

FINAL REPORT NUMBER: SINCAP-TRC-16-004

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

**Volkswagen de Mexico S.A. de C.V. Mexico
2016 Volkswagen Golf SportWagen
NHTSA NUMBER: M20165802**

**PREPARED BY:
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Report Date: March 4, 2016

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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Approval Date: March 4, 2016

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

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16. Abstract This 55 / 28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2016 Volkswagen Golf SportWagen, 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 January 26, 2016. The impact velocity of the Moving Deformable Barrier (MDB) was 61.33 km/h, and the ambient temperature at the struck (left) side of the target vehicle at the time of impact was 22° C. The target vehicle post-test maximum crush was 212 mm at Level 3. The test vehicle's performance was as follows: <table border="1"> <thead> <tr> <th colspan="4">Driver ATD (ES-2re)</th> </tr> <tr> <th>Measurement Description</th><th>Units</th><th>IARV</th><th>Result</th></tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td><td>N/A</td><td>1000</td><td>185</td></tr> <tr> <td>Maximum Thoracic Rib Deflection</td><td>mm</td><td>44</td><td>30.6</td></tr> <tr> <td>Total Abdominal Force</td><td>N</td><td>2500</td><td>964.5</td></tr> <tr> <td>Pubic Symphysis Force</td><td>N</td><td>6000</td><td>-1379.3</td></tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="4">Passenger ATD (SID-IIs)</th> </tr> <tr> <th>Measurement Description</th><th>Units</th><th>IARV</th><th>Result</th></tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td><td>N/A</td><td>1000</td><td>368</td></tr> <tr> <td>Lower Spine Resultant Acceleration</td><td>g's</td><td>82</td><td>63.1</td></tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td><td>N</td><td>5525</td><td>2616.6</td></tr> <tr> <td>Maximum Thoracic Rib Deflection</td><td>mm</td><td>38*</td><td>32.0</td></tr> <tr> <td>Maximum Abdominal Rib Deflection</td><td>mm</td><td>45*</td><td>33.0</td></tr> </tbody> </table> * Proposed IARV The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.				Driver ATD (ES-2re)				Measurement Description	Units	IARV	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	185	Maximum Thoracic Rib Deflection	mm	44	30.6	Total Abdominal Force	N	2500	964.5	Pubic Symphysis Force	N	6000	-1379.3	Passenger ATD (SID-IIs)				Measurement Description	Units	IARV	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	368	Lower Spine Resultant Acceleration	g's	82	63.1	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2616.6	Maximum Thoracic Rib Deflection	mm	38*	32.0	Maximum Abdominal Rib Deflection	mm	45*	33.0
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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 2016 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 2016 Volkswagen Golf SportWagen. 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 2016 Volkswagen Golf SportWagen 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 61.33 km/h (38.11 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 January 26, 2016. 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.

Dummy injury readings were recorded as follows:

Measurement Description	Driver ATD (ES-2-re)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	185
Maximum Thoracic Rib Deflection	mm	44	30.6
Combined Abdominal Force	N	2500	964.5
Pubic Symphysis Force	N	6000	-1379.3

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	368
Lower Spine (T12) Resultant Acceleration	G	82	63.1
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2616.6
Maximum Thoracic Rib Deflection	mm	38*	32.0
Maximum Abdominal Rib Deflection	mm	45*	33.0

* 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	N/A	No	N/A
Seat Belt Load Limiter	Yes	N/A	No	N/A
Other	N/A	N/A	N/A	N/A

GENERAL COMMENTS

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

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2016 Volkswagen Golf SportWagen
 Test Program: NCAP Side Impact

NHTSA No.: M20165802
 Test Date: 1/26/16

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20165802
Model Year	2016
Make	Volkswagen
Model	Golf SportWagen
Body Style	Passenger Car
VIN	3VWC17AU5GM513432
Body Color	Tornado Red
Odometer Reading (km/mi)	14.0 mi
Engine Displacement (L)	1.8
Type/No. Cylinders	Straight/4
Engine Placement	Front/Transverse
Transmission Type	Automatic
Transmission Speeds	6
Overdrive	Yes
Final Drive	FWD
Roof Rack	Rails
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Seatback only
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	N/A
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Rear Pass. Curtain Airbag	Yes
Rear Pass. Head/Torso Airbag	No
Rear Pass. Torso Airbag	No
Rear Pass. Torso/Pelvis Airbag	No
Rear Passenger Pelvis Airbag	No
Driver Seat Belt Pretensioner	Yes
Rear Pass. Seat Belt Pretensioner	No
Driver Load Limiter	Yes
Rear Passenger Load Limiter	No
Other Safety Restraint	No

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

Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Volkswagen de Mexico S.A. de C.V. Mexico
Date of Manufacture	10/15
Vehicle Type	Passenger Car

GVWR (kg)	1930
GAWR Front (kg)	980
GAWR Rear (kg)	1000

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity (DSC)	2	3	N/A	5
Capacity Weight (VCW) (kg)				454.0
DSC x 68.04 (kg)				340.2
Cargo Weight (RCLW) (kg) ¹				113.8

VEHICLE SEAT TYPE

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

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

Test Vehicle: 2016 Volkswagen Golf SportWagen
 Test Program: NCAP Side Impact

NHTSA No.: M20165802
 Test Date: 1/26/16

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	248	262	248	248
Tire Placard	kPa	230	230	230	230
Owner's Manual	kPa	N/A	N/A	N/A	N/A
As Tested	kPa	230	230	230	230

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	409.0	305.0		449.8	411.2		456.6	416.0	
Right	kg	402.4	295.8		405.0	376.0		407.6	370.8	
Ratio	%	57.5	42.5		52.1	47.9		52.3	47.7	
Totals	kg	811.4	600.8	1412.2	854.8	787.2	1642.0	864.2	786.8	1651.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1412.2	(A)
Actual Weight of 1 P572V ATD (SID-III) Dummy Used	kg	125.0	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	113.8	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1651.0	(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	698	695	Yes
RF	mm	708	698	Yes
RR	mm	673	668	Yes
LR	mm	673	669	Yes
Vehicle CG (Aft of Front Axle)	mm	1253	1261	
Vehicle CG (Left(+)/Right(-) from Longitudinal Centerline)	mm	+44	+38	

***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".

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast: Steel plates placed in spare tire well	65.3
Removed: None.	0.0

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

Test Vehicle: 2016 Volkswagen Golf SportWagen
 Test Program: NCAP Side Impact

NHTSA No.: M20165802
 Test Date: 1/26/16

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	21.9	16.9	19.4
Front Passenger Seat	21.3	16.6	19.0
Front Center Seat*	N/A	N/A	N/A
Struck Side Rear Seat	Fixed	N/A	N/A
Non-Struck Side Rear Seat	Fixed	N/A	N/A
Rear Center Seat*	Fixed	N/A	N/A

* 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	19.4	148	Max	N/A	N/A	N/A
			Mid	141	148	156
			Min	N/A	N/A	N/A
Front Passenger Seat	19.0	140	Max	N/A	N/A	N/A
			Mid	136	140	146
			Min	N/A	N/A	N/A
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	17.5	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	17.4	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*	12.4	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: 2016 Volkswagen Golf SportWagen

NHTSA No.: M20165802

Test Program: NCAP Side Impact

Test Date: 1/26/16

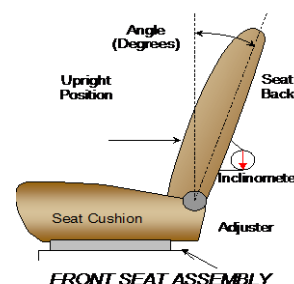
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents	mm	Detent
Driver Seat	350	38	230	19
Front Passenger Seat	350	38	230	19
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat	Fixed	N/A	Fixed	N/A
Non-Struck Side Rear Seat	Fixed	N/A	Fixed	N/A
Rear Center Seat*	Fixed	N/A	Fixed	N/A

* If applicable

SEAT BACK ANGLE ADJUSTMENT

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



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents	Degrees	Detent
Driver Seat w/ Seated Dummy	71.7	N/A	18.3	N/A
Front Passenger Seat	71.2	N/A	18.2	N/A
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat w/ Seated Dummy	Fixed	N/A	N/A	N/A
Non-Struck Side Rear Seat	Fixed	N/A	N/A	N/A
Rear Center Seat*	Fixed	N/A	N/A	N/A

* If applicable

SEAT BELT ANCHORAGE ADJUSTMENT

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

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

HEAD RESTRAINT ADJUSTMENT

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

	Total # of Positions	Placed in Position #
Driver Seat	5, Numbered from 0 to 4	4, 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

Test Vehicle: 2016 Volkswagen Golf SportWagen

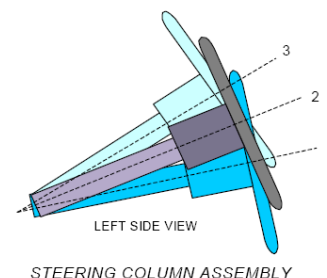
NHTSA No.: M20165802

Test Program: NCAP Side Impact

Test Date: 1/26/16

STEERING COLUMN ADJUSTMENT

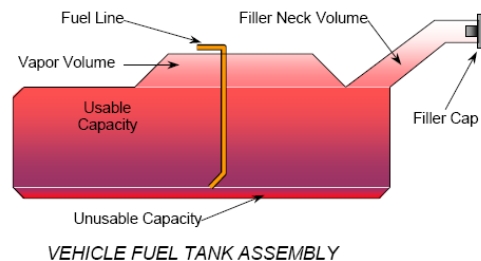
Steering wheel and column adjustments are made so that the steering wheel hub is at the center of its geometric locus it describes when it moves through its full range of motion.



	Degrees	Fore/Aft Position (mm)
Lowermost, Position No. 1	71.0	300
Geometric Center, Position No. 2	68.2	354
Uppermost, Position No. 3	65.4	327
Telescoping Steering Wheel Travel		54
Test Position	68.2	327

FUEL PUMP

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. The fuel Pump is located under the rear seat and sealed with a black cap. The fuel pump needs 12 volts for running.



FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	50.0
Usable Capacity of "Optional Tank" (see Form No. 1)	N/A
Usable Capacity of Standard Tank (see Owner's Manual)	50.0
Usable Capacity of Optional Tank (see Owner's Manual)	N/A
93% of Usable Capacity	46.5
Actual Amount of Solvent Used in Test	46.5
1/3 of Usable Capacity	16.7

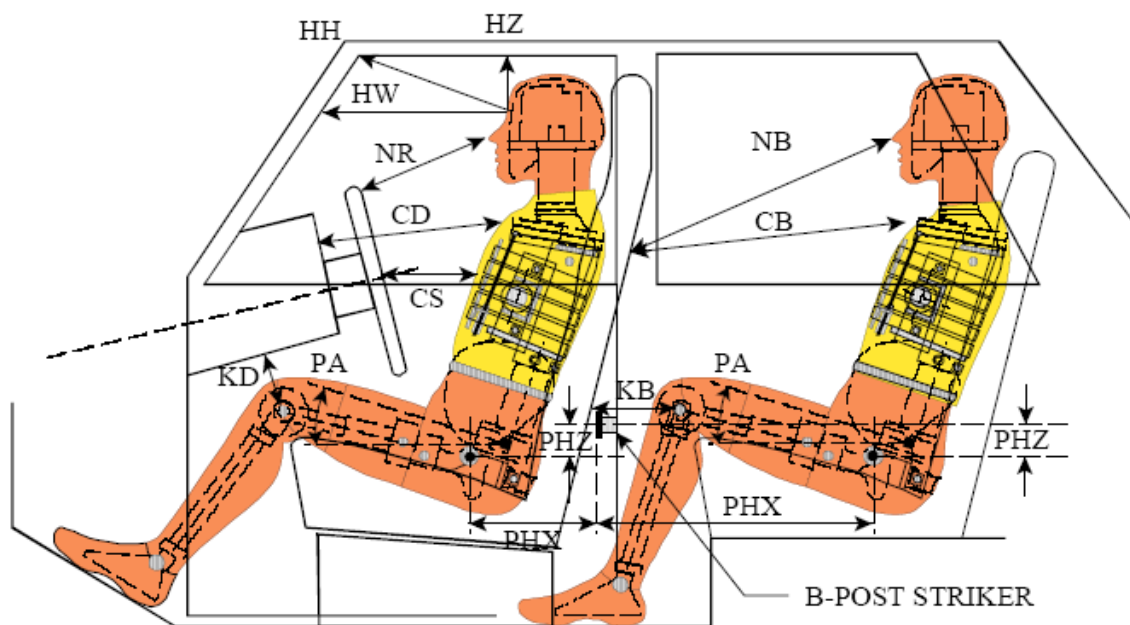
Is the Actual Amount of Solvent Used in the test equal to 93% $\pm$ 1% of the Usable Capacity stated in on Form No. 1? ☒ YES ☐ NO

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2016 Volkswagen Golf SportWagen
 Test Program: NCAP Side Impact

NHTSA No.: M20165802
 Test Date: 1/26/16



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

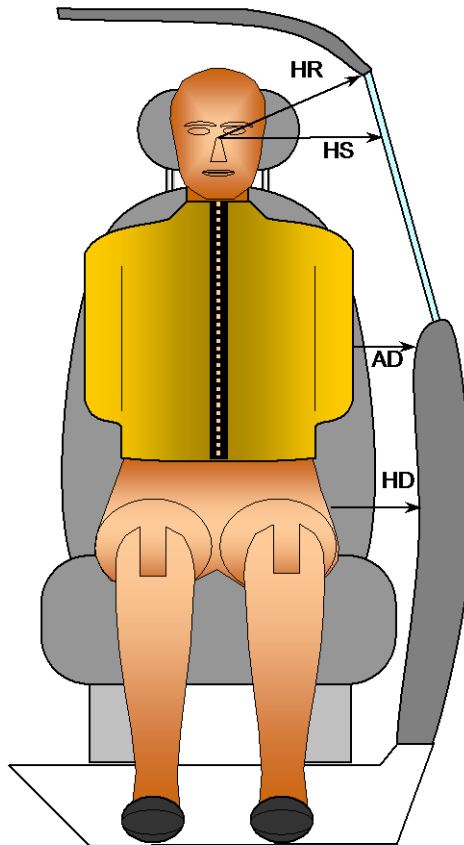
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	415			
HW		Header to Windshield	656			
HZ	HZ	Head to Roof Liner	176		279	
NR	NB	Nose to Rim/Seat Back	452		554	
CD	CB	Chest to Dash/Seat Back	564		515	
CS		Chest to Steering Wheel	348			
KD(L)/KDA(L) ^o	KB(L)/KBA(L) ^o	Left Knee to Dash/Seat Back	218	31.5	240	18.5
KD(R)/KDA(R) ^o	KB(R)/KBA(R) ^o	Right Knee to Dash/Seat Back	167	37	238	18.5
PAX ^o	PAX ^o	Pelvic Tilt Angle X		0.1 up		1.5 down
	PAY ^o	Pelvic Tilt Angle Y				22.2
PHX	PHX	Hip Point to Striker (X-Axis)	143		166	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	218		238	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2016 Volkswagen Golf SportWagen
 Test Program: NCAP Side Impact

NHTSA No.: M20165802
 Test Date: 1/26/16



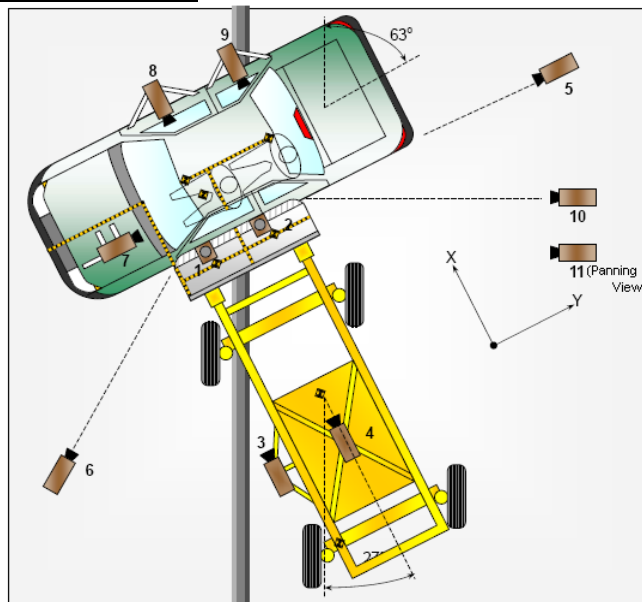
FRONT VIEW OF DUMMY

Code	Description	Units	Driver	Passenger
HR	Head to Side Header	mm	197	248
HS	Head to Side Window	mm	327	363
AD	Arm to Door	mm	111	132
HD	H-Point to Door	mm	157	152

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2016 Volkswagen Golf SportWagen
 Test Program: NCAP Side Impact

NHTSA No.: M20165802
 Test Date: 1/26/16



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	-250	1140	-5725	8.5	1000
2	Overhead Close-up	-150	840	-5702	25	1000
3	Left Impact Point (MDB)	-1783	871	-834	12.5	1000
4	Side Overall (MDB)	-2470	0	-1437	8.5	1000
5	Rear	275	7381	-1287	20	1000
6	Left Front	-2273	-3535	-1205	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

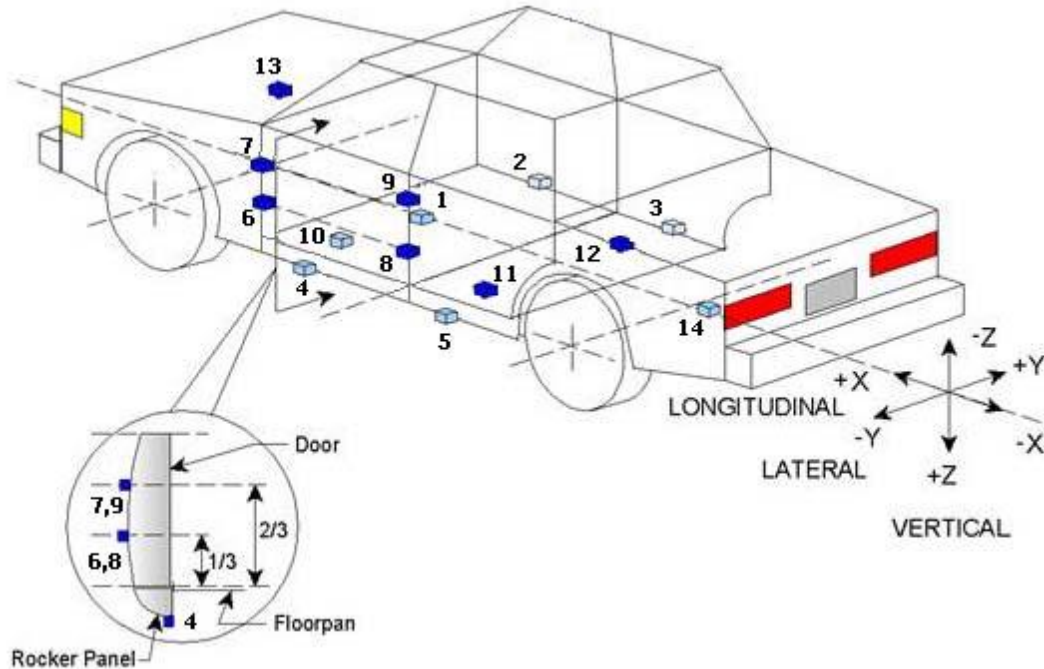
INSTRUMENTATION

Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	23
MBD Accelerometers	7
TOTAL	62

DATA SHEET NO. 6
TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2016 Volkswagen Golf SportWagen
 Test Program: NCAP Side Impact

NHTSA No.: M20165802
 Test Date: 1/26/16



TEST VEHICLE ACCELEROMETER LOCATIONS

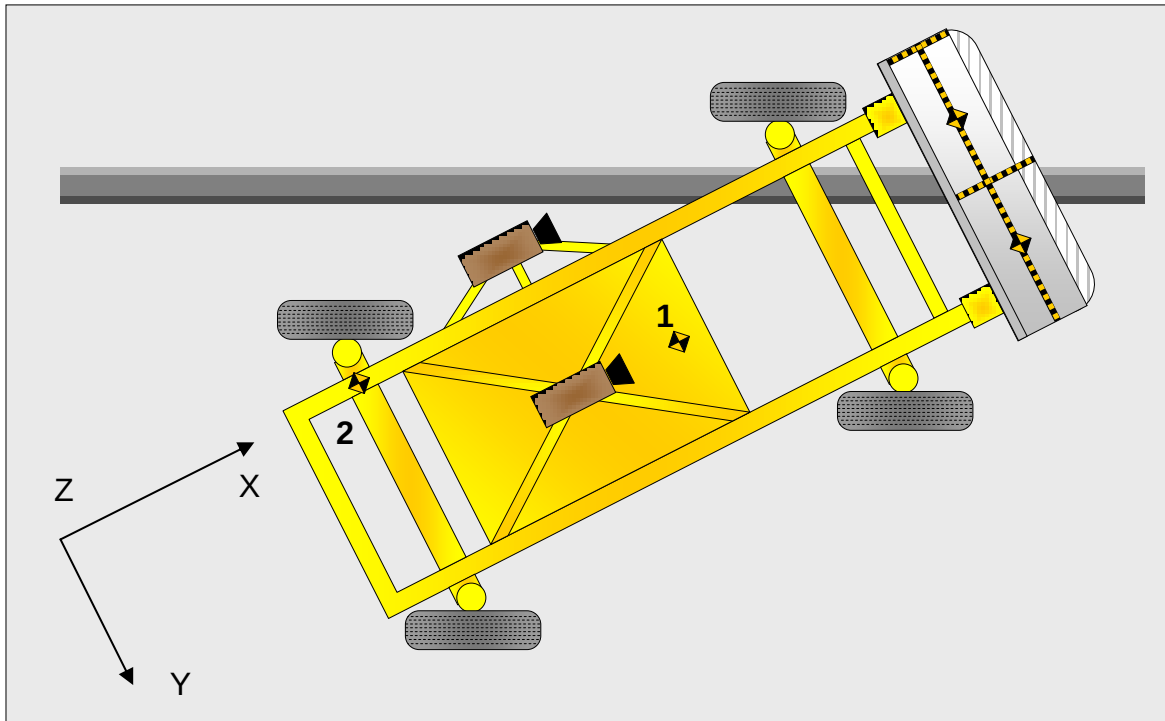
Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2745	90	-372
2	Right Sill at Front Seat	2862	690	-271
3	Right Sill at Rear Seat	1972	690	-268
4	Left Sill at Front Door	2858	-690	-263
5	Left Sill at Rear Door	1997	-690	-278
6	A-Post Lower	3180	-790	-410
7	A-Post Middle	3178	-790	-775
8	B-Post Lower	2137	-785	-520
9	B-Post Middle	2100	-785	-630
10	Front Seat Track	2365	-585	-273
11	Rear Seat Structure	1736	-460	-365
12	Right Rear Occ. Compartment	1740	495	-415
13	Engine Block	3902	15	-755
14	Rear Above Axle	1010	0	-450

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: 2016 Volkswagen Golf SportWagen
 Test Program: NCAP Side Impact

NHTSA No.: M20165802
 Test Date: 1/26/16



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: 2016 Volkswagen Golf SportWagen
Test Program: NCAP Side Impact

NHTSA No.: M20165802
Test Date: 1/26/16

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES2-re)	Rear Seat Dummy (SID-IIs)
Face	SCAB	SCAB
Top of Head	SCAB/Side Header	SCAB
Left Side of Head	SCAB/Side Header	SCAB
Back of Head	SCAB/Side Header	SCAB
Left Shoulder	Door Panel	Door Panel
Upper Torso	Seat Bolster/Torso/Pelvis Airbag	Seat Bolster/C-Pillar
Lower Torso	Seat Bolster	Seat Bolster/C-Pillar
Left Hip	Door Panel/Torso/Pelvis Airbag	C-Pillar/Door Panel/Seat Bolster
Left Knee	None	Door Panel

POST TEST DOOR PERFORMANCE

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

POST TEST SEAT PERFORMANCE

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

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Minor Deformation
Sill Separation	None Visible
Windshield Damage	None
Side Window Damage	Front and Rear Window Shattered
Other Notable Effects	None

DATA SHEET NO. 8 (CONTINUED)**POST TEST OBSERVATIONS**Test Vehicle: 2016 Volkswagen Golf SportWagenNHTSA No.: M20165802Test Program: NCAP Side ImpactTest Date: 1/26/16**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

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

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2630
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		376
Actual Impact Point (Aft of Front Axle)	mm		366
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact point	+10
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact point	0

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2016 Volkswagen Golf SportWagen
 Test Program: NCAP Side Impact

NHTSA No.: M20165802
 Test Date: 1/26/16

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	1111

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	385.8	298.0	683.8
Right	kg	395.6	288.2	683.8
Ratio	%	57.1	42.9	100.0
Totals	kg	781.4	586.2	1367.6

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.33
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.36
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

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

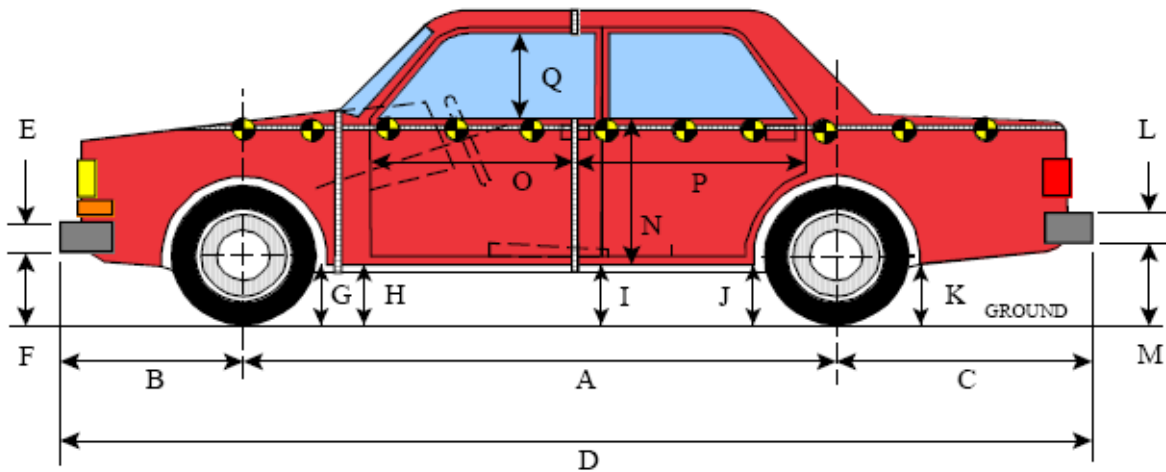
Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Left	240
B ¹	Top of Bumper	560	100	Left	371
C	Mid-Level	686	800	Left	190
D	Top of Stack	813	800	Left	175

¹ At Row B, Top of Bumper, a maximum crush of 371 mm was achieved at 100 mm left of center to 100 mm right of center.

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2016 Volkswagen Golf SportWagen
 Test Program: NCAP Side Impact

NHTSA No.: M20165802
 Test Date: 1/26/16



LEFT SIDE VIEW

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

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2630	2638	-8
B	Front Axle to Front Surface of Vehicle	845	845	0
C	Rear Axle to Rear Surface of Vehicle	1075	1075	0
D	Total Length at Centerline	4550	4551	-1
E	Front Bumper Thickness	115	115	0
F	Front Bumper Bottom to Ground	425	422	3
G	Sill Height at Front Wheel Well	234	310	-76
H	Sill Height at Front Door Leading Edge	235	296	-61
I	Sill Height at B-Pillar	241	254	-13
J1	Sill Height at Rear Wheel Well	250	301	-51
J2	Pinch Weld Height at Rear Wheel Well	171	220	-49
K	Sill Height Aft of Rear Wheel Well	305	357	-52
L	Rear Bumper Thickness	135	135	0
M	Rear Bumper Bottom to Ground	385	436	-51
N	Sill Height to Window Bottom Sill	705	660	45
O	Front Door Leading Edge to Impact CL	773	742	31
P	Rear Door Trailing Edge to Impact CL	1081	1027	54
Q	Front Window Opening	410	403	7
R	Right Side Length	4477	4481	-4
S	Left Side Length	4480	4482	-2
T	Vehicle Width	1775	1793	-18

DATA SHEET NO. 11

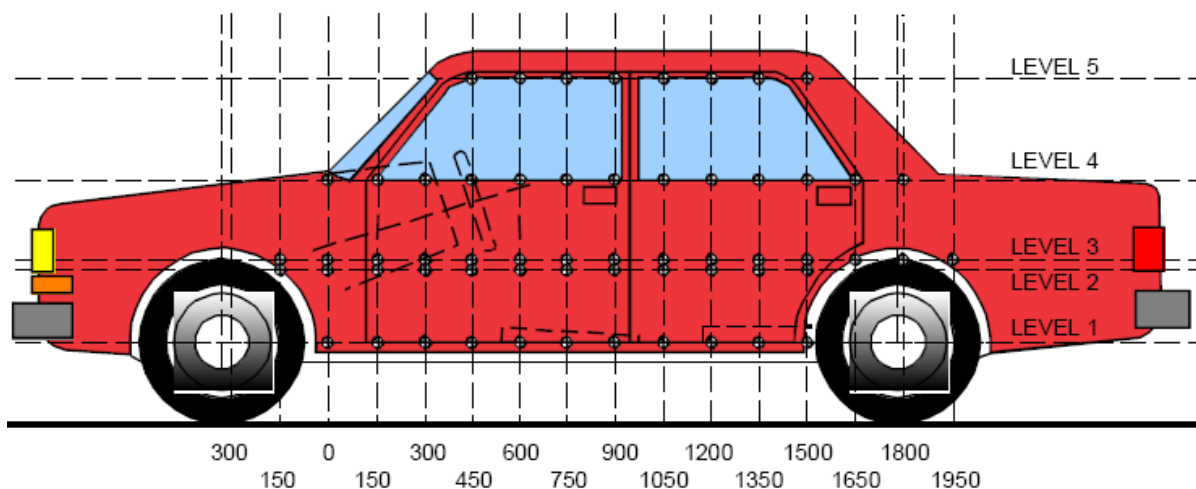
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2016 Volkswagen Golf SportWagen

NHTSA No.: M20165802

Test Program: NCAP Side Impact

Test Date: 1/26/16



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance From Impact
1	Sill Top	333	112	900
2	Driver Hip Point	510	185	1500
3	Mid-Door	614	212	1500
4	Window Sill	879	178	1650
5 ¹	Window Top	1312	2	1800

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

¹ Level 5, Window Top, maximum exterior static crush of 2 mm was achieved at 1800 and 1950 mm.

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

Test Vehicle: 2016 Volkswagen Golf SportWagen
 Test Program: NCAP Side Impact

NHTSA No.: M20165802
 Test Date: 1/26/16

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

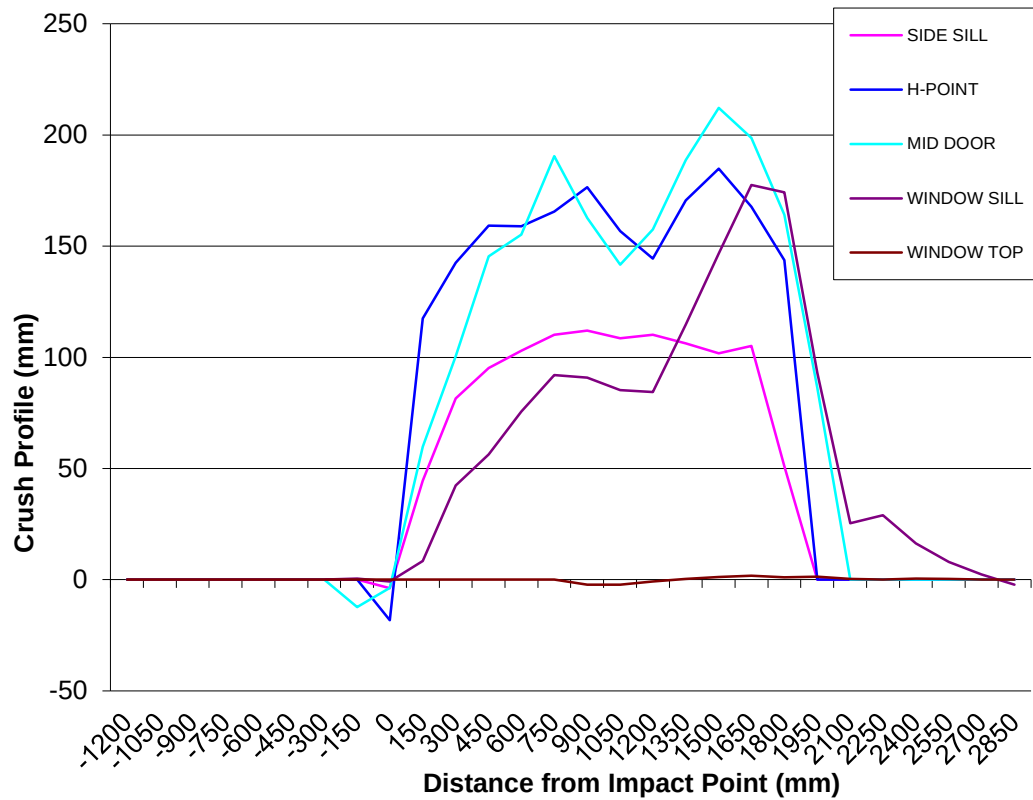
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-750	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-450	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-150	0	0	884	779	0	0	0	897	778	0	0	0	-13	1	0
0	873	883	878	799	0	877	902	882	800	0	-4	-19	-4	-1	0
150	860	872	876	814	0	815	755	816	805	0	45	117	60	9	0
300	864	874	879	823	0	783	732	778	780	0	81	142	101	43	0
450	867	876	881	830	0	772	717	736	774	0	95	159	145	56	0
600	869	877	883	836	0	766	718	727	761	0	103	159	156	75	0
750	870	877	883	841	0	760	711	693	749	0	110	166	190	92	0
900	869	875	883	844	550	757	699	720	753	552	112	176	163	91	-2
1050	868	874	882	845	564	759	717	740	760	566	109	157	142	85	-2
1200	865	872	880	847	569	755	727	723	762	570	110	145	157	85	-1
1350	863	868	877	845	569	756	698	688	731	569	107	170	189	114	0
1500	859	864	872	844	567	757	679	660	698	566	102	185	212	146	1
1650	855	859	867	842	563	750	691	668	664	562	105	168	199	178	1
1800	852	860	863	838	558	801	716	699	664	556	51	144	164	174	2
1950	0	0	872	818	551	0	0	786	725	549	0	0	86	93	2
2100	0	0	0	826	541	0	0	0	801	540	0	0	0	25	1
2250	0	0	0	819	528	0	0	0	789	528	0	0	0	0	0
2400	0	0	0	809	512	0	0	0	792	512	0	0	0	17	0
2550	0	0	0	796	489	0	0	0	788	489	0	0	0	8	0
2700	0	0	0	781	0	0	0	0	779	0	0	0	0	2	0
2850	0	0	0	764	0	0	0	0	766	0	0	0	0	-2	0

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

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

Test Vehicle: 2016 Volkswagen Golf SportWagen
Test Program: NCAP Side Impact

NHTSA No.: M20165802
Test Date: 1/26/16

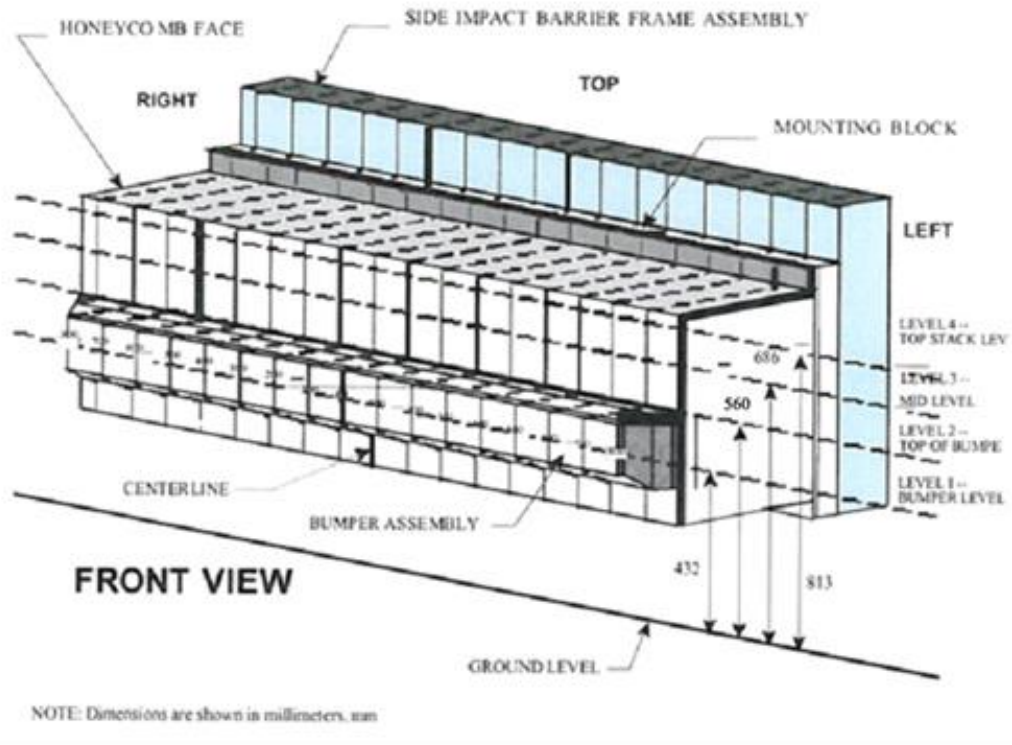


DATA SHEET NO. 12

MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2016 Volkswagen Golf SportWagen
 Test Program: NCAP Side Impact

NHTSA No.: M20165802
 Test Date: 1/26/16



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	24	22	35	51	73	116	126	116	101	80	85	83	98	120	131	140	175
2 ¹	110	108	108	111	115	114	370	371	371	371	113	116	120	126	132	146	186
3	41	28	34	41	53	83	101	94	68	56	50	52	62	75	100	135	190
4	24	22	35	51	73	116	126	116	101	80	85	83	98	120	131	140	175

¹ Level 2, Top of Bumper, measurements were collected at 560 mm to eliminate post-test measurement obstruction by the bumper element.

DATA SHEET NO. 13**FMVSS NO. 301 STATIC ROLLOVER RESULTS**Test Vehicle: 2016 Volkswagen Golf SportWagenNHTSA No.: M20165802Test Program: NCAP Side ImpactTest Date: 1/26/16Test Time: 14:18 Temperature: 21.7°CA. From impact until vehicle motion ceases: 0 oz.

