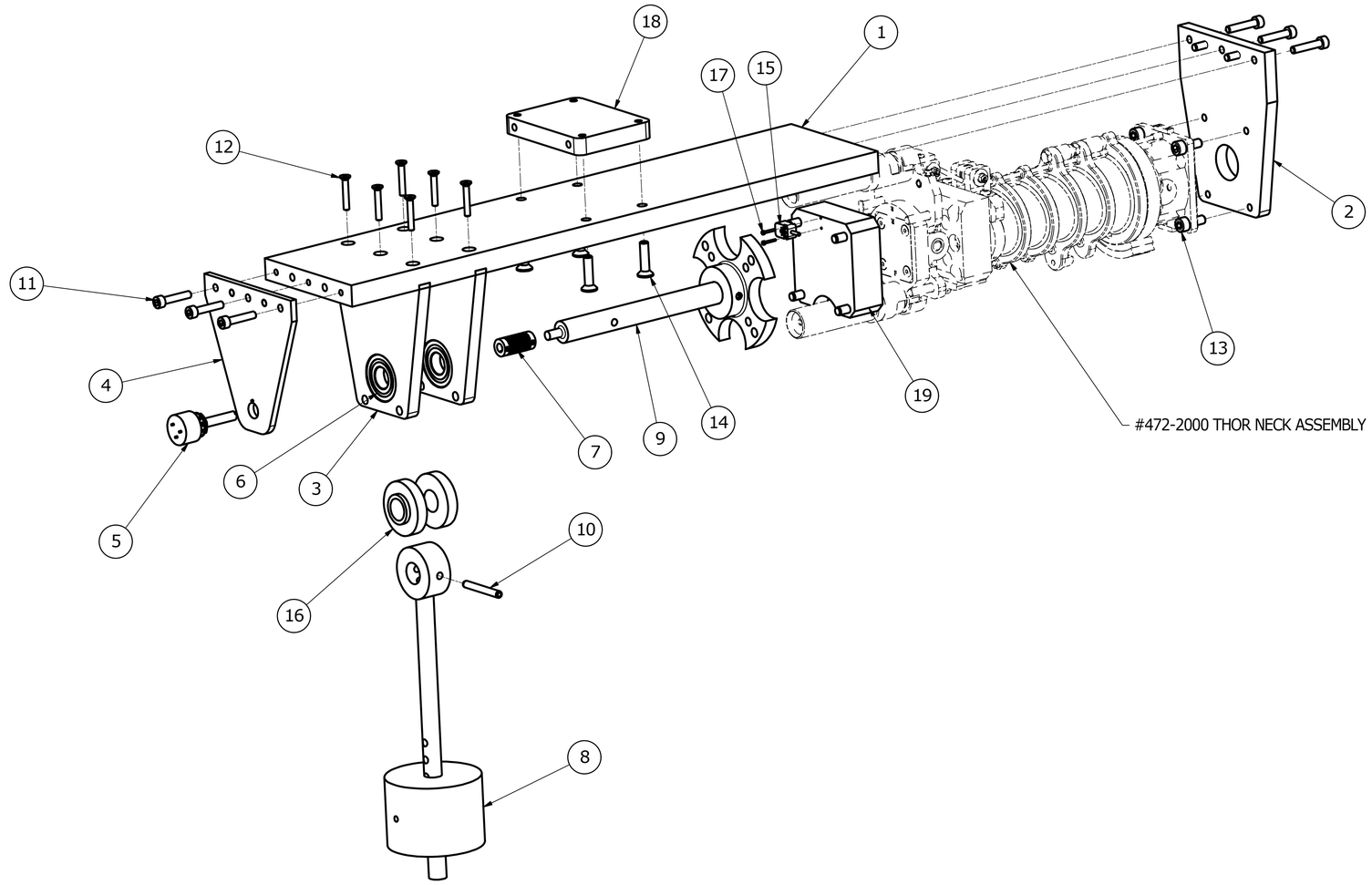


UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED ANGLES ±.5° ASME Y14.5M - 1994 **DO NOT SCALE DRAWING**	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER		**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION**
	APPROVALS	DATE	PELVIS STANDOFF BLOCK THOR-50M
	DRAWN Dave Walker	3/8/2017	
MATERIAL Aluminum 6061	CHECKED		SIZE **A2** / DRAWING NUMBER DL472-9010 / REV
HEAT TREAT	ENG		THIRD ANGLE PROJECTION / SCALE: 1 / 2 / SHEET 1 OF 1
FINISH	APPROVED		

DL472-9010.ipt

TEST FIXTURES

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC; REMOVED PART #DL472-1135 - NECK TWIST FIXTURE END PLATE ASS'Y., LEFT, FRONT IMPACT	9/9/2015	DW
	B	REVISED ITEM 8 - DL472-1160 - NECK TWIST FIXTURE PENDULUM ROD ASS'Y.; ITEM 11 DESCRIPTION WAS SCREW, SHCS M5-08 x 25; ITEM 15 PART # SA572-S56 WAS SA572-S55	8/17/2016	DW
	C	ITEM #12 PART NUMBER WAS 5000292V	7/6/2017	DW



ITEM	QTY	PART NUMBER	DESCRIPTION
19	1	DL472-1170	NECK TWIST FIXTURE NECK MOUNTING ADAPTER
18	1	DL472-109	NECK TWIST TEST FIXTURE MOUNTING PLATE
17	2	5000376V	SCREW, SHCS M1.4-0.3 x 10
16	2	DL472-1180	NECK TWIST FIXTURE PENDULUM SPACER
B	15	1	SA572-S56	ANGULAR RATE SENSOR
14	4	5000135	SCREW, FHCS M6-1 x 25
13	4	5000604	SCREW, SHCS M6-1 x 16
C	12	6	5000452V	SCREW, FHCS M4-0.7 x 25
B	11	6	5000373V	SCREW, SHCS M5-0.8 x 25
10	1	5000200V	PIN, ROLL M5 x 40
9	1	DL472-1150	NECK TWIST FIXTURE SHAFT ASSEMBLY
B	8	1	DL472-1160	NECK TWIST FIXTURE PENDULUM ROD ASS'Y.
7	1	3000300V	SHAFT COUPLING, FLEXIBLE BELLOWS FOR ¼" [6.4 MM] SHAFT, 1.09" [27.7 MM] LG., ½" [12.7 MM] O.D.
6	2	3000150V	BALL BEARING, 5/8" [15.9] BORE, 1 3/8" [35.0] O.D., 11/32" [8.7] THK., S.S.
5	1	SA572-S51	ROTARY POTENTIOMETER
4	1	DL472-1120	NECK TWIST FIXTURE END PLATE ASSEMBLY
3	2	DL472-1140	NECK TWIST FIXTURE MIDDLE SUPPORT PLATE
2	1	DL472-1130	NECK TWIST FIXTURE END PLATE ASS'Y., LATERAL IMPACT
1	1	DL472-1110	NECK TWIST FIXTURE TOP PLATE

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	6/10/2015
CHECKED	
ENG	
APPROVED	

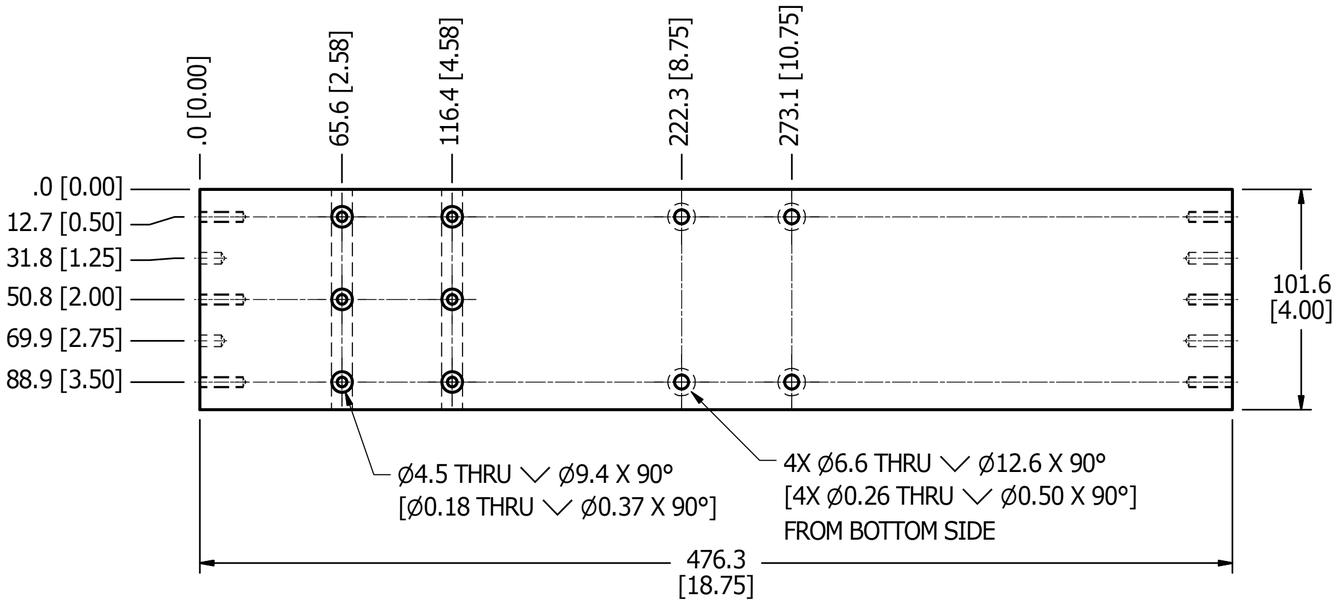
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

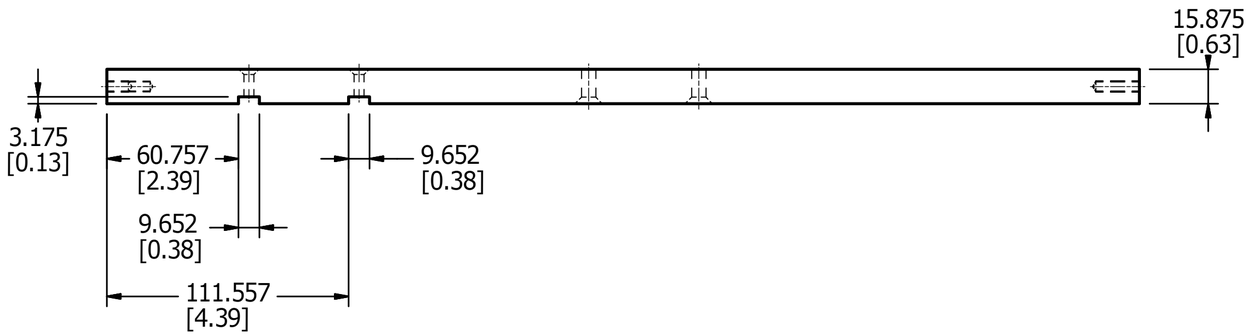
NECK TWIST FIXTURE
THOR-50M

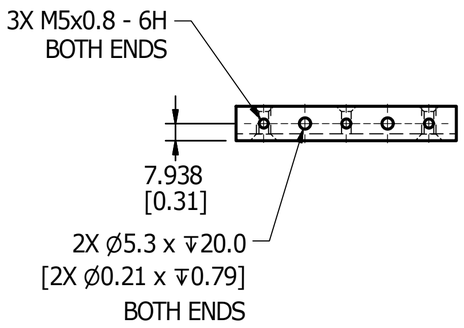
THIRD ANGLE PROJECTION
SIZE A1 | DRAWING NUMBER DL472-1000 | REV C
SCALE: 1/2 | SHEET 1 OF 1

THOR M NTF
Complete
Assembly.iam

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC	9/8/2015	DW







UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Aluminum-6061
HEAT TREAT:
FINISH:

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	2/23/2015
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

NECK TWIST FIXTURE TOP PLATE

THOR-50M

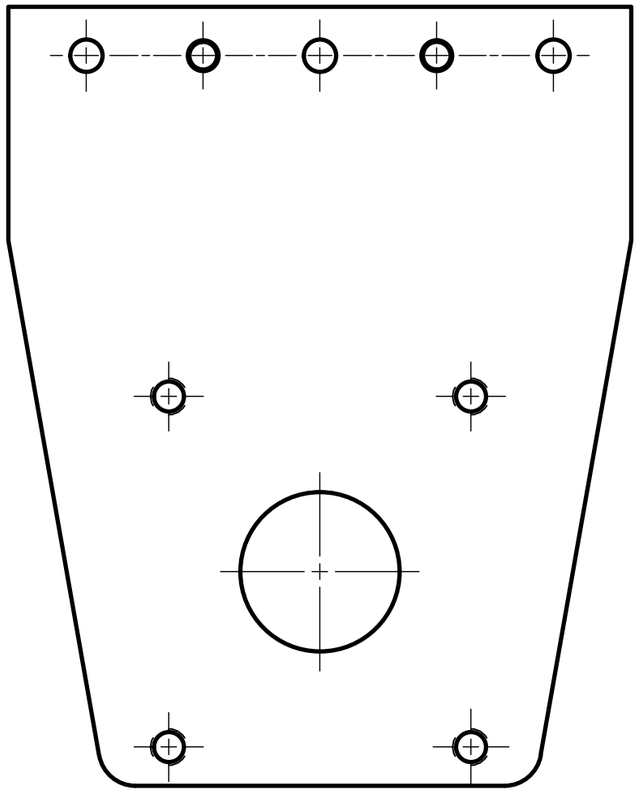
THIRD ANGLE PROJECTION

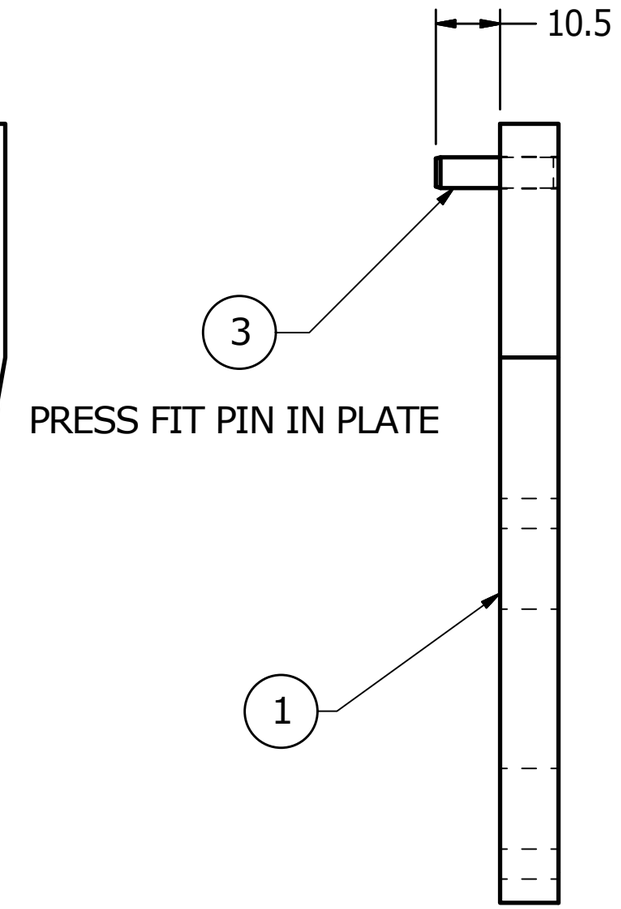
SIZE	DRAWING NUMBER	REV
A2	DL472-1110	A

SCALE: 1/2 | SHEET 1 OF 1

THOR M NTF Top Plate.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC	9/8/2015	DW





ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL
3	2	5000332V	PIN, DOWEL M5 x 20	Steel
1	1	DL472-1131	NECK TWIST FIXTURE END PLATE, LATERAL IMPACT	

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	2/24/2015
CHECKED	
ENG	
APPROVED	

DEPARTMENT OF TRANSPORTATION UNITED STATES OF AMERICA
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

NECK TWIST FIXTURE END PLATE ASS'Y., LATERAL IMPACT
THOR-50M

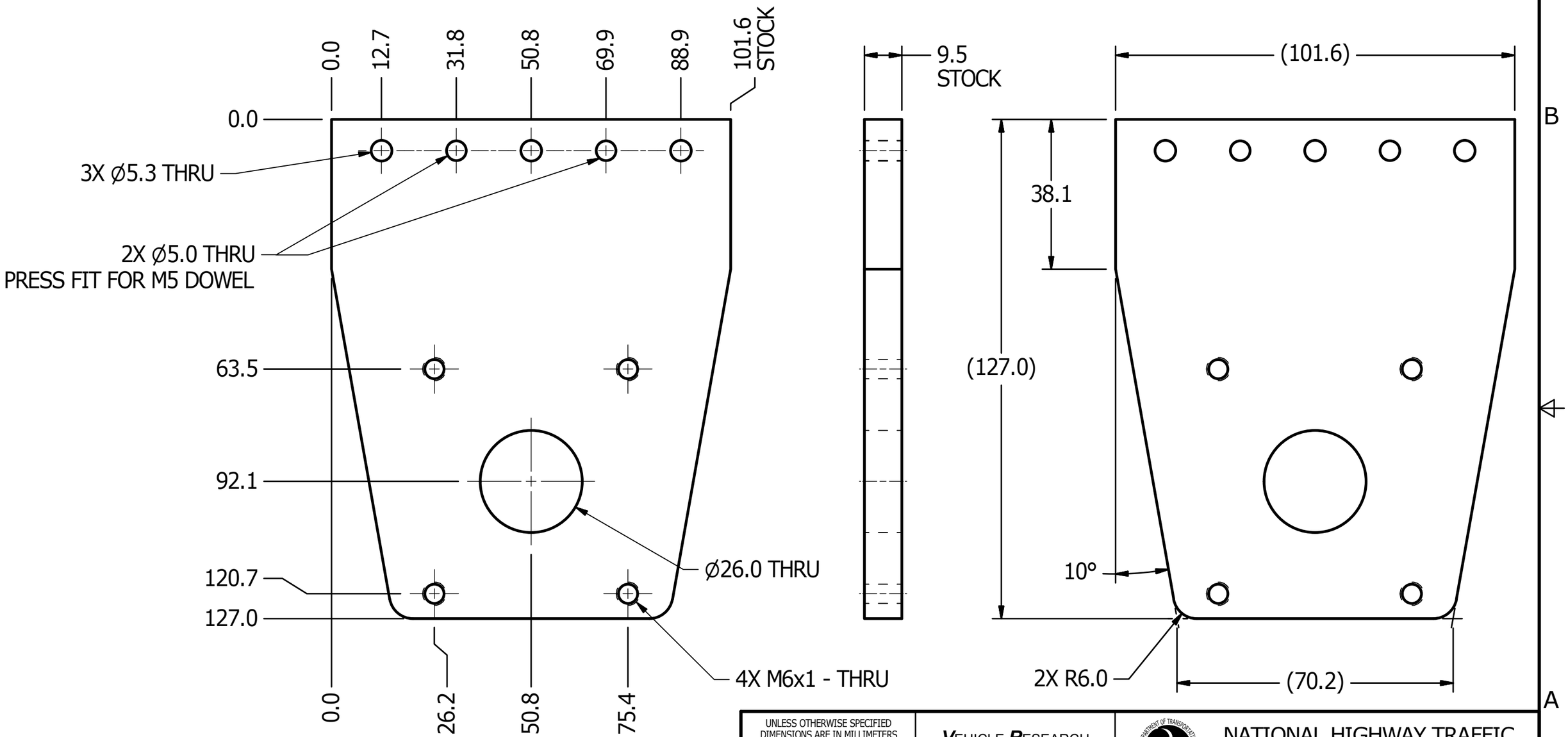
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A3	DL472-1130	A

SCALE: 1:1
SHEET 1 OF 1

THOR M NTF End Plate Left Assy, Side Impact.iam

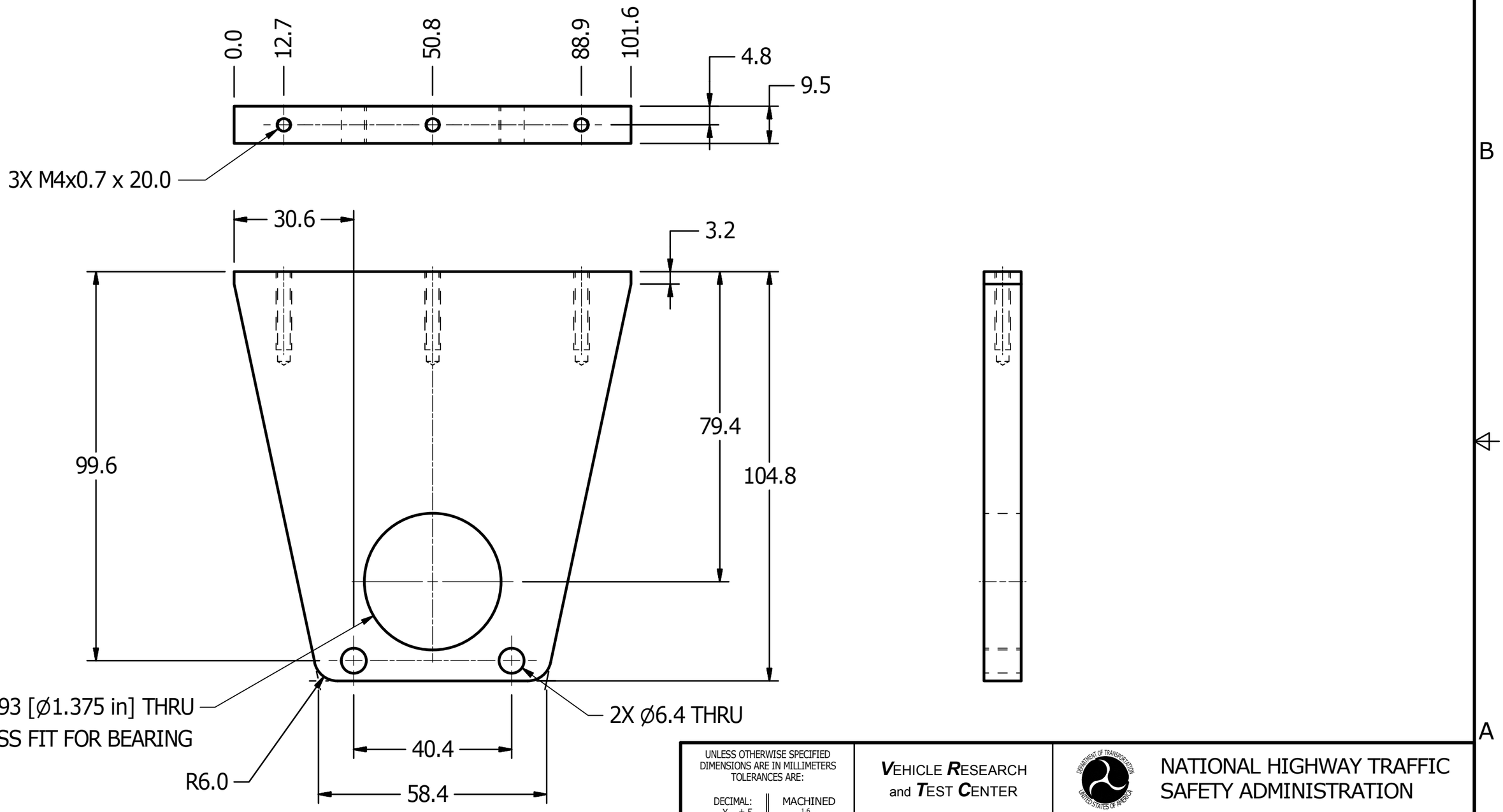
REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC	9/8/2015	DW



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	NECK TWIST FIXTURE END PLATE, LATERAL IMPACT THOR-50M
	DRAWN: JIM CLEVENGER / 2/24/2015	
MATERIAL: Aluminum-6061	CHECKED	SIZE: A3 | DRAWING NUMBER: DL472-1131 | REV: A
HEAT TREAT	ENG	
FINISH	APPROVED	THIRD ANGLE PROJECTION | SCALE: 1:1 | SHEET: 1 OF 1

THOR M NTF End Plate Left, Side Impact.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC	9/8/2015	DW



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN JIM CLEVENGER	2/24/2015
CHECKED	
ENG	
APPROVED	

MATERIAL: Aluminum-6061
HEAT TREAT:
FINISH:

NECK TWIST FIXTURE MIDDLE SUPPORT PLATE
THOR-50M

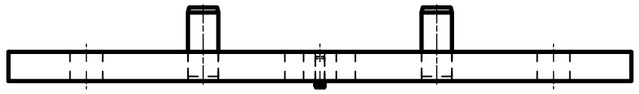
THIRD ANGLE PROJECTION

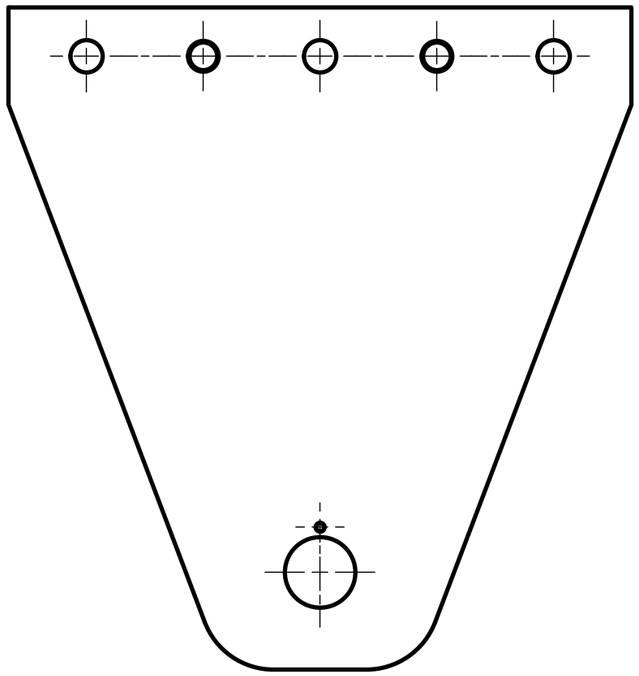
SIZE: A3 | DRAWING NUMBER: DL472-1140 | REV: A

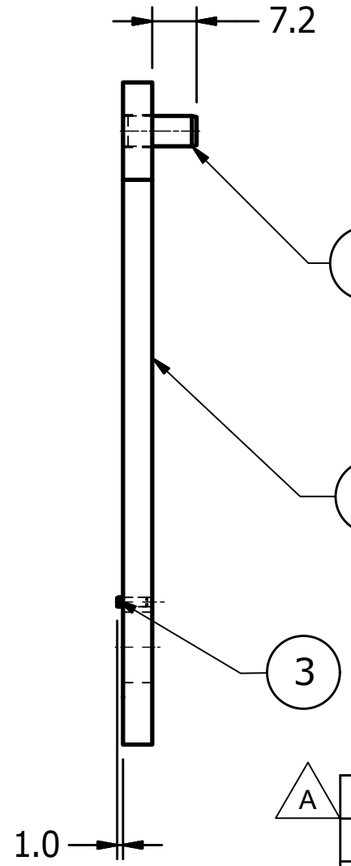
SCALE: 1:1 | SHEET: 1 OF 1

THOR M NTF Middle Support Plate.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC, ADDED PART #5000224 - PIN, DOWEL M1.5 X 5	9/8/2015	DW
	B	REVISED ITEM #1 – DL472-1121 – NECK TWIST FIXTURE END PLATE, RIGHT	3/18/2016	DW







ITEM	QTY	PART NUMBE	DESCRIPTION	MATERIAL
3	1	5000224	PIN, DOWEL M1.5 x 5	Steel
2	2	5000002	PIN, DOWEL M5 x 12	Steel
1	1	DL472-1121	NECK TWIST FIXTURE END PLATE, RIGHT	

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	2/24/2015
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

NECK TWIST FIXTURE END PLATE ASSEMBLY THOR-50M

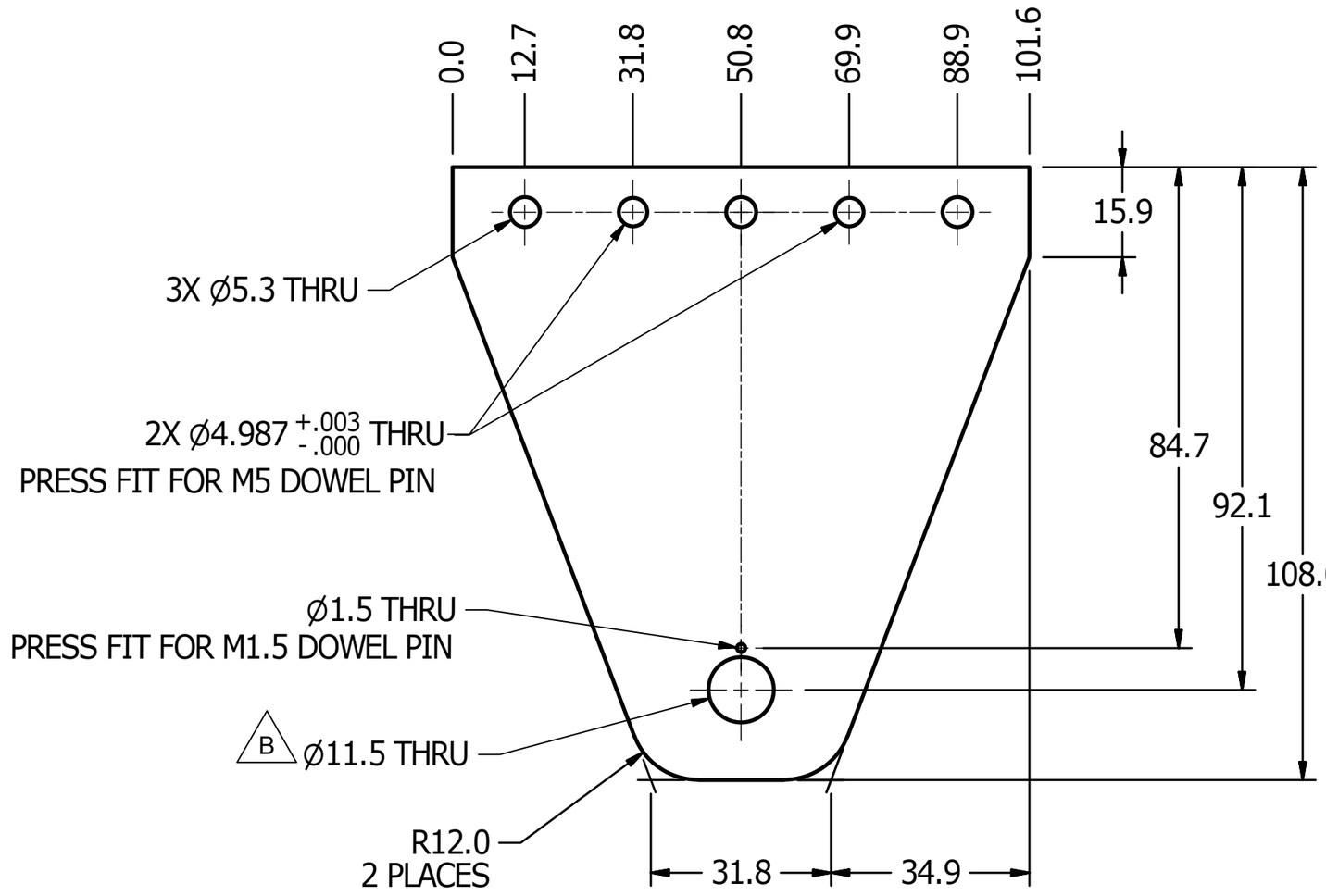
THIRD ANGLE PROJECTION

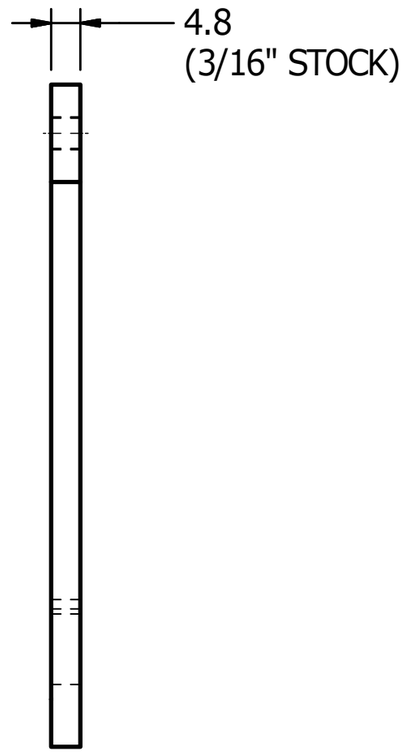
SIZE A3 | DRAWING NUMBER DL472-1120 | REV B

SCALE: 1:1 | SHEET 1 OF 1

THOR M NTF End Plate Right Assy.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC	9/8/2015	DW
	B	DIM. Ø11.5 THRU WAS Ø9.5 THRU	2/24/2016	DW





UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Aluminum-6061
HEAT TREAT:
FINISH:

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	2/24/2015
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

NECK TWIST FIXTURE END PLATE, RIGHT THOR-50M

THIRD ANGLE PROJECTION

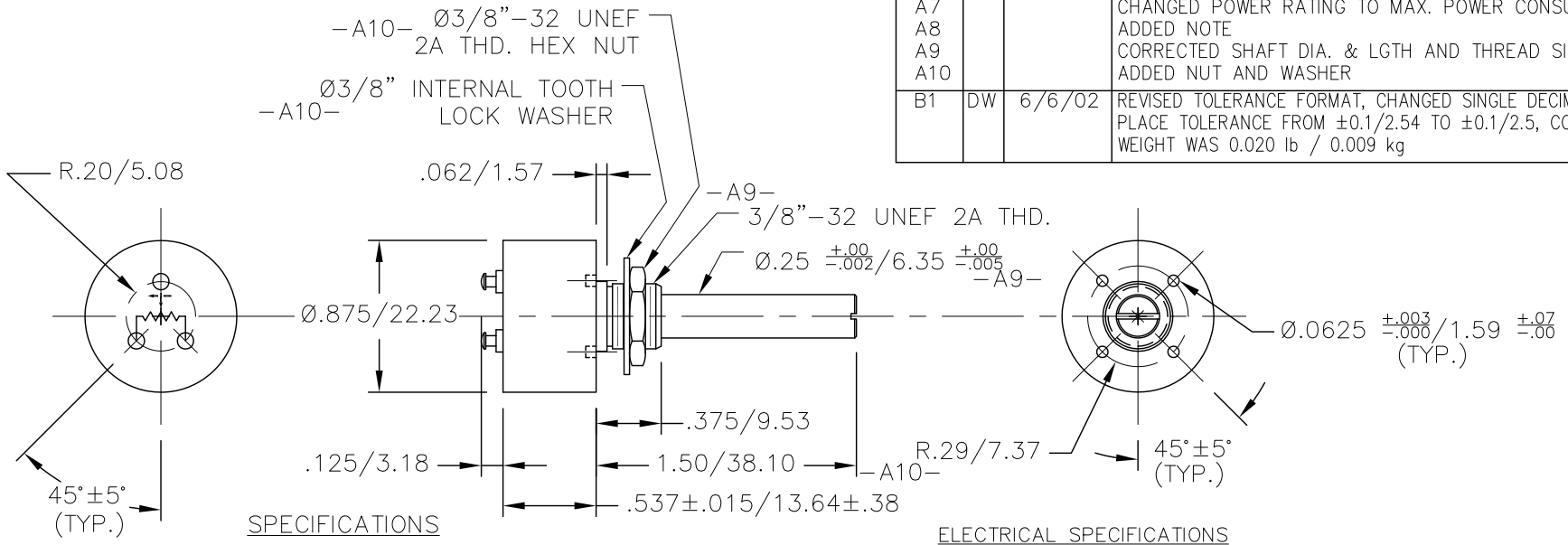
SIZE: A3 | DRAWING NUMBER: DL472-1121 | REV: B

