FINAL REPORT NUMBER: SINCAP-TRC-19-004

NEW CAR ASSESSMENT PROGRAM (NCAP)
MOVING DEFORMABLE BARRIER SIDE IMPACT TEST

FCA US LLC
2019 Ram 1500 Crew Cab
NHTSA NUMBER: M20190312

PREPARED BY:
Transportation Research Center Inc.
10820 State Route 347
P. O. Box B-67
East Liberty, OH 43319

Report Date: July 24, 2019

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Office of Crashworthiness Standards
Mail Code: NRM-110
1200 New Jersey Ave, SE, Room W43-410
Washington, D.C. 20590

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Report Prepared By: ILO Project Operations Group

Report Approved By: 

John Shultz

Approval Date: July 24, 2019

FINAL REPORT ACCEPTANCE BY OCWS:

Division Chief, New Car Assessment Program
NHTSA, Office of Crashworthiness Standards

Date:

COTR, New Car Assessment Program
NHTSA, Office of Crashworthiness Standards

Date:

Technical Report Documentation Page

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15. Supplemental Notes		

16. Abstract

This 55 / 28 km/h 90° Moving Deformable Barrier SINCAP Side Impact Test was conducted on the subject 2019 Ram 1500 Crew Cab, in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on May 10, 2019.

The impact velocity of the Moving Deformable Barrier (MDB) was 61.94 km/h, and the ambient temperature at the struck (left) side of the target vehicle at the time of impact was 21.3° C. The target vehicle post-test maximum crush was 229 mm at Level 1. The test vehicle's performance was as follows:

Driver ATD (ES-2re)

Measurement Description	**Units**	**IARV**	**Result**
Head Injury Criteria (HIC_{36})	N/A	1000	25
Maximum Thoracic Rib Deflection	mm	44	16.5
Total Abdominal Force	N	2500	475.6
Pubic Symphysis Force	N	6000	-870.6
Lower Spine Acceleration	G	82*	22.8

Passenger ATD (SID-IIs)

Measurement Description	**Units**	**IARV**	**Result**
Head Injury Criteria (HIC_{36})	N/A	1000	13
Lower Spine Resultant Acceleration	g's	82	28.5
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	1484.3
Maximum Thoracic Rib Deflection	mm	38*	5.0
Maximum Abdominal Rib Deflection	mm	45*	1.8

* Proposed IARV

The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.

17. Key Words New Car Assessment Program (NCAP) Side Impact MDB ES-2re SID-IIs	18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave, SE Washington, DC 20590

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SECTION 1
TEST PURPOSE AND PROCEDURE

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test was conducted as part of the MY 2019 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-14-D-00354. The purpose of this test is to generate comparative side impact performance in a 2019 Ram 1500 Crew Cab. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated October 2015.

SECTION 2

SUMMARY OF TEST RESULTS

A 2019 Ram 1500 Crew Cab was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.94 km/h (38.49 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Transportation Research Center Inc. in East Liberty, Ohio, on May 10, 2019. Pre-test and post-test photographs of the test vehicle and the MDB and the dummies (ES-2-re and SID-IIs) are included in this report.

Dummies were placed in the driver and left rear designated seating positions according to instructions specified in the OCWS Side Impact Laboratory Test Procedure, dated October 2015. The side impact event was documented by 11 cameras. Camera locations are included in this report.

The dummies were instrumented in the following manner:

DRIVER ATD (ES-2re)
Primary and redundant head CG tri-axial accelerometers
Chest upper rib, middle rib, and lower rib y-axis displacement potentiometers
Abdomen forward, middle, and rear y-axis load cells
Lower spine (T12) tri-axial accelerometers
Pubic symphysis y-axis load cell

PASSENGER ATD (SID-IIs)
Primary and redundant head CG triaxial accelerometers
Chest upper rib, middle rib, and lower rib y-axis displacement potentiometers
Abdomen upper rib and lower rib y-axis displacement potentiometers
Lower spine (T12) tri-axial accelerometers
Acetabulum and iliac wing y-axis load cells

APPENDIX B contains the vehicle and dummy response data. Dummy configuration and performance verification data can be found in APPENDIX C of this report. APPENDIX D of this report contains the test equipment and instrumenation calibration data.

Dummy injury readings were recorded as follows:

Measurement Description	Driver ATD (ES-2-re)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	N/A	1000	25
Maximum Thoracic Rib Deflection	mm	44	16.5
Combined Abdominal Force	N	2500	475.6
Pubic Symphysis Force	N	6000	-870.6
Lower Spine (T12) Resultant Acceleration	G	82*	22.8

* Proposed IARV

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	N/A	1000	13
Lower Spine (T12) Resultant Acceleration	G	82	28.5
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	1484.3
Maximum Thoracic Rib Deflection	mm	38*	5.0
Maximum Abdominal Rib Deflection	mm	45*	1.8

* Proposed IARV

Supplemental Restraint Information is given below:

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Pelvis Airbag	Yes	Yes	No	N/A
Side Pelvis Airbag	No	N/A	No	N/A
Knee Airbag	No	N/A	No	N/A
Seat Belt Pretensioner	Yes	Yes	No	N/A
Seat Belt Load Limiter	Yes	Unknown	No	N/A
Other Safety Restraint	No	N/A	No	N/A

GENERAL COMMENTS

All doors remained closed throughout the test. No fuel spillage occurred during the impact or the static rollover test which followed. Injury values for both ATDs were within the established performance thresholds.

NHTSA numbers were changed between receipt of the vehicles and testing therefore some incoming photos have the original number in them as prep work had already began

Left Middle B-Post Acceleration (Y); Channel failed at 24.0 ms

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2019 Ram 1500 Crew Cab NHTSA No.: M20190312
Test Program: SINCAP Side Impact Test Date: 5/10/2019

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20190312
Model Year	2019
Make	Ram
Model	1500 Crew Cab
Body Style	Truck
VIN	1C6RREGG6KN751002
Body Color	Granite Crystal Metallic
Odometer Reading (km/mi)	14.0 mi
Engine Displacement (L)	3.6
Type/No. Cylinders	V/6
Engine Placement	Front Longitudinal
Transmission Type	Automatic
Transmission Speeds	8
Overdrive	Yes
Final Drive	RWD
Roof Rack	No
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks (ADL)	Yes
Power Window Auto-Reverse	Yes
Other Optional Feature	No
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Rear Pass. Curtain Airbag	Yes
Rear Pass. Head/Torso Airbag	No
Rear Pass. Torso Airbag	No
Rear Pass. Torso/Pelvis Airbag	No
Rear Passenger Pelvis Airbag	No
Driver Seat Belt Pretensioner	Yes
Rear Pass. Seat Belt Pretensioner	No
Driver Load Limiter	Yes
Rear Passenger Load Limiter	No
Other Safety Restraint	No

Does owner's manual provide instructions to turn off automatic door locks? No

DATA FROM CERTIFICATION LABEL

Manufactured By	FCA US LLC
Date of Manufacture	1-19
Vehicle Type	Truck

GVWR (kg)	3130
GAWR Front (kg)	1679
GAWR Rear (kg)	1860

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

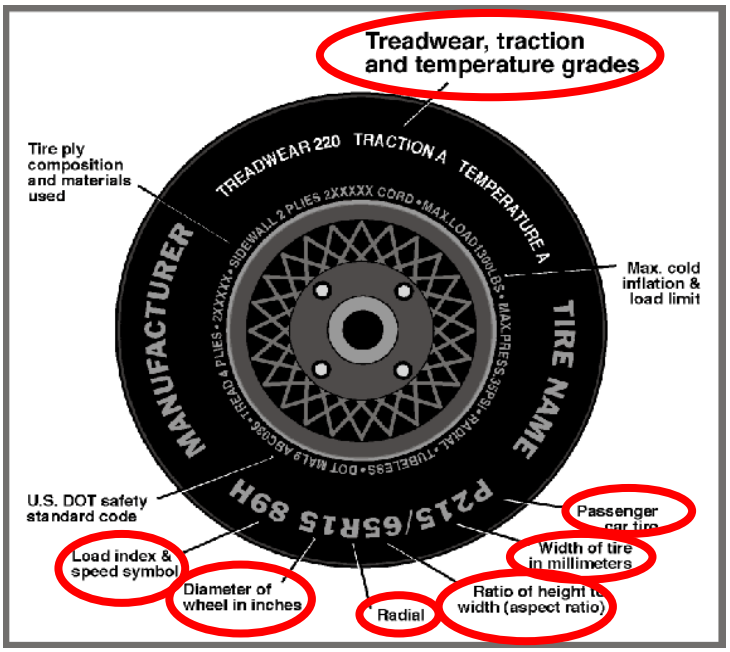
Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity DSC)	3	3	N/A	6
Capacity Weight (VCW) (kg)				884.0
DSC x 68.04 (kg)				408.2
Cargo Weight (RCLW) (kg)				475.8

VEHICLE SEAT TYPE

Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						w/ Lever	w/ Knob
Front Seat	N/A	N/A	Yes		N/A	Yes	N/A
Rear or Second Row Seat	N/A	Yes	N/A	Yes	Yes	N/A	N/A
Third Row Seat	N/A	N/A	N/A	N/A	N/A	N/A	N/A

DATA SHEET NO. 1 (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2019 Ram 1500 Crew Cab
Test Program: SINCAP Side Impact
NHTSA No.: M20190312
Test Date: 5/10/2019



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	250	250
Recommended Tire Size	275/65R18 116T	275/65R18 116T
Tire Size on Vehicle	275/65R18	275/65R18
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Dueler H/T	Dueler H/T
Treadwear	520	520
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index/Speed Symbol	116T	116T
Tire Material	Polyester/Steel/Nylon	Polyester/Steel/Nylon
DOT Safety Code Left	9BYJ DHT 3818	9BYJ DHT 3618
DOT Safety Code Right	9BYJ DHT 3718	9BYJ DHT 3718

DATA SHEET NO. 1 (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2019 Ram 1500 Crew Cab NHTSA No.: M20190312
Test Program: SINCAP Side Impact Test Date: 5/10/2019

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	276	276	276	276
Tire Placard	kPa	250	250	250	250
Owner's Manual	kPa	250	250	250	250
As Tested	kPa	250	250	250	250

MDB TIRE SPECIFICATIONS

	Units	Requirement	LF	RF	LR	RR
Tire Size		P205/75R15	P205/75R15	P205/75R15	P205/75R15	P205/75R15
Tire Pressure	kPa	200 ± 21 kPa	207	207	207	207

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	647.2	497.6		713.6	586.0		716.8	615.0	
Right	kg	608.8	486.2		626.0	566.4		600.4	568.6	
Ratio	%	56.1	43.9		53.8	46.2		52.7	47.3	
Totals	kg	1256.0	983.8	2239.8	1339.6	1152.4	2494.0	1317.2	1183.6	2500.8

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	2239.8	(A)
Actual Weight of 1 P572V ATD (SID-IIs) Dummy Used	kg	125.0	(B)
Rated Cargo/Luggage Weight (RCLW)[1]	kg	136.0	(C)
Calculated Vehicle Target Weight (TVTW)	kg	2500.8	(A+B+C)

Does the measured As Tested Vehicle Weight lie within the required weight range (i.e. Calculated Test Vehicle Target Weight – 4.5 kg to 9 kg)? ☒ YES ☐ NO

TEST VEHICLE ATTITUDES AND CG

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement
LF	mm	911	905	Yes
RF	mm	920	915	Yes
RR	mm	980	980	Yes
LR	mm	961	966	Yes
Vehicle CG (Aft of Front Axle)	mm	1739	1699	
Vehicle CG (Left(+)/Right(-) from Longitudinal Centerline)	mm	+57	+37	

***The "As Tested" vehicle attitude measurements must be equal to or within ± 10 mm of the "Fully Loaded" vehicle attitude measurements at each wheel well. Indicate "Yes" or "No" for "Meets Requirement".

Test height adjustable suspension setting, if applicable: N/A

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast: Steel plate mounted in truck bed	69.8
Removed: None	0.0

[1] Rated cargo and luggage weight limited to 136.0 kg or 300.0 lbs.

DATA SHEET NO. 2
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEM DATA

Test Vehicle: 2019 Ram 1500 Crew Cab NHTSA No.: M20190312
Test Program: SINCAP Side Impact Test Date: 5/10/2019

SEAT POSITIONING

The driver seat, front center seat (if applicable), and right front passenger's seat should be set to the mid-track, lowest, mid-angle position. The struck-side rear passenger's seat, rear center seat, and non-struck side rear passenger's seats should be set to the rear-most, lowest, mid-angle position.

SCRL ANGLE RANGE

Seat	SCRL(°)		
	Max.	Min.	Mid
Driver Seat	14.0	14.0	14.0
Front Passenger Seat	13.5	13.5	13.5
Front Center Seat*	N/A	N/A	6.9
Struck Side Rear Seat	N/A	N/A	11.1
Non-Struck Side Rear Seat	N/A	N/A	11.3
Rear Center Seat*	N/A	N/A	10.2

* If applicable.

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore/Aft	Forward-Most
Driver Seat	14.0	333	Max	N/A	N/A	N/A
			Mid	333	333	333
			Min	N/A	N/A	N/A
Front Passenger Seat	13.5	334	Max	N/A	N/A	N/A
			Mid	334	334	334
			Min	N/A	N/A	N/A
Front Center Seat*	6.9	112	Max	N/A	N/A	N/A
			Mid	N/A	112	N/A
			Min	N/A	N/A	N/A
Struck Side Rear Seat	11.1	313	Max	N/A	N/A	N/A
			Mid	N/A	313	N/A
			Min	N/A	N/A	N/A
Non-Struck Side Rear Seat	11.3	300	Max	N/A	N/A	N/A
			Mid	N/A	300	N/A
			Min	N/A	N/A	N/A
Rear Center Seat*	10.2	327	Max	N/A	N/A	N/A
			Mid	N/A	327	N/A
			Min	N/A	N/A	N/A

* If applicable.

DATA SHEET NO. 2 (CONTINUED)
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEM DATA

Test Vehicle: 2019 Ram 1500 Crew Cab NHTSA No.: M20190312
Test Program: SINCAP Side Impact Test Date: 5/10/2019

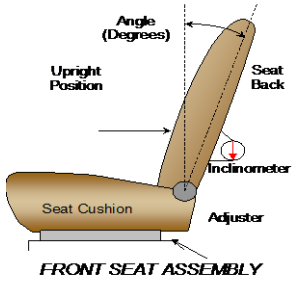
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents	mm	Detent
Driver Seat	220	33	110	16
Front Passenger Seat	220	33	110	16
Front Center Seat*	0	N/A	N/A	N/A
Struck Side Rear Seat	0	N/A	N/A	N/A
Non-Struck Side Rear Seat	0	N/A	N/A	N/A
Rear Center Seat*	0	N/A	N/A	N/A

* If applicable

SEAT BACK ANGLE ADJUSTMENT

The driver's seat back is positioned to the manufacturer's designated seat back angle. The front center and front passenger's seat backs are positioned in a similar manner as the driver's seat back. The struck side rear seat back is positioned such that the dummy's head is level. The rear center and non-struck side rear outboard seat backs are positioned in a similar manner as the struck-side rear seat back.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents	Degrees	Detent
Driver Seat w/ Seated Dummy	70.0	34	2.5	7
Front Passenger Seat	68.9	35	1.2	7
Front Center Seat*	N/A	N/A	Fixed	N/A
Struck Side Rear Seat w/ Seated Dummy	N/A	N/A	Fixed	N/A
Non-Struck Side Rear Seat	N/A	N/A	Fixed	N/A
Rear Center Seat*	N/A	N/A	Fixed	N/A

* If applicable

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on Form No. 1.

	Total # of Positions	Placed in Position #
Driver Seat	5	5, Uppermost
Rear Seat	1, Fixed	Fixed

HEAD RESTRAINT ADJUSTMENT

The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

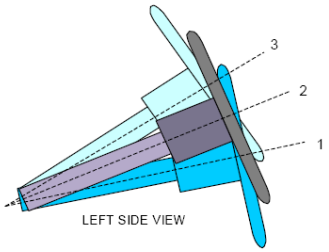
	Total # of Positions	Placed in Position #
Driver Seat	5 Vertical; 11 Horizontal	Full Up, Full Forward
Rear Seat	1; Fixed	Fixed

DATA SHEET NO. 2 (CONTINUED)
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle: 2019 Ram 1500 Crew Cab NHTSA No.: M20190312
Test Program: SINCAP Side Impact Test Date: 5/10/2019

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the center of its geometric locus it describes when it moves through its full range of motion.



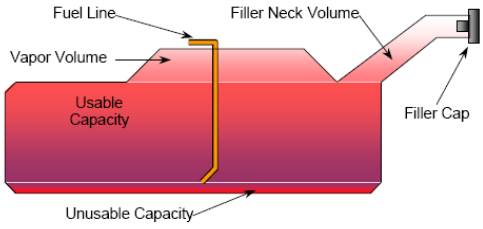
STEERING COLUMN ASSEMBLY

	Degrees	Fore/Aft Position (mm)
Lowermost, Position No. 1	20.6	0
Geometric Center, Position No. 2	23.1	30
Uppermost, Position No. 3	25.5	60
Telescoping Steering Wheel Travel		60
Test Position	23.0	30

FUEL PUMP

Describe the fuel pump type, details about how it operates, and the location of the fuel filler neck.

Ignition key in and turned to the run position. For keyless system use start/stop button to set it run position.



VEHICLE FUEL TANK ASSEMBLY

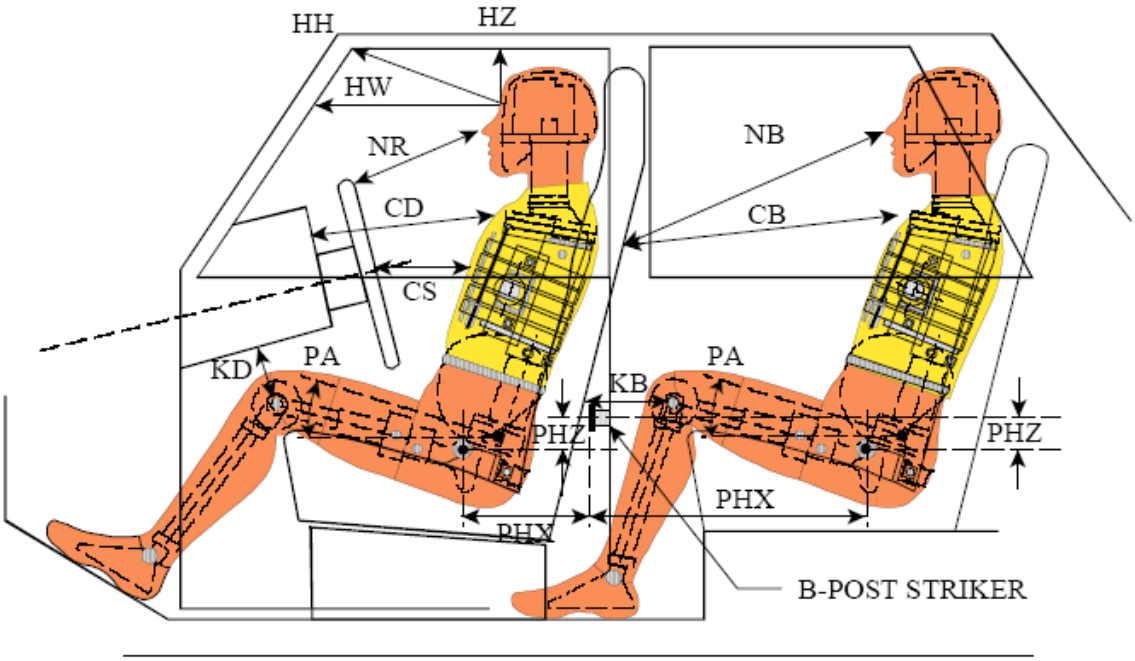
FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	87.0
Usable Capacity of "Optional Tank" (see Form No. 1)	124.9
Usable Capacity of Standard Tank (see Owner's Manual)	87.0
Usable Capacity of Optional Tank (see Owner's Manual)	124.9
93% of Usable Capacity	116.2
Actual Amount of Solvent Used in Test	116.2
1/3 of Usable Capacity	41.6

Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in on Form No. 1? ☒ YES ☐ NO

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2019 Ram 1500 Crew Cab NHTSA No.: M20190312
Test Program: SINCAP Side Impact Test Date: 5/10/2019



LEFT SIDE VIEW

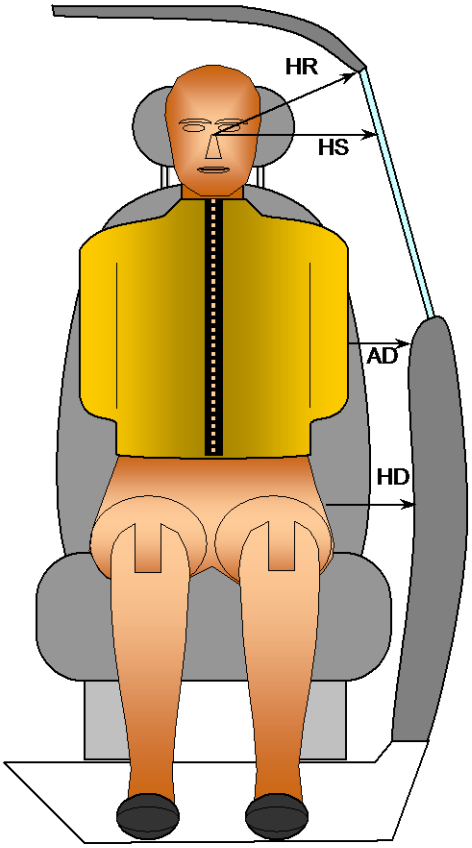
NOTE: 2-DOOR VEHICLE SHOWN. REAR DUMMY PHX & PHZ MEASUREMENTS FOR A 4-DOOR VEHICLE WOULD USE THE C-POST STRIKER AS A REFERENCE POINT

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	460			
HW		Header to Windshield	714			
HZ	HZ	Head to Roof Liner	202		297	
NR	NB	Nose to Rim/Seat Back	425		740	
CD	CB	Chest to Dash/Seat Back	581		742	
CS		Chest to Steering Wheel	367			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	143	24.6	443	0
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	94	35.9	440	0
PAX°	PAX°	Pelvic Tilt Angle X		0.1		0.3
	PAY°	Pelvic Tilt Angle Y				20.3
PHX	PHX	Hip Point to Striker (X-Axis)	193		168	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	11		16	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2019 Ram 1500 Crew Cab NHTSA No.: M20190312
Test Program: SINCAP Side Impact Test Date: 5/10/2019

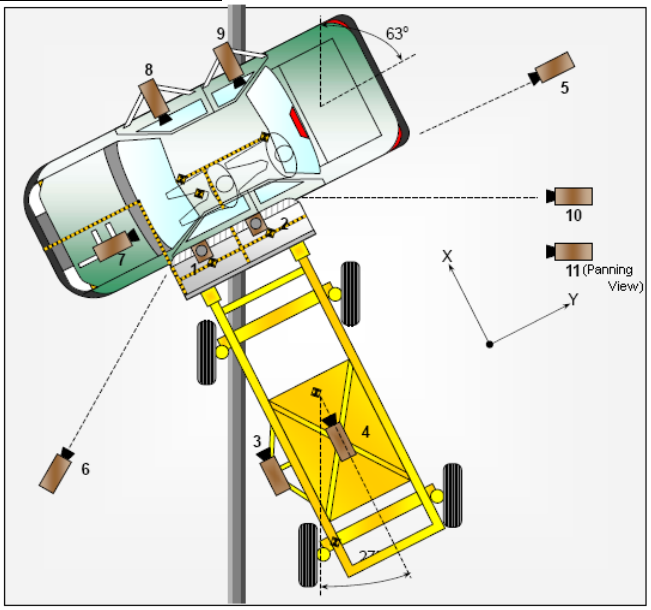


FRONT VIEW OF DUMMY

Code	Description	Units	Driver	Passenger
HR	Head to Side Header	mm	265	306
HS	Head to Side Window	mm	352	349
AD	Arm to Door	mm	97	142
HD	H-Point to Door	mm	148	154

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2019 Ram 1500 Crew Cab NHTSA No.: M20190312
Test Program: SINCAP Side Impact Test Date: 5/10/2019



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	-1578	0	-5692	8.5	1000
2	Overhead Close-up	1387	0	-5692	28	1000
3	Left Impact Point (MDB)	1522	907	-861	25	1000
4	Side Overall (MDB)	2250	0	-1429	12.5	1000
5	Rear	0	-8882	-1295	20	1000
6	Left Front	2141	4584	-1306	20	1000
7	Driver Front (OB)				25	1000
8	Driver Side (OB)				12.5	1000
9	Passenger Side (OB)				12.5	1000
10	Real-time Left Rear				Zoom	30
11	Real-time Inrun				Zoom	30

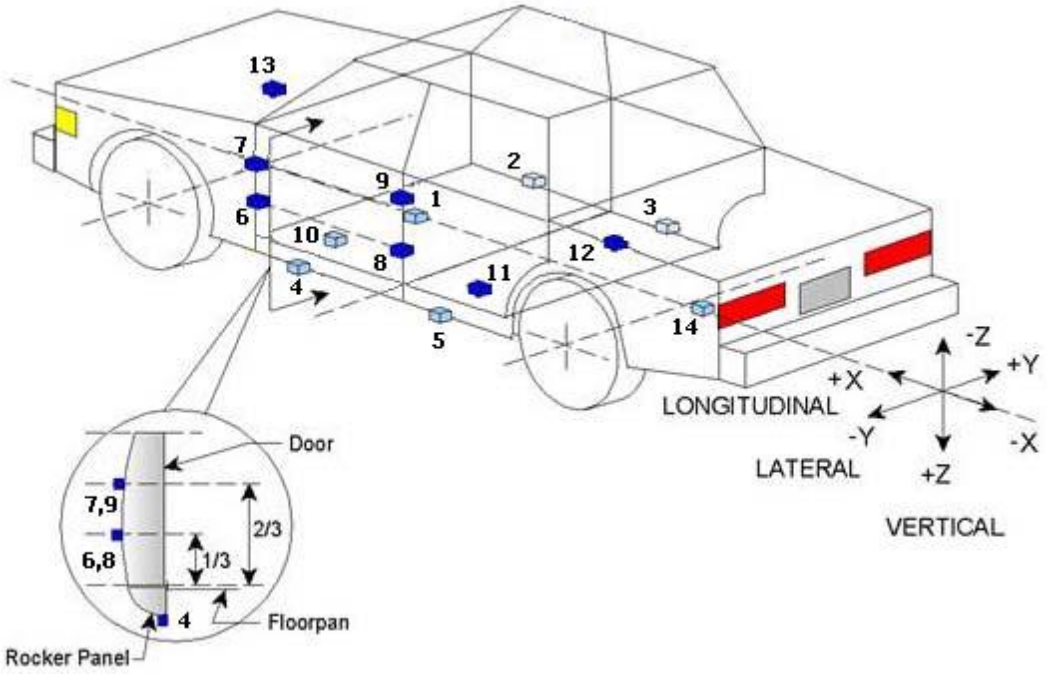
Reference: Impact Point projected to Ground; +X = To Front of MDB +Y = To Right of MDB; +Z = Down
*All measurements accurate to ± 6 mm.
If applicable, explain why camera(s) did not operate as intended: Camera view 7 triggered late at approximately 230.0 ms

INSTRUMENTATION

Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	23
MBD Accelerometers	5
TOTAL	60

DATA SHEET NO. 6
TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2019 Ram 1500 Crew Cab NHTSA No.: M20190312
Test Program: SINCAP Side Impact Test Date: 5/10/2019



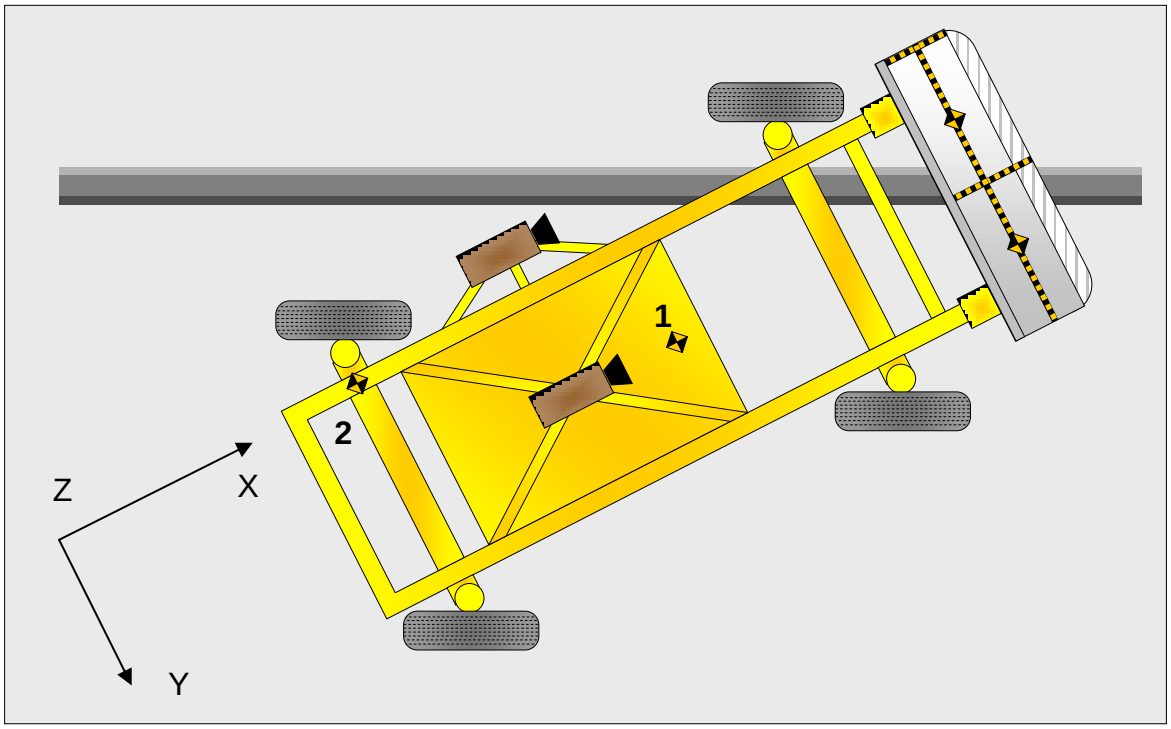
TEST VEHICLE ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	3895	230	-623
2	Right Sill at Front Seat	3903	730	-560
3	Right Sill at Rear Seat	2622	750	-595
4	Left Sill at Front Door	3915	-730	-552
5	Left Sill at Rear Door	2630	-750	-591
6	A-Post Lower	4305	-940	-651
7	A-Post Middle	4322	-908	-1172
8	B-Post Lower	3185	-922	-688
9	B-Post Middle	3168	-905	-1213
10	Front Seat Track	3435	-670	-666
11	Rear Seat Structure	2545	-620	-613
12	Right Rear Occ. Compartment	2535	620	-608
13	Engine Block	5036	25	-955
14	Rear Above Axle	960	0	-840

Reference: X - Rear surface of vehicle (+ forward)
Y - Vehicle Centerline (+ to right)
Z - Ground Plane (+ down)

DATA SHEET NO. 7
MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2019 Ram 1500 Crew Cab
Test Program: SINCAP Side Impact
NHTSA No.: M20190312
Test Date: 5/10/2019



MDB ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	MDB CG	-2179	0	-505
2	MDB Rear	-3648	-650	-618

Reference : X - Face of MDB (+ forward)
Y - MDB Centerline (+ to right)
Z - Ground Plane (+ down)

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2019 Ram 1500 Crew Cab NHTSA No.: M20190312
Test Program: SINCAP Side Impact Test Date: 5/10/2019

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES2-re)	Rear Seat Dummy (SID-IIs)
Face	None	SCAB
Top of Head	Headliner	SCAB
Left Side of Head	SCAB	SCAB
Back of Head	SCAB, Headliner	None
Left Shoulder	SAB	SAB, Door panel, C-pillar trim
Upper Torso	Seat back bolster, SAB	None
Lower Torso	Seat back bolster, SAB	None
Left Hip	SAB	Seat cushion bolster, Door panel
Left Knee	Door panel	Door panel

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Trunk Lid
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	No	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge Systems Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Record Width of Opening at Striker (mm)	N/A	N/A	N/A	N/A	N/A

POST-TEST SEAT PERFORMANCE

Description	Struck Side		Non-Struck Side	
	Front	Rear	Front	Rear
Seat Movement Along Seat Track	No	No	No	No
Seat Disengagement from Floor pan	No	No	No	No
Seat Back Movement from Initial Position	No	No	No	No
Seat Back Collapse	No	No	No	No

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Good
Sill Separation	None
Windshield Damage	None
Side Window Damage	None
Other Notable Effects	None

DATA SHEET NO. 8 (CONTINUED)
POST TEST OBSERVATIONS

Test Vehicle: 2019 Ram 1500 Crew Cab NHTSA No.: M20190312
Test Program: SINCAP Side Impact Test Date: 5/10/2019

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side Driver		Struck Side Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	No	N/A		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Pelvis Airbag	Yes	Yes	No	N/A
Side Pelvis Airbag	No	N/A	No	N/A
Seat Belt Pretensioner	Yes	Yes	No	N/A
Seat Belt Load Limiter	Yes	Unknown	No	N/A
Other	No	N/A	No	N/A

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		3675
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		508
Actual Impact Point (Aft of Front Axle)	mm		499
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact point	+9
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact point	-2

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2019 Ram 1500 Crew Cab NHTSA No.: M20190312
Test Program: SINCAP Side Impact Test Date: 5/10/2019

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheel Base of Framework Carriage	2591
C.G. Location aft of Front Axle	1100

MDB WEIGHTS

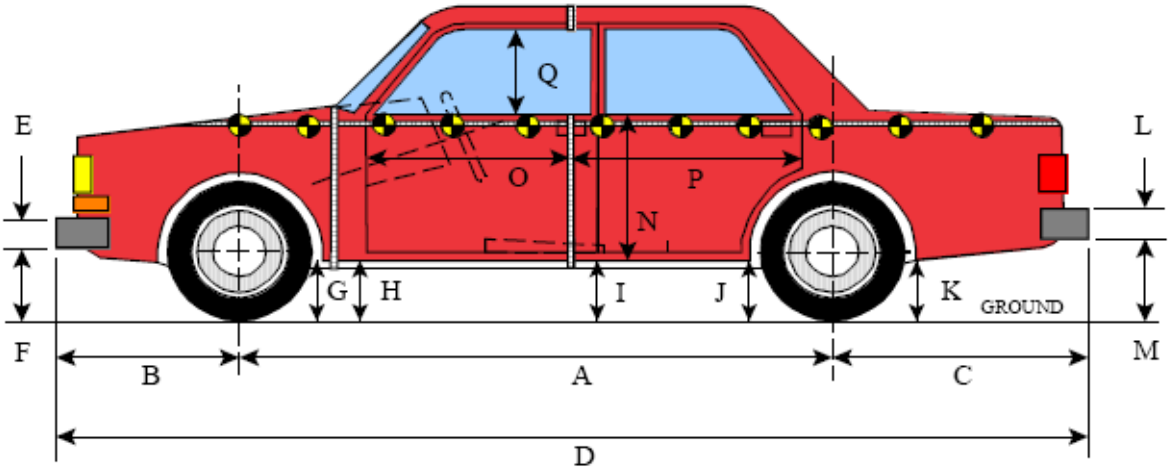
	Units	Front Axle	Rear Axle	Total
Left	kg	412.8	265.4	678.2
Right	kg	372.6	314.0	686.6
Ratio	%	57.5	42.5	100.0
Totals	kg	785.4	579.4	1364.8

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.94
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.95
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	27

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2019 Ram 1500 Crew Cab NHTSA No.: M20190312
Test Program: SINCAP Side Impact Test Date: 5/10/2019



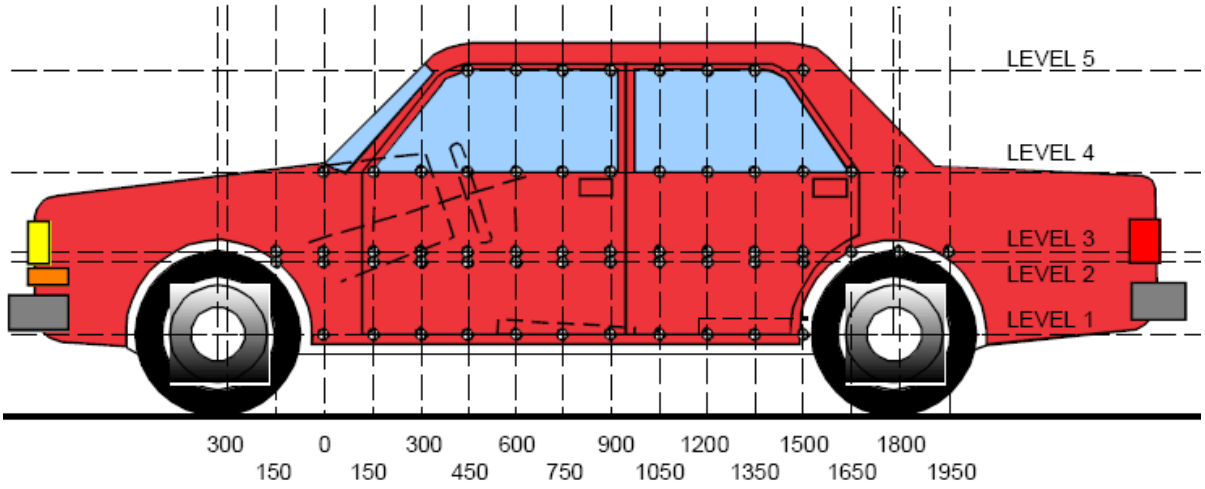
LEFT SIDE VIEW
All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3675	3670	5
B	Front Axle to Front Surface of Vehicle	1005	1005	0
C	Rear Axle to Rear Surface of Vehicle	1230	1230	0
D	Total Length at Centerline	5910	5925	-15
E	Front Bumper Thickness	115	115	0
F	Front Bumper Bottom to Ground	528	530	-2
G	Sill Height at Front Wheel Well	427	423	4
H	Sill Height at Front Door Leading Edge	405	400	5
I	Sill Height at B-Pillar	420	423	-3
J1	Sill Height at Rear Wheel Well	405	440	-35
J2	Pinch Weld Height at Rear Wheel Well	352	393	-41
K	Sill Height Aft of Rear Wheel Well	560	590	-30
L	Rear Bumper Thickness	110	110	0
M	Rear Bumper Bottom to Ground	550	580	-30
N	Sill Height to Window Bottom Sill	865	870	-5
O	Front Door Leading Edge to Impact CL	795	790	5
P	Rear Door Trailing Edge to Impact CL	1408	1380	28
Q	Front Window Opening	485	485	0
R	Right Side Length	5630	5645	-15
S	Left Side Length	5625	5630	-5
T	Vehicle Width	2025	2025	0

DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2019 Ram 1500 Crew Cab NHTSA No.: M20190312
Test Program: SINCAP Side Impact Test Date: 5/10/2019



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance From Impact
1	Sill Top	519	229	1650
2	Driver Hip Point	943	150	1500
3	Mid-Door	869	171	1500
4	Window Sill	1255	65	1200
5	Window Top	1836	7	2250

NOTE: The above measurements were taken along the vertical impact reference line. Vehicle measurements forward of the vertical impact reference line are negative.

DATA SHEET NO. 11 (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2019 Ram 1500 Crew Cab NHTSA No.: M20190312
Test Program: SINCAP Side Impact Test Date: 5/10/2019

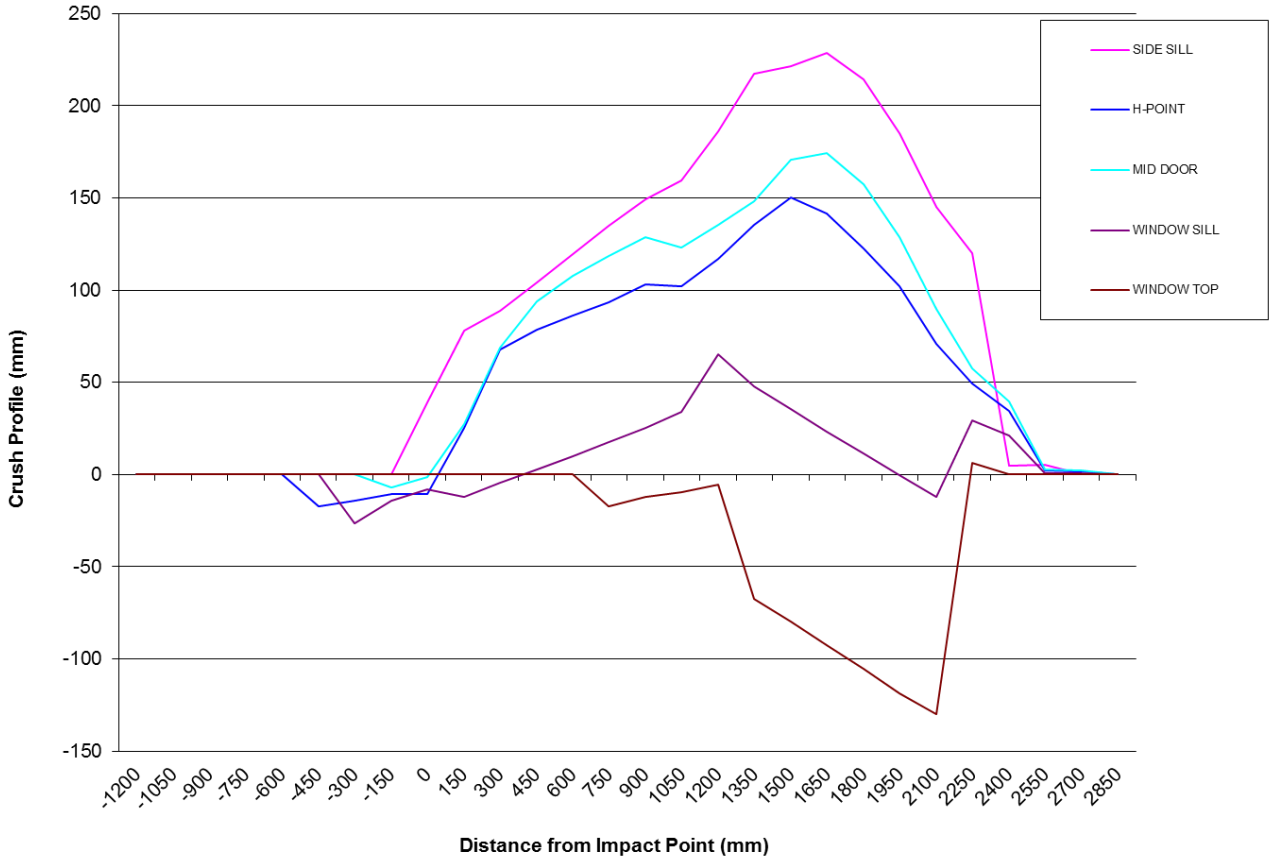
EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-450	0	1007	0	0	0	0	1025	0	0	0	0	-18	0	0	0
-300	0	1008	0	872	0	0	1022	0	898	0	0	-14	0	-26	0
-150	0	1006	1008	900	0	0	1016	1015	914	0	0	-10	-7	-14	0
0	984	1002	1004	916	0	945	1012	1005	924	0	39	-10	-1	-8	0
150	974	997	998	926	0	896	971	971	938	0	78	26	27	-12	0
300	966	993	993	935	0	877	925	924	940	0	89	68	69	-5	0
450	966	989	990	943	0	862	911	896	941	0	104	78	94	2	0
600	968	987	988	951	0	848	901	880	940	0	120	86	108	11	0
750	969	987	989	956	689	834	893	871	939	706	135	94	118	17	-17
900	969	988	991	961	711	820	885	862	936	723	149	103	129	25	-12
1050	969	990	994	966	722	810	888	870	932	731	159	102	124	34	-9
1200	969	991	995	971	725	783	874	859	906	730	186	117	136	65	-5
1350	969	991	996	974	731	752	856	848	927	798	217	135	148	47	-67
1500	968	992	997	976	735	747	842	826	941	815	221	150	171	35	-80
1650	967	992	998	978	737	738	850	824	955	830	229	142	174	23	-93
1800	964	992	999	979	739	750	870	842	968	844	214	122	157	11	-105
1950	961	992	999	979	740	776	890	870	980	858	185	102	129	-1	-118
2100	957	991	998	978	739	811	920	908	990	869	146	71	90	-12	-130
2250	950	987	995	976	735	830	938	938	947	728	120	49	57	29	7
2400	939	947	959	944	0	934	912	920	923	0	5	35	39	21	0
2550	957	990	993	964	0	952	987	990	963	0	5	3	3	1	0
2700	0	1006	1009	966	0	0	1005	1007	966	0	0	1	2	0	0

NOTE: Pre-test measurements are taken when the vehicle is in the “As Tested” weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point.

