

**DRAFT REPORT NUMBER: SINCAP-TRC-18-005**

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

**VOLSKWAGEN DE MEXICO S.A. DE C.V. MEXICO  
2018 Volkswagen Tiguan  
NHTSA NUMBER: M20185805**

**PREPARED BY:  
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**Report Date: March 22, 2018**

**FINAL REPORT**

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

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Report Prepared By: ILO Project Operations Group

Report Approved By: 

John Shultz

Approval Date: March 22, 2018

FINAL REPORT ACCEPTANCE BY OCWS:

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

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

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

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

Technical Report Documentation Page

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16. Abstract <p>This 55 / 28 km/h 90° Moving Deformable Barrier SINCAP Side Impact Test was conducted on the subject 2018 Volkswagen Tiguan, in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on December 14, 2017.</p> <p>The impact velocity of the Moving Deformable Barrier (MDB) was 61.77 km/h, and the ambient temperature at the struck (left) side of the target vehicle at the time of impact was 21.2° C. The target vehicle post-test maximum crush was 181 mm at Level 3. The test vehicle's performance was as follows:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="4" style="text-align: center;"><b>Driver ATD (ES-2re)</b></th> </tr> <tr> <th style="text-align: left;">Measurement Description</th> <th style="text-align: center;">Units</th> <th style="text-align: center;">IARV</th> <th style="text-align: center;">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC<sub>36</sub>)</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">1000</td> <td style="text-align: center;">49</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">44</td> <td style="text-align: center;">18.3</td> </tr> <tr> <td>Total Abdominal Force</td> <td style="text-align: center;">N</td> <td style="text-align: center;">2500</td> <td style="text-align: center;">365.1</td> </tr> <tr> <td>Pubic Symphysis Force</td> <td style="text-align: center;">N</td> <td style="text-align: center;">6000</td> <td style="text-align: center;">-1497.7</td> </tr> <tr> <td>Lower Spine Acceleration</td> <td style="text-align: center;">G</td> <td style="text-align: center;">82*</td> <td style="text-align: center;">24.5</td> </tr> </tbody> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="4" style="text-align: center;"><b>Passenger ATD (SID-IIs)</b></th> </tr> <tr> <th style="text-align: left;">Measurement Description</th> <th style="text-align: center;">Units</th> <th style="text-align: center;">IARV</th> <th style="text-align: center;">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC<sub>36</sub>)</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">1000</td> <td style="text-align: center;">156</td> </tr> <tr> <td>Lower Spine Resultant Acceleration</td> <td style="text-align: center;">g's</td> <td style="text-align: center;">82</td> <td style="text-align: center;">43.7</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td style="text-align: center;">N</td> <td style="text-align: center;">5525</td> <td style="text-align: center;">2269.7</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">38*</td> <td style="text-align: center;">11.3</td> </tr> <tr> <td>Maximum Abdominal Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">45*</td> <td style="text-align: center;">36.0</td> </tr> </tbody> </table> <p>* Proposed IARV</p> <p>The driver door opened during the test all other doors did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.</p>				<b>Driver ATD (ES-2re)</b>				Measurement Description	Units	IARV	Result	Head Injury Criteria (HIC <sub>36</sub> )	N/A	1000	49	Maximum Thoracic Rib Deflection	mm	44	18.3	Total Abdominal Force	N	2500	365.1	Pubic Symphysis Force	N	6000	-1497.7	Lower Spine Acceleration	G	82*	24.5	<b>Passenger ATD (SID-IIs)</b>				Measurement Description	Units	IARV	Result	Head Injury Criteria (HIC <sub>36</sub> )	N/A	1000	156	Lower Spine Resultant Acceleration	g's	82	43.7	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2269.7	Maximum Thoracic Rib Deflection	mm	38*	11.3	Maximum Abdominal Rib Deflection	mm	45*	36.0
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**SECTION 1**  
**TEST PURPOSE AND PROCEDURE**

**TEST PURPOSE AND PROCEDURE**

This moving deformable barrier side impact test was conducted as part of the MY 2018 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-14-D-00354. The purpose of this test is to generate comparative side impact performance in a 2018 Volkswagen Tiguan. 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 2018 Volkswagen Tiguan 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 61.77 km/h (38.38 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Transportation Research Center Inc. in East Liberty, Ohio, on December 14, 2017. Pre-test and post-test photographs of the test vehicle and the MDB and the dummies (ES-2-re and SID-IIs) are included in this report.

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

The dummies were instrumented in the following manner:

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

Primary and redundant head CG tri-axial accelerometers

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

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

Lower spine (T12) tri-axial accelerometers

Pubic symphysis y-axis load cell

**PASSENGER ATD (SID-IIs)**

Primary and redundant head CG triaxial accelerometers

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

Abdomen upper rib and lower rib y-axis displacement potentiometers

Lower spine (T12) tri-axial accelerometers

Acetabulum and iliac wing y-axis load cells

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

Dummy injury readings were recorded as follows:

Measurement Description	Driver ATD (ES-2-re)		
	Units	Threshold	Result
Head Injury Criteria (HIC <sub>36</sub> )	N/A	1000	49
Maximum Thoracic Rib Deflection	mm	44	18.3
Combined Abdominal Force	N	2500	365.1
Pubic Symphysis Force	N	6000	-1497.7
Lower Spine (T12) Resultant Acceleration	G	82*	24.5

\* Proposed IARV

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC <sub>36</sub> )	N/A	1000	156
Lower Spine (T12) Resultant Acceleration	G	82	43.7
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2269.7
Maximum Thoracic Rib Deflection	mm	38*	11.3
Maximum Abdominal Rib Deflection	mm	45*	36.0

\* Proposed IARV

Supplemental Restraint Information is given below:

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

### GENERAL COMMENTS

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

Driver Head X Resultant has a questionable spike at 42 ms

Left Lower A-Post Y has no valid data

Left Mid -B-Post Y has no valid data

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

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

Test Vehicle: 2018 Volkswagen Tiguan  
Test Program: SINCAP Side Impact

NHTSA No.: M20185805  
Test Date: 12/14/2017

**TEST VEHICLE INFORMATION AND OPTIONS**

NHTSA No.	M20185805
Model Year	2018
Make	Volkswagen
Model	Tiguan
Body Style	MPV
VIN	3VV1B7AX2JM018714
Body Color	Silk Blue Metallic
Odometer Reading (km/mi)	103 mi
Engine Displacement (L)	2.0
Type/No. Cylinders	Straight/4
Engine Placement	Front/Transverse
Transmission Type	Automatic
Transmission Speeds	8
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	Yes
Other Optional Feature	No
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Rear Pass. Curtain Airbag	Yes
Rear Pass. Head/Torso Airbag	No
Rear Pass. Torso Airbag	No
Rear Pass. Torso/Pelvis Airbag	No
Rear Passenger Pelvis Airbag	No
Driver Seat Belt Pretensioner	Yes
Rear Pass. Seat Belt Pretensioner	No
Driver Load Limiter	Yes
Rear Passenger Load Limiter	Yes
Other Safety Restraint	No

Does owner's manual provide instructions to turn off automatic door locks? Yes\*

**DATA FROM CERTIFICATION LABEL**

Manufactured By	VOLSKWAGEN DE MEXICO S.A. DE C.V. MEXICO
Date of Manufacture	07/17
Vehicle Type	MPV

GVWR (kg)	2380
GAWR Front (kg)	2537
GAWR Rear (kg)	1270

**VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION**

Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity (DSC)	2	3	2	7
Capacity Weight (VCW) (kg)				550
DSC x 68.04 (kg)				476.3
Cargo Weight (RCLW) (kg)				73.7

**VEHICLE SEAT TYPE**

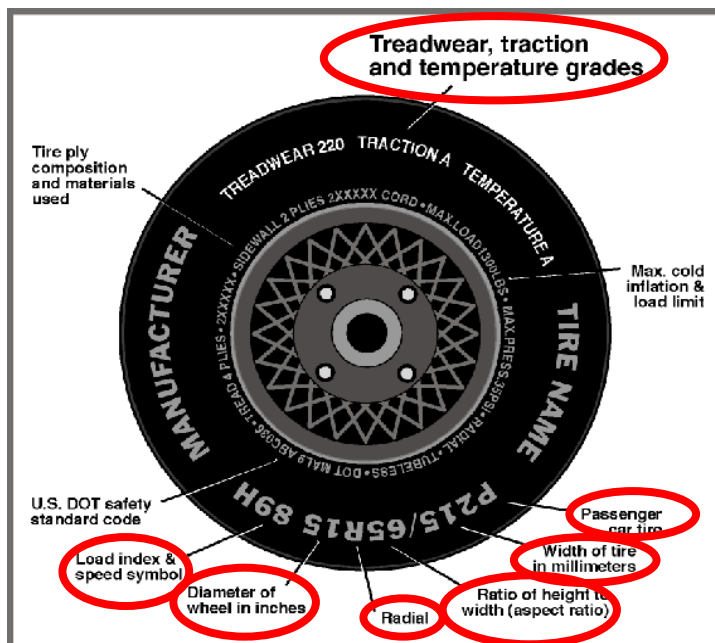
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						w/ Lever	w/ Knob
Front Seat	Yes	N/A	N/A		N/A	Yes	N/A
Rear or Second Row Seat	N/A	N/A	Yes	Yes	N/A	Yes	N/A
Third Row Seat	N/A	N/A	Yes	N/A	N/A	N/A	N/A

\* This functionality cannot be completed in the Infotainment system. It would have to be conducted at an authorized dealer.

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

Test Vehicle: 2018 Volkswagen Tiguan  
 Test Program: SINCAP Side Impact

NHTSA No.: M20185805  
 Test Date: 12/14/2017



**DATA FROM TIRE PLACARD**

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	260	260
Recommended Tire Size	215/65R17	215/65R17
Tire Size on Vehicle	215/65R17	215/65R17
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Ecopia H/L 422 Plus	Ecopia H/L 422 Plus
Treadwear	600	600
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2	2
Tire Plies Body	4	4
Load Index/Speed Symbol	99H	99H
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon
DOT Safety Code Left	V6E3 EC1 2717	V6E3 EC1 2717
DOT Safety Code Right	V6E3 EC1 2717	V6E3 EC1 2717

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

Test Vehicle: 2018 Volkswagen Tiguan  
 Test Program: SINCAP Side Impact

NHTSA No.: M20185805  
 Test Date: 12/14/2017

**TIRE PRESSURES**

	Units	LF	RF	LR	RR
As Delivered	kPa	260	260	260	260
Tire Placard	kPa	260	260	260	260
Owner's Manual	kPa	N/A	N/A	N/A	N/A
As Tested	kPa	260	260	260	260

**MDB TIRE SPECIFICATIONS**

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

**TEST VEHICLE AXLE WEIGHTS**

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	479.2	384.4		537.6	452.0		531.2	481.6	
Right	kg	473.4	369.0		481.8	425.0		465.0	427.0	
Ratio	%	55.8	44.2		53.8	46.2		52.3	47.7	
Totals	kg	952.6	753.4	1706.0	1019.4	877.0	1896.4	996.2	908.6	1904.8

**TARGET TEST WEIGHT CALCULATION**

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1706	(A)
Actual Weight of 1 P572V ATD (SID-ILs) Dummy Used	kg	125	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	73.7	(C)
Calculated Vehicle Target Weight (TVTWTW)	kg	1904.7	(A+B+C)

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

**TEST VEHICLE ATTITUDES AND CG**

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement
LF	mm	775	765	Yes
RF	mm	786	778	Yes
RR	mm	775	783	Yes
LR	mm	764	773	Yes
Vehicle CG (Aft of Front Axle)	mm	1233	1291	
Vehicle CG (Left(+)/Right(-) from Longitudinal Centerline)	mm	+10	+34	

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

Test height adjustable suspension setting, if applicable:

N/A

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

Component Description	Weight (kg)
Ballast: Steel plate mounted in cargo area	68.0
Removed: None	0.0

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

Test Vehicle: 2018 Volkswagen Tiguan  
 Test Program: SINCAP Side Impact

NHTSA No.: M20185805  
 Test Date: 12/14/2017

**SEAT POSITIONING**

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

**SCRL ANGLE RANGE**

Seat	SCRL(°)		
	Max.	Min.	Mid
Driver Seat	19.6	15.2	17.4
Front Passenger Seat	19.1	14.9	17.0
Front Center Seat*	N/A	N/A	N/A
Struck Side Rear Seat	N/A	N/A	10.5
Non-Struck Side Rear Seat	N/A	N/A	12.1
Rear Center Seat*	N/A	N/A	10.1

\* 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	17.4	227	Max	253	248	245
			Mid	225	227	225
			Min	214	210	205
Front Passenger Seat	17.0	213	Max	253	250	245
			Mid	224	213	218
			Min	210	210	204
Front Center Seat*	N/A	N/A	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Struck Side Rear Seat	10.5	Fixed	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Non-Struck Side Rear Seat	12.1	Fixed	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A
Rear Center Seat*	10.1	Fixed	Max	N/A	N/A	N/A
			Mid	N/A	N/A	N/A
			Min	N/A	N/A	N/A

\* If applicable.

**DATA SHEET NO. 2 (CONTINUED)**

**SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEM DATA**

Test Vehicle: 2018 Volkswagen Tiguan  
 Test Program: SINCAP Side Impact

NHTSA No.: M20185805  
 Test Date: 12/14/2017

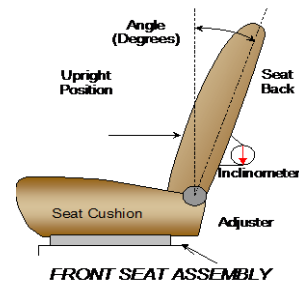
**SEAT FORE/AFT POSITION**

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents	mm	Detent
Driver Seat	254	39	127	19
Front Passenger Seat	254	39	127	19
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat	180	19	180	19
Non-Struck Side Rear Seat	180	19	180	19
Rear Center Seat*	180	19	180	19

\* If applicable

**SEAT BACK ANGLE ADJUSTMENT**

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



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents	Degrees	Detent
Driver Seat w/ Seated Dummy	65.5	36	17.5	9
Front Passenger Seat	63.8	36	17.5	9
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat w/ Seated Dummy	9.8	6	17.4	0
Non-Struck Side Rear Seat	10.1	6	17.4	0
Rear Center Seat*	9.8	6	17.4	0

\* If applicable

**SEAT BELT ANCHORAGE ADJUSTMENT**

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

	Total # of Positions	Placed in Position #
Driver Seat	4, Numbered from 0 to 3	0, Uppermost
Rear Seat	1, Fixed	1, 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, Numbered from 0 to 3	3, Uppermost
Rear Seat	2, Numbered from 0 to 1	0, Lowermost

**DATA SHEET NO. 2 (CONTINUED)**

**SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA**

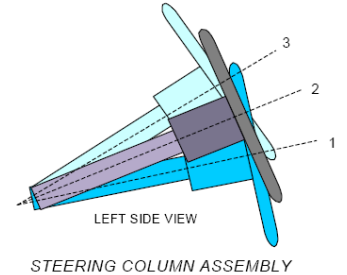
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 Test Date: 12/14/2017

**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.

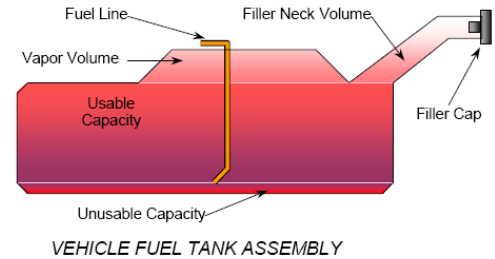
	<b>Degrees</b>	<b>Fore/Aft Position (mm)</b>
Lowermost, Position No. 1	23.6	0
Geometric Center, Position No. 2	26.3	27
Uppermost, Position No. 3	28.9	55
Telescoping Steering Wheel Travel		55
Test Position	26.3	27



**FUEL PUMP**

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

The fuel pump runs for 2 seconds after ignition is switched on. If the engine doesn't run, the fuel pump stops running. If there is a crash signal, it will also stop running.



**FUEL TANK CAPACITY**

	<b>Liters</b>
Usable Capacity of "Standard Tank" (see Form No. 1)	57.9
Usable Capacity of "Optional Tank" (see Form No. 1)	N/A
Usable Capacity of Standard Tank (see Owner's Manual)	57.9
Usable Capacity of Optional Tank (see Owner's Manual)	N/A
93% of Usable Capacity	53.8
Actual Amount of Solvent Used in Test	53.8
1/3 of Usable Capacity	17.9

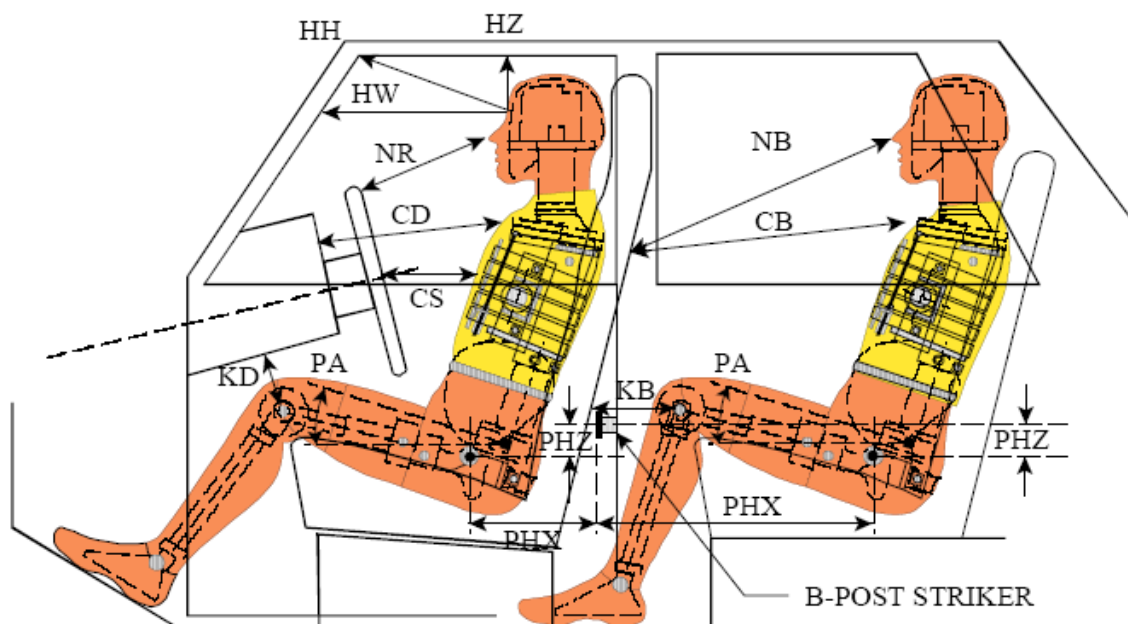
**Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in on Form No. 1?**       YES       NO

### DATA SHEET NO. 3

### DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2018 Volkswagen Tiguan  
 Test Program: SINCAP Side Impact

NHTSA No.: M20185805  
 Test Date: 12/14/2017



**LEFT SIDE VIEW**

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

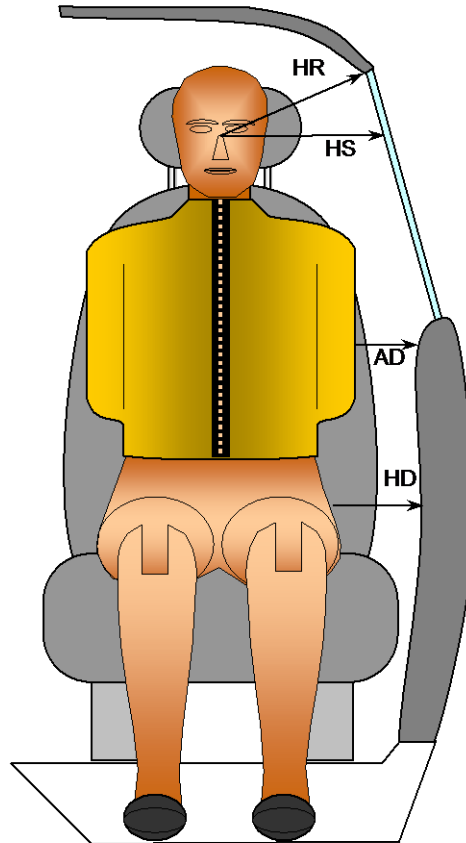
### DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	386			
HW		Header to Windshield	594			
HZ	HZ	Head to Roof Liner	181		290	
NR	NB	Nose to Rim/Seat Back	441		630	
CD	CB	Chest to Dash/Seat Back	551		615	
CS		Chest to Steering Wheel	372			
KD(L)/KDA(L) <sup>°</sup>	KB(L)/KBA(L) <sup>°</sup>	Left Knee to Dash/Seat Back	165	22.1	322	13.0
KD(R)/KDA(R) <sup>°</sup>	KB(R)/KBA(R) <sup>°</sup>	Right Knee to Dash/Seat Back	183	22.4	319	13.0
PAX <sup>°</sup>	PAX <sup>°</sup>	Pelvic Tilt Angle X		0.1		0.4
	PAY <sup>°</sup>	Pelvic Tilt Angle Y				20.6
PHX	PHX	Hip Point to Striker (X-Axis)	203		284	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	220		170	

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

Test Vehicle: 2018 Volkswagen Tiguan  
 Test Program: SINCAP Side Impact

NHTSA No.: M20185805  
 Test Date: 12/14/2017



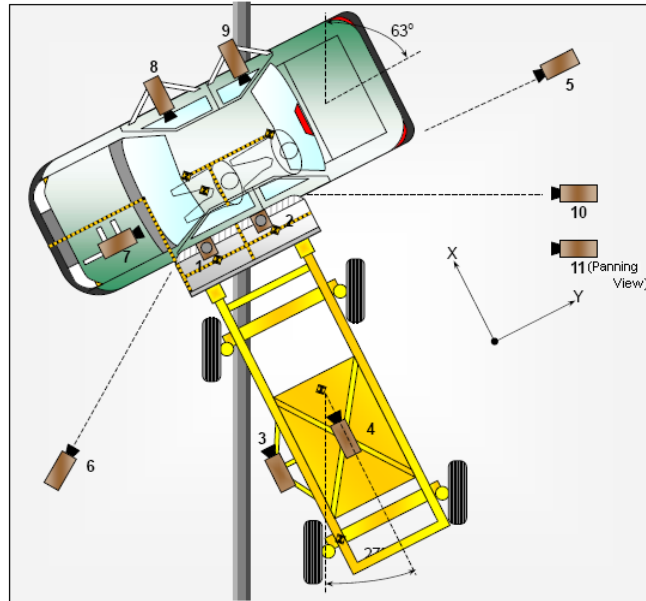
**FRONT VIEW OF DUMMY**

Code	Description	Units	Driver	Passenger
HR	Head to Side Header	mm	218	261
HS	Head to Side Window	mm	347	360
AD	Arm to Door	mm	115	170
HD	H-Point to Door	mm	160	161

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

Test Vehicle: 2018 Volkswagen Tiguan  
Test Program: SINCAP Side Impact

NHTSA No.: M20185805  
Test Date: 12/14/2017



**CAMERA LOCATIONS AND DATA**

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	0	-256	-4872	8.5	1000
2	Overhead Close-up	0	256	-4872	25	1000
3	Left Impact Point (MDB)	937	1666	-979	25	1000
4	Side Overall (MDB)	0	2442	1557	12.5	1000
5	Rear	0	8349	1461	20	1000
6	Left Front	2265	4051	-1306	20	1000
7	Driver Front (OB)				25	1000
8	Driver Side (OB)				12.5	1000
9	Passenger Side (OB)				12.5	1000
10	Real-time Left Rear				Zoom	30
11	Real-time Inrun				Zoom	30

Reference: Impact Point projected to Ground; +X = To Front of MDB +Y = To Right of MDB; +Z = Down

\*All measurements accurate to ± 6 mm.

If applicable, explain why camera(s) did not operate as intended: N/A

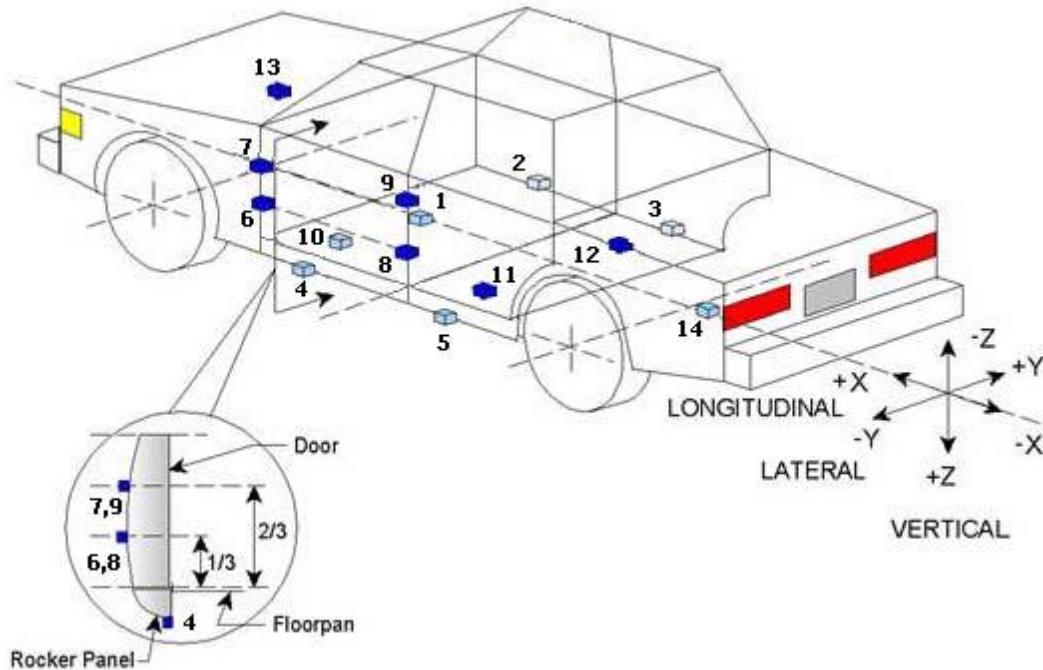
**INSTRUMENTATION**

Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	23
MBD Accelerometers	5
<b>TOTAL</b>	<b>60</b>

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

Test Vehicle: 2018 Volkswagen Tiguan  
Test Program: SINCAP Side Impact

NHTSA No.: M20185805  
Test Date: 12/14/2017



**TEST VEHICLE ACCELEROMETER LOCATIONS**

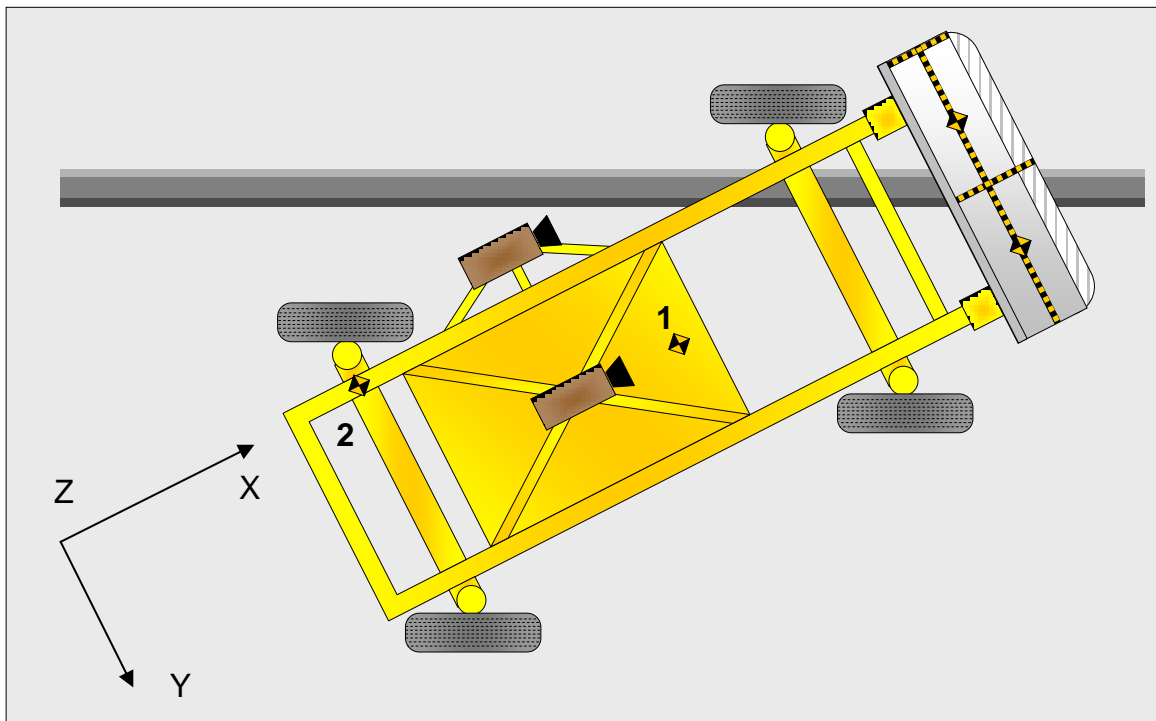
Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	3104	76	-400
2	Right Sill at Front Seat	2893	687	-333
3	Right Sill at Rear Seat	1944	685	-335
4	Left Sill at Front Door	2900	-685	-330
5	Left Sill at Rear Door	1940	-698	-326
6	A-Post Lower	3277	-837	-519
7	A-Post Middle	3290	-833	-935
8	B-Post Lower	2235	-841	-557
9	B-Post Middle	2213	-839	-935
10	Front Seat Track	2528	-605	-443
11	Rear Seat Structure	1835	-482	-458
12	Right Rear Occ. Compartment	1847	466	-429
13	Engine Block	4020	220	-805
14	Rear Above Axle	906	-15	-434

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: 2018 Volkswagen Tiguan  
 Test Program: SINCAP Side Impact

NHTSA No.: M20185805  
 Test Date: 12/14/2017



**MDB ACCELEROMETER LOCATIONS**

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

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

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

Test Vehicle: 2018 Volkswagen Tiguan  
Test Program: SINCAP Side Impact

NHTSA No.: M20185805  
Test Date: 12/14/2017

**TEST DUMMY INFORMATION AND CONTACT POINTS**

Dummy Body Part	Front Seat Dummy (ES2-re)	Rear Seat Dummy (SID-IIs)
Face	SCAB, Head liner	SCAB
Top of Head	Head liner	SCAB
Left Side of Head	SCAB, Head liner	SCAB
Back of Head	Head liner	SCAB, Head restraint
Left Shoulder	SCAB	Door panel
Upper Torso	SAB	Door panel
Lower Torso	SAB	Door panel
Left Hip	Door panel	Door panel
Left Knee	Door Panel	Door panel

**POST-TEST DOOR PERFORMANCE**

Description	Struck Side		Non-Struck Side		Trunk Lid
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	No	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge Systems Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	Yes	No	No	No	No
Latch Separated from Striker	Yes	No	No	No	No
Jammed Shut	No	Yes	No	No	No
If Door Opened at Striker, Record Width of Opening at Striker (mm)	447	N/A	N/A	N/A	N/A

**POST-TEST SEAT PERFORMANCE**

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

**POST-TEST STRUCTURAL OBSERVATIONS**

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Good
Sill Separation	None
Windshield Damage	None
Side Window Damage	None
Other Notable Effects	Driver door opened during impact

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

Test Vehicle: 2018 Volkswagen Tiguan  
Test Program: SINCAP Side Impact

NHTSA No.: M20185805  
Test Date: 12/14/2017

**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

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

**IMPACT POINT LOCATION DATA**

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2791
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		455
Actual Impact Point (Aft of Front Axle)	mm		454
Horizontal Offset ( + forward / - rearward)	mm	+/- 50 of Intended Impact point	+1
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact point	-1

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

Test Vehicle: 2018 Volkswagen Tiguan  
Test Program: SINCAP Side Impact

NHTSA No.: M20185805  
Test Date: 12/14/2017

**MDB SPECIFICATIONS**

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

**MDB WEIGHTS**

	Units	Front Axle	Rear Axle	Total
Left	kg	391.2	286.8	678.0
Right	kg	392.8	292.0	684.8
Ratio	%	57.5	42.5	100.0
Totals	kg	784.0	578.8	1362.8

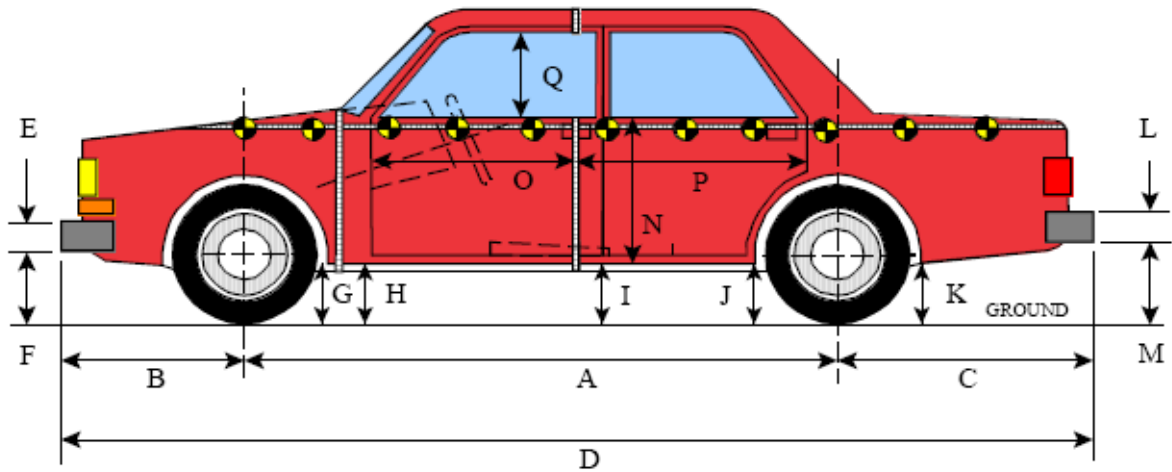
**SPEED AND IMPACT ANGLE DATA**

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.77
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.78
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	27

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

Test Vehicle: 2018 Volkswagen Tiguan  
 Test Program: SINCAP Side Impact

NHTSA No.: M20185805  
 Test Date: 12/14/2017



**LEFT SIDE VIEW**

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

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

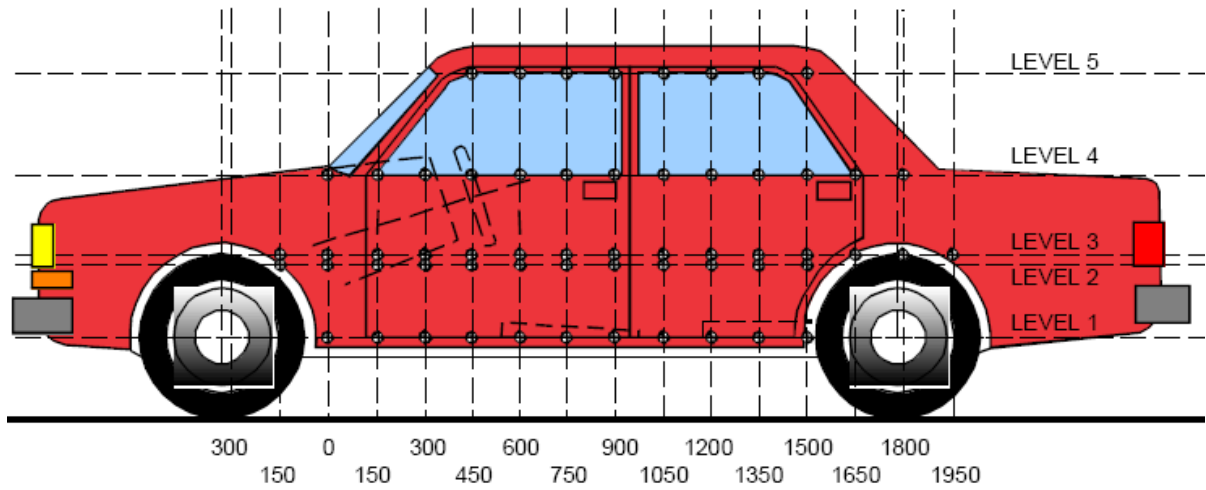
Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2791	2920	-129
B	Front Axle to Front Surface of Vehicle	890	870	20
C	Rear Axle to Rear Surface of Vehicle	1039	1039	0
D	Total Length at Centerline	4720	4740	-20
E	Front Bumper Thickness	120	120	0
F	Front Bumper Bottom to Ground	514	512	2
G	Sill Height at Front Wheel Well	243	274	-31
H	Sill Height at Front Door Leading Edge	278	333	-55
I	Sill Height at B-Pillar	281	340	-59
J1	Sill Height at Rear Wheel Well	286	404	-118
J2	Pinch Weld Height at Rear Wheel Well	241	292	-51
K	Sill Height Aft of Rear Wheel Well	242	295	-53
L	Rear Bumper Thickness	111	111	0
M	Rear Bumper Bottom to Ground	531	586	-55
N	Sill Height to Window Bottom Sill	887	825	62
O	Front Door Leading Edge to Impact CL	820	780	40
P	Rear Door Trailing Edge to Impact CL	1405	1388	17
Q	Front Window Opening	408	411	-3
R	Right Side Length	4525	4540	-15
S	Left Side Length	4525	4580	-55
T	Vehicle Width	1825	1820	5

**DATA SHEET NO. 11**

**TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2018 Volkswagen Tiguan  
 Test Program: SINCAP Side Impact

NHTSA No.: M20185805  
 Test Date: 12/14/2017



**LEFT SIDE VIEW**

**MAXIMUM EXTERIOR CRUSH MEASUREMENTS**

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance From Impact
1	Sill Top <sup>1</sup>	433	44	150
2	Driver Hip Point	675	179	1650
3	Mid-Door	702	181	1650
4	Window Sill	1040	33	1200
				1350
5	Window Top	1574	1	1500
				1650
				1800
				1950
				2100

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

<sup>1</sup> Sill top measurements 1200 thru 1800 fell off during the test leaving these points unmeasurable

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

Test Vehicle: 2018 Volkswagen Tiguan  
 Test Program: SINCAP Side Impact

NHTSA No.: M20185805  
 Test Date: 12/14/2017

**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
-300	0	0	0	790	0	0	0	0	798	0	0	0	0	-8	0
-150	0	917	919	820	0	0	912	914	820	0	0	5	5	0	0
0	904	915	916	842	0	905	918	920	842	0	-1	-3	-4	0	0
150	910	910	911	845	0	866	877	874	870	0	44	33	37	-25	0
300	914	912	913	852	0	877	832	828	896	0	37	80	85	-44	0
450	917	914	915	860	0	897	846	838	930	0	20	68	77	-70	0
600	920	915	916	866	0	916	860	854	960	0	4	55	62	-94	0
750	921	916	917	872	0	934	883	876	990	0	-13	33	41	-118	0
900	921	916	917	877	0	957	920	918	1018	0	-36	-4	-1	-141	0
1050	920	916	916	880	606	978	982	982	1043	606	-58	-66	-66	-163	0
1200	916	909	910	878	610	N/A <sup>1</sup>	805	805	845	611	N/A <sup>1</sup>	104	105	33	-1
1350	912	907	908	876	610	N/A <sup>1</sup>	781	776	843	610	N/A <sup>1</sup>	126	132	33	0
1500	906	904	904	869	606	N/A <sup>1</sup>	749	739	838	605	N/A <sup>1</sup>	155	165	31	1
1650	901	901	902	863	602	N/A <sup>1</sup>	722	721	834	601	N/A <sup>1</sup>	179	181	29	1
1800	896	901	901	857	596	N/A <sup>1</sup>	743	740	827	595	N/A <sup>1</sup>	158	161	30	1
1950	0	906	906	852	587	0	861	853	840	586	0	45	53	12	1
2100	0	0	0	846	575	0	0	0	859	574	0	0	0	-13	1
2250	0	0	0	846	558	0	0	0	835	558	0	0	0	11	0
2400	0	0	0	842	534	0	0	0	830	534	0	0	0	12	0

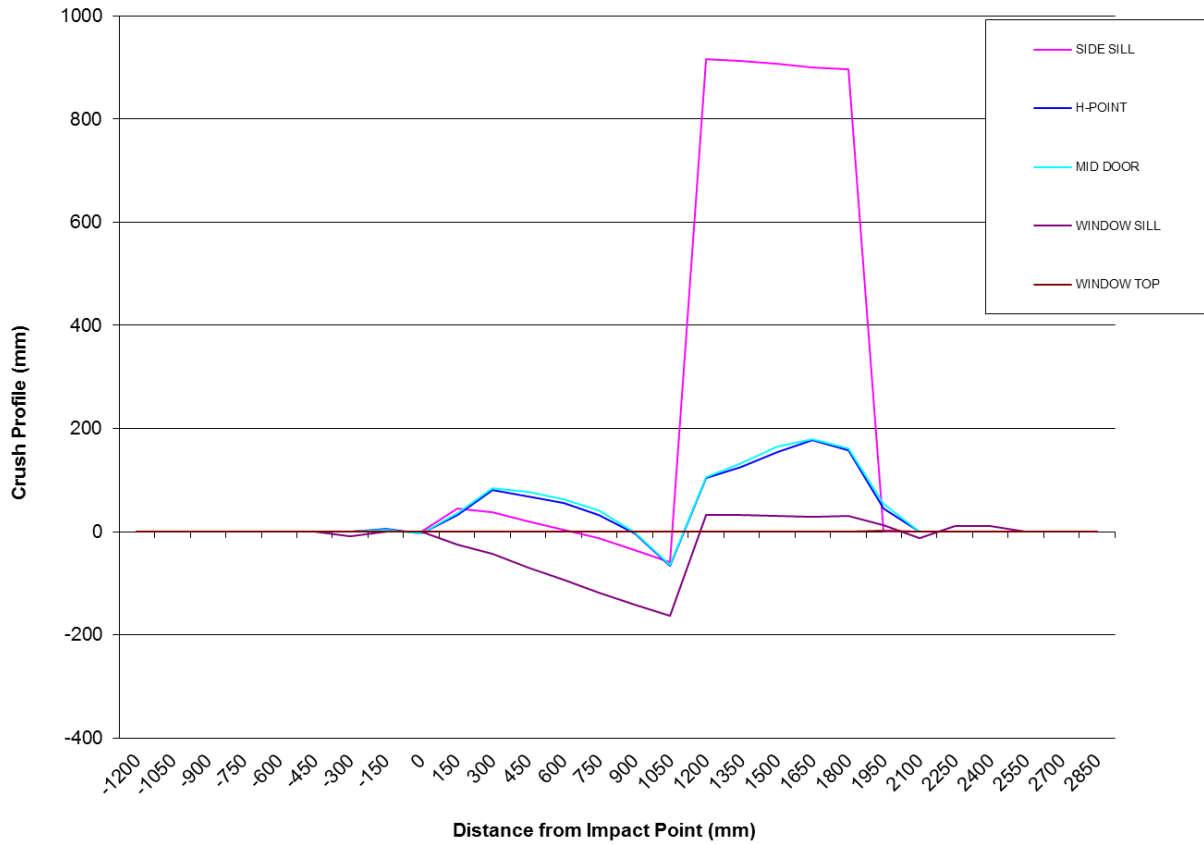
**NOTE:** Pre-test measurements are taken when the vehicle is in the "As Tested" weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point.

<sup>1</sup> Sill top measurements 1200 thru 1800 fell off during the test leaving these points unmeasurable

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

Test Vehicle: 2018 Volkswagen Tiguan  
Test Program: SINCAP Side Impact

NHTSA No.: M20185805  
Test Date: 12/14/2017

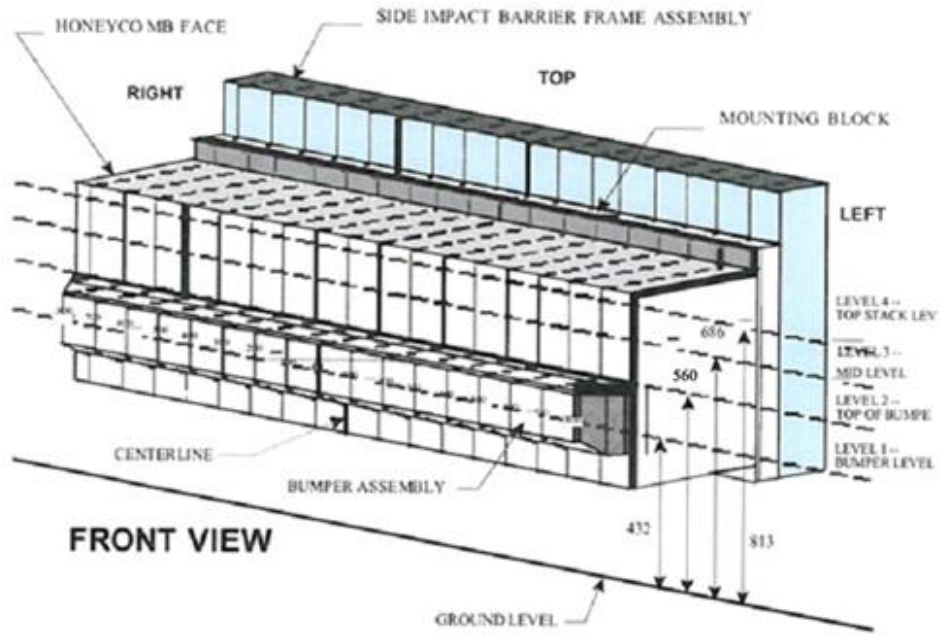


<sup>1</sup> Sill top measurements 1200 thru 1800 fell off during the test leaving these points unmeasurable

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

Test Vehicle: 2018 Volkswagen Tiguan  
 Test Program: SINCAP Side Impact

NHTSA No.: M20185805  
 Test Date: 12/14/2017



NOTE: Dimensions are shown in millimeters, mm

**MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE**

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Right	239
B	Top of Bumper	560	800	Right	152
C	Mid-Level	686	800	Left	132
D	Top of Stack	813	800	Right	128

**DEFORMABLE BARRIER STATIC CRUSH**

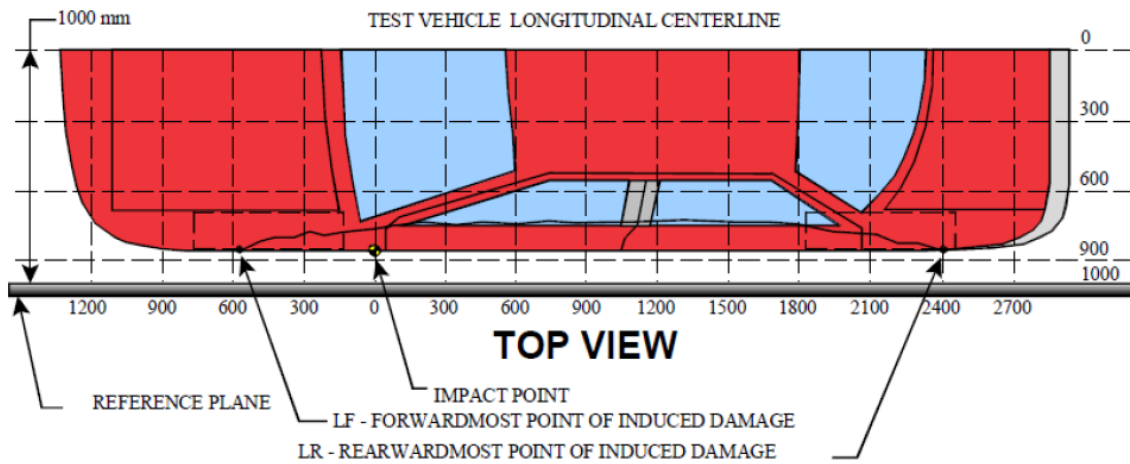
Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		0	100	200	300	400	500	600	700
1	239	232	228	224	220	216	212	208	204	198	189	184	179	175	171	172	182
2	152	150	148	143	139	N/A <sup>1</sup>	N/A <sup>1</sup>	N/A <sup>1</sup>	123	115	108	102	98	95	88	87	104
3	97	78	72	78	89	104	124	119	96	63	47	38	39	42	50	72	132
4	128	96	75	71	77	100	127	119	87	80	78	72	66	76	84	93	121

<sup>1</sup> Missing MDB points 40 thru 42 post-test

**DATA SHEET NO. 13**  
**VEHICLE AND MDB DAMAGE PROFILE DISTANCES**

Test Vehicle: 2018 Volkswagen Tiguan  
 Test Program: SINCAP Side Impact

NHTSA No.: M20185805  
 Test Date: 12/14/2017



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

**VEHICLE DAMAGE PROFILE DISTANCES**

DPD	Distance From Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	2400	4	830	842	12
2	1950	3	853	906	53
3	1350	3	776	908	132
4	900	3	918	917	-1
5	300	3	828	913	85
6 <sup>1</sup>	-150	3	914	919	0

**MDB DAMAGE PROFILE DISTANCES**

DPD	Distance From Center of MDB	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	800 mm Left of Center	1	291	473	182
2	500 mm Left of Center	1	310	485	175
3	200 mm Left of Center	1	295	486	189
4	200 mm Right of Center	1	274	486	212
5	500 mm Right of Center	1	262	486	224
6	800 mm Right of Center	1	237	476	239

<sup>1</sup> DPD 6 defined as zero crush since the crush does not extend to the end of the vehicle.

