

**REPORT NUMBER: SINCAP-CAL-18-012**

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

**FCA US LLC  
2019 Jeep Cherokee  
SUV**

**NHTSA No: M20190307**

**PREPARED BY:  
CALSPAN CORPORATION  
P.O. BOX 400  
BUFFALO, NEW YORK 14225**



**February 27, 2019**

**FINAL REPORT**

**PREPARED FOR:  
U.S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
OFFICE OF CRASHWORTHINESS STANDARDS  
MAIL CODE: NRM-110  
1200 NEW JERSEY AVE SE, ROOM W43-410  
WASHINGTON, D.C. 20590**

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Administration, in response to Contract Number DTNH22-14-D-00352L.

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Prepared by: Zachary Granby  
Zachary Granby, Test Engineer

Date: February 27, 2019

Approved by: Edward Dutton  
Edward Dutton, Test Engineer  
Transportation Test Operations

Date: February 27, 2019

**FINAL REPORT ACCEPTANCE BY OCWS:**

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

Date: \_\_\_\_\_

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

Date: \_\_\_\_\_

## TECHNICAL REPORT DOCUMENTATION PAGE

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<b>4. Title and Subtitle</b> Final Report of New Car Assessment Program Side Impact MDB Testing of a 2019 Jeep Cherokee four door sport utility vehicle NHTSA No.: M20190307		<b>5. Report Date</b> February 27, 2019																												
		<b>6. Performing Organization Code</b> CAL																												
Zachary Granby, Test Engineer Edward Dutton, Operations Manager		<b>8. Performing Organization Report No.</b> CAL-DOT-2018-012																												
<b>9. Performing Organization Name and Address</b> Calspan Corporation Transportation Test Operations P.O. Box 400 Buffalo, New York 14225		<b>10. Work Unit No.</b>																												
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<b>12. Sponsoring Agency Name and Address</b> U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NRM-110) 1200 New Jersey Ave., SE, Room W43-410 Washington, D.C. 20590		<b>13. Type of Report and Period Covered:</b> Final Test Report October 30, 2018 - February 27, 2019																												
		<b>14. Sponsoring Agency Code</b> NRM-110																												
<b>15. Supplementary Notes</b>																														
<b>16. Abstract</b> <p>A 55/28, (61.83kph / 38.4 mph), 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2019 Jeep Cherokee four door sport utility vehicle in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. This test was conducted at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on October 30, 2018.</p> <p>The impact velocity of the Moving Deformable Barrier (MDB) was 61.83 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21°C. The target vehicle's maximum post-test static crush was 158mm located at level 3. The test vehicle's occupant performance data is as follows:</p>																														
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<b>17. Key Words</b> New Car Assessment Program (NCAP) Side Impact MDB ES-2re SID-IIs		<b>18. Distribution Statement</b> Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave. SE Washington, D.C. 20590 e-mail: <a href="mailto:tis@nhtsa.dot.gov">tis@nhtsa.dot.gov</a> FAX: 202-493-2833																												
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## **SECTION 1**

### **TEST PURPOSE AND PROCEDURE**

This moving deformable barrier side impact test is part of the MY 2018 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract number DTNH22-14-D-00352L. The purpose of this test is to generate comparative side impact performance in a 2019 Jeep Cherokee four door sport utility vehicle . The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated October 2015.

## SECTION 2

### SUMMARY OF TEST RESULTS

A 2019 Jeep Cherokee four door sport utility vehicle was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.83 km/h. The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Calspan Corporation's Transportation Test Operations Center in Buffalo, New York on October 30, 2018. Pre-test and post-test photographs of the test vehicle, the MDB and the dummies (ES-2re and SID-IIs) are included in this report.

Dummies were placed in the driver and left rear designated seating positions according to instructions specified in the OCWS Side Impact Laboratory Test Procedure, dated October 2015. The side impact event was documented by 9 high-speed and 2 real-time cameras. Camera locations are included in this report.

The Dummies were instrumented in the following manner:

#### DRIVER ATD (ES-2re)

Primary and redundant head CG tri-axial accelerometers

Chest upper rib, middle rib, and lower rib y-axis displacement potentiometers

Abdomen forward, middle, and rear y-axis load cells

Lower spine (T12) tri-axial accelerometers

Public symphysis y-axis load cell

#### PASSENGER ATD (SID-IIs)

Primary and redundant head CG tri-axial accelerometers

Chest upper rib, middle rib, and lower rib y-axis displacement potentiometers

Abdomen upper rib and lower rib y-axis displacement potentiometers

Lower spine (T12) tri-axial accelerometers

Acetabulum and iliac wing y-axis load cells

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

### DUMMY INJURY VALUES

Measurement Description	Driver ATD (ES-2re)		
	Units	Threshold	Result
Head Injury Criteria (HIC36)		1000	64.484
Maximum Thorax Rib Deflection	mm	44	16.918
Combined Abdominal Force	N	2500	591.554
Pubic Symphysis Force	N	6000	1613.815

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC36)		1000	264.222
Lower Spine (T12) Resultant Acceleration	G	82	53.418
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	4172.844
Maximum Thoracic Rib Deflection	mm	38*	22.603
Maximum Abdominal Rib Deflection	mm	45*	33.242

\*Proposed IARV

### SUPPLEMENTAL RESTRAINT INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Air bag	Yes	No		
Knee Air bag	Yes	No		
Side Air bag 1 - Curtain	Yes	Yes	Yes	Yes
Side Air bag 2 – Torso/Pelvis Air bag	Yes	Yes	No	-
Seat Belt Pretensioner	Yes	Yes	No	-
Seat Belt Load Limiter	Yes	Yes	No	-
Other				

**GENERAL COMMENTS:**

1. P1 serial number – F034
2. P4 serial number – DG8012

**Data Anomalies:**

The following channel was questionable for:

- Left B-Pillar Lower Y Acceleration, Exceeded calibration range at 11ms, 15.3ms
- Left B-Pillar Middle Y Acceleration, Exceeded calibration range & saturated at 11ms

**SECTION 3**  
**OCCUPANT AND VEHICLE INFORMATION**

This section contains information reporting for the following Data Sheets:

Data Sheet No. 1 - General Test and Vehicle Parameter Data

Data Sheet No. 2 – Seat, Seat Belt, Steering Wheel Adjustment and Fuel System Data

Data Sheet No. 3 – Dummy Longitudinal Clearance Dimensions

Data Sheet No. 4 – Dummy Lateral Clearance Dimensions

Data Sheet No. 5 – Camera and Instrumentation Data

Data Sheet No. 6 – Test Vehicle Accelerometer Locations

Data Sheet No. 7 – MDB Accelerometer Locations

Data Sheet No. 8 – Post-Test Observations

Data Sheet No. 9 – MDB Summary of Results

Data Sheet No. 10 – Test Vehicle Profile Measurements

Data Sheet No. 11 – Test Vehicle Exterior Crush Measurements

Data Sheet No. 12 – MDB Exterior Static Crush Measurements

Data Sheet No. 13 – Vehicle and MDB Damage Profile Distances

Data Sheet No. 14 – FMVSS No. 301 Static Rollover Results

Data Sheet No. 15 – Dummy/Vehicle Temperature and Humidity Stabilization Data

**DATA SHEET NO. 1  
GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190307  
 Test Date: 10/30/2018

**TEST VEHICLE INFORMATION AND OPTIONS**

NHTSA No.	M20190307
Model Year	2019
Make	Jeep
Model	Cherokee Latitude
Body Style	SUV
VIN	1C4PJLCB0KD114358
Body Color	Light Brown
Odometer Reading (mi)	48
Engine Displacement (L)	1.5
Type/No. Cylinders	I4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	9 Speed
Overdrive	Yes
Final Drive	FWD
Roof Rack	No
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

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

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

**DATA FROM CERTIFICATION LABEL**

Manufactured By	FCA US LLC
Date of Manufacture	2/18
Vehicle Type	MPV

GVWR (kg)	2291
GAWR Front (kg)	1273
GAWR Rear (kg)	1273

**VEHICLE SEATING AND WEIGHT CAPACITY DATA**

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3	-	5	
Capacity Weight (VCW) (kg)				408	(A)
DSC X 68.04 kg				340.2	(B)
Cargo Weight (RCLW) (kg)				67.8	(A-B)

**VEHICLE SEAT TYPE**

Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						W/ Lever	W/ Knob
Front Seat	X					X	
Rear or Second Row Seat			X		X		
Third Row seat							

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

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190307  
 Test Date: 10/30/2018

**VEHICLE TIRE INFORMATION**

*Collected for year, make, model, & VIN, all items circled in red, tire manufacturer and tire name.*



**TIRE SIDEWALL INFORMATION**

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	250	250
Recommended Tire Size	225/60R17	225/60R17
Tire Size on Vehicle	225/60R17	225/60R17
Tire Manufacturer	Firestone	Firestone
Tire Model	Destination	Destination
Treadwear	520	520
Traction	A	A
Temperature Grade	B	B
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester + 2 Steel + 2 Nylon	2 Polyester + 2 Steel + 2 Nylon
Load Index/Speed Symbol	99T	99T
Tire Material	Rubber	Rubber
DOT Safety Code Left	W241DEZ5317	W241DEZ5317
DOT Safety Code Right	W241DEZ5317	W241DEZ5317

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

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190307  
 Test Date: 10/30/2018

**TIRE PRESSURES**

	Units	LF	RF	LR	RR
As Delivered	kPa	235	235	235	235
Tire Placard	kPa	250	250	250	250
Owner's Manual	kPa	250	250	250	250
As Tested	kPa	250	250	250	250

**MDB TIRE SPECIFICATIONS**

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

**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	493	336		541	409		536	424	
Right	kg	491	314		495	376		497	376	
Ratio	%	60	40		57	43		56	44	
Totals	kg	984	650	1634	1036	785	1821	1033	800	1833

**TARGET TEST WEIGHT CALCULATION**

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1634	(A)
Sum of Actual Weight of 1 ES2re and 1 P572 ATD (SID-IIs)	kg	127	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	67.8	(C)
Calculated Target Vehicle Test Weight (TVTW)	kg	1828.8	(A+B+C)

**Does the measured As Test Vehicle Weight lie within the required weight range**

**(i.e. Calculated Test Vehicle Target Weight – 4.5 kg to – 9 kg)?**  Yes  No

**TEST VEHICLE ATTITUDES AND CG**

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement**
LF	mm	810	805	Yes
RF	mm	818	810	Yes
RR	mm	860	851	Yes
LR	mm	851	845	Yes
Vehicle CG (Aft of Front Axle)	mm	1182	1168	
Vehicle CG (Left+)/Right(-) from Longitudinal Centerline)	mm	38	35	

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

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

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

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle      NHTSA No.: M20190307  
Test Program: NCAP Side MDB Impact Test      Test Date: 10/30/2018

**WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW**

Component Description	Weight (kg)
Trunk Carpeting	13
Air Pump	3
Passenger Windows	8
Tail Light	1
Ballast / Equipment Added	16

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

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190307  
 Test Date: 10/30/2018

**SEAT POSITIONING**

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

**SCRL ANGLE RANGE**

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	15.7	10.7	13.2
Front Passenger Seat	15.8	10.8	13.3
Front Center Seat*			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat*	Fixed	Fixed	Fixed

*\*if applicable*

**SEAT HEIGHT AND ANGLE**

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore/Aft	Forward-Most
Driver Seat	13.2	16.5	Max	-	-	-
			Mid	15	16.5	18
			Min	-	-	-
Front Passenger Seat	13.3	16.5	Max	-	-	-
			Mid	15	16.5	18
			Min	-	-	-
Front Center Seat*	N/A	N/A	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Struck Side Rear Seat	Fixed	Fixed	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Non-Struck Side Rear Seat	Fixed	Fixed	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Rear Center Seat*	Fixed	Fixed	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-

*\*if applicable*

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

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190307  
 Test Date: 10/30/2018

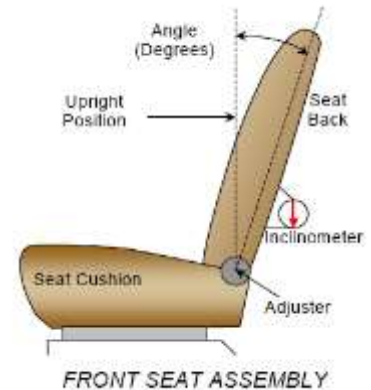
**SEAT FORE / AFT POSITION**

Seat	Total Fore / Aft Travel		Test Position from Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	210	21	110	11
Front Passenger Seat	190	19	100	10
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat	FIXED	FIXED	FIXED	FIXED
Non-Struck Side Rear Seat	FIXED	FIXED	FIXED	FIXED
Rear Center Seat*	FIXED	FIXED	FIXED	FIXED

*\*if applicable*

**SEAT BACK ANGLE ADJUSTMENT**

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



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degrees	Detents*
Driver Seat w/ Seated Dummy	60.0	-	0.0	7
Front Passenger Seat	60.0	-	0.3	7
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat w/ Seated Dummy	4.0	2	20.0	0
Non-Struck Side Rear Seat	4.0	2	20.0	0
Rear Center Seat*	4.0	2	20.0	0

*\*if applicable*

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

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190307  
 Test Date: 10/30/2018

**SEAT BELT ANCHORAGE ADJUSTMENT**

*Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on Form No. 1. For this test zero is defined as the uppermost position.*

	Total # of Positions	Placed in Position #
Driver Seat	4	0
Rear Seat	Fixed	Fixed

**HEAD RESTRAINT ADJUSTMENT**

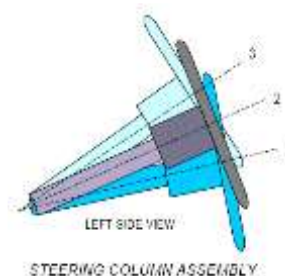
*The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.*

	Total # of Positions	Placed in Position #
Driver Seat	4	Full Up
Rear Seat	2	Lowest

**STEERING COLUMN ADJUSTMENT**

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

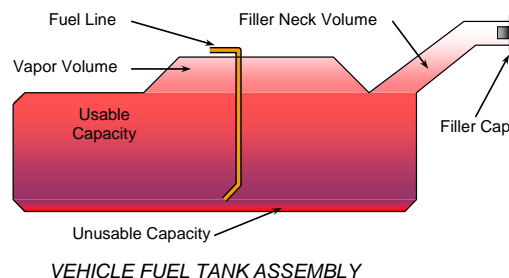
	Degrees	Fore/Aft Position (mm)
Lowermost – Position 1	25.3	
Geometric Center – Position 2	27.4	
Uppermost – Position 3	29.5	
Telescoping Steering Wheel Travel		40
Test Position	27.4	20



**FUEL PUMP**

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

The vehicle is equipped with an electric fuel pump. The fuel filler neck is on the right side of the vehicle. The pump creates positive pressure in the fuel lines, pushing the gasoline to the engine. See form 1 for more information.



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

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle      NHTSA No.: M20190307  
 Test Program: NCAP Side MDB Impact Test      Test Date: 10/30/2018

**FUEL TANK CAPACITY**

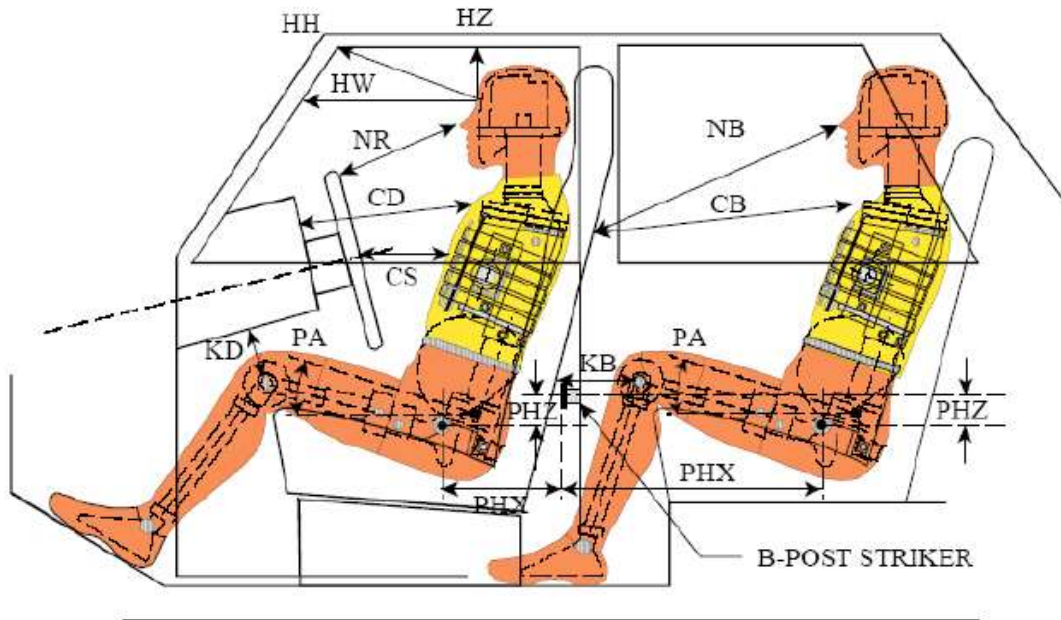
	<b>Liters</b>
Usable Capacity of "Standard Tank" (see Form No. 1)	60
Usable Capacity of "Optional Tank" (see Form No. 1)	N/A
Usable Capacity of Standard Tank (see Owner's Manual)	60
Usable Capacity of Optional Tank (see Owner's Manual)	N/A
93% of Usable Capacity	55.8
Actual Amount of Solvent Used in Test	55.8
1/3 of Usable Capacity	20

Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in Form No. 1?     **Yes**       **No**

**DATA SHEET NO. 3  
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS**

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190307  
 Test Date: 10/30/2018