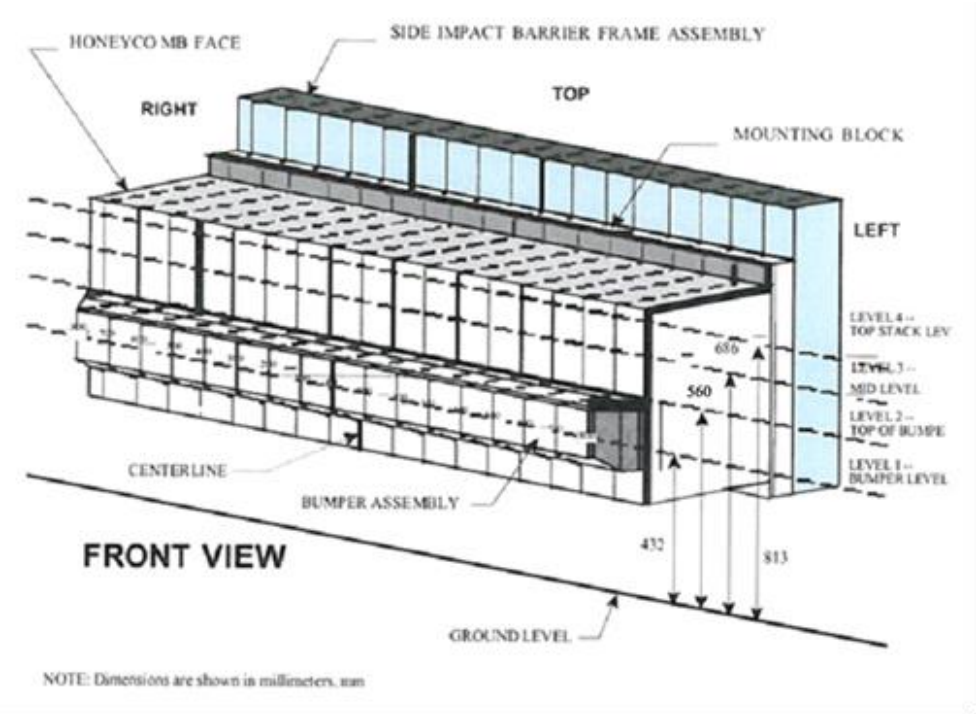
DATA SHEET NO. 11 (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2019 Ram 1500 Crew Cab NHTSA No.: M20190312
Test Program: SINCAP Side Impact Test Date: 5/10/2019



DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2019 Ram 1500 Crew Cab NHTSA No.: M20190312
Test Program: SINCAP Side Impact Test Date: 5/10/2019



MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

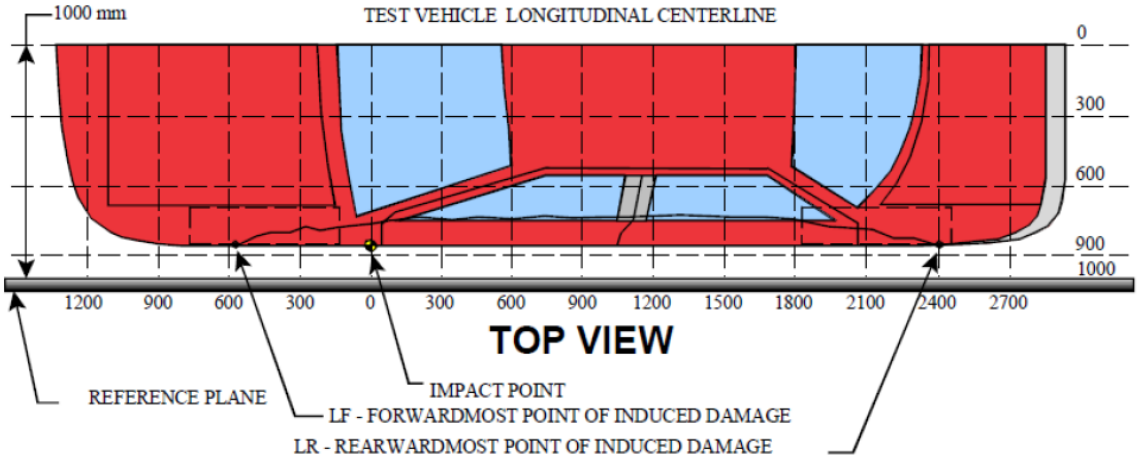
Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Left	159
B	Top of Bumper	560	800	Left	154
C	Mid-Level	686	800	Right	136
D	Top of Stack	813	800	Right	192

DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
1	24	30	40	50	64	78	90	98	101	98	98	105	113	122	131	146	159
2	65	46	54	63	73	84	89	95	97	100	106	111	119	128	137	147	154
3	136	100	70	51	45	64	89	106	102	92	78	75	82	87	92	102	125
4	192	137	97	82	75	89	131	158	138	117	115	111	98	92	106	129	154

DATA SHEET NO. 13
VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2019 Ram 1500 Crew Cab NHTSA No.: M20190312
Test Program: SINCAP Side Impact Test Date: 5/10/2019



MEASUREMENT CONVENTIONS:
Forward of the impact point (towards front of vehicle) is considered negative (—).
Rearward of the impact point (toward rearend of vehicle) is considered positive (+).

VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	2700	3	1007	1009	2
2	2100	1	811	957	146
3	1650	1	738	967	229
4	1050	1	810	969	159
5	600	1	848	968	120
6[1]	0	1	945	984	0

MDB DAMAGE PROFILE DISTANCES

DPD	Distance From Center of MDB	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	800 mm Left of Center	1	314	473	159
2	500 mm Left of Center	2	255	383	128
3	200 mm Left of Center	4	269	384	115
4	200 mm Right of Center	4	253	384	131
5	500 mm Right of Center	4	302	384	82
6	800 mm Right of Center	4	193	385	192

[1] DPD 6 is defined as zero crush since the crush does not extend to the end of the vehicle.

DATA SHEET NO. 14
FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2019 Ram 1500 Crew Cab NHTSA No.: M20190312
Test Program: SINCAP Side Impact Test Date: 5/10/2019

Test Time: 15:22 **Temperature:** 21.9°C

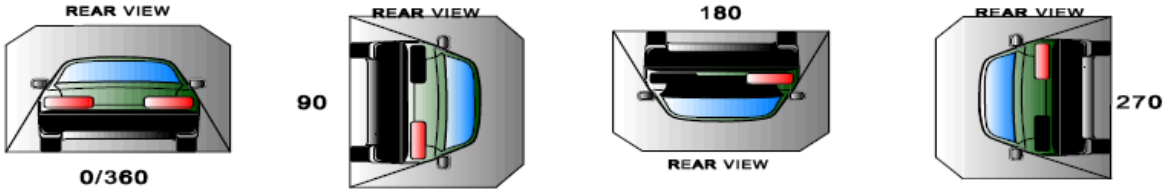
A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable is 1 ounce)

B. For the 5 minute period after motion ceases: 0 oz.
(Maximum allowable is 5 ounces)

C. For the following 25 minutes: 0 oz.
(Maximum allowable is 1 ounce/minute)

D. Spillage Details: None

FMVSS 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0 to 90	90	330	420
90 to 180	90	330	840
180 to 270	90	330	1260
270 to 360	90	330	1680

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

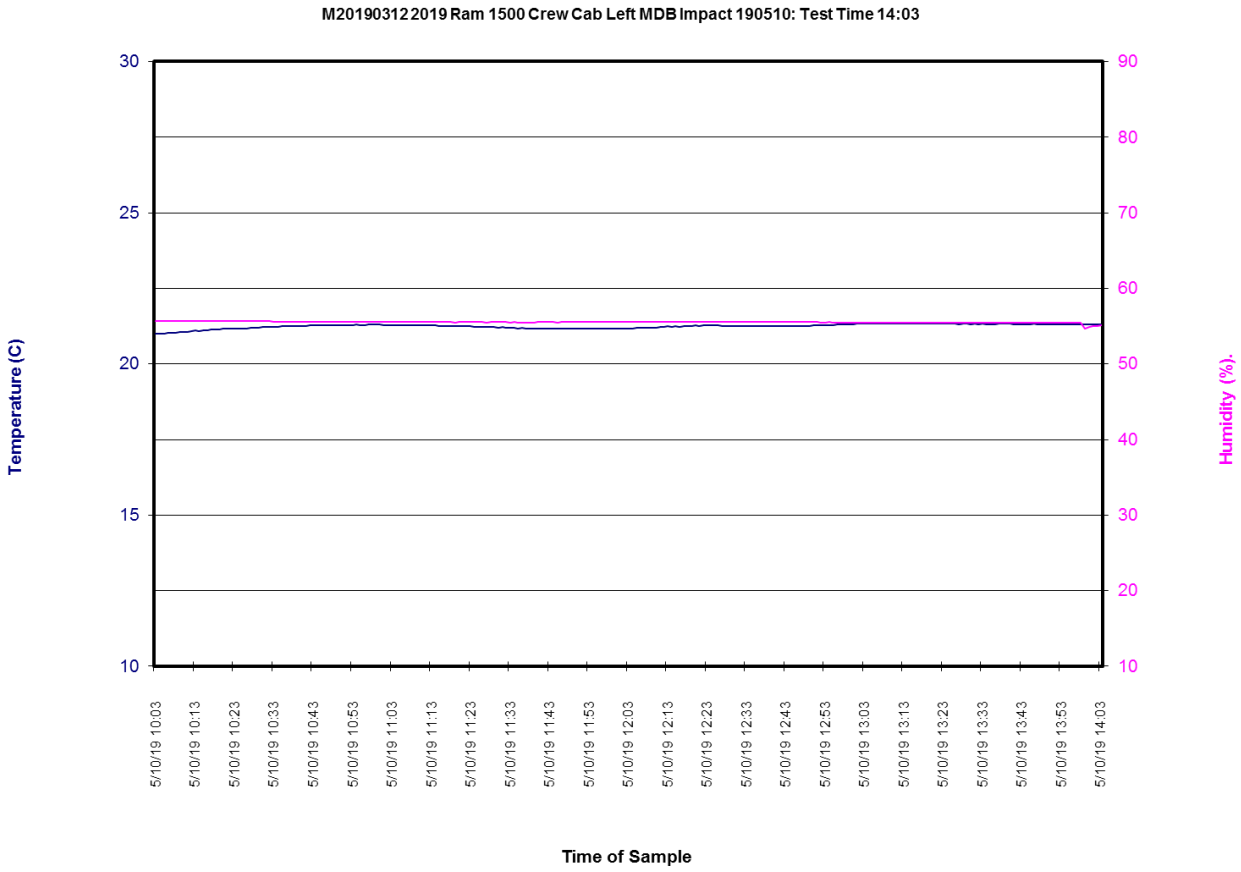
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0 to 90	0	0	0	N/A
90 to 180	0	0	0	N/A
180 to 270	0	0	0	N/A
270 to 360	0	0	0	N/A

ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0 to 90	None
90 to 180	None
180 to 270	None
270 to 360	None

DATA SHEET NO. 15
DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2019 Ram 1500 Crew Cab NHTSA No.: M20190312
Test Program: SINCAP Side Impact Test Date: 5/10/2019



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

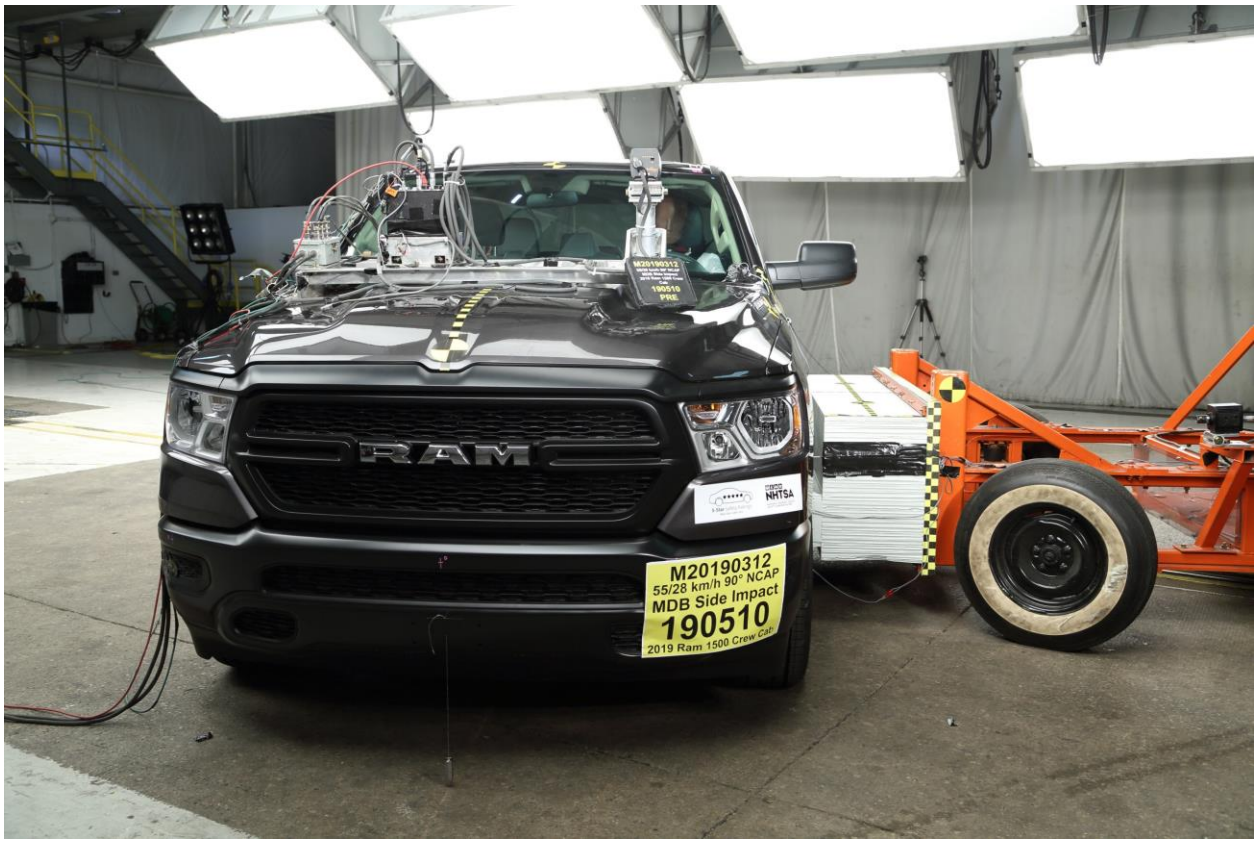
TABLE OF PHOTOGRAPHS (CONTINUED)

TABLE OF PHOTOGRAPHS (CONTINUED)

TABLE OF PHOTOGRAPHS (CONTINUED)

001 As-Delivered Right Front ¾ View of Test Vehicle

002 As-Delivered Left Rear ¾ View of Test Vehicle



003 Pre-Test Frontal View of Test Vehicle

004 Post-Test Frontal View of Test Vehicle

005 Pre-Test Left Front ¾ View of Test Vehicle

006 Post-Test Left Front ¾ View of Test Vehicle

007 Pre-Test Left Side View of Test Vehicle

008 Post-Test Left Side View of Test Vehicle

009 Pre-Test Left Rear ¾ View of Test Vehicle

010 Post-Test Left Rear ¾ View of Test Vehicle

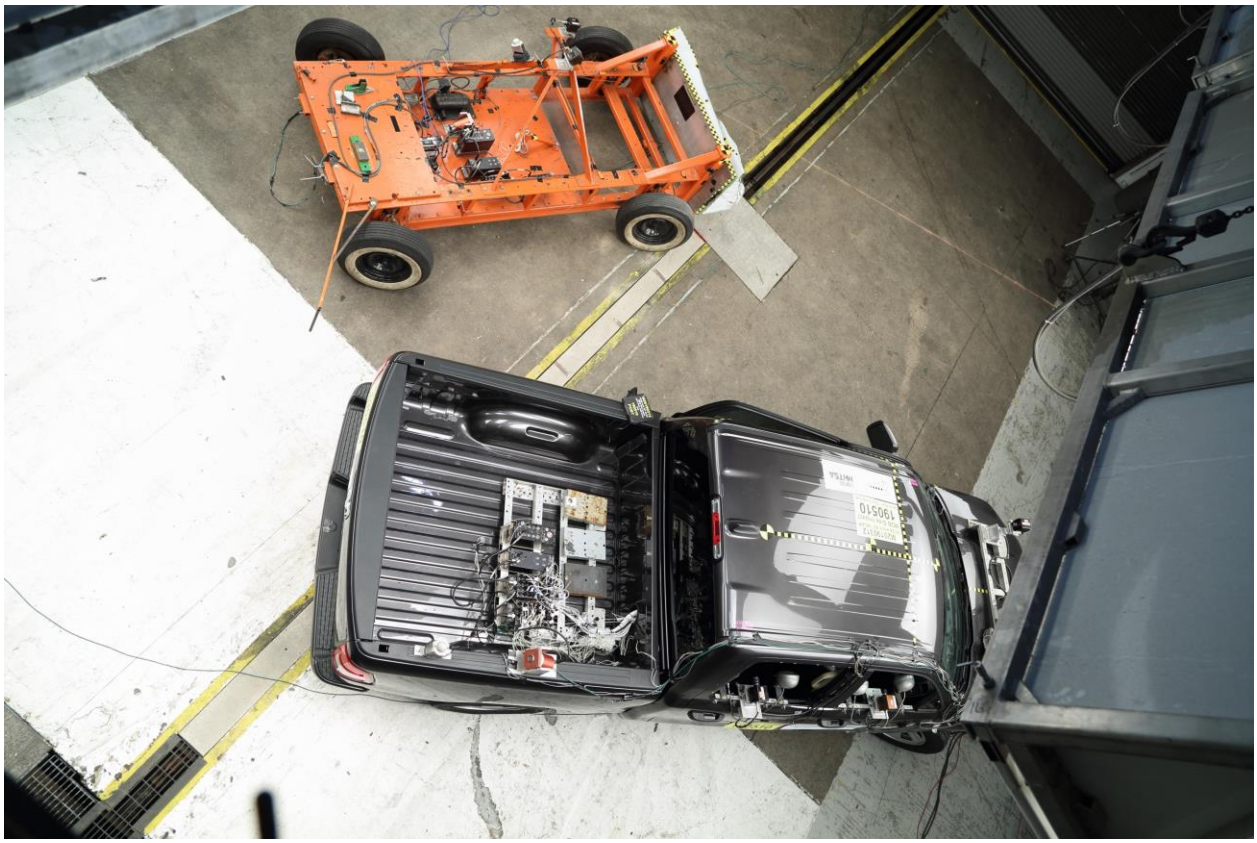
011 Pre-Test Rear View of Test Vehicle

012 Post-Test Rear View of Test Vehicle

013 Pre-Test Right Side View of Test Vehicle

014 Post-Test Right Side View of Test Vehicle

015 Pre-Test Overhead View of Test Area



016 Post-Test Overhead View of Test Area

017 Pre-Test Left Side View of MDB Positioned Against Side of Test Vehicle

018 Pre-Test Right Side View MDB Positioned Against Side of Test Vehicle

019 Pre-Test Close-Up View of Impact Point Target

020 Post-Test Close-Up View of Impact Point Target

021 Pre-Test Left Front Door Latch Close-Up

022 Post-Test Left Front Door Latch Close-Up

023 Pre-Test Left Rear Door Latch Close-Up

024 Post-Test Left Rear Door Latch Close-Up

025 Pre-Test Front Close-Up View of Driver Dummy

026 Post-Test Front Close-Up View of Driver Dummy

027 Pre-Test Left Side View of Driver Dummy Showing Belt and Chalking

Intentionally Left Blank

028 Pre-Test Left Side View of Driver Dummy Shoulder and Door Top

029 Post-Test Left Side View of Driver Dummy Shoulder and Door Top

030 Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning

031 Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint

032 Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning

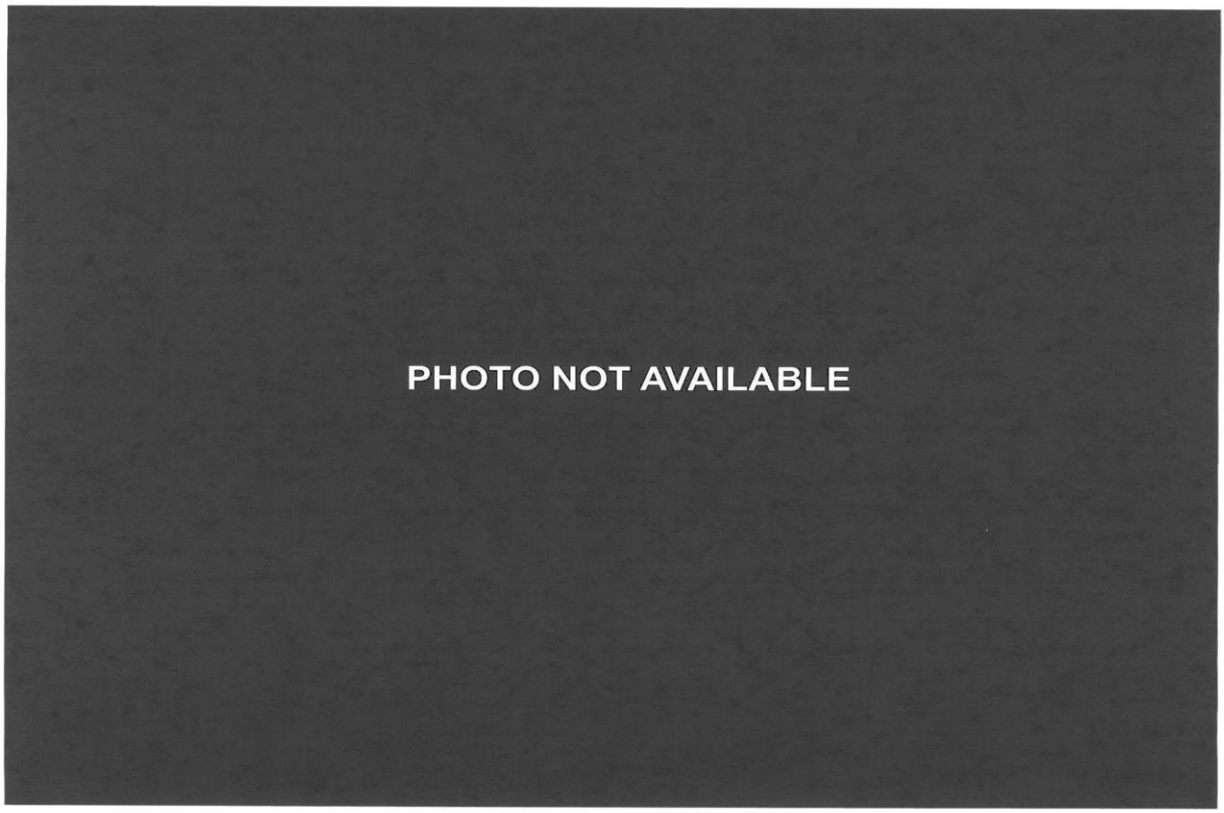
033 Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan

034 Pre-Test Placement of Driver's Dummy Feet

035 Pre-Test View of Belt Anchorage for Driver Dummy

036 Pre-Test Left Side View of Steering Wheel

037 View of Disengaged Parking Brake



038 Pre-Test View of Parking Brake

039 Pre-Test Close-Up Left Side View of Driver Seat Track

040 Pre-Test Close-Up Left Side View of Driver Seat Back

041 Pre-Test Close-Up View of Driver Seat Back or Head Restraint

042 Pre-Test Driver Dummy and Door Clearance View

043 Post-Test Driver Dummy and Door Clearance View

044 Pre-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment

045 Post-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment

046 Pre-Test Driver Inner Door Panel View

047 Post-Test Driver Inner Door Panel View Showing Driver Dummy Contact Locations

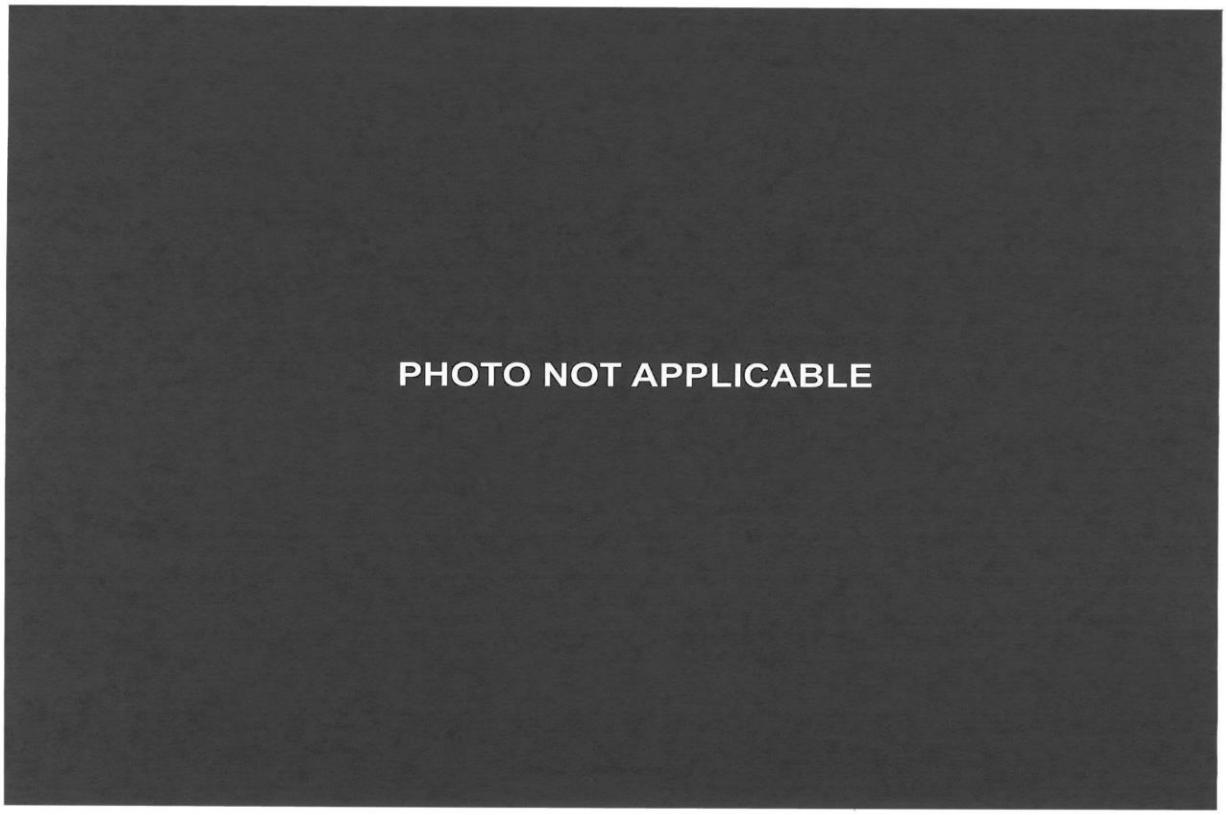
048 Post-Test Driver Dummy Close-Up Head Contact with Vehicle View

049 Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View

050 Post-Test Driver Dummy Close-Up Torso Contact with Vehicle Interior View

051 Post-Test Driver Dummy Close-Up Torso Contact with Side Airbag View

052 Post-Test Driver Dummy Close-Up Pelvis Contact View



053 Post-Test Driver Dummy Close-Up Pelvis Contact with Side Airbag View

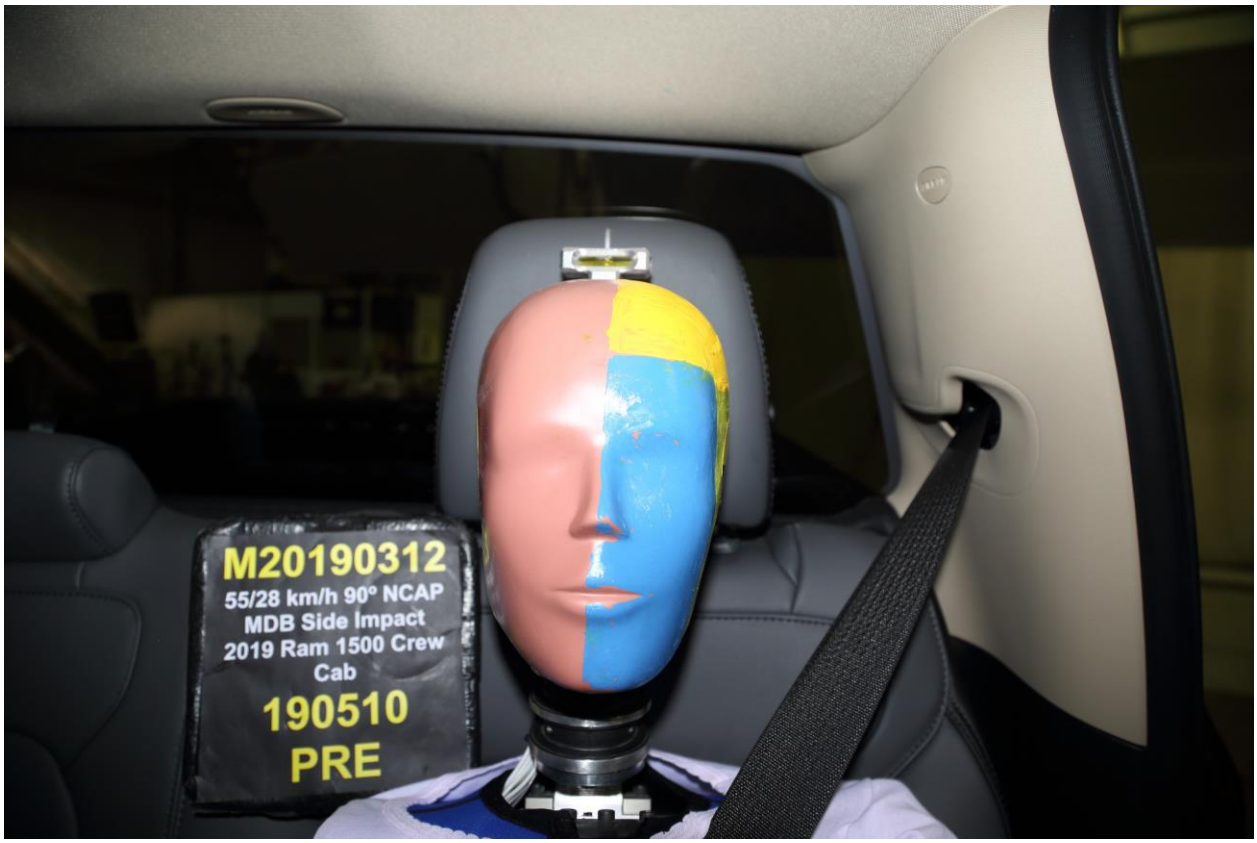
054 Post-Test Driver Dummy Close-Up Knee Contact View

055 Pre-Test Left Side View of Passenger Dummy Showing Belt and Chalking

056 Pre-Test Left Side View of Passenger Dummy Shoulder and Door Top View

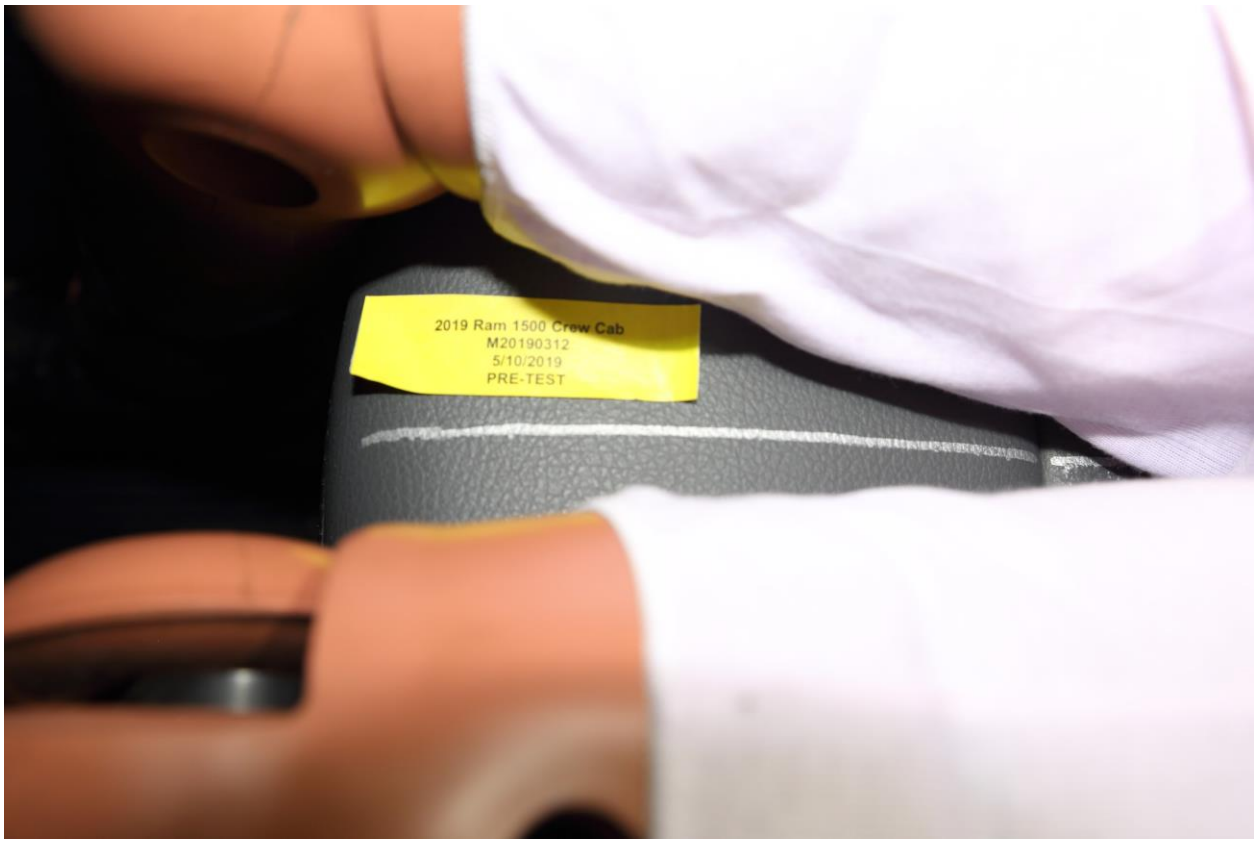
057 Post-Test Left Side View of Passenger Dummy Shoulder and Door Top View

058 Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning

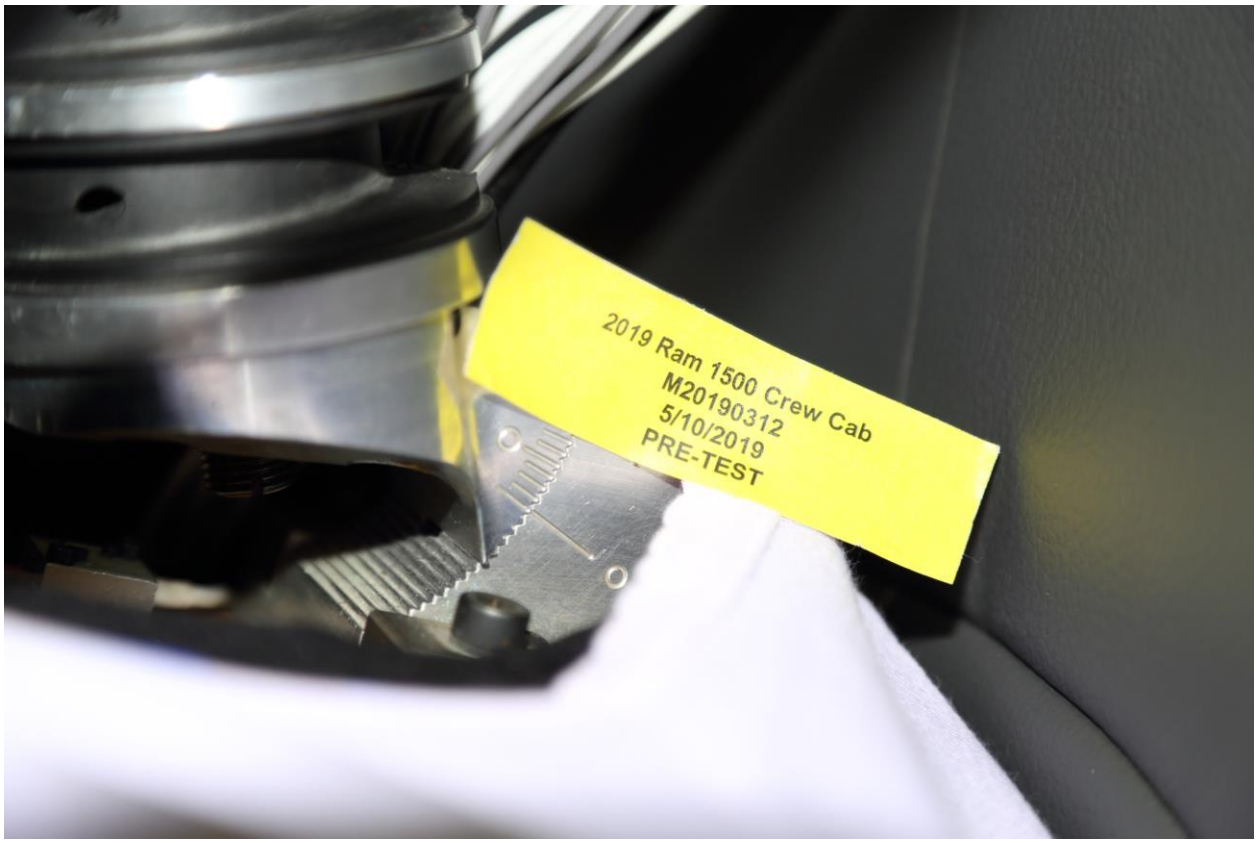


059 Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint

060 Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning



061 Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan



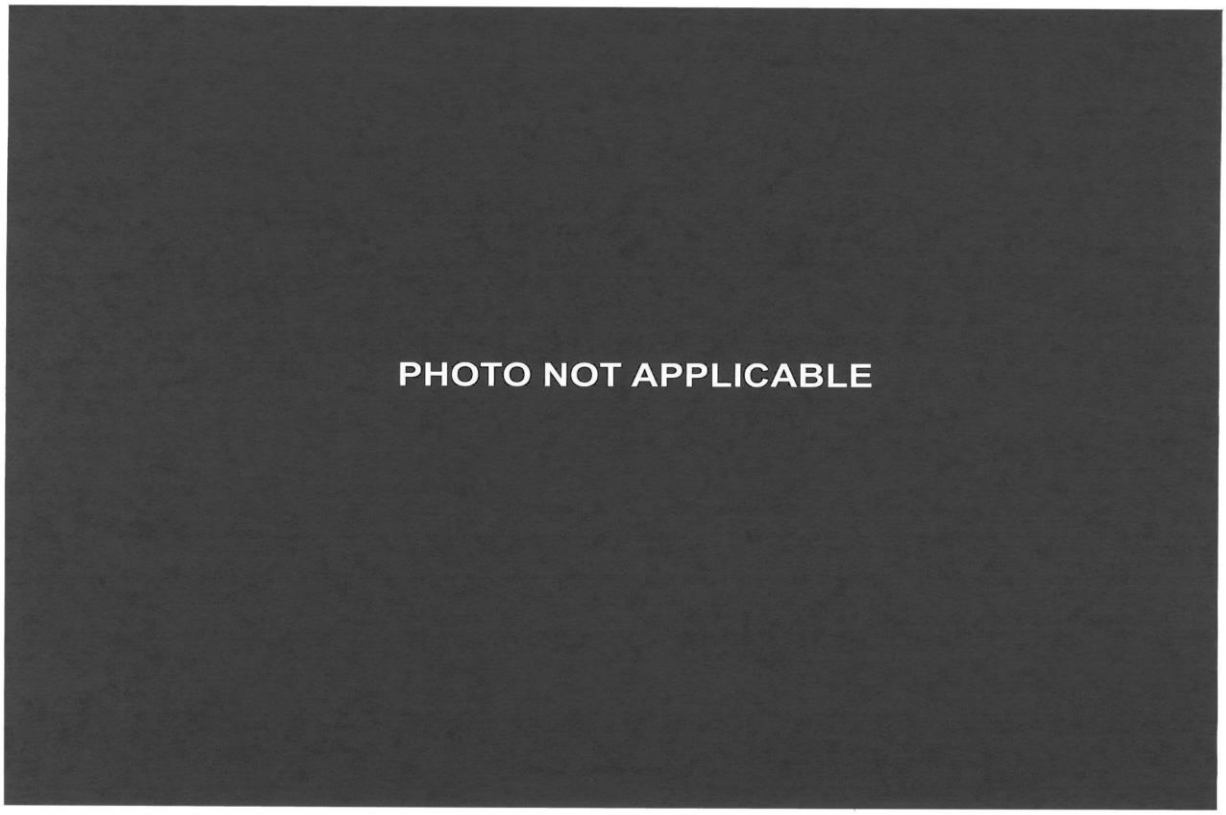
062 Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket

063 Pre-Test View of Rear Passenger Dummy's Head Showing Dummy Head is Level

064 Pre-Test Placement of Rear Passenger Dummy's Feet

065 Pre-Test View of Belt Anchorage for Rear Passenger Dummy

066 Pre-Test Close-Up Left Side View of Rear Passenger Seat Track



067 Pre-test Close-Up Left Side View of Rear Passenger Seat Back

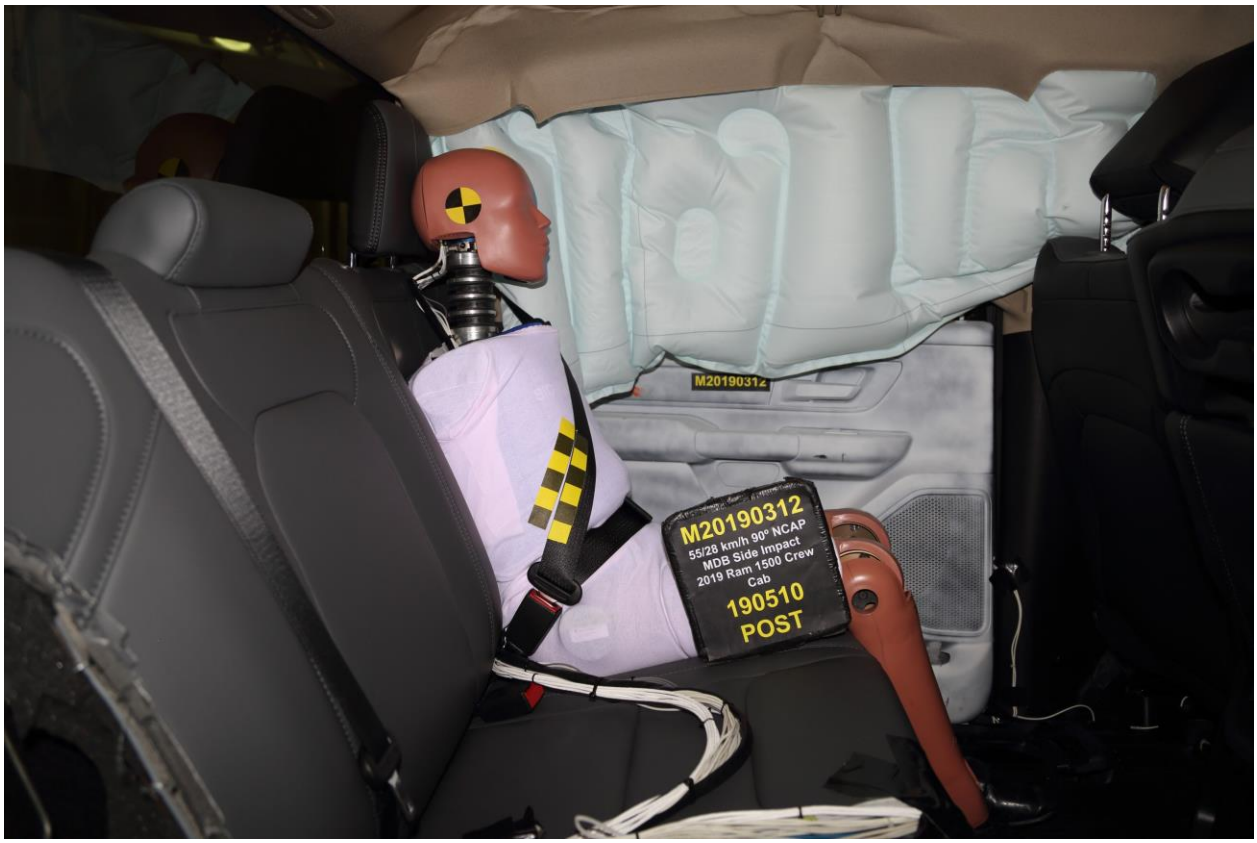
068 Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint

Intentionally Left Blank

069 Pre-Test Rear Passenger Dummy and Door Clearance View

070 Post-Test Rear Passenger Dummy and Door Clearance View

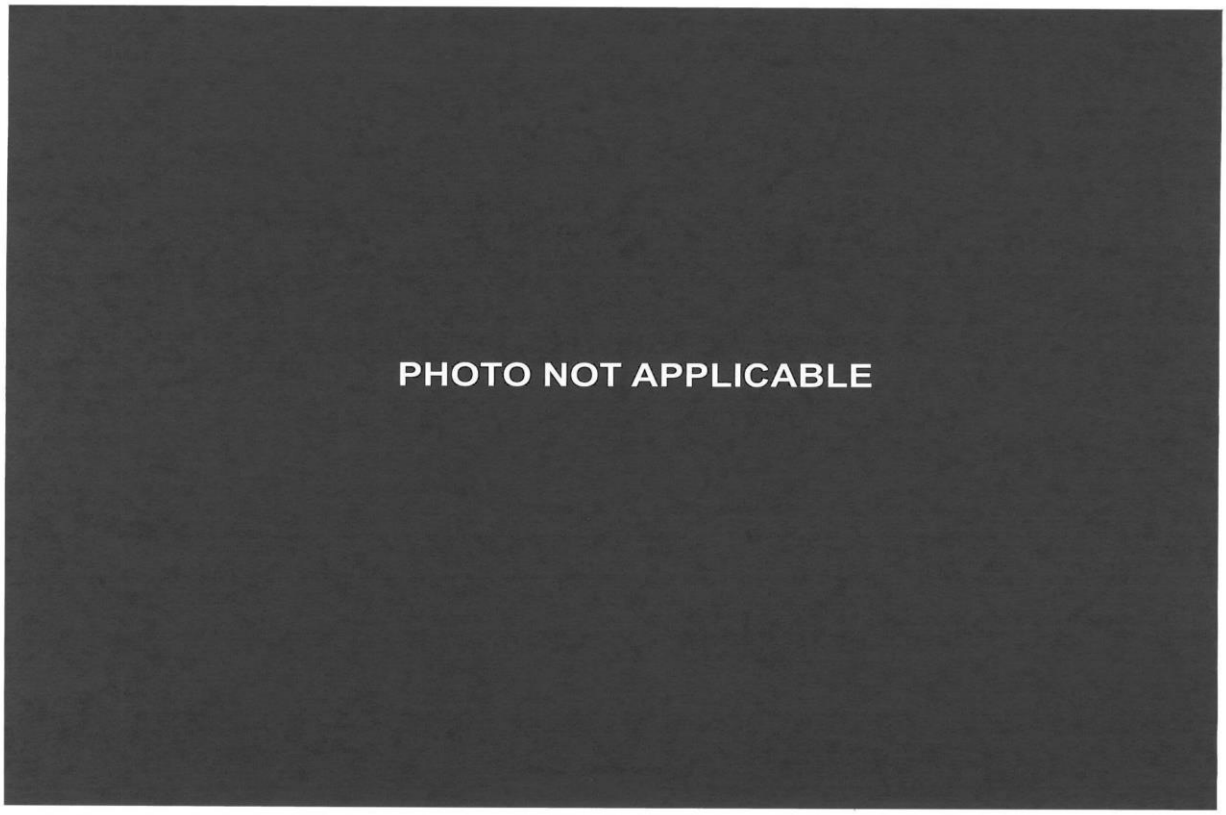
071 Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



072 Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment

073 Pre-Test Rear Passenger Inner Door Panel View

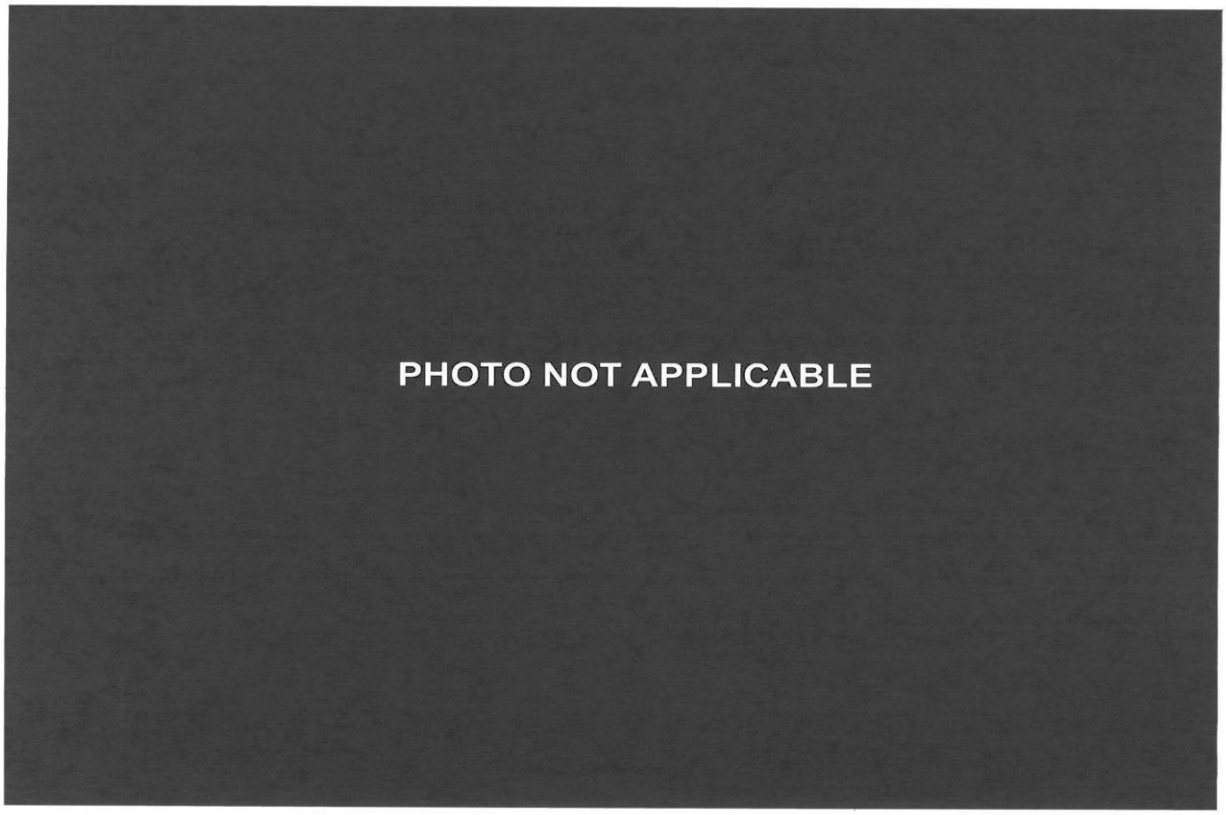
074 Post-Test Rear Passenger Inner Door Panel View



075 Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle View

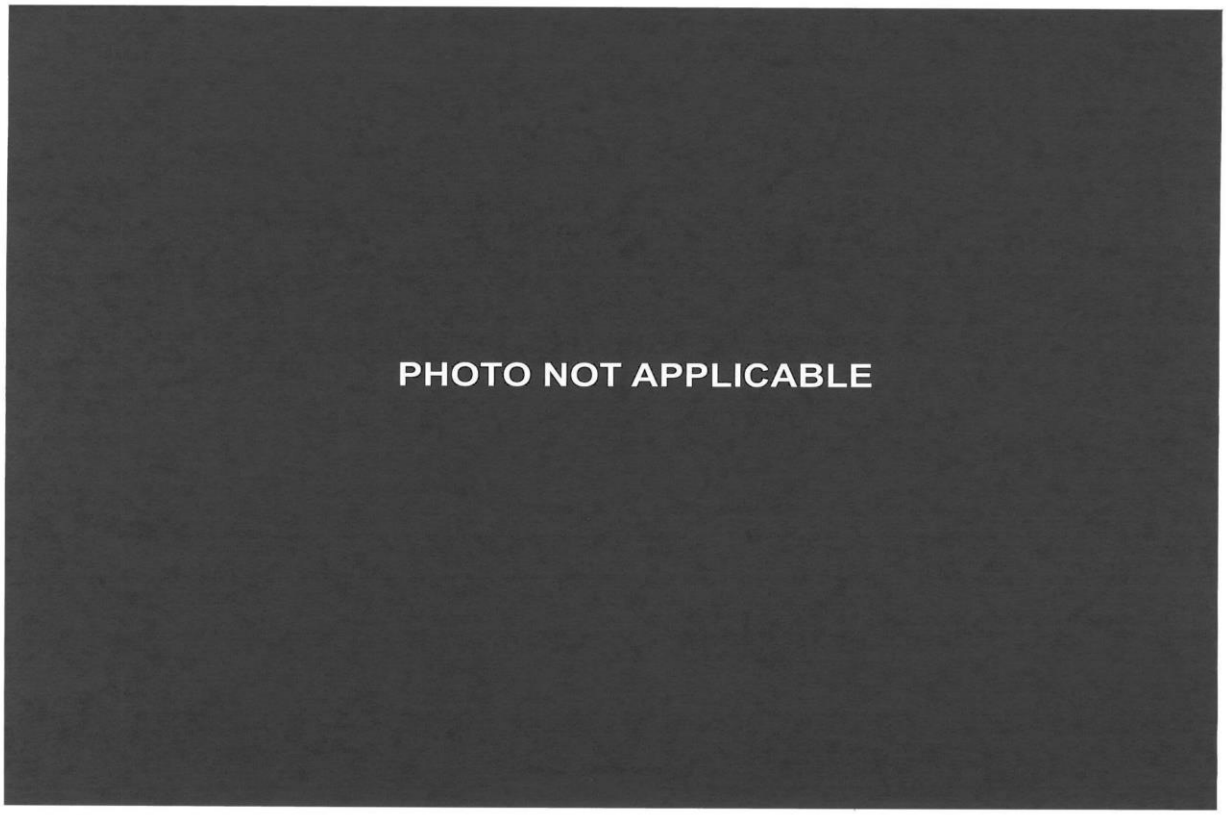
076 Post-Test Rear Passenger Dummy Close-Up Head Contact with Side Airbag View

077 Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View



078 Post-Test Rear Passenger Dummy Close-Up Torso Contact with Side Airbag View

079 Post-Test Rear Passenger Dummy Close-Up Pelvis Contact View



080 Post-Test Rear Passenger Dummy Close-Up Pelvis Contact with Side Airbag View

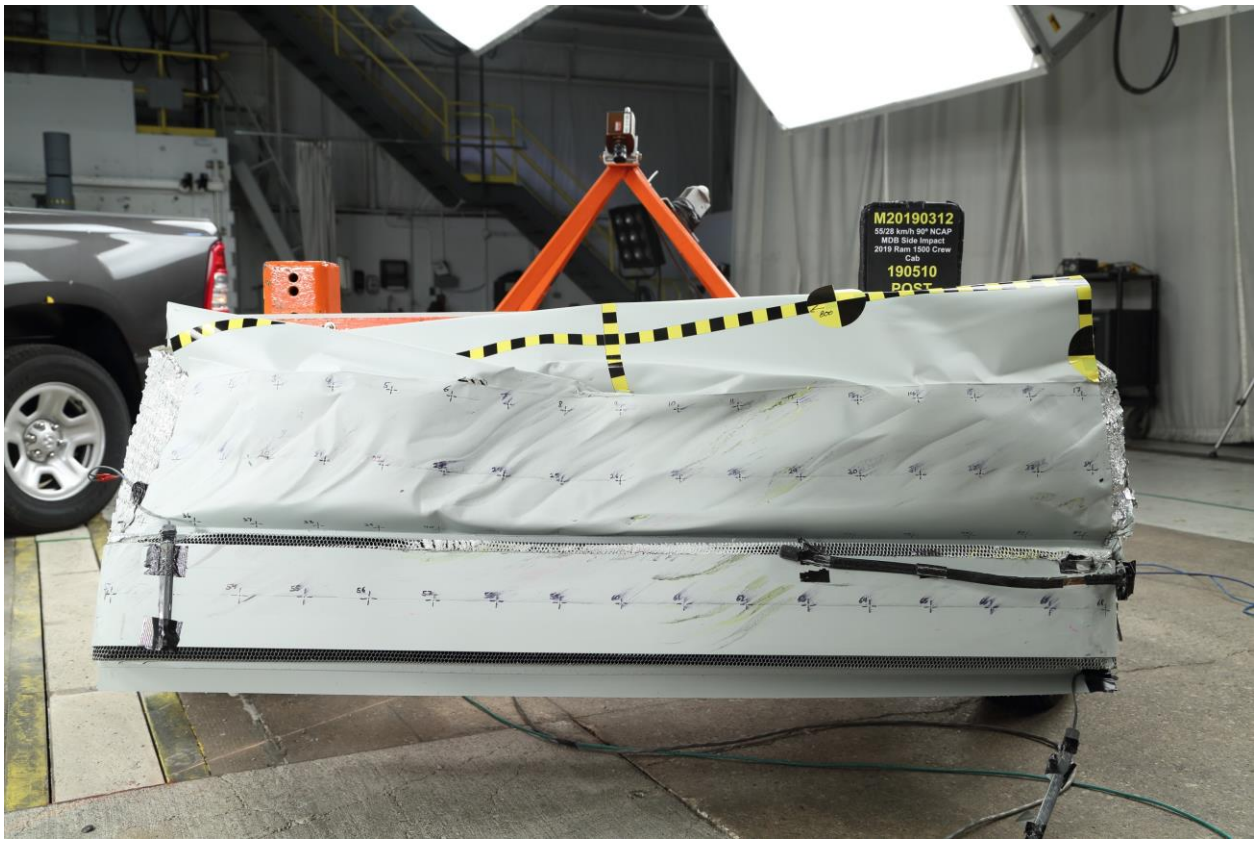
081 Post-Test Rear Passenger Dummy Close-Up Knee Contact View

Intentionally Left Blank

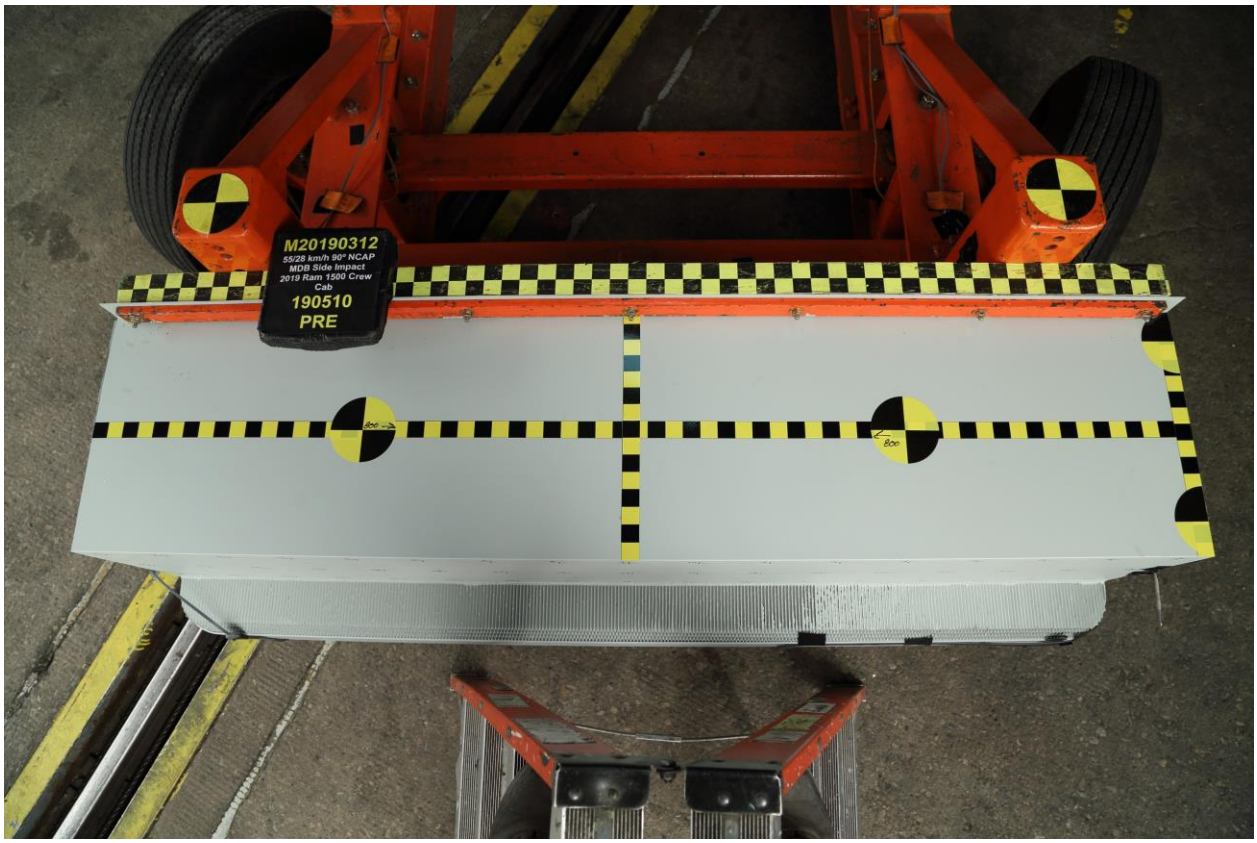
082 Pre-Test View of Fuel Filler Cap or Fuel Filler Neck

083 Post-Test View of Fuel Filler Cap or Fuel Filler Neck

084 Pre-Test Front View of MDB Impactor Face



085 Post-Test Front View of MDB Impactor Face



086 Pre-Test Top View of MDB Impactor Face

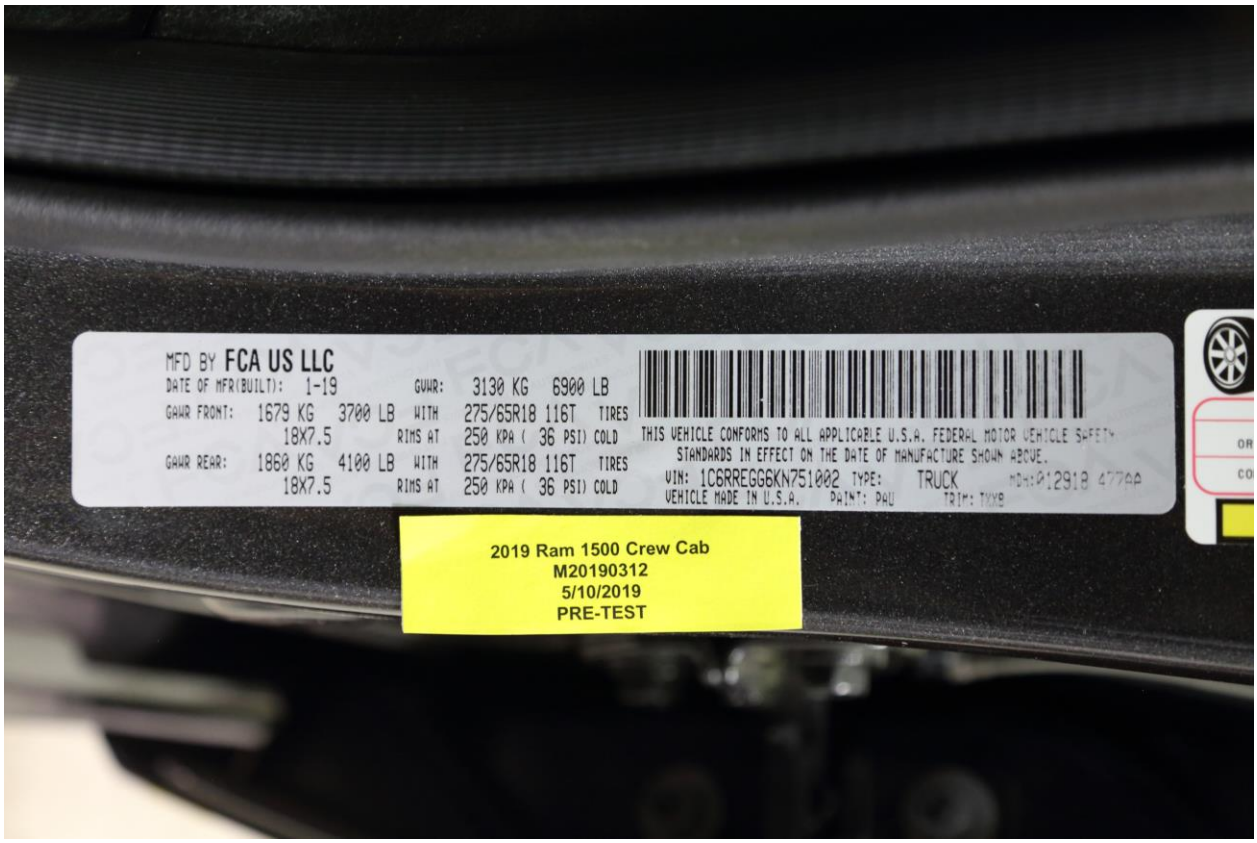
087 Post-Test Top View of MDB Impactor Face

088 Pre-Test Left Side View of MDB Impactor Face

089 Post-Test Left Side View of MDB Impactor Face

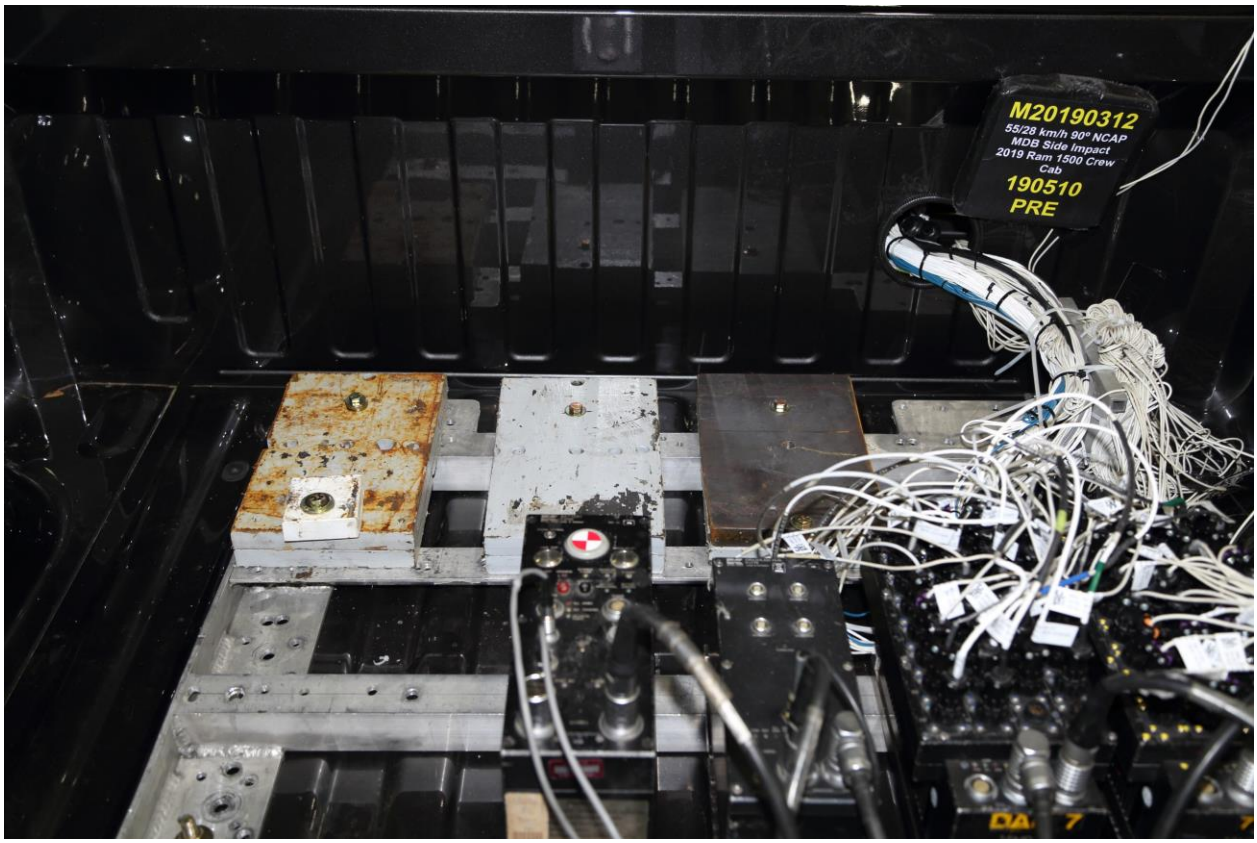
090 Pre-Test Right Side View of MDB Impactor Face

091 Post-Test Right Side View of MDB Impactor Face



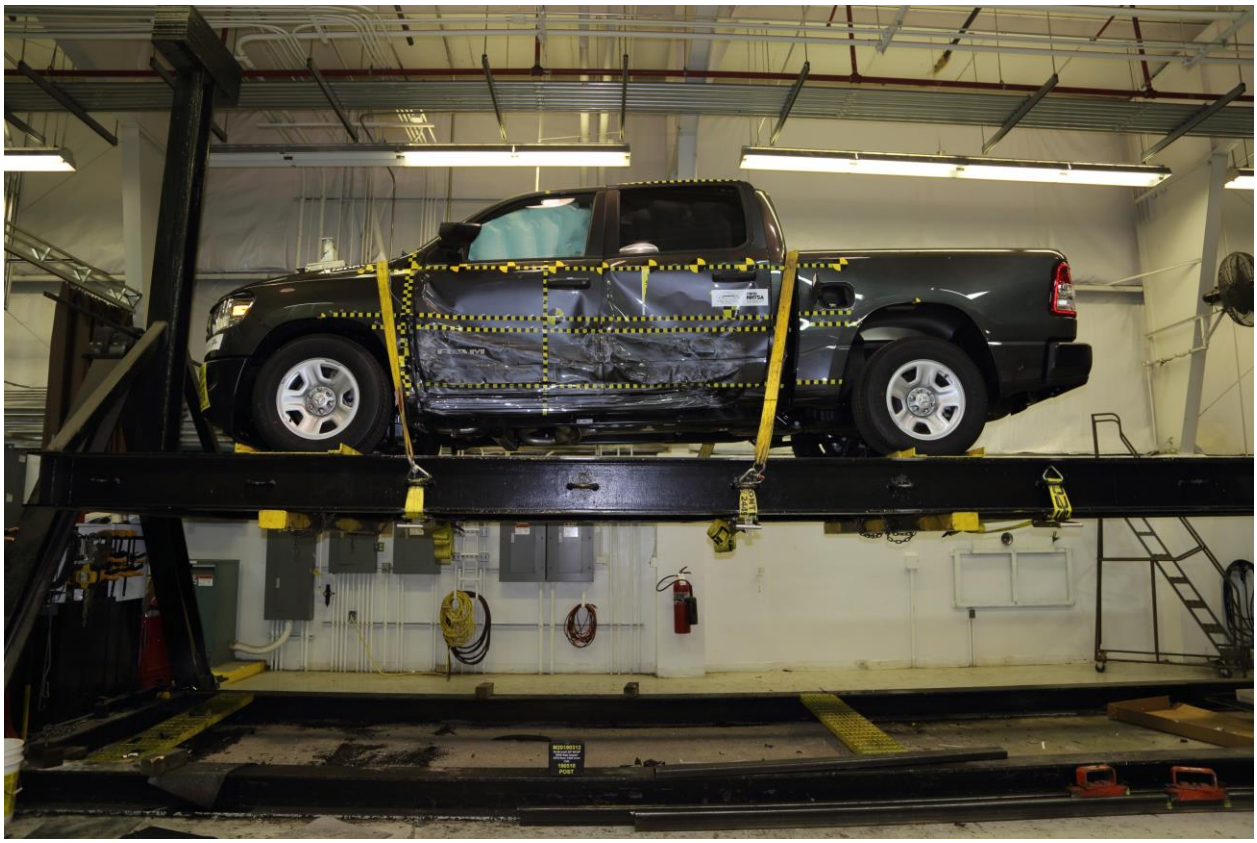
092 Close-Up View of Vehicle's Certification Label

093 Close-Up View of Vehicle's Tire Information Placard or Label



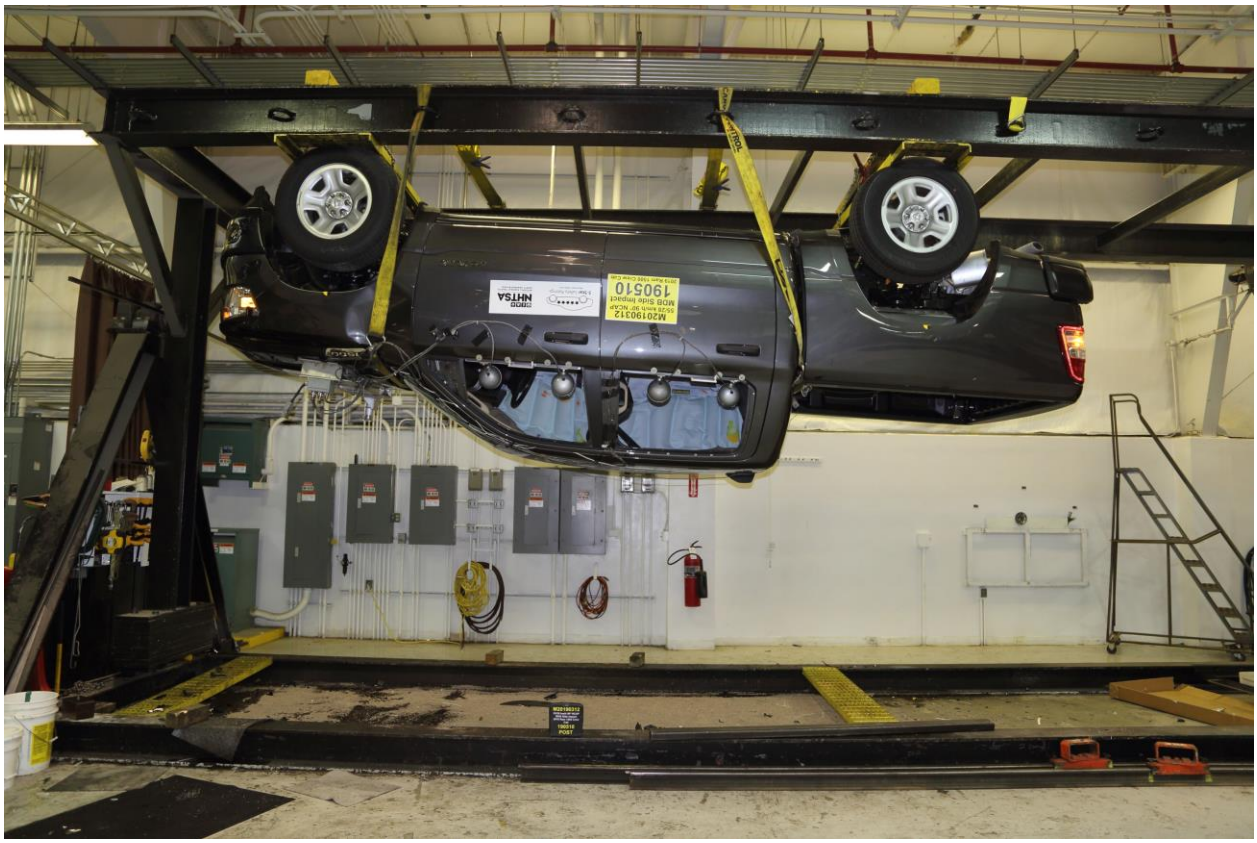
094 Pre-Test Ballast View

095 No. Post-Test Primary and Redundant Speed Trap Read-Out



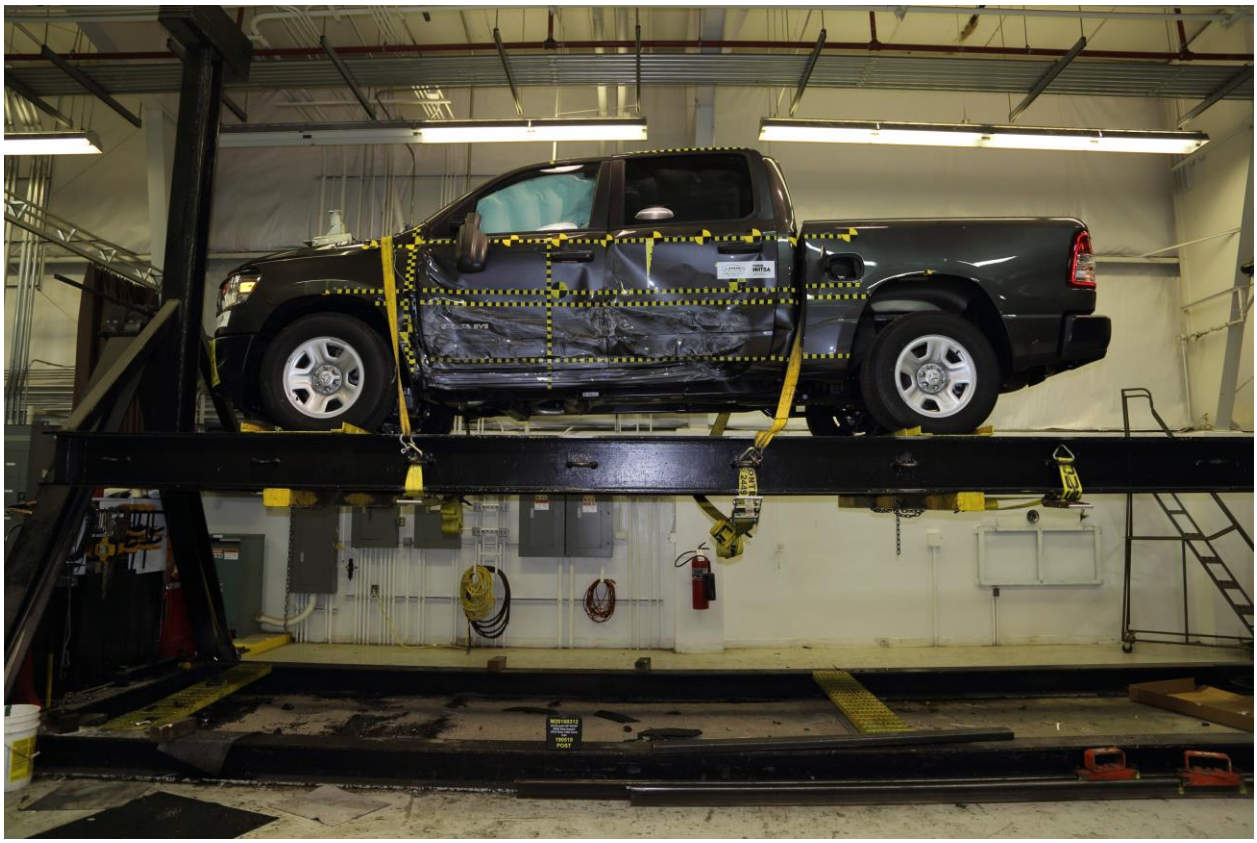
096 FMVSS No. 301 Static Rollover 0 Degrees

097 FMVSS No. 301 Static Rollover 90 Degrees



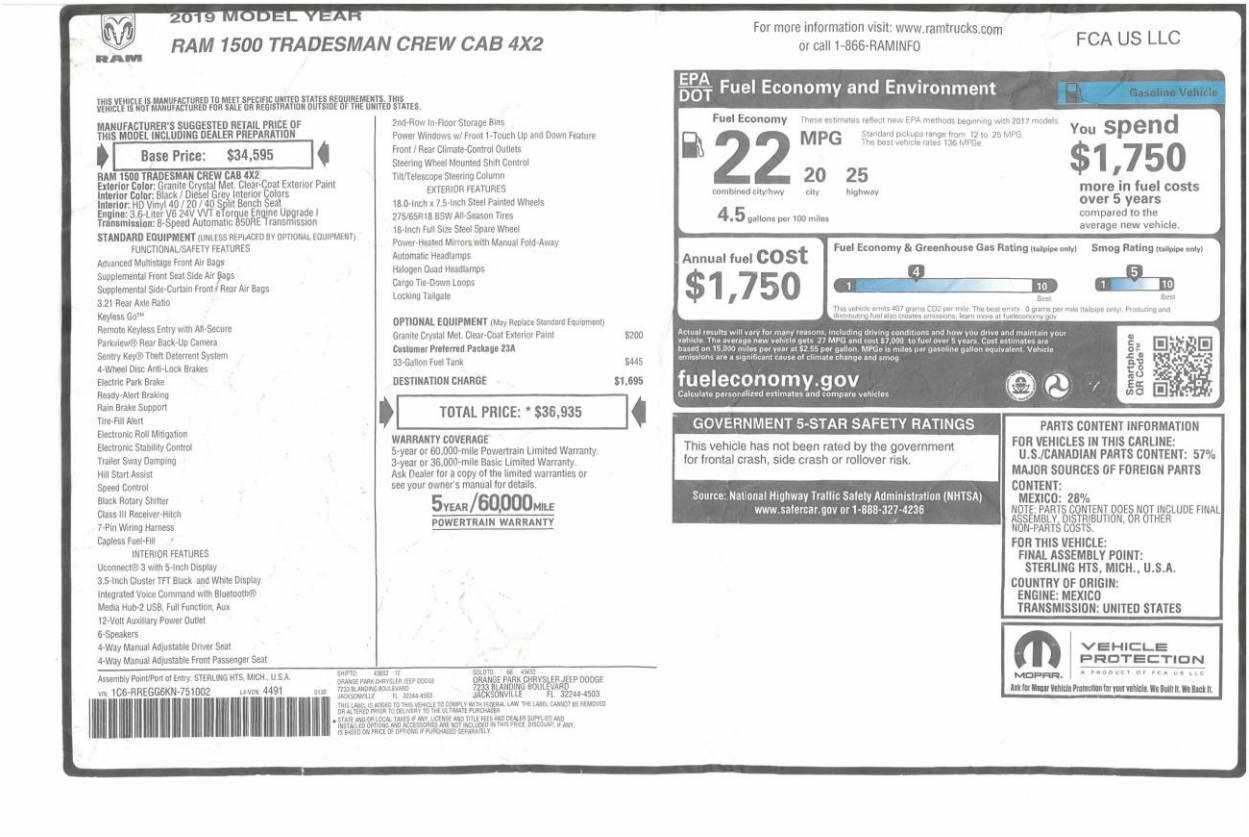
098 FMVSS No. 301 Static Rollover 180 Degrees

099 FMVSS No. 301 Static Rollover 270 Degrees



100 FMVSS No. 301 Static Rollover 360 Degrees

101 Impact Event



2019 MODEL YEAR

RAM 1500 TRADESMAN CREW CAB 4X2

For more information visit: www.ramtrucks.com
or call 1-866-RAMINFO

FCA US LLC

THIS VEHICLE IS MANUFACTURED TO MEET SPECIFIC UNITED STATES REQUIREMENTS. THIS VEHICLE IS NOT MANUFACTURED FOR SALE OR REGISTRATION OUTSIDE OF THE UNITED STATES.

MANUFACTURER'S SUGGESTED RETAIL PRICE OF THIS MODEL INCLUDING DEALER PREPARATION

Base Price: $34,595

RAM 1500 TRADESMAN CREW CAB 4X2
Exterior Color: Granite Crystal Met. Clear-Coat Exterior Paint
Interior Color: Black / Diesel Grey Interior Colors
Interior: HD Vinyl 40 / 20 / 40 Split Bench Seat
Engine: 3.6-Liter V6 24V VVT eTorque Engine Upgrade I
Transmission: 8-Speed Automatic 850RE Transmission

STANDARD EQUIPMENT (UNLESS REPLACED BY OPTIONAL EQUIPMENT)

FUNCTIONAL/SAFETY FEATURES
Advanced Multistage Front Air Bags
Supplemental Front Seat Side Air Bags
Supplemental Side-Curtain Front / Rear Air Bags
3.21 Rear Axle Ratio
Keyless Go™
Remote Keyless Entry with All-Secure
Parkview® Rear Back-Up Camera
Sentry Key® Theft Deterrent System
4-Wheel Disc Anti-Lock Brakes
Electric Park Brake
Ready-Alert Braking
Rain Brake Support
Tire-Fill Alert
Electronic Roll Mitigation
Electronic Stability Control
Trailer Sway Damping
Hill Start Assist
Speed Control
Black Rotary Shifter
Class III Receiver-Hitch
7-Pin Wiring Harness
Capless Fuel-Fill

INTERIOR FEATURES
Uconnect® 3 with 5-Inch Display
3.5-Inch Cluster TFT Black and White Display
Integrated Voice Command with Bluetooth®
Media Hub-2 USB, Full Function, Aux
12-Volt Auxiliary Power Outlet
6-Speakers
4-Way Manual Adjustable Driver Seat
4-Way Manual Adjustable Front Passenger Seat
2nd-Row In-Floor Storage Bins
Power Windows w/ Front 1-Touch Up and Down Feature
Front / Rear Climate-Control Outlets
Steering Wheel Mounted Shift Control
Tilt/Telescope Steering Column

EXTERIOR FEATURES
18.0-Inch x 7.5-Inch Steel Painted Wheels
275/65R18 BSW All-Season Tires
18-Inch Full Size Steel Spare Wheel
Power-Heated Mirrors with Manual Fold-Away
Automatic Headlamps
Halogen Quad Headlamps
Cargo Tie-Down Loops
Locking Tailgate

OPTIONAL EQUIPMENT (May Replace Standard Equipment)
Granite Crystal Met. Clear-Coat Exterior Paint $200
Customer Preferred Package 23A
33-Gallon Fuel Tank $445

DESTINATION CHARGE $1,695

TOTAL PRICE: * $36,935

WARRANTY COVERAGE
5-year or 60,000-mile Powertrain Limited Warranty.
3-year or 36,000-mile Basic Limited Warranty.
Ask Dealer for a copy of the limited warranties or see your owner's manual for details.

5YEAR/60,000MILE
POWERTRAIN WARRANTY

Assembly Point/Port of Entry: STERLING HTS, MICH., U.S.A.
VIN: 1C6-RREGG6KN-751002 LA-VIN: 4491

SHIPTO: 43653 12
ORANGE PARK CHRYSLER JEEP DODGE
7233 BLANDING BOULEVARD
JACKSONVILLE FL 32244-4503

SOLDTO: 66 43653
ORANGE PARK CHRYSLER JEEP DODGE
7233 BLANDING BOULEVARD
JACKSONVILLE FL 32244-4503

THIS LABEL IS ADDED TO THIS VEHICLE TO COMPLY WITH FEDERAL LAW. THE LABEL CANNOT BE REMOVED OR ALTERED PRIOR TO DELIVERY TO THE ULTIMATE PURCHASER.

• STATE AND/OR LOCAL TAXES IF ANY, LICENSE AND TITLE FEES AND DEALER SUPPLIED AND INSTALLED OPTIONS AND ACCESSORIES ARE NOT INCLUDED IN THIS PRICE. DISCOUNT, IF ANY, IS BASED ON PRICE OF OPTIONS IF PURCHASED SEPARATELY.