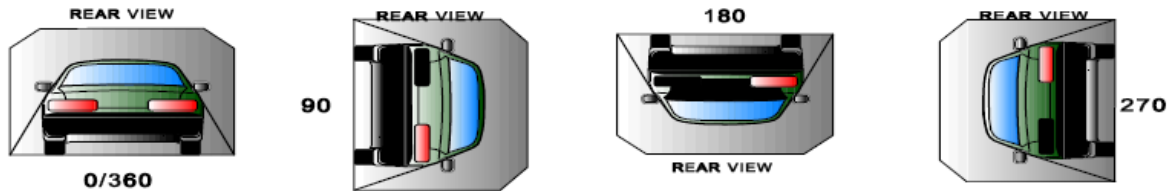
**DATA SHEET NO. 14  
FMVSS NO. 301 STATIC ROLLOVER RESULTS**

Test Vehicle: 2018 Volkswagen Tiguan NHTSA No.: M20185805  
 Test Program: SINCAP Side Impact Test Date: 12/14/2017

Test Time: 15:44 Temperature: 21.1°C

- A. From impact until vehicle motion ceases: 0 oz.  
 (Maximum allowable is 1 ounce)
- B. For the 5 minute period after motion ceases: 0 oz.  
 (Maximum allowable is 5 ounces)
- C. For the following 25 minutes: 0 oz.  
 (Maximum allowable is 1 ounce/minute)
- D. Spillage Details: None

**FMVSS 301 STATIC ROLLOVER DATA**



**ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS**

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

**FMVSS NO. 301 ROLLOVER SPILLAGE TABLE**

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

**ROLLOVER SOLVENT SPILLAGE LOCATION TABLE**

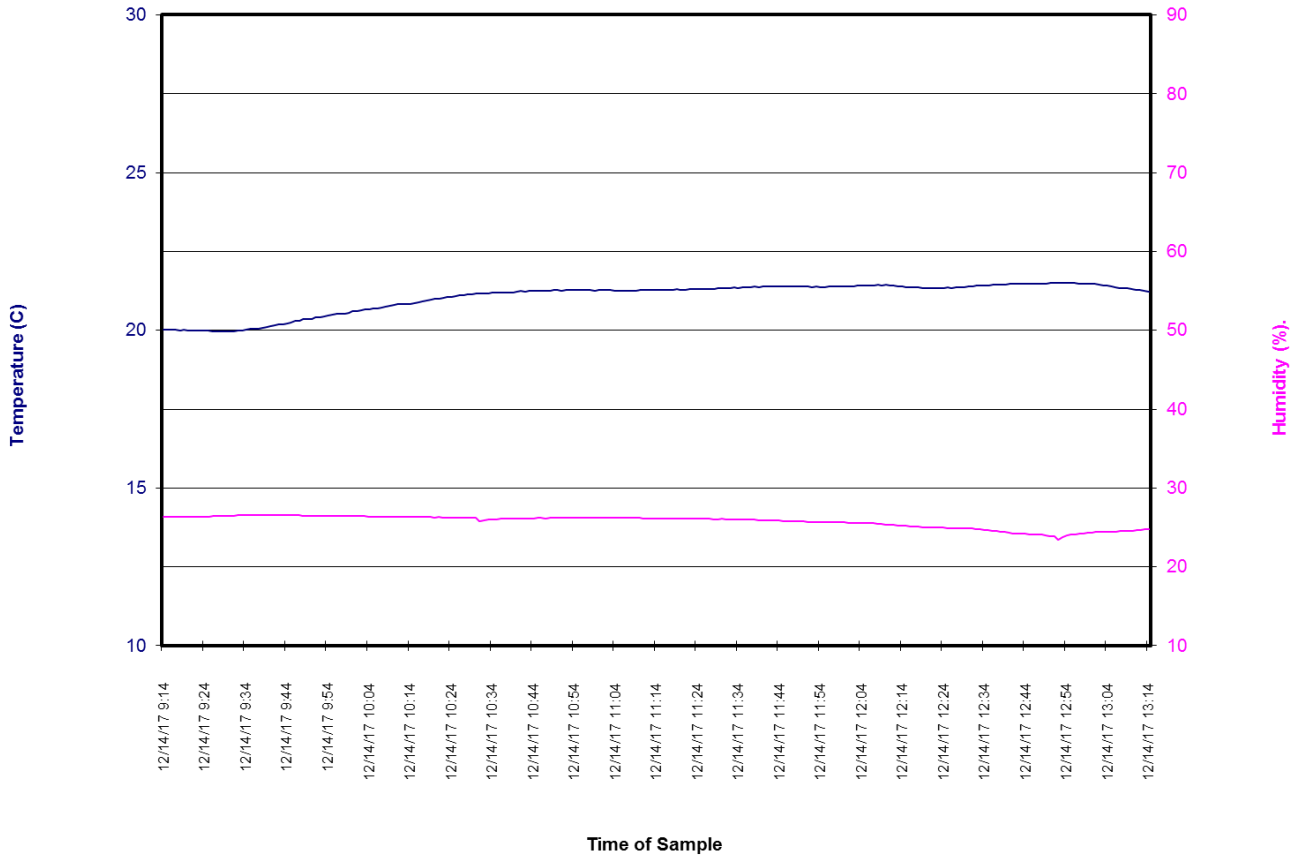
Test Phase	Spillage Location
0 to 90	None
90 to 180	None
180 to 270	None
270 to 360	None

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

Test Vehicle: 2018 Volkswagen Tiguan  
Test Program: SINCAP Side Impact

NHTSA No.: M20185805  
Test Date: 12/14/2017

M20185805 2018 Volkswagen Tiguan Left MDB Impact 171214: Test Time 13:14



**APPENDIX A  
PHOTOGRAPHS**

## TABLE OF PHOTOGRAPHS

<b>No.</b>	<b>Description</b>	<b>Page</b>
<b>001</b>	As-Delivered Right Front $\frac{3}{4}$ View of Test Vehicle	<b>A-6</b>
<b>002</b>	As-Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle	<b>A-6</b>
<b>003</b>	Pre-Test Frontal View of Test Vehicle	<b>A-7</b>
<b>004</b>	Post-Test Frontal View of Test Vehicle	<b>A-7</b>
<b>005</b>	Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle	<b>A-8</b>
<b>006</b>	Post-Test Left Front $\frac{3}{4}$ View of Test Vehicle	<b>A-8</b>
<b>007</b>	Pre-Test Left Side View of Test Vehicle	<b>A-9</b>
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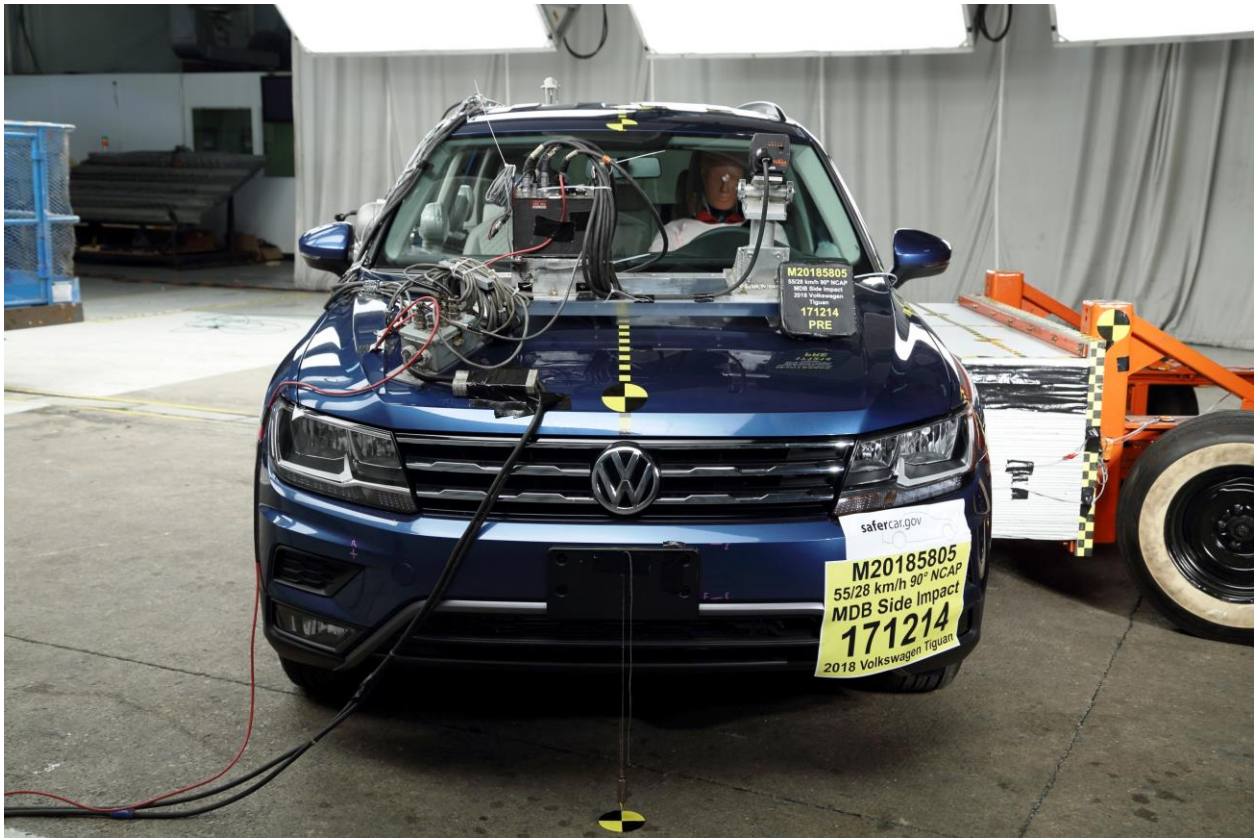
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**001** As-Delivered Right Front  $\frac{3}{4}$  View of Test Vehicle



**002** As-Delivered Left Rear  $\frac{3}{4}$  View of Test Vehicle



003 Pre-Test Frontal View of Test Vehicle



004 Post-Test Frontal View of Test Vehicle



**005** Pre-Test Left Front  $\frac{3}{4}$  View of Test Vehicle



**006** Post-Test Left Front  $\frac{3}{4}$  View of Test Vehicle



**007** Pre-Test Left Side View of Test Vehicle



**008** Post-Test Left Side View of Test Vehicle



009 Pre-Test Left Rear  $\frac{3}{4}$  View of Test Vehicle



010 Post-Test Left Rear  $\frac{3}{4}$  View of Test Vehicle



011 Pre-Test Rear View of Test Vehicle



012 Post-Test Rear View of Test Vehicle



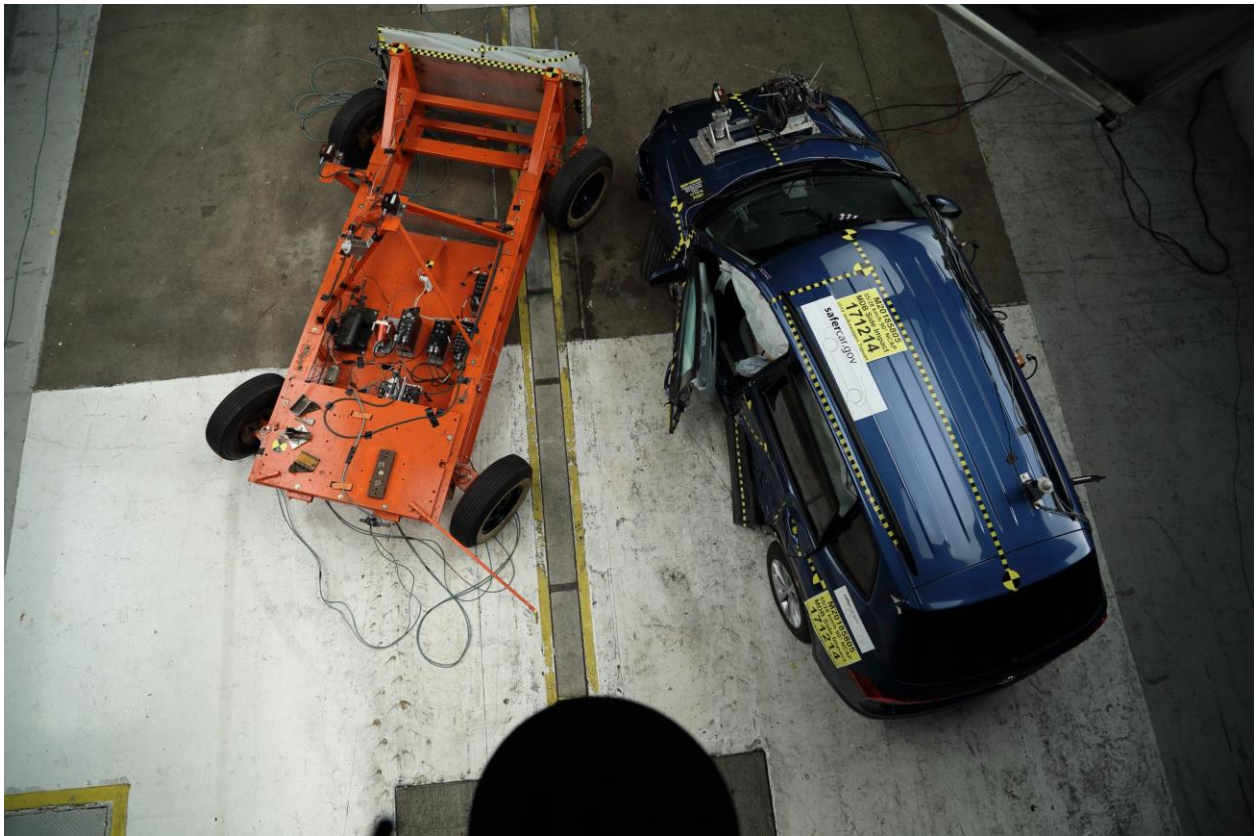
**013** Pre-Test Right Side View of Test Vehicle



**014** Post-Test Right Side View of Test Vehicle



015 Pre-Test Overhead View of Test Area



016 Post-Test Overhead View of Test Area



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



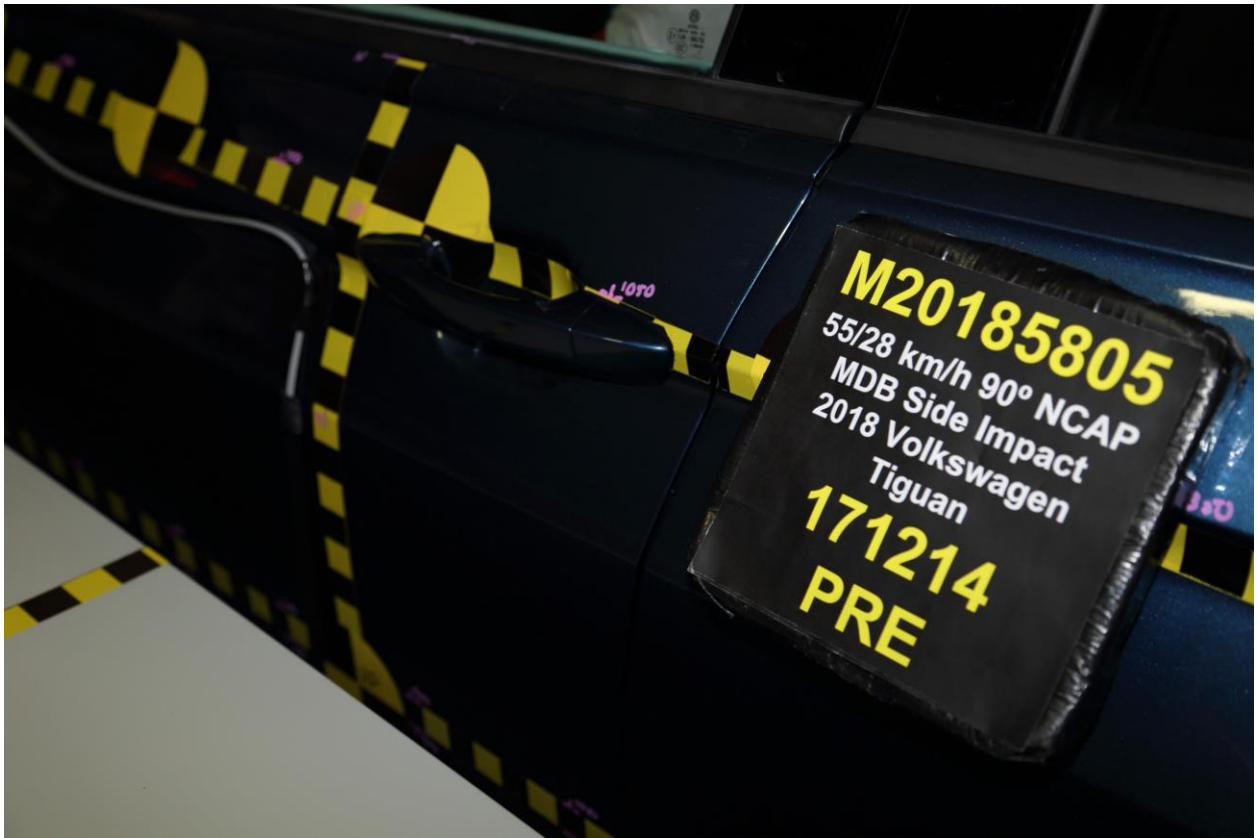
**018** Pre-Test Right Side View MDB Positioned Against Side of Test Vehicle



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



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



**021** Pre-Test Left Front Door Latch Close-Up



**022** Post-Test Left Front Door Latch Close-Up



023 Pre-Test Left Rear Door Latch Close-Up



024 Post-Test Left Rear Door Latch Close-Up



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



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



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

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



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



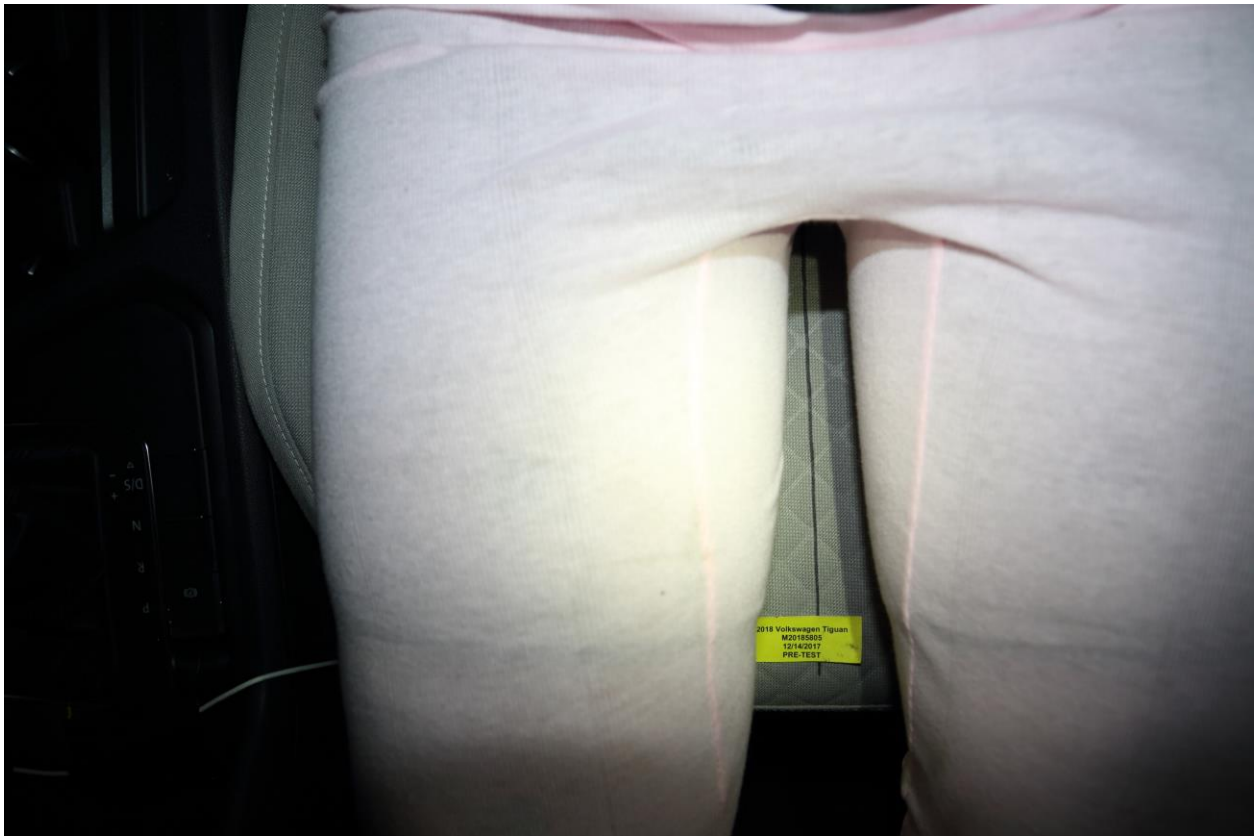
**030** Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning



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



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



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



**034** Pre-Test Placement of Driver's Dummy Feet



**035** Pre-Test View of Belt Anchorage for Driver Dummy



**036** Pre-Test Left Side View of Steering Wheel



**037** View of Disengaged Parking Brake



**038** Pre-Test View of Parking Brake



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



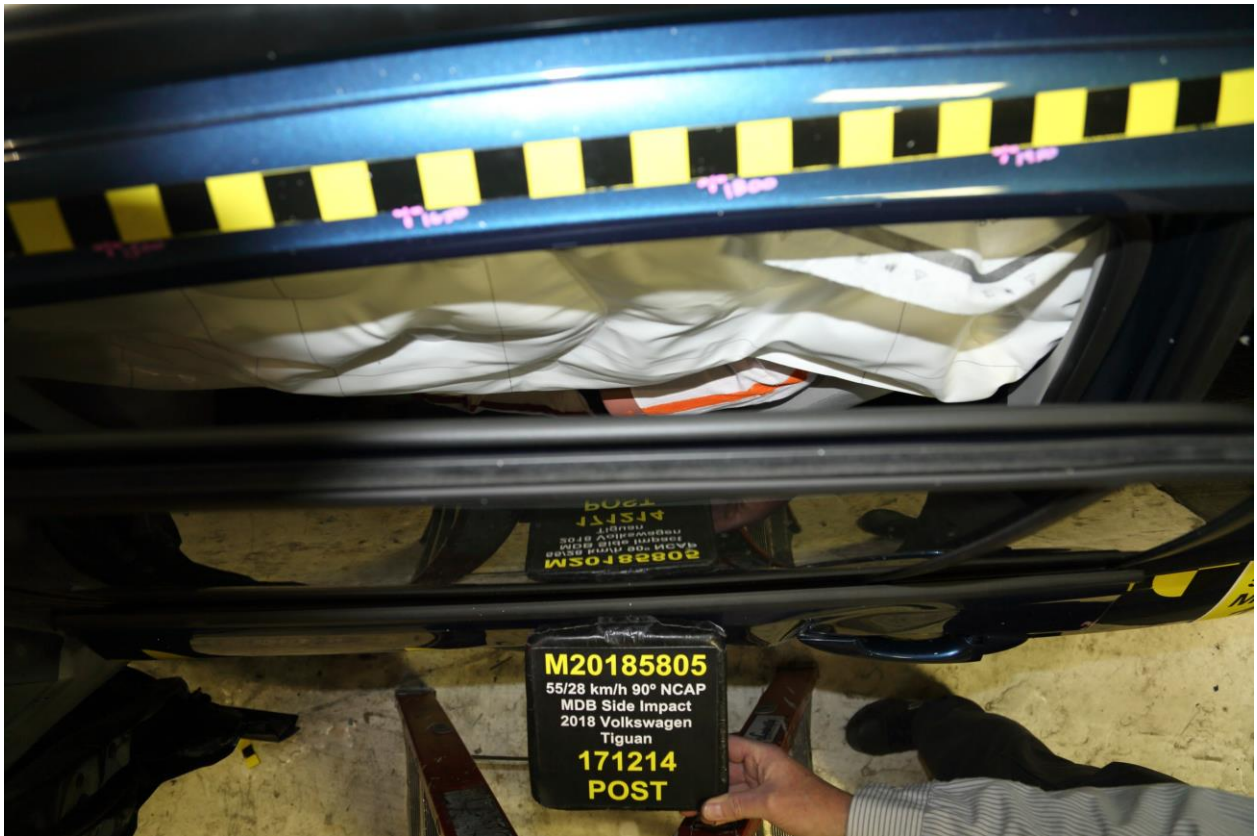
**040** Pre-Test Close-Up Left Side View of Driver Seat Back



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



042 Pre-Test Driver Dummy and Door Clearance View



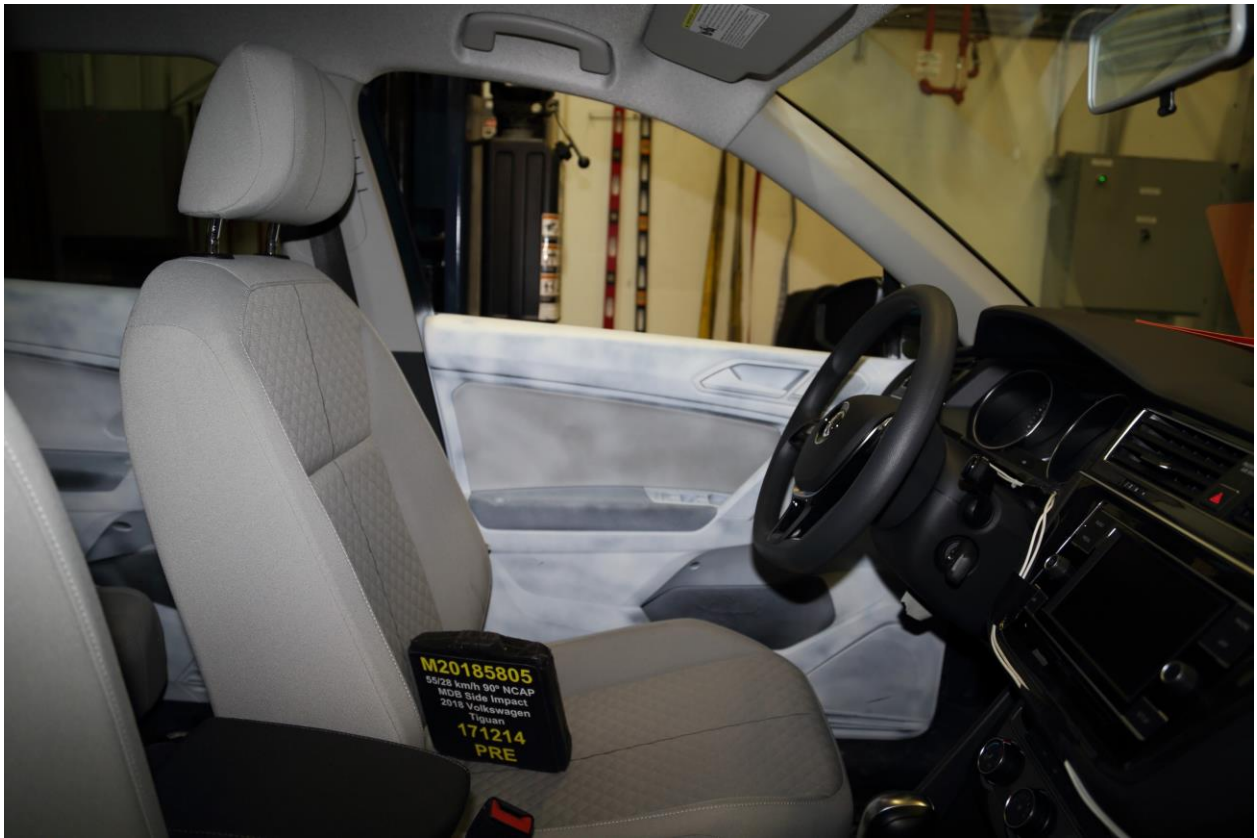
043 Post-Test Driver Dummy and Door Clearance View



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



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



**046** Pre-Test Driver Inner Door Panel View



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



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



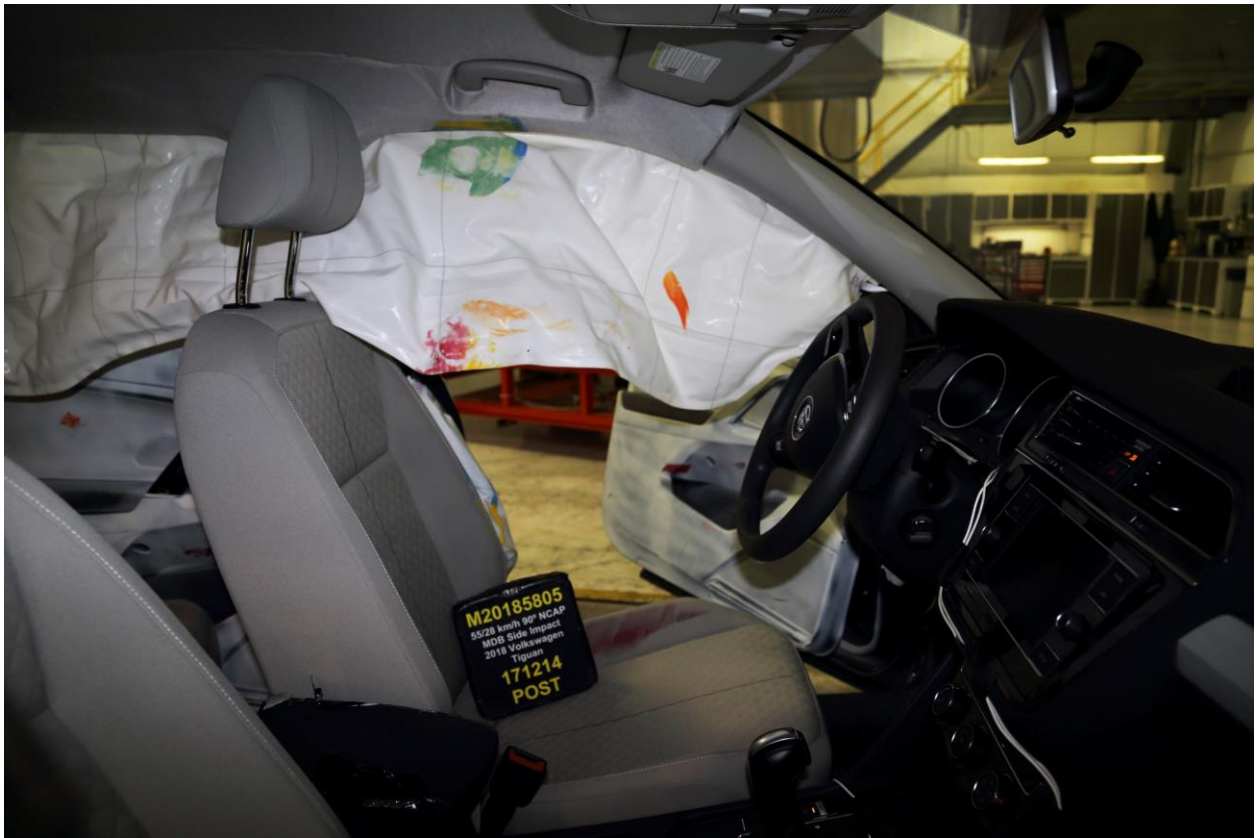
**049** Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View



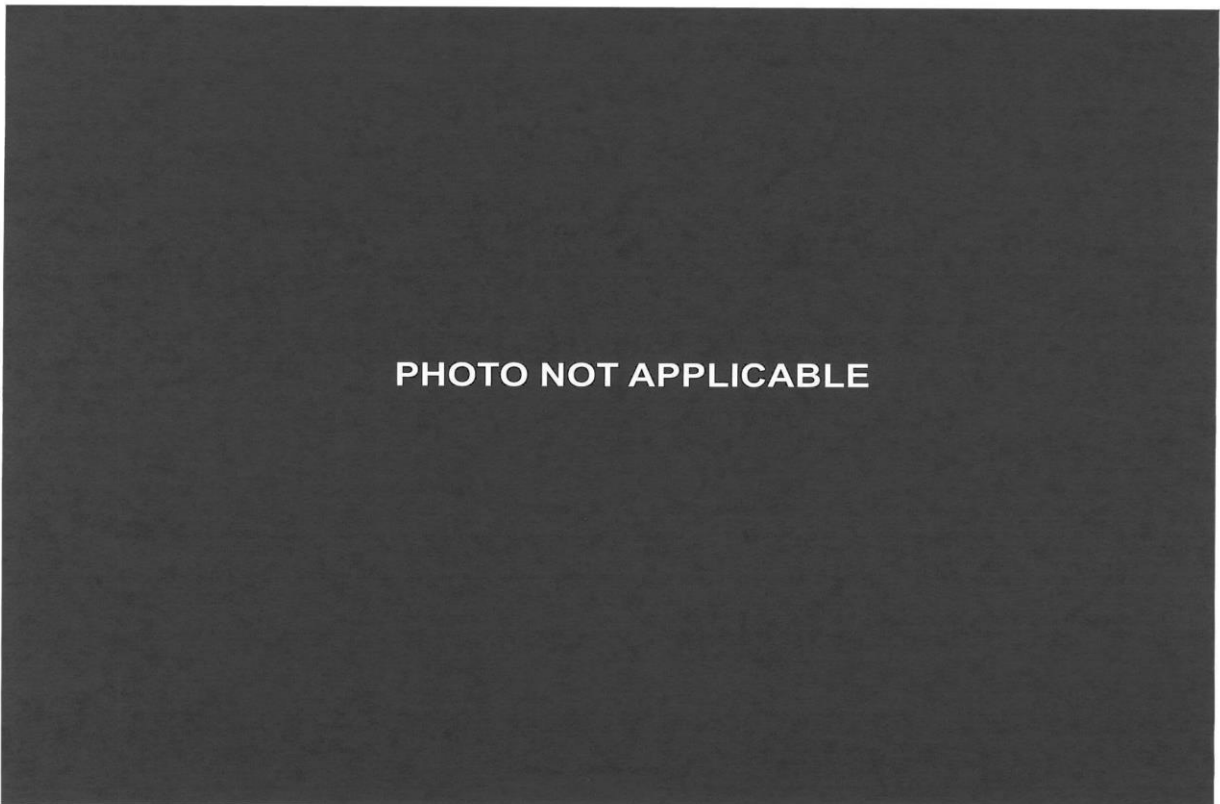
**050** Post-Test Driver Dummy Close-Up Torso Contact with Vehicle Interior View



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



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



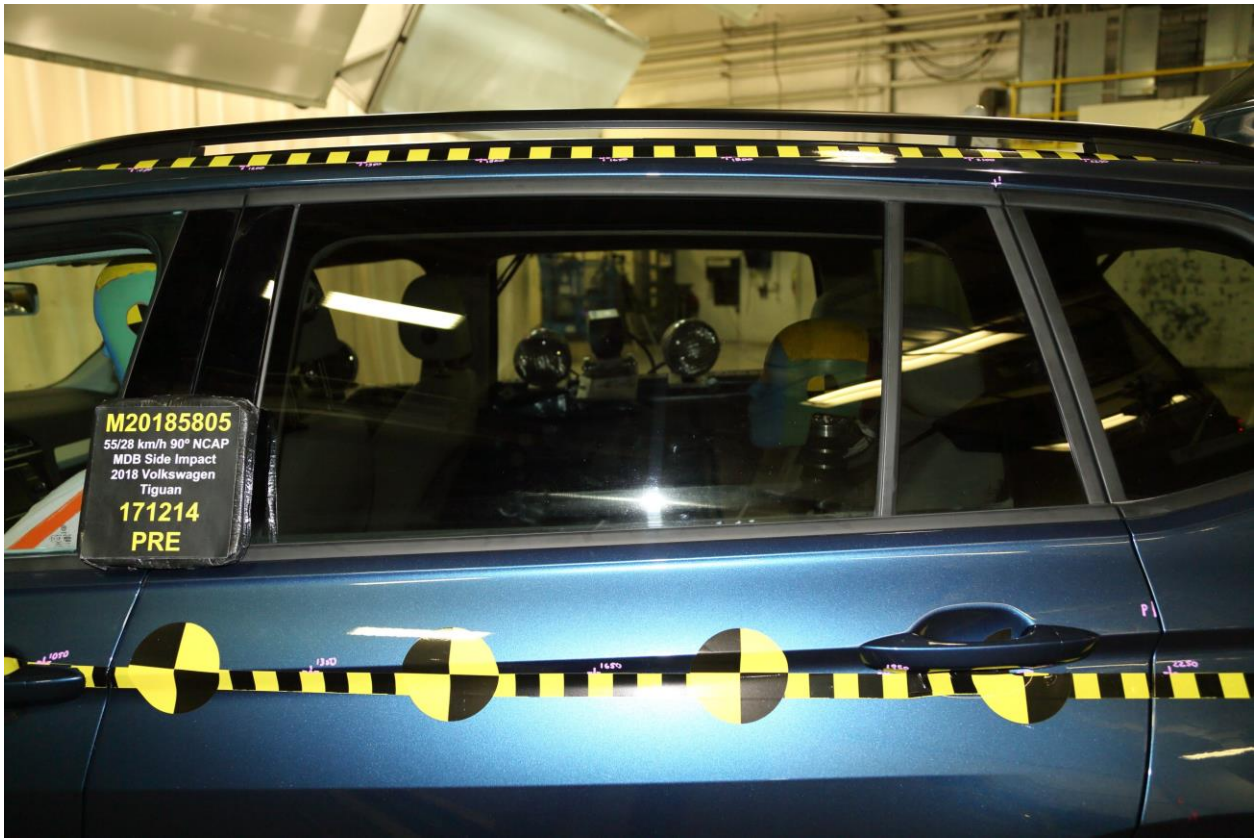
**053** Post-Test Driver Dummy Close-Up Pelvis Contact with Side Airbag View



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



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



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



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



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



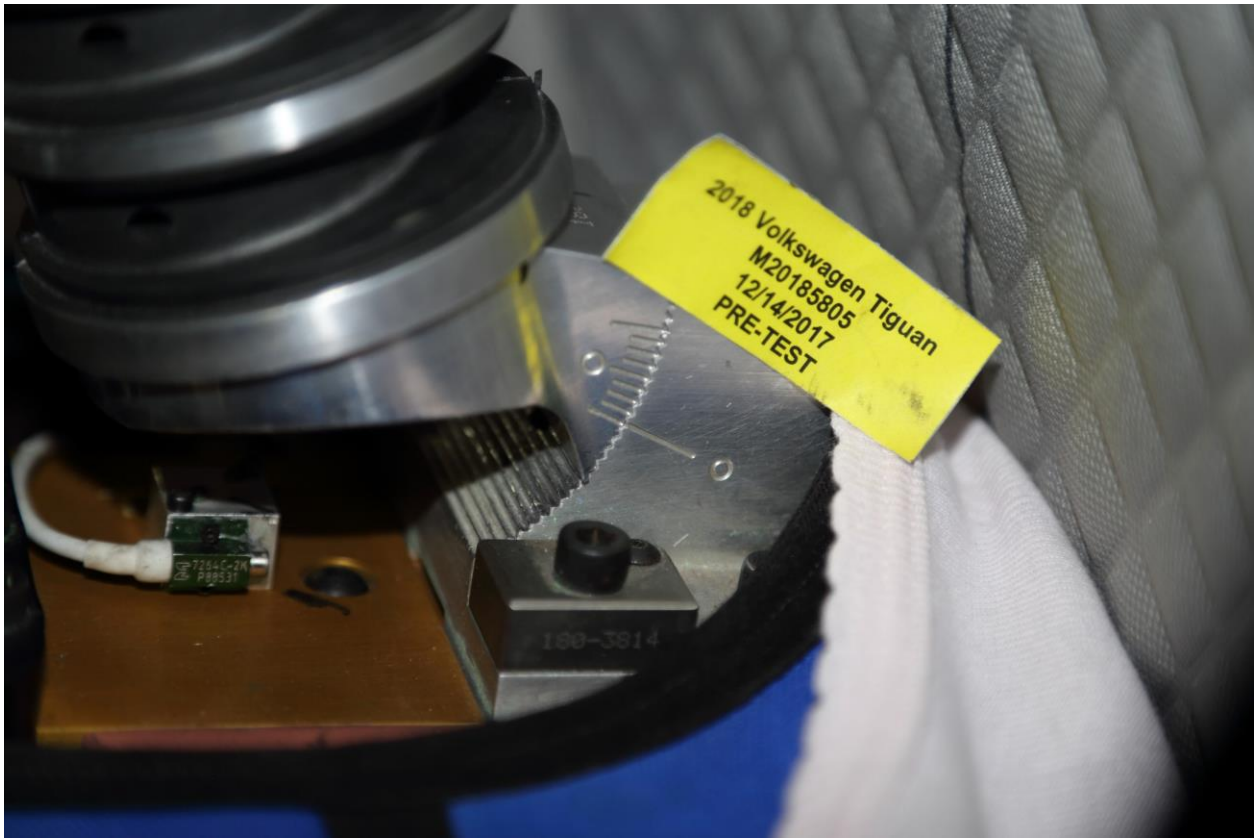
**059** Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint



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



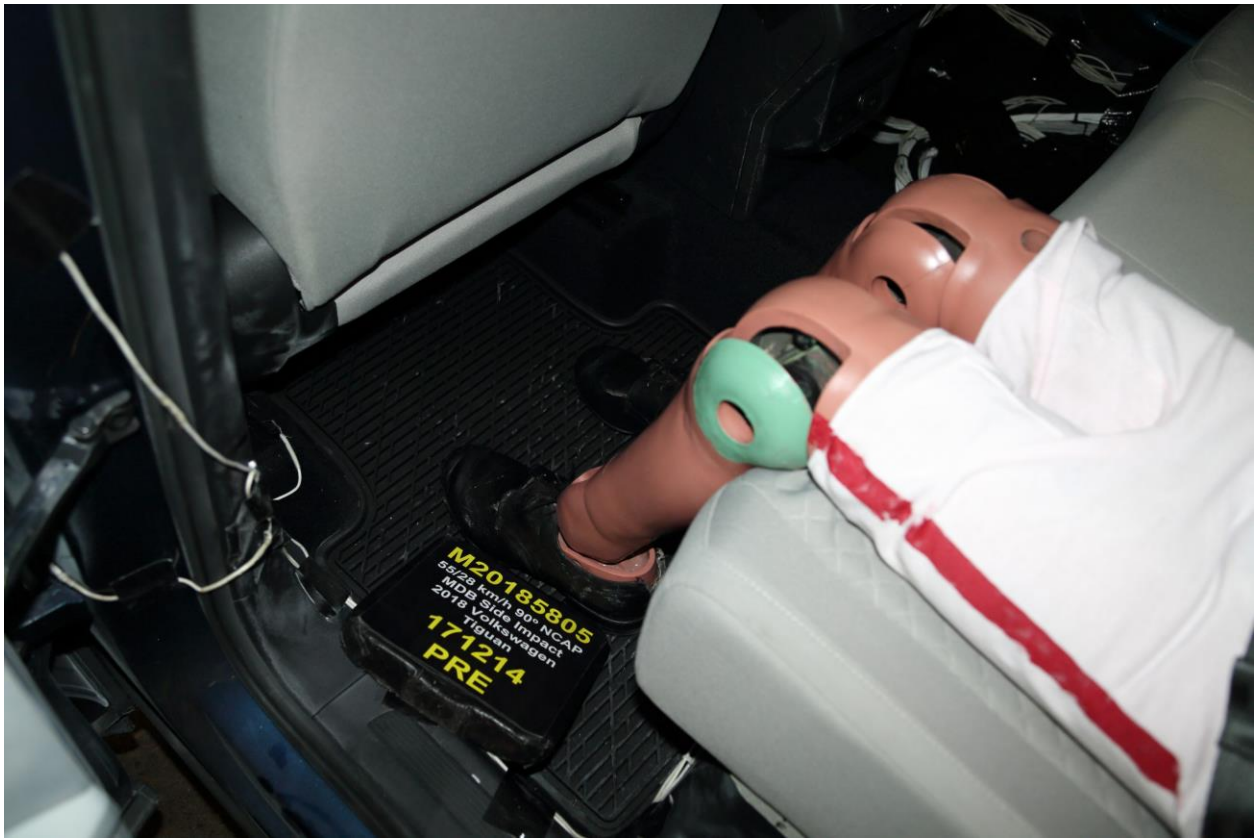
**061** Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan



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



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



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



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



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



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

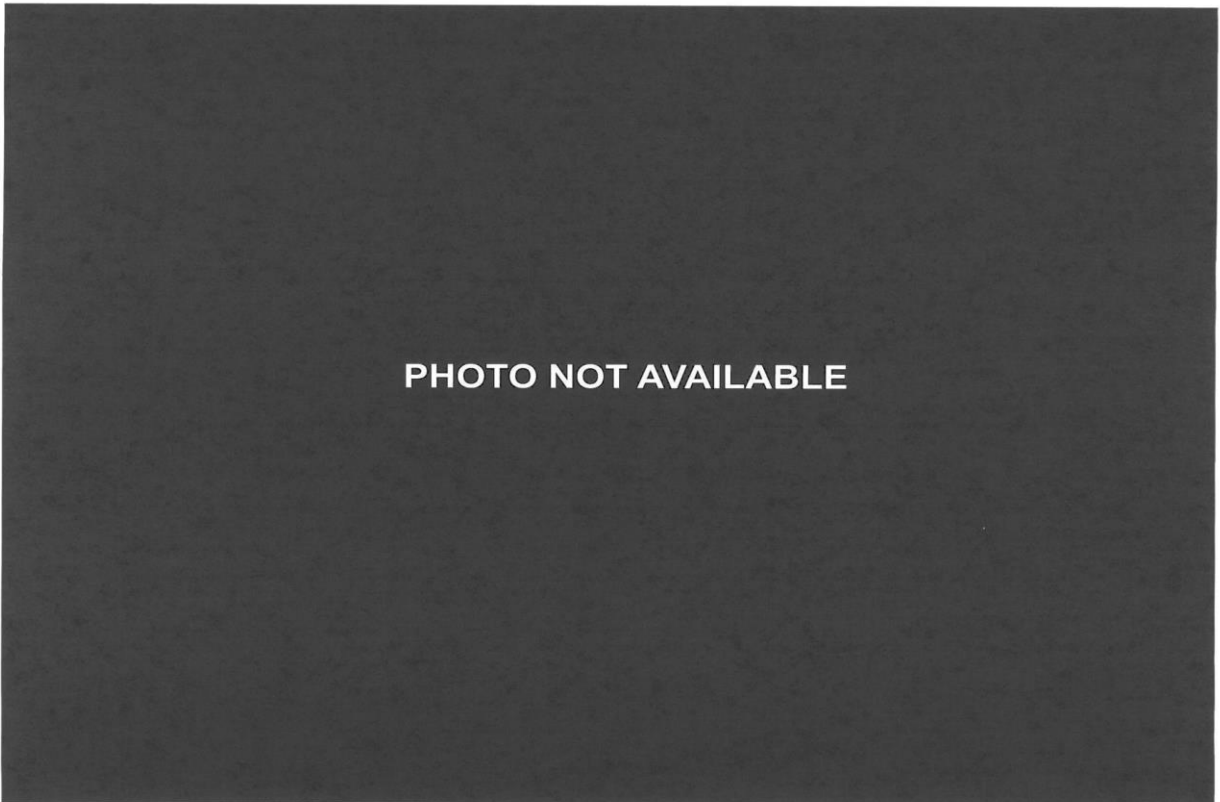
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**068** Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint

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**069** Pre-Test Rear Passenger Dummy and Door Clearance View



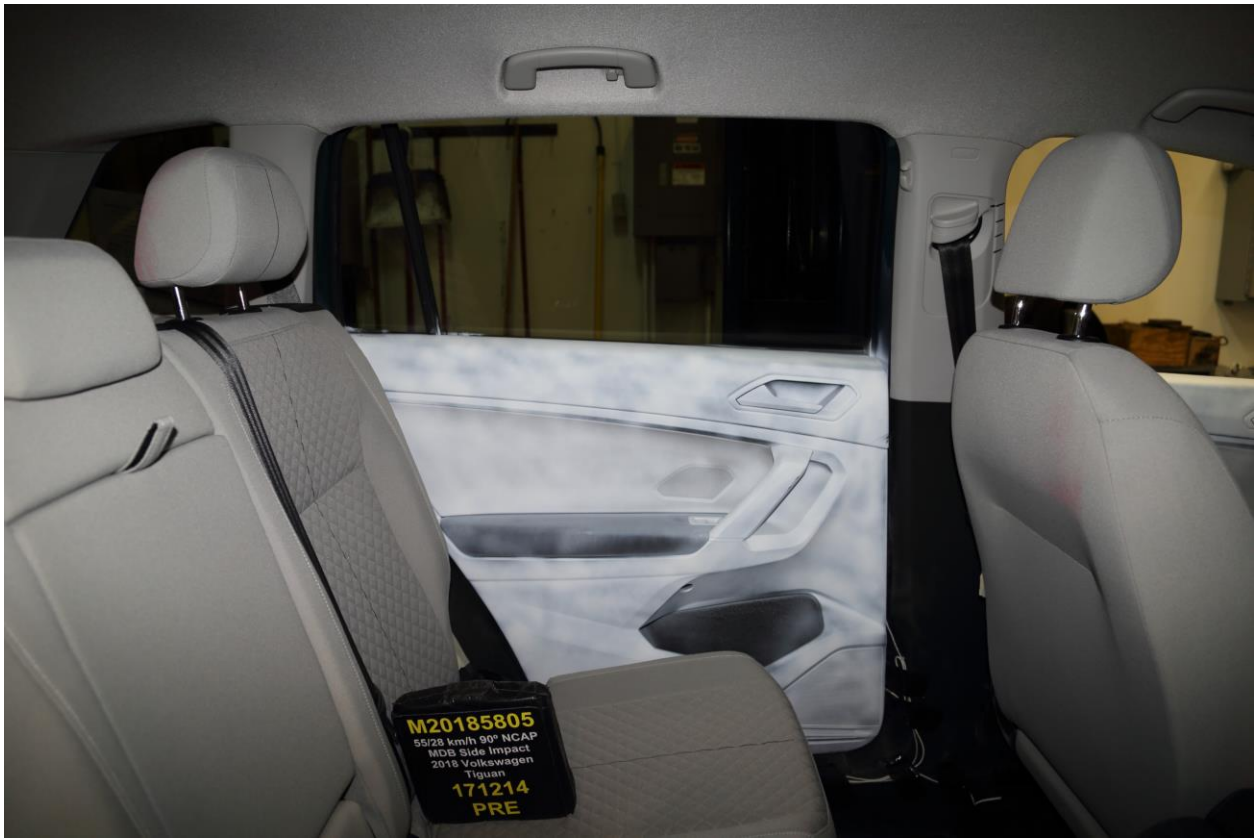
**070** Post-Test Rear Passenger Dummy and Door Clearance View



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



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



**073** Pre-Test Rear Passenger Inner Door Panel View



**074** Post-Test Rear Passenger Inner Door Panel View



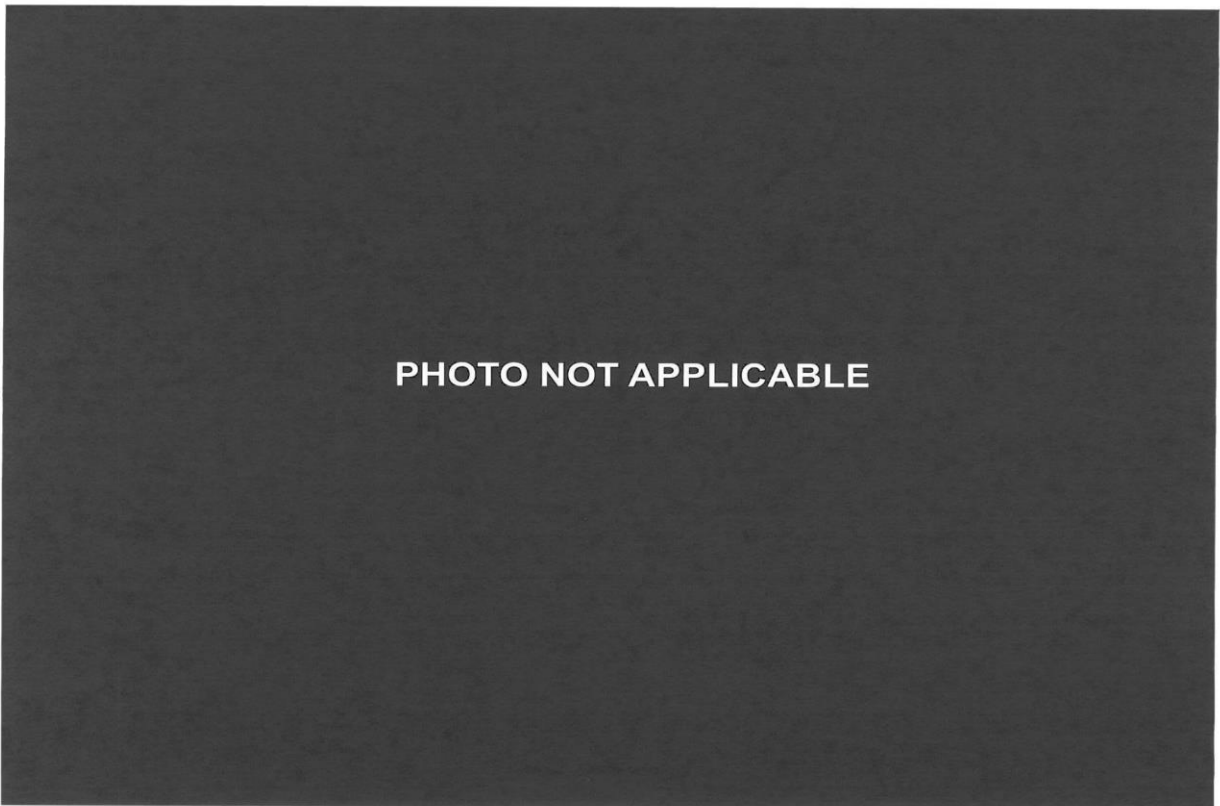
**075** Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle View



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



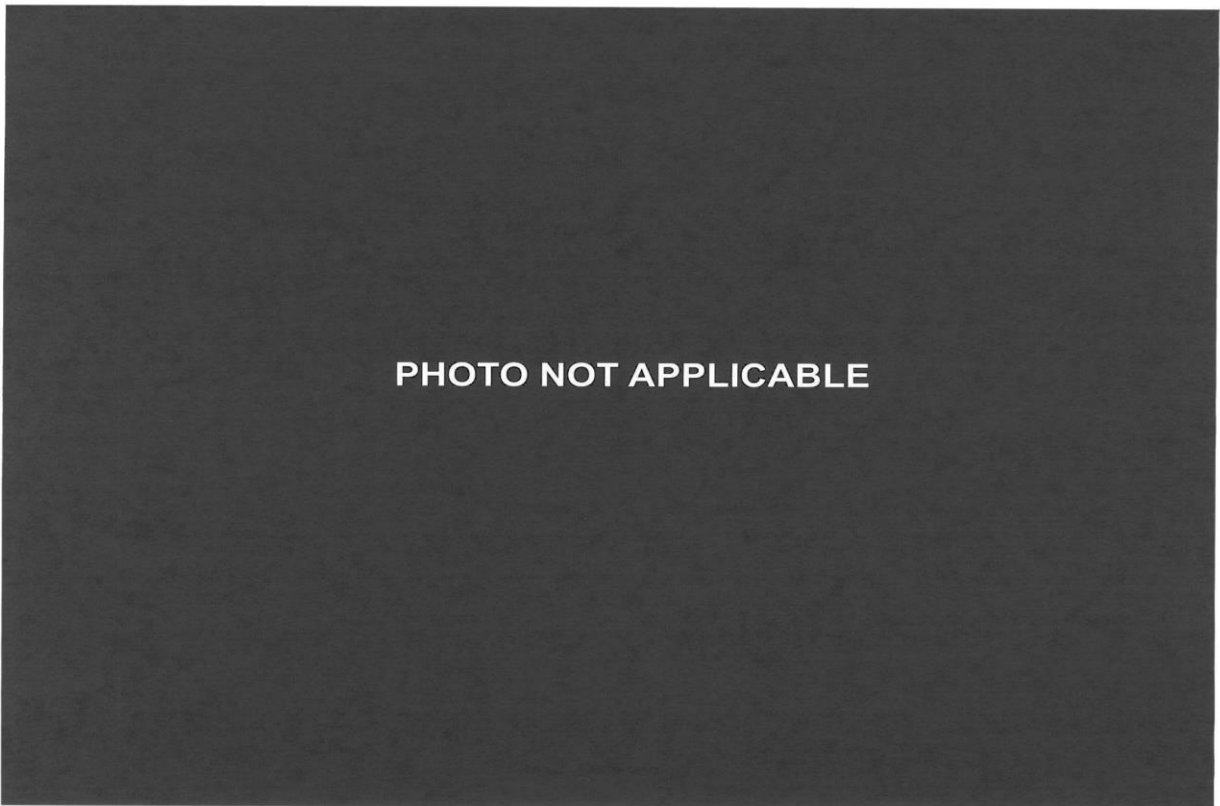
**077** Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View



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



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



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



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

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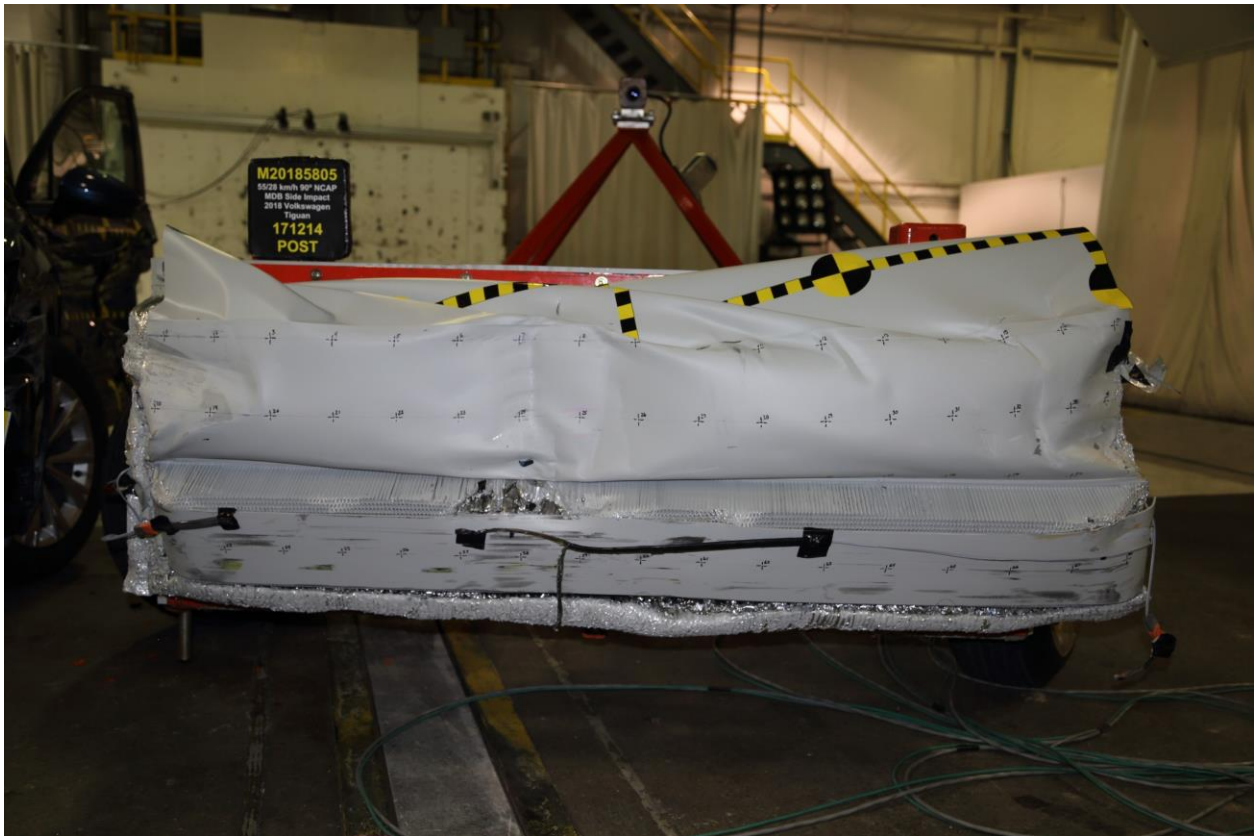
082 Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



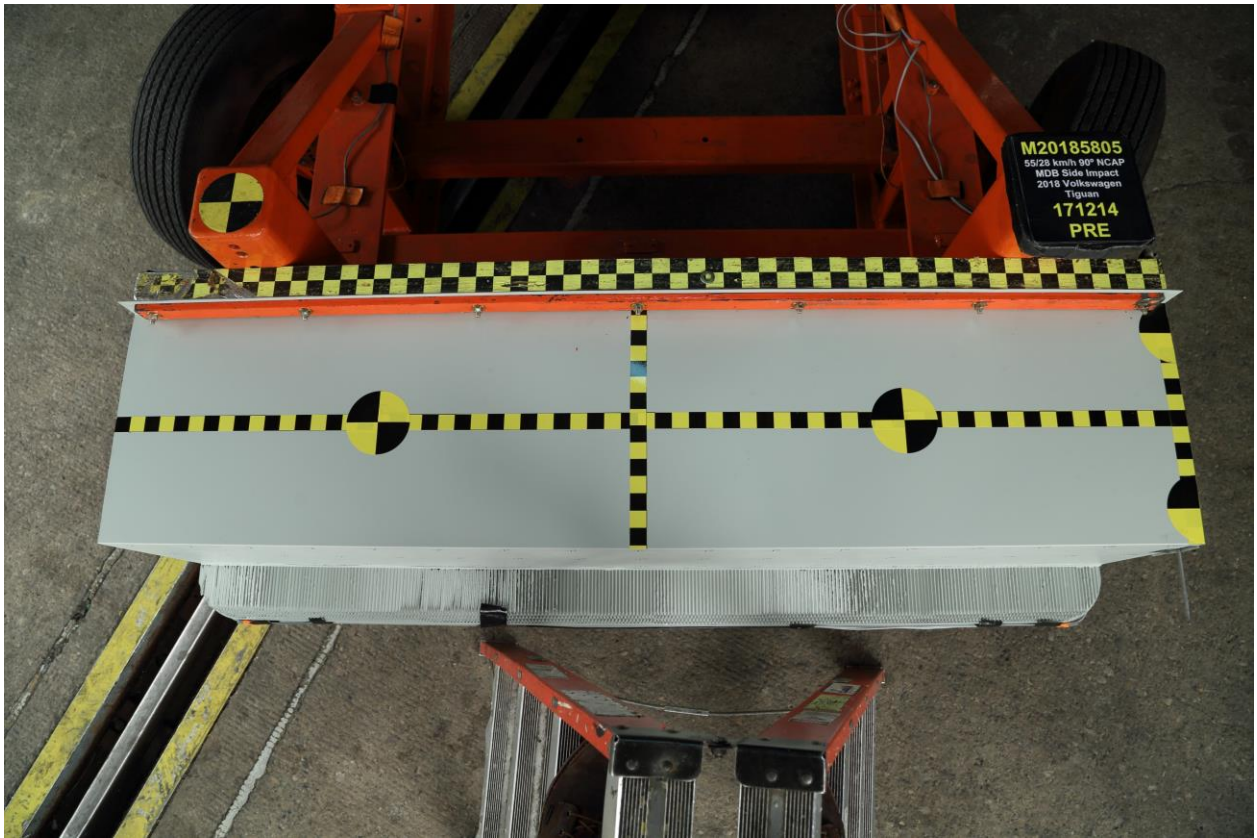
083 Post-Test View of Fuel Filler Cap or Fuel Filler Neck



**084** Pre-Test Front View of MDB Impactor Face



**085** Post-Test Front View of MDB Impactor Face



**086** Pre-Test Top View of MDB Impactor Face



**087** Post-Test Top View of MDB Impactor Face



**088** Pre-Test Left Side View of MDB Impactor Face



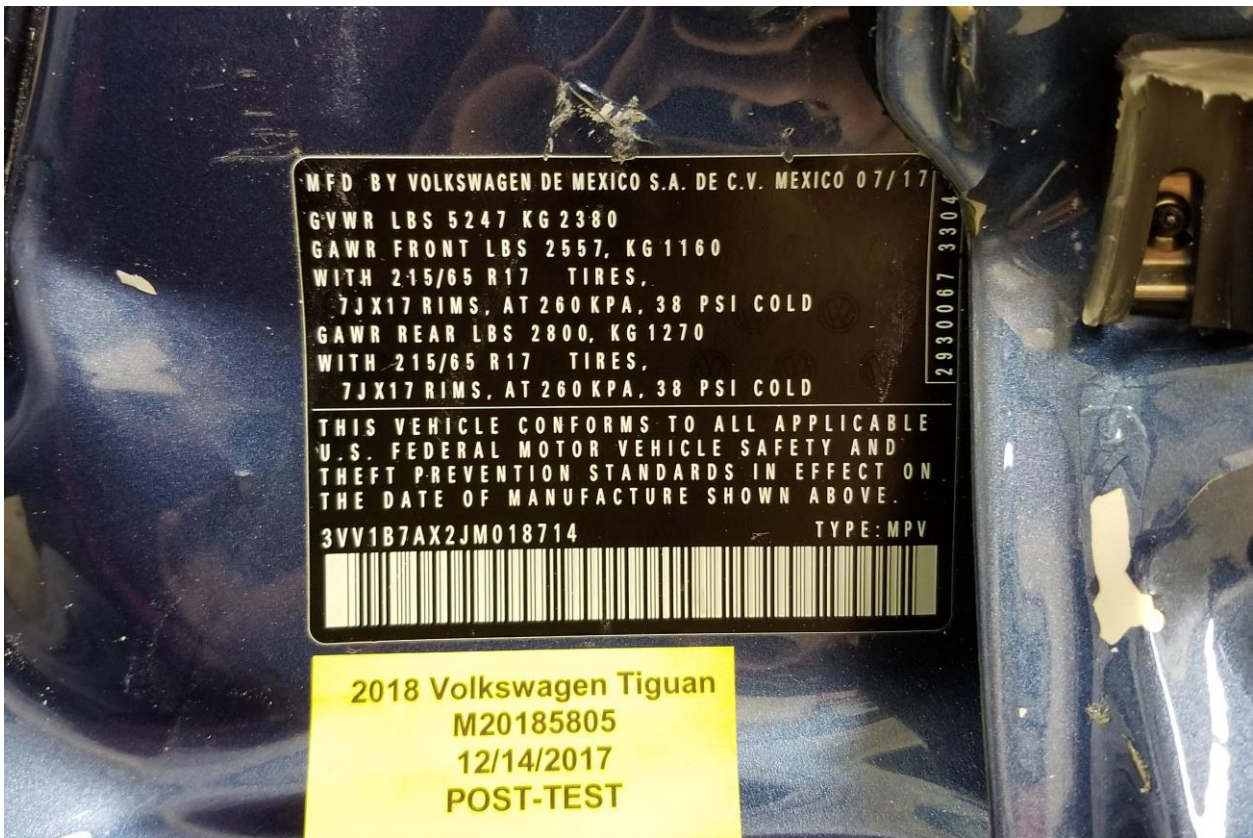
**089** Post-Test Left Side View of MDB Impactor Face



**090** Pre-Test Right Side View of MDB Impactor Face



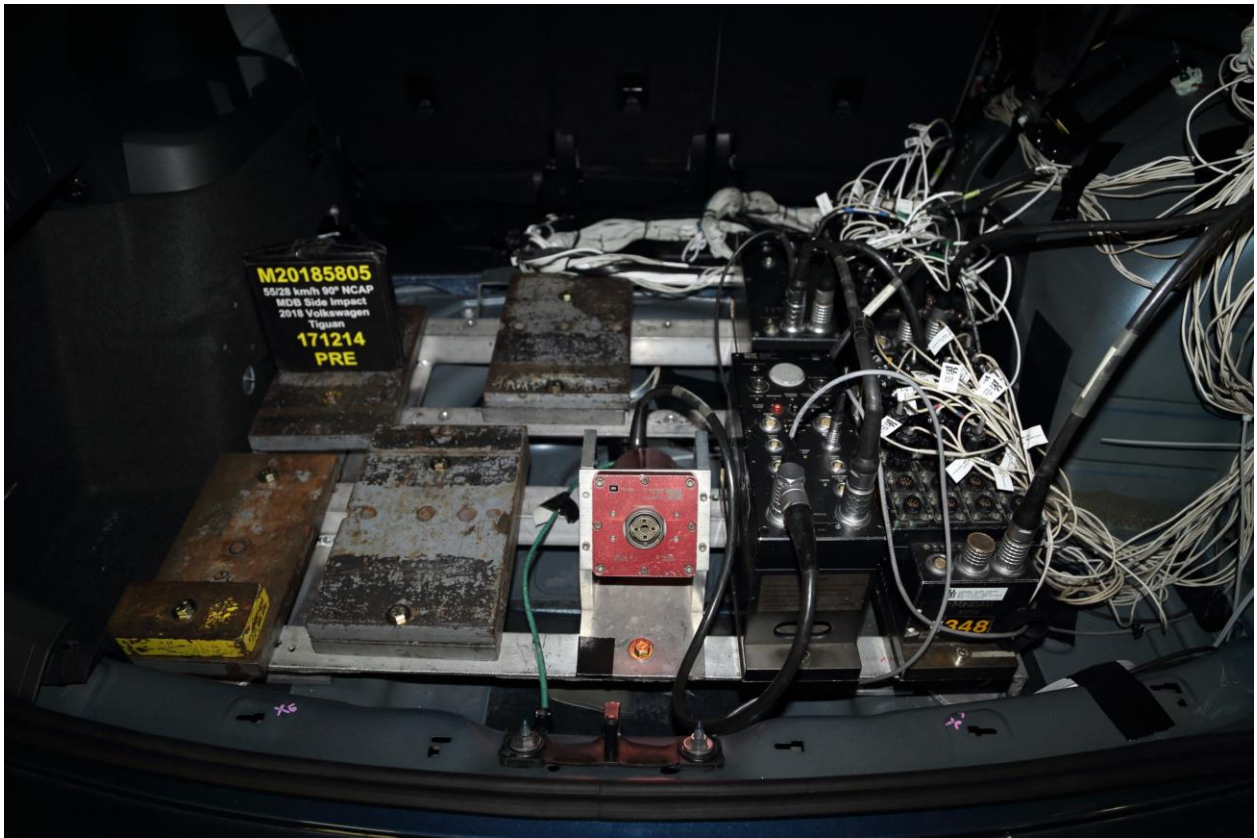
**091** Post-Test Right Side View of MDB Impactor Face



092 Close-Up View of Vehicle's Certification Label



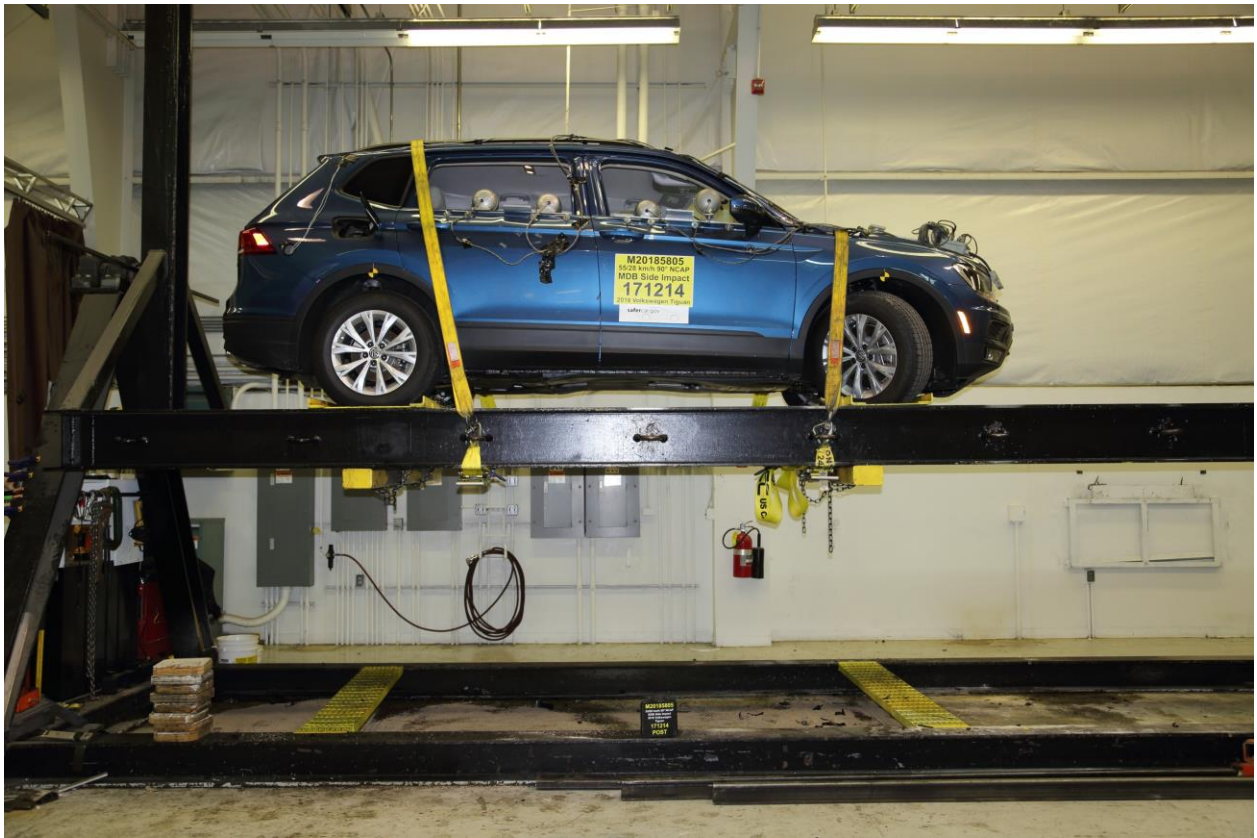
093 Close-Up View of Vehicle's Tire Information Placard or Label



094 Pre-Test Ballast View



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



**096** FMVSS No. 301 Static Rollover 0 Degrees



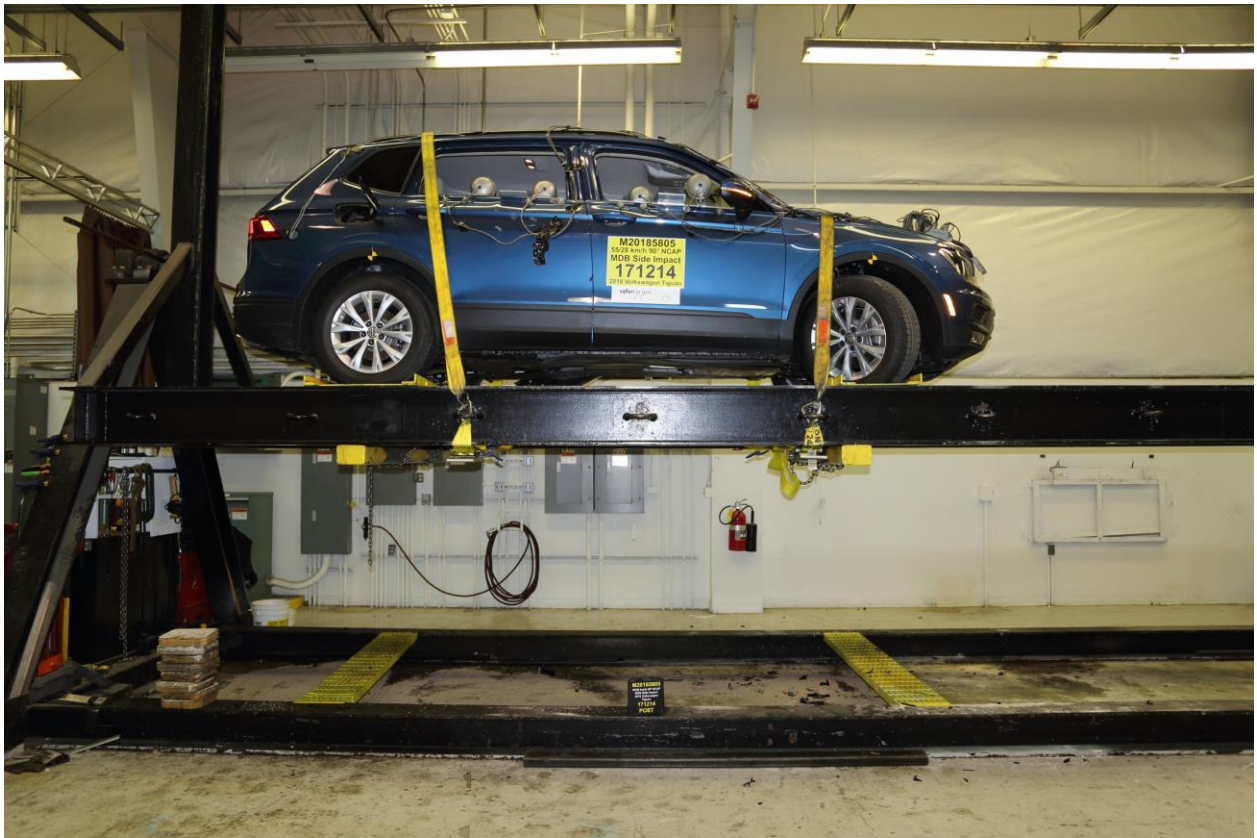
**097** FMVSS No. 301 Static Rollover 90 Degrees



**098** FMVSS No. 301 Static Rollover 180 Degrees



**099** FMVSS No. 301 Static Rollover 270 Degrees



100 FMVSS No. 301 Static Rollover 360 Degrees



101 Impact Event

**2018 Tiguan 2.0T S**  
 Silk Blue Metallic Exterior Storm Gray Cloth Interior

**STANDARD FEATURES** (unless replaced by options)

**PERFORMANCE**

- 2.0L TSI® 16-valve DOHC turbo 4-cylinder engine w/ direct fuel injection
- Front-wheel drive
- Four-wheel independent suspension

**SAFETY FEATURES**

- Driver & front passenger front & side airbag supplemental restraint system
- Seat Belt Pretensioner/force limiter w/ load limiter
- 3-point safety belts, all seating positions
- Anti-Lock Braking System (ABS) w/ brake assist
- Anti-Slip Regulation (ASR) & Engine Brake Assist (EBA)
- Electronic Brake Pressure Distribution (EBD) & Hydraulic Brake Assist (HBA)
- Electronic Stability Control (ESC) & Electronic Differential Lock (EDL)
- Intelligent Cruise Control System (ACC)
- Lower Anchors & Tethers for Children (LATCH)
- Tire Pressure Monitoring System (TPMS)

**EXTERIOR**

- 17 alloy wheels w/ all-season tires
- Automatic, halogen headlights w/ LED Daytime Running Lights (DRL)
- Heated, tilt-out, power adjustable side mirrors w/ integrated turn signals
- Variable intermittent front wipers
- Rear window washer & wiper
- Black roof rails

**INTERIOR**

- Manual climate control
- 2-spoke, multi-function steering wheel
- Tilt & telescoping adjustable steering column
- Driver's seat 6-way manual w/ height adjustment
- Front passenger seat 6-way manual w/ height adjustment
- 2nd-row seat 40/20/40 split-folding, sliding & reclining w/ armrest
- 3-row seat 50/50 split-folding & lock flat
- Cloth seating surfaces
- Front center console w/ cup holders, armrest & storage
- Front reading lights & illuminated vanity mirrors
- Completed cargo area w/ tie-down hooks

**TECHNOLOGY**

- Rear View Camera System
- Composition Color 8.3" touchscreen AM/FM radio w/ USB input
- 6-speaker sound system
- Bluetooth® connectivity (for compatible devices)
- Cruise control
- Color multi-function display (MFD) w/ trip computer
- Power door locks w/ remote featuring panic button
- Electric parking brake

**MANUFACTURER'S SUGGESTED RETAIL PRICE: \$25,195.00**

**VW CAR-NET® EQUIPPED. Features Include:**

- App-Connect (Smartphone integration & interface)

**DRIVER CARE PACKAGE**

**WARRANTY INFORMATION**

- Volkswagen New Vehicle Limited Warranty
- 3 year/50,000 miles (whichever occurs first)
- Includes coverage for powertrain components
- Limited lifetime against Corrosion Perforation
- \* 7 year/100,000 miles (whichever occurs first)

Please ask your dealer for a copy of the Volkswagen warranty booklet for details.

**24-HOUR ROADSIDE ASSISTANCE**

- \* 1 year/100,000 miles (whichever occurs first)
- (Towing, Jump Starts, Tire Changes, Out of Fuel, and Lock-Out)
- Provided by a third party supplier.

**PACKAGE/OPTIONS**

- Silk Blue Metallic Exterior
- Storm Gray Cloth Interior
- Moscar Metal® (set of 5) w/ Trunk Liner & VW CarGo Hooks
- Podcasts Assistance Kit
- 8-Speed Automatic w/ Tiptronic®

No Charge  
 No Charge  
 No Charge

**Annual fuel cost \$1,500**

**Fuel Economy and Environment**

**Fuel Economy**

**24 MPG** combined city/hwy  
**22 MPG** city  
**27 MPG** highway

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

**Annual fuel cost \$1,500**

**Fuel Economy & Greenhouse Gas Rating** (tailpipe only) **Smog Rating** (tailpipe only)

**5** (tailpipe only) **7** (tailpipe only)

This vehicle emits 269 grams of CO<sub>2</sub> per mile. The best emits 129 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions; learn more at [fuelconomy.gov](http://fuelconomy.gov).

**Actual results may vary for many reasons, including driving conditions and how you drive and maintain your vehicle. EPA's mileage estimates are based on 21 mpg city and 29 mpg highway. Cost estimates are based on 16.9¢/gallon (regular) fuel at \$2.42 per gallon, \$8.99 a month per gallon (national average). Vehicle emissions are a significant cause of climate change and smog.**

**fuelconomy.gov**  
 Calculate personalized estimates and compare vehicles

**GOVERNMENT 5-STAR SAFETY RATINGS**

**Overall Vehicle Score Not Rated**

Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.

Frontal Crash	Driver Passenger	Not Rated
Side Crash	Front Seat Rear Seat	Not Rated
Rollover		Not Rated

Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.

Based on the risk of injury in a side impact. Should ONLY be compared to other vehicles of similar size and weight.

Based on the risk of rollover in a single-vehicle crash. Star ratings range from 1 to 5 stars (★★★★★) with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA). [www.safercar.gov](http://www.safercar.gov) or 1-888-327-4236

**SOL ID: 402128**  
 LDU BACKROCK VOLKSWAGEN  
 7070 CHERYLVALE NORTH BLVD  
 ROCKFORD, IL 61112

**SHIP TO: 402128**  
 LDU BACKROCK VOLKSWAGEN  
 7070 CHERYLVALE NORTH BLVD  
 ROCKFORD, IL 61112

Peer of Entry: HOUSTON  
 VIN: 3VV187AX2JMM18714

**Destination Charge \$900.00**

**Total Price: \$26,465.00**

Fuel, license, title fees, taxes and dealer-installed accessories are not included.

**PARTS CONTENT INFORMATION**

FOR VEHICLES IN THIS CARLINE:	FOR THIS VEHICLE:
U.S./CANADIAN	FINAL ASSEMBLY POINT:
PARTS CONTENT: 11%	PUEBLA, MEXICO
MAJOR SOURCES OF FOREIGN	COUNTRY OF ORIGIN:
PARTS CONTENT:	ENGINE: MEXICO
MEXICO: 43%	TRANSMISSION: JAPAN
GERMANY: 16%	

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

**DEALER: Lou Bachrodt VW**  
 7070 Cherylva N Blvd  
 Rockford, IL 61112

**EPA DOT Fuel Economy**

**THIS PROTECTS THE CONSUMER. THIS IS NOT AN OFFICIAL FACTORY OR GOVERNMENT STICKER.**

Affixed as a supplemental Consumer Information Label by your dealer.

**For Smog Rating, Fuel Economy & Greenhouse Gas Rating**

**1** (tailpipe only) **10** (tailpipe only)

See the Fuel Economy and Environment Label w/ tailpipe only.

**fuelconomy.gov**  
 Calculate estimates and compare vehicles

**DEALER-ADDED INFORMATION**

- \* STOCK NO.: 48028
- \* SERIAL NO.: 3VV187AX2JMM18714
- \* MODEL: 2018 TIGUAN
- \* AVAL. SERVICE AGREEMENT: YES

**STANDARD EQUIP INCLUDED**

ACCESSORY PACKAGE \$499  
 NITRO TIRES

**VEHICLE INCLUDES**

Q-CERTIFIED 109K-100,000 MILE  
 POWERTRAIN WARRANTY

**Destination INCLUDED \$2,696**

**TOTAL \$26,964**

102 Monroney Label

## Head restraints

### Introduction

**WARNING**

Driving without head restraints or with improperly adjusted head restraints increases the risk of serious injuries in a collision.

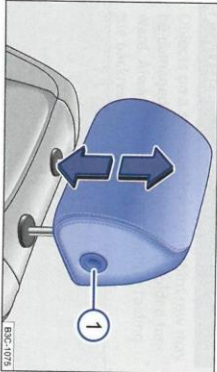
- Never drive or let a passenger ride in the vehicle until the head restraints are properly adjusted to help minimize the risk of neck injury in a crash.
- Each head restraint must be adjusted according to the occupants' size so that the upper edge is even with the top of the person's head, but no lower than eye level. Always sit so that the back of your head is as close as possible to the head restraint.
- Never adjust head restraints while driving.

**NOTICE**

When removing or reinstalling the head restraint, take care that the head restraint does not strike the headliner or other parts of the vehicle. The headliner or other parts of the vehicle could otherwise be damaged.

### Adjusting the front head restraints

Please read the introductory information and heed the Warnings and Notice and on page 144.



**Fig. 89** Adjusting the front head restraints.

All seats are equipped with head restraints.

144 Owner's Manual

### Adjusting the height of the front head restraints

There are notches in the head restraint guide rods so that the head restraint can lock into place. Only properly installed head restraints can lock into place at the adjustment range notches. In order to help prevent inadvertent removal of the head restraints after installation, there are stops at the top and bottom of the adjustment range.

**Adjusting the height of the front head restraints**

- While pressing the button → Fig. 89 (1), pull the head restraint up or push it down → In Introduction on page 144.
- The head restraint must lock securely in position.

### Proper head restraint adjustment

Adjust head restraints so that the upper edge of the head restraint is at least at eye level or higher. Position the back of the head as close as possible to the head restraint.

### Adjusting the head restraint for shorter people

Push the head restraint down as far as it will go, even if this means the person's head is still below the top edge of the head restraint. A small gap may remain between the head restraint and the backrest when the head restraint is all the way down.

### Adjusting the head restraint for taller people

Pull the head restraint up as far as it will go.

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

### Adjusting the rear head restraints

ⓘ Please read the introductory information and head the Warnings and Notice ⚠ and ① on page 144.

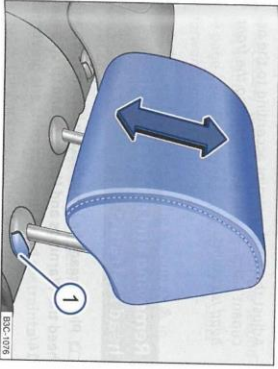


Fig. 90 Adjusting the second row head restraints.

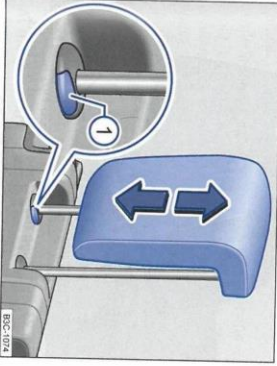


Fig. 91 Adjusting the third row head restraints (if equipped).

All seats are equipped with head restraints.

The second row center head restraint is designed only for the center seat on the second row bench. Therefore, only install the center head restraint in the center position.

### Adjusting the height of the rear head restraints

- Push the head restraint up.
- To lower the headrest, first push the headrest down as far as it will go. Then push the button → fig. 90 ① or → fig. 91 ① and push the head restraint down completely.
- The head restraint must lock securely in position. There are two possible positions for the head restraints in the second row and one possible position for the head restraints in the third row.

### Proper head restraint adjustment

Adjust head restraints so that the upper edge of the head restraint is at least at eye level or higher. Position the back of the head as close as possible to the head restraint.

### Adjusting the head restraint for shorter people

Push the head restraint down as far as it will go, even if this means the person's head is still below the top edge of the head restraint. A small gap may remain between the head restraint and the backrest when the head restraint is all the way down.

### Adjusting the head restraint for taller people

Pull the head restraint up as far as it will go.