SCALE: 1:1 | SHEET: 1 OF 1

THOR M NTF End Plate Right.ipt

REVISION RECORD

ITEM NO.	BY	DATE	DESCRIPTION
A1	DW	9/20/99	CHANGED RESISTANCE OF 1 K OhM TO 1K, 2K, 5K, 10K Ohm
A2			RESOLUTION FROM CONTINUES TO VIRTUALLY INFINITE
A3			LIFE REDUCED TO >10,000 REVS.
A4			ADDED REFERENCE TO NORMAL OUTPUT SENSITIVITY
A5			CHANGED EFFECTIVE LINEAR RANGE FROM 320–360 ±5° TO 320 ±5°
A6			CHANGED EFFECTIVE ELECTRICAL TRAVEL FROM 320–360 ±5° TO 320 ±5°
A7			CHANGED POWER RATING TO MAX. POWER CONSUMPTION
A8			ADDED NOTE
A9			CORRECTED SHAFT DIA. & LGTH AND THREAD SIZE
A10			ADDED NUT AND WASHER
B1	DW	6/6/02	REVISED TOLERANCE FORMAT, CHANGED SINGLE DECIMAL PLACE TOLERANCE FROM ±0.1/2.54 TO ±0.1/2.5, CORRECTED WEIGHT WAS 0.020 lb / 0.009 kg



SPECIFICATIONS

PERFORMANCE PARAMETERS

–A1–	TOTAL RESISTANCE	1K,2K,5K,10K Ohm ±10%
–A2–	RESOLUTION	VIRTUALLY INFINITE
	ROTATIONAL SPEED	to 700 rpm
	LINEARITY	± 0.5% F.S.
–A3–	ROTATIONAL LIFE	> 10,000 REVS
	SHOCK	50 g

CHARACTERISTICS

	NOMINAL MAXIMUM INPUT VOLTAGE	10V DC
–A4–	NOMINAL OUTPUT SENSITIVITY	> 0.03%Vin/10 deg (REF.)
–A5–	EFFECTIVE LINEAR RANGE	320, ±5 deg
	MECHANICAL TRAVEL	NO LIMIT
	MOUNTING	PLANE

–A8– SIGNAL OUTPUT MUST BE COMPATIBLE WITH AND RECORDABLE IN A DATA CHANNEL AS DEFINED IN SAE J211

RELEASED

JUN. 10, 2002

NHTSA

ELECTRICAL SPECIFICATIONS

–A6–	EFFECTIVE ELECTRICAL TRAVEL	320, ±5 deg
	INDEPENDENT LINEARITY	< ± 0.5% F.S.
–A7–	MAX POWER CONSUMPTION	< 1/10 Watts

MECHANICAL SPECIFICATIONS

	MECHANICAL ANGLE	CONTINUOUS NO STOPS
	TORQUE MAX	MINIMAL TORQUE
	OPERATING TEMP.	69–72°F/20.6 – 22.2°C
	STORAGE TEMP.	0–200°F/–17.8–93.3°C
	HUMIDITY	10–70% RELATIVE HUMIDITY
	WATER PROOF	NO
–B1–	WEIGHT	< .050 lb / 0.023 kg

UNITS ARE in/mm

TOLERANCES ARE: *

DECIMALS	ANGLES
.X ±0.1/2.5	+ 0.5°
.XX ±0.01/.25	
.XXX ±0.005/.127	

* unless otherwise noted

–B1–

MATERIAL:

SCALE NONE

APPROVALS	DATE
DRAWN Gerda England	4/7/98
CHECKED	
ENG J. McFadden	

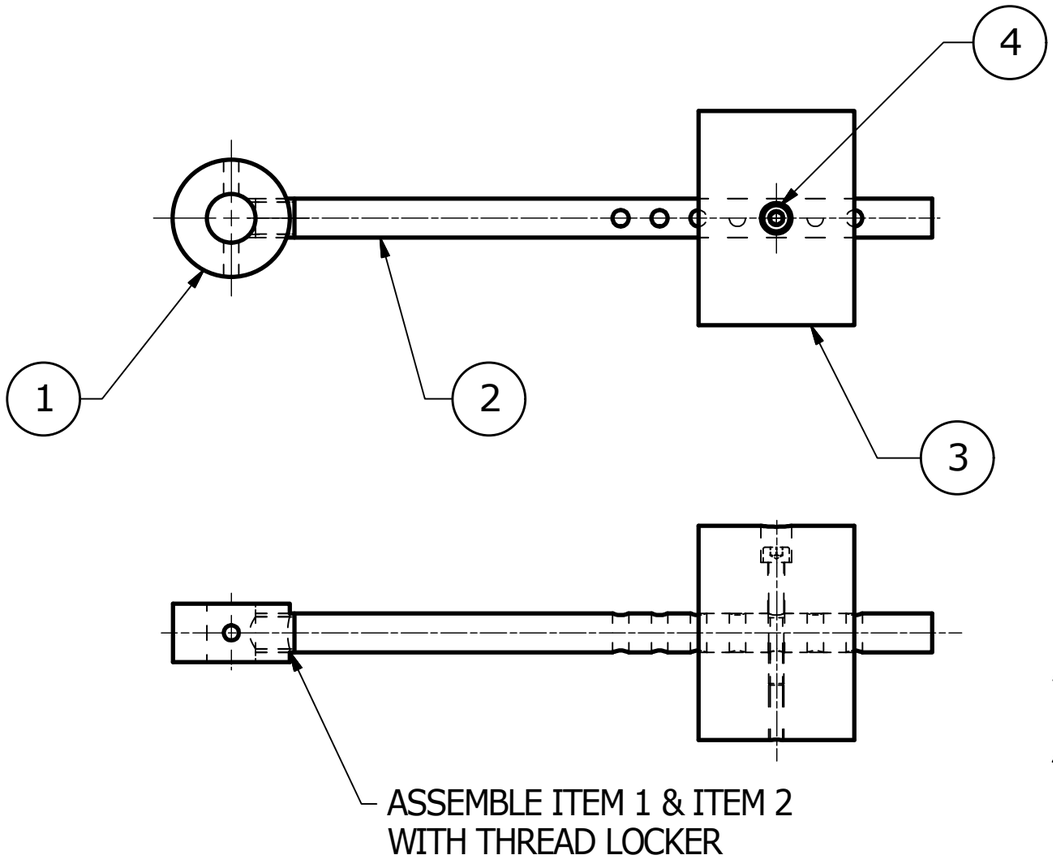
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

CHEST ROTARY POTENTIOMETER

HYBRID III DUMMY FAMILY

SIZE		DRAWING NUMBER	REV
A		SA572–S51	B

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC	9/8/2015	JC
	B	REVISED ITEM 3 - DL472-1163 - NECK TWIST FIXTURE PENDULUM WEIGHT	3/7/2016	DW
	C	ITEM #4 PART NUMBER WAS 5000472V	7/7/2017	DW



ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL
C 4	1	5000473V	SCREW, SHCS M5-0.8 x 40	Steel, Mild
B 3	1	DL472-1163	NECK TWIST FIXTURE PENDULUM WEIGHT	
2	1	DL472-1162	NECK TWIST FIXTURE PENDULUM ROD	
1	1	DL472-1161	NECK TWIST FIXTURE PENDULUM COLLAR	

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	2/25/2015
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

NECK TWIST FIXTURE PENDULUM ROD ASS'Y. THOR-50M

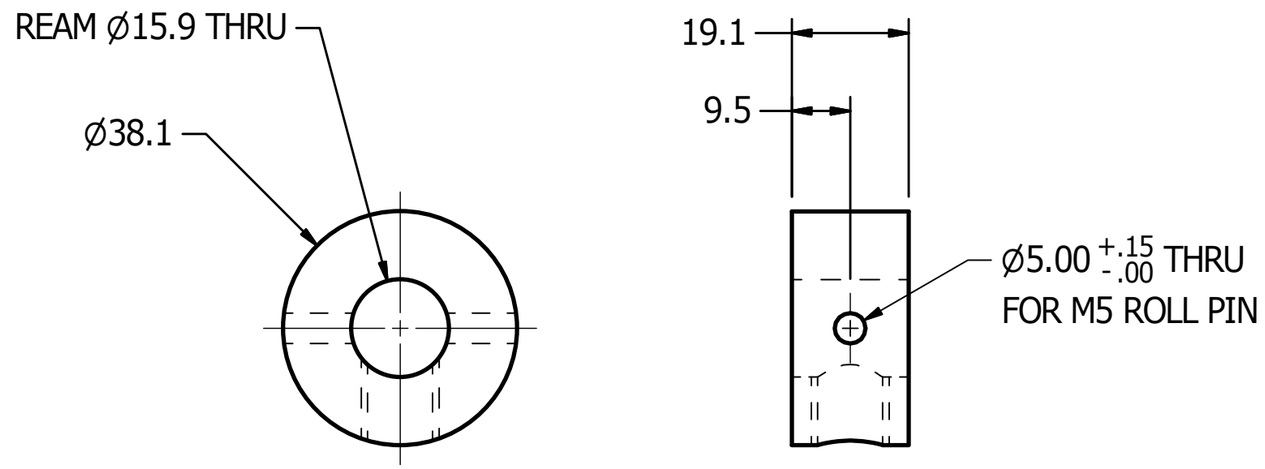
THIRD ANGLE PROJECTION

SIZE A3 | DRAWING NUMBER DL472-1160 | REV C

SCALE: 1/2 | SHEET 1 OF 1

THOR M NTF Pendulum Rod Assembly.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC	9/8/2015	DW



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Steel
HEAT TREAT:
FINISH:

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN: JIM CLEVENGER	2/25/2015
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

NECK TWIST FIXTURE PENDULUM COLLAR THOR-50M

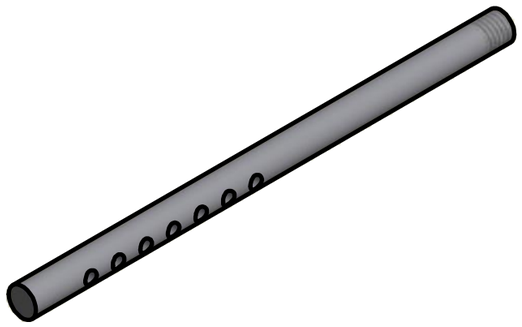
THIRD ANGLE PROJECTION

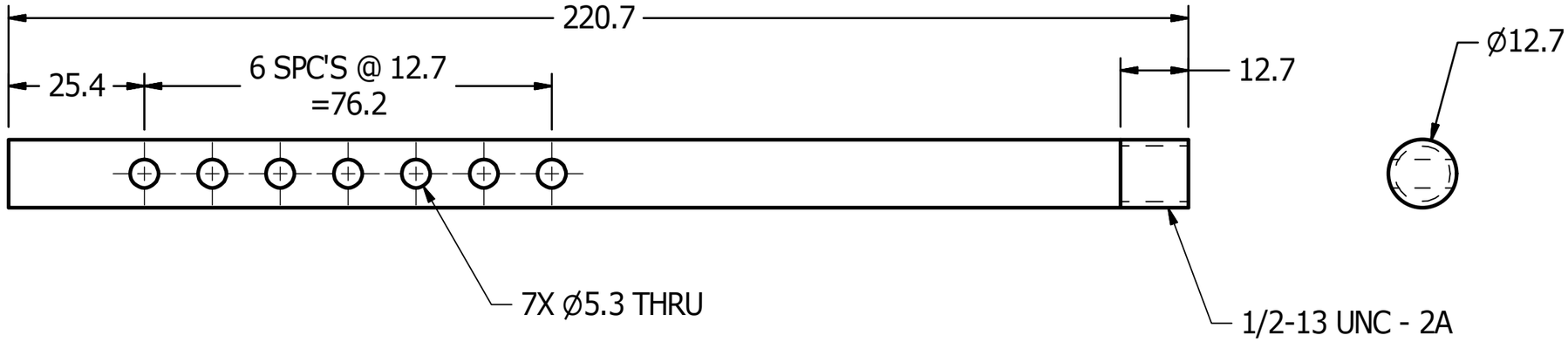
SIZE: A3 | DRAWING NUMBER: DL472-1161 | REV: A

SCALE: 1:1 | SHEET: 1 OF 1

THOR M NTF Pendulum Collar.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC	2/25/2015	JC



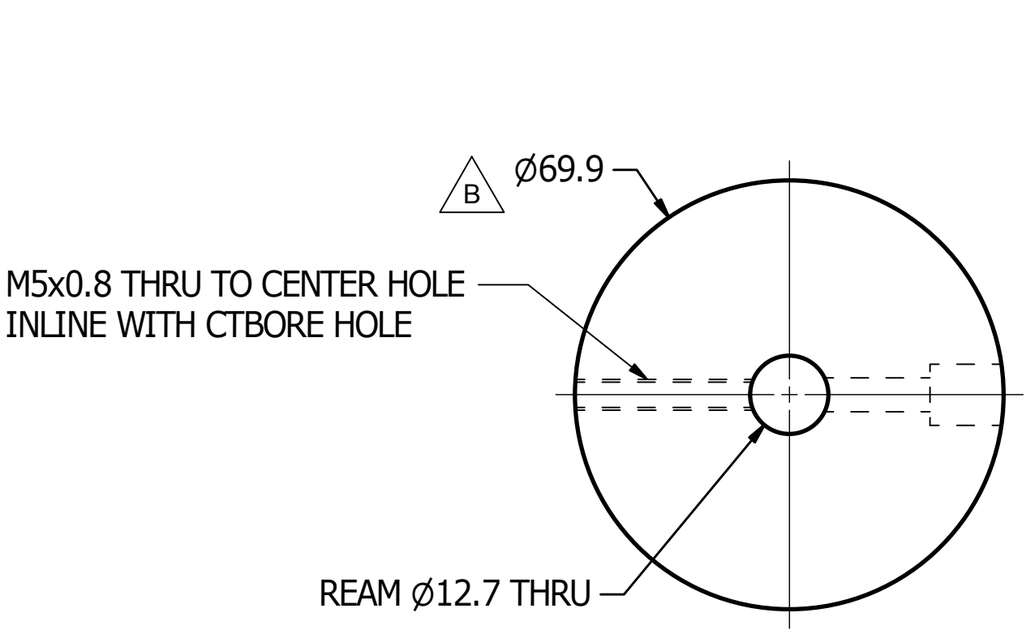


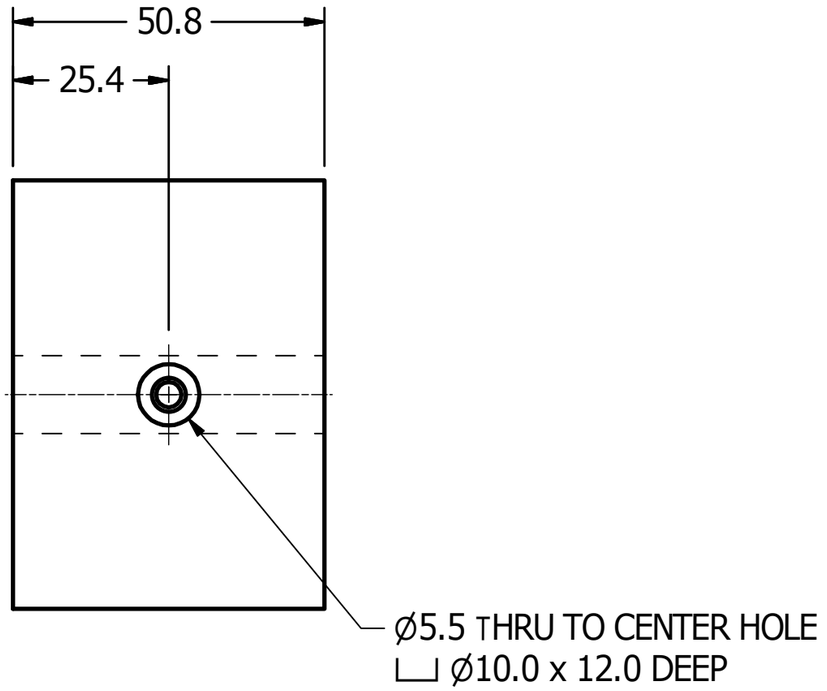
STOCK: ∅1/2" CR ROUND BAR

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED 1.6 / ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	NECK TWIST FIXTURE PENDULUM ROD THOR-50M
MATERIAL: Steel	DRAWN: JIM CLEVENGER	2/25/2015	
HEAT TREAT	CHECKED		SIZE: A3 / DRAWING NUMBER: DL472-1162 / REV: A
FINISH	ENG		
	APPROVED		THIRD ANGLE PROJECTION / SCALE: 1:1 / SHEET: 1 OF 1

THOR M NTF Pendulum Shaft.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC	9/8/2015	DW
	B	⌀69.9 WAS ⌀50.8	2/24/2016	DW





UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL:	MACHINED
X ±.5	1.6
X.X ±.2	ANGLES
X.XX ±.1	±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN JIM CLEVENGER	2/25/2015
CHECKED	
ENG	
APPROVED	

MATERIAL: Steel
HEAT TREAT:
FINISH:

NECK TWIST FIXTURE PENDULUM WEIGHT THOR-50M

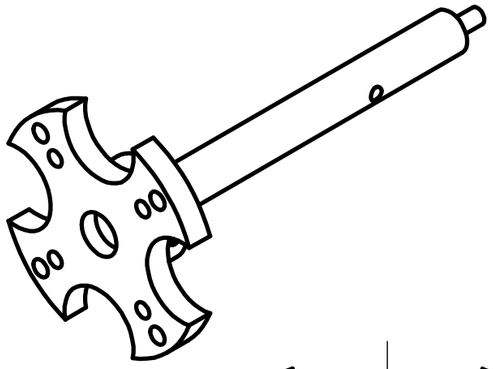
THIRD ANGLE PROJECTION

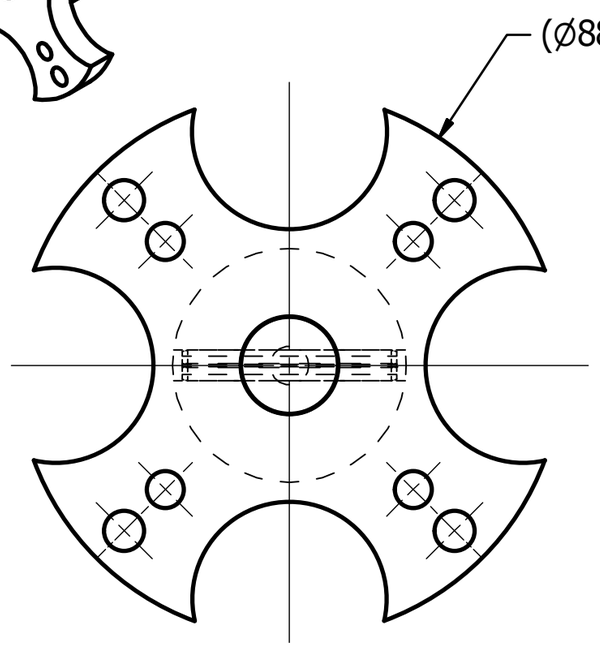
SIZE	DRAWING NUMBER	REV
A3	DL472-1163	B

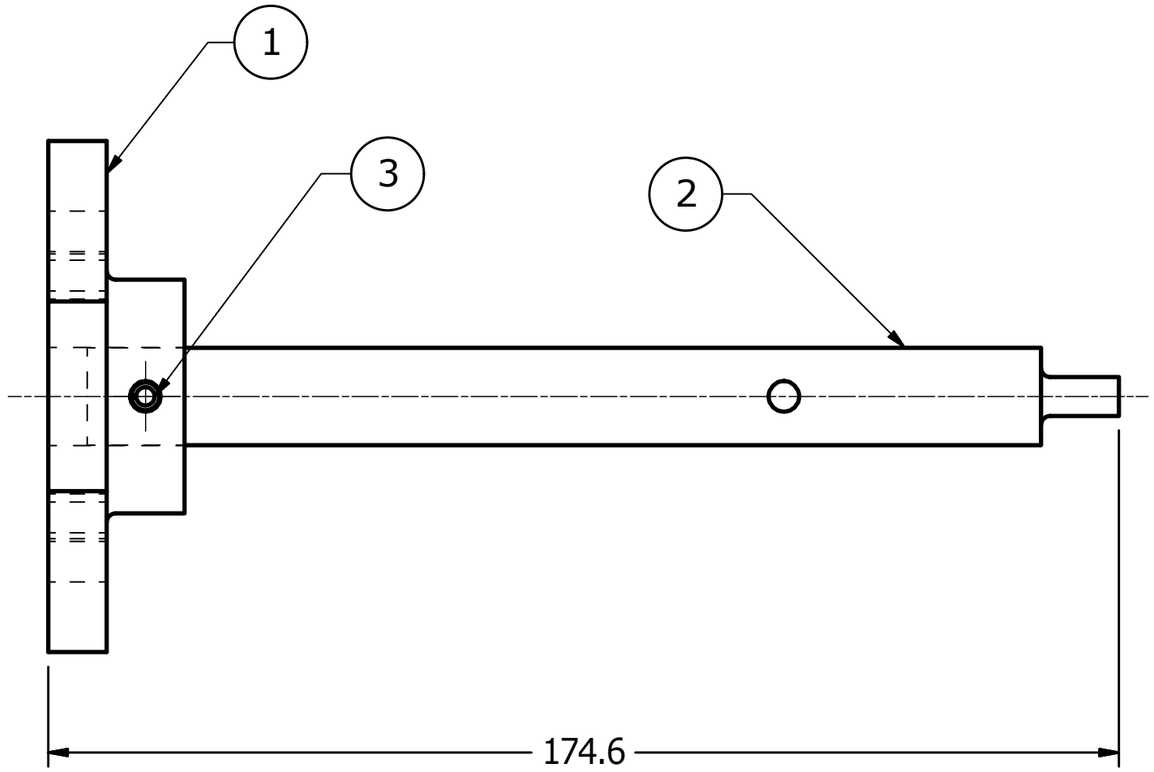
SCALE: 1:1 SHEET 1 OF 1

THOR M NTF Pendulum Weight.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC	9/8/2015	DW







ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL
3	1	5000198V	PIN, ROLL M5 x 35	S.S.
2	1	DL472-1152	NECK TWIST FIXTURE ROTATION SHAFT	
1	1	DL472-1151	NECK TWIST FIXTURE NECK ATTACHMENT PLATE	

PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

FRACTION: ±1/64 DECIMAL: .X ±.1, .XX ±.01, .XXX ±.005 ANGLES: ±.5 MACHINED: 1/2

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	2/24/2015
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

NECK TWIST FIXTURE SHAFT ASSEMBLY
THOR-50M

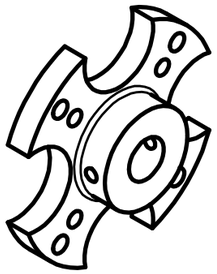
THIRD ANGLE PROJECTION

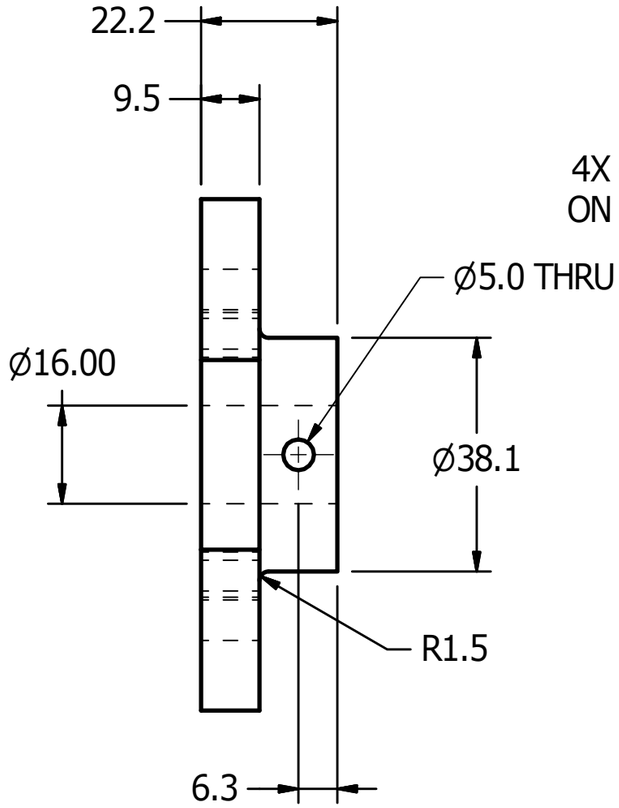
SIZE A3 | DRAWING NUMBER DL472-1150 | REV A

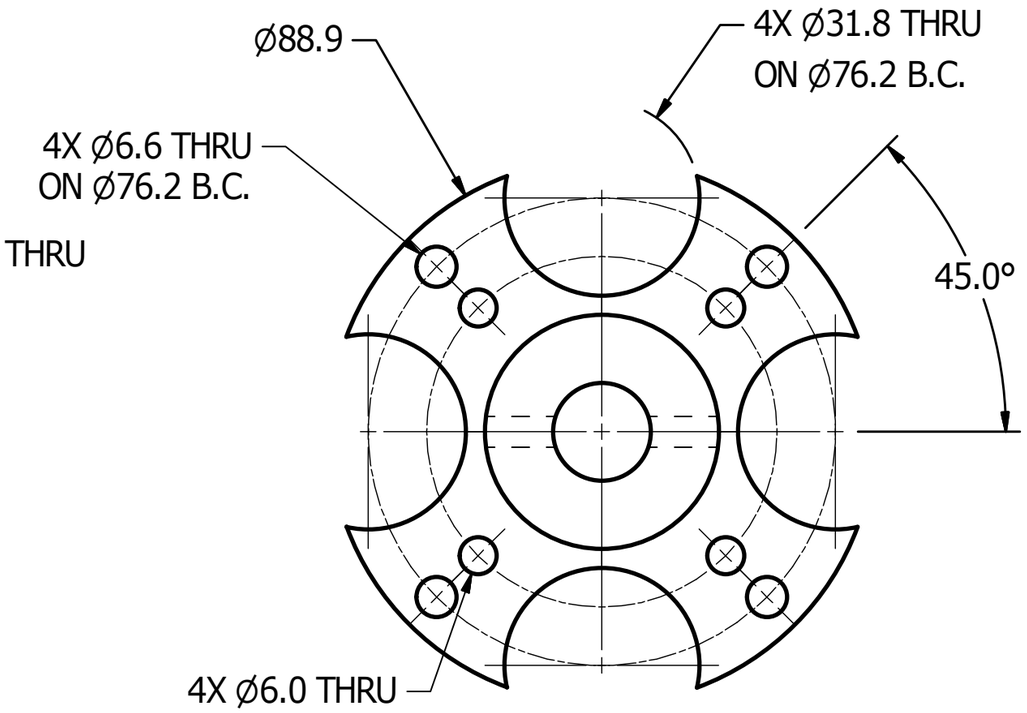
SCALE: 1:1 | SHEET 1 OF 1

THOR M NTF Shaft Assembly.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC	9/8/2015	DW







UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	2/24/2015
CHECKED	
ENG	
APPROVED	

MATERIAL: Aluminum 6061
HEAT TREAT:
FINISH:

DEPARTMENT OF TRANSPORTATION UNITED STATES OF AMERICA

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

NECK TWIST FIXTURE NECK ATTACHMENT PLATE
THOR-50M

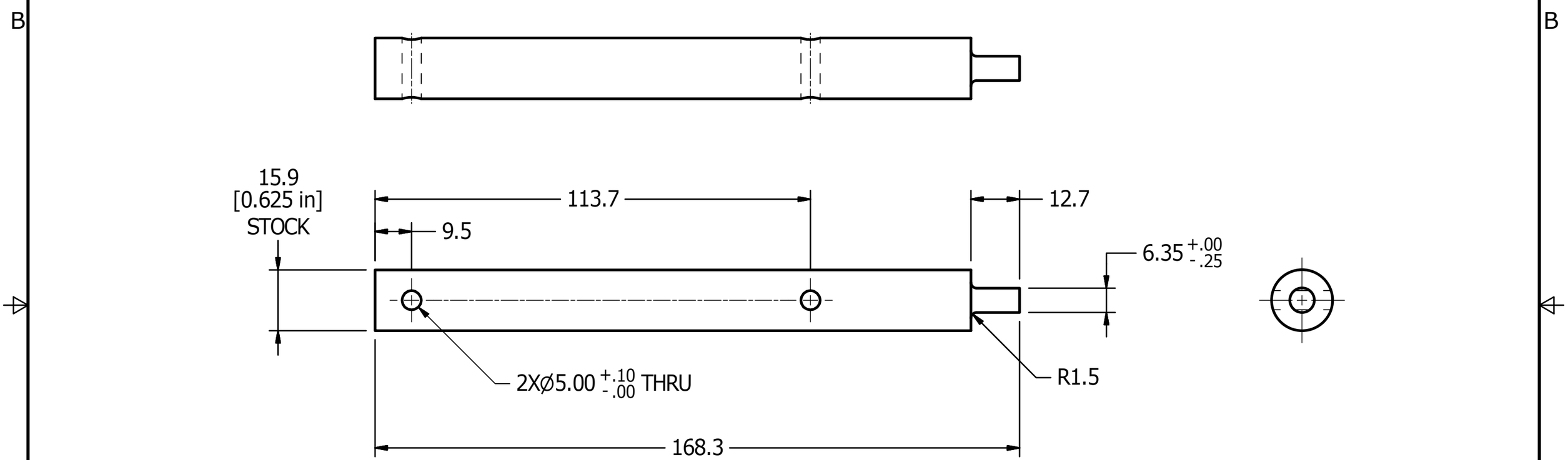
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A3	DL472-1151	A

SCALE: 1:1 | SHEET 1 OF 1

THOR M NTF Upper Neck Attachment Plate.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC	9/4/2015	DW

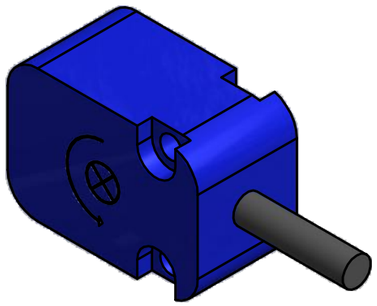


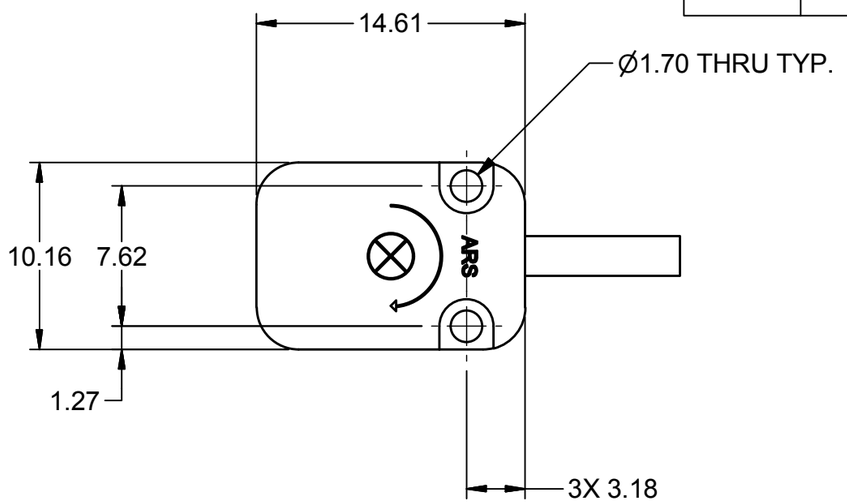
STOCK: Ø5/8" CR BAR

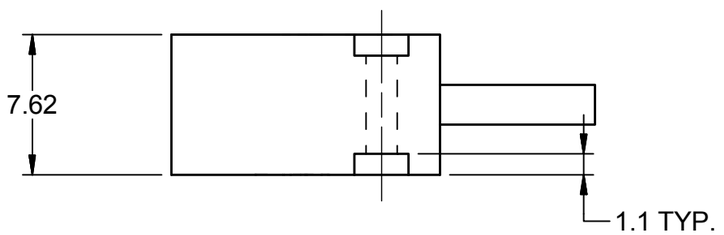
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6, ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	NECK TWIST FIXTURE ROTATION SHAFT THOR- 50M
	DRAWN JIM CLEVENGER	2/24/2015	
MATERIAL Steel, Mild	CHECKED		
HEAT TREAT	ENG		SIZE A3 | DRAWING NUMBER DL472-1152 | REV A
FINISH	APPROVED		THIRD ANGLE PROJECTION | SCALE: 1:1 | SHEET 1 OF 1

THOR M NTF Shaft.ipt

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	A	RELEASED TO PRODUCTION	AB		04/30/2013
	B	ADDED NHTSA TITLE BLOCK, ADDED AXIS OF ROTATION SYMBOL	DW		5/20/2014
	C	MASS WAS 3g; BANDWITH WAS 0-300 Hz OR 0-600 Hz (DC RESPONSE); CURRENT WAS 6mA NOMINAL; NOISE WAS 0.15% (RMS FULL SCALE) ADDED PERFORMANCE SPECIFICATIONS	DW		3/31/2016







Test Procedure:
1) Mount the ARS unit to the shock anvil such that the axis of rotation of ARS is parallel to the axis of the imparted shock pulse.

2) Subject ARS to linear acceleration haversine pulse with peak between 500g and 550g and a pulse width less than 3.5ms, measured at 10% of peak acceleration, when filtered at SAE Class 1000.

3)Record ARS output and filter at SAE Class 180.

Performance requirements:
ARS output should be within ±100 deg/second.