EPA DOT Fuel Economy and Environment — Gasoline Vehicle

Fuel Economy
22 MPG
combined city/hwy
20 city
25 highway
Standard pickups range from 12 to 25 MPG. The best vehicle rates 136 MPGe.
4.5 gallons per 100 miles

You spend $1,750 more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost $1,750

Fuel Economy & Greenhouse Gas Rating (tailpipe only) 4 (1 Worst, 10 Best)
Smog Rating (tailpipe only) 5 (1 Worst, 10 Best)
This vehicle emits 407 grams CO2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions; learn more at fueleconomy.gov

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and cost $7,000 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $2.55 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

Smartphone Sticker Code

GOVERNMENT 5-STAR SAFETY RATINGS

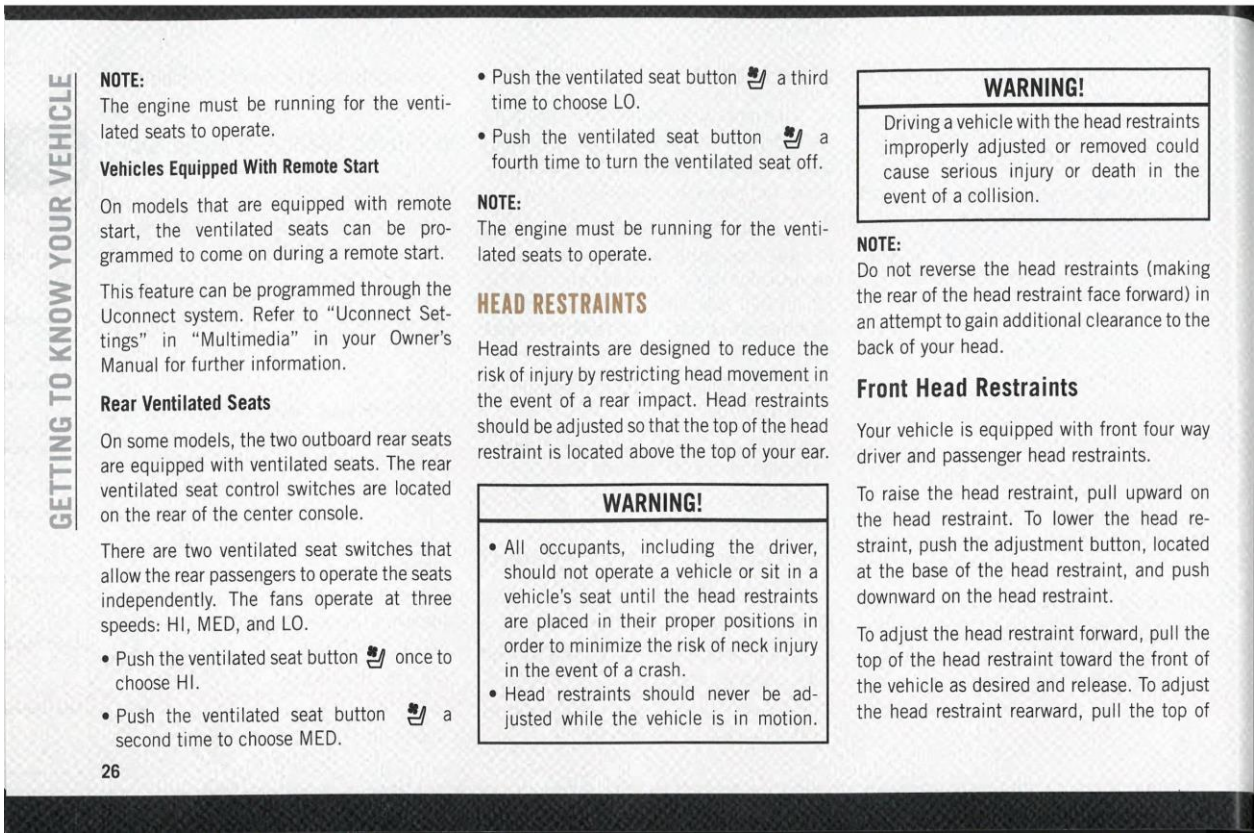
This vehicle has not been rated by the government for frontal crash, side crash or rollover risk.

Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4236

PARTS CONTENT INFORMATION
FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 57%
MAJOR SOURCES OF FOREIGN PARTS CONTENT:
MEXICO: 28%
NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.
FOR THIS VEHICLE:
FINAL ASSEMBLY POINT:
STERLING HTS, MICH., U.S.A.
COUNTRY OF ORIGIN:
ENGINE: MEXICO
TRANSMISSION: UNITED STATES

MOPAR VEHICLE PROTECTION
A PRODUCT OF FCA US LLC
Ask for Mopar Vehicle Protection for your vehicle. We Built It. We Back It.

102 Monroney Label



GETTING TO KNOW YOUR VEHICLE

NOTE:
The engine must be running for the ventilated seats to operate.

Vehicles Equipped With Remote Start

On models that are equipped with remote start, the ventilated seats can be programmed to come on during a remote start.

This feature can be programmed through the Uconnect system. Refer to "Uconnect Settings" in "Multimedia" in your Owner's Manual for further information.

Rear Ventilated Seats

On some models, the two outboard rear seats are equipped with ventilated seats. The rear ventilated seat control switches are located on the rear of the center console.

There are two ventilated seat switches that allow the rear passengers to operate the seats independently. The fans operate at three speeds: HI, MED, and LO.

- Push the ventilated seat button once to choose HI.
- Push the ventilated seat button a second time to choose MED.
- Push the ventilated seat button a third time to choose LO.
- Push the ventilated seat button a fourth time to turn the ventilated seat off.

NOTE:
The engine must be running for the ventilated seats to operate.

HEAD RESTRAINTS

Head restraints are designed to reduce the risk of injury by restricting head movement in the event of a rear impact. Head restraints should be adjusted so that the top of the head restraint is located above the top of your ear.

WARNING!

- All occupants, including the driver, should not operate a vehicle or sit in a vehicle's seat until the head restraints are placed in their proper positions in order to minimize the risk of neck injury in the event of a crash.
- Head restraints should never be adjusted while the vehicle is in motion.

WARNING!

Driving a vehicle with the head restraints improperly adjusted or removed could cause serious injury or death in the event of a collision.

NOTE:
Do not reverse the head restraints (making the rear of the head restraint face forward) in an attempt to gain additional clearance to the back of your head.

Front Head Restraints

Your vehicle is equipped with front four way driver and passenger head restraints.

To raise the head restraint, pull upward on the head restraint. To lower the head restraint, push the adjustment button, located at the base of the head restraint, and push downward on the head restraint.

To adjust the head restraint forward, pull the top of the head restraint toward the front of the vehicle as desired and release. To adjust the head restraint rearward, pull the top of

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103 Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

the head restraint to the forward most position and release. The head restraint will return to the rear most position.

NOTE:
If your vehicle is equipped with a front bench seat, the center head restraint is not adjustable or removable.

Head Restraint Adjustment Button

NOTE:
The head restraints should only be removed by qualified technicians, for service purposes only. If either of the head restraints require removal, see an authorized dealer.

WARNING!

- All occupants, including the driver, should not operate a vehicle or sit in a vehicle's seat until the head restraints are placed in their proper positions in order to minimize the risk of neck injury in the event of a crash.
- Head restraints should never be adjusted while the vehicle is in motion. Driving a vehicle with the head restraints improperly adjusted or removed could cause serious injury or death in the event of a collision.

Rear Head Restraints

The outboard head restraints are non-adjustable, but can be folded down for improved rearward visibility. Push the button on the outboard side of the head restraint to release. To return the head restraint to its upright position, push up on the head restraint until it locks back into place.

Release Button

104 Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

Driver & Passenger Dummy Instrumentation Plots

The following additional data can be obtained from the Research and Development section of the NHTSA website (http://www.nhtsa.gov)

Additional Driver & Passenger Dummy Instrumentation Data

Driver Lower Spine T12 Acceleration (X)
Driver Lower Spine T12 Acceleration (Y)
Driver Lower Spine T12 Acceleration (Z)
Passenger Upper Thorax Rib Deflection (Y)
Passenger Middle Thorax Rib Deflection (Y)
Passenger Lower Thorax Rib Deflection (Y)
Passenger Upper Abdomen Rib Deflection (Y)
Passenger Lower Abdomen Rib Deflection (Y)
Driver Head Acceleration Redundant (X)
Driver Head Acceleration Redundant (Y)
Driver Head Acceleration Redundant (Z)
Passenger Head Acceleration Redundant (X)
Passenger Head Acceleration Redundant (Y)
Passenger Head Acceleration Redundant (Z)
Passenger Head Angular Velocity (X)
Passenger Head Angular Velocity (Y)
Passenger Head Angular Velocity (Z)

Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Right Side Sill at Front Seat Acceleration (X)
Right Side Sill at Front Seat Acceleration (Y)
Right Side Sill at Front Seat Acceleration (Z)
Right Side Sill at Rear Seat Acceleration (X)
Right Side Sill at Rear Seat Acceleration (Y)
Right Side Sill at Rear Seat Acceleration (Z)
Left Side Sill at Front Seat Acceleration (Y)
Left Side Sill at Rear Seat Acceleration (Y)
Lower A-Post Acceleration (Y)
Middle A-Post Acceleration (Y)
Lower B-Post Acceleration (Y)
Middle B-Post Acceleration (Y)
Front Seat Track Acceleration (Y)
Rear Seat Structure Acceleration (Y)
Right Rear Occupant Compartment Acceleration (Y)
Engine Block (X)
Engine Block (Y)
Rear Floorpan Above Axle Acceleration (X)
Rear Floorpan Above Axle Acceleration (Y)
Rear Floorpan Above Axle Acceleration (Z)

MDB Instrumentation Data

MDB Center of Gravity Acceleration (X)
MDB Center of Gravity Acceleration (Y)
MDB Center of Gravity Acceleration (Z)
MDB Rear Acceleration (X)
MDB Rear Acceleration (Y)
Left MDB Contact Switch
Right MDB Contact Switch

NHTSA

Test Date: 05/10/2019

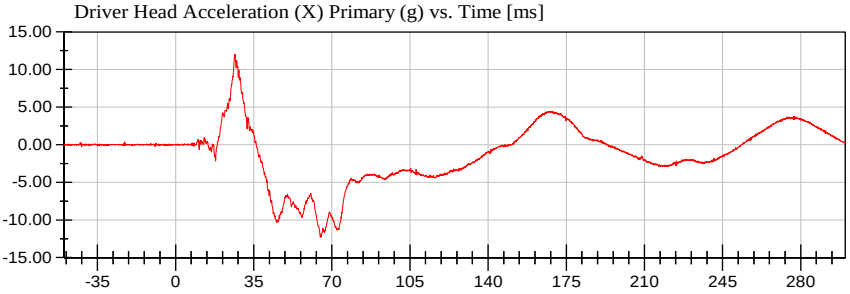
Test Lab: CTF

Position #1 ES-2 Dummy with Rib Extension (F030)

Test Number: 190510 (M20190312)

Position #4 SID IIs Dummy (305)

Driver Head Acceleration (X) Primary (g) vs. Time [ms]



<Max>

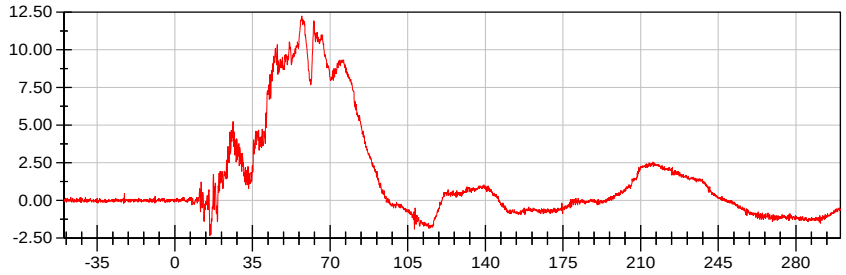
12.05 g at 26.64 ms

<Min>

-12.32 g at 64.80 ms

CFC_1000

Driver Head Acceleration (Y) Primary (g) vs. Time [ms]



<Max>

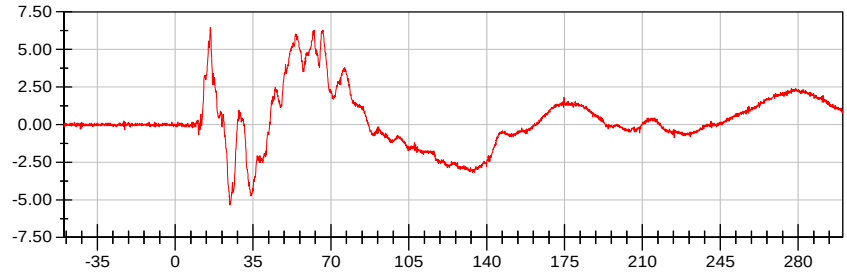
12.26 g at 57.28 ms

<Min>

-2.34 g at 15.84 ms

CFC_1000

Driver Head Acceleration (Z) Primary (g) vs. Time [ms]



<Max>

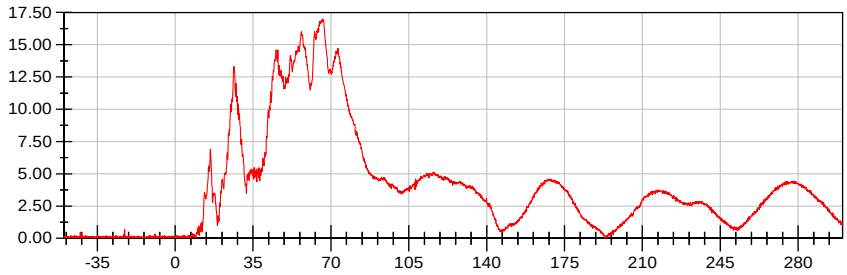
6.48 g at 15.84 ms

<Min>

-5.35 g at 24.64 ms

CFC_1000

Driver Head Resultant Acceleration Primary (g) vs. Time [ms]



<Max>

17.00 g at 66.16 ms

<Min>

0.03 g at -47.76 ms

CFC_1000

NHTSA

Test Date: 05/10/2019

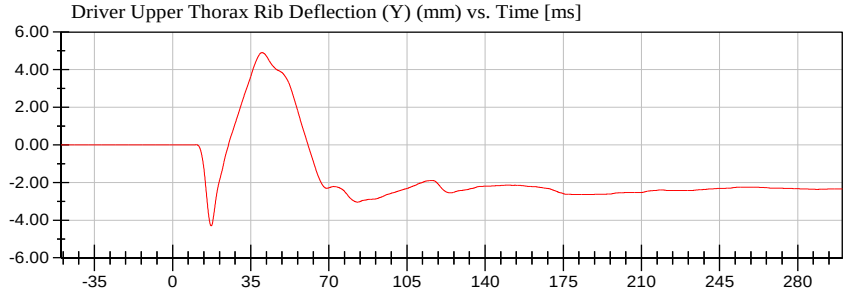
Test Lab: CTF

Position #1 ES-2 Dummy with Rib Extension (F030)

Test Number: 190510 (M20190312)

Position #4 SID IIs Dummy (305)

Driver Upper Thorax Rib Deflection (Y) (mm) vs. Time [ms]



<Max>

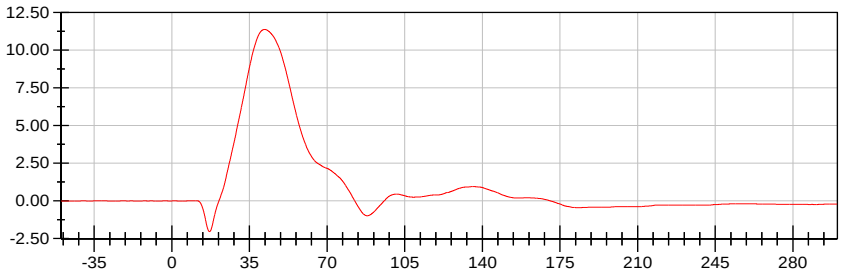
4.90 mm at 40.08 ms

<Min>

-4.31 mm at 17.28 ms

CFC_180

Driver Middle Thorax Rib Deflection (Y) (mm) vs. Time [ms]



<Max>

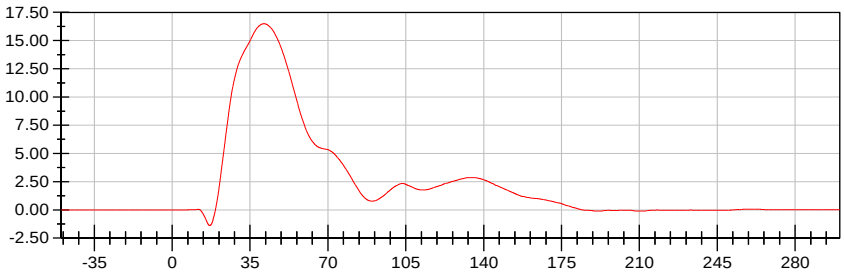
11.38 mm at 41.84 ms

<Min>

-2.04 mm at 16.96 ms

CFC_180

Driver Lower Thorax Rib Deflection (Y) (mm) vs. Time [ms]



<Max>

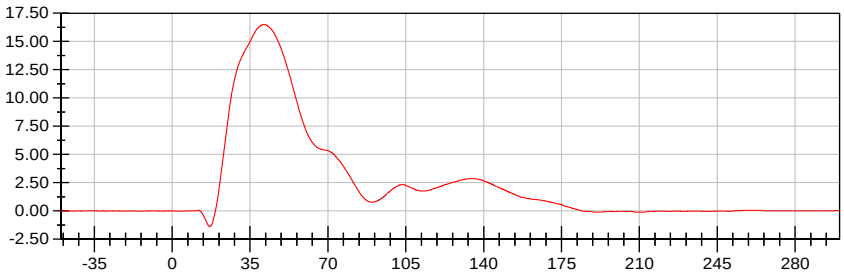
16.49 mm at 41.28 ms

<Min>

-1.39 mm at 16.88 ms

CFC_180

Driver Thorax Rib Deflection Maximum (mm) vs. Time [ms]



<Max>

16.49 mm at 41.28 ms

<Min>

-1.39 mm at 16.88 ms

CFC_180

NHTSA

Test Date: 05/10/2019

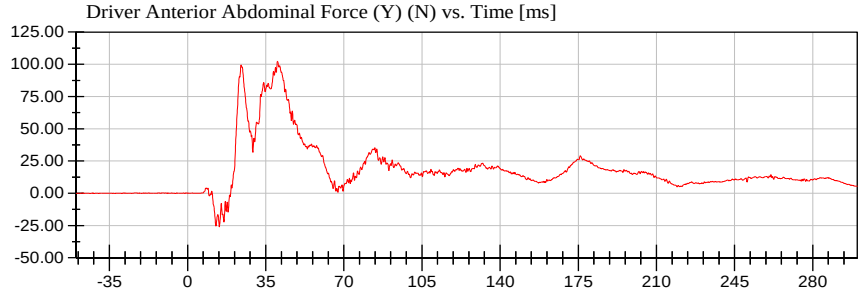
Test Lab: CTF

Position #1 ES-2 Dummy with Rib Extension (F030)

Test Number: 190510 (M20190312)

Position #4 SID IIs Dummy (305)

Driver Anterior Abdominal Force (Y) (N) vs. Time [ms]



<Max>

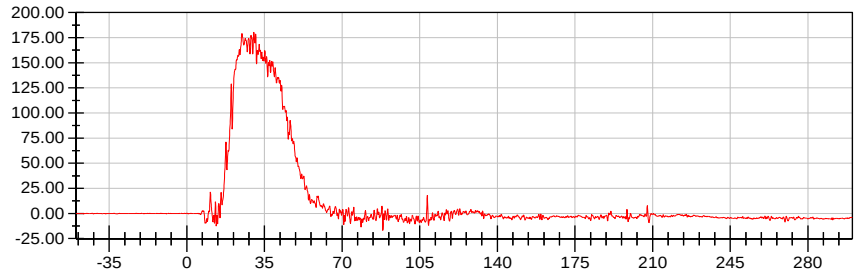
102.41 N at 40.32 ms

<Min>

-25.99 N at 14.24 ms

CFC_600

Driver Middle Abdominal Force (Y) (N) vs. Time [ms]



<Max>

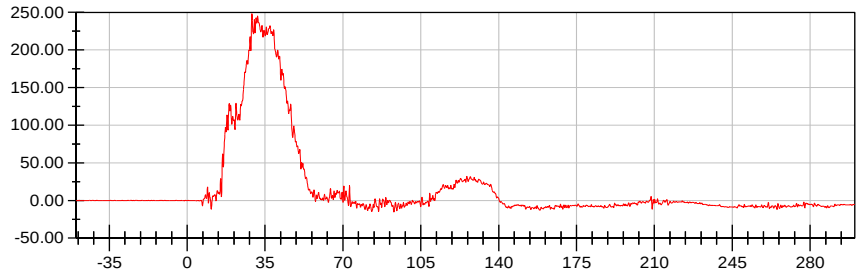
180.39 N at 30.24 ms

<Min>

-16.83 N at 88.40 ms

CFC_600

Driver Posterior Abdominal Force (Y) (N) vs. Time [ms]



<Max>

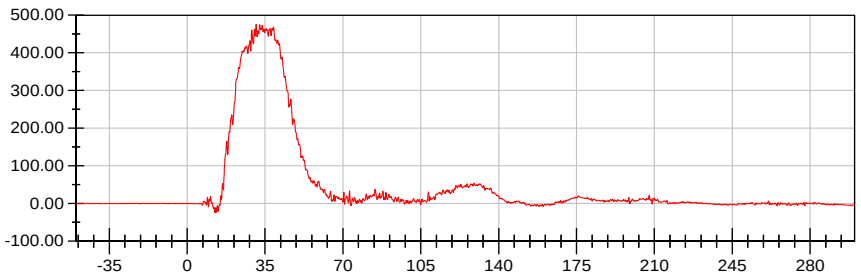
248.00 N at 29.12 ms

<Min>

-15.29 N at 92.96 ms

CFC_600

Driver Total Abdmoninal Force (Y) (N) vs. Time [ms]



<Max>

475.64 N at 30.96 ms

<Min>

-24.88 N at 12.56 ms

CFC_600

NHTSA

Test Date: 05/10/2019

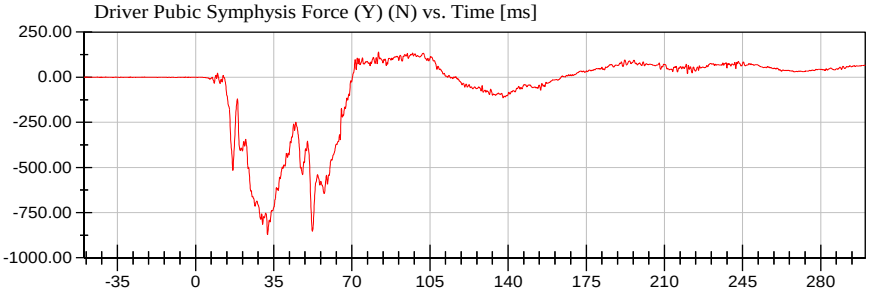
Test Lab: CTF

Position #1 ES-2 Dummy with Rib Extension (F030)

Test Number: 190510 (M20190312)

Position #4 SID IIs Dummy (305)

Driver Pubic Symphysis Force (Y) (N) vs. Time [ms]



<Max>

139.72 N at 81.92 ms

<Min>

-870.58 N at 32.32 ms

CFC_600

NHTSA

Test Date: 05/10/2019

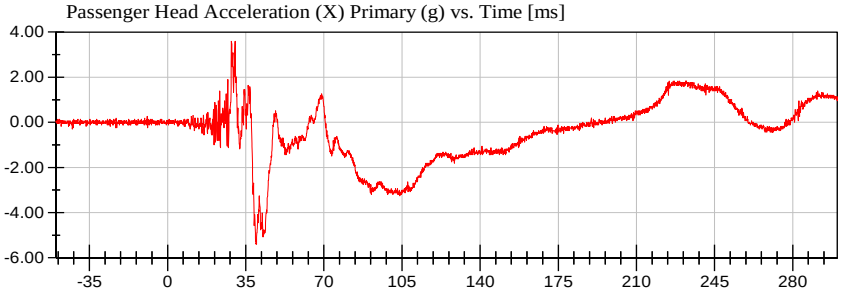
Test Lab: CTF

Position #1 ES-2 Dummy with Rib Extension (F030)

Test Number: 190510 (M20190312)

Position #4 SID IIs Dummy (305)

Passenger Head Acceleration (X) Primary (g) vs. Time [ms]



<Max>

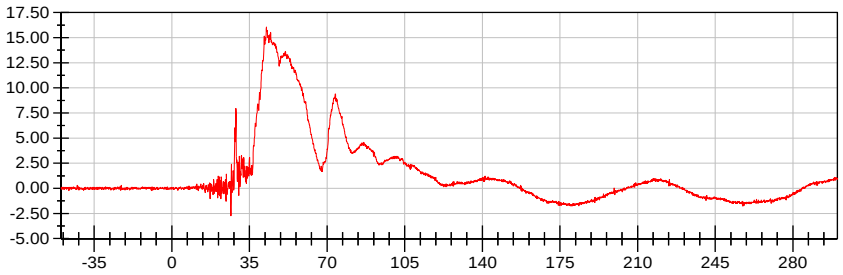
3.59 g at 28.64 ms

<Min>

-5.39 g at 39.68 ms

CFC_1000

Passenger Head Acceleration (Y) Primary (g) vs. Time [ms]



<Max>

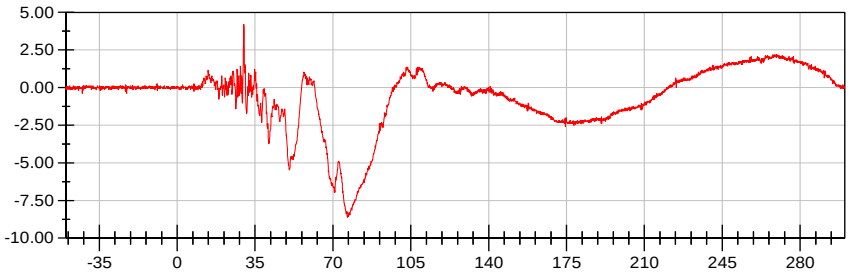
16.07 g at 42.64 ms

<Min>

-2.74 g at 26.64 ms

CFC_1000

Passenger Head Acceleration (Z) Primary (g) vs. Time [ms]



<Max>

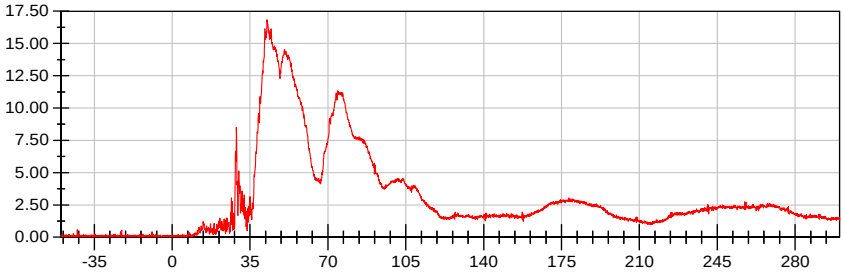
4.19 g at 30.00 ms

<Min>

-8.64 g at 76.56 ms

CFC_1000

Passenger Head Resultant Acceleration Primary (g) vs. Time [ms]



<Max>

16.85 g at 42.64 ms

<Min>

0.03 g at -46.24 ms

CFC_1000

NHTSA

Test Date: 05/10/2019

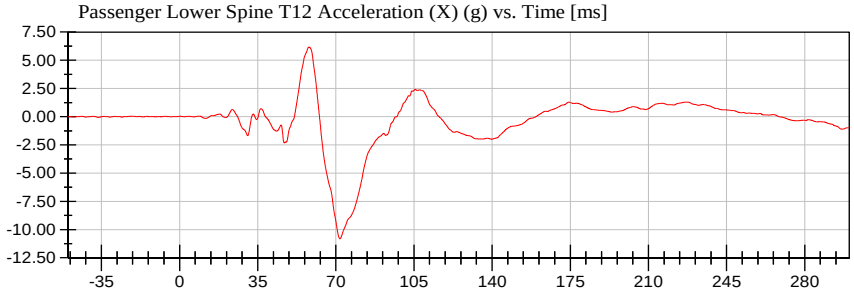
Test Lab: CTF

Position #1 ES-2 Dummy with Rib Extension (F030)

Test Number: 190510 (M20190312)

Position #4 SID IIs Dummy (305)

Passenger Lower Spine T12 Acceleration (X) (g) vs. Time [ms]



<Max>

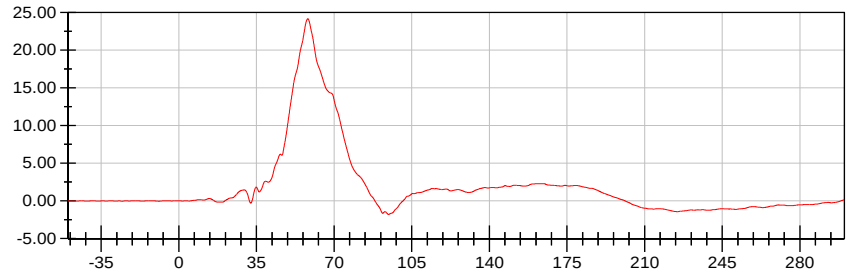
6.17 g at 57.92 ms

<Min>

-10.82 g at 71.84 ms

CFC_180

Passenger Lower Spine T12 Acceleration (Y) (g) vs. Time [ms]



<Max>

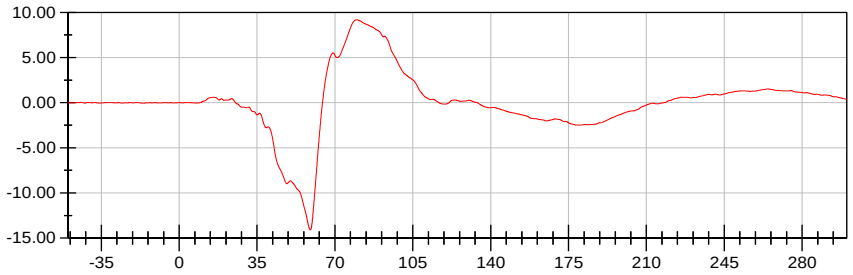
24.18 g at 58.16 ms

<Min>

-1.80 g at 94.56 ms

CFC_180

Passenger Lower Spine T12 Acceleration (Z) (g) vs. Time [ms]



<Max>

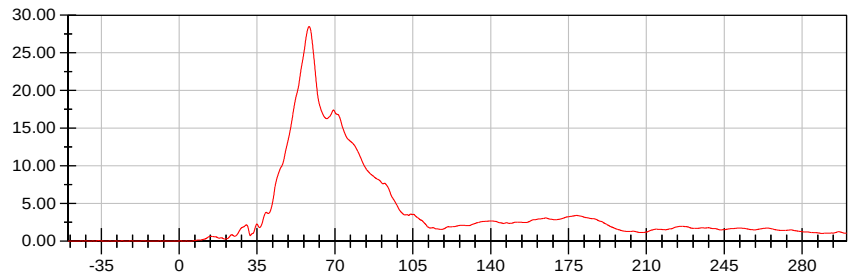
9.18 g at 79.60 ms

<Min>

-14.09 g at 58.96 ms

CFC_180

Passenger Lower Spine T12 Resultant Acceleration (g) vs. Time [ms]



<Max>

28.50 g at 58.40 ms

<Min>

0.00 g at -45.92 ms

CFC_180

NHTSA

Test Date: 05/10/2019

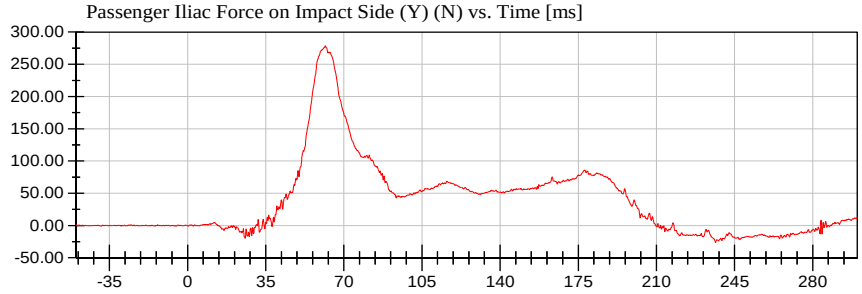
Test Lab: CTF

Position #1 ES-2 Dummy with Rib Extension (F030)

Test Number: 190510 (M20190312)

Position #4 SID IIs Dummy (305)

Passenger Iliac Force on Impact Side (Y) (N) vs. Time [ms]



<Max>

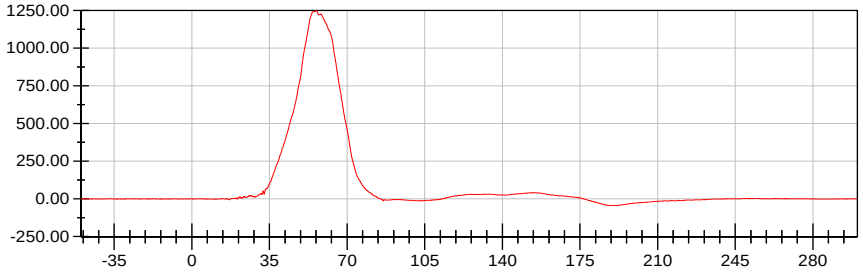
278.59 N at 61.68 ms

<Min>

-26.47 N at 236.48 ms

CFC_600

Passenger Acetabulum Force on Impact Side (Y) (N) vs. Time [ms]



<Max>

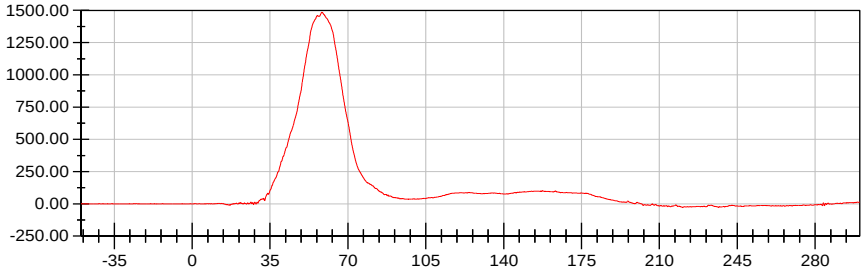
1,249.01 N at 56.00 ms

<Min>

-43.86 N at 189.20 ms

CFC_600

Passenger Total Pelvic Force on Impact Side (Y) (N) vs. Time [ms]



<Max>

1,484.27 N at 58.32 ms

<Min>

-27.21 N at 236.48 ms

CFC_600

APPENDIX C
DUMMY PERFORMANCE CALIBRATION TEST DATA

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

ES-2re (Driver) Dummy

Description

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

SID-IIs (Rear Passenger) Dummy

Description

Pre-Test Calibration Sheets
Driver S/N F030

Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 62

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	911	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	561	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	347	Yes
4	Seat to Hip Joint (center of bolt)	97.0 - 103.0	97	Yes
5	Sole to Seat, Sitting	433.0 - 451.0	445	Yes
6	Head Width	152.0 - 158.0	155	Yes
7	Shoulder/Arm Width	461.0 - 479.0	475	Yes
8	Thorax Width	322.0 - 332.0	328	Yes
9	Abdomen Width	273.0 - 287.0	280	Yes
10	Pelvis Lap Width	359.0 - 373.0	367	Yes
11	Head Depth	196.0 - 206.0	201	Yes
12	Thorax Depth	262.0 - 272.0	262	Yes
13	Abdomen Depth	194.0 - 204.0	199	Yes
14	Pelvis Depth	235.0 - 245.0	242	Yes
15	Back of Buttocks to Hip Joint (center of bolt)	150.0 - 160.0	156	Yes
16	Back of Buttocks to Front of Knee	597.0 - 615.0	605	Yes

Baseline 10/07/05

Transportation Research Center Inc.

Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Peak Resultant Acceleration	125 - 155 g	143.2 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	9.6 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

Test meets specifications.

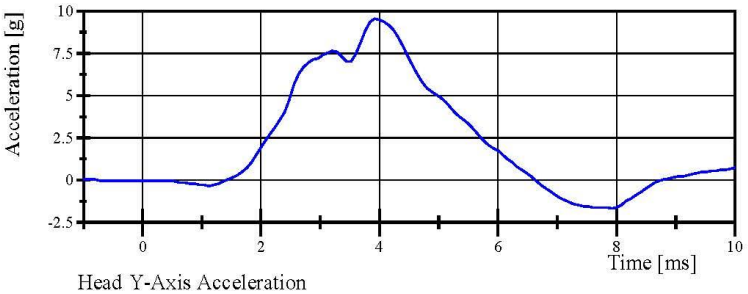
Condition: Used

Comments:
Head Skin S/N: DP6812

Transportation Research Center Inc.

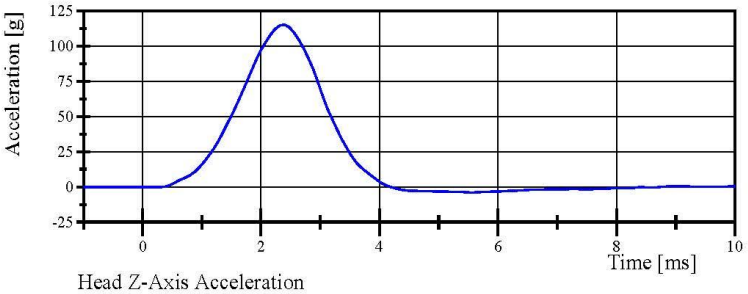
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019

Head X-Axis Acceleration



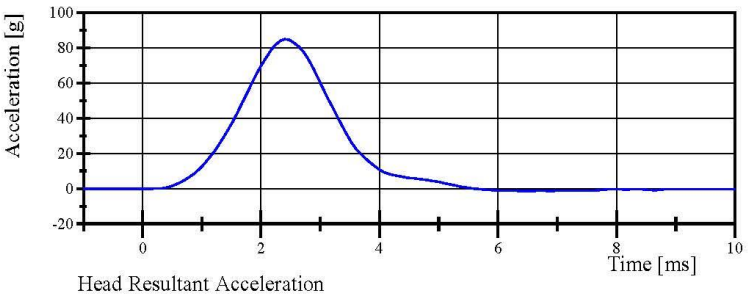
Filter Class: CFC_1000
Max: 9.6 g at 3.9 ms
Min: -1.7 g at 7.9 ms

Head Y-Axis Acceleration



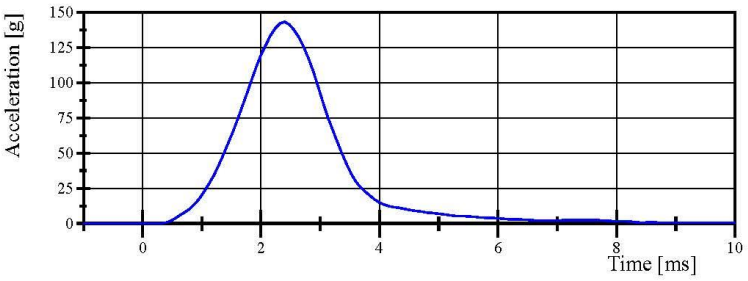
Filter Class: CFC_1000
Max: 115.2 g at 2.4 ms
Min: -3.9 g at 5.5 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 85.0 g at 2.4 ms
Min: -1.3 g at 6.4 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 143.2 g at 2.4 ms
Min: 0.0 g at -0.7 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.22.2019 08:58:29 324

Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 62-4
Test Date: 3/25/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.44 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-53.3 deg	Yes
Time of Peak	54 - 66 ms	54.4 ms	Yes
Headform Flexion Decay - Peak to Zero	53 - 88 ms	63.9 ms	Yes

Test meets specifications.

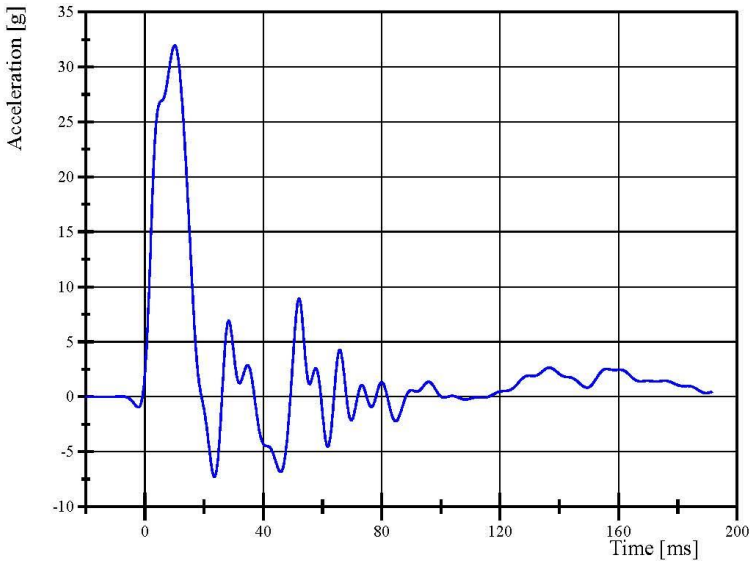
Condition: Used

Comments:
Neck S/N: DS5463

Transportation Research Center Inc.

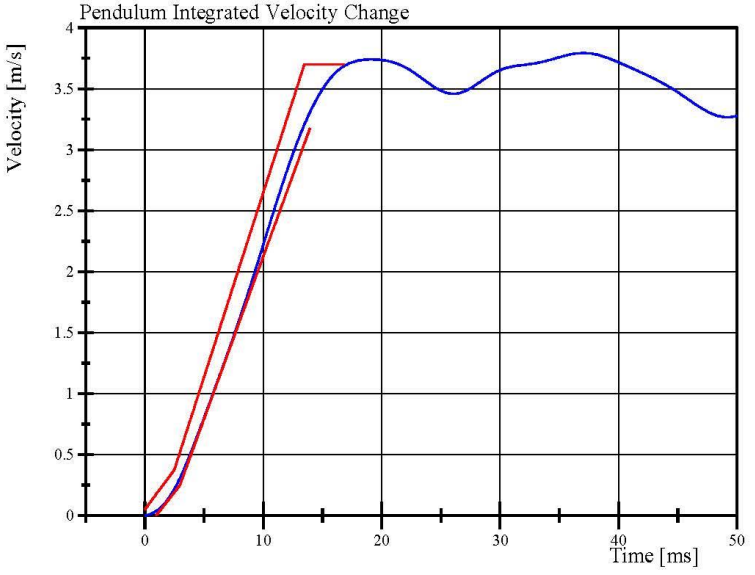
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 62-4
Test Date: 3/25/2019

Pendulum Acceleration



Filter Class: CFC_60
Max: 31.9 g at 10.1 ms
Min: -7.3 g at 23.5 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 3.8 m/s at 37.0 ms
Min: 0.0 m/s at 0.0 ms

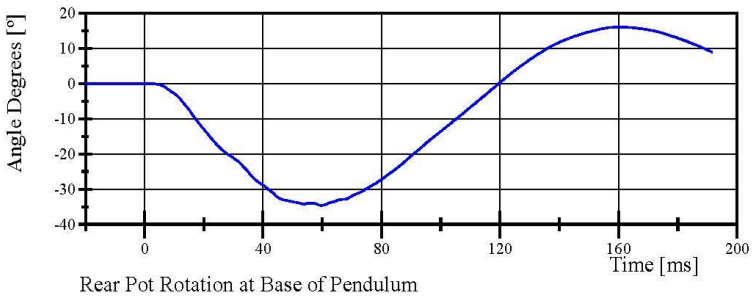
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.25.2019 07:24:13 1430

Transportation Research Center Inc.

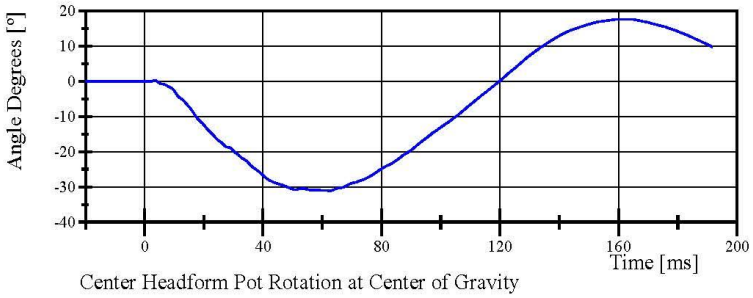
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 62-4
Test Date: 3/25/2019

Forward Pot Rotation at Base of Pendulum



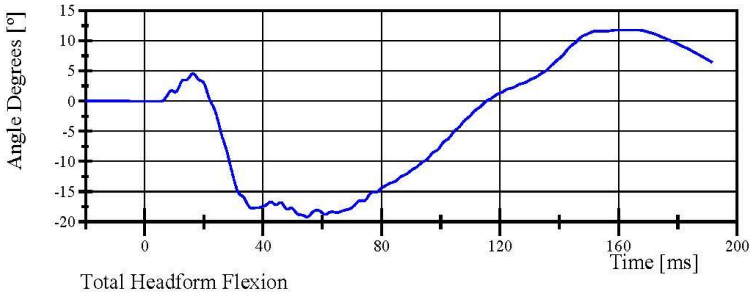
Filter Class: CFC_180
Max: 16.0 ° at 161.7 ms
Min: -34.6 ° at 59.7 ms

Rear Pot Rotation at Base of Pendulum



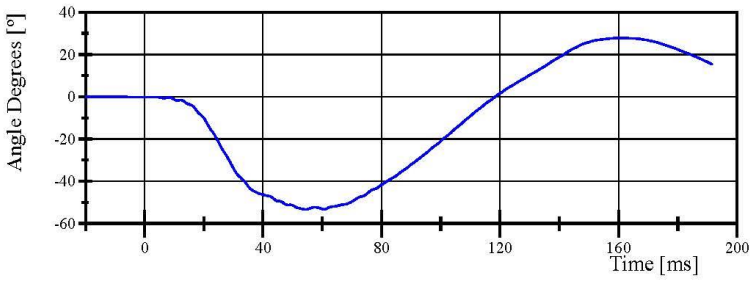
Filter Class: CFC_180
Max: 17.7 ° at 162.6 ms
Min: -31.0 ° at 62.6 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 11.8 ° at 166.5 ms
Min: -19.2 ° at 54.8 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 27.8 ° at 161.7 ms
Min: -53.3 ° at 54.4 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.25.2019 07:24:14 1430

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/25/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.31 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-10.22 g	Yes

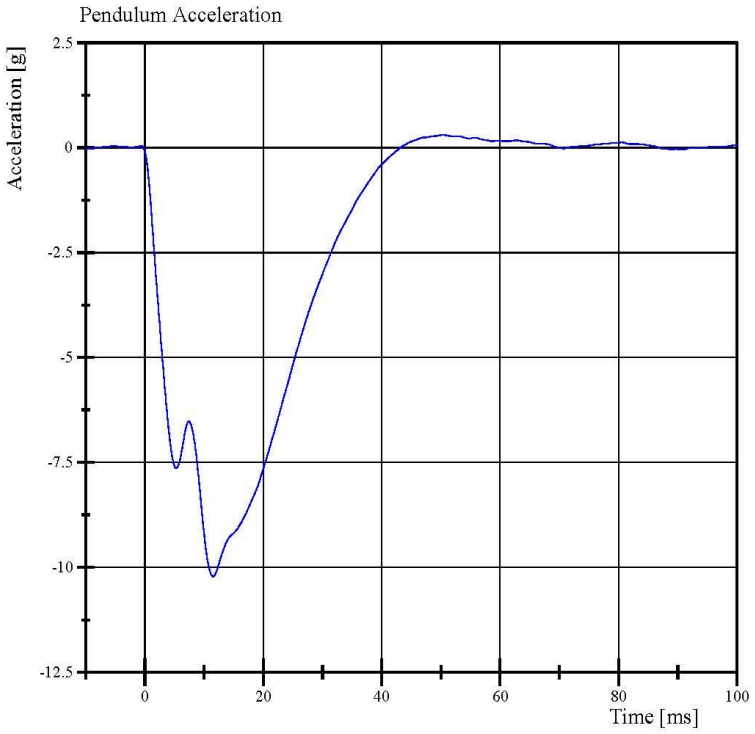
Test meets specifications.