**LEFT SIDE VIEW**

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

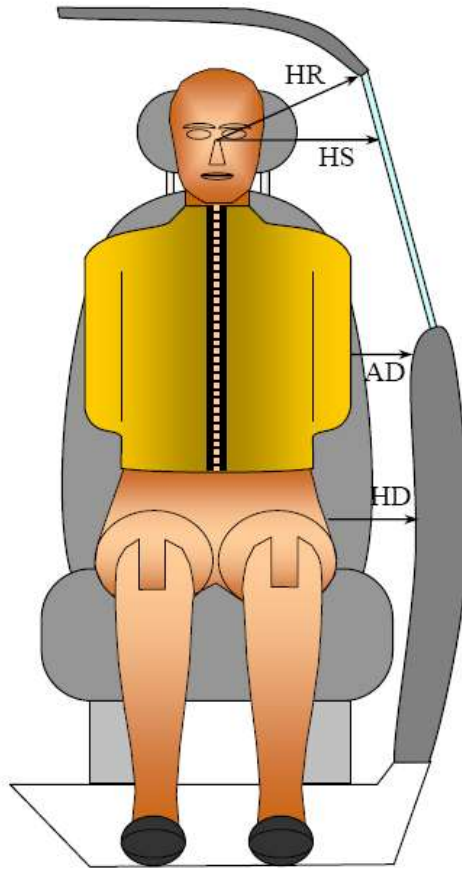
**DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION**

Driver Code	Pass. Code	Description	Driver (Serial No. F034)		Passenger (Serial No. DG8012)	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	413			
HW		Header to Windshield	643			
HZ	HZ	Head to Roof Liner	168		295	
NR	NB	Nose to Rim/Seat Back	474		567	
CD	CB	Chest to Dash/Seat Back	577		545	
CS		Chest to Steering Wheel	363			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	195	29.2	272	5.2
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	202	6.2	268	4.2
PAX°	PAX°	Pelvic Tilt Angle X		20.8		28.7
	PAY°	Pelvic Tilt Angle Y				0.2
PHX	PHX	Hip Point to Striker (X-Axis)	148		220	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	62		197	

**DATA SHEET NO. 4  
DUMMY LATERAL CLEARANCE DIMENSIONS**

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190307  
 Test Date: 10/30/2018



*FRONT VIEW OF DUMMY*

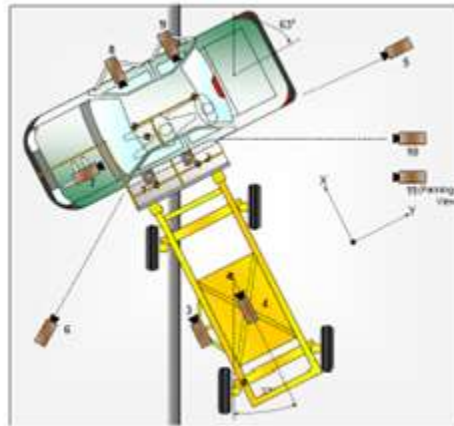
**DUMMY LATERAL CLEARANCE DIMENSION INFORMATION**

Code	Measurement Description	Units	Driver (Serial No. F034)	Passenger (Serial No. DG8012)
HR	Head to Side Header	mm	189	248
HS	Head to Side Window	mm	320	368
AD	Arm to Door	mm	97	121
HD	Hip Point to Door	mm	146	155

**DATA SHEET NO. 5  
CAMERA AND INSTRUMENTATION DATA**

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190307  
 Test Date: 10/30/2018



**CAMERA LOCATIONS AND DATA**

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	423	842	-8160	14	1000
2	Overhead Close-up	423	1169	-8160	28	1000
3	Left Impact Point (MDB)	-1950	610	-880	25	1000
4	Side Overall (MDB)	-1531	1087	-1559	12.5	1000
5	Rear	4456	7827	-1250	24	1000
6	Left Front	-4865	-3317	-1327	24	1000
7	Driver Front (OB)				25	1000
8	Driver Side (OB)				12.5	1000
9	Passenger Side (OB)				12.5	1000
10	Real-time Left Rear				Zoom	60
11	Real-time In run				Zoom	60

Notes: Reference: Impact Point projected to Ground  
 +X = To Front of MDB, +Y = To Right of MDB, +Z = Down  
 \*All measurements accurate to ± 6 mm.

If applicable, explain why camera(s) did not operate as intended: All cameras operated normally

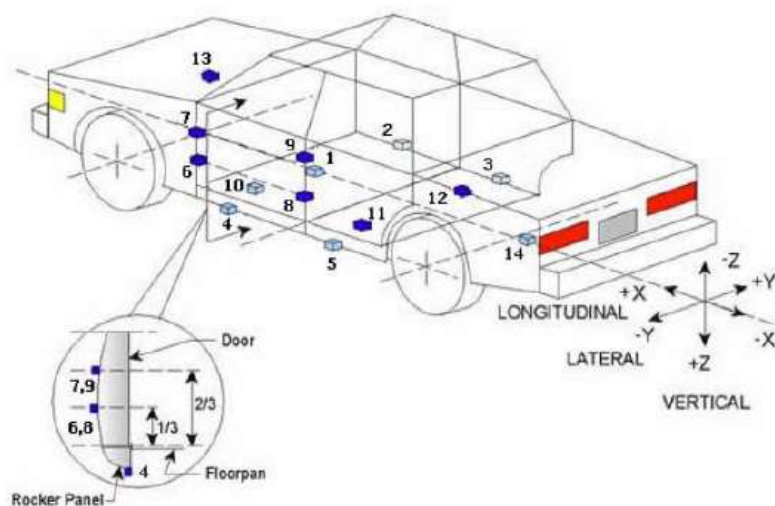
**INSTRUMENTATION**

Driver Dummy Channels	19
Passenger Dummy Channels	25
Vehicle Structure Accelerometers	23
MDB Accelerometers	7
<b>Total</b>	<b>74</b>

**DATA SHEET NO. 6  
TEST VEHICLE ACCELEROMETER LOCATIONS**

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190307  
 Test Date: 10/30/2018



**TEST VEHICLE ACCELEROMETER LOCATIONS**

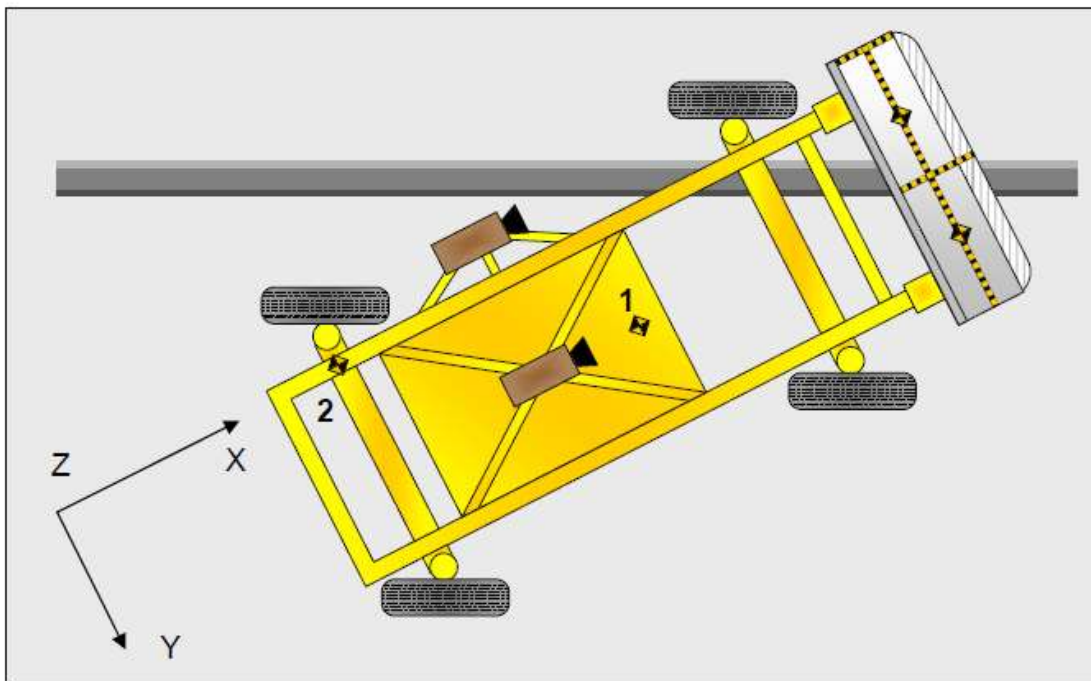
No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2410	-3	-43
2	Right Sill at Front Seat	2716	647	270
3	Right Sill at Rear Seat	1878	638	278
4	Left Sill at Front Door	2797	-646	255
5	Left Sill at Rear Door	1882	-636	255
6	A-Post Lower	3147	-638	-8
7	A-Post Middle	3141	-682	-544
8	B-Post Lower	2112	-669	72
9	B-Post Middle	2095	-674	-356
10	Front Seat Track	2264	-563	201
11	Rear Seat Structure	1724	-480	120
12	Rt. Rear Occ. Compartment	2009	372	336
13	Engine Block	3877	275	-272
14	Rear Above Axle	1030	-1	127

Reference: X – Rear surface of vehicle (+ forward)  
 Y – Vehicle centerline (+ to right)  
 Z – Ground plane (+ down)

**DATA SHEET NO. 7  
MDB ACCELEROMETER LOCATIONS**

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190307  
 Test Date: 10/30/2018



**MDB ACCELEROMETER LOCATIONS**

No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	MDB CG	1859	0	-330
2	MDB Rear	386	-660	-660

*Reference: X – Face of MDB (+ forward)  
 Y – MDB centerline (+ to right)  
 Z – Ground plane (+ down)*

**DATA SHEET NO. 8  
POST-TEST OBSERVATIONS**

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190307  
 Test Date: 10/30/2018

**TEST DUMMY INFORMATION AND CONTACT POINTS**

Dummy Body Part	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Face	Curtain Air bag	Curtain Air Bag
Top of Head	Header, Curtain Air Bag	Curtain Air Bag
Left Side of Head	Curtain Air Bag	Curtain Air Bag
Back of Head	Headrest, Curtain Airbag	Headrest, Curtain Air Bag, Middle Seat
Left Shoulder	Window	Rear Passenger Door
Upper Torso	Side Air Bag	Rear Passenger Door
Lower Torso	Side Air Bag	Rear Passenger Door
Left Hip	Side Air Bag Door	Rear Passenger Door, Seat Bolster
Left Knee	Driver Door	Rear Passenger Door

**POST-TEST DOOR PERFORMANCE**

Description	Struck Side		Non-Struck Side		Rear Hatch/ Other
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	No	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge Systems Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Width of Opening at Striker (mm)	0	0	0	0	0

**POST-TEST SEAT PERFORMANCE**

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

**POST-TEST STRUCTURAL OBSERVATIONS**

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Pushed inward due to side impact
Sill Separation	None
Windshield Damage	None
Side Window Damage	None
Other Notable Effects	None

**DATA SHEET NO. 8 ... (CONTINUED)  
POST-TEST OBSERVATIONS**

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190307  
 Test Date: 10/30/2018

**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

Restraint Type	Struck Side Driver		Struck Side Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Air bag	Yes	No		
Knee Air bag	Yes	No		
Side Air bag 1 - Curtain	Yes	Yes	Yes	Yes
Side Air bag 2 - Torso/Pelvis Air bag	Yes	Yes	No	N/A
Seat Belt Pretensioner	Yes	Yes	No	N/A
Seat Belt Load Limiter	Yes	Yes	No	N/A
Other				

**IMPACT POINT LOCATION DATA**

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2707
Vertical Impact Reference Line (Aft of Front Axle - Intended Impact Point)	mm		413.5
Actual Impact Point (Aft of Frontal Axle)	mm		402.5
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact Point	11
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact Point	-4

**DATA SHEET NO. 9  
MDB SUMMARY OF RESULTS**

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190307  
 Test Date: 10/30/2018

**MDB SPECIFICATIONS**

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1,250
Overall Length Including Honeycomb Frame	4,120
Wheelbase of Framework Carriage	2,600
CG Location of Front Axle	1,120

**MDB WEIGHTS**

	Units	Front Axle	Rear Axle	Total
Left	kg	392.5	297.5	690.0
Right	kg	386.0	291.5	677.5
Ratio	%	57.4%	42.6%	100.0%
Totals	kg	778.5	589.0	1367.5

**SPEED AND ANGLE AT IMPACT DATA**

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.10 to 62.70	61.83
Trap No. 2 Velocity (Redundant)	km/h	61.10 to 62.70	61.89
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.0
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63.0
MDB Crabbed angle to MDB Forward Line of Motion	degrees	26.0 to 28.0	27.0

**MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE**

Vertical Location			From Centerline		Maximum Crush (mm)
Row	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	430	800	Left	253
B	Top of Bumper	542	800	Left	173
C	Mid-Level	682	800	Left	146
D	Top of Stack	811	800	Left	171

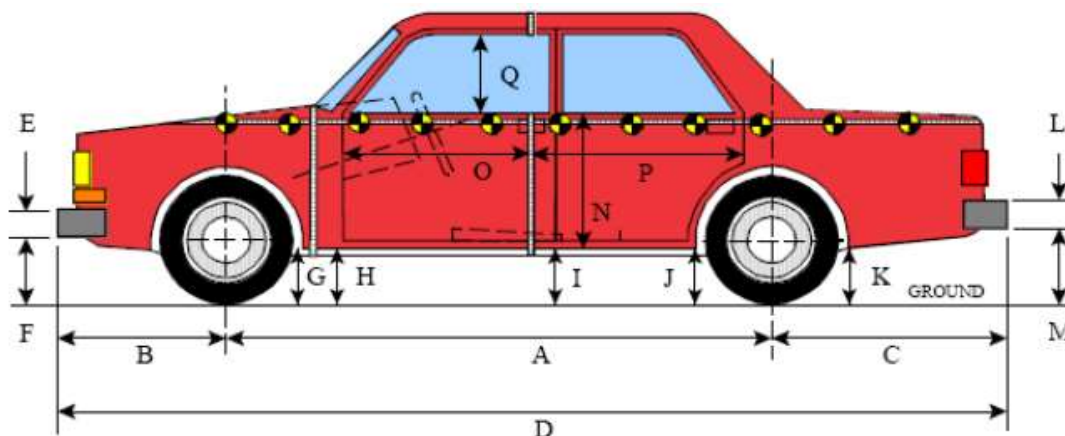
**DATA SHEET NO. 10**  
**TEST VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle

NHTSA No.: M20190307

Test Program: NCAP Side MDB Impact Test

Test Date: 10/30/2018



**LEFT SIDE VIEW**

All MEASUREMENTS IN (mm) WITH TOLERANCE OF  $\pm 3$ mm

**VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION**

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2707	2709	2
B	Front Axle to FSOV	981	984	3
C	Rear Axle to RSOV	963	959	-4
D	Total Length at Centerline	4653	4651	-2
E	Front Bumper Thickness	150	150	0
F	Front Bumper Bottom to Ground	470	470	0
G	Sill Height at Front Wheel Well	197	197	0
H	Sill Height at Front Door Leading Edge	233	234	1
I	Sill Height at B Pillar	242	224	-18
J1	Sill Height at Rear Wheel Well	228	233	5
J2	Pinch Weld Height at Rear Wheel Well	252	254	2
K	Sill Height Aft of Rear Wheel Well	258	273	15
L	Rear Bumper Thickness	110	110	0
M	Rear Bumper Bottom to Ground	543	561	18
N	Sill Height to Window Bottom of Front Window Sill	778	754	-24
O	Front Door Leading Edge to Impact CL	505	524	19
P	Rear Door Trailing Edge to Impact CL	503	500	-3
Q	Front Window Opening	446	445	-1
R	Right Side Length	4539	4536	-3
S	Left Side Length	4541	4541	0
T	Maximum Vehicle Width	1839	1789	-50

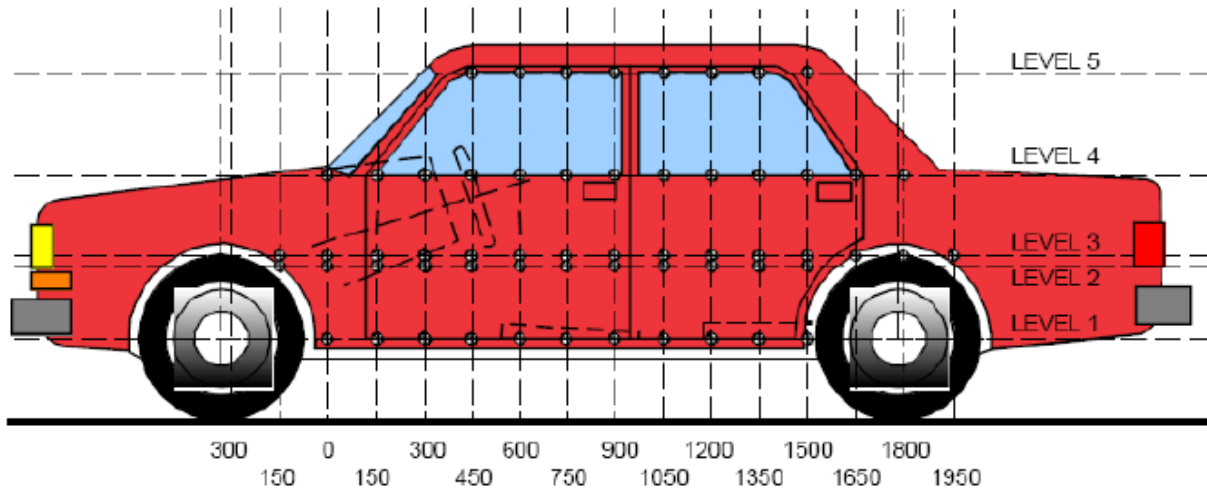
**DATA SHEET NO. 11**  
**TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle

NHTSA No.: M20190307

Test Program: NCAP Side MDB Impact Test

Test Date: 10/30/2018



**LEFT SIDE VIEW**

**MAXIMUM EXTERIOR CRUSH MEASUREMENTS**

Level	Measurement Description	Units	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	mm	364	79	1200
2	Driver Hip Point	mm	673	143	900
3	Mid-Door	mm	739	158	1650
4	Window Sill	mm	1065	51	1350
5	Window Top	mm	1546	2	1950

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

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

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle

NHTSA No.: M20190307

Test Program: NCAP Side MDB Impact Test

Test Date: 10/30/2018

**EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL**

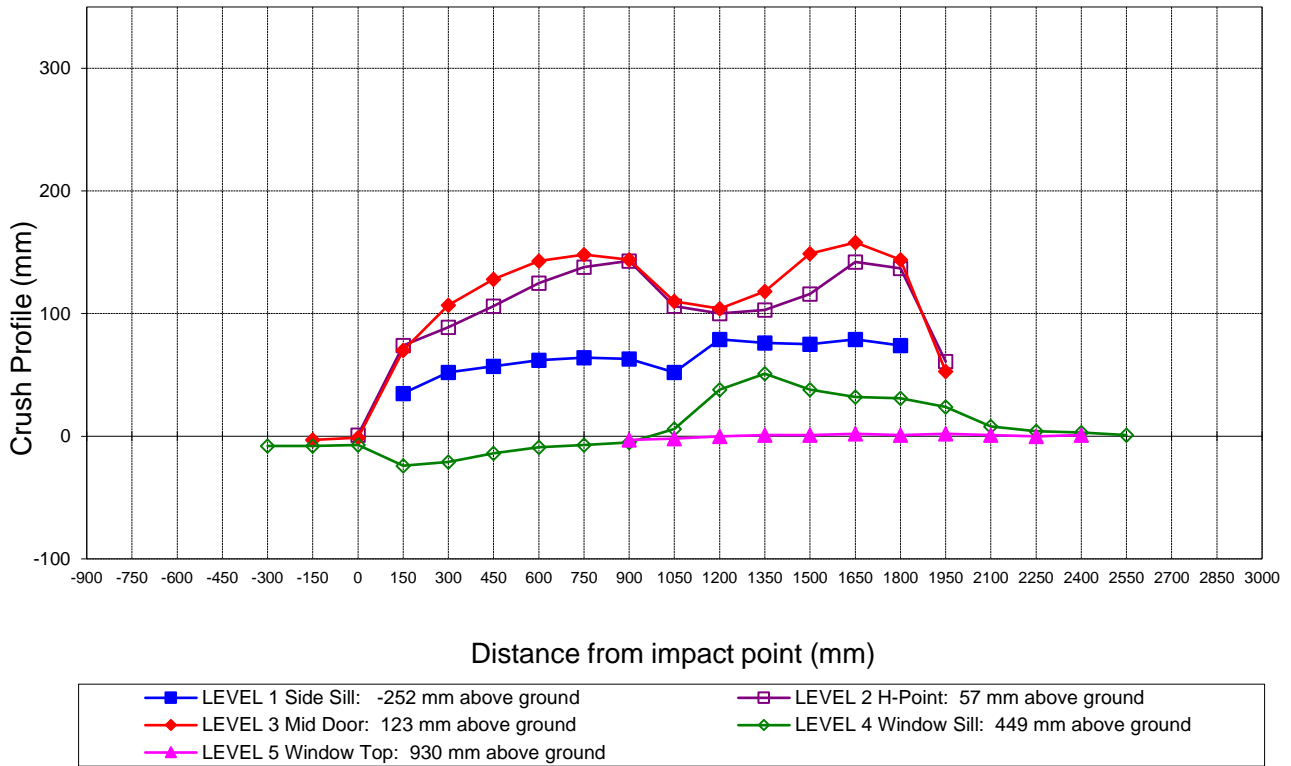
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-750	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-450	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-300	--	--	--	806	--	--	--	--	814	--	--	--	--	-8	--
-150	--	--	925	818	--	--	--	928	826	--	--	--	-3	-8	--
0	--	919	919	827	--	--	918	919	834	--	--	1	0	-7	--
150	887	906	902	833	--	852	832	832	857	--	35	74	70	-24	--
300	888	904	902	834	--	836	815	795	855	--	52	89	107	-21	--
450	888	906	905	832	--	831	800	777	846	--	57	106	128	-14	--
600	887	908	907	836	--	825	783	764	845	--	62	125	143	-9	--
750	885	909	909	842	--	821	771	761	849	--	64	138	148	-7	--
900	881	910	910	849	636	818	767	766	854	639	63	143	144	-5	-3
1050	878	910	911	857	640	826	804	801	851	642	52	106	110	6	-2
1200	872	909	910	863	641	793	809	806	825	641	79	100	104	38	0
1350	867	908	909	868	640	791	805	791	817	639	76	103	118	51	1
1500	862	907	908	871	639	787	791	759	833	638	75	116	149	38	1
1650	863	907	908	873	638	784	765	750	841	636	79	142	158	32	2
1800	867	915	917	874	635	793	778	773	843	634	74	137	144	31	1
1950	--	922	917	903	631	--	861	864	879	629	--	61	53	24	2
2100	--	--	--	870	626	--	--	--	862	625	--	--	--	8	1
2250	--	--	--	864	618	--	--	--	860	618	--	--	--	4	0
2400	--	--	--	858	603	--	--	--	855	602	--	--	--	3	1
2550	--	--	--	848	--	--	--	--	847	--	--	--	--	1	--
2700	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2850	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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

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

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190307  
 Test Date: 10/30/2018

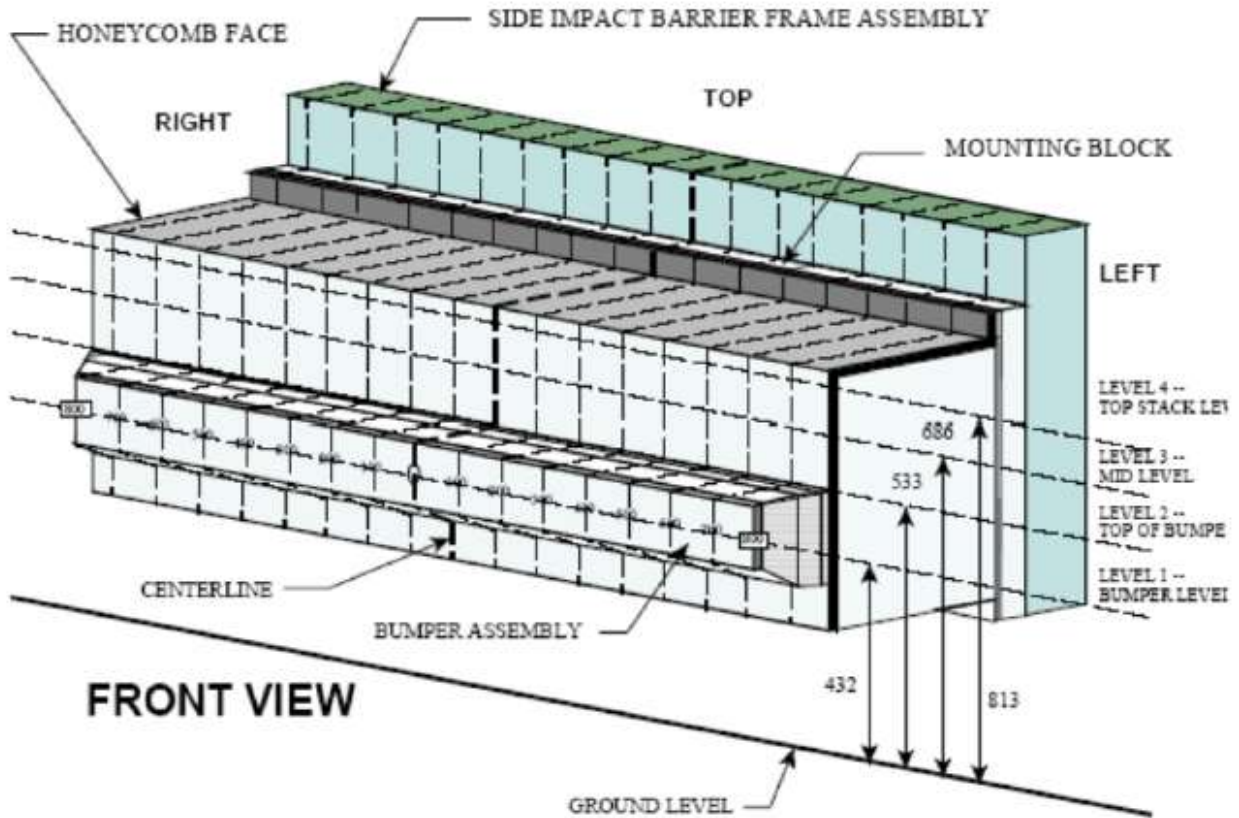


**Vehicle Exterior Crush Measurements - Visual Representation**

**DATA SHEET NO. 12  
MDB EXTERIOR STATIC CRUSH MEASUREMENTS**

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190307  
 Test Date: 10/30/2018



NOTE: Dimensions are shown in millimeters, mm

**DEFORMABLE BARRIER STATIC CRUSH**

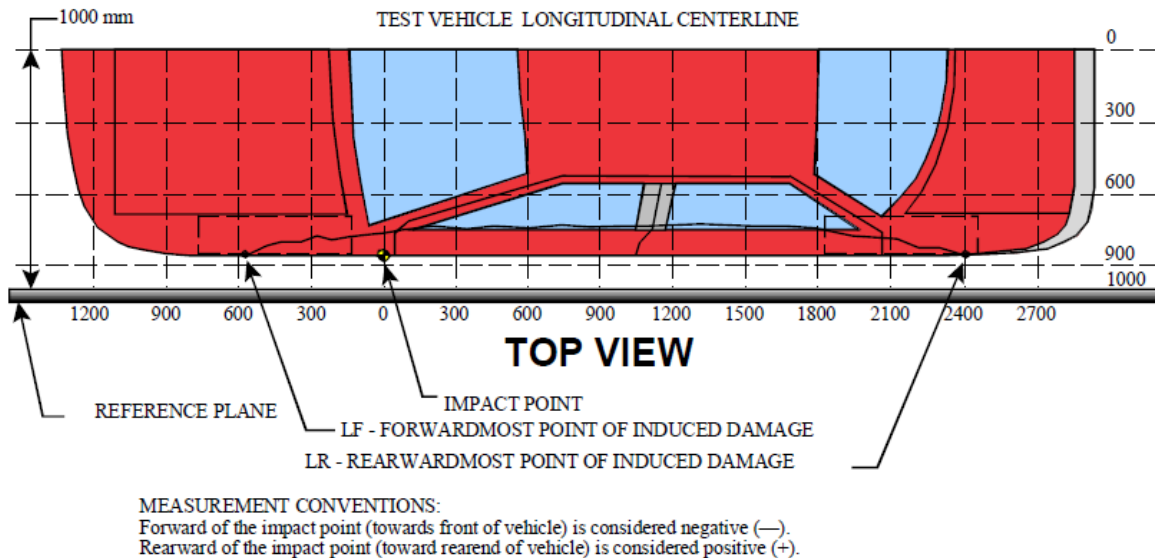
Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		0	100	200	300	400	500	600	700
1	213	204	197	194	194	195	196	197	198	198	199	199	200	200	206	223	253
2	149	144	138	136	136	136	136	132	135	135	136	136	137	137	139	150	173
3	100	86	89	105	112	107	120	123	88	69	63	63	68	78	92	112	146
4	84	78	72	70	81	102	129	124	93	83	74	78	84	93	102	125	171

**DATA SHEET NO. 13**  
**MDB EXTERIOR STATIC CRUSH MEASUREMENTS**

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle  
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190307  
 Test Date: 10/30/2018

For guidance regarding damage profile distance measurements, please refer to the latest version of the *NHTSA Test Reference Guide, Volume 1: Vehicle Tests*.



**VEHICLE DAMAGE PROFILE DISTANCES**

DPD	Distance From Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	-150	3	72	75	-3
2	270	3	198	98	100
3	690	3	92	238	146
4	1110	3	89	197	108
5	1530	3	92	243	151
6	1950	3	97	121	24

**MDB DAMAGE PROFILE DISTANCES**

DPD	Distance From Center of MDB	Level	Post-Test (mm)
1	800 mm left of center	1	253
2	480 mm left of center	1	200
3	160 mm left of center	1	199
4	160 mm right of center	1	196
5	480 mm right of center	1	194
6	800 mm right of center	1	213

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

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle NHTSA No.: M20190307  
 Test Program: NCAP Side MDB Impact Test Test Date: 10/30/2018

Test Time: 12:45 PM Temperature: 21°C

- A. From impact until vehicle motion ceases: \_\_\_\_\_ 0 oz.  
 (Maximum allowable is 1 oz.)
- B. For the 5-minute period after motion ceases: \_\_\_\_\_ 0 oz.  
 (Maximum allowable is 5 oz.)
- C. For the following 25 minutes: \_\_\_\_\_ 0 oz.  
 (Maximum allowable is 1 oz./minute)
- D. Spillage Details: No Spillage Occurred

**FMVSS NO. 301 STATIC ROLLOVER DATA**



**ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS**

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	73	300	373
90° to 180°	62	300	362
180° to 270°	65	300	365
270° to 360°	67	300	367

**FMVSS NO. 301 ROLLOVER SPILLAGE TABLE**

Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° to 90°	0	0	0	
90° to 180°	0	0	0	
180° to 270°	0	0	0	
270° to 360°	0	0	0	

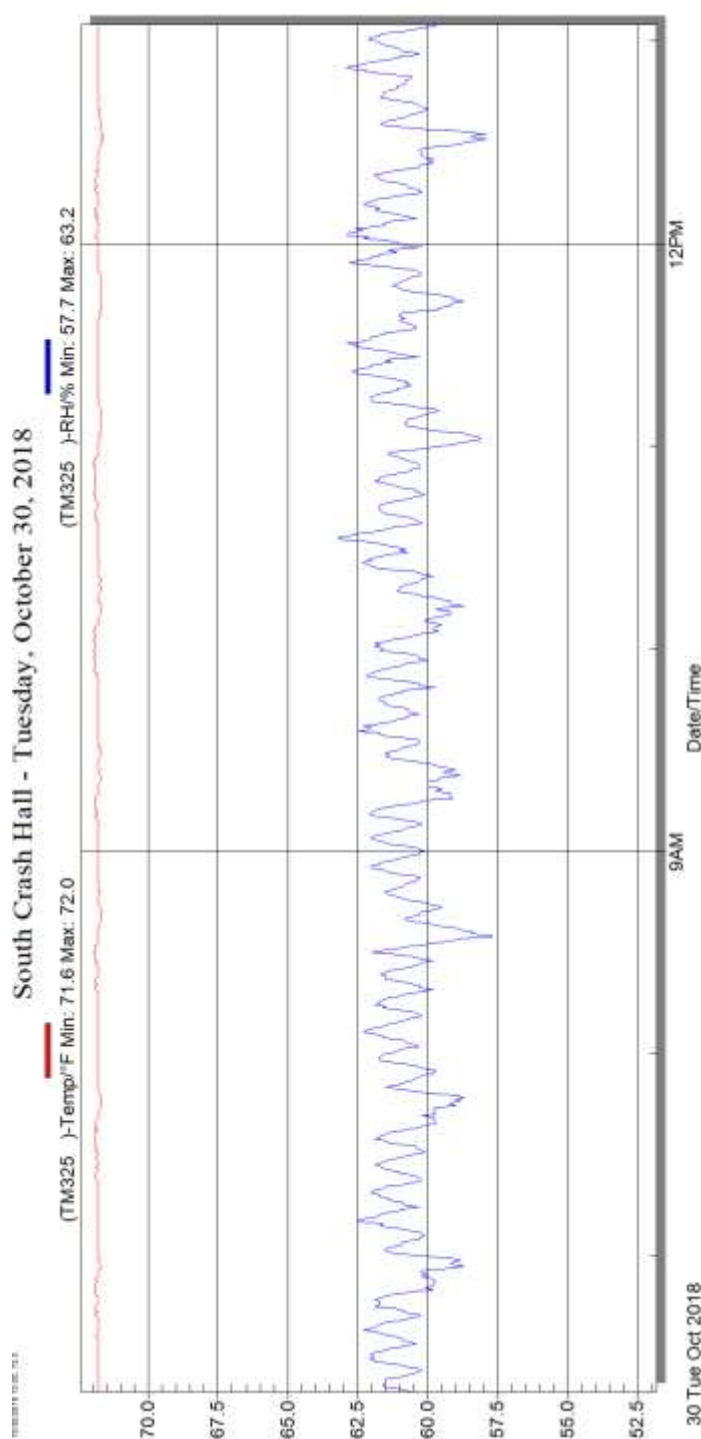
**ROLLOVER SOLVENT SPILLAGE LOCATION TABLE**

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

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

Test Vehicle: 2019 Jeep Cherokee four door sport utility vehicle  
Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190307  
Test Date: 10/30/2018



**Temperature and Humidity Stabilization Chart/Data for Dummies and Test Vehicle**

**APPENDIX A**  
**PHOTOGRAPHS**

## TABLE OF PHOTOGRAPHS

Fig.	Description	Page
1	As-Delivered Right Front 3/4 View of Test Vehicle	A-5
2	As-Delivered Left Rear 3/4 View of Test Vehicle	A-5
3	Pre-Test Frontal View of Test Vehicle	A-6
4	Post-Test Frontal View of Test Vehicle	A-6
5	Pre-Test Left Front 3/4 View of Test Vehicle	A-7
6	Post-Test Left Front 3/4 View of Test Vehicle	A-7
7	Pre-Test Left Side View of Test Vehicle	A-8
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**Figure A-1: As-Delivered Right Front 3/4 View of Test Vehicle**



