
*Rollover Stability Measurements For
2019 New Car Assessment Program
(NCAP)*

Final Report

Contract:
DTNH22-14-D-00326

For:
National Highway Traffic Safety Administration

November 2019



7001 Buffalo Parkway
Columbus, Ohio 43229

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ROLLOVER STABILITY MEASUREMENTS FOR 2019 NEW CAR ASSESSMENT PROGRAM (NCAP)

Introduction

This report contains results from the measurements including track width and center-of-gravity (CG) height for 41 light duty vehicles under one loading condition: Driver Only. The relationship between the track width and CG height of a vehicle is a static metric that has been used for vehicle-to-vehicle comparison. The most common form, “ $T/2h$,” is computed as one-half the average track width ($T/2$) divided by the vehicle center-of-gravity height (h). In this report, the Static Stability Factor (SSF) is defined as $T/(2h)$ for the Driver Only loading condition. These measurements were performed for the National Highway Traffic Safety Administration's Office of Crash Avoidance Standards under contract DTNH22-14-D-00326 (hereinafter referred to as “the Contract”). The particular make/models represent a subset of the vehicles in the 2019 National Highway Traffic Safety Administration (NHTSA) frontal and side impact New Car Assessment Program.

Discussion

Each of the vehicle models listed in Table I was secured in new or as-new condition. Prior to testing, each test vehicle's fuel tank was filled with gasoline, and its tires inflated to the vehicle manufacturer's recommended pressure. All tests are conducted with the Driver Only load: each test vehicle had an anthropomorphic test dummy placed in the driver seating position of the vehicle. In all tests, the driver was an un-instrumented "Hybrid II" anthropomorphic test dummy (weighing 163.0 lbs) which is representative in size, overall weight, and weight distribution of a 50th percentile human male.

Table II lists the information recorded, measured, and computed for each vehicle. All of the information listed in Table II is provided in Appendix A. The information related to vehicle mass and center-of-gravity locations was obtained using SEA, Ltd.'s (S-E-A) Vehicle Inertia Measurement Facility (VIMF). The NHTSA document titled “Laboratory Test Procedure for Rollover Stability Measurement for New Car Assessment Program (NCAP) – Static Stability Factor (SSF) Measurement,” details the procedure for making the measurements (1). Descriptions of the design and operation of the VIMF are provided in the papers listed in the references (2-3).

The track width measurements were made using the procedure detailed in the contract. In summary, this is:

- Measure the track width with the vehicle in its driver only configuration.
- Make two Tire Edge Determination Tools as shown in Figure 1. These are modified 4-inch beams which, when placed on the floor and pushed against the tire, will define a longitudinal line on the inside or outside lower sidewall of the tire approximately 4 inches (106 mm) above the floor. Figure 2 shows the beams as used at S-E-A's VIMF.
- Place the beams on the right sides of both front tires and measure the separation of the beams below the front and rear edges of the tires. Repeat this with the beams on the left sides of the front tires for four measurements - the average of which is the front track width. An identical procedure is used for measuring the rear track width. Thus, a total of eight measurements are taken, the average of which is reported as the vehicle track width.

Figure 3 contains a sample results page from one of the vehicle tests, the 2019 Acura RDX, in the "Driver Only" condition. The results pages contain all of the information in Table II, as well as additional information. The individual wheel weights, the four front track width measurements, the four rear track width measurements, and the left and right side wheelbase measurements are recorded on the test pages. Additionally, details specific to the VIMF measurements of CG Height are included. These are the Applied Weights (calibrated hanging weights used to tilt the VIMF platform in pitch during a VIMF CG Height test), the Platform Angle (resulting VIMF pitch angle), Relative Motion (relative longitudinal motion between the vehicle body and VIMF platform), and the resulting individual CG Height measurements.

The critical calculations listed on the pages are Average Track, Average C.G. Height, and T/2h. As mentioned, the Average Track is calculated from eight individual track width measurements, four for the front track and four for the rear track. Each of the eight measurements is made using a tape measure divided into tenths of an inch. The measurements are recorded to the nearest half division, which is 0.05 inches. The four front measurements are averaged using Microsoft Excel to compute the Front Track listed on the results sheets. Similarly, the four rear measurements are averaged to compute the Rear Track listed. The Average Track is the average of Front Track and Rear Track. Since no rounding takes place in the calculations of Front Track and Rear Track, the value computed for Average Track is the same as if all eight individual measurements were averaged. The individual measurements are listed on the results sheets using two decimal places. This is because the measurements are made to the nearest 0.05 inches. The Front Track, Rear Track, and Average Track calculations are listed using one decimal place. However, decimal places beyond the first are retained in Excel and used in the calculations for SSF. The Front Track, Rear Track, and Average Track width measurements are thought to be accurate to the nearest 0.1 inches. Based on a 60 inch Average Track and 0.1 inches measurement accuracy, the Average Track value listed is good to an accuracy of 0.17%. The resolution in the recorded value is 0.05 inches, which is one-half of the listed accuracy.

The Average C.G. Height listed is based on the average value calculation for the four individual C.G. Height tests (Runs #2-5 listed on the results pages). The VIMF software/database uses more than two decimal places in this calculation, and rounding to two decimal places is done for reporting purposes. The values listed on the sheets for Average C.G. Height are to the nearest

0.01 inches, with a resolution of 0.005 inches. Based on theoretical error analysis, on doing numerous repeat testing of the same vehicles, and on numerous tests done using calibration fixtures; the accuracy of the VIMF is thought to be 0.5% or better. This means that for a 20 inch C.G. Height, the measured value is accurate to 0.1 inches, or better. Based on this fact and the significance of the VIMF measurement values that go into calculating C.G. Height, recording the Average C.G. Height using two decimal places is warranted.

As requested by NHTSA, the T/2h values are listed on the data sheets using four decimal places. The SSF, defined by NHTSA as the two decimal place value of the T/2h for the vehicle with a driver, is reported accordingly in the Summary Results Table, Appendix B.

Results

Results for all the values listed in Table II are summarized for all 41 vehicles tested in the spreadsheet contained in Appendix A.

Appendix B contains a one-page Summary Results Table containing all measured track widths, C.G. Heights, and SSF values using two decimal places.

Appendix C contains individual test results pages for all 41 tests.

Photos of the test vehicles (a side view and a $\frac{3}{4}$ front view) are provided in Appendix D.

Table I. Test Vehicles

Test Sequence Number	Vehicle Make/Model	Date Tested	VIMF Number
3	Acura RDX AWD	9/14/2018	7027
2	Acura RDX FWD	8/22/2018	7017
40	Audi E-Tron	7/2/2019	7279
41	Audi Q3 AWD	8/6/2019	7303
7	Audi Q8	1/10/2019	7119
16	BMW X3 AWD	2/18/2019	7162
25	BMW X3 RWD	3/8/2019	7191
12	BMW X5 AWD	2/1/2019	7140
18	Cadillac XT4 AWD	2/28/2019	7175
20	Cadillac XT4 FWD	2/28/2019	7180
32	Chevrolet Blazer AWD	5/7/2019	7239
33	Chevrolet Blazer FWD	5/8/2019	7241
15	Chevrolet Silverado Crew 4X4	2/14/2019	7160
21	Chevrolet Silverado Crew 4X2	3/1/2019	7181
34	Ford Ranger SuperCrew 4X4	5/8/2019	7243
35	Ford Ranger SuperCrew 4X2	5/9/2019	7245
1	Honda Insight	7/31/2018	6994
22	Honda Passport AWD	3/4/2019	7185
36	Honda Passport FWD	5/22/2019	7251
19	Hyundai Kona AWD	2/28/2019	7178
17	Hyundai Kona FWD	2/22/2019	7168
11	Hyundai Santa Fe AWD	1/23/2019	7128
10	Hyundai Santa Fe FWD	1/23/2019	7126
24	Infiniti QX50 AWD	3/7/2019	7189
26	Infiniti QX50 FWD	3/8/2019	7193
23	Jeep Wrangler Unlimited 4X4	3/5/2019	7187
9	Kia Forte	1/22/2019	7124
31	Kia Niro Hybrid	5/7/2019	7237
13	Lexus ES350 FWD	2/12/2019	7151
27	Lexus UX200 FWD	3/21/2019	7200
5	Mitsubishi Outlander PHEV	11/13/2018	7079
39	Nissan Altima	7/1/2019	7277
14	Nissan Kicks FWD	2/12/2019	7153
38	Ram 1500 4X4 Crew Cab	6/6/2019	7260
37	Ram 1500 4X2 Crew Cab	5/29/2019	7257
4	Subaru Ascent	9/14/2018	7029
6	Subaru Forester	1/10/2019	7116
28	Toyota Corolla	3/21/2019	7202
29	Toyota RAV4 AWD	5/3/2019	7235
30	Toyota RAV4 FWD	5/3/2019	7233
8	Volkswagen Jetta	1/11/2019	7120

Table II
Vehicle Information Contained in Results Spreadsheets

MY

Model Year (all test vehicles are model year 2018 or 2019)

Make, Model and Body Style

Three columns with Manufacturer's information about the test vehicle

Drive

FWD – Front Wheel Drive

RWD – Rear Wheel Drive

AWD – All Wheel Drive

4WD or 4X4 – Four Wheel Drive

4X2 – Two Wheel Drive

VIN

17 Digit Vehicle Identification Number

Engine Size/Type

Vehicle engine size and type

Trans. Type

Vehicle transmission type

Doors

Number of doors

Significant Options

Optional equipment that may significantly affect the CG Height.

Shorthand notes: RR = Roof Rack, RB = Running Boards, SR = Sun Roof, MR = Moon Roof, PSR = Panoramic Sunroof.

Front Tire Make/Type – Front Tire Size - Front Press.**Rear Tire Make/Type – Rear Tire Size - Rear Press.**

These six columns contain information on the tires on the test vehicles. The tire size and type are specified, and the tire pressures are the vehicle manufacturers' specified tire pressures that were used during the tests.

Front Track - Rear Track - Average Track (T)

Front, rear and average track widths measured on test vehicles

Table II (continued)
Vehicle Information Contained in Spreadsheets

Wheelbase

Average of measured left side wheelbase and right side wheelbase

GVWR, GAWR Front, GAWR Rear

Gross vehicle and axle weight ratings for the test vehicle

Load

Driver Only - described in the Discussion section on page 2 of the report.

Test Date

Test date for the VIMF test

VIMF Test No.

VIMF test number

Roof Height

Measured height of test vehicle after loading – does not include roof rack

Test Weight

Measured weight of test vehicles

CG Long.

Longitudinal distance from front wheel axis (axis through the centers of the front wheels) to vehicle center of gravity location

CG Lateral

Lateral distance from vehicle centerline to vehicle center of gravity location (negative to driver's side of vehicle)

CG Height (h)

Measured height of vehicle center of gravity

T/2h

$(\text{Average Track Width}) / (2 \times \text{CG Height})$

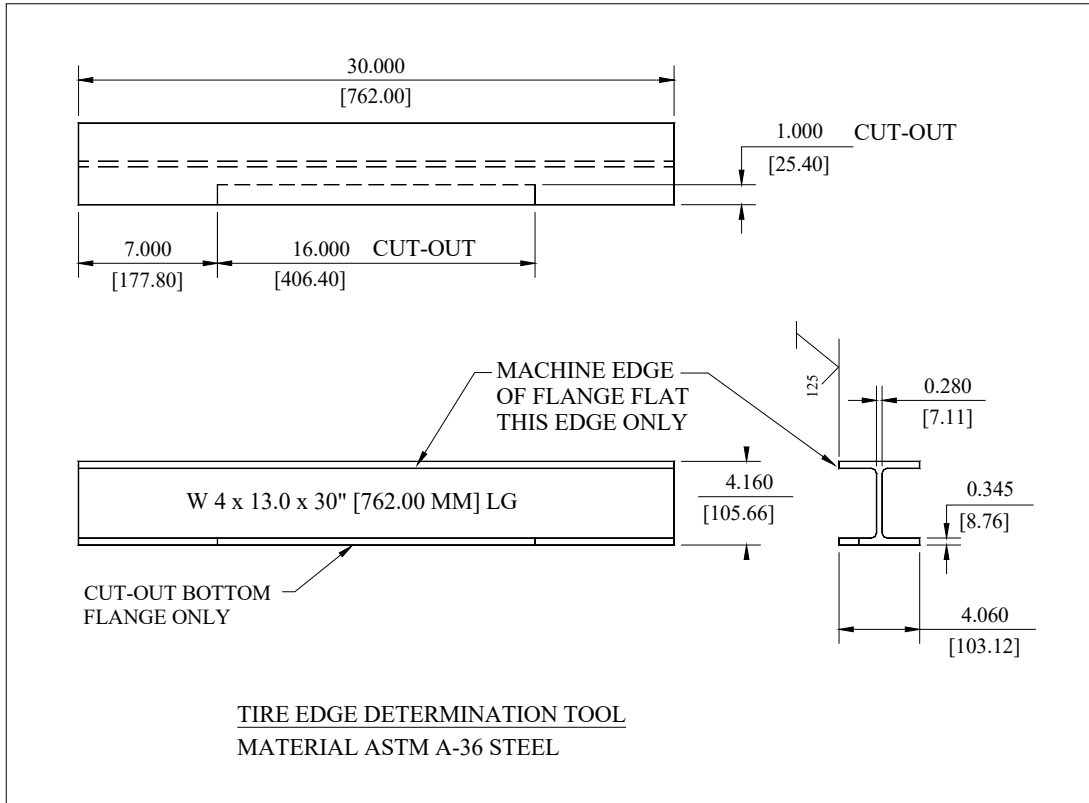


Figure 1: Tire Edge Determination Tool Used for Track Width Measurements



Figure 2: Measurements at S-E-A

References

- 1) *Laboratory Test Procedure for Rollover Stability Measurement for New Car Assessment Program (NCAP) – Static Stability Factor (SSF) Measurements*, U.S. Department of Transportation, National Highway Traffic Safety Administration, March 2013.
- 2) *The Design of a Vehicle Inertia Measurement Facility*, Heydinger, G.J., Durisek, N.J., Covert, D.A., Guenther, D.A., and Novak, S.J., SAE Paper No. 950309, February, 1995. Also presented and reprinted by invitation at the 1995 Society of Allied Weight Engineers (SAWE) International Conference, May, 1995.
- 3) *An Overview of a Vehicle Inertia Measurement Facility*, Heydinger, G.J., Durisek, N.J., Covert, D.A., Lawrence, R.D., Nowjack, J.A., and Guenther, D.A., 27th International Symposium on Automotive Technology and Automation, ISATA Paper 94SF034, October, 1994.