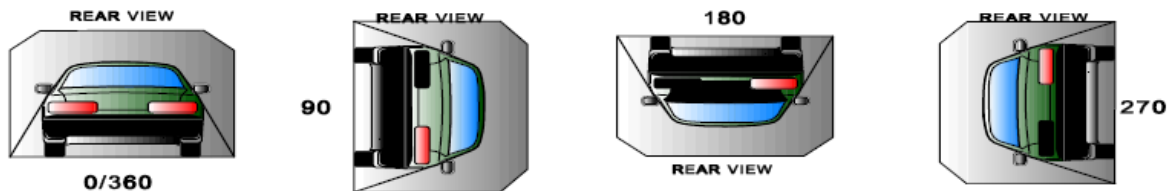
(Maximum allowable is 1 ounce)

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. 14

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

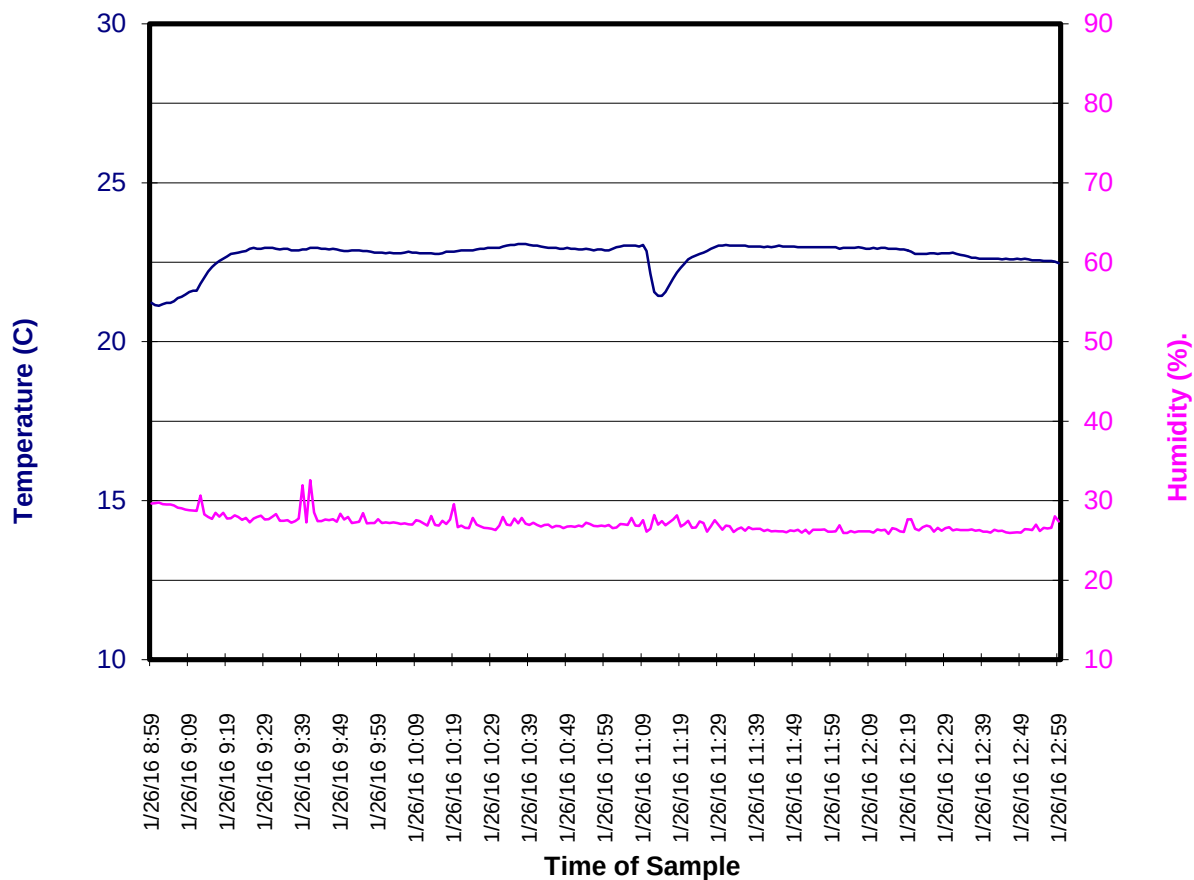
Test Vehicle: 2016 Volkswagen Golf SportWagen

NHTSA No.: M20165802

Test Program: NCAP Side Impact

Test Date: 1/26/16

M20165802 2016 Volkswagen Golf SportWagen Left MDB Impact 160126: Test Time 12:59



APPENDIX A
PHOTOGRAPHS

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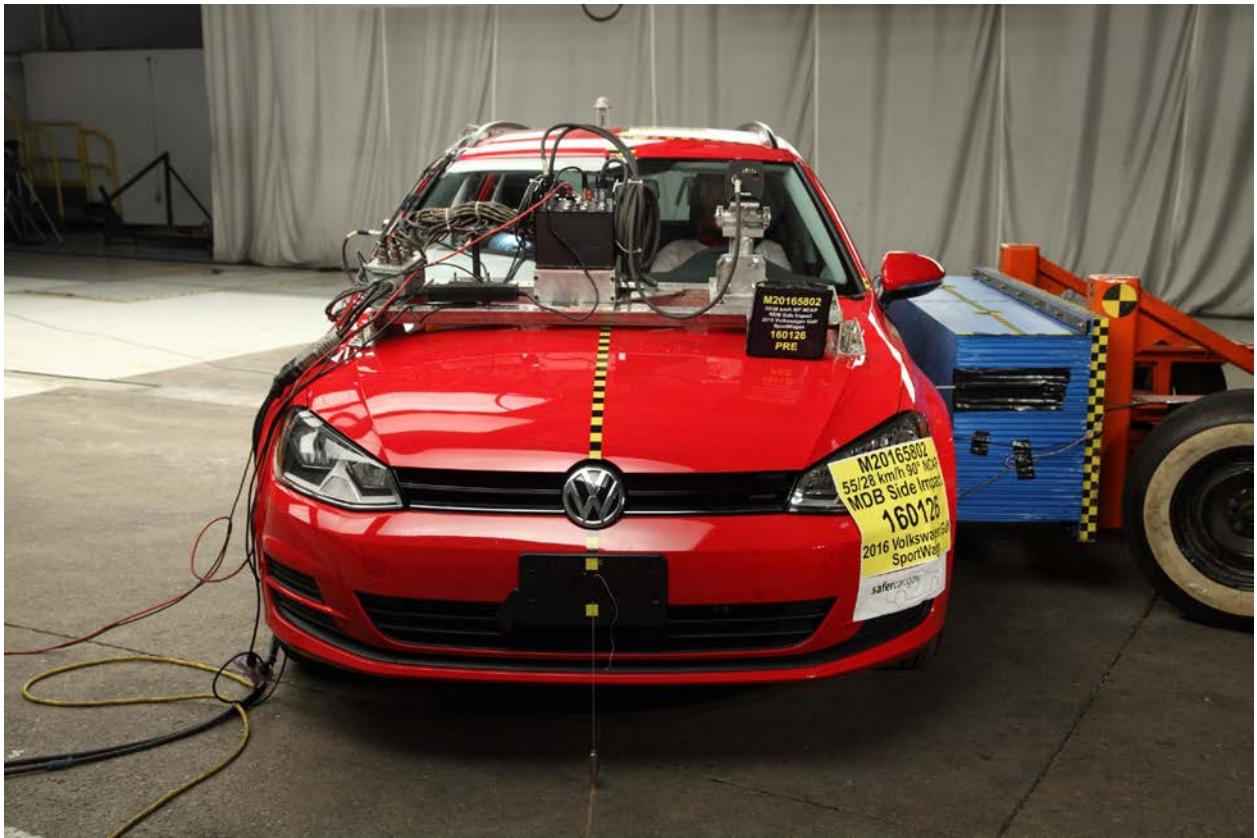
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098	FMVSS No. 301 Static Rollover 180 Degrees	A-55
099	FMVSS No. 301 Static Rollover 270 Degrees	A-55
100	FMVSS No. 301 Static Rollover 360 Degrees	A-56
101	Impact Event	A-56
102	Monroney Label	A-57
103	Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-57
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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



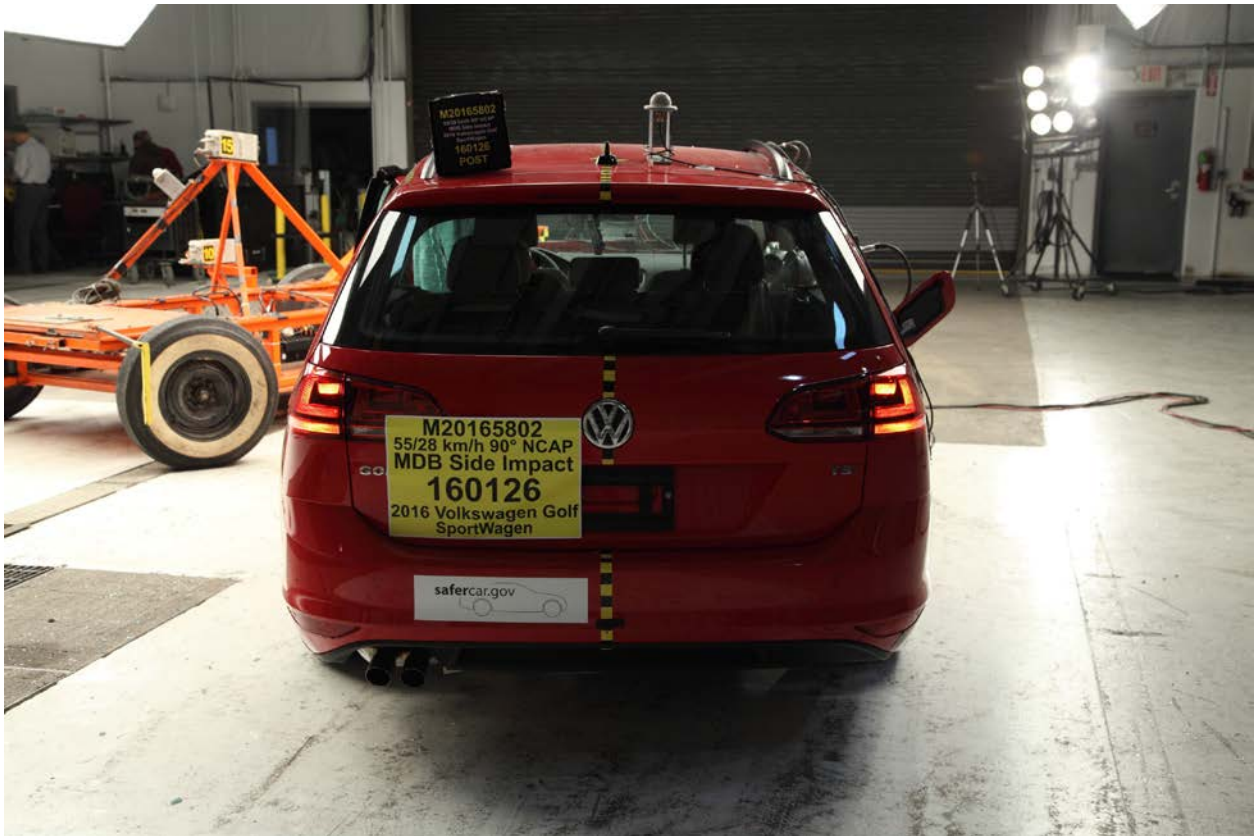
009 Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



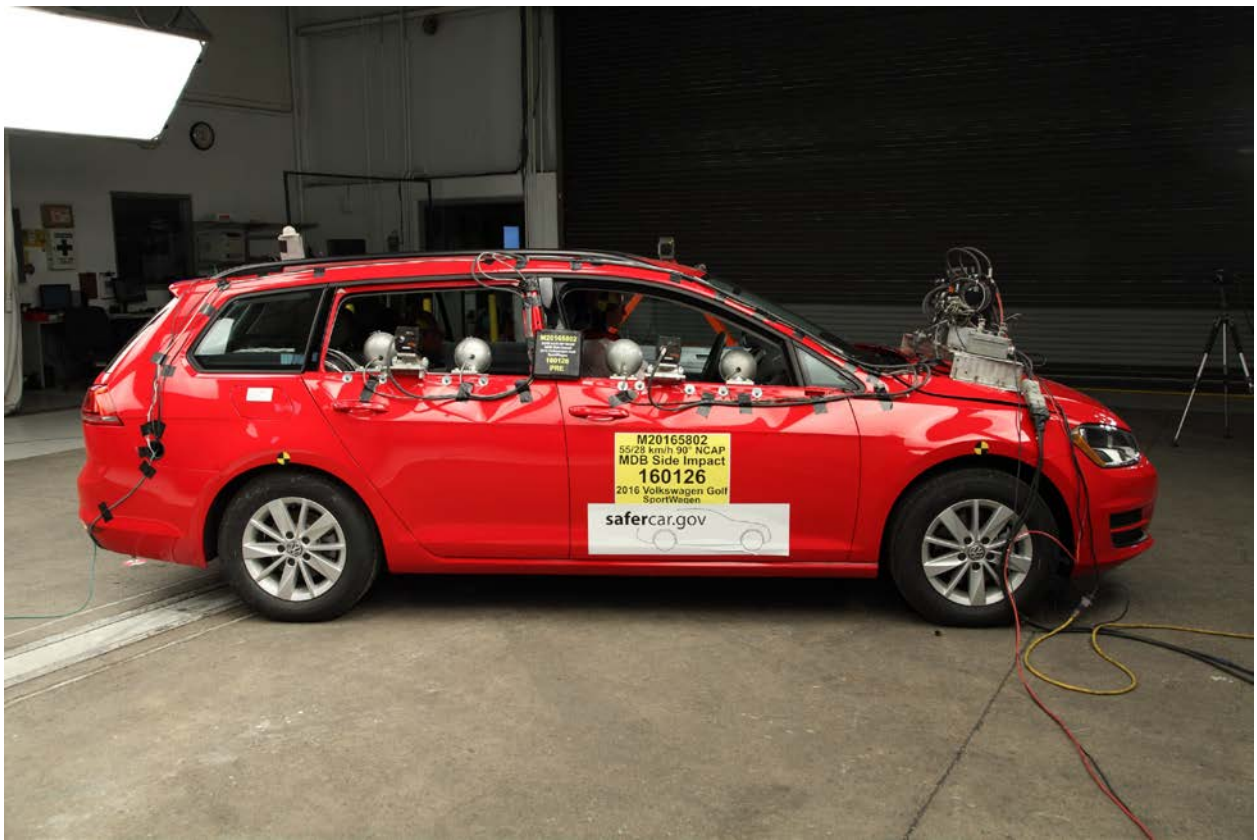
010 Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



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 of 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



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 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



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



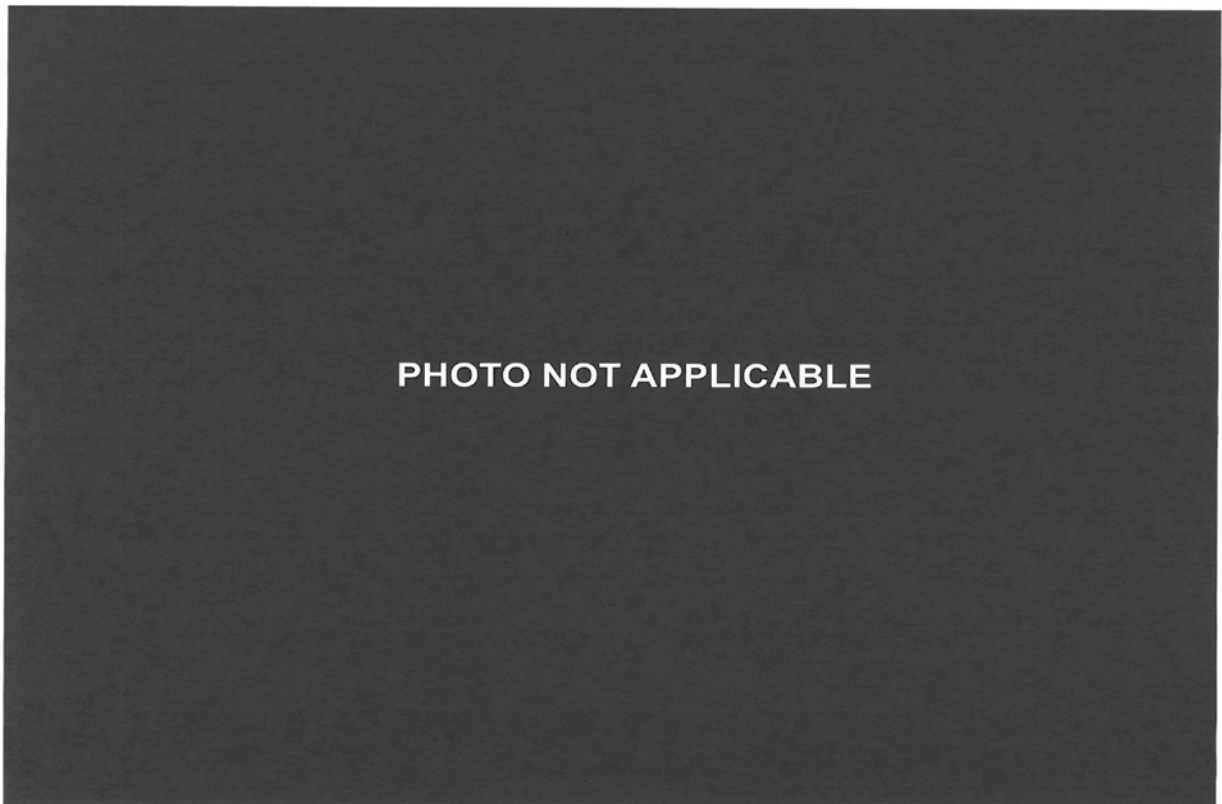
051 Post-Test Driver Dummy Close-Up Torso Contact with Side Airbag View



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



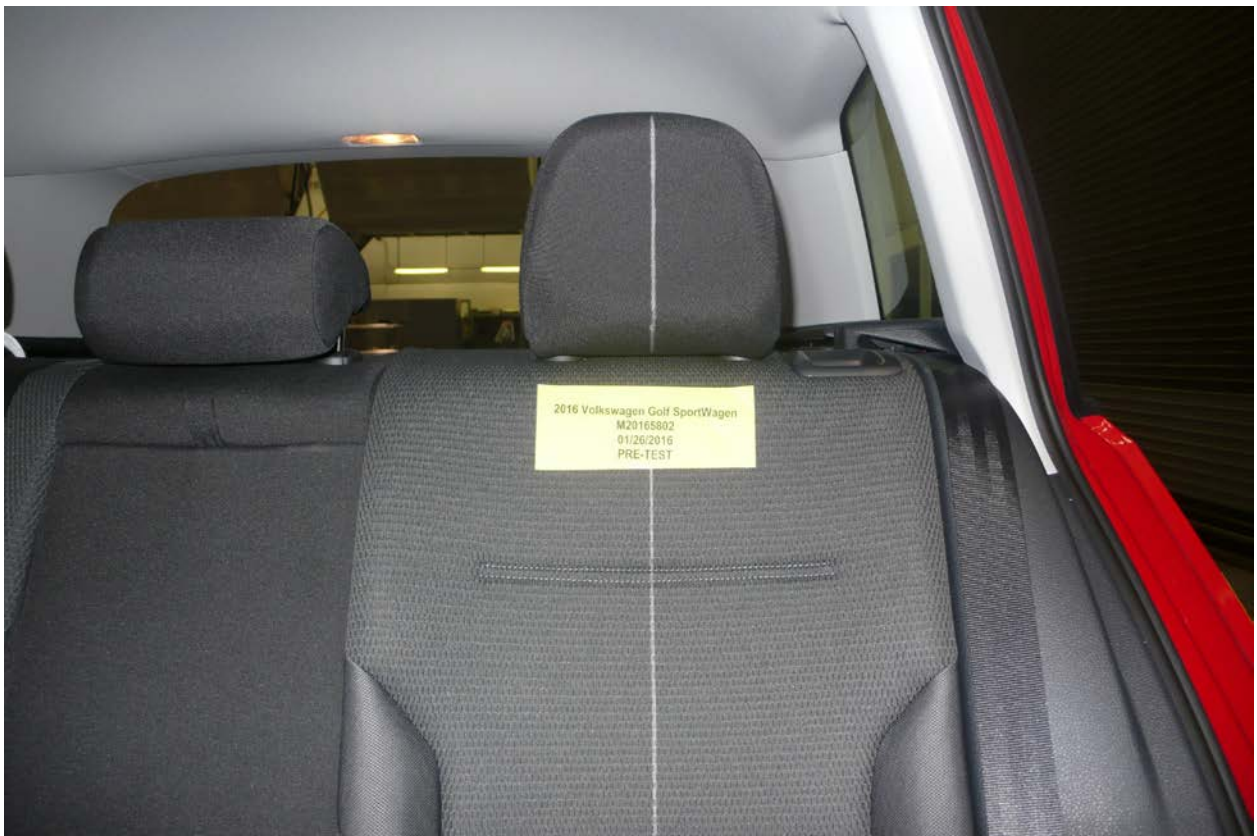
055 Pre-Test Left Side View of Passenger Dummy Showing Belt and Chalking



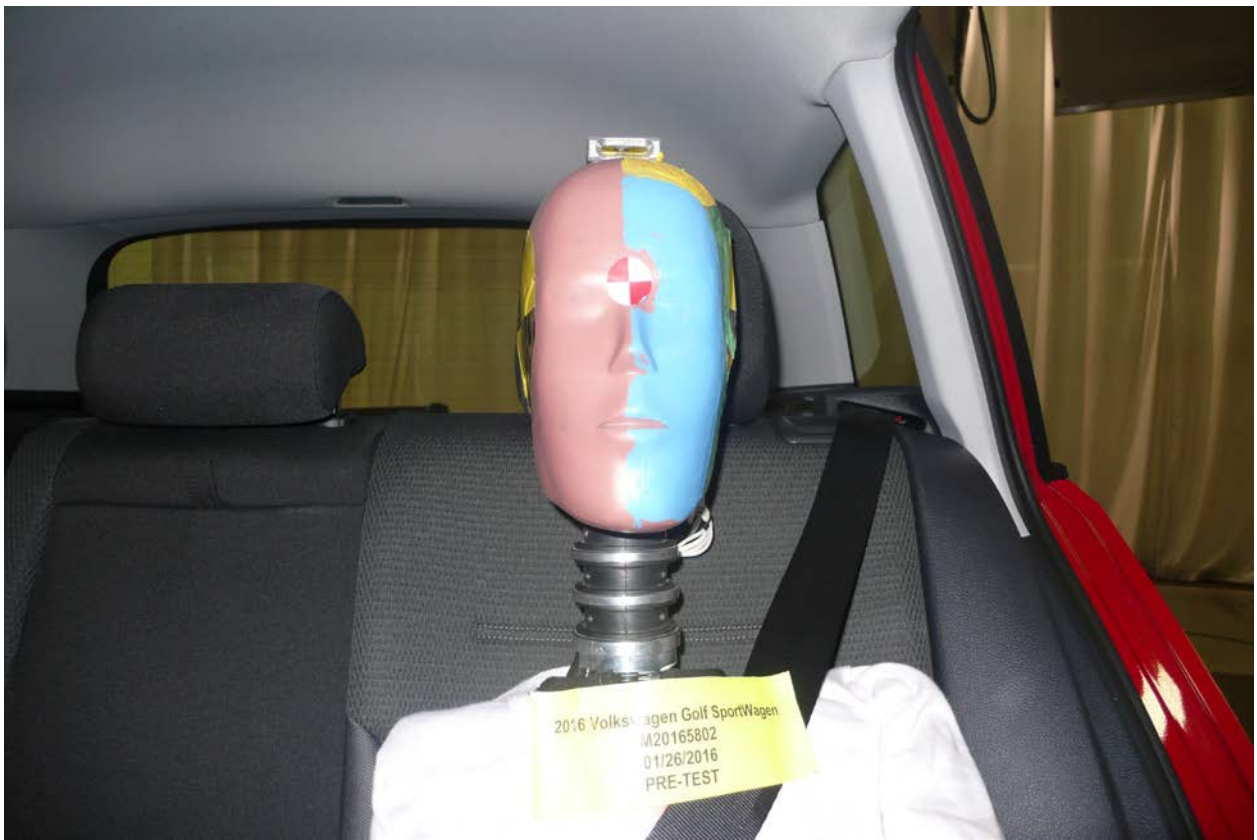
056 Pre-Test Left Side View of Passenger Dummy Shoulder and Door Top View



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



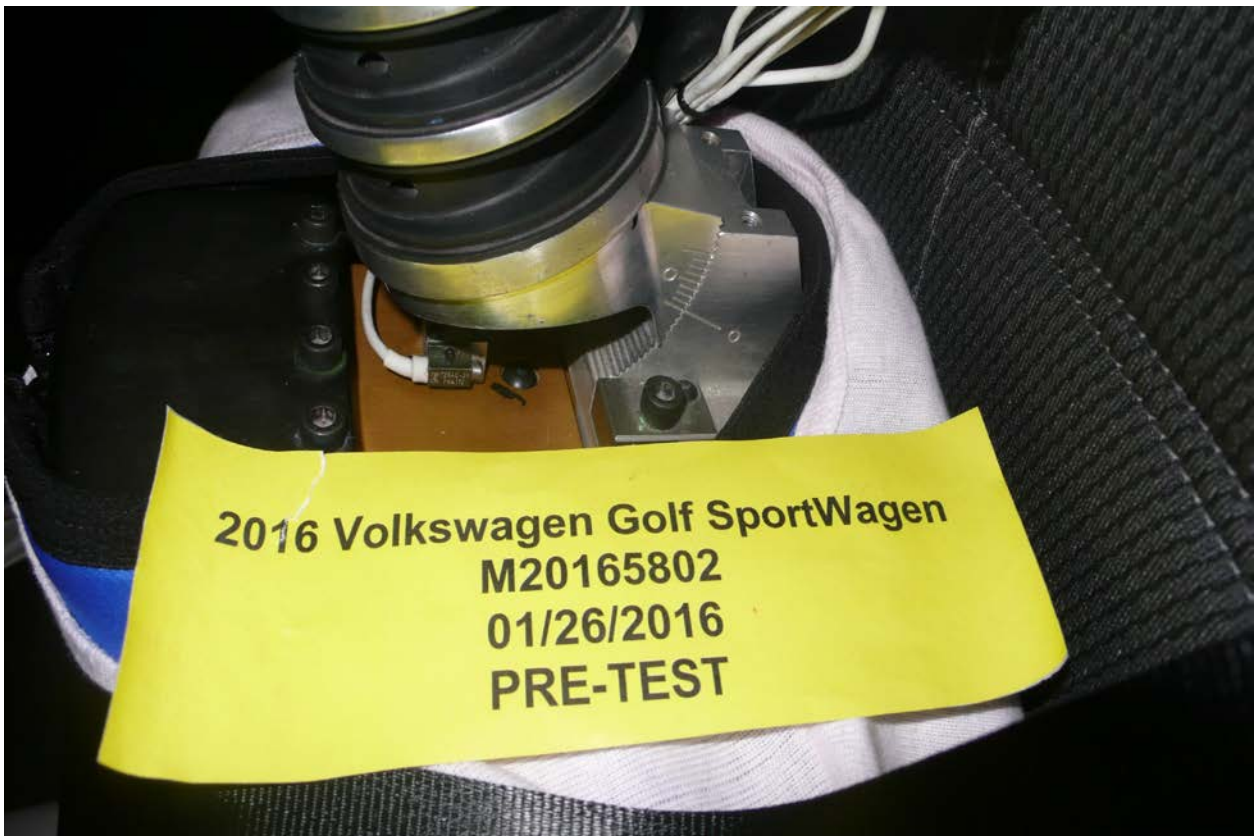
059 Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint



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 Neck Showing Position of Adjustable Neck Bracket



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



064 Pre-Test Placement of Rear Passenger Dummy 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

PHOTO NOT APPLICABLE

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



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



069 Pre-Test Passenger Dummy and Door Clearance View



070 Post-Test 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 Passenger Inner Door Panel View



074 Post-Test Passenger Inner Door Panel View

PHOTO NOT APPLICABLE

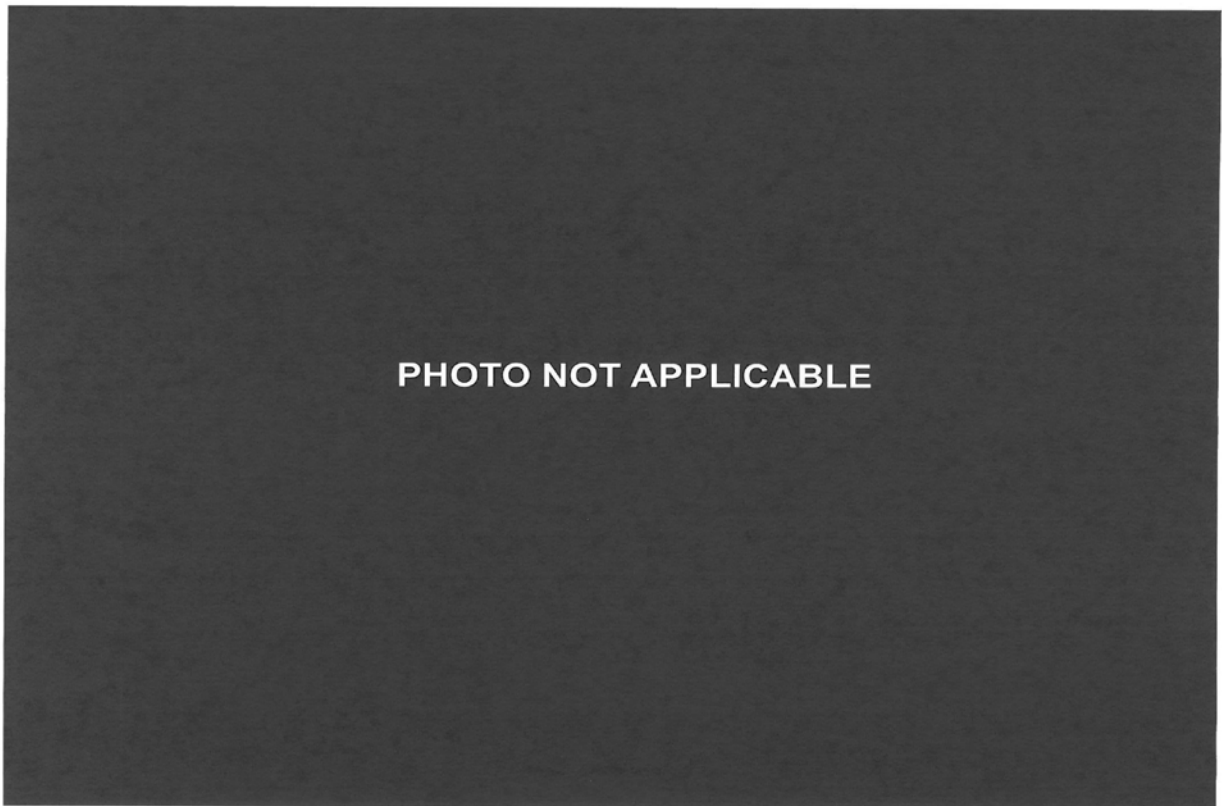
075 Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle View



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



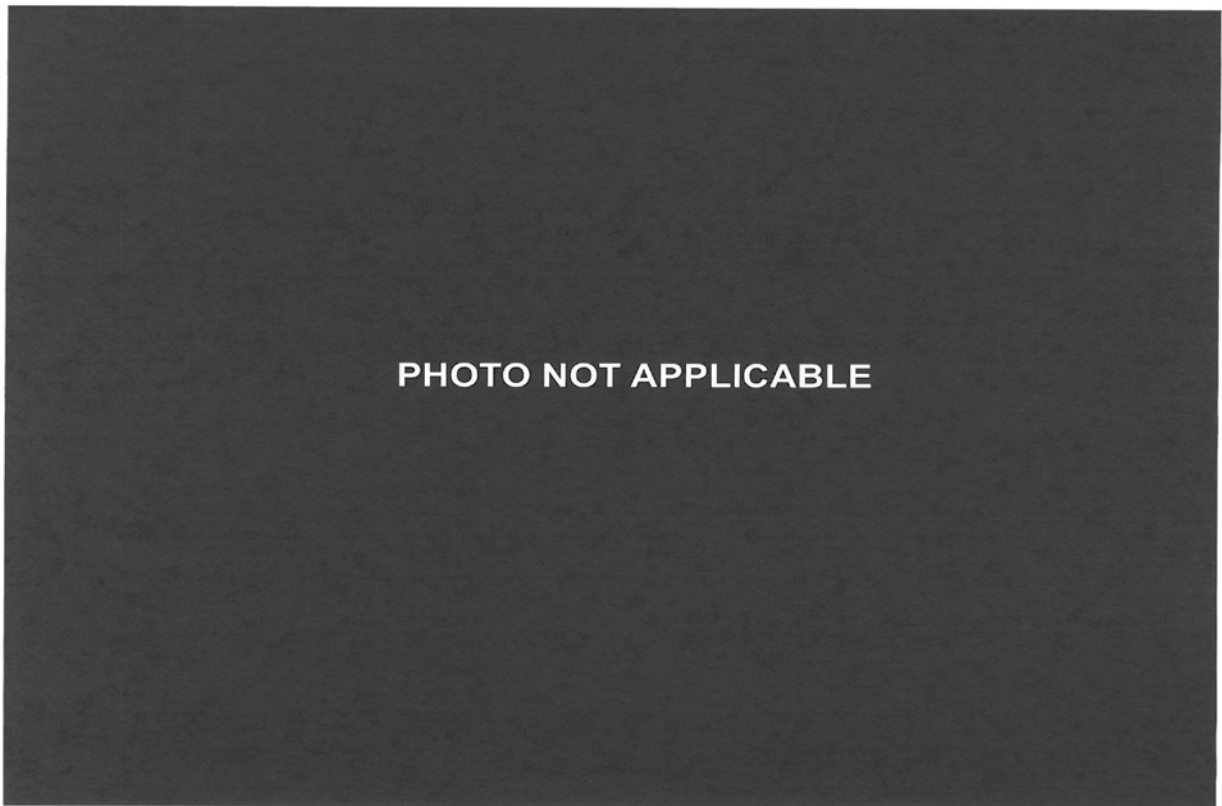
077 Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View



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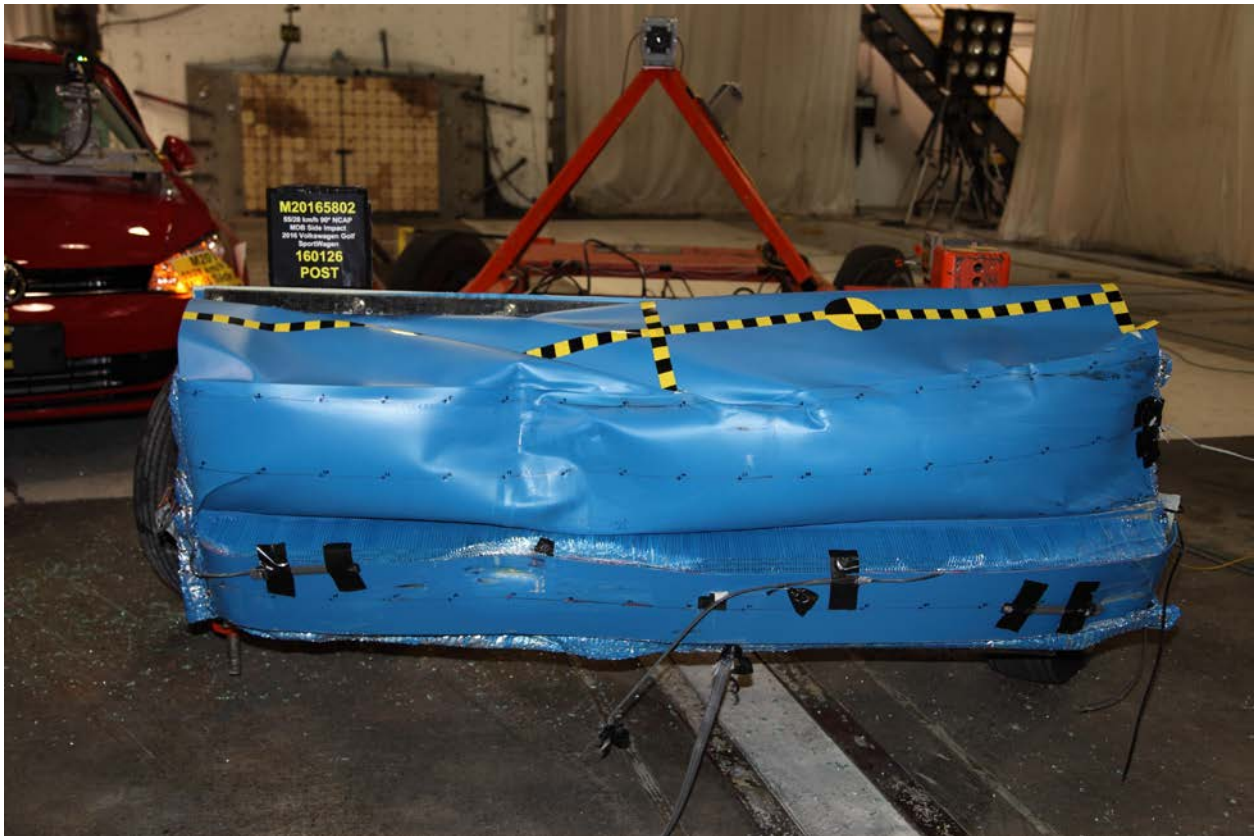
082 Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



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



084 Pre-Test Front View of MDB Impactor Face



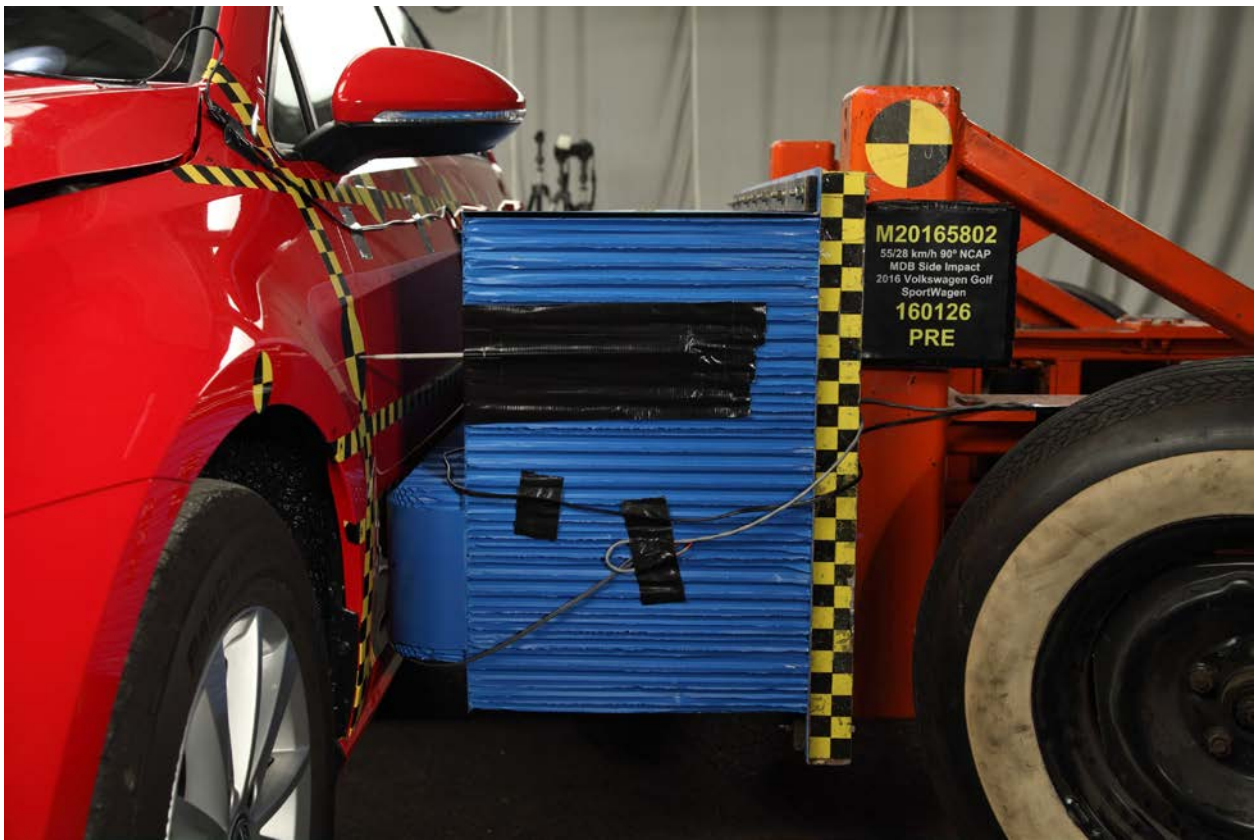
085 Post-Test Front View of MDB Impactor Face