Condition: Used

Comments:
Arm S/N: 175-3501-07014

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/25/2019



Filter Class: CFC_180
Max: 0.3 g at 50.4 ms
Min: -10.2 g at 11.5 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.25.2019 08:16:51 554

Transportation Research Center Inc.

3.0 m/s Upper Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.4 mm	Yes

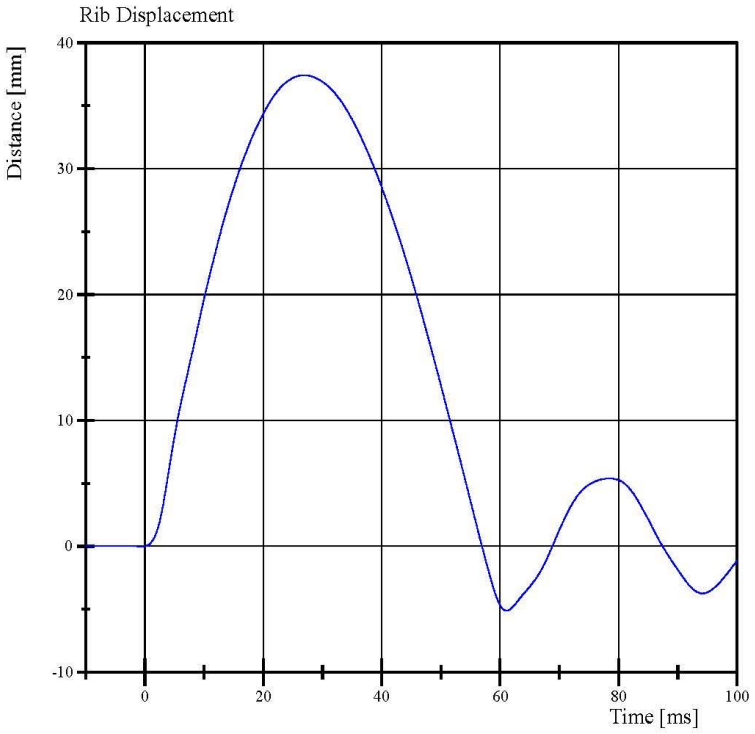
Test meets specifications.

Condition: Used

Comments:
Drop Height: 462mm
Rib Module: 175-4008-A

Transportation Research Center Inc.

3.0 m/s Upper Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019



Filter Class: CFC_180
Max: 37.4 mm at 27.0 ms
Min: -5.1 mm at 61.0 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.22.2019 09:14:43 481

Transportation Research Center Inc.

4.0 m/s Upper Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	46.7 mm	Yes

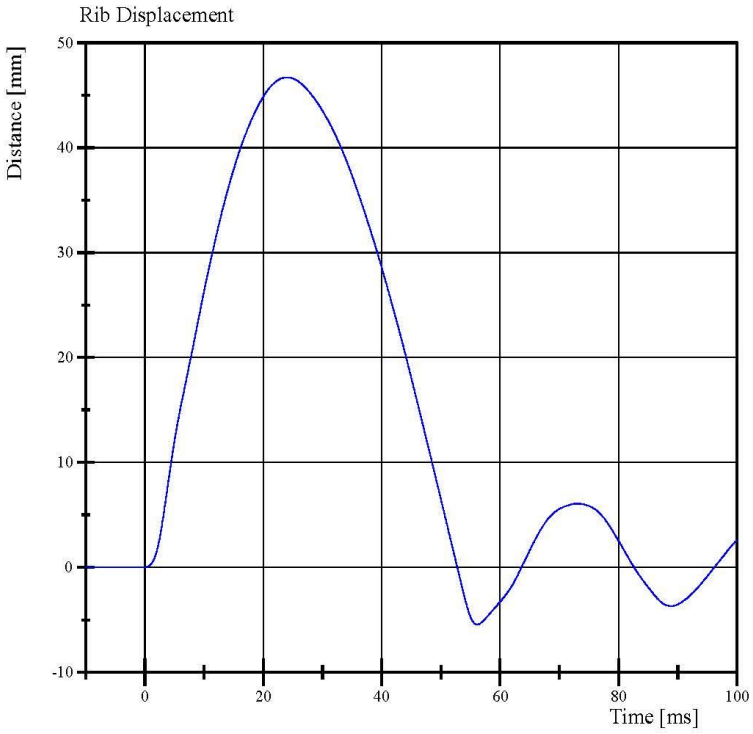
Test meets specifications.

Condition: Used

Comments:
Drop Height: 816mm
Rib Module: 175-4008-A

Transportation Research Center Inc.

4.0 m/s Upper Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019



Filter Class: CFC_180
Max: 46.7 mm at 24.0 ms
Min: -5.5 mm at 56.1 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.22.2019 09:05:00 409

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.6 mm	Yes

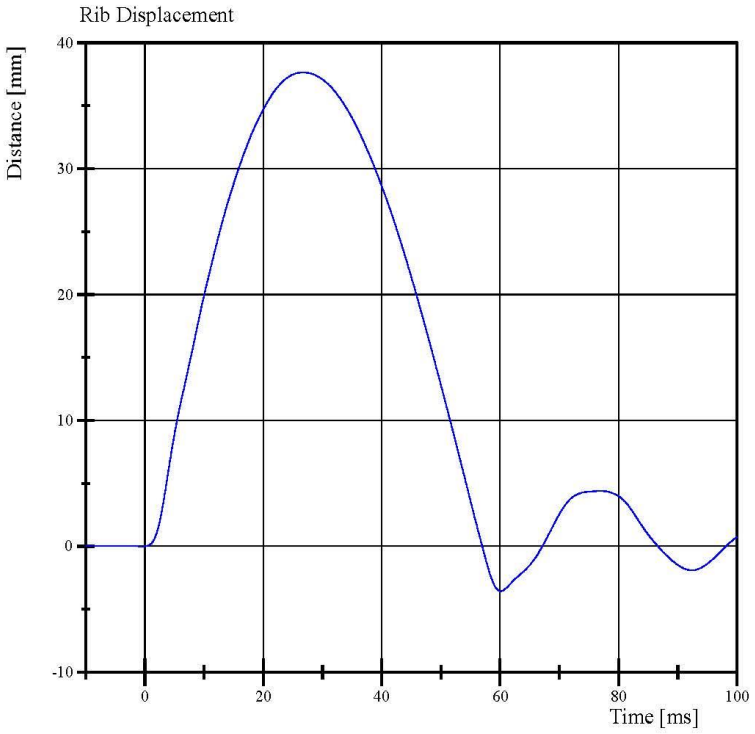
Test meets specifications.

Condition: Used

Comments:
Drop Height: 462 mm
Rib Module: 175-4008-A

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019



Filter Class: CFC_180
Max: 37.6 mm at 26.8 ms
Min: -3.6 mm at 60.1 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.22.2019 09:54:50 501

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.8 mm	Yes

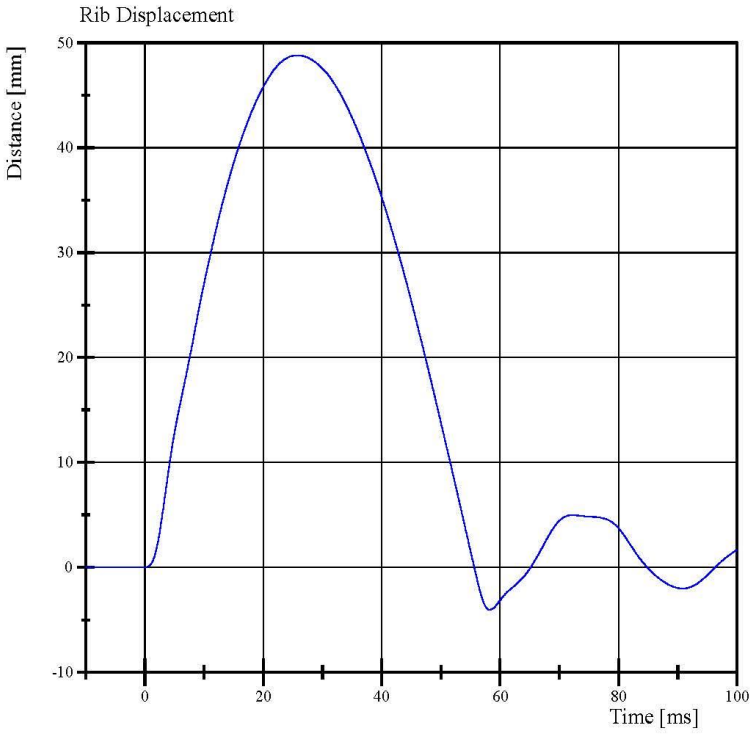
Test meets specifications.

Condition: Used

Comments:
Drop Height: 816 mm
Rib Module: 175-4008-A

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019



Filter Class: CFC_180
Max: 48.8 mm at 25.8 ms
Min: -4.1 mm at 58.2 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.22.2019 09:48:57 417

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 ℃	21.6 ℃	Yes
Relative Humidity	10 - 70 %	40 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.5 mm	Yes

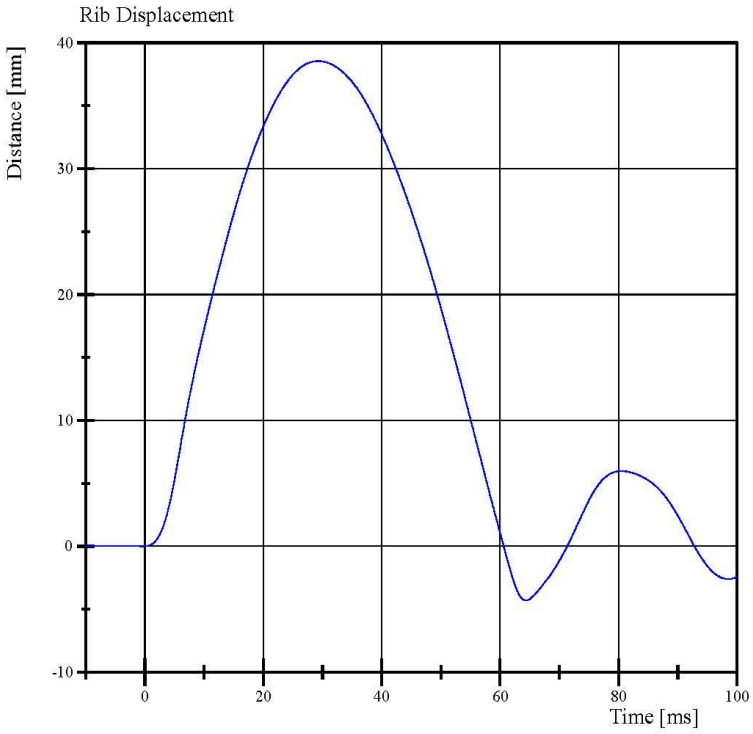
Test meets specifications.

Condition: Used

Comments:
Drop Height: 462 mm
Rib Module: 175-4008-A-06-017

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019



Filter Class: CFC_180
Max: 38.5 mm at 29.4 ms
Min: -4.3 mm at 64.3 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.22.2019 10:16:08 476

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 ℃	21.4 ℃	Yes
Relative Humidity	10 - 70 %	40 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	49.5 mm	Yes

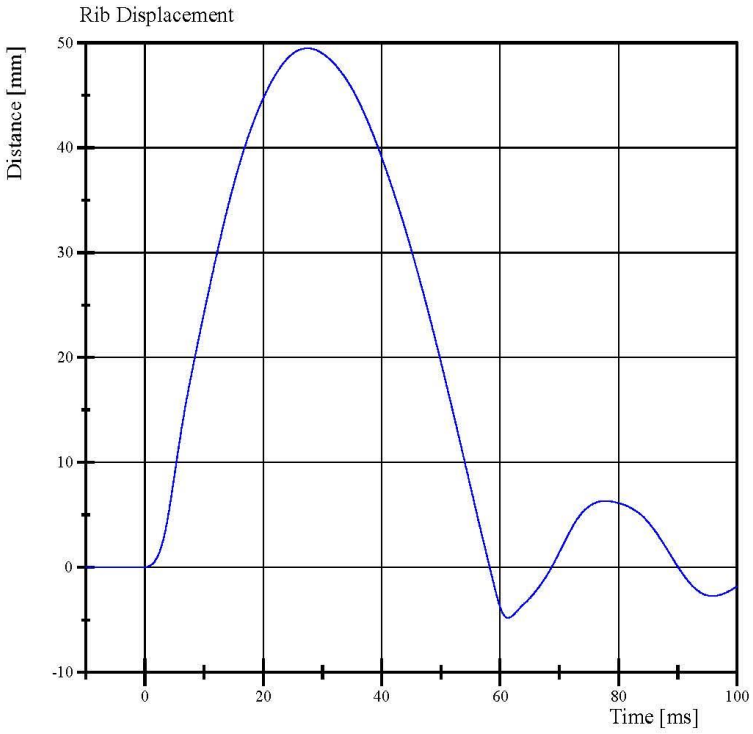
Test meets specifications.

Condition: Used

Comments:
Drop Height: 816 mm
Rib Module: 175-4008-A-06-017

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/22/2019



Filter Class: CFC_180
Max: 49.5 mm at 27.4 ms
Min: -4.8 mm at 61.3 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.22.2019 10:10:09 393

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/25/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.546 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,376.4 N	Yes
Upper Rib Displacement	34 - 41 mm	37.8 mm	Yes
Center Rib Displacement	37 - 45 mm	42.2 mm	Yes
Lower Rib Displacement	37 - 44 mm	41.1 mm	Yes

Test meets specifications.

Condition: Used

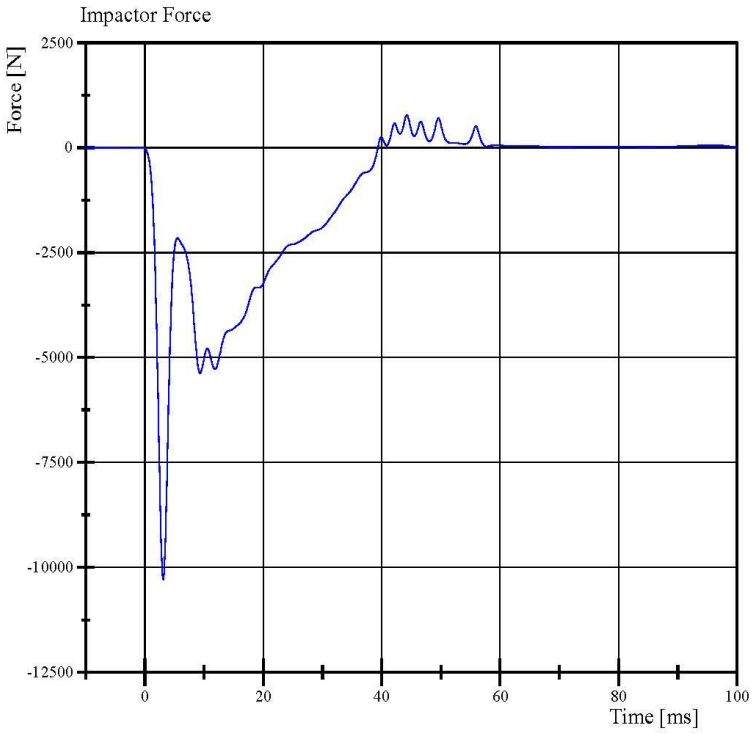
Comments:
Upper Rib Module S/N: 175-4008-A
Middle Rib Module S/N: 175-4008-A
Lower Rib Module S/N: 175-4008-A-06-017

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.25.2019 08:33:14 446

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/25/2019



Filter Class: CFC_180
Max: 785.8 N at 44.2 ms
Min: -10,296.6 N at 3.1 ms

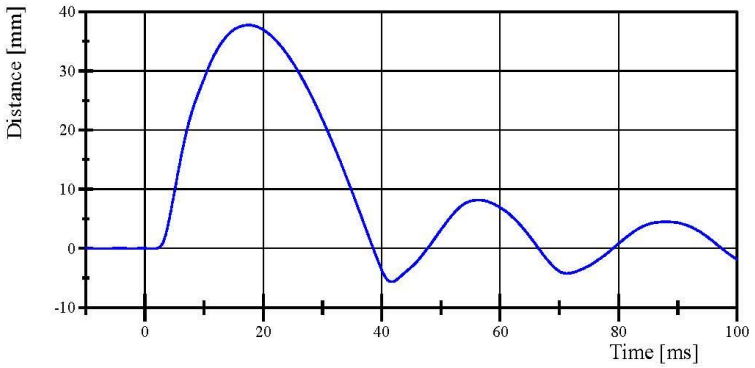
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.25.2019 08:33:59 446

Transportation Research Center Inc.

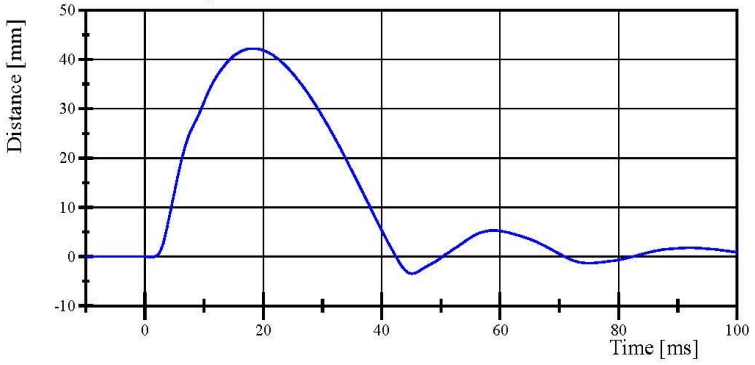
Left Lower Thorax
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/25/2019

Upper Rib Displacement



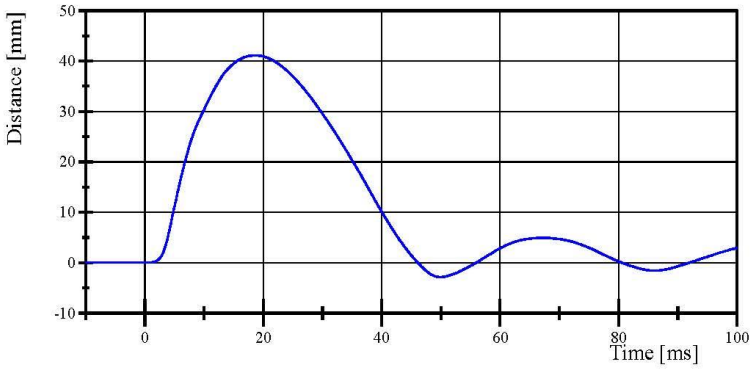
Filter Class: CFC_180
Max: 37.8 mm at 17.5 ms
Min: -5.7 mm at 41.7 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 42.2 mm at 18.3 ms
Min: -3.5 mm at 45.1 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 41.1 mm at 18.6 ms
Min: -2.8 mm at 49.9 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.25.2019 08:34:00 446

Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 62-2
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.095 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-47.8 deg	Yes
Time of Peak	39 - 53 ms	43.0 ms	Yes
Headform Flexion Decay - Peak to Zero	37 - 57 ms	38.0 ms	Yes

Test meets specifications.

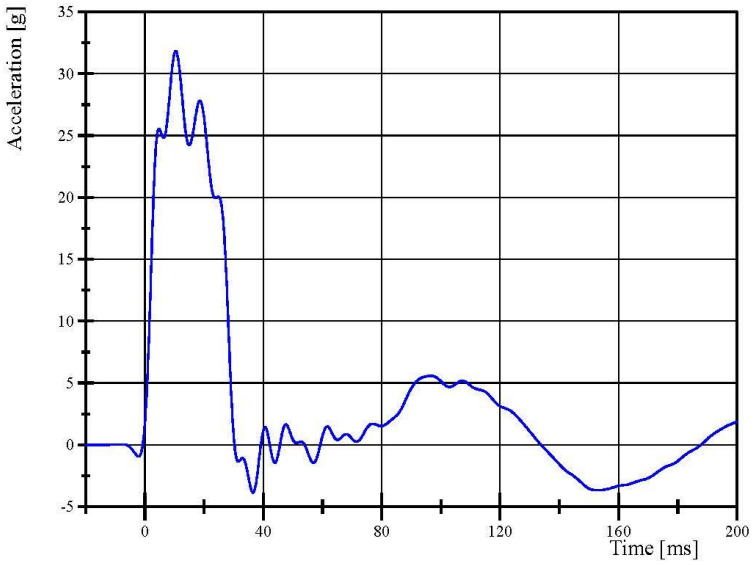
Condition: Used

Comments:
Lumbar S/N: DM3011

Transportation Research Center Inc.

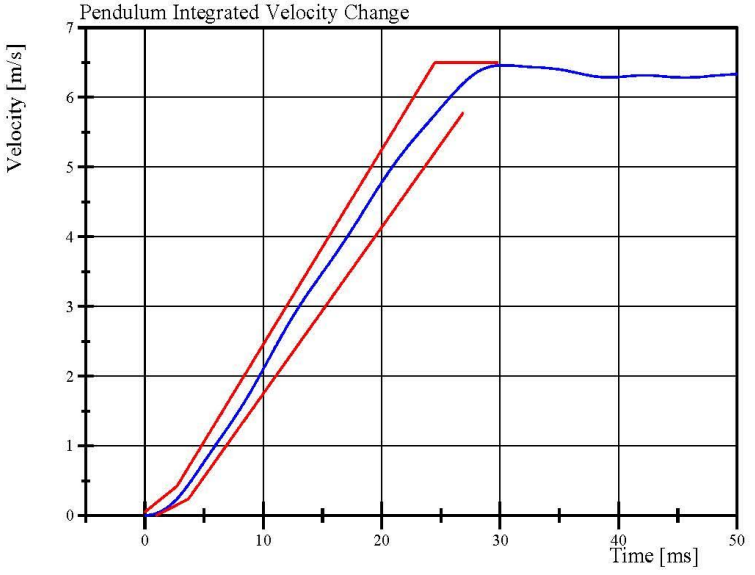
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 62-2
Test Date: 3/22/2019

Pendulum Acceleration



Filter Class: CFC_60
Max: 31.8 g at 10.4 ms
Min: -3.9 g at 36.6 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 6.5 m/s at 30.2 ms
Min: 0.0 m/s at 0.0 ms

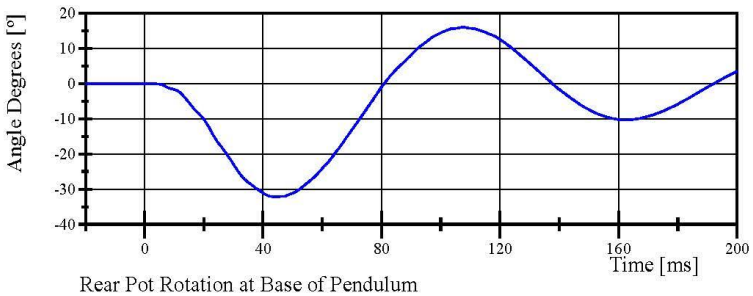
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.22.2019 10:36:42 638

Transportation Research Center Inc.

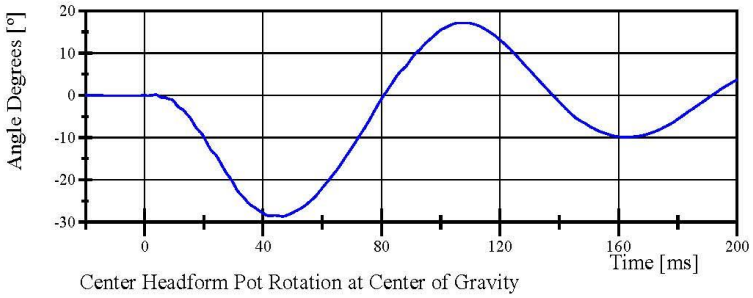
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 62-2
Test Date: 3/22/2019

Forward Pot Rotation at Base of Pendulum



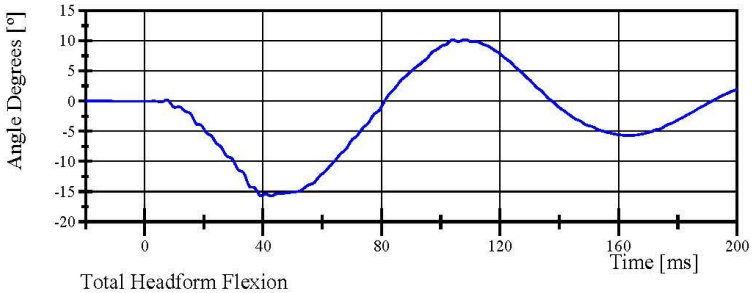
Filter Class: CFC_180
Max: 16.0 ° at 107.4 ms
Min: -32.2 ° at 44.4 ms

Rear Pot Rotation at Base of Pendulum



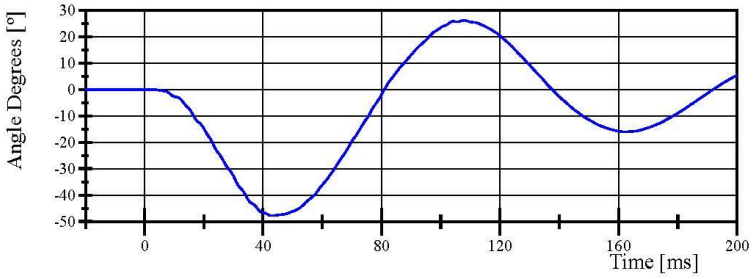
Filter Class: CFC_180
Max: 17.2 ° at 107.0 ms
Min: -28.6 ° at 46.5 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 10.2 ° at 108.1 ms
Min: -15.7 ° at 42.7 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 26.2 ° at 107.8 ms
Min: -47.8 ° at 43.0 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.22.2019 10:36:42 638

Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/25/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.08 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,219.7 N	Yes
Time of Peak	10.6 - 13.0 ms	11.20 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,472.7 N	Yes
Time of Peak	10.0 - 12.3 ms	10.80 ms	Yes

Test meets specifications.

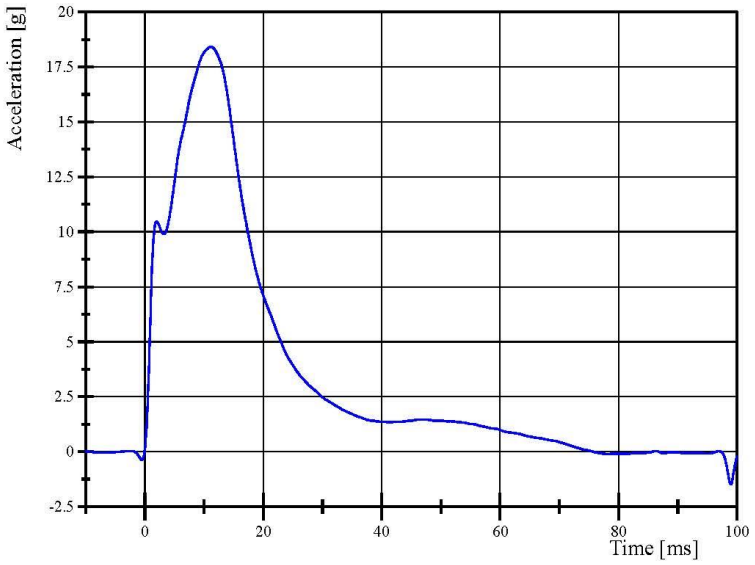
Condition: Used

Comments:
Abdomen S/N: 1066

Transportation Research Center Inc.

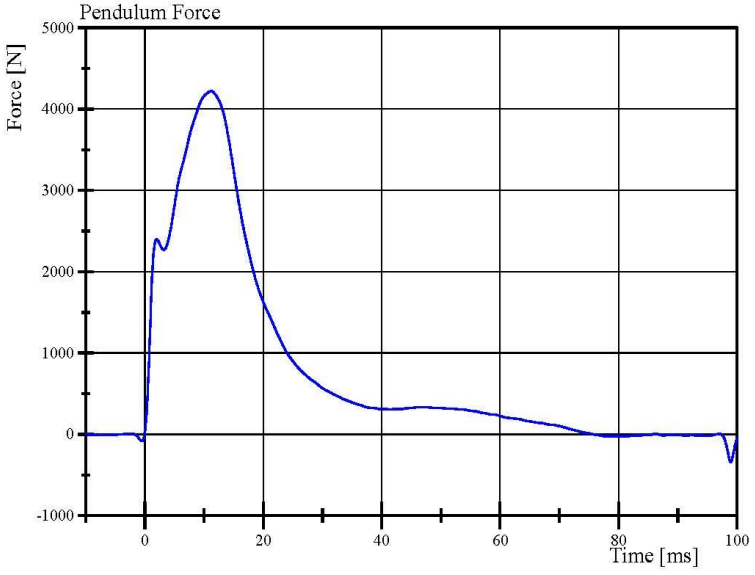
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/25/2019

Pendulum Acceleration



Filter Class: CFC_180
Max: 18.4 g at 11.2 ms
Min: -1.5 g at 99.0 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,219.7 N at 11.2 ms
Min: -341.7 N at 99.0 ms

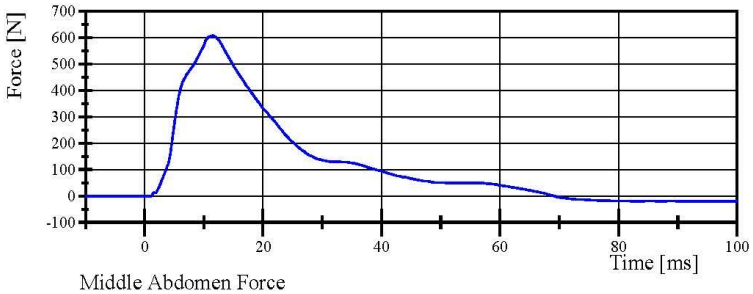
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.25.2019 08:51:00 595

Transportation Research Center Inc.

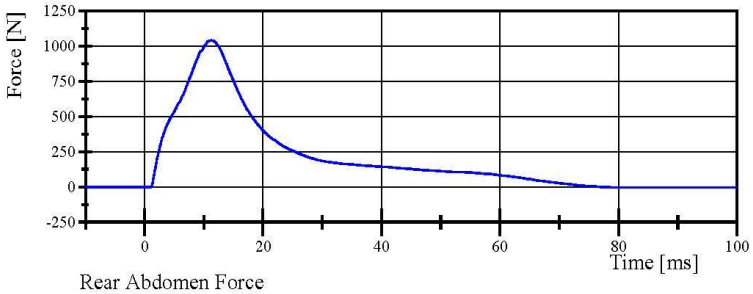
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/25/2019

Front Abdomen Force



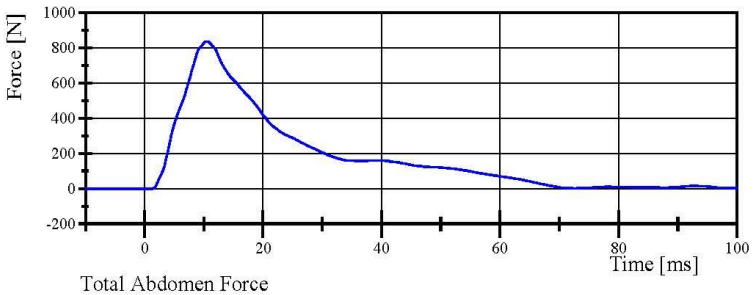
Filter Class: CFC_600
Max: 607.7 N at 11.4 ms
Min: -20.7 N at 97.4 ms

Middle Abdomen Force



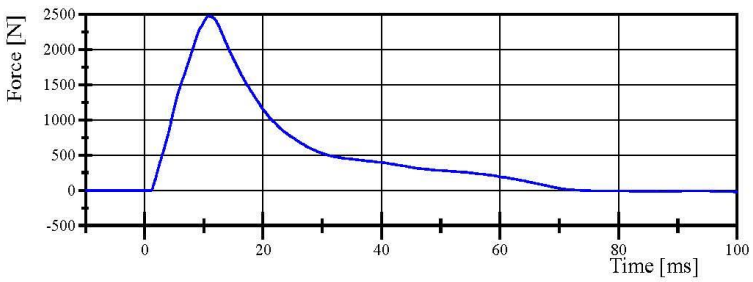
Filter Class: CFC_600
Max: 1,040.4 N at 11.4 ms
Min: -4.4 N at 97.3 ms

Rear Abdomen Force



Filter Class: CFC_600
Max: 837.0 N at 10.5 ms
Min: -0.2 N at -4.1 ms

Total Abdomen Force



Filter Class: CFC_600
Max: 2,472.7 N at 10.8 ms
Min: -21.3 N at 100.0 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

03.25.2019 08:51:01 595

Transportation Research Center Inc.

Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/25/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.36 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,344.6 N	Yes
Time of Peak	11.8 - 16.1 ms	13.12 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,324.8 N	Yes
Time of Peak	12.2 - 17.0 ms	13.12 ms	Yes

Test meets specifications.

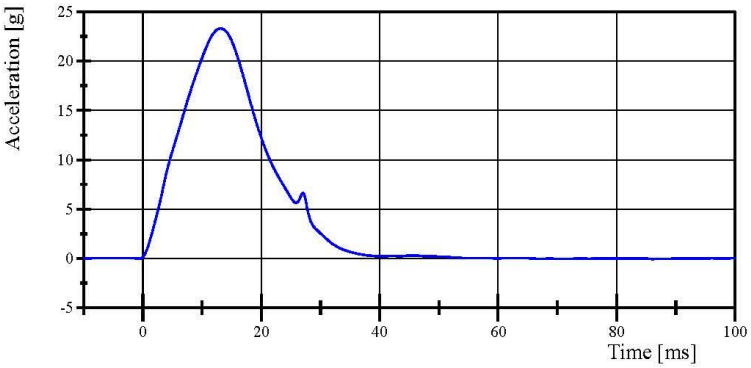
Condition: Used

Comments:
Pelvis Skin S/N: N/A

Transportation Research Center Inc.

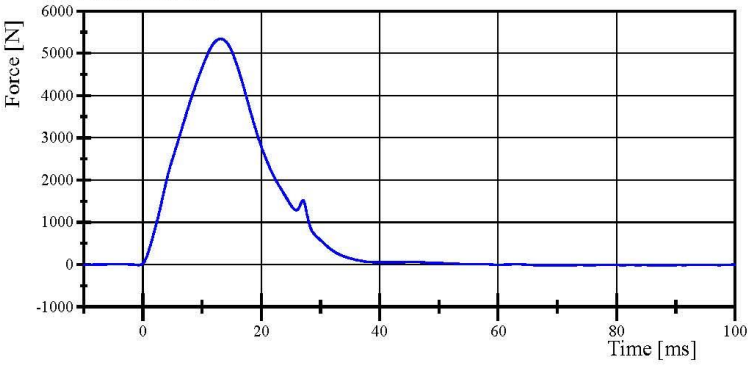
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 62-1
Test Date: 3/25/2019

Pendulum Acceleration



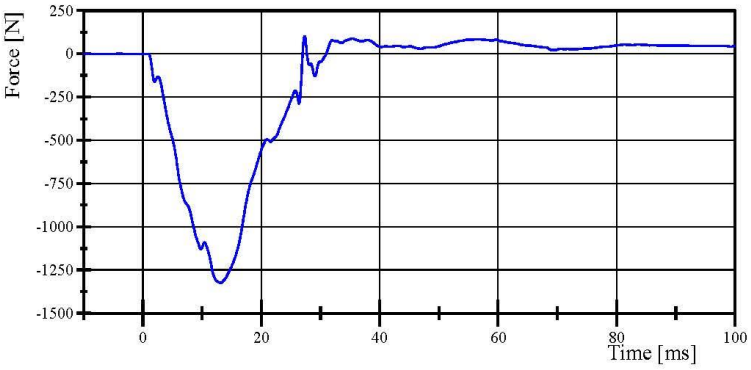
Filter Class: CFC_180
Max: 23.3 g at 13.1 ms
Min: -0.1 g at 86.1 ms

Pendulum Force



Filter Class: CFC_180
Max: 5,344.6 N at 13.1 ms
Min: -16.8 N at 86.1 ms

Pubic Symphysis Force



Filter Class: CFC_600
Max: 101.6 N at 27.3 ms
Min: -1,324.8 N at 13.1 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

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Post-Test Calibration Sheets
Driver S/N F030

Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 63

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	911	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	561	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	347	Yes
4	Seat to Hip Joint (center of bolt)	97.0 - 103.0	97	Yes
5	Sole to Seat, Sitting	433.0 - 451.0	445	Yes
6	Head Width	152.0 - 158.0	155	Yes
7	Shoulder/Arm Width	461.0 - 479.0	475	Yes
8	Thorax Width	322.0 - 332.0	328	Yes
9	Abdomen Width	273.0 - 287.0	280	Yes
10	Pelvis Lap Width	359.0 - 373.0	367	Yes
11	Head Depth	196.0 - 206.0	201	Yes
12	Thorax Depth	262.0 - 272.0	262	Yes
13	Abdomen Depth	194.0 - 204.0	199	Yes
14	Pelvis Depth	235.0 - 245.0	242	Yes
15	Back of Buttocks to Hip Joint (center of bolt)	150.0 - 160.0	156	Yes
16	Back of Buttocks to Front of Knee	597.0 - 615.0	605	Yes

Baseline 10/07/05

Transportation Research Center Inc.

Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/13/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Peak Resultant Acceleration	125 - 155 g	145.1 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	8.7 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

Test meets specifications.

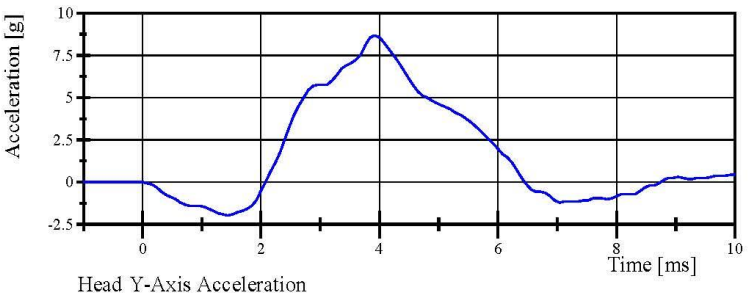
Condition: Used

Comments:
Head Skin S/N: DP6812

Transportation Research Center Inc.

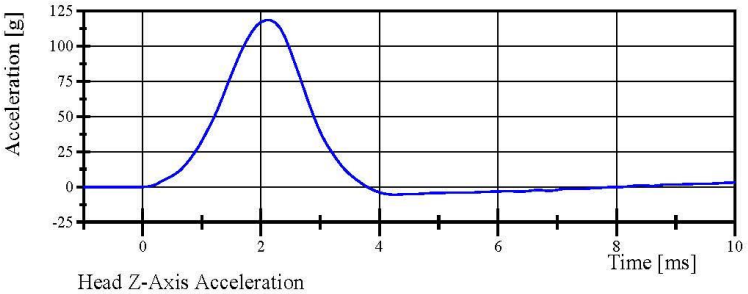
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/13/2019

Head X-Axis Acceleration



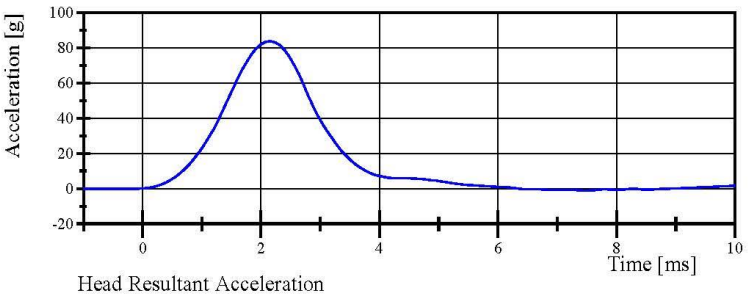
Filter Class: CFC_1000
Max: 8.7 g at 3.9 ms
Min: -2.0 g at 1.4 ms

Head Y-Axis Acceleration



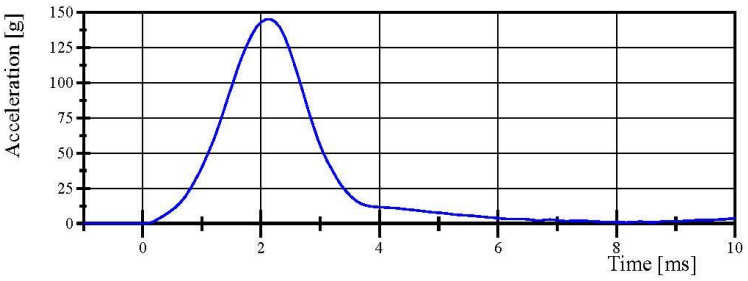
Filter Class: CFC_1000
Max: 118.4 g at 2.1 ms
Min: -5.5 g at 4.2 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 83.8 g at 2.2 ms
Min: -1.0 g at 7.4 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 145.1 g at 2.2 ms
Min: 0.0 g at -0.7 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

05.13.2019 15:24:01 328

Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 63-3
Test Date: 5/14/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.37 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-52.7 deg	Yes
Time of Peak	54 - 66 ms	59.9 ms	Yes
Headform Flexion Decay - Peak to Zero	53 - 88 ms	59.4 ms	Yes

Test meets specifications.

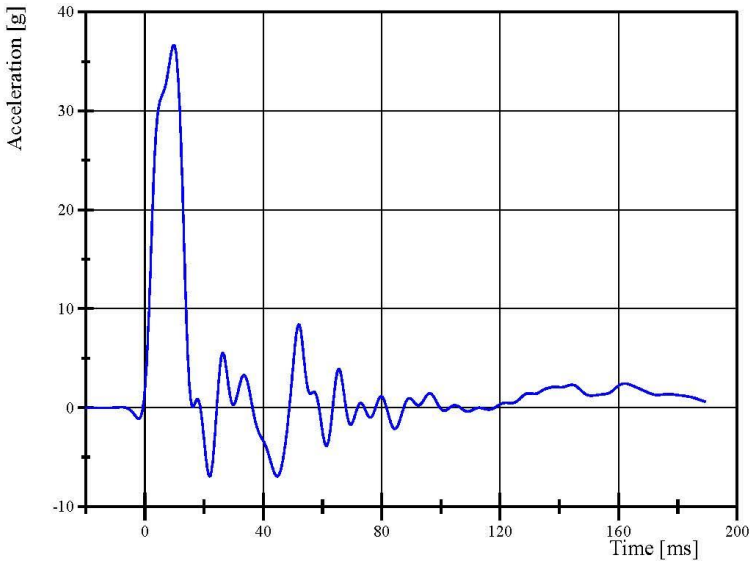
Condition: Used

Comments:
Neck S/N: DS5463

Transportation Research Center Inc.

