

REPORT NUMBER: SPNCAP-CAL-15-002

**NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE IMPACT POLE TEST**

**Honda of Canada MFG a division of Honda Canada INC
2015 Honda CR-V
SUV**

NHTSA No: M20155316

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



June 22, 2015

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
MAIL CODE: NVS-111
1200 NEW JERSEY AVE SE, ROOM W43-410
WASHINGTON, D.C. 20590**

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Date: June 22, 2015

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Date: June 22, 2015

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: _____

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16. Abstract A 32.20 km/h (20 mph), 75° oblique impact Side NCAP Test was conducted on the subject 2015 Honda CR-V SUV in accordance with the specifications of the Office of Crashworthiness Standards Side NCAP Pole Laboratory Test Procedure for the generation of consumer information on vehicle side pole crash protection. This test was conducted at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on December 9, 2014. The impact velocity of the vehicle was 32.53 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle was 21°C. The target vehicle's maximum post-test static crush was 359 mm located at level 3. The test vehicle's occupant performance data is as follows: <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Driver ATD (SID-IIs) (Serial No. 303)</th> </tr> <tr> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td></td> <td>1000</td> <td>473.192</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>G</td> <td>82</td> <td>36.729</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>2410.288</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38</td> <td>21.596</td> </tr> <tr> <td>Maximum Abdomen Rib Deflection</td> <td>mm</td> <td>45</td> <td>16.587</td> </tr> </tbody> </table> The two 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.				Measurement Description	Driver ATD (SID-IIs) (Serial No. 303)			Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)		1000	473.192	Resultant Lower Spine Acceleration	G	82	36.729	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2410.288	Maximum Thoracic Rib Deflection	mm	38	21.596	Maximum Abdomen Rib Deflection	mm	45	16.587
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17. Key Words New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave. SE Washington, D.C. 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833																												
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SECTION 1

TEST PURPOSE AND PROCEDURE

This side impact test was conducted as part of the MY 2015 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-14-D-00352. The purpose of this test is to generate comparative side impact performance in a 2015 Honda CR-V SUV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Pole Laboratory Test Procedure, dated September 2013.

SECTION 2

SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2015 Honda CR-V SUV. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.53 km/h. The test was conducted by Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on December 9, 2014. Pre-test and post-test photographs of the test vehicle and side impact dummy (SID-IIs) are included in Appendix A of this report.

One Part 572V (SID-IIs) dummy was placed in the driver designated seating position according to instructions specified in the OCWS Side NCAP Pole Laboratory Test Procedure, dated September 2013. Camera locations and other pertinent camera information are included on page 3-11 in this report.

The Part 572V (SID-IIs) dummy was instrumented accordingly:

- Head CG tri-axial accelerometers

- Thorax upper, middle, and lower rib displacement potentiometers

- Abdomen upper and lower rib displacement potentiometers

- Lower spine tri-axial accelerometers

- Iliac load cell

- Acetabulum load cell

Appendix B contains the dummy response data. Dummy configuration and performance verification data can be found in Appendix C of this report. Appendix D identifies all serial numbers, manufacturers, and calibration dates for test equipment, dummy sensors, potentiometers, and load cells used to collect data during the test.

Injury readings for the SID-IIs dummy were recorded as follows:

INJURY READINGS

Measurement Description	Driver ATD (SID-IIs)		
	Units	IARV	Result
Head Injury Criteria (HIC ₃₆)		1000	473.192
Resultant Lower Spine Acceleration	g	82	36.729
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2410.288
Maximum Thoracic Rib Deflection	mm	38*	21.596
Maximum Abdominal Rib Deflection	mm	45*	16.587

*Proposed IARV

Supplemental restraint information was recorded as follows:

SUPPLEMENTAL RESTRAINT INFORMATION

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

GENERAL COMMENTS:

1. P1 serial number - 303

Data Anomalies:

- None

SECTION 3

OCCUPANT AND VEHICLE INFORMATION

This section contains information reporting for the following Data Sheets:

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

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

Data Sheet No. 3 – Dummy Longitudinal Clearance Dimensions

Data Sheet No. 4 – Dummy Lateral Clearance Dimensions

Data Sheet No. 5 – Camera and instrumentation Data

Data Sheet No. 6 – Vehicle Accelerometer Data

Data Sheet No. 7 – Rigid Pole Load Cell Data

Data Sheet No. 8 – Post-Test Observations

Data Sheet No. 9 – Test Vehicle Profile Measurements

Data Sheet No. 10 – Test Vehicle Exterior Crush Measurements

Data Sheet No. 11 – Vehicle Damage Profile Distances

Data Sheet No. 12 – FMVSS No. 301 Static Rollover Results

Data Sheet No. 13 – Dummy / Vehicle Temperature and Humidity Stabilization Data

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2015 Honda CR-V SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20155316
Test Date: 12/9/2014

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20155316
Model Year	2015
Make	Honda
Model	CR-V
Body Style	SUV
VIN	2HKRM3H32FH502502
Body Color	Charcoal Gray
Odometer Reading (km/mi)	107.8 km / 67 mi
Engine Displacement (L)	2.4
Type / No. Cylinders	I4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	CVT
Overdrive	Yes
Final Drive	Front Wheel Drive
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

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

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

Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Honda of Canada MFG.
Date of Manufacture	10/14
Vehicle Type	Passenger

GVWR (kg)	2025
GAWR Front (kg)	1030
GAWR Rear (kg)	1015

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity (DSC)	2	3	-	5
Capacity Weight (VCW) (kg)				385
DSC X 68.04 kg				340.2
Cargo Weight (RCLW) (kg)				44.8

(A)

(B)

(A-B)

VEHICLE SEAT TYPE

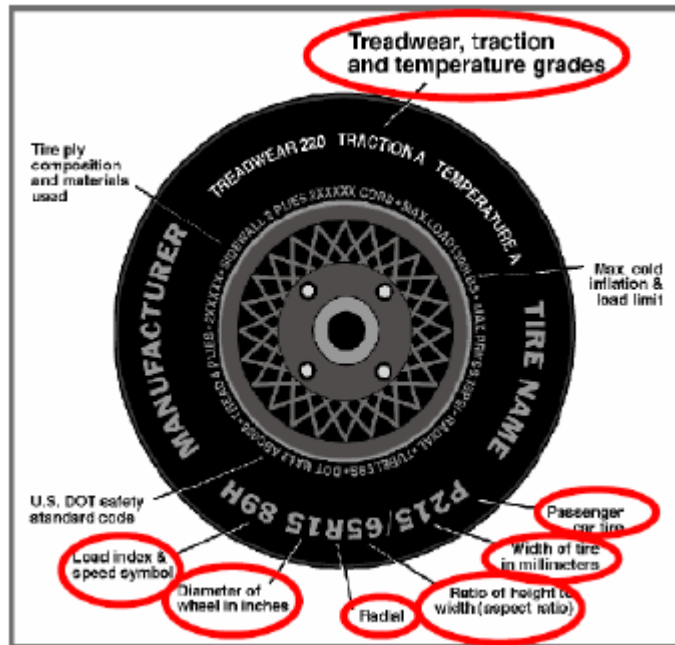
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable W/ Lever	Adjustable W/ Knob
Front Seat	X					X	
Rear or Second Row Seat			X		X		
Third Row seat	-	-	-	-	-	-	-

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

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20155316
 Test Date: 12/9/2014

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



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	220	220
Recommended Tire Size	P215/70R16	P215/70R16
Tire Size on Vehicle	P215/70R16	P215/70R16
Tire Manufacturer	Continental	Continental
Tire Model	Cross Contact LX	Cross Contact LX
Treadwear	680	680
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Polyamide	1 Polyester, 2 Steel, 1 Polyamide
Load Index/Speed Symbol	100S	100S
Tire Material	Rubber	Rubber
DOT Safety Code Left	AF093WM3514	AF093WM3514
DOT Safety Code Right	AF093WM3514	AF093WM3514

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

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20155316
 Test Date: 12/9/2014

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	242	242	242	242
Tire Placard	kPa	220	220	220	220
Owner's Manual	kPa	220	220	220	220
As Tested	kPa	220	220	220	220

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	490	286		480	335		506	327	
Right	kg	415	340		455	341		421	371	
Ratio	%	59%	41%		58%	42%		57%	43%	
Totals	kg	905	626	1531	935	676	1611	927	698	1625

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1531	(A)
Actual Weight of 1 P572V (SID-IIs) ATD Used	kg	44.1	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	44.8	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1619.9	(A+B+C)

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

TEST VEHICLE ATTITUDES AND CG

Measurement Description	Units	As Delivered	As Tested	Fully Loaded	Meets Rqmt***
Driver Door Sill Angle (front-to-rear)*	Deg	-0.5	-0.1	-0.1	Yes
Front Passenger Sill Angle (front-to-rear)*	Deg	-0.5	-0.2	-0.1	Yes
Front Bumper-Line Angle (left-to-right)**	Deg	-0.4	-0.4	-0.6	Yes
Rear Bumper-Line Angle (left-to-right)**	Deg	0	-0.3	-0.3	Yes
Vehicle CG (Aft of Front Axle)	mm	1072	1100	1126	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	+11	+9.5	+20	

* ND = Nose Down (-), NU = Nose Up (+)

** LD = Left Down (-), LU = Left Up (+)

*** The "As Tested" vehicle attitude measurements must be equal to or between the "As Delivered" and "Fully Loaded" vehicle attitude measurements. Indicate "Yes" or "No" for Meets Requirement

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

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20155316
 Test Date: 12/9/2014

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Tail light	3
Trunk Carpeting	8
Hatch Plastic	3
Spare Tire / Jack	19
Ballast / Equipment Added	10

Test Height – Adjustable Suspension Setting, if Applicable	N/A
--	-----

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

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20155316
 Test Date: 12/9/2014

SEAT POSITIONING

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

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	14.8	13.6	14.2
Front Passenger Seat	-	Not Adjustable	-
Front Center Seat	N/A	N/A	N/A
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore / Aft	Forward- Most
Driver Seat	14.2	39	Max	45	62	75
			Mid	22.5	39	52
			Min	0	12.5	28
Front Passenger Seat	Not Adjustable		Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Front Center Seat	N/A	N/A	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Struck Side Rear Seat	Fixed	Fixed	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Non-Struck Side Rear Seat	Fixed	Fixed	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Rear Center Seat	Fixed	Fixed	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-

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

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Side Pole Impact Test

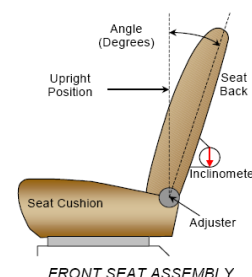
NHTSA No.: M20155316
 Test Date: 12/9/2014

SEAT FORE / AFT POSITION

Seat	Total Fore / Aft Travel		Test Position from Forwardmost Position	
	mm	Detents*	mm	Detents*
Driver Seat	240	25 (0-24)	0	0
Front Passenger Seat	240	25 (0-24)	0	0
Front Center Seat	N/A	N/A	N/A	N/A
Struck Side Rear Seat	FIXED	FIXED	FIXED	FIXED
Non-Struck Side Rear Seat	FIXED	FIXED	FIXED	FIXED
Rear Center Seat	FIXED	FIXED	FIXED	FIXED

SEAT BACK ANGLE ADJUSTMENT

The driver's seat back is positioned such that the dummy's head is level. 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 passenger seat back is positioned in accordance with the information provided by the manufacturer on Form No. 1 for the 5th percentile female dummy in a Side NCAP MDB test. The rear center and non-struck side rear passenger's seat back are set to match the struck-side rear seat back.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degrees	Detents*
Driver Seat w/Seated Dummy	67.7	N/A	1.5	N/A
Front Passenger Seat	64.7	N/A	1.3	N/A
Front Center Seat	N/A	N/A	N/A	N/A
Struck Side Rear Seat	FIXED	FIXED	FIXED	FIXED
Non-Struck Side Rear Seat	FIXED	FIXED	FIXED	FIXED
Rear Center Seat	FIXED	FIXED	FIXED	FIXED

SEAT BELT ANCHORAGE ADJUSTMENT

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

Seat	Total # of Positions	Placed in Position #
Driver Seat	4	0 - Uppermost

HEAD RESTRAINT ADJUSTMENT

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

Seat	Total # of Positions	Placed in Position #
Driver Seat	6 (0-5)	5 - Lowest

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

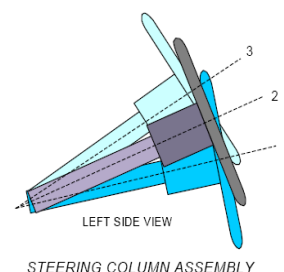
Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20155316
 Test Date: 12/9/2014

STEERING COLUMN ADJUSTMENT

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

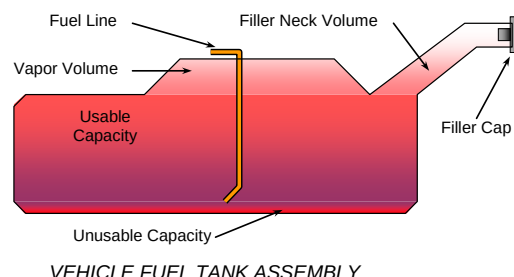
		Degrees	Fore / Aft Position (mm)
Lowermost	– Position 1	25.8	
Geometric Center	– Position 2	28.15	
Uppermost	– Position 3	30.5	
Telescoping Steering Wheel Travel			40
Test Position		28.15	20