**APPENDIX B**  
**VEHICLE AND DUMMY RESPONSE DATA PLOTS**

## TABLE OF DATA PLOTS

### Driver & Passenger Dummy Instrumentation Plots

<b>No.</b>	<b>Description</b>	<b>Page</b>
1	Driver Head Acceleration (X) Primary vs. Time	B-5
2	Driver Head Acceleration (Y) Primary vs. Time	B-5
3	Driver Head Acceleration (Z) Primary vs. Time	B-5
4	Driver Head Resultant Acceleration Primary vs. Time	B-5
5	Driver Upper Thorax Rib Deflection (Y) vs. Time	B-6
6	Driver Middle Thorax Rib Deflection (Y) vs. Time	B-6
7	Driver Lower Thorax Rib Deflection (Y) vs. Time	B-6
8	Driver Thorax Rib Deflection Maximum vs. Time	B-6
9	Driver Anterior Abdominal Force (Y) vs. Time	B-7
10	Driver Middle Abdominal Force (Y) vs. Time	B-7
11	Driver Posterior Abdominal Force (Y) vs. Time	B-7
12	Driver Total Abdominal Force (Y) vs. Time	B-7
13	Driver Pubic Symphysis Force (Y) vs. Time	B-8
14	Passenger Head Acceleration (X) Primary vs. Time	B-9
15	Passenger Head Acceleration (Y) Primary vs. Time	B-9
16	Passenger Head Acceleration (Z) Primary vs. Time	B-9
17	Passenger Head Resultant Acceleration Primary vs. Time	B-9
18	Passenger Lower Spine T12 Acceleration (X) vs. Time	B-10
19	Passenger Lower Spine T12 Acceleration (Y) vs. Time	B-10
20	Passenger Lower Spine T12 Acceleration (Z) vs. Time	B-10
21	Passenger Lower Spine T12 Resultant Acceleration vs. Time	B-10
22	Passenger Iliac Force on Impact Side (Y) vs. Time	B-11
23	Passenger Acetabulum Force on Impact Side (Y) vs. Time	B-11
24	Passenger Total Pelvic Force on Impact Side (Y) vs. Time	B-11

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

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

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

## Vehicle Instrumentation Data

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

## MDB Instrumentation Data

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

**NHTSA**

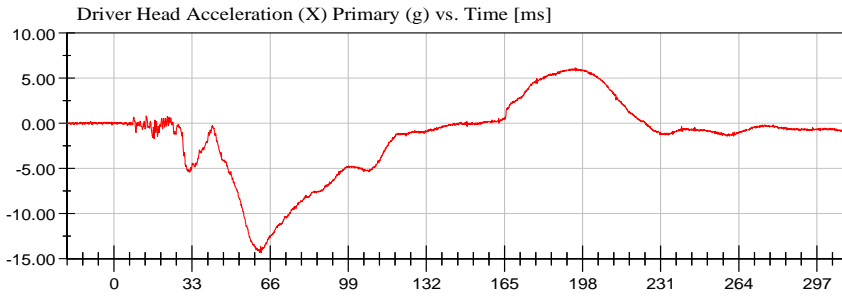
Test Lab: CTF

Test Number: 171214 (M20185805)

Test Date: 12/14/2017

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

Position #4 SID IIs Dummy (305)



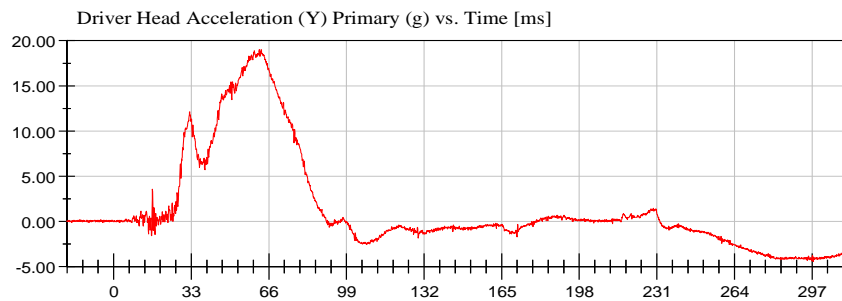
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6.15 g at 194.88 ms

<Min>

-14.29 g at 61.68 ms

CFC\_1000



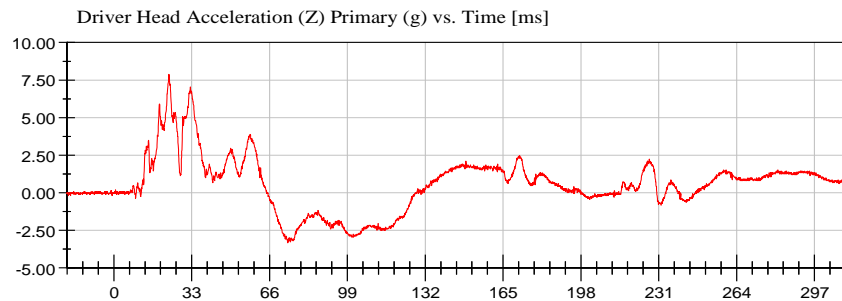
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19.01 g at 61.92 ms

<Min>

-4.48 g at 297.52 ms

CFC\_1000



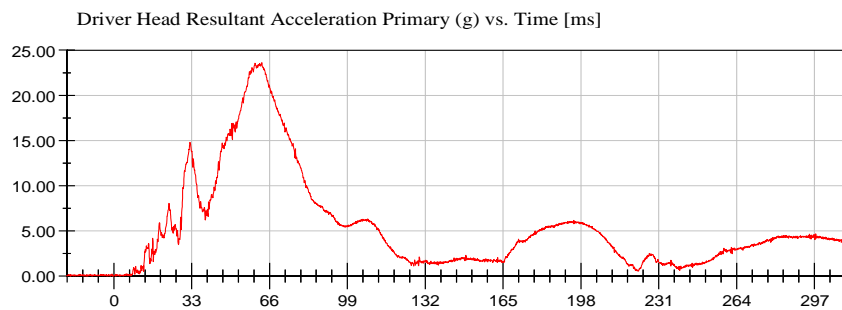
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7.89 g at 23.36 ms

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-3.34 g at 73.76 ms

CFC\_1000



<Max>

23.62 g at 62.72 ms

<Min>

0.03 g at -20.00 ms

CFC\_1000



**NHTSA**

Test Lab: CTF

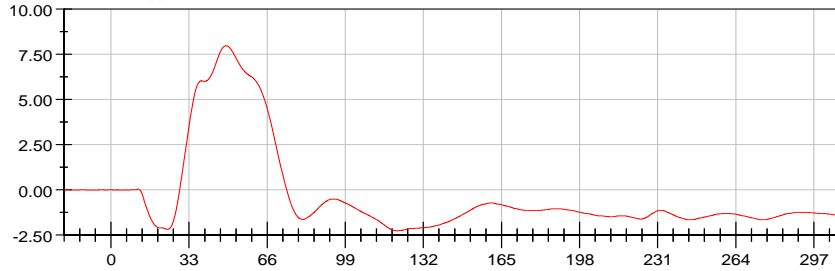
Test Number: 171214 (M20185805)

Test Date: 12/14/2017

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

Position #4 SID IIs Dummy (305)

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



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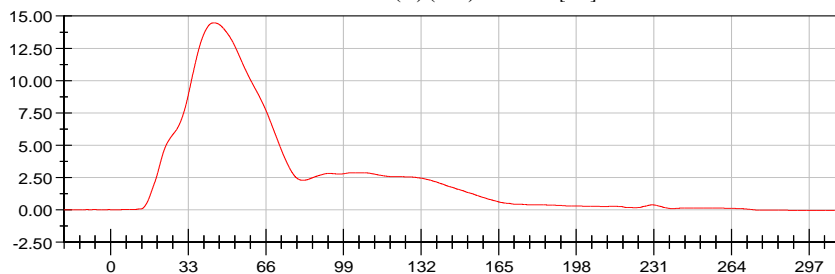
7.97 mm at 48.64 ms

<Min>

-2.26 mm at 120.96 ms

CFC\_180

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



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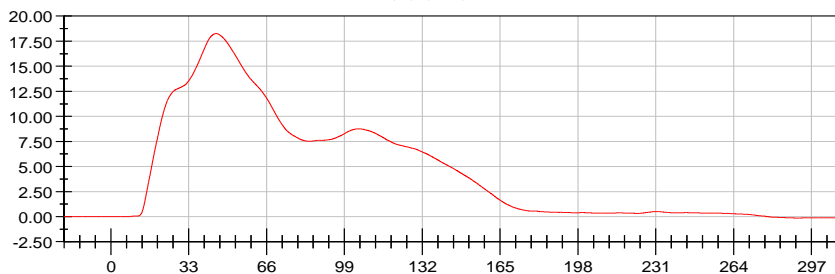
14.47 mm at 43.92 ms

<Min>

-0.06 mm at 310.00 ms

CFC\_180

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



<Max>

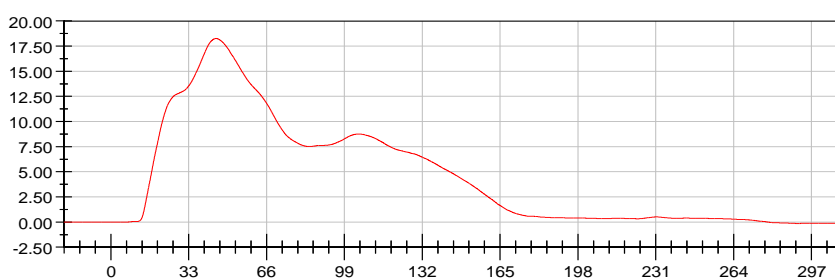
18.26 mm at 44.64 ms

<Min>

-0.14 mm at 291.28 ms

CFC\_180

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



<Max>

18.26 mm at 44.64 ms

<Min>

-0.14 mm at 291.28 ms

CFC\_180



**NHTSA**

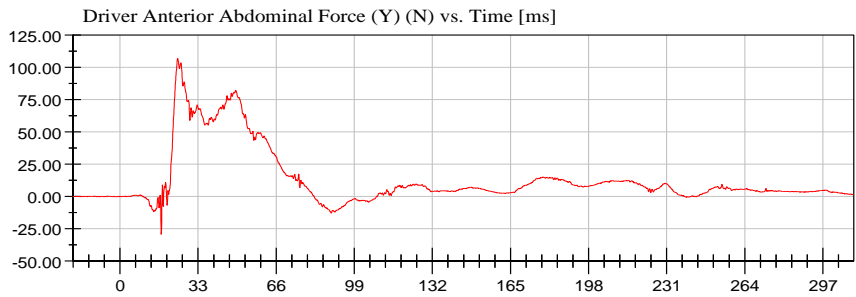
Test Lab: CTF

Test Number: 171214 (M20185805)

Test Date: 12/14/2017

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

Position #4 SID II's Dummy (305)



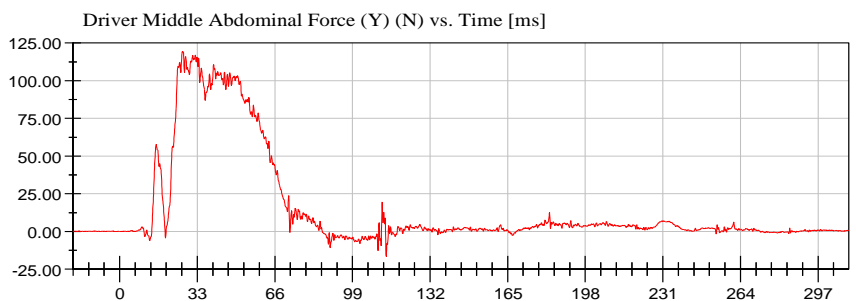
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107.03 N at 24.40 ms

**<Min>**

-29.13 N at 17.44 ms

CFC\_600



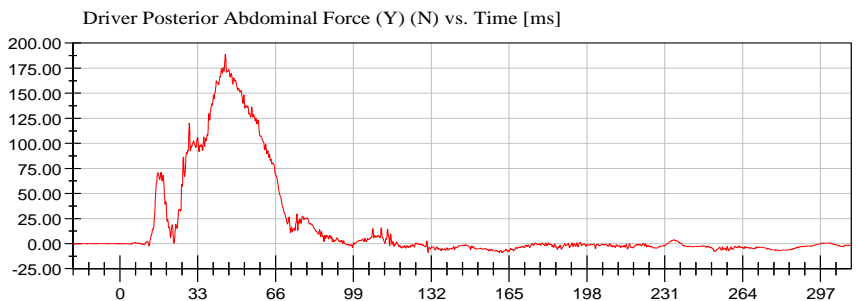
**<Max>**

119.39 N at 26.72 ms

**<Min>**

-16.75 N at 113.36 ms

CFC\_600



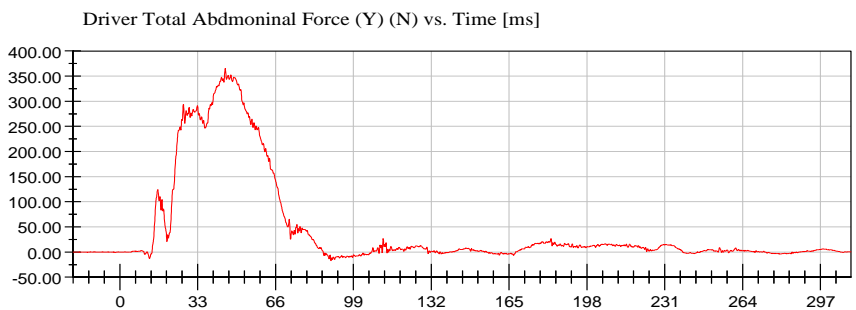
**<Max>**

189.06 N at 44.72 ms

**<Min>**

-9.13 N at 162.08 ms

CFC\_600



**<Max>**

365.13 N at 44.72 ms

**<Min>**

-17.17 N at 89.52 ms

CFC\_600



**NHTSA**

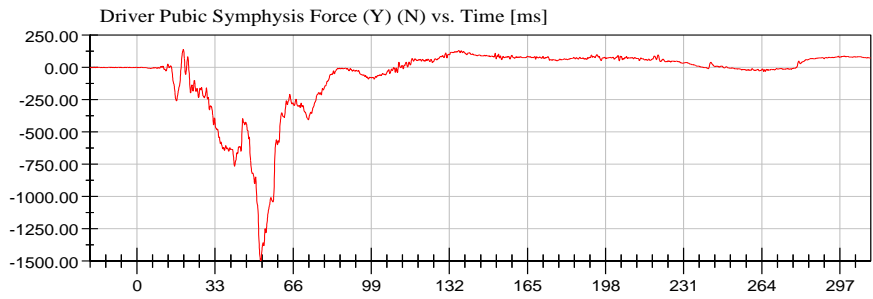
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Test Number: 171214 (M20185805)

Test Date: 12/14/2017

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

Position #4 SID II's Dummy (305)



<Max>

139.99 N at 19.60 ms

<Min>

-1,497.67 N at 52.24 ms

CFC\_600



**NHTSA**

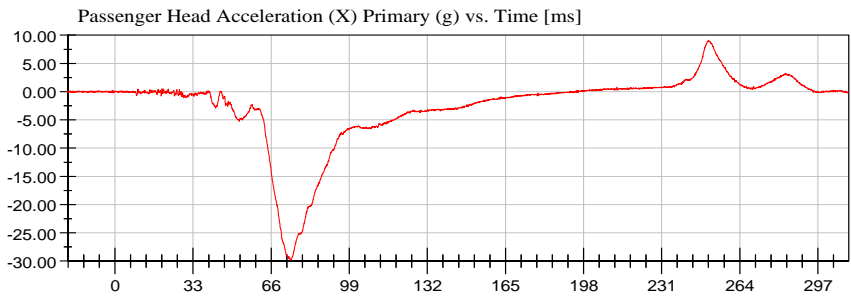
Test Lab: CTF

Test Number: 171214 (M20185805)

Test Date: 12/14/2017

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

Position #4 SID IIs Dummy (305)



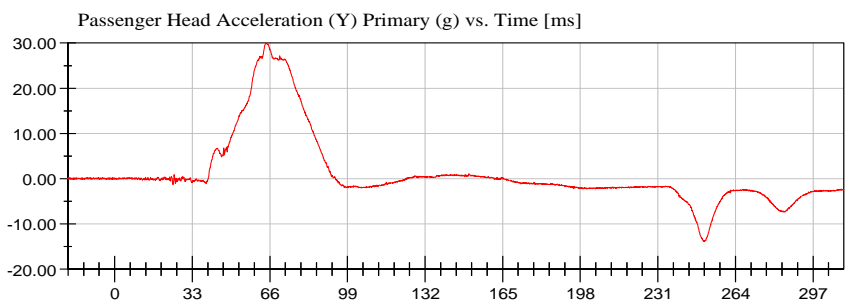
**<Max>**

9.07 g at 250.72 ms

**<Min>**

-29.83 g at 74.08 ms

CFC\_1000



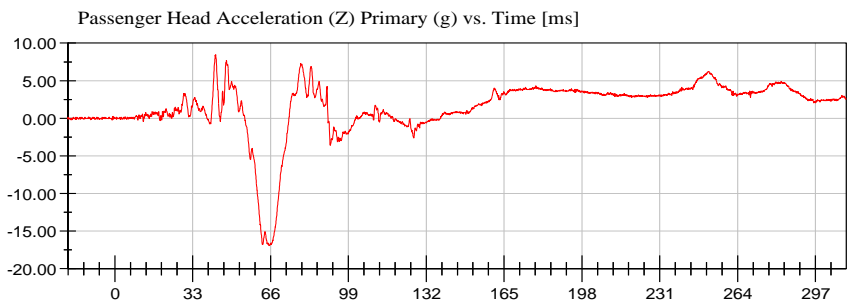
**<Max>**

29.98 g at 64.32 ms

**<Min>**

-13.90 g at 250.72 ms

CFC\_1000



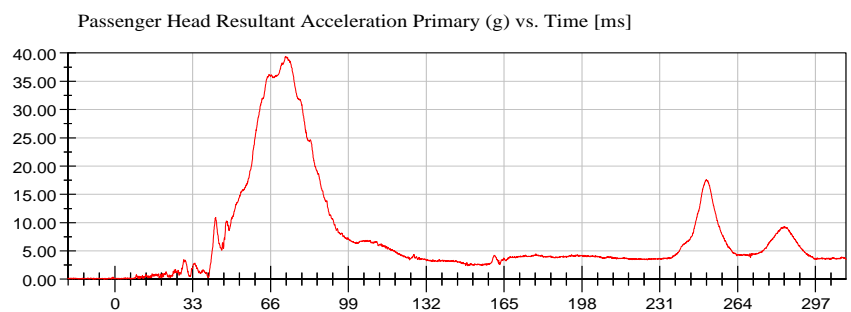
**<Max>**

8.44 g at 42.72 ms

**<Min>**

-16.92 g at 65.36 ms

CFC\_1000



**<Max>**

39.38 g at 72.40 ms

**<Min>**

0.03 g at -18.00 ms

CFC\_1000



**NHTSA**

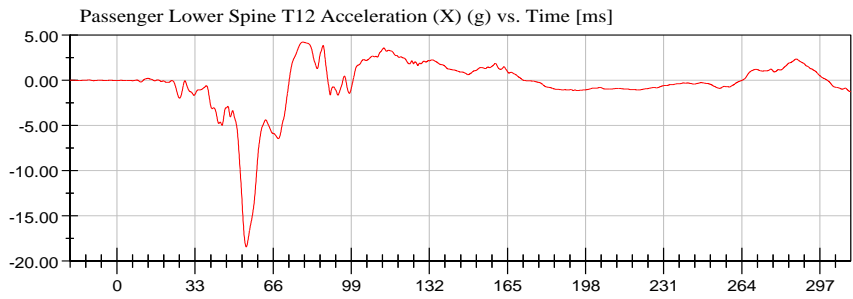
Test Lab: CTF

Test Number: 171214 (M20185805)

Test Date: 12/14/2017

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

Position #4 SID IIs Dummy (305)



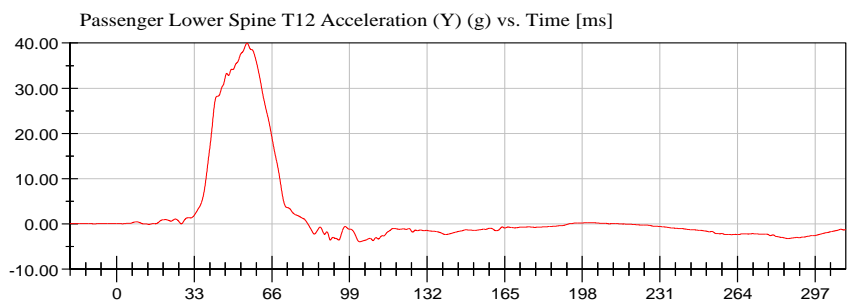
**<Max>**

4.24 g at 78.56 ms

**<Min>**

-18.42 g at 54.64 ms

CFC\_180



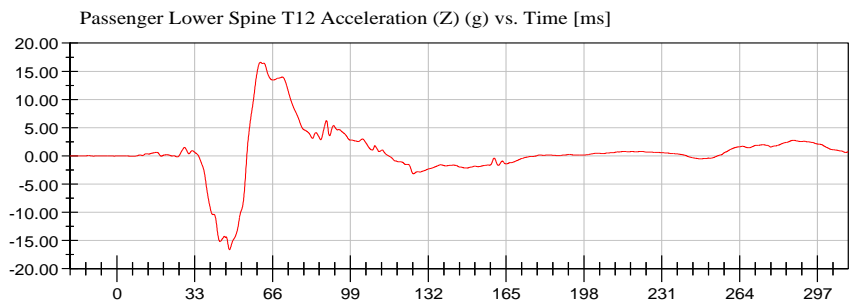
**<Max>**

39.94 g at 55.44 ms

**<Min>**

-3.98 g at 103.36 ms

CFC\_180



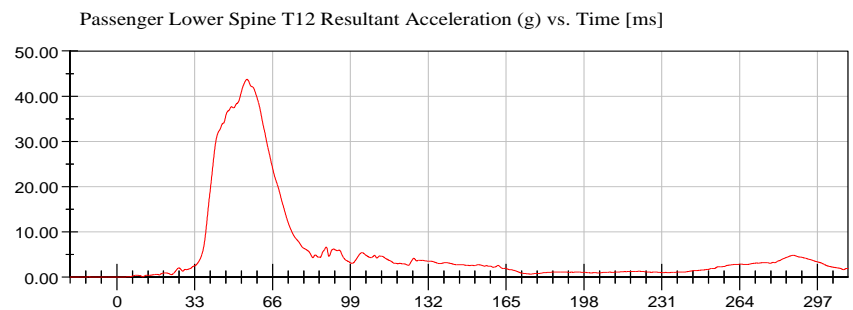
**<Max>**

16.59 g at 60.80 ms

**<Min>**

-16.63 g at 47.76 ms

CFC\_180



**<Max>**

43.72 g at 55.20 ms

**<Min>**

0.01 g at -17.84 ms

CFC\_180



**NHTSA**

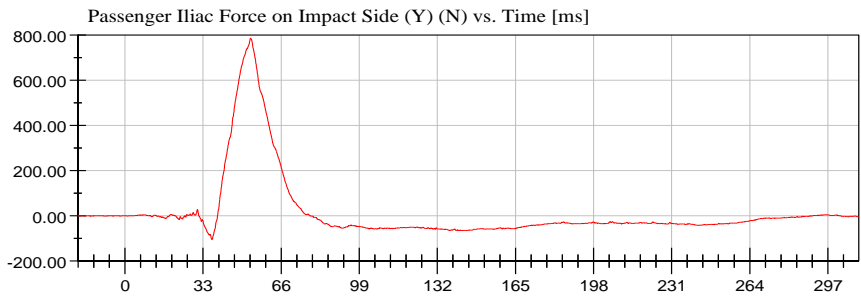
Test Lab: CTF

Test Number: 171214 (M20185805)

Test Date: 12/14/2017

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

Position #4 SID II's Dummy (305)



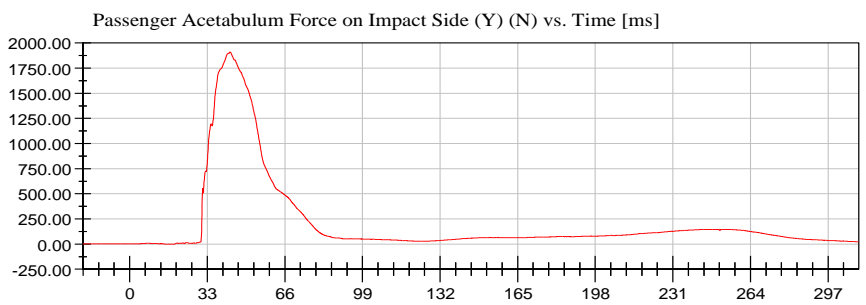
**<Max>**

786.63 N at 53.04 ms

**<Min>**

-104.08 N at 36.72 ms

CFC\_600



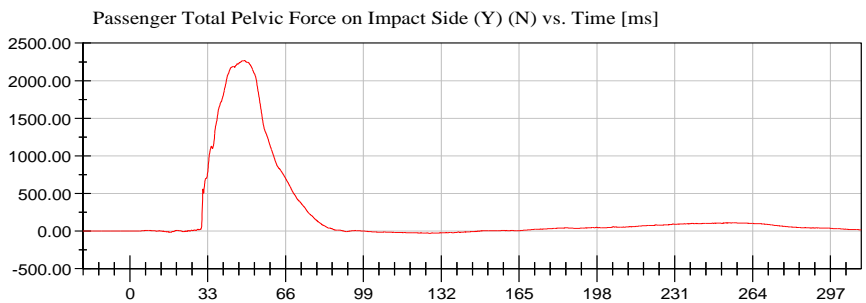
**<Max>**

1,909.47 N at 42.72 ms

**<Min>**

-4.27 N at 16.72 ms

CFC\_600



**<Max>**

2,269.67 N at 48.64 ms

**<Min>**

-28.48 N at 127.44 ms

CFC\_600



**APPENDIX C**  
**DUMMY PERFORMANCE CALIBRATION TEST DATA**

## TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

### ES-2re (Driver) Dummy

#### Description

**Table 1.** External Measurements

**Table 2.** Head Drop Test

- Head (X) Acceleration (G's) vs. Time (ms)
- Head (Y) Acceleration (G's) vs. Time (ms)
- Head (Z) Acceleration (G's) vs. Time (ms)
- Resultant Head Acceleration (G's) vs. Time (ms)

**Table 3** Neck Pendulum Test

- Pendulum Velocity (m/s) vs. Time (ms)
- Flexion Angle (°) vs. Time (ms)
- Potentiometer A (°) vs. Time (ms)
- Potentiometer B (°) vs. Time (ms)
- Potentiometer C (°) vs. Time (ms)

**Table 4.** Shoulder Impact Test

- Impactor Acceleration (G's) vs. Time (ms)

**Table 5.** Thorax – Upper Rib Drop Test

- Upper Rib Displacement @ 459 mm Drop Height (mm) vs. Time (ms)
- Upper Rib Displacement @ 815 mm Drop Height (mm) vs. Time (ms)

**Table 6.** Thorax – Middle Rib Drop Test

- Middle Rib Displacement @ 459 mm Drop Height (mm) vs. Time (ms)
- Middle Rib Displacement @ 815 mm Drop Height (mm) vs. Time (ms)

**Table 7.** Thorax – Lower Rib Drop Test

- Lower Rib Displacement @ 459 mm Drop Height (mm) vs. Time (ms)
- Lower Rib Displacement @ 815 mm Drop Height (mm) vs. Time (ms)

**Table 8.** Thorax – Full Body Impact Test

- Pendulum Acceleration (G's) vs. Time (ms)
- Impactor Force (kN) vs. Time (ms)
- Upper Rib Displacement (mm) vs. Time (ms)
- Middle Rib Displacement (mm) vs. Time (ms)
- Lower Rib Displacement (mm) vs. Time (ms)

**Table 9.** Abdomen Impact Test

- Impactor Force (kN) vs. Time (ms)
- Front Abdomen Force (kN) vs. Time (ms)
- Middle Abdomen Force (kN) vs. Time (ms)
- Rear Abdomen Force (kN) vs. Time (ms)
- Total Abdomen Force (kN) vs. Time (ms)

**Table 10.** Lumbar Spine Flexion Test

- Pendulum Velocity (m/s) vs. Time (ms)
- Spine Flexion Angle (°) vs. Time (ms)
- Potentiometer A (°) vs. Time (ms)
- Potentiometer B (°) vs. Time (ms)
- Potentiometer C (°) vs. Time (ms)

**Table 11.** Pelvis Impact Test

- Pendulum Acceleration (G's) vs. Time (ms)
- Impactor Force (kN) vs. Time (ms)
- Pubic Symphysis (Y) Force (kN) vs. Time (ms)

## TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

### SID-IIs (Rear Passenger) Dummy

#### Description

**Table 1.** External Measurements

**Table 2.** Head Drop Test

- Head (X) Acceleration (G's) vs. Time (ms)
- Head (Y) Acceleration (G's) vs. Time (ms)
- Head (Z) Acceleration (G's) vs. Time (ms)
- Resultant Head Acceleration (G's) vs. Time (ms)

**Table 3.** Lateral Neck Pendulum Test

- Pendulum Velocity (m/s) vs. Time (ms)
- Flexion Angle (°) vs. Time (ms)
- Moment About Occipital Condyle (Nm) vs. Time (ms)

**Table 4.** Shoulder Impact Test

- Impactor Acceleration (G's) vs. Time (ms)
- Shoulder Displacement (mm) vs. Time (ms)
- Upper Spine Acceleration (G's) vs. Time (ms)

**Table 5.** Thorax (With Arm) Impact Test

- Impactor Acceleration (G's) vs. Time (ms)
- Shoulder Displacement (mm) vs. Time (ms)
- Upper Rib Displacement (mm) vs. Time (ms)
- Middle Rib Displacement (mm) vs. Time (ms)
- Lower Rib Displacement (mm) vs. Time (ms)
- Upper Spine Acceleration (G's) vs. Time (ms)
- Lower Spine Acceleration (G's) vs. Time (ms)

**Table 6.** Thorax (Without Arm) Impact Test

- Impactor Acceleration (G's) vs. Time (ms)
- Upper Rib Displacement (mm) vs. Time (ms)
- Middle Rib Displacement (mm) vs. Time (ms)
- Lower Rib Displacement (mm) vs. Time (ms)
- Upper Spine Acceleration (G's) vs. Time (ms)
- Lower Spine Acceleration (G's) vs. Time (ms)

**Table 7.** Abdomen Impact Test

- Impactor Acceleration (G's) vs. Time (ms)
- Upper Abdominal Rib Displacement (mm) vs. Time (ms)
- Lower Abdominal Rib Displacement (mm) vs. Time (ms)
- Lower Spine Acceleration (G's) vs. Time (ms)

**Table 8.** Pelvis Plug Quasi-Static Test (Optional\*)

**Table 9.** Pelvis Acetabulum Impact Test

- Impactor Acceleration (G's) vs. Time (ms)
- Pelvis (Y) Acceleration (G's) vs. Time (ms)
- Acetabulum Force (N) vs. Time (ms)

**Table 10.** Pelvis Iliac Impact Test

- Impactor Acceleration (G's) vs. Time (ms)
- Pelvis (Y) Acceleration (G's) vs. Time (ms)
- Iliac Force (N) vs. Time (ms)

**Pre-Test Calibration Sheets**  
**Driver S/N F030**

**Transportation Research Center Inc.**  
**572U ES-2re Dummy**  
**External Dimensions**  
**Serial No. F030 Calibration No. 53**

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	912	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	561	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	347	Yes
4	Seat to Hip Joint (center of bolt)	97.0 - 103.0	97	Yes
5	Sole to Seat, Sitting	433.0 - 451.0	445	Yes
6	Head Width	152.0 - 158.0	155	Yes
7	Shoulder/Arm Width	461.0 - 479.0	475	Yes
8	Thorax Width	322.0 - 332.0	326	Yes
9	Abdomen Width	273.0 - 287.0	282	Yes
10	Pelvis Lap Width	359.0 - 373.0	367	Yes
11	Head Depth	196.0 - 206.0	202	Yes
12	Thorax Depth	262.0 - 272.0	262	Yes
13	Abdomen Depth	194.0 - 204.0	199	Yes
14	Pelvis Depth	235.0 - 245.0	242	Yes
15	Back of Buttocks to Hip Joint (center of bolt)	150.0 - 160.0	156	Yes
16	Back of Buttocks to Front of Knee	597.0 - 615.0	605	Yes

Baseline 10/07/05



## Transportation Research Center Inc.

Left Lateral Head Drop  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Peak Resultant Acceleration	125 - 155 g	138.2 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	8.4 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

**Test meets specifications.**

**Condition: Used**

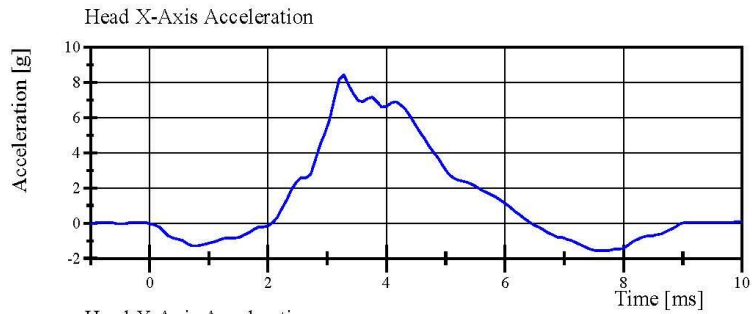
**Comments:**

**Head Skin S/N: DP6812**

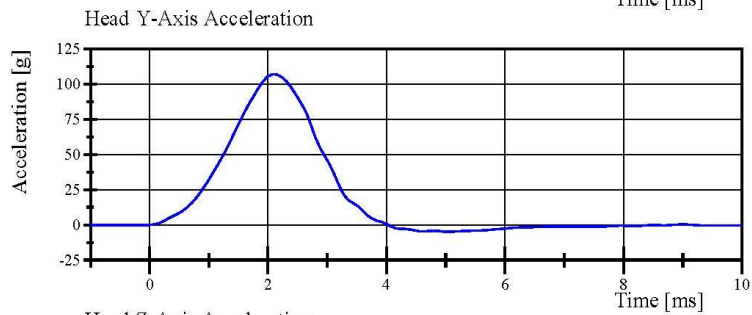
**Skull S/N: N/A**

# Transportation Research Center Inc.

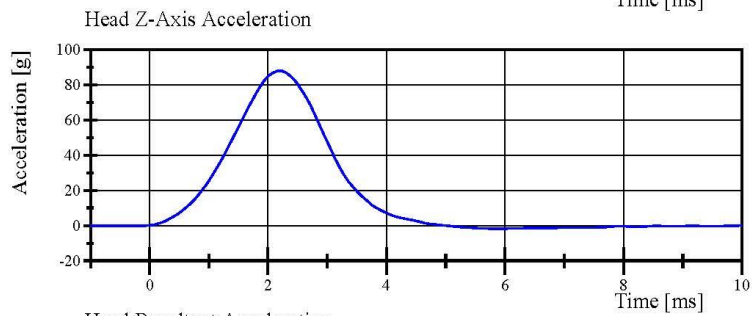
Left Lateral Head Drop  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017



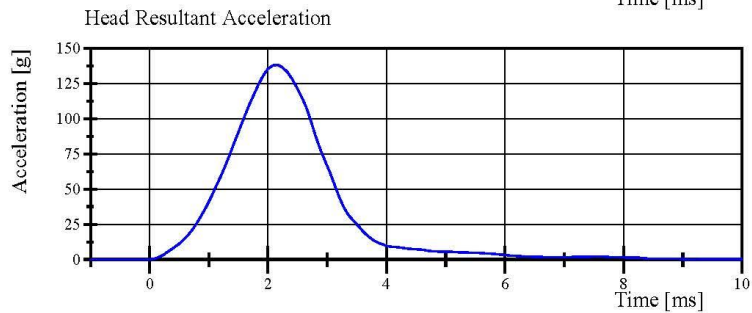
Filter Class: CFC\_1000  
Max: 8.4 g at 3.3 ms  
Min: -1.5 g at 7.5 ms



Filter Class: CFC\_1000  
Max: 107.1 g at 2.1 ms  
Min: -4.9 g at 5.0 ms



Filter Class: CFC\_1000  
Max: 88.0 g at 2.2 ms  
Min: -1.8 g at 5.8 ms



Filter Class: CFC\_1000  
Max: 138.2 g at 2.2 ms  
Min: 0.0 g at -1.0 ms

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

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## Transportation Research Center Inc.

Left Lateral Neck  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.39 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-52.9 deg	Yes
Time of Peak	54 - 66 ms	56.4 ms	Yes
Headform Flexion Decay			
- Peak to Zero	53 - 88 ms	66.8 ms	Yes

**Test meets specifications.**

**Condition:** Used

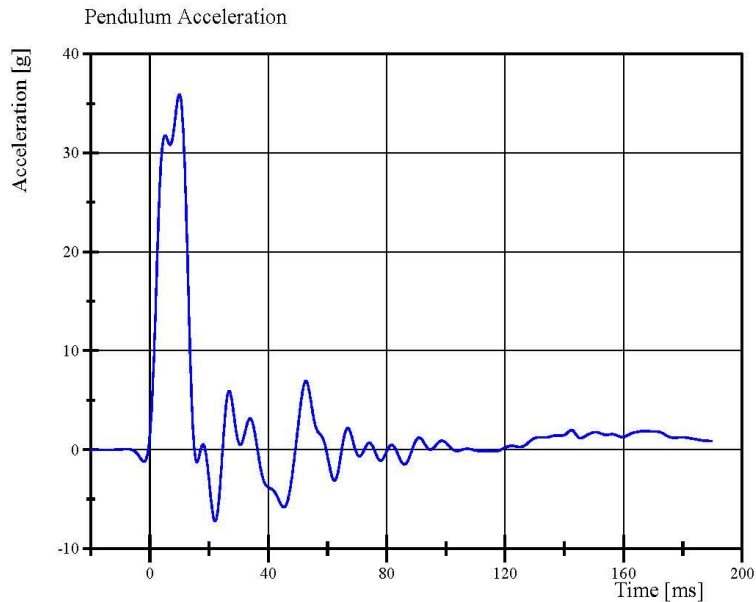
**Comments:**

**Neck S/N:** DI5031

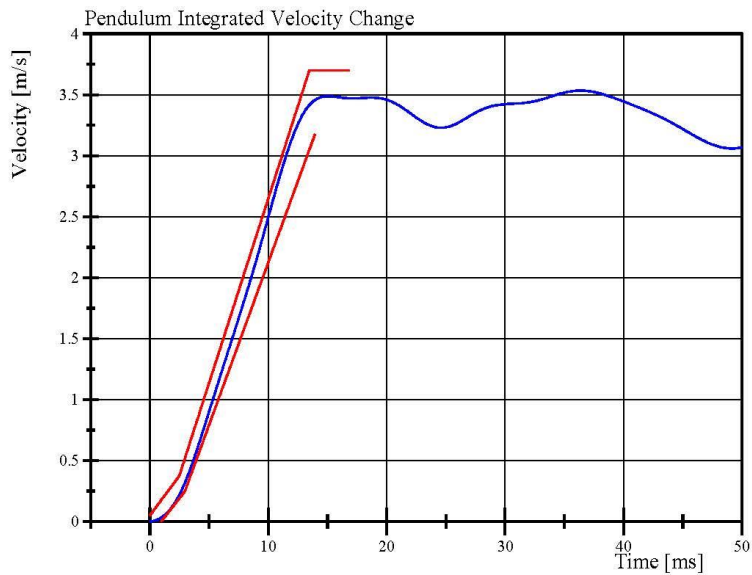
**Neck Buffer Molded(Yellow) S/N:** N/A

# Transportation Research Center Inc.

Left Lateral Neck  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017



Filter Class: CFC\_60  
Max: 35.9 g at 10.0 ms  
Min: -7.2 g at 22.1 ms



Filter Class: CFC\_60  
Max: 3.5 m/s at 36.4 ms  
Min: 0.0 m/s at 0.0 ms

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

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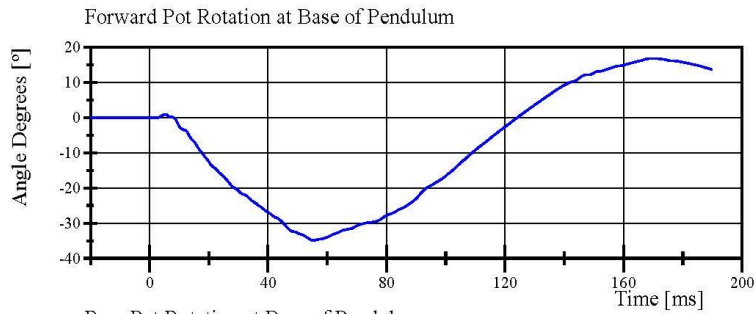


# Transportation Research Center Inc.

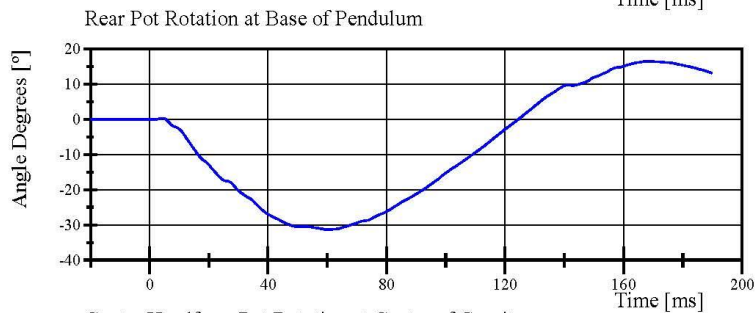
Left Lateral Neck

ES-2re Serial No. F030 Certification No. 53-1

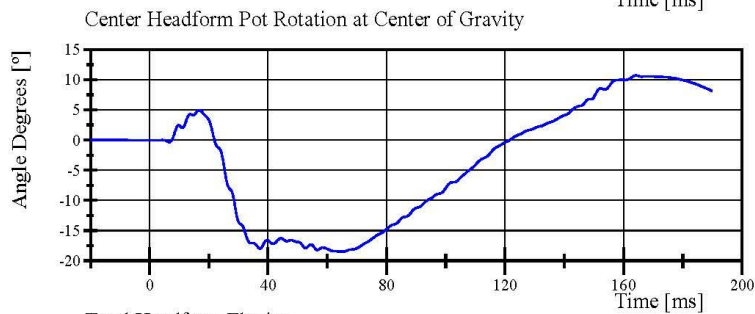
Test Date: 12/8/2017



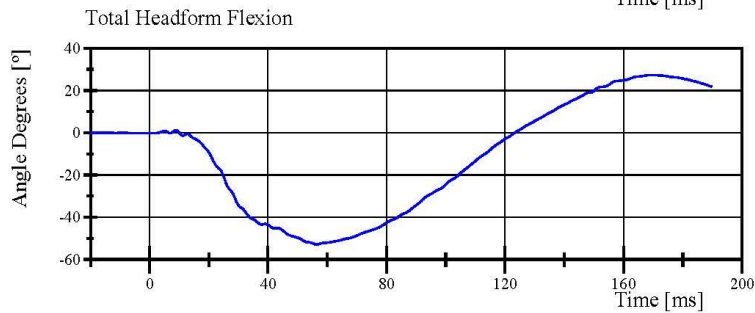
Filter Class: CFC\_180  
Max: 16.8 ° at 169.5 ms  
Min: -34.8 ° at 55.3 ms



Filter Class: CFC\_180  
Max: 16.5 ° at 167.9 ms  
Min: -31.3 ° at 60.2 ms



Filter Class: CFC\_180  
Max: 10.7 ° at 164.2 ms  
Min: -18.5 ° at 64.9 ms



Filter Class: CFC\_180  
Max: 27.3 ° at 169.1 ms  
Min: -52.9 ° at 56.4 ms

## Transportation Research Center Inc.

Left Lateral Shoulder  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.26 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.94 g	Yes

**Test meets specifications.**

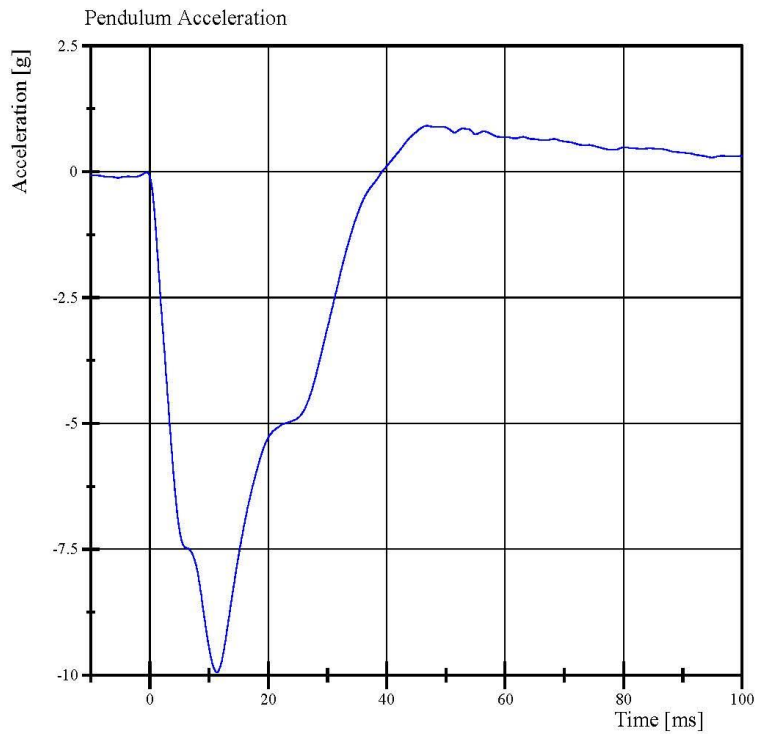
**Condition: Used**

**Comments:**

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

# Transportation Research Center Inc.

Left Lateral Shoulder  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017



Filter Class: CFC\_180  
Max: 0.9 g at 46.8 ms  
Min: -9.9 g at 11.3 ms

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

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## Transportation Research Center Inc.

3.0 m/s Upper Upper Full Rib Module  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.4 mm	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

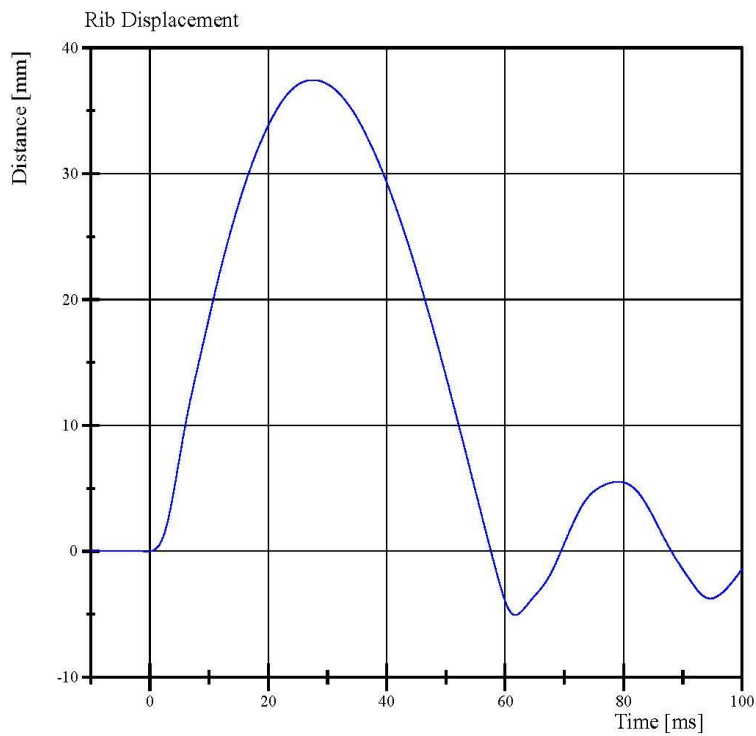
**Drop Height: 462 mm**

**Rib Module: 175-4008-A**

**Rib Foam: 07229**

# Transportation Research Center Inc.

3.0 m/s Upper Upper Full Rib Module  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017



Filter Class: CFC\_180  
Max: 37.4 mm at 27.6 ms  
Min: -5.1 mm at 61.7 ms

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

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## Transportation Research Center Inc.

4.0 m/s Upper Upper Full Rib Module  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	46.4 mm	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

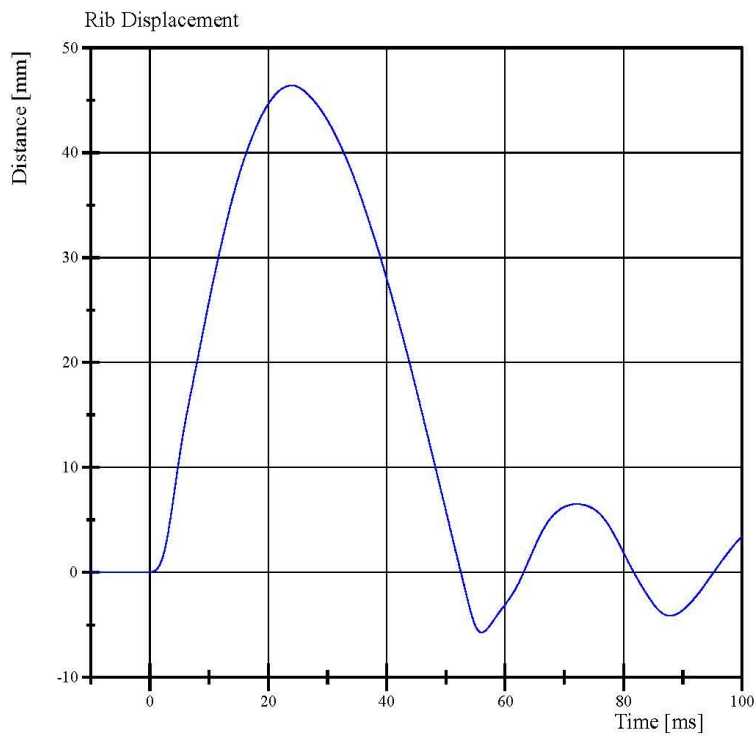
**Drop Height: 816mm**

**Rib Module: 175-4008-A**

**Rib Foam: 07229**

# Transportation Research Center Inc.

4.0 m/s Upper Upper Full Rib Module  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017



Filter Class: CFC\_180  
Max: 46.4 mm at 23.9 ms  
Min: -5.7 mm at 56.0 ms

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

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## Transportation Research Center Inc.