**Figure A-2: As-Delivered Left Rear 3/4 View of Test Vehicle**



**Figure A-3: Pre-Test Frontal View of Test Vehicle**



**Figure A-4: Post-Test Frontal View of Test Vehicle**



**Figure A-5: Pre-Test Left Front  $\frac{3}{4}$  View of Test Vehicle**



**Figure A-6: Post-Test Left Front  $\frac{3}{4}$  View of Test Vehicle**



**Figure A-7: Pre-Test Left Side View of Test Vehicle**



**Figure A-8: Post-Test Left Side View of Test Vehicle**



**Figure A-9: Pre-Test Left Rear  $\frac{3}{4}$  View of Test Vehicle**



**Figure A-10: Post-Test Left Rear  $\frac{3}{4}$  View of Test Vehicle**



Figure A-11: Pre-Test Rear View of Test Vehicle



Figure A-12: Post-Test Rear Side View of Test Vehicle



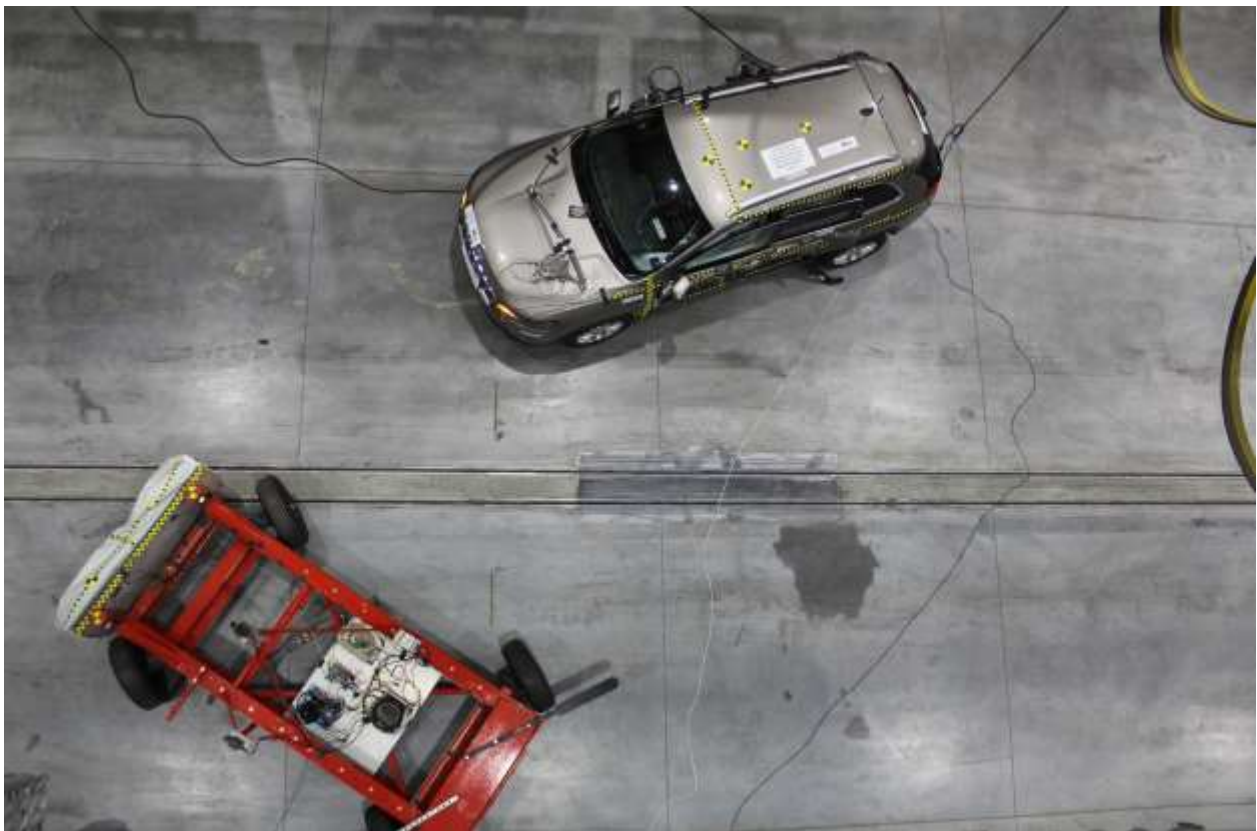
**Figure A-13: Pre-Test Right Side View of Test Vehicle**



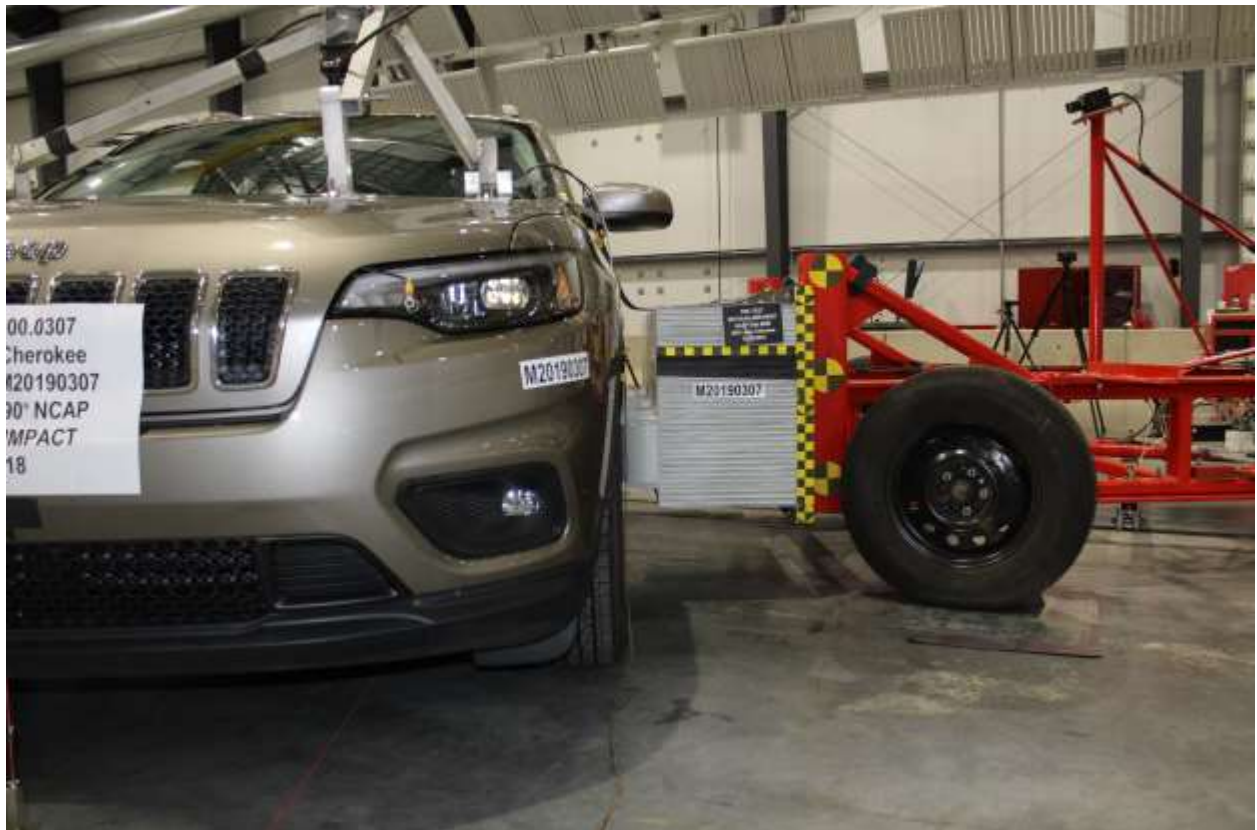
**Figure A-14: Post-Test Right Side View of Test Vehicle**



**Figure A-15: Pre-Test Overhead View of the Test Area**



**Figure A-16: Post-Test Overhead View of Test Area**



**Figure A-17: Pre-Test Left Side View of MDB Positioned Against Side of Test Vehicle**



**Figure A-18: Pre-Test Right Side View of MDB Positioned Against Side of Test Vehicle**



**Figure A-19: Pre-Test Close-up View of Impact Point Target**



**Figure A-20: Post-Test Close-up View of Impact Point Target**



Figure A-21: Pre-Test Left Front Door Latch Close-Up



Figure A-22: Post-Test Left Front Door Latch Close-Up



Figure A-23: Pre-Test Left Rear Door Latch Close-Up



Figure A-24: Post-Test Left Rear Door Latch Close-Up



**Figure A-25: Pre-Test Front Close-up View of Driver Dummy**



**Figure A-26: Post-Test Front Close-up View of Driver Dummy**



Figure A-27: Pre-Test Left Side View of Driver Dummy Showing Belt and Chalking



Figure A-28: Pre-Test Left Side View of Driver Dummy Shoulder and Door Top View



**Figure A-29: Post-Test Left Side View of Driver Dummy Shoulder and Door Top View**



**Figure A-30: Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning**



**Figure A-31: Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint**



**Figure A-32: Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning**



**Figure A-33: Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan**



**Figure A-34: Pre-Test Placement of Driver Dummy's Feet**



**Figure A-35: Pre-Test View of Belt Anchorage for Driver Dummy**



**Figure A-36: Pre-Test Left Side View of Steering Wheel**



**Figure A-37: View of Disengaged Parking Brake**



**Figure A-38: Pre-Test View of Parking Brake**



Figure A-39: Pre-test Close-Up Left Side View of Driver Seat Track

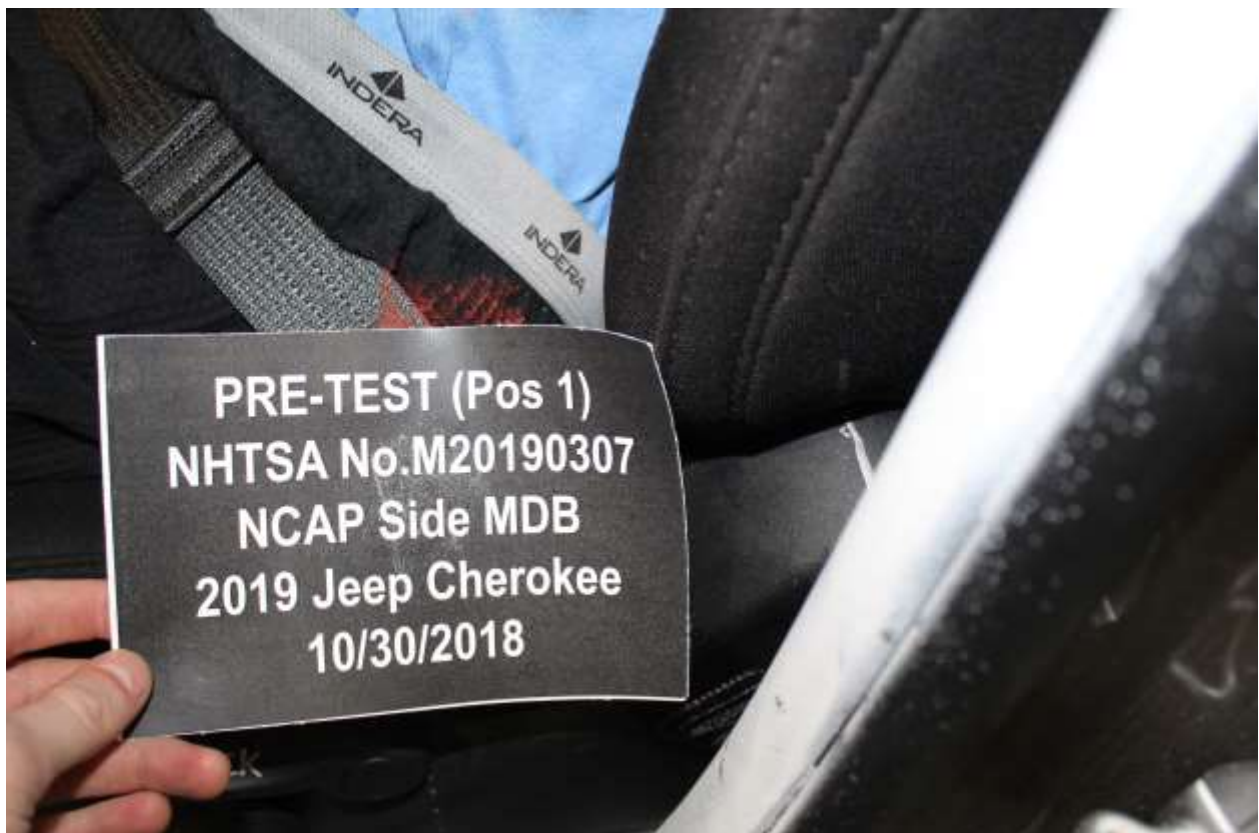


Figure A-40: Pre-Test Close-Up Left Side View of Driver Seat Back



**Figure A-41: Pre-Test Close-Up View of Driver Seat Back or Head Restraint**



**Figure A-42: Pre-Test Driver Dummy and Door Clearance View**



**Figure A-43: Post-Test Driver Dummy and Door Clearance View**



**Figure A-44: Pre-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment**



**Figure A-45: Post-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment**



**Figure A-46: Pre-Test Driver Inner Door Panel View**



**Figure A-47: Post-Test Driver Inner Door Panel View Showing Driver Dummy Contact Locations**



**Figure A-48: Post-Test Driver Dummy Close-Up Head Contact with Vehicle View**



**Figure A-49: Post-Test Driver Dummy Close-Up Head Contact with Side Air bag View**



**Figure A-50: Post-Test Driver Dummy Close-Up Torso Contact with Vehicle Interior View**



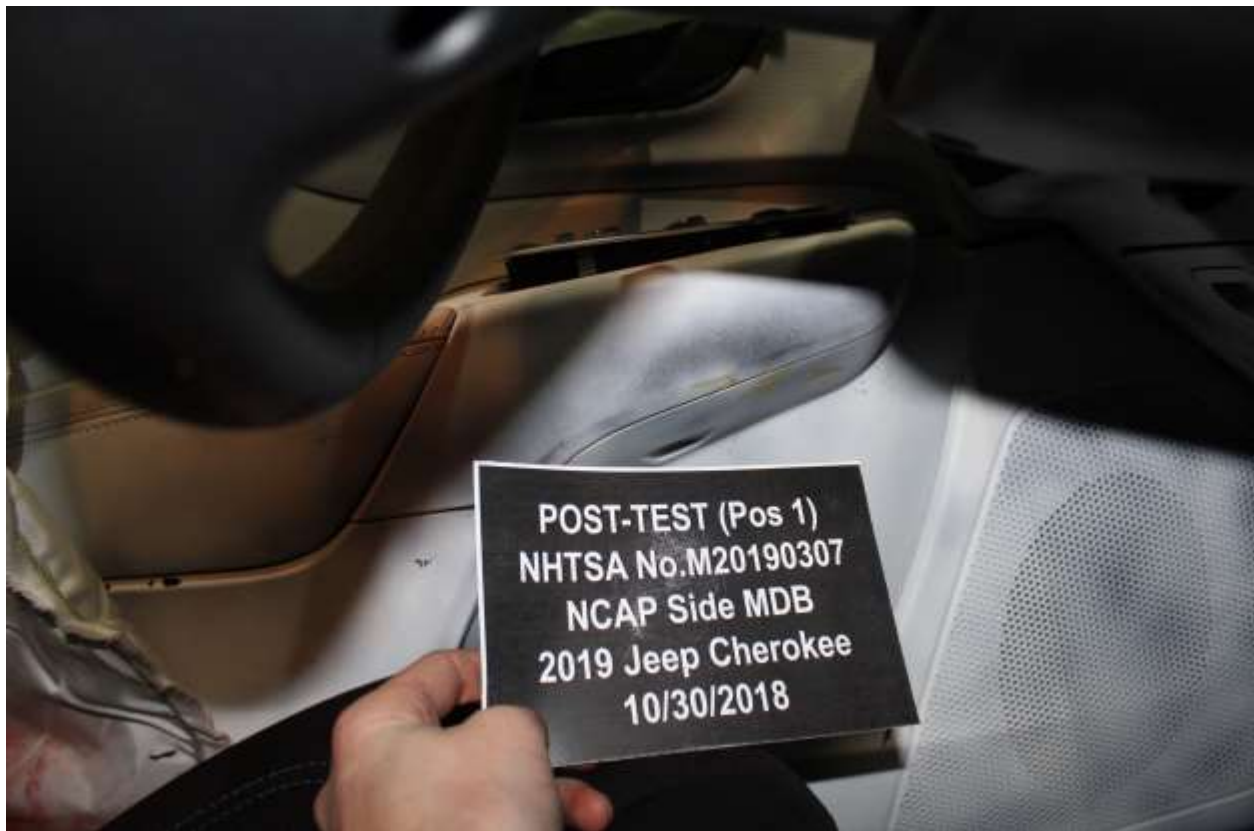
**Figure A-51: Post-Test Driver Dummy Close-Up Torso Contact with Side Air bag View**