FUEL PUMP

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

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



FUEL TANK CAPACITY DATA

Description	Liters
Usable Capacity of "Standard Tank" - see Form No. 1	57.9
Usable Capacity of "Optional Tank" - see Form No. 1	N/A
Usable Capacity of "Standard Tank" - see Owner's Manual	57.9
Usable Capacity of "Optional Tank" - see Owner's Manual	
93% of Usable Capacity	53.8
Actual Amount of Solvent Used in Test	53.8
1/3 of Usable Capacity	19.3

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



Yes

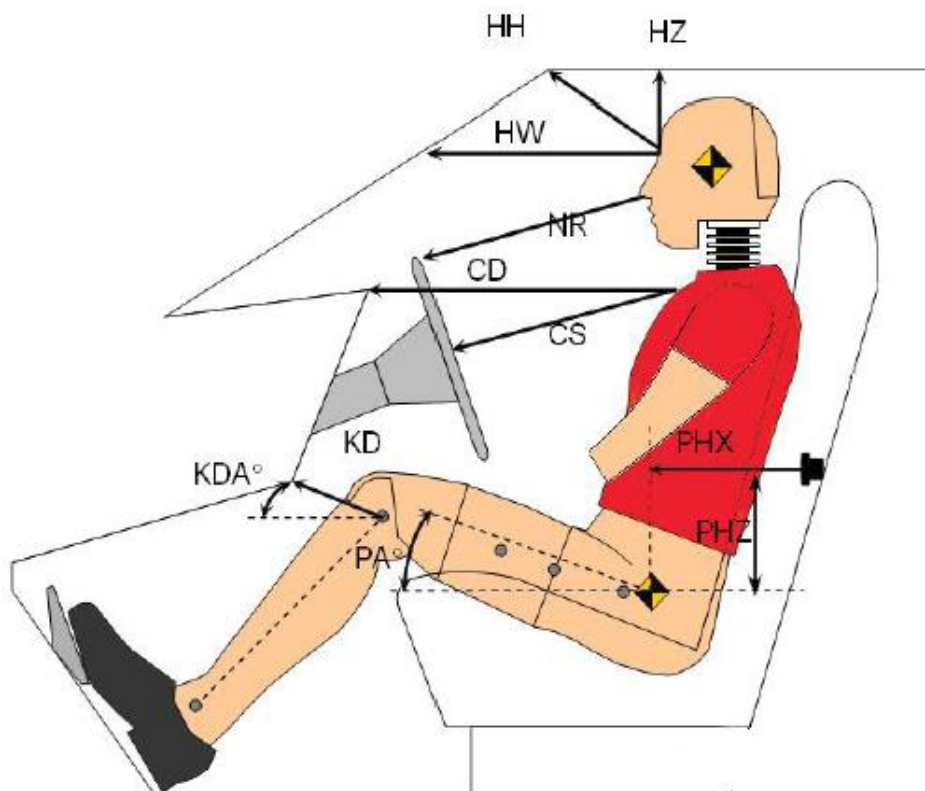


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DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20155316
 Test Date: 12/9/2014



Left Side View

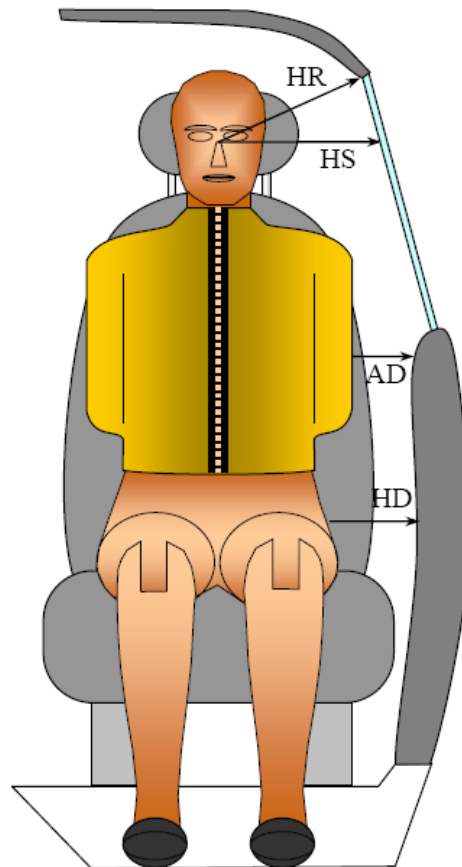
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Description	Driver (Serial No. 303)	
		Length (mm)	Angle (°)
HH	Head to Header	302	
HW	Head to Windshield	608	
HZ	Head to Roof Liner	223	
NR	Nose to Rim	260	
CD	Chest to Dash	468	
CS	Chest to Steering Wheel	192	
KD(L) / KDA(L)°	Left Knee to Dash	91	31.2
KD(R) / KDA(R)°	Right Knee to Dash	75	32.6
PAX°	Pelvic Tilt Angle (X-Axis)		17.8
PAY°	Pelvic Tilt Angle (Y-Axis)		0.4
PHX	Hip Point to Striker (X-Axis)	378	
PHZ	Hip Point to Striker (Z-Axis)	184	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20155316
 Test Date: 12/9/2014



FRONT VIEW OF DUMMY

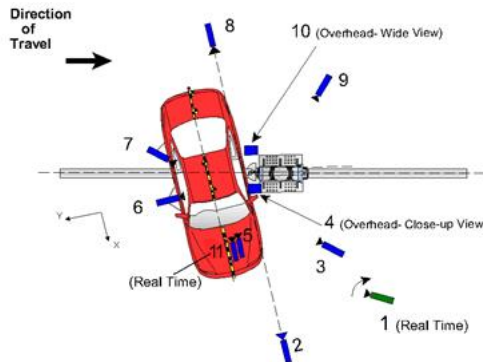
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver - Length (Serial No. 303)
HR	Head To Side Header	mm	248
HS	Head to Side Window	mm	358
AD	Arm to Door	mm	160
HD	Hip Point to Door	mm	166

DATA SHEET NO. 5 CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2015 Honda CR-V SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20155316
Test Date: 12/9/2014



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Real-time (24 - 30 fps) pan view of impact				Zoom	30
2	Front ground level - impact view	6988	-1885	-1166	24	1000
3	Impact side 45° - forward pole view	-3011	3015	-1598	28	1000
4	Overhead Close-up view of impact	0	0	-5245	20	1000
5	Onboard - dummy front view				25	1000
6	Onboard - dummy side view				12.5	1000
7	Onboard - dummy rear oblique view				12.5	1000
8	Rear ground level - impact view	6996	-1923	-1189	24	1000
9	Impact side 45° - rearward pole view	-3024	-3302	-1571	28	1000
10	Overhead wide - view of impact	-219	0	-5245	14	1000
11	Real-time (24 - 30 fps) - dummy front view				Zoom	30

Notes: Reference - From Point of Impact for X and Y; from Ground for Z
+X = Forward of vehicle, +Y = Right of vehicle, +Z = Down
* All measurements accurate to ± 6 mm. Vehicle is at a 75° angle to the rigid pole.

Comments: All cameras operated as intended.

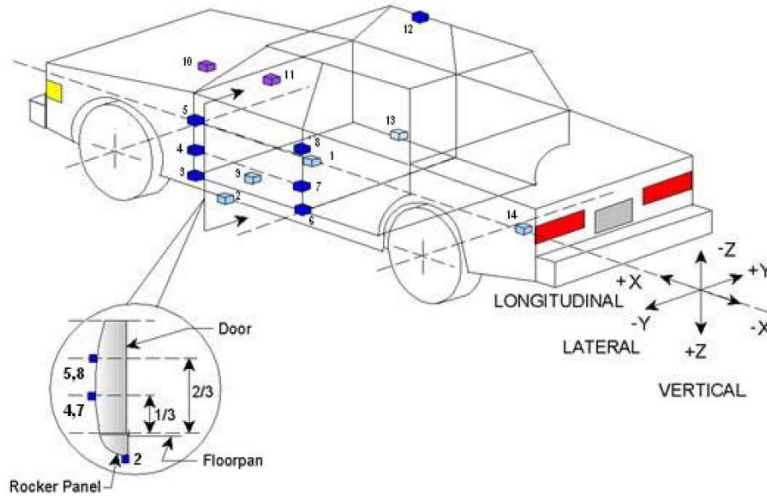
INSTRUMENTATION

Description	Number of Channels
Driver Dummy Channels	16
Vehicle Structure Accelerometers	18
Pole Load Cells	8
Total	42

DATA SHEET NO. 6 VEHICLE ACCELEROMETER DATA

Test Vehicle: 2015 Honda CR-V SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20155316
Test Date: 12/9/2014



TEST VEHICLE ACCELEROMETER LOCATIONS

No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2573	2	-53
2	Left Floor Sill	2728	-627	87
3	A-Pillar Sill	3109	-614	106
4	A-Pillar Low	3092	-625	-127
5	A-Pillar Mid	3085	-664	-584
6	B-Pillar Sill	2055	-621	110
7	B-Pillar Low	2087	-665	-152
8	B-Pillar Mid	2063	-674	-395
9	Driver Seat Track	2230	-553	42
10	Engine Top	3797	-8	-363
11	Firewall	3431	238	-299
12	Right Roof	2241	636	-1076
13	Right Floor Sill	2664	634	97
14	Rear Floorpan	1081	89	-78

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

DATA SHEET NO. 7
RIGID POLE LOAD CELL DATA

Test Vehicle: 2015 Honda CR-V SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20155316
Test Date: 12/9/2014

POLE BARRIER



RIGID POLE LOAD CELL LOCATIONS

ID	Units	Height From Ground
1	mm	200
2	mm	590
3	mm	750
4	mm	1075
5	mm	1260
6	mm	1740
7	mm	1920
8	mm	2300

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

Test Vehicle: 2015 Honda CR-V SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20155316
Test Date: 12/9/2014

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Driver Seat Dummy (SID-IIs)
Face	Curtain Airbag & Seatback
Top of Head	Curtain Airbag
Left Side of Head	Curtain Airbag
Back of Head	Headrest
Left Shoulder	Torso Airbag
Upper Torso	Seatback
Lower Torso	Seatback
Left Hip	None
Left Knee	Seatback & Torso/Pelvis Airbag

POST-TEST DOOR PERFORMANCE

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

POST-TEST SEAT PERFORMANCE

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

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

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20155316
 Test Date: 12/9/2014

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	A-Pillar & B-Pillar Buckled
Sill Separation	None
Windshield Damage	Cracks throughout with separation along Driver's A-Pillar
Side Window Damage	Driver's window shattered during impact
Other Notable Effects	None

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

VEHICLE SPEED, VEHICLE ANGLE AT IMPACT AND IMPACT POINT LOCATION DATA

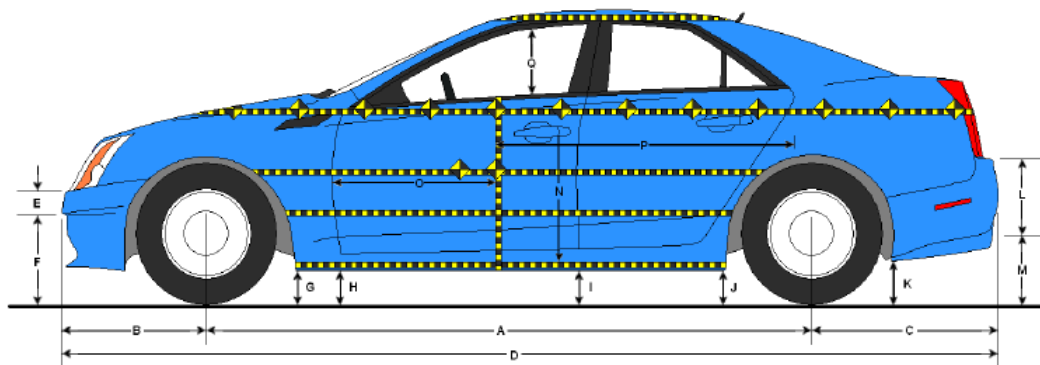
Measured Parameter	Units	Tolerance	Value
Vertical Impact Ref Line - Aft of Front Axle, Intended Impact Pt	mm		1068
Actual Impact Point - Aft of Front Axle	mm		1050
Horizontal Offset (+ forward / - rearward)	mm	+/- 38 *	+18
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	deg	75 +/- 3	75.0
Trap No. 1 Velocity - Primary	kph	31.4 to 33.0	32.53
Trap No. 2 Velocity - Redundant	kph	31.4 to 33.0	32.48

* Of Intended Impact Point

DATA SHEET NO. 9
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2015 Honda CR-V SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20155316
Test Date: 12/9/2014