086 Pre-Test Top View of MDB Impactor Face



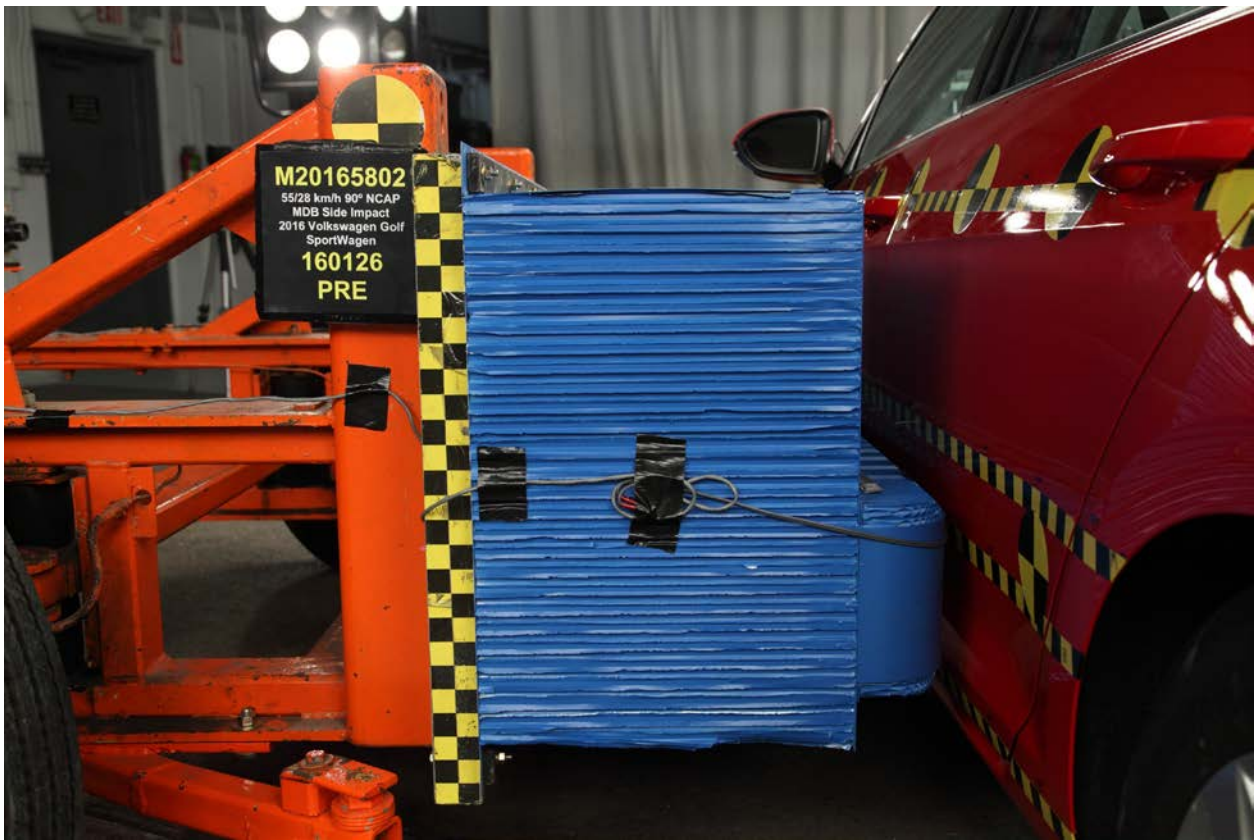
087 Post-Test Top View of MDB Impactor Face



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



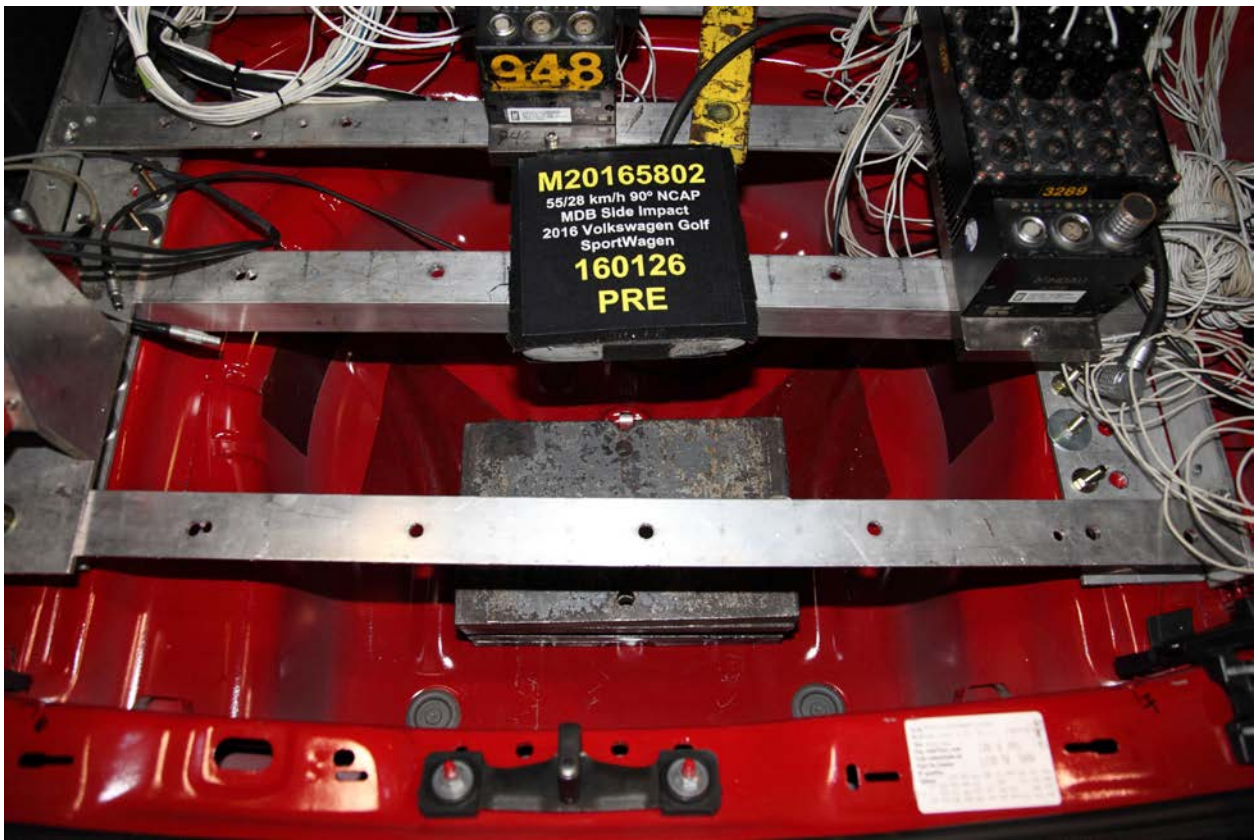
091 Post-Test Right Side View of MDB Impactor Face



092 Close-Up View of Vehicle Certification Label



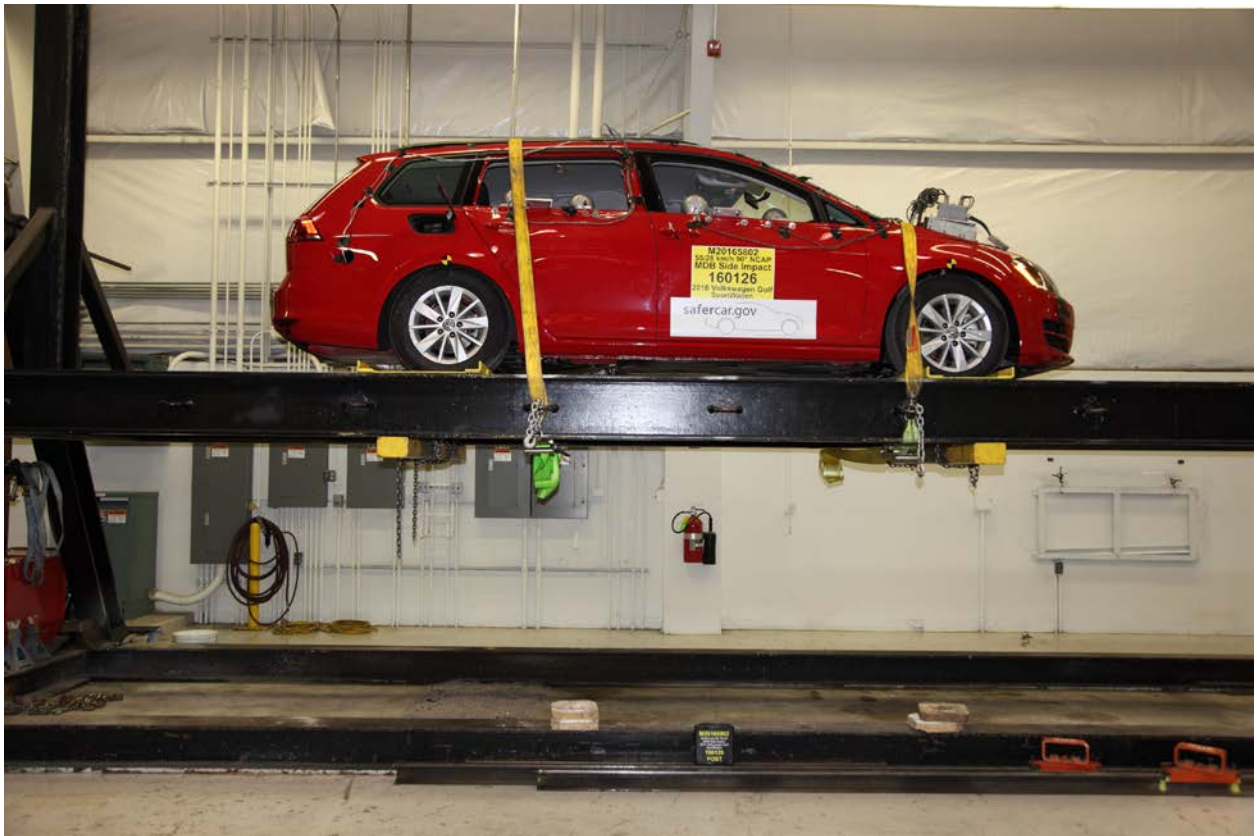
093 Close-Up View of Vehicle Tire Information Placard or Label



094 Pre-Test Ballast View



095 Post-Test Primary 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

2016 Golf SportWagen TSI® S

Tomato Red Exterior Titan Black Cloth Interior

The German-Tuned Wagon.

STANDARD FEATURES (unless replaced by options)

PERFORMANCE

- 1.8L TSI® DOHC 16V TURBO 4-CYLINDER DIRECT INJECTION ENGINE
- PARTIAL ZERO EMISSIONS VEHICLE (PZEV)
- FOUR-WHEEL INDEPENDENT SUSPENSION
- SERVO-TRONIC® ELECTRO-MECHANICAL POWER STEERING

SAFETY FEATURES

- FRONT & SIDE AIRBAG SUPPLEMENTAL RESTRAINT SYSTEMS FOR DRIVER & FRONT PASSENGER
- ROOF CURTAIN PROTECTION HEAD IMPACT AIRBAGS
- 3-POINT SAFETY BELTS, ALL SEATING POSITIONS
- ANTI-LOCK BRAKING SYSTEM (ABS) W/ DISC BRAKES
- ELECTRONIC STABILITY CONTROL (ESC)
- INTELLIGENT CRASH RESPONSE SYSTEM (ICRS)
- LOWER ANCHORS & TETHERS FOR CHILDREN LATCH
- TIRE PRESSURE MONITORING SYSTEM (TPMS)

EXTERIOR

- 15" ALLOY WHEELS W/ ALL-SEASON TIRES
- HALOGEN HEADLIGHTS W/ DAYTIME RUNNING LIGHTS (DRL)
- HEATED, FOLDABLE, POWER ADJUSTABLE SIDE MIRRORS
- BLACK ROOF RAILS

INTERIOR

- CLIMATIC MANUAL CLIMATE CONTROL
- TILTING & TELESCOPING, MULTI-FUNCTION STEERING WHEEL
- LEATHER-UPHOLSTERED SEATING, BRAKE LEVER & SHIFT KNOB
- MANUAL FRONT SEAT W/ POWER RECLINE
- FRONT SEAT LUMBAR SUPPORT ADJUSTMENT
- SPLIT-FOLDING REAR SEAT W/ ARMREST & PASS-THROUGH
- CLOTH SEATING SURFACES
- FRONT CENTER CONSOLE W/ ARMREST & CUPHOLDERS
- ILLUMINATED VANITY MIRRORS, FRONT & REAR READING LIGHTS
- POWER WINDOWS W/ AUTO UP/DOWN
- CARPETED FLOOR MATS, FRONT & REAR

TECHNOLOGY

- REARVIEW CAMERA
- COMPOSITION MEDIA 6.5" TOUCHSCREEN AM/FM/HD RADIO W/ CD PLAYER, USB & AUX-IN
- 8-SPEAKER SOUND SYSTEM
- BLUETOOTH® MOBILE TELEPHONE CONNECTIVITY
- SIRIUSXM® SATELLITE RADIO (W/ LIMITED TIME SUBSCRIPTION)
- CRUISE CONTROL
- MULTI-FUNCTION DISPLAY W/ TRIP COMPUTER
- POWER DOOR LOCKS W/ REMOTE

Manufacturer's Suggested Retail Price: \$22,725.00

VW CAR-NET® EQUIPPED. Features include:

- App-Connect (Smartphone Integration & Interface)
- Security & Service (Emergency Assistance, Remote Access)
- Vehicle Health: Limited emergency services temporarily active on delivery. Full trial available, subscription required. All services subject to Terms of Service available in glove box.

DRIVER CARE PACKAGE

WARRANTY INFORMATION

- Volkswagen New Vehicle Limited Warranty
- 3 years/36,000 miles (whichever occurs first)
- Powertrain Limited Warranty
- 5 years/60,000 miles (whichever occurs first)
- Limited Warranty against Corrosion Perforation
- 12 years/120,000 miles (whichever occurs first)

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

24-HOUR ROADSIDE ASSISTANCE

- 3 years/36,000 miles (whichever occurs first)
- Towing, Jump Starts, Tire Changes, Out of Fuel, and Lock-Out

Provided by a third party supplier.

PACKAGES/OPTIONS

Tomato Red Exterior
Titan Black Cloth Interior
Mooner Moonlight (set of 4), Heavy Duty Trunk Liner
with VW CarGo Books
6-Speed Automatic Transmission

No Charge
No Charge
\$235.00
No Charge

Destination Charge \$820.00

Total Price: \$23,780.00

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

Fuel Economy and Environment

Fuel Economy

29 MPG
combined city/hwy

25 city
35 highway

3.4 gallons per 100 miles

Small Station Wagons range from 20 to 105 MPG. The best vehicle rates 115 MPG.

You save \$1,250
in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$1,550

Fuel Economy & Greenhouse Gas Rating (tailpipe only)

1 7 10 Best

This vehicle emits 305 grams of CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions. Learn more at fuelconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 28 MPG and costs \$0.00 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.00 per gallon. MPG is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

Smog Rating (tailpipe only)

1 9 10 Best

This vehicle emits 305 grams of CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions. Learn more at fuelconomy.gov.

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 <td>Front Seat</td> <td>Not Rated</td>	Front Seat	Not Rated
	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.

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 or 1-888-327-4236

Who better to get you into a Volkswagen than us? Volkswagen Credit

PARTS CONTENT INFORMATION	
FOR VEHICLES IN THIS CARLINE:	FOR THIS VEHICLE:
U.S./CANADIAN	FINAL ASSEMBLY POINT:
PARTS CONTENT: 4%	PUEBLA, MEXICO
MAJOR SOURCES OF FOREIGN	COUNTRY OF ORIGIN:
PARTS CONTENT:	ENGINE: MEXICO
MEXICO: 35%	TRANSMISSION: JAPAN

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

102 Monroney Label

Removing and reinstalling the rear head restraints

Fig. 45 Removing the rear head restraint (Version A)

Please first read and note the introductory information and heed the WARNINGS on page 68.

Fig. 46 Removing the rear head restraint (Version B)

Removing the rear head restraint (Version A)

- Unlock the backrest of the rear seat bench and fold it forward → page 159, Luggage compartment.
- Pull the head restraint all the way up → ▲.
- Push button → fig. 45 ① in the direction of the arrow and hold it in this position.
- At the same time press button ② while a second person pulls out the head restraint completely, so that it locks securely.

Removing the rear head restraint (Version B)

- Unlock the backrest of the rear seat bench and fold it forward → page 159, Luggage compartment.
- Pull the head restraint all the way up → ▲.
- If necessary, press the flat blade of the screwdriver from the vehicle tool kit into the slit of the and hold it in this position.
- At the same time press button ② while a second person pulls out the head restraint completely, so that it locks securely.

Reinstalling the rear head restraint (both versions)

- Unlock the backrest of the rear seat bench and fold it forward → page 159, Luggage compartment.
- Position head restraint properly over the head restraint guides of the respective seat backrest and insert the head restraint into the guides.
- Push the head restraint down while pressing button → fig. 45 ② or → fig. 46 ②.
- Fold the backrest of the rear seat bench back so that it locks securely.
- Adjust the head restraint according to the occupant's size → page 73, Adjusting the front and rear head restraints.

WARNING

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

- Always drive with the head restraints in place and properly adjusted to help minimize the risk of neck injury in a crash.
- Always reinstall head restraints as soon as possible so that vehicle occupants are properly protected.

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.

Sitting properly and safely

75

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

Adjusting the front and rear head restraints

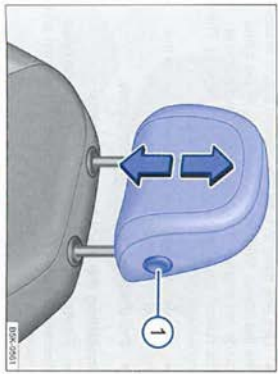


Fig. 42 Adjusting the front head restraints.

Please first read and note the introductory information and heed the WARNINGS on page 58.

All seats are equipped with head restraints. The rear center head restraint is designed only for the center seat on the rear bench. Therefore, only install the center head restraint in the center position.

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 prevent inadvertent removal of the head restraints after installation, there are stops at the top and bottom of the adjustment range.

Adjusting the height

- Pull the head restraint up in the direction of the arrow, or push it down while pressing the button ⇒ fig. 42 ① or ⇒ fig. 43 ① ⇒ **▲**
- The head restraint must lock securely in the position selected.

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

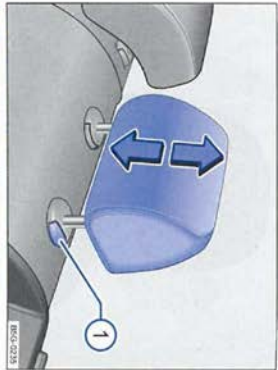


Fig. 43 Adjusting the rear head restraints.

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.

▲ WARNING

- Driving without head restraints or with improperly adjusted head restraints increases the risk of serious injuries in a collision.
- Always drive with the head restraints in place and properly adjusted to help minimize the risk of neck injury in a crash.
- Every person in the vehicle must have a properly adjusted head restraint to 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 restraint while driving.

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

Driver & Passenger Dummy Instrumentation Plots

No.	Description	Page
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-8
15	Passenger Head Acceleration (Y) Primary vs. Time	B-8
16	Passenger Head Acceleration (Z) Primary vs. Time	B-8
17	Passenger Head Resultant Acceleration Primary vs. Time	B-9
18	Passenger Lower Spine T12 Acceleration (X) vs. Time	B-9
19	Passenger Lower Spine T12 Acceleration (Y) vs. Time	B-9
20	Passenger Lower Spine T12 Acceleration (Z) vs. Time	B-9
21	Passenger Lower Spine T12 Resultant Acceleration vs. Time	B-10
22	Passenger Iliac Force on Impact Side (Y) vs. Time	B-10
23	Passenger Acetabulum Force on Impact Side (Y) vs. Time	B-10
24	Passenger Total Pelvic Force on Impact Side (Y) vs. Time	B-10

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

NHSTA

Test Lab: CTF

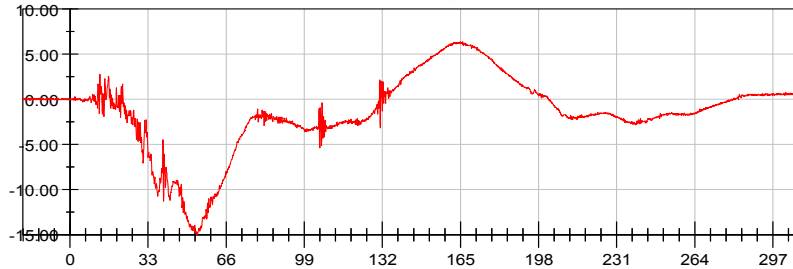
Test Number: 160126 (M20165802)

Test Date: 01/26/2016

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

Position #4 SID IIs Dummy (305)

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



<Max>

6.39 g at 164.96 ms

<Min>

-14.96 g at 53.52 ms

CFC_1000

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



<Max>

40.67 g at 42.88 ms

<Min>

-8.97 g at 12.16 ms

CFC_1000

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



<Max>

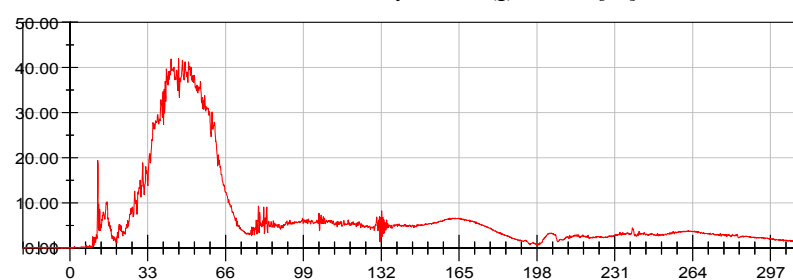
10.51 g at 29.36 ms

<Min>

-7.02 g at 56.48 ms

CFC_1000

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



<Max>

41.94 g at 46.08 ms

<Min>

0.03 g at -19.84 ms

CFC_1000



NHSTA

Test Lab: CTF

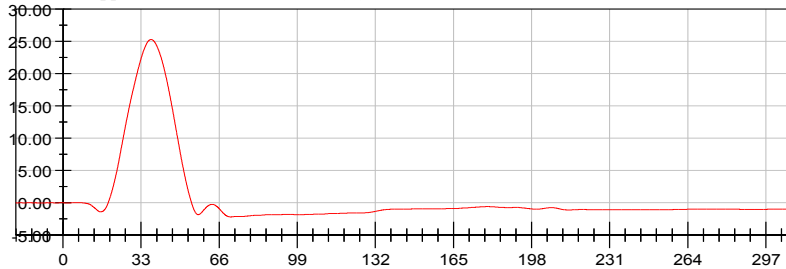
Test Number: 160126 (M20165802)

Test Date: 01/26/2016

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

Position #4 SID IIs Dummy (305)

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



<Max>

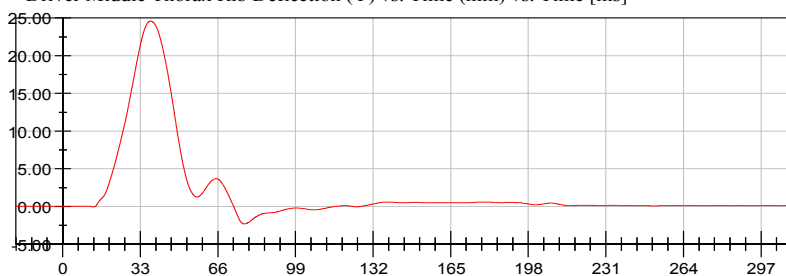
25.30 mm at 37.20 ms

<Min>

-2.18 mm at 70.88 ms

CFC_180

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



<Max>

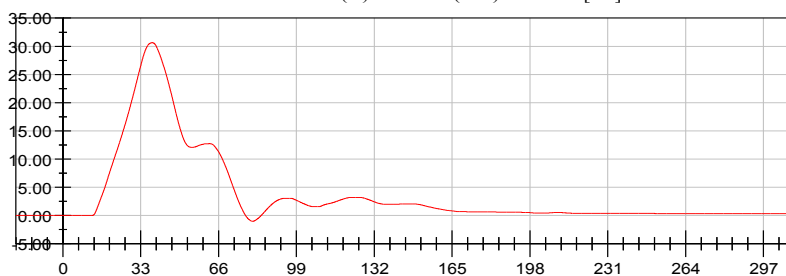
24.59 mm at 37.36 ms

<Min>

-2.35 mm at 77.28 ms

CFC_180

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



<Max>

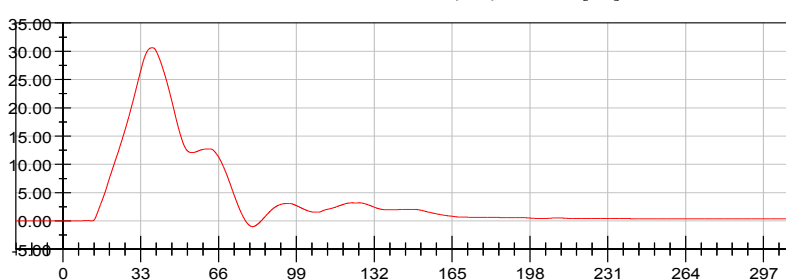
30.63 mm at 37.84 ms

<Min>

-1.01 mm at 80.48 ms

CFC_180

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



<Max>

30.63 mm at 37.84 ms

<Min>

-1.01 mm at 80.48 ms

CFC_180



NHSTA

Test Lab: CTF

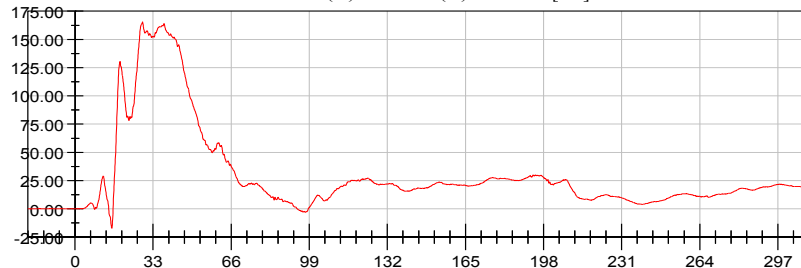
Test Number: 160126 (M20165802)

Test Date: 01/26/2016

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

Position #4 SID IIs Dummy (305)

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



<Max>

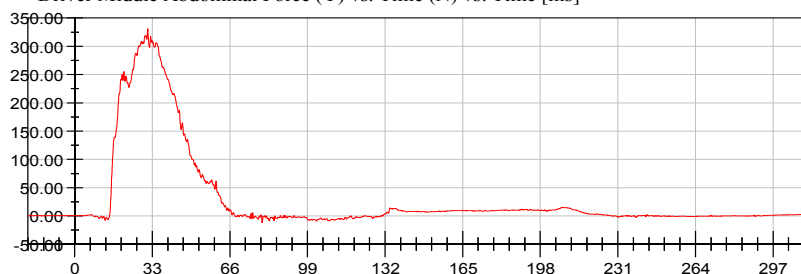
165.47 N at 28.56 ms

<Min>

-17.21 N at 15.52 ms

CFC_600

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



<Max>

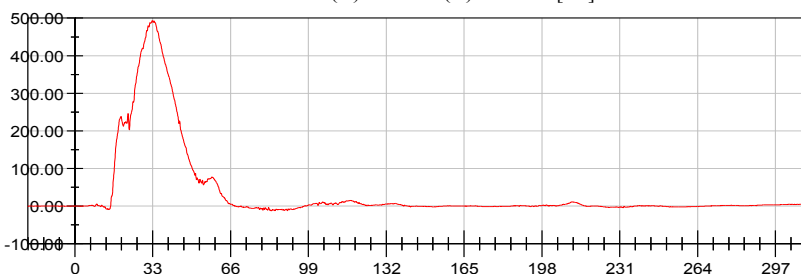
331.12 N at 31.04 ms

<Min>

-12.27 N at 79.68 ms

CFC_600

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



<Max>

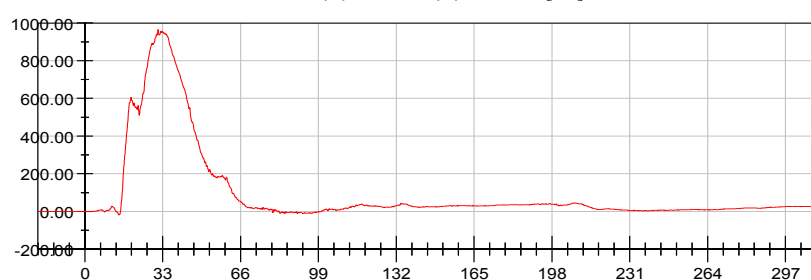
493.48 N at 32.80 ms

<Min>

-12.58 N at 83.28 ms

CFC_600

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



<Max>

964.45 N at 31.04 ms

<Min>

-18.64 N at 14.40 ms

CFC_600



NHSTA

Test Lab: CTF

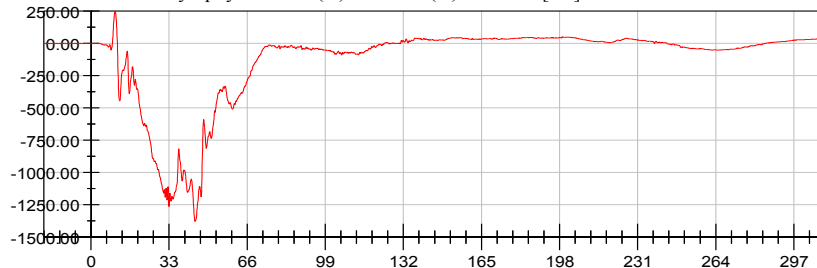
Test Number: 160126 (M20165802)

Test Date: 01/26/2016

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

Position #4 SID IIs Dummy (305)

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



<Max>

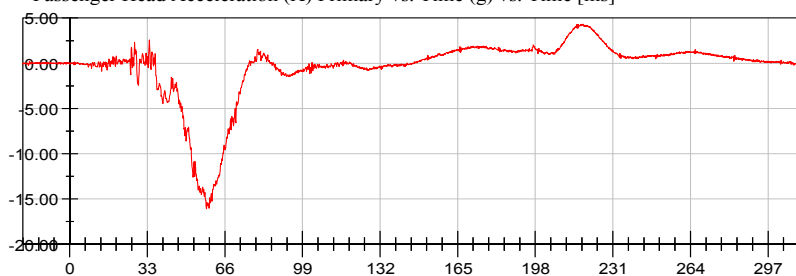
249.97 N at 10.24 ms

<Min>

-1,379.34 N at 44.00 ms

CFC_600

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



<Max>

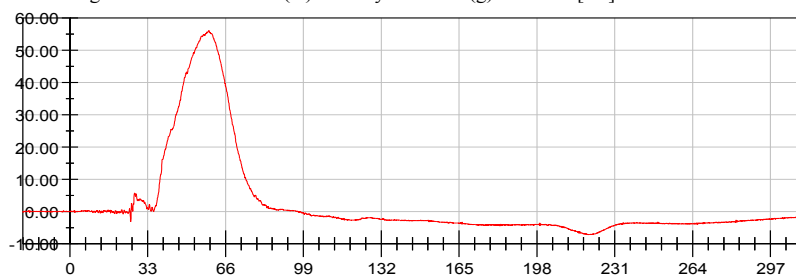
4.32 g at 218.24 ms

<Min>

-16.11 g at 58.16 ms

CFC_1000

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



<Max>

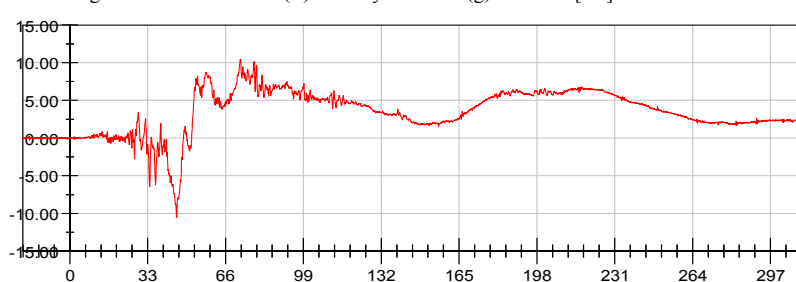
56.15 g at 58.96 ms

<Min>

-7.23 g at 219.68 ms

CFC_1000

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



<Max>

10.45 g at 72.32 ms

<Min>

-10.55 g at 45.28 ms

CFC_1000



NHSTA

Test Lab: CTF

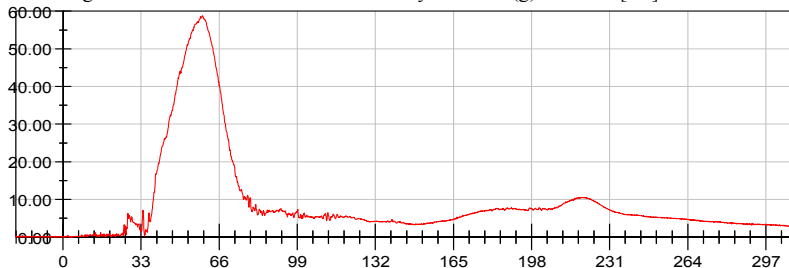
Test Number: 160126 (M20165802)

Test Date: 01/26/2016

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

Position #4 SID IIs Dummy (305)

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



<Max>

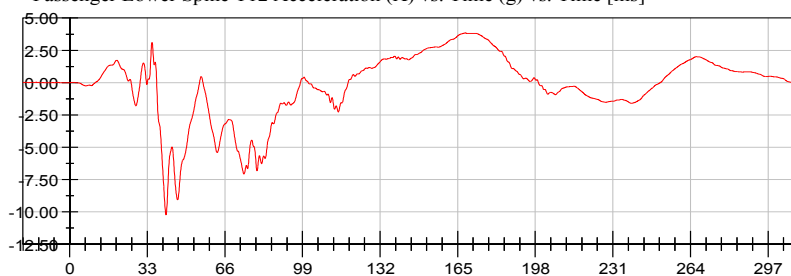
58.83 g at 58.96 ms

<Min>

0.03 g at -20.00 ms

CFC_1000

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



<Max>

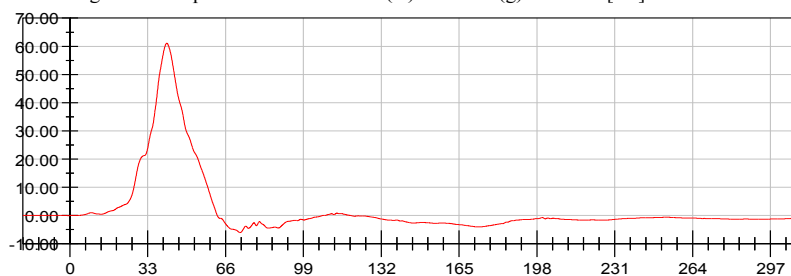
3.84 g at 168.16 ms

<Min>

-10.25 g at 40.96 ms

CFC_180

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



<Max>

61.06 g at 41.12 ms

<Min>

-6.05 g at 72.16 ms

CFC_180

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



<Max>

11.20 g at 55.84 ms

<Min>

-12.59 g at 32.08 ms

CFC_180



NHSTA

Test Lab: CTF

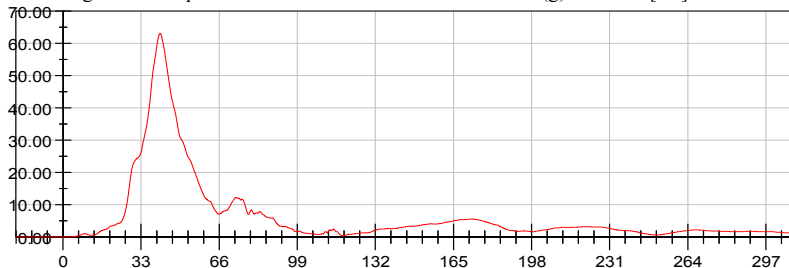
Test Number: 160126 (M20165802)

Test Date: 01/26/2016

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

Position #4 SID IIs Dummy (305)

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



<Max>

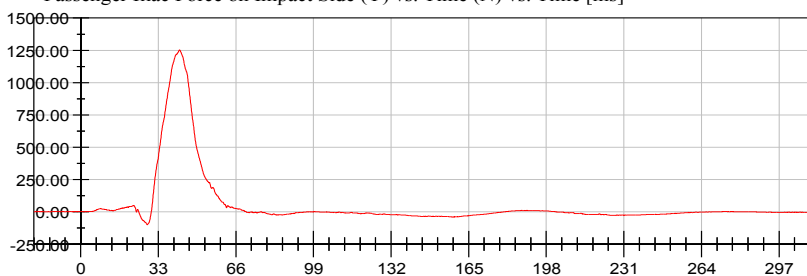
63.12 g at 41.04 ms

<Min>

0.01 g at -7.36 ms

CFC_180

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



<Max>

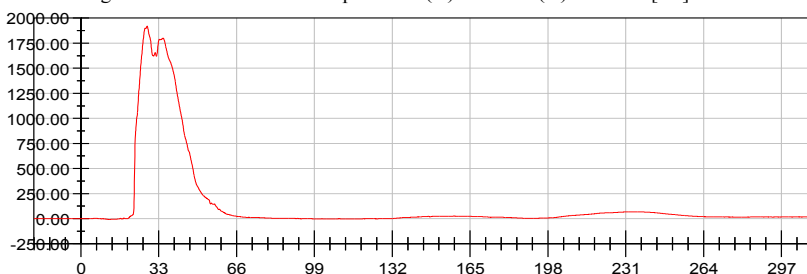
1,252.48 N at 42.00 ms

<Min>

-100.60 N at 28.32 ms

CFC_600

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



<Max>

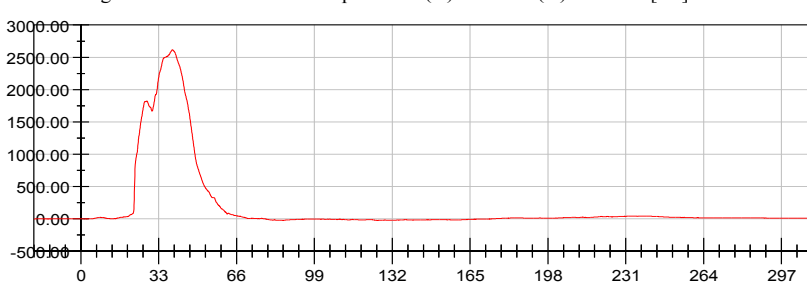
1,920.06 N at 28.08 ms

<Min>

-7.97 N at 11.76 ms

CFC_600

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



<Max>

2,616.56 N at 38.88 ms

<Min>

-24.37 N at 85.68 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. 31
01/16/16

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	910	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	559	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	350	Yes
4	Seat to Hip Joint (center of bolt)	97.0 - 103.0	98	Yes
5	Sole to Seat, Sitting	433.0 - 451.0	443	Yes
6	Head Width	152.0 - 158.0	155	Yes
7	Shoulder/Arm Width	461.0 - 479.0	474	Yes
8	Thorax Width	322.0 - 332.0	325	Yes
9	Abdomen Width	273.0 - 287.0	280	Yes
10	Pelvis Lap Width	359.0 - 373.0	366	Yes
11	Head Depth	196.0 - 206.0	205	Yes
12	Thorax Depth	262.0 - 272.0	262	Yes
13	Abdomen Depth	194.0 - 204.0	200	Yes
14	Pelvis Depth	235.0 - 245.0	240	Yes
15	Back of Buttocks to Hip Joint (center of bolt)	150.0 - 160.0	158	Yes
16	Back of Buttocks to Front of Knee	597.0 - 615.0	605	Yes

Technician

Approved

Baseline 10/07/05



Transportation Research Center Inc.

Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Peak Resultant Acceleration	125 - 155 g	154.9 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	7.6 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 11:23:02 361

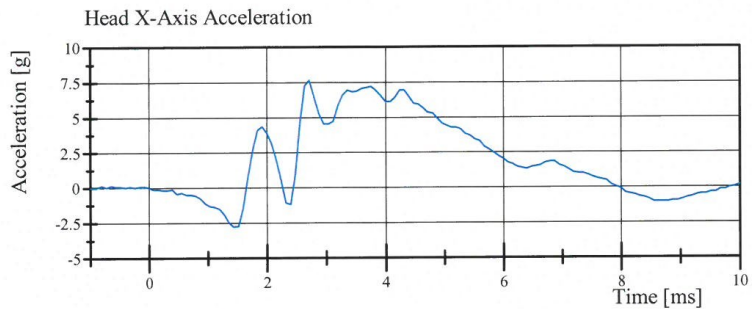


Transportation Research Center Inc.