**Figure A-52: Post-Test Driver Dummy Close-Up Pelvis Contact View**



**Figure A-53: Post-Test Driver Dummy Close-Up Pelvis Contact with Side Air bag View**



**Figure A-54: Post-Test Driver Dummy Close-Up Knee Contact View**



**Figure A-55: Pre-Test Left Side View of Rear Passenger Dummy Showing Belt and Chalking**



**Figure A-56: Pre-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View**



**Figure A-57: Post-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View**



**Figure A-58: Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning**



**Figure A-59: Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint**



**Figure A-60: Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning**



**Figure A-61: Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan**



**Figure A-62: Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket**



**Figure A-63: Pre-Test View of Rear Passenger Dummy's Head Showing Dummy's Head is Level**



**Figure A-64: Pre-Test Placement of Rear Passenger Dummy's Feet**



**Figure A-65: Pre-Test View of Belt Anchorage for Rear Passenger Dummy**



**Figure A-66: Pre-Test Close-Up Left Side View of Rear Passenger Seat Track**



**Figure A-67: Pre-Test Close-Up Left Side View of Rear Passenger Seat Back**



**Figure A-68: Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint**



Figure A-69: Pre-Test Rear Passenger Dummy and Door Clearance View



Figure A-70: Post-Test Rear Passenger Dummy and Door Clearance View



**Figure A-71: Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment**



**Figure A-72: Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment**



**Figure A-73: Pre-Test Rear Passenger Inner Door Panel View**



**Figure A-74: Post-Test Rear Passenger Inner Door Panel View Showing Rear Passenger Dummy Contact Locations**



Figure A-75: Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle View



Figure A-76: Post-Test Rear Passenger Dummy Close-Up Head Contact with Side Air bag View



**Figure A-77: Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View**

# Photo Not Applicable

**Figure A-78: Post-Test Rear Passenger Dummy Close-Up Torso Contact with Side Air bag View**



**Figure A-79: Post-Test Rear Passenger Dummy Close-Up Pelvis Contact View**

**Photo Not Applicable**

**Figure A-80: Post-Test Rear Passenger Dummy Close-Up Pelvis Contact with Side Air bag View**



Figure A-81: Post-Test Rear Passenger Dummy Close-Up Knee Contact View



Figure A-82: Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



**Figure A-83: Post-Test View of Fuel Filler Cap or Fuel Filler Neck**



**Figure A-84: Pre-Test Front View of MDB Impactor Face**



Figure A-85: Post-Test Front View of MDB Impactor Face



Figure A-86: Pre-Test Top View of MDB Impactor Face



**Figure A-87: Post-Test Top View of MDB Impactor Face**



**Figure A-88: Pre-Test Left Side View of MDB Impactor Face**



**Figure A-89: Post-Test Left Side View of MDB Impactor Face**



**Figure A-90: Pre-Test Right Side View of MDB Impactor Face**



Figure A-91: Post-Test Right Side View of MDB Impactor Face



Figure A-92: Close-Up View of Vehicle's Certification Label



Figure A-93: Close-Up View of Vehicle's Tire Information Placard or Label



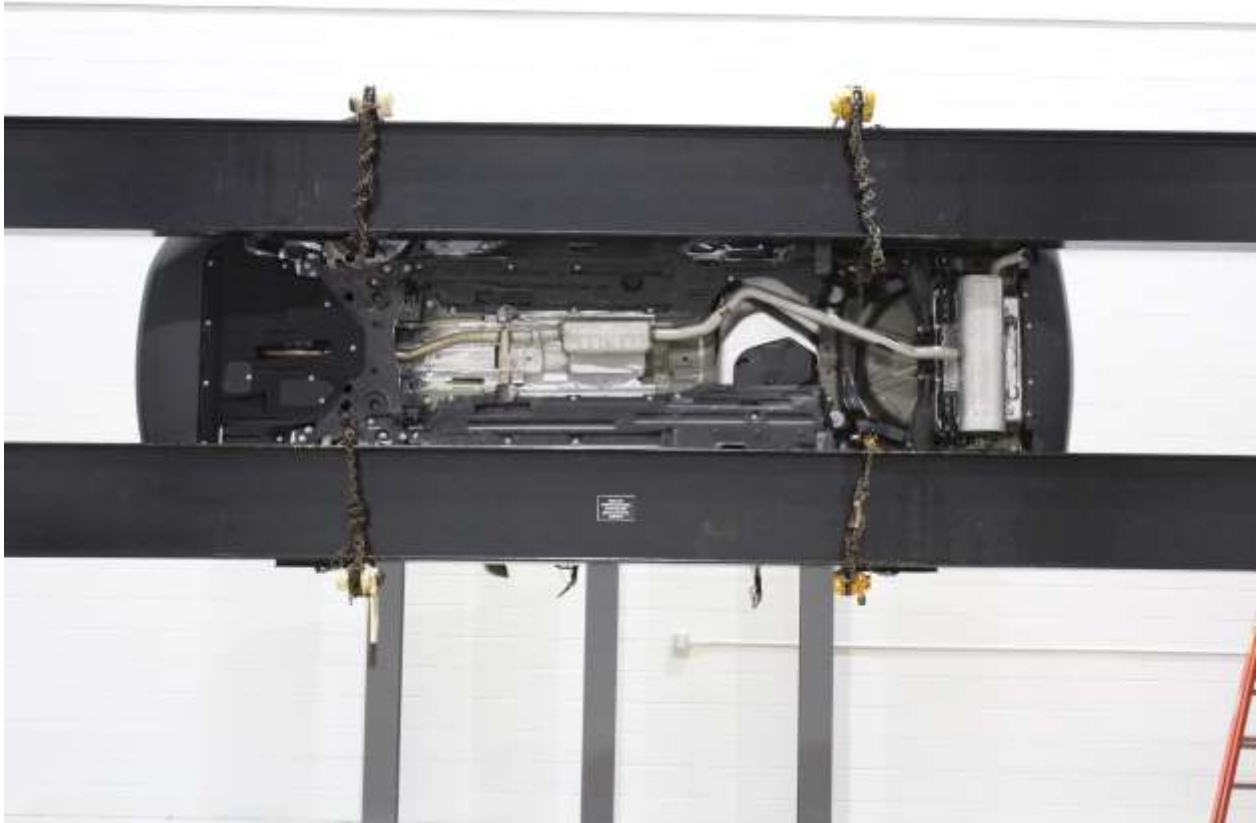
Figure A-94: Pre-Test Ballast View



**Figure A-95: Post-Test Primary and Redundant Speed Trap Read-Out**



**Figure A-96: FMVSS No. 301 Static Rollover 0 Degrees**



**Figure A-97: FMVSS No. 301 Static Rollover 90 Degrees**



**Figure A-98: FMVSS No. 301 Static Rollover 180 Degrees**



**Figure A-99: FMVSS No. 301 Static Rollover 270 Degrees**



**Figure A-100: FMVSS No. 301 Static Rollover 360 Degrees**



Figure A-101: Impact Event

2019 MODEL YEAR

For more information visit: [www.jeep.com](http://www.jeep.com) or call 1-877-4AM-JEEP

FCA US LLC

## Jeep CHEROKEE LATITUDE FWD

THIS VEHICLE IS MANUFACTURED TO MEET SPECIFIC SAFETY CRASH REQUIREMENTS. THIS VEHICLE IS NOT MANUFACTURED FOR SALE IN JURISDICTIONS OUTSIDE OF THE UNITED STATES.

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

Base Price: **\$23,995**

**Jeep Cherokee Latitude FWD**  
 Exterior Color: 101 Champagne Pearl-Cast Express Paint  
 Interior Color: 440 Granite Cloth  
 Wheel: 17-inch Painted Steel  
 Engine: 3.6L V-6 Multi-Point Injection  
 Transmission: 8-Speed Automatic Transmission

**STANDARD EQUIPMENT (A AND B) REPLACED BY OPTIONAL EQUIPMENT (FUNCTIONAL SAFETY FEATURES)**

- Advanced Multiple View Image
- Supplemental Side-Curtain Front and Rear Airbags
- Supplemental Front Seat-Belted Side Airbags
- LATCH Ready Child Seat Anchor System
- Front/Rear Head Rest Lp Control
- Keyless Entry with Panic Alarm
- All-Season Traction Control
- Electronic Stability Control
- Electronic Roll Mitigation
- Anti-Lock 4-Wheel Disc Brakes
- Speed Control
- The 7th Air Bag
- The Pressure Monitoring Display
- Cross-Traffic Alert

**INTERIOR FEATURES**

- Steersight 4 with 7-inch Display
- Apple CarPlay Capable
- Google Android Auto™ Capable
- Cluster 3.5-inch TFT Screen and White Display
- Integrated Voice Command with Bluetooth
- Media Center With Motion Storage
- 8-Speakers
- 12-Volt Auxiliary Power Outlet
- Power Windows with Driver's One-Touch-Open Feature

**EXTERIOR FEATURES**

- 10-inch 7-spoke Full-Size Steel Wheels
- 2019 EPA 24 City 31 Highway 18 Combined 22 MPG
- The Sentinel 66 (16) Compound Sport
- Power Heated Mirrors
- Automatic Headlamps

LED Low Beam High Beam Headlamps  
 LED Fog Lamps  
 Bright Day Roof Rails  
**OPTIONAL EQUIPMENT (See Dealer Discount/Amount)**  
 Customer Preferred Package (CU) \$600  
 Popular Appearance Group \$1,100  
 17-inch 7-Spoke Painted Aluminum Wheels  
 Day-Time Running Lamps  
 Destination Charge \$1,095

**TOTAL PRICE\* \$28,095**

**WARRANTY COVERAGE**  
 3-year or 50,000-mile Powertrain Limited Warranty  
 5-year or 100,000-mile Basic Limited Warranty  
 Ask Dealer for a copy of the limited warranties or see your dealer's manual for details.

**5 YEAR / 60,000 MILE POWERTRAIN WARRANTY**

**Fuel Economy and Environment** Gasoline Vehicle

**Fuel Economy** These estimates reflect new EPA methods beginning with 2017 models. **You spend \$750** in fuel costs over 5 years compared to the average new vehicle.

**25** MPG **22** City **31** Highway  
combined city/hwy

4.0 gallons per 100 miles

**Annual fuel cost \$1,550**

**Fuel Economy & Greenhouse Gas Rating** compared to other vehicles

**1** **5** **10** **10** **10** **10**  
Best Worst Best Worst

This vehicle saves 252 grams CO2 per mile. The best saves 9 grams per mile (better only). Fueling and driving habits affect fuel economy estimates. See dealer for full details.

[fuel economy.gov](http://fuel economy.gov)

Calculate environmental estimates and compare vehicles.

**GOVERNMENT 5-STAR SAFETY RATINGS**

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

Source: National Highway Traffic Safety Administration (NHTSA)  
[www.safercar.gov](http://www.safercar.gov) or 1-888-327-4228

**PARTS CONTENT INFORMATION**

FOR VEHICLES IN THIS CLASSLINE:  
 U.S./CANADIAN PARTS CONTENT: 88%  
 MAJOR SOURCES OF FOREIGN PARTS CONTENT:

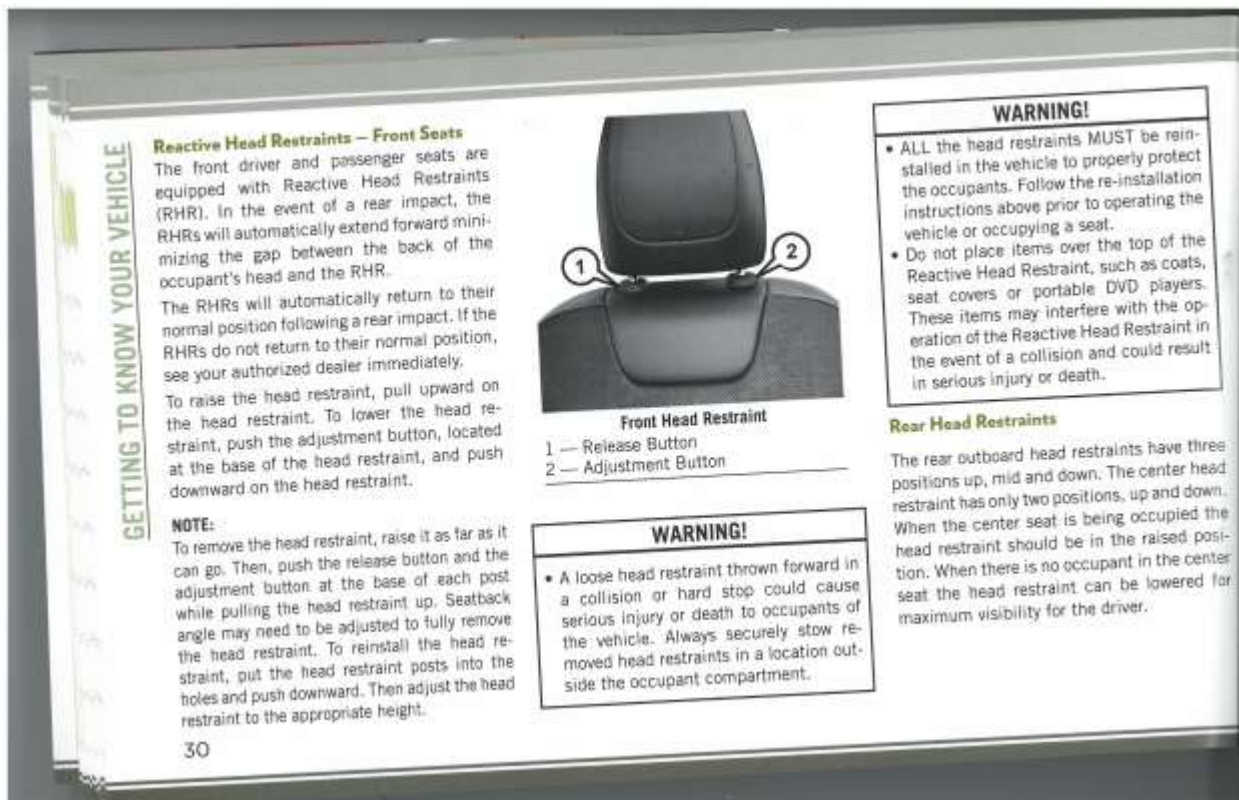
MEXICO - 23%

NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.

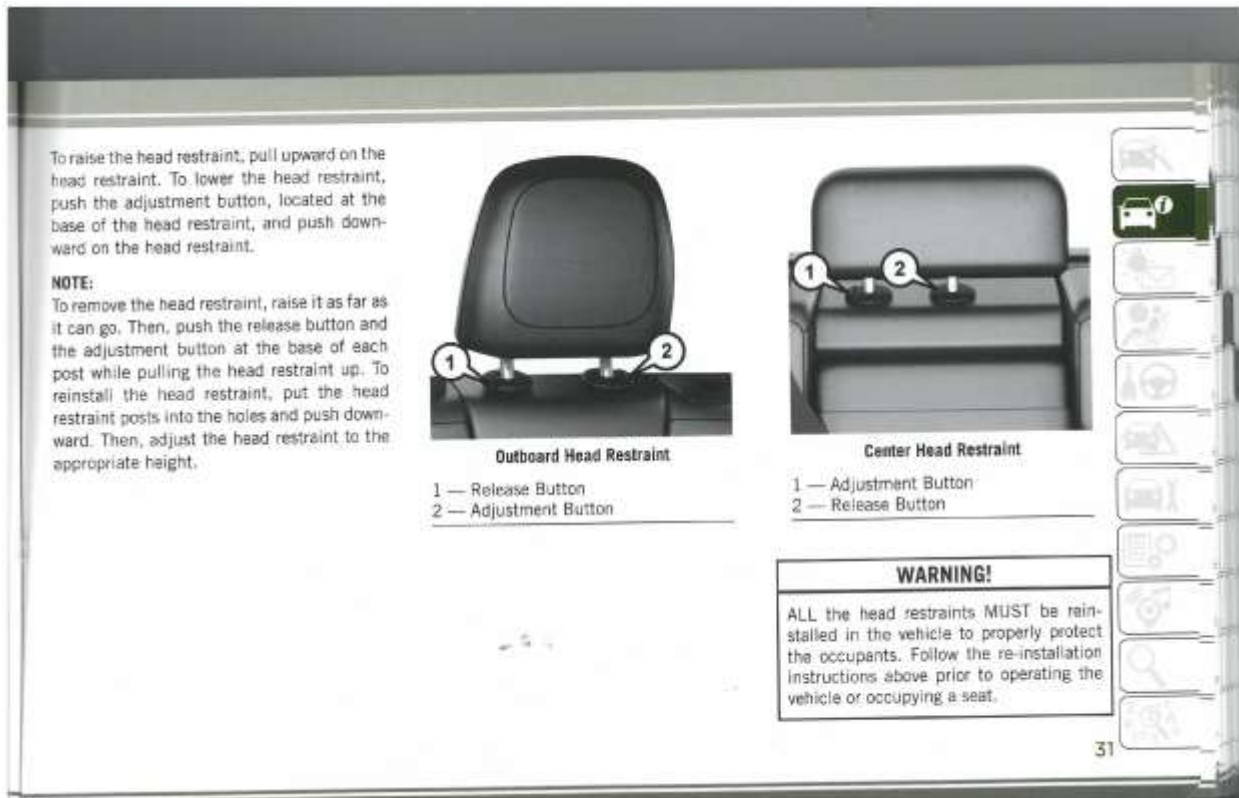
FOR THIS VEHICLE:  
 FINAL ASSEMBLY POINT:  
 BELVEDERE, ILLINOIS, U.S.A.  
 COUNTRY OF ORIGIN:  
 ENGINE: UNITED STATES  
 TRANSMISSION: UNITED STATES

Assembled in Mexico from U.S. and Canadian parts. ©2018 FCA US LLC. All rights reserved. MSRP includes destination charge and excludes taxes, title, license, dealer fees, and optional equipment. \*MSRP excludes \$1,095 destination charge. Dealer sets actual price. MSRP includes \$1,095 destination charge. Dealer sets actual price. MSRP includes \$1,095 destination charge. Dealer sets actual price.