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

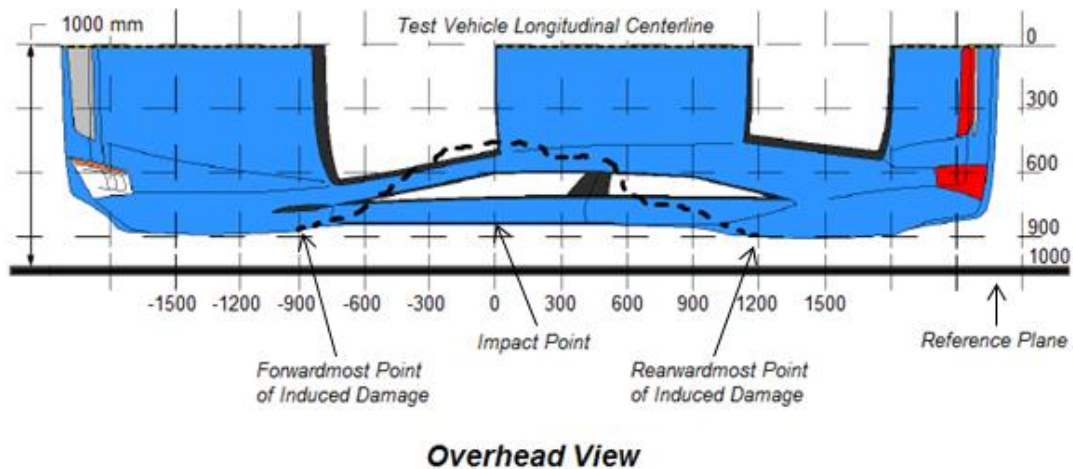
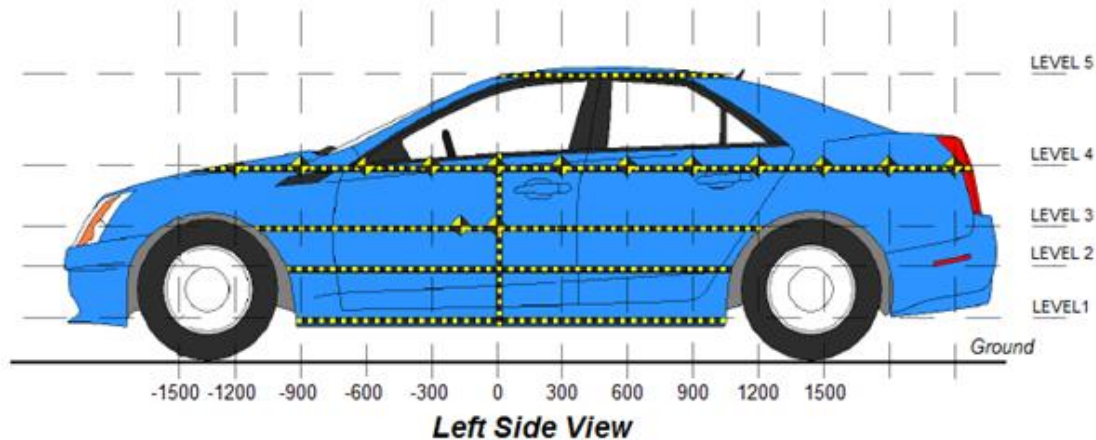
Code	Description	Pre-Test	Post-Test	Difference
A	Vehicle Wheelbase	2622	2529	93
B	Front Axle to FSOV	916	968	-52
C	Rear Axle to RSOV	1018	1013	5
D	Total Length at Centerline	4556	4510	46
E	Front Bumper Thickness	135	130	5
F	Front Bumper Bottom to Ground	457	476	-19
G	Sill Height at Front Wheel Well	260	272	-12
H	Sill Height at Front Door Leading Edge	260	274	-14
I	Sill Height at B-Pillar	259	282	-23
J1	Sill Height at Rear Wheel Well	253	278	-25
J2	Pinch Weld Height at Rear Wheel Well	275	295	-20
K	Sill Height Aft of Rear Wheel Well	280	291	-11
L	Rear Bumper Thickness	120	120	0
M	Rear Bumper Bottom to Ground	420	412	8
N	Sill Height to Bottom of Front Window Sill	816	821	-5
O	Front Door Leading Edge to Impact CL	606	510	95
P	Rear Door Trailing Edge to Impact CL	1488	1418	70
Q	Front Window Opening	435	404	30
R	Right Side Length	4436	4425	12
S	Left Side Length	4436	4364	73
T	Vehicle Width at B-Pillars	1830	1739	91

* All measurements in mm with tolerance of $\pm 3\text{mm}$

DATA SHEET NO. 10
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20155316
 Test Date: 12/9/2014



MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Units	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	mm	323	297	0
2	Occupant Hip Point	mm	609	356	0
3	Mid - Door	mm	699	359	0
4	Window Sill	mm	1049	305	0
5	Window Top	mm	1569	114	150

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

DATA SHEET NO. 10 ... (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20155316
 Test Date: 12/9/2014

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

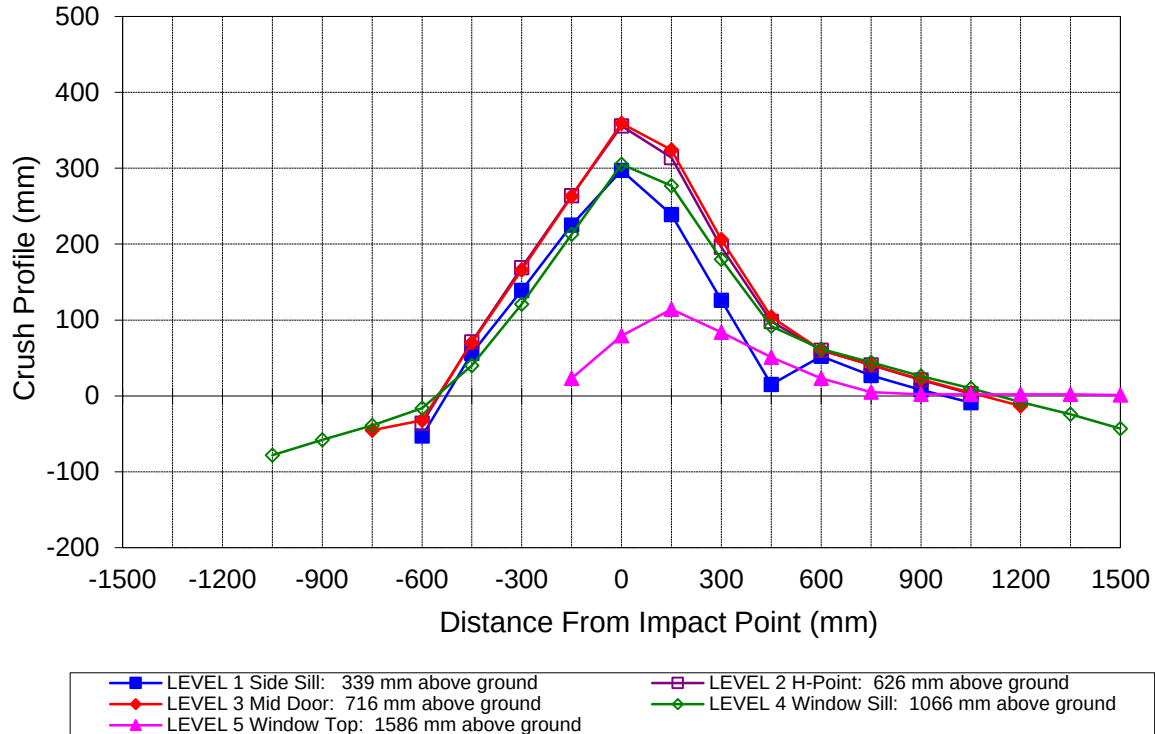
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1500															
-1350															
-1200															
-1050				764					842					-78	
-900				795					853					-58	
-750			914	809				959	848				-45	-39	
-600	902	908	912	821		955	944	944	837		-53	-36	-32	-16	
-450	898	904	905	832		842	833	835	792		56	71	70	40	
-300	892	902	904	838		753	733	738	717		139	169	166	121	
-150	885	902	905	843	507	660	638	642	630	484	225	264	263	213	23
0	881	902	905	848	562	584	546	546	543	483	297	356	359	305	79
150	880	901	906	852	601	641	587	582	575	487	239	314	324	277	114
300	881	901	905	854	616	755	705	699	674	532	126	196	206	180	84
450	885	900	904	856	620	870	802	800	764	569	15	98	104	92	51
600	889	898	902	856	621	837	838	842	794	598	52	60	60	62	23
750	892	899	902	856	619	865	858	861	812	614	27	41	41	44	5
900	895	902	904	855	616	887	881	882	829	614	8	21	22	26	2
1050	896	909	908	854	611	905	906	904	844	609	-9	3	4	10	2
1200			909	851	604			922	859	602			-13	-8	2
1350				868	594				892	592				-24	2
1500				841	578				884	577				-43	1

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. The final distance from impact is determined after the final dummy positioning and the pole is aligned with the center of gravity of the dummy’s head.

DATA SHEET NO. 10 ... (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20155316
 Test Date: 12/9/2014



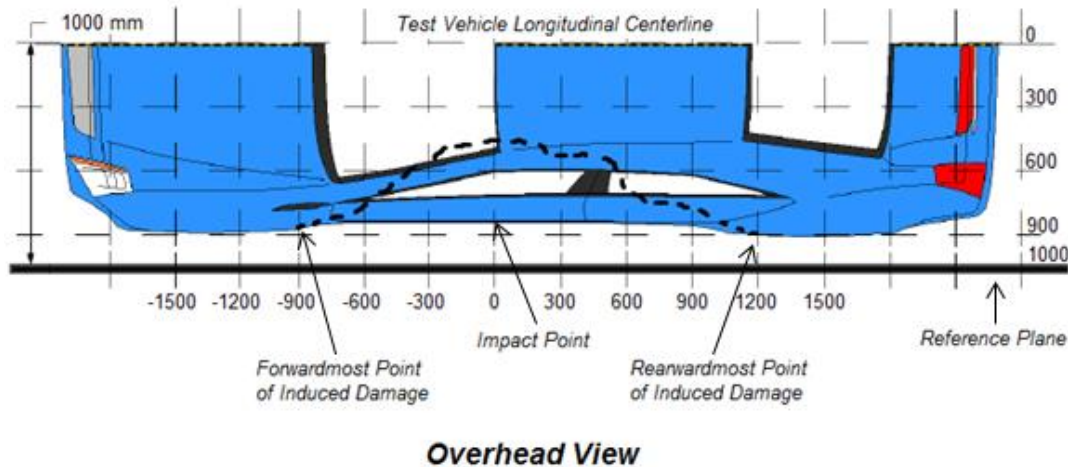
Vehicle Exterior Crush Measurements - Visual Representation

DATA SHEET NO. 11 **VEHICLE DAMAGE PROFILE DISTANCES**

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20155316
 Test Date: 12/9/2014

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



VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	-750	3	41	86	-45
2	-360	3	223	96	127
3	30	3	447	95	352
4	420	3	220	96	124
5	810	3	131	97	34
6	1200	3	78	91	-13

DATA SHEET NO. 12
FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: <u>2015 Honda CR-V SUV</u>	NHTSA No.: <u>M20155316</u>
Test Program: <u>NCAP Side MDB Impact Test</u>	Test Date: <u>12/9/2014</u>
Test Time: <u>2:50 PM</u>	Temperature: <u>21° C</u>

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

FMVSS NO. 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	73	300	373
90° to 180°	64	300	364
180° to 270°	62	300	362
270° to 360°	70	300	370

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

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

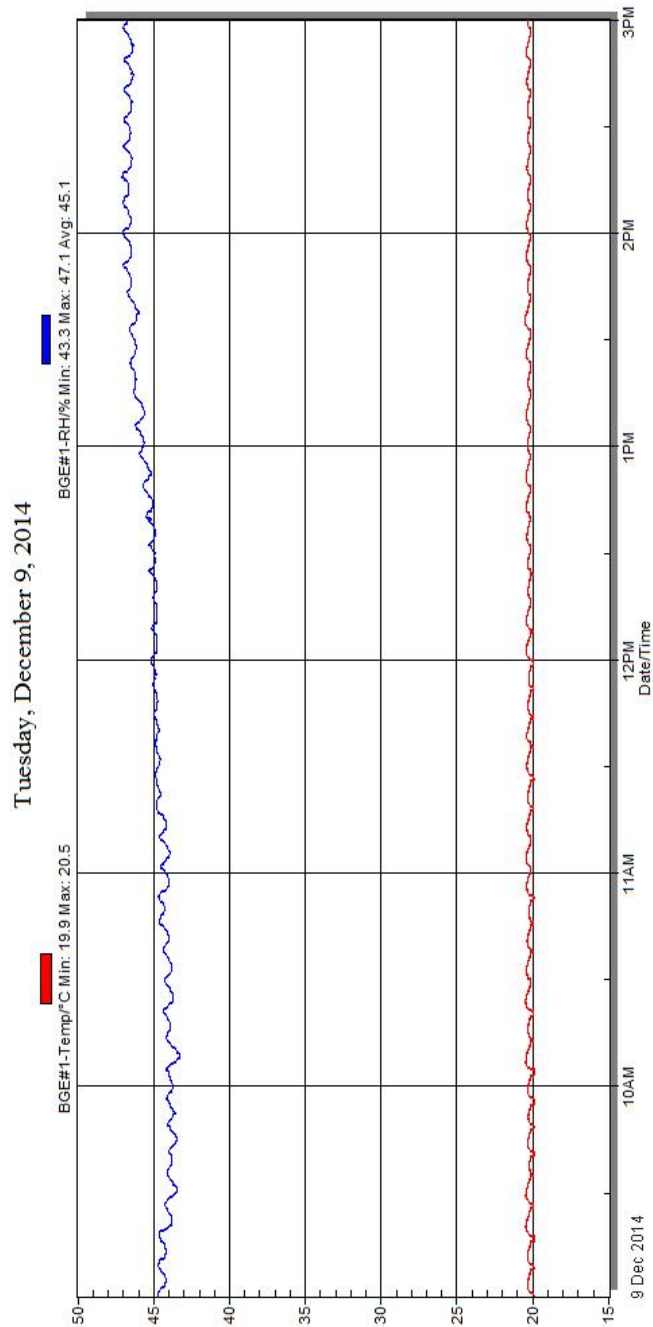
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	No Spillage Occurred
90° to 180°	No Spillage Occurred
180° to 270°	No Spillage Occurred
270° to 360°	No Spillage Occurred