Appendix A

Results Spreadsheets for all Tests

Seq No.	MY	Make	Model	Drive	Trim	VIN	Engine Size/Type	Trans Type	Doors	Significant Options
3	2019	Acura	RDX	AWD	SUV	5J8TC2H58KL01####	2.0L I4	10AT	4	PSR
2	2019	Acura	RDX	FWD	SUV	5J8TC1H38KL00####	2.0L I4	10AT	4	PSR
40	2019	Audi	E-Tron	AWD	SUV	WA1LAAGE0KB01####	Electric	Auto	4	PSR, RR
41	2019	Audi	Q3	AWD	SUV	WA1FECF3XK106####	2.0L I4	8AT	4	PSR, RR
7	2019	Audi	Q8	AWD	SUV	WA1CVAF12KD01####	3.0L V6	8AT	4	PSR, RR, Hitch
16	2019	BMW	X3	AWD	SUV	5UXTR9C5XKLE1####	2.0L I4 Turbo	8AT	4	PSR, RR, Hitch
25	2019	BMW	X3	RWD	SUV	5UXTR7C59KLF3####	2.0L I4 Turbo	8AT	4	PSR, RR, Hitch
12	2019	BMW	X5	AWD	SUV	5UXJU2C59KLN4####	4.4L V8 Turbo	8AT	4	RR, Hitch
18	2019	Cadillac	XT4	AWD	SUV	1GYFZDR42KF14####	2.0L I4 Turbo	9AT	4	PSR, RR
20	2019	Cadillac	XT4	FWD	SUV	1GYFZCR46KF13####	2.0L I4 Turbo	9AT	4	PSR, RR
32	2019	Chevrolet	Blazer	AWD	SUV	3GNKBKRS6KS57####	3.6L V6	9AT	4	PSR, RR
33	2019	Chevrolet	Blazer	FWD	SUV	3GNKBDRS7KS58####	3.6L V6	9AT	4	PSR, RR
15	2019	Chevrolet	Silverado Crew	4X4	Pickup	1GCUYDED3KZ11####	5.3L V8	8AT	4	Hitch
21	2019	Chevrolet	Silverado Crew	4X2	Pickup	3GCPWAEH0KG11####	4.3L V6	6AT	4	Hitch
34	2019	Ford	Ranger SuperCrew	4X4	Pickup XLT	1FTER4FH1KLA3####	2.3L I4	10AT	4	Hitch
35	2019	Ford	Ranger SuperCrew	4X2	Pickup XLT	1FTER4EH6KLA2####	2.3L I4	10AT	4	Hitch
1	2019	Honda	Insight	FWD	Sedan	19XZE4F10KE00####	1.5L I4	CVT	4	
22	2019	Honda	Passport	AWD	SUV	5FNYP8H27KB00####	3.5L V6	9AT	4	
36	2019	Honda	Passport	2WD	SUV	5FNYP7H22KB00####	3.5L V6	9AT	4	
19	2019	Hyundai	Kona	AWD	SUV	KM8K3CA51KU26####	1.6L I4 Turbo	7AT	4	SR, RR
17	2019	Hyundai	Kona	FWD	SUV	KM8K22AA3KU21####	2.0L I4	6AT	4	RR
11	2019	Hyundai	Santa Fe	AWD	SUV	5NMS2CAD5KH02####	2.4L I4	8AT	4	
10	2019	Hyundai	Santa Fe	FWD	SUV	5NMS23AD5KH06####	2.4L I4	8AT	4	
24	2019	Infiniti	QX50	AWD	SUV	3PCAJ5M33KF10####	2.0L I4	CVT	4	PSR, RR
26	2019	Infiniti	QX50	FWD	SUV	3PCAJ5M18KF10####	2.0L I4	CVT	4	PSR, RR
23	2019	Jeep	Wrangler Unlimited	4X4	SUV	1C4HJXFN4KW53####	2.4L I4 Turbo	8AT	4	
9	2019	Kia	Forte	FWD	Sedan	3KPF24AD5KE06####	2.0L I4	CVT	4	
31	2019	Kia	Niro Hybrid	FWD	SUV	KNDGB3LC2K525####	1.6L I4	6AT	4	
13	2019	Lexus	ES350	FWD	Sedan	58ABZ1B16KU01####	3.5L V6	8AT	4	SR
27	2019	Lexus	UX200	FWD	Hatchback	JTHY3JBH8K200####	2.0L I4	CVT	4	SR, RR
5	2018	Mitsubishi	Outlander PHEV	AWD	SUV SEL	JA4J24A54JZ05####	2.0L I4	AT	4	RR, Hitch
39	2019	Nissan	Altima	AWD	Sedan	WA1LAAGE0KB01####	2.5L I4	CVT	4	SR
14	2019	Nissan	Kicks	FWD	SUV	3N1CP5CU6KL47####	1.6L I4	CVT	4	
38	2019	Ram	1500 Crew Cab	4X4	Pickup	1C6SRFF77KN74####	5.7L V8 Hemi	8AT	4	Hitch
37	2019	Ram	1500 Crew Cab	4X2	Pickup	1C6RREFTXKN68####	5.7L V8 Hemi	8AT	4	Hitch
4	2019	Subaru	Ascent	AWD	SUV	4S4VMAMD1K340####	2.4L Flat 4 Turbo	CVT	4	
6	2019	Subaru	Forester	AWD	SUV	JF2SKACC4KH44####	2.5L Flat 4	CVT	4	
28	2019	Toyota	Corolla	FWD	Hatchback	JTNK4RBE8K302####	2.0L I4	CVT	4	
29	2019	Toyota	RAV4	AWD	SUV	2T3G1RFV1KW04####	2.5L I4	8AT	4	RR
30	2019	Toyota	RAV4	FWD	SUV	JTMK1RFV1KJ00####	2.5L I4	8AT	4	RR
8	2019	Volkswagen	Jetta	FWD	Sedan	3VWVC57BUXKM12####	1.4L I4 Turbo	8AT	4	

Seq No.	MY	Make	Model	Drive	Front Tire Make/Type	Front Tire Size	Front Press. (psi)	Rear Tire Make/Type
3	2019	Acura	RDX	AWD	Continental Cross Contact LX Sport	235/55R19 101H	33	Continental Cross Contact LX Sport
2	2019	Acura	RDX	FWD	Continental Cross Contact LX Sport	235/55R19 101H	33	Continental Cross Contact LX Sport
40	2019	Audi	E-Tron	AWD	Goodyear Eagle Sport M+S	255/50R20 109H	38	Goodyear Eagle Sport M+S
41	2019	Audi	Q3	AWD	Goodyear Eagle Sport M+S	235/50R19 99H	38	Goodyear Eagle Sport M+S
7	2019	Audi	Q8	AWD	Continental Cross Contact LX Sport M+S	285/40R22 110H	39	Continental Cross Contact LX Sport M+S
16	2019	BMW	X3	AWD	Bridgestone Dueler H/P Sport AS M+S	245/50R19 105H	32	Bridgestone Dueler H/P Sport AS M+S
25	2019	BMW	X3	RWD	Pirelli Cinturato P7 M+S	245/50R19 105H	32	Pirelli Cinturato P7 M+S
12	2019	BMW	X5	AWD	Pirelli Scorpion Zero M+S	275/45R20 110H	33	Pirelli Scorpion Zero M+S
18	2019	Cadillac	XT4	AWD	Continental Pro Contact TX M+S	245/45R20 99H	35	Continental Pro Contact TX M+S
20	2019	Cadillac	XT4	FWD	Continental Pro Contact TX M+S	245/45R20 99H	35	Continental Pro Contact TX M+S
32	2019	Chevrolet	Blazer	AWD	Continental Cross Contact LX Sport M+S	265/45R21 104V	36	Continental Cross Contact LX Sport M+S
33	2019	Chevrolet	Blazer	FWD	Michelin Premier LTX M+S	235/55R20 102H	36	Michelin Premier LTX M+S
15	2019	Chevrolet	Silverado Crew	4X4	Bridgestone Dueler A/T	275/60R20 115S	35	Bridgestone Dueler A/T
21	2019	Chevrolet	Silverado Crew	4X2	General Grabber HTS M+S	255/70R17 112S	35	General Grabber HTS M+S
34	2019	Ford	Ranger SuperCrew	4X4	Bridgestone Dueler A/T RH-S M+S	255/65R17 110S	30	Bridgestone Dueler A/T RH-S M+S
35	2019	Ford	Ranger SuperCrew	4X2	Bridgestone Dueler H/T M+S	265/60R18 110T	35	Bridgestone Dueler H/T M+S
1	2019	Honda	Insight	FWD	Michelin Energy Saver A/S	215/55R16 93V	35	Michelin Energy Saver A/S
22	2019	Honda	Passport	AWD	Continental Cross Contact LX Sport	245/50R20 102H	35	Continental Cross Contact LX Sport
36	2019	Honda	Passport	2WD	Continental Cross Contact Sport M+S	245/50R20 102H	35	Continental Cross Contact Sport M+S
19	2019	Hyundai	Kona	AWD	Goodyear Eagle Touring M+S	235/45R18 98V	33	Goodyear Eagle Touring M+S
17	2019	Hyundai	Kona	FWD	Hankook Kinergy GT M+S	215/55R17 94V	33	Hankook Kinergy GT M+S
11	2019	Hyundai	Santa Fe	AWD	Hankook Durapro HP2 M+S	235/65R17 104H	35	Hankook Durapro HP2 M+S
10	2019	Hyundai	Santa Fe	FWD	Hankook Durapro HP2 M+S	235/65R17 104H	35	Hankook Durapro HP2 M+S
24	2019	Infiniti	QX50	AWD	Bridgestone Ecopia H/L 422 Plus M+S	P255/45RF20 101V	33	Bridgestone Ecopia H/L 422 Plus M+S
26	2019	Infiniti	QX50	FWD	Bridgestone Ecopia H/L 422 Plus M+S	P255/45RF20 101V	33	Bridgestone Ecopia H/L 422 Plus M+S
23	2019	Jeep	Wrangler Unlimited	4X4	BF Goodrich All Terrain T/A K02 M+S	LT285/70R17 116/113Q	37	BF Goodrich All Terrain T/A K02 M+S
9	2019	Kia	Forte	FWD	Kumho Solus TA31 M+S	205/55R16 91H	33	Kumho Solus TA31 M+S
31	2019	Kia	Niro Hybrid	FWD	Michelin Energy Saver A/S	205/65R16 92H	36	Michelin Energy Saver A/S
13	2019	Lexus	ES350	FWD	Michelin Energy Saver A/S M+S	235/45R18 94V	35	Michelin Energy Saver A/S M+S
27	2019	Lexus	UX200	FWD	Bridgestone Turanza M+S	225/50RF18 95V	33	Bridgestone Turanza M+S
5	2018	Mitsubishi	Outlander PHEV	AWD	Goodyear Eagle Sport M+S	235/55R18 97H	35	Goodyear Eagle Sport M+S
39	2019	Nissan	Altima	AWD	Continental Pro Contact TX M+S	215/55R17 94V	33	Continental Pro Contact TX M+S
14	2019	Nissan	Kicks	FWD	Firestone FT140 M+S	205/55R17 91V	32	Firestone FT140 M+S
38	2019	Ram	1500 Crew Cab	4X4	Bridgestone Dueler H/T M+S	275/65R18 116T	36	Bridgestone Dueler H/T M+S
37	2019	Ram	1500 Crew Cab	4X2	Bridgestone Dueler H/L M+S	275/55R20 113T	36	Bridgestone Dueler H/L M+S
4	2019	Subaru	Ascent	AWD	Falken ZieX ZE001 A/S M+S	245/50R20 102H	33	Falken ZieX ZE001 A/S M+S
6	2019	Subaru	Forester	AWD	Bridgestone Ecopia H/L 422 M+S	225/60R17 99H	33	Bridgestone Ecopia H/L 422 M+S
28	2019	Toyota	Corolla	FWD	Yokohama Avid GT M+S	225/40R18 88V	33	Yokohama Avid GT M+S
29	2019	Toyota	RAV4	AWD	Dunlap Grand Trek PT20	225/65R17 102H	36	Dunlap Grand Trek PT20
30	2019	Toyota	RAV4	FWD	Toyo A38 Open Country	225/65R17 102H	35	Toyo A38 Open Country
8	2019	Volkswagen	Jetta	FWD	Hankook Kinergy GT M+S	205/55R17 91H	36	Hankook Kinergy GT M+S

Seq No.	MY	Make	Model	Drive	Rear Tire Size	Rear Press. (psi)	Front Track (in)	Rear Track (in)	Avg. Track (in)	Wheel Base (in)	GVWR (lb)	GAWR Front (lb)	GAWR Rear (lb)	Load
3	2019	Acura	RDX	AWD	235/55R19 101H	33	64.2	64.5	64.3	108.1	5027	2623	2513	Driver
2	2019	Acura	RDX	FWD	235/55R19 101H	33	64.1	64.4	64.2	108.1	4784	2579	2337	Driver
40	2019	Audi	E-Tron	AWD	255/50R20 109H	41	64.8	64.7	64.8	115.2	6978	3527	4079	Driver
41	2019	Audi	Q3	AWD	235/50R19 99H	38	62.0	61.6	61.8	105.6	5129	2691	2647	Driver
7	2019	Audi	Q8	AWD	285/40R22 110H	40	66.0	66.2	66.1	117.8	6471	3329	3891	Driver
16	2019	BMW	X3	AWD	245/50R19 105H	35	62.8	63.4	63.1	112.8	5258	2513	3020	Driver
25	2019	BMW	X3	RWD	245/50R19 105H	35	62.9	63.5	63.2	112.8	5137	2403	3009	Driver
12	2019	BMW	X5	AWD	275/45R20 110H	41	66.3	66.9	66.6	117.2	6460	3175	3737	Driver
18	2019	Cadillac	XT4	AWD	245/45R20 99H	35	63.3	63.5	63.4	109.3	5180	2689	2689	Driver
20	2019	Cadillac	XT4	FWD	245/45R20 99H	35	63.3	63.4	63.4	109.3	5180	2689	2689	Driver
32	2019	Chevrolet	Blazer	AWD	265/45R21 104V	36	66.1	66.0	66.0	112.7	6001	2976	3196	Driver
33	2019	Chevrolet	Blazer	FWD	235/55R20 102H	36	66.5	66.5	66.5	112.8	6001	2976	3196	Driver
15	2019	Chevrolet	Silverado Crew	4X4	275/60R20 115S	35	68.7	68.2	68.4	147.9	7100	3800	3800	Driver
21	2019	Chevrolet	Silverado Crew	4X2	255/70R17 112S	35	68.8	68.5	68.6	147.9	6800	3700	3800	Driver
34	2019	Ford	Ranger SuperCrew	4X4	255/65R17 110T	30	61.6	61.6	61.6	126.8	6050	3130	3370	Driver
35	2019	Ford	Ranger SuperCrew	4X2	265/60R18 110T	35	61.8	61.5	61.7	126.8	6050	2930	3500	Driver
1	2019	Honda	Insight	FWD	215/55R16 93V	35	60.9	61.3	61.1	106.4	3968	2116	1851	Driver
22	2019	Honda	Passport	AWD	245/50R20 102H	35	66.8	66.8	66.8	111.0	5291	2855	3142	Driver
36	2019	Honda	Passport	2WD	245/50R20 102H	35	67.1	67.1	67.1	111.2	5291	2734	2965	Driver
19	2019	Hyundai	Kona	AWD	235/45R18 98V	33	61.4	61.8	61.6	102.6	4255	2293	2205	Driver
17	2019	Hyundai	Kona	FWD	215/55R17 94V	33	61.6	61.8	61.7	102.4	3979	2293	2205	Driver
11	2019	Hyundai	Santa Fe	AWD	235/65R17 104H	35	64.8	65.0	64.9	109.0	4872	2866	3075	Driver
10	2019	Hyundai	Santa Fe	FWD	235/65R17 104H	35	64.7	65.0	64.8	109.0	4729	2866	3075	Driver
24	2019	Infiniti	QX50	AWD	P255/45RF20 101V	33	64.1	64.0	64.0	110.1	5062	2822	2513	Driver
26	2019	Infiniti	QX50	FWD	P255/45RF20 101V	33	64.1	64.0	64.0	110.1	4916	2822	2513	Driver
23	2019	Jeep	Wrangler Unlimited	4X4	LT285/70R17 116/113Q	37	64.6	64.6	64.6	118.2	5800	3100	3100	Driver
9	2019	Kia	Forte	FWD	205/55R16 91H	33	61.2	61.4	61.3	106.2	3792	2183	2094	Driver
31	2019	Kia	Niro Hybrid	FWD	205/65R16 92H	36	61.6	62.1	61.8	106.5	4189	2319	2002	Driver
13	2019	Lexus	ES350	FWD	235/45R18 94V	35	62.5	63.0	62.8	112.8	4740	2625	2425	Driver
27	2019	Lexus	UX200	FWD	225/50RF18 95V	33	61.1	61.2	61.2	104.0	4410	2425	2425	Driver
5	2018	Mitsubishi	Outlander PHEV	AWD	P255/55R18 97H	35	60.8	60.7	60.7	105.1	5225	2557	2800	Driver
39	2019	Nissan	Altima	AWD	215/55R17 94V	33	63.1	63.4	63.2	111.3	4449	2418	2136	Driver
14	2019	Nissan	Kicks	FWD	205/55R17 91V	32	59.8	60.1	59.9	103.0	3600	1903	1698	Driver
38	2019	Ram	1500 Crew Cab	4X4	275/65R18 116T	36	68.6	68.0	68.3	144.9	7100	3900	4100	Driver
37	2019	Ram	1500 Crew Cab	4X2	275/55R20 113T	36	68.7	68.1	68.4	144.9	6900	3700	4100	Driver
4	2019	Subaru	Ascent	AWD	245/50R20 102H	33	64.7	63.9	64.3	113.7	6000	3021	3296	Driver
6	2019	Subaru	Forester	AWD	225/60R17 99H	32	61.7	61.8	61.8	105.1	4891	2563	2486	Driver
28	2019	Toyota	Corolla	FWD	225/40R18 88V	33	60.3	60.6	60.4	104.0	4065	2315	2140	Driver
29	2019	Toyota	RAV4	AWD	225/65R17 102H	36	63.3	63.8	63.5	105.8	4610	2535	2535	Driver
30	2019	Toyota	RAV4	FWD	225/65R17 102H	35	63.3	63.8	63.5	105.8	4610	2535	2535	Driver
8	2019	Volkswagen	Jetta	FWD	205/55R17 91H	36	60.8	60.2	60.5	105.4	4123	2161	2072	Driver