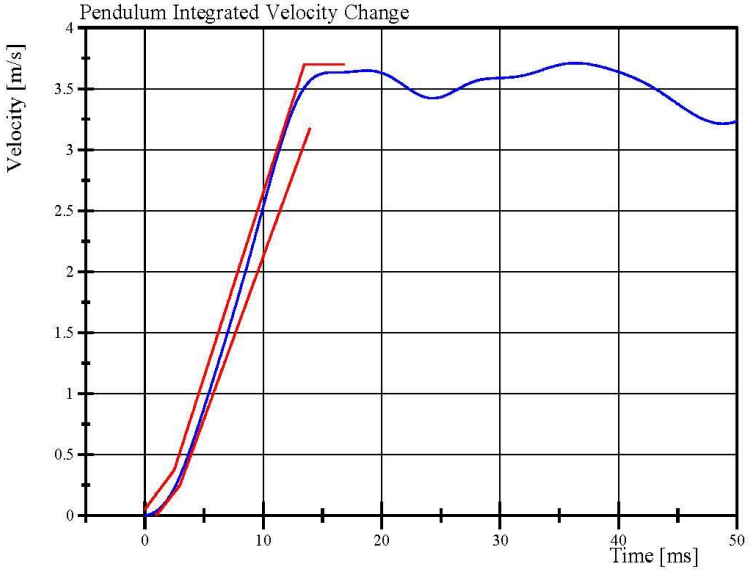
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 63-3
Test Date: 5/14/2019

Pendulum Acceleration



Filter Class: CFC_60
Max: 36.6 g at 9.8 ms
Min: -6.9 g at 21.9 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 3.7 m/s at 36.4 ms
Min: 0.0 m/s at 0.0 ms

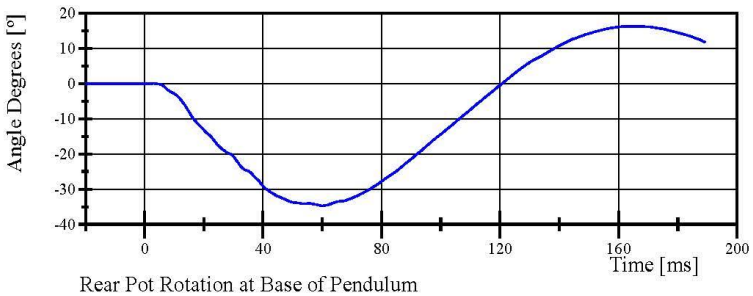
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

05.14.2019 15:35:47 1459

Transportation Research Center Inc.

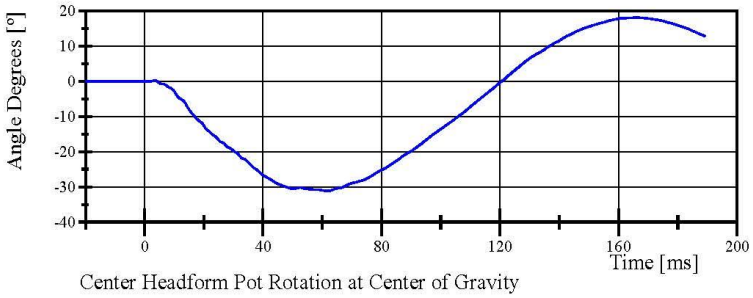
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 63-3
Test Date: 5/14/2019

Forward Pot Rotation at Base of Pendulum



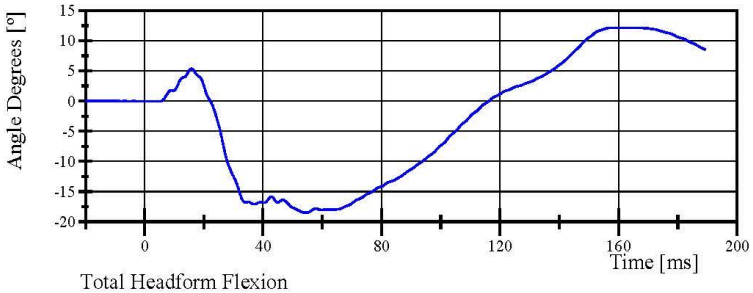
Filter Class: CFC_180
Max: 16.3 ° at 165.0 ms
Min: -34.7 ° at 60.0 ms

Rear Pot Rotation at Base of Pendulum



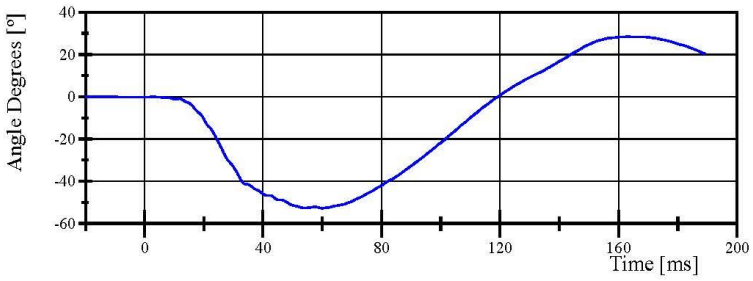
Filter Class: CFC_180
Max: 18.1 ° at 166.1 ms
Min: -31.1 ° at 61.9 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 12.1 ° at 161.6 ms
Min: -18.5 ° at 54.4 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 28.4 ° at 163.1 ms
Min: -52.7 ° at 59.9 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

05.14.2019 15:35:47 1459

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/15/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.30 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.32 g	Yes

Test meets specifications.

Condition: Used

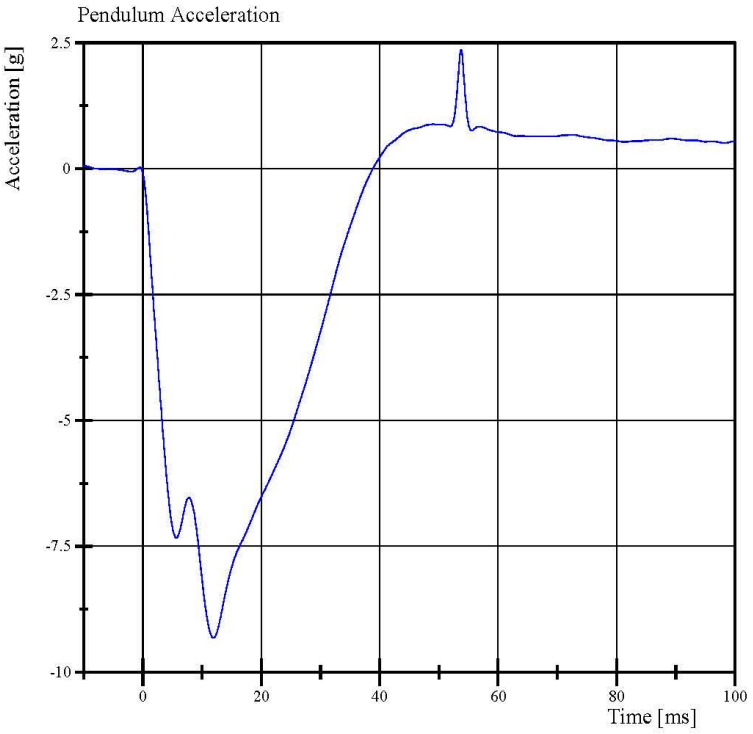
Comments:
Arm S/N: 175-3501-07014

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

05.15.2019 09:03:11 532

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/15/2019



Filter Class: CFC_180
Max: 2.4 g at 53.8 ms
Min: -9.3 g at 11.9 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

05.15.2019 09:03:54 532

Transportation Research Center Inc.

3.0 m/s Upper Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/14/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.9 mm	Yes

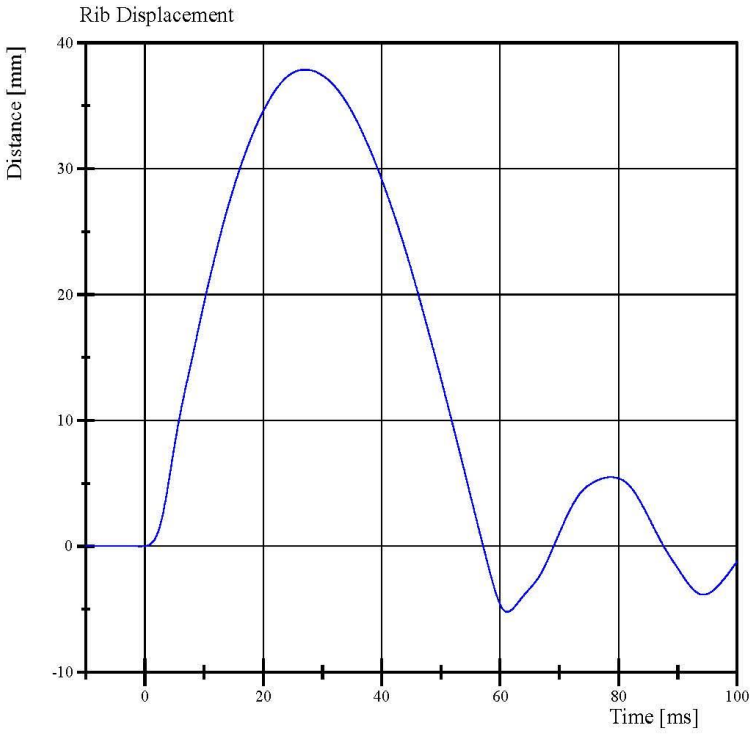
Test meets specifications.

Condition: Used

Comments:
Drop Height: 462mm
Rib Module: 175-4008-A

Transportation Research Center Inc.

3.0 m/s Upper Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/14/2019



Filter Class: CFC_180
Max: 37.9 mm at 27.0 ms
Min: -5.2 mm at 61.2 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

05.14.2019 07:39:03 498

Transportation Research Center Inc.

4.0 m/s Upper Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/14/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	46.8 mm	Yes

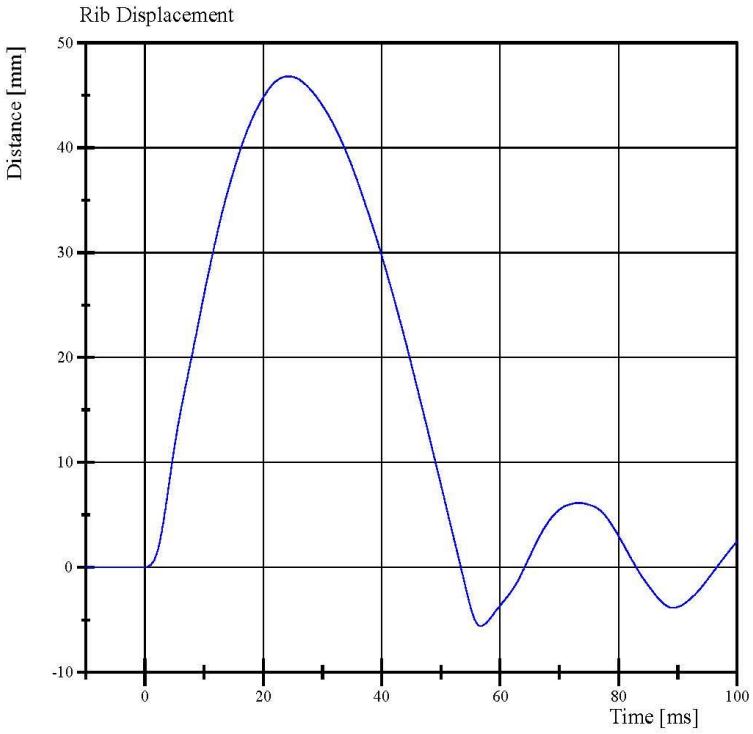
Test meets specifications.

Condition: Used

Comments:
Drop Height: 816mm
Rib Module: 175-4008-A

Transportation Research Center Inc.

4.0 m/s Upper Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/14/2019



Filter Class: CFC_180
Max: 46.8 mm at 24.3 ms
Min: -5.6 mm at 56.7 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

05.14.2019 07:33:42 409

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/14/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.3 mm	Yes

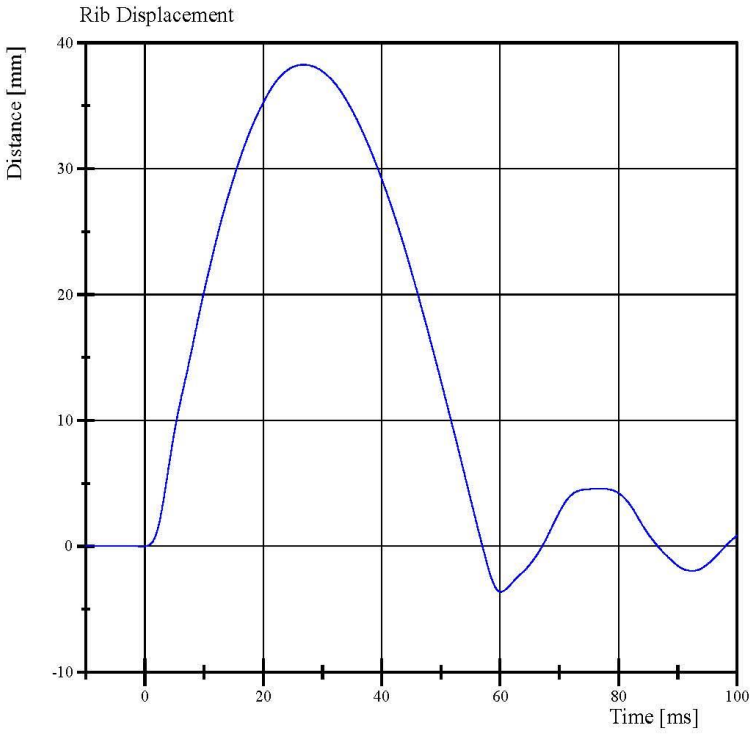
Test meets specifications.

Condition: Used

Comments:
Drop Height: 462 mm
Rib Module: 175-4008-A

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/14/2019



Filter Class: CFC_180
Max: 38.3 mm at 26.8 ms
Min: -3.6 mm at 60.2 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

05.14.2019 11:19:03 476

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 63-2
Test Date: 5/14/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	49.3 mm	Yes

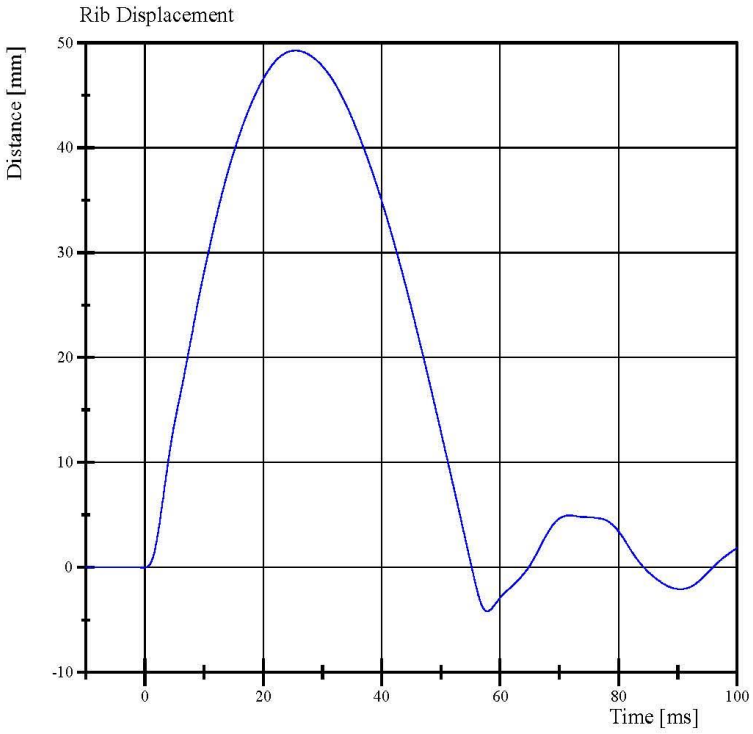
Test meets specifications.

Condition: Used

Comments:
Drop Height: 816 mm
Rib Module: 175-4008-A

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 63-2
Test Date: 5/14/2019



Filter Class: CFC_180
Max: 49.3 mm at 25.4 ms
Min: -4.2 mm at 57.8 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

05.14.2019 10:51:21 405

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/14/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	39.0 mm	Yes

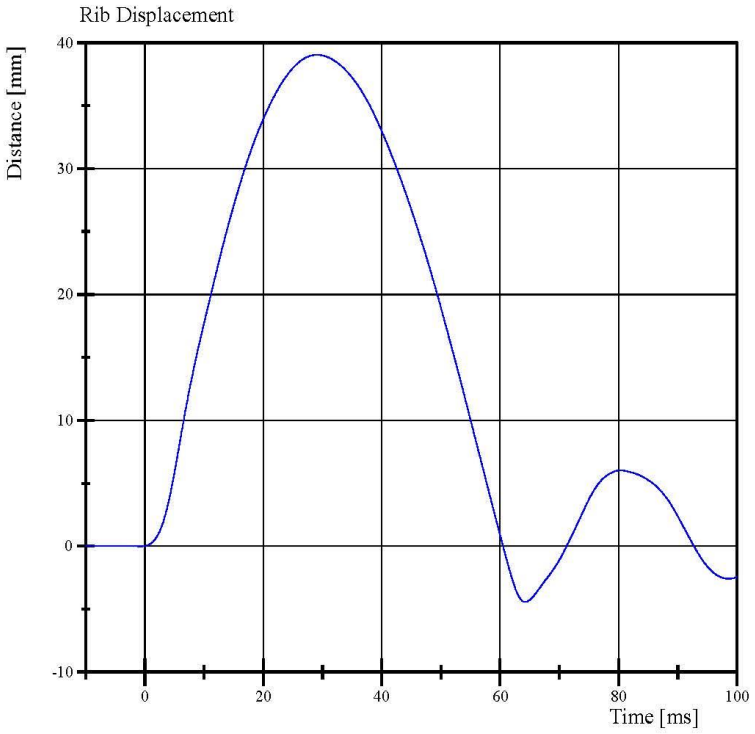
Test meets specifications.

Condition: Used

Comments:
Drop Height: 462 mm
Rib Module: 175-4008-A-06-017

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/14/2019



Filter Class: CFC_180
Max: 39.0 mm at 29.1 ms
Min: -4.4 mm at 64.2 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

05.14.2019 11:53:02 462

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/14/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	49.8 mm	Yes

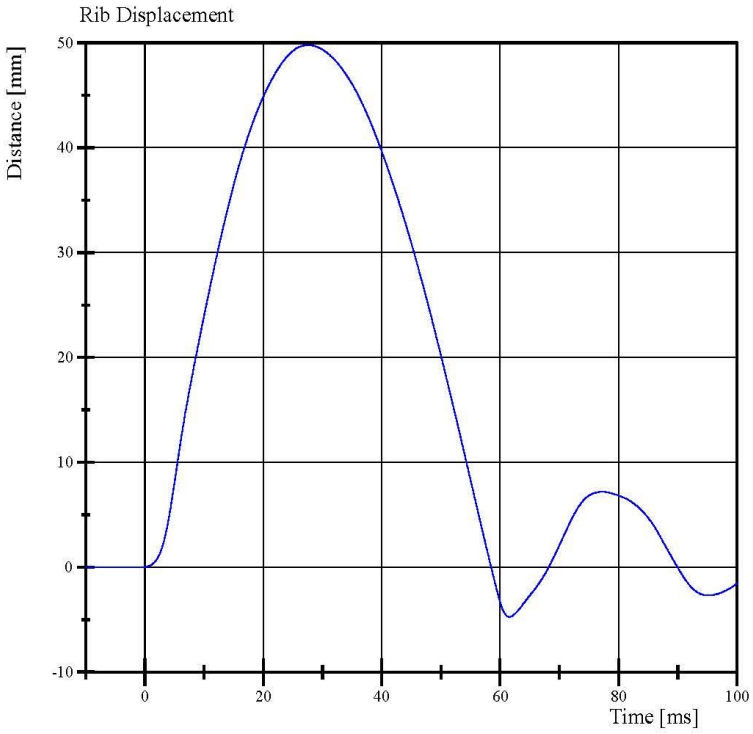
Test meets specifications.

Condition: Used

Comments:
Drop Height: 816 mm
Rib Module: 175-4008-A-06-017

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/14/2019



Filter Class: CFC_180
Max: 49.8 mm at 27.6 ms
Min: -4.7 mm at 61.5 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

05.14.2019 11:39:38 379

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/15/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.503 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,474.9 N	Yes
Upper Rib Displacement	34 - 41 mm	38.3 mm	Yes
Center Rib Displacement	37 - 45 mm	43.2 mm	Yes
Lower Rib Displacement	37 - 44 mm	43.0 mm	Yes

Test meets specifications.

Condition: Used

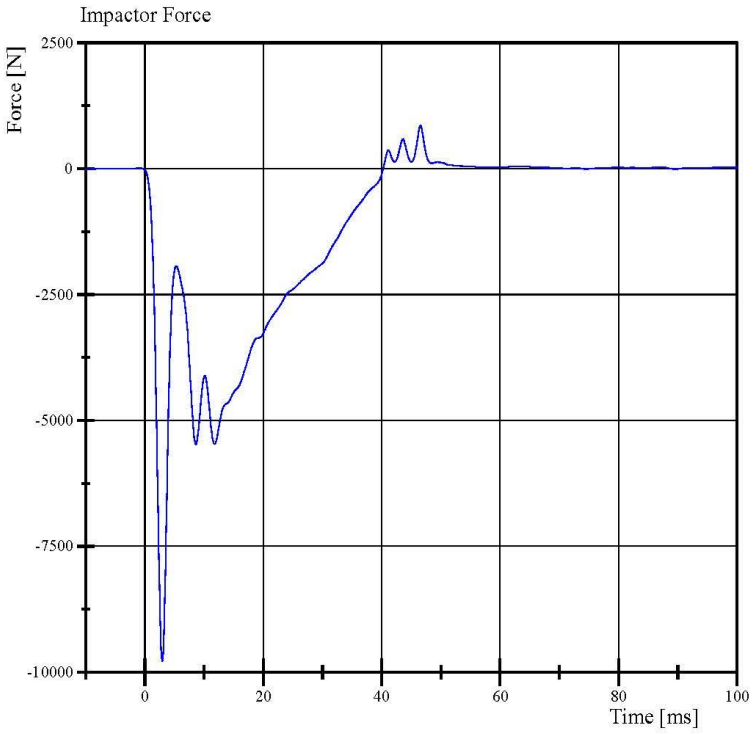
Comments:
Upper Rib Module S/N: 175-4008-A
Middle Rib Module S/N: 175-4008-A
Lower Rib Module S/N: 175-4008-A-06-017

Specification Source: CFR49 Part 572 Subpart U with Polarity in accordance with J211

05.15.2019 09:17:49 422

Transportation Research Center Inc.

Left Lower Thorax
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/15/2019



Filter Class: CFC_180
Max: 856.2 N at 46.6 ms
Min: -9,787.1 N at 3.0 ms

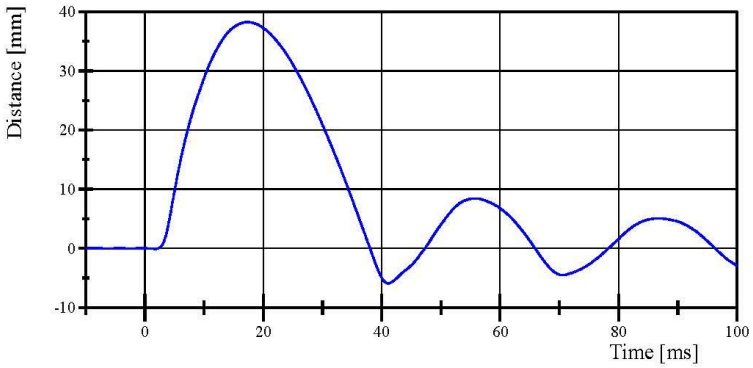
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

05.15.2019 09:18:48 422

Transportation Research Center Inc.

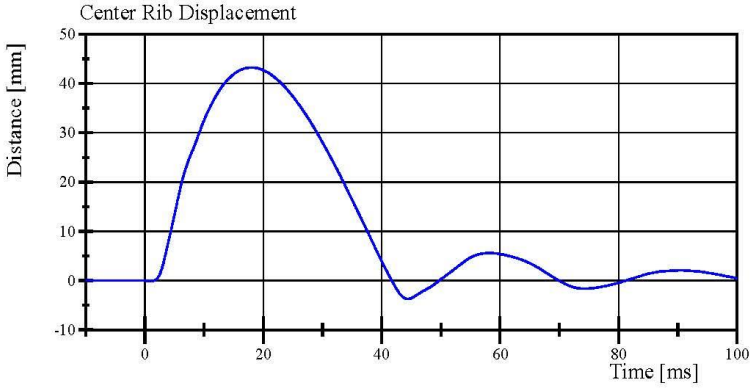
Left Lower Thorax
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/15/2019

Upper Rib Displacement



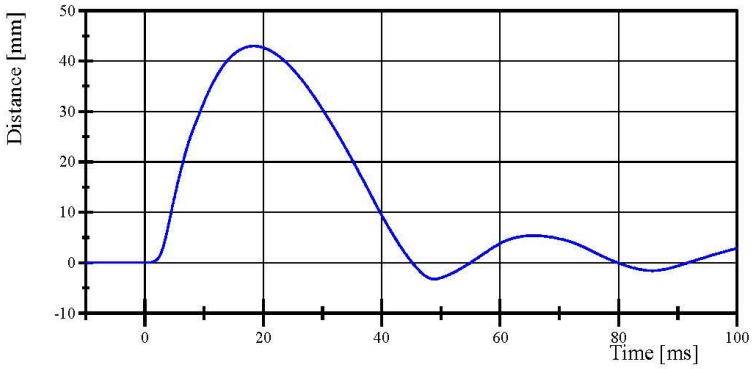
Filter Class: CFC_180
Max: 38.3 mm at 17.3 ms
Min: -5.9 mm at 41.1 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 43.2 mm at 18.0 ms
Min: -3.7 mm at 44.4 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 43.0 mm at 18.4 ms
Min: -3.2 mm at 48.9 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

05.15.2019 09:18:49 422

Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 63-2
Test Date: 5/14/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.112 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-46.3 deg	Yes
Time of Peak	39 - 53 ms	42.9 ms	Yes
Headform Flexion Decay - Peak to Zero	37 - 57 ms	37.0 ms	Yes

Test meets specifications.

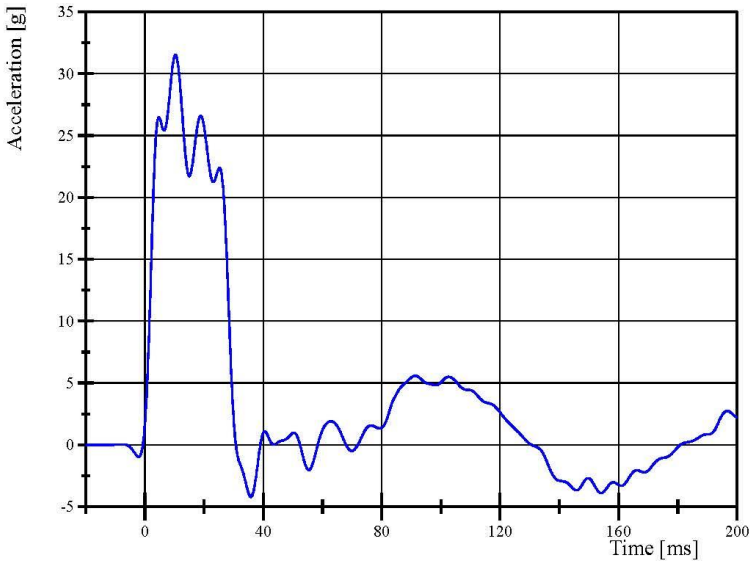
Condition: Used

Comments:
Lumbar S/N: DM3011

Transportation Research Center Inc.

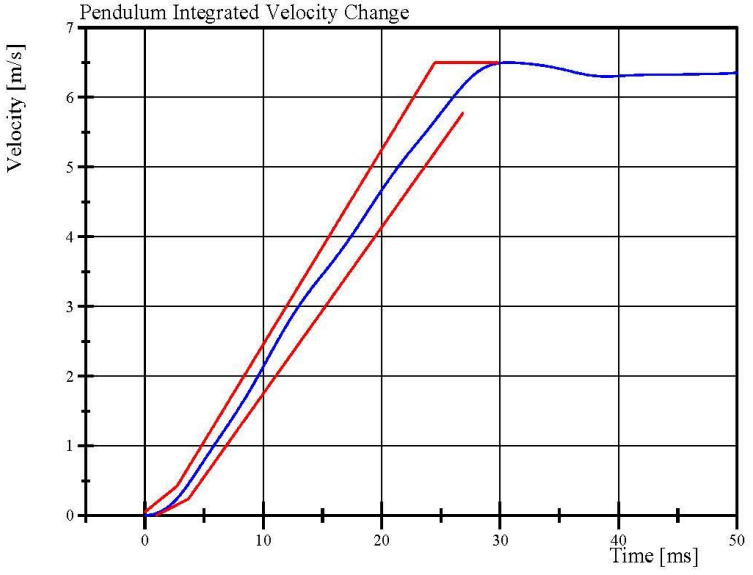
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 63-2
Test Date: 5/14/2019

Pendulum Acceleration



Filter Class: CFC_60
Max: 31.5 g at 10.3 ms
Min: -4.2 g at 35.8 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 6.5 m/s at 30.7 ms
Min: 0.0 m/s at 0.0 ms

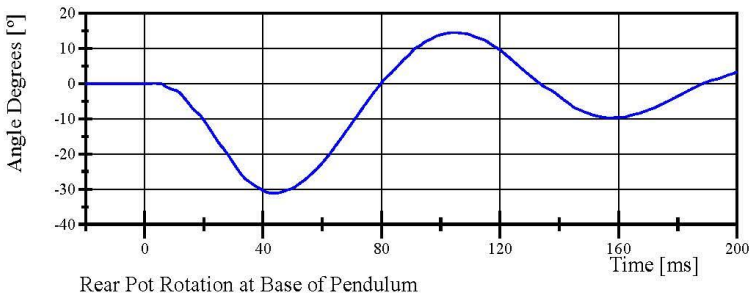
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

05.14.2019 12:39:32 638

Transportation Research Center Inc.

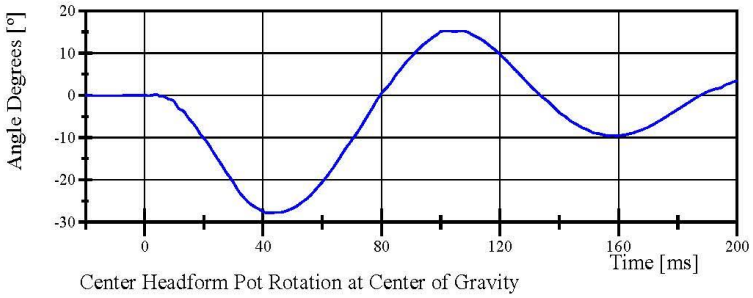
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 63-2
Test Date: 5/14/2019

Forward Pot Rotation at Base of Pendulum



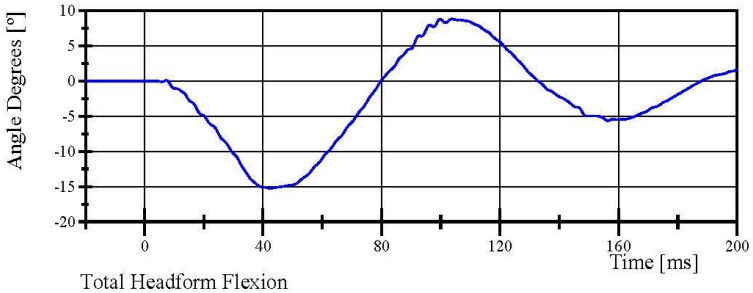
Filter Class: CFC_180
Max: 14.5 ° at 104.8 ms
Min: -31.1 ° at 43.7 ms

Rear Pot Rotation at Base of Pendulum



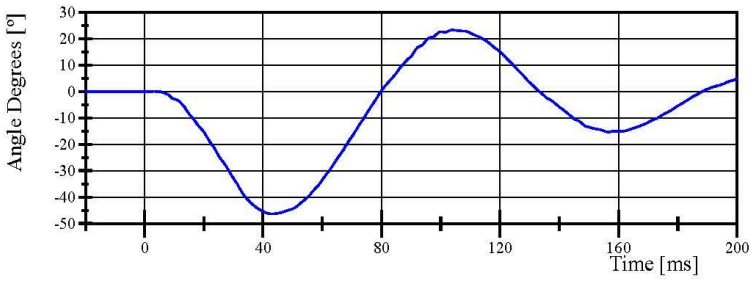
Filter Class: CFC_180
Max: 15.3 ° at 101.7 ms
Min: -27.8 ° at 41.8 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 8.8 ° at 103.8 ms
Min: -15.2 ° at 42.4 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 23.3 ° at 103.8 ms
Min: -46.3 ° at 42.9 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

05.14.2019 12:39:33 638

Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/15/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.05 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,207.4 N	Yes
Time of Peak	10.6 - 13.0 ms	11.60 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,455.1 N	Yes
Time of Peak	10.0 - 12.3 ms	11.28 ms	Yes

Test meets specifications.

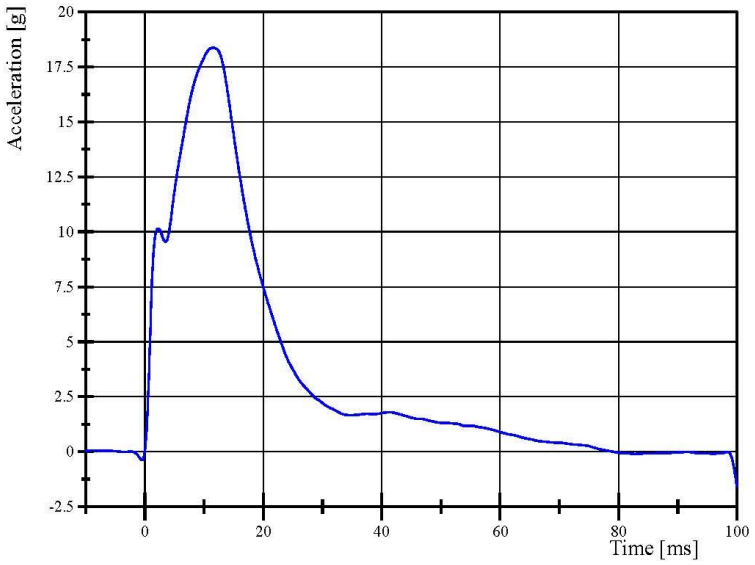
Condition: Used

Comments:
Abdomen S/N: 1066

Transportation Research Center Inc.

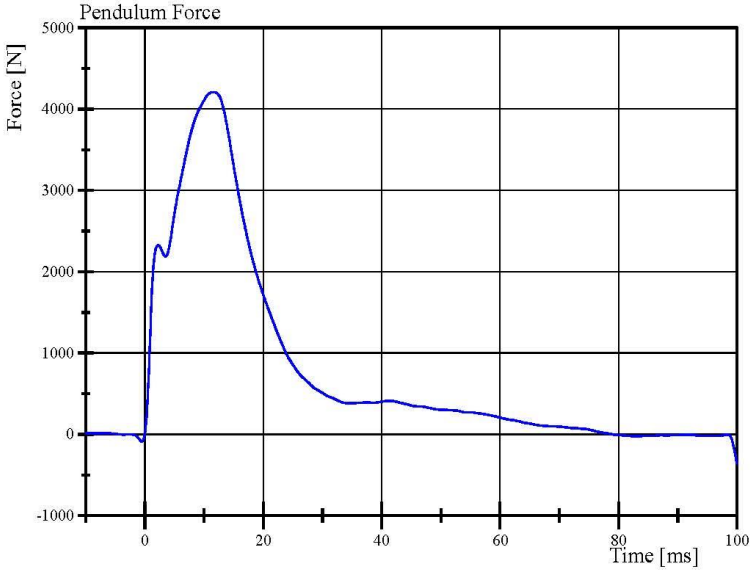
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/15/2019

Pendulum Acceleration



Filter Class: CFC_180
Max: 18.4 g at 11.6 ms
Min: -1.6 g at 100.0 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,207.4 N at 11.6 ms
Min: -366.6 N at 100.0 ms

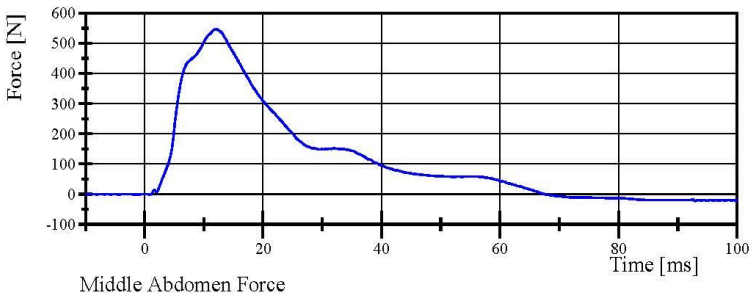
Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

05.15.2019 09:38:25 571

Transportation Research Center Inc.

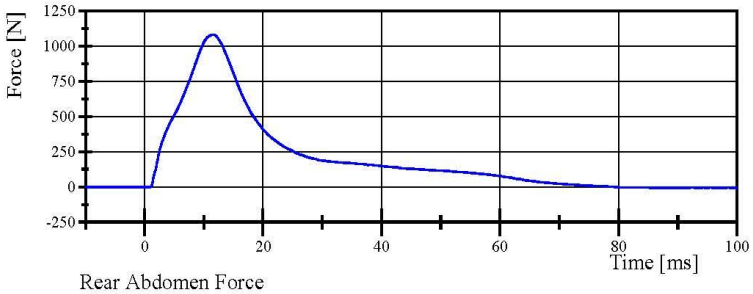
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/15/2019

Front Abdomen Force



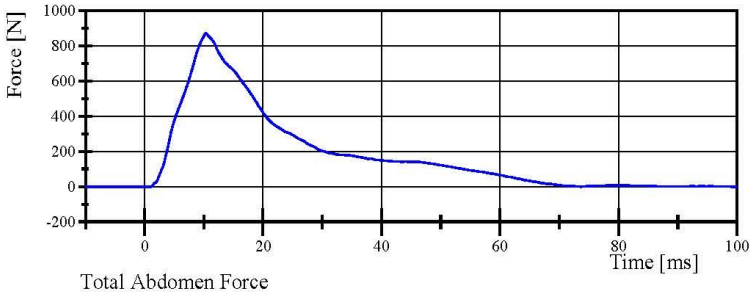
Filter Class: CFC_600
Max: 547.0 N at 12.0 ms
Min: -22.1 N at 93.0 ms

Middle Abdomen Force



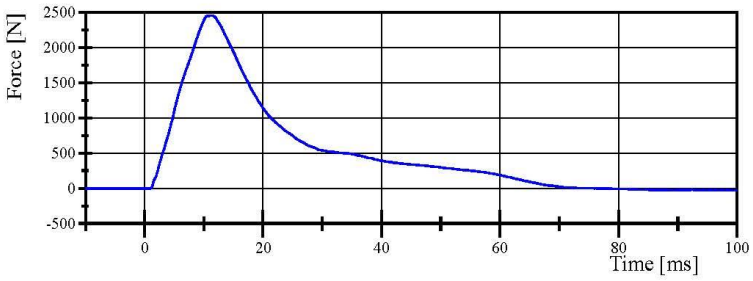
Filter Class: CFC_600
Max: 1,081.9 N at 11.6 ms
Min: -8.4 N at 93.0 ms

Rear Abdomen Force



Filter Class: CFC_600
Max: 869.8 N at 10.3 ms
Min: -1.4 N at 100.0 ms

Total Abdomen Force



Filter Class: CFC_600
Max: 2,455.1 N at 11.3 ms
Min: -29.1 N at 93.0 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

05.15.2019 09:38:26 571

Transportation Research Center Inc.

Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/15/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,242.9 N	Yes
Time of Peak	11.8 - 16.1 ms	13.52 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,310.8 N	Yes
Time of Peak	12.2 - 17.0 ms	14.00 ms	Yes

Test meets specifications.

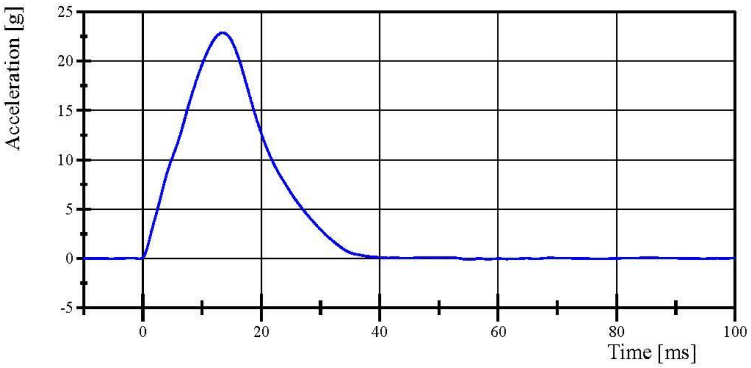
Condition: Used

Comments:
Pelvis Skin S/N: N/A

Transportation Research Center Inc.

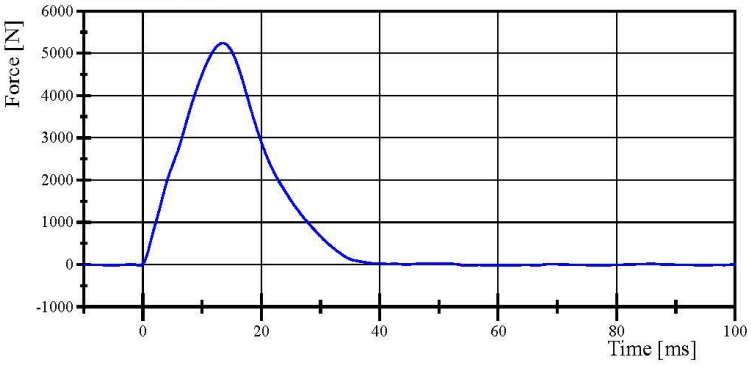
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 63-1
Test Date: 5/15/2019

Pendulum Acceleration



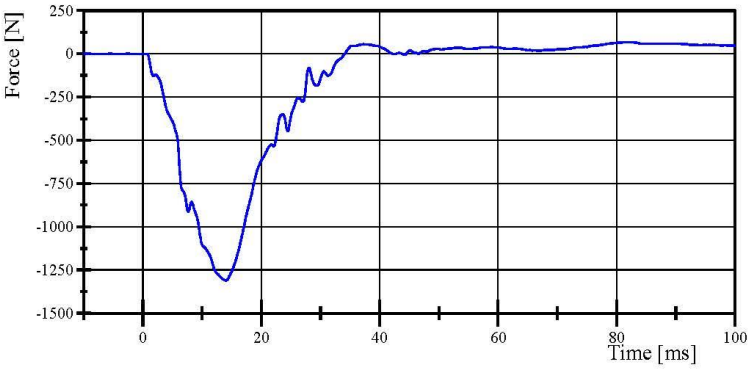
Filter Class: CFC_180
Max: 22.9 g at 13.5 ms
Min: -0.1 g at 55.6 ms

Pendulum Force



Filter Class: CFC_180
Max: 5,242.9 N at 13.5 ms
Min: -27.7 N at 55.6 ms

Pubic Symphysis Force



Filter Class: CFC_600
Max: 68.2 N at 82.5 ms
Min: -1,310.8 N at 14.0 ms

Specification Source: CFR49 Part 572 Subpart U
with Polarity in accordance with J211

05.15.2019 10:01:49 573

Pre-Test Calibration Sheets
Passenger S/N 305

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 305 Calibration No. 70

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	782	Yes
B	Shoulder Pivot Height	437.0 - 453.0	448	Yes
C	H-Point Height	79.0 - 89.0	86	Yes
D	H-Point from Seat Back	141.0 - 151.0	146	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	101	Yes
F	Thigh Clearance	119.0 - 135.0	130	Yes
G	Head Breadth	140.0 - 148.0	143	Yes
H	Head Back from Backline	40.0 - 46.0	44	Yes
I	Head Depth	178.0 - 188.0	185	Yes
J	Head Circumference	541.0 - 551.0	543	Yes
K	Buttock to Knee Length	514.0 - 540.0	534	Yes
L	Popliteal Height	343.0 - 369.0	348	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	396	Yes
N	Buttock Popliteal Length	416.0 - 442.0	434	Yes
O	Chest Depth without Jacket	195.0 - 211.0	197	Yes
P	Foot Length (right)	216.0 - 232.0	222	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	320	Yes
R	Arm Length	249.0 - 259.0	252	Yes
S	Knee Joint to seat Back	478.0 - 493.0	482	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	351	Yes
W	Foot Width (right)	78.0 - 94.0	85	Yes
W	Foot Width (left)	78.0 - 94.0	85	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	877	Yes
Z	Waist Circumference	761.0 - 791.0	780	Yes

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 ℃	21.3 ℃	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	120.2 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	3.5 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

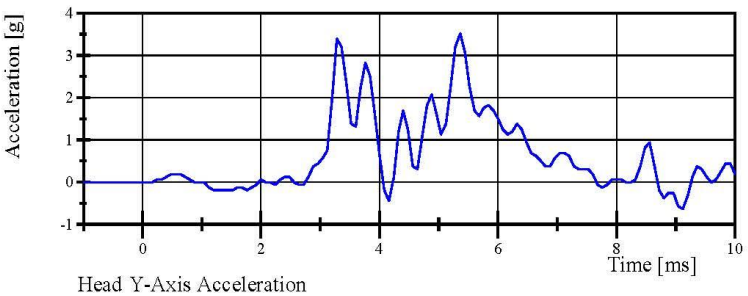
Condition: Used

Comments:
Head Skin S/N: 1253

Transportation Research Center Inc.