DATA SHEET NO. 13
DUMMY / VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2015 Honda CR-V SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20155316
Test Date: 12/9/2014



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

APPENDIX A
PHOTOGRAPHS

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50	Post-Test Dummy Close-Up Pelvis Contact with Vehicle Interior View	A-28
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52	Post-Test Dummy Close-Up Knee Contact with Vehicle Interior View	A-29
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Figure A-1: As Delivered Right Front $\frac{3}{4}$ View of Test Vehicle



Figure A-2: As Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle



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



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



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



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



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



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



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



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



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

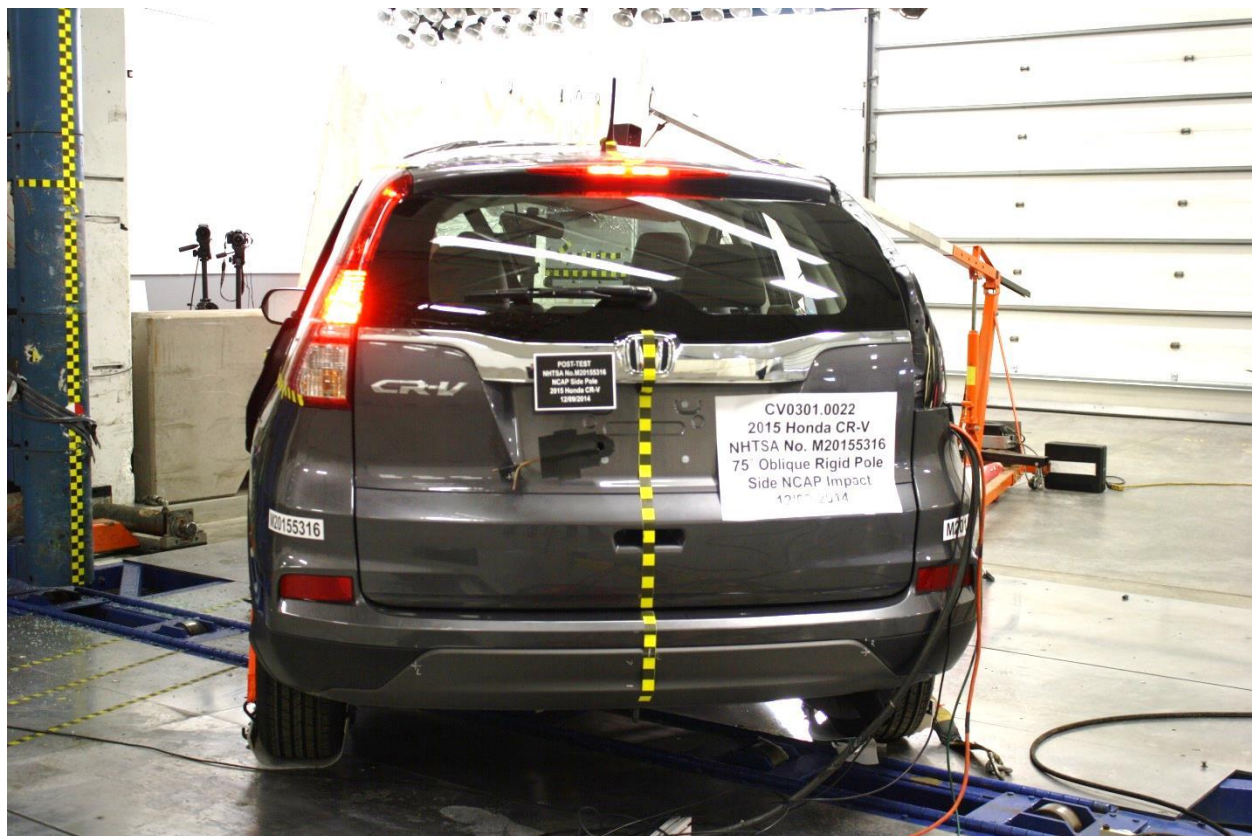


Figure A-12: Post-Test Rear View of Test Vehicle



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



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



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



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



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



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

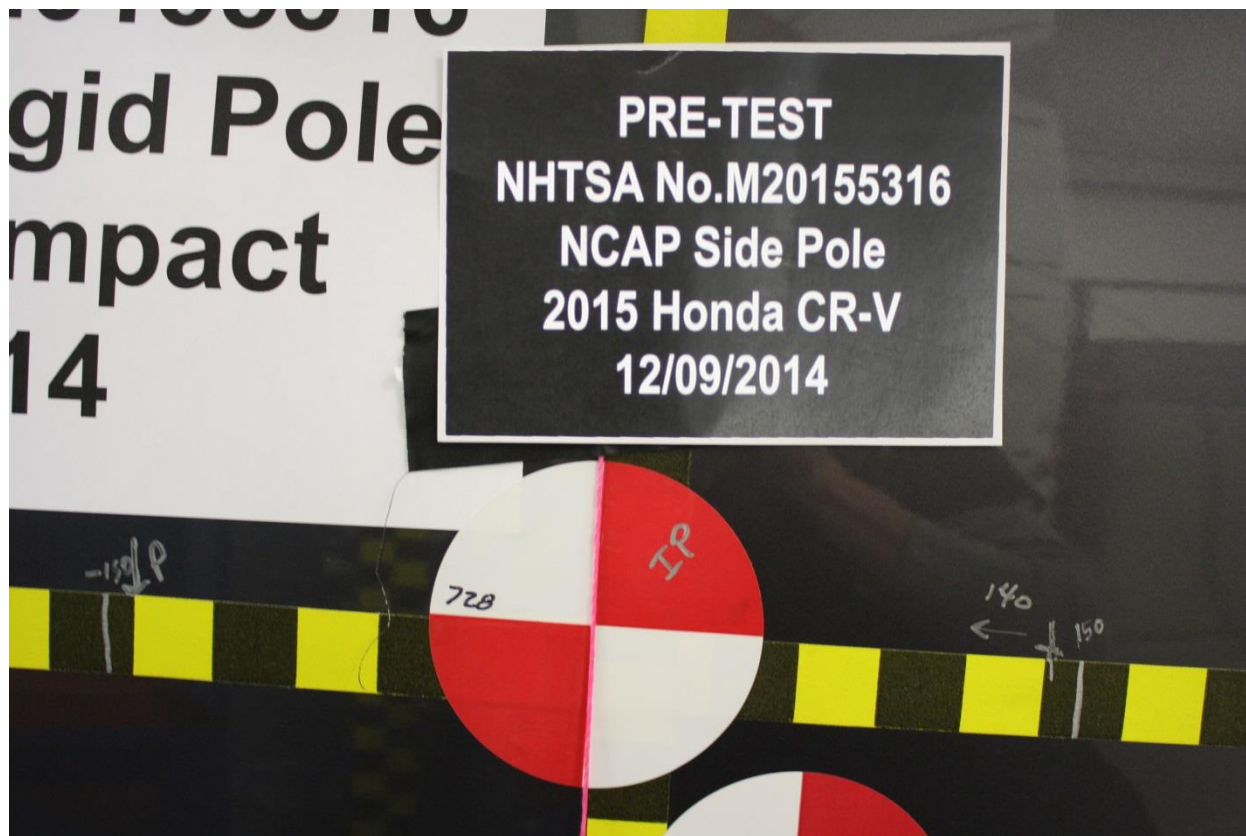


Figure A-19: Pre-Test Close-Up View of Impact Point Target

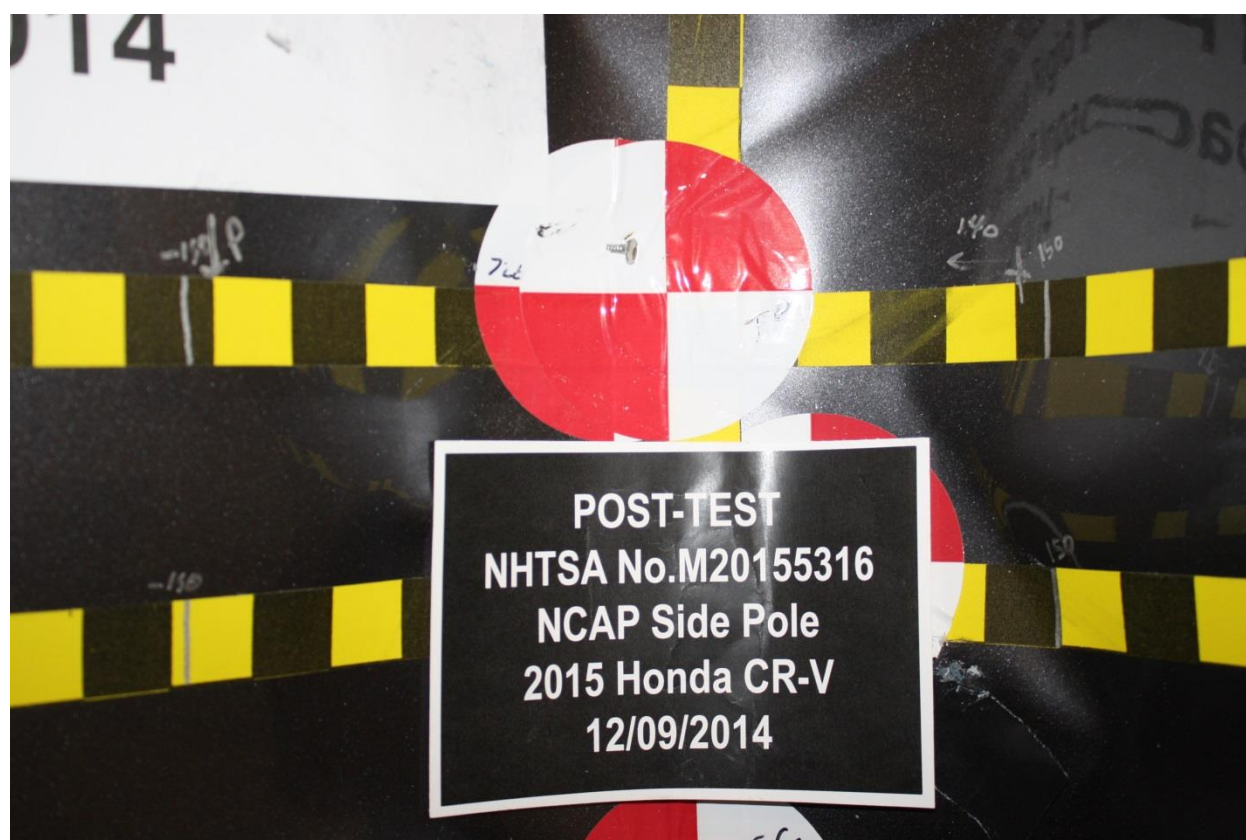


Figure A-20: Post-Test Close-Up View of Impact Point Target Showing Impact Location



Figure A-21: Pre-Test Front Close-Up View of Dummy Head and Chest



Figure A-22: Post-Test Front Close-Up View of Dummy



Figure A-23: Pre-Test Left Side View of Dummy Showing Belt and Chalking



Figure A-24: Pre-Test Left Side View of Dummy Shoulder and Door Top View



Figure A-25: Post-Test Left Side View of Dummy Shoulder and Door Top View



Figure A-26: Pre-Test Frontal View of Seat Back Prior to Dummy Positioning



Figure A-27: Pre-Test Frontal Close-Up View of Dummy Head / Shoulders in Relation to Head Restraint



Figure A-28: Pre-Test Frontal View of Seat Pan Prior to Dummy Positioning



Figure A-29: Pre-Test Overhead View of Dummy Thighs on Seat Pan



Figure A-30: Pre-Test Left Side View of Dummy's Neck Showing Position of Adjustable Neck Bracket



Figure A-31: Pre-Test Left Side View of Dummy's Head Showing Dummy's Head is Level