Seq No.	MY	Make	Model	Drive	Test Date	VIMF Test No.	Roof Height (in)	Test Weight (lb)	CG Long. (in)	CG Lateral (in)	CG Height (in)	T/2h
3	2019	Acura	RDX	AWD	9/14/2018	7027	64.7	4179.5	46.1	-0.9	25.29	1.2719
2	2019	Acura	RDX	FWD	8/22/2018	7017	64.8	3932.0	44.1	-1.0	25.95	1.2372
40	2019	Audi	E-Tron	AWD	7/2/2019	7279	63.6	5941.2	57.5	-0.4	21.59	1.5003
41	2019	Audi	Q3	AWD	8/6/2019	7303	62.6	4112.7	45.5	-0.9	24.82	1.2448
7	2019	Audi	Q8	AWD	1/10/2019	7119	66.9	5225.2	53.8	-0.1	26.37	1.2523
16	2019	BMW	X3	AWD	2/18/2019	7162	65.7	4389.7	58.7	-0.8	25.74	1.2256
25	2019	BMW	X3	RWD	3/8/2019	7191	65.5	4248.8	59.2	-0.7	25.81	1.2240
12	2019	BMW	X5	AWD	2/1/2019	7140	69.3	5342.8	58.1	-0.6	26.62	1.2506
18	2019	Cadillac	XT4	AWD	2/28/2019	7175	63.8	4144.7	46.4	-1.2	25.09	1.2633
20	2019	Cadillac	XT4	FWD	2/28/2019	7180	64.0	3942.8	45.4	-1.2	25.67	1.2345
32	2019	Chevrolet	Blazer	AWD	5/7/2019	7239	66.1	4579.6	47.0	-1.2	25.79	1.2795
33	2019	Chevrolet	Blazer	FWD	5/8/2019	7241	66.0	4253.9	45.4	-1.1	26.43	1.2573
15	2019	Chevrolet	Silverado Crew	4X4	2/14/2019	7160	75.6	5450.2	62.1	-0.8	28.93	1.1827
21	2019	Chevrolet	Silverado Crew	4X2	3/1/2019	7181	74.9	4885.9	63.6	-0.9	28.90	1.1878
34	2019	Ford	Ranger SuperCrew	4X2	5/8/2019	7243	71.0	4613.2	53.6	-1.6	27.65	1.1140
35	2019	Ford	Ranger SuperCrew	4X2	5/9/2019	7245	71.4	4415.5	55.0	-1.4	28.48	1.0827
1	2019	Honda	Insight	FWD	7/31/2018	6994	55.3	3158.6	41.9	-1.4	20.47	1.4929
22	2019	Honda	Passport	AWD	3/4/2019	7185	70.4	4285.6	45.9	-1.0	27.39	1.2193
36	2019	Honda	Passport	2WD	5/22/2019	7251	70.1	4132.1	44.6	-0.8	27.30	1.2292
19	2019	Hyundai	Kona	AWD	2/28/2019	7178	61.5	3396.3	41.4	-1.2	23.51	1.3100
17	2019	Hyundai	Kona	FWD	2/22/2019	7168	61.2	3084.5	40.2	-1.3	23.79	1.2964
11	2019	Hyundai	Santa Fe	AWD	1/23/2019	7128	66.4	3762.6	46.9	-0.5	25.27	1.2838
10	2019	Hyundai	Santa Fe	FWD	1/23/2019	7126	66.2	3790.7	46.1	-1.2	25.71	1.2605
24	2019	Infiniti	QX50	AWD	3/7/2019	7189	64.4	4310.6	47.1	-0.7	25.07	1.2772
26	2019	Infiniti	QX50	FWD	3/8/2019	7193	64.4	4169.6	46.7	-0.8	25.49	1.2558
23	2019	Jeep	Wrangler Unlimited	4X4	3/5/2019	7187	73.1	4850.0	57.0	-0.1	29.43	1.0967
9	2019	Kia	Forte	FWD	1/22/2019	7124	56.3	2973.3	40.6	-1.2	21.62	1.4179
31	2019	Kia	Niro Hybrid	FWD	5/7/2019	7237	60.4	3297.7	42.4	-1.1	22.68	1.3627
13	2019	Lexus	ES350	FWD	2/12/2019	7151	56.7	3884.3	44.7	-0.9	22.00	1.4265
27	2019	Lexus	UX200	FWD	3/21/2019	7200	59.2	3484.8	41.8	-1.2	23.58	1.2966
5	2018	Mitsubishi	Outlander PHEV	AWD	11/13/2018	7079	65.1	4485.7	49.9	-1.1	23.19	1.3091
39	2019	Nissan	Altima	AWD	7/1/2019	7277	56.7	3600.3	45.9	-1.0	21.05	1.5021
14	2019	Nissan	Kicks	FWD	2/12/2019	7153	61.8	2824.8	41.1	-1.6	23.78	1.2599
38	2019	Ram	1500 Crew Cab	4X4	6/6/2019	7260	75.1	5508.9	59.7	-1.4	28.85	1.1841
37	2019	Ram	1500 Crew Cab	4X2	5/29/2019	7257	74.3	5423.1	61.9	-1.3	29.00	1.1787
4	2019	Subaru	Ascent	AWD	9/14/2018	7029	68.5	4664.0	51.1	-1.1	26.18	1.2274
6	2019	Subaru	Forester	AWD	1/10/2019	7116	67.4	3617.6	44.3	-1.2	25.12	1.2292
28	2019	Toyota	Corolla	FWD	3/21/2019	7202	56.4	3267.6	40.9	-1.2	21.12	1.4309
29	2019	Toyota	RAV4	AWD	5/3/2019	7235	65.7	3682.7	44.7	-1.1	25.25	1.2582
30	2019	Toyota	RAV4	FWD	5/3/2019	7233	65.3	3539.0	43.8	-1.0	25.33	1.2541
8	2019	Volkswagen	Jetta	FWD	1/11/2019	7120	57.3	3257.5	43.9	-1.2	22.79	1.3273

Appendix B

Summary Results Table with Track Width, CG Height, and SSF

Vehicle Make/Model	Date Tested	VIMF Number	Track Width (inches)	DRIVER ONLY	
				C.G. Height (inches)	SSF
Acura RDX AWD	9/14/2018	7027	64.3	25.29	1.27
Acura RDX FWD	8/22/2018	7017	64.2	25.95	1.24
Audi E-Tron	7/2/2019	7279	64.8	21.59	1.50
Audi Q3 AWD	8/6/2019	7303	61.8	24.82	1.24
Audi Q8	1/10/2019	7119	66.1	26.37	1.25
BMW X3 AWD	2/18/2019	7162	63.1	25.74	1.23
BMW X3 RWD	3/8/2019	7191	63.2	25.81	1.22
BMW X5 AWD	2/1/2019	7140	66.6	26.62	1.25
Cadillac XT4 AWD	2/28/2019	7175	63.4	25.09	1.26
Cadillac XT4 FWD	2/28/2019	7180	63.4	25.67	1.23
Chevrolet Blazer AWD	5/7/2019	7239	66.0	25.79	1.28
Chevrolet Blazer FWD	5/8/2019	7241	66.5	26.43	1.26
Chevrolet Silverado Crew 4X4	2/14/2019	7160	68.4	28.93	1.18
Chevrolet Silverado Crew 4X2	3/1/2019	7181	68.6	28.90	1.19
Ford Ranger SuperCrew 4X4	5/8/2019	7243	61.6	27.65	1.11
Ford Ranger SuperCrew 4X2	5/9/2019	7245	61.7	28.48	1.08
Honda Insight	7/31/2018	6994	61.1	20.47	1.49
Honda Passport AWD	3/4/2019	7185	66.8	27.39	1.22
Honda Passport FWD	5/22/2019	7251	67.1	27.30	1.23
Hyundai Kona AWD	2/28/2019	7178	61.6	23.51	1.31
Hyundai Kona FWD	2/22/2019	7168	61.7	23.79	1.30
Hyundai Santa Fe AWD	1/23/2019	7128	64.9	25.27	1.28
Hyundai Santa Fe FWD	1/23/2019	7126	64.8	25.71	1.26
Infiniti QX50 AWD	3/7/2019	7189	64.0	25.07	1.28
Infiniti QX50 FWD	3/8/2019	7193	64.0	25.49	1.26
Jeep Wrangler Unlimited 4X4	3/5/2019	7187	64.6	29.43	1.10
Kia Forte	1/22/2019	7124	61.3	21.62	1.42
Kia Niro Hybrid	5/7/2019	7237	61.8	22.68	1.36
Lexus ES350 FWD	2/12/2019	7151	62.8	22.00	1.43
Lexus UX200 FWD	3/21/2019	7200	61.2	23.58	1.30
2018 Mitsubishi Outlander PHEV	11/13/2018	7079	60.7	23.19	1.31
Nissan Altima	7/1/2019	7277	63.2	21.05	1.50
Nissan Kicks FWD	2/12/2019	7153	59.9	23.78	1.26
Ram 1500 4X4 Crew Cab	6/6/2019	7260	68.3	28.85	1.18
Ram 1500 4X2 Crew Cab	5/29/2019	7257	68.4	29.00	1.18
Subaru Ascent	9/14/2018	7029	64.3	26.18	1.23
Subaru Forester	1/10/2019	7116	61.8	25.12	1.23
Toyota Corolla	3/21/2019	7202	60.4	21.12	1.43
Toyota RAV4 AWD	5/3/2019	7235	63.5	25.25	1.26
Toyota RAV4 FWD	5/3/2019	7233	63.5	25.33	1.25
Volkswagen Jetta	1/11/2019	7120	60.5	22.79	1.33

Appendix C

Individual Test Results Pages

Acura RDX AWD

YEAR: 2019
MAKE: Acura
MODEL: RDX
VIN: 5J8TC2H58KL01####

DATE TESTED: 9/14/2018
VIMF TEST NO.: 7027
Mfg Date: 8/18

BODY STYLE AND TRIM: SUV
LOAD: Driver
ENGINE SIZE AND TYPE: 2.0L I4
TRANSMISSION TYPE: 10AT
DRIVE: AWD
DOORS: 4
FUEL: Full
OPTIONAL EQUIPMENT: Panoramic Sunroof

FRONT TIRE TYPE: Continental Cross Contact LX Sport
FRONT TIRE SIZE: 235/55R19 101H
FRONT TIRE PRESSURE: 33
REAR TIRE TYPE: Continental Cross Contact LX Sport
REAR TIRE SIZE: 235/55R19 101H
REAR TIRE PRESSURE: 33

FRONT TRACK: 64.2 inches
REAR TRACK: 64.5 inches
AVERAGE TRACK: 64.3 inches
WHEELBASE: 108.1 inches
ROOF HEIGHT: 64.7 inches

Track Width Measurements

Front	A	64.20	inches
	B	64.20	inches
	C	64.20	inches
	D	64.20	inches
Rear	E	64.40	inches
	F	64.50	inches
	G	64.40	inches
	H	64.50	inches

GVWR 5027 lb
FRONT GAWR 2623 lb
REAR GAWR 2513 lb

LEFT FRONT WEIGHT 1242.7 lb
RIGHT FRONT WEIGHT 1151.8 lb
LEFT REAR WEIGHT 906.5 lb
RIGHT REAR WEIGHT 878.5 lb
TOTAL WEIGHT 4179.5 lb

Wheelbase Measurements

Left Side	108.00	inches
Right Side	108.10	inches

C.G. LONGITUDINAL 46.15 inches (From Front Axle)
C.G. LATERAL -0.91 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	32.5	3.036	-0.022	25.25
Run #3	42.9	3.985	-0.030	25.24
Run #4	32.5	-3.019	0.018	25.31
Run #5	42.9	-3.991	0.029	25.34

AVERAGE C.G. HEIGHT 25.29

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h 1.2719

Acura RDX FWD

YEAR: 2019
MAKE: Acura
MODEL: RDX
VIN: 5J8TC1H38KL00####

DATE TESTED: 8/22/2018
VIMF TEST NO.: 7017
Mfg Date: 8/18

BODY STYLE AND TRIM: SUV
LOAD: Driver
ENGINE SIZE AND TYPE: 2.0L I4
TRANSMISSION TYPE: 10AT
DRIVE: FWD
DOORS: 4
FUEL: Full
OPTIONAL EQUIPMENT: Panoramic Sunroof

FRONT TIRE TYPE: Continental Cross Contact LX Sport
FRONT TIRE SIZE: 235/55R19 101H
FRONT TIRE PRESSURE: 33
REAR TIRE TYPE: Continental Cross Contact LX Sport
REAR TIRE SIZE: 235/55R19 101H
REAR TIRE PRESSURE: 33

FRONT TRACK: 64.1 inches
REAR TRACK: 64.4 inches
AVERAGE TRACK: 64.2 inches
WHEELBASE: 108.1 inches
ROOF HEIGHT: 64.8 inches

Track Width Measurements

Front	A	64.00	inches
	B	64.10	inches
	C	64.00	inches
	D	64.10	inches
Rear	E	64.35	inches
	F	64.40	inches
	G	64.35	inches
	H	64.40	inches

GVWR 4784 **lb**
FRONT GAWR 2579 **lb**
REAR GAWR 2337 **lb**

LEFT FRONT WEIGHT 1201.1 **lb**
RIGHT FRONT WEIGHT 1125.4 **lb**
LEFT REAR WEIGHT 824.6 **lb**
RIGHT REAR WEIGHT 780.9 **lb**
TOTAL WEIGHT 3932.0 **lb**

Wheelbase Measurements

Left Side	108.00	inches
Right Side	108.10	inches

C.G. LONGITUDINAL 44.12 **inches** (From Front Axle)
C.G. LATERAL -0.97 **inches** (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	32.3	3.146	-0.021	25.92
Run #3	42.9	4.158	-0.029	25.93
Run #4	32.3	-3.146	0.021	25.97
Run #5	42.9	-4.162	0.030	25.98

AVERAGE C.G. HEIGHT 25.95

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h 1.2372

Audi E-Tron

YEAR: 2019 **DATE TESTED:** 7/2/2019
MAKE: Audi **VIMF TEST NO.:** 7279
MODEL: E-Tron
VIN: WA1LAAGE0KB01#### **Mfg Date:** 05/19

BODY STYLE AND TRIM: SUV
LOAD: Driver
ENGINE SIZE AND TYPE: Electric
TRANSMISSION TYPE: Auto
DRIVE: AWD
DOORS: 4
FUEL:
OPTIONAL EQUIPMENT: Panoramic Sunroof, Roof Rails

FRONT TIRE TYPE: Goodyear Eagle Sport M+S
FRONT TIRE SIZE: 255/50R20 109H
FRONT TIRE PRESSURE: 38
REAR TIRE TYPE: Goodyear Eagle Sport M+S
REAR TIRE SIZE: 255/50R20 109H
REAR TIRE PRESSURE: 41

FRONT TRACK: 64.8 inches
REAR TRACK: 64.7 inches
AVERAGE TRACK: 64.8 inches
WHEELBASE: 115.2 inches
ROOF HEIGHT: 63.6 inches

Track Width Measurements

Front	A	64.90	inches
	B	64.75	inches
	C	64.80	inches
	D	64.85	inches
Rear	E	64.65	inches
	F	64.80	inches
	G	64.65	inches
	H	64.80	inches

GVWR 6978 **lb**
FRONT GAWR 3527 **lb**
REAR GAWR 4079 **lb**

LEFT FRONT WEIGHT 1535.3 **lb**
RIGHT FRONT WEIGHT 1438.7 **lb**
LEFT REAR WEIGHT 1470.9 **lb**
RIGHT REAR WEIGHT 1496.3 **lb**
TOTAL WEIGHT 5941.2 **lb**

Wheelbase Measurements

Left Side	115.20	inches
Right Side	115.20	inches

C.G. LONGITUDINAL 57.53 **inches** (From Front Axle)
C.G. LATERAL -0.39 **inches** (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	40.9	3.108	-0.099	21.50
Run #3	61.3	4.738	-0.180	21.50
Run #4	40.9	-2.943	0.050	21.68
Run #5	61.3	-4.593	0.132	21.67

AVERAGE C.G. HEIGHT 21.59

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h 1.5003

Audi Q3 AWD

YEAR: 2019

DATE TESTED: 8/6/2019

MAKE: Audi

VIMF TEST NO.: 7303

MODEL: Q3

VIN: WA1FECF3XK106####

Mfg Date: 05/19

BODY STYLE AND TRIM: SUV

LOAD: Driver

ENGINE SIZE AND TYPE: 2.0L I4

TRANSMISSION TYPE: 8AT

DRIVE: AWD

DOORS: 4

FUEL: Full

OPTIONAL EQUIPMENT: Roof Rails, Panoramic Sunroof

FRONT TIRE TYPE: Goodyear Eagle Sport M+S

FRONT TIRE SIZE: 235/50R19 99H

FRONT TIRE PRESSURE: 38

REAR TIRE TYPE: Goodyear Eagle Sport M+S

REAR TIRE SIZE: 235/50R19 99H

REAR TIRE PRESSURE: 38

FRONT TRACK: 62.0 inches

REAR TRACK: 61.6 inches

AVERAGE TRACK: **61.8** inches

WHEELBASE: 105.6 inches

ROOF HEIGHT: 62.6 inches

GVWR 5129 lb

FRONT GAWR 2691 lb

REAR GAWR 2647 lb

LEFT FRONT WEIGHT 1204.3 lb

RIGHT FRONT WEIGHT 1136.0 lb

LEFT REAR WEIGHT 910.2 lb

RIGHT REAR WEIGHT 862.2 lb

TOTAL WEIGHT 4112.7 lb

C.G. LONGITUDINAL 45.51 inches (From Front Axle)