Figure A-102: Monroney Label



**Figure A-103: Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual**



**Figure A-104: Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual-Rear Restraints Not Adjustable**

## **APPENDIX B**

### VEHICLE AND DUMMY RESPONSE DATA PLOTS

## TABLE OF DATA PLOTS

### Driver & Passenger Dummy Instrumentation Plots

<b>Fig.</b>	<b>Description</b>	<b>Page</b>
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21	Passenger Lower Spine T12 Resultant Acceleration vs. Time	B-10
22	Passenger Iliac Force on Impact Side (Y) vs. Time	B-10
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24	Passenger Total Pelvic Force on Impact Side (Y) vs. Time	B-10

The following additional data for this test can be obtained from the Research and Development section of the NHTSA website. The website can be found at [www.NHTSA.dot.gov](http://www.NHTSA.dot.gov).

#### **Additional Driver & Passenger Dummy Instrumentation Data**

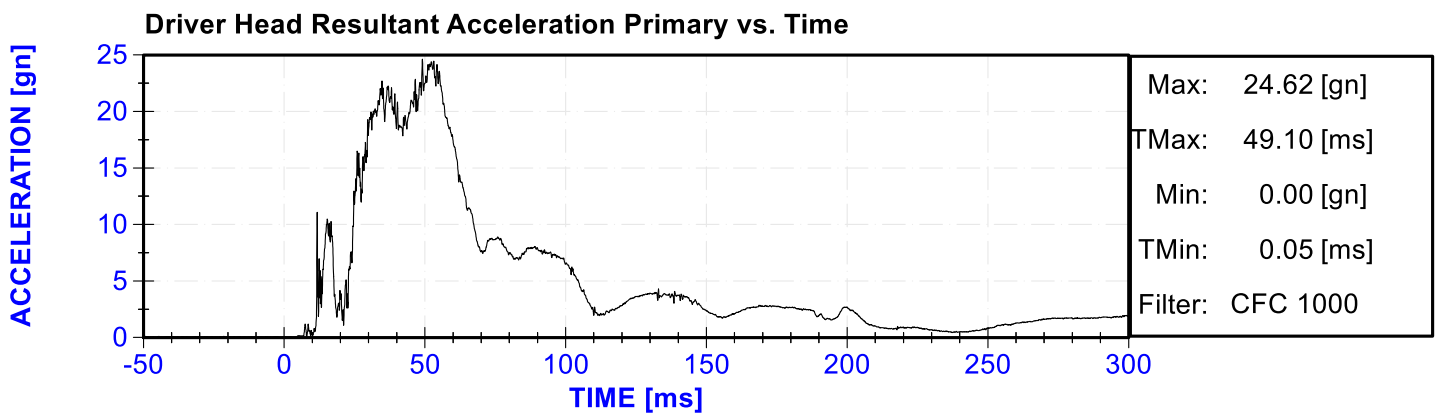
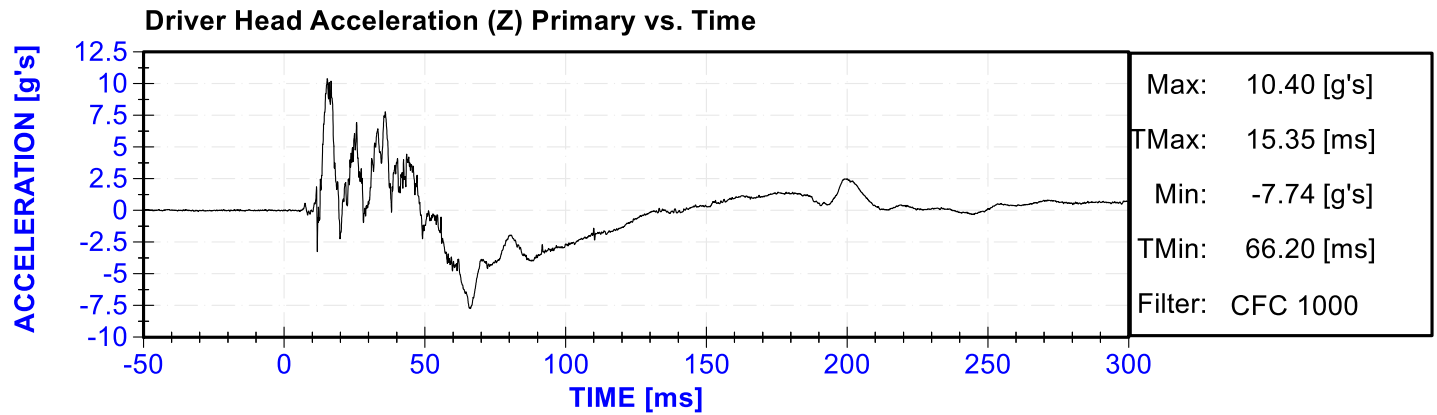
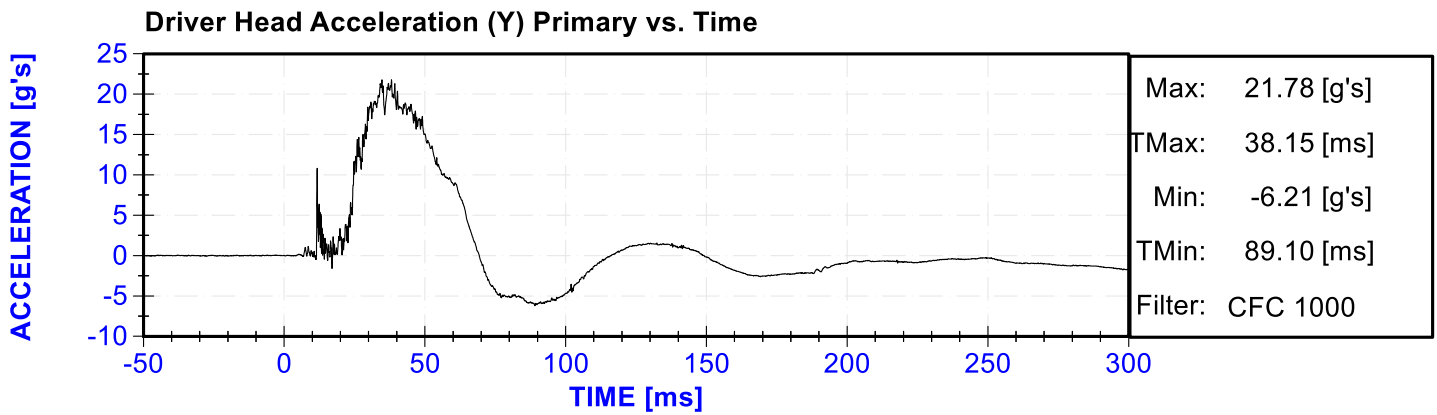
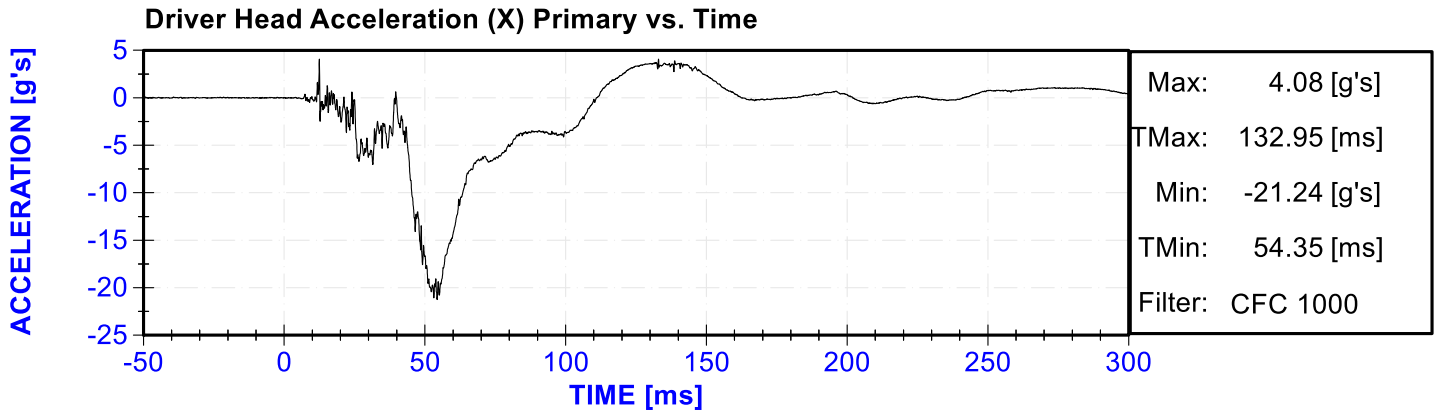
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Driver Lower Spine T12 Acceleration (Z)  
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Passenger Middle Thorax Rib Deflection (Y)  
Passenger Lower Thorax Rib Deflection (Y)  
Passenger Upper Abdomen Rib Deflection (Y)  
Passenger Lower Abdomen Rib Deflection (Y)  
Driver Head Acceleration Redundant (X)  
Driver Head Acceleration Redundant (Y)  
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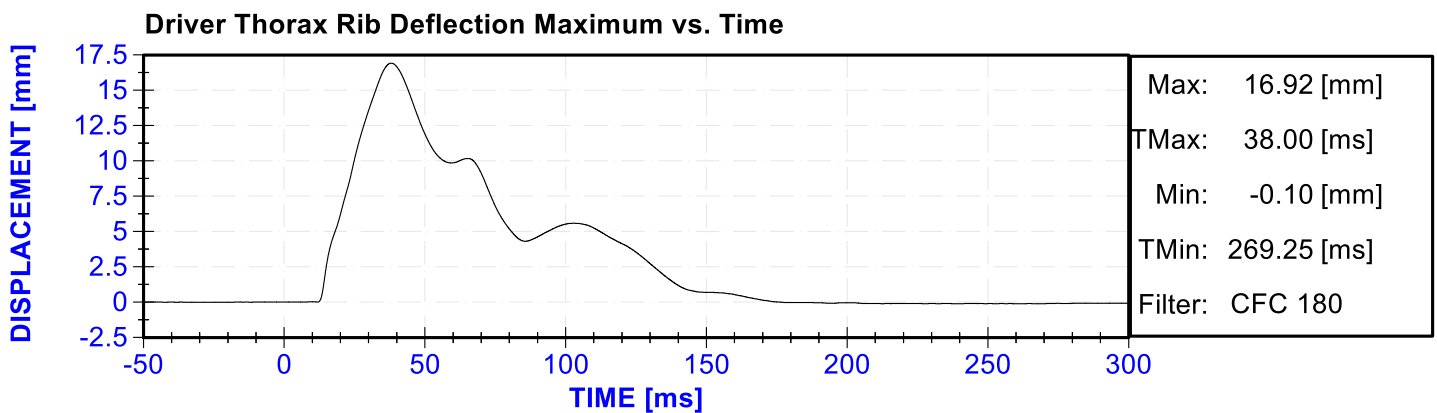
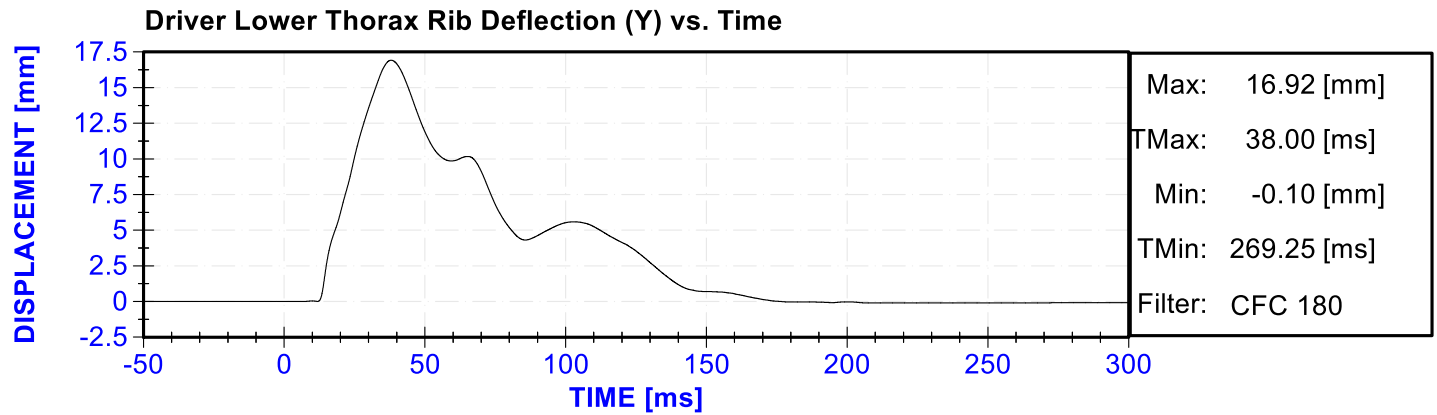
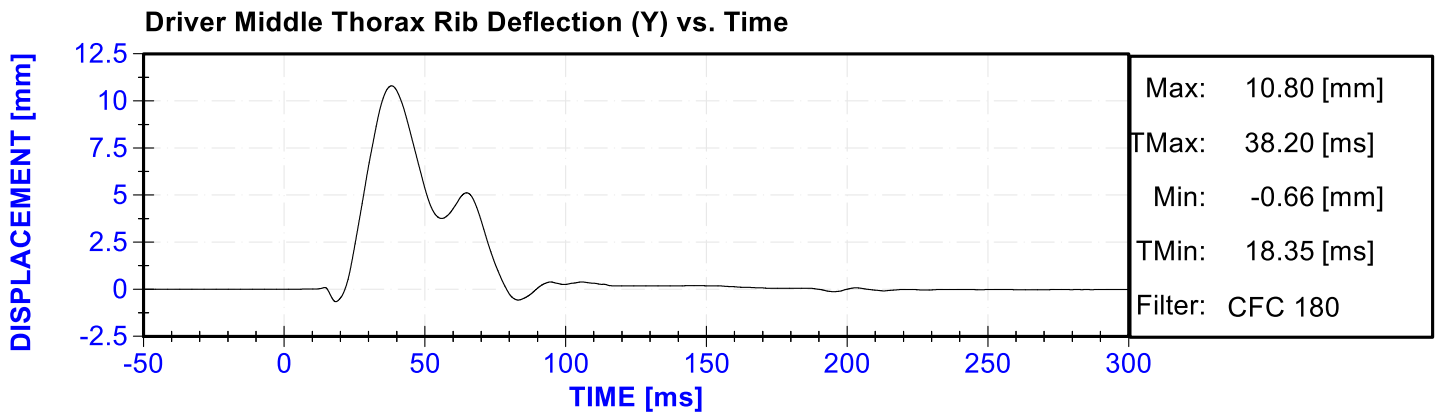
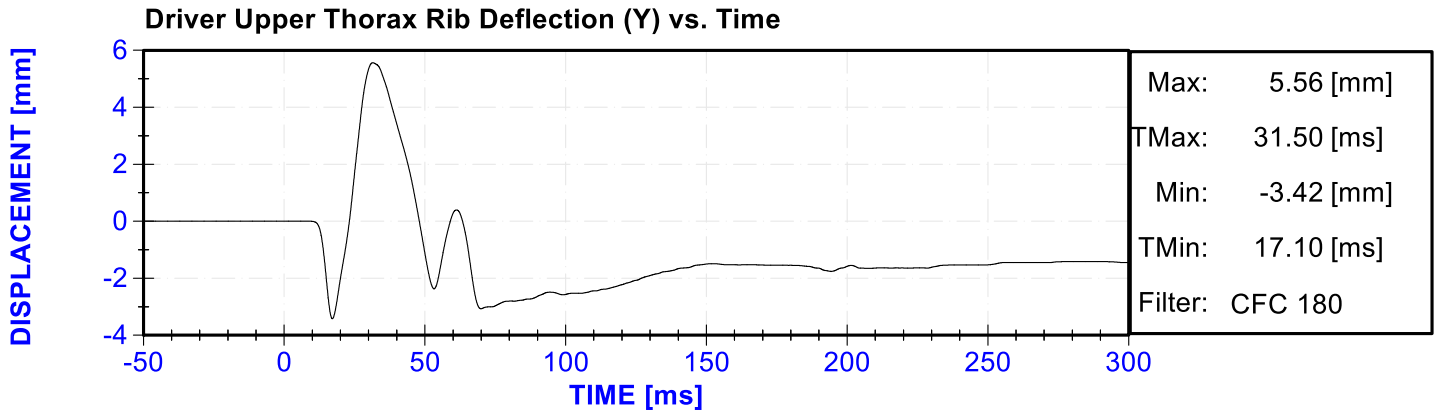
#### **Vehicle Instrumentation Data**