Figure A-32: Pre-Test Placement of Dummy's Feet

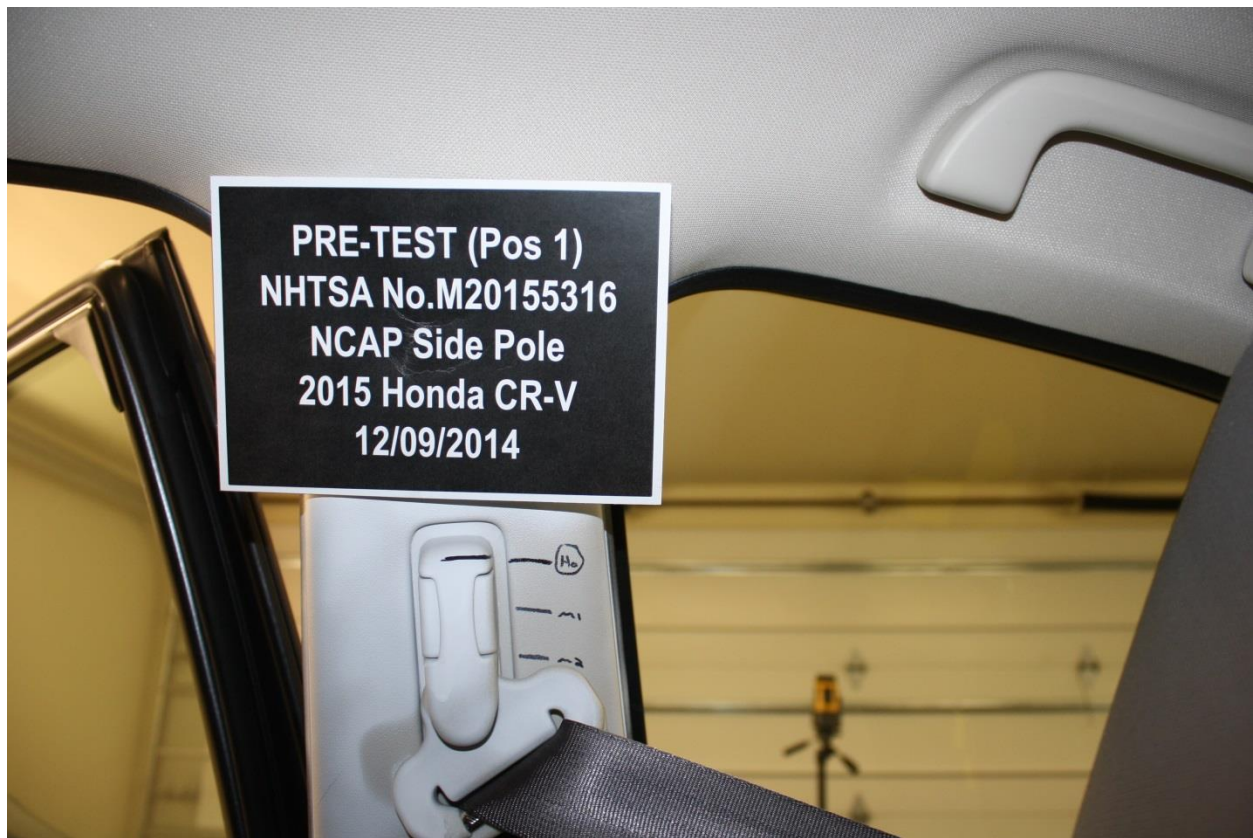


Figure A-33: Pre-Test View of Belt Anchorage for Dummy



Figure A-34: Pre-Test Left Side View of Steering Wheel



Figure A-35: Pre-Test View of Disengaged Parking Brake



Figure A-36: Pre-Test View of Parking Brake



Figure A-37: Pre-Test Close-Up Left Side View of Driver Seat Track



Figure A-38: Pre-Test Close-Up Left Side View of Driver Seat Back



Figure A-39: Pre-Test Close-Up View of Driver Seat Back or Head Restraint



Figure A-40: Pre-Test Dummy and Door Clearance View



Figure A-41: Post-Test Dummy and Door Clearance View

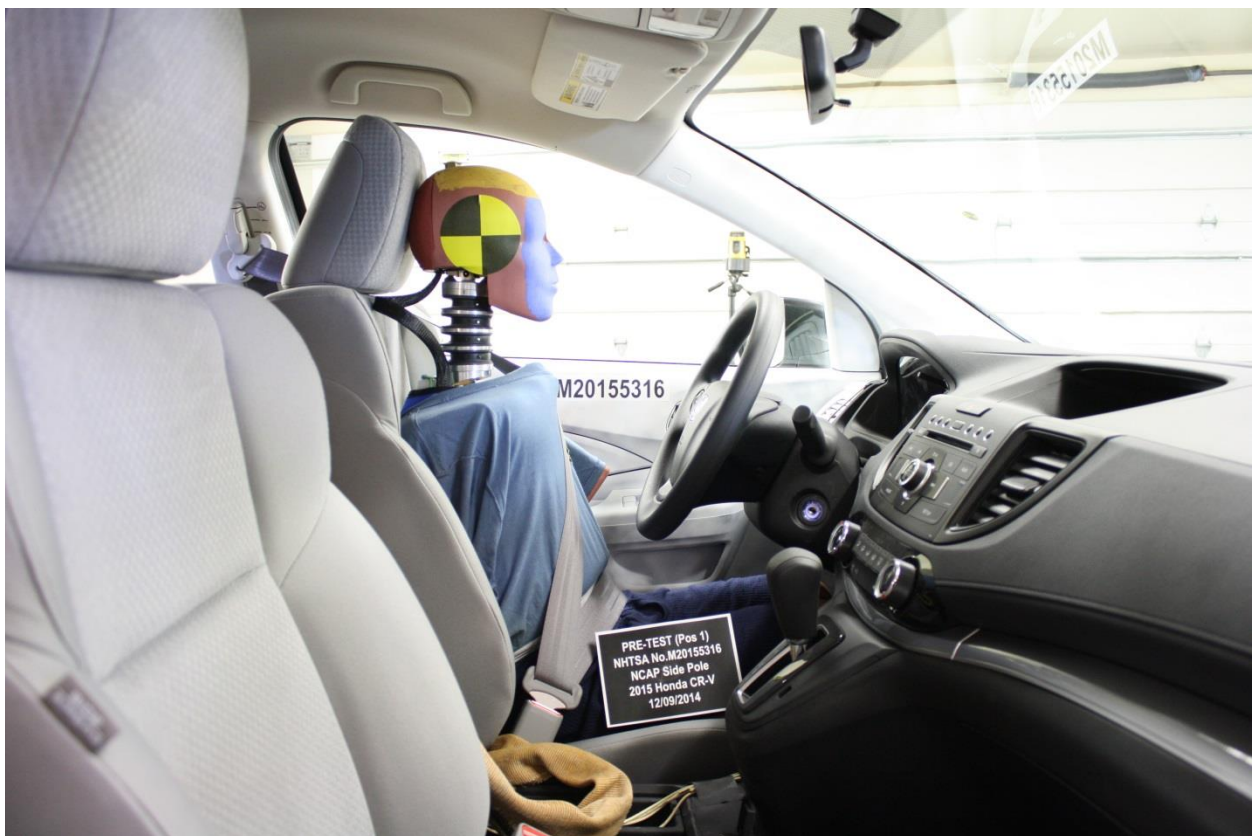


Figure A-42: Pre-Test Right Side View of Dummy and Front Seat of Occupant Compartment



Figure A-43: Post-Test Right Side View of Dummy and Front Seat of Occupant Compartment