Left Lateral Head Drop

ES-2re Serial No. F030 Certification No. 31-1

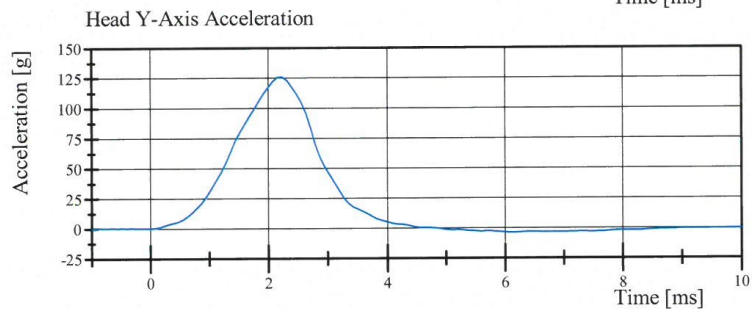
Test Date: 1/15/2016



Filter Class: CFC_1000

Max: 7.6 g at 2.7 ms

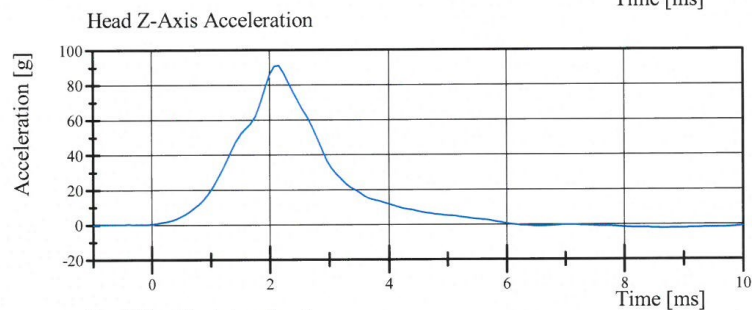
Min: -2.8 g at 1.4 ms



Filter Class: CFC_1000

Max: 125.9 g at 2.2 ms

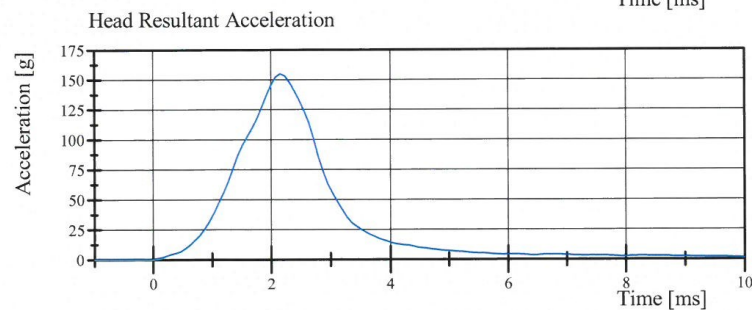
Min: -3.9 g at 6.2 ms



Filter Class: CFC_1000

Max: 90.8 g at 2.2 ms

Min: -2.2 g at 8.6 ms



Filter Class: CFC_1000

Max: 154.9 g at 2.2 ms

Min: 0.0 g at -0.7 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 11:23:16 361



Transportation Research Center Inc.

Left Lateral Neck

ES-2re Serial No. F030 Certification No. 31-1

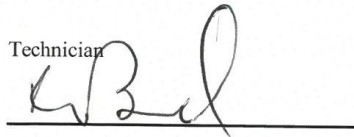
Test Date: 1/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.36 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-53.1 deg	Yes
Time of Peak	54 - 66 ms	54.4 ms	Yes
Headform Flexion Decay			
- Peak to Zero	53 - 88 ms	69.0 ms	Yes

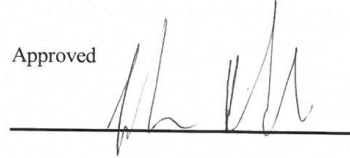
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

01.18.2016 16:13:02 1314

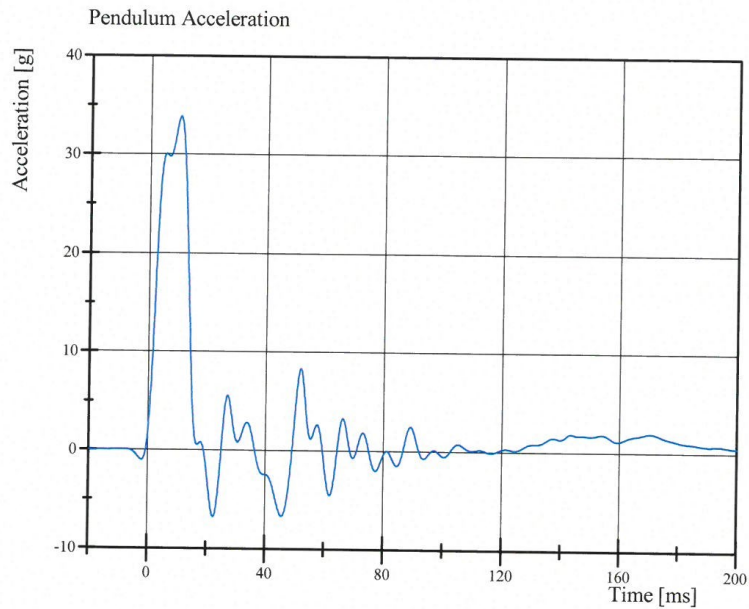


Transportation Research Center Inc.

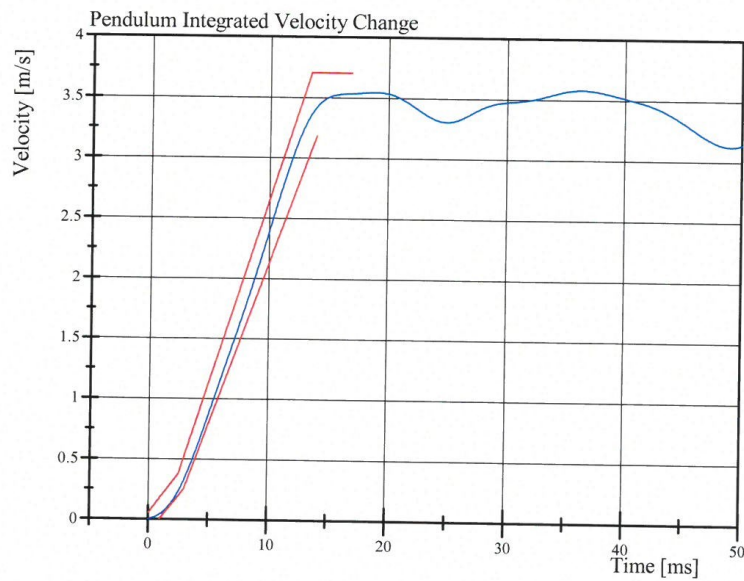
Left Lateral Neck

ES-2re Serial No. F030 Certification No. 31-1

Test Date: 1/15/2016



Filter Class: CFC_60
Max: 33.8 g at 10.2 ms
Min: -6.8 g at 22.4 ms



Filter Class: CFC_60
Max: 3.6 m/s at 36.3 ms
Min: 0.0 m/s at 0.0 ms

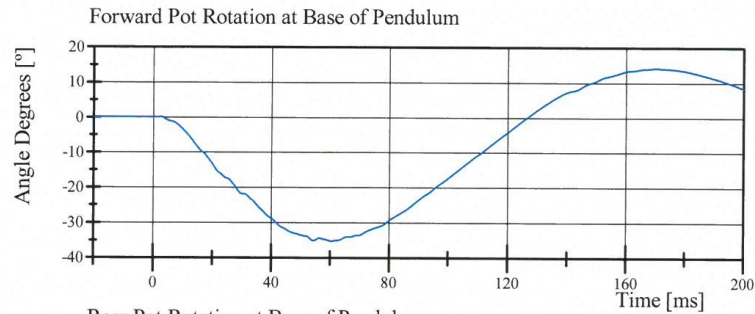
Specification Source: NHTSA Final Rule 8/15/2008

01.18.2016 16:13:10 1314

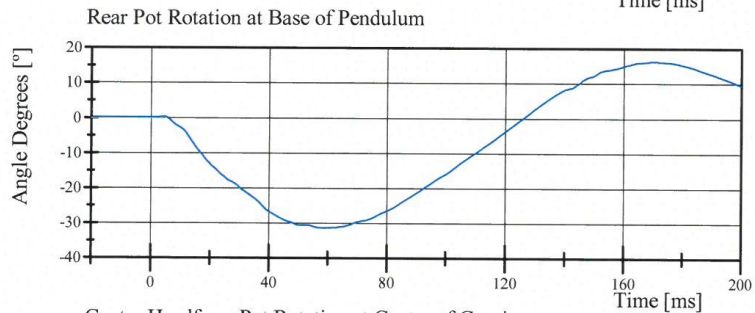


Transportation Research Center Inc.

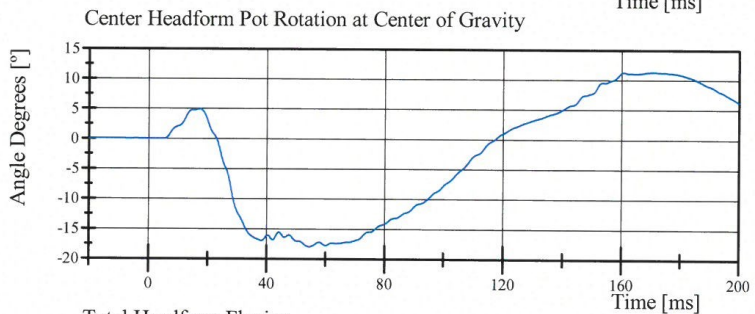
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016



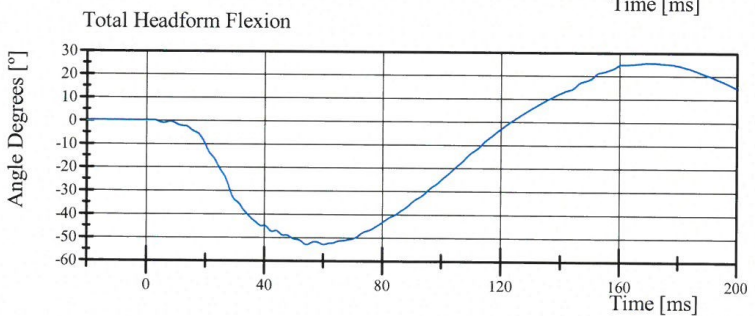
Filter Class: CFC_180
Max: 14.1 ° at 170.1 ms
Min: -35.3 ° at 60.4 ms



Filter Class: CFC_180
Max: 16.3 ° at 170.0 ms
Min: -31.4 ° at 58.7 ms



Filter Class: CFC_180
Max: 11.4 ° at 171.4 ms
Min: -18.0 ° at 54.4 ms



Filter Class: CFC_180
Max: 25.5 ° at 170.1 ms
Min: -53.1 ° at 54.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.18.2016 16:13:10 1314



Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-10.15 g	Yes

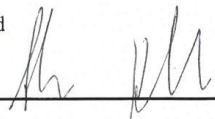
Test meets specifications.

Comments:

Technician



Approved



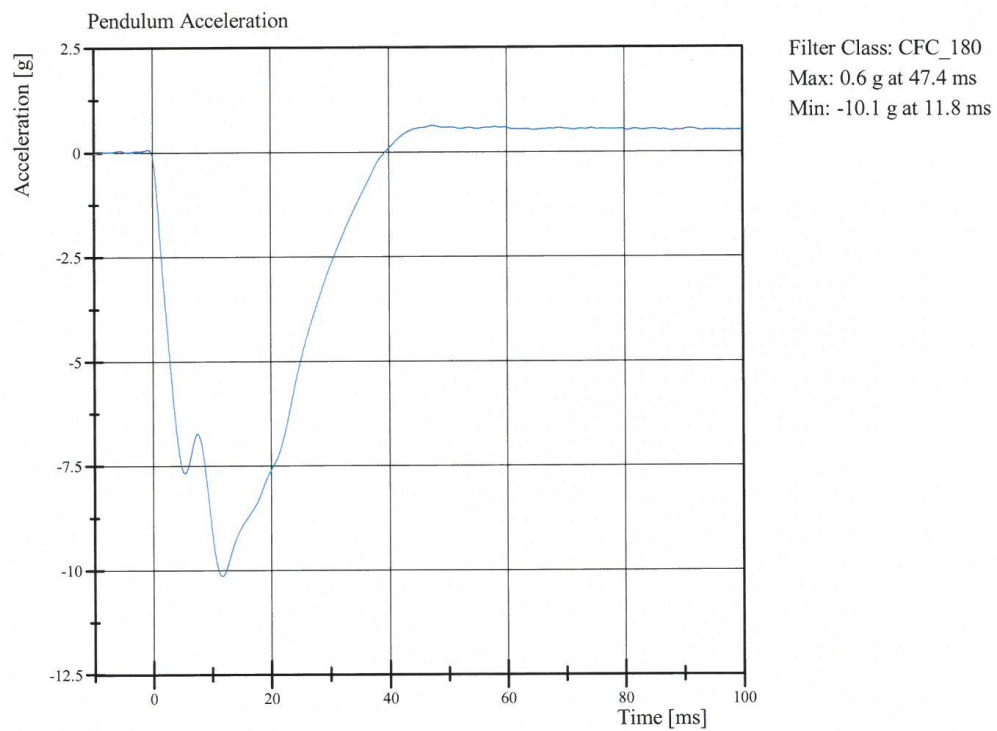
Specification Source: NHTSA final rule 8/15/2008

01.15.2016 13:56:09 566



Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016



Specification Source: NHTSA final rule 8/15/2008

01.15.2016 13:56:21 566



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016

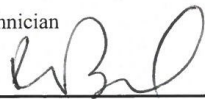
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.1 mm	Yes

Test meets specifications.

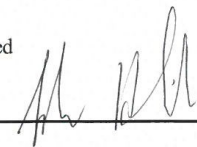
Comments:

Drop Height: 462

Technician



Approved



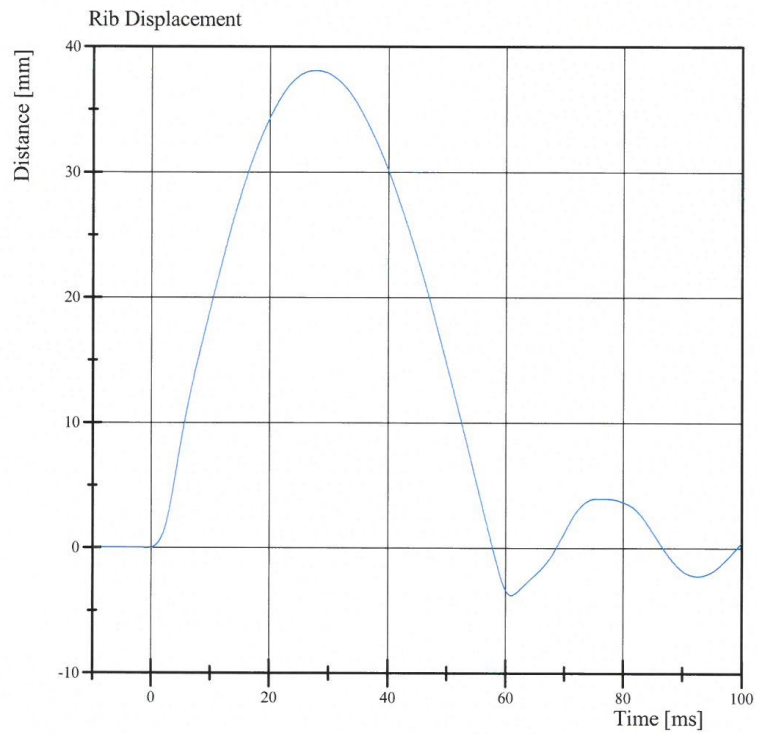
Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 09:39:49 862



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016



Filter Class: CFC_180
Max: 38.1 mm at 27.8 ms
Min: -3.8 mm at 61.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 09:40:04 862



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016

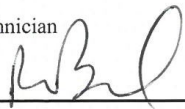
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.9 mm	Yes

Test meets specifications.

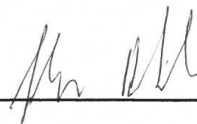
Comments:

Drop Height: 816

Technician



Approved



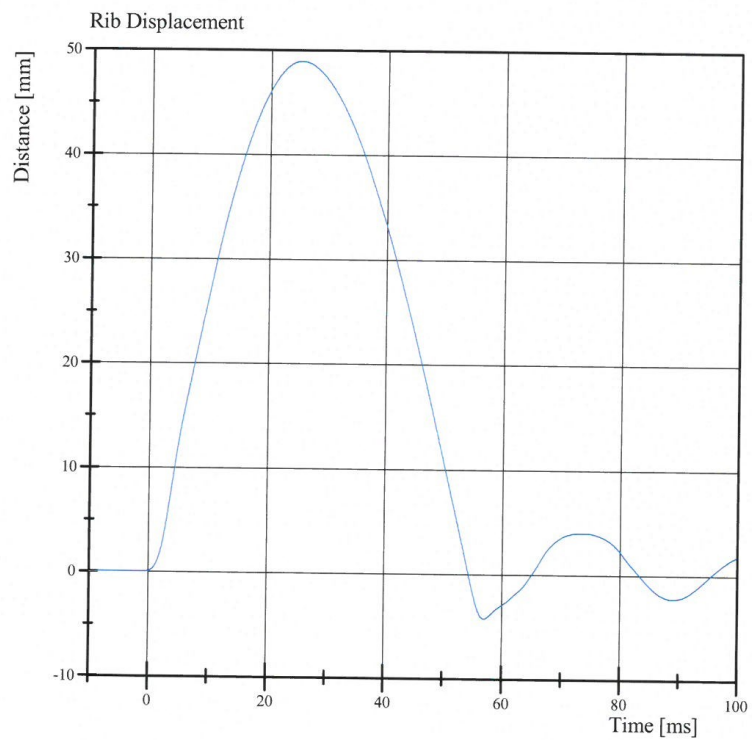
Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 09:34:16 693



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016



Filter Class: CFC_180
Max: 48.9 mm at 25.3 ms
Min: -4.3 mm at 57.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 09:34:31 693



Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.4 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician



Approved



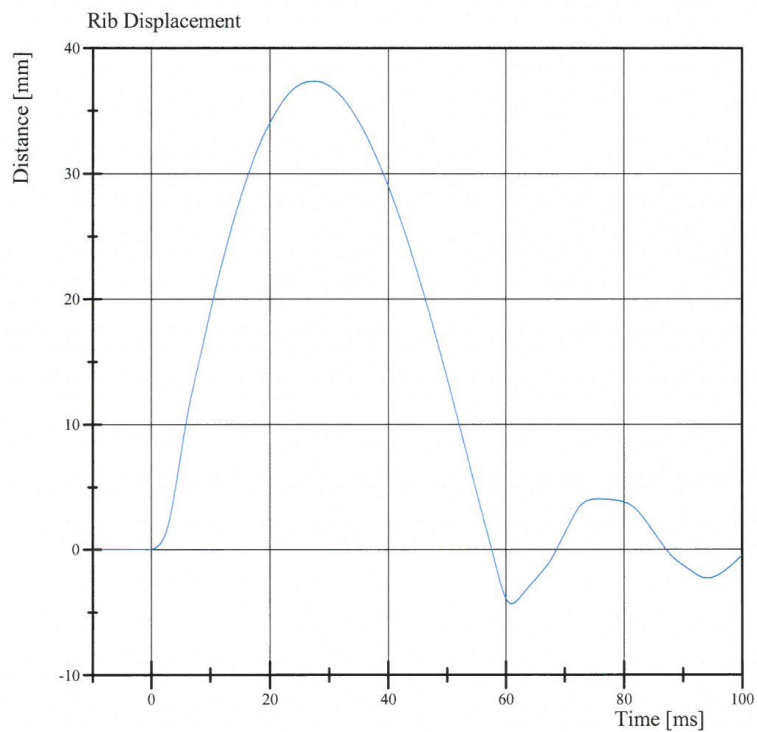
Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 09:52:00 881



Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016



Filter Class: CFC_180
Max: 37.4 mm at 27.4 ms
Min: -4.3 mm at 61.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 09:52:08 881



Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016

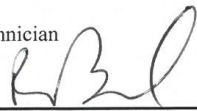
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.4 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician



Approved



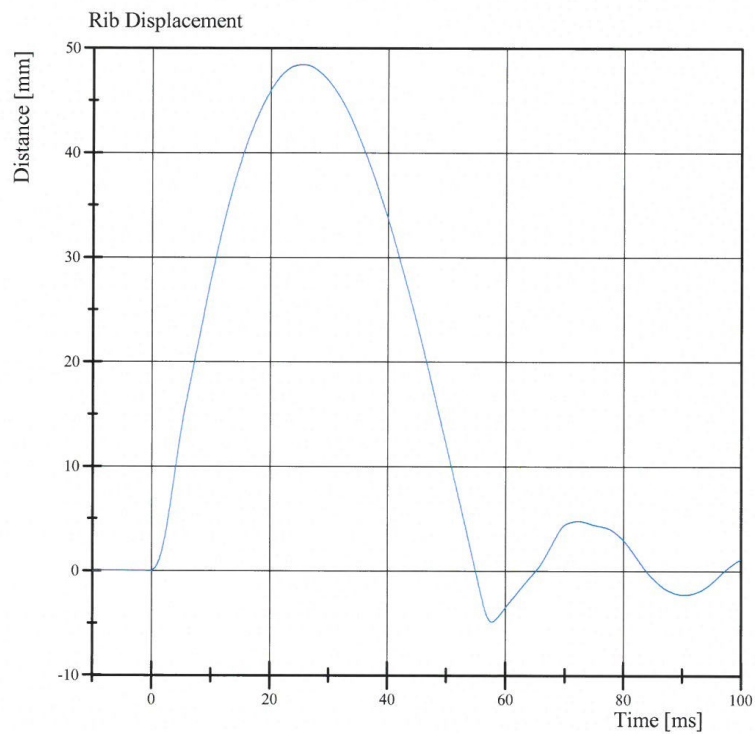
Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 09:43:41 706



Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016



Filter Class: CFC_180
Max: 48.4 mm at 25.4 ms
Min: -4.9 mm at 57.8 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 09:43:50 706



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.0 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician



Approved



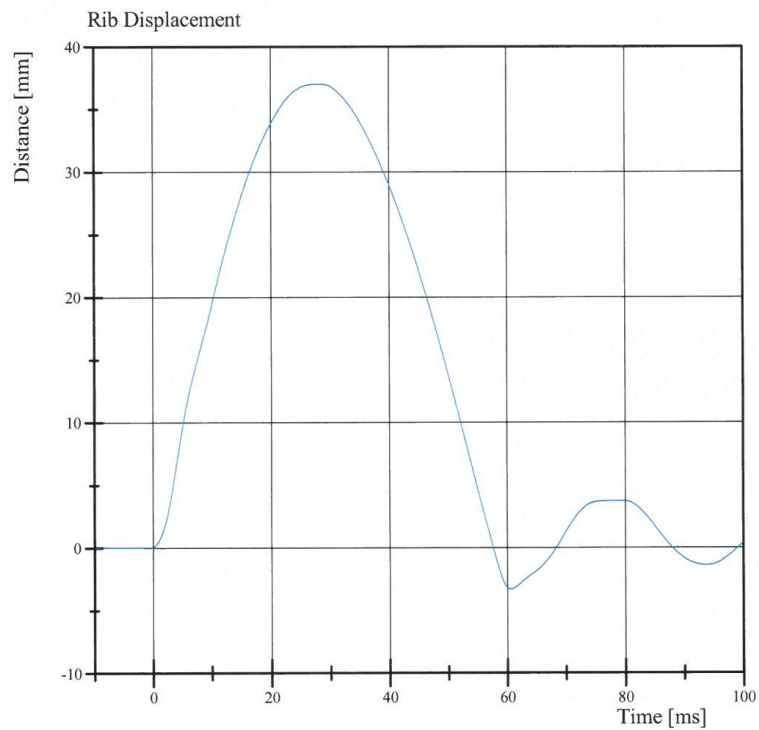
Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 10:01:34 862



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016



Filter Class: CFC_180
Max: 37.0 mm at 28.3 ms
Min: -3.3 mm at 60.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 10:01:42 862



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016

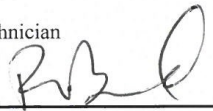
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	47.9 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician



Approved



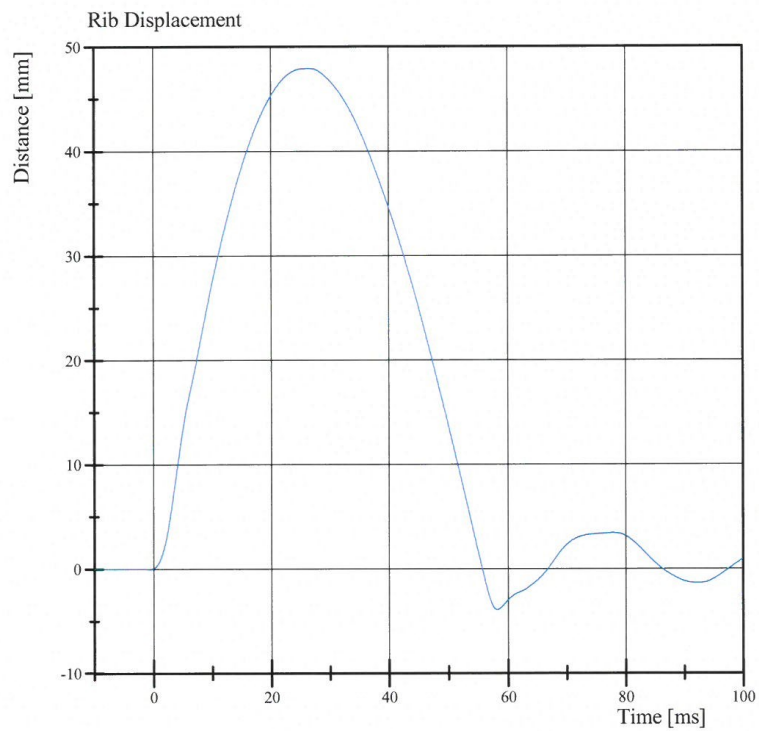
Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 09:55:38 696



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016



Filter Class: CFC_180
Max: 47.9 mm at 26.5 ms
Min: -3.9 mm at 58.2 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 09:55:53 696



Transportation Research Center Inc.

Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 31-1

Test Date: 1/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.539 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,512.2 N	Yes
Upper Rib Displacement	34 - 41 mm	38.8 mm	Yes
Center Rib Displacement	37 - 45 mm	41.8 mm	Yes
Lower Rib Displacement	37 - 44 mm	41.7 mm	Yes

Test meets specifications.

Comments:

Technician



Approved



Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

01.15.2016 14:00:32 414

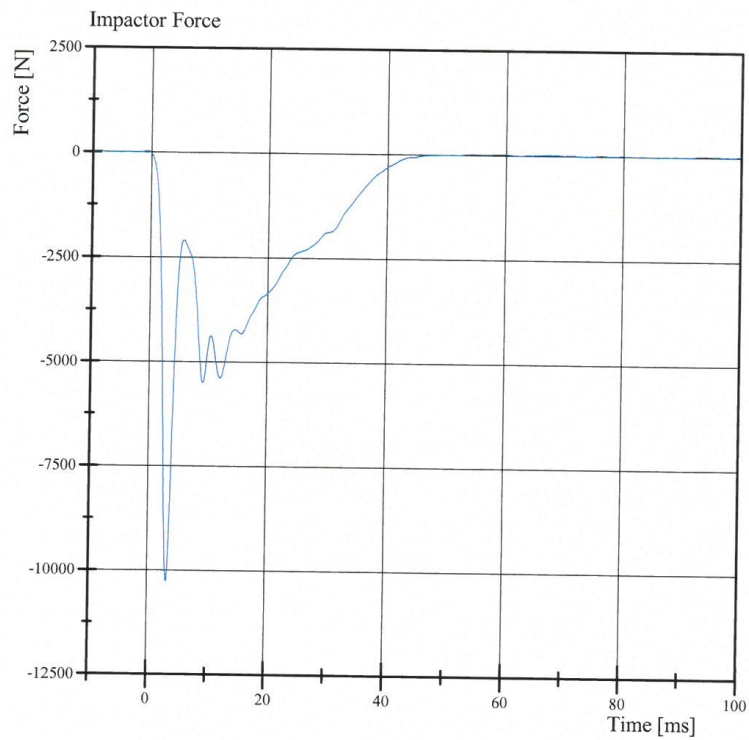


Transportation Research Center Inc.

Left Lateral Thorax

ES-2re Serial No. F030 Certification No. 31-1

Test Date: 1/15/2016



Filter Class: CFC_180
Max: 29.0 N at 67.2 ms
Min: -10,288.4 N at 3.2 ms

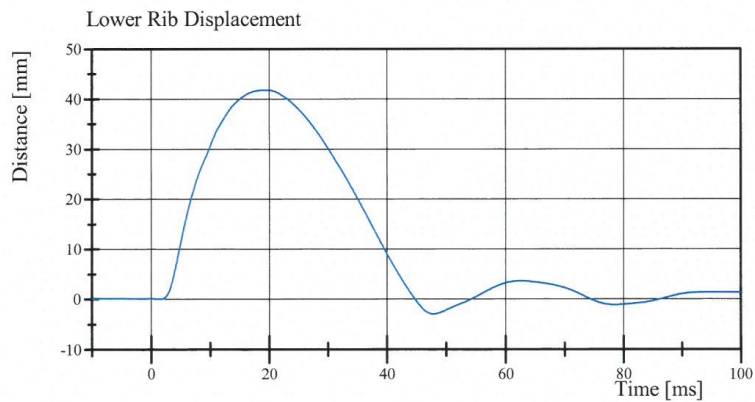
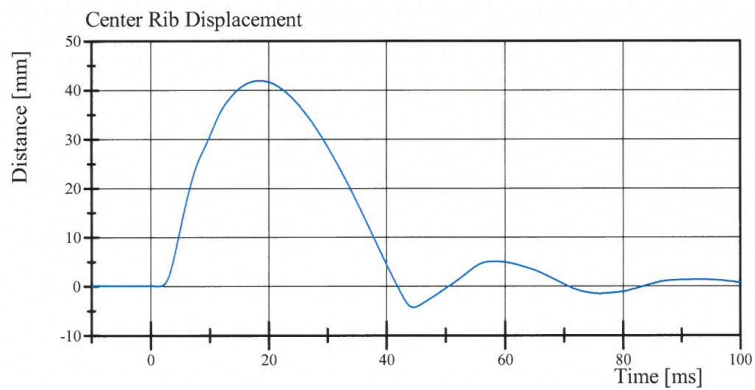
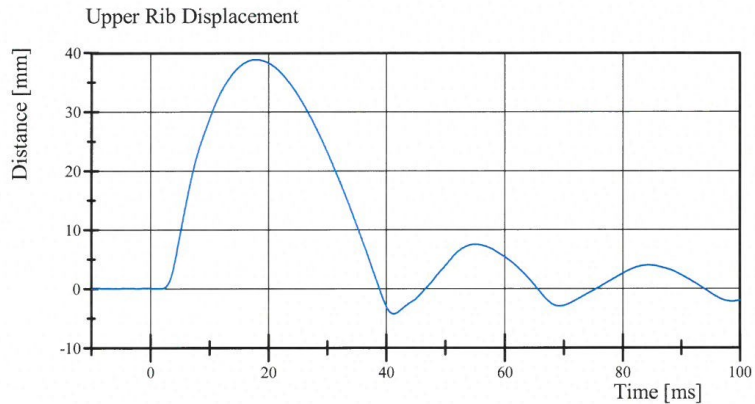
Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

01.15.2016 14:00:58 414



Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 31-1
Test Date: 1/15/2016



Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

01.15.2016 14:00:59 414



Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 31-6
Test Date: 1/16/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.08 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,268.7 N	Yes
Time of Peak	10.6 - 13.0 ms	10.64 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,646.4 N	Yes
Time of Peak	10.0 - 12.3 ms	10.48 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



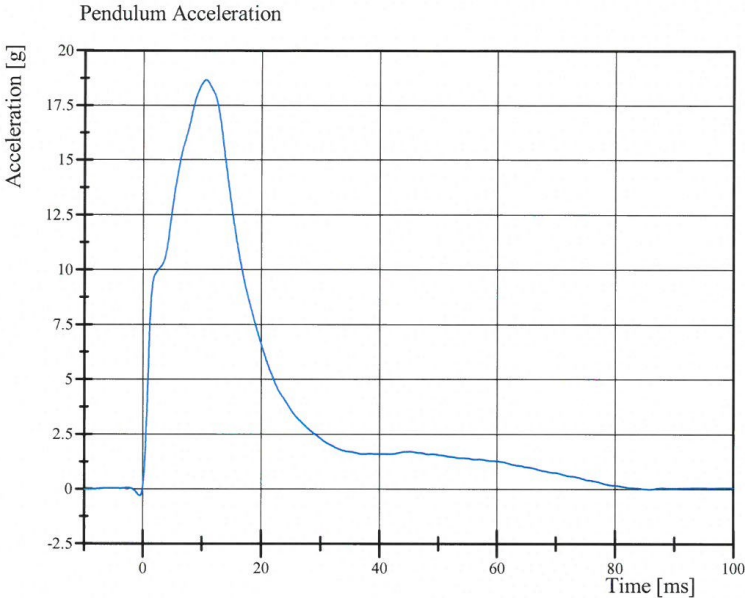
Specification Source: NHTSA Final Rule 8/15/2008

01.16.2016 07:26:21 557

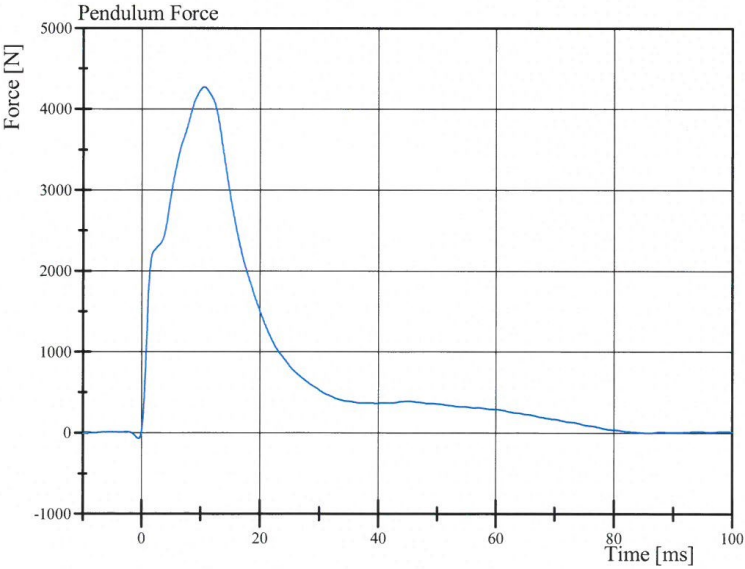


Transportation Research Center Inc.

Left Lateral Abdomen
 ES-2re Serial No. F030 Certification No. 31-6
 Test Date: 1/16/2016



Filter Class: CFC_180
 Max: 18.6 g at 10.6 ms
 Min: -0.3 g at -0.5 ms



Filter Class: CFC_180
 Max: 4,268.7 N at 10.6 ms
 Min: -75.4 N at -0.5 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.16.2016 07:26:45 557



Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 31-4
Test Date: 1/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.085 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-49.7 deg	Yes
Time of Peak	39 - 53 ms	43.4 ms	Yes
Headform Flexion Decay			
- Peak to Zero	37 - 57 ms	39.5 ms	Yes

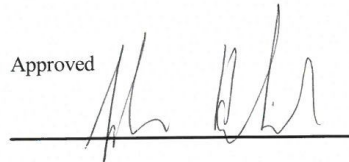
Test meets specifications.

Comments:

Technician



Approved



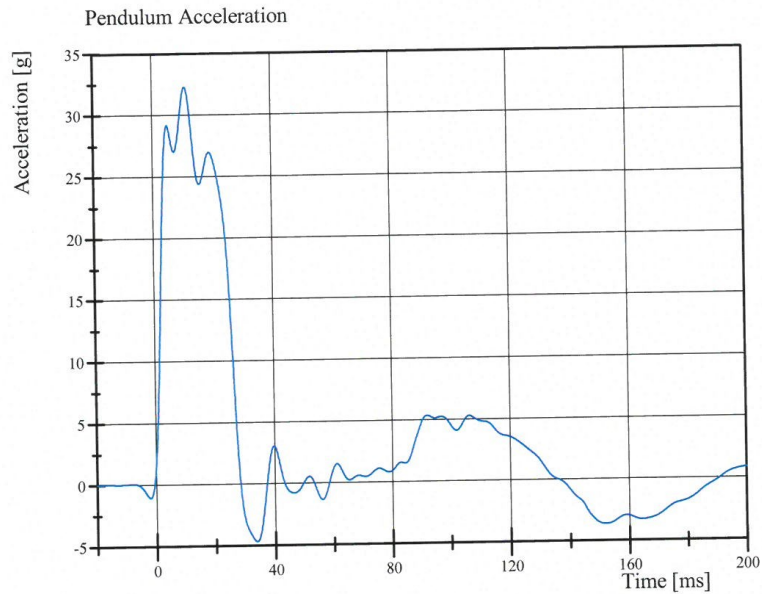
Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 13:13:15 574

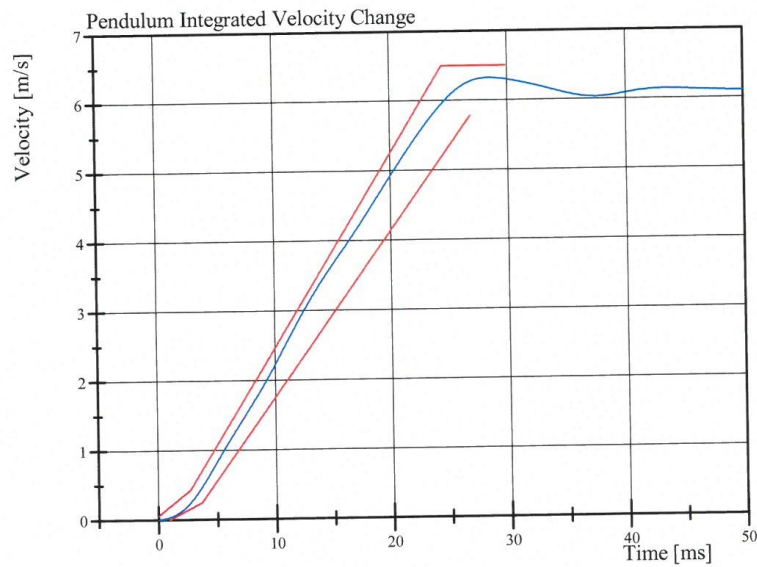


Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 31-4
Test Date: 1/15/2016



Filter Class: CFC_60
Max: 32.2 g at 11.0 ms
Min: -4.7 g at 33.8 ms



Filter Class: CFC_60
Max: 6.3 m/s at 28.5 ms
Min: 0.0 m/s at 0.0 ms

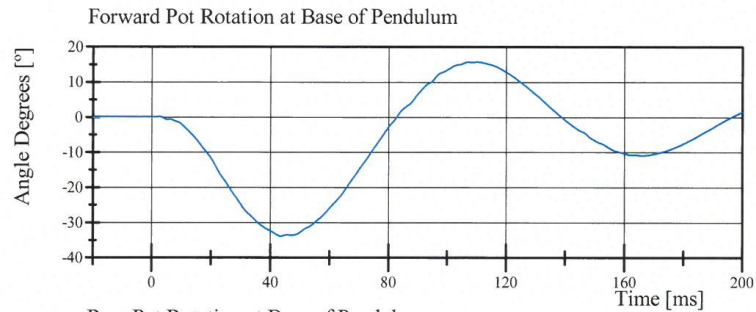
Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 13:13:38 574

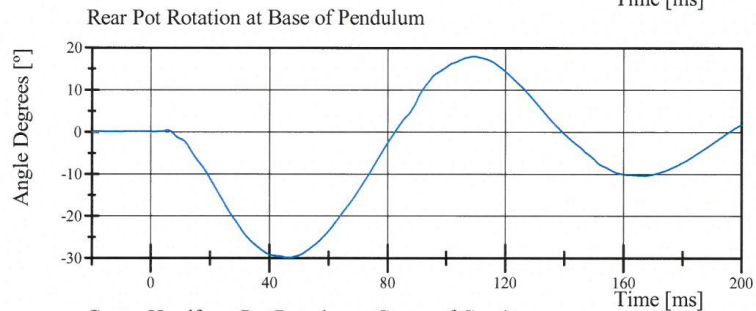


Transportation Research Center Inc.