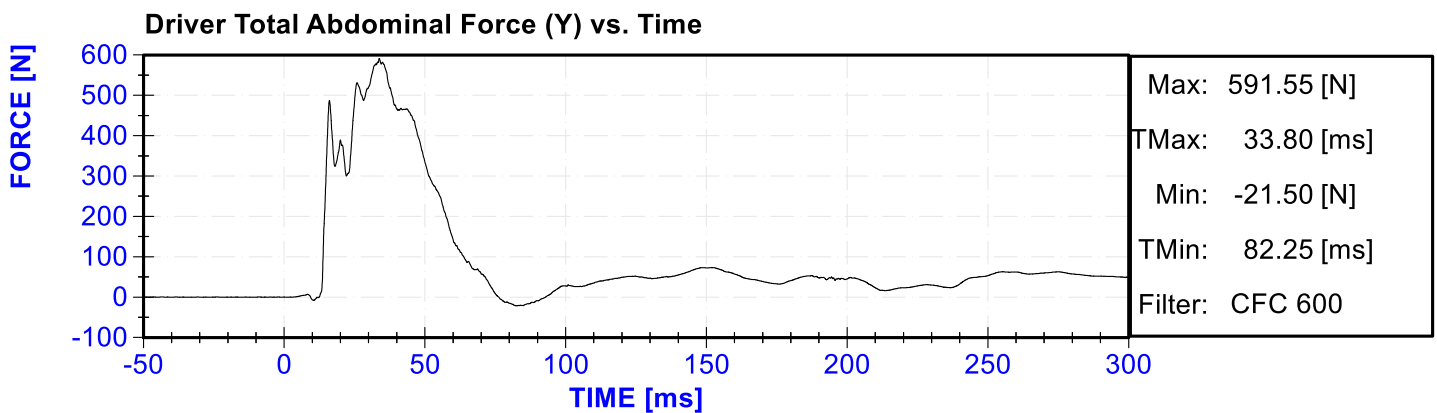
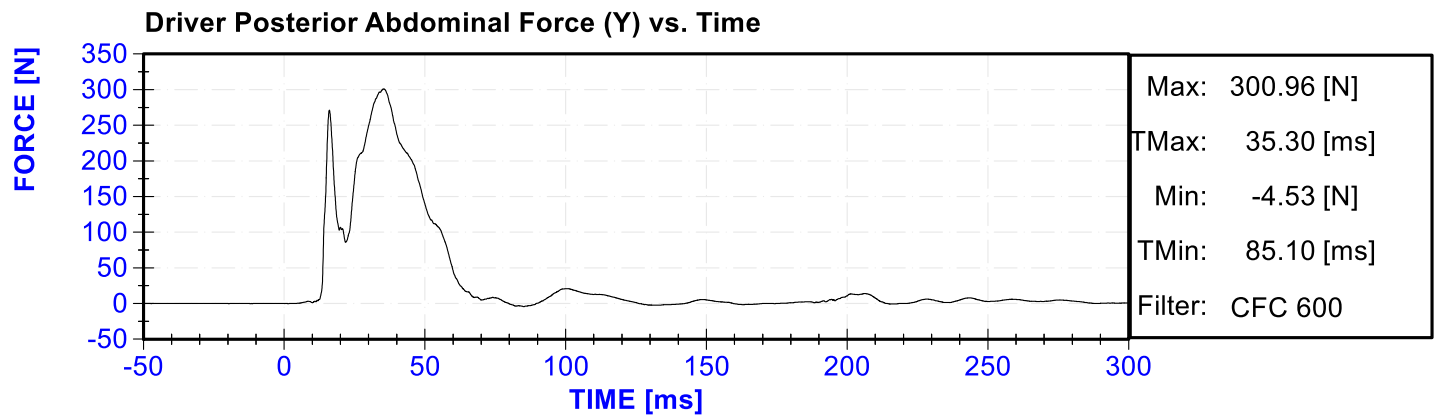
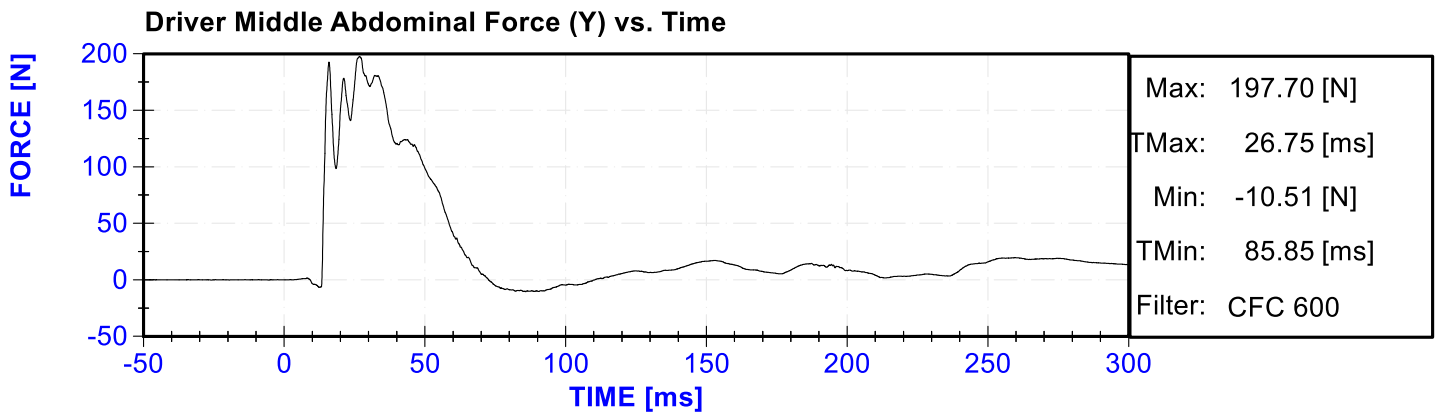
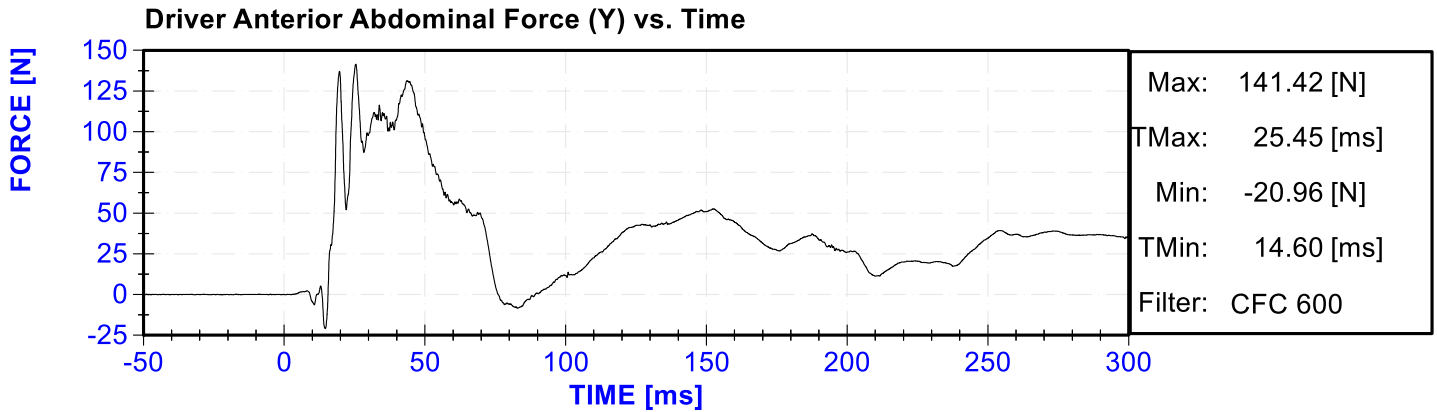
Vehicle Center of Gravity Acceleration (X)  
Vehicle Center of Gravity Acceleration (Y)  
Vehicle Center of Gravity Acceleration (Z)  
Right Side Sill at Front Seat Acceleration (X)  
Right Side Sill at Front Seat Acceleration (Y)  
Right Side Sill at Front Seat Acceleration (Z)  
Right Side Sill at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

## **MDB Instrumentation Data**

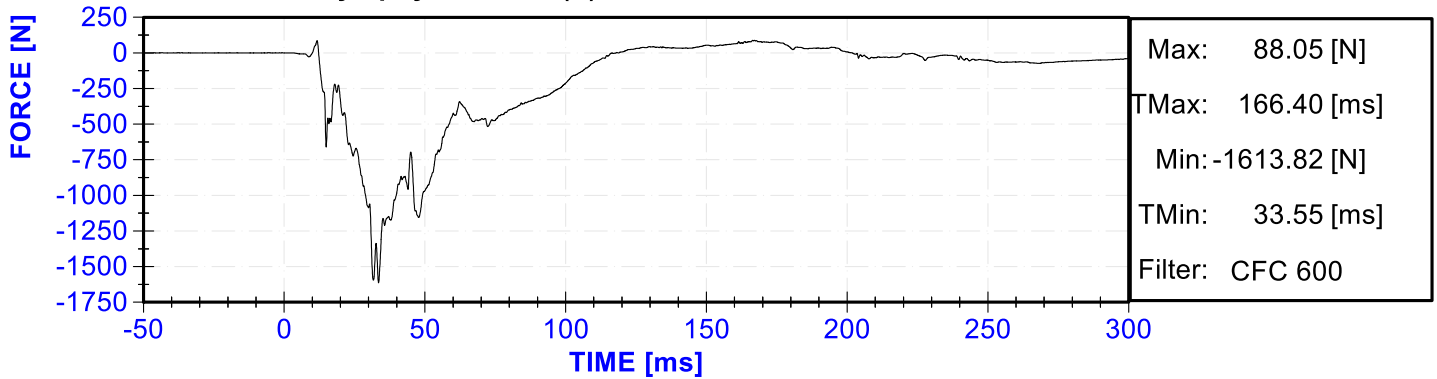
MDB Center of Gravity Acceleration (X)  
MDB Center of Gravity Acceleration (Y)  
MDB Center of Gravity Acceleration (Z)  
MDB Rear Acceleration (X)  
MDB Rear Acceleration (Y)  
Left MDB Contact Switch  
Right MDB Contact Switch



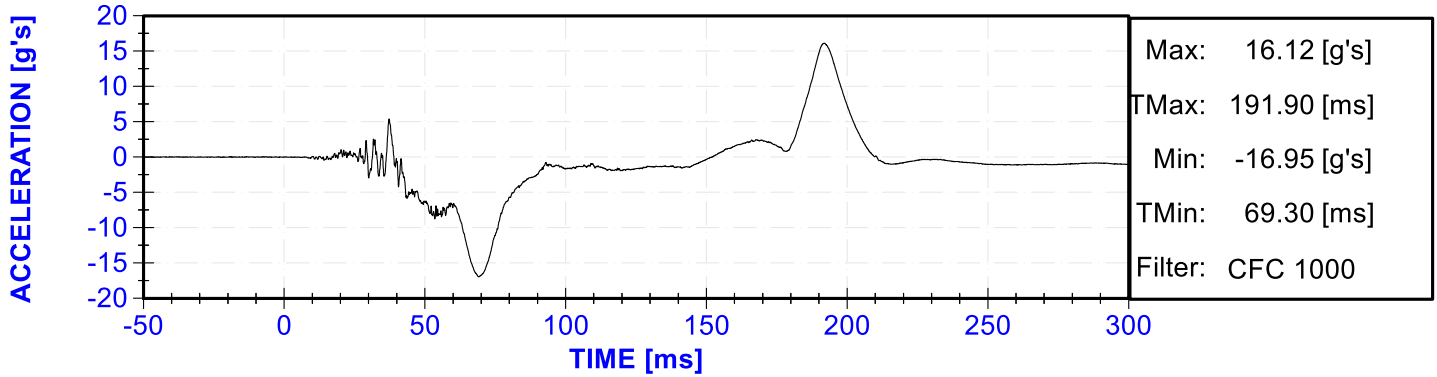




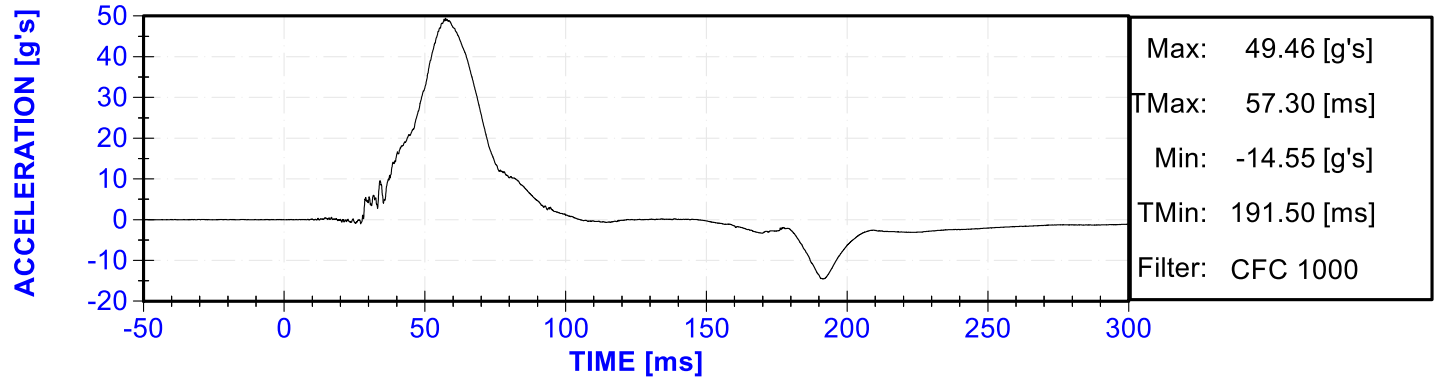
Driver Pubic Symphysis Force (Y) vs. Time



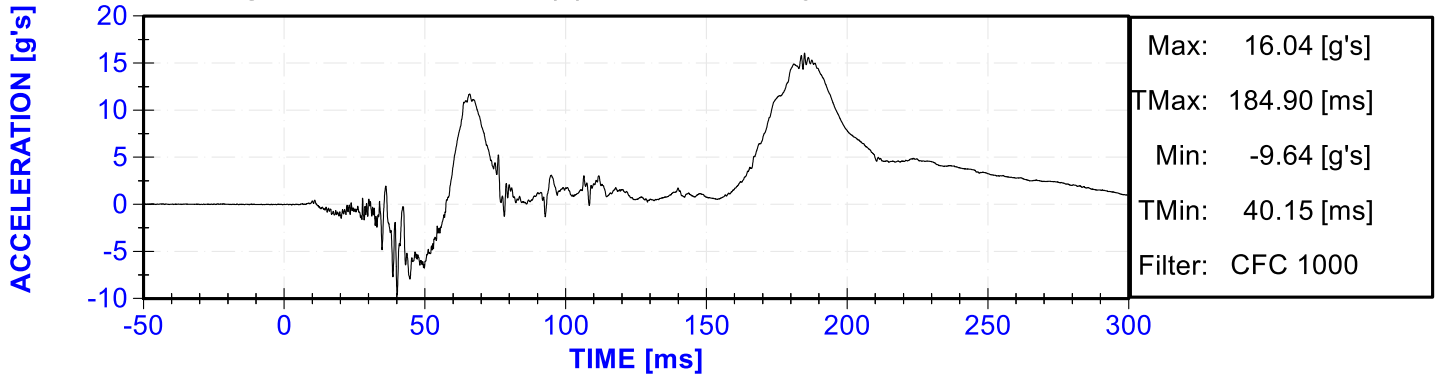
Passenger Head Acceleration (X) vs. Time Primary