Figure A-44: Pre-Test Inner Door Panel View



Figure A-45: Post-Test Inner Door Panel View Showing Dummy Contact Location



Figure A-46: Post-Test Dummy Close-Up Head Contact with Vehicle Interior View



Figure A-47: Post-Test Dummy Close-Up Head Contact with Side Airbag View



Figure A-48: Post-Test Dummy Close-Up Torso Contact with Vehicle Interior View



Figure A-49: Post-Test Dummy Close-Up Torso Contact with Side Airbag View



Figure A-50: Post-Test Dummy Close-Up Pelvis Contact with Vehicle Interior View



Figure A-51: Post-Test Dummy Close-Up Pelvis Contact with Side Airbag View

Photo Not Applicable

Figure A-52: Post-Test Dummy Close-Up Knee Contact with Vehicle Interior View



Figure A-53: Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



Figure A-54: Post-Test View of Fuel Filler Cap or Fuel Filler Neck



Figure A-55: Close-Up View of Vehicle's Certification Label

Photo Not Applicable

Figure A-55a: Close-Up View of Reduced Load Capacity Label

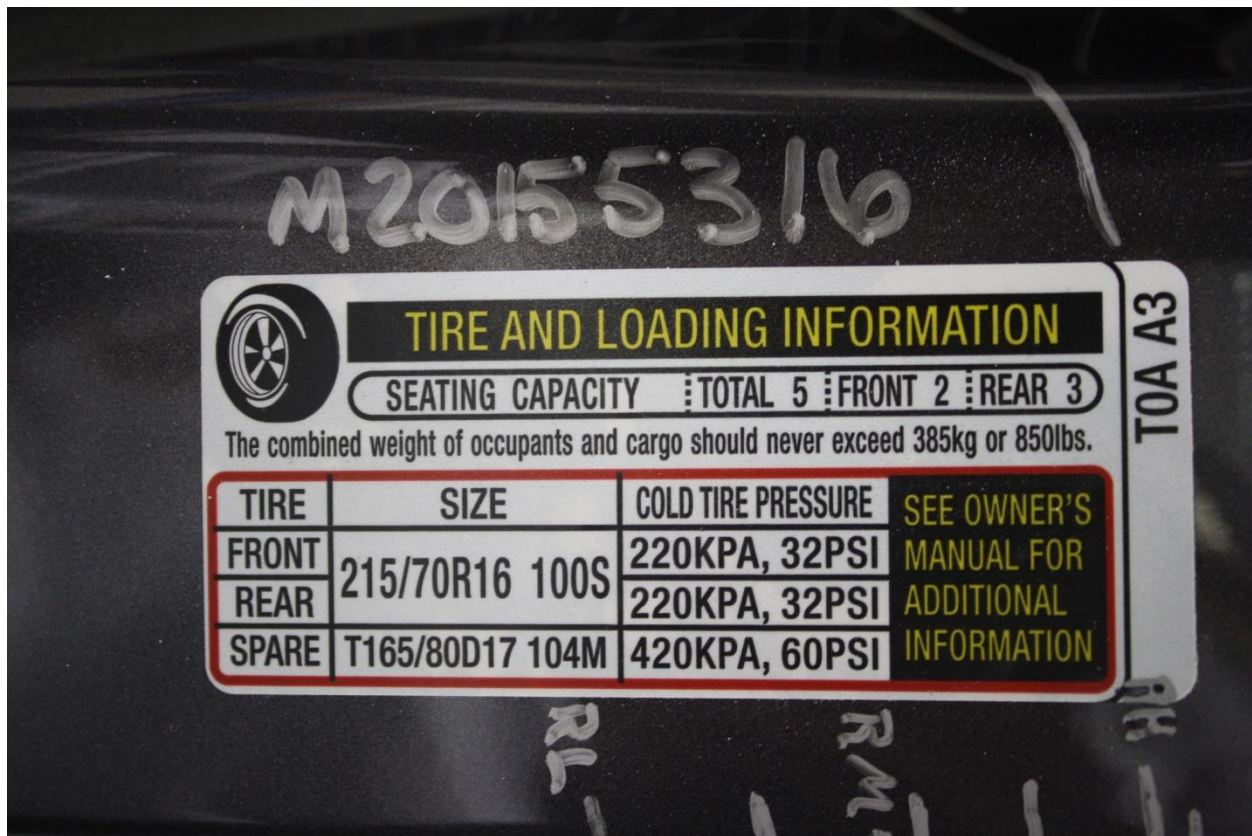


Figure A-56: Close-Up View of Vehicle's Tire Information Placard or Label

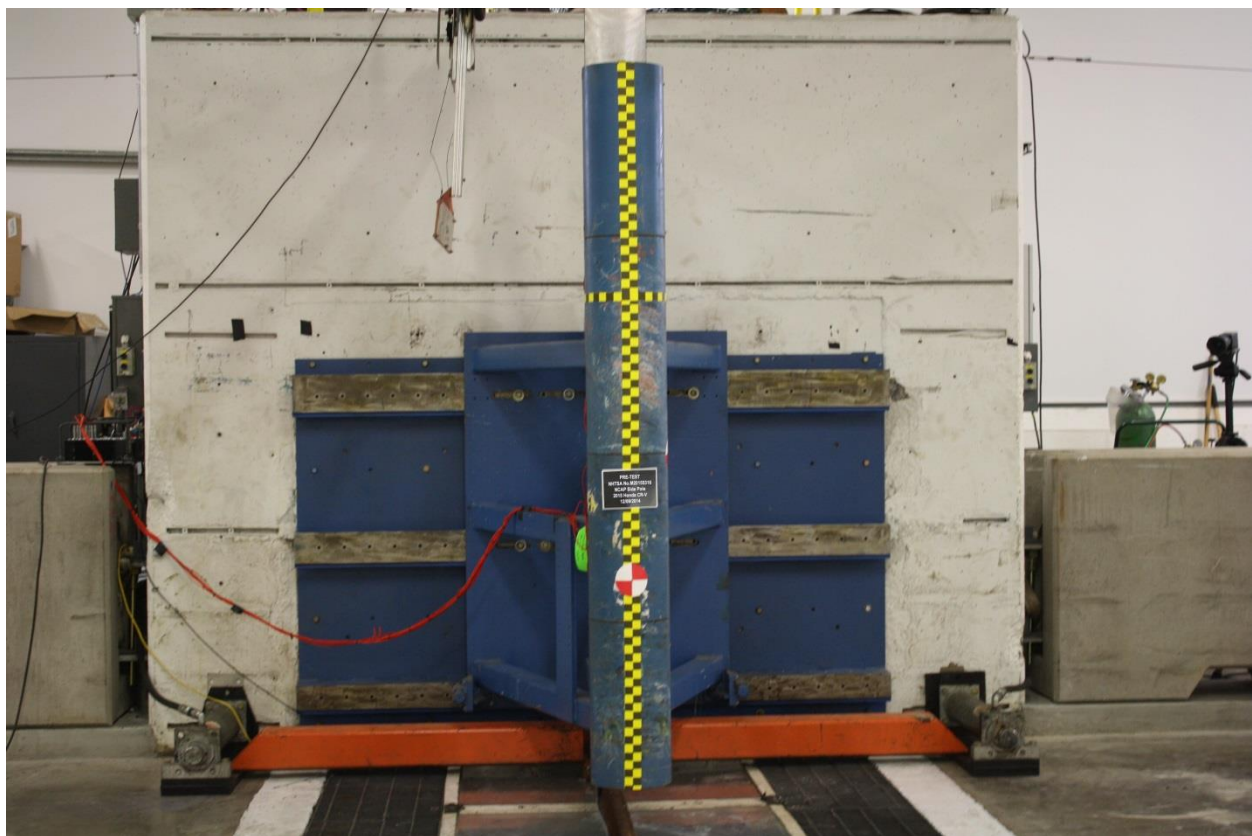


Figure A-57: Pre-Test Pole Barrier Front View

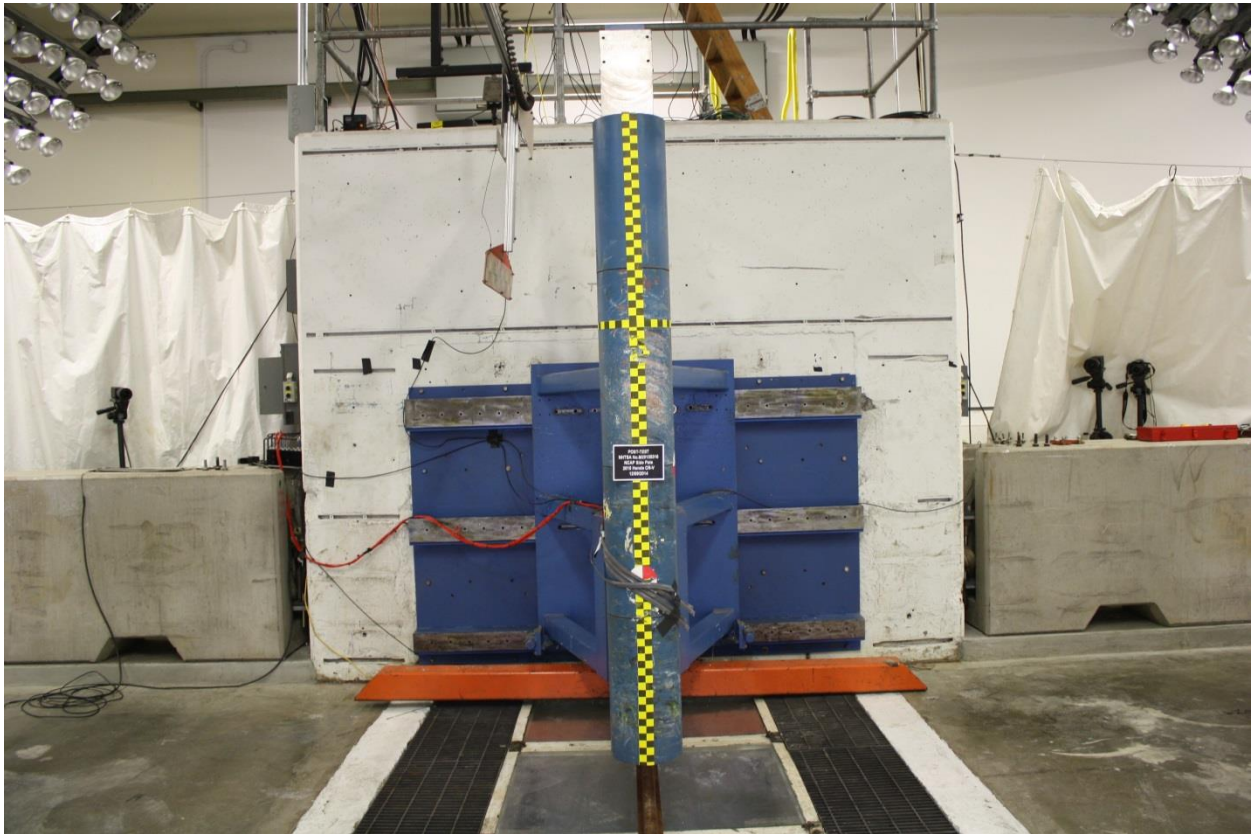


Figure A-58: Post-Test Pole Barrier Front View

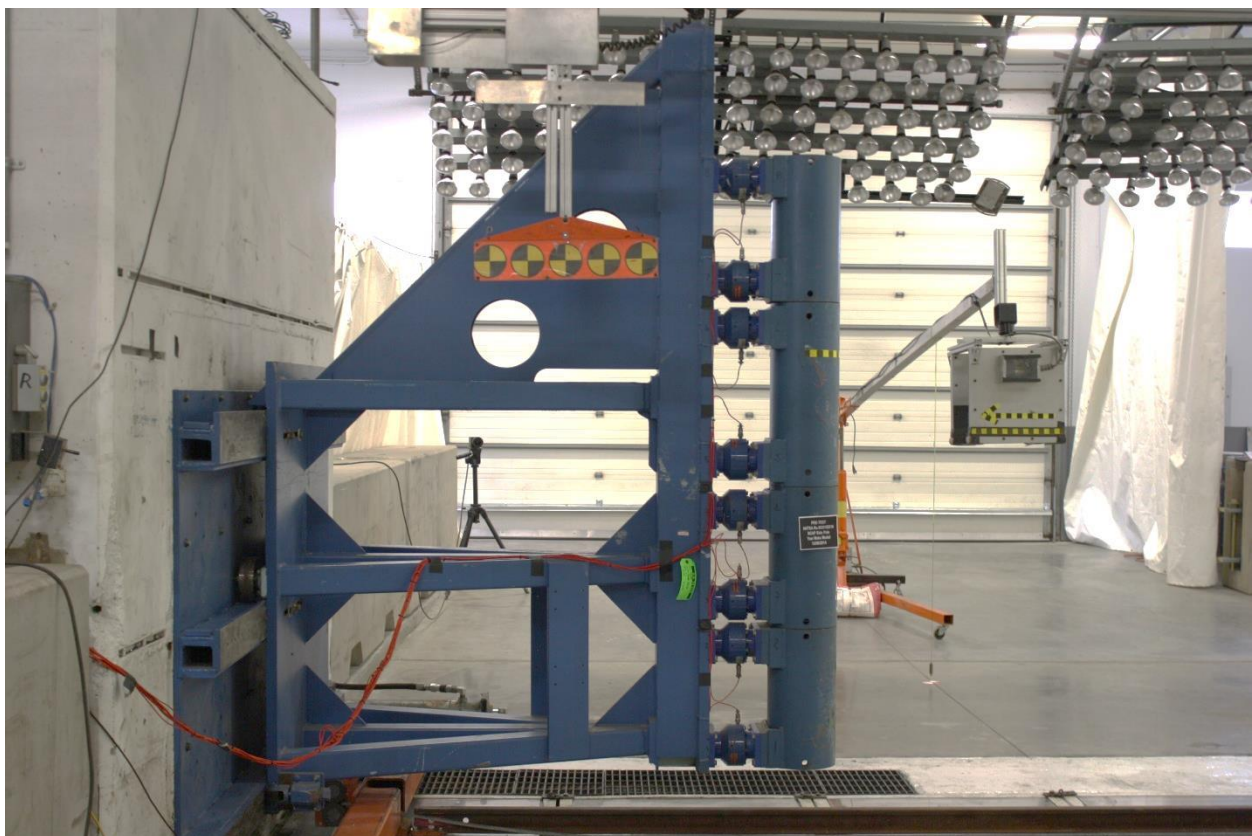


Figure A-59: Pre-Test Pole Barrier Side View

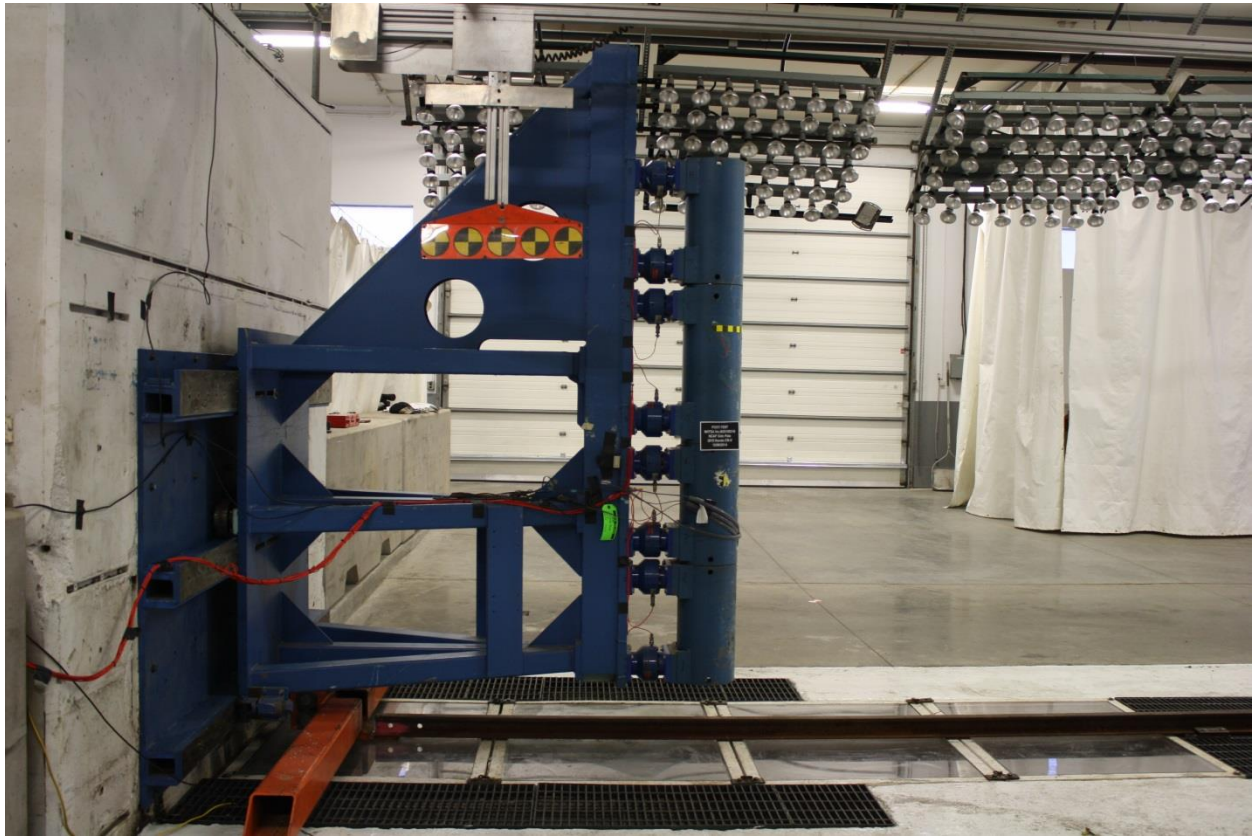


Figure A-60: Post-Test Pole Barrier Side View

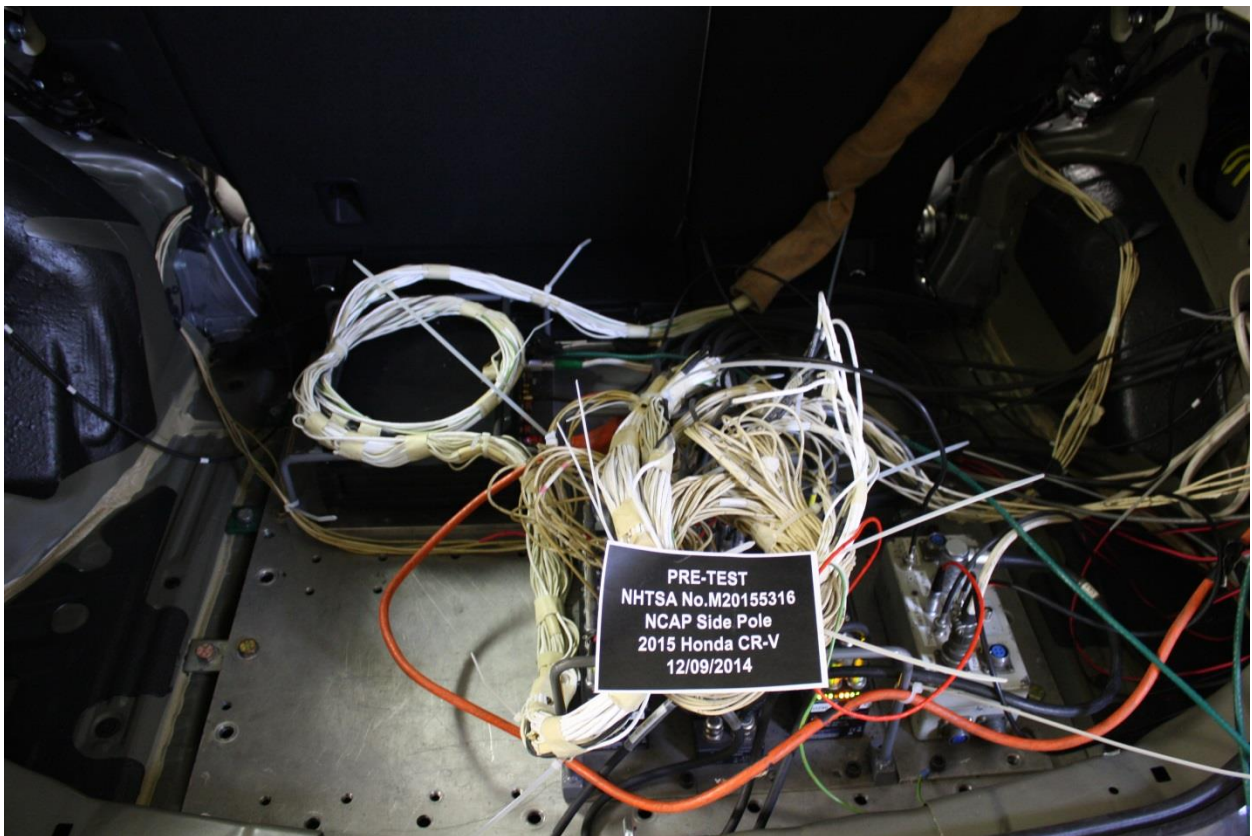


Figure A-61: Pre-Test Ballast View

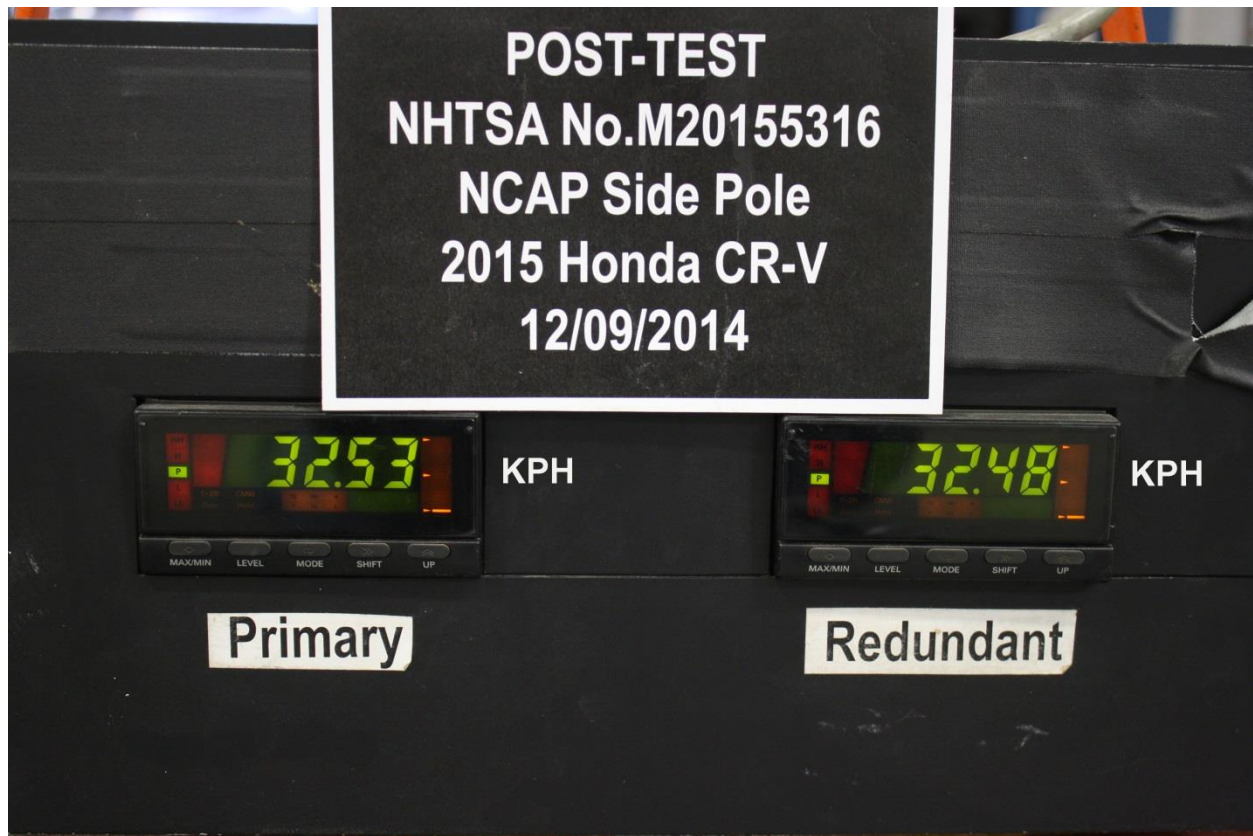


Figure A-62: Post-Test Primary and Redundant Speed Trap Read-Out



Figure A-63: FMVSS No. 301 Static Rollover 0 Degrees



Figure A-64: FMVSS No. 301 Static Rollover 90 Degrees



Figure A-65: FMVSS No. 301 Static Rollover 180 Degrees

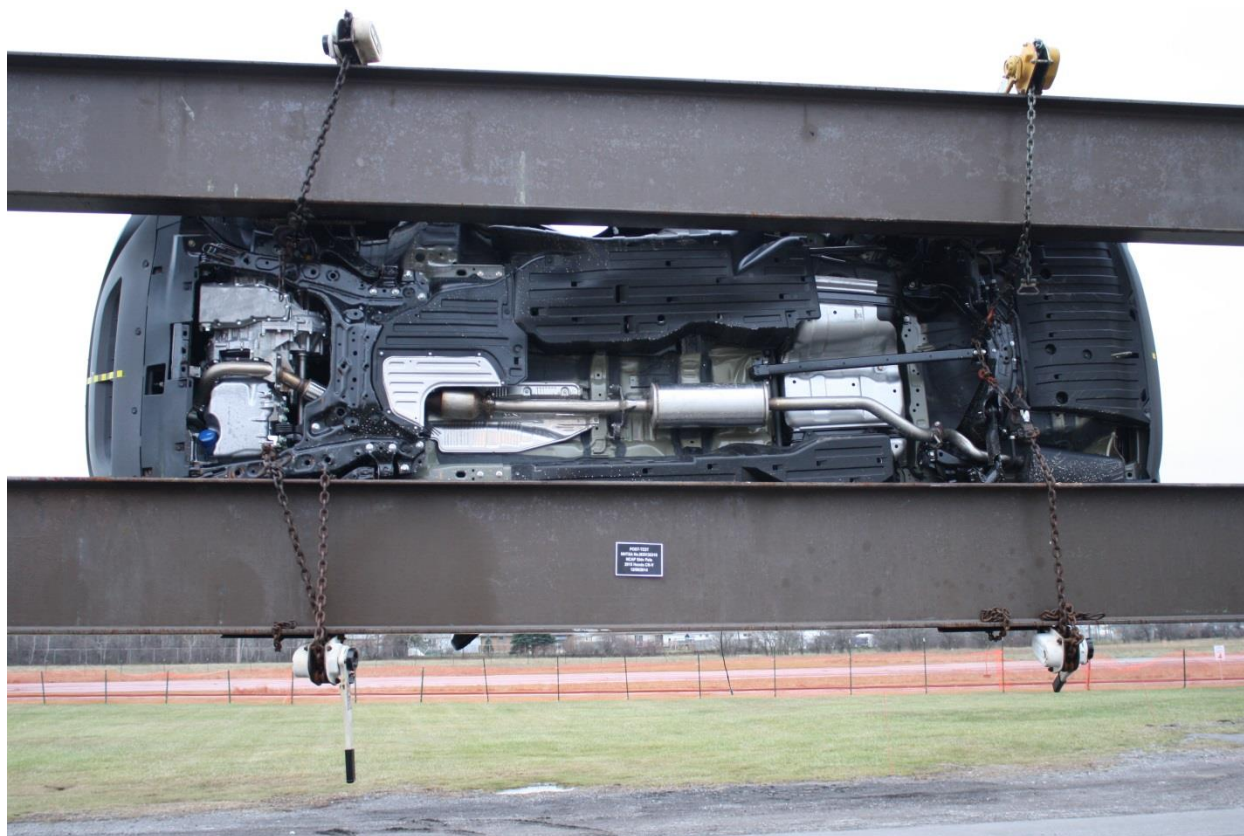


Figure A-66: FMVSS No. 301 Static Rollover 270 Degrees



Figure A-67: FMVSS No. 301 Static Rollover 360 Degrees



Figure A-68: Impact Event

HONDA		2015 CR-V 5DR 2WD LX EXT: MODERN STEEL M. ENGINE NUMBER: K24V1-1028476 INT: GRAY		EPA DOT Fuel Economy and Environment Gasoline Vehicle																			
STANDARD EQUIPMENT AT NO EXTRA COST TECHNICAL FEATURES* 185hp 2.4-Liter DOHC 16-Valve i-VTEC 4-Cyl. Earth Dreams Direct-Injection Engine - Continuously Variable Transmission (CVT) 4-Wheel Disc Brakes - Front MacPherson Strut Suspension - Rear Multi-Link Suspension - Drive-by-Wire Throttle System - Electric Power-Assisted Rack-and-Pinion Steering - Front and Rear Stabilizer Bars SAFETY FEATURES* - Driver's and Front Passenger's Dual-Stage Airbags (SRS) - Driver's and Front Passenger's Side Airbags - Side Curtain Airbags with Rollover Sensor - Vehicle Stability Assist (VSA) - Anti-Lock Braking System (ABS) - Electronic Brake Distribution (EBD) - Brake Assist - Tire Pressure Monitoring System - ACE Body Structure - LATCH System for Child Seats		INTERIOR FEATURES* - AM/FM/CD Audio System with 4 Speakers - Intelligent Multi-Information Display (i-MID) w/ Rearview Camera - Steering Wheel-Mounted Controls - Bluetooth Audio - Bluetooth HandsFreeLink - Pandora Internet Radio Interface - USB Audio Interface - SMS Text Messaging Functionality - Air Conditioning with Air Filtration System - Rear Console Vents 60/40 Split Fold-Down Rear Seatback - Power Windows and Door Locks - Driver's Auto Up/Down Window - Exterior Temperature Display 12-Volt Power Outlets - Cruise Control - Floor Mats - Front Center Console with Conversation Mirror EXTERIOR FEATURES* 16" x 6.5" Steel Wheels - P215/70 R16 All-Season Tires - Intermittent Windshield Wipers - Power Door Mirrors - Remote Entry System		Manufacturer's Suggested Retail Price \$23,320.00 Full Tank of Fuel No Charge																			