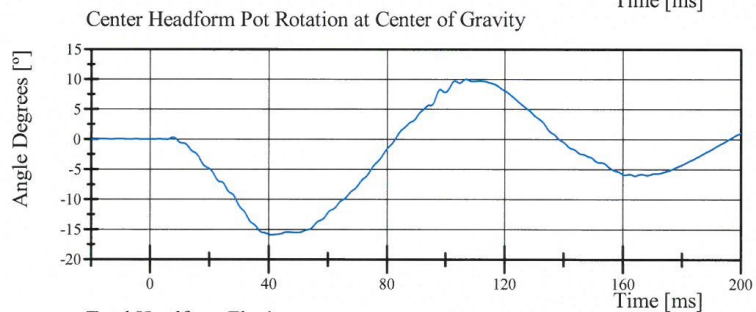
Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 31-4
Test Date: 1/15/2016



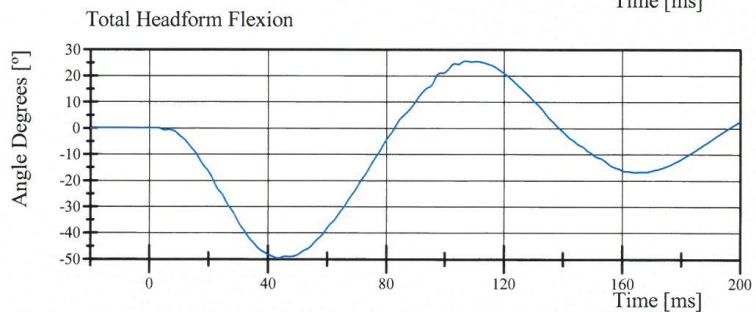
Filter Class: CFC_180
Max: 15.6 ° at 110.3 ms
Min: -33.9 ° at 43.5 ms



Filter Class: CFC_180
Max: 17.9 ° at 109.4 ms
Min: -29.9 ° at 46.6 ms



Filter Class: CFC_180
Max: 10.0 ° at 107.0 ms
Min: -15.9 ° at 41.0 ms



Filter Class: CFC_180
Max: 25.7 ° at 107.0 ms
Min: -49.7 ° at 43.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 13:13:39 574



Transportation Research Center Inc.

Left Lateral Pelvis

ES-2re Serial No. F030 Certification No. 31-3

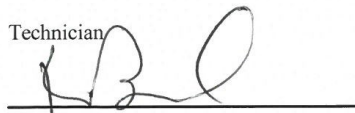
Test Date: 1/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.26 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,130.3 N	Yes
Time of Peak	11.8 - 16.1 ms	13.44 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,253.8 N	Yes
Time of Peak	12.2 - 17.0 ms	13.36 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



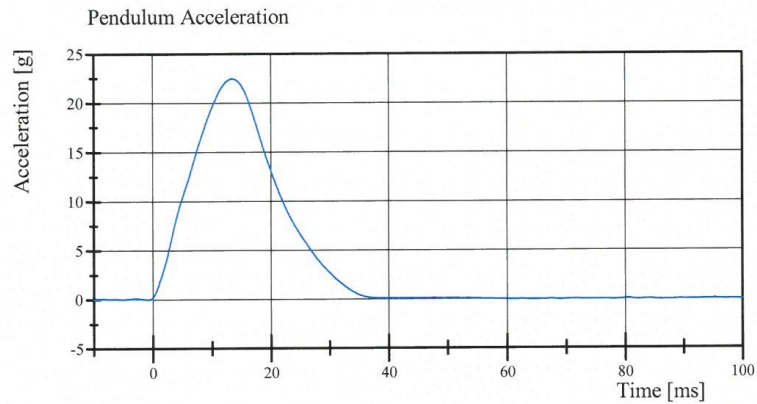
Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 15:29:23 564

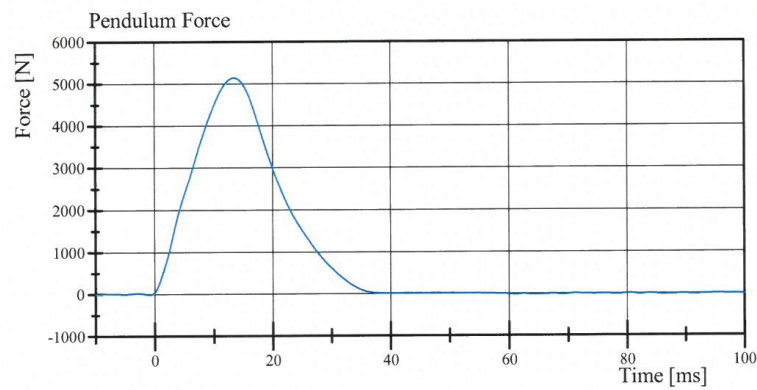


Transportation Research Center Inc.

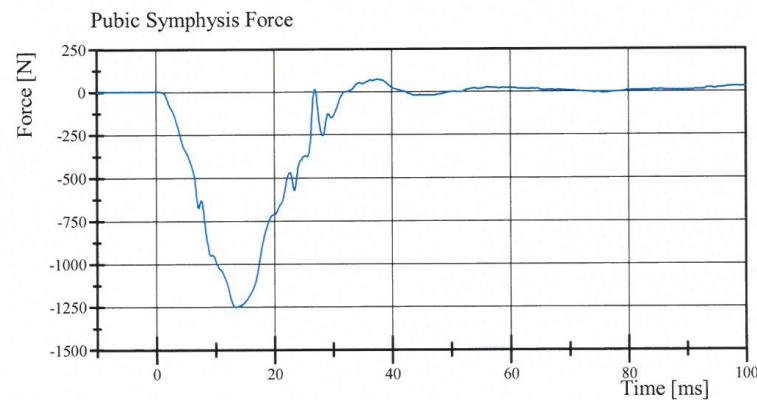
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 31-3
Test Date: 1/15/2016



Filter Class: CFC_180
Max: 22.4 g at 13.4 ms
Min: -0.1 g at 64.0 ms



Filter Class: CFC_180
Max: 5,130.3 N at 13.4 ms
Min: -19.6 N at 64.0 ms



Filter Class: CFC_600
Max: 70.9 N at 37.6 ms
Min: -1,253.8 N at 13.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

01.15.2016 15:29:43 564



Post-Test Calibration Sheets
Driver S/N F030

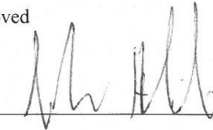
Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 32
02/3/16

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	559	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	350	Yes
4	Seat to Hip Joint (center of bolt)	97.0 - 103.0	98	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	474	Yes
8	Thorax Width	322.0 - 332.0	324	Yes
9	Abdomen Width	273.0 - 287.0	280	Yes
10	Pelvis Lap Width	359.0 - 373.0	366	Yes
11	Head Depth	196.0 - 206.0	205	Yes
12	Thorax Depth	262.0 - 272.0	262	Yes
13	Abdomen Depth	194.0 - 204.0	200	Yes
14	Pelvis Depth	235.0 - 245.0	240	Yes
15	Back of Buttocks to Hip Joint (center of bolt)	150.0 - 160.0	158	Yes
16	Back of Buttocks to Front of Knee	597.0 - 615.0	605	Yes

Technician



Approved



Baseline 10/07/05



Transportation Research Center Inc.

Left Lateral Head Drop

ES-2re Serial No. F030 Certification No. 32-3

Test Date: 2/2/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Peak Resultant Acceleration	125 - 155 g	142.0 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	6.6 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

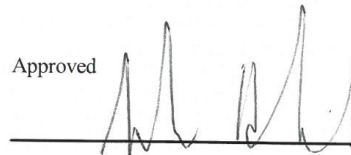
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

02.02.2016 07:21:23 360

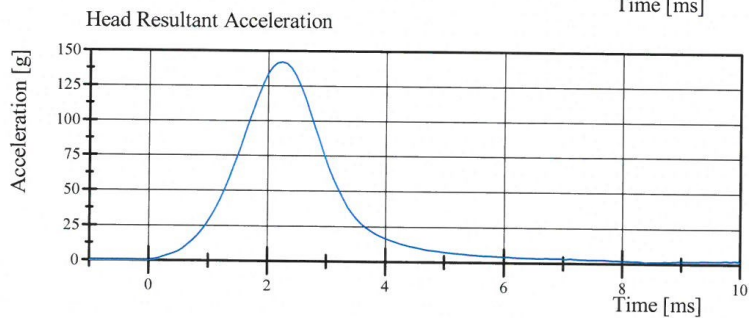
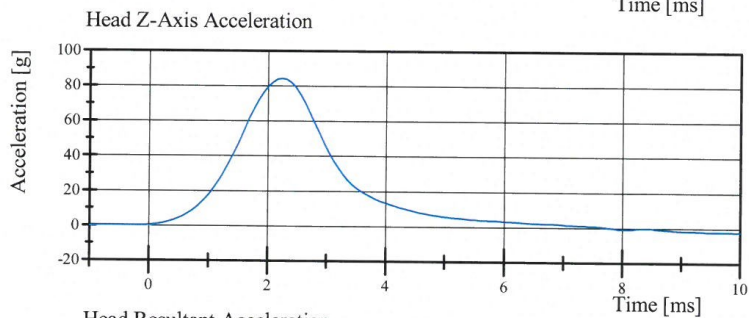
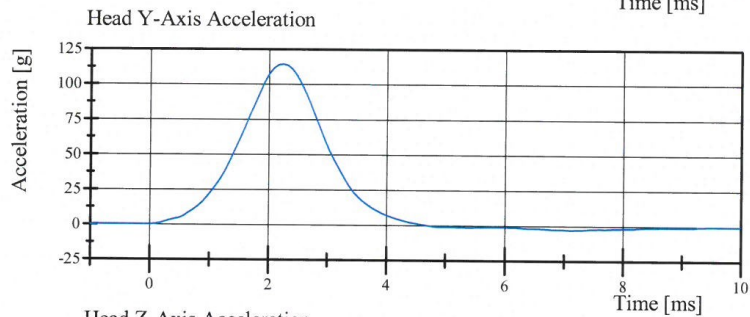
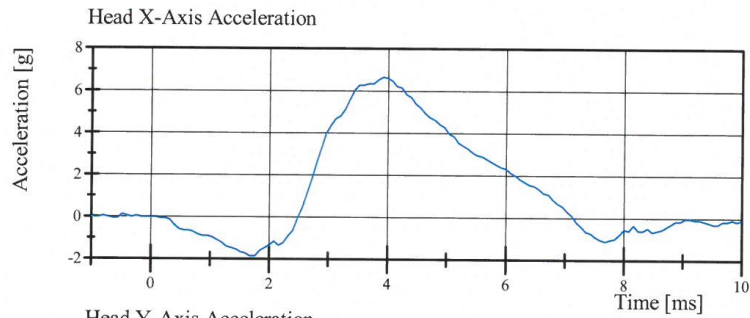


Transportation Research Center Inc.

Left Lateral Head Drop

ES-2re Serial No. F030 Certification No. 32-3

Test Date: 2/2/2016



Specification Source: NHTSA Final Rule 8/15/2008

02.02.2016 07:21:30 360



Transportation Research Center Inc.

Left Lateral Neck

ES-2re Serial No. F030 Certification No. 32-1

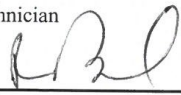
Test Date: 2/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.36 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-53.0 deg	Yes
Time of Peak	54 - 66 ms	54.6 ms	Yes
Headform Flexion Decay			
- Peak to Zero	53 - 88 ms	68.7 ms	Yes

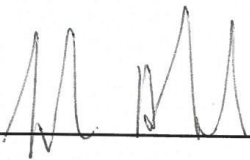
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

02.01.2016 11:47:40 1314

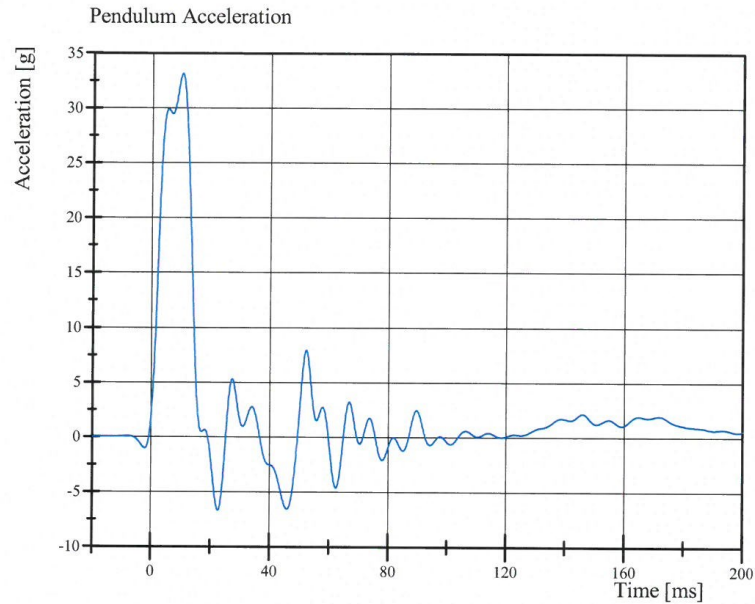


Transportation Research Center Inc.

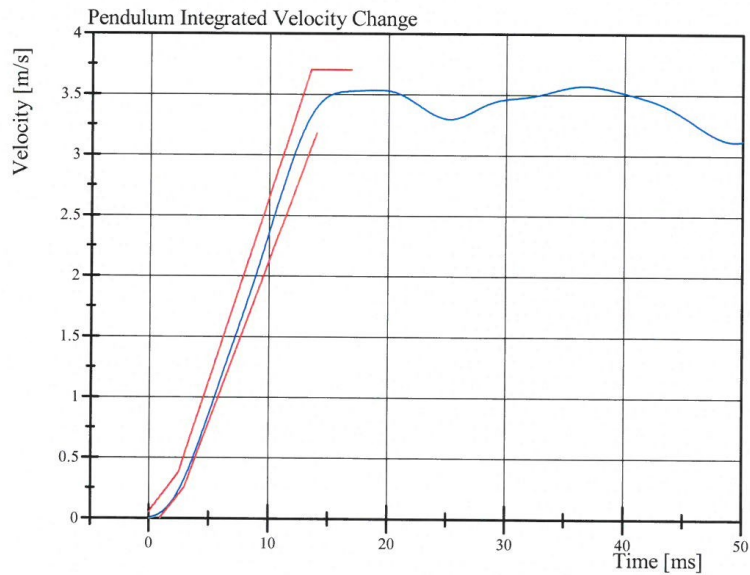
Left Lateral Neck

ES-2re Serial No. F030 Certification No. 32-1

Test Date: 2/1/2016



Filter Class: CFC_60
Max: 33.1 g at 10.2 ms
Min: -6.7 g at 22.6 ms



Filter Class: CFC_60
Max: 3.6 m/s at 36.6 ms
Min: 0.0 m/s at 0.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.01.2016 11:47:47 1314

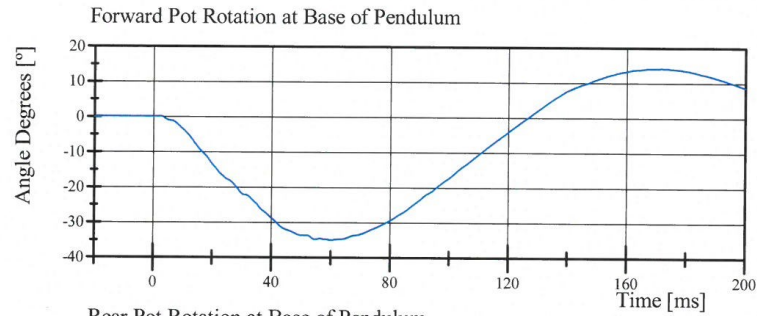


Transportation Research Center Inc.

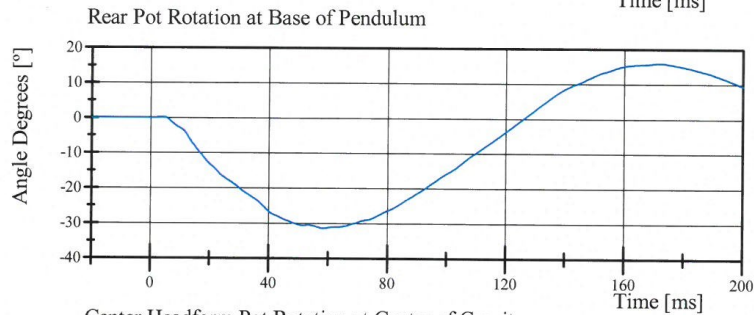
Left Lateral Neck

ES-2re Serial No. F030 Certification No. 32-1

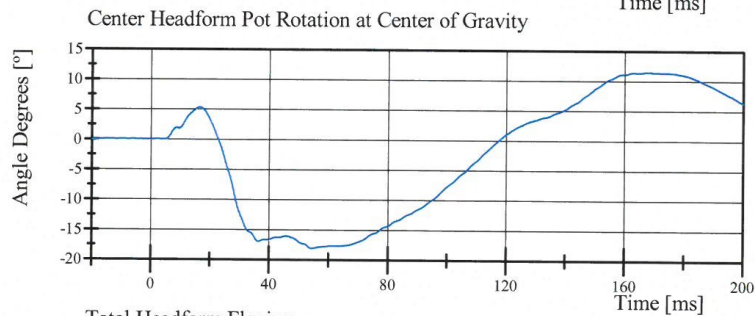
Test Date: 2/1/2016



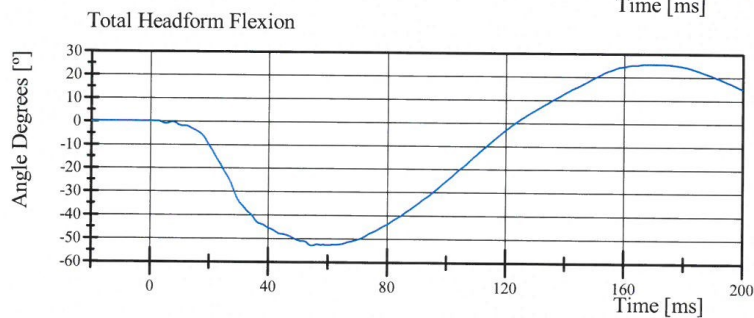
Filter Class: CFC_180
Max: 14.2 ° at 171.6 ms
Min: -35.0 ° at 60.1 ms



Filter Class: CFC_180
Max: 16.0 ° at 172.0 ms
Min: -31.4 ° at 58.4 ms



Filter Class: CFC_180
Max: 11.5 ° at 167.7 ms
Min: -18.2 ° at 54.4 ms



Filter Class: CFC_180
Max: 25.6 ° at 168.0 ms
Min: -53.0 ° at 54.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.01.2016 11:47:47 1314



Transportation Research Center Inc.

Left Lateral Shoulder

ES-2re Serial No. F030 Certification No. 32-1

Test Date: 2/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.32 g	Yes

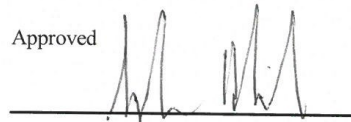
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA final rule 8/15/2008

02.01.2016 13:44:25 635

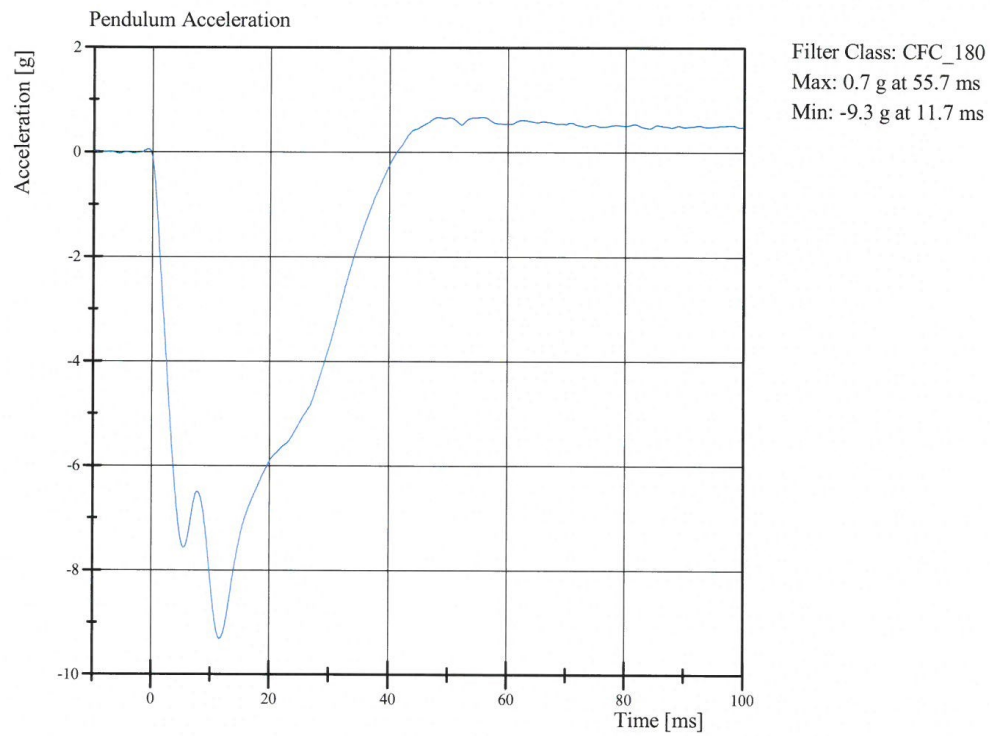


Transportation Research Center Inc.

Left Lateral Shoulder

ES-2re Serial No. F030 Certification No. 32-1

Test Date: 2/1/2016



Specification Source: NHTSA final rule 8/15/2008

02.01.2016 13:44:31 635



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 32-1
Test Date: 2/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	38.1 mm	Yes

Test meets specifications.

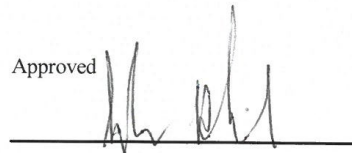
Comments:

Drop Height: 462

Technician



Approved



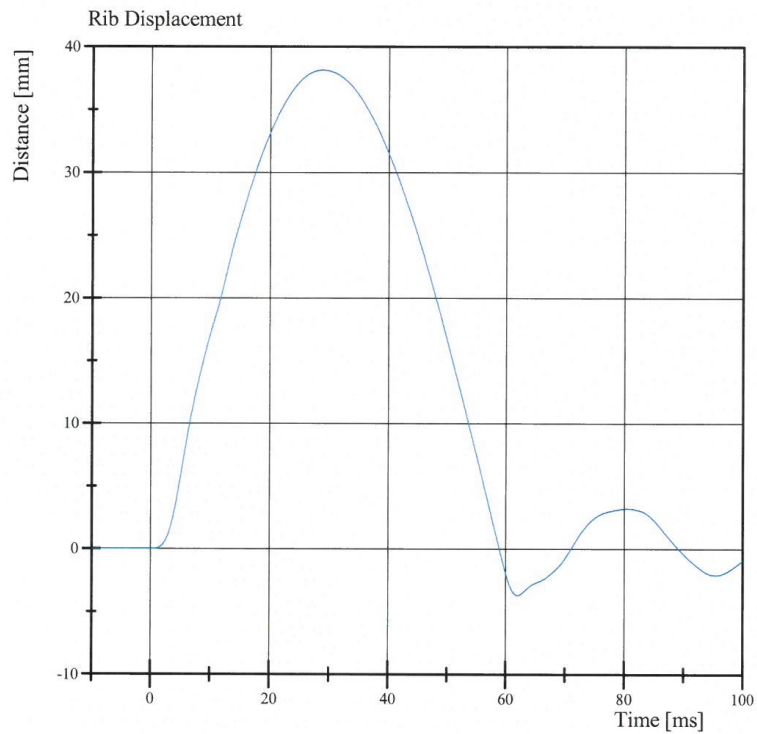
Specification Source: NHTSA Final Rule 8/15/2008

02.01.2016 09:48:03 832



Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 32-1
Test Date: 2/1/2016



Filter Class: CFC_180
Max: 38.1 mm at 28.8 ms
Min: -3.7 mm at 62.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.01.2016 09:48:10 832



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 32-1
Test Date: 2/1/2016

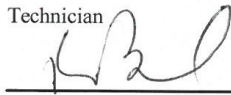
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	49.1 mm	Yes

Test meets specifications.

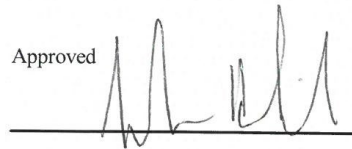
Comments:

Drop Height: 816

Technician



Approved



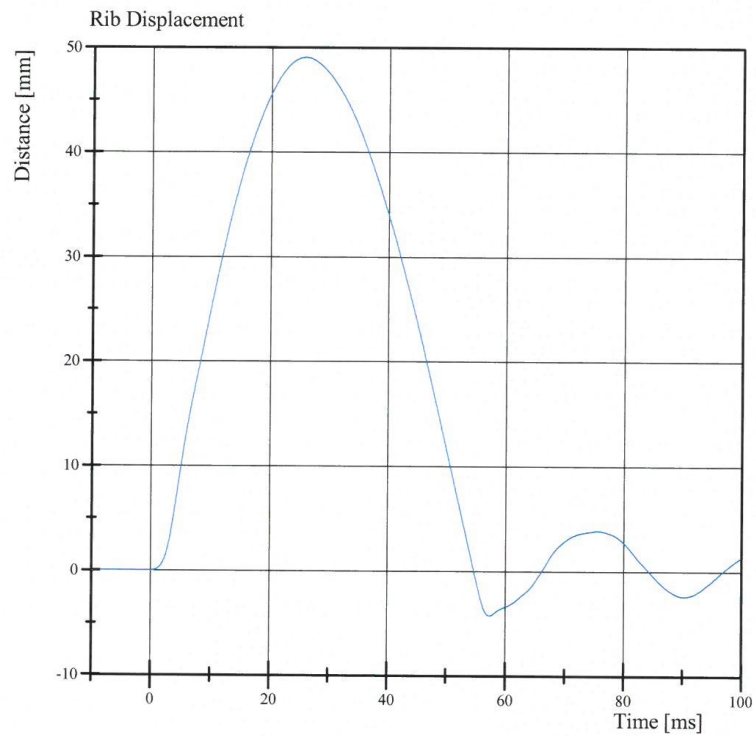
Specification Source: NHTSA Final Rule 8/15/2008

02.01.2016 09:33:47 663



Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 32-1
Test Date: 2/1/2016



Filter Class: CFC_180
Max: 49.1 mm at 25.8 ms
Min: -4.2 mm at 57.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.01.2016 09:33:53 663



Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 32-1
Test Date: 2/1/2016

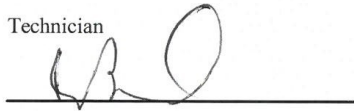
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.2 mm	Yes

Test meets specifications.

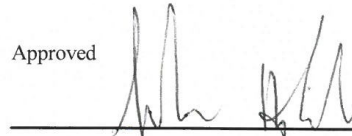
Comments:

Drop Height: 462

Technician



Approved



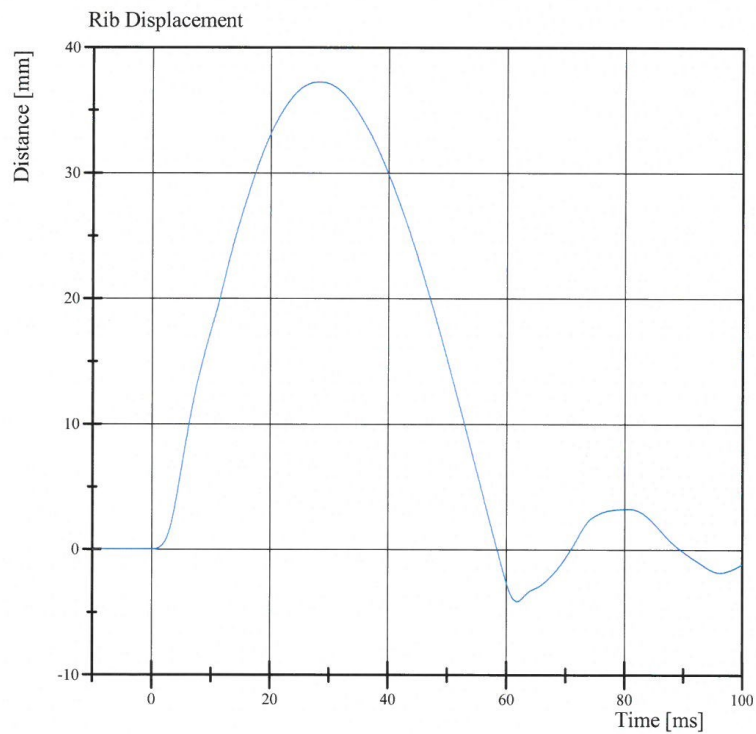
Specification Source: NHTSA Final Rule 8/15/2008

02.01.2016 09:59:52 853



Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 32-1
Test Date: 2/1/2016



Filter Class: CFC_180
Max: 37.2 mm at 28.3 ms
Min: -4.1 mm at 61.8 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.01.2016 10:00:01 853



Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 32-1
Test Date: 2/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.2 mm	Yes

Test meets specifications.

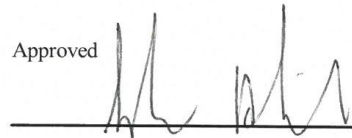
Comments:

Drop Height: 462

Technician



Approved



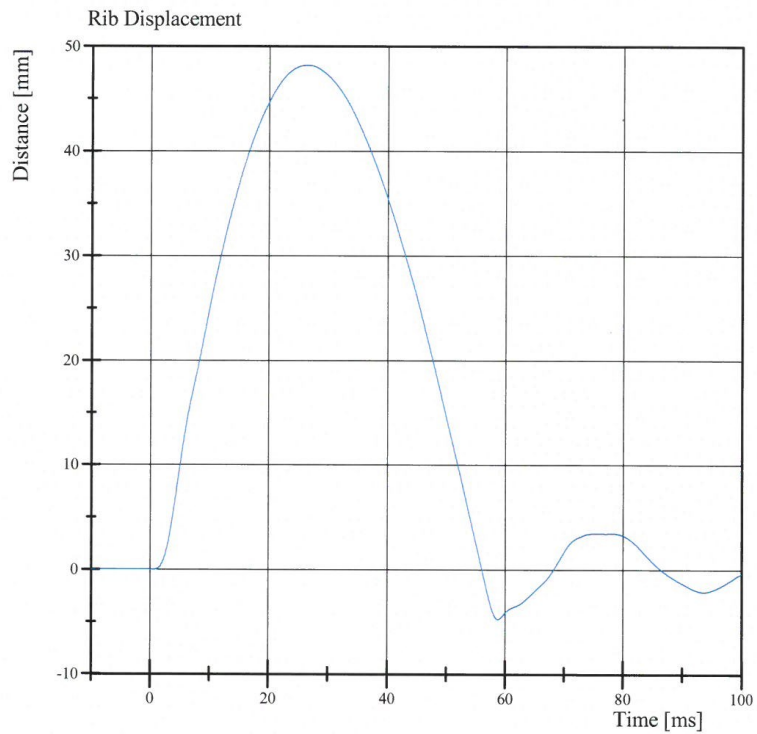
Specification Source: NHTSA Final Rule 8/15/2008

02.01.2016 09:55:28 677



Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 32-1
Test Date: 2/1/2016



Filter Class: CFC_180
Max: 48.2 mm at 26.4 ms
Min: -4.7 mm at 58.8 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.01.2016 09:55:40 677



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 32-1
Test Date: 2/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	36.9 mm	Yes

Test meets specifications.

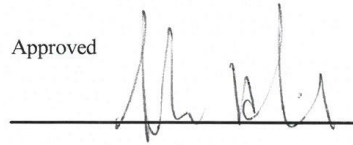
Comments:

Drop Height: 462

Technician



Approved



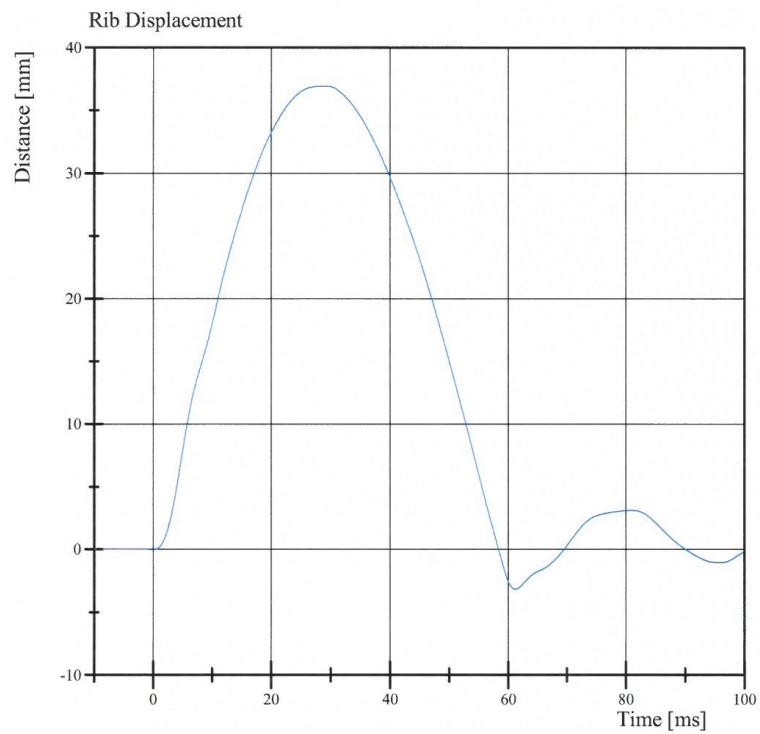
Specification Source: NHTSA Final Rule 8/15/2008

02.01.2016 10:11:43 863



Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 32-1
Test Date: 2/1/2016



Filter Class: CFC_180
Max: 36.9 mm at 29.2 ms
Min: -3.2 mm at 61.2 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.01.2016 10:11:50 863



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module

ES-2re Serial No. F030 Certification No. 32-1

Test Date: 2/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.1 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician



Approved



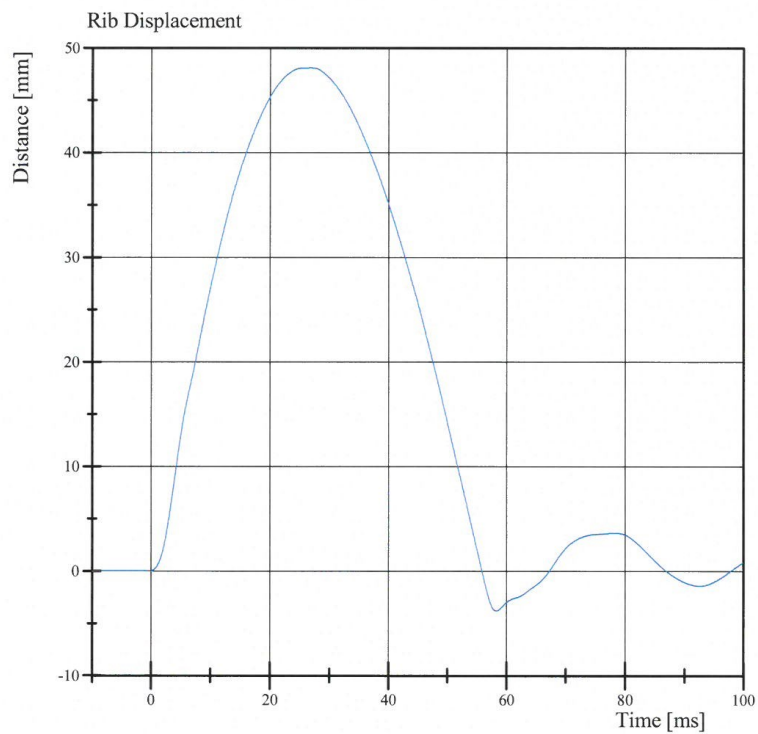
Specification Source: NHTSA Final Rule 8/15/2008

02.01.2016 10:05:24 683



Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 32-1
Test Date: 2/1/2016



Filter Class: CFC_180
Max: 48.1 mm at 26.9 ms
Min: -3.8 mm at 58.3 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.01.2016 10:05:31 683



Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 32-1
Test Date: 2/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.544 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,568.7 N	Yes
Upper Rib Displacement	34 - 41 mm	38.9 mm	Yes
Center Rib Displacement	37 - 45 mm	42.0 mm	Yes
Lower Rib Displacement	37 - 44 mm	41.4 mm	Yes

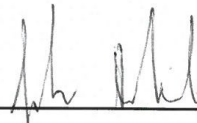
Test meets specifications.

Comments:

Technician



Approved



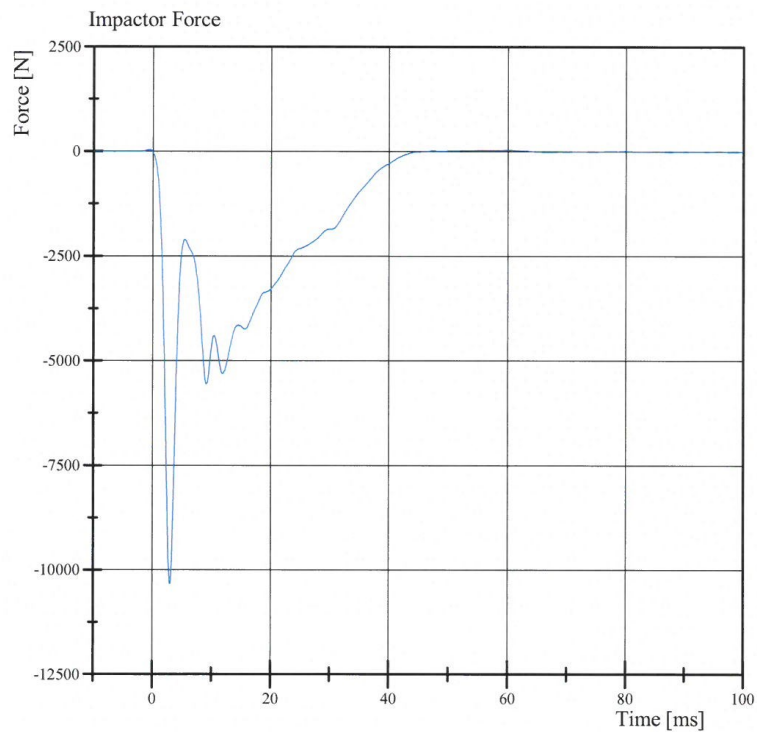
Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

02.01.2016 13:52:10 440



Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 32-1
Test Date: 2/1/2016



Filter Class: CFC_180
Max: 38.5 N at 60.2 ms
Min: -10,347.5 N at 3.0 ms

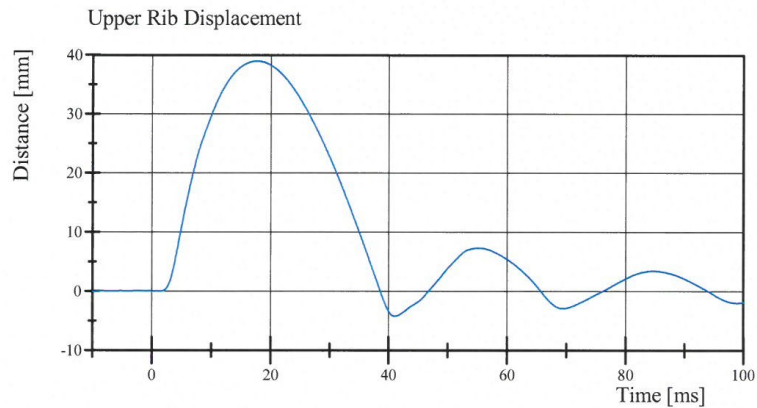
Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

02.01.2016 13:52:17 440

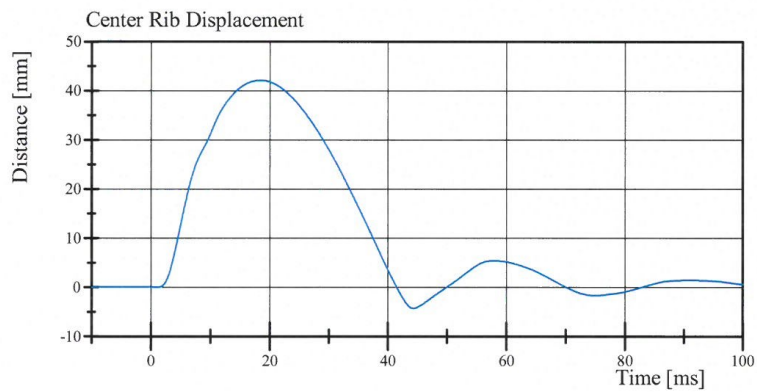


Transportation Research Center Inc.