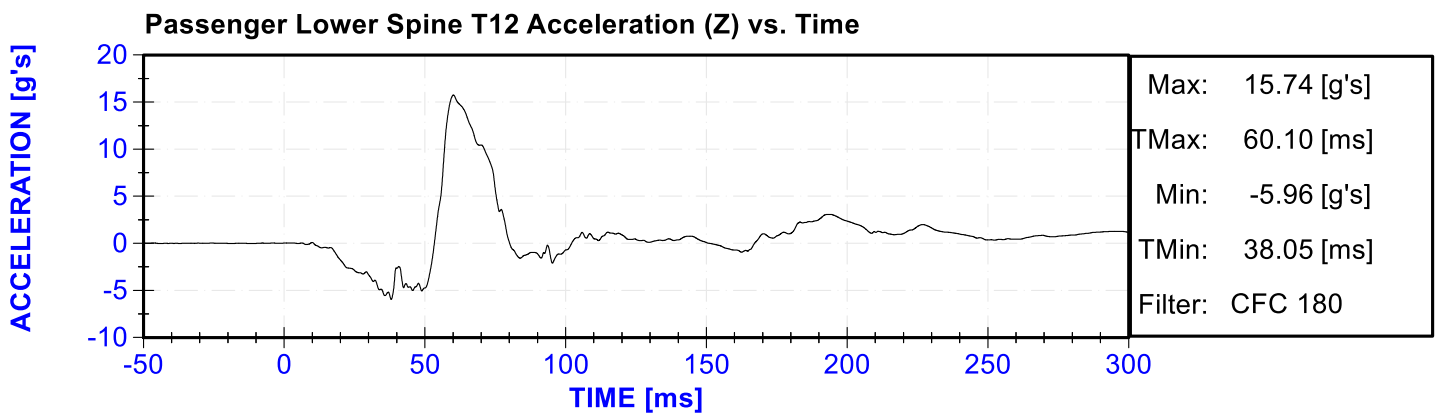
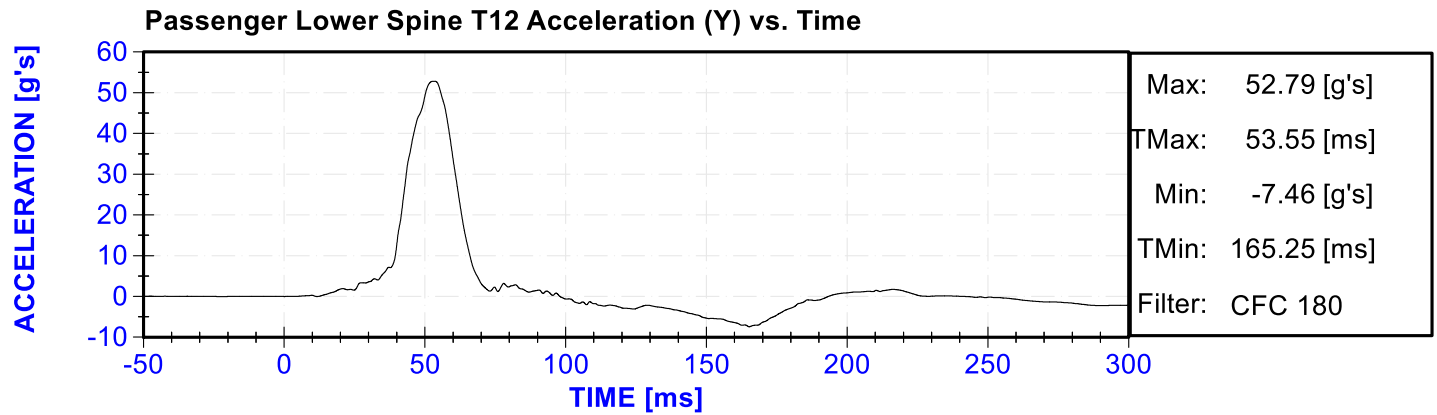
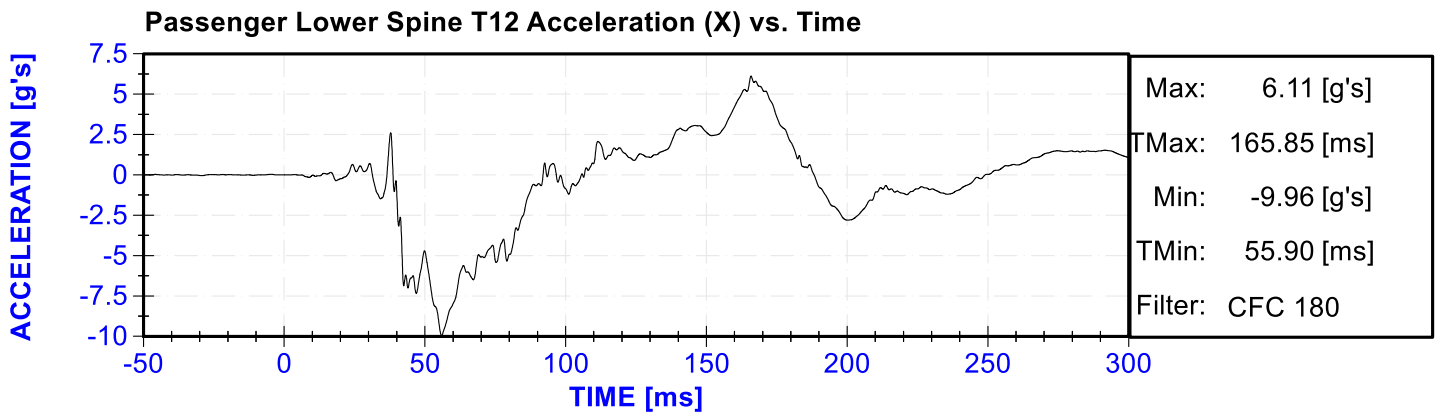
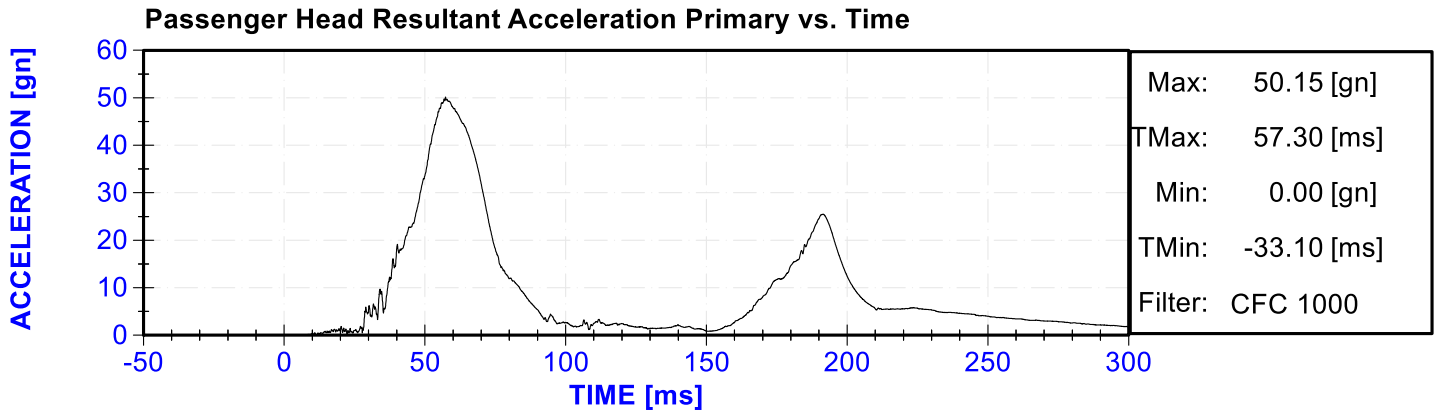


Passenger Head Acceleration (Y) vs. Time Primary

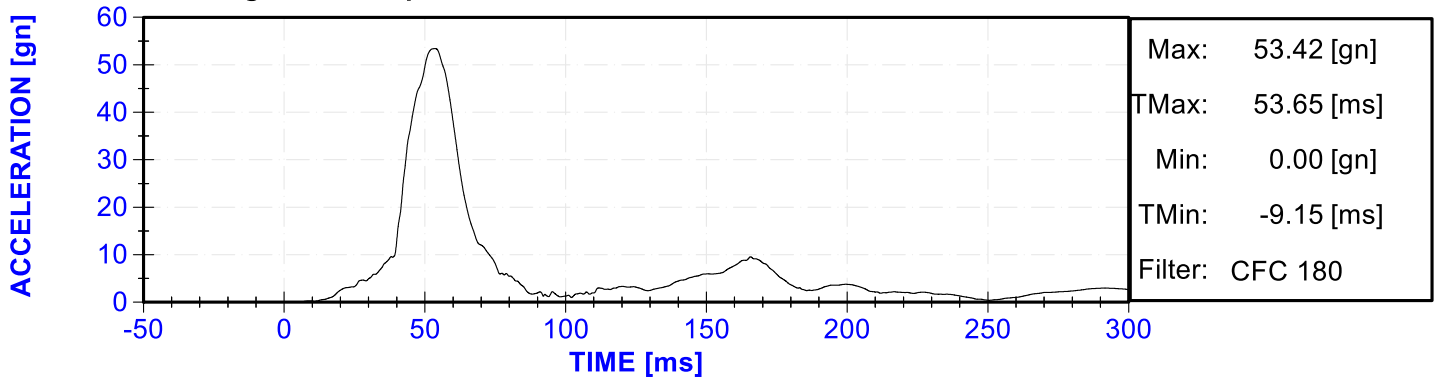


Passenger Head Acceleration (Z) vs. Time Primary

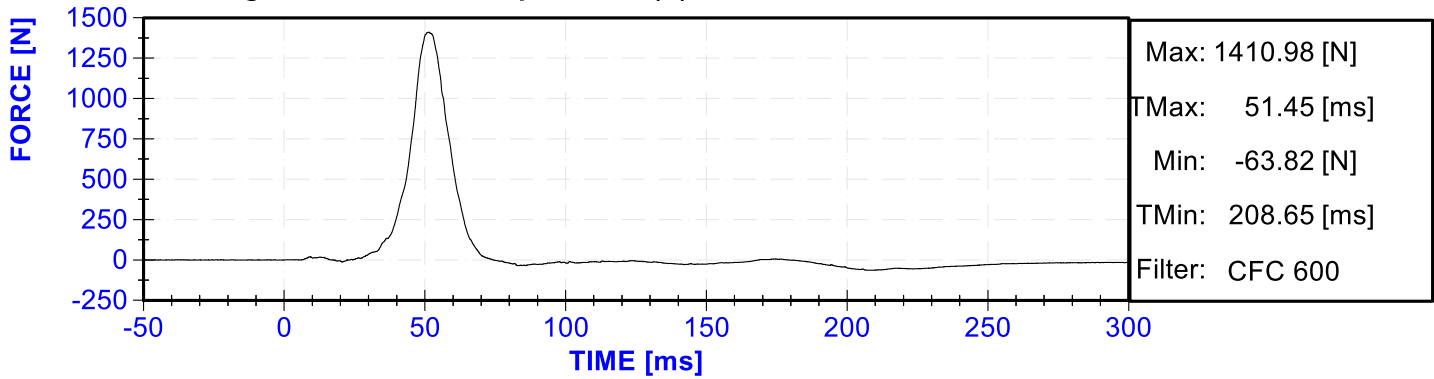




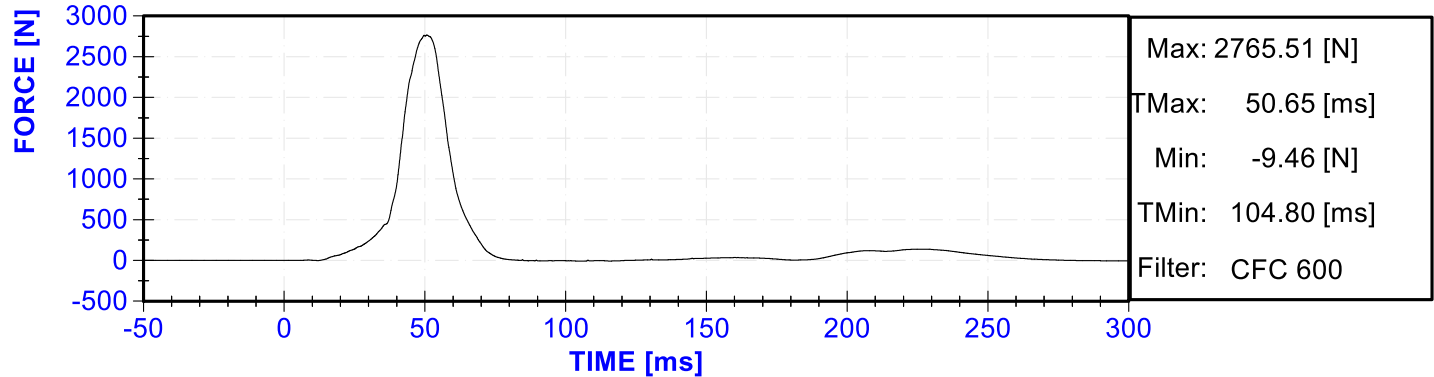
Passenger Lower Spine T12 Resultant Acceleration vs. Time



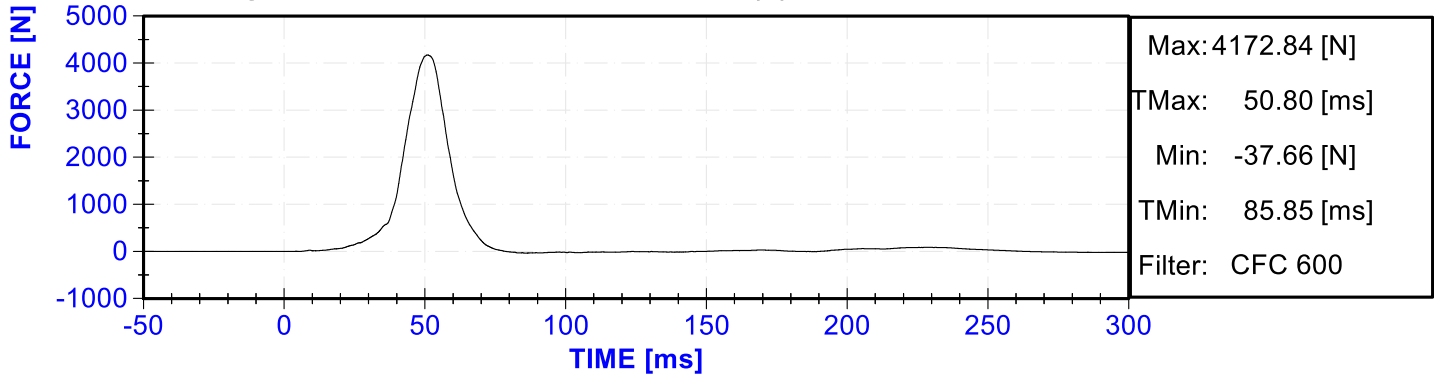
Passenger Iliac Force on Impact Side (Y) vs. Time



Passenger Acetabulum Force on Impact Side (Y) vs. Time



Passenger Total Pelvic Force on Impact Side (Y) vs. Time



## APPENDIX C

### DUMMY PERFORMANCE CALIBRATION TEST DATA

**CALIBRATION TEST RESULTS**

**PRE-TEST**

**EUROSID 2 (ES-2RE) MALE – DRIVER ATD**

**SERIAL NO: F034**

**(CONFIGURED FOR LEFT SIDE IMPACT)**

**CALIBRATION TEST RESULTS**

**PRE-TEST**

**SID-IIS 5<sup>TH</sup> PERCENTILE FEMALE - PASSENGER ATD**

**SERIAL No: DG8012**

**(CONFIGURED FOR LEFT SIDE IMPACT)**

**CALIBRATION TEST RESULTS**

**POST-TEST**

**EUROSID 2 (ES-2RE) MALE – DRIVER ATD**

**SERIAL NO: F034**

**(CONFIGURED FOR LEFT SIDE IMPACT)**

**CALIBRATION TEST RESULTS**

**POST-TEST**

**SID-IIS 5<sup>TH</sup> PERCENTILE FEMALE - PASSENGER ATD**

**SERIAL No: DG8012**

**APPENDIX D**

**TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA**

**Table 1 – Dummy Instrumentation (ES-2re)**

			ES-2re S/N: F034		
			Serial Number	Manufacturer	Calibration Date
Head Accelerometers	Primary	X	P58904	Endevco	10/5/2018
		Y	P58911	Endevco	10/5/2018
		Z	P58776	Endevco	10/5/2018
	Redundant	X	P58887	Endevco	10/5/2018
		Y	P58888	Endevco	10/5/2018
		Z	P51734	Endevco	10/5/2018
Thorax Rib Displacement Potentiometers	Upper	Y	183GFE	Endevco	10/10/2018
	Middle	Y	184GFE	Endevco	10/11/2018
	Lower	Y	182GFE	Endevco	10/10/2018
Abdomen Load Cells	Forward	Y	1440	Endevco	6/4/2018
	Middle	Y	1525	Endevco	6/4/2018
	Rear	Y	1528	Endevco	6/4/2018
Lower Spine Accelerometers (T12)		X	P52079	Endevco	10/4/2018
		Y	P51948	Endevco	10/4/2018
		Z	P51269	Endevco	10/4/2018
Pubic Symphysis Load Cell		Y	464Fy	Endevco	6/4/2018

**Table 2 – Dummy Instrumentation (SID-IIs)**

			SID-IIs S/N: DG8012			
			Serial Number	Manufacturer	Calibration Date	
Head Accelerometers	Primary	X	P74788	Endevco	5/2/2018	
		Y	P83432	Endevco	5/2/2018	
		Z	P83319	Endevco	5/2/2018	
	Redundant	X	P80334	Endevco	5/2/2018	
		Y	P84345	Endevco	5/2/2018	
		Z	P83322	Endevco	5/2/2018	
Displacement Potentiometers	Thoracic Rib	Upper	Y	2165GFE	Endevco	5/15/2018
		Middle	Y	45GFE	Endevco	5/15/2018
		Lower	Y	011GFE	Endevco	5/15/2018
	Abdominal Rib	Upper	Y	8	Endevco	10/11/2018
		Lower	Y	1774GFE	Endevco	10/12/2018
Lower Spine Accelerometers (T12)		X	P45019	Endevco	10/17/2018	
		Y	P51699	Endevco	10/17/2018	
		Z	P51685	Endevco	10/17/2018	
Acetabulum Load Cell		Y	4986Fy	Endevco	6/4/2018	
Iliac Wing Load Cell		Y	113Fy	Endevco	6/4/2018	
Pelvis Plug (struck side)			11631	SACO Research	10/20/2017	
Pelvis Plug (non-struck side)			-	-	-	

**Table 3 – Vehicle Instrumentation**

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	A255998	MSI	10/2/2018
	Vehicle Center of Gravity	Y	A255984	MSI	10/2/2018
	Vehicle Center of Gravity	Z	A255887	MSI	10/4/2018
2	Right Sill at Front Seat	X	A250353	MSI	5/7/2018
	Right Sill at Front Seat	Y	A250354	MSI	4/31/2018
	Right Sill at Front Seat	Z	A250368	MSI	4/31/2018
3	Right Sill at Rear Seat	X	A262045	MSI	6/4/2018
	Right Sill at Rear Seat	Y	A262043	MSI	6/4/2018
	Right Sill at Rear Seat	Z	A255838	MSI	8/15/2018
4	Left Sill at Front Door	Y	A262066	MSI	6/4/2018
5	Left Sill at Rear Door	Y	A262046	MSI	8/17/2018
6	Left A-Post Lower	Y	A217578	MSI	10/11/2018
7	Left A-Post Middle	Y	A196981	MSI	5/7/2018
8	Left B-Post Lower	Y	A250371	MSI	7/17/2018
9	Left B-Post Middle	Y	A217543	MSI	10/4/2018
10	Front Seat Track	Y	A250362	MSI	7/29/2018
11	Rear Seat Track or Structure	Y	A255124	MSI	9/20/2018
12	Right Rear Occ. Compartment	Y	A254674	MSI	10/4/2018
13	Engine Block	X	A217550	MSI	1/24/2018
	Engine Block	Y	A255992	MSI	10/3/2018
14	Rear Floorpan Above Axle	X	A255843	MSI	10/3/2018
	Rear Floorpan Above Axle	Y	A255869	MSI	10/3/2018
	Rear Floorpan Above Axle	Z	A250364	MSI	10/13/2018

**TABLE 4 – MDB Instrumentation**

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	A222648	MSI	9/2/2018
MDB Center of Gravity	Y	A255839	MSI	10/3/2018
MDB Center of Gravity	Z	A255863	MSI	9/23/2018
Left Frame at Rear Axle Centerline	X	A197044	MSI	9/29/2018
Left Frame at Rear Axle Centerline	Y	A255845	MSI	9/23/2018