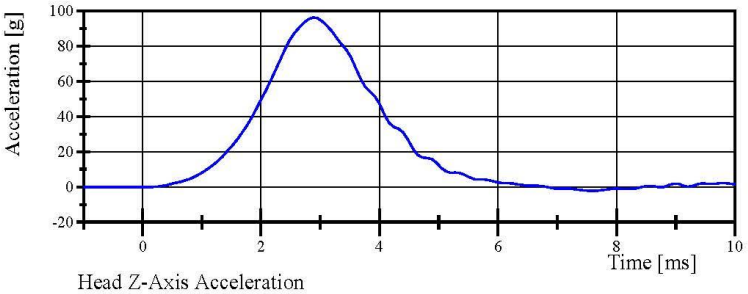
Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Head X-Axis Acceleration



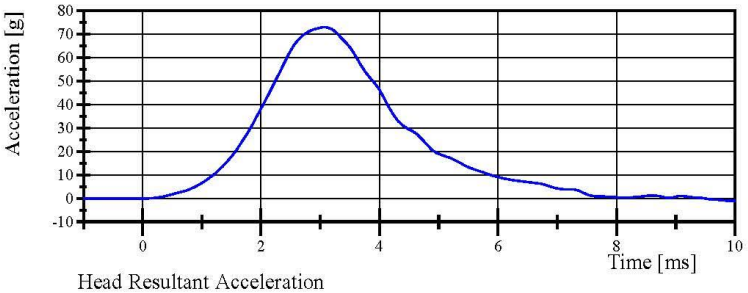
Filter Class: CFC_1000
Max: 3.5 g at 5.4 ms
Min: -0.6 g at 9.1 ms

Head Y-Axis Acceleration



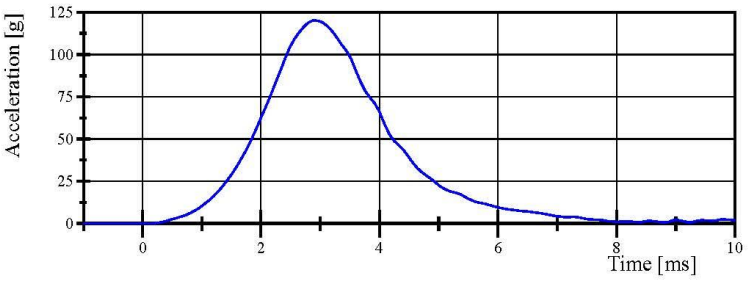
Filter Class: CFC_1000
Max: 96.3 g at 2.9 ms
Min: -2.2 g at 7.5 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 72.9 g at 3.0 ms
Min: -1.1 g at 9.9 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 120.2 g at 2.9 ms
Min: 0.0 g at -0.9 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.22.2019 11:58:38 195

Transportation Research Center Inc.

Left Lateral Neck
SID IIs Serial No. 305 Certification No. 70-2
Test Date: 3/25/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.607 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.418 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.545 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	4.762 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.770 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	6.014 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-71.0 deg	Yes
Time of Peak	50 - 70 ms	69.0 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	40.1 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	119.2 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Neck S/N: 180-2001-606

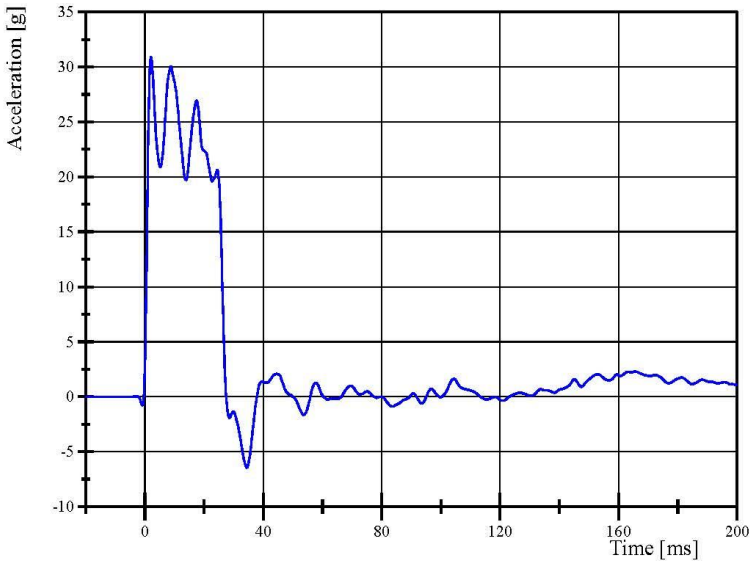
Specification Source: CFR49 Part 572 Subpart V with Polarity in accordance with J211

03.25.2019 08:26:45 717

Transportation Research Center Inc.

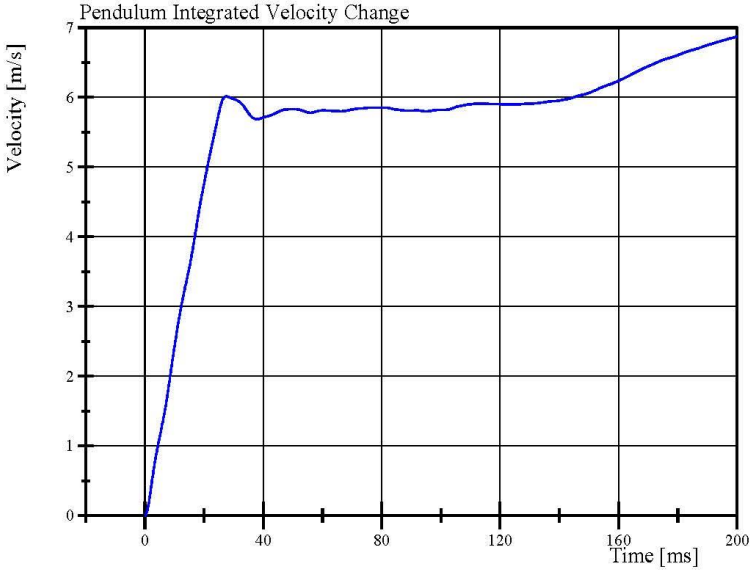
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 70-2
Test Date: 3/25/2019

Pendulum Acceleration



Filter Class: CFC_180
Max: 30.9 g at 2.1 ms
Min: -6.4 g at 34.5 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 6.9 m/s at 200.0 ms
Min: 0.0 m/s at 0.0 ms

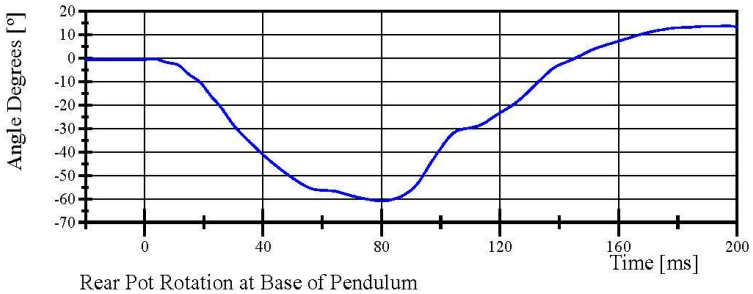
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.25.2019 08:27:16 717

Transportation Research Center Inc.

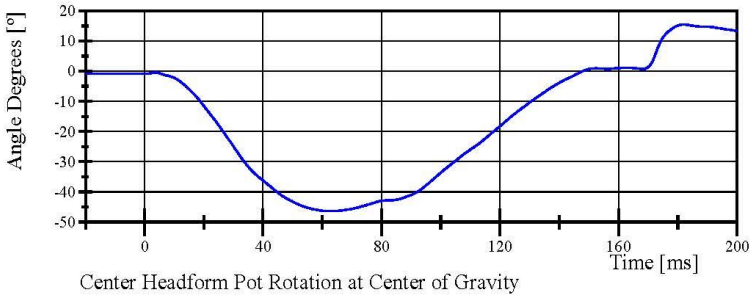
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 70-2
Test Date: 3/25/2019

Forward Pot Rotation at Base of Pendulum



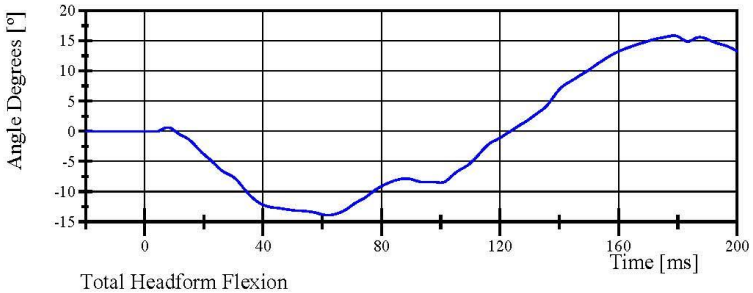
Filter Class: CFC_60
Max: 13.7 ° at 196.8 ms
Min: -60.8 ° at 80.0 ms

Rear Pot Rotation at Base of Pendulum



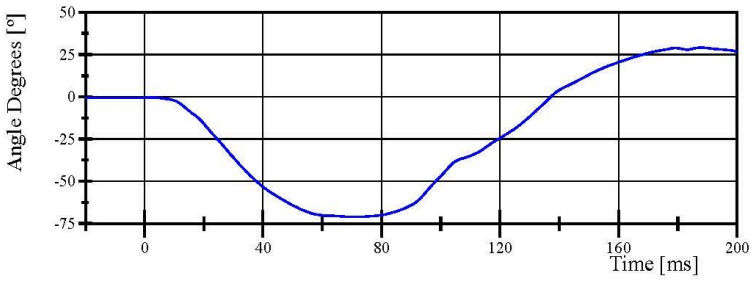
Filter Class: CFC_60
Max: 15.5 ° at 182.0 ms
Min: -46.4 ° at 62.9 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 15.9 ° at 178.6 ms
Min: -13.9 ° at 61.9 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 29.2 ° at 187.9 ms
Min: -71.0 ° at 69.0 ms

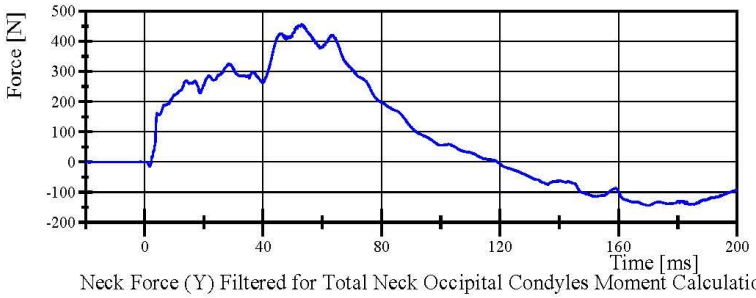
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.25.2019 08:27:17 717

Transportation Research Center Inc.

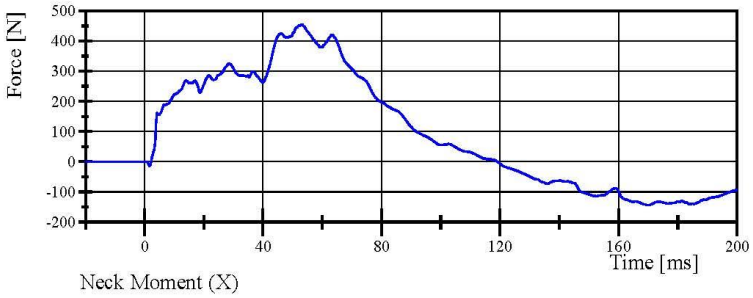
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 70-2
Test Date: 3/25/2019

Neck Force (Y)



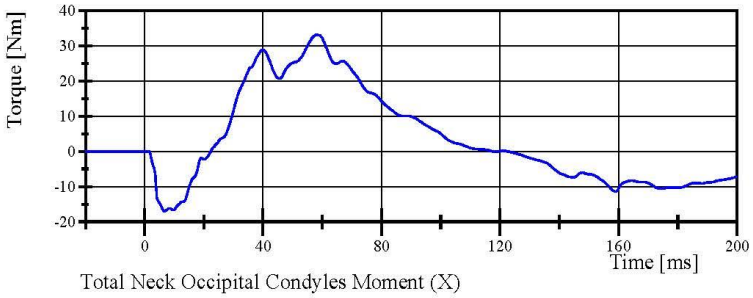
Filter Class: CFC_1000
Max: 456.7 N at 53.0 ms
Min: -143.6 N at 169.8 ms

Neck Force (Y) Filtered for Total Neck Occipital Condyles Moment Calculation



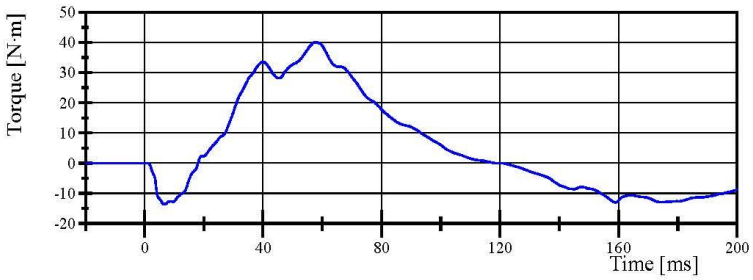
Filter Class: CFC_600
Max: 454.9 N at 53.0 ms
Min: -143.4 N at 169.8 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 33.1 Nm at 58.4 ms
Min: -17.0 Nm at 6.6 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Constar
Max: 40.1 N·m at 57.7 ms
Min: -13.6 N·m at 6.6 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.25.2019 08:27:18 717

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 70-2
Test Date: 4/26/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	48 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.5 g	Yes
Shoulder Displacement	28 - 37 mm	31.7 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	17.7 g	Yes

Test meets specifications.

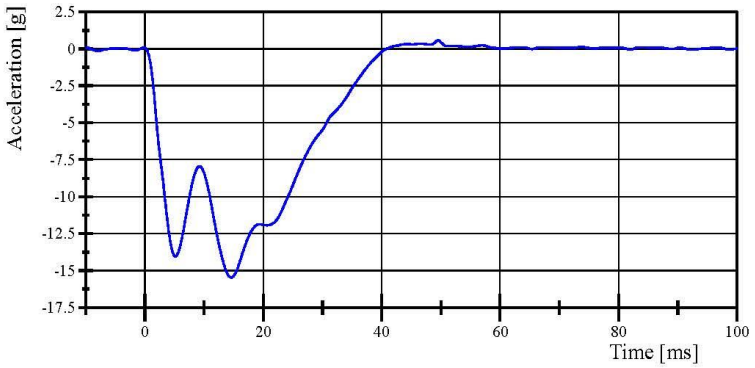
Condition: New

Comments:
Left Arm S/N: 952
Shoulder Rib S/N: 180-3355 DM4450

Transportation Research Center Inc.

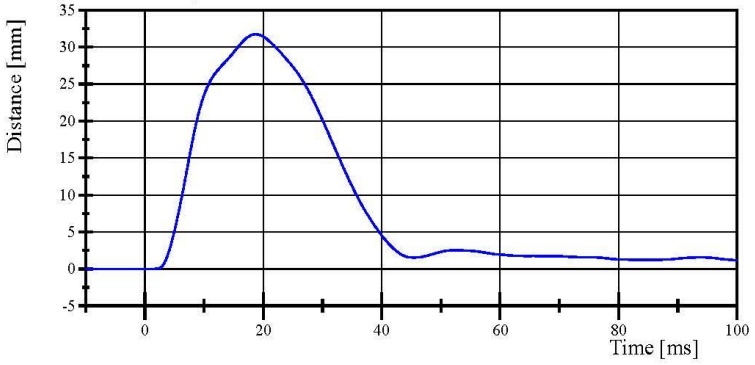
Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 70-2
Test Date: 4/26/2019

Probe Acceleration



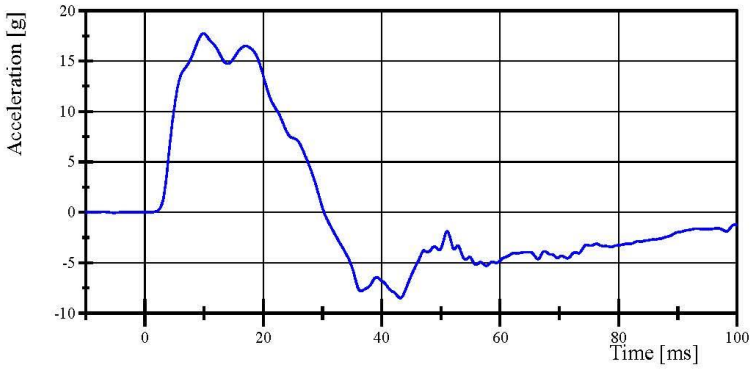
Filter Class: CFC_180
Max: 0.6 g at 49.5 ms
Min: -15.5 g at 14.6 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 31.7 mm at 18.7 ms
Min: -0.0 mm at -7.4 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 17.7 g at 9.9 ms
Min: -8.5 g at 43.1 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

04.26.2019 11:15:56 849

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 70-2
Test Date: 4/26/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.716 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.2 g	Yes
Shoulder Displacement	31 - 40 mm	34.4 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	26.3 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	32.5 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	36.1 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	37.6 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	31.4 g	Yes

Test meets specifications.

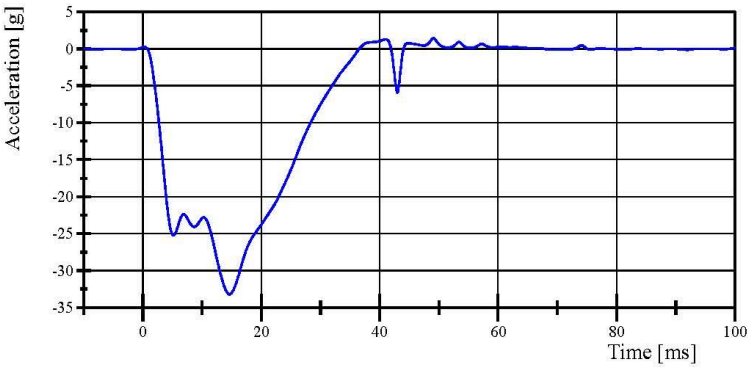
Condition: New Shoulder Rib, Shoulder displacement pot.

Comments:
Left Arm S/N: 952
Shoulder Rib S/N: 180-3355 DM4450
Upper Thorax Rib S/N: 2135
Middle Thorax Rib S/N: 2136
Lower Thorax Rib S/N: 2137

Transportation Research Center Inc.

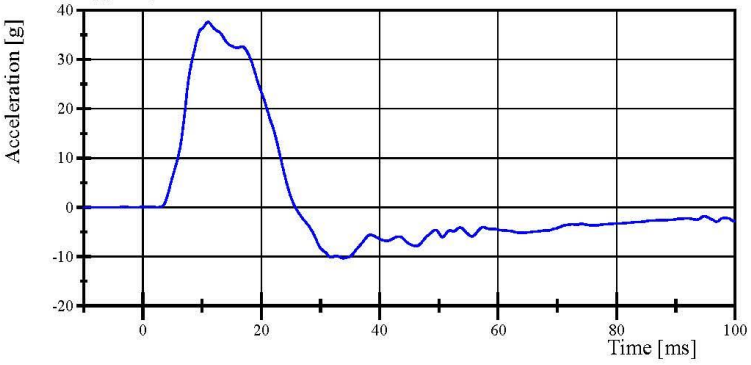
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 70-2
Test Date: 4/26/2019

Probe Acceleration



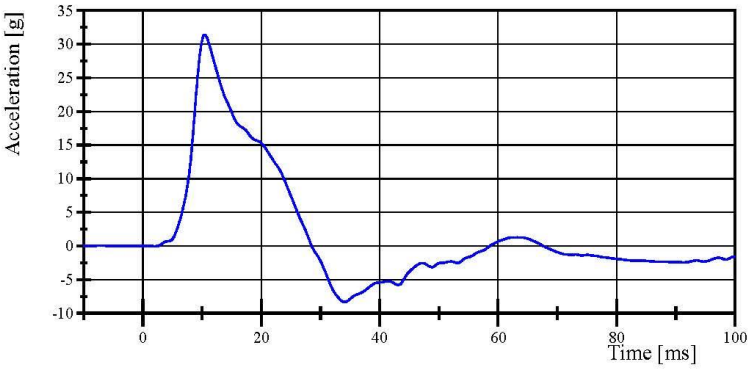
Filter Class: CFC_180
Max: 1.4 g at 49.1 ms
Min: -33.2 g at 14.6 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 37.6 g at 11.0 ms
Min: -10.3 g at 33.8 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 31.4 g at 10.5 ms
Min: -8.3 g at 34.1 ms

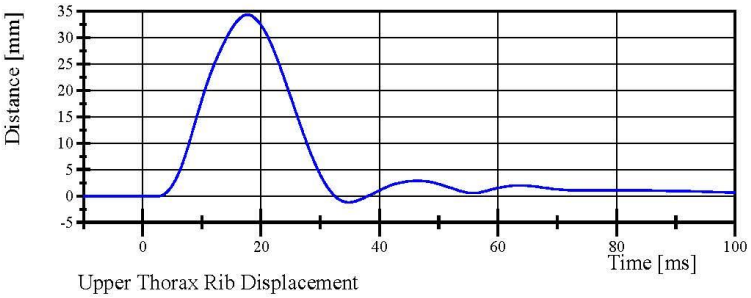
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

04.26.2019 11:35:07 602

Transportation Research Center Inc.

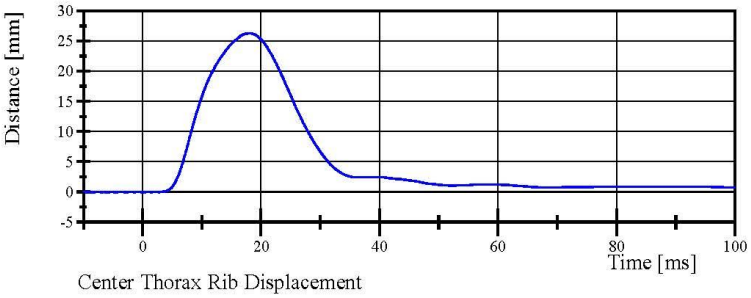
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 70-2
Test Date: 4/26/2019

Shoulder Rib Displacement



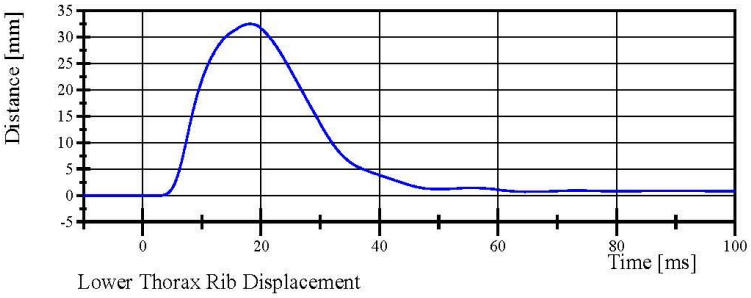
Filter Class: CFC_600
Max: 34.4 mm at 17.7 ms
Min: -1.2 mm at 34.8 ms

Upper Thorax Rib Displacement



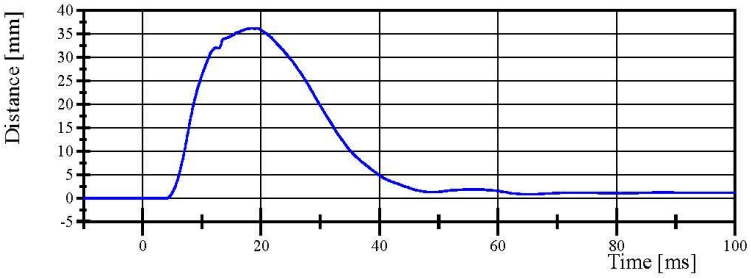
Filter Class: CFC_600
Max: 26.3 mm at 18.1 ms
Min: -0.0 mm at -9.3 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 32.5 mm at 18.2 ms
Min: -0.0 mm at -2.8 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 36.1 mm at 18.2 ms
Min: -0.0 mm at 4.0 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

04.26.2019 11:35:08 602

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.274 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-15.8 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	34.4 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	39.9 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	37.8 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	14.5 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	10.0 g	Yes

Test meets specifications.

Condition: Used

Comments:
Upper Thorax Rib S/N: 2135
Middle Thorax Rib S/N: 2136
Lower Thorax Rib S/N: 2137

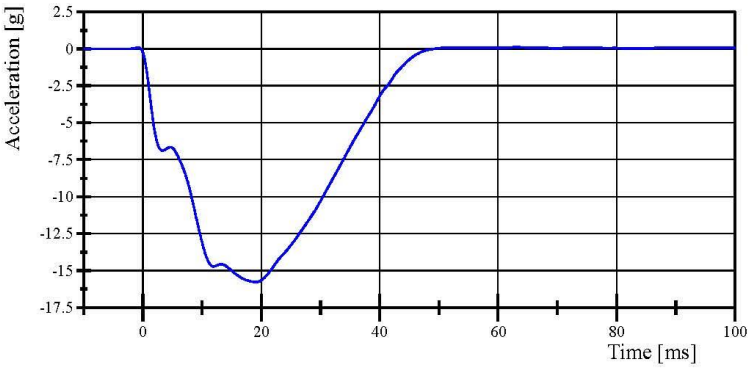
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.22.2019 09:26:06 841

Transportation Research Center Inc.

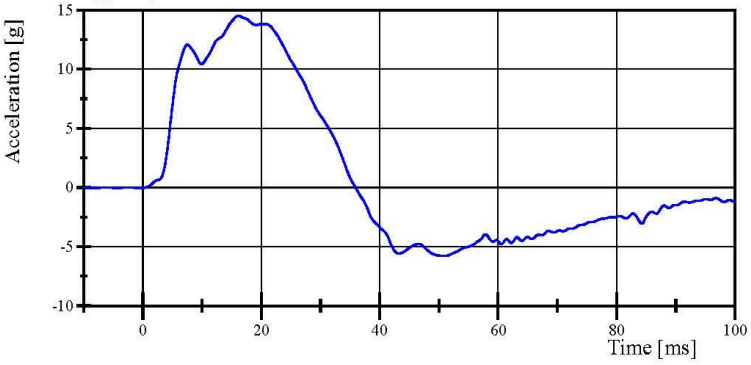
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Probe Acceleration



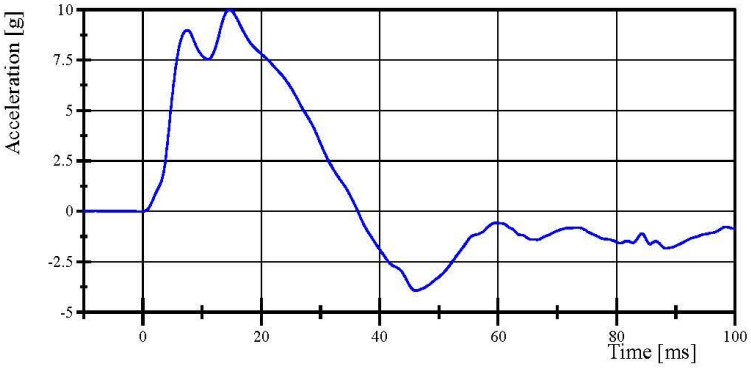
Filter Class: CFC_180
Max: 0.1 g at 63.1 ms
Min: -15.8 g at 19.0 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 14.5 g at 16.2 ms
Min: -5.8 g at 50.8 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 10.0 g at 14.6 ms
Min: -3.9 g at 46.1 ms

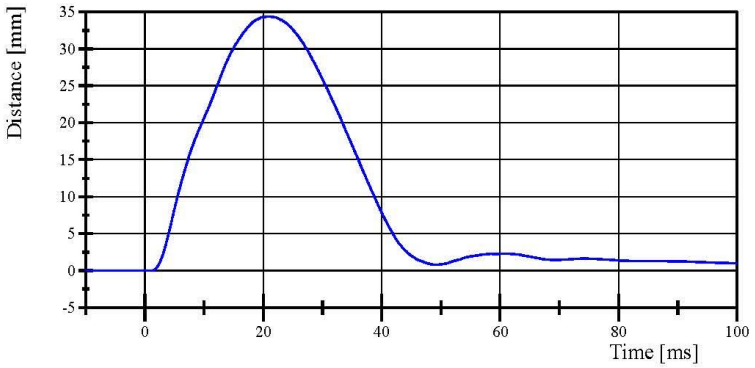
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.22.2019 09:27:00 841

Transportation Research Center Inc.

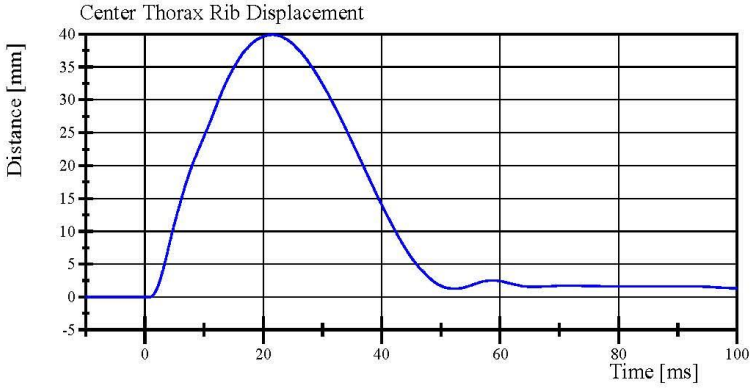
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Upper Thorax Rib Displacement



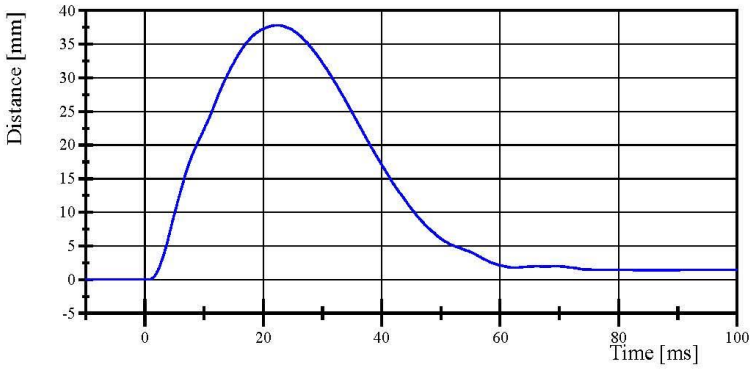
Filter Class: CFC_600
Max: 34.4 mm at 20.9 ms
Min: -0.0 mm at 1.0 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 39.9 mm at 21.5 ms
Min: -0.0 mm at 0.7 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 37.8 mm at 22.3 ms
Min: -0.0 mm at 0.6 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.22.2019 09:27:00 841

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.28 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-13.1 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	45.7 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	41.4 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.14 g	Yes

Test meets specifications.

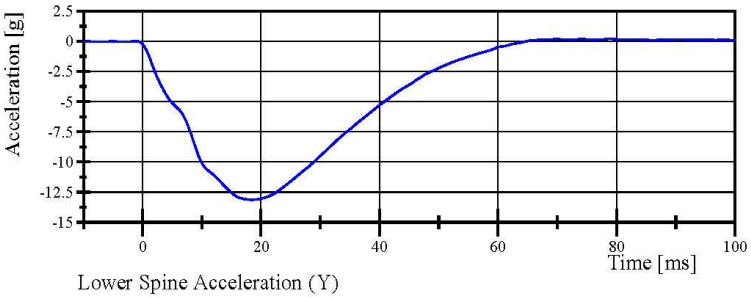
Condition: Used

Comments:
Upper Abdominal Rib S/N: 1997
Lower Abdominal Rib S/N: DS1234

Transportation Research Center Inc.

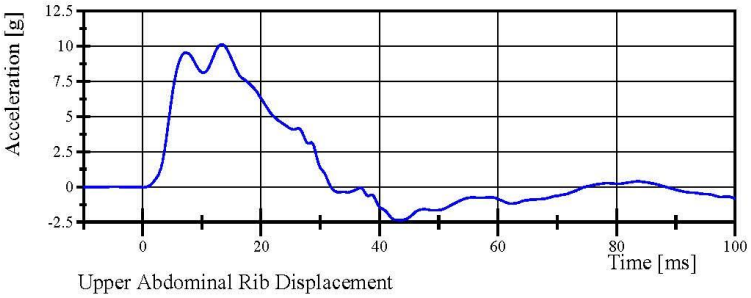
Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Probe Acceleration



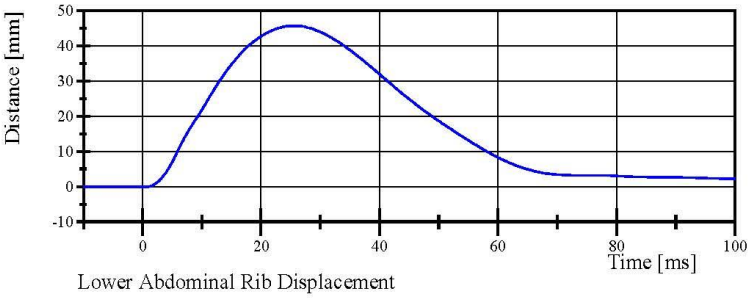
Filter Class: CFC_180
Max: 0.2 g at 79.0 ms
Min: -13.1 g at 18.4 ms

Lower Spine Acceleration (Y)



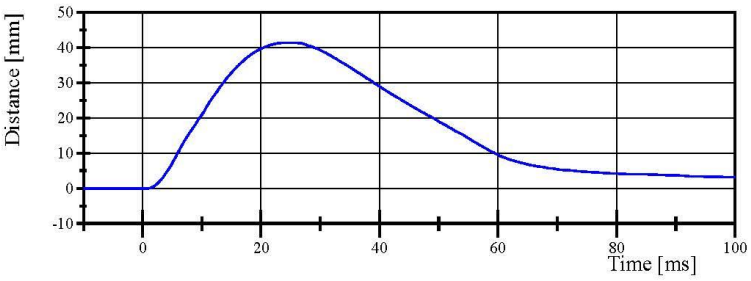
Filter Class: CFC_180
Max: 10.1 g at 13.4 ms
Min: -2.4 g at 43.4 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 45.7 mm at 25.5 ms
Min: -0.0 mm at 0.4 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 41.4 mm at 24.8 ms
Min: -0.0 mm at 0.6 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.22.2019 09:09:42 646

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.61 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-42.47 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	37.1 g	Yes
Acetabulum Force	3,600 - 4,300 N	3,877.5 N	Yes

Test meets specifications.

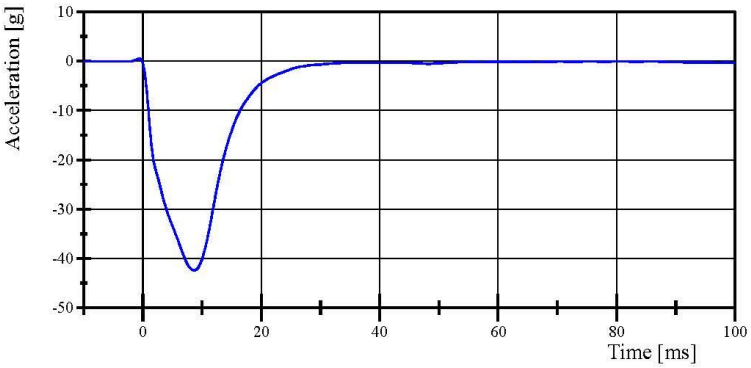
Condition: Used

Comments:
Pelvis Skin S/N: 884
Pelvis Plug Info:
Manufacturer: SACO
S/N: 11764
Cal Date: 20180116

Transportation Research Center Inc.

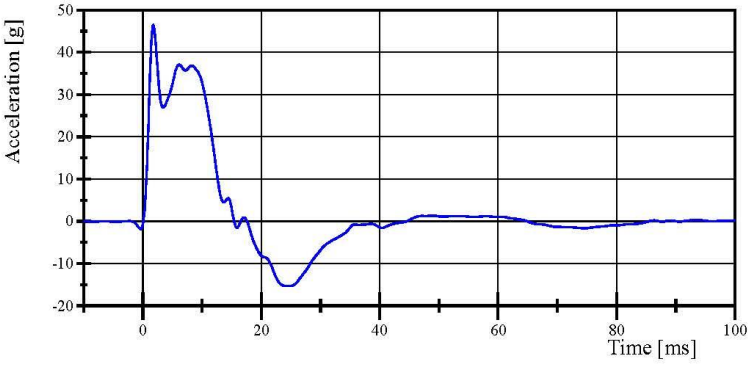
Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Probe Acceleration



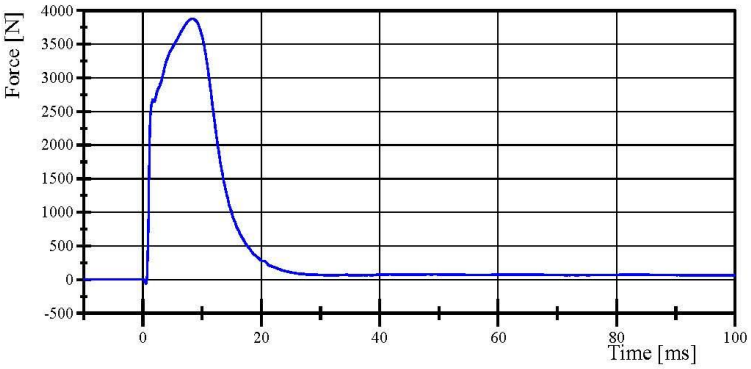
Filter Class: CFC_180
Max: 0.5 g at -0.6 ms
Min: -42.5 g at 8.6 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 46.6 g at 1.8 ms
Min: -15.3 g at 24.8 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 3,877.5 N at 8.3 ms
Min: -58.1 N at 0.6 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.22.2019 08:34:11 423

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-38.7 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	30.4 g	Yes
Iliac Force	4,100 - 5,100 N	4,534.0 N	Yes

Test meets specifications.

Condition: Used

Comments:
Pelvis Skin S/N: 884

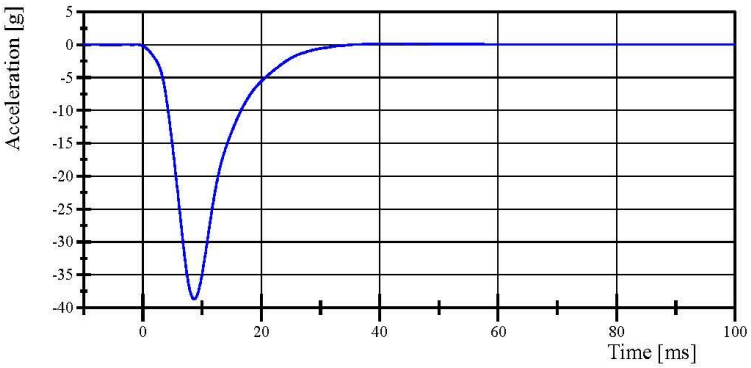
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.22.2019 10:51:35 626

Transportation Research Center Inc.

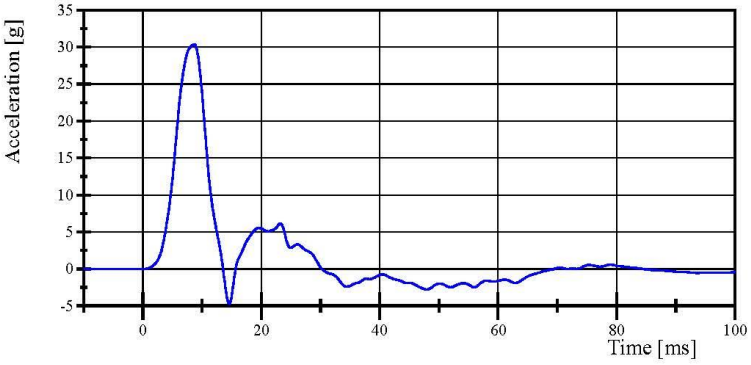
Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 70-1
Test Date: 3/22/2019

Probe Acceleration



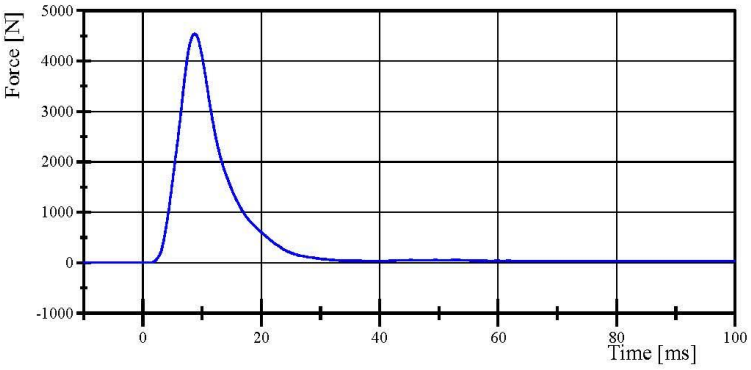
Filter Class: CFC_180
Max: 0.2 g at 43.3 ms
Min: -38.7 g at 8.6 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 30.4 g at 8.6 ms
Min: -4.7 g at 14.6 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,534.0 N at 8.7 ms
Min: -0.9 N at -0.2 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

03.22.2019 10:52:28 626

Post-Test Calibration Sheets
Passenger S/N 305

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 305 Calibration No. 71

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	781	Yes
B	Shoulder Pivot Height	437.0 - 453.0	448	Yes
C	H-Point Height	79.0 - 89.0	86	Yes
D	H-Point from Seat Back	141.0 - 151.0	146	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	100	Yes
F	Thigh Clearance	119.0 - 135.0	131	Yes
G	Head Breadth	140.0 - 148.0	143	Yes
H	Head Back from Backline	40.0 - 46.0	44	Yes
I	Head Depth	178.0 - 188.0	185	Yes
J	Head Circumference	541.0 - 551.0	543	Yes
K	Buttock to Knee Length	514.0 - 540.0	534	Yes
L	Popliteal Height	343.0 - 369.0	348	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	396	Yes
N	Buttock Popliteal Length	416.0 - 442.0	434	Yes
O	Chest Depth without Jacket	195.0 - 211.0	197	Yes
P	Foot Length (right)	216.0 - 232.0	222	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	320	Yes
R	Arm Length	249.0 - 259.0	252	Yes
S	Knee Joint to seat Back	478.0 - 493.0	482	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	351	Yes
W	Foot Width (right)	78.0 - 94.0	85	Yes
W	Foot Width (left)	78.0 - 94.0	85	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	878	Yes
Z	Waist Circumference	761.0 - 791.0	780	Yes

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 71-1
Test Date: 5/14/2019

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 ℃	21.9 ℃	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	117.0 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	2.0 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

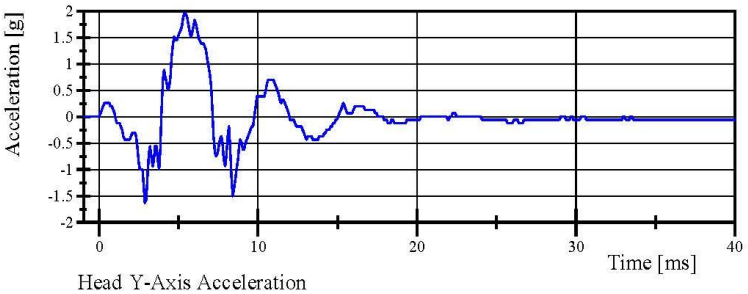
Condition: Used

Comments:
Head Skin S/N: 1253

Transportation Research Center Inc.