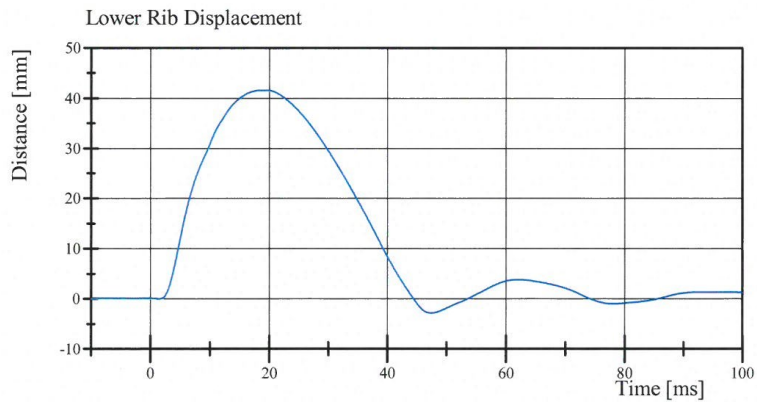
Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 32-1
Test Date: 2/1/2016



Filter Class: CFC_180
Max: 38.9 mm at 17.6 ms
Min: -4.2 mm at 41.1 ms



Filter Class: CFC_180
Max: 42.0 mm at 18.4 ms
Min: -4.3 mm at 44.3 ms



Filter Class: CFC_180
Max: 41.4 mm at 19.3 ms
Min: -2.9 mm at 47.4 ms

Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

02.01.2016 13:52:17 440



Transportation Research Center Inc.

Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 32-5

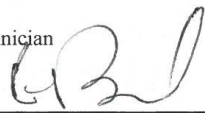
Test Date: 2/2/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	4.10 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,305.6 N	Yes
Time of Peak	10.6 - 13.0 ms	10.64 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,635.3 N	Yes
Time of Peak	10.0 - 12.3 ms	10.72 ms	Yes

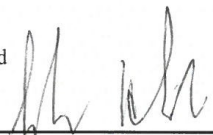
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

02.02.2016 07:02:14 590

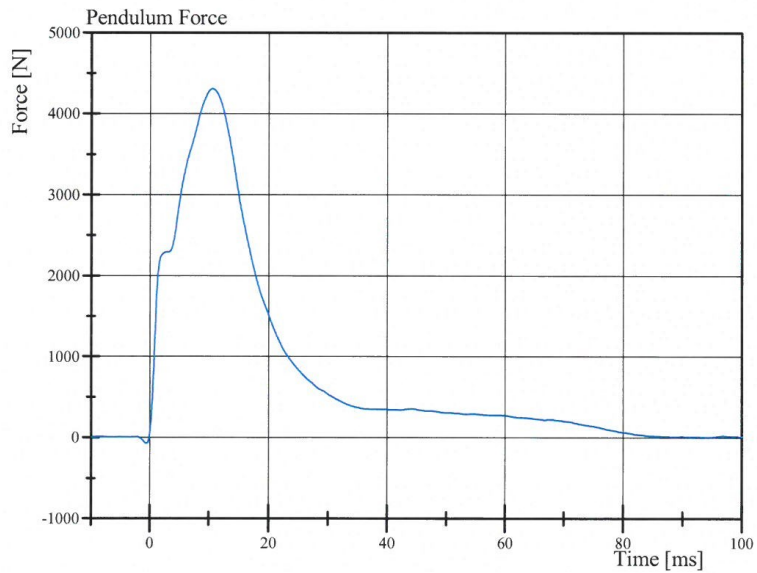
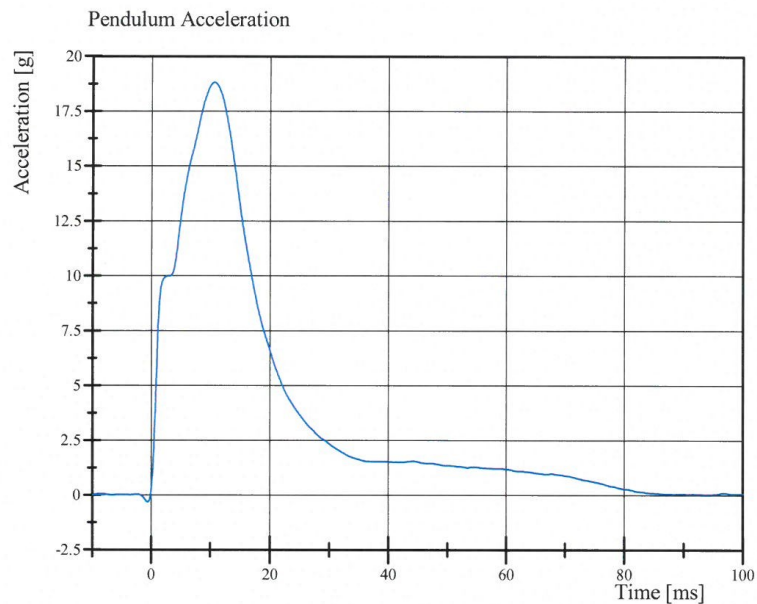


Transportation Research Center Inc.

Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 32-5

Test Date: 2/2/2016



Specification Source: NHTSA Final Rule 8/15/2008

02.02.2016 07:02:21 590

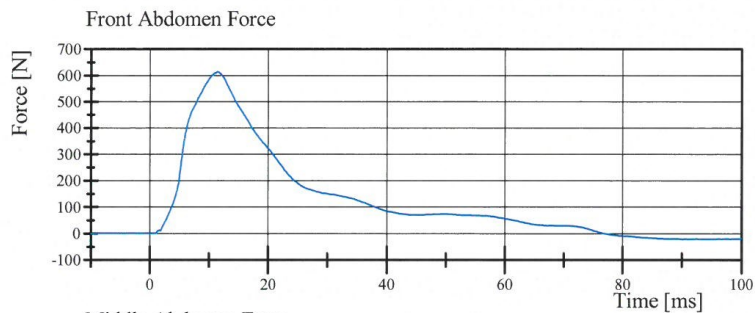


Transportation Research Center Inc.

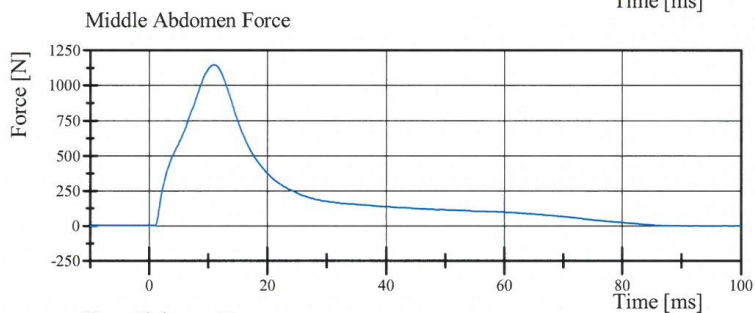
Left Lateral Abdomen

ES-2re Serial No. F030 Certification No. 32-5

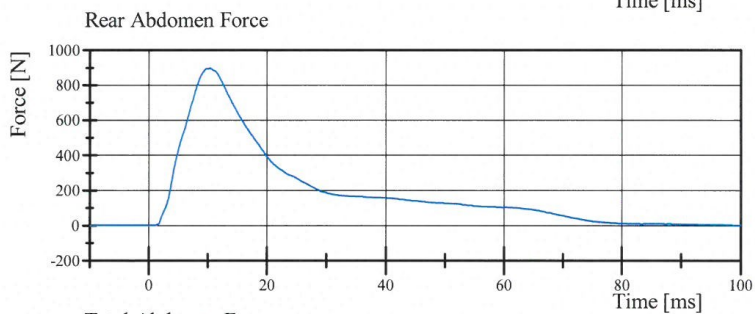
Test Date: 2/2/2016



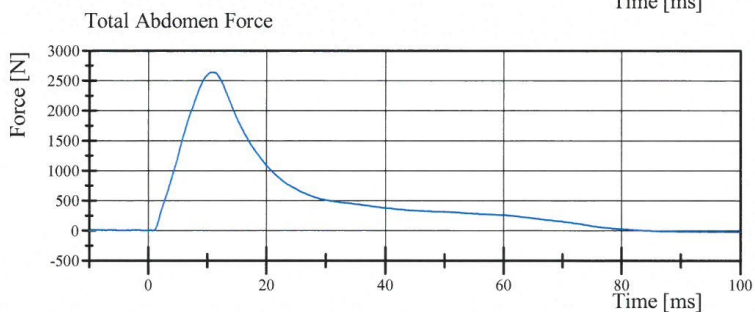
Filter Class: CFC_600
Max: 611.6 N at 11.4 ms
Min: -21.6 N at 90.2 ms



Filter Class: CFC_600
Max: 1,144.0 N at 10.8 ms
Min: -1.5 N at 1.0 ms



Filter Class: CFC_600
Max: 894.9 N at 10.4 ms
Min: -0.3 N at -5.8 ms



Filter Class: CFC_600
Max: 2,635.3 N at 10.7 ms
Min: -17.2 N at 99.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.02.2016 07:02:22 590



Transportation Research Center Inc.

Left Lateral Lumbar
ES-2re Serial No. F030 Certification No. 32-2
Test Date: 2/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-5.95) - (-6.15) m/s	-6.075 m/s	Yes
Maximum Headform Flexion			
Peak	(-45) - (-55) deg	-50.7 deg	Yes
Time of Peak	39 - 53 ms	43.3 ms	Yes
Headform Flexion Decay			
- Peak to Zero	37 - 57 ms	39.5 ms	Yes

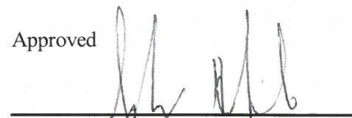
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

02.01.2016 11:23:01 574

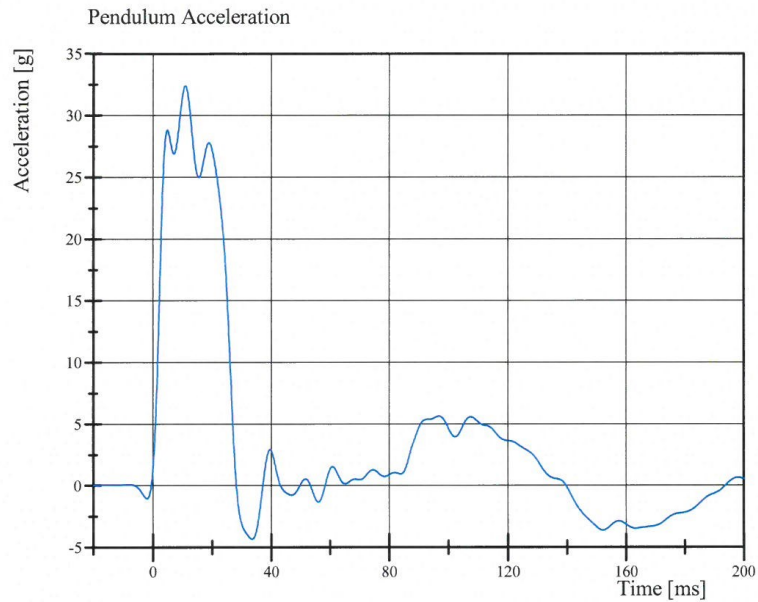


Transportation Research Center Inc.

Left Lateral Lumbar

ES-2re Serial No. F030 Certification No. 32-2

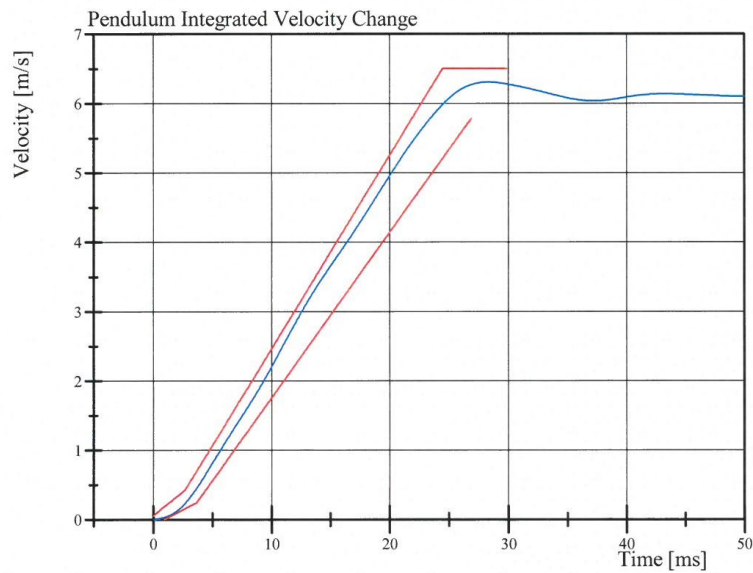
Test Date: 2/1/2016



Filter Class: CFC_60

Max: 32.4 g at 11.0 ms

Min: -4.4 g at 33.5 ms



Filter Class: CFC_60

Max: 6.3 m/s at 28.3 ms

Min: 0.0 m/s at 0.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.01.2016 11:23:13 574

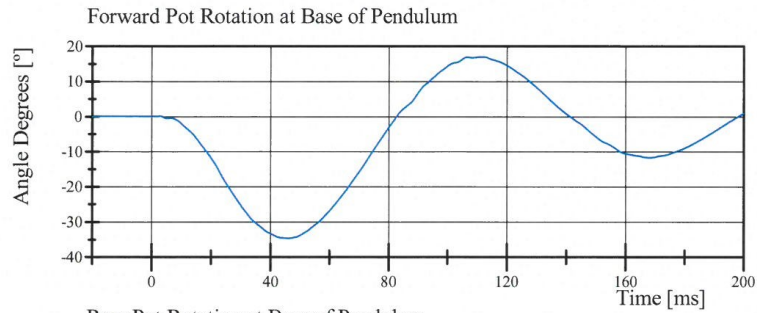


Transportation Research Center Inc.

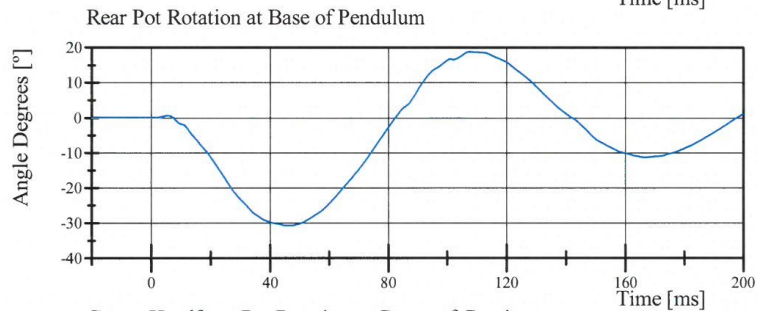
Left Lateral Lumbar

ES-2re Serial No. F030 Certification No. 32-2

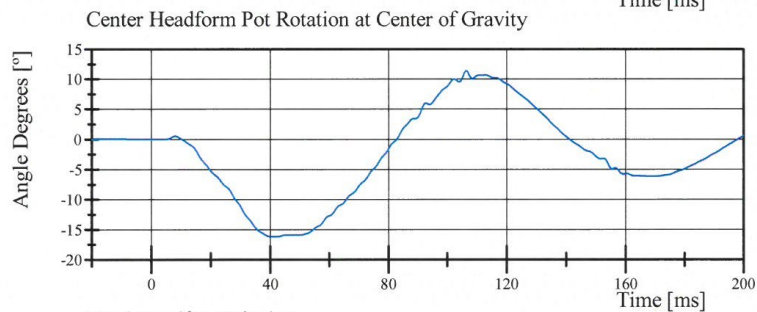
Test Date: 2/1/2016



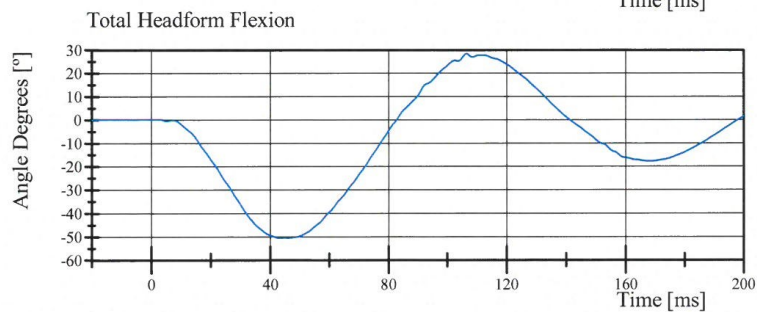
Filter Class: CFC_180
Max: 17.0 ° at 111.8 ms
Min: -34.7 ° at 46.0 ms



Filter Class: CFC_180
Max: 18.8 ° at 107.8 ms
Min: -30.8 ° at 46.6 ms



Filter Class: CFC_180
Max: 11.4 ° at 106.5 ms
Min: -16.2 ° at 40.6 ms



Filter Class: CFC_180
Max: 28.3 ° at 106.6 ms
Min: -50.7 ° at 43.3 ms

Specification Source: NHTSA Final Rule 8/15/2008

02.01.2016 11:23:14 574



Transportation Research Center Inc.

Left Lateral Pelvis

ES-2re Serial No. F030 Certification No. 32-1

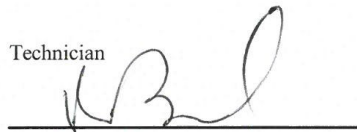
Test Date: 2/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.25 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,061.6 N	Yes
Time of Peak	11.8 - 16.1 ms	13.20 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,246.9 N	Yes
Time of Peak	12.2 - 17.0 ms	13.20 ms	Yes

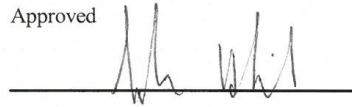
Test meets specifications.

Comments:

Technician



Approved



Specification Source: NHTSA Final Rule 8/15/2008

02.01.2016 14:23:41 567

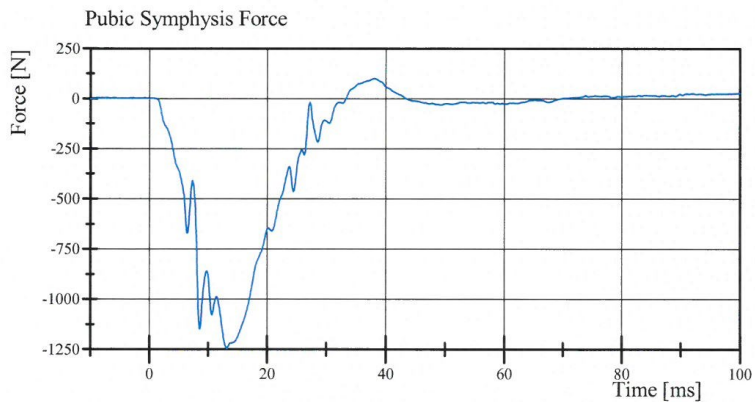
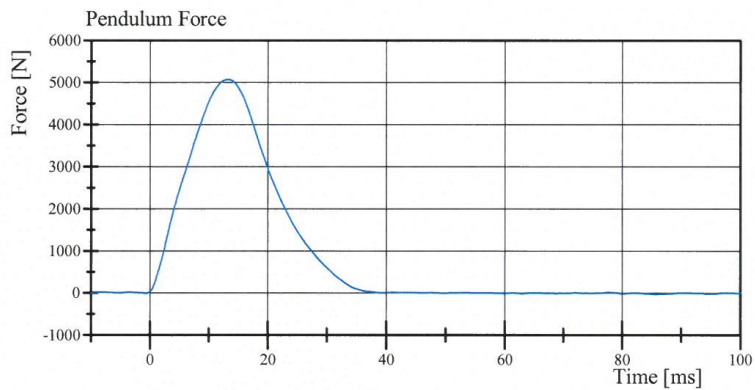
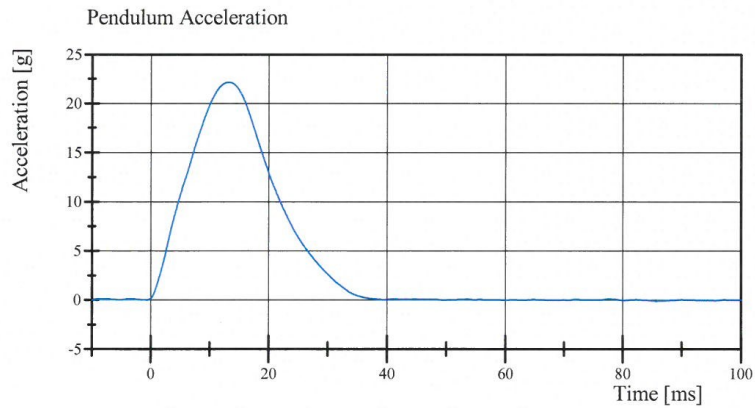


Transportation Research Center Inc.

Left Lateral Pelvis

ES-2re Serial No. F030 Certification No. 32-1

Test Date: 2/1/2016



Specification Source: NHTSA Final Rule 8/15/2008

02.01.2016 14:23:47 567



Pre-Test Calibration Sheets
Passenger S/N 305

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 305 Calibration No.36

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	782	Yes
B	Shoulder Pivot Height	437.0 - 453.0	445	Yes
C	H-Point Height	79.0 - 89.0	85	Yes
D	H-Point from Seat Back	141.0 - 151.0	145	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	101	Yes
F	Thigh Clearance	119.0 - 135.0	129	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	545	Yes
K	Buttock to Knee Length	514.0 - 540.0	525	Yes
L	Popliteal Height	343.0 - 369.0	355	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	401	Yes
N	Buttock Popliteal Length	416.0 - 442.0	428	Yes
O	Chest Depth without Jacket	195.0 - 211.0	200	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	318	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	484	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	347	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
W	Foot Width (left)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	870	Yes
Z	Waist Circumference	761.0 - 791.0	780	Yes

Technician



Approved




Revised 9/29/2005

Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 305 Certification No. 36-1

Test Date: 1/16/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	120.2 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	7.3 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician



Approved



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 08:28:25 231

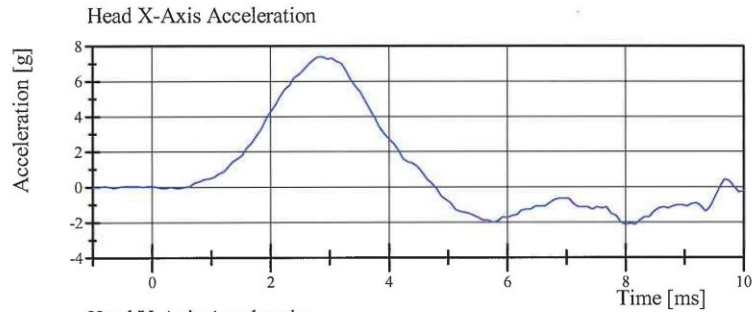


Transportation Research Center Inc.

Left Lateral Head Drop

SID II_s Serial No. 305 Certification No. 36-1

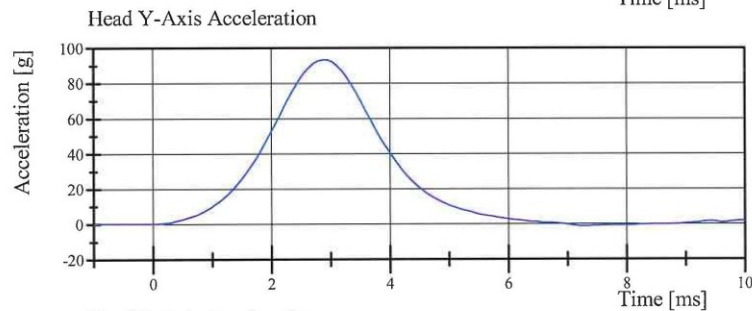
Test Date: 1/16/2016



Filter Class: CFC_1000

Max: 7.3 g at 2.8 ms

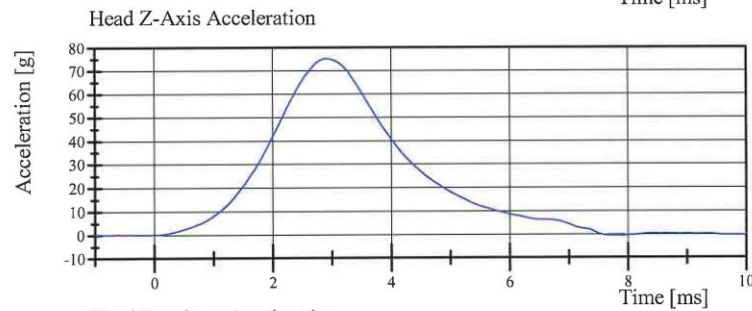
Min: -2.1 g at 8.0 ms



Filter Class: CFC_1000

Max: 93.5 g at 2.9 ms

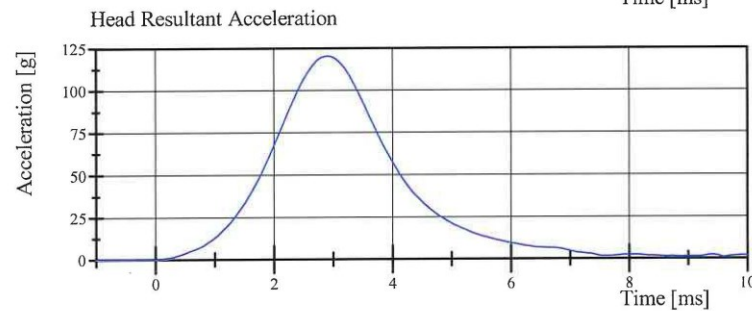
Min: -1.2 g at 7.2 ms



Filter Class: CFC_1000

Max: 75.2 g at 2.9 ms

Min: -0.5 g at 7.9 ms



Filter Class: CFC_1000

Max: 120.2 g at 2.9 ms

Min: 0.0 g at -0.2 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 08:28:37 231



Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 36-2

Test Date: 1/16/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.609 m/s	Yes
Pendulum Integrated Velocity			
Change at 10 ms	2.20 - 2.80 m/s	2.757 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.952 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.221 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.869 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.871 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-73.6 deg	Yes
Time of Peak	50 - 70 ms	63.8 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	41.3 N·m	Yes
Total Neck Occipital Condyles Moment			
Decay Time to 0 N·m	102 - 126 ms	119.5 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 10:05:05 642

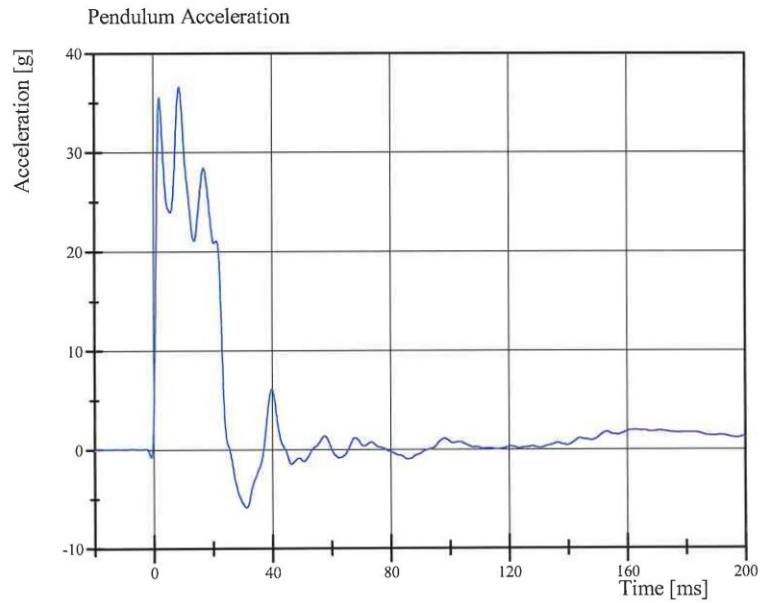


Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 36-2

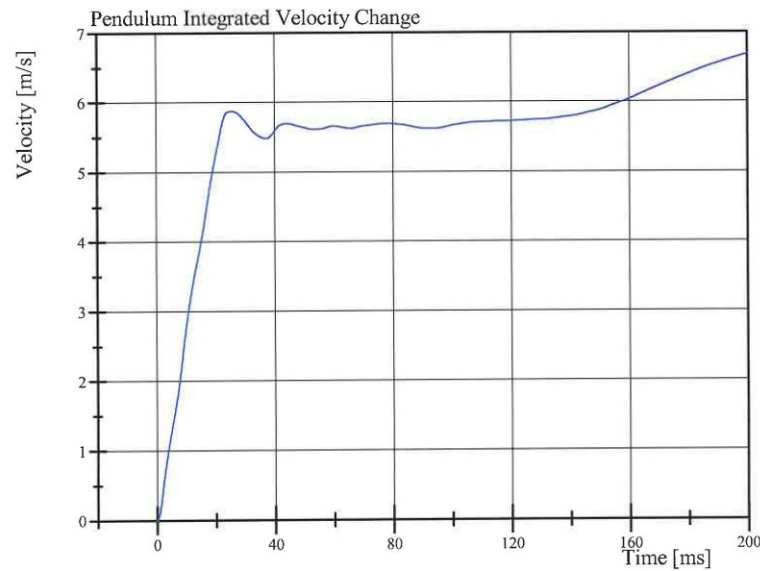
Test Date: 1/16/2016



Filter Class: CFC_180

Max: 36.5 g at 8.7 ms

Min: -5.9 g at 31.2 ms



Filter Class: CFC_180

Max: 6.7 m/s at 200.0 ms

Min: 0.0 m/s at 0.0 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 10:05:19 642

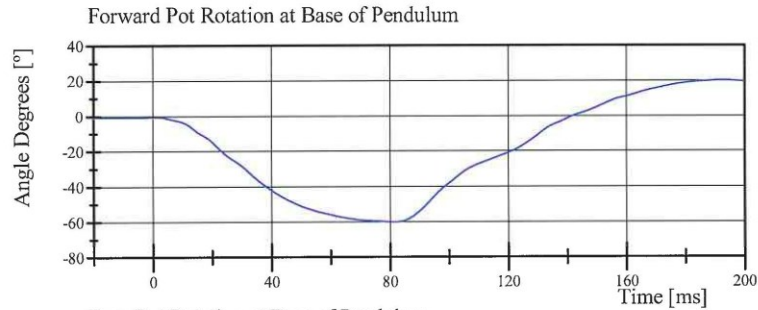


Transportation Research Center Inc.

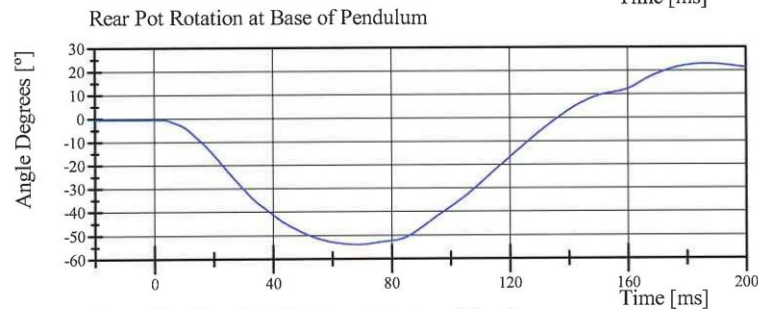
Left Lateral Neck

SID IIs Serial No. 305 Certification No. 36-2

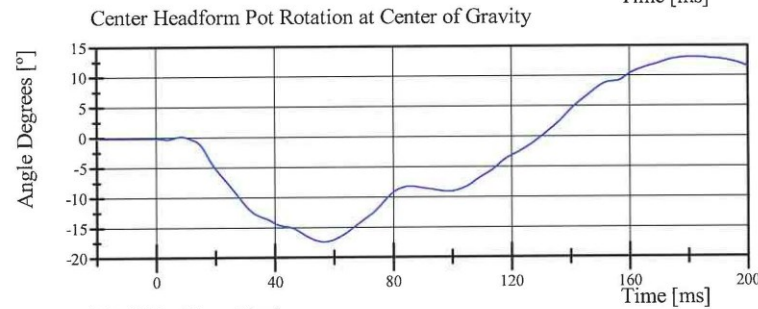
Test Date: 1/16/2016



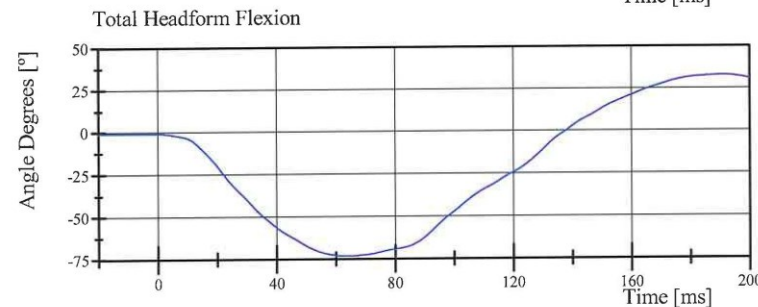
Filter Class: CFC_60
Max: 20.3 ° at 192.3 ms
Min: -60.3 ° at 81.2 ms



Filter Class: CFC_60
Max: 23.1 ° at 186.6 ms
Min: -54.0 ° at 68.6 ms



Filter Class: CFC_60
Max: 13.1 ° at 180.7 ms
Min: -17.4 ° at 56.6 ms



Filter Class: CFC_60
Max: 33.0 ° at 190.9 ms
Min: -73.6 ° at 63.8 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 10:05:20 642

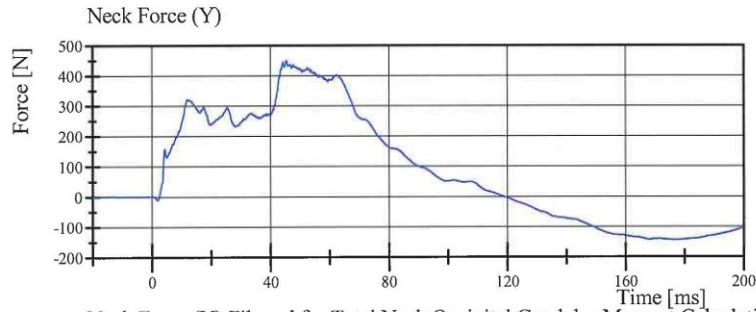


Transportation Research Center Inc.

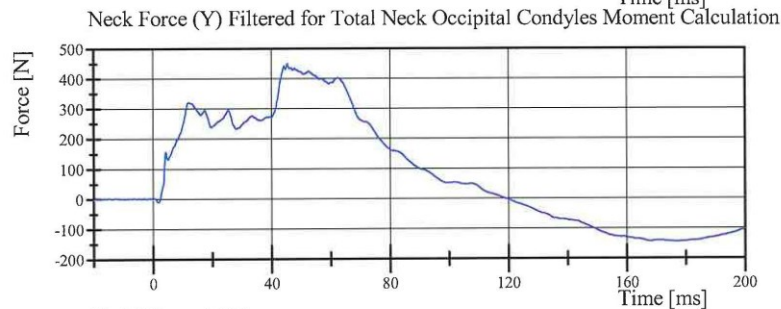
Left Lateral Neck

SID IIs Serial No. 305 Certification No. 36-2

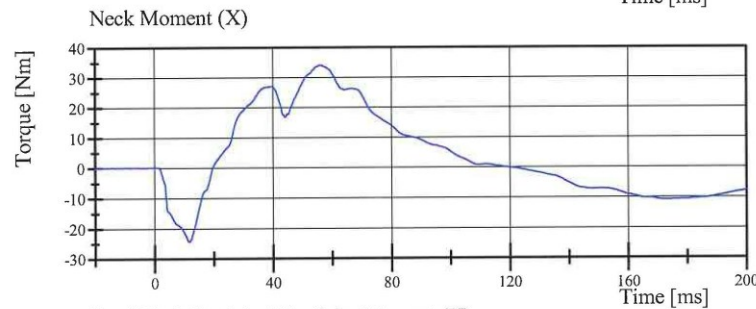
Test Date: 1/16/2016



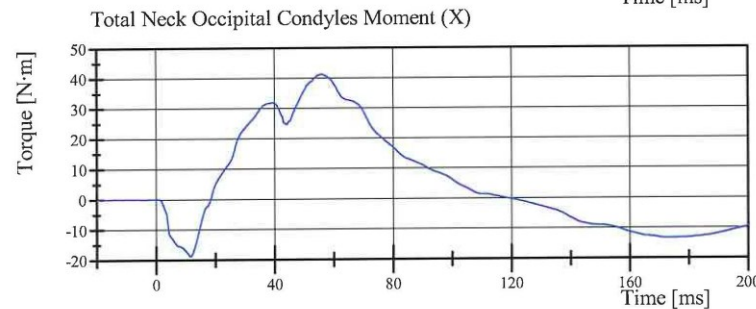
Filter Class: CFC_1000
Max: 449.7 N at 45.5 ms
Min: -144.3 N at 176.2 ms



Filter Class: CFC_600
Max: 449.3 N at 45.4 ms
Min: -143.7 N at 176.2 ms



Filter Class: CFC_600
Max: 34.2 Nm at 56.2 ms
Min: -24.6 Nm at 11.8 ms



Filter Class: Without_(Consta
Max: 41.3 N·m at 56.1 ms
Min: -19.0 N·m at 11.7 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 10:05:21 642



Transportation Research Center Inc.

Left Lateral Shoulder

SID IIs Serial No. 305 Certification No. 36-1

Test Date: 1/16/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-17.9 g	Yes
Shoulder Displacement	28 - 37 mm	30.1 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	21.0 g	Yes

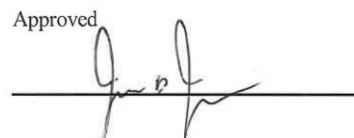
Test meets specifications.

Comments:

Technician



Approved



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 10:34:27 854

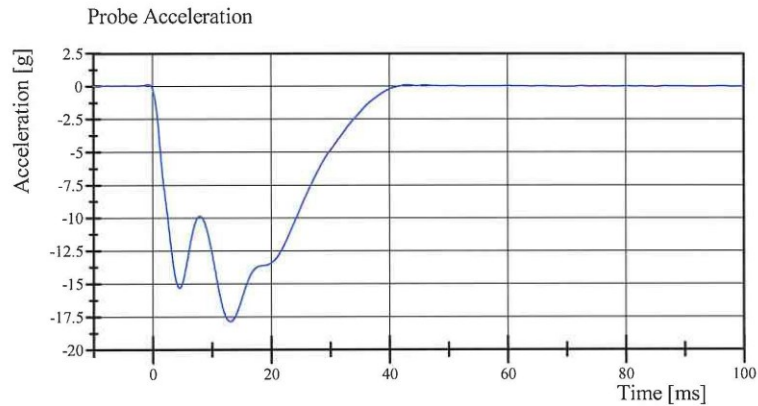


Transportation Research Center Inc.