Destination and Handling 330.00 TOTAL VEHICLE PRICE (Includes Pre-Delivery Service) \$24,150.00 License and title fees, state and local taxes and dealer options and accessories are not included in the manufacturer's suggested retail price.		Annual fuel cost \$1,800 Fuel Economy 29 MPG combined city/hwy 27 city 34 highway 3.4 gallons per 100 miles Small SUVs range from 16 to 31 MPG. The best vehicle rates 119 MPG.		You save \$2,000 in fuel costs over 5 years compared to the average new vehicle. Fuel Economy & Greenhouse Gas Rating (tailpipe only) 1 7 10 Best Smog Rating (tailpipe only) 1 5 10 Best This vehicle emits 302 grams CO₂/per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions; learn more at fueleconomy.gov.																			
H43293 66 miles 10/14		VALLEY HONDA 4173 OGDEN AVENUE AURORA, IL 60504 PORT OF ENTRY: BUFFALO DELIVERY POINT: SCHAMBURG SHIP: ROW/SPACE: 307-007 TRANS.METHOD: N50 ELWOOD VIN: 2HKRM3H32FH502502 ORIG. DLR: 208390 REF. NO: 42422 HN CODE: HN-7460 EMISSION: 50 STATE CONTROL NO: 107478 DEALER: 208390		GOVERNMENT 5-STAR SAFETY RATING 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. <table border="1"> <tr> <td>Frontal Crash</td> <td>Driver Passenger</td> <td>Not Rated</td> </tr> <tr> <td colspan="3">Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.</td> </tr> <tr> <td>Side Crash</td> <td>Front seat Rear seat</td> <td>Not Rated</td> </tr> <tr> <td colspan="3">Based on the risk of injury in a side impact.</td> </tr> <tr> <td>Rollover</td> <td colspan="2">★★★★</td> </tr> <tr> <td colspan="3">Based on the risk of rollover in a single vehicle crash.</td> </tr> </table>		Frontal Crash	Driver Passenger	Not Rated	Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.			Side Crash	Front seat Rear seat	Not Rated	Based on the risk of injury in a side impact.			Rollover	★★★★		Based on the risk of rollover in a single vehicle crash.		
Frontal Crash	Driver Passenger	Not Rated																					
Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.																							
Side Crash	Front seat Rear seat	Not Rated																					
Based on the risk of injury in a side impact.																							
Rollover	★★★★																						
Based on the risk of rollover in a single vehicle crash.																							
FOR THIS VEHICLE Final Assembly Point: ALLISTON, ONTARIO CANADA Country of Origin: Engine: U.S.A. Transmission: U.S.A.		FOR VEHICLES IN THIS CARLINE U.S./Canadian Parts Content: 70 % Major Sources of Foreign Parts Content: JAPAN 15 % NOTE: Parts content does not include final assembly, distribution or other non-parts costs.		Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 24 MPG and costs \$11,000 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.50 per gallon. MPG is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog. fueleconomy.gov Calculate personalized estimates and compare vehicles Smartphone QR Code																			