C.G. LATERAL -0.87 inches (Negative Towards Driver's Side)

Track Width Measurements

Front A 62.00 inches

B 62.00 inches

C 62.00 inches

D 62.00 inches

Rear E 61.60 inches

F 61.60 inches

G 61.60 inches

H 61.60 inches

Wheelbase Measurements

Left Side 105.60 inches

Right Side 105.60 inches

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	37.5	3.404	-0.026	24.83
Run #3	51.2	4.623	-0.038	24.83
Run #4	37.5	-3.371	0.021	24.81
Run #5	51.2	-4.587	0.033	24.82

AVERAGE C.G. HEIGHT **24.82**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

$$T/2h \quad \mathbf{1.2448}$$

Audi Q8

YEAR: 2019 **DATE TESTED:** 1/10/2019
MAKE: Audi **VIMF TEST NO.:** 7119
MODEL: Q8
VIN: WA1CVAF12KD01#### **Mfg Date:** 11/18

BODY STYLE AND TRIM: SUV
LOAD: Driver
ENGINE SIZE AND TYPE: 3.0L V6
TRANSMISSION TYPE: 8AT
DRIVE: AWD
DOORS: 4
FUEL: Full
OPTIONAL EQUIPMENT: Panoramic Sunroof, Hitch, Roof Rails

FRONT TIRE TYPE: Continental Cross Contact LX Sport M+S
FRONT TIRE SIZE: 285/40R22 110H
FRONT TIRE PRESSURE: 39
REAR TIRE TYPE: Continental Cross Contact LX Sport M+S
REAR TIRE SIZE: 285/40R22 110H
REAR TIRE PRESSURE: 40

FRONT TRACK:	66.0	inches	Track Width Measurements		
REAR TRACK:	66.2	inches	Front A	66.00	inches
AVERAGE TRACK:	66.1	inches	B	65.90	inches
WHEELBASE:	117.8	inches	C	65.90	inches
ROOF HEIGHT:	66.9	inches	D	66.00	inches
			Rear E	66.10	inches
GVWR	6471	lb	F	66.20	inches
FRONT GAWR	3329	lb	G	66.10	inches
REAR GAWR	3891	lb	H	66.20	inches

LEFT FRONT WEIGHT	1438.9	lb	Wheelbase Measurements		
RIGHT FRONT WEIGHT	1401.6	lb	Left Side	117.80	inches
LEFT REAR WEIGHT	1185.6	lb	Right Side	117.80	inches
RIGHT REAR WEIGHT	1199.1	lb			
TOTAL WEIGHT	5225.2	lb			

C.G. LONGITUDINAL 53.76 **inches** (From Front Axle)
C.G. LATERAL -0.15 **inches** (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	32.0	3.281	-0.030	26.28
Run #3	42.4	4.337	-0.041	26.31
Run #4	32.0	-3.251	0.017	26.45
Run #5	42.4	-4.299	0.026	26.45
AVERAGE C.G. HEIGHT				26.37

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

$$T/2h \quad \boxed{1.2523}$$

BMW X3 AWD

YEAR: 2019

DATE TESTED: 2/18/2019

MAKE: BMW

VIMF TEST NO.: 7162

MODEL: X3

VIN: 5UXTR9C5XKLE1####

Mfg Date: 10/18

BODY STYLE AND TRIM: SUV

LOAD: Driver

ENGINE SIZE AND TYPE: 2.0L I4 Turbo

TRANSMISSION TYPE: 8AT

DRIVE: AWD

DOORS: 4

FUEL: Full

OPTIONAL EQUIPMENT: Panoramic Sunroof, Roof Rails ,Hitch

FRONT TIRE TYPE: Bridgestone Dueler H/P Sport AS M+S

FRONT TIRE SIZE: 245/50R19 105H

FRONT TIRE PRESSURE: 32

REAR TIRE TYPE: Bridgestone Dueler H/P Sport AS M+S

REAR TIRE SIZE: 245/50R19 105H

REAR TIRE PRESSURE: 35

FRONT TRACK:	62.8	inches	Track Width Measurements		
REAR TRACK:	63.4	inches	Front A	62.85	inches
AVERAGE TRACK:	63.1	inches	B	62.75	inches
WHEELBASE:	112.8	inches	C	62.70	inches
ROOF HEIGHT:	65.7	inches	D	62.85	inches
			Rear E	63.40	inches
GVWR	5258	lb	F	63.40	inches
FRONT GAWR	2513	lb	G	63.40	inches
REAR GAWR	3020	lb	H	63.40	inches

LEFT FRONT WEIGHT	1087.8	lb	Wheelbase Measurements		
RIGHT FRONT WEIGHT	1016.6	lb	Left Side	112.80	inches
LEFT REAR WEIGHT	1160.0	lb	Right Side	112.80	inches
RIGHT REAR WEIGHT	1125.3	lb			
TOTAL WEIGHT	4389.7	lb			

C.G. LONGITUDINAL 58.72 inches (From Front Axle)

C.G. LATERAL -0.76 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	37.3	3.598	-0.024	25.70
Run #3	47.6	4.574	-0.030	25.72
Run #4	37.3	-3.588	0.021	25.77
Run #5	47.6	-4.557	0.028	25.76

AVERAGE C.G. HEIGHT **25.74**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

$$T/2h \quad \mathbf{1.2256}$$

BMW X3 RWD

YEAR: 2019

DATE TESTED: 3/8/2019

MAKE: BMW

VIMF TEST NO.: 7191

MODEL: X3

VIN: 5UXTR7C59KLF3####

Mfg Date: 11/18

BODY STYLE AND TRIM: SUV

LOAD: Driver

ENGINE SIZE AND TYPE: 2.0L I4 Turbo

TRANSMISSION TYPE: 8AT

DRIVE: RWD

DOORS: 4

FUEL: Full

OPTIONAL EQUIPMENT: Panoramic Sunroof, Hitch, Roof Rails

FRONT TIRE TYPE: Pirelli Cinturato P7 M+S

FRONT TIRE SIZE: 245/50R19 105H

FRONT TIRE PRESSURE: 32

REAR TIRE TYPE: Pirelli Cinturato P7 M+S

REAR TIRE SIZE: 245/50R19 105H

REAR TIRE PRESSURE: 35

FRONT TRACK: 62.9 inches
 REAR TRACK: 63.5 inches
 AVERAGE TRACK: **63.2** inches
 WHEELBASE: 112.8 inches
 ROOF HEIGHT: 65.5 inches

Track Width Measurements

Front	A	63.00	inches
	B	62.85	inches
	C	62.85	inches
	D	63.00	inches
Rear	E	63.40	inches
	F	63.50	inches
	G	63.40	inches
	H	63.50	inches

GVWR 5137 lb
 FRONT GAWR 2403 lb
 REAR GAWR 3009 lb

LEFT FRONT WEIGHT 1040.6 lb
 RIGHT FRONT WEIGHT 977.3 lb
 LEFT REAR WEIGHT 1129.1 lb
 RIGHT REAR WEIGHT 1101.8 lb
 TOTAL WEIGHT 4248.8 lb

Wheelbase Measurements

Left Side	112.80	inches
Right Side	112.80	inches

C.G. LONGITUDINAL 59.23 inches (From Front Axle)

C.G. LATERAL -0.67 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	32.3	3.130	-0.024	25.79
Run #3	42.3	4.090	-0.033	25.79
Run #4	32.3	-3.090	0.015	25.81
Run #5	42.3	-4.063	0.025	25.85

AVERAGE C.G. HEIGHT **25.81**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h **1.2240**

BMW X5 AWD

YEAR: 2019
 MAKE: BMW
 MODEL: X5
 VIN: 5UXJU2C59KLN4####

DATE TESTED: 2/1/2019
 VIMF TEST NO.: 7140
 Mfg Date: 10/18

BODY STYLE AND TRIM: SUV
 LOAD: Driver
 ENGINE SIZE AND TYPE: 4.4L V8 Turbo
 TRANSMISSION TYPE: 8AT
 DRIVE: AWD
 DOORS: 4
 FUEL: Full
 OPTIONAL EQUIPMENT: Roof Rails, Hitch

FRONT TIRE TYPE: Pirelli Scorpion Zero M+S
 FRONT TIRE SIZE: 275/45R20 110H
 FRONT TIRE PRESSURE: 33
 REAR TIRE TYPE: Pirelli Scorpion Zero M+S
 REAR TIRE SIZE: 275/45R20 110H
 REAR TIRE PRESSURE: 41

FRONT TRACK: 66.3 inches
 REAR TRACK: 66.9 inches
 AVERAGE TRACK: **66.6** inches
 WHEELBASE: 117.2 inches
 ROOF HEIGHT: 69.3 inches

Track Width Measurements

Front A	66.40	inches
B	66.15	inches
C	66.10	inches
D	66.45	inches
Rear E	66.90	inches
F	66.90	inches
G	66.90	inches
H	66.90	inches

GVWR 6460 lb
 FRONT GAWR 3175 lb
 REAR GAWR 3737 lb

LEFT FRONT WEIGHT 1380.6 lb
 RIGHT FRONT WEIGHT 1315.8 lb
 LEFT REAR WEIGHT 1337.4 lb
 RIGHT REAR WEIGHT 1309.0 lb
 TOTAL WEIGHT 5342.8 lb

Wheelbase Measurements

Left Side	117.20	inches
Right Side	117.20	inches

C.G. LONGITUDINAL 58.05 inches (From Front Axle)
 C.G. LATERAL -0.58 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	32.1	3.378	-0.024	26.57
Run #3	42.2	4.432	-0.033	26.60
Run #4	32.1	-3.344	0.016	26.64
Run #5	42.2	-4.406	0.026	26.67

AVERAGE C.G. HEIGHT **26.62**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h **1.2506**

Cadillac XT4 AWD

YEAR: 2019 **DATE TESTED:** 2/28/2019
MAKE: Cadillac **VIMF TEST NO.:** 7175
MODEL: XT4
VIN: 1GYFZDR42KF14#### **Mfg Date:** 12/18

BODY STYLE AND TRIM: SUV
LOAD: Driver
ENGINE SIZE AND TYPE: 2.0L I4 Turbo
TRANSMISSION TYPE: 9AT
DRIVE: AWD
DOORS: 4
FUEL: Full
OPTIONAL EQUIPMENT: Panoramic Sunroof, Roof Rails

FRONT TIRE TYPE: Continental Pro Contact TX M+S
FRONT TIRE SIZE: 245/45R20 99H
FRONT TIRE PRESSURE: 35
REAR TIRE TYPE: Continental Pro Contact TX M+S
REAR TIRE SIZE: 245/45R20 99H
REAR TIRE PRESSURE: 35

FRONT TRACK: 63.3 inches	Track Width Measurements
REAR TRACK: 63.5 inches	Front A 63.30 inches
AVERAGE TRACK: 63.4 inches	B 63.30 inches
WHEELBASE: 109.3 inches	C 63.30 inches
ROOF HEIGHT: 63.8 inches	D 63.30 inches
	Rear E 63.50 inches
GVWR 5180 lb	F 63.50 inches
FRONT GAWR 2689 lb	G 63.50 inches
REAR GAWR 2689 lb	H 63.50 inches

LEFT FRONT WEIGHT 1254.3 lb	Wheelbase Measurements
RIGHT FRONT WEIGHT 1132.5 lb	Left Side 109.30 inches
LEFT REAR WEIGHT 896.8 lb	Right Side 109.30 inches
RIGHT REAR WEIGHT 861.1 lb	
TOTAL WEIGHT 4144.7 lb	

C.G. LONGITUDINAL 46.36 inches (From Front Axle)
C.G. LATERAL -1.20 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	32.0	2.932	-0.014	25.09
Run #3	47.2	4.298	-0.023	25.09
Run #4	32.0	-2.908	0.011	25.08
Run #5	47.2	-4.279	0.020	25.12
AVERAGE C.G. HEIGHT				25.09

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

$$T/2h \quad \boxed{1.2633}$$

Cadillac XT4 FWD

YEAR: 2019
MAKE: Cadillac
MODEL: XT4
VIN: 1GYFZCR46KF13####

DATE TESTED: 2/28/2019
VIMF TEST NO.: 7180
Mfg Date: 12/18

BODY STYLE AND TRIM: SUV
LOAD: Driver
ENGINE SIZE AND TYPE: 2.0L I4 Turbo
TRANSMISSION TYPE: 9AT
DRIVE: FWD
DOORS: 4
FUEL: Full
OPTIONAL EQUIPMENT: Panoramic Sunroof, Roof Rails

FRONT TIRE TYPE: Continental Pro Contact TX M+S
FRONT TIRE SIZE: 245/45R20 99H
FRONT TIRE PRESSURE: 35
REAR TIRE TYPE: Continental Pro Contact TX M+S
REAR TIRE SIZE: 245/45R20 99H
REAR TIRE PRESSURE: 35

FRONT TRACK: 63.3 inches
REAR TRACK: 63.4 inches
AVERAGE TRACK: 63.4 inches
WHEELBASE: 109.3 inches
ROOF HEIGHT: 64.0 inches

Track Width Measurements

Front	A	63.35	inches
	B	63.30	inches
	C	63.30	inches
	D	63.35	inches
Rear	E	63.40	inches
	F	63.45	inches
	G	63.40	inches
	H	63.45	inches

GVWR 5180 lb
FRONT GAWR 2689 lb
REAR GAWR 2689 lb

LEFT FRONT WEIGHT 1198.8 lb
RIGHT FRONT WEIGHT 1104.8 lb
LEFT REAR WEIGHT 845.4 lb
RIGHT REAR WEIGHT 793.8 lb
TOTAL WEIGHT 3942.8 lb

Wheelbase Measurements

Left Side 109.30 inches
Right Side 109.30 inches

C.G. LONGITUDINAL 45.44 inches (From Front Axle)
C.G. LATERAL -1.17 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	37.2	3.526	-0.016	25.67
Run #3	47.6	4.483	-0.022	25.65
Run #4	37.2	-3.500	0.012	25.68
Run #5	47.6	-4.454	0.017	25.67

AVERAGE C.G. HEIGHT 25.67

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h 1.2345

Chevrolet Blazer AWD

YEAR: 2019	DATE TESTED: 5/7/2019
MAKE: Chevrolet	VIMF TEST NO.: 7239
MODEL: Blazer	
VIN: 3GNKBKRS6KS57####	Mfg Date: 01/19

BODY STYLE AND TRIM: SUV
LOAD: Driver
ENGINE SIZE AND TYPE: 3.6L V6
TRANSMISSION TYPE: 9AT
DRIVE: AWD
DOORS: 4
FUEL: Full
OPTIONAL EQUIPMENT: Roof Rails, Panoramic Sunroof

FRONT TIRE TYPE: Continental Cross Contact LX Sport M+S
FRONT TIRE SIZE: 265/45R21 104V
FRONT TIRE PRESSURE: 36
REAR TIRE TYPE: Continental Cross Contact LX Sport M+S
REAR TIRE SIZE: 265/45R21 104V
REAR TIRE PRESSURE: 36

FRONT TRACK: 66.1 inches	Track Width Measurements
REAR TRACK: 66.0 inches	Front A 66.10 inches
AVERAGE TRACK: 66.0 inches	B 66.00 inches
WHEELBASE: 112.7 inches	C 66.00 inches
ROOF HEIGHT: 66.1 inches	D 66.10 inches
	Rear E 65.80 inches
GVWR 6001 lb	F 66.10 inches
FRONT GAWR 2976 lb	G 65.80 inches
REAR GAWR 3196 lb	H 66.10 inches

LEFT FRONT WEIGHT 1404.2 lb	Wheelbase Measurements
RIGHT FRONT WEIGHT 1265.0 lb	Left Side 112.70 inches
LEFT REAR WEIGHT 967.8 lb	Right Side 112.70 inches
RIGHT REAR WEIGHT 942.6 lb	
TOTAL WEIGHT 4579.6 lb	

C.G. LONGITUDINAL 47.01 inches (From Front Axle)
C.G. LATERAL -1.19 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	32.3	3.174	-0.027	25.89
Run #3	42.9	4.180	-0.034	25.89
Run #4	32.3	-3.105	0.023	25.70
Run #5	42.9	-4.090	0.030	25.68
AVERAGE C.G. HEIGHT				25.79

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

$$T/2h \quad \boxed{1.2795}$$

Chevrolet Blazer FWD

YEAR: 2019
MAKE: Chevrolet
MODEL: Blazer
VIN: 3GNKBDRS7KS58####

DATE TESTED: 5/8/2019
VIMF TEST NO.: 7241
Mfg Date: 01/19

BODY STYLE AND TRIM: SUV
LOAD: Driver
ENGINE SIZE AND TYPE: 3.6L V6
TRANSMISSION TYPE: 9AT
DRIVE: FWD
DOORS: 4
FUEL: Full
OPTIONAL EQUIPMENT: Roof Rails, Panoramic Sunroof