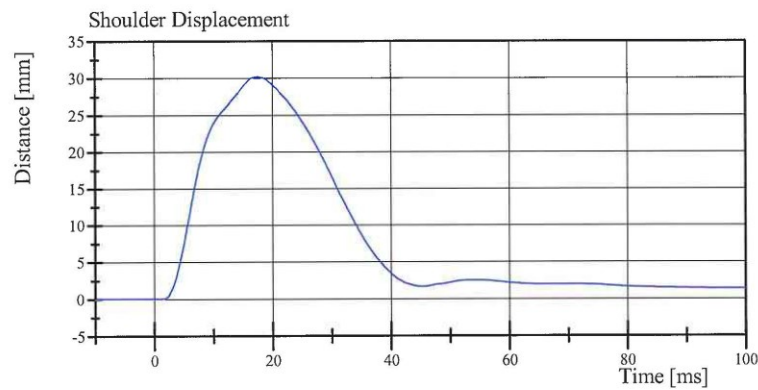
Left Lateral Shoulder

SID IIs Serial No. 305 Certification No. 36-1

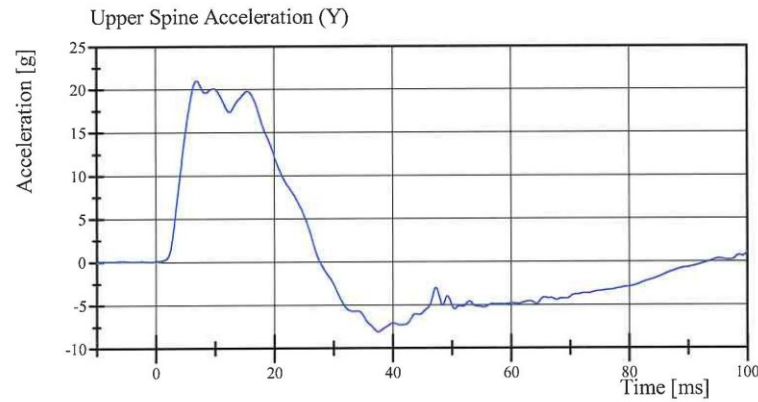
Test Date: 1/16/2016



Filter Class: CFC_180
Max: 0.1 g at -0.7 ms
Min: -17.9 g at 13.1 ms



Filter Class: CFC_600
Max: 30.1 mm at 17.5 ms
Min: -0.0 mm at -1.4 ms



Filter Class: CFC_180
Max: 21.0 g at 7.0 ms
Min: -8.1 g at 37.5 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 10:34:42 854



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 36-5
Test Date: 1/18/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	11 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.741 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-34.3 g	Yes
Shoulder Displacement	31 - 40 mm	31.9 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	25.6 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	31.4 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	35.2 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	40.1 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	33.0 g	Yes

Test meets specifications.

Comments:

Technician



Approved



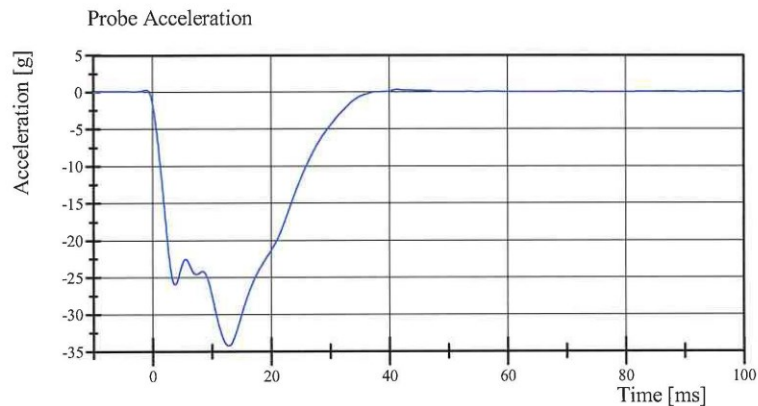
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.18.2016 08:19:49 618

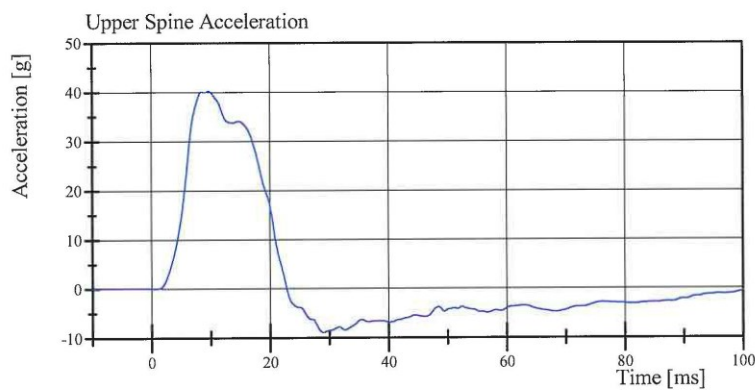


Transportation Research Center Inc.

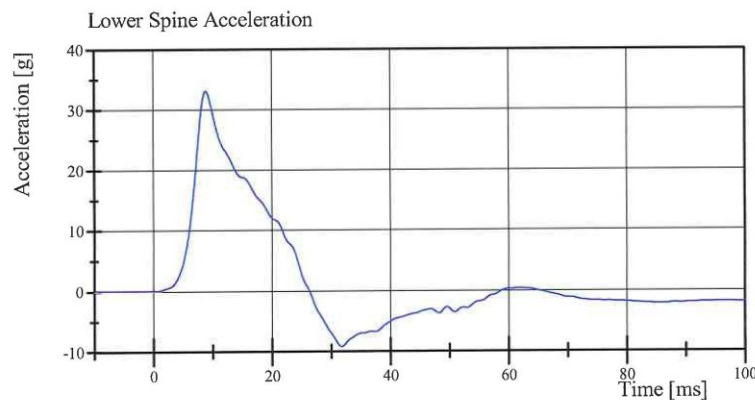
Left Lateral Thorax with Arm
SID IIa Serial No. 305 Certification No. 36-5
Test Date: 1/18/2016



Filter Class: CFC_180
Max: 0.3 g at 41.4 ms
Min: -34.3 g at 12.8 ms



Filter Class: CFC_180
Max: 40.1 g at 9.7 ms
Min: -9.0 g at 29.0 ms



Filter Class: CFC_180
Max: 33.0 g at 8.9 ms
Min: -9.3 g at 31.8 ms

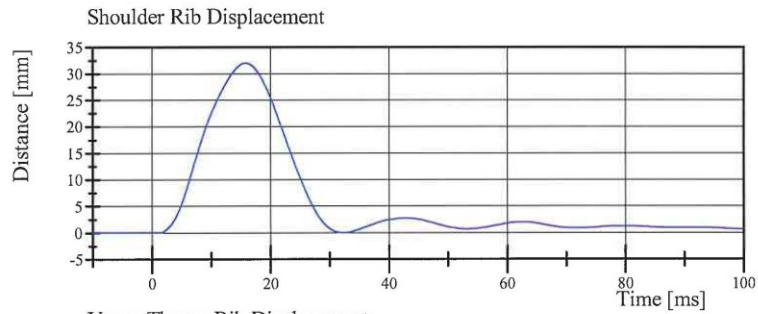
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.18.2016 08:20:03 618

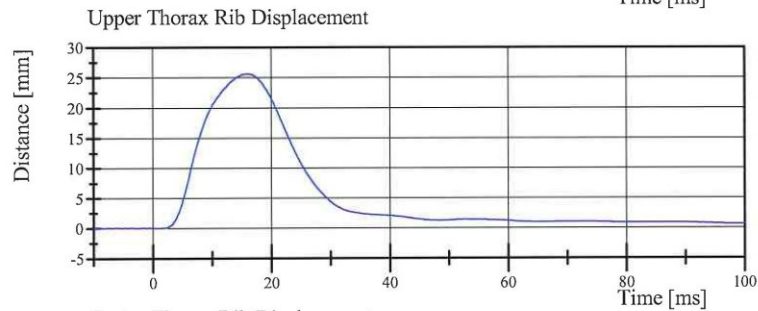


Transportation Research Center Inc.

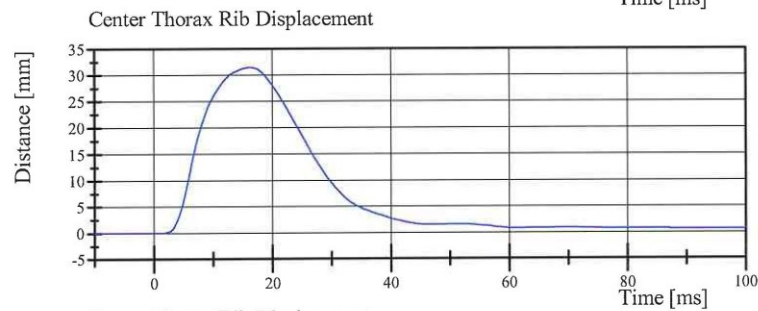
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 36-5
Test Date: 1/18/2016



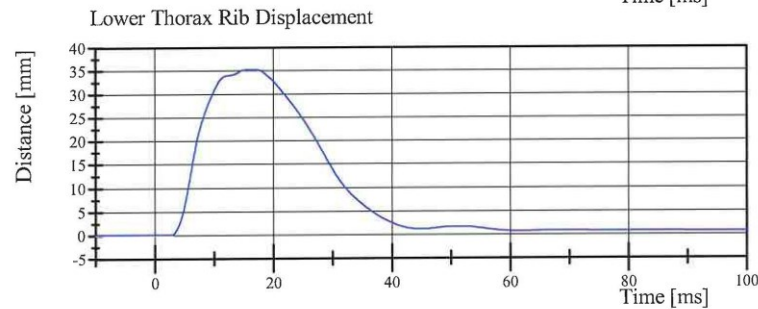
Filter Class: CFC_600
Max: 31.9 mm at 15.8 ms
Min: -0.0 mm at 1.1 ms



Filter Class: CFC_600
Max: 25.6 mm at 16.0 ms
Min: -0.0 mm at -8.3 ms



Filter Class: CFC_600
Max: 31.4 mm at 16.2 ms
Min: -0.0 mm at -9.1 ms



Filter Class: CFC_600
Max: 35.2 mm at 16.6 ms
Min: -0.0 mm at 2.7 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.18.2016 08:20:04 618



Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 36-1
Test Date: 1/16/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.337 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-17.5 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	35.4 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	40.3 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	37.2 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	15.8 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.9 g	Yes

Test meets specifications.

Comments:

Technician



Approved



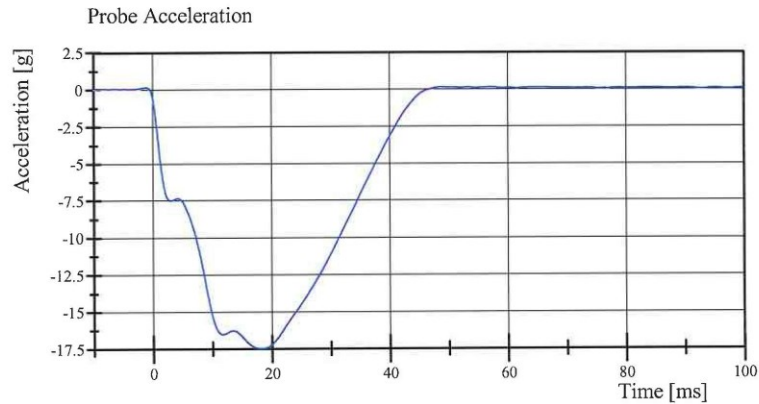
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 11:27:57 837

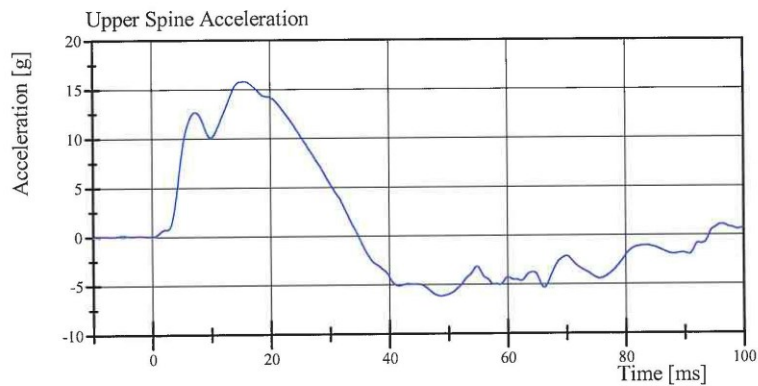


Transportation Research Center Inc.

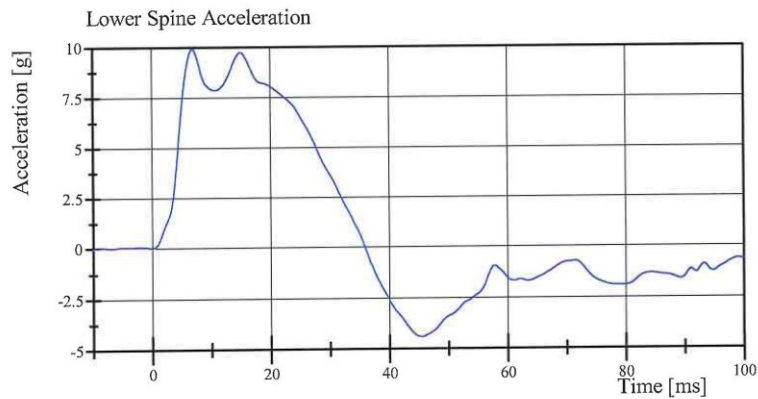
Left Lateral Thorax without Arm
SID IIa Serial No. 305 Certification No. 36-1
Test Date: 1/16/2016



Filter Class: CFC_180
Max: 0.1 g at 57.2 ms
Min: -17.5 g at 18.2 ms



Filter Class: CFC_180
Max: 15.8 g at 15.8 ms
Min: -6.2 g at 48.6 ms



Filter Class: CFC_180
Max: 9.9 g at 6.9 ms
Min: -4.4 g at 45.4 ms

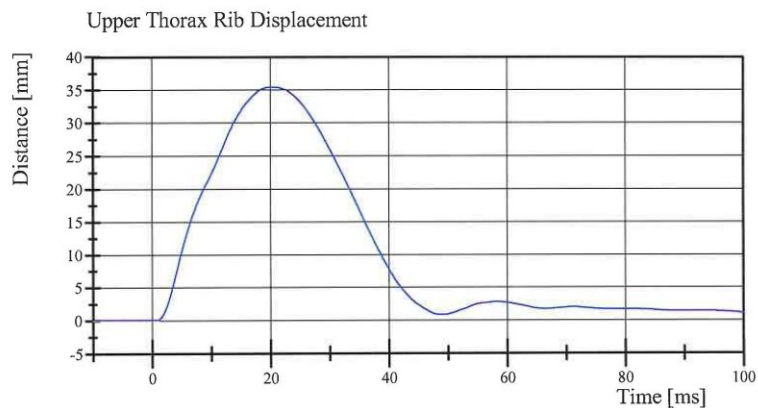
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 11:28:10 837

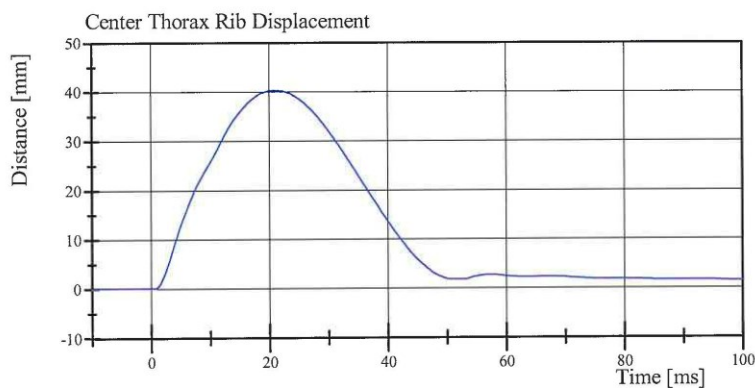


Transportation Research Center Inc.

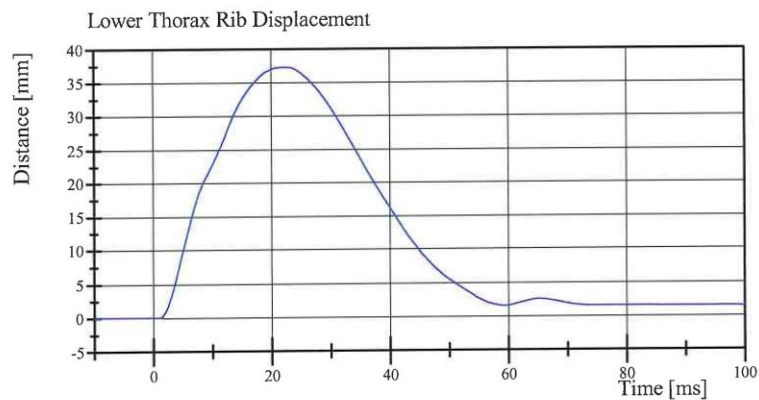
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 36-1
Test Date: 1/16/2016



Filter Class: CFC_600
Max: 35.4 mm at 20.4 ms
Min: -0.0 mm at -5.4 ms



Filter Class: CFC_600
Max: 40.3 mm at 21.0 ms
Min: -0.0 mm at 0.5 ms



Filter Class: CFC_600
Max: 37.2 mm at 22.2 ms
Min: -0.0 mm at 1.0 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 11:28:11 837



Transportation Research Center Inc.

Left Lateral Abdomen

SID IIs Serial No. 305 Certification No. 36-1

Test Date: 1/16/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-15.0 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	43.3 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	41.0 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.36 g	Yes

Test meets specifications.

Comments:

Technician



Approved



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 10:49:50 678

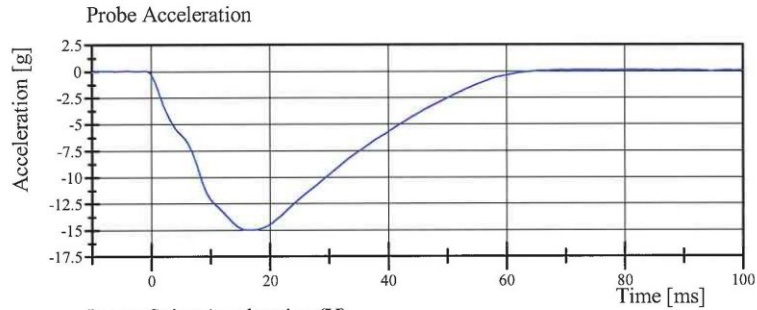


Transportation Research Center Inc.

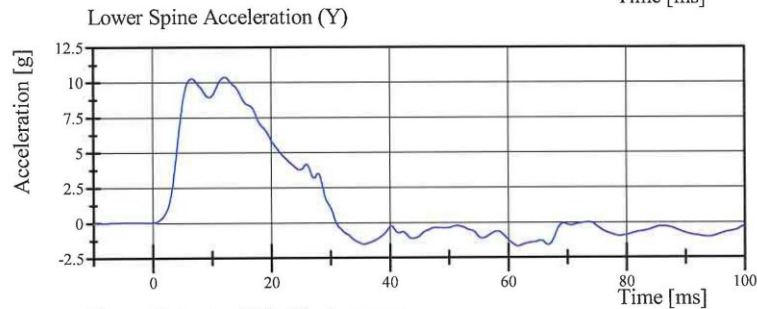
Left Lateral Abdomen

SID IIs Serial No. 305 Certification No. 36-1

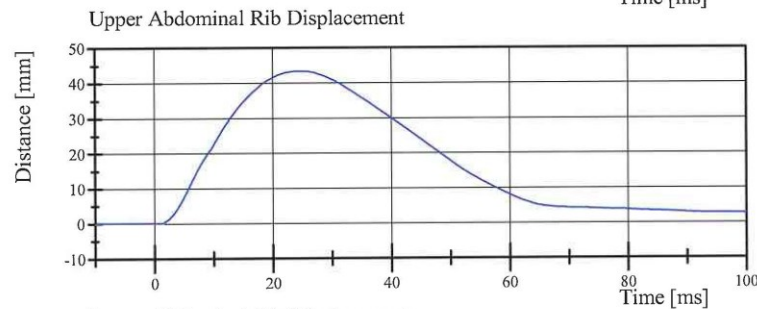
Test Date: 1/16/2016



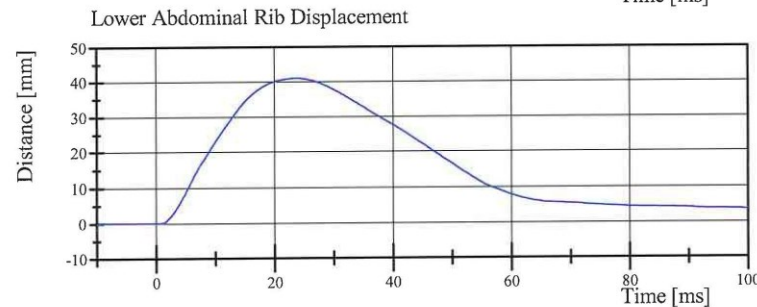
Filter Class: CFC_180
Max: 0.1 g at 72.0 ms
Min: -15.0 g at 16.3 ms



Filter Class: CFC_180
Max: 10.4 g at 12.2 ms
Min: -1.7 g at 61.6 ms



Filter Class: CFC_600
Max: 43.3 mm at 24.3 ms
Min: -0.0 mm at 1.1 ms



Filter Class: CFC_600
Max: 41.0 mm at 23.6 ms
Min: -0.0 mm at 0.6 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 10:50:04 678



Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 305 Certification No. 36-4

Test Date: 1/19/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	21 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.62 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-43.29 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	39.5 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,222.8 N	Yes

Test meets specifications.

Comments:

Technician



Approved



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.19.2016 16:24:29 469

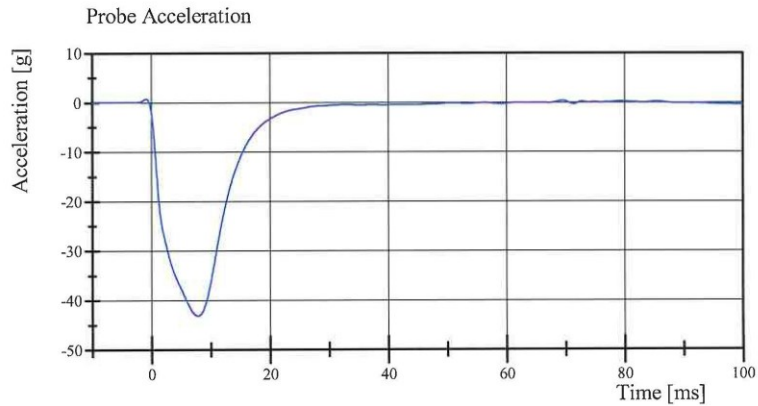


Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 305 Certification No. 36-4

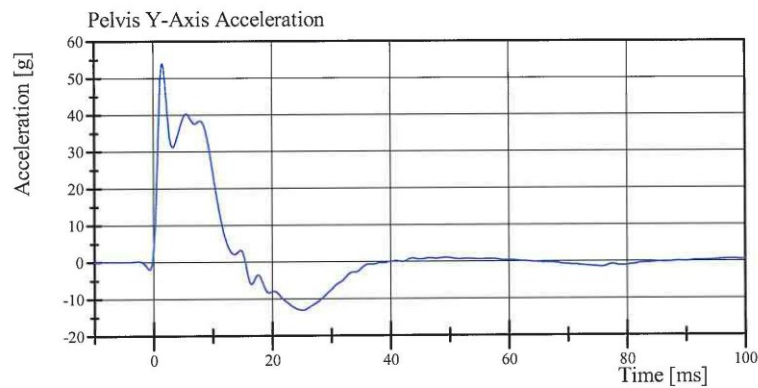
Test Date: 1/19/2016



Filter Class: CFC_180

Max: 0.6 g at -0.9 ms

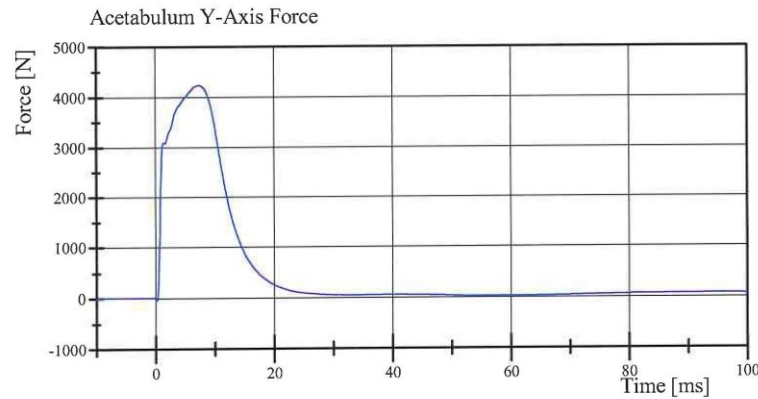
Min: -43.3 g at 7.8 ms



Filter Class: CFC_180

Max: 54.1 g at 1.5 ms

Min: -13.2 g at 25.1 ms



Filter Class: CFC_600

Max: 4,222.8 N at 7.4 ms

Min: -50.5 N at 0.2 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.19.2016 16:24:48 469



Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 36-1

Test Date: 1/16/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-43.4 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	32.2 g	Yes
Iliac Force	4,100 - 5,100 N	4,794.8 N	Yes

Test meets specifications.

Comments:

Technician



Approved



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 10:11:10 690

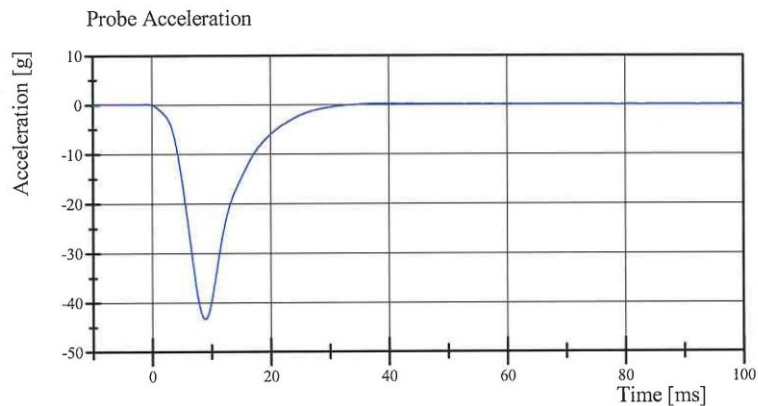


Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 36-1

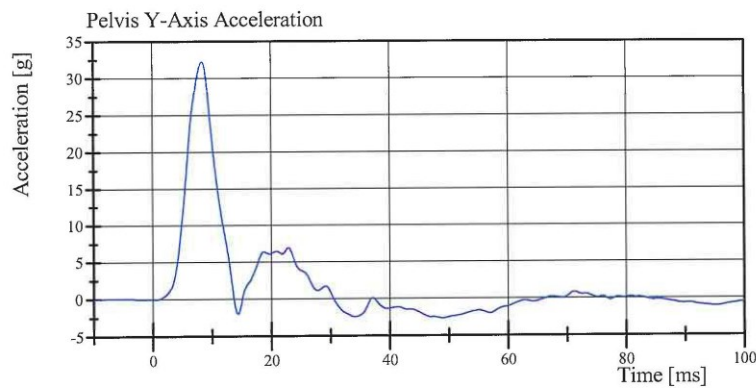
Test Date: 1/16/2016



Filter Class: CFC_180

Max: 0.2 g at 38.1 ms

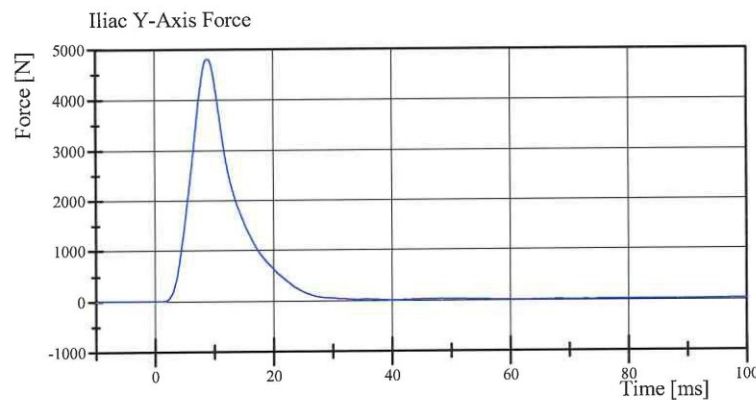
Min: -43.4 g at 9.0 ms



Filter Class: CFC_180

Max: 32.2 g at 8.4 ms

Min: -2.7 g at 49.0 ms



Filter Class: CFC_600

Max: 4,794.8 N at 9.0 ms

Min: -0.7 N at -9.4 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

01.16.2016 10:11:37 690



Post-Test Calibration Sheets
Passenger S/N 305

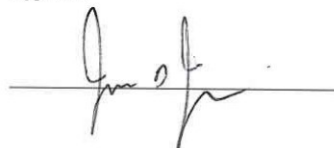
Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 305 Calibration No.37

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	782	Yes
B	Shoulder Pivot Height	437.0 - 453.0	445	Yes
C	H-Point Height	79.0 - 89.0	85	Yes
D	H-Point from Seat Back	141.0 - 151.0	145	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	101	Yes
F	Thigh Clearance	119.0 - 135.0	129	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	545	Yes
K	Buttock to Knee Length	514.0 - 540.0	525	Yes
L	Popliteal Height	343.0 - 369.0	355	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	401	Yes
N	Buttock Popliteal Length	416.0 - 442.0	428	Yes
O	Chest Depth without Jacket	195.0 - 211.0	200	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	318	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	484	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	347	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
W	Foot Width (left)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	870	Yes
Z	Waist Circumference	761.0 - 791.0	780	Yes

Technician



Approved



Revised 9/29/2005



Transportation Research Center Inc.

Left Lateral Head Drop

SID II Serial No. 305 Certification No. 37-1

Test Date: 2/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	121.7 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	3.0 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

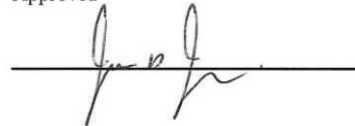
Test meets specifications.

Comments:

Technician



Approved



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.01.2016 11:58:27 234

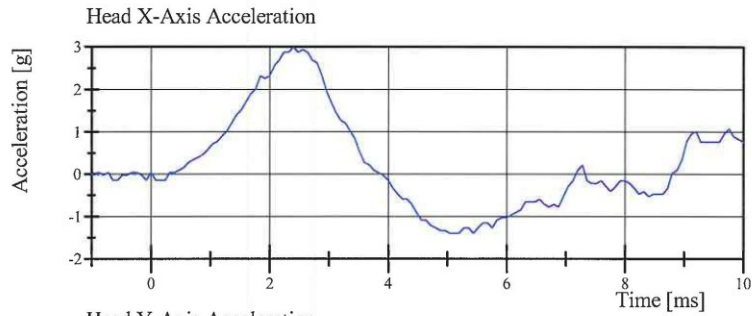


Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs Serial No. 305 Certification No. 37-1

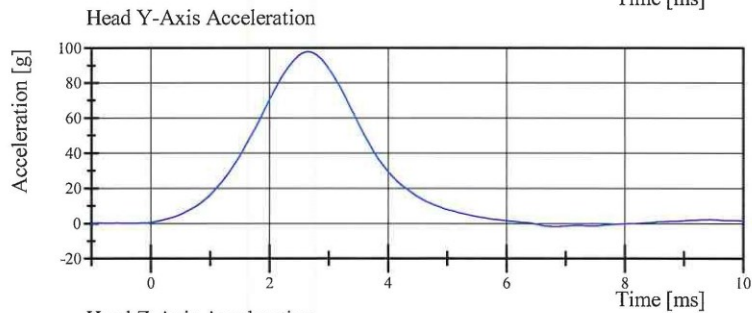
Test Date: 2/1/2016



Filter Class: CFC_1000

Max: 3.0 g at 2.4 ms

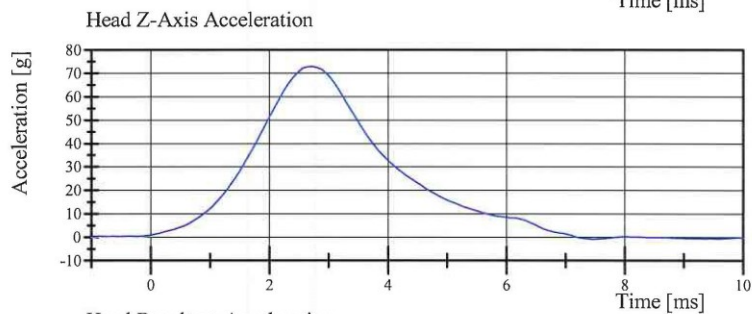
Min: -1.4 g at 5.0 ms



Filter Class: CFC_1000

Max: 97.7 g at 2.6 ms

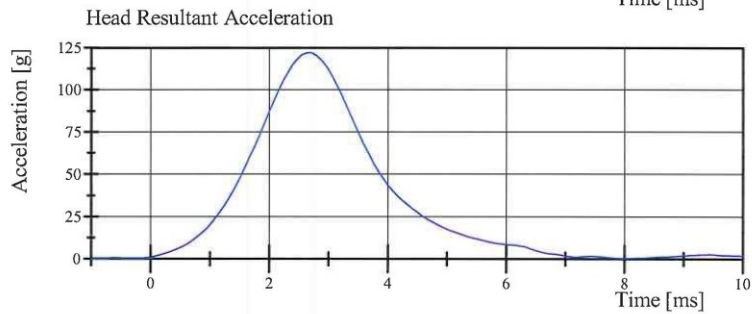
Min: -1.7 g at 6.8 ms



Filter Class: CFC_1000

Max: 72.8 g at 2.7 ms

Min: -1.0 g at 7.4 ms



Filter Class: CFC_1000

Max: 121.7 g at 2.6 ms

Min: 0.0 g at -0.2 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.01.2016 11:58:34 234



Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 37-1

Test Date: 2/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.612 m/s	Yes
Pendulum Integrated Velocity			
Change at 10 ms	2.20 - 2.80 m/s	2.498 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.684 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	5.022 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.867 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.877 m/s	Yes
Maximum Headform Flexion			
occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-76.4 deg	Yes
Time of Peak	50 - 70 ms	62.9 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	41.6 N·m	Yes
Total Neck Occipital Condyles Moment			
Decay Time to 0 N·m	102 - 126 ms	112.7 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.01.2016 14:42:51 638

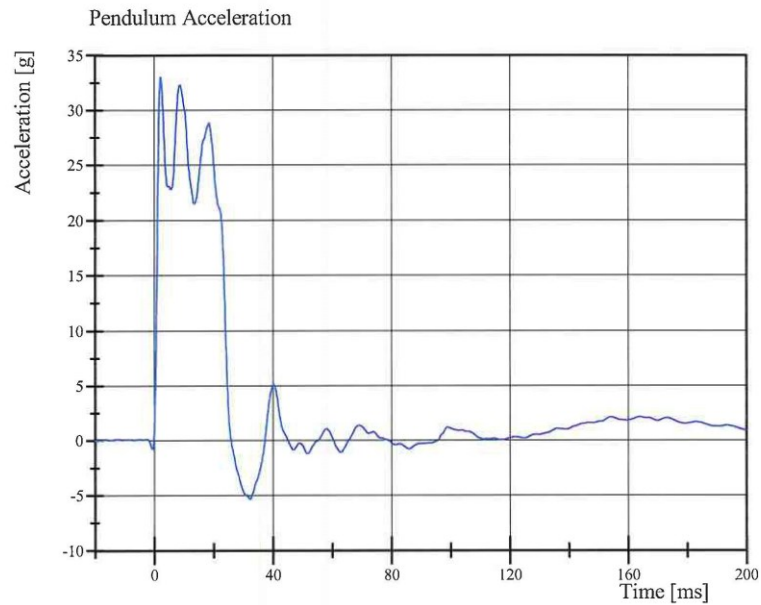


Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 37-1

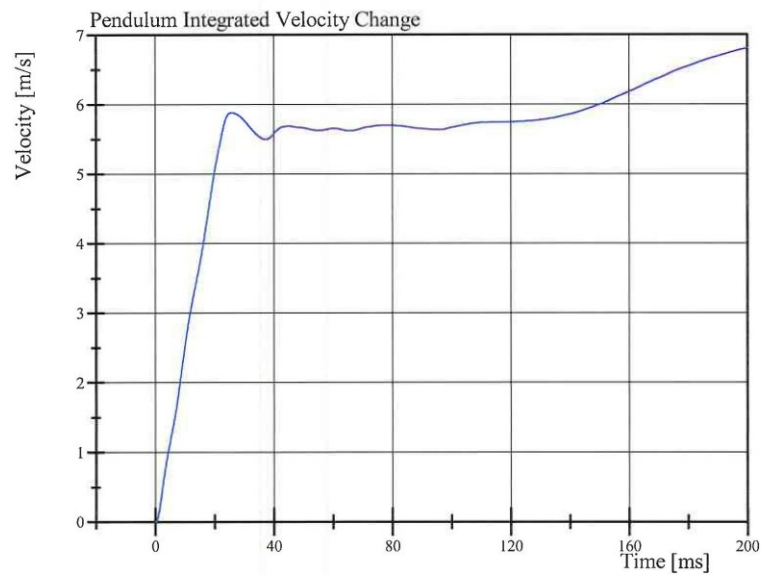
Test Date: 2/1/2016



Filter Class: CFC_180

Max: 32.9 g at 2.2 ms

Min: -5.4 g at 32.2 ms



Filter Class: CFC_180

Max: 6.8 m/s at 200.0 ms

Min: 0.0 m/s at 0.0 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.01.2016 14:42:59 638

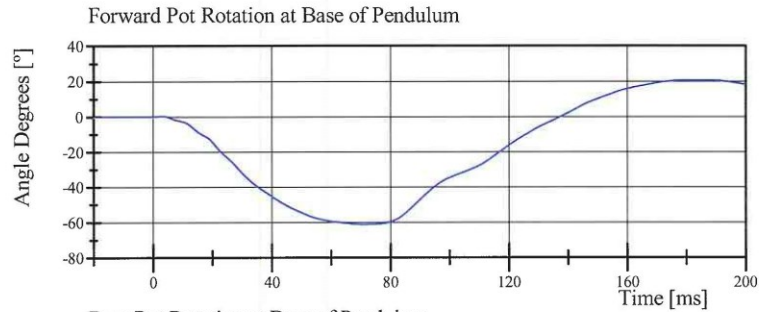


Transportation Research Center Inc.

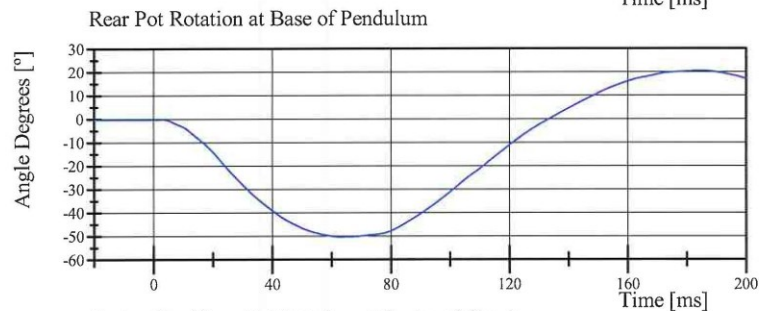
Left Lateral Neck

SID IIs Serial No. 305 Certification No. 37-1

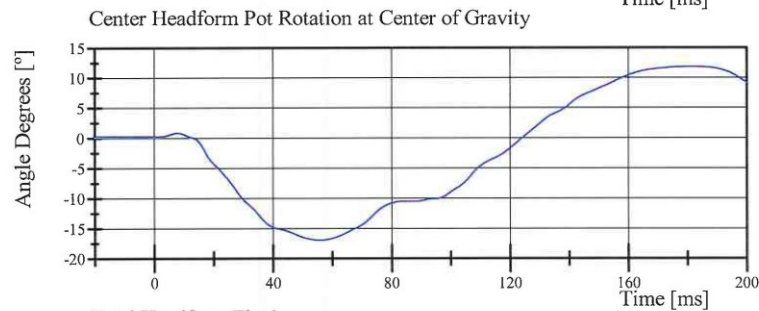
Test Date: 2/1/2016



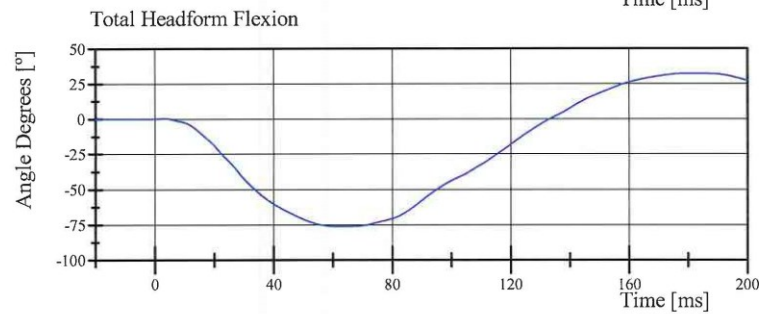
Filter Class: CFC_60
Max: 20.6 ° at 181.9 ms
Min: -61.3 ° at 70.9 ms



Filter Class: CFC_60
Max: 20.6 ° at 184.9 ms
Min: -50.5 ° at 63.0 ms



Filter Class: CFC_60
Max: 11.8 ° at 181.9 ms
Min: -17.0 ° at 55.8 ms



Filter Class: CFC_60
Max: 32.4 ° at 181.9 ms
Min: -76.4 ° at 62.9 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.01.2016 14:42:59 638

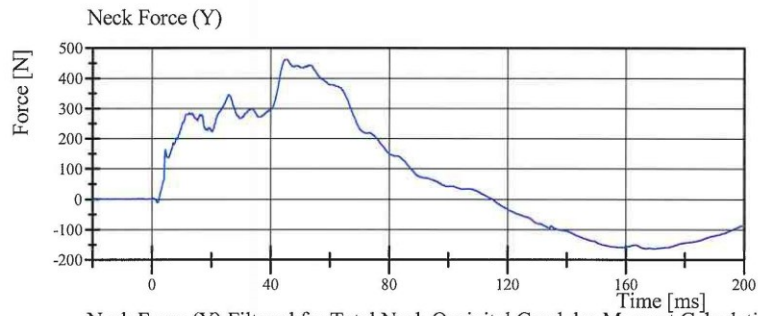


Transportation Research Center Inc.