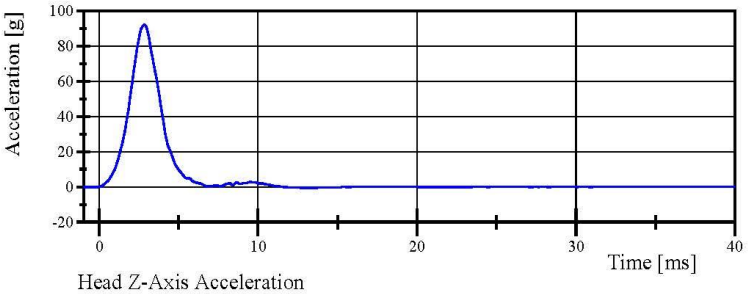
Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 71-1
Test Date: 5/14/2019

Head X-Axis Acceleration



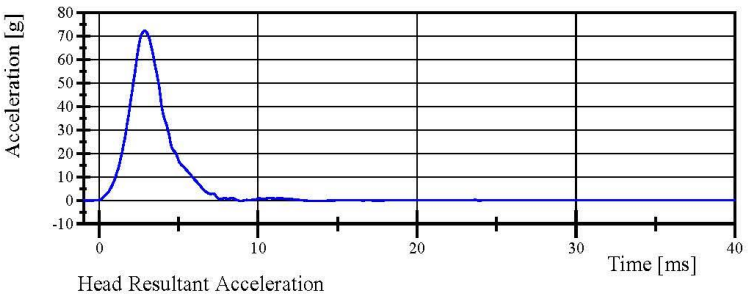
Filter Class: CFC_1000
Max: 2.0 g at 5.4 ms
Min: -1.6 g at 2.9 ms

Head Y-Axis Acceleration



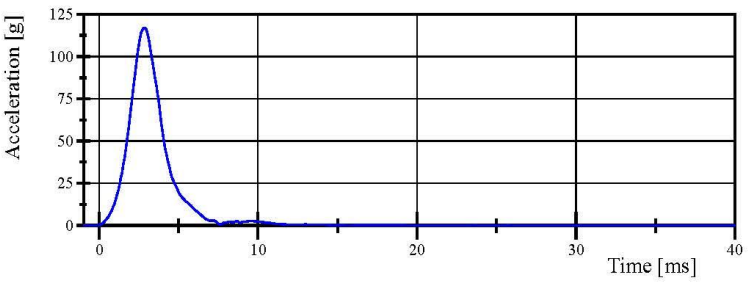
Filter Class: CFC_1000
Max: 92.0 g at 2.8 ms
Min: -0.6 g at 12.9 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 72.3 g at 2.9 ms
Min: -0.3 g at 8.9 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 117.0 g at 2.9 ms
Min: 0.0 g at -0.9 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

05.14.2019 11:58:17 195

Transportation Research Center Inc.

Left Lateral Neck
SID IIs Serial No. 305 Certification No. 71-1
Test Date: 5/15/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.553 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.457 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.559 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	4.784 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.821 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.957 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-74.9 deg	Yes
Time of Peak	50 - 70 ms	68.6 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	39.8 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	124.8 ms	Yes

Test meets specifications.

Condition: Used

Comments:
Neck S/N: 180-2001-606

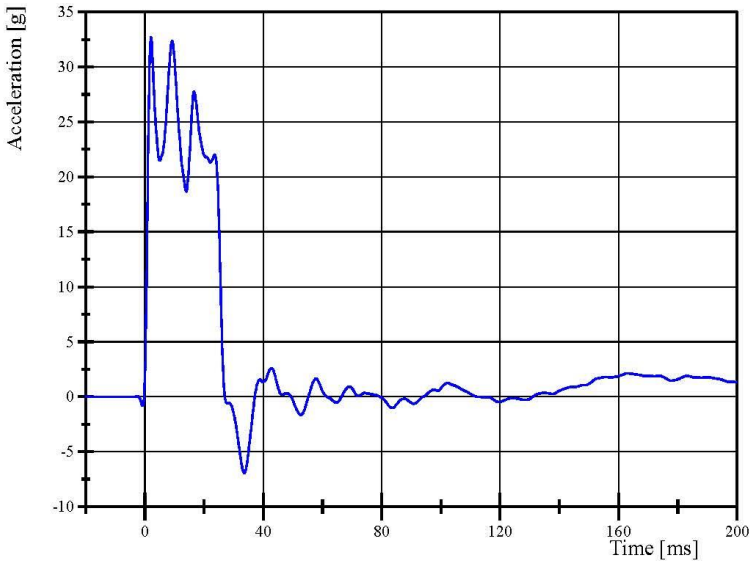
Specification Source: CFR49 Part 572 Subpart V with Polarity in accordance with J211

05.15.2019 08:22:58 722

Transportation Research Center Inc.

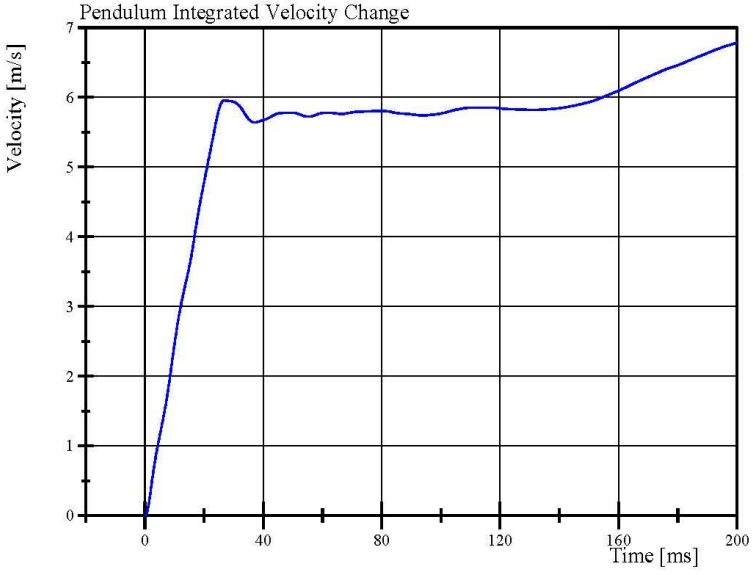
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 71-1
Test Date: 5/15/2019

Pendulum Acceleration



Filter Class: CFC_180
Max: 32.7 g at 2.1 ms
Min: -6.9 g at 33.6 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 6.8 m/s at 200.0 ms
Min: 0.0 m/s at 0.0 ms

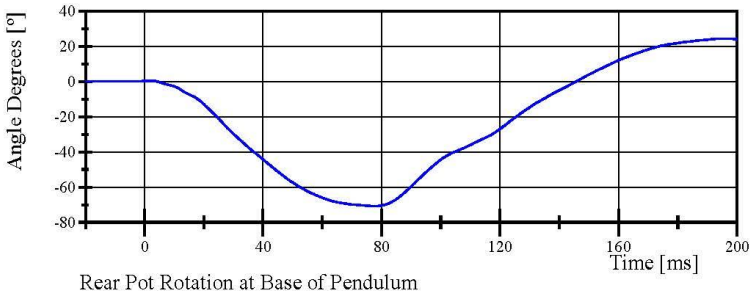
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

05.15.2019 08:23:25 722

Transportation Research Center Inc.

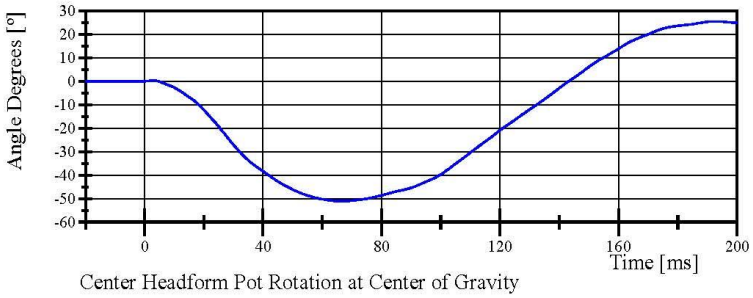
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 71-1
Test Date: 5/15/2019

Forward Pot Rotation at Base of Pendulum



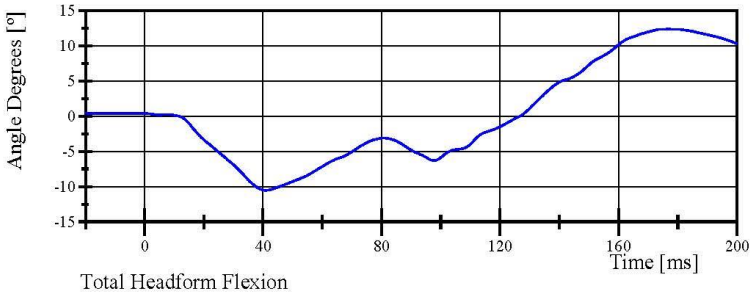
Filter Class: CFC_60
Max: 24.3 ° at 195.4 ms
Min: -70.7 ° at 77.7 ms

Rear Pot Rotation at Base of Pendulum



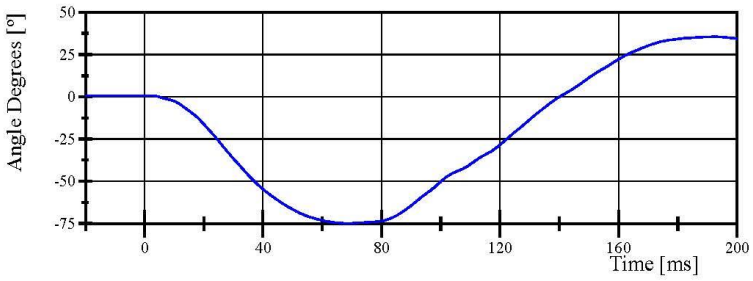
Filter Class: CFC_60
Max: 25.6 ° at 192.7 ms
Min: -51.0 ° at 66.6 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 12.4 ° at 176.9 ms
Min: -10.5 ° at 40.9 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 35.6 ° at 192.4 ms
Min: -74.9 ° at 68.6 ms

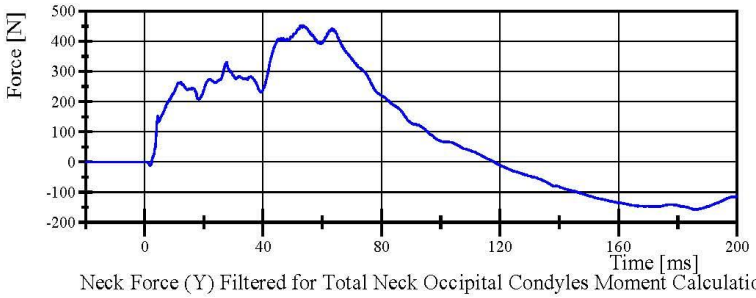
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

05.15.2019 08:23:26 722

Transportation Research Center Inc.

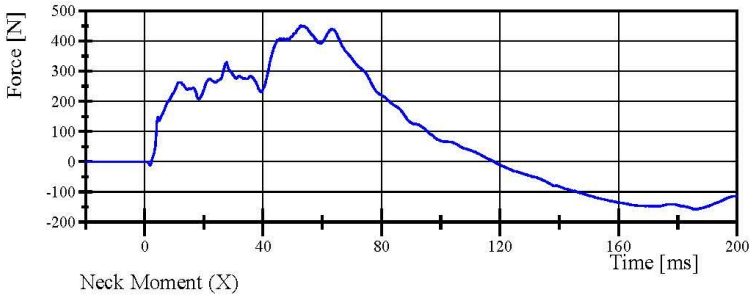
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 71-1
Test Date: 5/15/2019

Neck Force (Y)



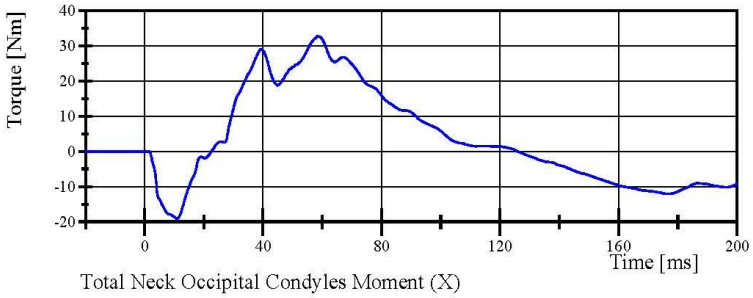
Filter Class: CFC_1000
Max: 452.8 N at 53.6 ms
Min: -157.0 N at 186.1 ms

Neck Force (Y) Filtered for Total Neck Occipital Condyles Moment Calculation



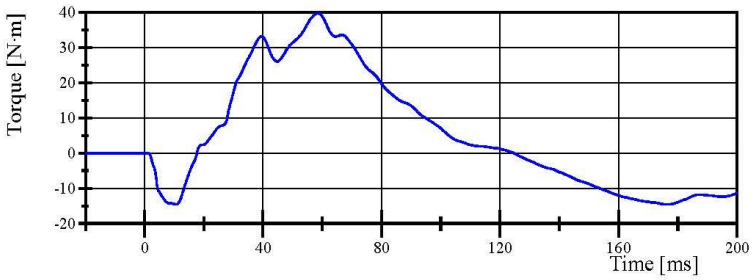
Filter Class: CFC_600
Max: 451.2 N at 52.7 ms
Min: -156.8 N at 186.2 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 32.7 Nm at 58.5 ms
Min: -19.1 Nm at 11.0 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Constar
Max: 39.8 N·m at 58.4 ms
Min: -14.6 N·m at 10.7 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

05.15.2019 08:23:27 722

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 71-1
Test Date: 5/14/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.4 g	Yes
Shoulder Displacement	28 - 37 mm	31.8 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	17.7 g	Yes

Test meets specifications.

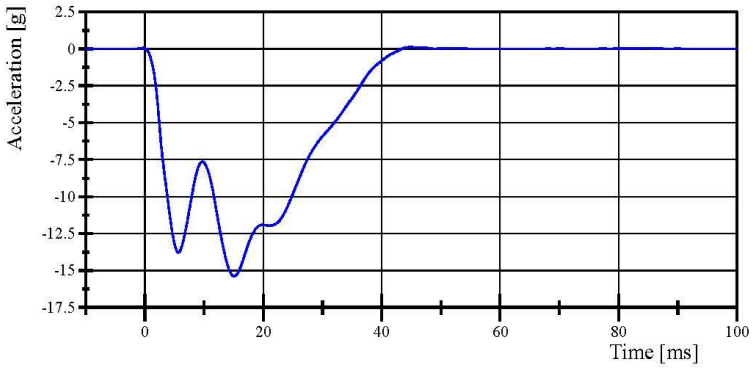
Condition: Used

Comments:
Left Arm S/N: 952
Shoulder Rib S/N: 180-3355 DM4450

Transportation Research Center Inc.

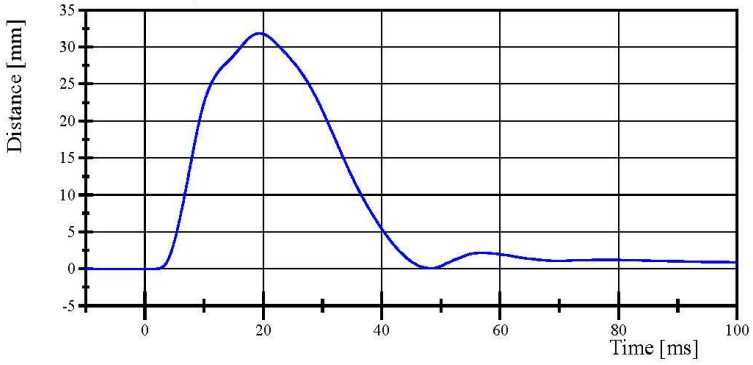
Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 71-1
Test Date: 5/14/2019

Probe Acceleration



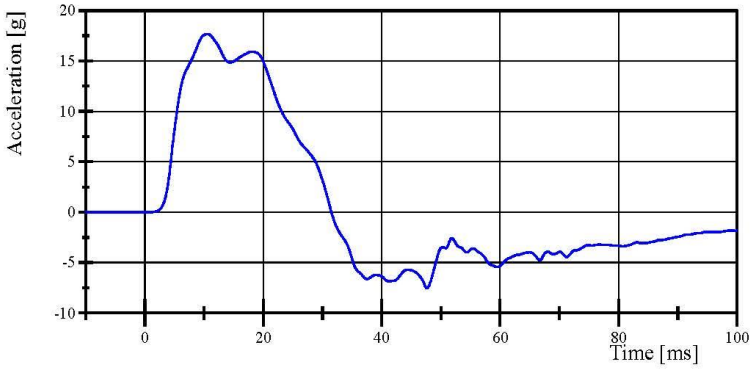
Filter Class: CFC_180
Max: 0.1 g at 44.8 ms
Min: -15.4 g at 15.0 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 31.8 mm at 19.4 ms
Min: -0.0 mm at 1.3 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 17.7 g at 10.6 ms
Min: -7.5 g at 47.6 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

05.14.2019 13:30:14 844

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 71-1
Test Date: 5/14/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.719 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-31.3 g	Yes
Shoulder Displacement	31 - 40 mm	34.0 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	26.2 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	32.3 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	35.6 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	37.7 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	30.7 g	Yes

Test meets specifications.

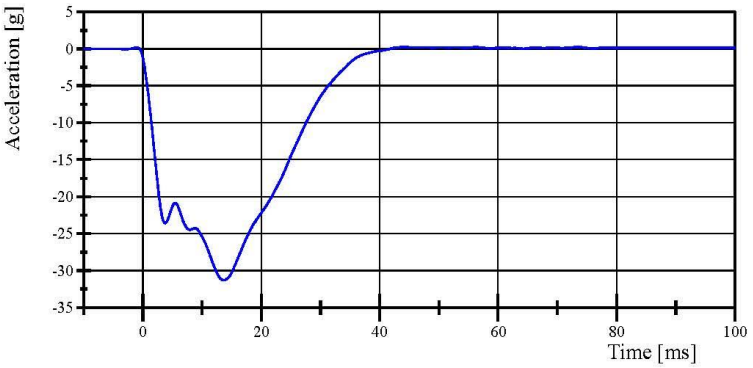
Condition: Used

Comments:
Left Arm S/N: 952
Shoulder Rib S/N: 180-3355 DM4450
Upper Thorax Rib S/N: 2135
Middle Thorax Rib S/N: 2136
Lower Thorax Rib S/N: 2137

Transportation Research Center Inc.

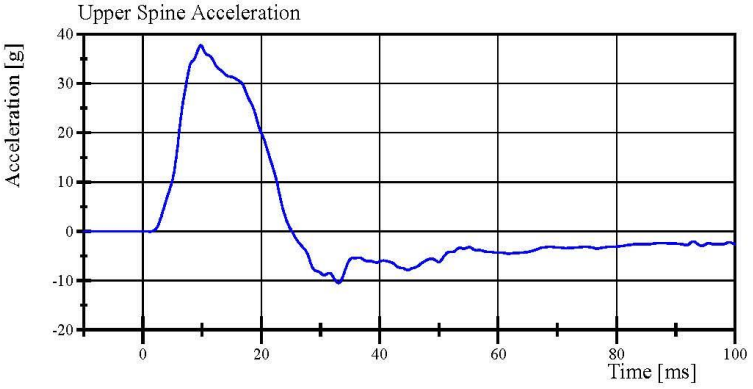
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 71-1
Test Date: 5/14/2019

Probe Acceleration



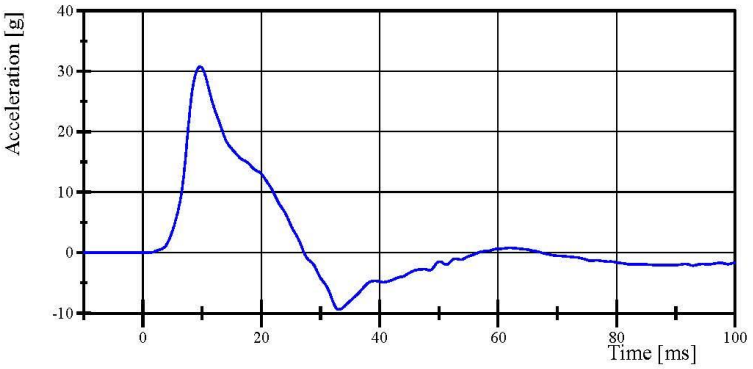
Filter Class: CFC_180
Max: 0.3 g at 73.4 ms
Min: -31.3 g at 13.6 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 37.7 g at 9.8 ms
Min: -10.5 g at 33.0 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 30.7 g at 9.7 ms
Min: -9.4 g at 33.0 ms

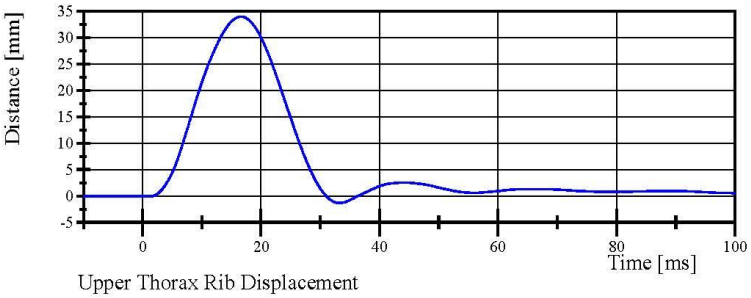
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

05.14.2019 14:46:52 617

Transportation Research Center Inc.

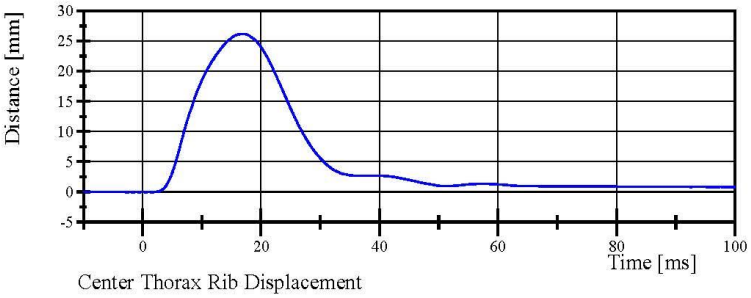
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 71-1
Test Date: 5/14/2019

Shoulder Rib Displacement



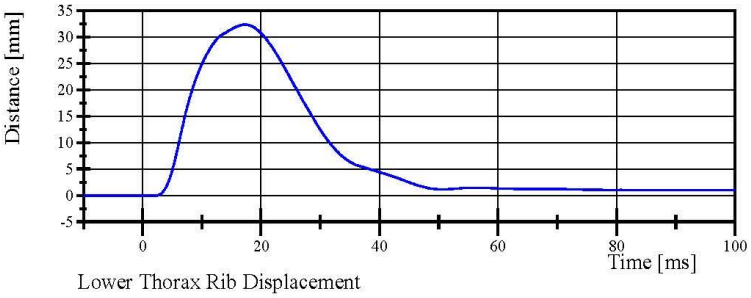
Filter Class: CFC_600
Max: 34.0 mm at 16.6 ms
Min: -1.3 mm at 33.2 ms

Upper Thorax Rib Displacement



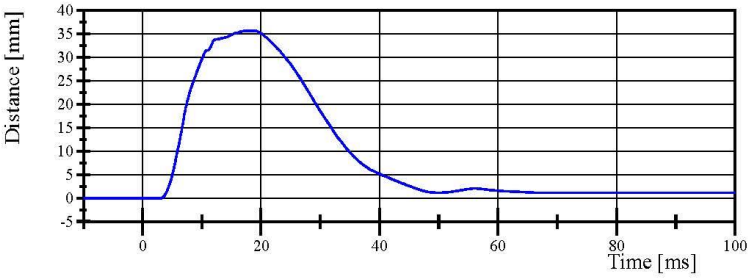
Filter Class: CFC_600
Max: 26.2 mm at 17.0 ms
Min: -0.0 mm at 1.8 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 32.3 mm at 17.3 ms
Min: -0.0 mm at 2.2 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 35.6 mm at 17.6 ms
Min: -0.0 mm at 3.0 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

05.14.2019 14:46:53 617

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 71-1
Test Date: 5/14/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.274 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-15.8 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	34.2 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	40.2 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	37.6 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	14.5 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.6 g	Yes

Test meets specifications.

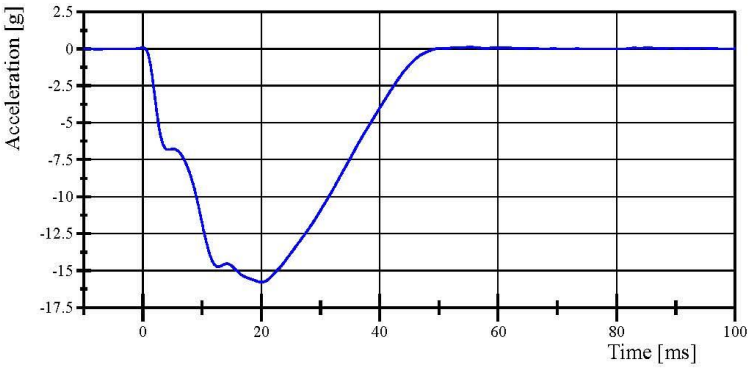
Condition: Used

Comments:
Upper Thorax Rib S/N: 2135
Middle Thorax Rib S/N: 2136
Lower Thorax Rib S/N: 2137

Transportation Research Center Inc.

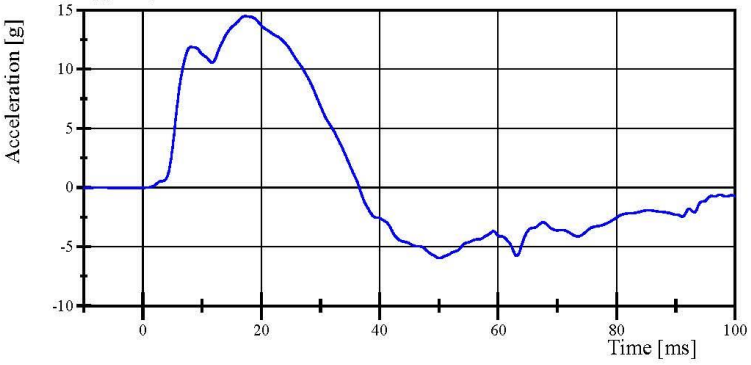
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 71-1
Test Date: 5/14/2019

Probe Acceleration



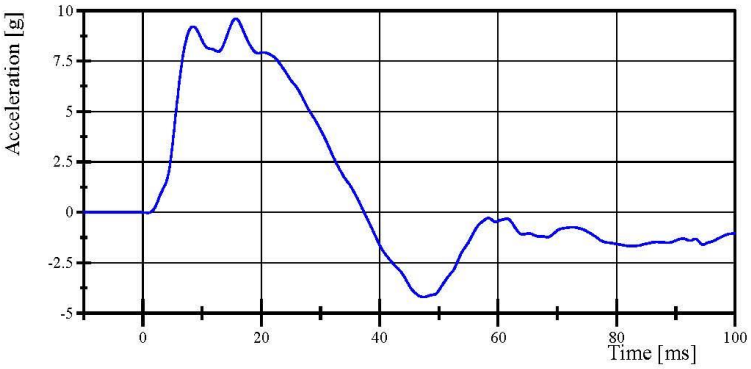
Filter Class: CFC_180
Max: 0.1 g at 55.0 ms
Min: -15.8 g at 20.1 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 14.5 g at 17.3 ms
Min: -6.0 g at 50.1 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 9.6 g at 15.7 ms
Min: -4.2 g at 47.4 ms

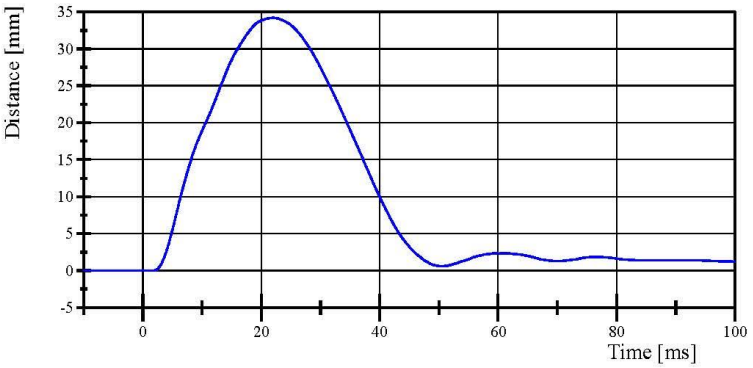
Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

05.14.2019 14:06:20 842

Transportation Research Center Inc.

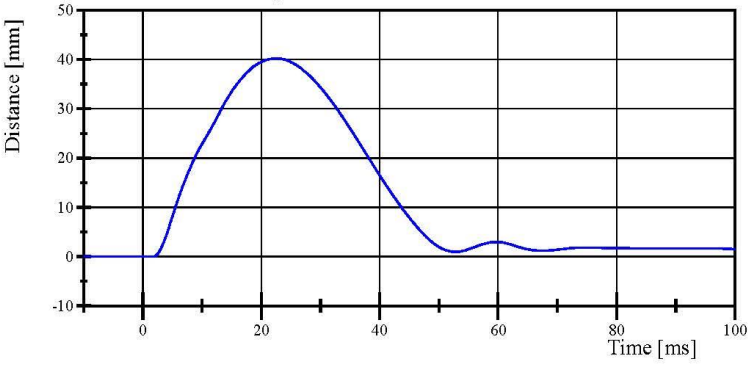
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 71-1
Test Date: 5/14/2019

Upper Thorax Rib Displacement



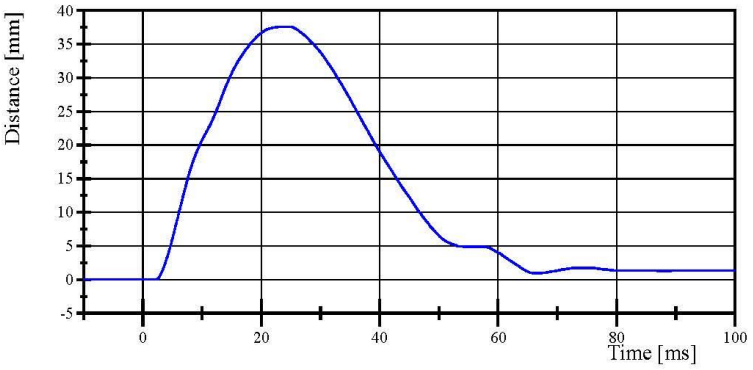
Filter Class: CFC_600
Max: 34.2 mm at 22.0 ms
Min: -0.0 mm at 1.8 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 40.2 mm at 22.6 ms
Min: -0.0 mm at 1.7 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 37.6 mm at 24.6 ms
Min: -0.0 mm at 2.2 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

05.14.2019 14:06:21 842

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 71-1
Test Date: 5/14/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-13.2 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	45.3 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	41.8 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.08 g	Yes

Test meets specifications.

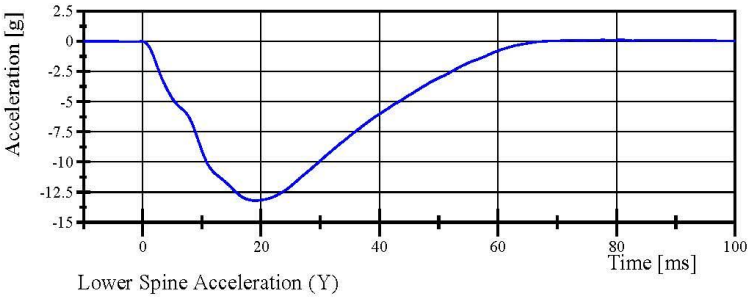
Condition: Used

Comments:
Upper Abdominal Rib S/N: 1997
Lower Abdominal Rib S/N: DS1234

Transportation Research Center Inc.

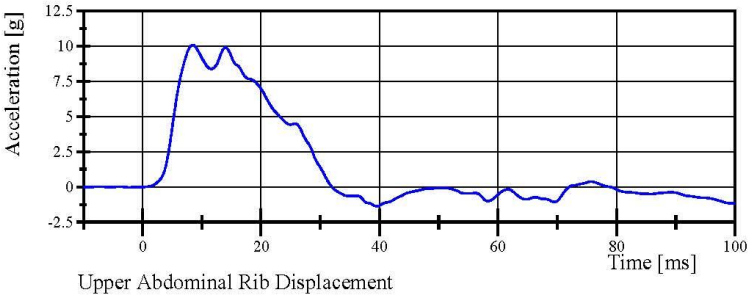
Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 71-1
Test Date: 5/14/2019

Probe Acceleration



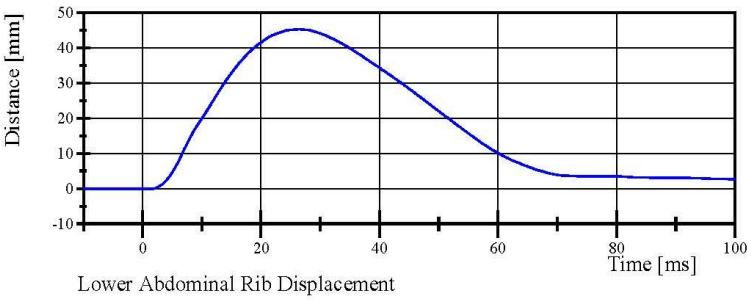
Filter Class: CFC_180
Max: 0.1 g at 80.7 ms
Min: -13.2 g at 19.0 ms

Lower Spine Acceleration (Y)



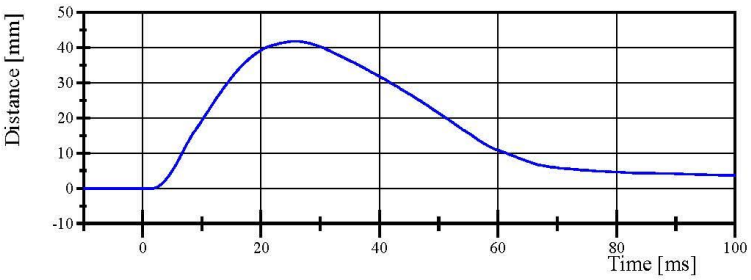
Filter Class: CFC_180
Max: 10.1 g at 8.5 ms
Min: -1.4 g at 39.6 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 45.3 mm at 26.4 ms
Min: -0.0 mm at 1.0 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 41.8 mm at 25.8 ms
Min: -0.0 mm at 1.5 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

05.14.2019 13:38:00 669

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 71-2
Test Date: 5/15/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.60 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-43.41 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	39.8 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,214.4 N	Yes

Test meets specifications.

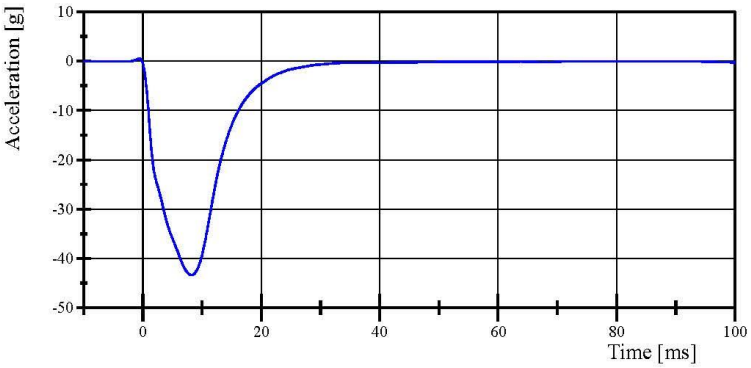
Condition: Used

Comments:
Pelvis Skin S/N: 884
Pelvis Plug Info:
Manufacturer: SACO
S/N: 12294
Cal Date: 20180315

Transportation Research Center Inc.

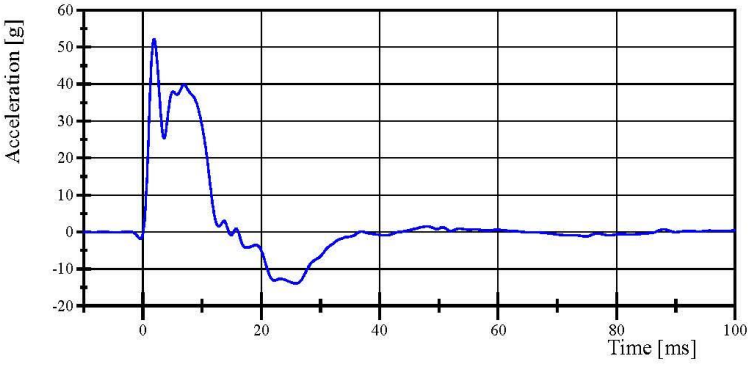
Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 71-2
Test Date: 5/15/2019

Probe Acceleration



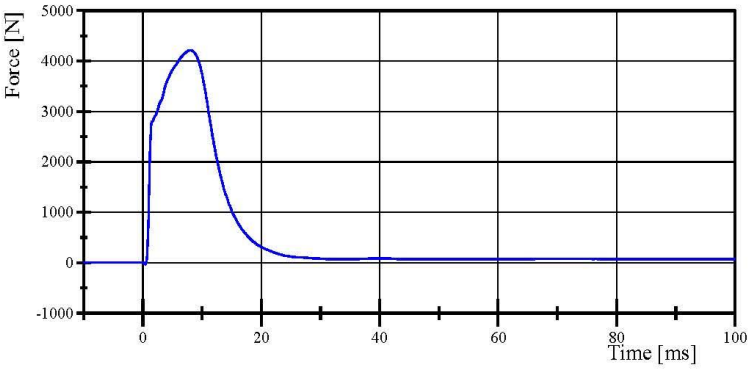
Filter Class: CFC_180
Max: 0.5 g at -0.6 ms
Min: -43.4 g at 8.2 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 52.2 g at 1.9 ms
Min: -14.0 g at 25.8 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 4,214.4 N at 8.0 ms
Min: -30.9 N at 0.5 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

05.15.2019 13:04:32 414

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 71-1
Test Date: 5/14/2019

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.28 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-38.4 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	31.6 g	Yes
Iliac Force	4,100 - 5,100 N	4,498.2 N	Yes

Test meets specifications.

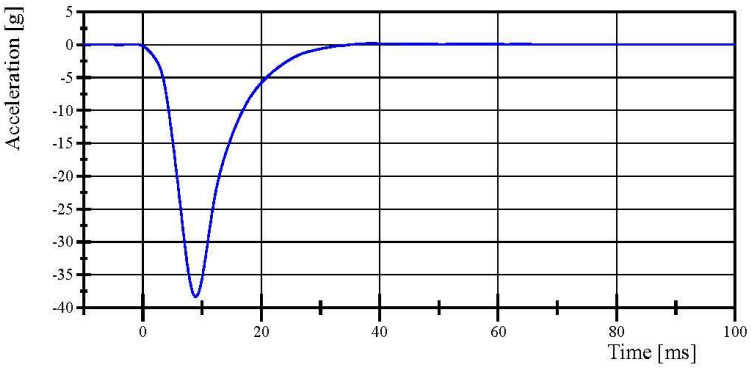
Condition: Used

Comments:
Pelvis Skin S/N: 884

Transportation Research Center Inc.

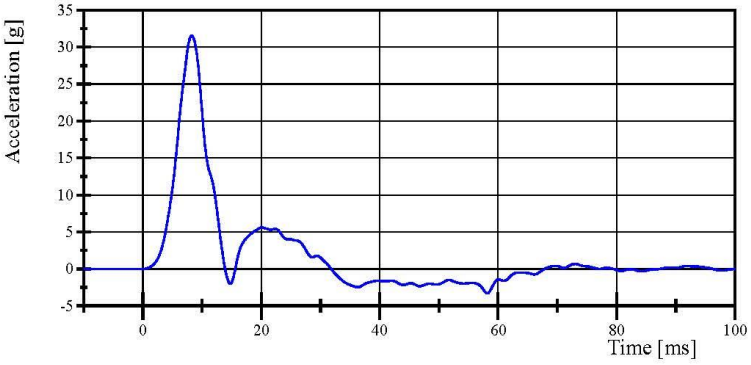
Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 71-1
Test Date: 5/14/2019

Probe Acceleration



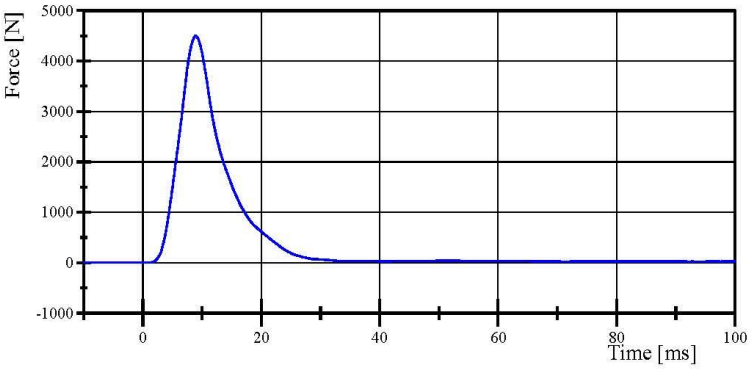
Filter Class: CFC_180
Max: 0.2 g at 38.8 ms
Min: -38.4 g at 8.9 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 31.6 g at 8.2 ms
Min: -3.3 g at 58.2 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,498.2 N at 8.9 ms
Min: -0.8 N at -1.0 ms

Specification Source: CFR49 Part 572 Subpart V
with Polarity in accordance with J211

05.14.2019 13:13:13 680

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (ES-2re)

			ES-2re S/N F030		
			Serial Number	**Manufacturer**	**Calibration Date**
Head Accelerometers		X	P87680	Endevco	16-Apr-2019
		Y	T10352	Endevco	16-Apr-2019
		Z	P91950	Endevco	16-Apr-2019
Redundant Head Accelerometers		X	P94566	Endevco	16-Apr-2019
		Y	P83368	Endevco	16-Apr-2019
		Z	P94483	Endevco	16-Apr-2019
Thoracic Rib Displacement Potentiometers	Upper	Y	111	Honeywell	16-Apr-2019
	Middle	Y	174	FTSS	16-Apr-2019
	Lower	Y	173	FTSS	16-Apr-2019
Abdomen Load Cells	Front	Y	1441	Denton	16-Apr-2019
	Middle	Y	1436	Denton	16-Apr-2019
	Rear	Y	1437	Denton	16-Apr-2019
Lower Spine Accelerometers (T12)		X	P89126	Endevco	16-Apr-2019
		Y	P87139	Endevco	16-Apr-2019
		Z	P64884	Endevco	16-Apr-2019
Acetabulum Load Cell		Y	N/A	N/A	N/A
Pubic Symphysis Load Cell		Y	457-FY	Denton	16-Apr-2019

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 305		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers			X	T11432	Endevco	18-Apr-2019
			Y	P93774	Endevco	18-Apr-2019
			Z	P91566	Endevco	18-Apr-2019
Redundant Head Accelerometers			X	P91615	Endevco	18-Apr-2019
			Y	P93762	Endevco	18-Apr-2019
			Z	P93761	Endevco	18-Apr-2019
Displacement Potentiometers	Shoulder		N/A	N/A	N/A	N/A
	Thoracic Rib	Upper	Y	007	Servo	18-Apr-2019
		Middle	Y	037	Servo	18-Apr-2019
		Lower	Y	1161	Servo	18-Apr-2019
	Abdominal Rib	Upper	Y	1295	Servo	18-Apr-2019
		Lower	Y	1136	Servo	18-Apr-2019
Lower Spine Accelerometers (T12)			X	P94545	Endevco	18-Apr-2019
			Y	P94647	Endevco	18-Apr-2019
			Z	P94530	Endevco	18-Apr-2019
Acetabulum Load Cell			Y	DK7483S-FY	FTSS	18-Apr-2019
Iliac Wing Load Cell			Y	287-FY	Denton	18-Apr-2019
Pelvis Plug (struck side)				12375	SACO	23-Mar-2018
Pelvis Plug (non-struck side)				36473	FTSS	29-Sep-2010

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	P58611	Endevco	25-Mar-2019
	Vehicle Center of Gravity	Y	P61295	Endevco	25-Mar-2019
	Vehicle Center of Gravity	Z	P76454	Endevco	25-Mar-2019
2	Right Sill at Front Seat	X	P94600	Endevco	8-May-2019
	Right Sill at Front Seat	Y	P88038	Endevco	15-Apr-2019
	Right Sill at Front Seat	Z	P94561	Endevco	15-Apr-2019
3	Right Sill at Rear Seat	X	P97539	Endevco	6-May-2019
	Right Sill at Rear Seat	Y	P97681	Endevco	2-Apr-2019
	Right Sill at Rear Seat	Z	P91482	Endevco	6-May-2019
4	Left Sill at Front Door	Y	P88455	Endevco	3-Jan-2019
5	Left Sill at Rear Door	Y	P80466	Endevco	6-May-2019
6	Left A-Post Lower	Y	P56615	Endevco	21-Dec-2018
7	Left A-Post Middle	Y	T11840	Endevco	8-Jan-2019
8	Left B-Post Lower	Y	T11823	Endevco	7-Jan-2019
9	B-Post Middle	Y	T11834	Endevco	7-Jan-2019
10	Front Seat Track	Y	T11847	Endevco	8-Jan-2019
11	Rear Seat Track or Structure	Y	T11835	Endevco	8-Jan-2019
12	Right Rear Occupant Compartment	Y	P97716	Endevco	21-Dec-2018
13	Engine Block	X	P75115	Endevco	25-Mar-2019
	Engine Block	Y	P94567	Endevco	25-Mar-2019
14	Rear Floorpan Above Axle	X	P94536	Endevco	6-May-2019
	Rear Floorpan Above Axle	Y	T10347	Endevco	6-May-2019
	Rear Floorpan Above Axle	Z	P91909	Endevco	6-May-2019

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	P75713	Endevco	19-Mar-2019
MDB Center of Gravity	Y	P76171	Endevco	19-Mar-2019
MDB Center of Gravity	Z	P76114	Endevco	19-Mar-2019
Left Frame Rail at Rear Axle Centerline	X	P81065	Endevco	3-Jan-2019
Left Frame Rail at Rear Axle Centerline	Y	P57192	Endevco	3-Jan-2019