FRONT TIRE TYPE: Michelin Premier LTX M+S
FRONT TIRE SIZE: 235/55R20 102H
FRONT TIRE PRESSURE: 36
REAR TIRE TYPE: Michelin Premier LTX M+S
REAR TIRE SIZE: 235/55R20 102H
REAR TIRE PRESSURE: 36

FRONT TRACK: 66.5 inches
REAR TRACK: 66.5 inches
AVERAGE TRACK: 66.5 inches
WHEELBASE: 112.8 inches
ROOF HEIGHT: 66.0 inches

Track Width Measurements

Front	A	66.50	inches
	B	66.40	inches
	C	66.40	inches
	D	66.50	inches
Rear	E	66.30	inches
	F	66.60	inches
	G	66.35	inches
	H	66.65	inches

GVWR 6001 lb
FRONT GAWR 2976 lb
REAR GAWR 3196 lb

LEFT FRONT WEIGHT 1328.8 lb
RIGHT FRONT WEIGHT 1211.2 lb
LEFT REAR WEIGHT 871.7 lb
RIGHT REAR WEIGHT 842.2 lb
TOTAL WEIGHT 4253.9 lb

Wheelbase Measurements

Left Side	112.80	inches
Right Side	112.80	inches

C.G. LONGITUDINAL 45.41 inches (From Front Axle)
C.G. LATERAL -1.15 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	32.3	3.284	-0.022	26.49
Run #3	42.9	4.337	-0.030	26.50
Run #4	32.3	-3.228	0.018	26.36
Run #5	42.9	-4.274	0.028	26.37

AVERAGE C.G. HEIGHT 26.43

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h 1.2573

Chevrolet Silverado Crew 4X4

YEAR: 2019
 MAKE: Chevrolet
 MODEL: Silverado Crew
 VIN: 1GCUYDED3KZ11####

DATE TESTED: 2/14/2019
 VIMF TEST NO.: 7160
 Mfg Date: 08/18

BODY STYLE AND TRIM: Pickup
 LOAD: Driver
 ENGINE SIZE AND TYPE: 5.3L V8
 TRANSMISSION TYPE: 8AT
 DRIVE: 4X4
 DOORS: 4
 FUEL: Full
 OPTIONAL EQUIPMENT: Hitch

FRONT TIRE TYPE: Bridgestone Dueler A/T
 FRONT TIRE SIZE: 275/60R20 115S
 FRONT TIRE PRESSURE: 35
 REAR TIRE TYPE: Bridgestone Dueler A/T
 REAR TIRE SIZE: 275/60R20 115S
 REAR TIRE PRESSURE: 35

FRONT TRACK: 68.7 inches
 REAR TRACK: 68.2 inches
 AVERAGE TRACK: **68.4** inches
 WHEELBASE: 147.9 inches
 ROOF HEIGHT: 75.6 inches

Track Width Measurements

Front A	68.70	inches
B	68.70	inches
C	68.70	inches
D	68.70	inches
Rear E	68.20	inches
F	68.10	inches
G	68.20	inches
H	68.10	inches

GVWR 7100 lb
 FRONT GAWR 3800 lb
 REAR GAWR 3800 lb

LEFT FRONT WEIGHT 1641.7 lb
 RIGHT FRONT WEIGHT 1520.6 lb
 LEFT REAR WEIGHT 1148.9 lb
 RIGHT REAR WEIGHT 1139.0 lb
 TOTAL WEIGHT 5450.2 lb

Wheelbase Measurements

Left Side	148.00	inches
Right Side	147.75	inches

C.G. LONGITUDINAL 62.08 inches (From Front Axle)
 C.G. LATERAL -0.83 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	61.3	3.222	-0.027	28.89
Run #3	85.9	4.487	-0.043	28.90
Run #4	61.3	-3.184	0.014	28.95
Run #5	85.9	-4.439	0.026	28.97

AVERAGE C.G. HEIGHT **28.93**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h **1.1827**

Chevrolet Silverado Crew 4X2

YEAR: 2019
 MAKE: Chevrolet
 MODEL: Silverado Crew
 VIN: 3GCPWAEH0KG11####

DATE TESTED: 3/1/2019
 VIMF TEST NO.: 7181
 Mfg Date: 02/19

BODY STYLE AND TRIM: Pickup
 LOAD: Driver
 ENGINE SIZE AND TYPE: 4.3L V6
 TRANSMISSION TYPE: 6AT
 DRIVE: 4X2
 DOORS: 4
 FUEL: Full
 OPTIONAL EQUIPMENT: Hitch

FRONT TIRE TYPE: General Grabber HTS M+S
 FRONT TIRE SIZE: 255/70R17 112S
 FRONT TIRE PRESSURE: 35
 REAR TIRE TYPE: General Grabber HTS M+S
 REAR TIRE SIZE: 255/70R17 112S
 REAR TIRE PRESSURE: 35

FRONT TRACK: 68.8 inches
 REAR TRACK: 68.5 inches
 AVERAGE TRACK: **68.6** inches
 WHEELBASE: 147.9 inches
 ROOF HEIGHT: 74.9 inches

Track Width Measurements

Front A	68.70	inches
B	68.90	inches
C	68.90	inches
D	68.70	inches
Rear E	68.50	inches
F	68.45	inches
G	68.50	inches
H	68.50	inches

GVWR 6800 lb
 FRONT GAWR 3700 lb
 REAR GAWR 3800 lb

LEFT FRONT WEIGHT 1437.3 lb
 RIGHT FRONT WEIGHT 1347.6 lb
 LEFT REAR WEIGHT 1066.8 lb
 RIGHT REAR WEIGHT 1034.2 lb
 TOTAL WEIGHT 4885.9 lb

Wheelbase Measurements

Left Side	147.90	inches
Right Side	147.90	inches

C.G. LONGITUDINAL 63.60 inches (From Front Axle)
 C.G. LATERAL -0.86 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	56.6	3.061	-0.027	28.80
Run #3	77.1	4.139	-0.038	28.82
Run #4	56.6	-3.042	0.015	28.99
Run #5	77.1	-4.123	0.028	28.97

AVERAGE C.G. HEIGHT **28.90**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h **1.1878**

Ford Ranger 4X4

YEAR: 2019
 MAKE: Ford
 MODEL: Ranger SuperCrew
 VIN: 1FTER4FH1KLA3####

DATE TESTED: 5/8/2019
 VIMF TEST NO.: 7243
 Mfg Date: 04/19

BODY STYLE AND TRIM: Pickup XLT
 LOAD: Driver
 ENGINE SIZE AND TYPE: 2.3L I4
 TRANSMISSION TYPE: 10AT
 DRIVE: 4X4
 DOORS: 4
 FUEL: Full
 OPTIONAL EQUIPMENT: Hitch

FRONT TIRE TYPE: Bridgestone Dueler A/T RH-S M+S
 FRONT TIRE SIZE: 255/65R17 110T
 FRONT TIRE PRESSURE: 30
 REAR TIRE TYPE: Bridgestone Dueler A/T RH-S M+S
 REAR TIRE SIZE: 255/65R17 110T
 REAR TIRE PRESSURE: 30

FRONT TRACK: 61.6 inches
 REAR TRACK: 61.6 inches
 AVERAGE TRACK: **61.6** inches
 WHEELBASE: 126.8 inches
 ROOF HEIGHT: 71.0 inches

Track Width Measurements

Front A	61.60	inches
B	61.60	inches
C	61.60	inches
D	61.60	inches
Rear E	61.60	inches
F	61.60	inches
G	61.60	inches
H	61.60	inches

GVWR 6050 lb
 FRONT GAWR 3130 lb
 REAR GAWR 3370 lb

LEFT FRONT WEIGHT 1408.4 lb
 RIGHT FRONT WEIGHT 1255.9 lb
 LEFT REAR WEIGHT 1015.5 lb
 RIGHT REAR WEIGHT 933.4 lb
 TOTAL WEIGHT 4613.2 lb

Wheelbase Measurements

Left Side	126.80	inches
Right Side	126.80	inches

C.G. LONGITUDINAL 53.57 inches (From Front Axle)
 C.G. LATERAL -1.57 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	27.2	3.059	-0.021	27.60
Run #3	37.2	4.184	-0.031	27.64
Run #4	27.2	-3.061	0.018	27.69
Run #5	37.2	-4.173	0.029	27.66

AVERAGE C.G. HEIGHT **27.65**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h **1.1140**

Ford Ranger 4X2

YEAR: 2019
 MAKE: Ford
 MODEL: Ranger SuperCrew
 VIN: 1FTER4EH6KLA2####

DATE TESTED: 5/9/2019
 VIMF TEST NO.: 7245
 Mfg Date: 03/19

BODY STYLE AND TRIM: Pickup XLT
 LOAD: Driver
 ENGINE SIZE AND TYPE: 2.3L I4
 TRANSMISSION TYPE: 10AT
 DRIVE: 4X2
 DOORS: 4
 FUEL: Full

OPTIONAL EQUIPMENT:

FRONT TIRE TYPE: Bridgestone Dueler H/T M+S
 FRONT TIRE SIZE: 265/60R18 110T
 FRONT TIRE PRESSURE: 35
 REAR TIRE TYPE: Bridgestone Dueler H/T M+S
 REAR TIRE SIZE: 265/60R18 110T
 REAR TIRE PRESSURE: 35

FRONT TRACK: 61.8 inches
 REAR TRACK: 61.5 inches
 AVERAGE TRACK: **61.7** inches
 WHEELBASE: 126.8 inches
 ROOF HEIGHT: 71.4 inches

Track Width Measurements

Front	A	61.80	inches
	B	61.85	inches
	C	61.85	inches
	D	61.80	inches
Rear	E	61.50	inches
	F	61.50	inches
	G	61.50	inches
	H	61.50	inches

GVWR 6050 lb
 FRONT GAWR 2930 lb
 REAR GAWR 3500 lb

LEFT FRONT WEIGHT 1322.1 lb
 RIGHT FRONT WEIGHT 1178.3 lb
 LEFT REAR WEIGHT 987.3 lb
 RIGHT REAR WEIGHT 927.8 lb
 TOTAL WEIGHT 4415.5 lb

Wheelbase Measurements

Left Side	126.80	inches
Right Side	126.80	inches

C.G. LONGITUDINAL 55.00 inches (From Front Axle)
 C.G. LATERAL -1.42 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	27.1	3.309	-0.030	28.48
Run #3	37.2	4.524	-0.044	28.50
Run #4	27.1	-3.233	0.017	28.47
Run #5	37.2	-4.418	0.029	28.45

AVERAGE C.G. HEIGHT **28.48**

$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$

$T/2h$ **1.0827**

Honda Insight

YEAR: 2019
 MAKE: Honda
 MODEL: Insight
 VIN: 19XZE4F10KE00####

DATE TESTED: 7/31/2018
 VIMF TEST NO.: 6994
 Mfg Date: 07/18

BODY STYLE AND TRIM: Sedan
 LOAD: Driver
 ENGINE SIZE AND TYPE: 1.5L I4
 TRANSMISSION TYPE: CVT
 DRIVE: FWD
 DOORS: 4
 FUEL: Full
 OPTIONAL EQUIPMENT:

FRONT TIRE TYPE: Michelin Energy Saver A/S
 FRONT TIRE SIZE: 215/55R16 93V
 FRONT TIRE PRESSURE: 35
 REAR TIRE TYPE: Michelin Energy Saver A/S
 REAR TIRE SIZE: 215/55R16 93V
 REAR TIRE PRESSURE: 35

FRONT TRACK: 60.9 inches
 REAR TRACK: 61.3 inches
 AVERAGE TRACK: **61.1** inches
 WHEELBASE: 106.4 inches
 ROOF HEIGHT: 55.3 inches

Track Width Measurements

Front A	60.90	inches
B	60.90	inches
C	60.95	inches
D	60.95	inches
Rear E	61.25	inches
F	61.45	inches
G	61.25	inches
H	61.40	inches

GVWR 3968 lb
 FRONT GAWR 2116 lb
 REAR GAWR 1851 lb

LEFT FRONT WEIGHT 1005.8 lb
 RIGHT FRONT WEIGHT 909.3 lb
 LEFT REAR WEIGHT 643.6 lb
 RIGHT REAR WEIGHT 599.9 lb
 TOTAL WEIGHT 3158.6 lb

Wheelbase Measurements

Left Side	106.30	inches
Right Side	106.40	inches

C.G. LONGITUDINAL 41.87 inches (From Front Axle)
 C.G. LATERAL -1.35 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	40.2	3.033	-0.016	20.47
Run #3	60.2	4.504	-0.025	20.46
Run #4	40.2	-3.013	0.011	20.50
Run #5	60.2	-4.477	0.020	20.47

AVERAGE C.G. HEIGHT **20.47**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h **1.4929**

Honda Passport AWD

YEAR: 2019
 MAKE: Honda
 MODEL: Passport
 VIN: 5FNYP8H27KB00####

DATE TESTED: 3/4/2019
 VIMF TEST NO.: 7185
 Mfg Date: 01/19

BODY STYLE AND TRIM: SUV
 LOAD: Driver
 ENGINE SIZE AND TYPE: 3.5L V6
 TRANSMISSION TYPE: 9AT
 DRIVE: AWD
 DOORS: 4
 FUEL: Full
 OPTIONAL EQUIPMENT:

FRONT TIRE TYPE: Continental Cross Contact LX Sport
 FRONT TIRE SIZE: 245/50R20 102H
 FRONT TIRE PRESSURE: 35
 REAR TIRE TYPE: Continental Cross Contact LX Sport
 REAR TIRE SIZE: 245/50R20 102H
 REAR TIRE PRESSURE: 35

FRONT TRACK: 66.8 inches
 REAR TRACK: 66.8 inches
 AVERAGE TRACK: **66.8** inches
 WHEELBASE: 111.0 inches
 ROOF HEIGHT: 70.4 inches

Track Width Measurements

Front	A	66.80	inches
	B	66.80	inches
	C	66.80	inches
	D	66.80	inches
Rear	E	66.75	inches
	F	66.80	inches
	G	66.75	inches
	H	66.80	inches

GVWR 5291 lb
 FRONT GAWR 2855 lb
 REAR GAWR 3142 lb

LEFT FRONT WEIGHT 1324.3 lb
 RIGHT FRONT WEIGHT 1190.1 lb
 LEFT REAR WEIGHT 879.6 lb
 RIGHT REAR WEIGHT 891.6 lb
 TOTAL WEIGHT 4285.6 lb

Wheelbase Measurements

Left Side	110.95	inches
Right Side	111.00	inches

C.G. LONGITUDINAL 45.86 inches (From Front Axle)
 C.G. LATERAL -0.95 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	31.8	3.466	-0.026	27.35
Run #3	42.1	4.574	-0.035	27.38
Run #4	31.8	-3.451	0.024	27.39
Run #5	42.1	-4.566	0.034	27.43

AVERAGE C.G. HEIGHT **27.39**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h **1.2193**

Honda Passport FWD

YEAR: 2019 **DATE TESTED:** 5/22/2019
MAKE: Honda **VIMF TEST NO.:** 7251
MODEL: Passport
VIN: 5FNYP7H22KB00#### **Mfg Date:** 04/19

BODY STYLE AND TRIM: SUV
LOAD: Driver
ENGINE SIZE AND TYPE: 3.5L V6
TRANSMISSION TYPE: 9AT
DRIVE: 2WD
DOORS: 4
FUEL: Full

OPTIONAL EQUIPMENT:

FRONT TIRE TYPE: Continental Cross Contact Sport M+S
FRONT TIRE SIZE: 245/50R20 102H
FRONT TIRE PRESSURE: 35
REAR TIRE TYPE: Continental Cross Contact Sport M+S
REAR TIRE SIZE: 245/50R20 102H
REAR TIRE PRESSURE: 35

FRONT TRACK: 67.1 inches
REAR TRACK: 67.1 inches
AVERAGE TRACK: 67.1 inches
WHEELBASE: 111.2 inches
ROOF HEIGHT: 70.1 inches

Track Width Measurements

Front	A	67.10	inches
	B	67.10	inches
	C	67.10	inches
	D	67.10	inches
Rear	E	67.10	inches
	F	67.15	inches
	G	67.10	inches
	H	67.15	inches

GVWR 5291 lb
FRONT GAWR 2734 lb
REAR GAWR 2965 lb

LEFT FRONT WEIGHT 1287.1 lb
RIGHT FRONT WEIGHT 1186.0 lb
LEFT REAR WEIGHT 830.5 lb
RIGHT REAR WEIGHT 828.5 lb
TOTAL WEIGHT 4132.1 lb

Wheelbase Measurements

Left Side	111.20	inches
Right Side	111.10	inches

C.G. LONGITUDINAL 44.63 inches (From Front Axle)
C.G. LATERAL -0.84 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	32.0	3.451	-0.024	27.30
Run #3	42.6	4.557	-0.034	27.26
Run #4	32.0	-3.447	0.027	27.29
Run #5	42.6	-4.589	0.039	27.35