SPECIFICATIONS:

C	MASS:	2.2g
	RANGE:	±8000 DEG/SEC
	BANDWIDTH:	0-2000 Hz (DC RESPONSE)
	NOISE:	<0.30% (RMS FULL SCALE)
	EXCITATION:	4.9-14.0 VDC
	CURRENT:	4mA NOMINAL
	ZERO OUTPUT:	±200mV
	FULL SCALE OUTPUT:	±2V NOMINAL

PERFORMANCE:

C	CROSS AXIS SENSITIVITY:	<1.0%
	NON-LINEARITY:	<0.5% FULL SCALE
	INFLUENCE OF LINEAR ACCELERATION:	<0.1 DEG/SEC/G TYPICAL
	THERMAL DRIFT:	-40 TP +80C
	ZERO:	±1 DEG/SEC
	SENSITIVITY:	±5%

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: ANGLES: MACHINED:
X ±.5 ±.5° ✓
X.X ±.2
X.XX ±.1
X.XXX ±.01
ASME Y14.5M – 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN abarchock	5/1/2013
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

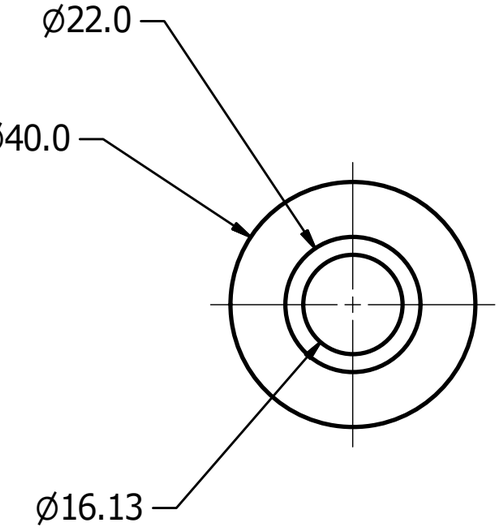
ANGULAR RATE SENSOR–8K

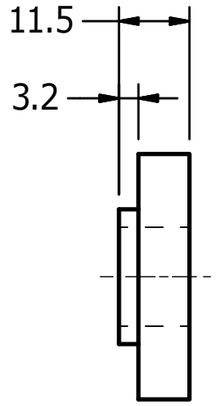
INSTRUMENTATION

SIZE A3 | DRAWING NUMBER SA572–S56 | REV C
SCALE: 3:1 | SHEET 1 OF 1

ARS Sensor.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC	9/4/2015	DW

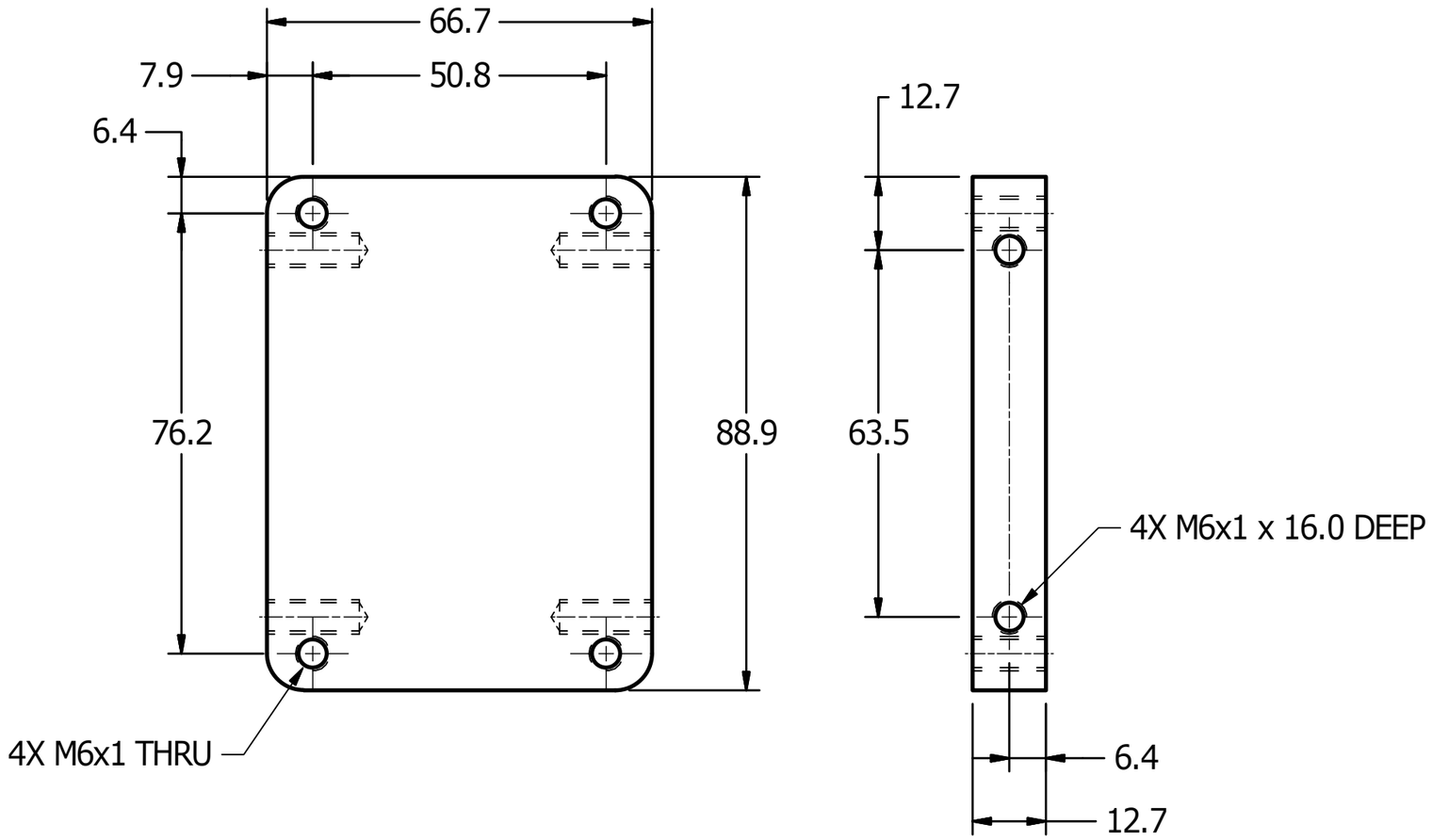




UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	NECK TWIST FIXTURE PENDULUM SPACER THOR-50M
MATERIAL: Steel, Mild	DRAWN: Jim Clevenger — 7/20/2015	
HEAT TREAT	CHECKED	
FINISH	ENG	
	APPROVED	
THIRD ANGLE PROJECTION	SIZE: A3 — DRAWING NUMBER: DL472-1180 — REV: A	
	SCALE: FULL — SHEET: 1 OF 1	

THOR M NTF Pendulum Movement Spacers.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC	9/4/2015	DW



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL:	MACHINED
X ±.5	1.6
X.X ±.2	ANGLES ±.5°
X.XX ±.1	

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	JIM CLEVENGER	2/24/2015
CHECKED		
ENG		
APPROVED		

MATERIAL: Aluminum-6061
HEAT TREAT:
FINISH:

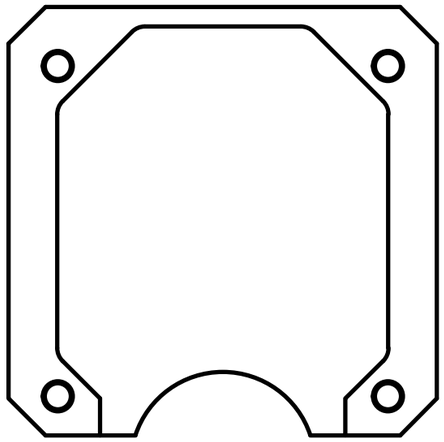
NECK TWIST TEST FIXTURE MOUNTING PLATE
THOR-50M

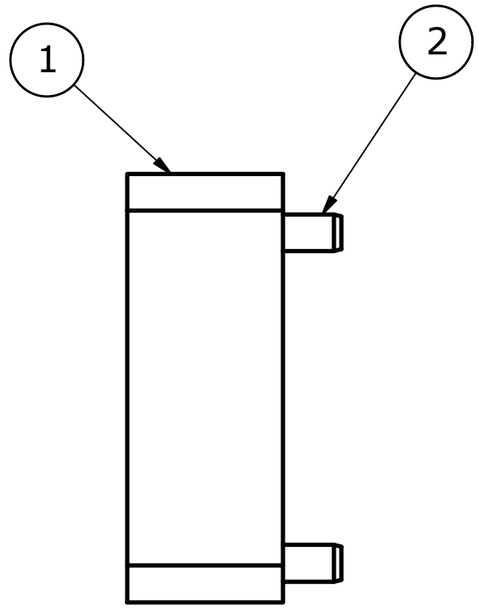
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: DL472-109 | REV: A
SCALE: 1:1 | SHEET: 1 OF 1

THOR M NTF Mounting Plate - One Piece.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC	9/4/2015	DW





ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL
2	4	5000445	PIN, DOWEL M6 x 20	Steel
1	1	DL472-1171	NECK TWIST FIXTURE NECK ADAPTER PLATE	Aluminum 6061

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT

FINISH

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	2/24/2015
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

NECK TWIST FIXTURE NECK MOUNTING ADAPTER THOR-50M

THIRD ANGLE PROJECTION

SIZE A3 | DRAWING NUMBER DL472-1170 | REV A

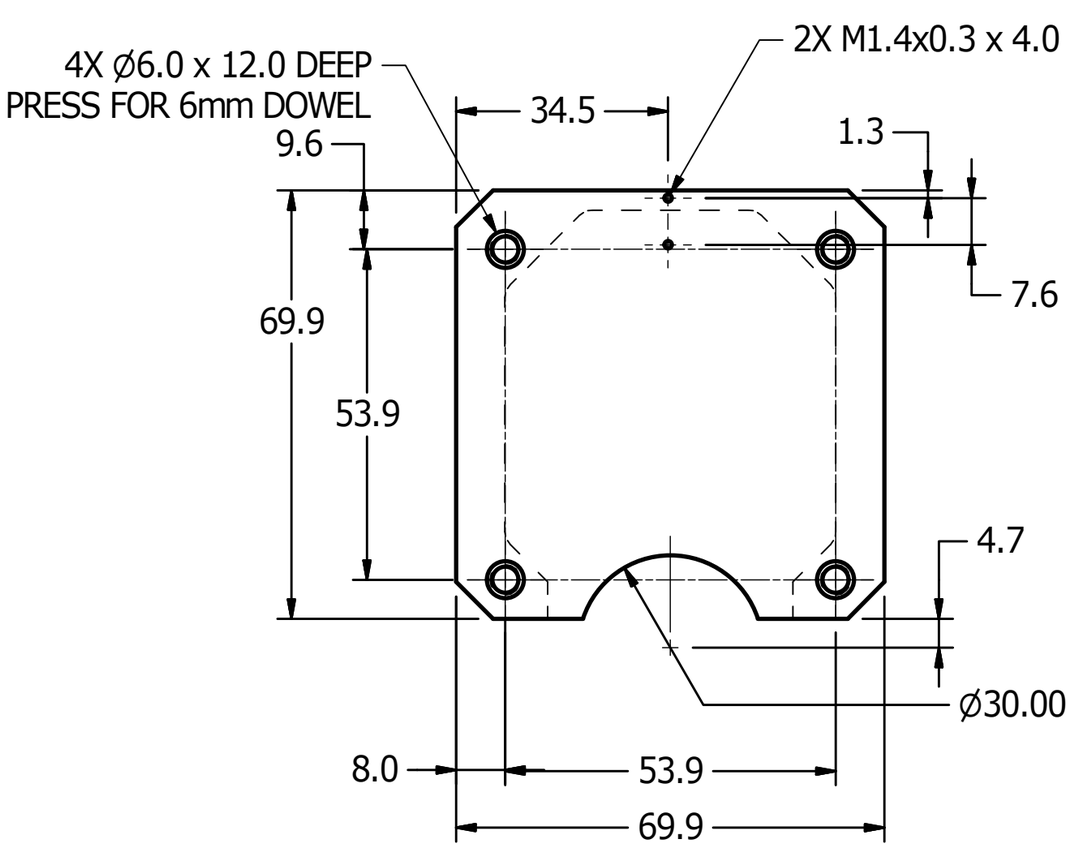
SCALE: 1:1 | SHEET 1 OF 1

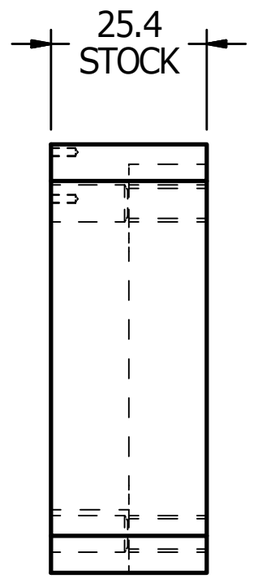
THOR M NTF Neck Mounting Bracket Assy.iam

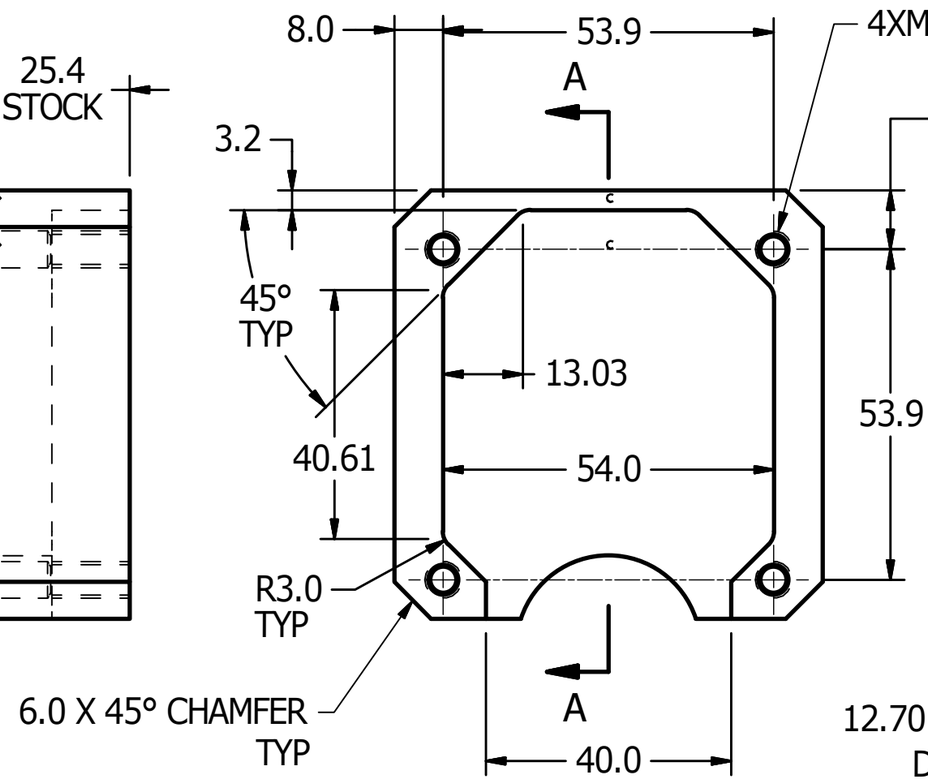
REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC	9/4/2015	JC

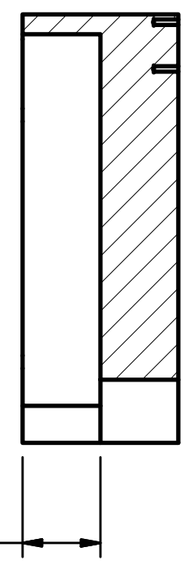
NOTE:

THE M6 AND THE 6mm
DOWEL HOLES LINE UP

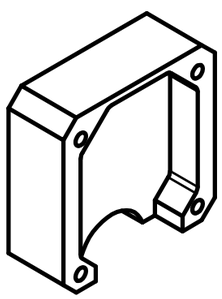








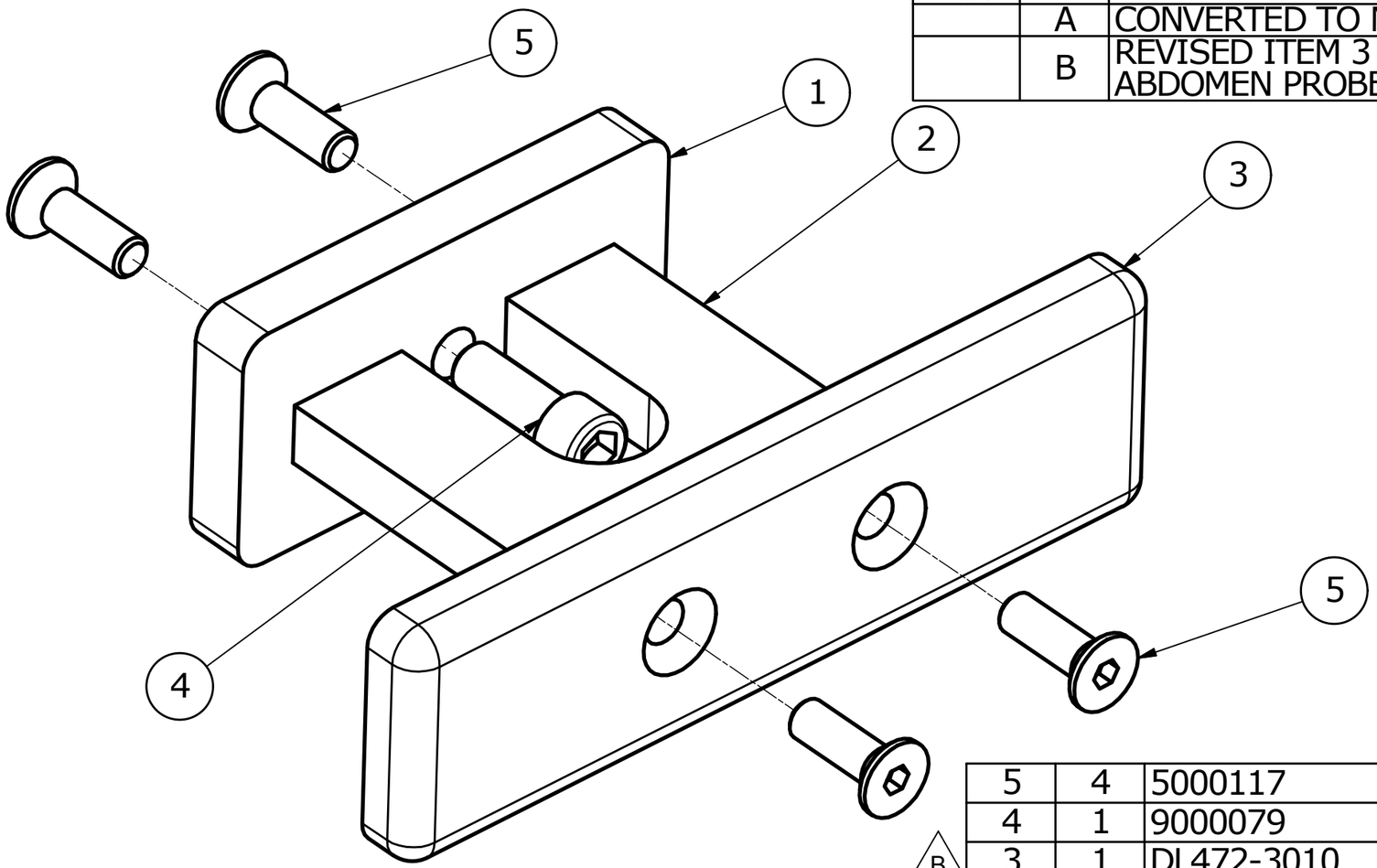
SECTION A–A
SCALE 1 : 1



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTION: ±1/64 DECIMAL: .X ±.1 .XX ±.01 .XXX ±.005 ANGLES: ±.5 MACHINED: ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	NECK TWIST FIXTURE NECK ADAPTER PLATE THOR-50M
MATERIAL: Aluminum 6061	DRAWN: JIM CLEVENGER 2/24/2015	
HEAT TREAT	CHECKED	SIZE: A3 DRAWING NUMBER: DL472-1171 REV: A
FINISH	ENG	THIRD ANGLE PROJECTION SCALE: 1:1 SHEET: 1 OF 1
	APPROVED	

THOR M NTF Neck Mounting Bracket.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC	9/9/2015	DW
	B	REVISED ITEM 3 – 472-3010 – LOWER ABDOMEN PROBE FACE FRONT PLATE	3/7/2016	DW



ITEM	QTY	PART NUMBER	DESCRIPTION
5	4	5000117	SCREW, FHCS M8-1.25 x 5
4	1	9000079	SCREW, SHCS 3/8-16 x 1"
3	1	DL472-3010	LOWER ABDOMEN PROBE FACE FRONT PLATE
2	1	DL472-3020	LOWER ABDOMEN PROBE FACE CONNECTOR PLATE
1	1	DL472-3030	LOWER ABDOMEN PROBE FACE MOUNTING PLATE

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	JIM CLEVENGER	6/10/2015
CHECKED		
ENG		
APPROVED		
MATERIAL		
HEAT TREAT		
FINISH		

LOWER ABDOMEN PROBE FACE ASSEMBLY
THOR-50M

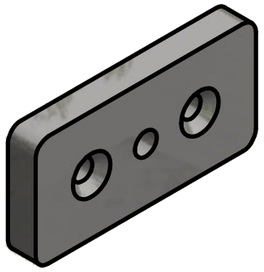
THIRD ANGLE PROJECTION

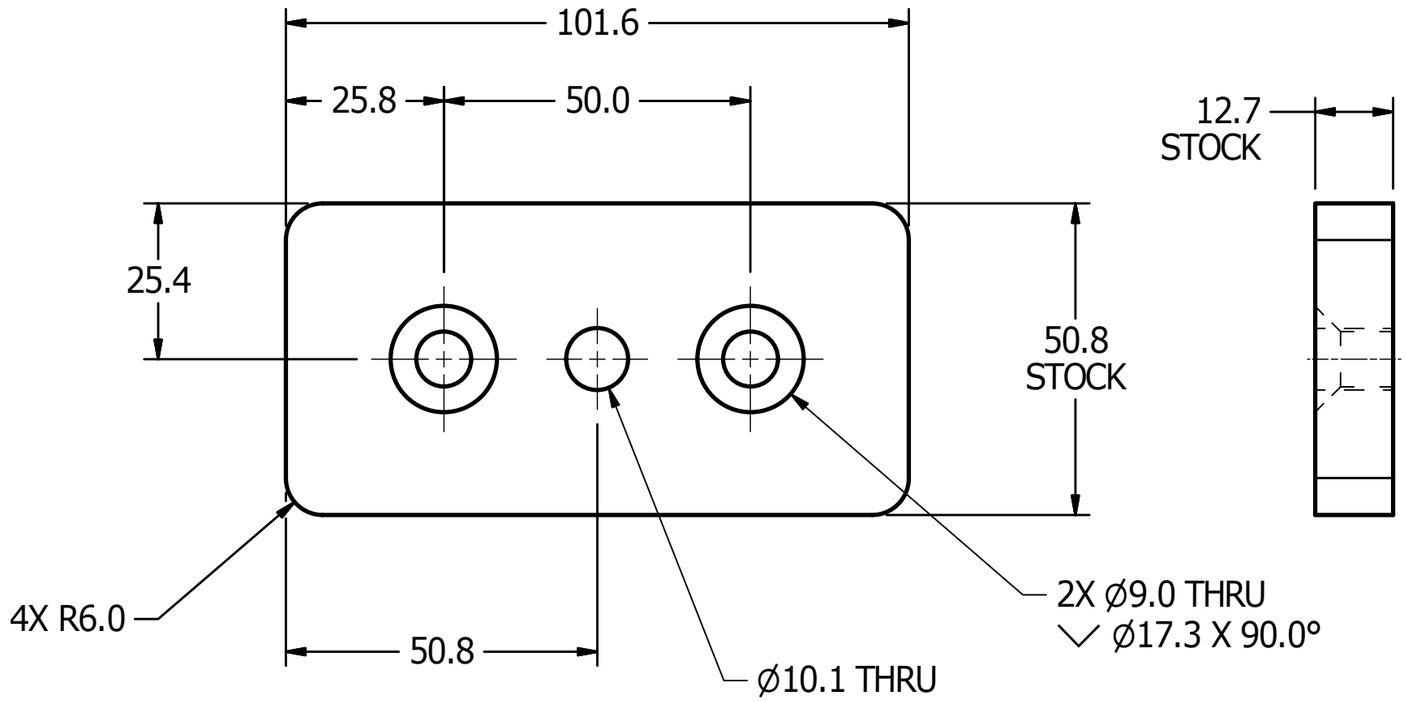
SIZE A3 | DRAWING NUMBER DL472-3000 | REV B

SCALE: 1:1 | SHEET 1 OF 1

472-Lower Abdomen Probe Face.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC	9/9/2015	DW





UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL:	MACHINED
X ±.5	1.6
X.X ±.2	ANGLES
X.XX ±.1	±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN JIM CLEVENGER	6/10/2015
CHECKED	
ENG	
APPROVED	

MATERIAL: Steel, Mild
HEAT TREAT:
FINISH:

LOWER ABDOMEN PROBE FACE MOUNTING PLATE
THOR-50M

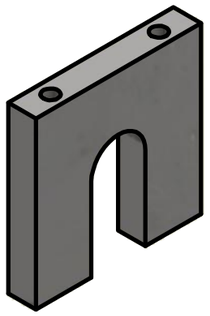
THIRD ANGLE PROJECTION

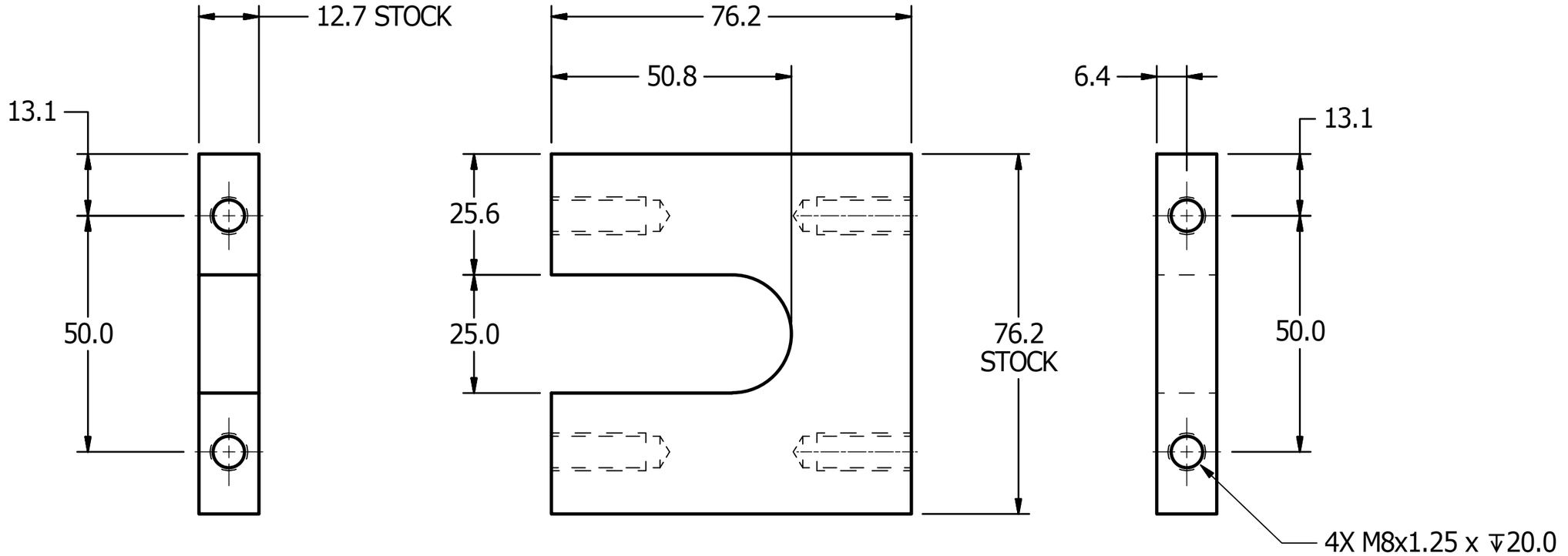
SIZE	DRAWING NUMBER	REV
A3	DL472-3030	A

SCALE: 1:1 SHEET 1 OF 1

472-Mounting Plate.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC	9/9/2015	DW





UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL:	MACHINED
X ±.5	1.6
X.X ±.2	ANGLES
X.XX ±.1	±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN JIM CLEVENGER	6/10/2015
CHECKED	
ENG	
APPROVED	

MATERIAL: Steel, Mild
HEAT TREAT:
FINISH:

LOWER ABDOMEN PROBE FACE CONNECTOR PLATE
THOR-50M

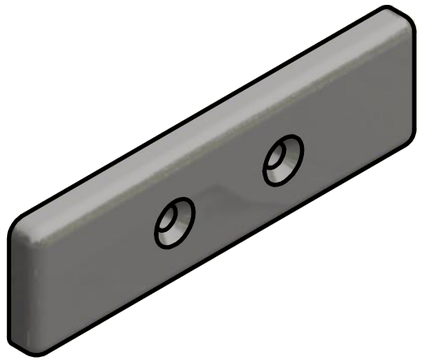
THIRD ANGLE PROJECTION

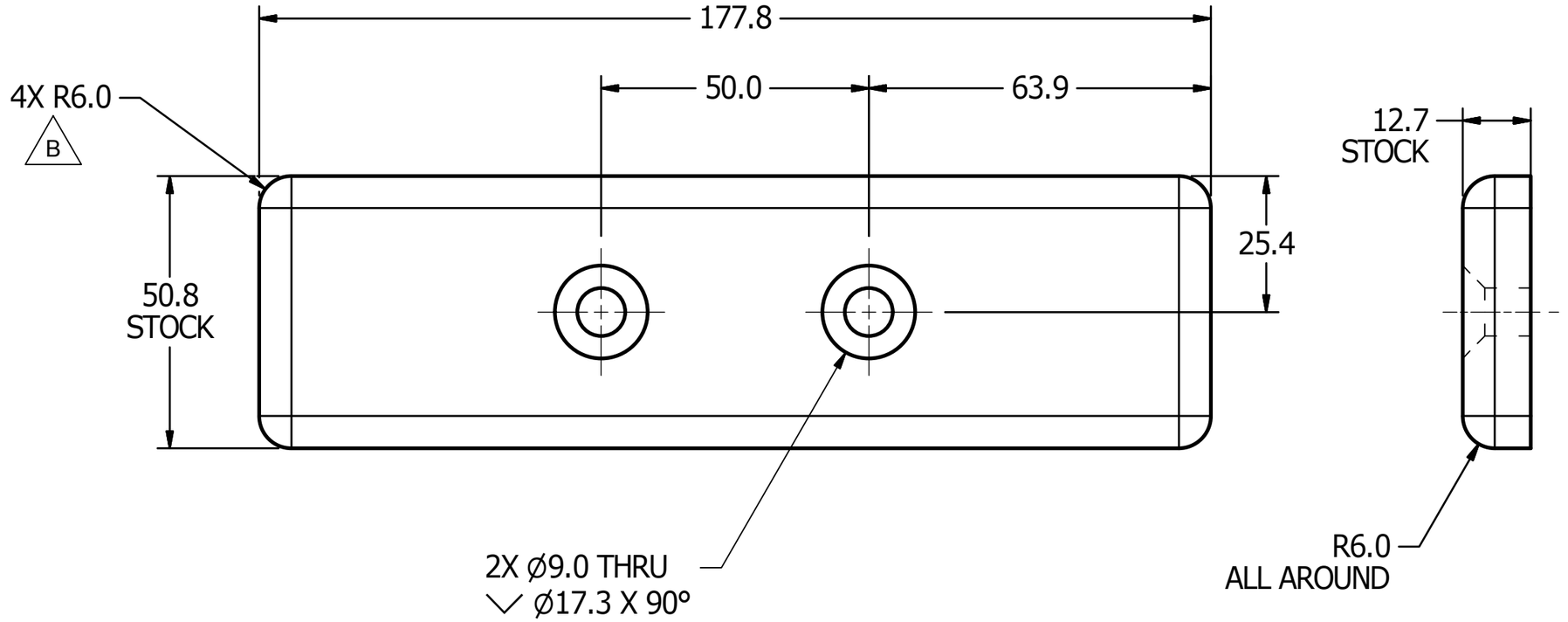
SIZE	DRAWING NUMBER	REV
A3	DL472-3020	A

SCALE: 1:1 SHEET 1 OF 1

472-Connector Plate.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC	9/9/2015	DW
	B	ADDED DIMINSION 4X R6	3/7/2016	DW





UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL:	MACHINED
X ±.5	1.6
X.X ±.2	ANGLES
X.XX ±.1	±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN JIM CLEVENGER	6/10/2015
CHECKED	
ENG	
APPROVED	

MATERIAL: Steel, Mild
HEAT TREAT:
FINISH:

LOWER ABDOMEN PROBE FACE FRONT PLATE
THOR-50M

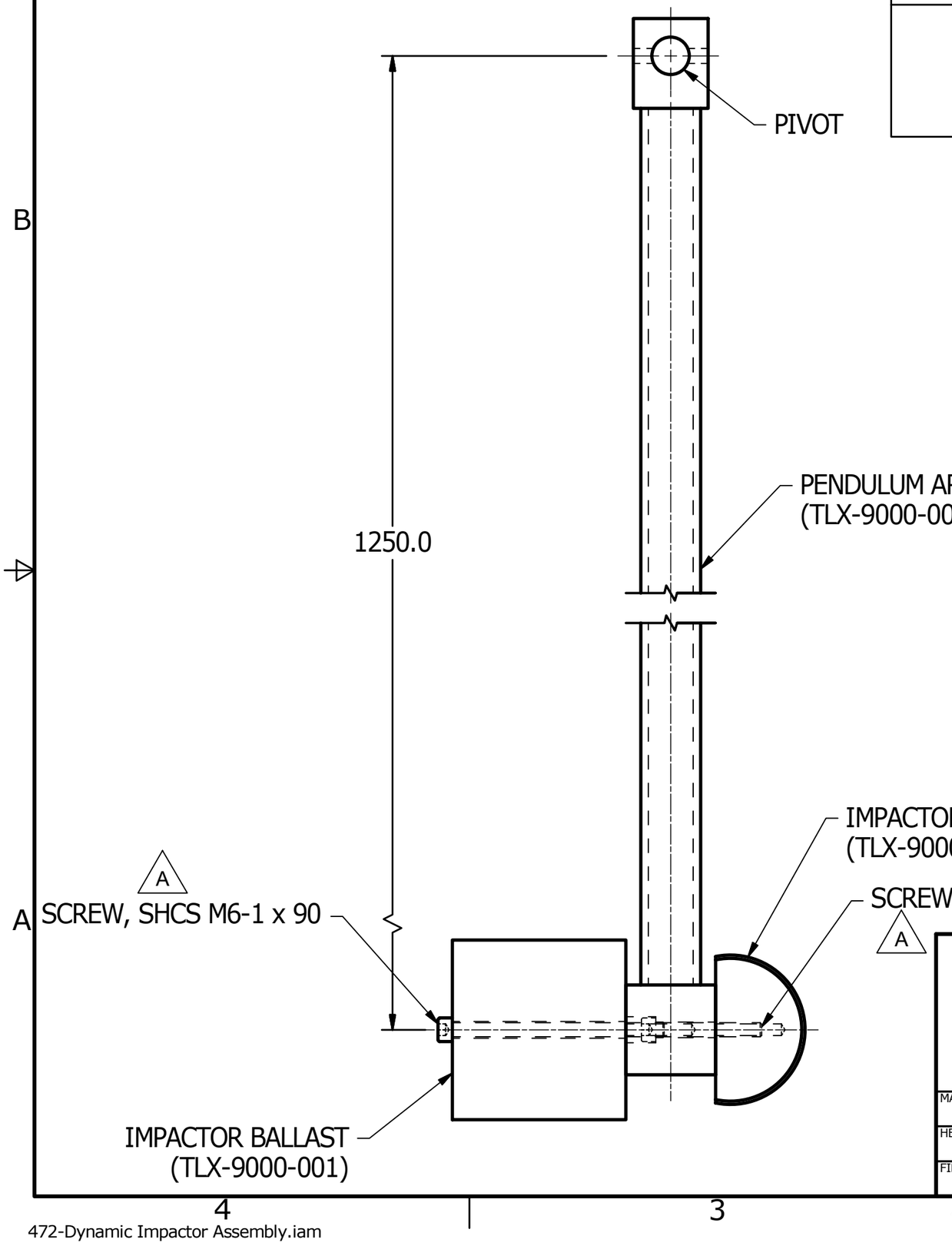
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A3	DL472-3010	B

SCALE: 1:1 SHEET 1 OF 1

472-Front Plate.ipt

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	SCREW, SHCS M6-1 x 45 WAS SHCS 1/4"Ø – 20 x 1 3/4"; AND SCREW, SHCS M6-1 x 90 WAS SHCS 1/4"Ø – 20 x 3 1/2"	9/28/2000	DW



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL:	MACHINED
X ±.5	1.6
X.X ±.2	ANGLES
X.XX ±.1	±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	Dave Walker	9/28/2000
MATERIAL	CHECKED	
HEAT TREAT	ENG	
FINISH	APPROVED	

DYNAMIC IMPACTOR

THOR-50M

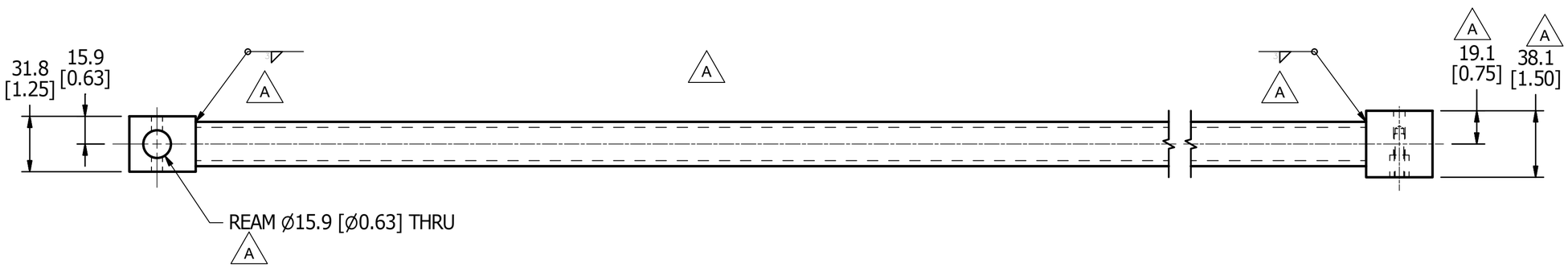
THIRD ANGLE PROJECTION

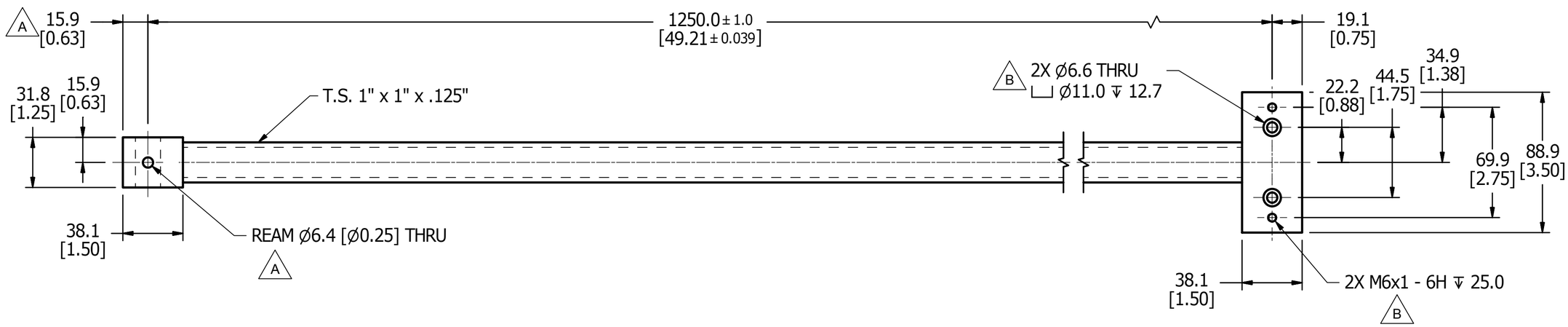
SIZE	DRAWING NUMBER	REV
A3	TLX-9000-013	A

SCALE: 1:1 SHEET 1 OF 1

472-Dynamic Impactor Assembly.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	REMOVED HOLES, ADDED DIMENSIONS, CHANGED DRILL TO REAM, CORRECTED DIMENSION (0.625 WAS 15.88), AND ADDED WELD SYMBOLS	9/8/2000	DW
	B	HOLE DIM. 2X Ø6.6 THRU ⌴Ø11.0 X12.7 WAS DRILL 6.528 (0.257) THRU COUNTERBORE 10.0/(0.4375) x 12.7/(0.50) DEEP (2 PLC'S.); AND 2X M6x1 – 6H x 25.0 WAS DRILL 5.105/(0.201) x 25.4/(1.0) DEEP TAP 1/4-20 (2 PLC'S.)	9/10/2015	DW
	C	ADDED MATERIAL	8/18/2016	DW
	D	MATERIAL WAS MILD STEEL	12/20/2016	DW





UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	APPROVALS	DATE
		DRAWN Dave Walker	3/20/2000
MATERIAL ALUM.		CHECKED	
HEAT TREAT		ENG	
FINISH		APPROVED	

D C

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

TEST FIXTURE - PENDULUM ARM

THOR-50M

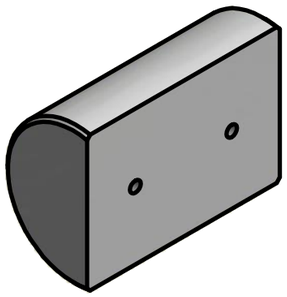
THIRD ANGLE PROJECTION

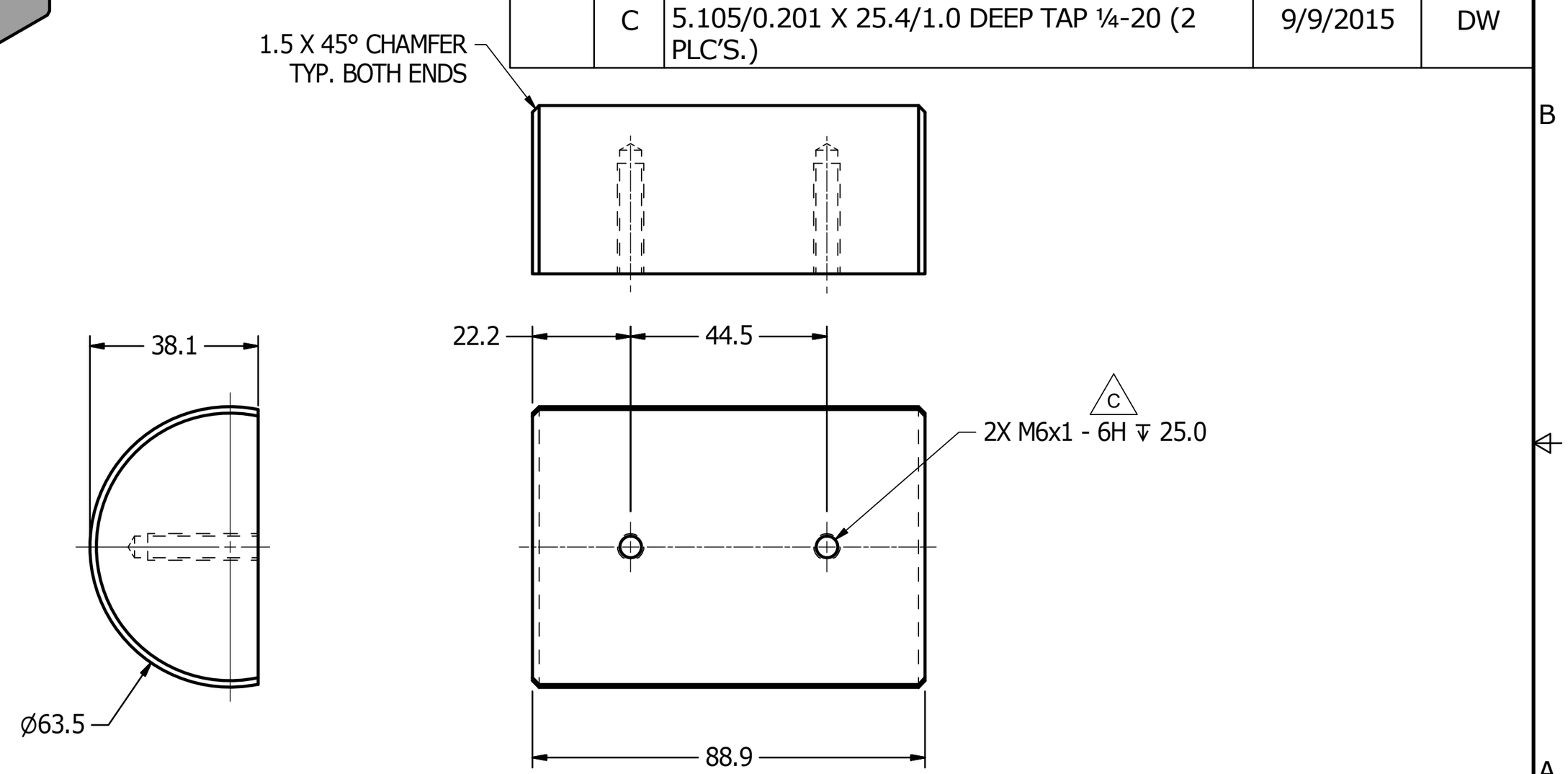
SIZE	DRAWING NUMBER	REV
A2	TLX-9000-007	D

SCALE: 1:2 SHEET 1 OF 1

472-Pendulum Arm Assembly.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	ADDED DECIMAL EQUIVALENT TO DRILL SIZE	5/23/2002	DW
	B	REMOVED "#7" FROM HOLE NOTE	9/19/2003	DW
	C	DIMENSION 2X M6-1 – 6H ↧25.0 WAS DRILL 5.105/0.201 X 25.4/1.0 DEEP TAP ¼-20 (2 PLC'S.)	9/9/2015	DW





UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED 1.6 / ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER
MATERIAL: PTFE, Teflon	APPROVALS / DATE
HEAT TREAT	DRAWN: Dave Walker — 9/9/2015
FINISH	CHECKED
	ENG
	APPROVED

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

TEST FIXTURE - IMPACTOR FACE

THOR-50M

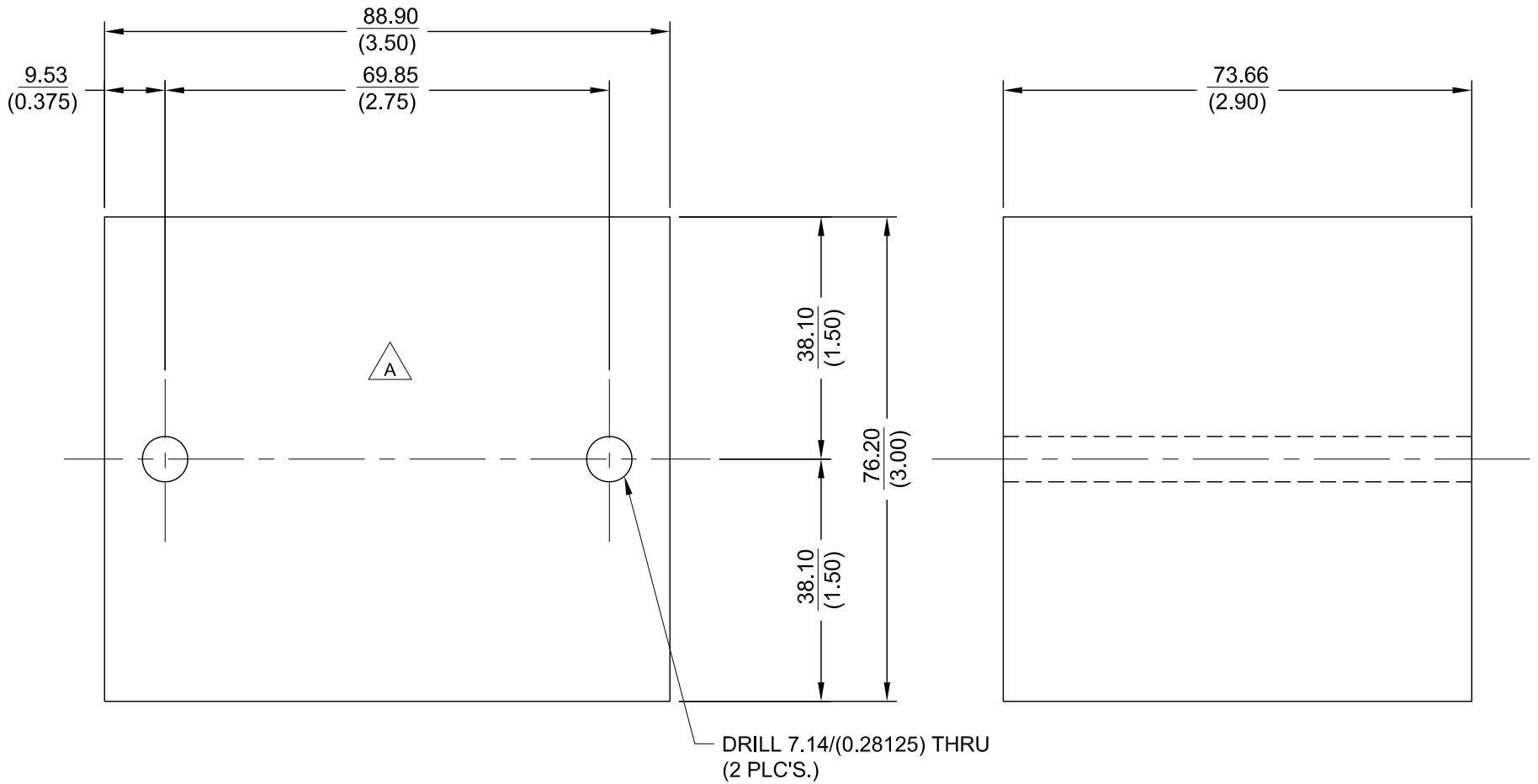
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A3	TLX-9000-006	C

SCALE: | SHEET 1 OF 1

472-Impactor Face.ipt

REVISION RECORD			
ITEM NO.	BY	DATE	DESCRIPTION
A	DW	9/19/2003	REMOVED TAPED HOLES (ACCELEROMETER)

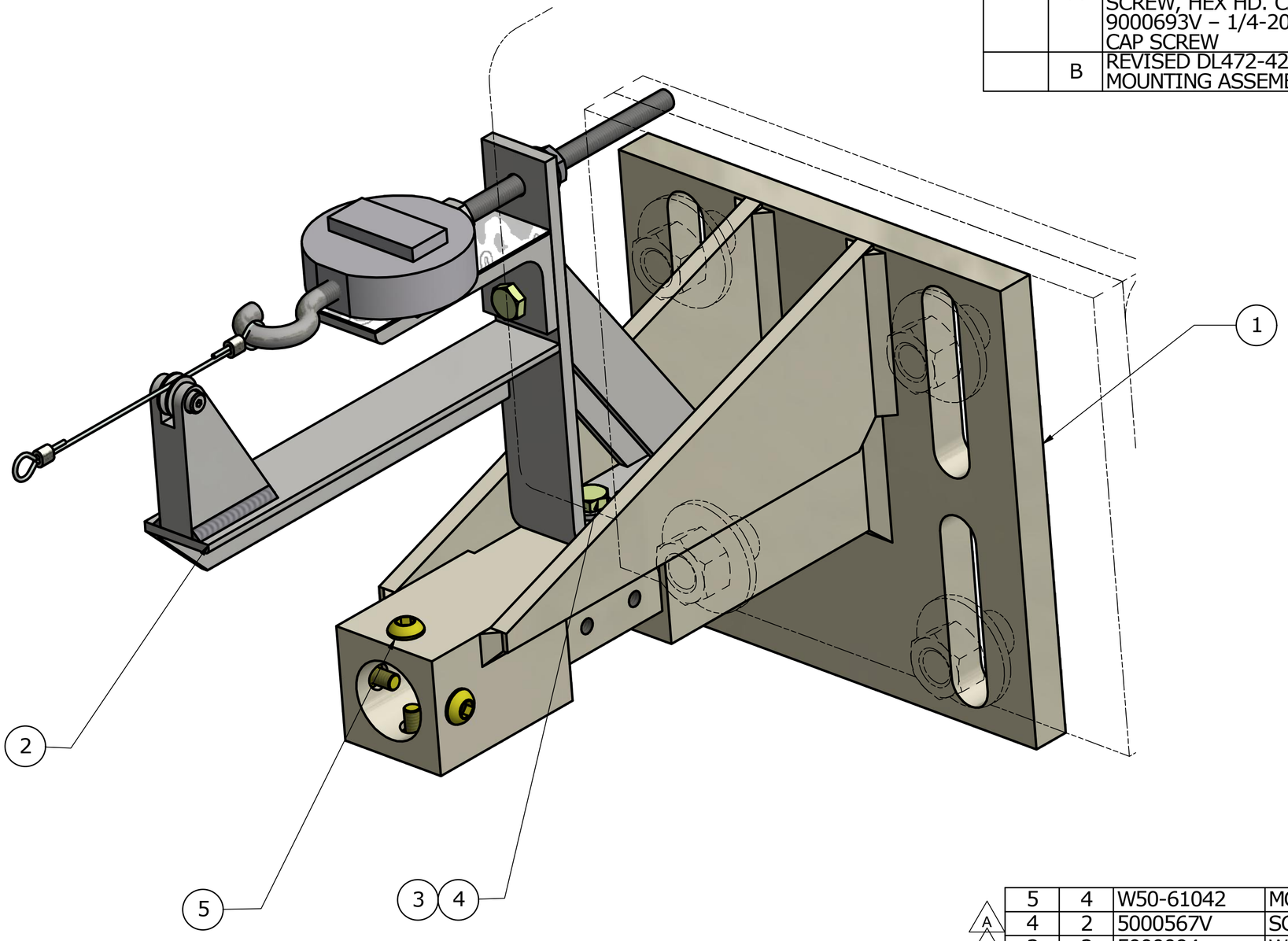


WEIGHT: 3.94 kg./(8.68 lbs.)

A

UNITS ARE mm/in			
TOLERANCES ARE: *	MATERIAL: STEEL	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
DECIMALS .X ±2.5/0.1 .XX ±0.25/0.01 .XXX ±0.127/0.005	ANGLES + 0.5°	SCALE 1=1	TEST FIXTURE – IMPACTOR BALLAST
* unless otherwise noted	APPROVALS / DATE	DRAWN D. WALKER 3/20/00	THOR-LX LOWER EXTREMITY
	CHECKED	ENG	SIZE A / DRAWING NUMBER TLX-9000-001 / REV A

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	PART #5000094 – WASHER, FLAT M6 WAS #9000244 – WASHER, FLAT Ø1/4; AND PART #5000567V – SCREW, HEX HD. CAP M6-1 x 20 WAS 9000693V – 1/4-20 x 3/4 HEX HEAD CAP SCREW	9/10/2015	DW
	B	REVISED DL472-4200 LOAD CELL MOUNTING ASSEMBLY	8/16/2016	DW



ITEM	QTY	PART NUMBER	DESCRIPTION
5	4	W50-61042	MODIFIED BHSS M6 THREAD
4	2	5000567V	SCREW, HEX HD. CAP M6-1 x 20
3	2	5000094	WASHER, FLAT M6
2	1	DL472-4200	LOAD CELL MOUNTING ASSEMBLY
1	1	DL472-4100	LOWER LEG MOUNTING BRACKET ASS'Y.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 1018
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN Jim Clevenger	10/26/2009
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

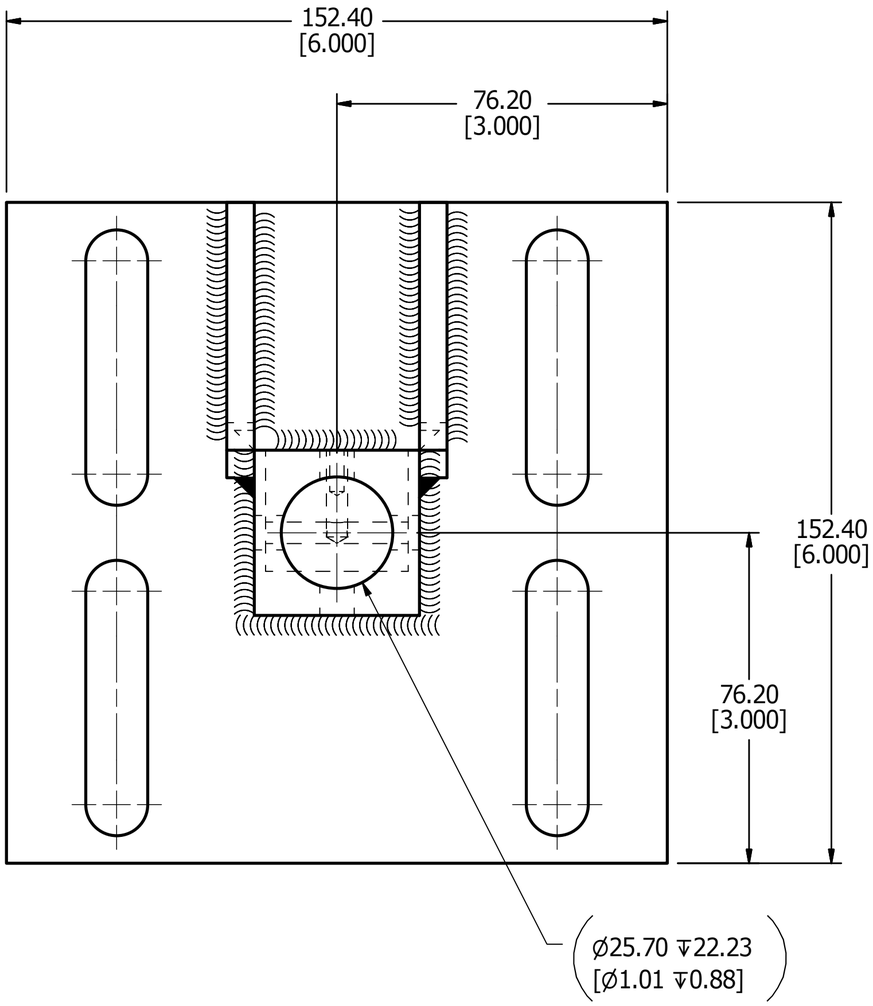
ACHILLES FIXTURE - COMPLETE

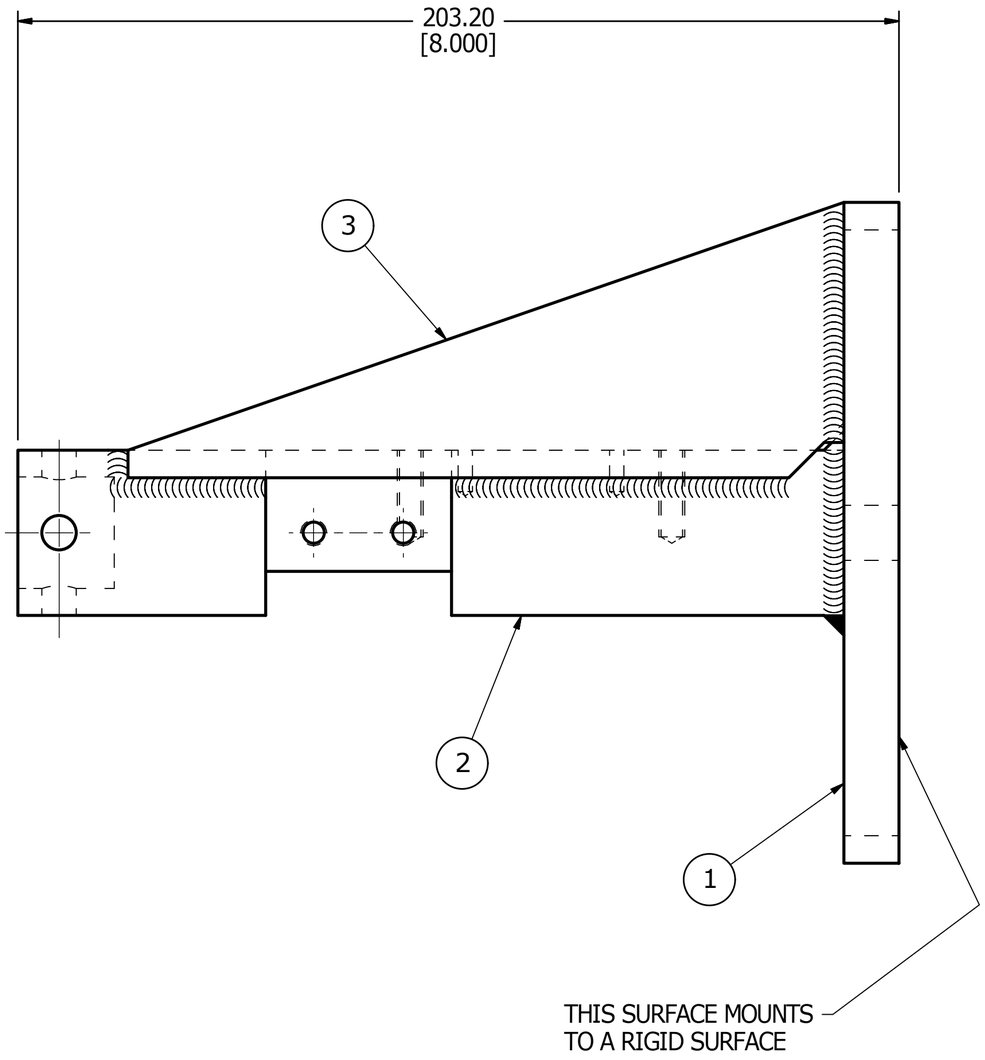
THOR 50M

THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: DL472-4000 | REV: B

SCALE: | SHEET: 1 OF 1





ITEM	QTY	PART NUMBER	DESCRIPTION
3	2	DL472-4103	GUSSET
2	1	DL472-4102	LEG MOUNTING BAR
1	1	DL472-4101	LOWER LEG MOUNTING BRACKET

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6, ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 1018 Welded Steel Mild
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: Jim Clevenger	8/13/2015
CHECKED:	
ENG:	
APPROVED:	

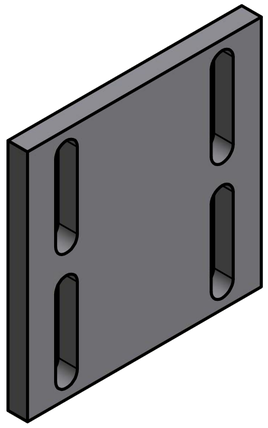
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

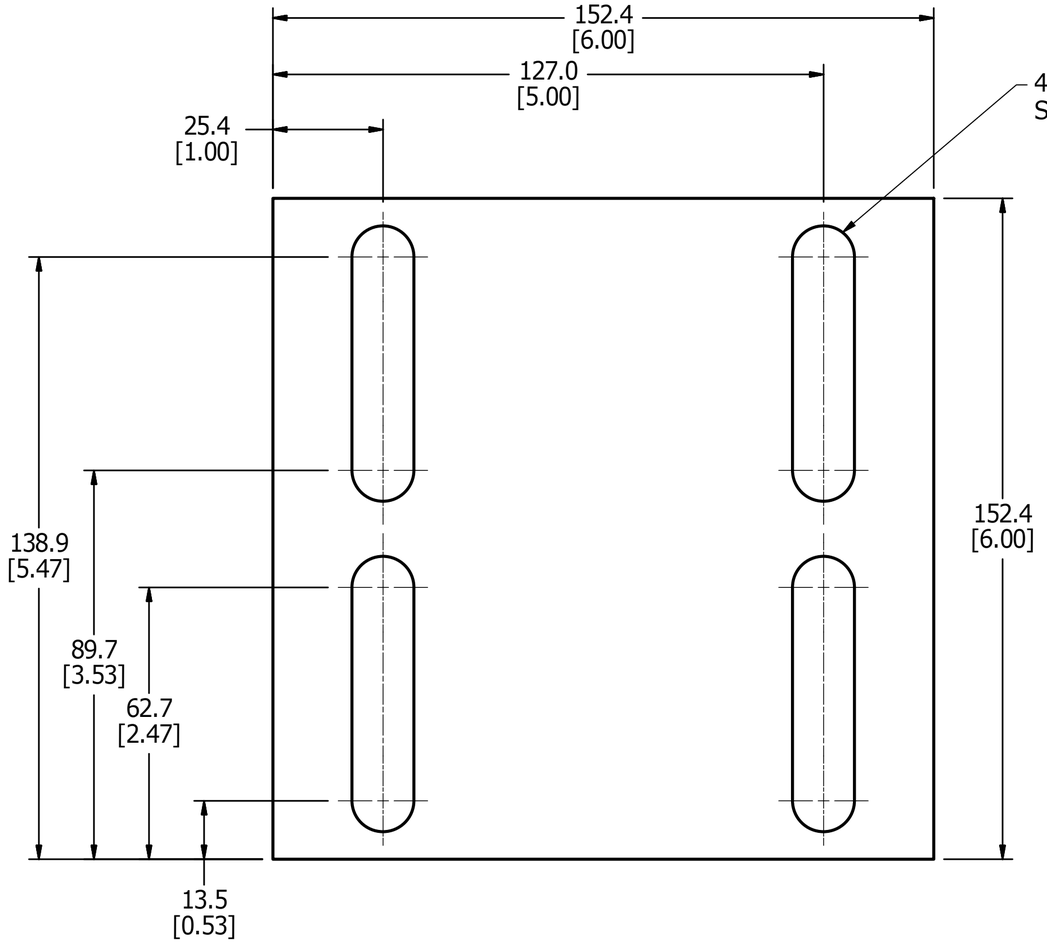
LOWER LEG MOUNTING BRACKET ASS'Y.
THOR-50M

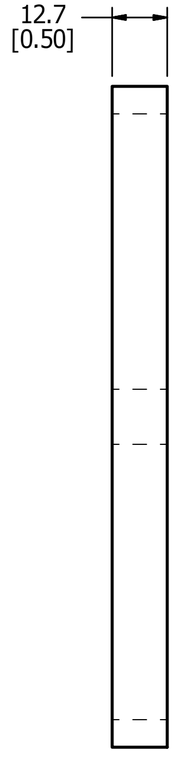
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: DL472-4100 | REV:

SCALE: 1:1 | SHEET: 1 OF 1

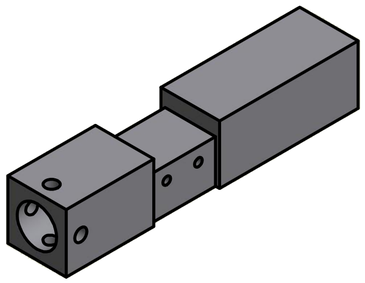


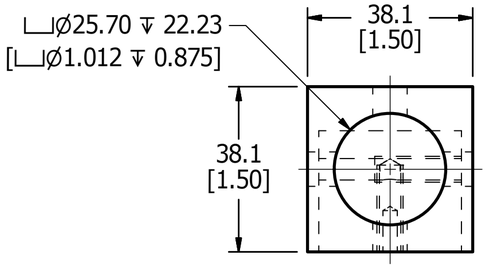


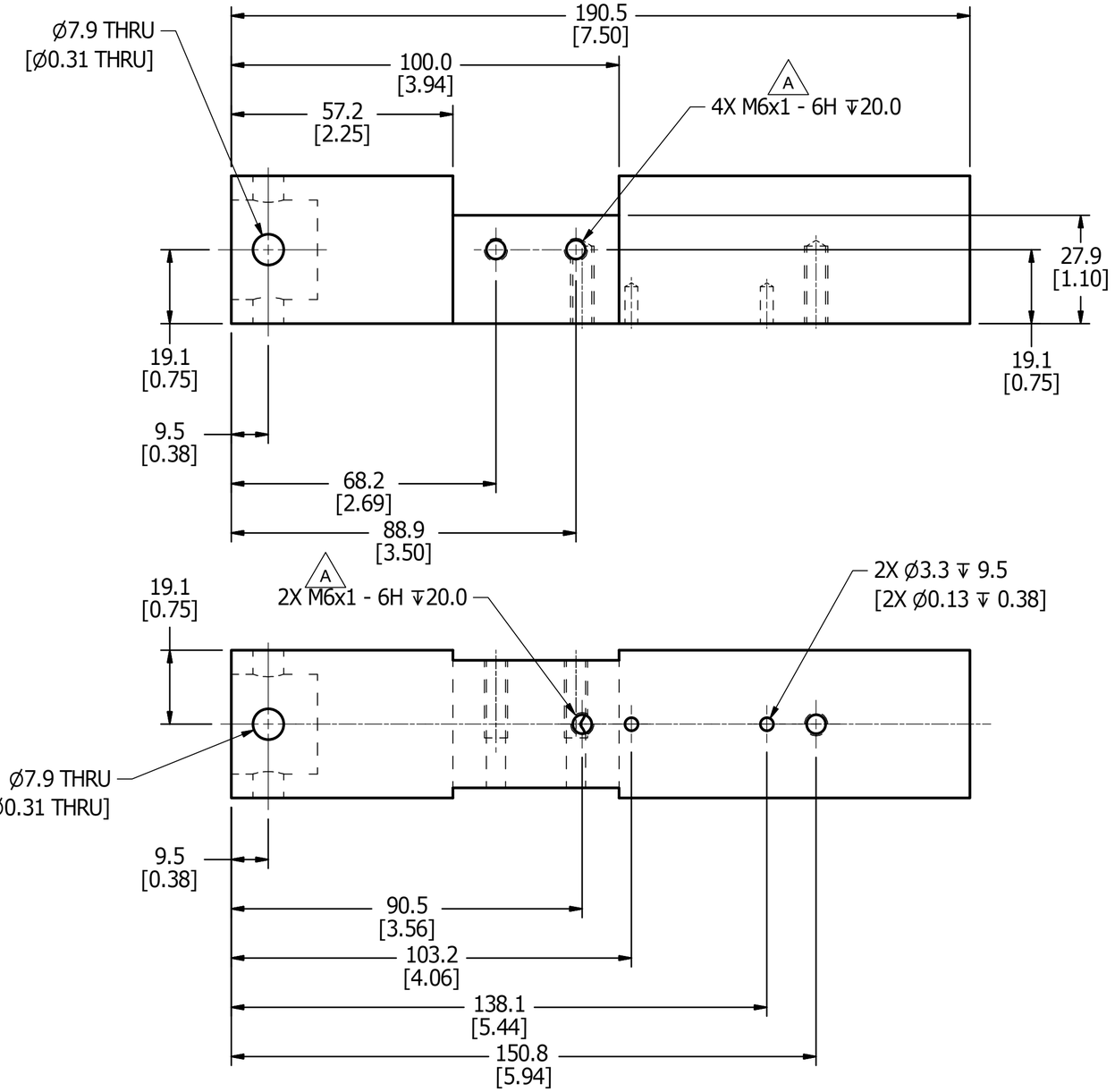


UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 / MACHINED ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	LOWER LEG MOUNTING BRACKET THOR-50M
MATERIAL 1018 Steel	DRAWN Dave Walker	9/1/2015	
HEAT TREAT	CHECKED		
FINISH	ENG		
	APPROVED		THIRD ANGLE PROJECTION
			SIZE A2 · DRAWING NUMBER DL472-4101 · REV
			SCALE: 1:1 · SHEET 1 OF 1