3.0 m/s Center Full Rib Module  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.1 mm	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

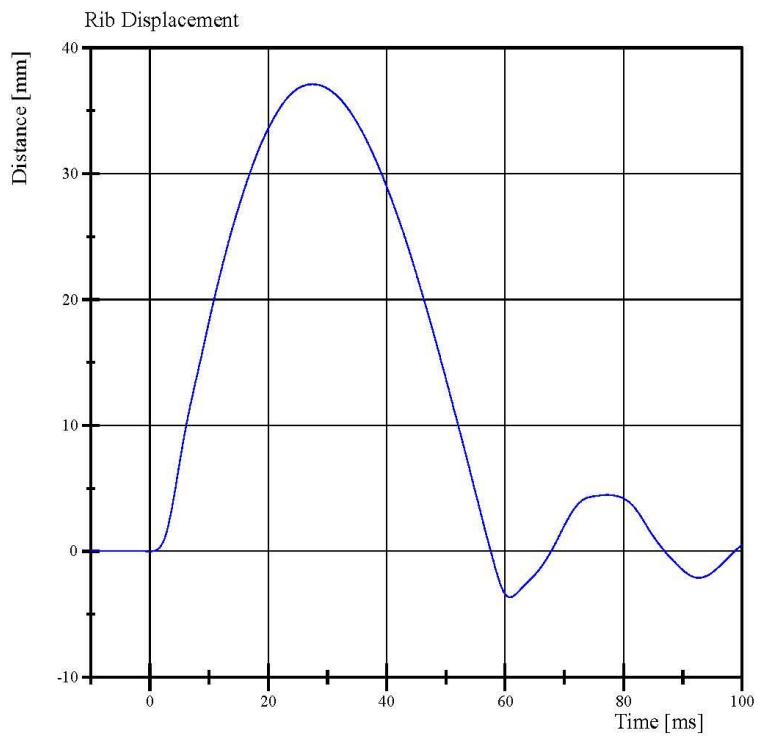
**Drop Height: 462 mm**

**Rib Module: 175-4008-A**

**Rib Foam: E2A-DCT-04082**

# Transportation Research Center Inc.

3.0 m/s Center Full Rib Module  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017



Filter Class: CFC\_180  
Max: 37.1 mm at 27.4 ms  
Min: -3.6 mm at 60.8 ms

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

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## Transportation Research Center Inc.

4.0 m/s Center Full Rib Module  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.6 mm	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

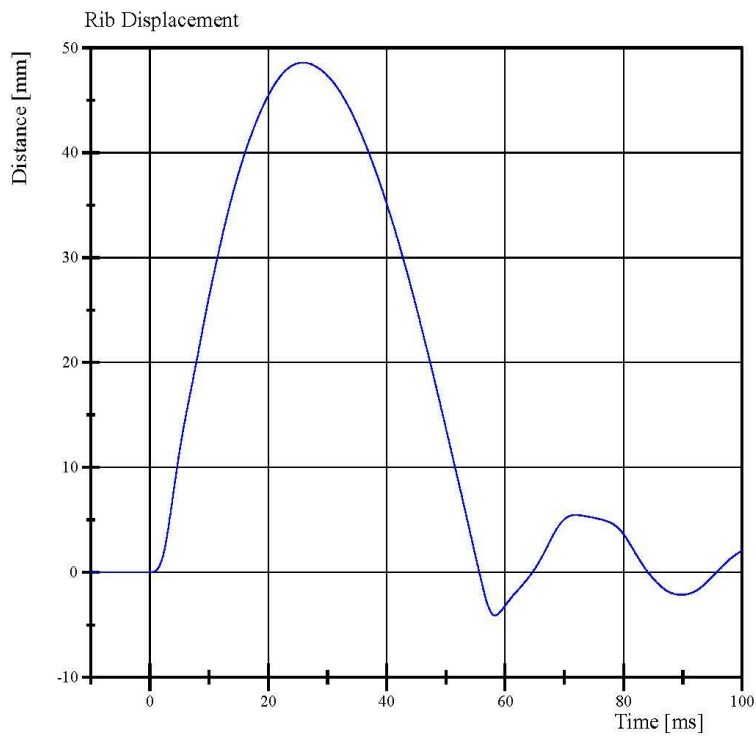
**Drop Height: 816 mm**

**Rib Module: 175-4008-A**

**Rib Foam: E2A-DCT-04082**

# Transportation Research Center Inc.

4.0 m/s Center Full Rib Module  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017



Filter Class: CFC\_180  
Max: 48.6 mm at 25.8 ms  
Min: -4.1 mm at 58.2 ms

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

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## Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.8 mm	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

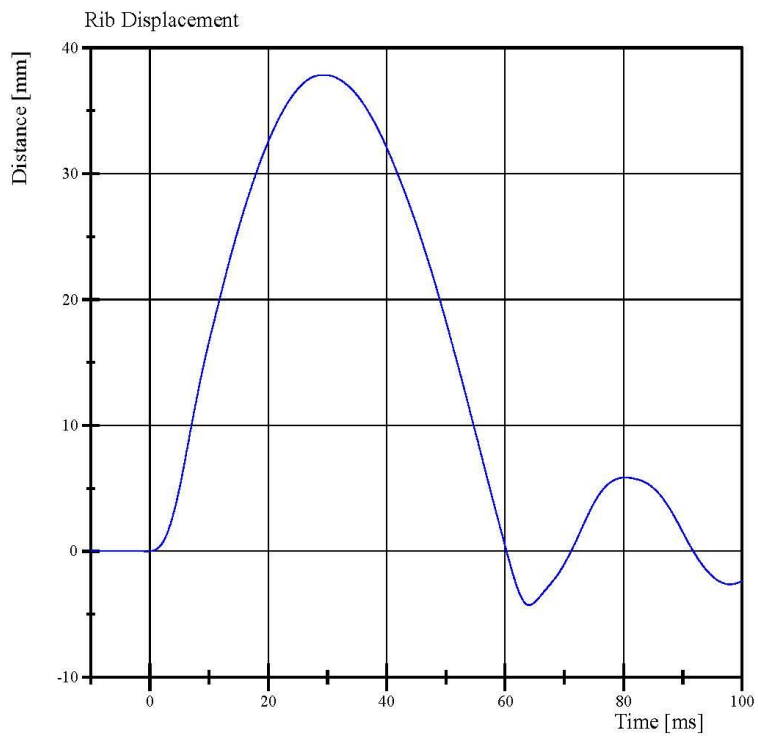
**Drop Height: 462 mm**

**Rib Module: 175-4008-A-06-017**

**Rib Foam: 175-4003-05125**

# Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017



Filter Class: CFC\_180  
Max: 37.8 mm at 29.4 ms  
Min: -4.3 mm at 64.1 ms

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

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## Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.7 mm	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

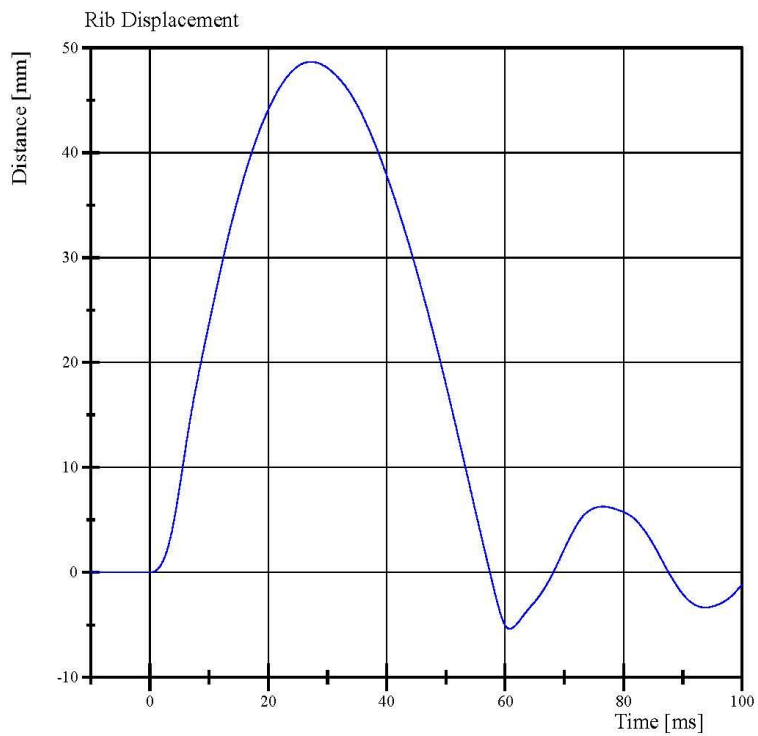
**Drop Height: 816mm**

**Rib Module: 175-4008-A-06-017**

**Rib Foam: 175-4003-05125**

# Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017



Filter Class: CFC\_180  
Max: 48.7 mm at 27.3 ms  
Min: -5.4 mm at 60.8 ms

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

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## Transportation Research Center Inc.

Left Lower Thorax  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.482 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,286.0 N	Yes
Upper Rib Displacement	34 - 41 mm	38.0 mm	Yes
Center Rib Displacement	37 - 45 mm	42.5 mm	Yes
Lower Rib Displacement	37 - 44 mm	41.3 mm	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

**Upper Rib**

**Rib Module: 175-4008-A**

**Rib Foam: 175-4003-07229**

**Center Rib**

**Rib Module: 175-4008-A**

**Rib Foam: E2A-DCT-04082**

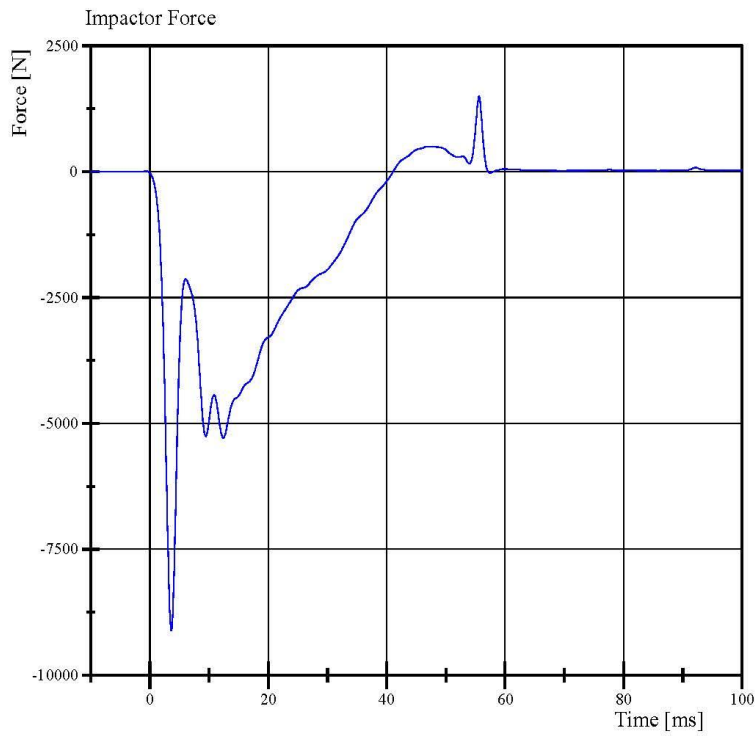
**Lower Rib**

**Rib Module: 175-4008-A-06-017**

**Rib Foam: 175-4003-05125**

# Transportation Research Center Inc.

Left Lower Thorax  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017



Filter Class: CFC\_180  
Max: 1,503.1 N at 55.6 ms  
Min: -9,108.5 N at 3.6 ms

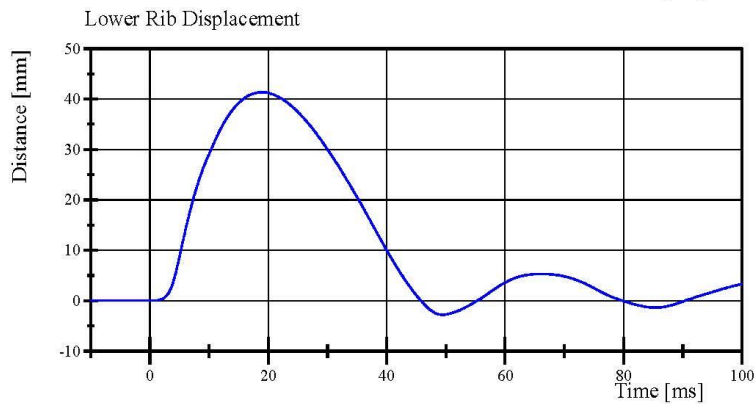
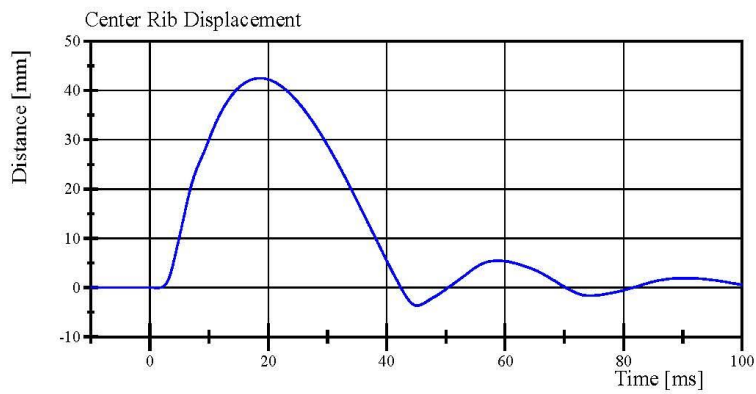
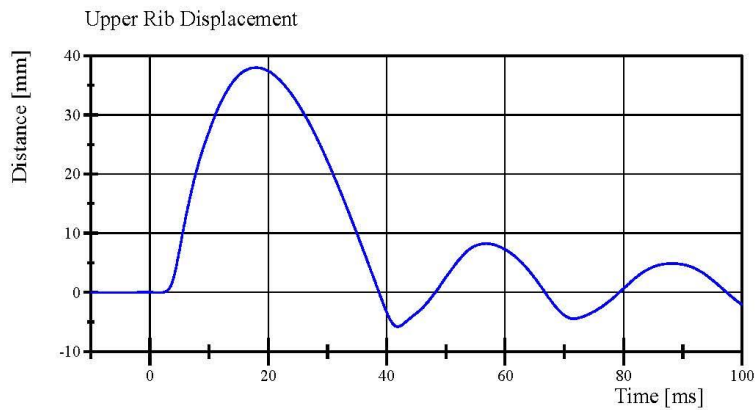
Specification Source: CFR49 Part 572 Subpart U  
with Polarity in accordance with J211

12.08.2017 15:17:24 411



# Transportation Research Center Inc.

Left Lower Thorax  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017



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

12.08.2017 15:17:25 411



## Transportation Research Center Inc.

Left Lateral Lumbar  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.093 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-53.0 deg	Yes
Time of Peak	39 - 53 ms	45.4 ms	Yes
Headform Flexion Decay			
- Peak to Zero	37 - 57 ms	39.0 ms	Yes

**Test meets specifications.**

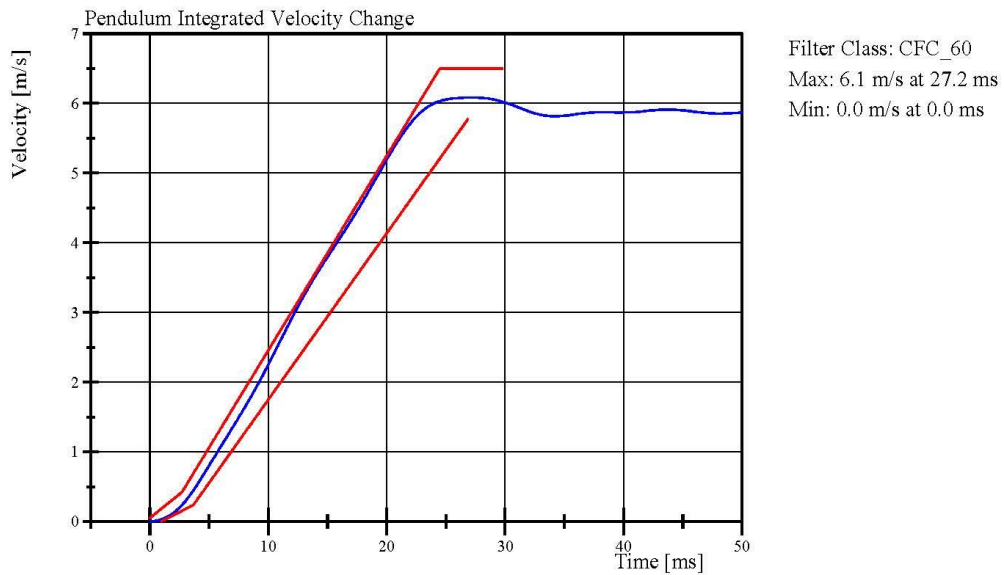
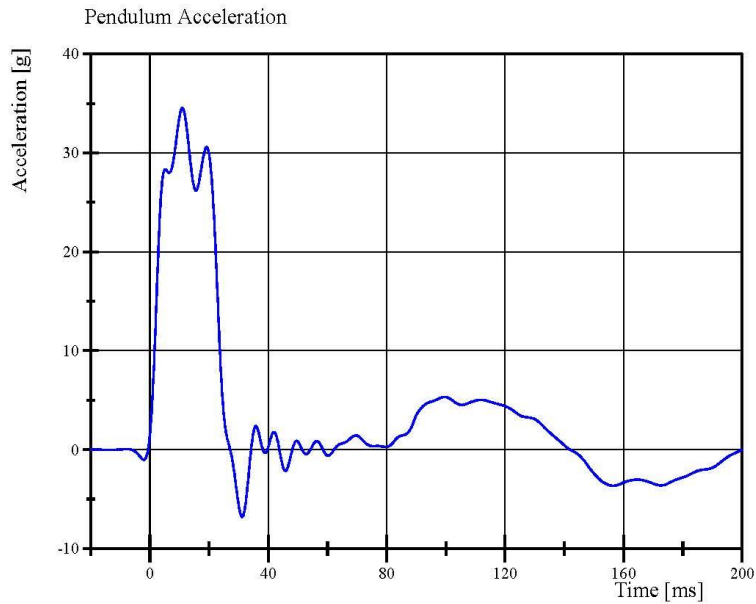
**Condition:** Used

**Comments:**

**Lumbar S/N:** 50375

# Transportation Research Center Inc.

Left Lateral Lumbar  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017



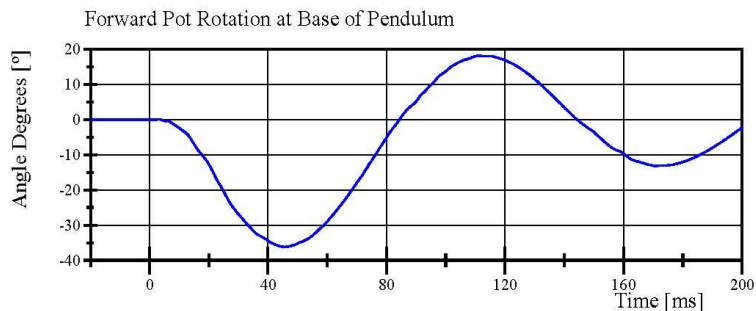
Specification Source: CFR49 Part 572 Subpart U  
with Polarity in accordance with J211

12.08.2017 11:09:30 640

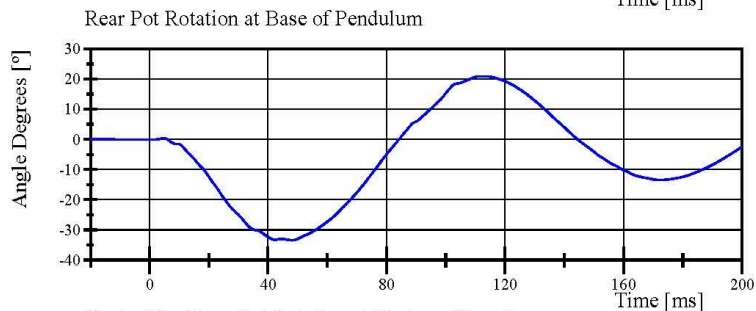


# Transportation Research Center Inc.

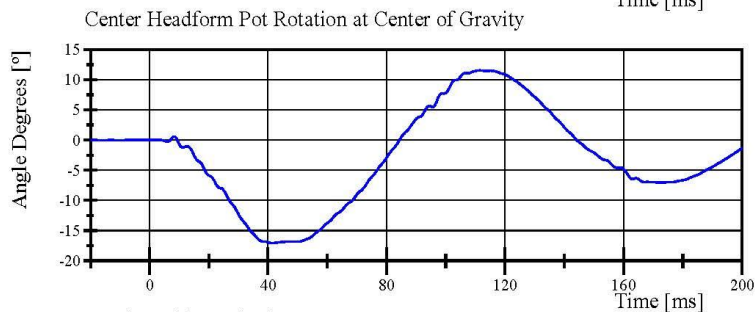
Left Lateral Lumbar  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/8/2017



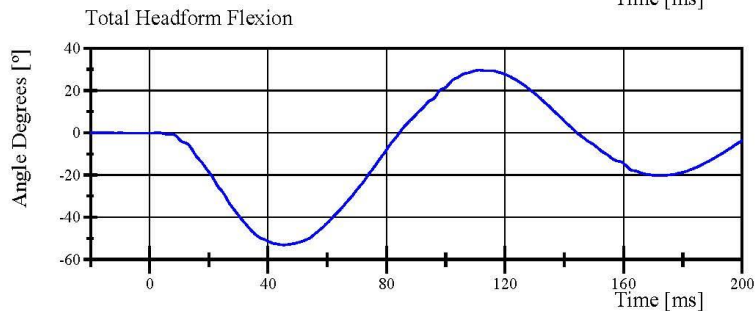
Filter Class: CFC\_180  
Max: 18.2 ° at 111.2 ms  
Min: -36.2 ° at 45.6 ms



Filter Class: CFC\_180  
Max: 20.9 ° at 111.6 ms  
Min: -33.4 ° at 48.2 ms



Filter Class: CFC\_180  
Max: 11.6 ° at 111.4 ms  
Min: -17.0 ° at 41.4 ms



Filter Class: CFC\_180  
Max: 29.7 ° at 111.3 ms  
Min: -53.0 ° at 45.4 ms

## Transportation Research Center Inc.

Left Lateral Pelvis  
ES-2re Serial No. F030 Certification No. 53-3  
Test Date: 12/9/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.25 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,349.1 N	Yes
Time of Peak	11.8 - 16.1 ms	13.36 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,278.3 N	Yes
Time of Peak	12.2 - 17.0 ms	12.72 ms	Yes

**Test meets specifications.**

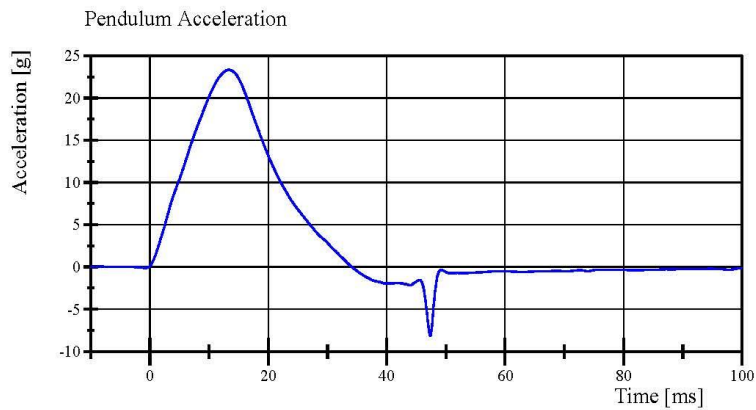
**Condition:** Used

**Comments:**

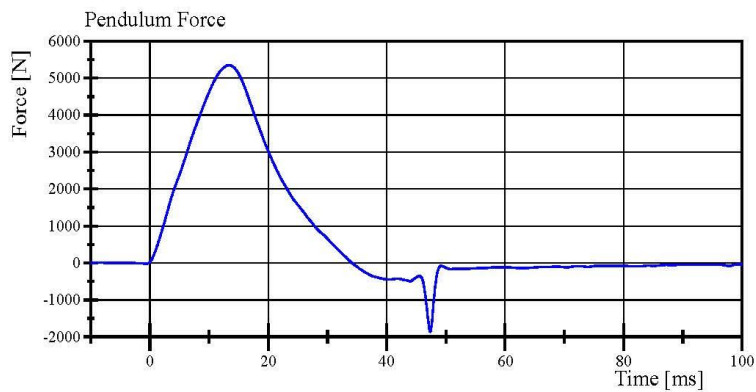
**Pelvis Skin S/N:** N/A

# Transportation Research Center Inc.

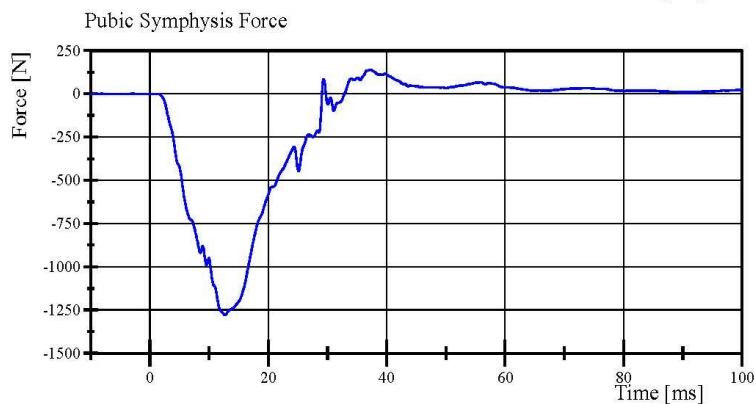
Left Lateral Pelvis  
ES-2re Serial No. F030 Certification No. 53-3  
Test Date: 12/9/2017



Filter Class: CFC\_180  
Max: 23.3 g at 13.4 ms  
Min: -8.1 g at 47.4 ms



Filter Class: CFC\_180  
Max: 5,349.1 N at 13.4 ms  
Min: -1,865.6 N at 47.4 ms



Filter Class: CFC\_600  
Max: 139.7 N at 37.3 ms  
Min: -1,278.3 N at 12.7 ms

## Transportation Research Center Inc.

Left Lateral Abdomen  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/9/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.03 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,377.0 N	Yes
Time of Peak	10.6 - 13.0 ms	11.52 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,422.1 N	Yes
Time of Peak	10.0 - 12.3 ms	10.40 ms	Yes

**Test meets specifications.**

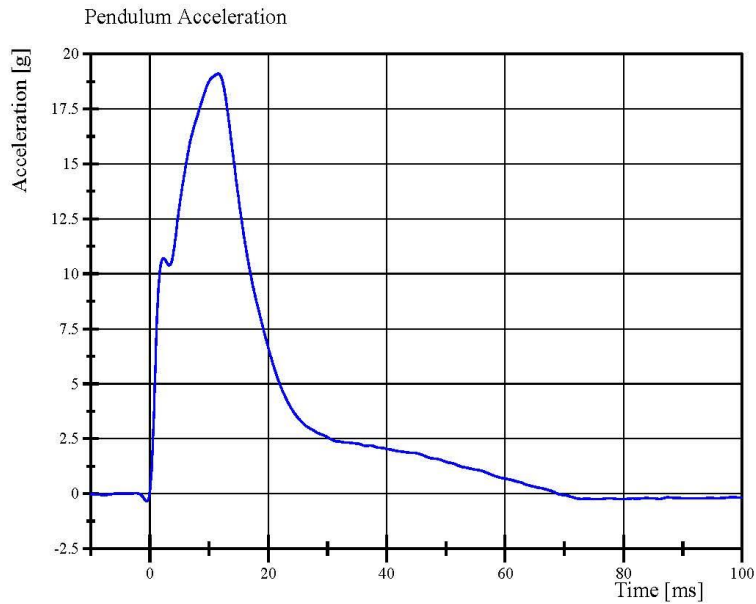
**Condition: Used**

**Comments:**

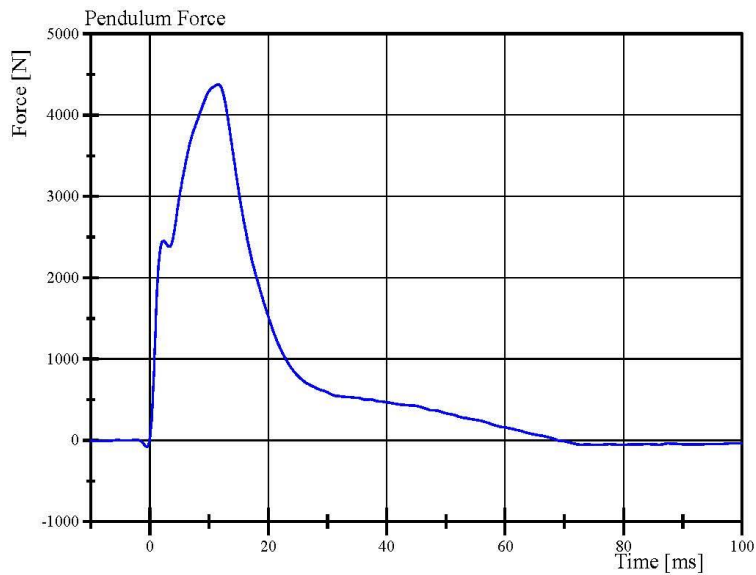
**Abdomen S/N: 1066**

# Transportation Research Center Inc.

Left Lateral Abdomen  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/9/2017



Filter Class: CFC\_180  
Max: 19.1 g at 11.5 ms  
Min: -0.3 g at -0.5 ms



Filter Class: CFC\_180  
Max: 4,377.0 N at 11.5 ms  
Min: -77.9 N at -0.5 ms

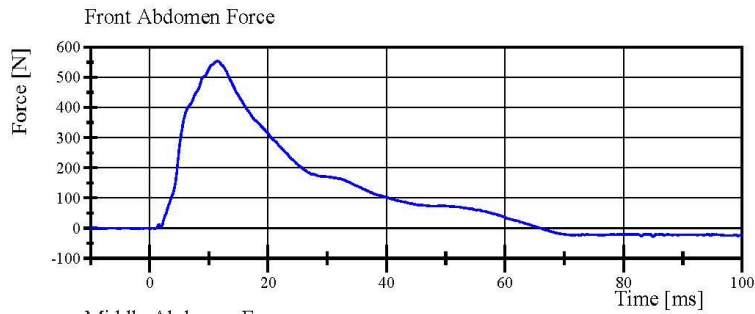
Specification Source: CFR49 Part 572 Subpart U  
with Polarity in accordance with J211

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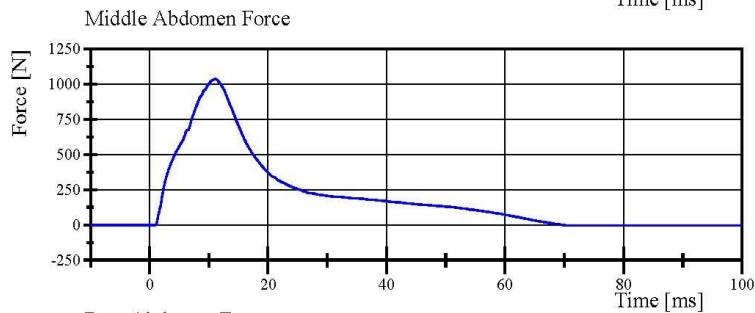


# Transportation Research Center Inc.

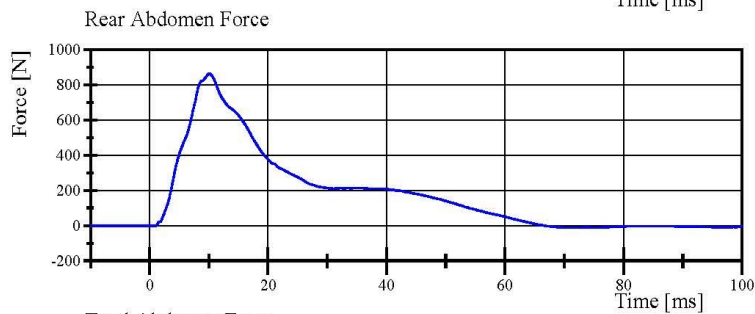
Left Lateral Abdomen  
ES-2re Serial No. F030 Certification No. 53-1  
Test Date: 12/9/2017



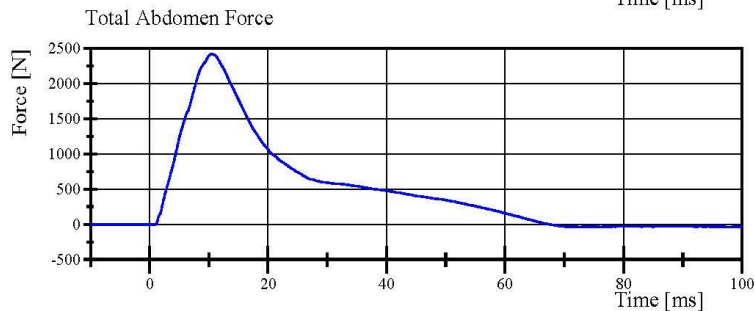
Filter Class: CFC\_600  
Max: 553.1 N at 11.4 ms  
Min: -27.5 N at 85.0 ms



Filter Class: CFC\_600  
Max: 1,036.3 N at 11.1 ms  
Min: -5.6 N at 95.1 ms



Filter Class: CFC\_600  
Max: 863.2 N at 10.1 ms  
Min: -10.5 N at 70.4 ms



Filter Class: CFC\_600  
Max: 2,422.1 N at 10.4 ms  
Min: -39.0 N at 72.6 ms

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

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**Post-Test Calibration Sheets  
Driver S/N F030**

**Transportation Research Center Inc.**  
**572U ES-2re Dummy**  
**External Dimensions**  
**Serial No. F030 Calibration No. 54**

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	911	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	561	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	347	Yes
4	Seat to Hip Joint (center of bolt)	97.0 - 103.0	97	Yes
5	Sole to Seat, Sitting	433.0 - 451.0	444	Yes
6	Head Width	152.0 - 158.0	155	Yes
7	Shoulder/Arm Width	461.0 - 479.0	475	Yes
8	Thorax Width	322.0 - 332.0	326	Yes
9	Abdomen Width	273.0 - 287.0	282	Yes
10	Pelvis Lap Width	359.0 - 373.0	367	Yes
11	Head Depth	196.0 - 206.0	202	Yes
12	Thorax Depth	262.0 - 272.0	262	Yes
13	Abdomen Depth	194.0 - 204.0	199	Yes
14	Pelvis Depth	235.0 - 245.0	242	Yes
15	Back of Buttocks to Hip Joint (center of bolt)	150.0 - 160.0	156	Yes
16	Back of Buttocks to Front of Knee	597.0 - 615.0	605	Yes

Baseline 10/07/05



## Transportation Research Center Inc.

Left Lateral Head Drop  
ES-2re Serial No. F030 Certification No. 54-4  
Test Date: 12/19/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Peak Resultant Acceleration	125 - 155 g	145.6 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	9.2 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

**Test meets specifications.**

**Condition:** Used

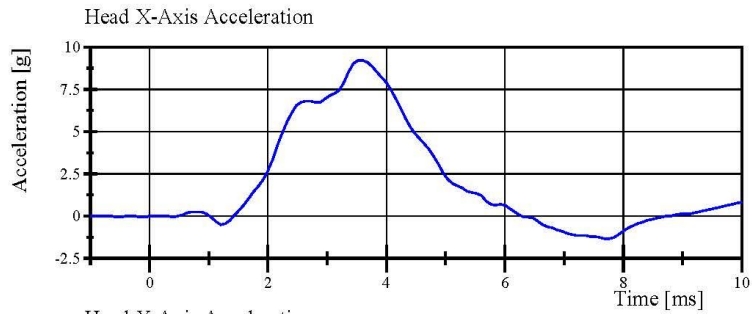
**Comments:**

**Head Skin S/N:** DP6812

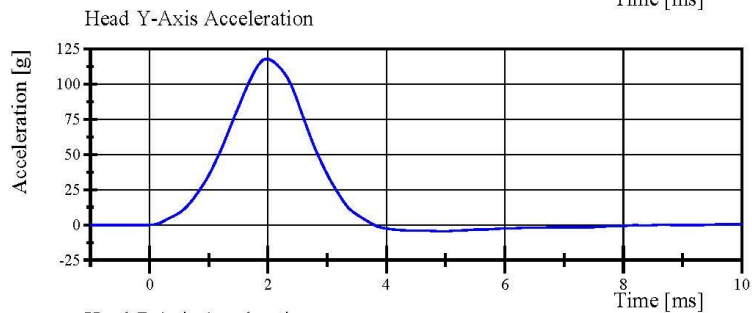
**Skull S/N:** N/A

# Transportation Research Center Inc.

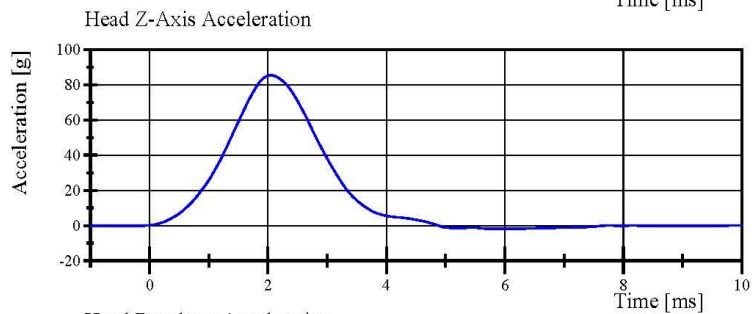
Left Lateral Head Drop  
ES-2re Serial No. F030 Certification No. 54-4  
Test Date: 12/19/2017



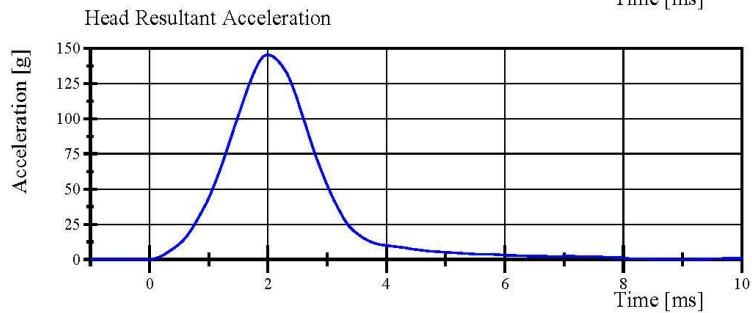
Filter Class: CFC\_1000  
Max: 9.2 g at 3.5 ms  
Min: -1.3 g at 7.7 ms



Filter Class: CFC\_1000  
Max: 118.0 g at 2.0 ms  
Min: -4.6 g at 5.0 ms



Filter Class: CFC\_1000  
Max: 85.3 g at 2.0 ms  
Min: -1.8 g at 5.8 ms



Filter Class: CFC\_1000  
Max: 145.6 g at 2.0 ms  
Min: 0.0 g at -1.0 ms

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

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## Transportation Research Center Inc.

Left Lateral Neck  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/18/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.38 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-52.9 deg	Yes
Time of Peak	54 - 66 ms	55.8 ms	Yes
Headform Flexion Decay			
- Peak to Zero	53 - 88 ms	68.6 ms	Yes

**Test meets specifications.**

**Condition:** Used

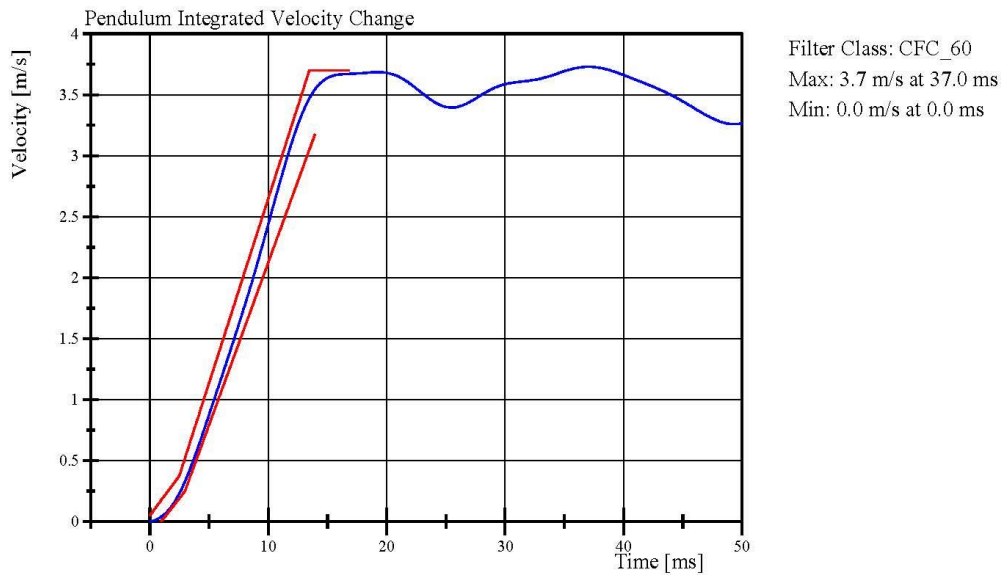
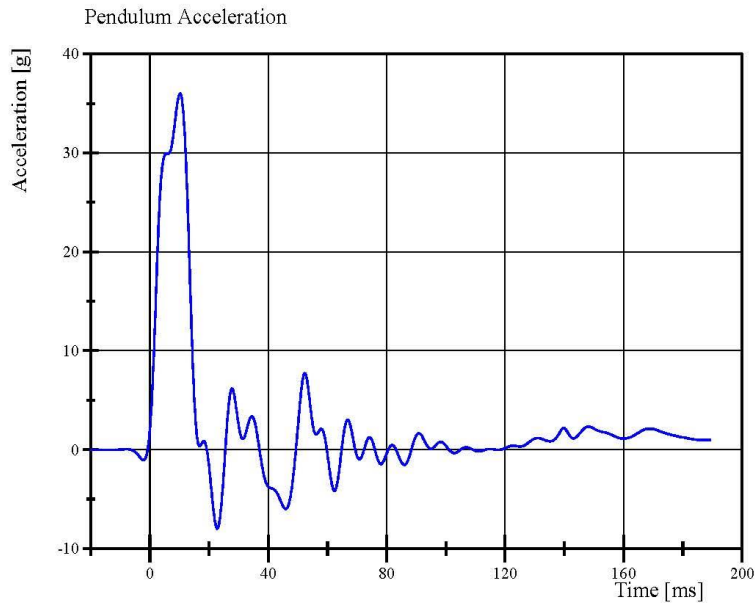
**Comments:**

Neck S/N: DI5031

Neck Buffer Molded(Yellow) S/N: N/A

# Transportation Research Center Inc.

Left Lateral Neck  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/18/2017



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

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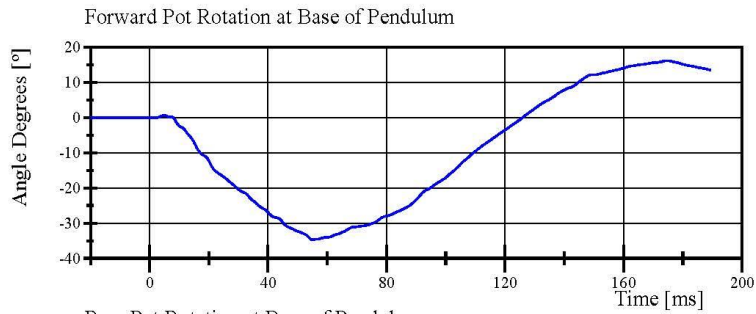


# Transportation Research Center Inc.

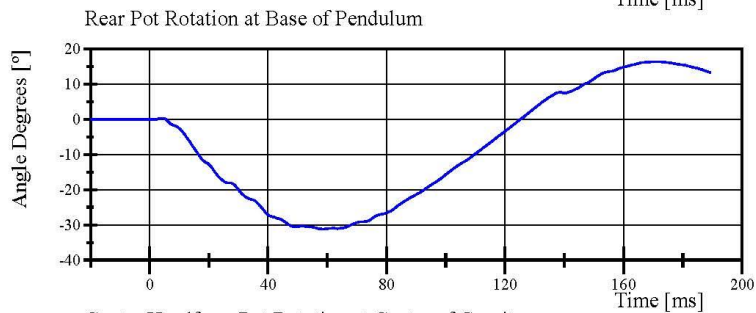
Left Lateral Neck

ES-2re Serial No. F030 Certification No. 54-1

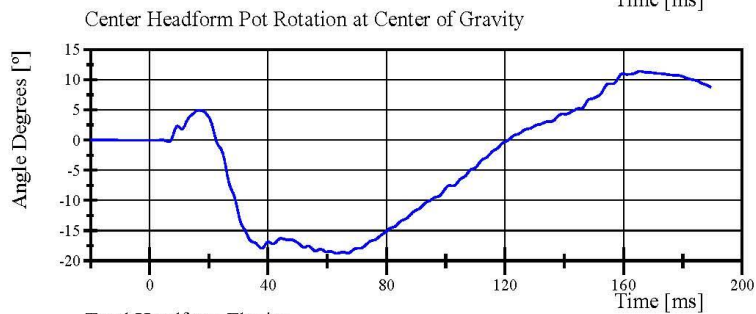
Test Date: 12/18/2017



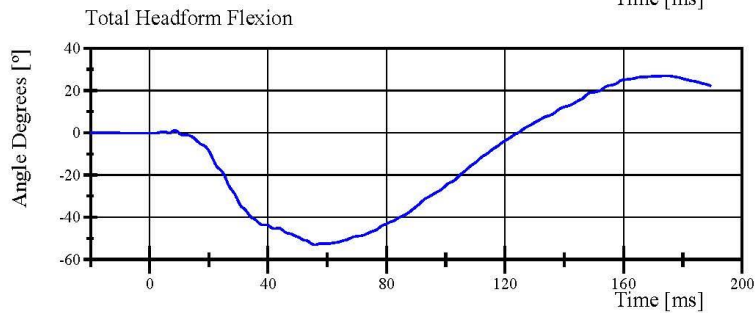
Filter Class: CFC\_180  
Max: 16.2 ° at 174.5 ms  
Min: -34.7 ° at 55.0 ms



Filter Class: CFC\_180  
Max: 16.3 ° at 171.1 ms  
Min: -31.2 ° at 58.6 ms



Filter Class: CFC\_180  
Max: 11.4 ° at 165.6 ms  
Min: -18.7 ° at 63.2 ms



Filter Class: CFC\_180  
Max: 27.1 ° at 174.3 ms  
Min: -52.9 ° at 55.8 ms

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

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## Transportation Research Center Inc.