AVERAGE C.G. HEIGHT 27.30

$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$

$T/2h$ 1.2292

Hyundai Kona AWD

YEAR: 2019
 MAKE: Hyundai
 MODEL: Kona
 VIN: KM8K3CA51KU26####

DATE TESTED: 2/28/2019
 VIMF TEST NO.: 7178
 Mfg Date: 11/18

BODY STYLE AND TRIM: SUV
 LOAD: Driver
 ENGINE SIZE AND TYPE: 1.6L I4 Turbo
 TRANSMISSION TYPE: 7AT
 DRIVE: AWD
 DOORS: 4
 FUEL: Full
 OPTIONAL EQUIPMENT: Sunroof, Roof Rails

FRONT TIRE TYPE: Goodyear Eagle Touring M+S
 FRONT TIRE SIZE: 235/45R18 98V
 FRONT TIRE PRESSURE: 33
 REAR TIRE TYPE: Goodyear Eagle Touring M+S
 REAR TIRE SIZE: 235/45R18 98V
 REAR TIRE PRESSURE: 33

FRONT TRACK: 61.4 inches
 REAR TRACK: 61.8 inches
 AVERAGE TRACK: **61.6** inches
 WHEELBASE: 102.6 inches
 ROOF HEIGHT: 61.5 inches

Track Width Measurements

Front A	61.40	inches
B	61.40	inches
C	61.40	inches
D	61.40	inches
Rear E	61.80	inches
F	61.75	inches
G	61.80	inches
H	61.75	inches

GVWR 4255 lb
 FRONT GAWR 2293 lb
 REAR GAWR 2205 lb

LEFT FRONT WEIGHT 1043.5 lb
 RIGHT FRONT WEIGHT 981.5 lb
 LEFT REAR WEIGHT 721.3 lb
 RIGHT REAR WEIGHT 650.0 lb
 TOTAL WEIGHT 3396.3 lb

Wheelbase Measurements

Left Side	102.60	inches
Right Side	102.60	inches

C.G. LONGITUDINAL 41.43 inches (From Front Axle)
 C.G. LATERAL -1.21 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	41.4	3.514	-0.019	23.51
Run #3	56.6	4.774	-0.030	23.49
Run #4	41.4	-3.483	0.014	23.49
Run #5	56.6	-4.744	0.022	23.53

AVERAGE C.G. HEIGHT **23.51**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h **1.3100**

Hyundai Kona FWD

YEAR: 2019
 MAKE: Hyundai
 MODEL: Kona
 VIN: KM8K22AA3KU21####

DATE TESTED: 2/22/2019
 VIMF TEST NO.: 7168
 Mfg Date: 8/18

BODY STYLE AND TRIM: SUV
 LOAD: Driver
 ENGINE SIZE AND TYPE: 2.0L I4
 TRANSMISSION TYPE: 6AT
 DRIVE: FWD
 DOORS: 4
 FUEL: Full
 OPTIONAL EQUIPMENT: Roof Rails

FRONT TIRE TYPE: Hankook Kinergy GT M+S
 FRONT TIRE SIZE: 215/55R17 94V
 FRONT TIRE PRESSURE: 33
 REAR TIRE TYPE: Hankook Kinergy GT M+S
 REAR TIRE SIZE: 215/55R17 94V
 REAR TIRE PRESSURE: 33

FRONT TRACK: 61.6 inches
 REAR TRACK: 61.8 inches
 AVERAGE TRACK: **61.7** inches
 WHEELBASE: 102.4 inches
 ROOF HEIGHT: 61.2 inches

Track Width Measurements

Front A	61.60	inches
B	61.60	inches
C	61.60	inches
D	61.60	inches
Rear E	61.70	inches
F	61.80	inches
G	61.70	inches
H	61.80	inches

GVWR 3979 lb
 FRONT GAWR 2293 lb
 REAR GAWR 2205 lb

LEFT FRONT WEIGHT 982.4 lb
 RIGHT FRONT WEIGHT 890.0 lb
 LEFT REAR WEIGHT 626.8 lb
 RIGHT REAR WEIGHT 585.3 lb
 TOTAL WEIGHT 3084.5 lb

Wheelbase Measurements

Left Side	102.40	inches
Right Side	102.40	inches

C.G. LONGITUDINAL 40.24 inches (From Front Axle)
 C.G. LATERAL -1.34 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	40.9	3.572	-0.020	23.76
Run #3	55.8	4.855	-0.030	23.80
Run #4	40.9	-3.549	0.017	23.77
Run #5	55.8	-4.827	0.025	23.82

AVERAGE C.G. HEIGHT **23.79**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h **1.2964**

Hyundai Santa Fe AWD

YEAR: 2019
 MAKE: Hyundai
 MODEL: Santa Fe
 VIN: 5NMS2CAD5KH02####

DATE TESTED: 1/23/2019
 VIMF TEST NO.: 7128
 Mfg Date: 09/18

BODY STYLE AND TRIM: SUV
 LOAD: Driver
 ENGINE SIZE AND TYPE: 2.4L I4
 TRANSMISSION TYPE: 8AT
 DRIVE: AWD
 DOORS: 4
 FUEL: Full

OPTIONAL EQUIPMENT:

FRONT TIRE TYPE: Hankook Durapro HP2 M+S
 FRONT TIRE SIZE: 235/65R17 104H
 FRONT TIRE PRESSURE: 35
 REAR TIRE TYPE: Hankook Durapro HP2 M+S
 REAR TIRE SIZE: 235/65R17 104H
 REAR TIRE PRESSURE: 35

FRONT TRACK: 64.8 inches
 REAR TRACK: 65.0 inches
 AVERAGE TRACK: **64.9** inches
 WHEELBASE: 109.0 inches
 ROOF HEIGHT: 66.4 inches

Track Width Measurements

Front A	64.80	inches
B	64.70	inches
C	64.70	inches
D	64.80	inches
Rear E	65.00	inches
F	65.00	inches
G	65.00	inches
H	65.00	inches

GVWR 4872 lb
 FRONT GAWR 2866 lb
 REAR GAWR 3075 lb

LEFT FRONT WEIGHT 1089.8 lb
 RIGHT FRONT WEIGHT 1055.3 lb
 LEFT REAR WEIGHT 818.7 lb
 RIGHT REAR WEIGHT 798.8 lb
 TOTAL WEIGHT 3762.6 lb

Wheelbase Measurements

Left Side	109.00	inches
Right Side	109.00	inches

C.G. LONGITUDINAL 46.86 inches (From Front Axle)
 C.G. LATERAL -0.47 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	37.2	3.454	-0.021	25.24
Run #3	47.6	4.410	-0.028	25.29
Run #4	37.2	-3.454	0.024	25.25
Run #5	47.6	-4.406	0.033	25.28

AVERAGE C.G. HEIGHT **25.27**

$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$

T/2h **1.2838**

Hyundai Santa Fe FWD

YEAR: 2019
 MAKE: Hyundai
 MODEL: Santa Fe
 VIN: 5NMS23AD5KH06####

DATE TESTED: 1/23/2019
 VIMF TEST NO.: 7126
 Mfg Date: 07/18

BODY STYLE AND TRIM: SUV
 LOAD: Driver
 ENGINE SIZE AND TYPE: 2.4L I4
 TRANSMISSION TYPE: 8AT
 DRIVE: FWD
 DOORS: 4
 FUEL: Full

OPTIONAL EQUIPMENT:

FRONT TIRE TYPE: Hankook Durapro HP2 M+S
 FRONT TIRE SIZE: 235/65R17 104H
 FRONT TIRE PRESSURE: 35
 REAR TIRE TYPE: Hankook Durapro HP2 M+S
 REAR TIRE SIZE: 235/65R17 104H
 REAR TIRE PRESSURE: 35

FRONT TRACK: 64.7 inches
 REAR TRACK: 65.0 inches
 AVERAGE TRACK: **64.8** inches
 WHEELBASE: 109.0 inches
 ROOF HEIGHT: 66.2 inches

Track Width Measurements

Front A	64.70	inches
B	64.70	inches
C	64.70	inches
D	64.70	inches
Rear E	65.00	inches
F	64.90	inches
G	64.95	inches
H	64.95	inches

GVWR 4729 lb
 FRONT GAWR 2866 lb
 REAR GAWR 3075 lb

LEFT FRONT WEIGHT 1135.0 lb
 RIGHT FRONT WEIGHT 1051.6 lb
 LEFT REAR WEIGHT 828.4 lb
 RIGHT REAR WEIGHT 775.7 lb
 TOTAL WEIGHT 3790.7 lb

Wheelbase Measurements

Left Side	108.90	inches
Right Side	109.00	inches

C.G. LONGITUDINAL 46.10 inches (From Front Axle)
 C.G. LATERAL -1.16 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	32.0	3.081	-0.022	25.72
Run #3	42.1	4.036	-0.031	25.72
Run #4	32.0	-3.059	0.019	25.71
Run #5	42.1	-4.016	0.030	25.71

AVERAGE C.G. HEIGHT **25.71**

$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$

T/2h **1.2605**

Infiniti QX50 AWD

YEAR: 2019
 MAKE: Infiniti
 MODEL: QX50
 VIN: 3PCAJ5M33KF10####

DATE TESTED: 3/7/2019
 VIMF TEST NO.: 7189
 Mfg Date: 02/18

BODY STYLE AND TRIM: SUV
 LOAD: Driver
 ENGINE SIZE AND TYPE: 2.0L I4
 TRANSMISSION TYPE: CVT
 DRIVE: AWD
 DOORS: 4
 FUEL: Full
 OPTIONAL EQUIPMENT: Panoramic Sunroof, Roof Rails

FRONT TIRE TYPE: Bridgestone Ecopia H/L 422 Plus M+S
 FRONT TIRE SIZE: P255/45RF20 101V
 FRONT TIRE PRESSURE: 33
 REAR TIRE TYPE: Bridgestone Ecopia H/L 422 Plus M+S
 REAR TIRE SIZE: P255/45RF20 101V
 REAR TIRE PRESSURE: 33

FRONT TRACK: 64.1 inches
 REAR TRACK: 64.0 inches
 AVERAGE TRACK: **64.0** inches
 WHEELBASE: 110.1 inches
 ROOF HEIGHT: 64.4 inches

Track Width Measurements

Front A	64.10	inches
B	64.10	inches
C	64.10	inches
D	64.10	inches
Rear E	63.90	inches
F	64.00	inches
G	63.90	inches
H	64.00	inches

GVWR 5062 lb
 FRONT GAWR 2822 lb
 REAR GAWR 2513 lb

LEFT FRONT WEIGHT 1277.0 lb
 RIGHT FRONT WEIGHT 1191.1 lb
 LEFT REAR WEIGHT 927.9 lb
 RIGHT REAR WEIGHT 914.6 lb
 TOTAL WEIGHT 4310.6 lb

Wheelbase Measurements

Left Side	110.10	inches
Right Side	110.10	inches

C.G. LONGITUDINAL 47.06 inches (From Front Axle)
 C.G. LATERAL -0.74 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	37.3	3.425	-0.024	25.09
Run #3	47.8	4.379	-0.031	25.11
Run #4	37.3	-3.352	0.013	25.00
Run #5	47.8	-4.304	0.020	25.06

AVERAGE C.G. HEIGHT **25.07**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h **1.2772**

Infiniti QX50 FWD

YEAR: 2019
 MAKE: Infiniti
 MODEL: QX50
 VIN: 3PCAJ5M18KF10####

DATE TESTED: 3/8/2019
 VIMF TEST NO.: 7193
 Mfg Date: 02/18

BODY STYLE AND TRIM: SUV
 LOAD: Driver
 ENGINE SIZE AND TYPE: 2.0L I4
 TRANSMISSION TYPE: CVT
 DRIVE: FWD
 DOORS: 4
 FUEL: Full
 OPTIONAL EQUIPMENT: Panoramic Sunroof, Roof Rails

FRONT TIRE TYPE: Bridgestone Ecopia H/L 422 Plus M+S
 FRONT TIRE SIZE: P255/45RF20 101V
 FRONT TIRE PRESSURE: 33
 REAR TIRE TYPE: Bridgestone Ecopia H/L 422 Plus M+S
 REAR TIRE SIZE: P255/45RF20 101V
 REAR TIRE PRESSURE: 33

FRONT TRACK: 64.1 inches
 REAR TRACK: 64.0 inches
 AVERAGE TRACK: **64.0** inches
 WHEELBASE: 110.1 inches
 ROOF HEIGHT: 64.4 inches

Track Width Measurements

Front A	64.10	inches
B	64.00	inches
C	64.00	inches
D	64.10	inches
Rear E	63.95	inches
F	64.05	inches
G	63.95	inches
H	64.05	inches

GVWR 4916 lb
 FRONT GAWR 2822 lb
 REAR GAWR 2513 lb

LEFT FRONT WEIGHT 1237.7 lb
 RIGHT FRONT WEIGHT 1164.5 lb
 LEFT REAR WEIGHT 900.9 lb
 RIGHT REAR WEIGHT 866.5 lb
 TOTAL WEIGHT 4169.6 lb

Wheelbase Measurements

Left Side	110.10	inches
Right Side	110.10	inches

C.G. LONGITUDINAL 46.67 inches (From Front Axle)
 C.G. LATERAL -0.83 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	32.3	3.045	-0.019	25.48
Run #3	42.3	3.979	-0.027	25.48
Run #4	32.3	-3.028	0.015	25.49
Run #5	47.2	-4.417	0.027	25.52

AVERAGE C.G. HEIGHT **25.49**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h **1.2558**

Jeep Wrangler Unlimited 4X4

YEAR: 2019
 MAKE: Jeep
 MODEL: Wrangler Unlimited
 VIN: 1C4HJXFN4KW53####

DATE TESTED: 3/5/2019
 VIMF TEST NO.: 7187
 Mfg Date: 2/19

BODY STYLE AND TRIM: SUV
 LOAD: Driver
 ENGINE SIZE AND TYPE: 2.4L I4 Turbo
 TRANSMISSION TYPE: 8AT
 DRIVE: 4X4
 DOORS: 4
 FUEL: Full
 OPTIONAL EQUIPMENT:

FRONT TIRE TYPE: BF Goodrich All Terrain T/A K02 M+S
 FRONT TIRE SIZE: LT285/70R17 116/113Q
 FRONT TIRE PRESSURE: 37
 REAR TIRE TYPE: BF Goodrich All Terrain T/A K02 M+S
 REAR TIRE SIZE: LT285/70R17 116/113Q
 REAR TIRE PRESSURE: 37

FRONT TRACK: 64.6 inches
 REAR TRACK: 64.6 inches
 AVERAGE TRACK: 64.6 inches
 WHEELBASE: 118.2 inches
 ROOF HEIGHT: 73.1 inches

Track Width Measurements

Front A	64.60	inches
B	64.50	inches
C	64.50	inches
D	64.60	inches
Rear E	64.50	inches
F	64.60	inches
G	64.50	inches
H	64.60	inches

GVWR 5800 lb
 FRONT GAWR 3100 lb
 REAR GAWR 3100 lb

LEFT FRONT WEIGHT 1261.2 lb
 RIGHT FRONT WEIGHT 1247.3 lb
 LEFT REAR WEIGHT 1170.4 lb
 RIGHT REAR WEIGHT 1171.1 lb
 TOTAL WEIGHT 4850.0 lb

Wheelbase Measurements

Left Side	118.20	inches
Right Side	118.10	inches

C.G. LONGITUDINAL 57.04 inches (From Front Axle)
 C.G. LATERAL -0.09 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	51.5	2.848	-0.019	29.36
Run #3	72.1	3.965	-0.029	29.39
Run #4	62.0	-3.418	0.017	29.47
Run #5	77.5	-4.255	0.024	29.50

AVERAGE C.G. HEIGHT 29.43

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h 1.0967

Kia Forte

YEAR: 2019

DATE TESTED: 1/22/2019

MAKE: Kia

VIMF TEST NO.: 7124

MODEL: Forte

VIN: 3KPF24AD5KE06####

Mfg Date: 11/18

BODY STYLE AND TRIM: Sedan

LOAD: Driver

ENGINE SIZE AND TYPE: 2.0L I4

TRANSMISSION TYPE: CVT

DRIVE: FWD

DOORS: 4

FUEL: Full

OPTIONAL EQUIPMENT:

FRONT TIRE TYPE: Kumho Solus TA31 M+S

FRONT TIRE SIZE: 205/55R16 91H

FRONT TIRE PRESSURE: 33

REAR TIRE TYPE: Kumho Solus TA31 M+S

REAR TIRE SIZE: 205/55R16 91H

REAR TIRE PRESSURE: 33

FRONT TRACK: 61.2 inches
 REAR TRACK: 61.4 inches
 AVERAGE TRACK: **61.3** inches
 WHEELBASE: 106.2 inches
 ROOF HEIGHT: 56.3 inches