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	HOLE NOTE 4X M6x1 – 6H ↧20.0 WAS 4X 1/4-28 UNF – 2B ↧9.5; HOLE NOTE 2X M6x1 -6H ↧ 20.0 WAS 2X 1/4-20 UNC – 2B ↧15.9	9/10/2015	DW

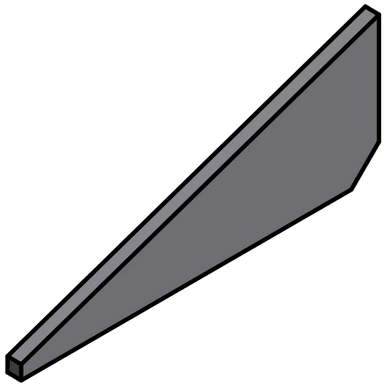


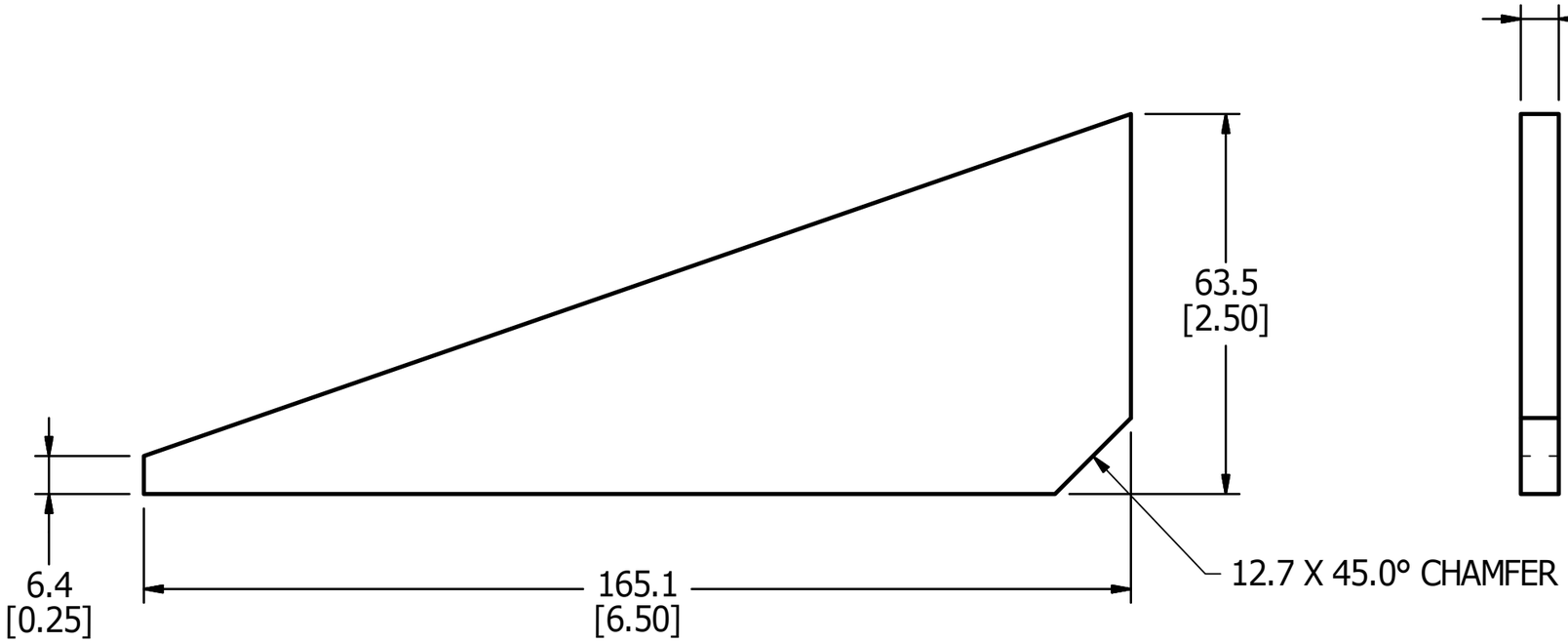




UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	LEG MOUNTING BAR THOR-50M
	DRAWN Dave Walker	9/1/2015	
MATERIAL 1018 Steel	CHECKED		
HEAT TREAT	ENG		
FINISH	APPROVED		THIRD ANGLE PROJECTION
			SIZE A2 · DRAWING NUMBER DL472-4102 · REV A · SCALE: 1:1 · SHEET 1 OF 1

DL472-Leg Mounting Bar.ipt

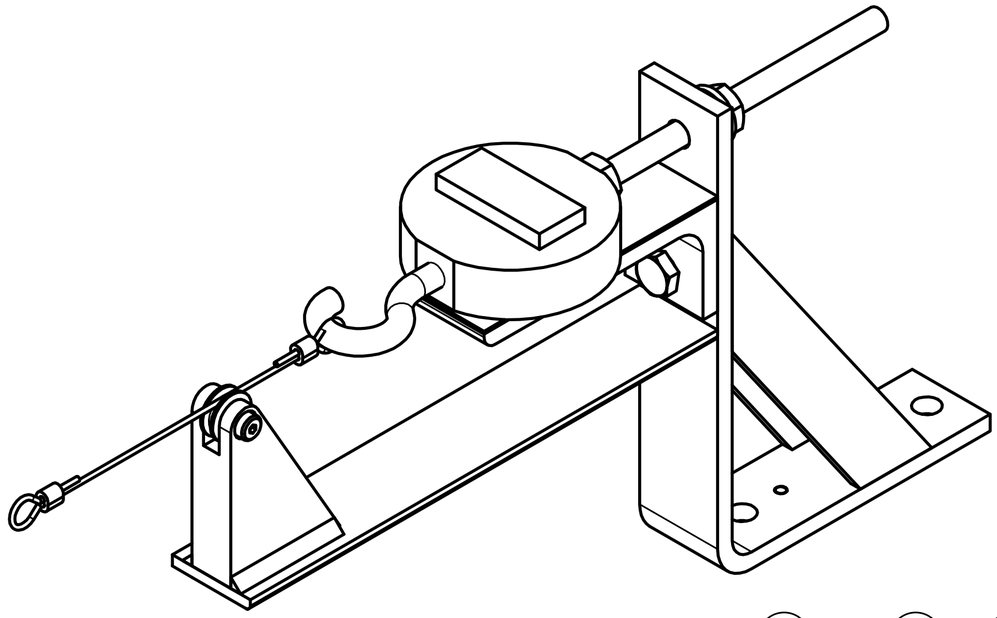


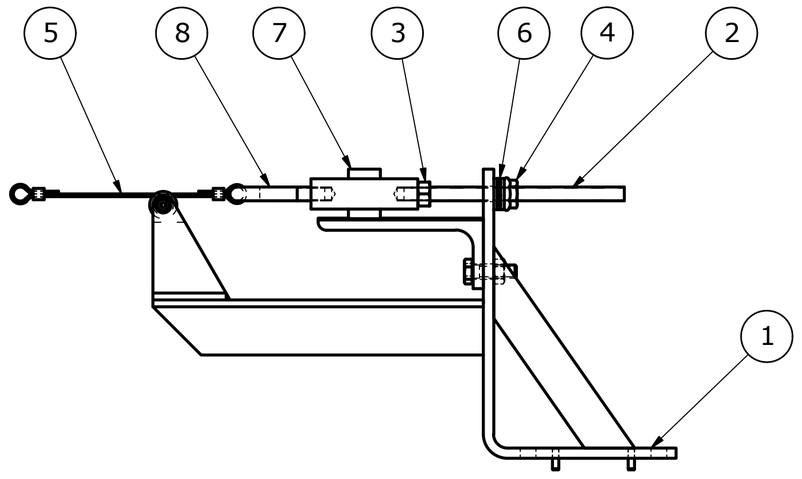


UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	GUSSET THOR-50M
	DRAWN: Dave Walker — 9/1/2015	
MATERIAL: 1018 Steel	CHECKED	
HEAT TREAT	ENG	
FINISH	APPROVED	
THIRD ANGLE PROJECTION	SIZE: A3 — DRAWING NUMBER: DL472-4103 — REV	
	SCALE: 1:1 — SHEET: 1 OF 1	

DL472-Leg Mount Gusset.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	REVISED PART # DL472-4203 PULL WIRE ASSEMBLY	8/16/2016	DW





ITEM	QTY	PART NUMBER	DESCRIPTION
8	1	DL472-4204	EYE BOLT - MODIFIED
7	1	5001500V	LOAD CELL, 25# CAP, LCR-25
6	1	5000685V	THRUST BEARING, 1/4" ID
5	1	DL472-4203	PULL WIRE ASSEMBLY
4	1	9000101V	HEX NUT, FLANGED, 1/4-28
3	1	9000110	HEX NUT 1/4-28
2	1	DL472-4202	DRAW SCREW
1	1	DL472-4210	MOUNTING BRACKET ASSEMBLY

A

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

APPROVALS	DATE
DRAWN Jim Clevenger	8/13/2015
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LOAD CELL MOUNTING ASSEMBLY

THOR-50M

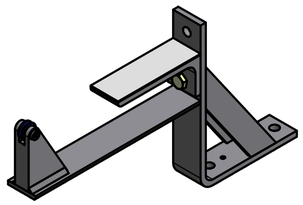
THIRD ANGLE PROJECTION

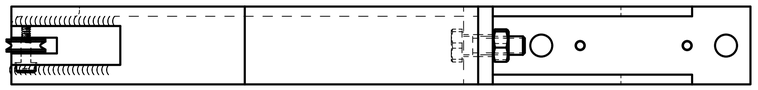
SIZE A2 | DRAWING NUMBER DL472-4200 | REV A

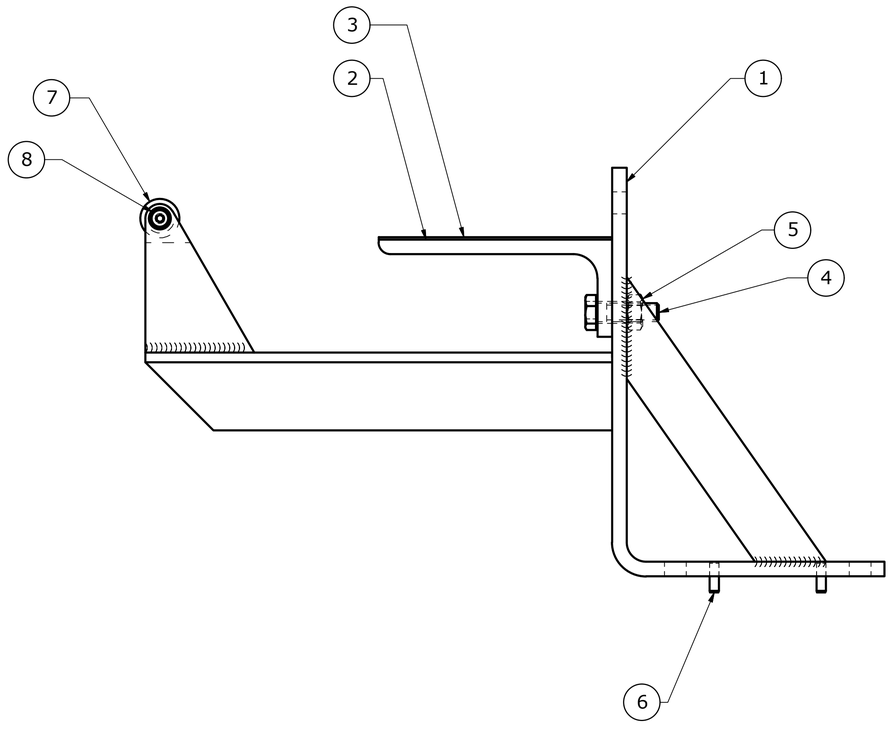
SCALE: 1 : 1 | SHEET 1 OF 1

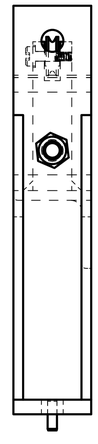
DL472- Load Cell Mount Assembly.iam

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	PART # 5000567V – SCREW, HEX HD. CAP M6-1 x 20 WAS 90000963V – SCREW, HEX HD. CAP, 1/4-20 x 3/4; PART #9009091 – NUT, HEX M6-1 WAS 9000105 – NUT, HEX 1/4; PART #5000284 – PIN, DOWEL M3 x 10 WAS 9000046 – PIN DOWEL 1/8" x 3/8"	9/10/2015	JC









ITEM	QTY	PART NUMBER	DESCRIPTION
8	1	9002947V	SCREW, SHSS 1/8 x 3/8
7	1		PULLEY, FOR 3/16"Ø WIRE ROPE, .125"Ø BORE x .375"Ø GROOVE x .1875" HUB WIDTH
6	2	5000284	PIN, DOWEL M3 x 10
5	1	9009091	NUT, HEX M6-1
4	1	5000567V	SCREW, HEX HD. CAP M6-1 x 20
3	1		TEFLON PAD, 0.8 [0.03] x 25.4 [1.00] x 76.2 [3.00]
2	1	DL472-4216	LOAD CELL SUPPORT
1	1	DL472-4211	LOAD ARM WELDMENT

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

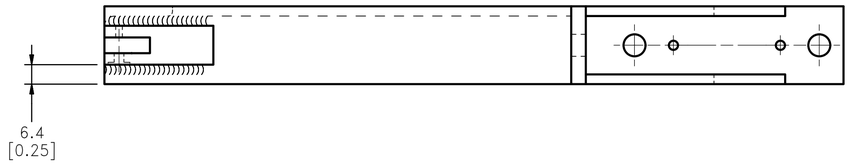
APPROVALS	DATE
DRAWN Jim Clevenger	10/22/2009
CHECKED	
ENG	
APPROVED	

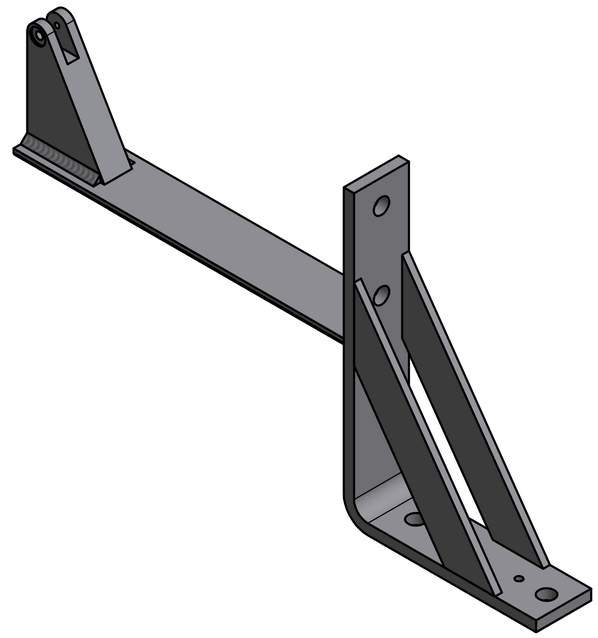
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

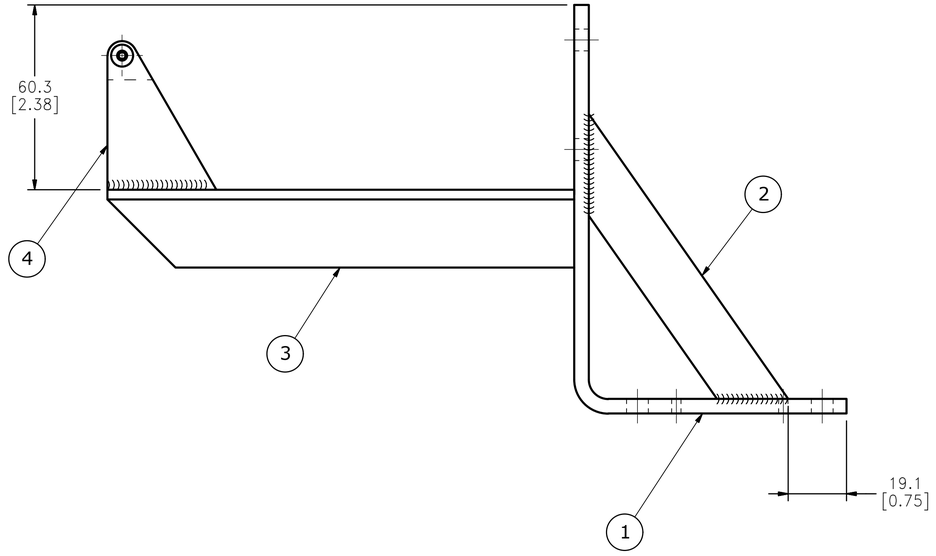
MOUNTING BRACKET ASSEMBLY
THOR-50M

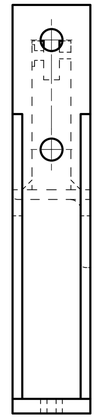
THIRD ANGLE PROJECTION

SIZE A1 | DRAWING NUMBER DL472-4210 | REV A
SCALE: 1:1 | SHEET 1 OF 1









ITEM	QTY	PART NUMBER	DESCRIPTION
4	1	DL472-4215	PULLEY BRACKET
3	1	DL472-4214	PULLEY SUPPPORT ANGLE
2	2	DL472-4213	GUSSET
1	1	DL472-4212	LOAD CELL BRACKET

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Welded Steel Mild
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN Jim Clevenger	10/26/2009
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LOAD ARM WELDMENT

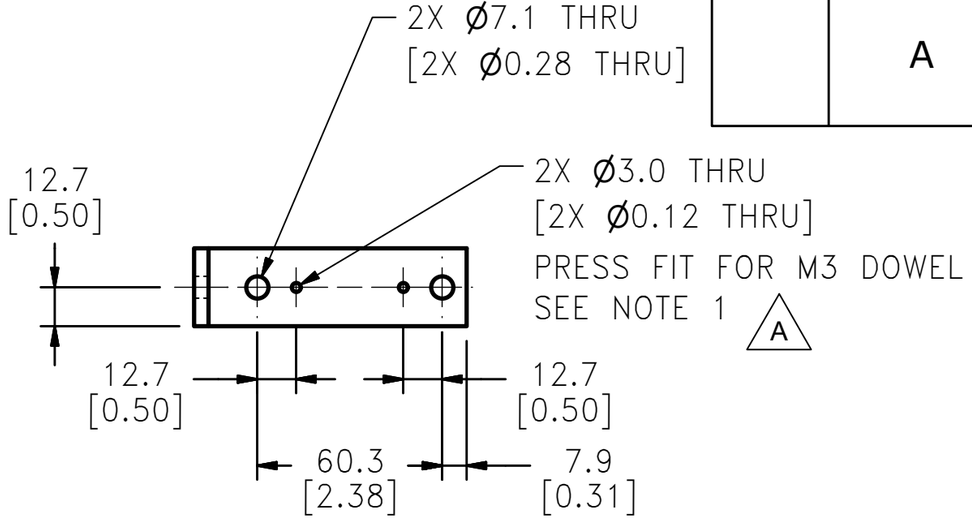
THOR-50M

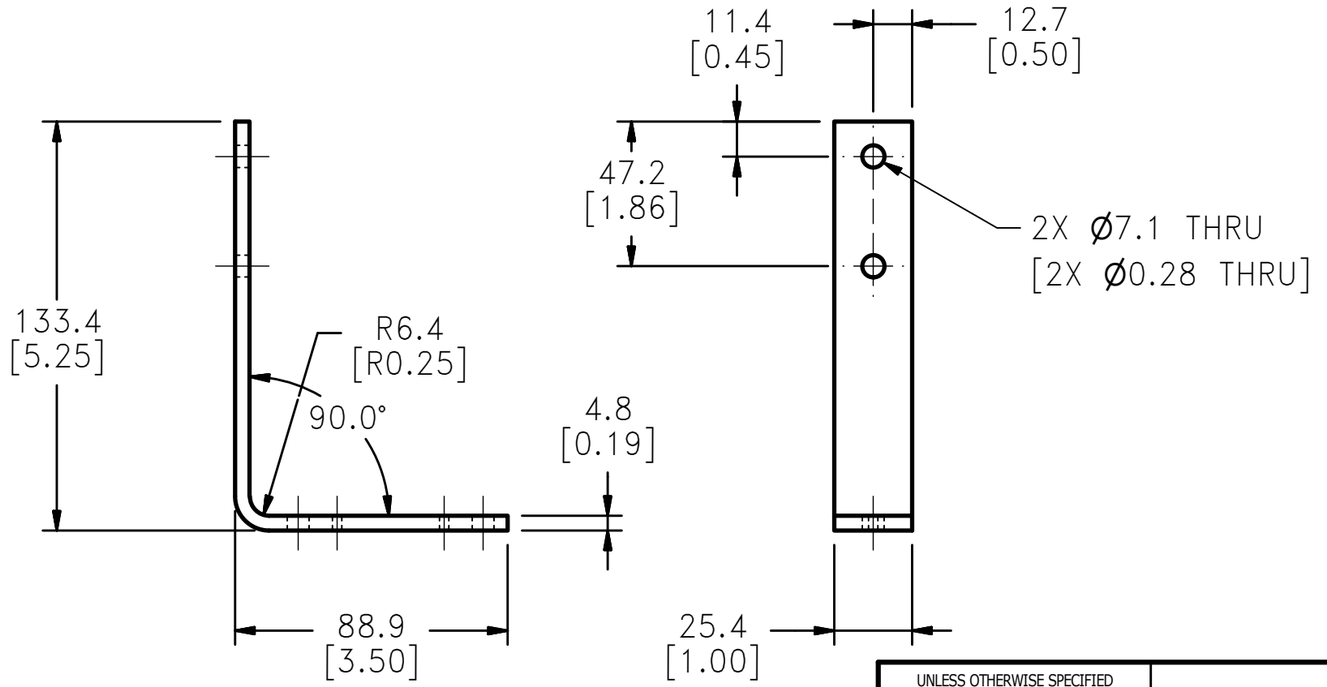
THIRD ANGLE PROJECTION

SIZE A1 | DRAWING NUMBER DL472-4211 | REV

SCALE: 1 : 1 | SHEET 1 OF 1

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	DIMENSION 2X Ø3.0 THRU [2X Ø0.12 THRU] PRESS FIT FOR M3 DOWEL SEE NOTE 1 WAS 2X Ø3.2 THRU [2X Ø0.13 THRU] 2 PLACES SEE NOTE 1	10/26/2009	JC





NOTE:

1. THESE HOLES ARE LOCATING DOWEL HOLES AND MUST MATCH UP WITH CORRESPONDING HOLES IN THE LEG MOUNTING BRACKET

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Steel
HEAT TREAT:
FINISH:

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN: Jim Clevenger	10/26/2009
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

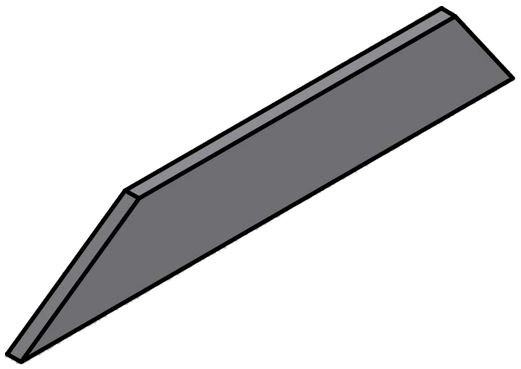
LOAD CELL BRACKET

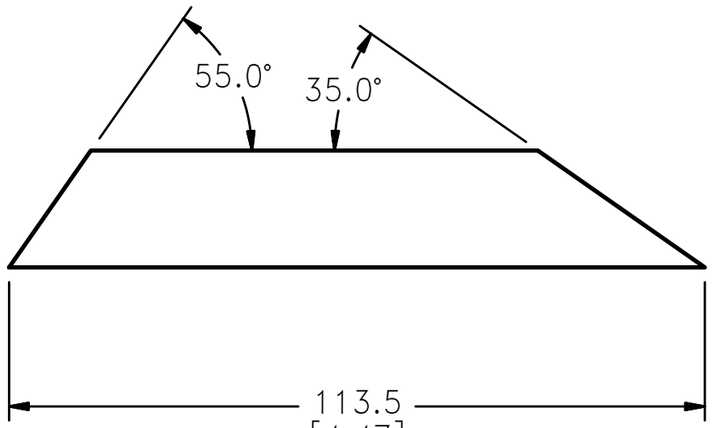
THOR-50M

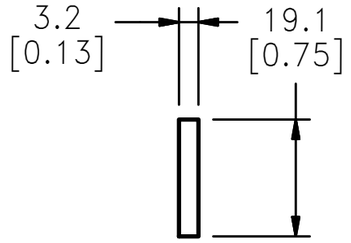
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: DL472-4212 | REV: A

SCALE: 1:1 | SHEET: 1 OF 1







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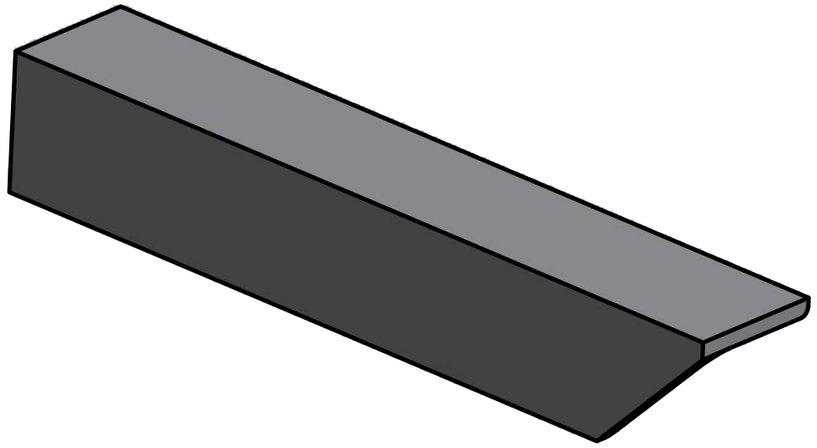
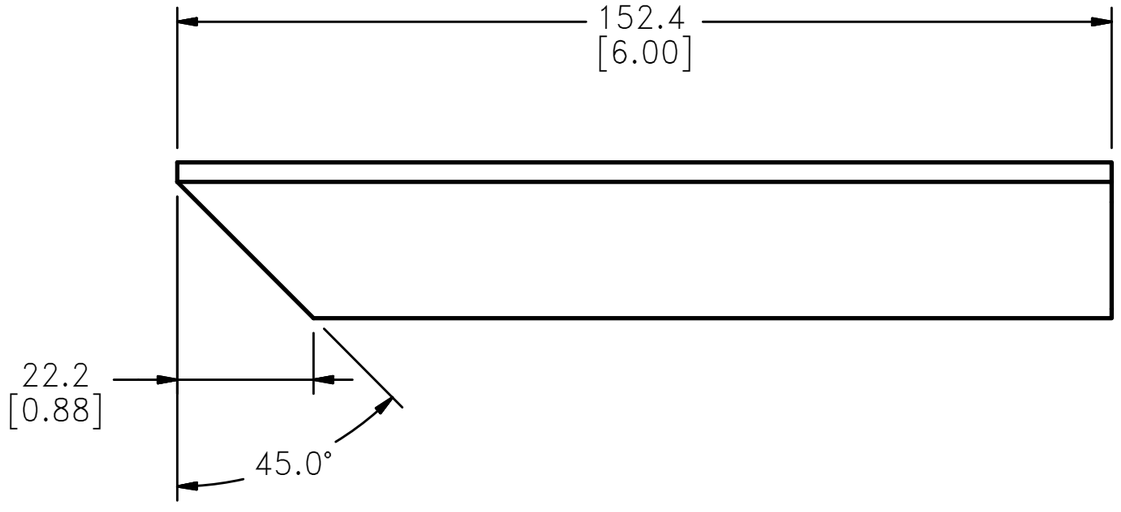
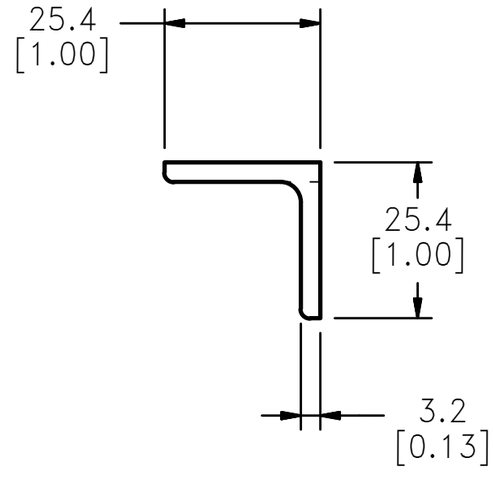
	APPROVALS	DATE	GUSSET THOR-50M
	DRAWN jim.clevenger	10/26/2009	
MATERIAL Steel	CHECKED		SIZE A3 | DRAWING NUMBER DL472-4213 | REV
HEAT TREAT	ENG		THIRD ANGLE PROJECTION | SCALE: 1:1 | SHEET 1 OF 1
FINISH	APPROVED		