Left Lateral Neck

SID IIs Serial No. 305 Certification No. 37-1

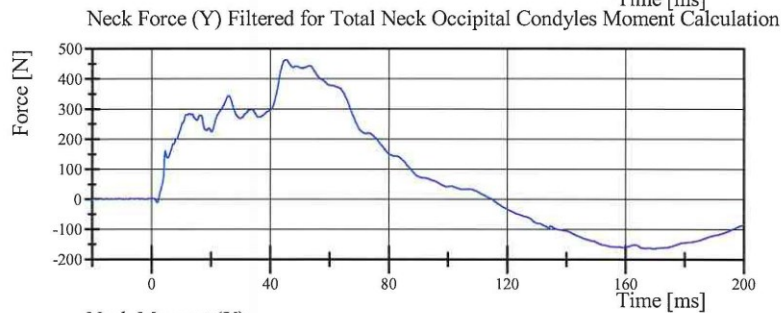
Test Date: 2/1/2016



Filter Class: CFC_1000

Max: 460.9 N at 45.5 ms

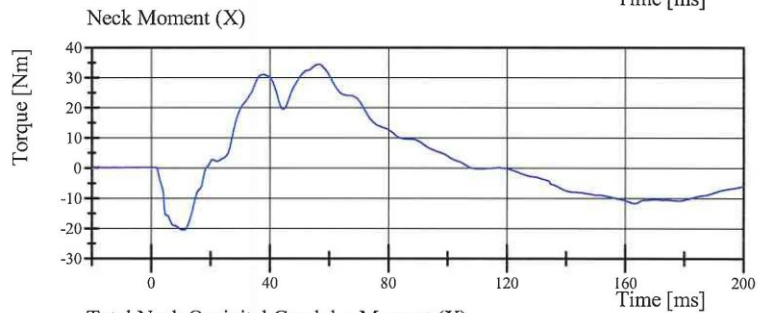
Min: -163.9 N at 169.1 ms



Filter Class: CFC_600

Max: 460.8 N at 45.5 ms

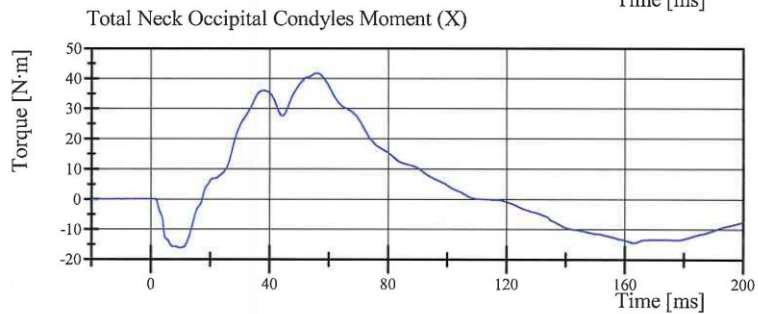
Min: -163.5 N at 169.1 ms



Filter Class: CFC_600

Max: 34.4 Nm at 56.2 ms

Min: -20.7 Nm at 11.3 ms



Filter Class: Without_(Consta

Max: 41.6 N·m at 56.2 ms

Min: -16.3 N·m at 9.6 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.01.2016 14:43:00 638



Transportation Research Center Inc.

Left Lateral Shoulder

SID IIs Serial No. 305 Certification No. 37-5

Test Date: 2/2/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.30 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-16.2 g	Yes
Shoulder Displacement	28 - 37 mm	29.5 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	21.9 g	Yes

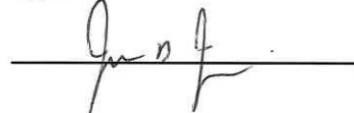
Test meets specifications.

Comments:

Technician



Approved



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.02.2016 07:34:52 804

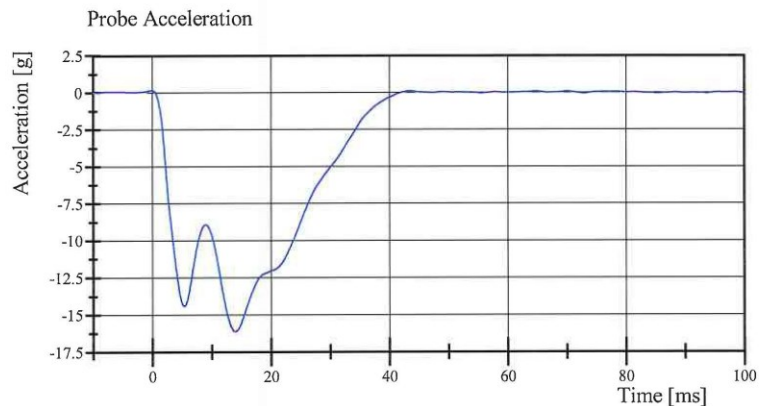


Transportation Research Center Inc.

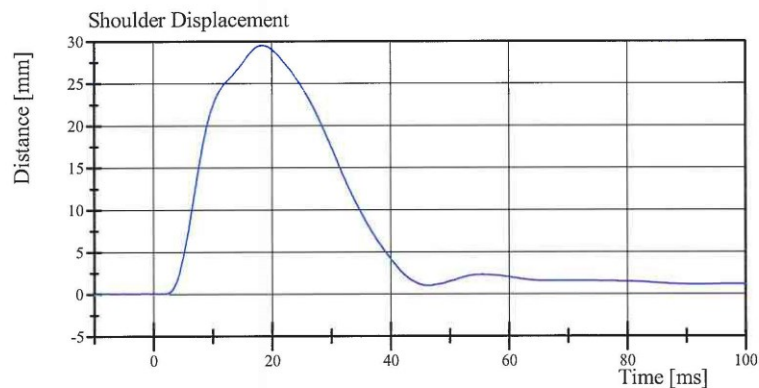
Left Lateral Shoulder

SID IIs Serial No. 305 Certification No. 37-5

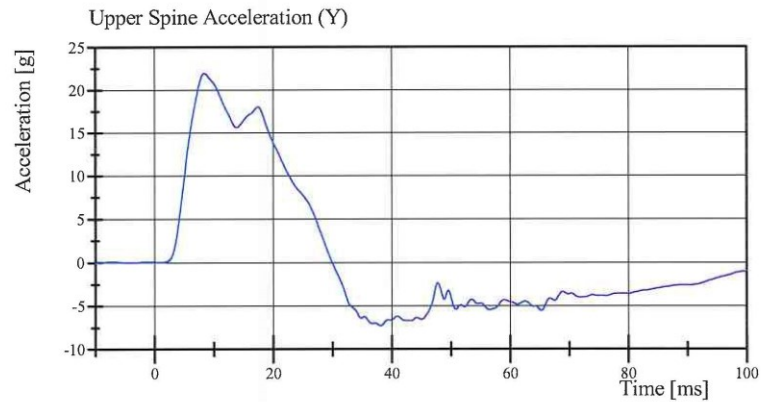
Test Date: 2/2/2016



Filter Class: CFC_180
Max: 0.1 g at -0.2 ms
Min: -16.2 g at 14.0 ms



Filter Class: CFC_600
Max: 29.5 mm at 18.4 ms
Min: -0.0 mm at -3.3 ms



Filter Class: CFC_180
Max: 21.9 g at 8.4 ms
Min: -7.3 g at 38.1 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.02.2016 07:35:00 804



Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 37-1
Test Date: 2/2/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.760 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-32.3 g	Yes
Shoulder Displacement	31 - 40 mm	33.4 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	25.3 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	30.5 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	33.1 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	40.2 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	33.0 g	Yes

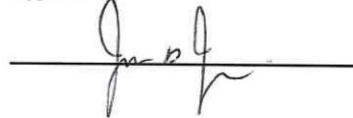
Test meets specifications.

Comments:

Technician



Approved



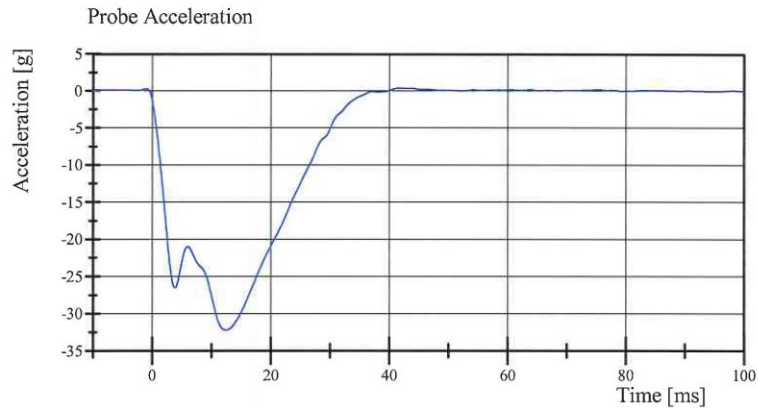
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.02.2016 08:06:49 611

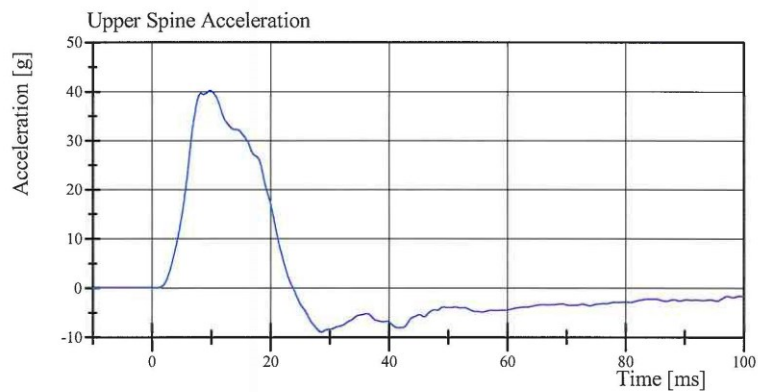


Transportation Research Center Inc.

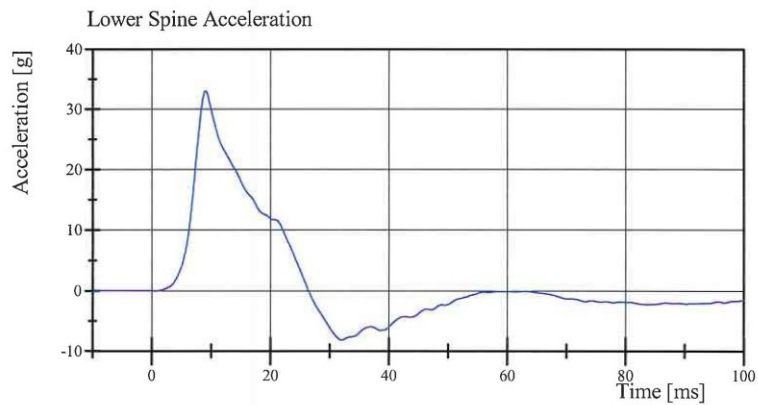
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 37-1
Test Date: 2/2/2016



Filter Class: CFC_180
Max: 0.3 g at 41.6 ms
Min: -32.3 g at 12.5 ms



Filter Class: CFC_180
Max: 40.2 g at 9.8 ms
Min: -9.0 g at 28.6 ms



Filter Class: CFC_180
Max: 33.0 g at 9.0 ms
Min: -8.2 g at 32.0 ms

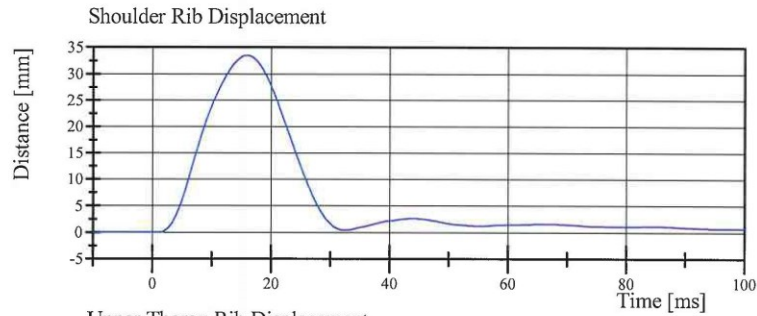
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.02.2016 08:07:08 611

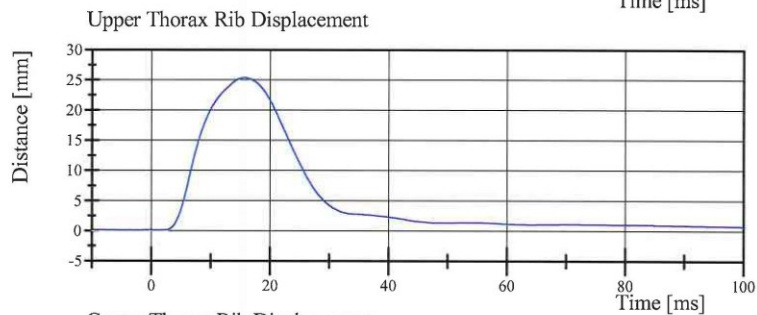


Transportation Research Center Inc.

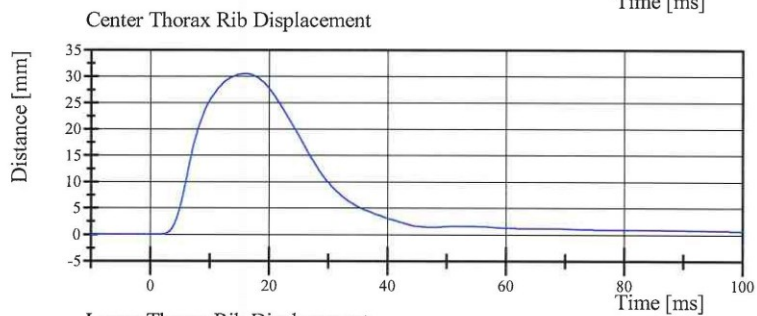
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 37-1
Test Date: 2/2/2016



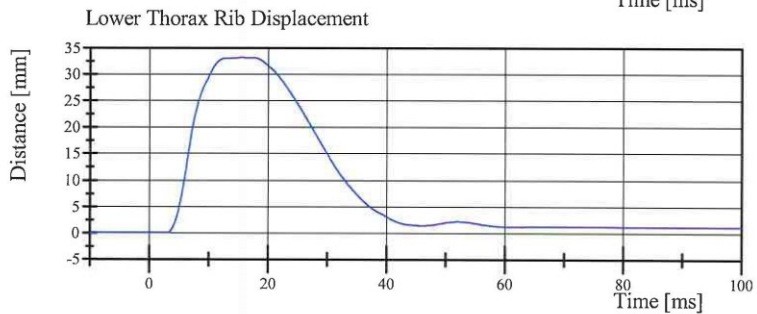
Filter Class: CFC_600
Max: 33.4 mm at 15.8 ms
Min: -0.0 mm at 0.6 ms



Filter Class: CFC_600
Max: 25.3 mm at 15.6 ms
Min: -0.0 mm at -1.9 ms



Filter Class: CFC_600
Max: 30.5 mm at 16.0 ms
Min: -0.0 mm at -4.5 ms



Filter Class: CFC_600
Max: 33.1 mm at 15.4 ms
Min: -0.0 mm at 2.9 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.02.2016 08:07:08 611



Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 37-1
Test Date: 2/2/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.342 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-15.7 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	36.6 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	39.9 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	35.2 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	14.8 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.4 g	Yes

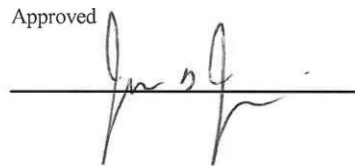
Test meets specifications.

Comments:

Technician



Approved



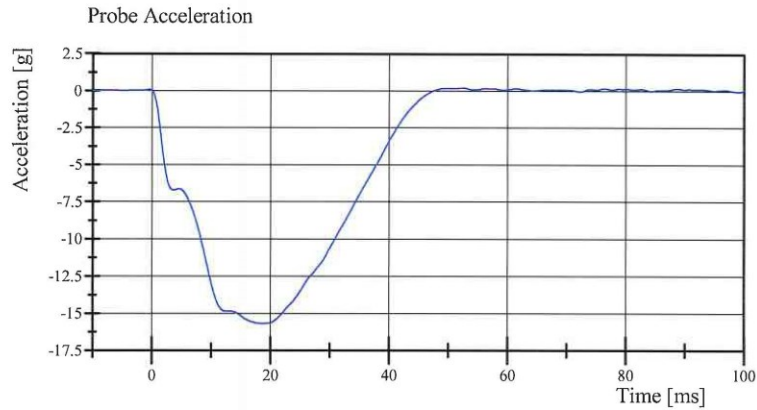
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.02.2016 08:43:25 842

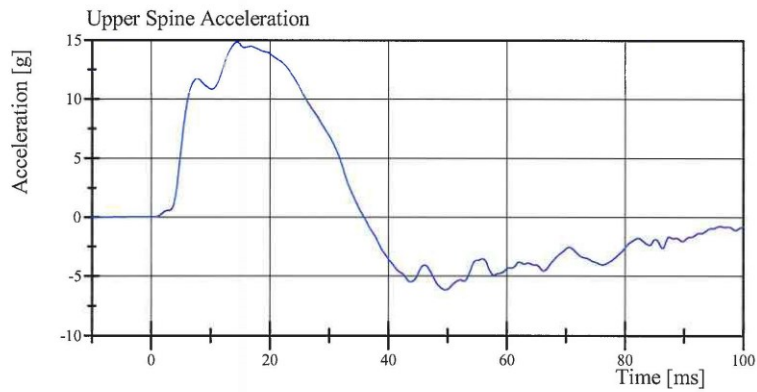


Transportation Research Center Inc.

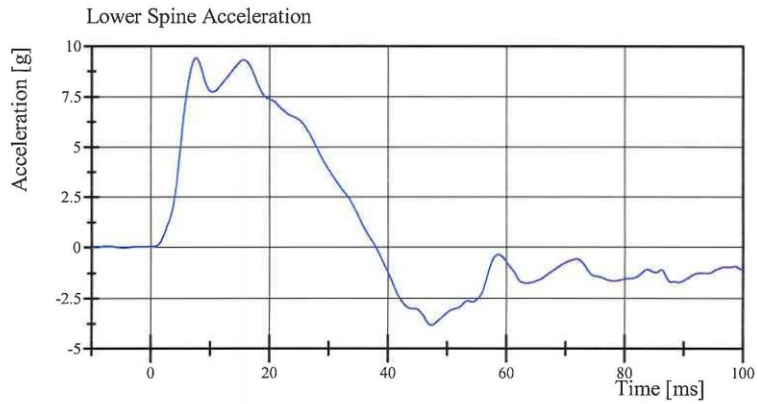
Left Lateral Thorax without Arm
SID II_s Serial No. 305 Certification No. 37-1
Test Date: 2/2/2016



Filter Class: CFC_180
Max: 0.2 g at 52.3 ms
Min: -15.7 g at 18.7 ms



Filter Class: CFC_180
Max: 14.8 g at 14.5 ms
Min: -6.2 g at 49.7 ms



Filter Class: CFC_180
Max: 9.4 g at 7.6 ms
Min: -3.8 g at 47.4 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

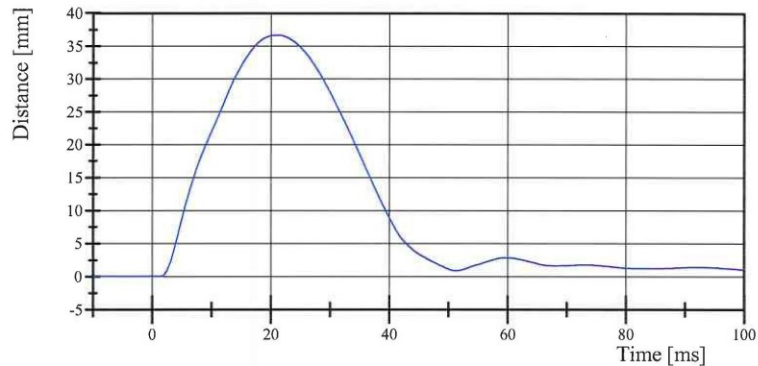
02.02.2016 08:43:51 842



Transportation Research Center Inc.

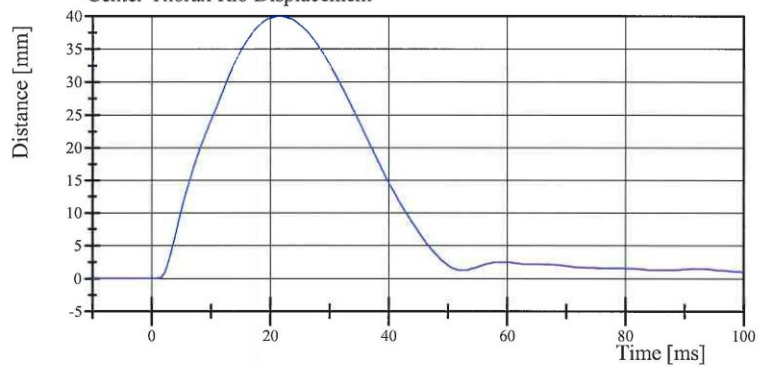
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 37-1
Test Date: 2/2/2016

Upper Thorax Rib Displacement



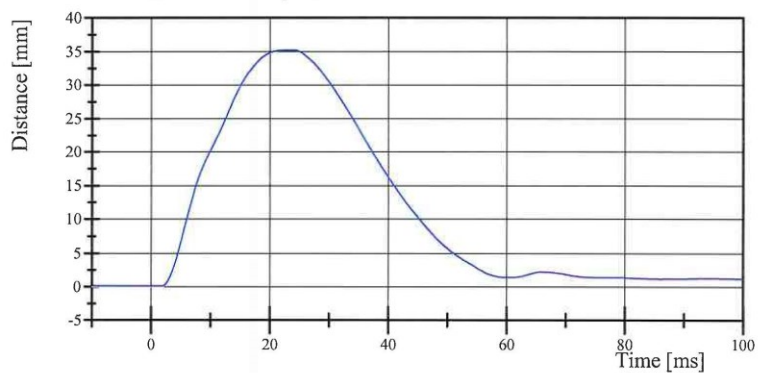
Filter Class: CFC_600
Max: 36.6 mm at 21.1 ms
Min: -0.0 mm at 1.3 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 39.9 mm at 21.5 ms
Min: -0.0 mm at -8.6 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 35.2 mm at 22.8 ms
Min: -0.0 mm at 1.8 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.02.2016 08:43:52 842



Transportation Research Center Inc.

Left Lateral Abdomen

SID IIs Serial No. 305 Certification No. 37-1

Test Date: 2/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.31 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-13.7 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	43.8 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	41.1 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	10.11 g	Yes

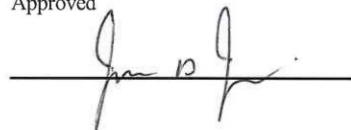
Test meets specifications.

Comments:

Technician



Approved



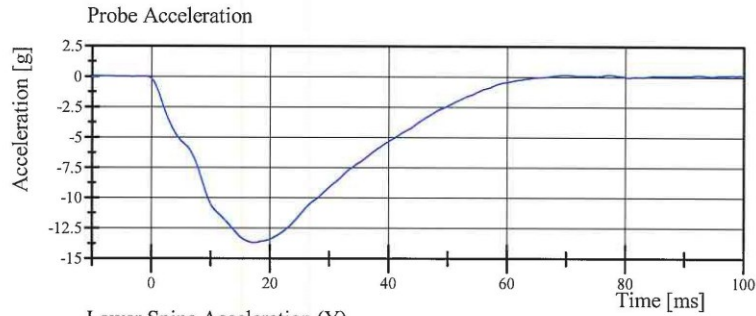
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.01.2016 16:48:12 678

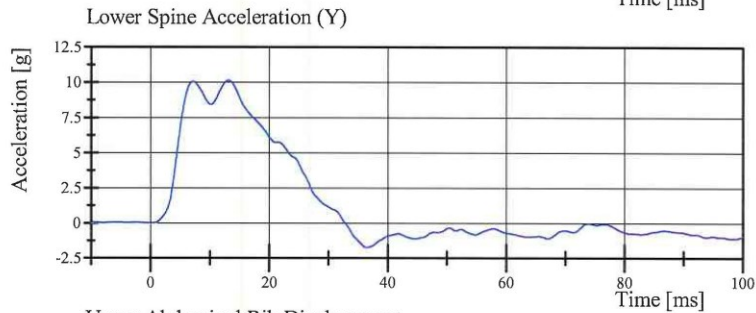


Transportation Research Center Inc.

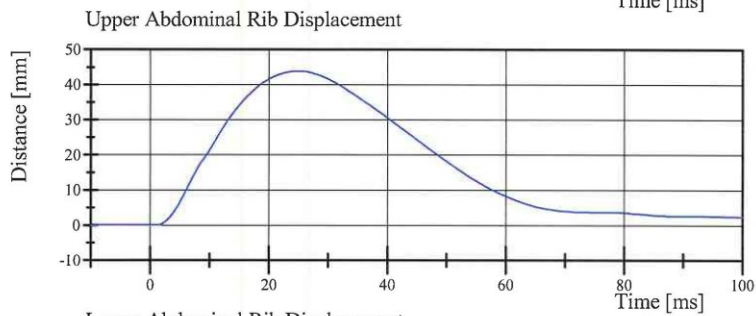
Left Lateral Abdomen
SID IIIs Serial No. 305 Certification No. 37-1
Test Date: 2/1/2016



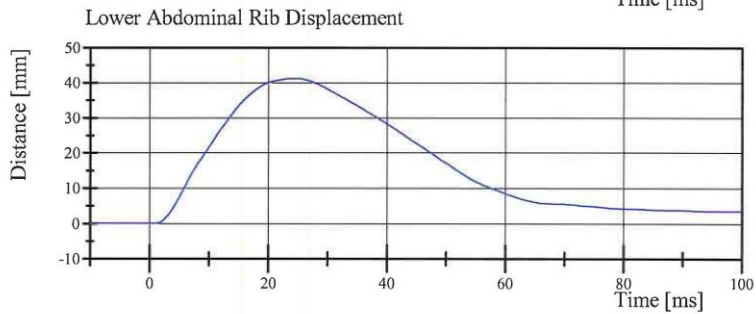
Filter Class: CFC_180
Max: 0.2 g at 77.1 ms
Min: -13.7 g at 17.3 ms



Filter Class: CFC_180
Max: 10.1 g at 13.1 ms
Min: -1.8 g at 36.5 ms



Filter Class: CFC_600
Max: 43.8 mm at 24.6 ms
Min: -0.0 mm at 1.4 ms



Filter Class: CFC_600
Max: 41.1 mm at 24.3 ms
Min: -0.0 mm at -8.1 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.01.2016 16:48:19 678



Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 305 Certification No. 37-2

Test Date: 2/2/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.62 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-42.87 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	37.2 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,156.8 N	Yes

Test meets specifications.

Comments:

Technician



Approved



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.02.2016 11:44:58 461

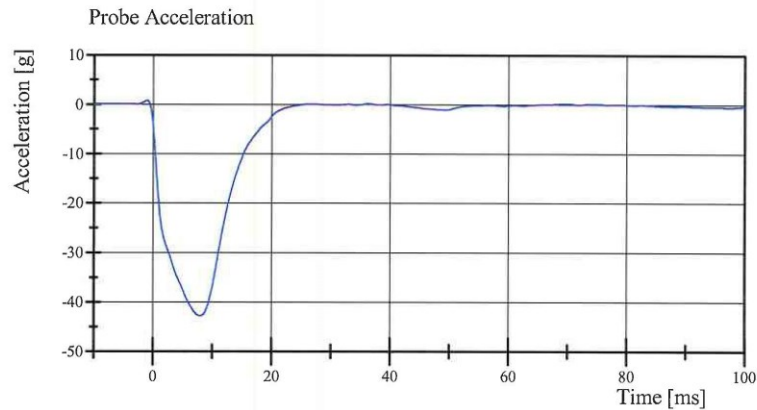


Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs Serial No. 305 Certification No. 37-2

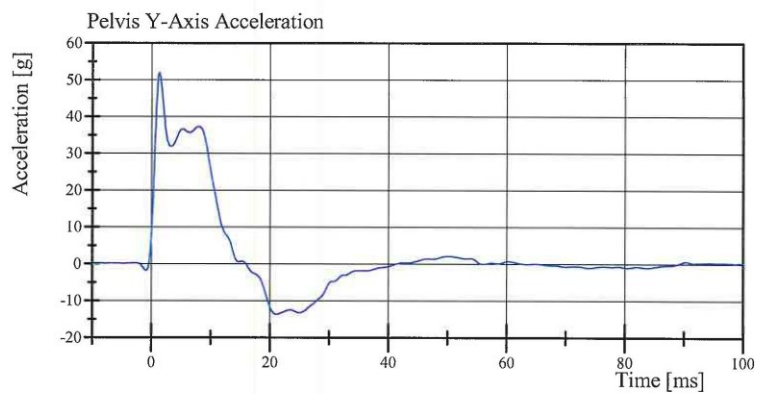
Test Date: 2/2/2016



Filter Class: CFC_180

Max: 0.7 g at -1.0 ms

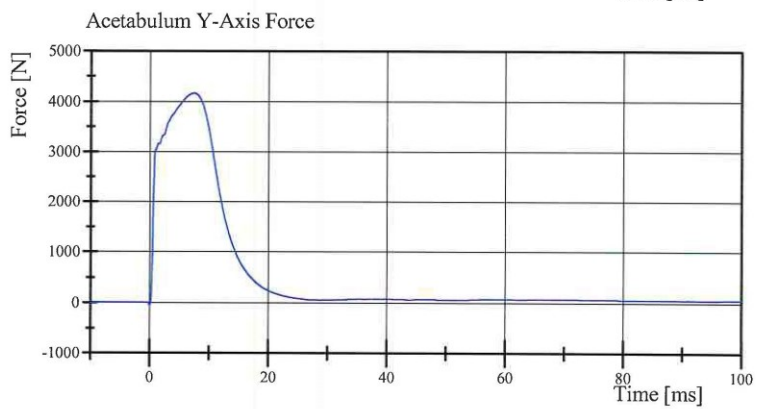
Min: -42.9 g at 8.0 ms



Filter Class: CFC_180

Max: 51.8 g at 1.4 ms

Min: -13.7 g at 21.1 ms



Filter Class: CFC_600

Max: 4,156.8 N at 7.4 ms

Min: -61.0 N at 0.1 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

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Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 37-3

Test Date: 2/2/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.23 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-42.0 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	33.8 g	Yes
Iliac Force	4,100 - 5,100 N	5,080.6 N	Yes

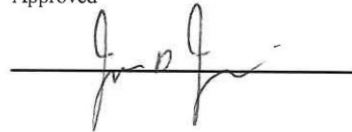
Test meets specifications.

Comments:

Technician



Approved



Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

02.02.2016 18:05:53 684

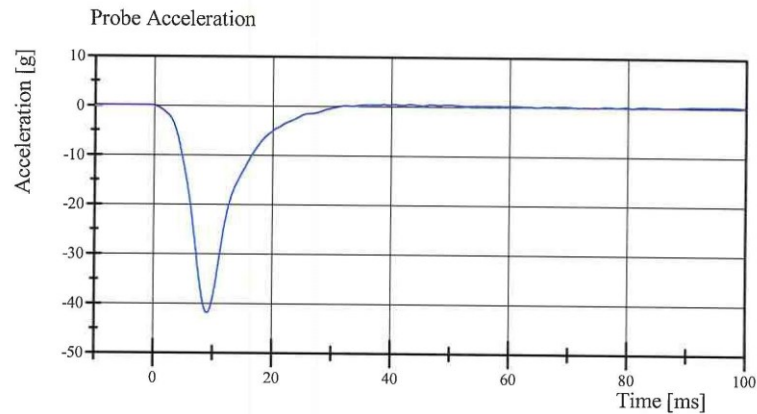


Transportation Research Center Inc.

Left Lateral Iliac

SID IIs Serial No. 305 Certification No. 37-3

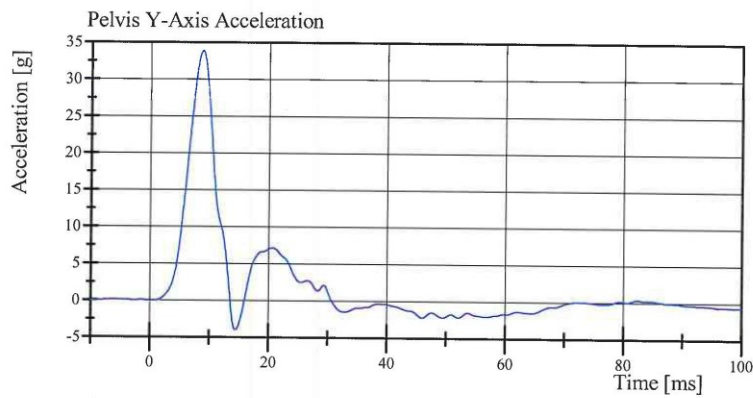
Test Date: 2/2/2016



Filter Class: CFC_180

Max: 0.4 g at 43.1 ms

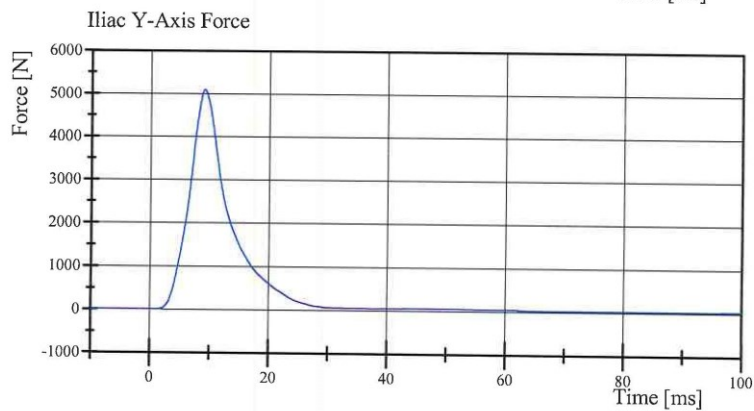
Min: -42.0 g at 9.0 ms



Filter Class: CFC_180

Max: 33.8 g at 8.8 ms

Min: -4.0 g at 14.5 ms



Filter Class: CFC_600

Max: 5,080.6 N at 9.0 ms

Min: -0.9 N at -3.9 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE 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		P58890	Endevco	29-Sep-15
	Y		P51702	Endevco	29-Sep-15
	Z		P52083	Endevco	29-Sep-15
Redundant Head Accelerometers	X		P49190	Endevco	29-Sep-15
	Y		P52044	Endevco	29-Sep-15
	Z		P51717	Endevco	29-Sep-15
Thoracic Rib Displacement Potentiometers	Upper	Y	111	FTSS	29-Sep-15
	Middle	Y	174	FTSS	29-Sep-15
	Lower	Y	173	FTSS	29-Sep-15
Abdomen Load Cells	Front	Y	1441	Denton	7-Apr-15
	Middle	Y	1436	Denton	7-Apr-15
	Rear	Y	1437	Denton	7-Apr-15
Lower Spine Accelerometers (T12)	X		P90854	Endevco	6-Nov-15
	Y		P90297	Endevco	14-Jan-16
	Z		P88531	Endevco	7-Aug-15
Acetabulum Load Cell		Y	N/A	N/A	N/A
Pubic Symphysis Load Cell		Y	457-FY	Denton	7-Apr-15

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 305			
				Serial Number	Manufacturer	Calibration Date	
Head Accelerometers				X	P51719	Endevco	1-Oct-15
				Y	P51272	Endevco	1-Oct-15
				Z	P58862	Endevco	1-Oct-15
Redundant Head Accelerometers				X	P80926	Endevco	1-Oct-15
				Y	P50073	Endevco	1-Oct-15
				Z	P52098	Endevco	1-Oct-15
Displacement Potentiometers	Shoulder			N/A	N/A	N/A	N/A
	Thoracic Rib	007	Y	007	Servo	1-Oct-15	
		1161	Y	1161	Servo	1-Oct-15	
		037	Y	037	Servo	1-Oct-15	
	Abdominal Rib	1295	Y	1295	Servo	1-Oct-15	
		1136	Y	1136	Servo	1-Oct-15	
Lower Spine Accelerometers (T12)				X	P50068	Endevco	1-Oct-15
				Y	P52051	Endevco	1-Oct-15
				Z	P51710	Endevco	1-Oct-15
Acetabulum Load Cell				Y	D14283-FY	FTSS	1-Oct-15
Iliac Wing Load Cell				Y	287-FY	Denton	1-Oct-15
Pelvis Plug (struck side)					71062	Humanetics	18-Dec-13
Pelvis Plug (non-struck side)					36473	Humanetics	23-Sep-10

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity ¹	X	J26980	Endevco	25-Aug-15
	Vehicle Center of Gravity ¹	Y	J27271	Endevco	25-Aug-15
	Vehicle Center of Gravity ¹	Z	J27283	Endevco	25-Aug-15
2	Right Sill at Front Seat	X	P25069	Endevco	30-Nov-15
	Right Sill at Front Seat	Y	P87173	Endevco	30-Nov-15
	Right Sill at Front Seat	Z	P87155	Endevco	30-Nov-15
3	Right Sill at Rear Seat	X	P90862	Endevco	12-Oct-15
	Right Sill at Rear Seat	Y	P88453	Endevco	2-Nov-15
	Right Sill at Rear Seat	Z	P88039	Endevco	6-Nov-15
4	Left Sill at Front Door	Y	P58528	Endevco	6-Jan-16
5	Left Sill at Rear Door	Y	P33862	Endevco	6-Jan-16
6	Left A-Post Lower	Y	P75519	Endevco	21-Oct-15
7	Left A-Post Middle	Y	P88424	Endevco	21-Oct-15
8	Left B-Post Lower	Y	P87172	Endevco	17-Dec-15
9	B-Post Middle	Y	P87464	Endevco	17-Dec-15
10	Front Seat Track	Y	P88035	Endevco	14-Jan-16
11	Rear Seat Track or Structure	Y	P47030	Endevco	14-Jan-16
12	Right Rear Occupant Compartment	Y	P88004	Endevco	14-Jan-16
13	Engine Block	X	P70050	Endevco	14-Oct-15
	Engine Block	Y	P88541	Endevco	7-Aug-15
14	Rear Floorpan Above Axle	X	P89038	Endevco	6-Jan-16
	Rear Floorpan Above Axle	Y	P61772	Endevco	21-Oct-15
	Rear Floorpan Above Axle	Z	P90300	Endevco	12-Oct-15

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	P88466	Endevco	6-Jan-16
MDB Center of Gravity	Y	P58759	Endevco	6-Jan-16
MDB Center of Gravity	Z	P49020	Endevco	6-Jan-16
Left Frame Rail at Rear Axle Centerline	X	P87095	Endevco	2-Nov-15
Left Frame Rail at Rear Axle Centerline	Y	P50473	Endevco	21-Oct-15

¹ Note: Transducers were out of calibration by one day.