Track Width Measurements

Front	A	61.20	inches
	B	61.20	inches
	C	61.25	inches
	D	61.25	inches
Rear	E	61.35	inches
	F	61.45	inches
	G	61.35	inches
	H	61.45	inches

GVWR 3792 lb
 FRONT GAWR 2183 lb
 REAR GAWR 2094 lb

Wheelbase Measurements

Left Side	106.20	inches
Right Side	106.20	inches

LEFT FRONT WEIGHT 951.4 lb
 RIGHT FRONT WEIGHT 884.8 lb
 LEFT REAR WEIGHT 593.0 lb
 RIGHT REAR WEIGHT 544.1 lb
 TOTAL WEIGHT 2973.3 lb

C.G. LONGITUDINAL 40.61 inches (From Front Axle)

C.G. LATERAL -1.19 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	37.5	2.995	-0.013	21.59
Run #3	52.5	4.160	-0.020	21.58
Run #4	37.5	-2.994	0.015	21.65
Run #5	52.5	-4.160	0.021	21.66

AVERAGE C.G. HEIGHT **21.62**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h **1.4179**

Kia Niro Hybrid

YEAR: 2019
 MAKE: Kia
 MODEL: Niro Hybrid
 VIN: KNDCB3LC2K525####

DATE TESTED: 5/7/2019
 VIMF TEST NO.: 7237
 Mfg Date: 11/18

BODY STYLE AND TRIM: SUV
 LOAD: Driver
 ENGINE SIZE AND TYPE: 1.6L I4
 TRANSMISSION TYPE: 6AT
 DRIVE: FWD
 DOORS: 4
 FUEL: Full

OPTIONAL EQUIPMENT:

FRONT TIRE TYPE: Michelin Energy Saver A/S
 FRONT TIRE SIZE: 205/65R16 92H
 FRONT TIRE PRESSURE: 36
 REAR TIRE TYPE: Michelin Energy Saver A/S
 REAR TIRE SIZE: 205/65R16 92H
 REAR TIRE PRESSURE: 36

FRONT TRACK: 61.6 inches
 REAR TRACK: 62.1 inches
 AVERAGE TRACK: **61.8** inches
 WHEELBASE: 106.5 inches
 ROOF HEIGHT: 60.4 inches

Track Width Measurements

Front	A	61.50	inches
	B	61.60	inches
	C	61.60	inches
	D	61.50	inches
Rear	E	62.15	inches
	F	62.00	inches
	G	62.10	inches
	H	62.00	inches

GVWR 4189 lb
 FRONT GAWR 2319 lb
 REAR GAWR 2002 lb

LEFT FRONT WEIGHT 1029.7 lb
 RIGHT FRONT WEIGHT 953.6 lb
 LEFT REAR WEIGHT 680.3 lb
 RIGHT REAR WEIGHT 634.1 lb
 TOTAL WEIGHT 3297.7 lb

Wheelbase Measurements

Left Side	106.50	inches
Right Side	106.50	inches

C.G. LONGITUDINAL 42.45 inches (From Front Axle)
 C.G. LATERAL -1.14 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	37.8	3.127	-0.022	22.68
Run #3	53.0	4.364	-0.034	22.67
Run #4	37.8	-3.106	0.016	22.69
Run #5	53.0	-4.336	0.027	22.67

AVERAGE C.G. HEIGHT **22.68**

$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$

T/2h **1.3627**

Lexus ES350 FWD

YEAR: 2019
 MAKE: Lexus
 MODEL: ES350
 VIN: 58ABZ1B16KU01####

DATE TESTED: 2/12/2019
 VIMF TEST NO.: 7151
 Mfg Date: 12/18

BODY STYLE AND TRIM: Sedan
 LOAD: Driver
 ENGINE SIZE AND TYPE: 3.5L V6
 TRANSMISSION TYPE: 8AT
 DRIVE: FWD
 DOORS: 4
 FUEL: Full
 OPTIONAL EQUIPMENT: Sunroof

FRONT TIRE TYPE: Michelin Energy Saver A/S M+S
 FRONT TIRE SIZE: 235/45R18 94V
 FRONT TIRE PRESSURE: 35
 REAR TIRE TYPE: Michelin Energy Saver A/S M+S
 REAR TIRE SIZE: 235/45R18 94V
 REAR TIRE PRESSURE: 35

FRONT TRACK: 62.5 inches
 REAR TRACK: 63.0 inches
 AVERAGE TRACK: **62.8** inches
 WHEELBASE: 112.8 inches
 ROOF HEIGHT: 56.7 inches

Track Width Measurements

Front A	62.50	inches
B	62.50	inches
C	62.55	inches
D	62.55	inches
Rear E	62.90	inches
F	63.10	inches
G	62.90	inches
H	63.10	inches

GVWR 4740 lb
 FRONT GAWR 2625 lb
 REAR GAWR 2425 lb

LEFT FRONT WEIGHT 1196.2 lb
 RIGHT FRONT WEIGHT 1147.7 lb
 LEFT REAR WEIGHT 800.0 lb
 RIGHT REAR WEIGHT 740.4 lb
 TOTAL WEIGHT 3884.3 lb

Wheelbase Measurements

Left Side	112.80	inches
Right Side	112.80	inches

C.G. LONGITUDINAL 44.73 inches (From Front Axle)
 C.G. LATERAL -0.87 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	40.9	3.177	-0.017	22.02
Run #3	61.5	4.735	-0.029	21.99
Run #4	40.9	-3.151	0.015	22.00
Run #5	61.3	-4.695	0.026	21.99

AVERAGE C.G. HEIGHT **22.00**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h **1.4265**

Lexus UX200 FWD

YEAR: 2019
MAKE: Lexus
MODEL: UX200
VIN: JTHY3JBH8K200####

DATE TESTED: 3/21/2019
VIMF TEST NO.: 7200
Mfg Date: 10/18

BODY STYLE AND TRIM: Hatchback
LOAD: Driver
ENGINE SIZE AND TYPE: 2.0L I4
TRANSMISSION TYPE: CVT
DRIVE: FWD
DOORS: 4
FUEL: Full
OPTIONAL EQUIPMENT: Roof Rails, Sunroof

FRONT TIRE TYPE: Bridgestone Turanza M+S
FRONT TIRE SIZE: 225/50RF18 95V
FRONT TIRE PRESSURE: 33
REAR TIRE TYPE: Bridgestone Turanza M+S
REAR TIRE SIZE: 225/50RF18 95V
REAR TIRE PRESSURE: 33

FRONT TRACK: 61.1 inches
REAR TRACK: 61.2 inches
AVERAGE TRACK: 61.2 inches
WHEELBASE: 104.0 inches
ROOF HEIGHT: 59.2 inches

Track Width Measurements

Front A	61.10	inches
B	61.10	inches
C	61.10	inches
D	61.10	inches
Rear E	61.10	inches
F	61.30	inches
G	61.10	inches
H	61.30	inches

GVWR 4410 lb
FRONT GAWR 2425 lb
REAR GAWR 2425 lb

LEFT FRONT WEIGHT 1084.3 lb
RIGHT FRONT WEIGHT 1000.7 lb
LEFT REAR WEIGHT 726.9 lb
RIGHT REAR WEIGHT 672.9 lb
TOTAL WEIGHT 3484.8 lb

Wheelbase Measurements

Left Side	104.00	inches
Right Side	104.00	inches

C.G. LONGITUDINAL 41.78 inches (From Front Axle)
C.G. LATERAL -1.21 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	37.5	3.202	-0.016	23.53
Run #3	52.7	4.475	-0.025	23.54
Run #4	37.5	-3.190	0.012	23.60
Run #5	52.7	-4.470	0.020	23.65

AVERAGE C.G. HEIGHT 23.58

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h 1.2966

Mitsubishi Outlander PHEV

YEAR: 2018
 MAKE: Mitsubishi
 MODEL: Outlander PHEV
 VIN: JA4J24A54JZ05####

DATE TESTED: 11/13/2018
 VIMF TEST NO.: 7079
 Mfg Date: 04/18

BODY STYLE AND TRIM: SUV SEL
 LOAD: Driver
 ENGINE SIZE AND TYPE: 2.0L I4
 TRANSMISSION TYPE: AT
 DRIVE: AWD
 DOORS: 4
 FUEL: Full
 OPTIONAL EQUIPMENT: Hitch, Roof Rails

FRONT TIRE TYPE: Toyo A24 M+S
 FRONT TIRE SIZE: P255/55R18 97H
 FRONT TIRE PRESSURE: 35
 REAR TIRE TYPE: Toyo A24 M+S
 REAR TIRE SIZE: P255/55R18 97H
 REAR TIRE PRESSURE: 35

FRONT TRACK: 60.8 inches
 REAR TRACK: 60.7 inches
 AVERAGE TRACK: **60.7** inches
 WHEELBASE: 105.1 inches
 ROOF HEIGHT: 65.1 inches

Track Width Measurements

Front	A	60.75	inches
	B	60.75	inches
	C	60.80	inches
	D	60.80	inches
Rear	E	60.65	inches
	F	60.65	inches
	G	60.65	inches
	H	60.65	inches

GVWR 5225 lb
 FRONT GAWR 2557 lb
 REAR GAWR 2800 lb

LEFT FRONT WEIGHT 1227.1 lb
 RIGHT FRONT WEIGHT 1127.8 lb
 LEFT REAR WEIGHT 1095.3 lb
 RIGHT REAR WEIGHT 1035.5 lb
 TOTAL WEIGHT 4485.7 lb

Wheelbase Measurements

Left Side	105.10	inches
Right Side	105.10	inches

C.G. LONGITUDINAL 49.92 inches (From Front Axle)
 C.G. LATERAL -1.08 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	37.2	3.027	-0.026	23.18
Run #3	51.5	4.175	-0.038	23.20
Run #4	37.2	-3.004	0.023	23.16
Run #5	51.5	-4.158	0.037	23.21

AVERAGE C.G. HEIGHT **23.19**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h **1.3091**

Nissan Altima

YEAR: 2019
 MAKE: Nissan
 MODEL: Altima
 VIN: WA1LAAGE0KB01####

DATE TESTED: 7/1/2019
 VIMF TEST NO.: 7277
 Mfg Date: 1/19

BODY STYLE AND TRIM: Sedan
 LOAD: Driver
 ENGINE SIZE AND TYPE: 2.5L I4
 TRANSMISSION TYPE: CVT
 DRIVE: AWD
 DOORS: 4
 FUEL: Full
 OPTIONAL EQUIPMENT: Sunroof

FRONT TIRE TYPE: Continental Pro Contact TX M+S
 FRONT TIRE SIZE: 215/55R17 94V
 FRONT TIRE PRESSURE: 33
 REAR TIRE TYPE: Continental Pro Contact TX M+S
 REAR TIRE SIZE: 215/55R17 94V
 REAR TIRE PRESSURE: 33

FRONT TRACK: 63.1 inches
 REAR TRACK: 63.4 inches
 AVERAGE TRACK: **63.2** inches
 WHEELBASE: 111.3 inches
 ROOF HEIGHT: 56.7 inches

Track Width Measurements

Front A	63.10	inches
B	63.10	inches
C	63.10	inches
D	63.10	inches
Rear E	63.65	inches
F	63.10	inches
G	63.65	inches
H	63.10	inches

GVWR 4449 lb
 FRONT GAWR 2418 lb
 REAR GAWR 2136 lb

LEFT FRONT WEIGHT 1089.9 lb
 RIGHT FRONT WEIGHT 1025.0 lb
 LEFT REAR WEIGHT 769.5 lb
 RIGHT REAR WEIGHT 715.9 lb
 TOTAL WEIGHT 3600.3 lb

Wheelbase Measurements

Left Side	111.30	inches
Right Side	111.30	inches

C.G. LONGITUDINAL 45.92 inches (From Front Axle)
 C.G. LATERAL -1.04 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	42.4	3.190	-0.019	21.03
Run #3	57.6	4.311	-0.027	21.04
Run #4	42.4	-3.172	0.015	21.04
Run #5	57.6	-4.297	0.024	21.08

AVERAGE C.G. HEIGHT **21.05**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h **1.5021**

Nissan Kicks

YEAR: 2019
MAKE: Nissan
MODEL: Kicks
VIN: 3N1CP5CU6KL47####

DATE TESTED: 2/12/2019
VIMF TEST NO.: 7153
Mfg Date: 10/18

BODY STYLE AND TRIM: SUV
LOAD: Driver
ENGINE SIZE AND TYPE: 1.6L I4
TRANSMISSION TYPE: CVT
DRIVE: FWD
DOORS: 4
FUEL: Full

OPTIONAL EQUIPMENT:

FRONT TIRE TYPE: Firestone FT140 M+S
FRONT TIRE SIZE: 205/55R17 91V
FRONT TIRE PRESSURE: 32
REAR TIRE TYPE: Firestone FT140 M+S
REAR TIRE SIZE: 205/55R17 91V
REAR TIRE PRESSURE: 32

FRONT TRACK: 59.8 inches
REAR TRACK: 60.1 inches
AVERAGE TRACK: 59.9 inches
WHEELBASE: 103.0 inches
ROOF HEIGHT: 61.8 inches

Track Width Measurements

Front	A	59.70	inches
	B	59.80	inches
	C	59.80	inches
	D	59.70	inches
Rear	E	60.10	inches
	F	60.10	inches
	G	60.10	inches
	H	60.10	inches

GVWR 3600 **lb**
FRONT GAWR 1903 **lb**
REAR GAWR 1698 **lb**

LEFT FRONT WEIGHT 901.1 **lb**
RIGHT FRONT WEIGHT 795.7 **lb**
LEFT REAR WEIGHT 587.2 **lb**
RIGHT REAR WEIGHT 540.8 **lb**
TOTAL WEIGHT 2824.8 **lb**

Wheelbase Measurements

Left Side 103.00 **inches**
Right Side 103.00 **inches**

C.G. LONGITUDINAL 41.13 **inches** (From Front Axle)
C.G. LATERAL -1.61 **inches** (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	40.9	3.586	-0.015	23.77
Run #3	61.3	5.326	-0.023	23.77
Run #4	40.9	-3.570	0.014	23.79
Run #5	61.3	-5.310	0.023	23.80

AVERAGE C.G. HEIGHT 23.78

$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$

T/2h 1.2599

Ram 1500 4X4 Crew Cab

YEAR: 2019 **DATE TESTED:** 6/6/2019
MAKE: Ram **VIMF TEST NO.:** 7260
MODEL: 1500 Crew Cab
VIN: 1C6SRFFT7KN74#### **Mfg Date:** 12/18

BODY STYLE AND TRIM: Pickup
LOAD: Driver
ENGINE SIZE AND TYPE: 5.7L V8 Hemi
TRANSMISSION TYPE: 8AT
DRIVE: 4X4
DOORS: 4
FUEL: Full
OPTIONAL EQUIPMENT: Hitch

FRONT TIRE TYPE: Bridgestone Dueler H/T M+S
FRONT TIRE SIZE: 275/65R18 116T
FRONT TIRE PRESSURE: 36
REAR TIRE TYPE: Bridgestone Dueler H/T M+S
REAR TIRE SIZE: 275/65R18 116T
REAR TIRE PRESSURE: 36

FRONT TRACK: 68.6 inches
REAR TRACK: 68.0 inches
AVERAGE TRACK: 68.3 inches
WHEELBASE: 144.9 inches
ROOF HEIGHT: 75.1 inches

Track Width Measurements

Front	A	68.60	inches
	B	68.60	inches
	C	68.60	inches
	D	68.60	inches
Rear	E	67.95	inches
	F	68.10	inches
	G	67.95	inches
	H	68.15	inches

GVWR 7100 **lb**
FRONT GAWR 3900 **lb**
REAR GAWR 4100 **lb**

LEFT FRONT WEIGHT 1699.4 **lb**
RIGHT FRONT WEIGHT 1539.9 **lb**
LEFT REAR WEIGHT 1163.8 **lb**
RIGHT REAR WEIGHT 1105.8 **lb**
TOTAL WEIGHT 5508.9 **lb**

Wheelbase Measurements

Left Side 144.90 **inches**
Right Side 144.90 **inches**

C.G. LONGITUDINAL 59.70 **inches** (From Front Axle)
C.G. LATERAL -1.35 **inches** (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	56.1	2.956	-0.031	28.85
Run #3	80.7	4.229	-0.047	28.89
Run #4	56.1	-2.916	0.023	28.82
Run #5	80.7	-4.188	0.042	28.84

AVERAGE C.G. HEIGHT 28.85

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h 1.1841

Ram 1500 4X2 Crew Cab

YEAR: 2019
 MAKE: Ram
 MODEL: 1500 Crew Cab
 VIN: 1C6RREFTXKN68####

DATE TESTED: 5/29/2019
 VIMF TEST NO.: 7257
 Mfg Date: 11/18

BODY STYLE AND TRIM: Pickup
 LOAD: Driver
 ENGINE SIZE AND TYPE: 5.7L V8 Hemi
 TRANSMISSION TYPE: 8AT
 DRIVE: 4X2
 DOORS: 4
 FUEL: Full
 OPTIONAL EQUIPMENT: Hitch