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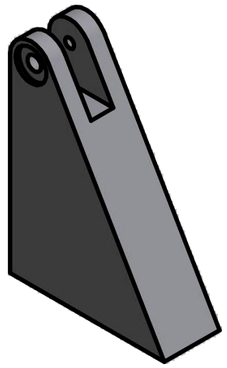
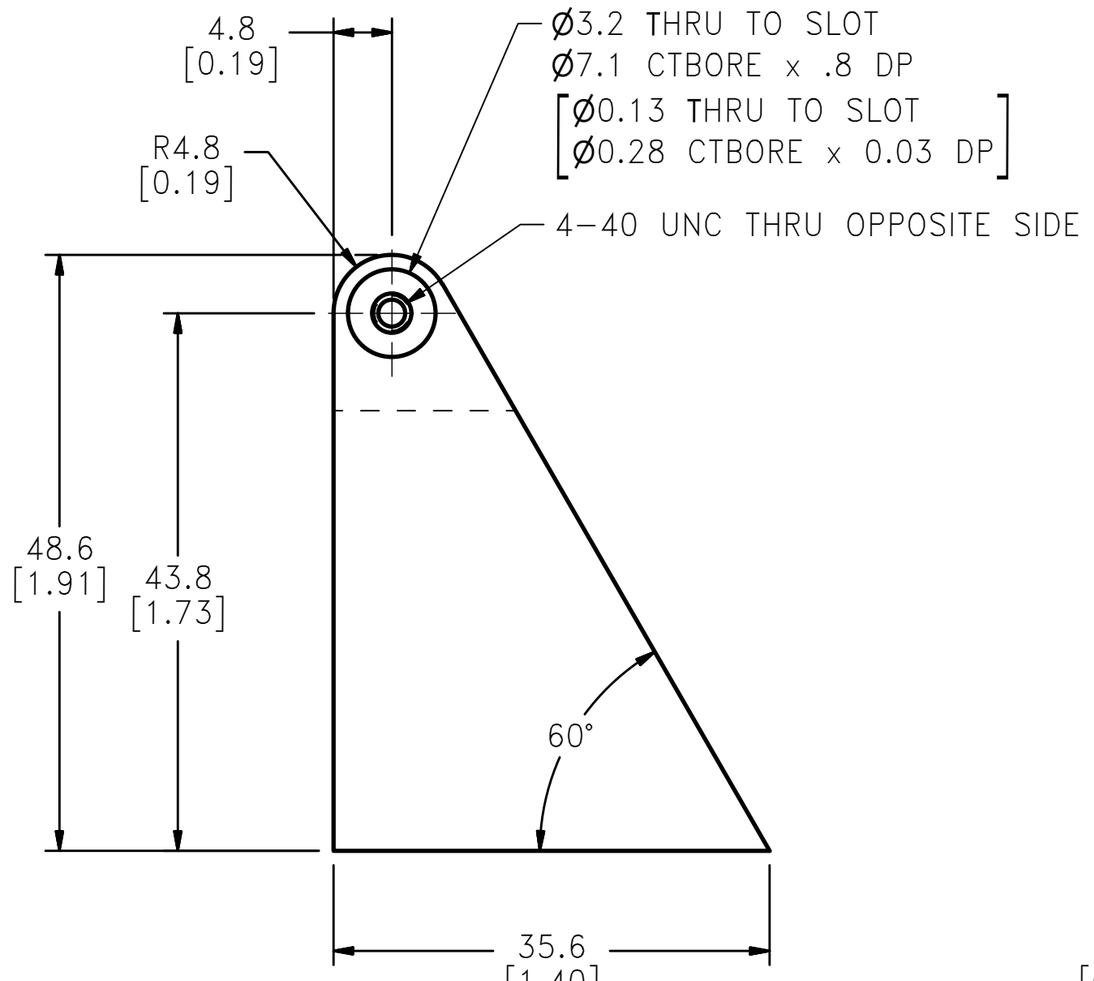
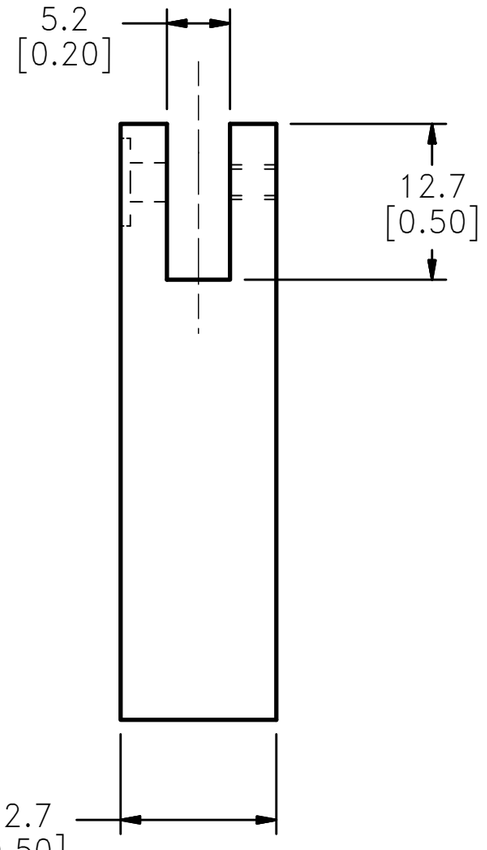
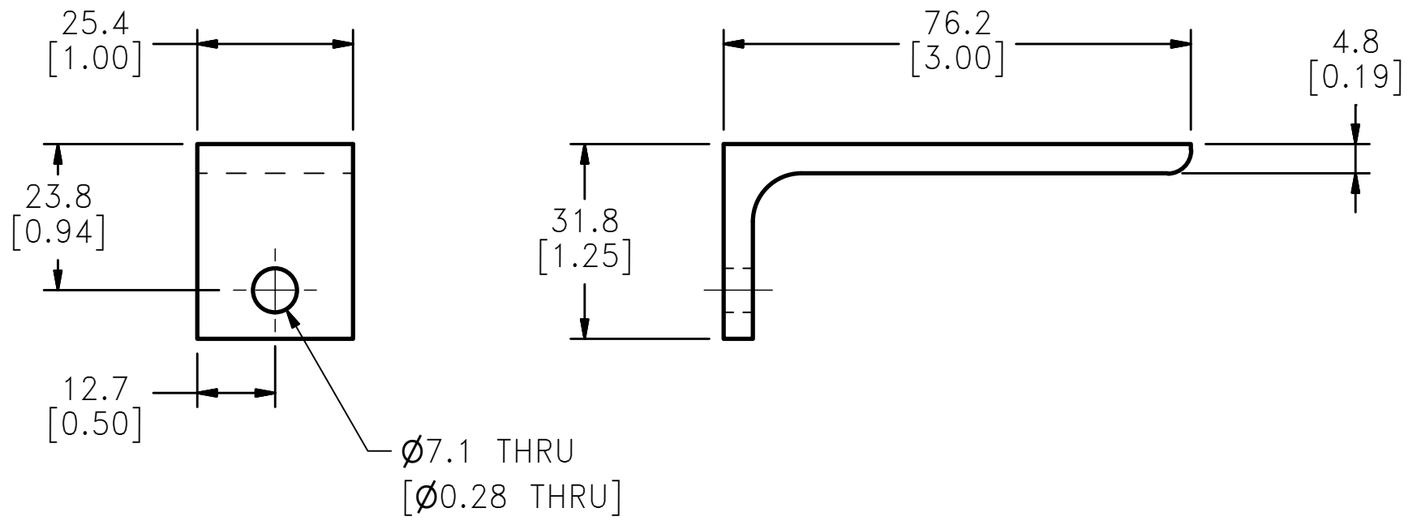
	APPROVALS	DATE	PULLEY SUPPPORT ANGLE THOR-50M
MATERIAL: Steel, Mild	DRAWN: Jim Clevenger	10/26/2009	
HEAT TREAT	CHECKED		SIZE: A3 · DRAWING NUMBER: DL472-4214 · REV
FINISH	ENG		THIRD ANGLE PROJECTION · SCALE: 1:1 · SHEET 1 OF 1
	APPROVED		



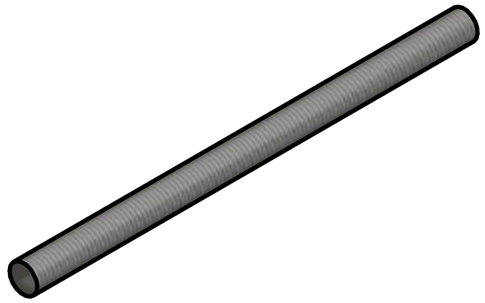


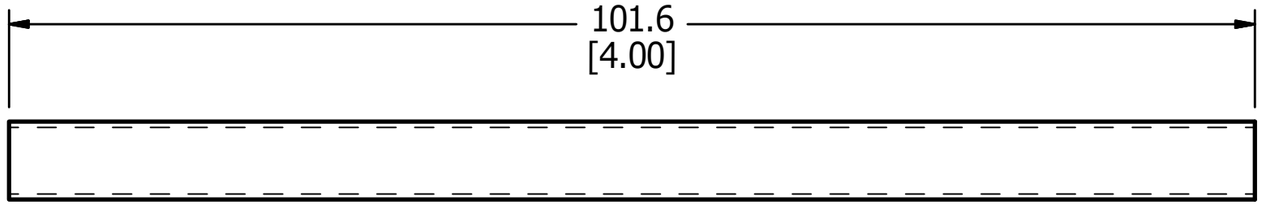


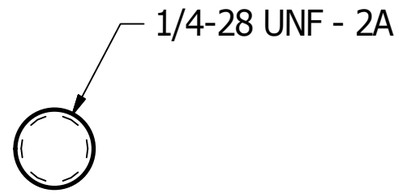
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	PULLEY BRACKET THOR-50M
	DRAWN Jim Clevenger	10/26/2009	
MATERIAL Steel	CHECKED		
HEAT TREAT	ENG		
FINISH	APPROVED		
			THIRD ANGLE PROJECTION
			SIZE A3 · DRAWING NUMBER DL472-4215 · REV
			SCALE: 1:1 · SHEET 1 OF 1



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	LOAD CELL SUPPORT THOR-50M
	DRAWN jim.clevenger	11/3/2009	
MATERIAL Steel, Mild	CHECKED		
HEAT TREAT	ENG		THIRD ANGLE PROJECTION
FINISH	APPROVED		SIZE A3 · DRAWING NUMBER DL472-4216 · REV · SCALE: 1:1 · SHEET 1 OF 1







UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL:	MACHINED
X ±.5	1.6
X.X ±.2	ANGLES
X.XX ±.1	±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN Dave Walker	9/1/2015
CHECKED	
ENG	
APPROVED	

MATERIAL: Steel, Mild
HEAT TREAT:
FINISH:

DRAW SCREW

THOR-50M

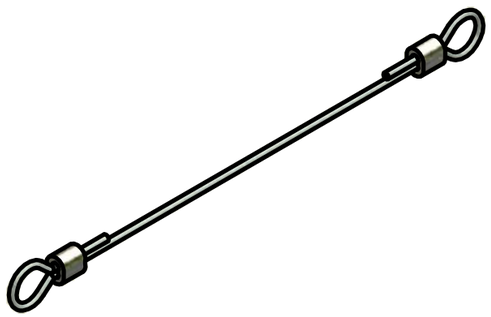
THIRD ANGLE PROJECTION

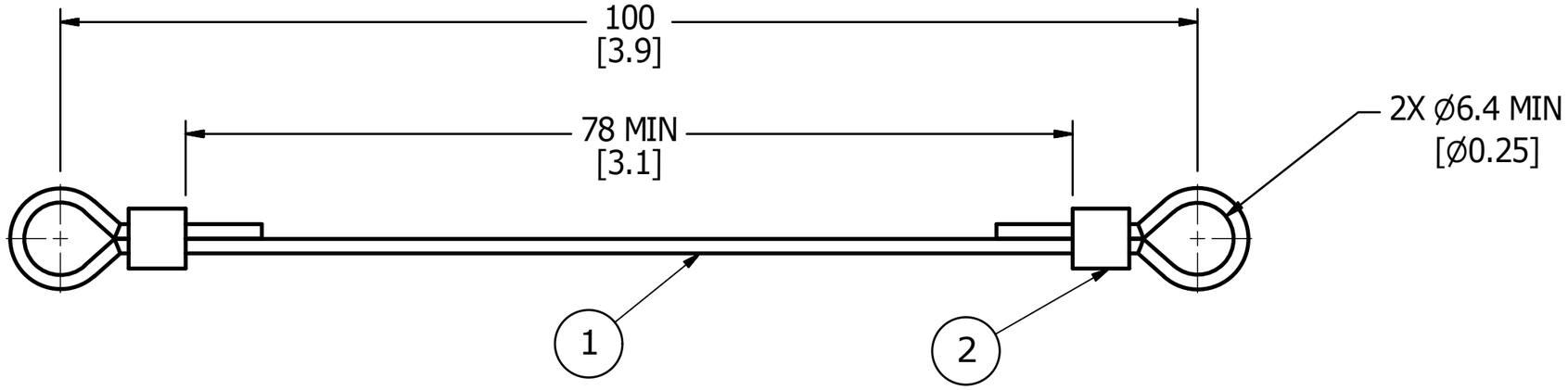
SIZE: A3 | DRAWING NUMBER: DL472-4202 | REV:

SCALE: 2:1 | SHEET: 1 OF 1

472-Draw Screw.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	SHORTENED CABLE AND ADDED LOOP TO LEFT END	8/9/2016	DW





ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL
2	2		WIRE ROPE OVAL COMPRESSION SLEEVE FOR 3/64"Ø WIRE ROPE	Zinc-Plated Copper
1	1		WIRE ROPE, 7 x 7, Ø0.047"	Steel, Galvanized

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN Dave Walker	9/1/2015
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PULL WIRE ASSEMBLY

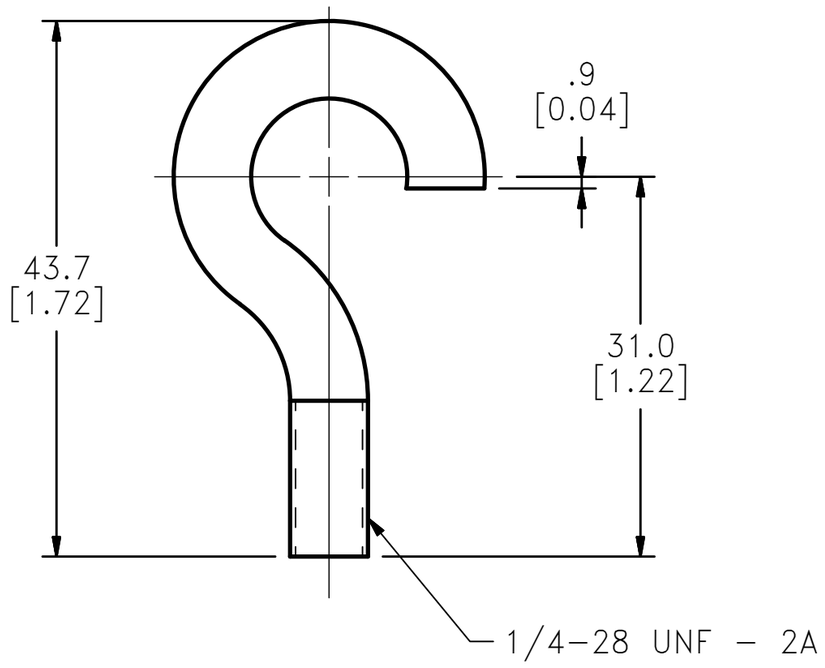
THOR-50M

THIRD ANGLE PROJECTION

SIZE A3 | DRAWING NUMBER DL472-4203 | REV A

SCALE: 2:1 | SHEET 1 OF 1

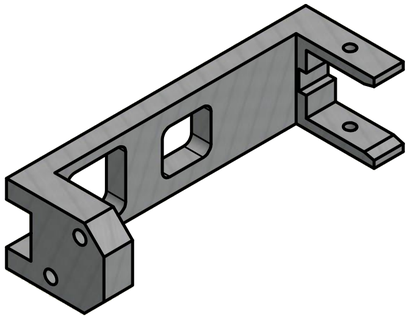
472-Pull Wire Assembly.iam

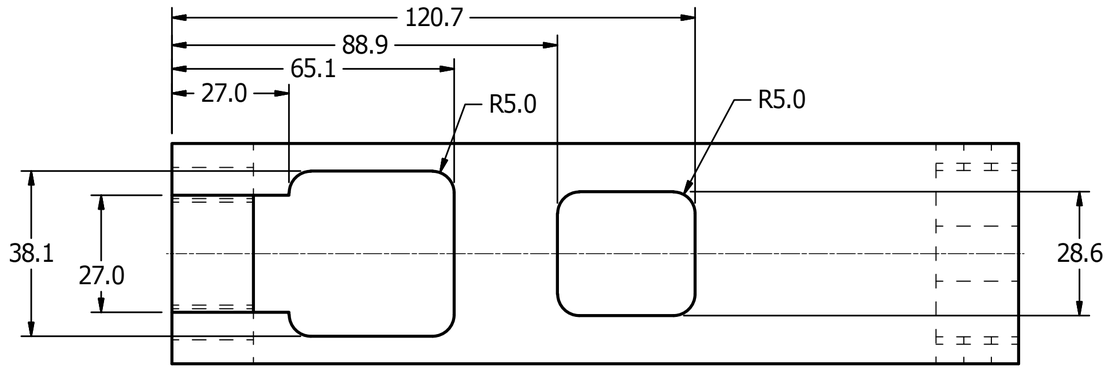


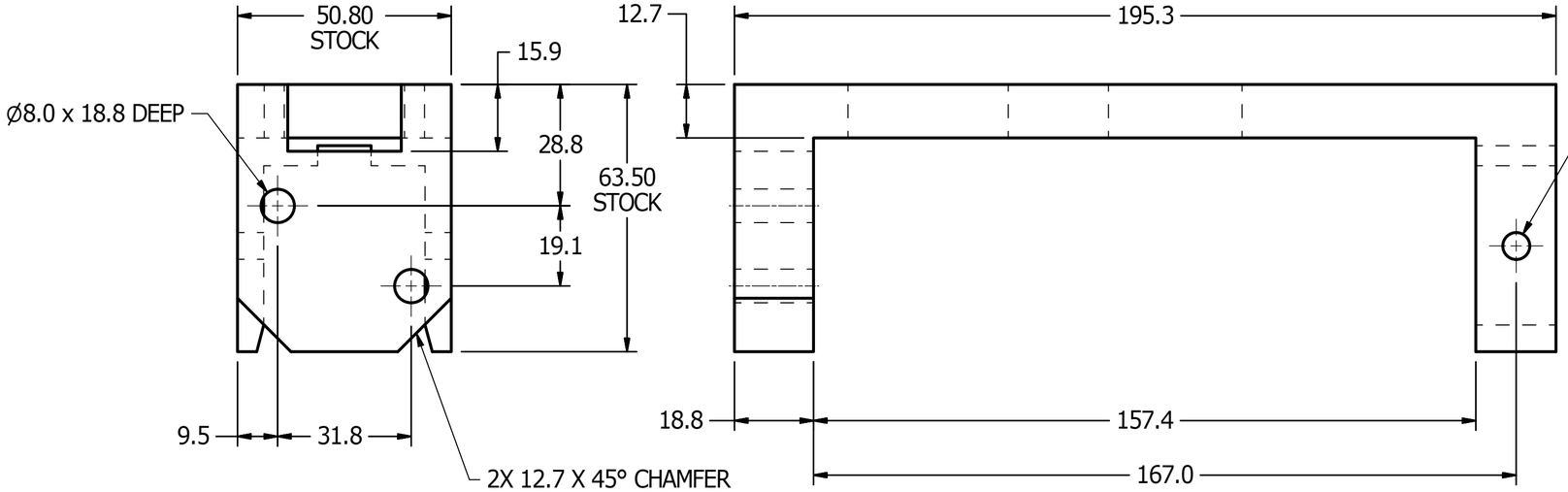
MAKE FROM EYEBOLT, 1/4-20 x 2.75" x 0.5" x 1.25"

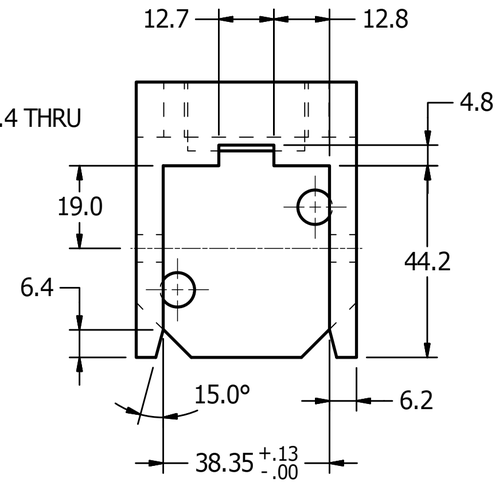
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	EYE BOLT - MODIFIED THOR-50M
	DRAWN Dave Walker / 12/21/2009	
MATERIAL Steel, Mild	CHECKED	
HEAT TREAT	ENG	THIRD ANGLE PROJECTION
FINISH	APPROVED	SIZE A3 · DRAWING NUMBER DL472-4204 · REV · SCALE: · SHEET 1 OF 1

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	CONVERTED TO METRIC	9/9/2015	DW

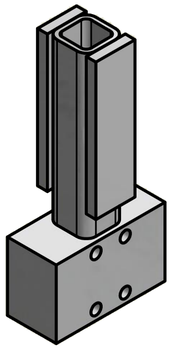




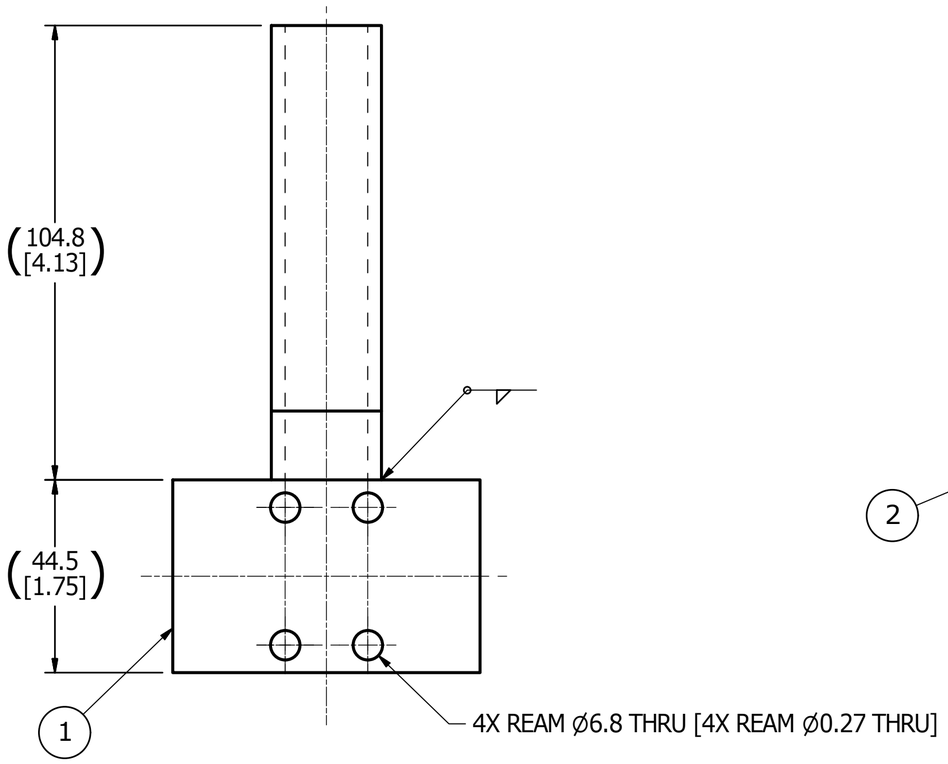


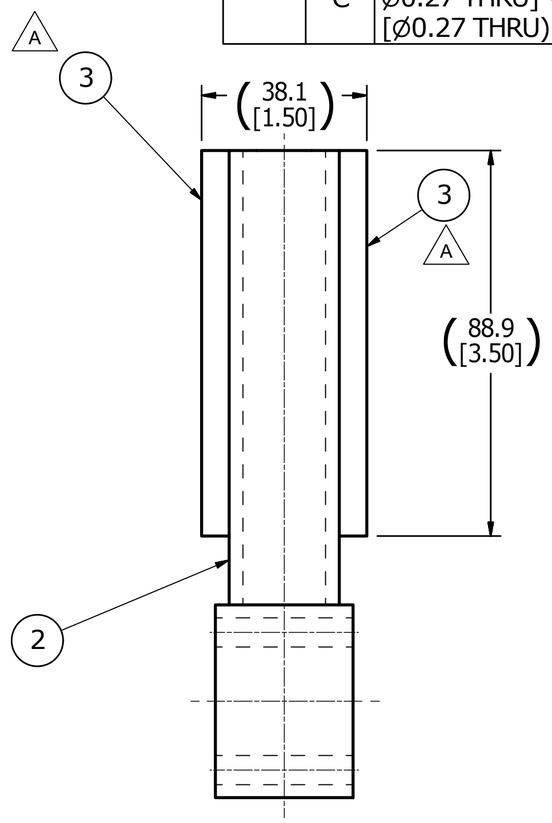


UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED 125 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	LOWER LEG ZERO BRACKET THOR-50M
MATERIAL Aluminum-6061	DRAWN Jim Clevenger	3/3/2010	SIZE A2 · DRAWING NUMBER DL472-3500 · REV A
HEAT TREAT	CHECKED		THIRD ANGLE PROJECTION · SCALE: 1:1 · SHEET 1 OF 1
FINISH	ENG		
	APPROVED		



REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	ADDED ENSOLITE FOAM	9/22/2003	DW
	B	ADDED PARTS NUMBERS AND DETAIL DRAWINGS; ADDED "OR EQUIVALENT" TO NOTE #1	9/11/2015	DW
	C	HOLE NOTE 4X REAM Ø6.8 THRU [4X Ø0.27 THRU] WAS (4X Ø6.8 THRU [Ø0.27 THRU)	3/16/2017	DW





NOTES:
A 1. ATTACH FOAM ITEM #3 WITH 3M DP-110 EPOXY ADHESIVE OR EQUIVALENT.
B

B

ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL
3	2	TLX-9000-027	INVERSION/EVERSION BRACKET, FOAM IMPACT PAD	ENSOLITE AHC
2	1	TLX-9000-026	INVERSION/EVERSION BRACKET, IMPACT TUBE	Aluminum 6061
1	1	TLX-9000-025	INVERSION/EVERSION BRACKET, ATTACHMENT BAR	Aluminum 6061

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

APPROVALS	DATE
DRAWN Dave Walker	3/20/2001
CHECKED	
ENG	
APPROVED	

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

TEST FIXTURE - DYNAMIC
INVERSION/EVERSION BRACKET
THOR-50M

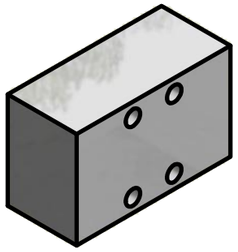
THIRD ANGLE PROJECTION

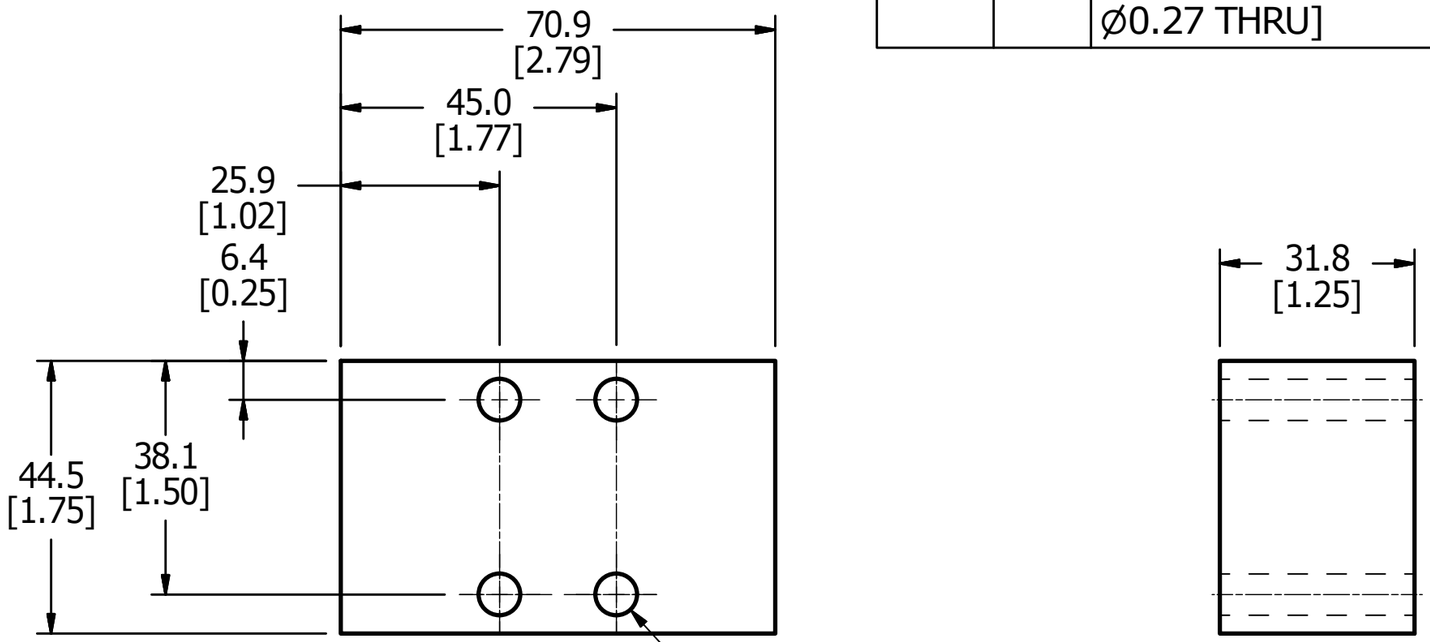
SIZE	DRAWING NUMBER	REV
A2	TLX-9000-015	C

SCALE: 1:1 | SHEET 1 OF 1

TLX-9000-015.iam

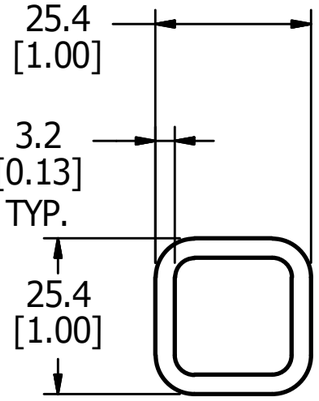
REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	HOLES NOTE (4X REAM ⌀6.8 THRU[4X REAM ⌀0.27 THRU]) DRILL AFTER ASSEMBLY, SEE DRAWING TLX-9000-015 WAS 4X ⌀6.8 THRU ⌀0.27 THRU]	3/16/2017	DW

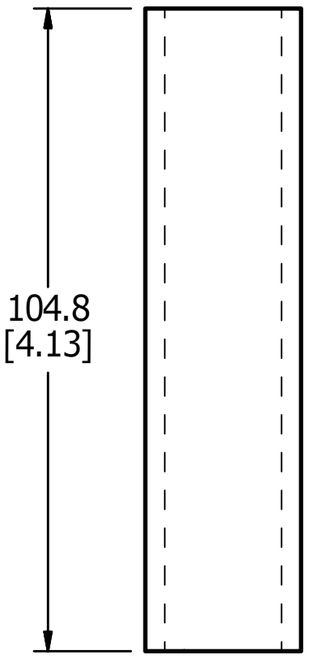




UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6, ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	INVERSION/EVERSION BRACKET, ATTACHMENT BAR THOR-50M
	DRAWN: Dave Walker — 9/11/2015	
MATERIAL: Aluminum 6061	CHECKED	SIZE: A3 — DRAWING NUMBER: TLX-9000-025 — REV: A
HEAT TREAT	ENG	THIRD ANGLE PROJECTION — SCALE: 1:1 — SHEET: 1 OF 1
FINISH	APPROVED	

472-Inversion_Eversion Attachment Bar.ipt

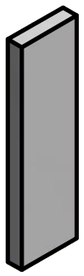


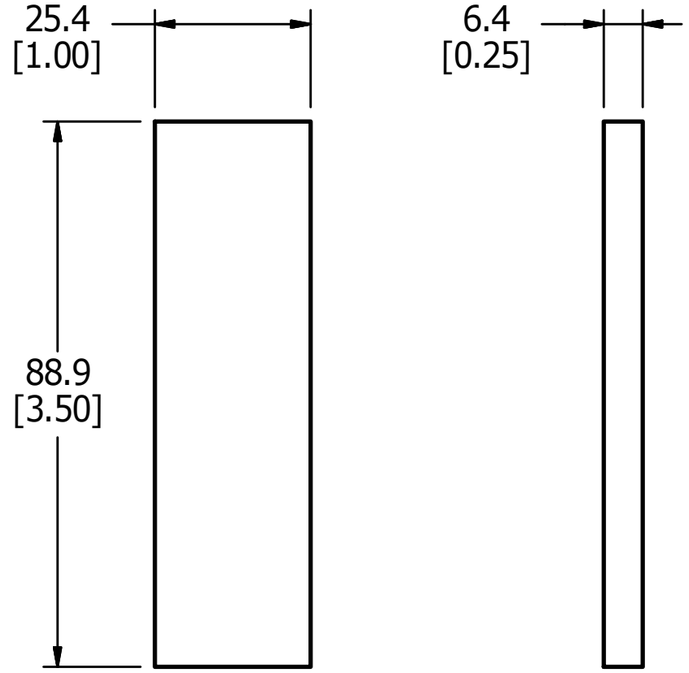


MATERIAL: T.S. 1" x 1" x 1/8" x 4.125"[104.8mm]

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6, ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	INVERSION/EVERSION BRACKET, IMPACT TUBE THOR-50M
	DRAWN: Dave Walker / 9/11/2015	
MATERIAL: Aluminum 6061	CHECKED	
HEAT TREAT	ENG	
FINISH	APPROVED	THIRD ANGLE PROJECTION SIZE: A3 · DRAWING NUMBER: TLX-9000-026 · REV SCALE: 1:1 · SHEET: 1 OF 1

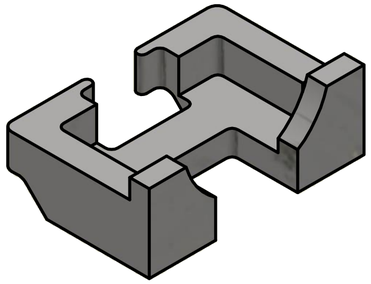
TS 1 x 1 x 1_8 - 4.125.ipt

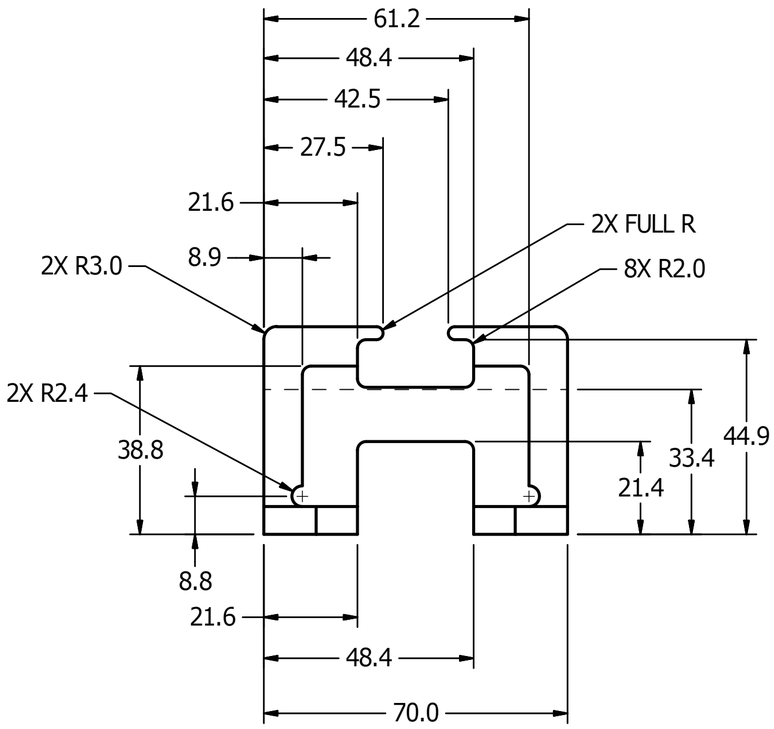


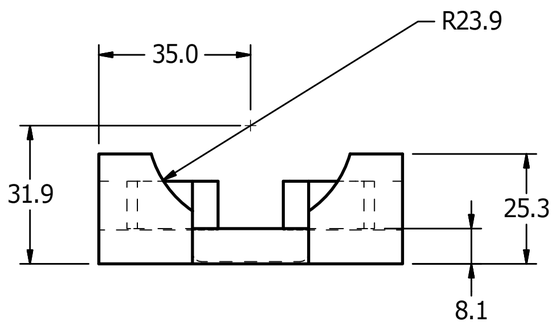


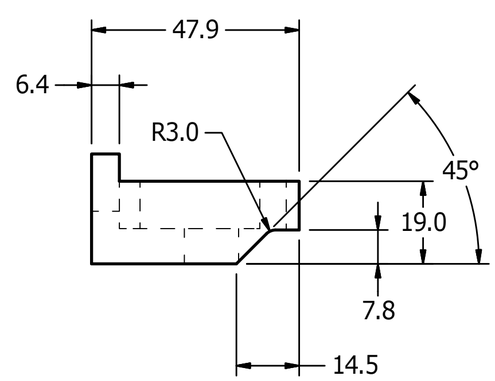
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	INVERSION/EVERSION BRACKET, FOAM IMPACT PAD THOR-50M
	DRAWN: Dave Walker / 9/11/2015	
MATERIAL: ENSOLITE FOAM AHC	CHECKED	
HEAT TREAT	ENG	SIZE: A3 / DRAWING NUMBER: TLX-9000-027 / REV
FINISH	APPROVED	THIRD ANGLE PROJECTION / SCALE: 1:1 / SHEET: 1 OF 1