Left Lateral Shoulder  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/19/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.30 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-10.03 g	Yes

**Test meets specifications.**

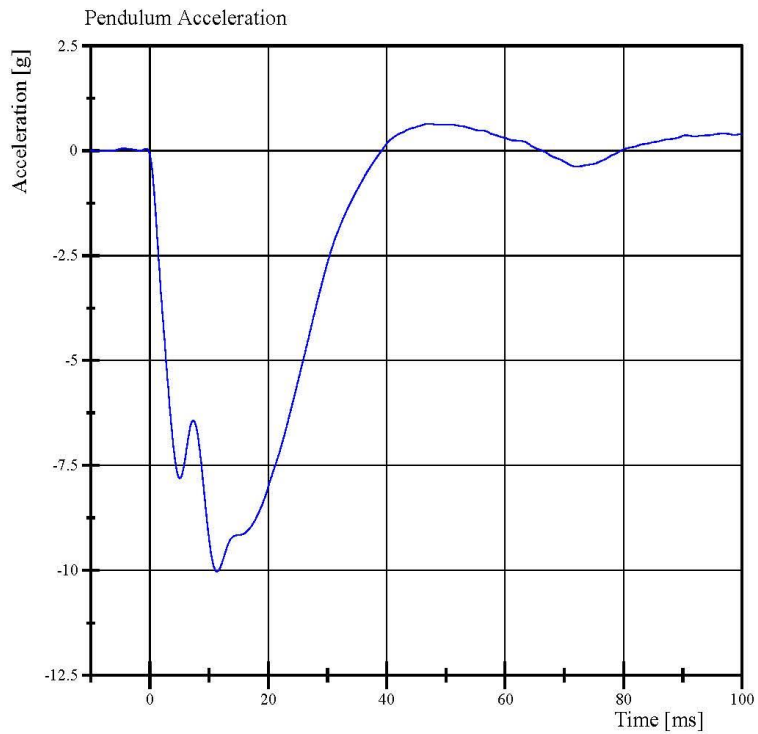
**Condition: Used**

**Comments:**

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

# Transportation Research Center Inc.

Left Lateral Shoulder  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/19/2017



Filter Class: CFC\_180  
Max: 0.6 g at 46.9 ms  
Min: -10.0 g at 11.4 ms

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

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## Transportation Research Center Inc.

3.0 m/s Upper Upper Full Rib Module  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/18/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.1 mm	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

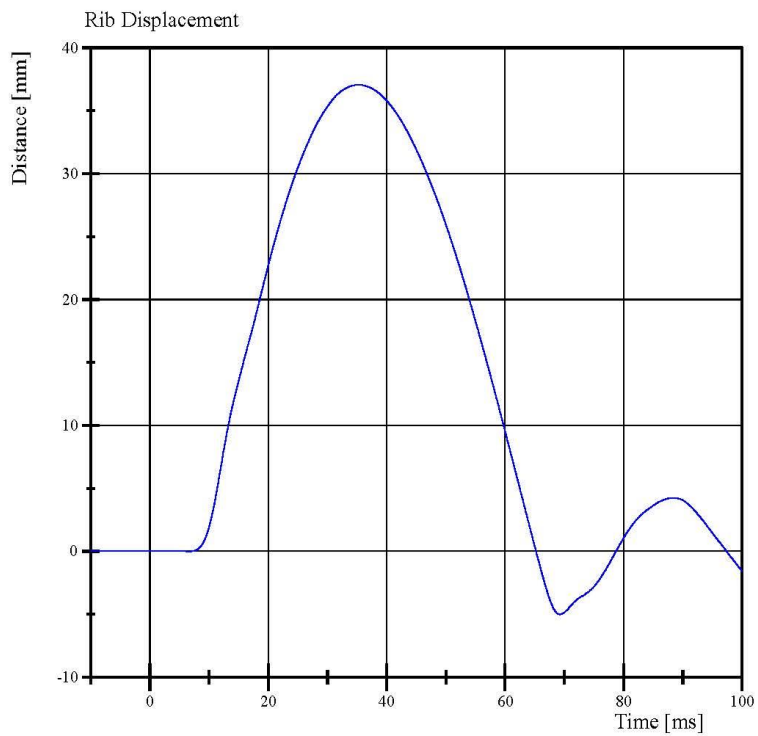
**Drop Height: 816mm**

**Rib Module: 175-4008-A**

**Rib Foam: 07229**

# Transportation Research Center Inc.

3.0 m/s Upper Upper Full Rib Module  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/18/2017



Filter Class: CFC\_180  
Max: 37.1 mm at 35.3 ms  
Min: -5.0 mm at 69.3 ms

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

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## Transportation Research Center Inc.

4.0 m/s Upper Upper Full Rib Module  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/18/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	46.3 mm	Yes

**Test meets specifications.**

**Condition:** Used

**Comments:**

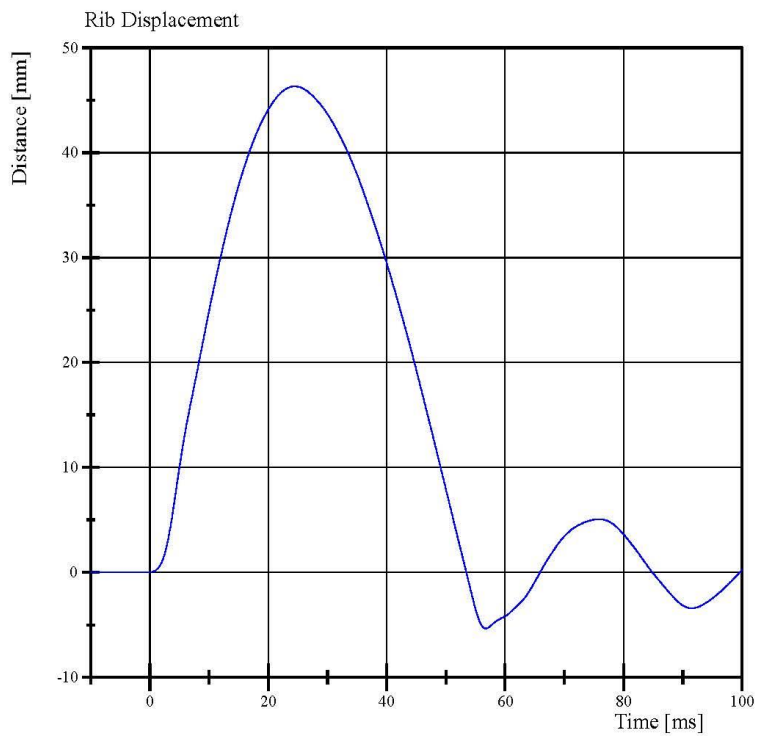
**Drop Height:** 816mm

**Rib Module:**175-4008-A

**Rib Foam:** 07229

# Transportation Research Center Inc.

4.0 m/s Upper Upper Full Rib Module  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/18/2017



Filter Class: CFC\_180  
Max: 46.3 mm at 24.5 ms  
Min: -5.4 mm at 56.7 ms

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

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## Transportation Research Center Inc.

3.0 m/s Center Full Rib Module  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/18/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.2 mm	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

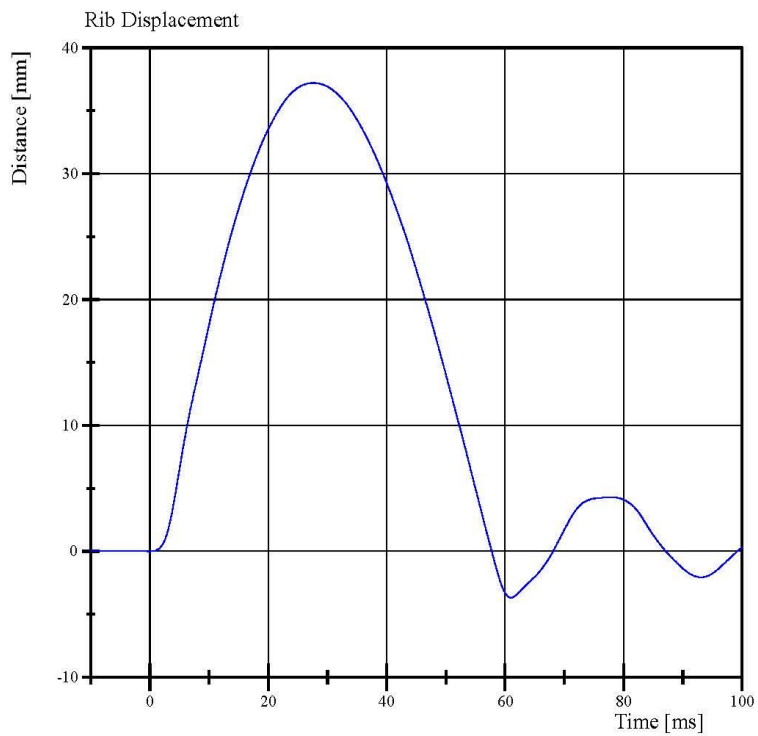
**Drop Height: 816 mm**

**Rib Module: 175-4008-A**

**Rib Foam: E2A-DCT-04082**

# Transportation Research Center Inc.

3.0 m/s Center Full Rib Module  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/18/2017



Filter Class: CFC\_180  
Max: 37.2 mm at 27.6 ms  
Min: -3.7 mm at 61.0 ms

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

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## Transportation Research Center Inc.

4.0 m/s Center Full Rib Module  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/18/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.2 mm	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

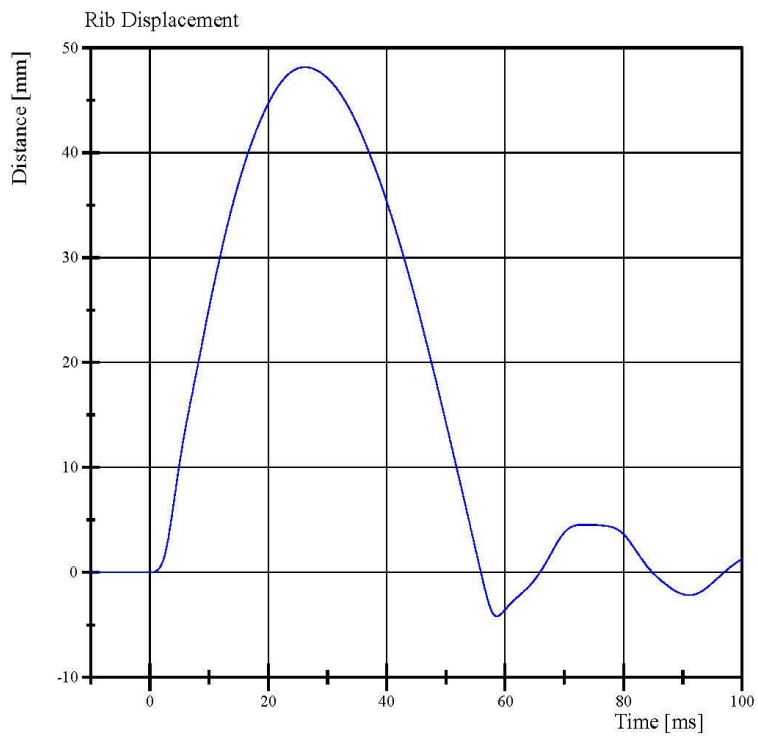
**Drop Height: 816 mm**

**Rib Module: 175-4008-A**

**Rib Foam: E2A-DCT-04082**

# Transportation Research Center Inc.

4.0 m/s Center Full Rib Module  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/18/2017



Filter Class: CFC\_180  
Max: 48.2 mm at 26.2 ms  
Min: -4.2 mm at 58.6 ms

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

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## Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/18/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.7 mm	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

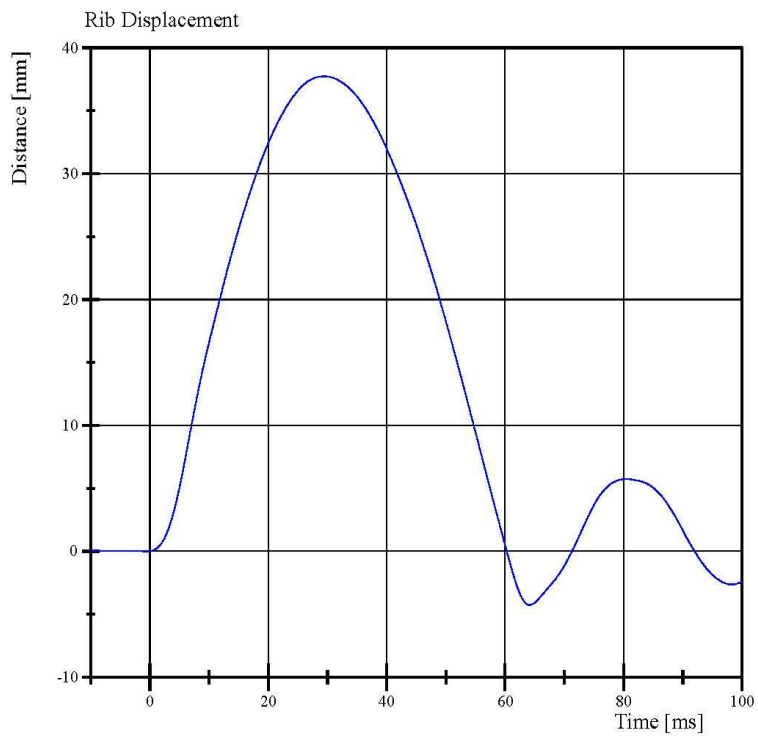
**Drop Height: 816mm**

**Rib Module: 175-4008-A-06-017**

**Rib Foam: 175-4003-05125**

# Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/18/2017



Filter Class: CFC\_180  
Max: 37.7 mm at 29.4 ms  
Min: -4.3 mm at 64.2 ms

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

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## Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/18/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.6 mm	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

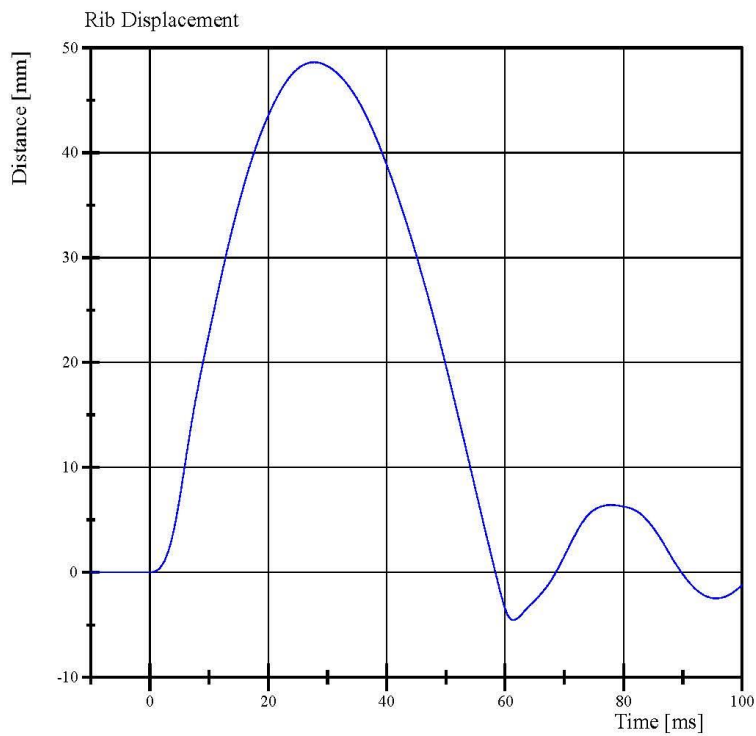
**Drop Height: 816mm**

**Rib Module: 175-4008-A-06-017**

**Rib Foam: 175-4003-05125**

# Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/18/2017



Filter Class: CFC\_180  
Max: 48.6 mm at 27.8 ms  
Min: -4.6 mm at 61.4 ms

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

12.18.2017 10:07:45 444



## Transportation Research Center Inc.

Left Lower Thorax  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/19/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.543 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,431.2 N	Yes
Upper Rib Displacement	34 - 41 mm	39.1 mm	Yes
Center Rib Displacement	37 - 45 mm	43.0 mm	Yes
Lower Rib Displacement	37 - 44 mm	41.1 mm	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

**Upper Rib**

**Rib Module: 175-4008-A**

**Rib Foam: 175-4003-07229**

**Center Rib**

**Rib Module: 175-4008-A**

**Rib Foam: E2A-DCT-04082**

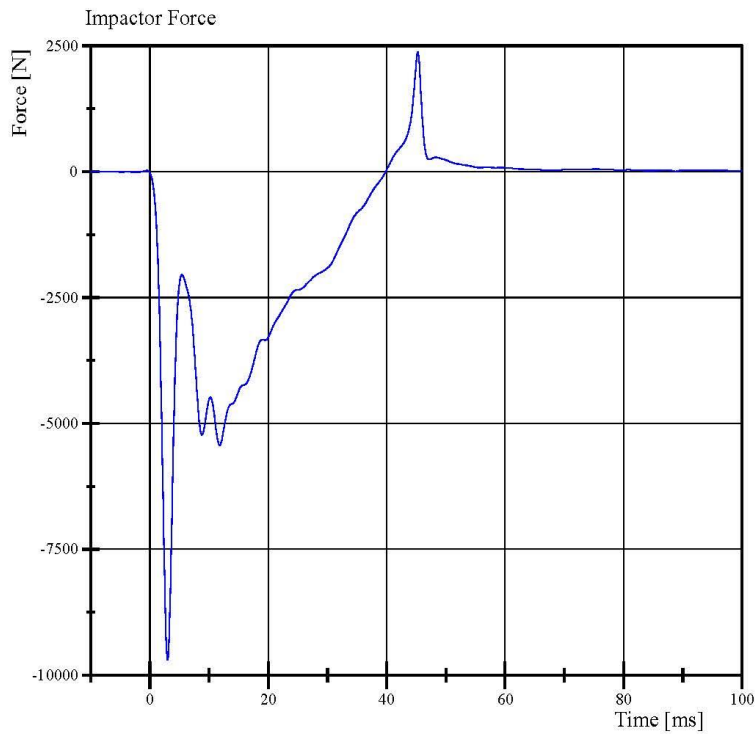
**Lower Rib**

**Rib Module: 175-4008-A-06-017**

**Rib Foam: 175-4003-05125**

# Transportation Research Center Inc.

Left Lower Thorax  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/19/2017



Filter Class: CFC\_180  
Max: 2,377.3 N at 45.3 ms  
Min: -9,693.9 N at 3.0 ms

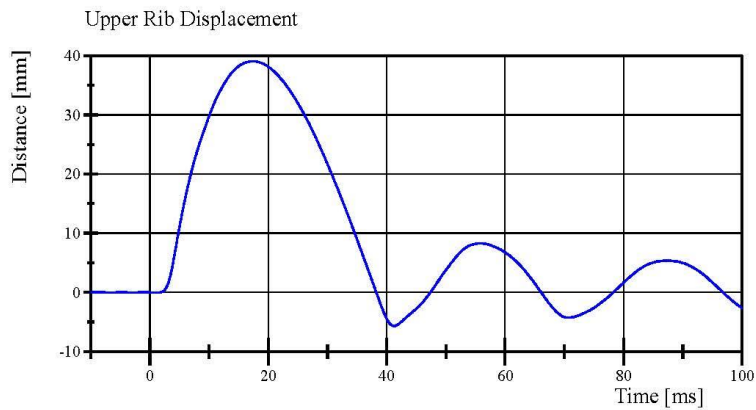
Specification Source: CFR49 Part 572 Subpart U  
with Polarity in accordance with J211

12.19.2017 08:26:08 426

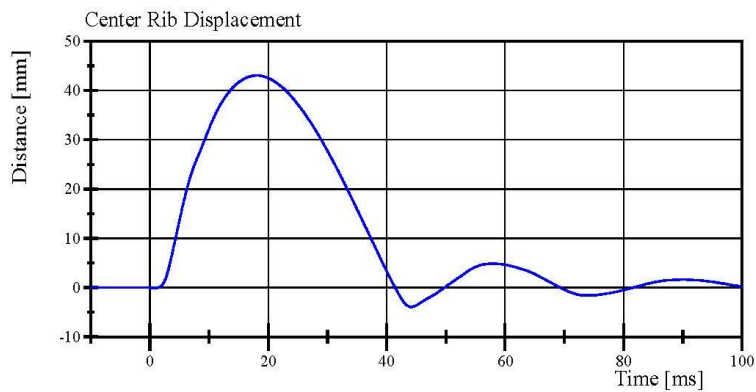


# Transportation Research Center Inc.

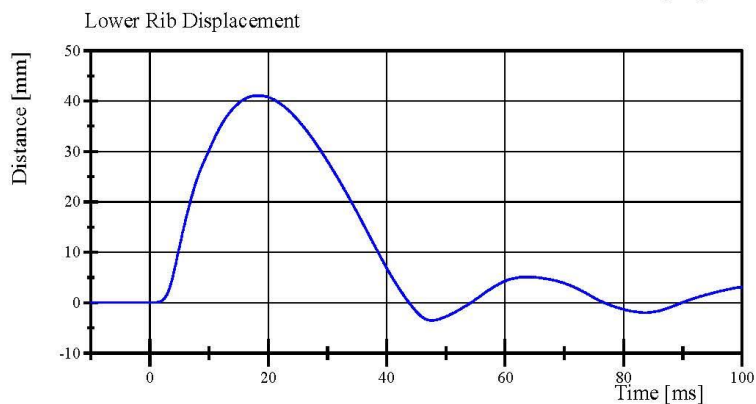
Left Lower Thorax  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/19/2017



Filter Class: CFC\_180  
Max: 39.1 mm at 17.4 ms  
Min: -5.7 mm at 41.2 ms



Filter Class: CFC\_180  
Max: 43.0 mm at 18.1 ms  
Min: -3.9 mm at 44.2 ms



Filter Class: CFC\_180  
Max: 41.1 mm at 18.3 ms  
Min: -3.5 mm at 47.6 ms

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

12.19.2017 08:26:08 426



## Transportation Research Center Inc.

Left Lateral Lumbar  
ES-2re Serial No. F030 Certification No. 54-12  
Test Date: 12/20/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.068 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-46.1 deg	Yes
Time of Peak	39 - 53 ms	43.7 ms	Yes
Headform Flexion Decay			
- Peak to Zero	37 - 57 ms	38.7 ms	Yes

**Test meets specifications.**

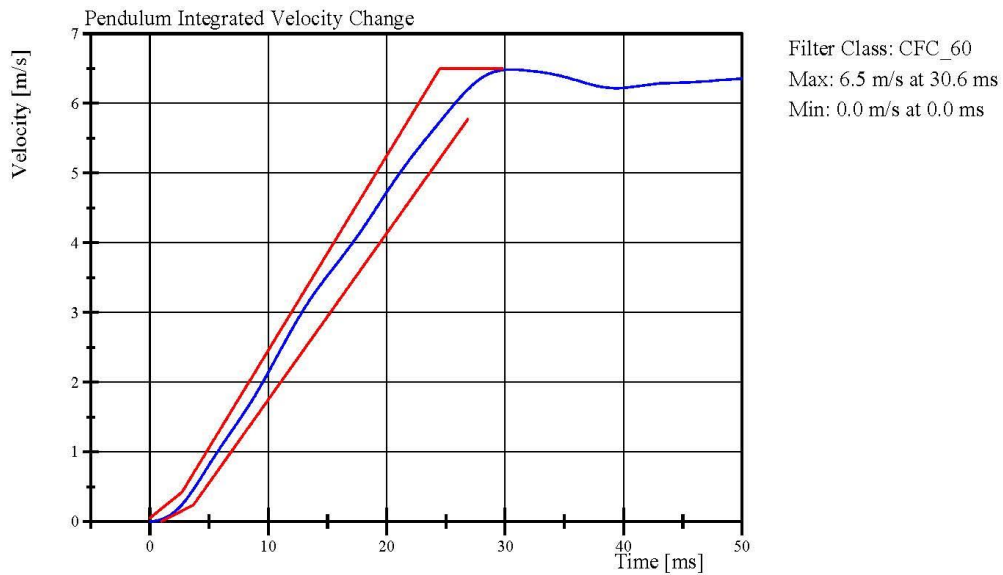
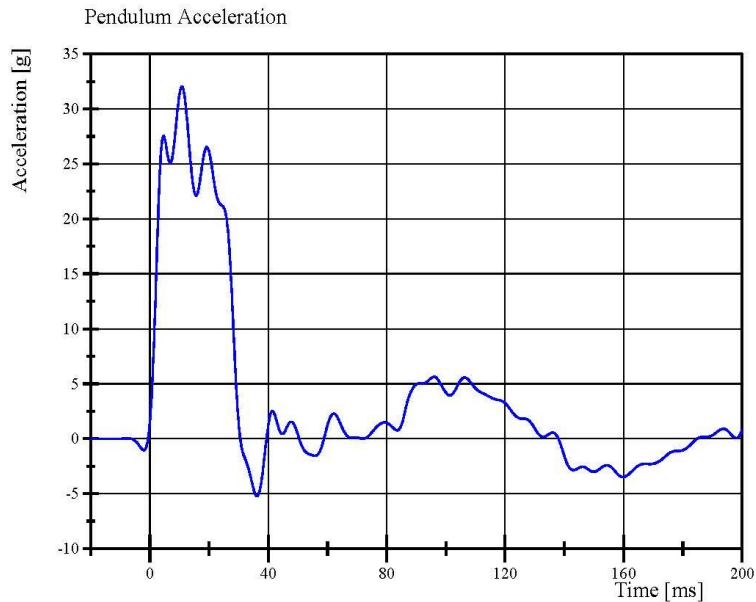
**Condition:** Used

**Comments:**

**Lumbar S/N: 175-5501 DP0815**

# Transportation Research Center Inc.

Left Lateral Lumbar  
ES-2re Serial No. F030 Certification No. 54-12  
Test Date: 12/20/2017



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

12.20.2017 08:24:53 642

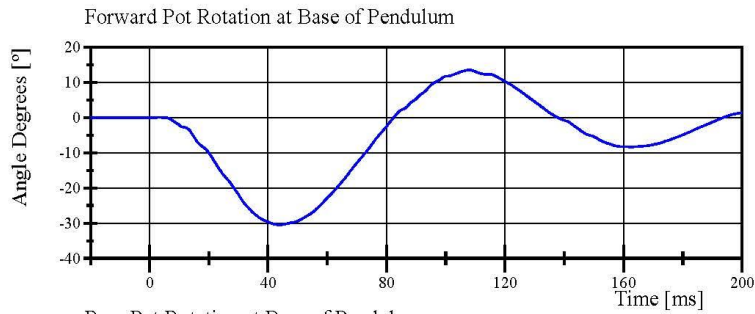


# Transportation Research Center Inc.

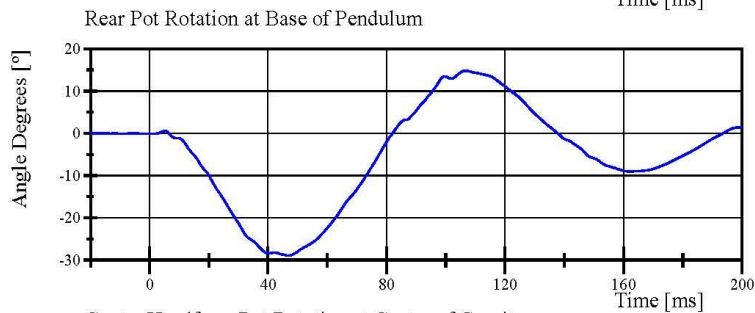
Left Lateral Lumbar

ES-2re Serial No. F030 Certification No. 54-12

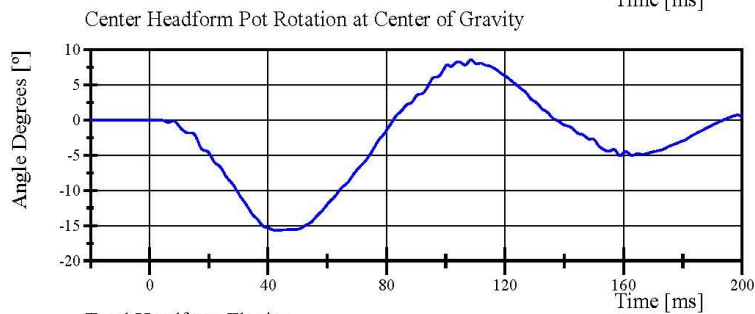
Test Date: 12/20/2017



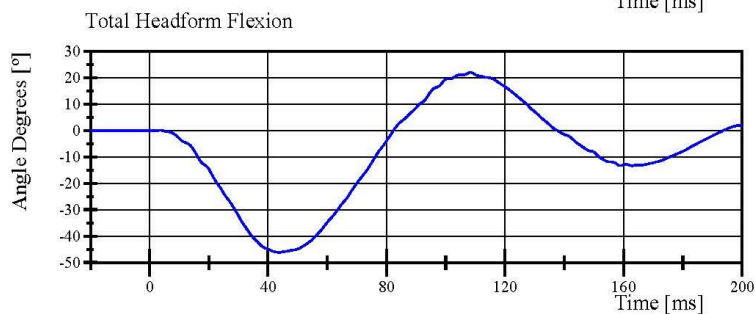
Filter Class: CFC\_180  
Max: 13.6 ° at 107.8 ms  
Min: -30.5 ° at 43.8 ms



Filter Class: CFC\_180  
Max: 14.9 ° at 106.7 ms  
Min: -28.9 ° at 46.9 ms



Filter Class: CFC\_180  
Max: 8.6 ° at 108.6 ms  
Min: -15.7 ° at 42.7 ms



Filter Class: CFC\_180  
Max: 22.1 ° at 108.3 ms  
Min: -46.1 ° at 43.7 ms

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

12.20.2017 08:24:54 642



## Transportation Research Center Inc.

Left Lateral Pelvis  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/19/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.30 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	4,985.6 N	Yes
Time of Peak	11.8 - 16.1 ms	11.92 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,301.4 N	Yes
Time of Peak	12.2 - 17.0 ms	12.88 ms	Yes

**Test meets specifications.**

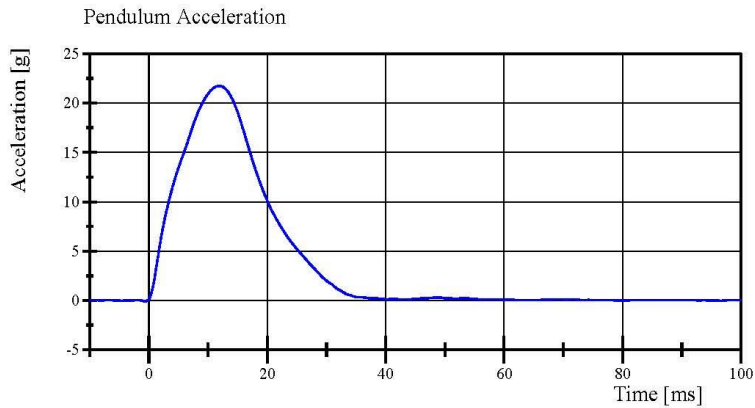
**Condition: Used**

**Comments:**

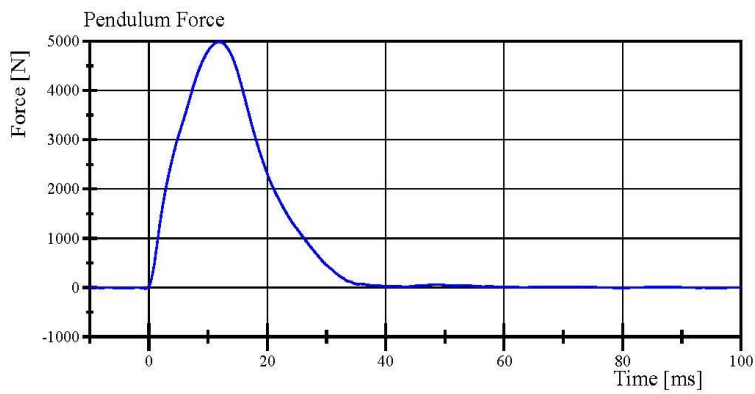
**Pelvis Skin S/N: N/A**

# Transportation Research Center Inc.

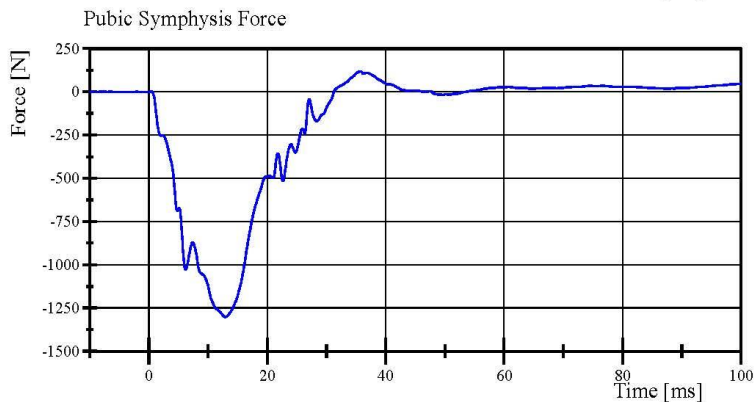
Left Lateral Pelvis  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/19/2017



Filter Class: CFC\_180  
Max: 21.8 g at 11.9 ms  
Min: -0.1 g at -0.6 ms



Filter Class: CFC\_180  
Max: 4,985.6 N at 11.9 ms  
Min: -20.9 N at -0.6 ms



Filter Class: CFC\_600  
Max: 118.4 N at 35.8 ms  
Min: -1,301.4 N at 12.9 ms

## Transportation Research Center Inc.

Left Lateral Abdomen  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/19/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.08 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,213.7 N	Yes
Time of Peak	10.6 - 13.0 ms	10.88 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,462.3 N	Yes
Time of Peak	10.0 - 12.3 ms	11.04 ms	Yes

**Test meets specifications.**

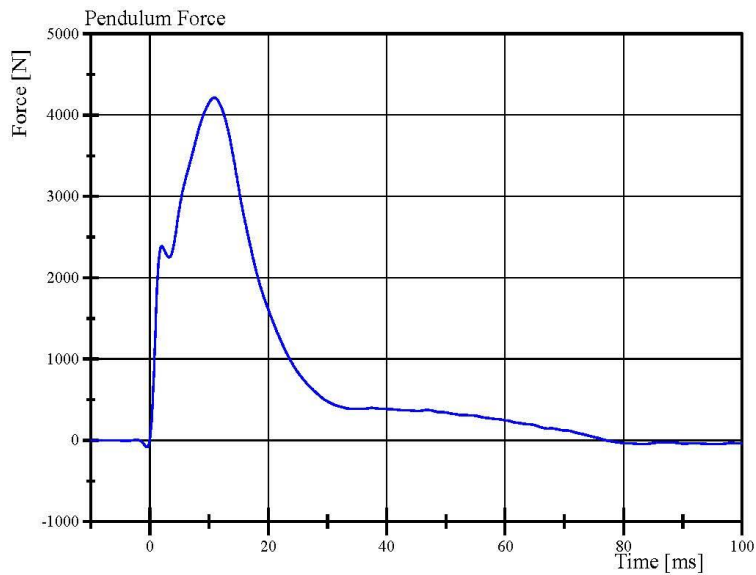
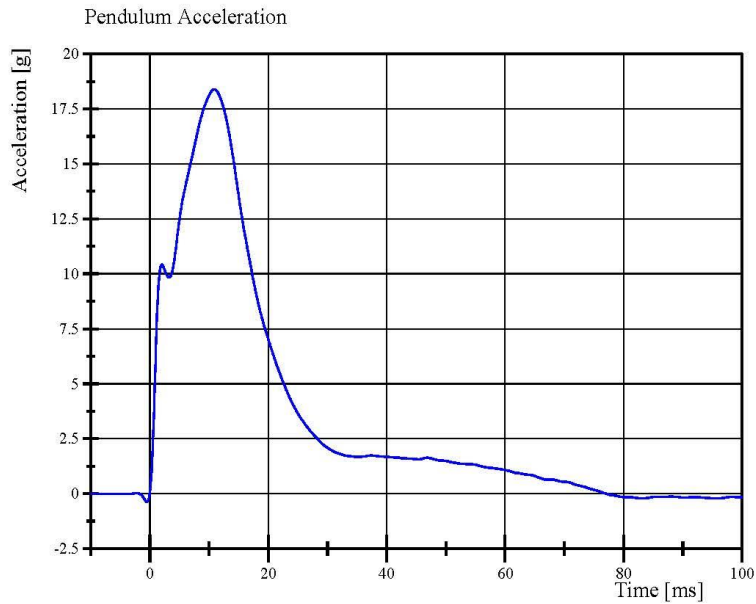
**Condition: Used**

**Comments:**

**Abdomen S/N: 1066**

# Transportation Research Center Inc.

Left Lateral Abdomen  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/19/2017



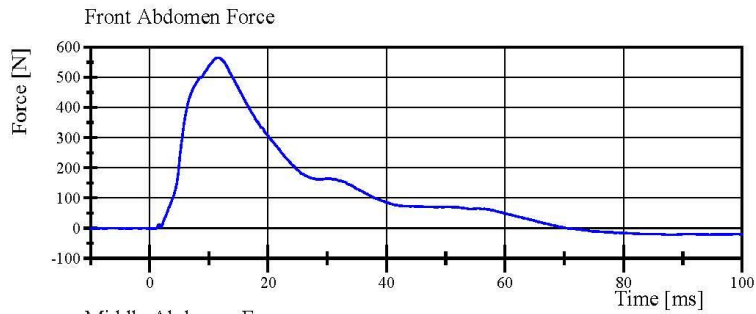
Specification Source: CFR49 Part 572 Subpart U  
with Polarity in accordance with J211

12.19.2017 08:33:38 500

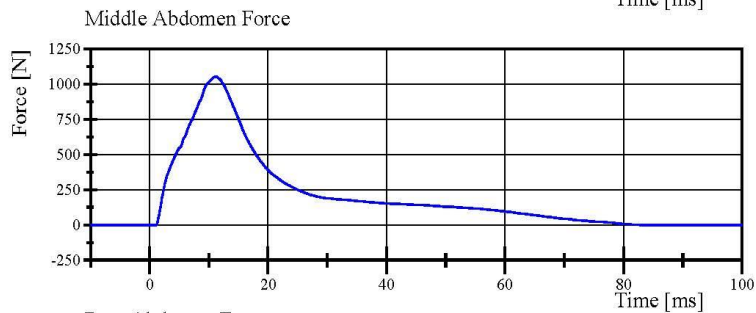


# Transportation Research Center Inc.

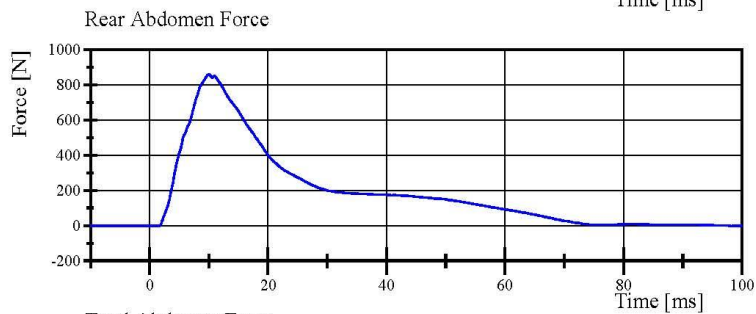
Left Lateral Abdomen  
ES-2re Serial No. F030 Certification No. 54-1  
Test Date: 12/19/2017



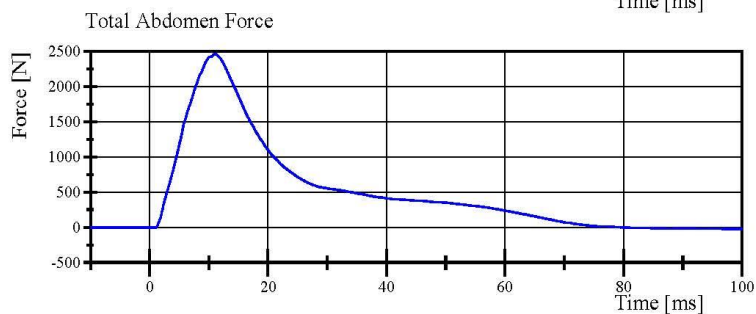
Filter Class: CFC\_600  
Max: 565.2 N at 11.7 ms  
Min: -21.3 N at 87.4 ms



Filter Class: CFC\_600  
Max: 1,053.0 N at 11.1 ms  
Min: -2.0 N at 1.0 ms



Filter Class: CFC\_600  
Max: 861.4 N at 10.0 ms  
Min: -2.3 N at 98.2 ms



Filter Class: CFC\_600  
Max: 2,462.3 N at 11.0 ms  
Min: -23.0 N at 98.2 ms

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

12.19.2017 08:33:39 500



**Pre-Test Calibration Sheets**  
**Passenger S/N 305**

**Transportation Research Center Inc.**  
**SIDIIs Dummy - Level D**  
**External Dimensions**  
**Serial No. 305 Calibration No. 61**

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	784	Yes
B	Shoulder Pivot Height	437.0 - 453.0	451	Yes
C	H-Point Height	79.0 - 89.0	87	Yes
D	H-Point from Seat Back	141.0 - 151.0	146	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	99	Yes
F	Thigh Clearance	119.0 - 135.0	130	Yes
G	Head Breadth	140.0 - 148.0	143	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	185	Yes
J	Head Circumference	541.0 - 551.0	544	Yes
K	Buttock to Knee Length	514.0 - 540.0	535	Yes
L	Popliteal Height	343.0 - 369.0	348	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	397	Yes
N	Buttock Popliteal Length	416.0 - 442.0	434	Yes
O	Chest Depth without Jacket	195.0 - 211.0	201	Yes
P	Foot Length (right)	216.0 - 232.0	222	Yes
P	Foot Length (left)	216.0 - 232.0	221	Yes
Q	Hip Breadth	313.0 - 323.0	320	Yes
R	Arm Length	249.0 - 259.0	252	Yes
S	Knee Joint to seat Back	478.0 - 493.0	482	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	350	Yes
W	Foot Width (right)	78.0 - 94.0	85	Yes
W	Foot Width (left)	78.0 - 94.0	85	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	874	Yes
Z	Waist Circumference	761.0 - 791.0	780	Yes

## Transportation Research Center Inc.

Left Lateral Head Drop

SID IIS Serial No. 305 Certification No. 61-1

Test Date: 12/9/2017

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	120.5 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-2.2 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

**Test meets specifications.**

**Condition:** Used

**Comments:**

**Head Skin S/N:** 1253

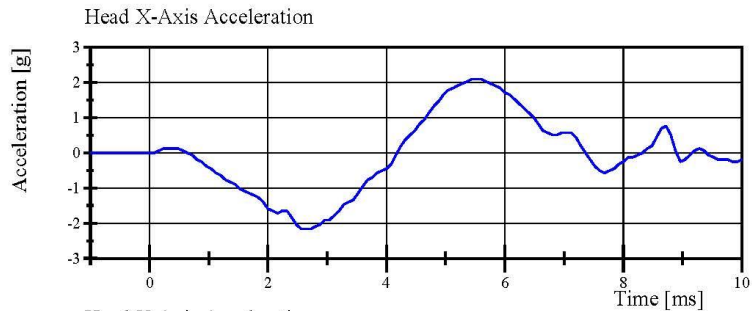
**Skull S/N:** 180/1001/C

# Transportation Research Center Inc.

Left Lateral Head Drop

SID IIS Serial No. 305 Certification No. 61-1

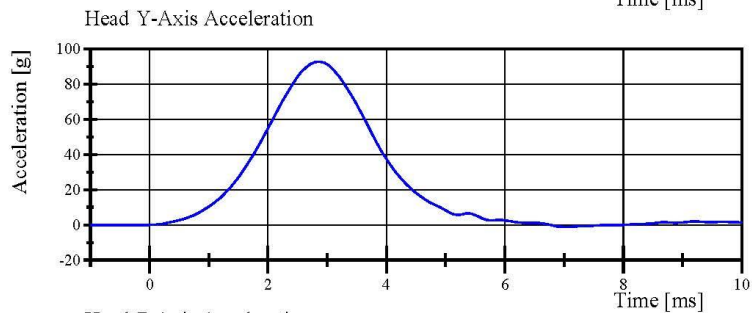
Test Date: 12/9/2017



Filter Class: CFC\_1000

Max: 2.1 g at 5.4 ms

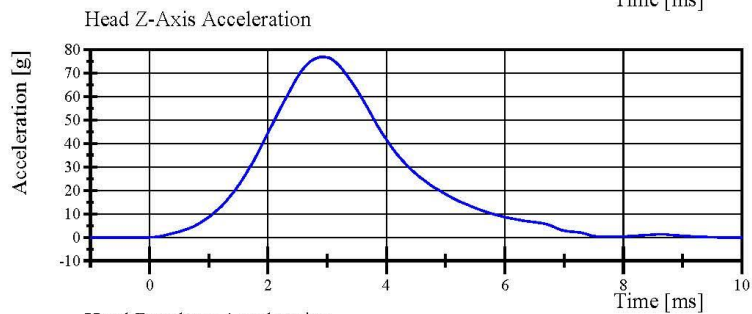
Min: -2.2 g at 2.6 ms



Filter Class: CFC\_1000

Max: 92.8 g at 2.9 ms

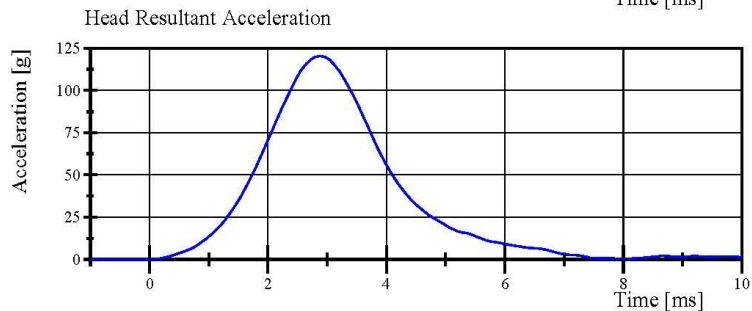
Min: -1.1 g at 7.0 ms



Filter Class: CFC\_1000

Max: 76.9 g at 3.0 ms

Min: -0.1 g at 9.8 ms



Filter Class: CFC\_1000

Max: 120.5 g at 2.9 ms

Min: 0.0 g at -1.0 ms

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

12.09.2017 11:17:03 197



## Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 61-3

Test Date: 12/9/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.581 m/s	Yes
Pendulum Integrated Velocity			
Change at 10 ms	2.20 - 2.80 m/s	2.674 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.969 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.367 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.563 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.574 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-75.2 deg	Yes
Time of Peak	50 - 70 ms	62.6 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	42.0 N·m	Yes
Total Neck Occipital Condyles Moment			
Decay Time to 0 N·m	102 - 126 ms	120.6 ms	Yes