FRONT TIRE TYPE: Bridgestone Dueler H/L M+S
 FRONT TIRE SIZE: 275/55R20 113T
 FRONT TIRE PRESSURE: 36
 REAR TIRE TYPE: Bridgestone Dueler H/L M+S
 REAR TIRE SIZE: 275/55R20 113T
 REAR TIRE PRESSURE: 36

FRONT TRACK: 68.7 inches
 REAR TRACK: 68.1 inches
 AVERAGE TRACK: **68.4** inches
 WHEELBASE: 144.9 inches
 ROOF HEIGHT: 74.3 inches

Track Width Measurements

Front A	68.70	inches
B	68.60	inches
C	68.60	inches
D	68.80	inches
Rear E	67.90	inches
F	68.20	inches
G	68.00	inches
H	68.20	inches

GVWR 6900 lb
 FRONT GAWR 3700 lb
 REAR GAWR 4100 lb

LEFT FRONT WEIGHT 1641.3 lb
 RIGHT FRONT WEIGHT 1464.1 lb
 LEFT REAR WEIGHT 1173.7 lb
 RIGHT REAR WEIGHT 1144.0 lb
 TOTAL WEIGHT 5423.1 lb

Wheelbase Measurements

Left Side	144.90	inches
Right Side	144.90	inches

C.G. LONGITUDINAL 61.93 inches (From Front Axle)
 C.G. LATERAL -1.31 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	62.1	3.267	-0.021	29.00
Run #3	80.9	4.235	-0.029	29.02
Run #4	62.1	-3.255	0.021	29.00
Run #5	80.9	-4.221	0.032	28.99

AVERAGE C.G. HEIGHT **29.00**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h **1.1787**

Subaru Ascent

YEAR: 2019
 MAKE: Subaru
 MODEL: Ascent
 VIN: 4S4WMAMD1K340####

DATE TESTED: 9/14/2018
 VIMF TEST NO.: 7029
 Mfg Date: 06/18

BODY STYLE AND TRIM: SUV
 LOAD: Driver
 ENGINE SIZE AND TYPE: 2.4L Flat 4 Turbo
 TRANSMISSION TYPE: CVT
 DRIVE: AWD
 DOORS: 4
 FUEL: Full
 OPTIONAL EQUIPMENT:

FRONT TIRE TYPE: Falken Ziex ZE001 A/S M+S
 FRONT TIRE SIZE: 245/50R20 102H
 FRONT TIRE PRESSURE: 33
 REAR TIRE TYPE: Falken Ziex ZE001 A/S M+S
 REAR TIRE SIZE: 245/50R20 102H
 REAR TIRE PRESSURE: 33

FRONT TRACK: 64.7 inches
 REAR TRACK: 63.9 inches
 AVERAGE TRACK: **64.3** inches
 WHEELBASE: 113.7 inches
 ROOF HEIGHT: 68.5 inches

Track Width Measurements

Front A	64.60	inches
B	64.60	inches
C	64.70	inches
D	64.70	inches
Rear E	63.85	inches
F	63.95	inches
G	63.85	inches
H	63.95	inches

GVWR 6000 lb
 FRONT GAWR 3021 lb
 REAR GAWR 3296 lb

LEFT FRONT WEIGHT 1343.8 lb
 RIGHT FRONT WEIGHT 1222.4 lb
 LEFT REAR WEIGHT 1066.8 lb
 RIGHT REAR WEIGHT 1031.0 lb
 TOTAL WEIGHT 4664.0 lb

Wheelbase Measurements

Left Side	113.70	inches
Right Side	113.70	inches

C.G. LONGITUDINAL 51.14 inches (From Front Axle)
 C.G. LATERAL -1.09 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	32.5	3.239	-0.017	26.14
Run #3	42.9	4.249	-0.024	26.12
Run #4	32.5	-3.268	0.021	26.23
Run #5	42.9	-4.288	0.028	26.23

AVERAGE C.G. HEIGHT **26.18**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h **1.2274**

Subaru Forester

YEAR: 2019 **DATE TESTED:** 1/10/2019
MAKE: Subaru **VIMF TEST NO.:** 7116
MODEL: Forester
VIN: JF2SKACC4KH44#### **Mfg Date:** 10/18

BODY STYLE AND TRIM: SUV
LOAD: Driver
ENGINE SIZE AND TYPE: 2.5L Flat 4
TRANSMISSION TYPE: CVT
DRIVE: AWD
DOORS: 4
FUEL: Full
OPTIONAL EQUIPMENT:

FRONT TIRE TYPE: Bridgestone Ecopia H/L 422 M+S
FRONT TIRE SIZE: 225/60R17 99H
FRONT TIRE PRESSURE: 33
REAR TIRE TYPE: Bridgestone Ecopia H/L 422 M+S
REAR TIRE SIZE: 225/60R17 99H
REAR TIRE PRESSURE: 32

FRONT TRACK: 61.7 inches
REAR TRACK: 61.8 inches
AVERAGE TRACK: 61.8 inches
WHEELBASE: 105.1 inches
ROOF HEIGHT: 67.4 inches

Track Width Measurements

Front	A	61.70	inches
	B	61.75	inches
	C	61.80	inches
	D	61.70	inches
Rear	E	61.75	inches
	F	61.80	inches
	G	61.75	inches
	H	61.80	inches

GVWR 4891 **lb**
FRONT GAWR 2563 **lb**
REAR GAWR 2486 **lb**

LEFT FRONT WEIGHT 1103.8 **lb**
RIGHT FRONT WEIGHT 989.0 **lb**
LEFT REAR WEIGHT 772.4 **lb**
RIGHT REAR WEIGHT 752.4 **lb**
TOTAL WEIGHT 3617.6 **lb**

Wheelbase Measurements

Left Side 105.10 **inches**
Right Side 105.10 **inches**

C.G. LONGITUDINAL 44.30 **inches** (From Front Axle)
C.G. LATERAL -1.15 **inches** (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	37.5	3.446	-0.017	25.10
Run #3	51.2	4.680	-0.026	25.11
Run #4	37.5	-3.446	0.020	25.12
Run #5	51.2	-4.686	0.030	25.15

AVERAGE C.G. HEIGHT 25.12

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h 1.2292

Toyota Corolla

YEAR: 2019
 MAKE: Toyota
 MODEL: Corolla
 VIN: JTNK4RBE8K302####

DATE TESTED: 3/21/2019
 VIMF TEST NO.: 7202
 Mfg Date: 10/18

BODY STYLE AND TRIM: Hatchback
 LOAD: Driver
 ENGINE SIZE AND TYPE: 2.0L I4
 TRANSMISSION TYPE: CVT
 DRIVE: FWD
 DOORS: 4
 FUEL: Full
 OPTIONAL EQUIPMENT:

FRONT TIRE TYPE: Yokohama Avid GT M+S
 FRONT TIRE SIZE: 225/40R18 88V
 FRONT TIRE PRESSURE: 33
 REAR TIRE TYPE: Yokohama Avid GT M+S
 REAR TIRE SIZE: 225/40R18 88V
 REAR TIRE PRESSURE: 33

FRONT TRACK: 60.3 inches
 REAR TRACK: 60.6 inches
 AVERAGE TRACK: **60.4** inches
 WHEELBASE: 104.0 inches
 ROOF HEIGHT: 56.4 inches

Track Width Measurements

Front	A	60.30	inches
	B	60.30	inches
	C	60.30	inches
	D	60.30	inches
Rear	E	60.50	inches
	F	60.65	inches
	G	60.50	inches
	H	60.65	inches

GVWR 4065 lb
 FRONT GAWR 2315 lb
 REAR GAWR 2140 lb

LEFT FRONT WEIGHT 1045.8 lb
 RIGHT FRONT WEIGHT 937.7 lb
 LEFT REAR WEIGHT 651.7 lb
 RIGHT REAR WEIGHT 632.4 lb
 TOTAL WEIGHT 3267.6 lb

Wheelbase Measurements

Left Side	103.95	inches
Right Side	103.95	inches

C.G. LONGITUDINAL 40.85 inches (From Front Axle)
 C.G. LATERAL -1.18 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	42.7	3.297	-0.023	21.15
Run #3	57.6	4.420	-0.031	21.13
Run #4	42.7	-3.262	0.016	21.09
Run #5	57.6	-4.389	0.025	21.10

AVERAGE C.G. HEIGHT **21.12**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h **1.4309**

Toyota RAV4 AWD

YEAR: 2019
 MAKE: Toyota
 MODEL: RAV4
 VIN: 2T3G1RFV1KW04####

DATE TESTED: 5/3/2019
 VIMF TEST NO.: 7235
 Mfg Date: 04/19

BODY STYLE AND TRIM: SUV
 LOAD: Driver
 ENGINE SIZE AND TYPE: 2.5L I4
 TRANSMISSION TYPE: 8AT
 DRIVE: AWD
 DOORS: 4
 FUEL: Full
 OPTIONAL EQUIPMENT: Roof Rails

FRONT TIRE TYPE: Dunlap Grand Trek PT20
 FRONT TIRE SIZE: 225/65R17 102H
 FRONT TIRE PRESSURE: 36
 REAR TIRE TYPE: Dunlap Grand Trek PT20
 REAR TIRE SIZE: 225/65R17 102H
 REAR TIRE PRESSURE: 36

FRONT TRACK: 63.3 inches
 REAR TRACK: 63.8 inches
 AVERAGE TRACK: **63.5** inches
 WHEELBASE: 105.8 inches
 ROOF HEIGHT: 65.7 inches

Track Width Measurements

Front A	63.40	inches
B	63.20	inches
C	63.20	inches
D	63.40	inches
Rear E	63.65	inches
F	63.90	inches
G	63.65	inches
H	63.90	inches

GVWR 4610 lb
 FRONT GAWR 2535 lb
 REAR GAWR 2535 lb

LEFT FRONT WEIGHT 1124.0 lb
 RIGHT FRONT WEIGHT 1002.0 lb
 LEFT REAR WEIGHT 778.8 lb
 RIGHT REAR WEIGHT 777.9 lb
 TOTAL WEIGHT 3682.7 lb

Wheelbase Measurements

Left Side	105.80	inches
Right Side	105.75	inches

C.G. LONGITUDINAL 44.71 inches (From Front Axle)
 C.G. LATERAL -1.06 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	37.2	3.470	-0.023	25.24
Run #3	47.8	4.435	-0.033	25.23
Run #4	37.2	-3.440	0.018	25.27
Run #5	47.8	-4.402	0.027	25.26

AVERAGE C.G. HEIGHT **25.25**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h **1.2582**

Toyota RAV4 FWD

YEAR: 2019
 MAKE: Toyota
 MODEL: RAV4
 VIN: JTMK1RFV1KJ00####

DATE TESTED: 5/3/2019
 VIMF TEST NO.: 7233
 Mfg Date: 02/19

BODY STYLE AND TRIM: SUV
 LOAD: Driver
 ENGINE SIZE AND TYPE: 2.5L I4
 TRANSMISSION TYPE: 8AT
 DRIVE: FWD
 DOORS: 4
 FUEL: Full
 OPTIONAL EQUIPMENT: Roof Rails

FRONT TIRE TYPE: Toyo A38 Open Country
 FRONT TIRE SIZE: 225/65R17 102H
 FRONT TIRE PRESSURE: 35
 REAR TIRE TYPE: Toyo A38 Open Country
 REAR TIRE SIZE: 225/65R17 102H
 REAR TIRE PRESSURE: 35

FRONT TRACK: 63.3 inches
 REAR TRACK: 63.8 inches
 AVERAGE TRACK: **63.5** inches
 WHEELBASE: 105.8 inches
 ROOF HEIGHT: 65.3 inches

Track Width Measurements

Front A	63.30	inches
B	63.30	inches
C	63.30	inches
D	63.30	inches
Rear E	63.70	inches
F	63.80	inches
G	63.70	inches
H	63.80	inches

GVWR 4610 lb
 FRONT GAWR 2535 lb
 REAR GAWR 2535 lb

LEFT FRONT WEIGHT 1083.9 lb
 RIGHT FRONT WEIGHT 989.7 lb
 LEFT REAR WEIGHT 740.3 lb
 RIGHT REAR WEIGHT 725.1 lb
 TOTAL WEIGHT 3539.0 lb

Wheelbase Measurements

Left Side	105.80	inches
Right Side	105.80	inches

C.G. LONGITUDINAL 43.81 inches (From Front Axle)
 C.G. LATERAL -0.98 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	32.1	3.020	-0.022	25.34
Run #3	47.8	4.449	-0.031	25.31
Run #4	32.1	-3.009	0.022	25.34
Run #5	47.8	-4.435	0.031	25.32

AVERAGE C.G. HEIGHT **25.33**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h **1.2541**

Volkswagen Jetta

YEAR: 2019
 MAKE: Volkswagen
 MODEL: Jetta
 VIN: 3VWC57BUXKM12####

DATE TESTED: 1/11/2019
 VIMF TEST NO.: 7120
 Mfg Date: 10/18

BODY STYLE AND TRIM: Sedan
 LOAD: Driver
 ENGINE SIZE AND TYPE: 1.4L I4 Turbo
 TRANSMISSION TYPE: 8AT
 DRIVE: FWD
 DOORS: 4
 FUEL: Full
 OPTIONAL EQUIPMENT:

FRONT TIRE TYPE: Hankook Kinergy GT M+S
 FRONT TIRE SIZE: 205/55R17 91H
 FRONT TIRE PRESSURE: 36
 REAR TIRE TYPE: Hankook Kinergy GT M+S
 REAR TIRE SIZE: 205/55R17 91H
 REAR TIRE PRESSURE: 36

FRONT TRACK: 60.8 inches
 REAR TRACK: 60.2 inches
 AVERAGE TRACK: **60.5** inches
 WHEELBASE: 105.4 inches
 ROOF HEIGHT: 57.3 inches

Track Width Measurements

Front A	60.75	inches
B	60.80	inches
C	60.80	inches
D	60.80	inches
Rear E	60.20	inches
F	60.20	inches
G	60.20	inches
H	60.20	inches

GVWR 4123 lb
 FRONT GAWR 2161 lb
 REAR GAWR 2072 lb

LEFT FRONT WEIGHT 1001.9 lb
 RIGHT FRONT WEIGHT 898.5 lb
 LEFT REAR WEIGHT 690.8 lb
 RIGHT REAR WEIGHT 666.3 lb
 TOTAL WEIGHT 3257.5 lb

Wheelbase Measurements

Left Side	105.40	inches
Right Side	105.40	inches

C.G. LONGITUDINAL 43.91 inches (From Front Axle)
 C.G. LATERAL -1.19 inches (Negative Towards Driver's Side)

VIMF C.G. HEIGHT MEASUREMENT RESULTS

	Applied Weight (lb)	Platform Angle (deg)	Relative Motion (inches)	C.G. Height (inches)
Run #1	0.0	0.000	0.000	0.00
Run #2	37.5	3.115	-0.019	22.75
Run #3	52.5	4.332	-0.028	22.77
Run #4	37.5	-3.102	0.013	22.81
Run #5	52.5	-4.319	0.021	22.83

AVERAGE C.G. HEIGHT **22.79**

$$T/(2 \times H) = \text{AVERAGE TRACK}/(2 \times \text{AVERAGE C.G. HEIGHT})$$

T/2h **1.3273**

Appendix D

Test Vehicle Photos



2019 Acura RDX AWD



2019 Acura RDX FWD



2019 Audi E-Tron



2019 Audi Q3 AWD



2019 Audi Q8



2019 BMW X3 AWD



2019 BMW X3 RWD



2019 BMW X5 AWD



2019 Cadillac XT4 AWD



2019 Cadillac XT4 FWD



Photo not Available

2019 Chevrolet Blazer AWD



2019 Chevrolet Blazer FWD



2019 Chevrolet Silverado Crew 4X4



2019 Chevrolet Silverado Crew 4X2



2019 Ford Ranger SuperCrew 4X4



2019 Ford Ranger SuperCrew 4X2



2019 Honda insight



2019 Honda Passport AWD



2019 Honda Passport FWD



2019 Hyundai Kona AWD



2019 Hyundai Kona FWD



2019 Hyundai Santa Fe AWD



2019 Hyundai Santa Fe FWD



2019 Infiniti QX50 AWD



2019 Infiniti QX50 FWD



2019 Jeep Wrangler Unlimited 4X4



2019 Kia Forte



2019 Kia Niro Hybrid



2019 Lexus ES350 FWD



2019 Lexus UX200 FWD



2018 Mitsubishi Outlander PHEV



2019 Nissan Altima



2019 Nissan Kicks FWD



2019 Ram 1500 4X4 Crew Cab



2019 Ram 1500 4X2 Crew Cab



2019 Subaru Ascent



2019 Subaru Forester



2019 Toyota Corolla



2019 Toyota RAV4 AWD



2019 Toyota RAV4 FWD



2019 Volkswagen Jetta