472-Foam Impact Pad.ipt





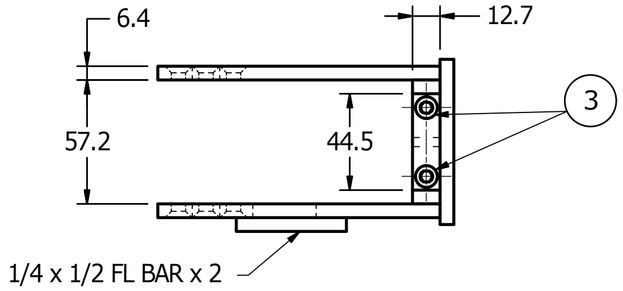


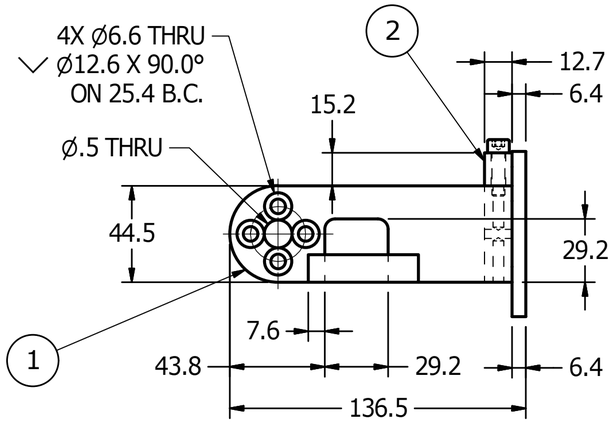


NOTES:

1. REMOVE ALL BURRS AND BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED 1.6; ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	EXTERNAL POSITIONING BRACKET THOR-50M
MATERIAL Steel, Mild	DRAWN Dave Walker	8/18/2016	
HEAT TREAT	CHECKED		SIZE A2 · DRAWING NUMBER TLX-9000-016M · REV
FINISH .0003 ELECTROLESS NICKEL	ENG		THIRD ANGLE PROJECTION · SCALE: 1 : 1 · SHEET 1 OF 1
	APPROVED		





ITEM	QTY	PART NUMBER	DESCRIPTION
3	2	5000001	SCREW, SHCS M6x1.0 x 20
2	1	DL472-5020	KNEE SLIDER TEST DISTRIBUTION BRACKET – BALLAST WEIGHT
1	1	DL472-5010	KNEE SLIDER TEST DISTRIBUTION BRACKET - WELDMENT

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

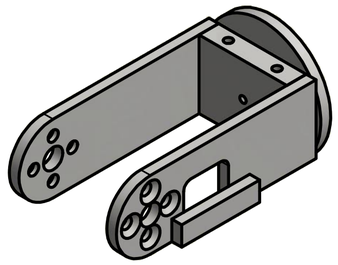
APPROVALS	DATE
DRAWN JIM CLEVENGER	8/27/2015
CHECKED	
ENG	
APPROVED	

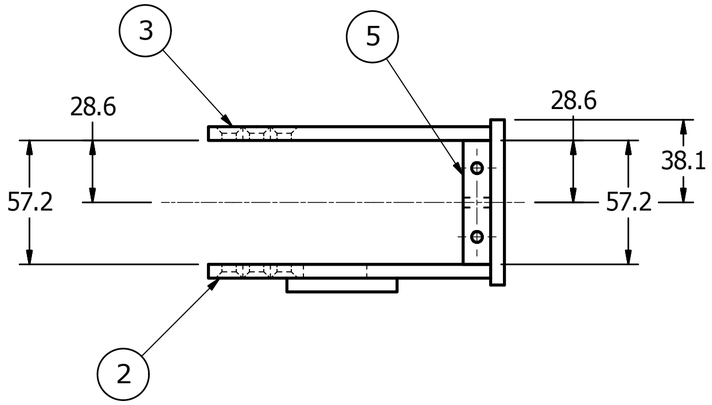
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

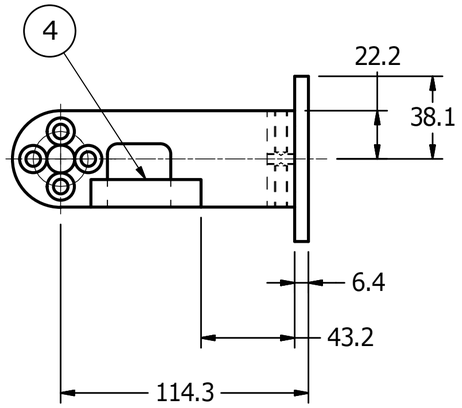
KNEE SLIDER TEST DISTRIBUTION BRACKET - ASS'Y.
THOR-50M

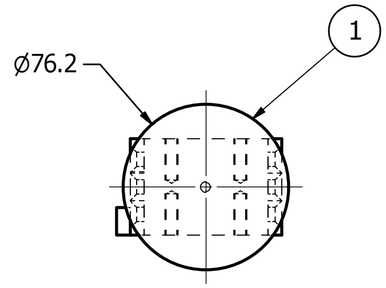
THIRD ANGLE PROJECTION
SIZE A2 | DRAWING NUMBER DL472-5000 | REV
SCALE: 0.5:1 | SHEET 1 OF 1

472-KSRT Distrubution Bracket Assembly.iam









ITEM	QTY	PART NUMBER	DESCRIPTION
5	1	DL472-5015	KNEE SLIDER TEST DISTRIBUTION BRACKET – BACK PLATE
4	1	DL472-5014	KNEE SLIDER TEST DISTRIBUTION BRACKET – TIE BAR
3	1	DL472-5013	KNEE SLIDER TEST DISTRIBUTION BRACKET, SIDE PLATE - LEFT
2	1	DL472-5012	KNEE SLIDER TEST DISTRIBUTION BRACKET, SIDE PLATE - RIGHT
1	1	DL472-5011	KNEE SLIDER TEST DISTRIBUTION BRACKET – IMPACT PLATE

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN Dave Walker	10/2/2015
CHECKED	
ENG	
APPROVED	

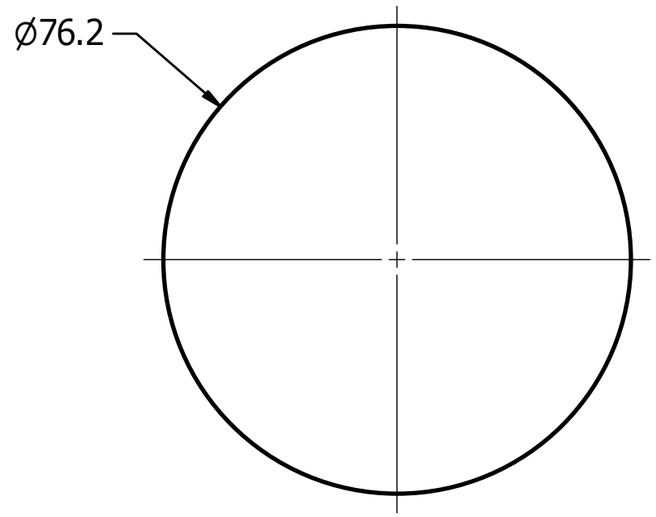
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

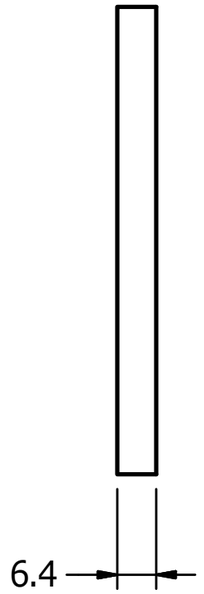
KNEE SLIDER TEST DISTRIBUTION BRACKET - WELDMENT
THOR-50M

THIRD ANGLE PROJECTION

SIZE A2 | DRAWING NUMBER DL472-5010 | REV
SCALE:
SHEET 1 OF 1

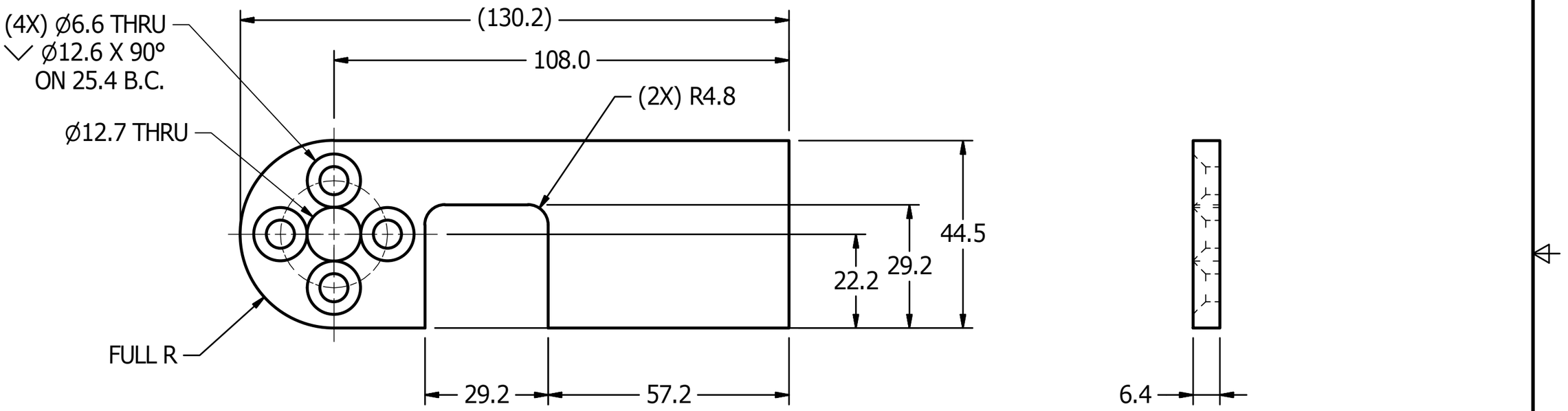
472-KSRT Distrubution Bracket Weldment.iam





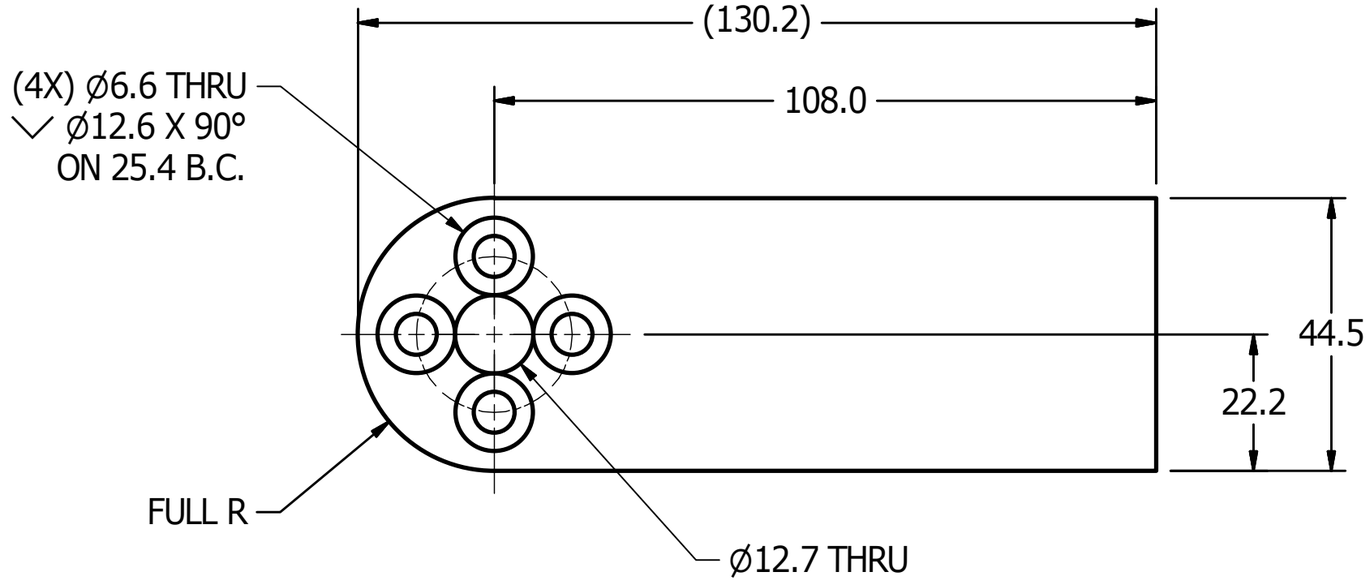
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	KNEE SLIDER TEST DISTRIBUTION BRACKET – IMPACT PLATE THOR-50M
MATERIAL: 1018 STEEL	DRAWN: Dave Walker — 10/2/2015	
HEAT TREAT	CHECKED	SIZE: A3 — DRAWING NUMBER: DL472-5011 — REV
FINISH	ENG	
	APPROVED	THIRD ANGLE PROJECTION — SCALE: — SHEET: 1 OF 1

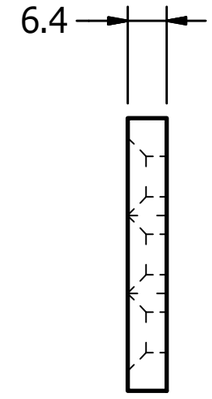
472-KSRT Impact Plate.ipt



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	KNEE SLIDER TEST DISTRIBUTION BRACKET, SIDE PLATE - RIGHT THOR-50M
MATERIAL: 1018 STEEL	DRAWN: Dave Walker / 10/2/2015	
HEAT TREAT	CHECKED	
FINISH	ENG	
	APPROVED	
THIRD ANGLE PROJECTION	SIZE: A3	DRAWING NUMBER: DL472-5012 REV
	SCALE:	SHEET: 1 OF 1

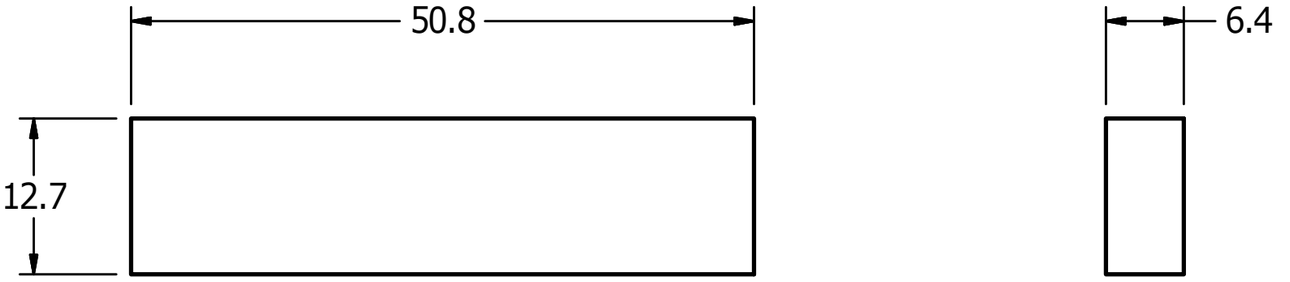
472-KSRT Side Plate, Right.ipt





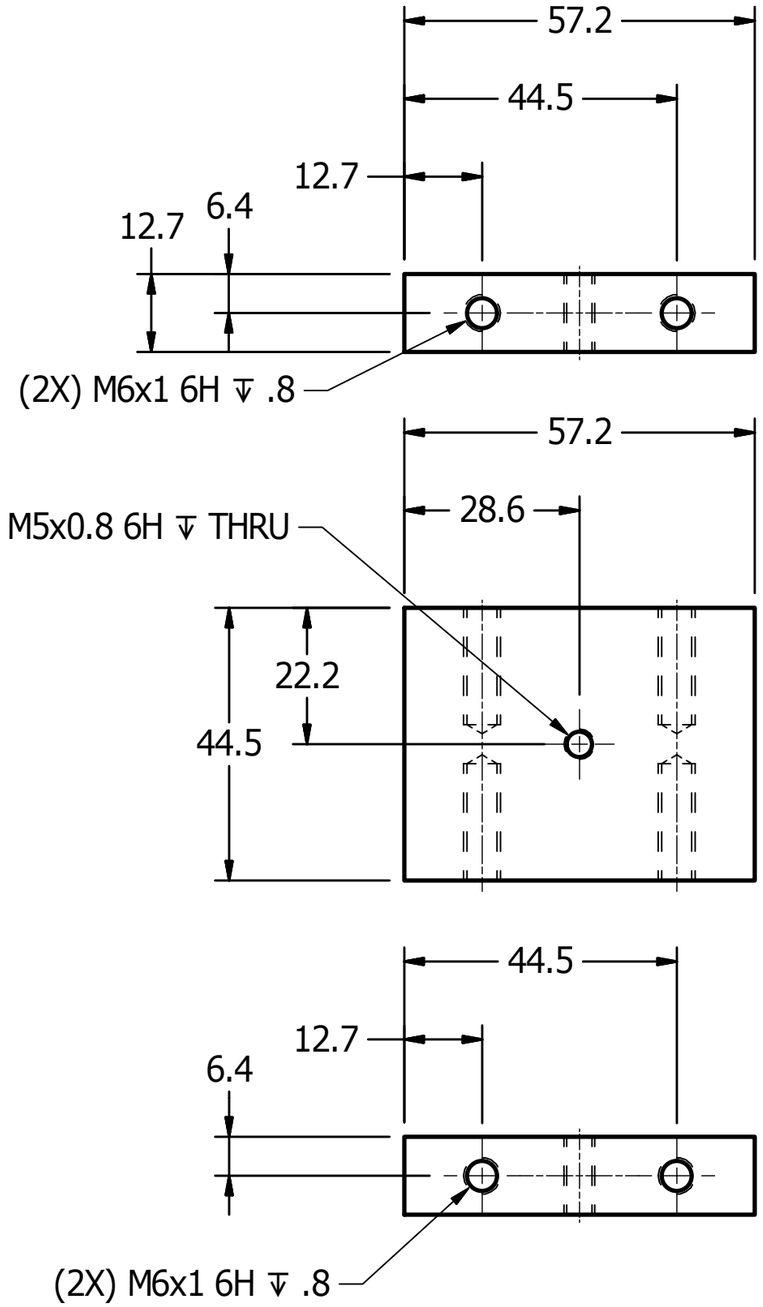
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	KNEE SLIDER TEST DISTRIBUTION BRACKET, SIDE PLATE - LEFT THOR-50M
MATERIAL: 1018 STEEL	DRAWN: Dave Walker — 10/2/2015	
HEAT TREAT	CHECKED	
FINISH	ENG	
	APPROVED	
THIRD ANGLE PROJECTION	SIZE: A3 — DRAWING NUMBER: DL472-5013 — REV	
	SCALE:	SHEET: 1 OF 1

472-KSRT Side Plate, Left.ipt



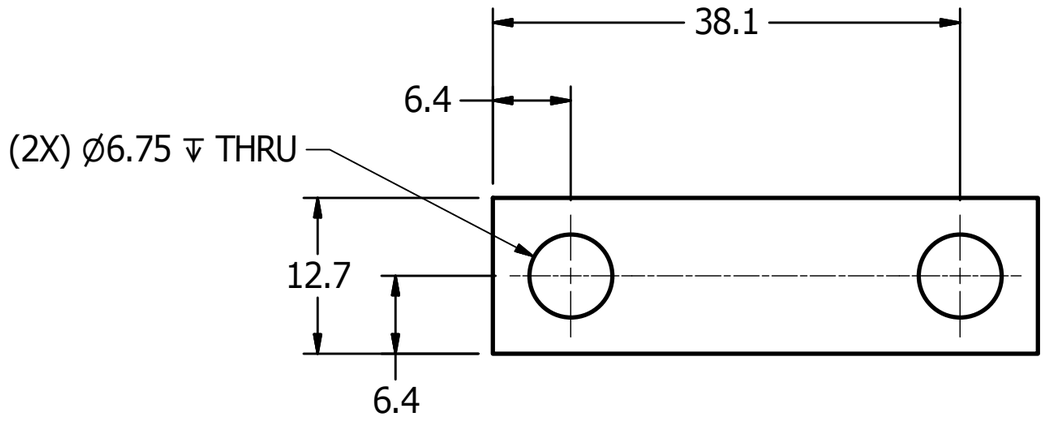
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
MATERIAL: 1018 STEEL	APPROVALS / DATE	KNEE SLIDER TEST DISTRIBUTION BRACKET – TIE BAR THOR-50M
HEAT TREAT	DRAWN: Dave Walker — 10/5/2015	SIZE: A3 — DRAWING NUMBER: DL472-5014 — REV
FINISH	CHECKED	THIRD ANGLE PROJECTION
	ENG	SCALE: 2:1 — SHEET: 1 OF 1
	APPROVED	

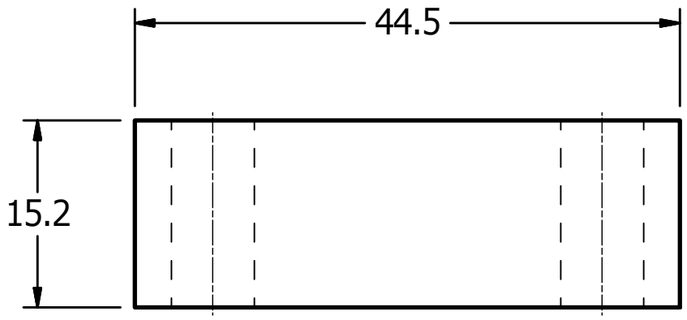
472-KSRT Tie Bar.ipt



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	KNEE SLIDER TEST DISTRIBUTION BRACKET – BACK PLATE THOR-50M
	DRAWN Dave Walker	10/5/2015	
MATERIAL 1018 STEEL	CHECKED		
HEAT TREAT	ENG		
FINISH	APPROVED		THIRD ANGLE PROJECTION
			SIZE A3 · DRAWING NUMBER DL472-5015 · REV
			SCALE: · SHEET 1 OF 1

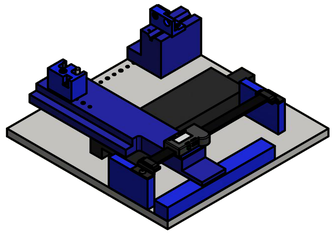
472-KSRT Back Plate.ipt

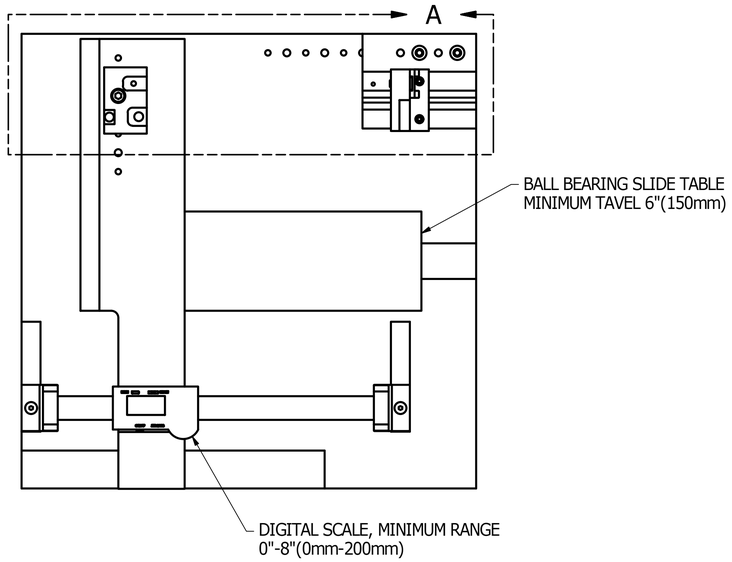


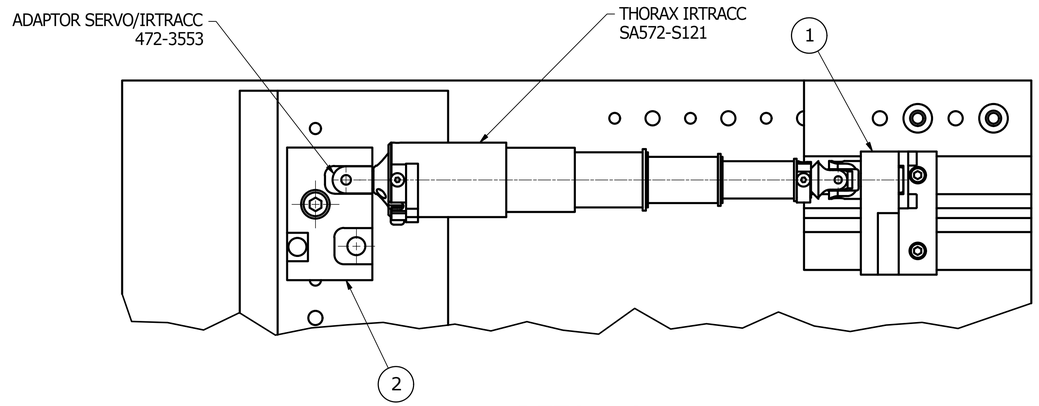


UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6 ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	KNEE SLIDER TEST DISTRIBUTION BRACKET – BALLAST WEIGHT THOR-50M
	DRAWN: Dave Walker — 10/5/2015	
MATERIAL: 1018 STEEL	CHECKED	
HEAT TREAT	ENG	
FINISH	APPROVED	THIRD ANGLE PROJECTION
		SIZE: A3 — DRAWING NUMBER: DL472-5020 — REV
		SCALE: 2:1 — SHEET: 1 OF 1

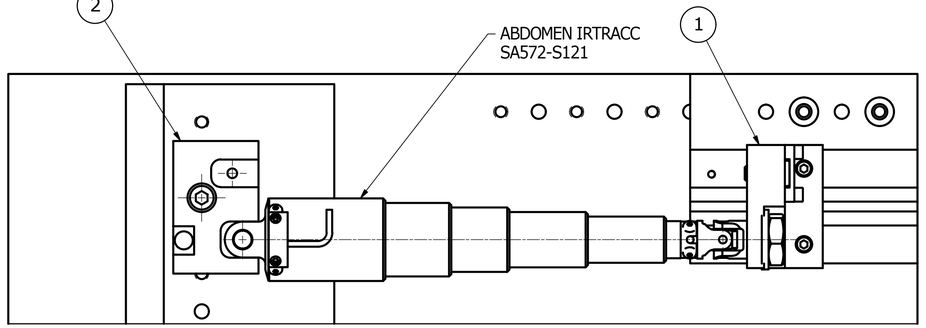
472-KSRT Ballast Weight Block.ipt



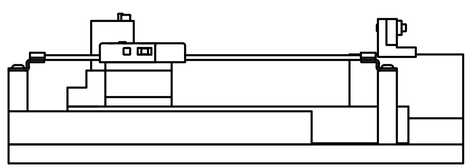


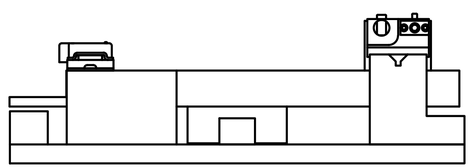


DETAIL A
THORAX IRTACC SETUP
SCALE 1 : 1



DETAIL A
ABDOMEN IRTRACC SETUP
SCALE 1 : 1





ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	DL472-6050	DSCF - REAR IRTRACC MOUNT BLOCK ASS'Y.
1	1	DL472-6010	DSCF - FRONT IRTRACC MOUNT BLOCK ASS'Y.

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
DECIMAL: .X ±.1, .XX ±.01, .XXX ±.005
MACHINED, ANGLES ±.5°, FRACTION ±1/64
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

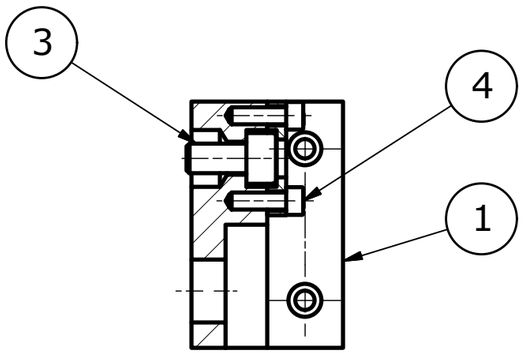
APPROVALS | DATE
DRAWN: Dave Walker | 5/3/2016
CHECKED
ENG
APPROVED

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

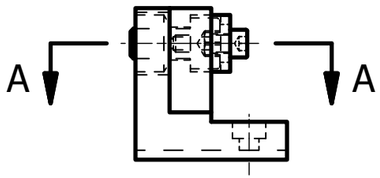
DIGITAL SLIDE CALIBRATION FIXTURE

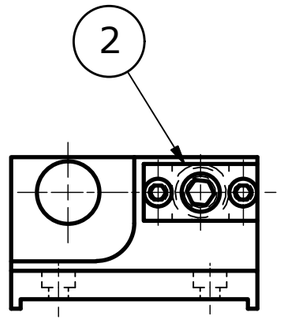
THIRD ANGLE PROJECTION
SIZE: D
DRAWING NUMBER: DL472-6000
REV
SCALE:
SHEET: 1 OF 1

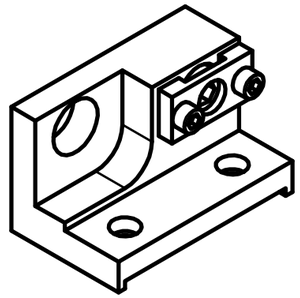
Digital Slide Calibration Fixture.iam



SECTION A-A
SCALE 1 : 1







ITEM	QTY	PART NUMBER	DESCRIPTION
4	2	9000378V	SCREW, SHCS #4-40 x 3/8"
3	1	5000291	SCREW, SHCS M5-0.8 x 10
2	1	DL472-6012	DSCF - FRONT IRTRACC MOUNT BLOCK ASS'Y. - SCREW RETAINER
1	1	DL472-6011	DSCF - FRONT IRTRACC MOUNT BLOCK

PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

DECIMAL: .X ±.1, .XX ±.01, .XXX ±.005
MACHINED 125
ANGLES ±.5°
FRACTION ±1/64

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/18/2015
CHECKED	
ENG	
APPROVED	

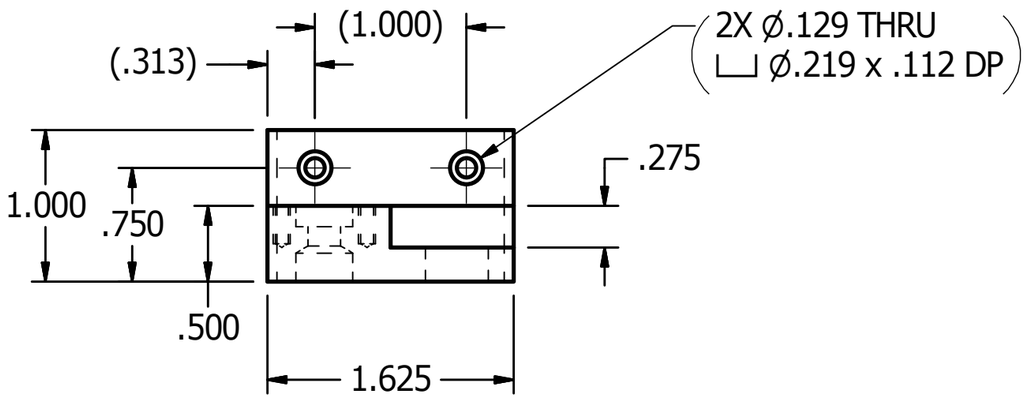
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

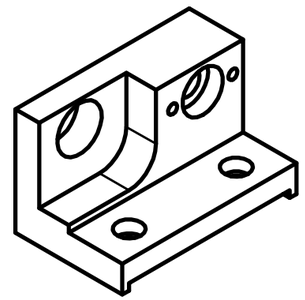
DSCF - FRONT IRTRACC MOUNT BLOCK ASS'Y.