**Test meets specifications.**

**Condition:** Used

**Comments:**

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

**Neck Cable S/N:** N/A

**Nodding Blocks:**

**Front S/N:** DN-3094

**Rear S/N:** 8550-DL6580

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

12.09.2017 14:23:12 721



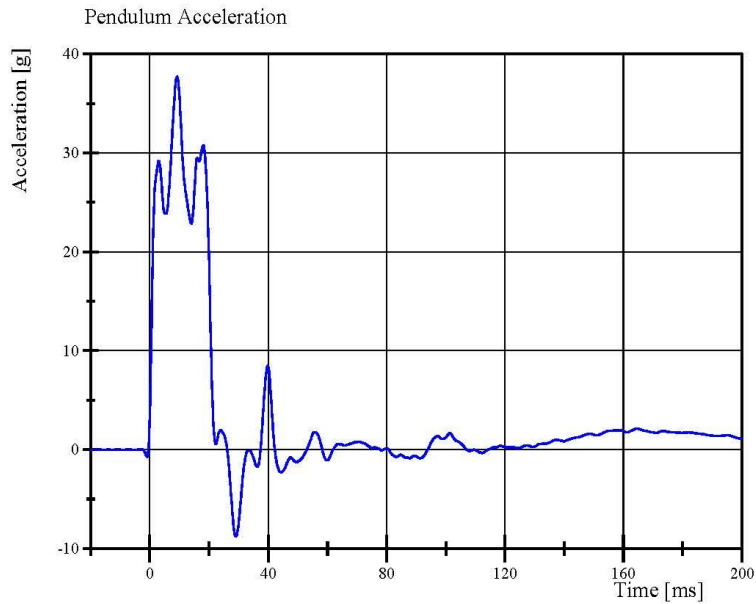
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# Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 61-3

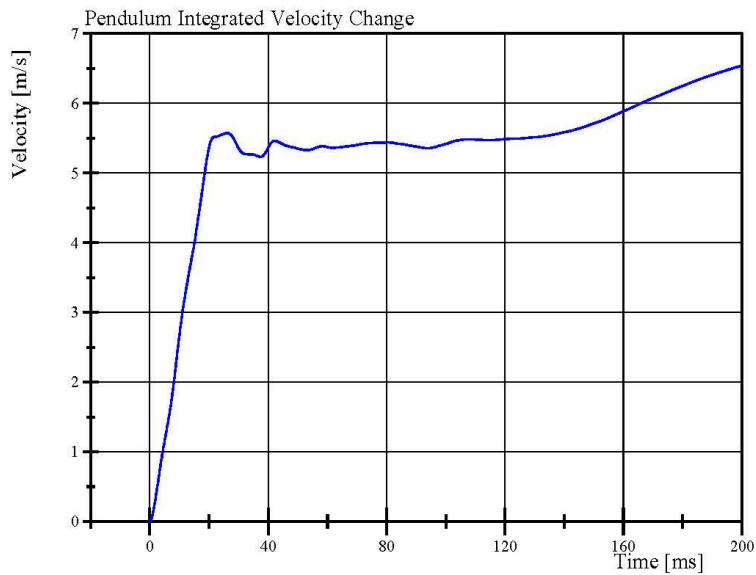
Test Date: 12/9/2017



Filter Class: CFC\_180

Max: 37.7 g at 9.2 ms

Min: -8.8 g at 29.0 ms



Filter Class: CFC\_180

Max: 6.5 m/s at 200.0 ms

Min: 0.0 m/s at 0.0 ms

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

12.09.2017 14:24:59 721

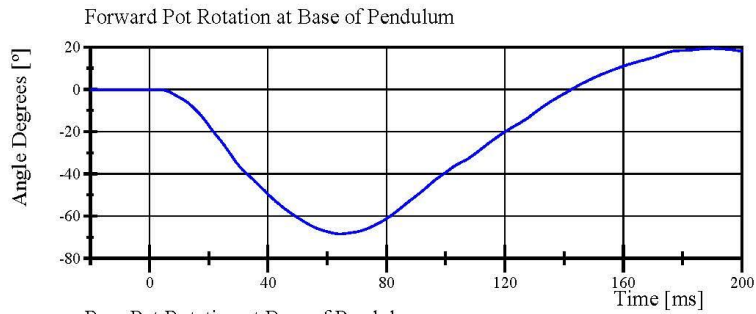


# Transportation Research Center Inc.

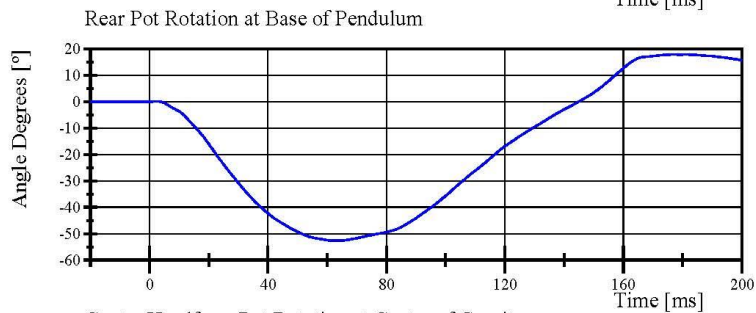
Left Lateral Neck

SID IIs Serial No. 305 Certification No. 61-3

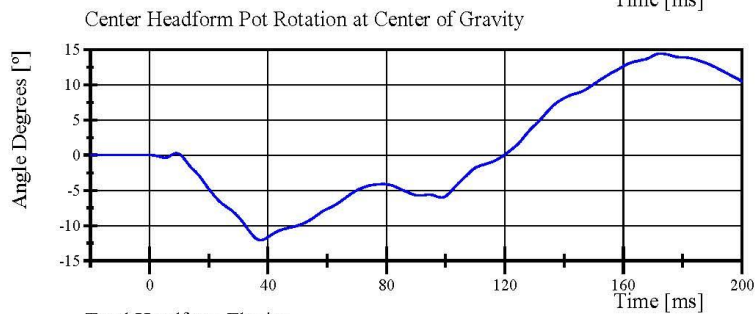
Test Date: 12/9/2017



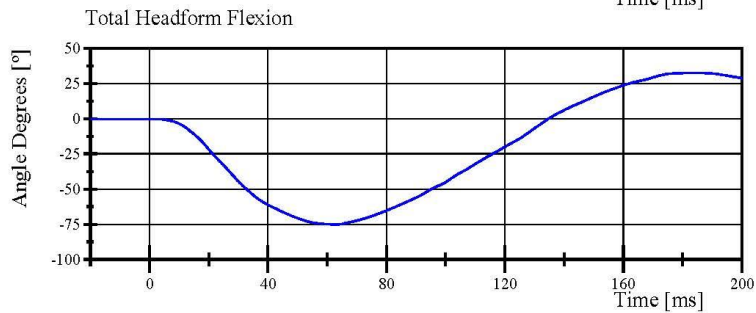
Filter Class: CFC\_60  
Max: 19.4 ° at 190.1 ms  
Min: -68.4 ° at 64.2 ms



Filter Class: CFC\_60  
Max: 17.8 ° at 176.8 ms  
Min: -52.7 ° at 63.0 ms



Filter Class: CFC\_60  
Max: 14.4 ° at 172.5 ms  
Min: -12.1 ° at 37.5 ms



Filter Class: CFC\_60  
Max: 32.5 ° at 182.0 ms  
Min: -75.2 ° at 62.6 ms

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

12.09.2017 14:24:59 721

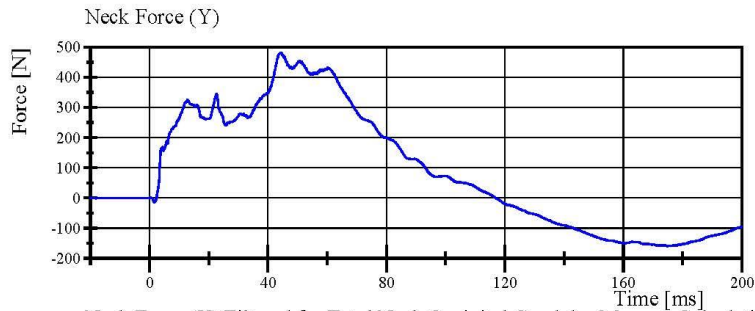


# Transportation Research Center Inc.

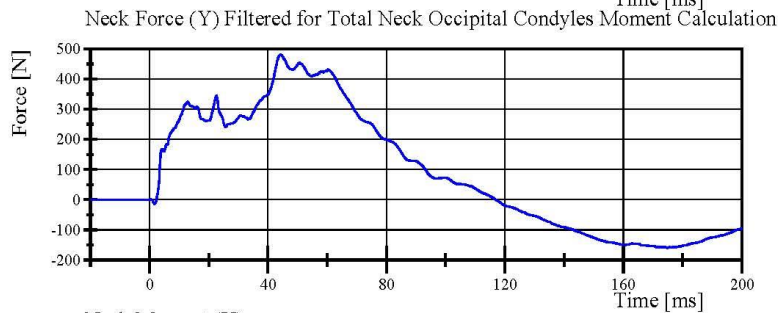
Left Lateral Neck

SID IIS Serial No. 305 Certification No. 61-3

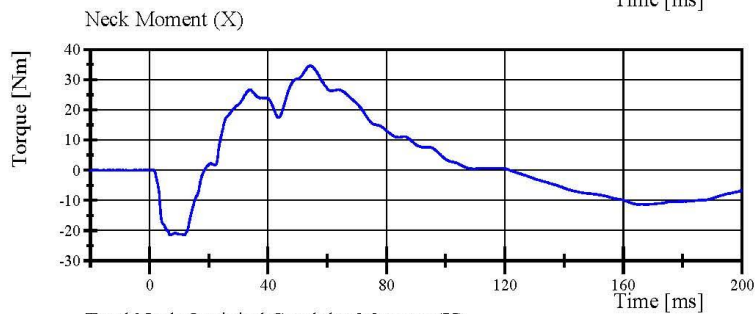
Test Date: 12/9/2017



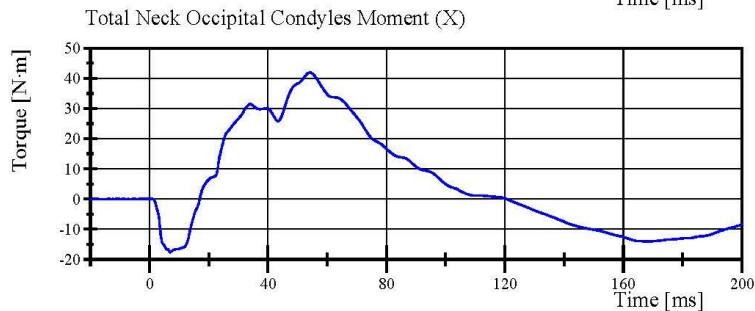
Filter Class: CFC\_1000  
Max: 480.6 N at 44.6 ms  
Min: -159.6 N at 174.9 ms



Filter Class: CFC\_600  
Max: 480.2 N at 44.2 ms  
Min: -159.3 N at 174.9 ms



Filter Class: CFC\_600  
Max: 34.7 Nm at 54.4 ms  
Min: -21.5 Nm at 6.9 ms



Filter Class: Without\_(Consta  
Max: 42.0 N.m at 54.3 ms  
Min: -17.6 N.m at 6.9 ms

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

12.09.2017 14:25:00 721



## Transportation Research Center Inc.

Left Lateral Shoulder  
SID IIs Serial No. 305 Certification No. 61-1  
Test Date: 12/9/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.5 g	Yes
Shoulder Displacement	28 - 37 mm	30.9 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	19.9 g	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

**Left Arm S/N: 952**

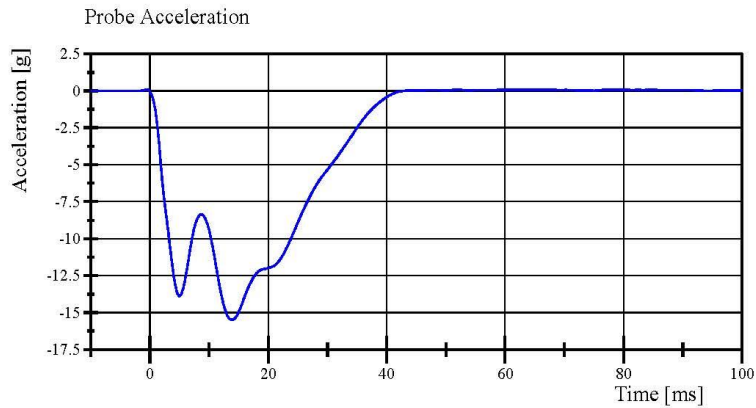
**Shoulder Rib S/N: 180-3355 169**

# Transportation Research Center Inc.

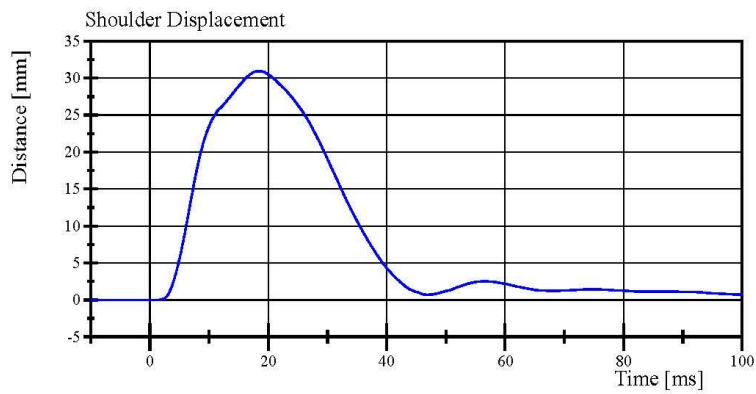
Left Lateral Shoulder

SID IIs Serial No. 305 Certification No. 61-1

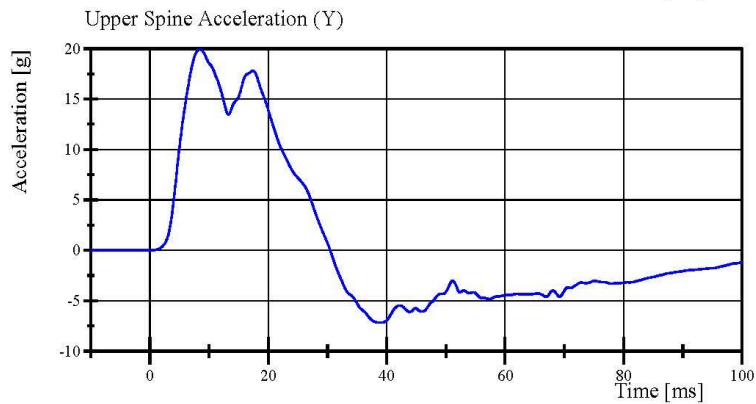
Test Date: 12/9/2017



Filter Class: CFC\_180  
Max: 0.1 g at 63.6 ms  
Min: -15.5 g at 13.8 ms



Filter Class: CFC\_600  
Max: 30.9 mm at 18.3 ms  
Min: -0.0 mm at 1.3 ms



Filter Class: CFC\_180  
Max: 19.9 g at 8.4 ms  
Min: -7.2 g at 38.6 ms

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

12.09.2017 09:02:33 795



## Transportation Research Center Inc.

Left Lateral Thorax with Arm  
SID IIS Serial No. 305 Certification No. 61-1  
Test Date: 12/9/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.734 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-31.3 g	Yes
Shoulder Displacement	31 - 40 mm	33.7 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	26.6 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	31.8 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	35.1 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	38.2 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	31.5 g	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

**Left Arm S/N: 952**

**Upper Thorax Rib S/N: RS506**

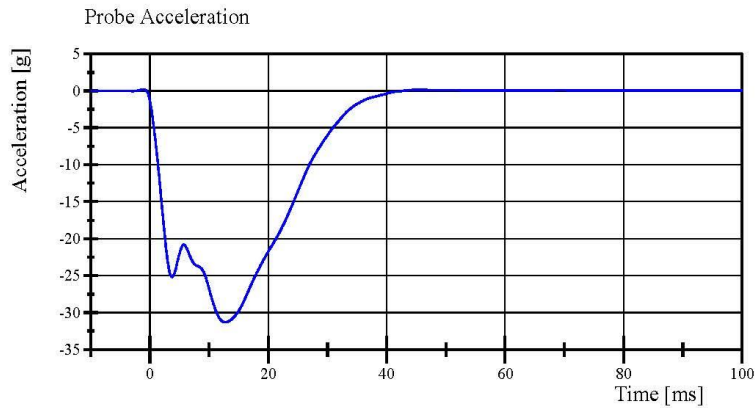
**Middle Thorax Rib S/N: RS506**

**Lower Thorax Rib S/N: RS506**

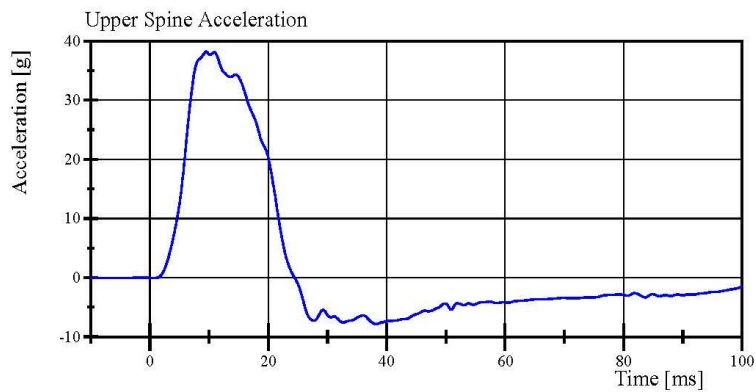
**Upper Thorax Pad S/N: 180-3451**

# Transportation Research Center Inc.

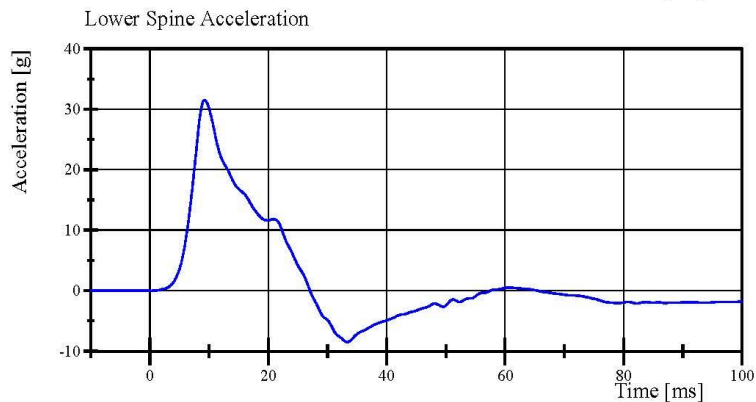
Left Lateral Thorax with Arm  
SID IIs Serial No. 305 Certification No. 61-1  
Test Date: 12/9/2017



Filter Class: CFC\_180  
Max: 0.2 g at -1.0 ms  
Min: -31.3 g at 12.7 ms



Filter Class: CFC\_180  
Max: 38.2 g at 9.5 ms  
Min: -7.8 g at 38.2 ms



Filter Class: CFC\_180  
Max: 31.5 g at 9.3 ms  
Min: -8.5 g at 33.4 ms

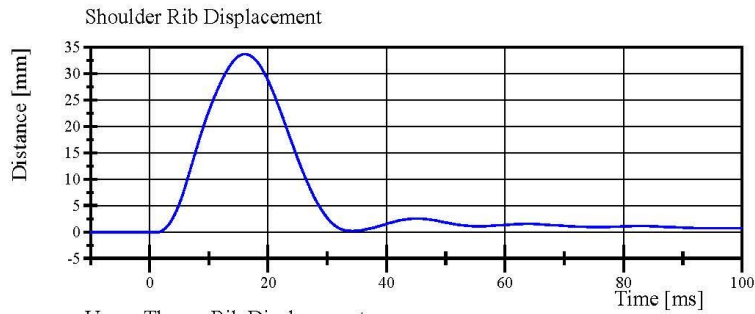
Specification Source: CFR49 Part 572 Subpart V  
with Polarity in accordance with J211

12.09.2017 09:57:08 576

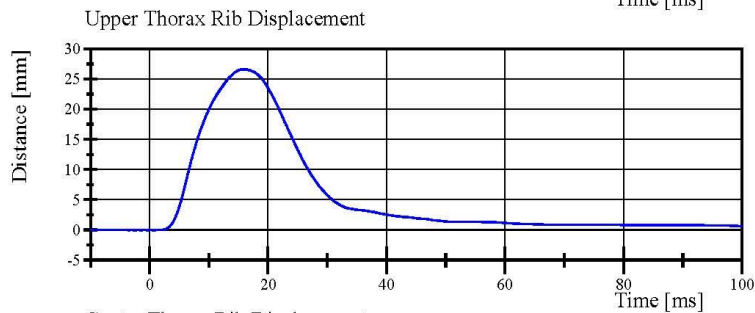


# Transportation Research Center Inc.

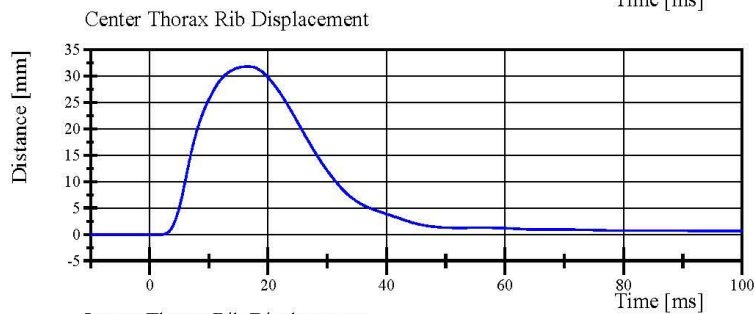
Left Lateral Thorax with Arm  
SID IIs Serial No. 305 Certification No. 61-1  
Test Date: 12/9/2017



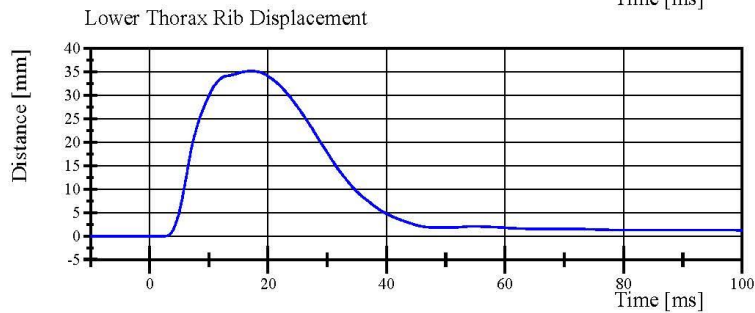
Filter Class: CFC\_600  
Max: 33.7 mm at 16.1 ms  
Min: -0.0 mm at 1.2 ms



Filter Class: CFC\_600  
Max: 26.6 mm at 16.0 ms  
Min: -0.0 mm at 0.8 ms



Filter Class: CFC\_600  
Max: 31.8 mm at 16.6 ms  
Min: -0.0 mm at -3.6 ms



Filter Class: CFC\_600  
Max: 35.1 mm at 16.9 ms  
Min: -0.0 mm at 1.8 ms

## Transportation Research Center Inc.

Left Lateral Thorax without Arm  
SID IIs Serial No. 305 Certification No. 61-1  
Test Date: 12/9/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.397 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.4 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	36.5 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	41.3 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	38.2 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	15.2 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	10.2 g	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

**Upper Thorax Rib S/N: RS506**

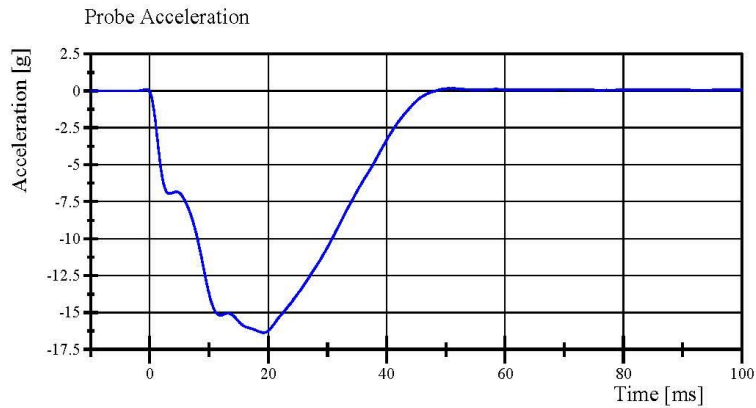
**Middle Thorax Rib S/N: RS506**

**Lower Thorax Rib S/N: RS506**

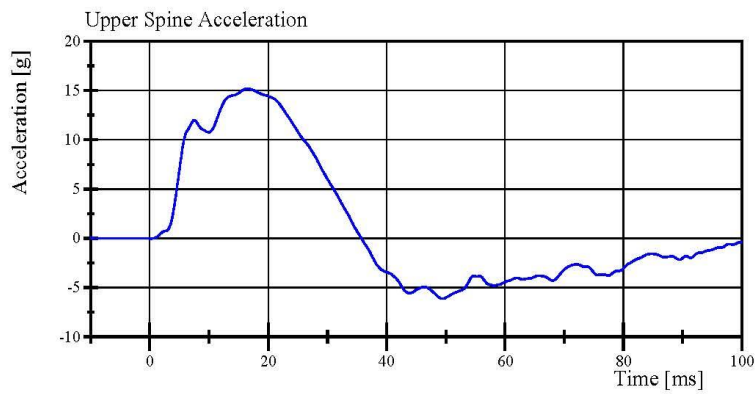
**Upper Thorax Pad S/N: 180-3451**

# Transportation Research Center Inc.

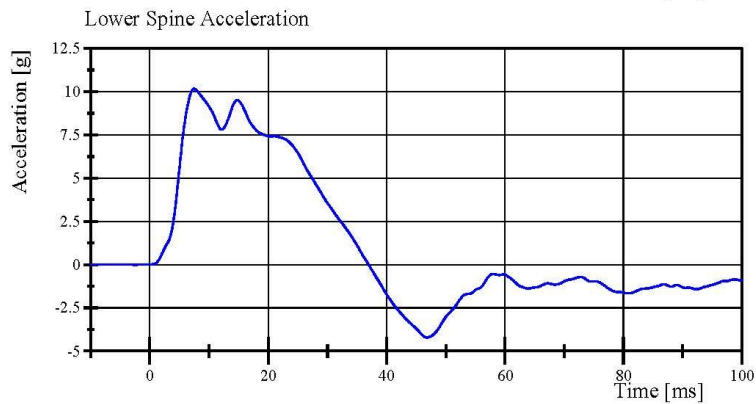
Left Lateral Thorax without Arm  
SID IIs Serial No. 305 Certification No. 61-1  
Test Date: 12/9/2017



Filter Class: CFC\_180  
Max: 0.2 g at 51.4 ms  
Min: -16.4 g at 19.2 ms



Filter Class: CFC\_180  
Max: 15.2 g at 16.5 ms  
Min: -6.1 g at 49.4 ms



Filter Class: CFC\_180  
Max: 10.2 g at 7.4 ms  
Min: -4.2 g at 46.8 ms

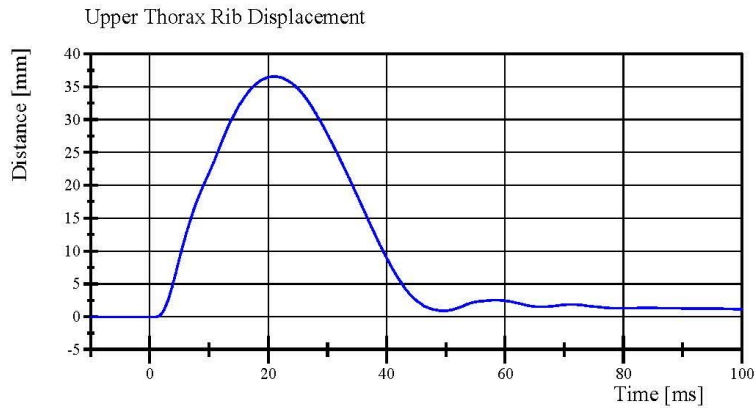
Specification Source: CFR49 Part 572 Subpart V  
with Polarity in accordance with J211

12.09.2017 09:21:25 800

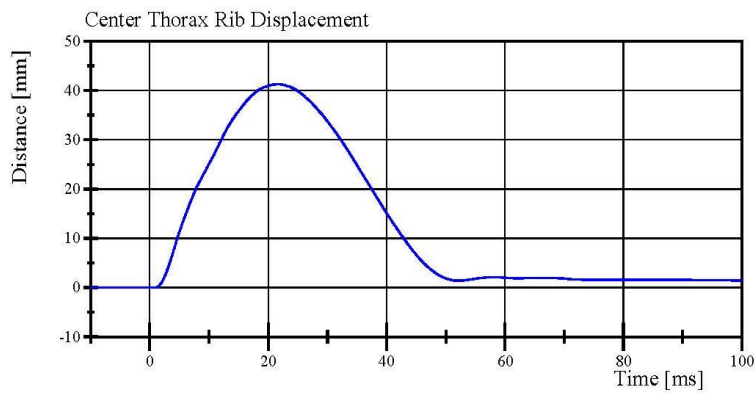


# Transportation Research Center Inc.

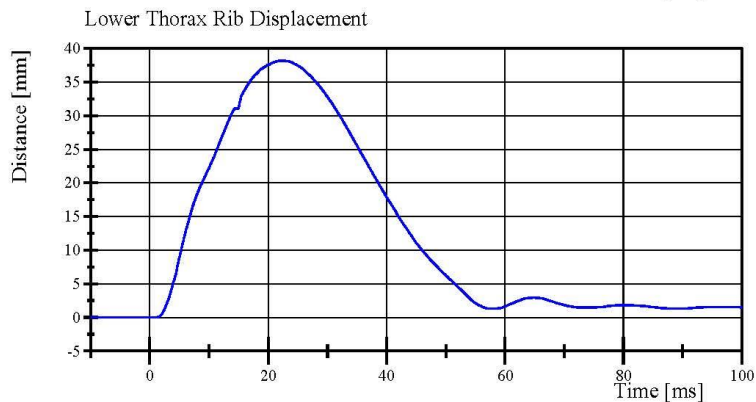
Left Lateral Thorax without Arm  
SID IIs Serial No. 305 Certification No. 61-1  
Test Date: 12/9/2017



Filter Class: CFC\_600  
Max: 36.5 mm at 21.0 ms  
Min: -0.0 mm at 1.0 ms



Filter Class: CFC\_600  
Max: 41.3 mm at 21.6 ms  
Min: -0.0 mm at 0.8 ms



Filter Class: CFC\_600  
Max: 38.2 mm at 22.2 ms  
Min: -0.0 mm at 0.9 ms

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

12.09.2017 09:21:26 800



## Transportation Research Center Inc.

Left Lateral Abdomen  
SID IIS Serial No. 305 Certification No. 61-1  
Test Date: 12/9/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-13.3 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	45.3 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	40.0 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.81 g	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

**Upper Abdominal Rib S/N: RS564**

**Lower Abdominal Rib S/N: 180-5368 DS1234**

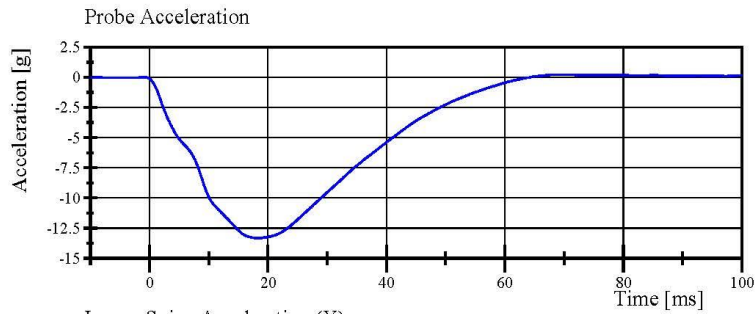
**Abdominal Pad S/N: 180-3453**

# Transportation Research Center Inc.

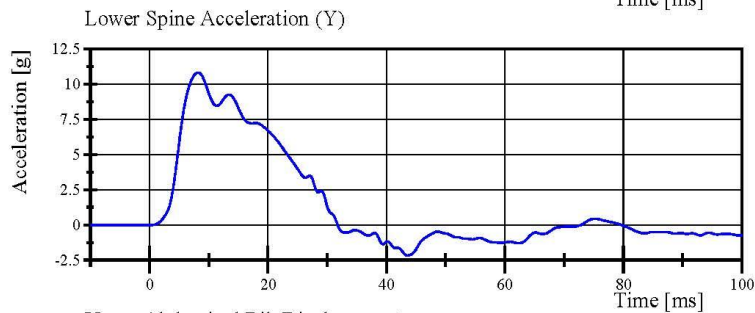
Left Lateral Abdomen

SID IIs Serial No. 305 Certification No. 61-1

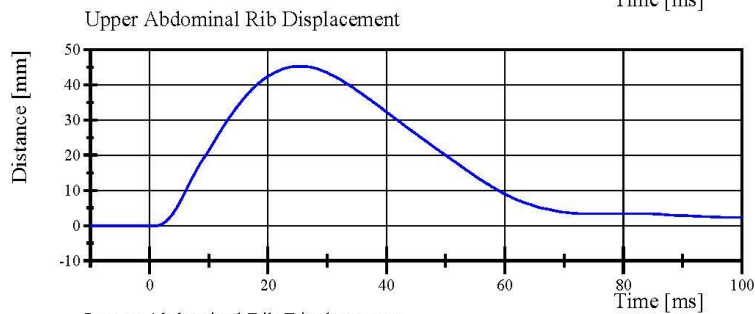
Test Date: 12/9/2017



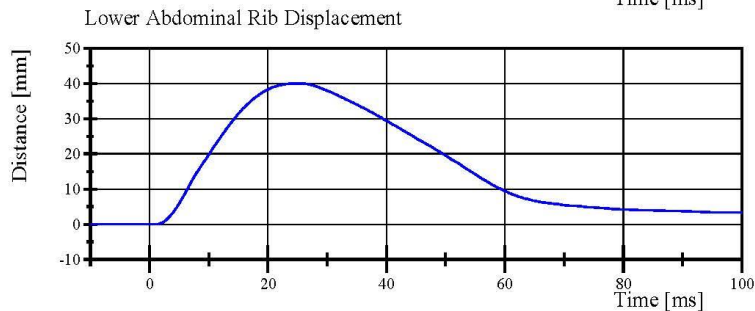
Filter Class: CFC\_180  
Max: 0.2 g at 68.6 ms  
Min: -13.3 g at 18.3 ms



Filter Class: CFC\_180  
Max: 10.8 g at 8.2 ms  
Min: -2.2 g at 43.6 ms



Filter Class: CFC\_600  
Max: 45.3 mm at 25.4 ms  
Min: -0.0 mm at -5.3 ms



Filter Class: CFC\_600  
Max: 40.0 mm at 24.7 ms  
Min: -0.0 mm at 0.7 ms

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

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## Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 61-1

Test Date: 12/9/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.35 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-41.3 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	32.3 g	Yes
Iliac Force	4,100 - 5,100 N	4,817.3 N	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

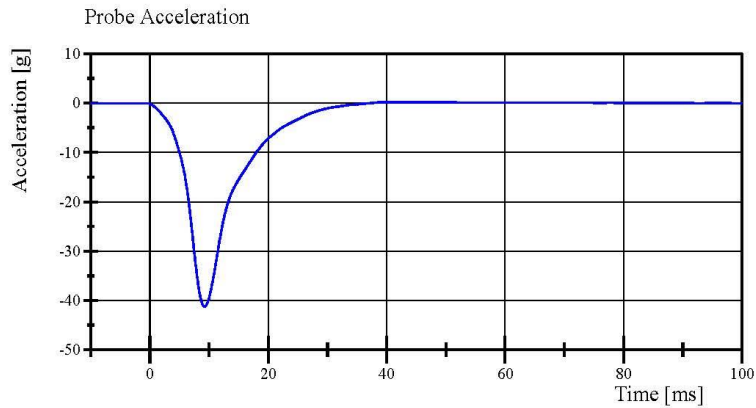
**Pelvis Skin S/N: 884**

# Transportation Research Center Inc.

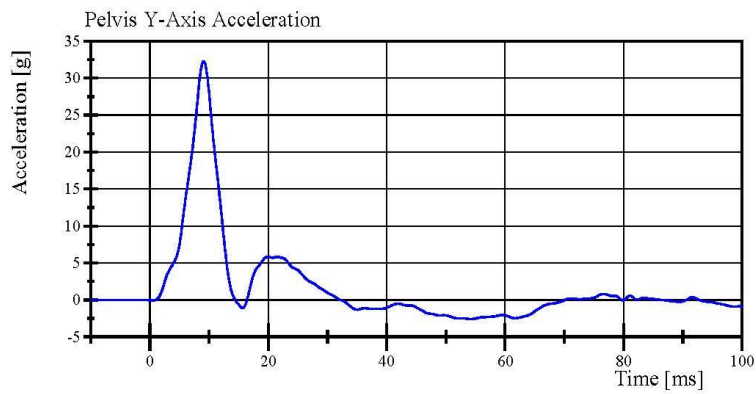
Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 61-1

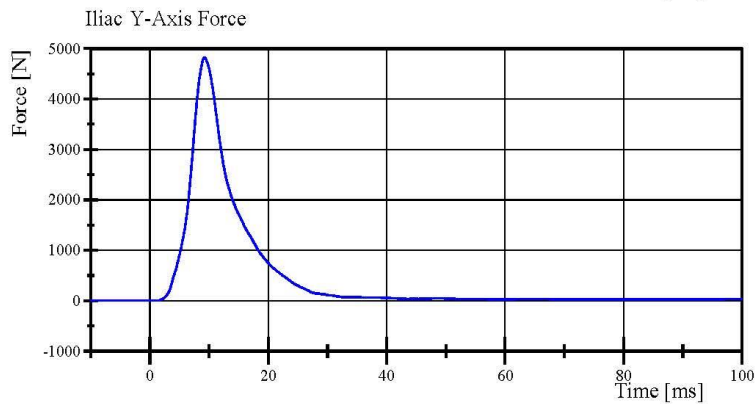
Test Date: 12/9/2017



Filter Class: CFC\_180  
Max: 0.2 g at 40.2 ms  
Min: -41.3 g at 9.3 ms



Filter Class: CFC\_180  
Max: 32.3 g at 9.1 ms  
Min: -2.6 g at 54.3 ms



Filter Class: CFC\_600  
Max: 4,817.3 N at 9.2 ms  
Min: -0.7 N at -2.7 ms

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

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## Transportation Research Center Inc.

Left Lateral Pelvis  
SID IIs Serial No. 305 Certification No. 61-1  
Test Date: 12/9/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.61 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-40.82 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	35.7 g	Yes
Acetabulum Force	3,600 - 4,300 N	3,826.7 N	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

**Pelvis Skin S/N: 884**

**Pelvis Plug Info:**

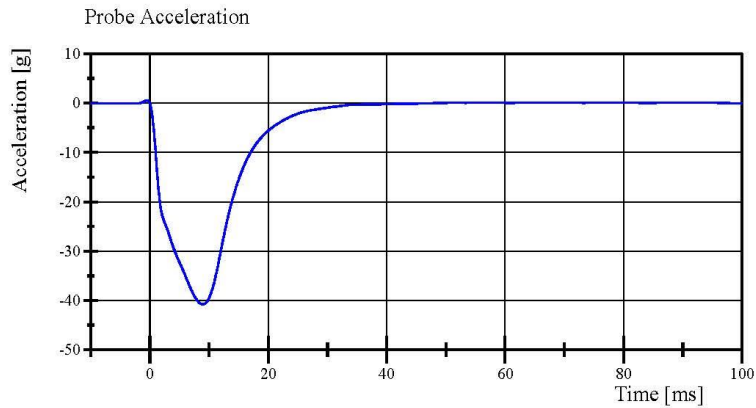
**Manufacturer: SACO**

**S/N: 11159**

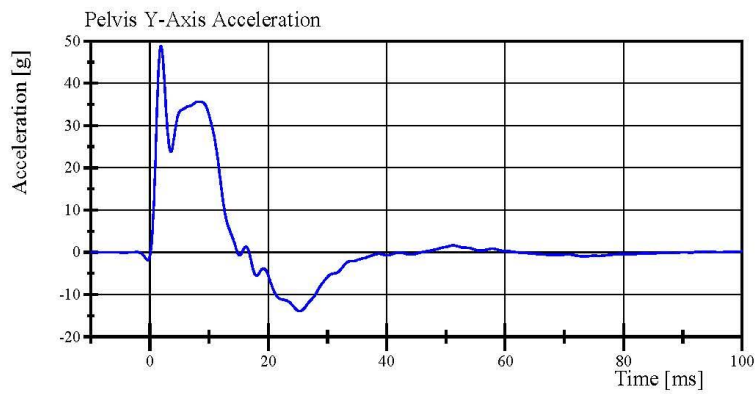
**Cal Date: 20160418**

# Transportation Research Center Inc.

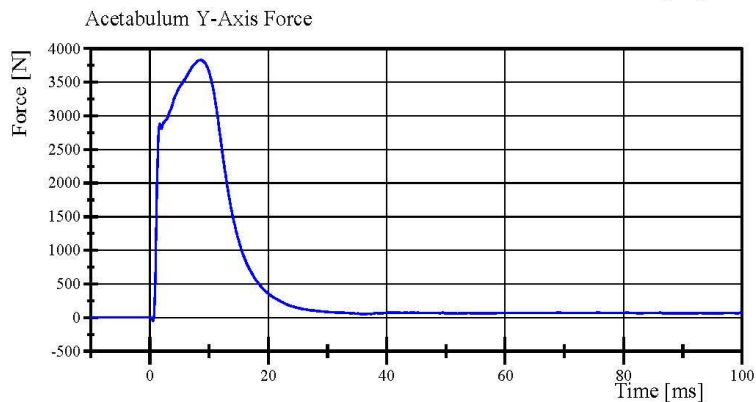
Left Lateral Pelvis  
SID IIS Serial No. 305 Certification No. 61-1  
Test Date: 12/9/2017



Filter Class: CFC\_180  
Max: 0.6 g at -0.5 ms  
Min: -40.8 g at 9.0 ms



Filter Class: CFC\_180  
Max: 48.8 g at 1.8 ms  
Min: -13.9 g at 25.4 ms



Filter Class: CFC\_600  
Max: 3,826.7 N at 8.6 ms  
Min: -49.6 N at 0.6 ms

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

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**Post-Test Calibration Sheets  
Passenger S/N 305**

**Transportation Research Center Inc.**  
**SIDI's Dummy - Level D**  
**External Dimensions**  
**Serial No. 305 Calibration No. 62**

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	782	Yes
B	Shoulder Pivot Height	437.0 - 453.0	449	Yes
C	H-Point Height	79.0 - 89.0	87	Yes
D	H-Point from Seat Back	141.0 - 151.0	146	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	100	Yes
F	Thigh Clearance	119.0 - 135.0	130	Yes
G	Head Breadth	140.0 - 148.0	143	Yes
H	Head Back from Backline	40.0 - 46.0	44	Yes
I	Head Depth	178.0 - 188.0	185	Yes
J	Head Circumference	541.0 - 551.0	543	Yes
K	Buttock to Knee Length	514.0 - 540.0	535	Yes
L	Popliteal Height	343.0 - 369.0	348	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	396	Yes
N	Buttock Popliteal Length	416.0 - 442.0	434	Yes
O	Chest Depth without Jacket	195.0 - 211.0	200	Yes
P	Foot Length (right)	216.0 - 232.0	222	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	320	Yes
R	Arm Length	249.0 - 259.0	252	Yes
S	Knee Joint to seat Back	478.0 - 493.0	482	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	350	Yes
W	Foot Width (right)	78.0 - 94.0	85	Yes
W	Foot Width (left)	78.0 - 94.0	85	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	874	Yes
Z	Waist Circumference	761.0 - 791.0	782	Yes

## Transportation Research Center Inc.

Left Lateral Head Drop

SID IIS Serial No. 305 Certification No. 62-2

Test Date: 12/17/2017

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	122.6 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	2.0 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

**Head Skin S/N: 1253**

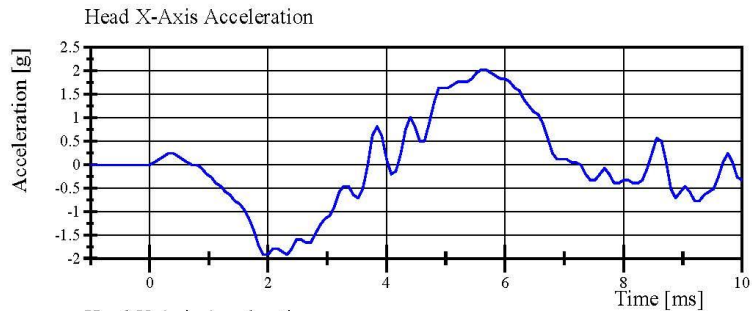
**Skull S/N: 180/1001/C**

# Transportation Research Center Inc.

Left Lateral Head Drop

SID IIS Serial No. 305 Certification No. 62-2

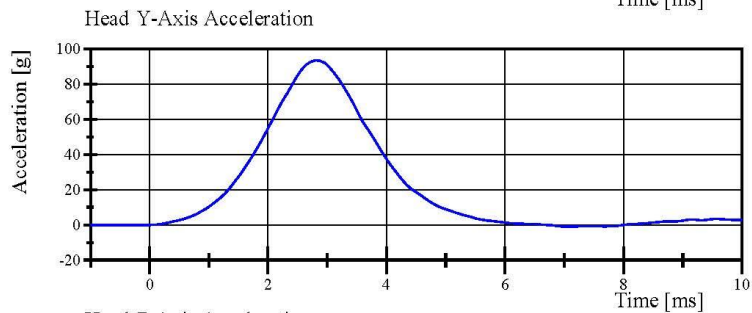
Test Date: 12/17/2017



Filter Class: CFC\_1000

Max: 2.0 g at 5.6 ms

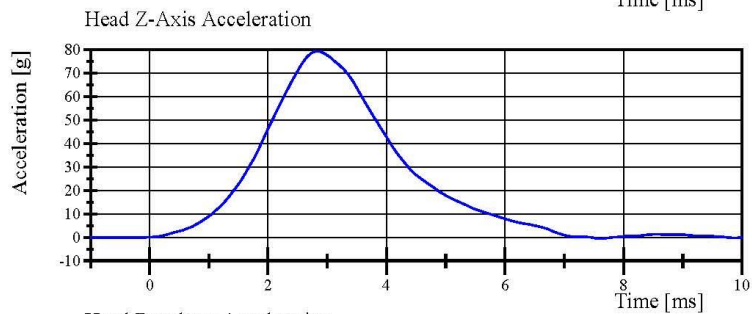
Min: -1.9 g at 1.9 ms



Filter Class: CFC\_1000

Max: 93.5 g at 2.8 ms

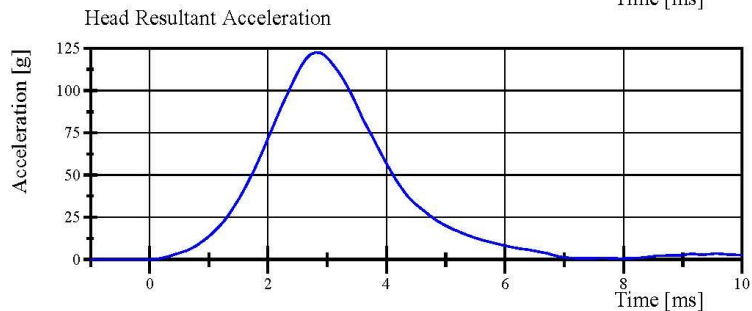
Min: -1.0 g at 7.0 ms



Filter Class: CFC\_1000

Max: 79.3 g at 2.8 ms

Min: -0.5 g at 7.6 ms



Filter Class: CFC\_1000

Max: 122.6 g at 2.8 ms

Min: 0.0 g at +0.9 ms

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

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## Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 62-1

Test Date: 12/17/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.620 m/s	Yes
Pendulum Integrated Velocity			
Change at 10 ms	2.20 - 2.80 m/s	2.483 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.614 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	4.843 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.857 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	6.012 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-73.5 deg	Yes
Time of Peak	50 - 70 ms	66.2 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	38.5 N·m	Yes
Total Neck Occipital Condyles Moment			
Decay Time to 0 N·m	102 - 126 ms	122.4 ms	Yes

**Test meets specifications.**

**Condition:** Used

**Comments:**

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

**Neck Cable S/N:** N/A

**Nodding Blocks:**

**Front S/N:** DN-3094

**Rear S/N:** 8550-DL6580

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

12.17.2017 13:44:36 716



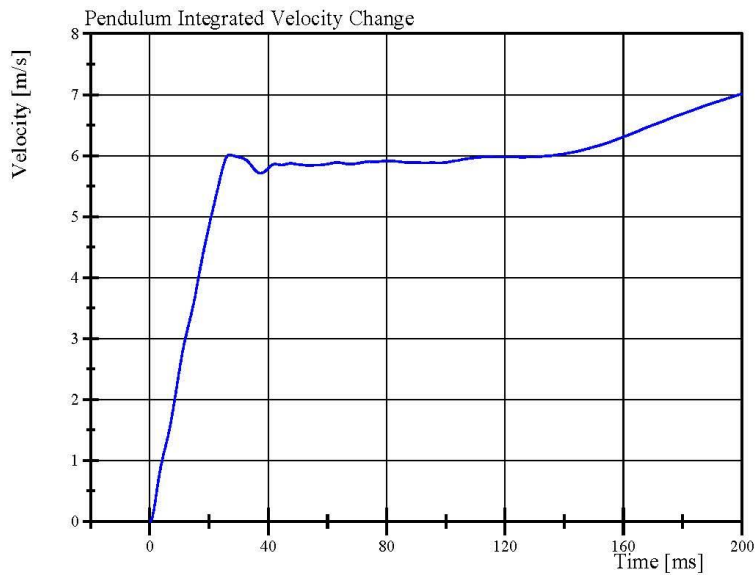
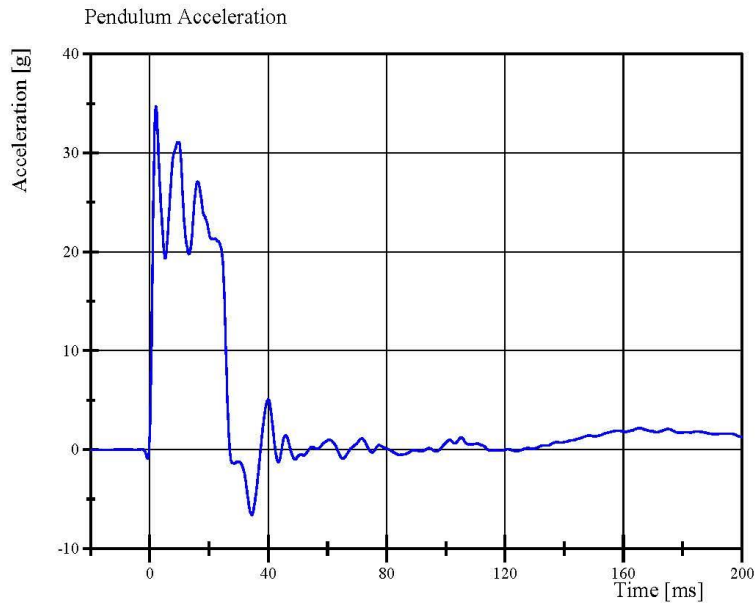
Page 11 of 31

# Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 62-1

Test Date: 12/17/2017



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

12.17.2017 13:45:33 716

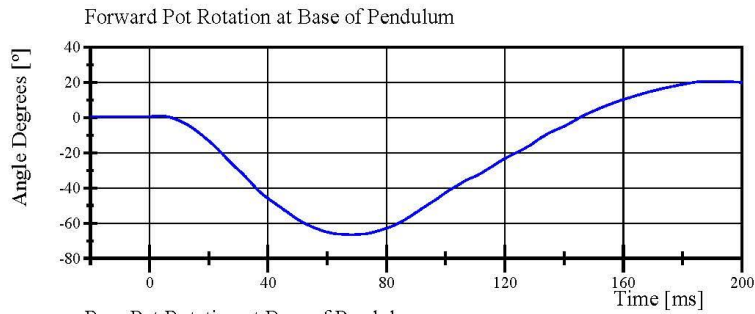


# Transportation Research Center Inc.

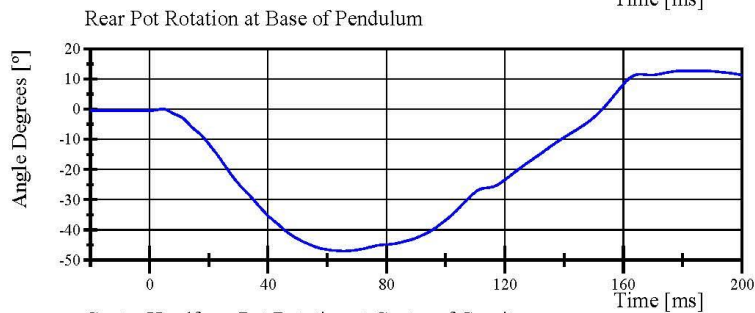
Left Lateral Neck

SID IIs Serial No. 305 Certification No. 62-1

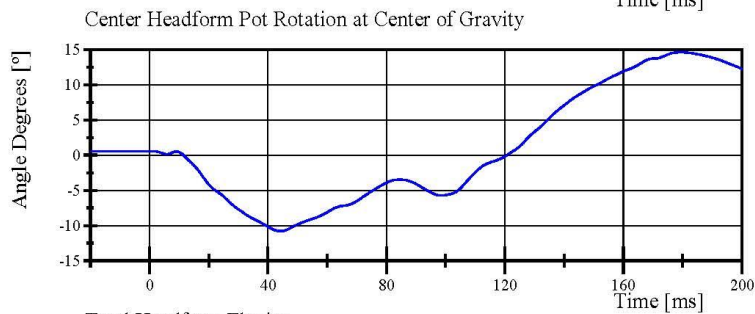
Test Date: 12/17/2017



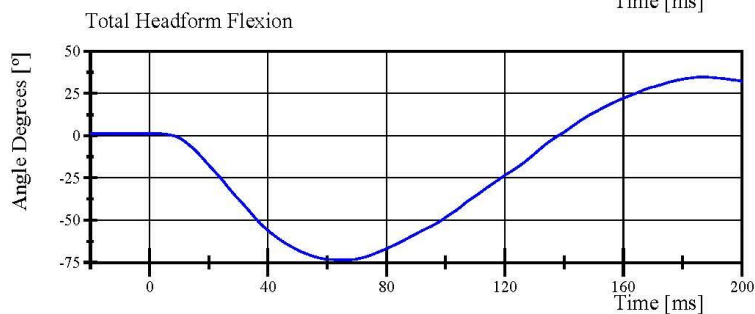
Filter Class: CFC\_60  
Max: 20.7 ° at 189.0 ms  
Min: -66.5 ° at 68.2 ms



Filter Class: CFC\_60  
Max: 12.7 ° at 185.2 ms  
Min: -47.0 ° at 65.6 ms



Filter Class: CFC\_60  
Max: 14.6 ° at 179.4 ms  
Min: -10.8 ° at 44.2 ms



Filter Class: CFC\_60  
Max: 34.8 ° at 186.7 ms  
Min: -73.5 ° at 66.2 ms

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

12.17.2017 13:45:33 716

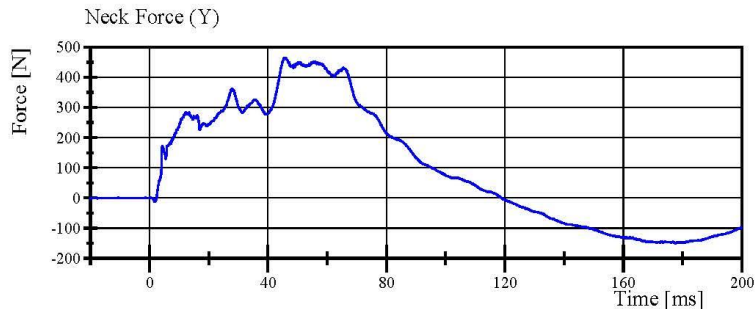


# Transportation Research Center Inc.

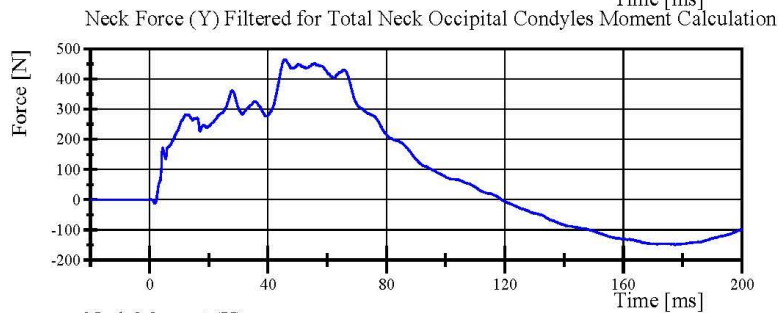
Left Lateral Neck

SID IIS Serial No. 305 Certification No. 62-1

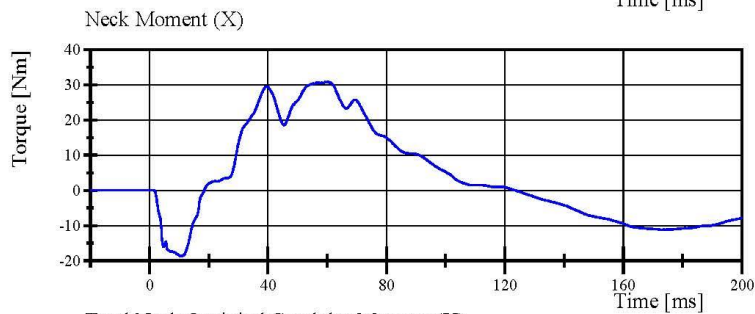
Test Date: 12/17/2017



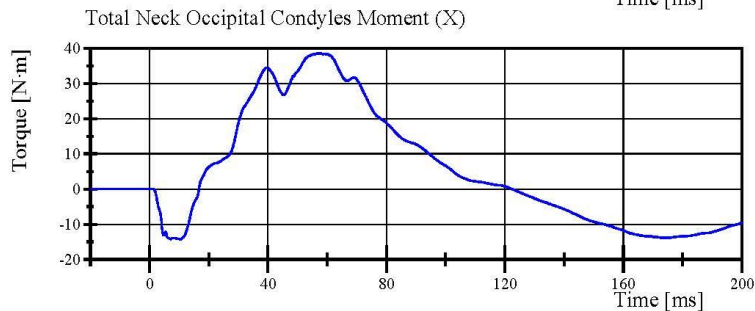
Filter Class: CFC\_1000  
Max: 464.8 N at 45.6 ms  
Min: -149.6 N at 177.5 ms



Filter Class: CFC\_600  
Max: 464.6 N at 45.7 ms  
Min: -149.1 N at 177.5 ms



Filter Class: CFC\_600  
Max: 30.9 Nm at 60.2 ms  
Min: -18.8 Nm at 10.6 ms



Filter Class: Without\_(Consta  
Max: 38.5 N.m at 57.1 ms  
Min: -14.3 N.m at 10.3 ms

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

12.17.2017 13:45:34 716



## Transportation Research Center Inc.

Left Lateral Shoulder  
SID IIs Serial No. 305 Certification No. 62-1  
Test Date: 12/17/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.28 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.3 g	Yes
Shoulder Displacement	28 - 37 mm	28.9 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	18.8 g	Yes

**Test meets specifications.**

**Condition: Used**

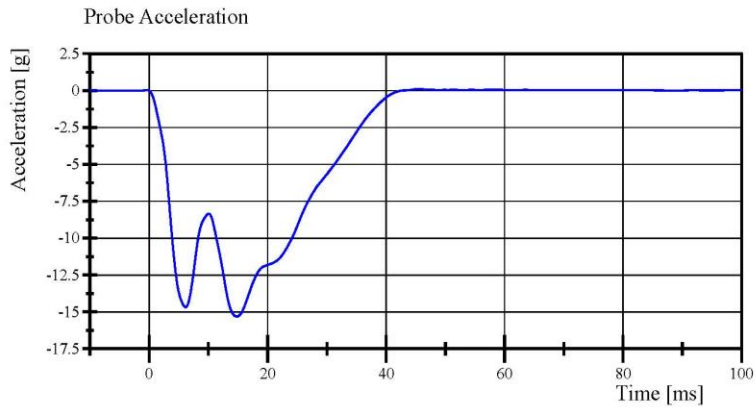
**Comments:**

**Left Arm S/N: 952**

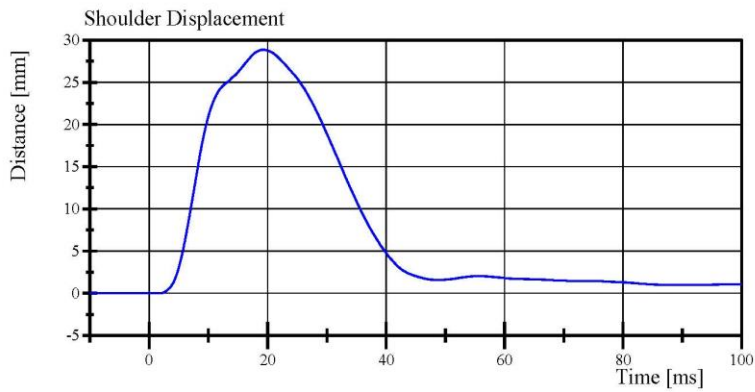
**Shoulder Rib S/N: 180-3355 169**

# Transportation Research Center Inc.

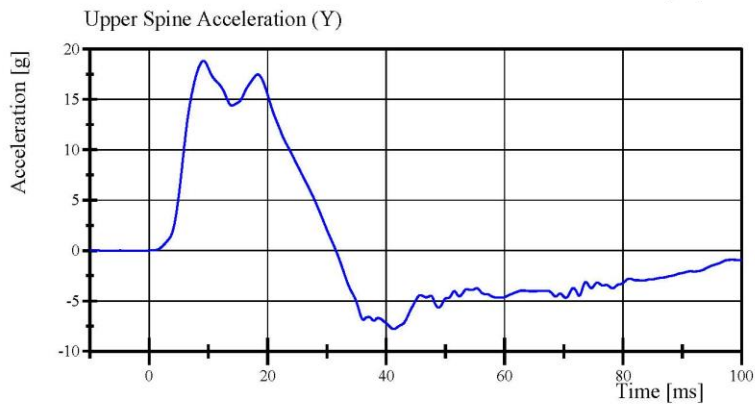
Left Lateral Shoulder  
SID IIs Serial No. 305 Certification No. 62-1  
Test Date: 12/17/2017



Filter Class: CFC\_180  
Max: 0.1 g at 45.4 ms  
Min: -15.3 g at 14.8 ms



Filter Class: CFC\_600  
Max: 28.9 mm at 19.2 ms  
Min: -0.0 mm at -1.0 ms



Filter Class: CFC\_180  
Max: 18.8 g at 9.2 ms  
Min: -7.8 g at 41.3 ms

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

12.19.2017 09:44:04 802



## Transportation Research Center Inc.

Left Lateral Thorax with Arm  
SID IIS Serial No. 305 Certification No. 62-1  
Test Date: 12/17/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.764 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-31.8 g	Yes
Shoulder Displacement	31 - 40 mm	34.5 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	26.8 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	31.6 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	34.5 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	38.4 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	33.1 g	Yes

**Test meets specifications.**

**Condition:** Used

**Comments:**

**Left Arm S/N:** 952

**Upper Thorax Rib S/N:** RS506

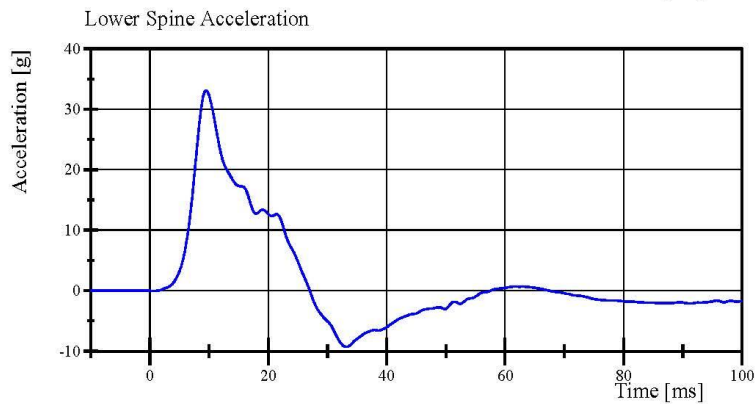
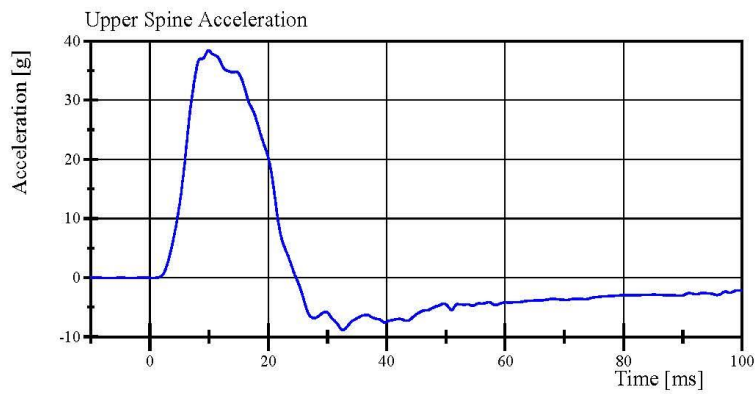
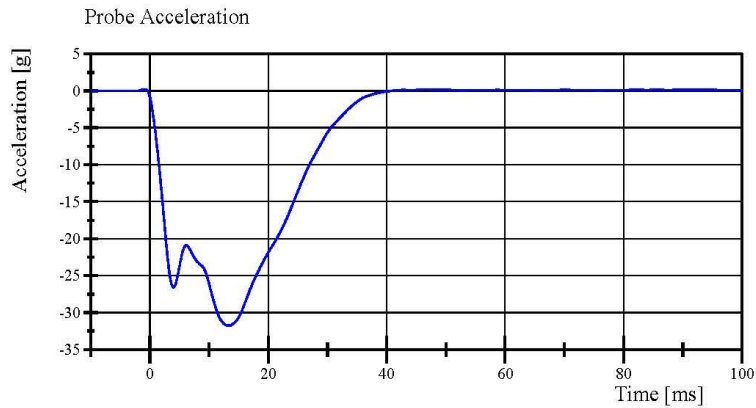
**Middle Thorax Rib S/N:** RS506

**Lower Thorax Rib S/N:** RS506

**Upper Thorax Pad S/N:** 180-3451

# Transportation Research Center Inc.

Left Lateral Thorax with Arm  
SID IIs Serial No. 305 Certification No. 62-1  
Test Date: 12/17/2017



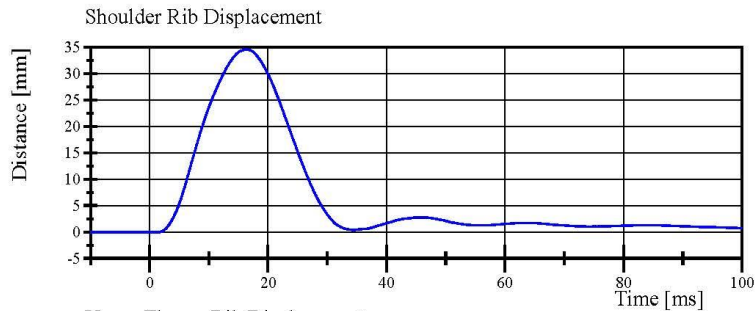
Specification Source: CFR49 Part 572 Subpart V  
with Polarity in accordance with J211

12.17.2017 10:56:30 585

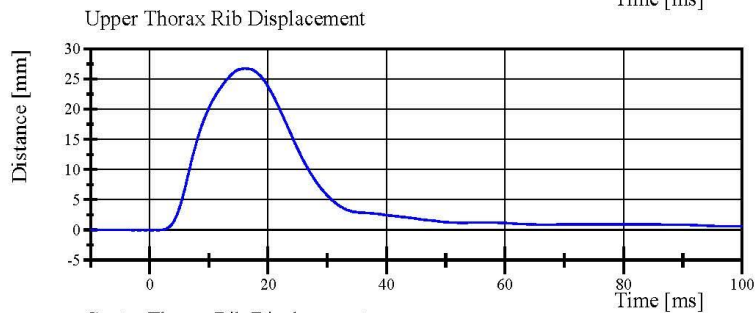


# Transportation Research Center Inc.

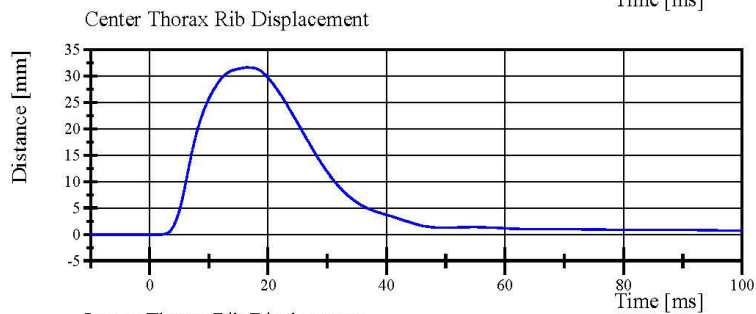
Left Lateral Thorax with Arm  
SID IIs Serial No. 305 Certification No. 62-1  
Test Date: 12/17/2017



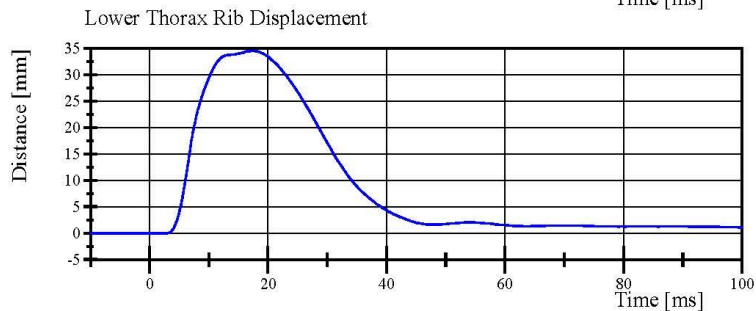
Filter Class: CFC\_600  
Max: 34.5 mm at 16.3 ms  
Min: -0.0 mm at -1.4 ms



Filter Class: CFC\_600  
Max: 26.8 mm at 16.1 ms  
Min: -0.0 mm at 1.6 ms



Filter Class: CFC\_600  
Max: 31.6 mm at 16.5 ms  
Min: -0.0 mm at 1.4 ms



Filter Class: CFC\_600  
Max: 34.5 mm at 17.4 ms  
Min: -0.0 mm at -5.8 ms

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

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## Transportation Research Center Inc.

Left Lateral Thorax without Arm  
SID IIs Serial No. 305 Certification No. 62-1  
Test Date: 12/17/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.385 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.2 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	35.9 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	40.6 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	37.8 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	15.7 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	10.0 g	Yes

**Test meets specifications.**

**Condition:** Used

**Comments:**

**Upper Thorax Rib S/N: RS506**

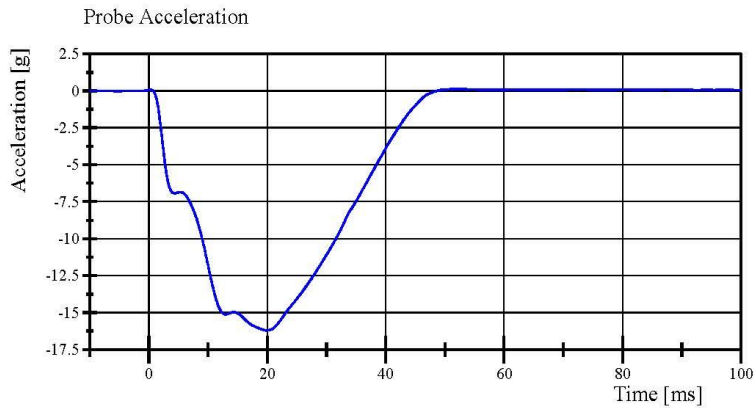
**Middle Thorax Rib S/N: RS506**

**Lower Thorax Rib S/N: RS506**

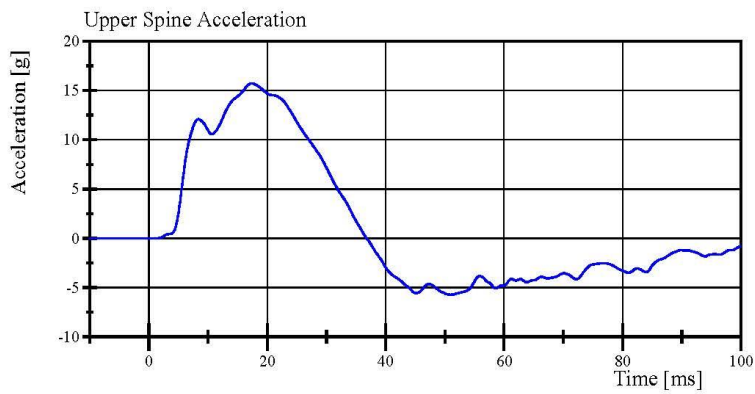
**Upper Thorax Pad S/N: 180-3451**

# Transportation Research Center Inc.

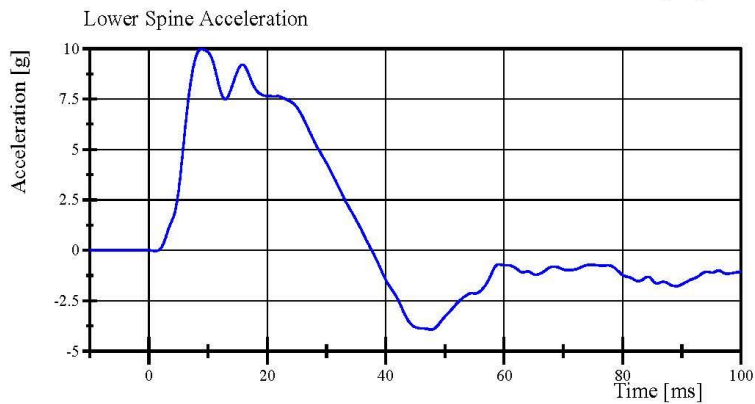
Left Lateral Thorax without Arm  
SID IIs Serial No. 305 Certification No. 62-1  
Test Date: 12/17/2017



Filter Class: CFC\_180  
Max: 0.1 g at 52.2 ms  
Min: -16.2 g at 19.9 ms



Filter Class: CFC\_180  
Max: 15.7 g at 17.4 ms  
Min: -5.7 g at 51.0 ms



Filter Class: CFC\_180  
Max: 10.0 g at 8.9 ms  
Min: -3.9 g at 47.7 ms

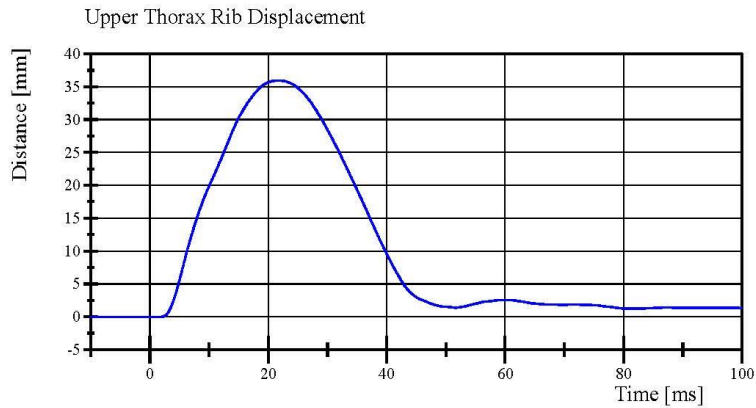
Specification Source: CFR49 Part 572 Subpart V  
with Polarity in accordance with J211

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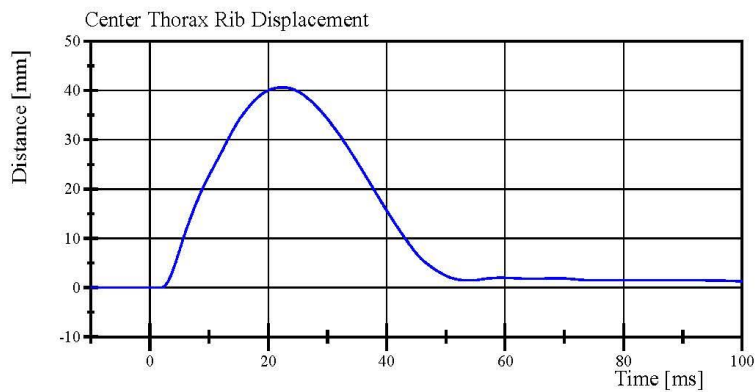


# Transportation Research Center Inc.

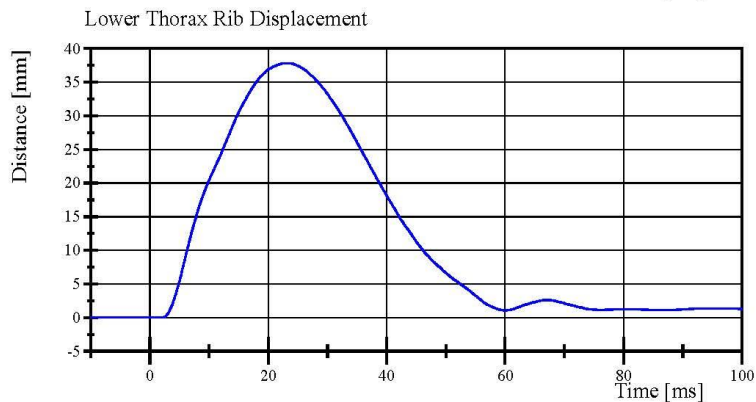
Left Lateral Thorax without Arm  
SID IIs Serial No. 305 Certification No. 62-1  
Test Date: 12/17/2017



Filter Class: CFC\_600  
Max: 35.9 mm at 21.8 ms  
Min: -0.0 mm at 1.9 ms



Filter Class: CFC\_600  
Max: 40.6 mm at 22.3 ms  
Min: -0.0 mm at 1.7 ms



Filter Class: CFC\_600  
Max: 37.8 mm at 23.1 ms  
Min: -0.0 mm at 1.8 ms

## Transportation Research Center Inc.

Left Lateral Abdomen  
SID IIS Serial No. 305 Certification No. 62-1  
Test Date: 12/17/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-13.3 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	42.8 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	41.1 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	11.06 g	Yes

**Test meets specifications.**

**Condition:** Used

**Comments:**

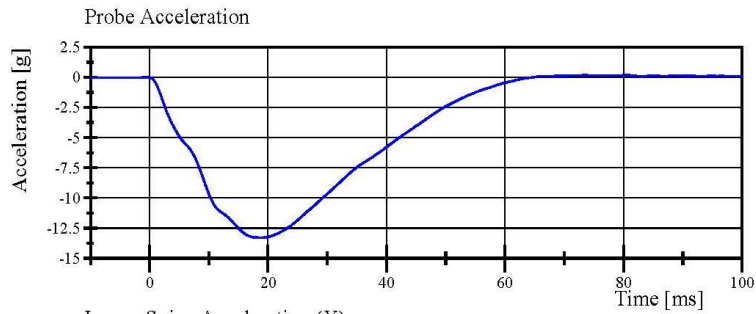
**Upper Abdominal Rib S/N: RS564**

**Lower Abdominal Rib S/N: 180-5368 DS1234**

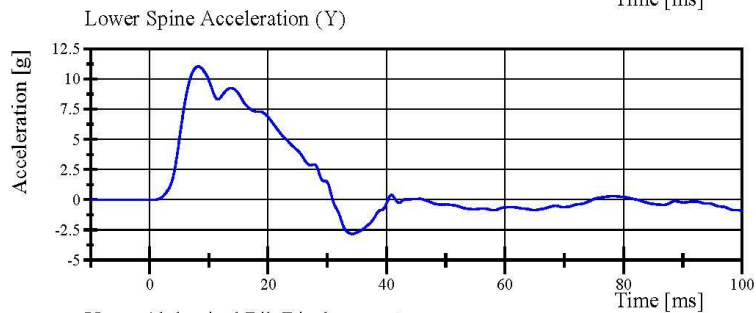
**Abdominal Pad S/N: 180-3453**

# Transportation Research Center Inc.

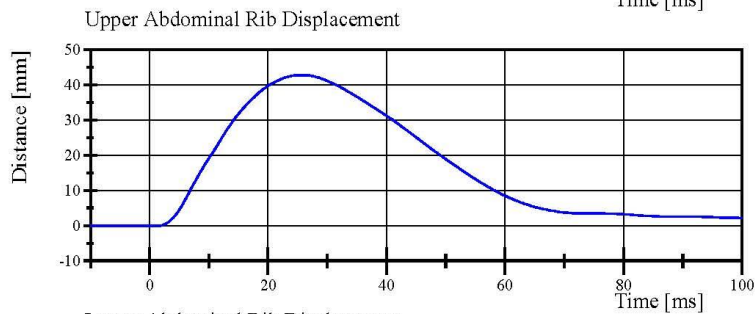
Left Lateral Abdomen  
SID IIs Serial No. 305 Certification No. 62-1  
Test Date: 12/17/2017



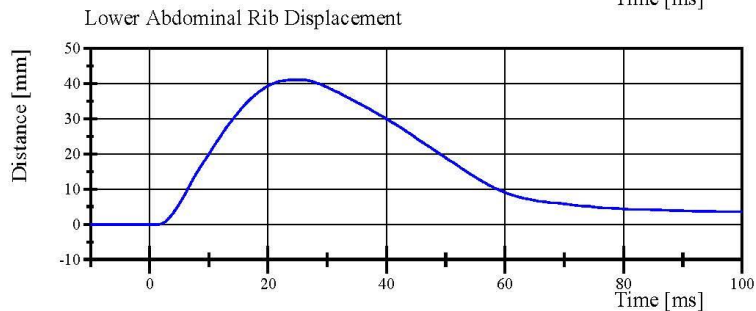
Filter Class: CFC\_180  
Max: 0.2 g at 80.6 ms  
Min: -13.3 g at 18.8 ms



Filter Class: CFC\_180  
Max: 11.1 g at 8.2 ms  
Min: -2.8 g at 34.2 ms



Filter Class: CFC\_600  
Max: 42.8 mm at 25.7 ms  
Min: -0.0 mm at 0.8 ms



Filter Class: CFC\_600  
Max: 41.1 mm at 24.8 ms  
Min: -0.0 mm at 1.4 ms

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

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## Transportation Research Center Inc.

Left Lateral Iliac

SID IIS Serial No. 305 Certification No. 62-1

Test Date: 12/17/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-39.8 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	33.0 g	Yes
Iliac Force	4,100 - 5,100 N	4,718.8 N	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

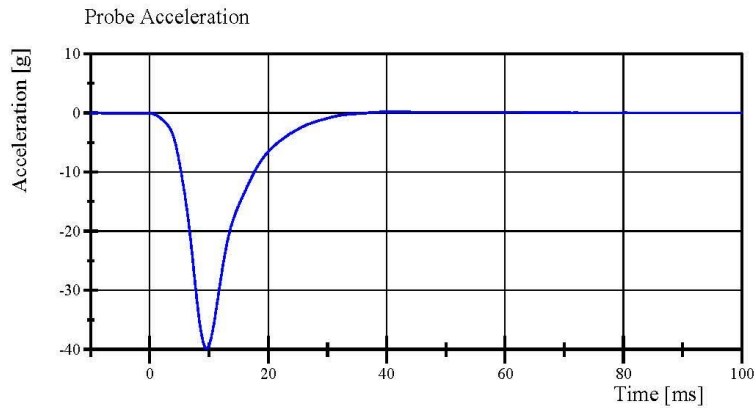
**Pelvis Skin S/N: 884**

# Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 62-1

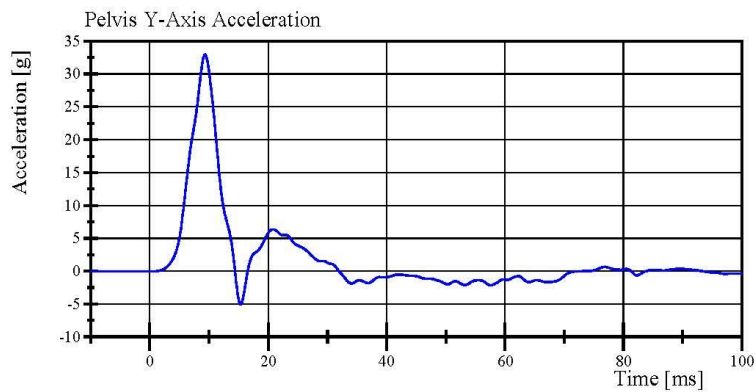
Test Date: 12/17/2017



Filter Class: CFC\_180

Max: 0.2 g at 41.8 ms

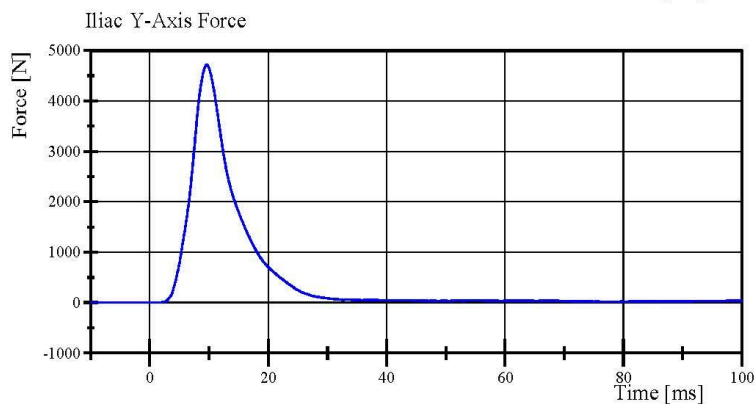
Min: -39.8 g at 9.6 ms



Filter Class: CFC\_180

Max: 33.0 g at 9.4 ms

Min: -5.0 g at 15.4 ms



Filter Class: CFC\_600

Max: 4,718.8 N at 9.6 ms

Min: -0.5 N at -8.8 ms

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

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## Transportation Research Center Inc.

Left Lateral Pelvis  
SID IIS Serial No. 305 Certification No. 62-1  
Test Date: 12/15/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.62 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-41.08 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	34.9 g	Yes
Acetabulum Force	3,600 - 4,300 N	3,914.0 N	Yes

**Test meets specifications.**

**Condition: Used**

**Comments:**

**Pelvis Skin S/N: 884**

**Pelvis Plug Info:**

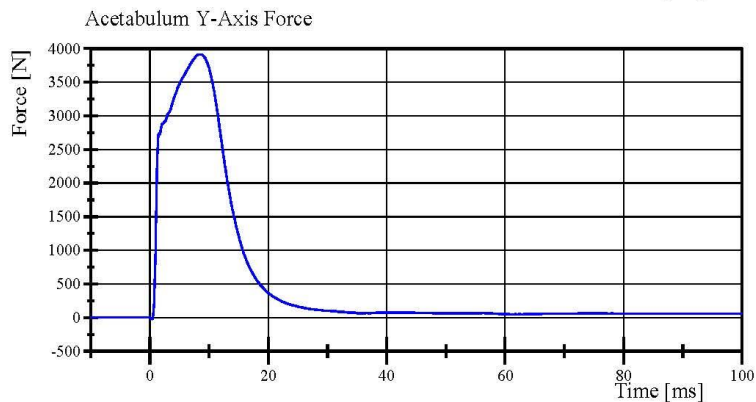
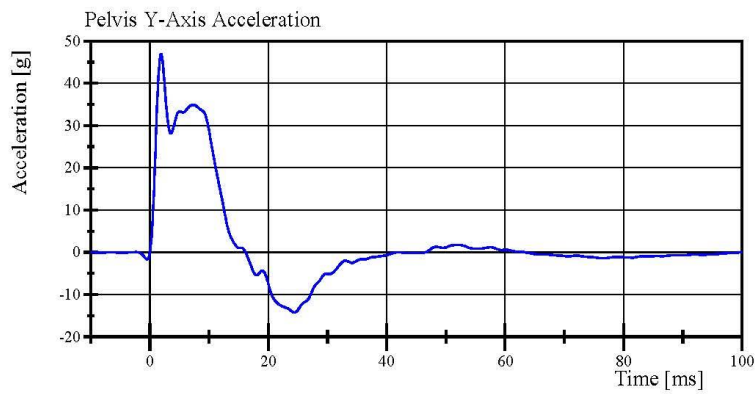
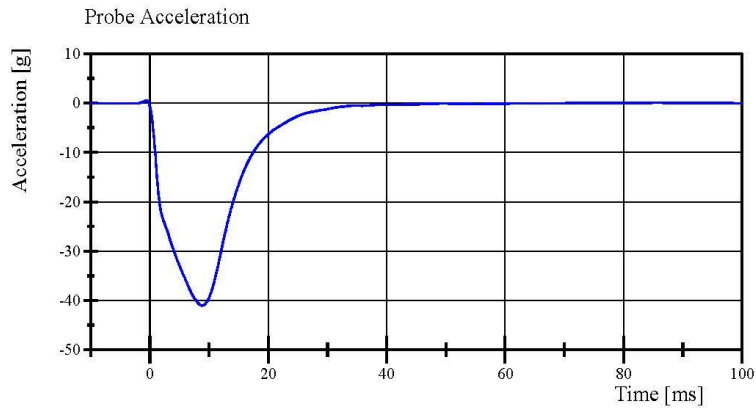
**Manufacturer: SACO**

**S/N: 11477**

**Cal Date: 20160831**

# Transportation Research Center Inc.

Left Lateral Pelvis  
SID IIS Serial No. 305 Certification No. 62-1  
Test Date: 12/15/2017



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

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**APPENDIX D**  
**TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA**

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

		ES-2re S/N F030			
		Serial Number	Manufacturer	Calibration Date	
Head Accelerometers	X	P87680	Endevco	28-Sep-2017	
	Y	P66873	Endevco	26-Sep-2017	
	Z	P91950	Endevco	26-Sep-2017	
Redundant Head Accelerometers	X	P94566	Endevco	26-Sep-2017	
	Y	P83368	Endevco	25-Oct-2017	
	Z	P94483	Endevco	26-Sep-2017	
Thoracic Rib Displacement Potentiometers	Upper	Y	111	Honeywell	26-Sep-2017
	Middle	Y	174	FTSS	26-Sep-2017
	Lower	Y	173	FTSS	26-Sep-2017
Abdomen Load Cells	Front	Y	1441	Denton	15-Mar-2017
	Middle	Y	1436	Denton	15-Mar-2017
	Rear	Y	1437	Denton	15-Mar-2017
Lower Spine Accelerometers (T12)	X	P89126	Endevco	25-Sep-2017	
	Y	P87139	Endevco	25-Sep-2017	
	Z	P64884	Endevco	25-Sep-2017	
Acetabulum Load Cell	Y	N/A	N/A	N/A	
Pubic Symphysis Load Cell	Y	457-FY	Denton	15-Mar-2017	

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

				SID-IIs S/N 305		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers		X	T11432	Endevco	03-Oct-2017	
		Y	P93774	Endevco	28-Sep-2017	
		Z	P91566	Endevco	28-Sep-2017	
Redundant Head Accelerometers		X	P91615	Endevco	28-Sep-2017	
		Y	P93762	Endevco	28-Sep-2017	
		Z	P93761	Endevco	28-Sep-2017	
Displacement Potentiometers	Shoulder		N/A	N/A	N/A	N/A
	Thoracic Rib	Upper	Y	007	Servo	28-Sep-2017
		Middle	Y	037	Servo	28-Sep-2017
		Lower	Y	1161	Servo	28-Sep-2017
	Abdominal Rib	Upper	Y	1295	Servo	28-Sep-2017
		Lower	Y	1136	Servo	28-Sep-2017
Lower Spine Accelerometers (T12)		X	P94545	Endevco	28-Sep-2017	
		Y	P94647	Endevco	28-Sep-2017	
		Z	P94530	Endevco	28-Sep-2017	
Acetabulum Load Cell		Y	DK7483S-FY	FTSS	28-Sep-2017	
Iliac Wing Load Cell		Y	287-FY	Denton	28-Sep-2017	
Pelvis Plug (struck side)			11417	SACO	29-Aug-2016	
Pelvis Plug (non-struck side)			36473	FTSS	23-Sep-2010	

**TABLE 3 – Vehicle Instrumentation**

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	P73587	Endevco	14-Nov-2017
	Vehicle Center of Gravity	Y	P73570	Endevco	14-Nov-2017
	Vehicle Center of Gravity	Z	P61288	Endevco	14-Nov-2017
2	Right Sill at Front Seat	X	P87577	Endevco	9-Nov-2017
	Right Sill at Front Seat	Y	P91963	Endevco	9-Nov-2017
	Right Sill at Front Seat	Z	P91171	Endevco	9-Nov-2017
3	Right Sill at Rear Seat	X	P58611	Endevco	14-Nov-2017
	Right Sill at Rear Seat	Y	P76454	Endevco	14-Nov-2017
	Right Sill at Rear Seat	Z	P61295	Endevco	14-Nov-2017
4	Left Sill at Front Door	Y	P97719	Endevco	2-Oct-2017
5	Left Sill at Rear Door	Y	P88453	Endevco	8-Nov-2017
6	Left A-Post Lower	Y	P93535	Endevco	8-Nov-2017
7	Left A-Post Middle	Y	P97245	Endevco	2-Oct-2017
8	Left B-Post Lower	Y	P33845	Endevco	13-Nov-2017
9	B-Post Middle	Y	P81599	Endevco	13-Nov-2017
10	Front Seat Track	Y	P94502	Endevco	13-Nov-2017
11	Rear Seat Track or Structure	Y	P34250	Endevco	2-Oct-2017
12	Right Rear Occupant Compartment	Y	P94577	Endevco	13-Nov-2017
13	Engine Block	X	P75506	Endevco	13-Nov-2017
	Engine Block	Y	P94485	Endevco	13-Nov-2017
14	Rear Floorpan Above Axle	X	P29093	Endevco	3-Oct-2017
	Rear Floorpan Above Axle	Y	P94489	Endevco	3-Oct-2017
	Rear Floorpan Above Axle	Z	P29109	Endevco	3-Oct-2017

**TABLE 4 – MDB Instrumentation**

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	P97724	Endevco	26-Sep-2017
MDB Center of Gravity	Y	P97718	Endevco	26-Sep-2017
MDB Center of Gravity	Z	P97715	Endevco	26-Sep-2017
Left Frame Rail at Rear Axle Centerline	X	P97876	Endevco	26-Sep-2017
Left Frame Rail at Rear Axle Centerline	Y	P97729	Endevco	26-Sep-2017