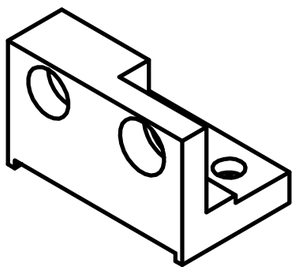
THIRD ANGLE PROJECTION

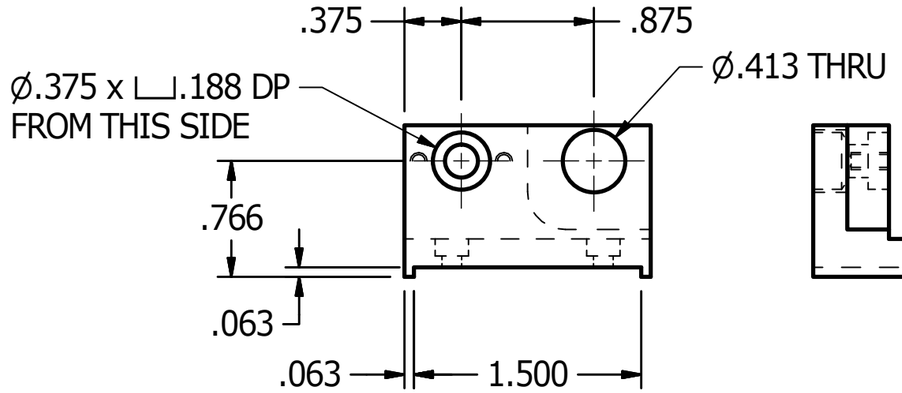
SIZE B
DRAWING NUMBER DL472-6010
REV
SCALE: 1:1
SHEET 1 OF 1

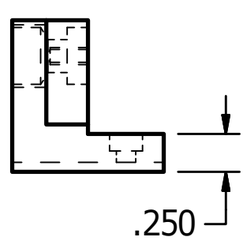
DSCF Stationary IRTRACC Mount Assy.iam

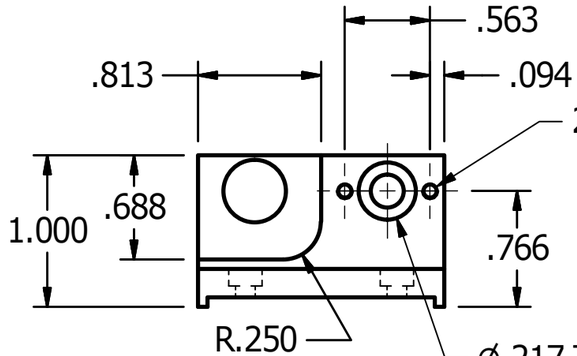








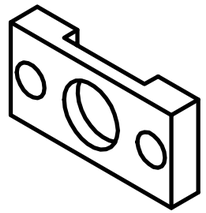


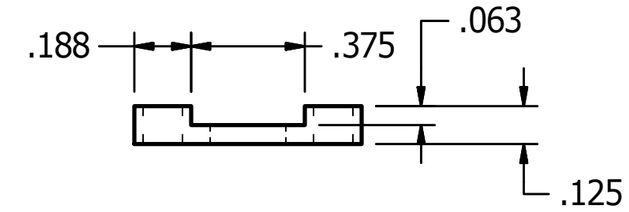


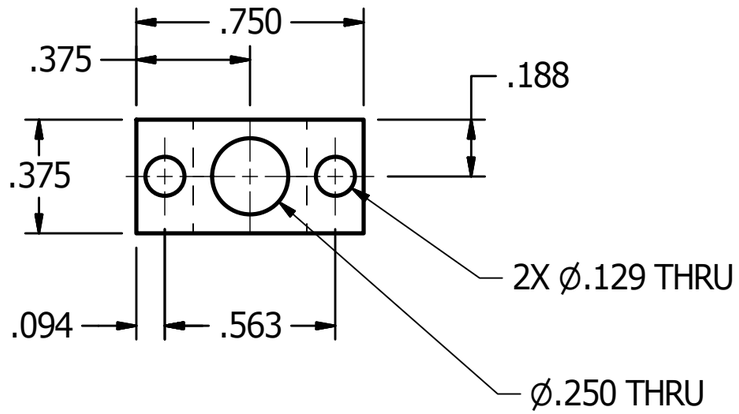
Ø.217 THRU
⌴ Ø.375 x .138 DP
FROM THIS SIDE
INLINE WITH .375 HOLE
ON OTHER SIDE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: DECIMAL: .X ±.1, .XX ±.01, .XXX ±.005 | MACHINED 125, ANGLES ±.5°, FRACTION ±1/64 ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	DSCF - FRONT IRTRACC MOUNT BLOCK
	DRAWN: JIM CLEVENGER 8/18/2015	
MATERIAL: Aluminum 6061	CHECKED	SIZE: B; DRAWING NUMBER: DL472-6011; REV
HEAT TREAT	ENG	THIRD ANGLE PROJECTION
FINISH	APPROVED	SCALE: 1:1; SHEET: 1 OF 1

DSCF Stationary IRTRACC Mount.ipt

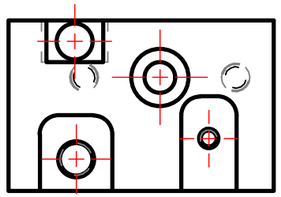


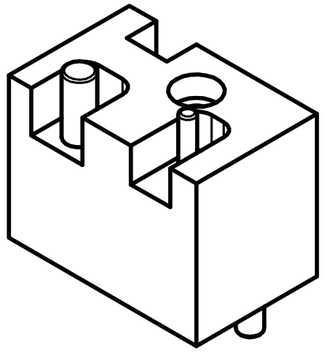


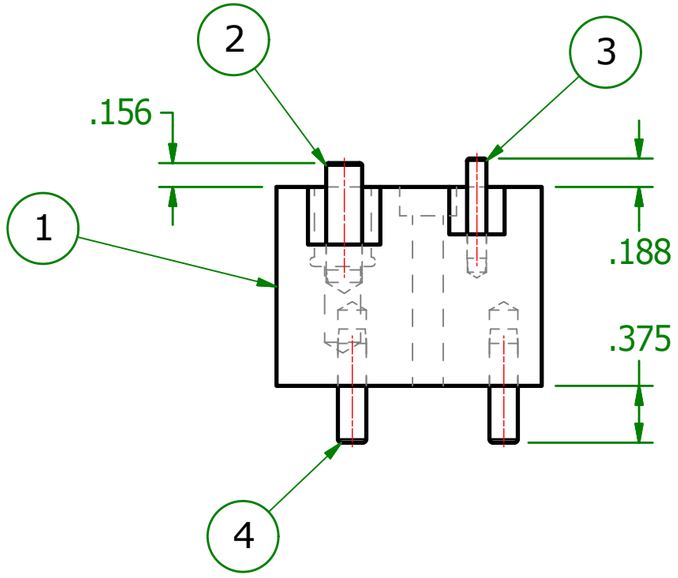


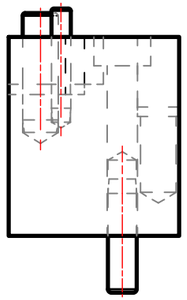
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: DECIMAL: .X ±.1, .XX ±.01, .XXX ±.005 | MACHINED 125, ANGLES ±.5°, FRACTION ±1/64 ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	DSCF - FRONT IRTRACC MOUNT BLOCK ASS'Y. - SCREW RETAINER
	DRAWN: JIM CLEVENGER / 8/18/2015	
MATERIAL: Aluminum 6061	CHECKED	
HEAT TREAT	ENG	
FINISH	APPROVED	
THIRD ANGLE PROJECTION	SIZE: B	DRAWING NUMBER: DL472-6012 REV
	SCALE: 2:1	SHEET: 1 OF 1

DSCF Screw Retainer.ipt









ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL
4	2	9000012V	PIN, DOWEL 1/8" x 3/4"	Steel, Mild
3	1	9000042V	PIN, DOWEL 3/16" x 3/4"	Steel, Mild
2	1	5000445	PIN, DOWEL M6 x 20mm	Steel, Mild
1	1	DL472-6051	DSCF - REAR IRTRACC MOUNT BLOCK	

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

DECIMAL: .X ±.1, .XX ±.01, .XXX ±.005
MACHINED 125, ANGLES ±.5°, FRACTION ±1/64

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN JIM CLEVENGER	8/18/2015
CHECKED	
ENG	
APPROVED	

MATERIAL
HEAT TREAT
FINISH

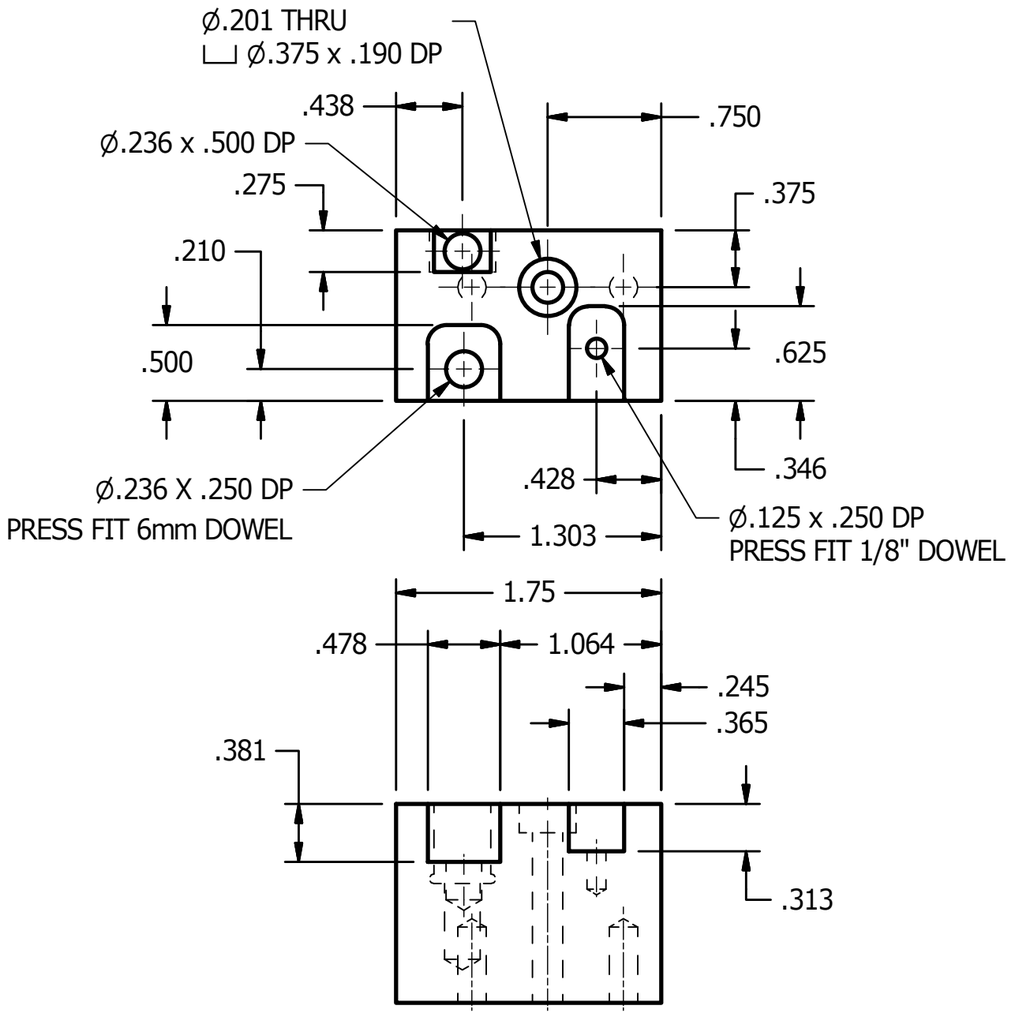
DSCF - REAR IRTRACC MOUNT BLOCK ASS'Y.

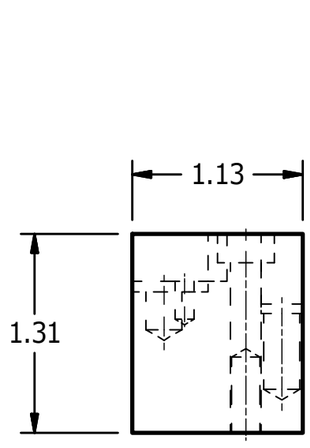
THIRD ANGLE PROJECTION

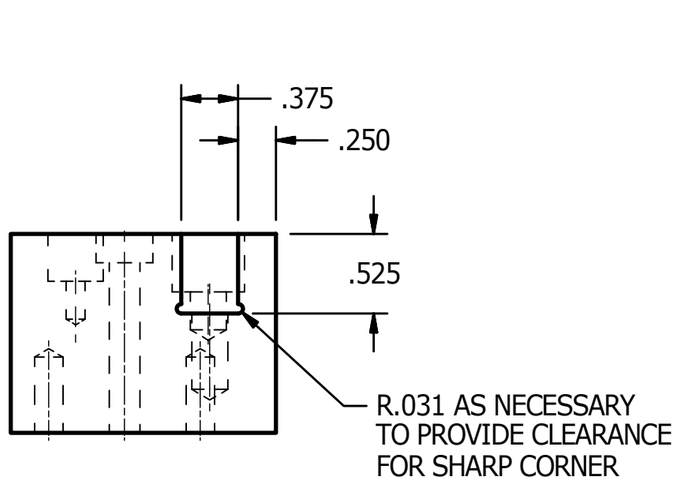
SIZE B | DRAWING NUMBER DL472-6050 | REV

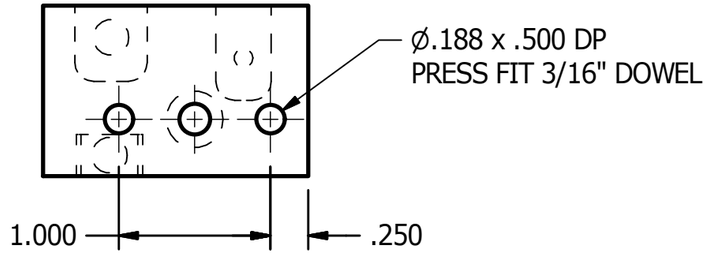
SCALE: 1:1 | SHEET 1 OF 1

DSCF Slide Bar IRTRACC Mount Assy.iam









UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

DECIMAL:		MACHINED	125
.X	±.1	ANGLES	±.5°
.XX	±.01	FRACTION	±1/64
.XXX	±.005		

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: JIM CLEVENGER	8/18/2015
CHECKED	
ENG	
APPROVED	

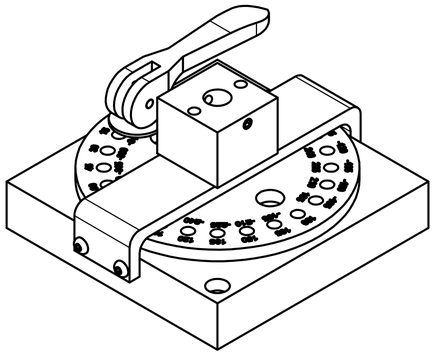
MATERIAL: Aluminum 6061
HEAT TREAT
FINISH

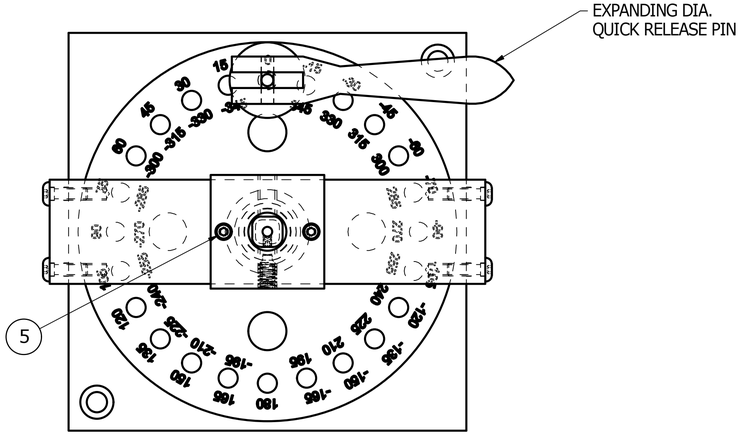
DSCF - REAR IRTRACC MOUNT BLOCK

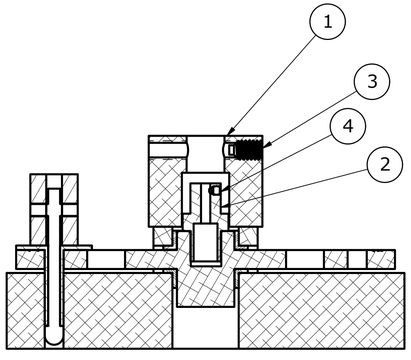
THIRD ANGLE PROJECTION

SIZE: B
DRAWING NUMBER: DL472-6051
REV:
SCALE: 1:1
SHEET: 1 OF 1

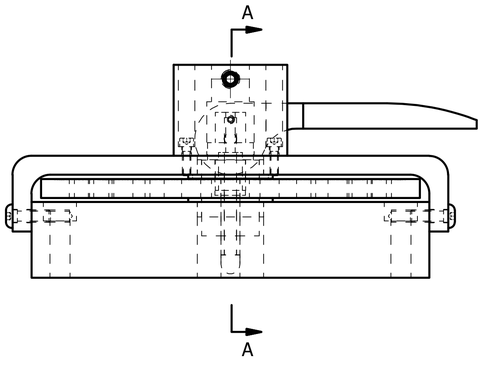
DSCF Slide Bar IRTRACC Mount.ipt

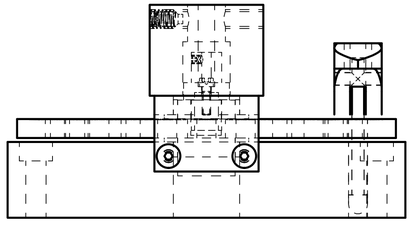






SECTION A-A





ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL
5	2	9000378V	SCREW, SHCS #4-40 x 3/8"	Steel, Mild
4	1	9000154	SCREW, SSCP #4-40 x 1/8"	Steel, Mild
3	1	9001016V	SCREW, SSCP 1/4-20 x 3/8" NYLON TIP	Steel, Mild
2	1	DL472-6122	POTENTIOMETER CLAMP BLOCK	
1	1	DL472-6121	POTENTIOMETER HOLD DOWN BLOCK	

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
DECIMAL: .X ±.1, .XX ±.01, .XXX ±.005
MACHINED
ANGLES ±.5°
FRACTION ±1/64
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN Dave Walker	5/4/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

POTENTIOMETER CALIBRATION FIXTURE ASS'Y.

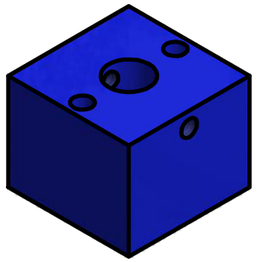
THIRD ANGLE PROJECTION

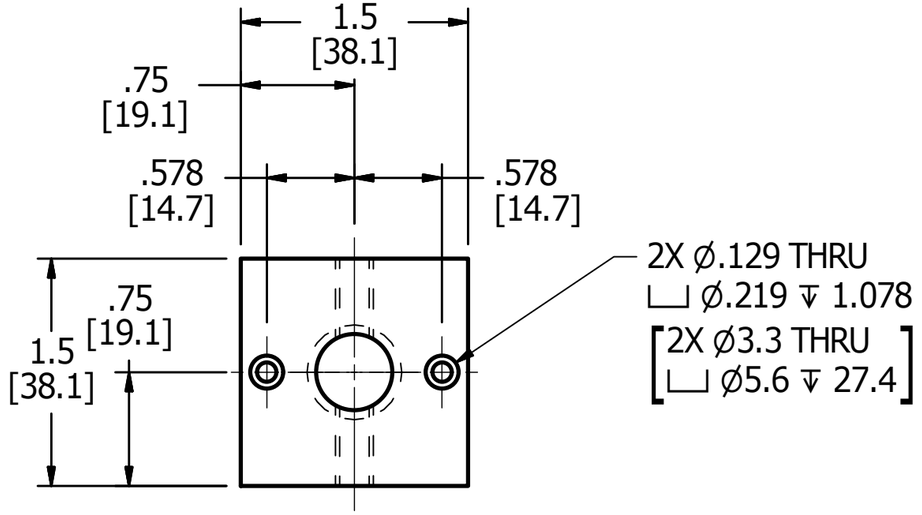
SIZE D | DRAWING NUMBER DL472-6100 | REV

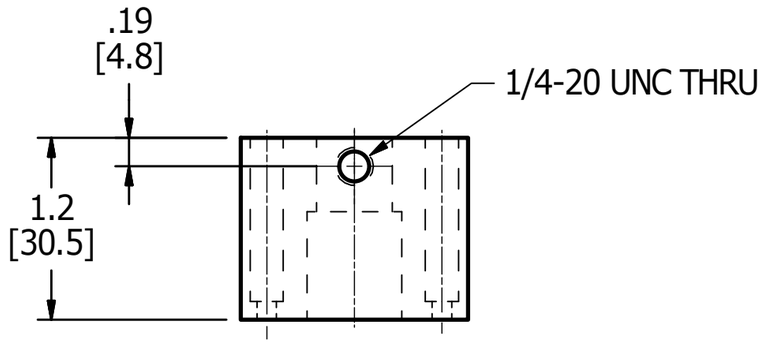
SCALE:

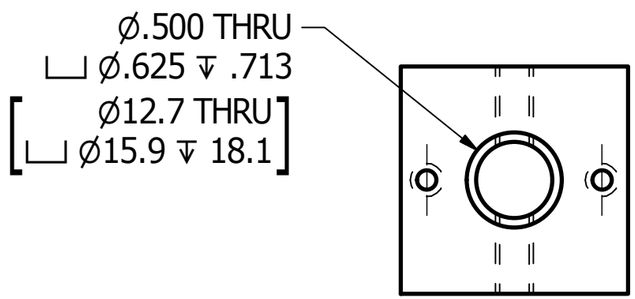
SHEET 1 OF 1

Potentiometer Calibration Fixture Assembly.iam



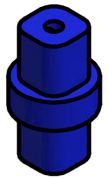


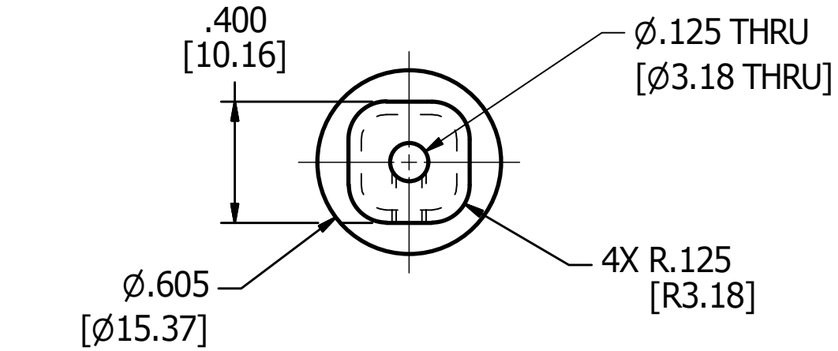


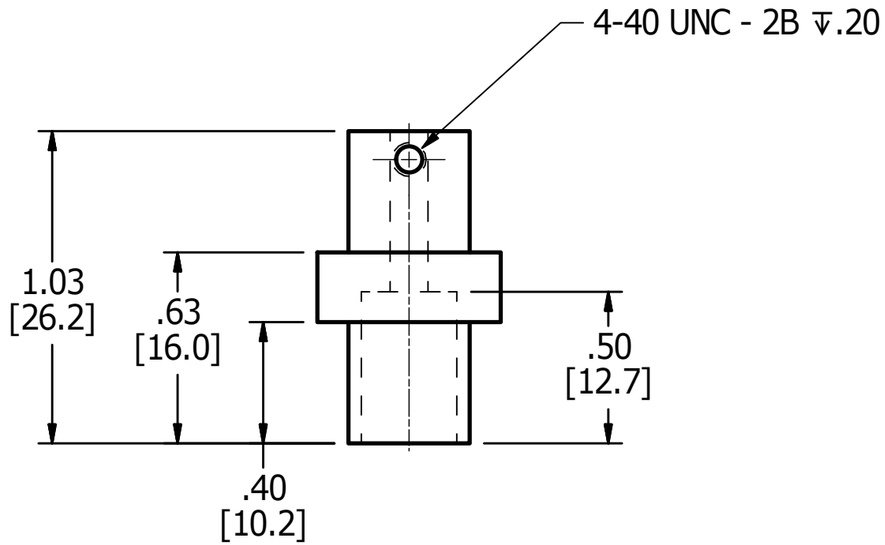


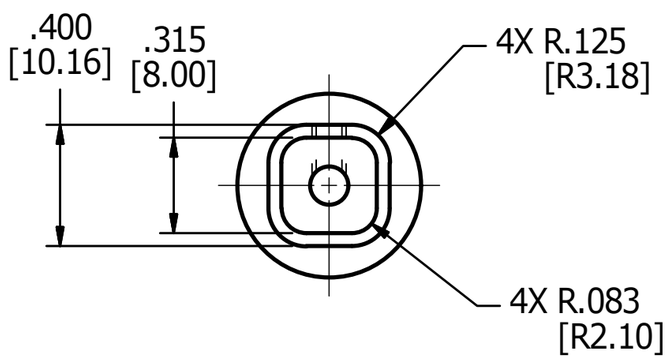
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: DECIMAL: .X ±.1, .XX ±.01, .XXX ±.005 MACHINED 125, ANGLES ±.5°, FRACTION ±1/64 ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	POTENTIOMETER HOLD DOWN BLOCK
	DRAWN Dave Walker	5/4/2016	
MATERIAL Aluminum 6061	CHECKED		
HEAT TREAT	ENG		
FINISH ANODIZE	APPROVED		
THIRD ANGLE PROJECTION	SIZE B	DRAWING NUMBER DL472-6121	REV
	SCALE: 1:1	SHEET 1 OF 1	

Potentiometer Hold Down Block.ipt





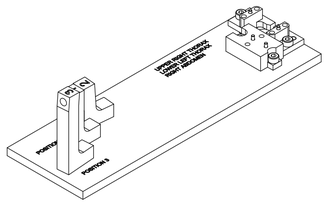


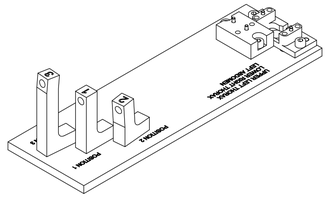


UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: DECIMAL: .X ±.1, .XX ±.01, .XXX ±.005 | MACHINED 125, ANGLES ±.5°, FRACTION ±1/64 ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	POTENTIOMETER CLAMP BLOCK
	DRAWN Dave Walker	5/4/2016	
MATERIAL Aluminum 6061	CHECKED		SIZE B | DRAWING NUMBER DL472-6122 | REV
HEAT TREAT	ENG		THIRD ANGLE PROJECTION
FINISH ANODIZE	APPROVED		SCALE: 2:1 | SHEET 1 OF 1

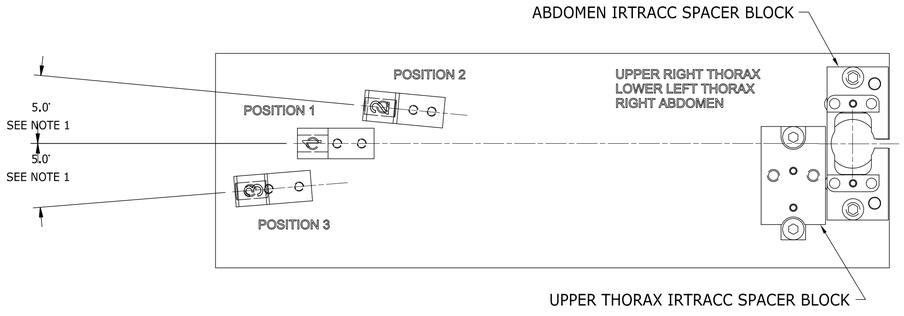
Potentiometer Clamp Block.ipt

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	BY
	A	REVISED ABDOMEN IRTRACC SPACER BLOCK AND UPPER THORAX IRTRACC SPACER BLOCK	9/28/2017	DW

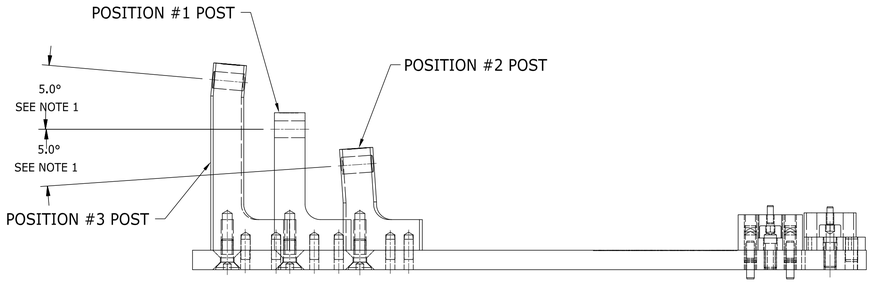


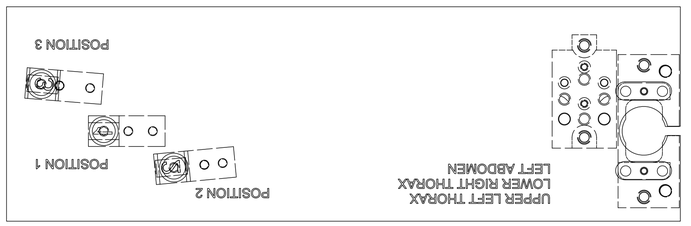


TOP SIDE

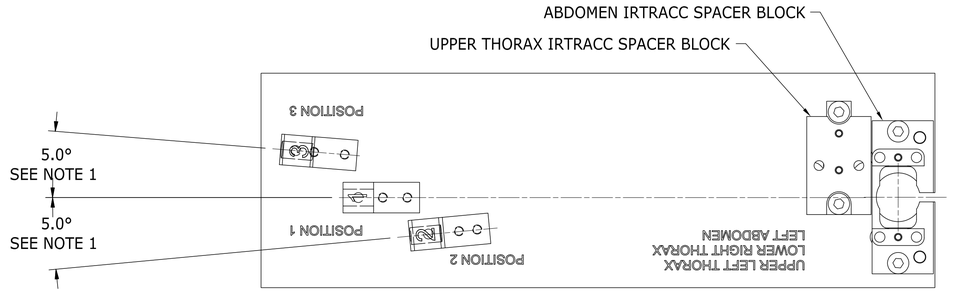


UPPER RIGHT THORAX
LOWER LEFT THORAX
RIGHT ABDOMEN

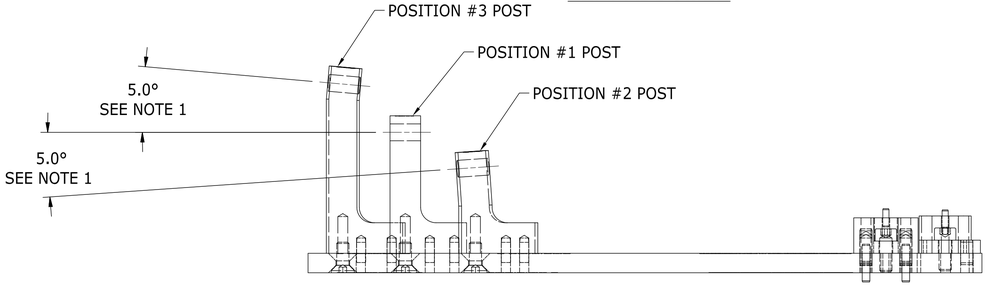


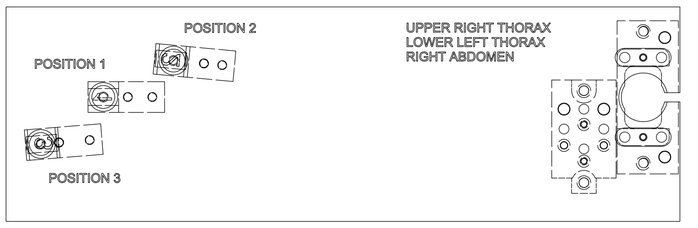


BOTTOM SIDE



UPPER LEFT THORAX
LOWER RIGHT THORAX
LEFT ABDOMEN

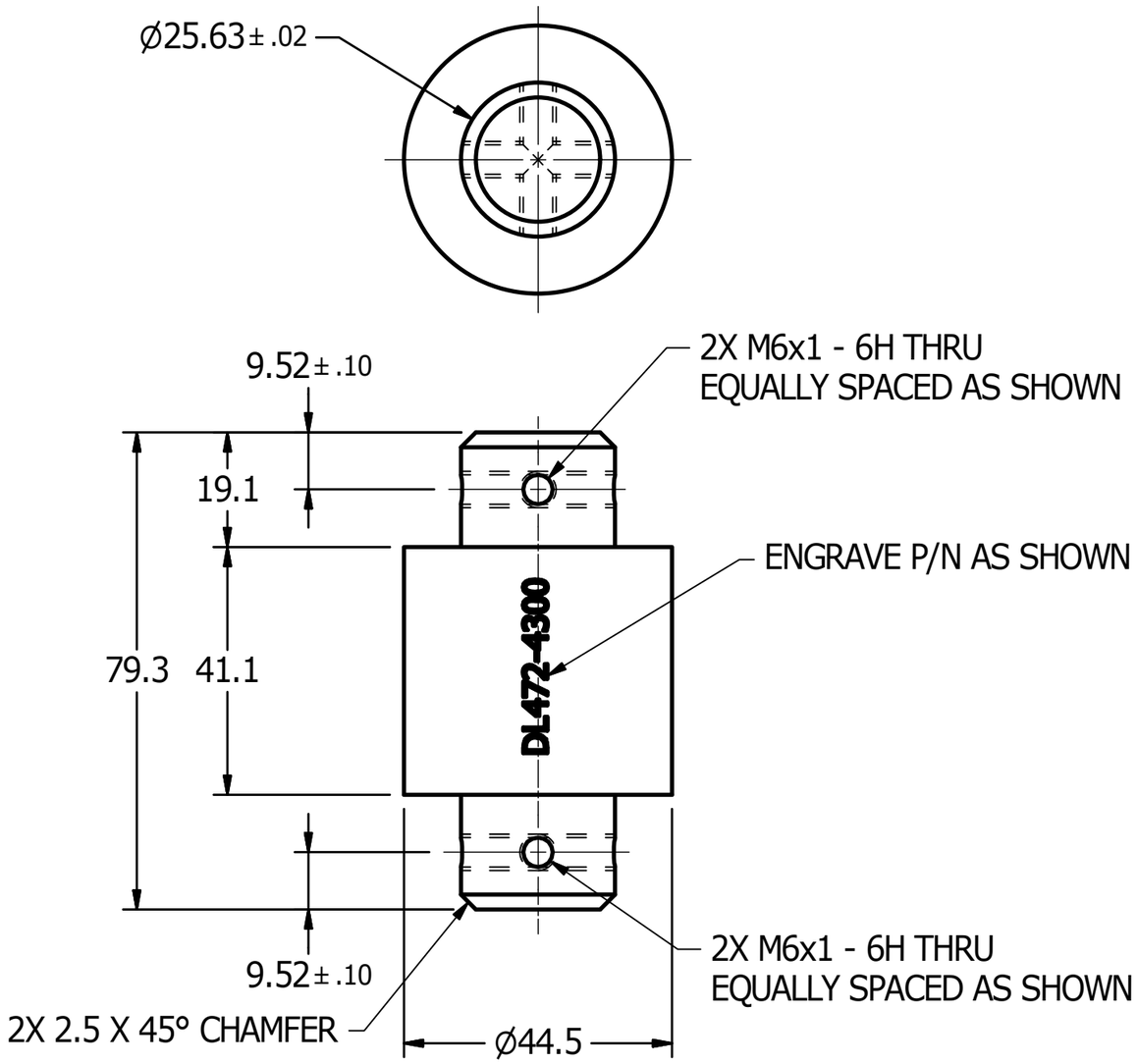


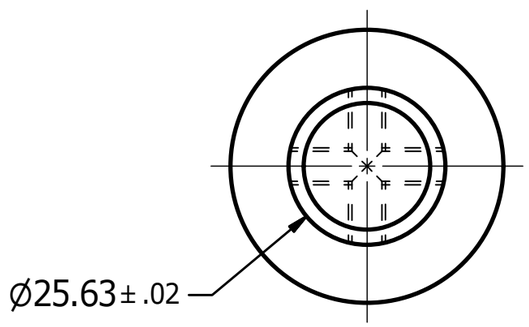


NOTES:

1. DIMENSIONS SHOWN, (5.0°) ARE FOR THE THORAX IRTRACC'S, THE DIMENSIONS FOR THE ABDOMEN IRTACC'S ARE 4.3°.
2. THE LINEAR IRTRACC LENGTH DIMENSIONS ARE 20 mm FOR THE THORAC IRTRACCS AND 21.6 mm FOR THE ABDOMEN IRTRACS.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED √, ANGLES ±.5°. ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	THOR 3D IRTRACC SET UP FIXTURE
	DRAWN: Dave Walker — 5/10/2016	THOR-50M
MATERIAL	CHECKED	SIZE: A1 — DRAWING NUMBER: TF-472-6000 — REV: A
HEAT TREAT	ENG	THIRD ANGLE PROJECTION — SCALE: NTS — SHEET: 1 OF 1
FINISH	APPROVED	





UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 || MACHINED 1.6, ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	***V***EHICLE ***R***ESEARCH and ***T***EST ***C***ENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	TIBIA ADAPTOR THOR 50M
	DRAWN: Dave Walker / 8/16/2016	
MATERIAL: 1018 STEEL	CHECKED	
HEAT TREAT	ENG	
FINISH: .0003 ELECTROLESS NICKEL	APPROVED	THIRD ANGLE PROJECTION SIZE: A3 · DRAWING NUMBER: DL472-4300 · REV SCALE: 1 : 1 · SHEET: 1 OF 1

DL472-4300 Tibia Adaptor.ipt