Figure A-69: Monroney Label

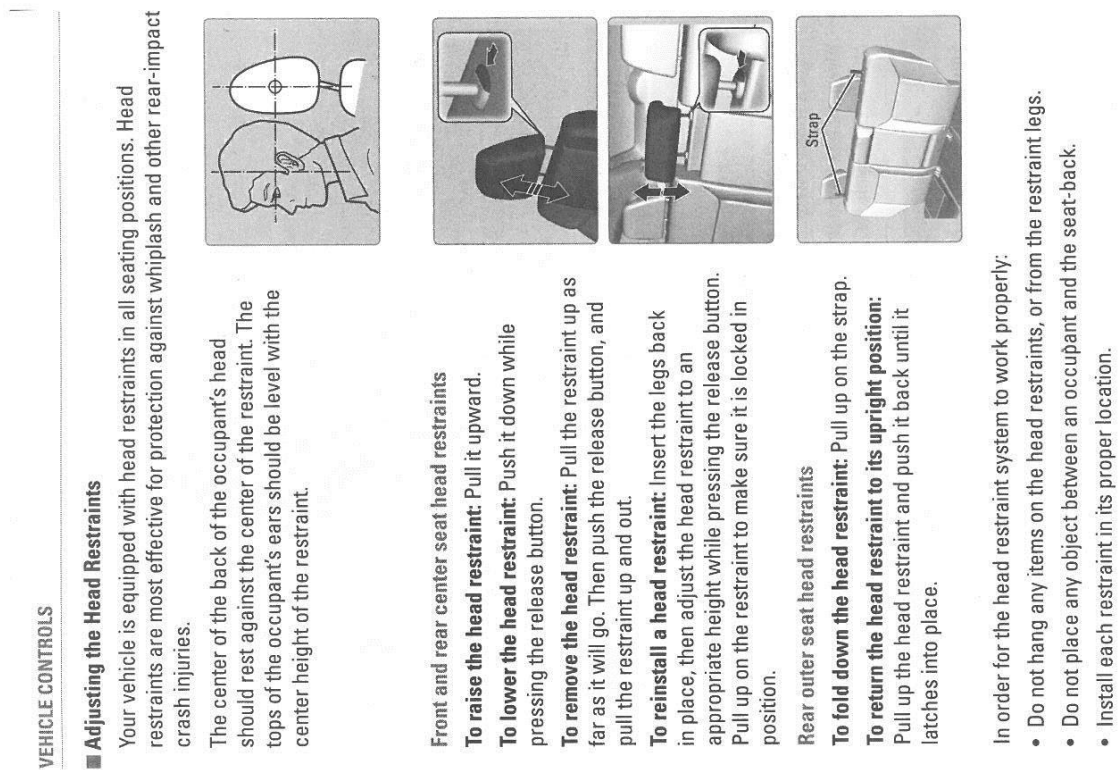


Figure A-70: Head Restraint Use and Adjustment Information from Vehicle Owner's Manual



Figure A-71: Post-Test View of Shattered Vehicle Inner Door Panel (if applicable)

APPENDIX B

VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

Driver Dummy Instrumentation Plots

Fig.	Description	Page
1	Driver Head Acceleration (X) Primary vs. Time	B-4
2	Driver Head Acceleration (Y) Primary vs. Time	B-4
3	Driver Head Acceleration (Z) Primary vs. Time	B-4
4	Driver Head Resultant Acceleration Primary vs. Time	B-4
5	Driver Lower Spine T12 Acceleration (X) vs. Time	B-5
6	Driver Lower Spine T12 Acceleration (Y) vs. Time	B-5
7	Driver Lower Spine T12 Acceleration (Z) vs. Time	B-5
8	Driver Lower Spine T12 Resultant Acceleration vs. Time	B-5
9	Driver Iliac Wing Force on Impact Side (Y) vs. Time	B-6
10	Driver Acetabulum Force on Impact Side (Y) vs. Time	B-6
11	Driver Total Pelvis Force on Impact Side (Y) vs. Time	B-6

The following additional data for this test can be obtained from the Research and Development section of the NHTSA website. The website can be found at www.NHTSA.dot.gov.

Additional Driver Dummy Instrumentation Data

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

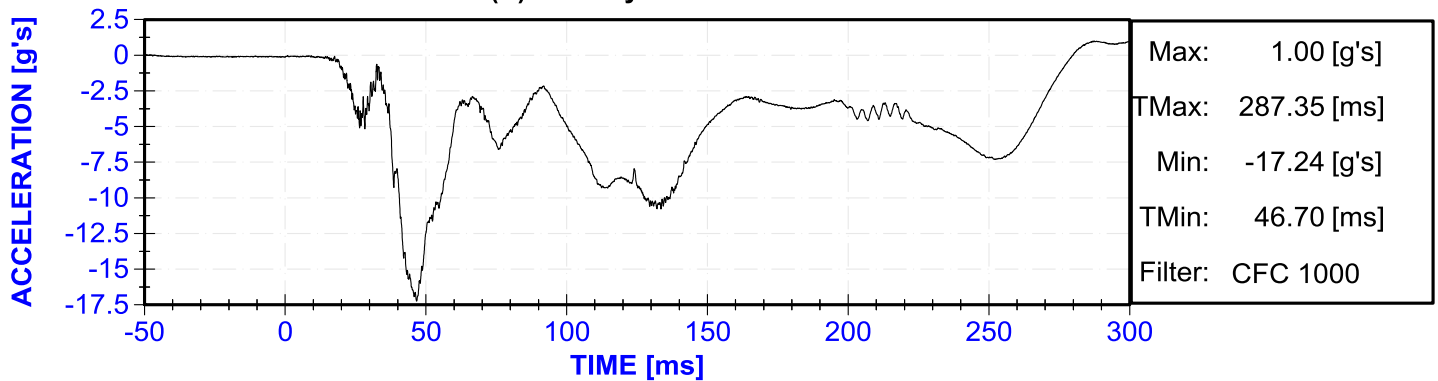
Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Left Floor Sill Acceleration (Y)
Left A-Pillar Sill Acceleration (Y)
Left Lower A-Pillar Acceleration (Y)
Left Mid A-Pillar Acceleration (Y)
Left B-Pillar Sill Acceleration (Y)
Left Lower B-Pillar Acceleration (Y)
Left Mid B-Pillar Acceleration (Y)
Driver Seat Track at Dummy Hip Point Acceleration (Y)
Engine Top Acceleration (X)
Engine Top Acceleration (Y)
Firewall Center Acceleration (Y)
Right Roof at Vertical Impact Reference Line Acceleration (Y)
Right Sill at Vertical Impact Reference Line Acceleration (Y)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)

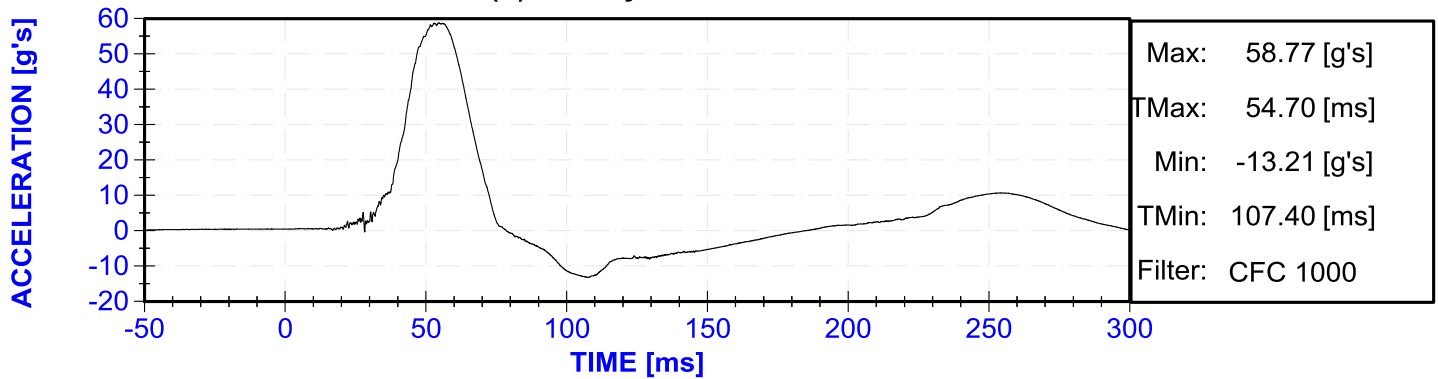
Pole Instrumentation Data

Load Cell Pole Barrier #1 Force (Y)
Load Cell Pole Barrier #2 Force (Y)
Load Cell Pole Barrier #3 Force (Y)
Load Cell Pole Barrier #4 Force (Y)
Load Cell Pole Barrier #5 Force (Y)
Load Cell Pole Barrier #6 Force (Y)
Load Cell Pole Barrier #7 Force (Y)
Load Cell Pole Barrier #8 Force (Y)

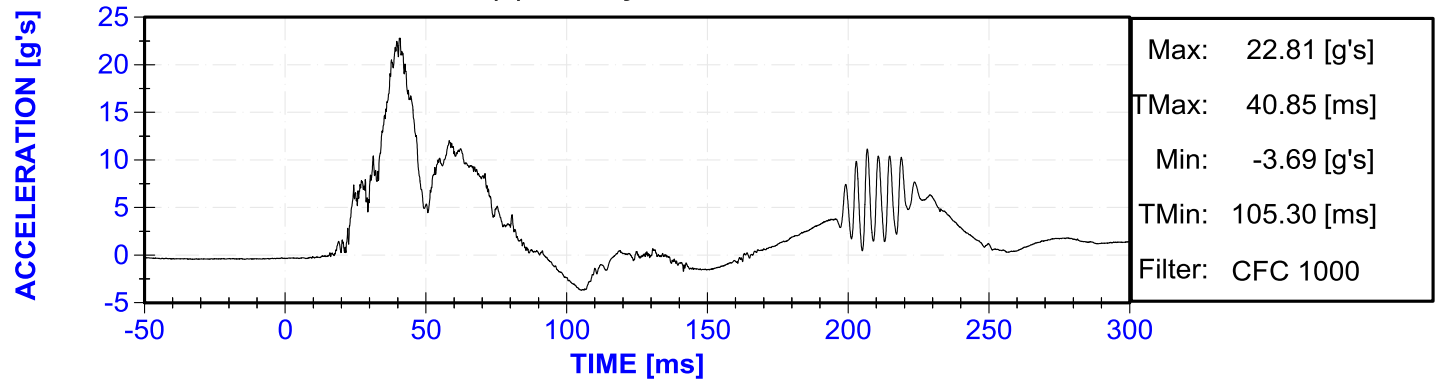
Driver Head Acceleration (X) Primary vs. Time



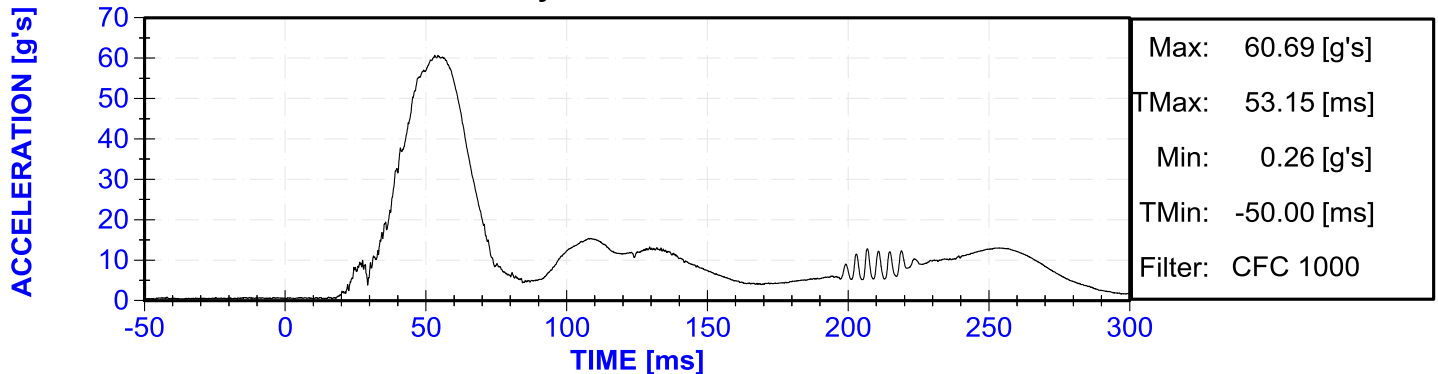
Driver Head Acceleration (Y) Primary vs. Time



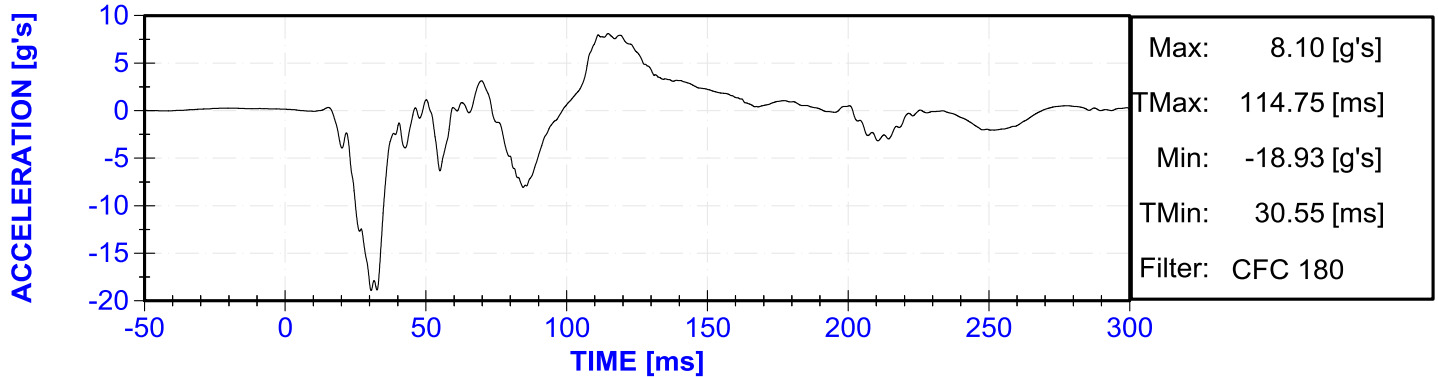
Driver Head Acceleration (Z) Primary vs. Time



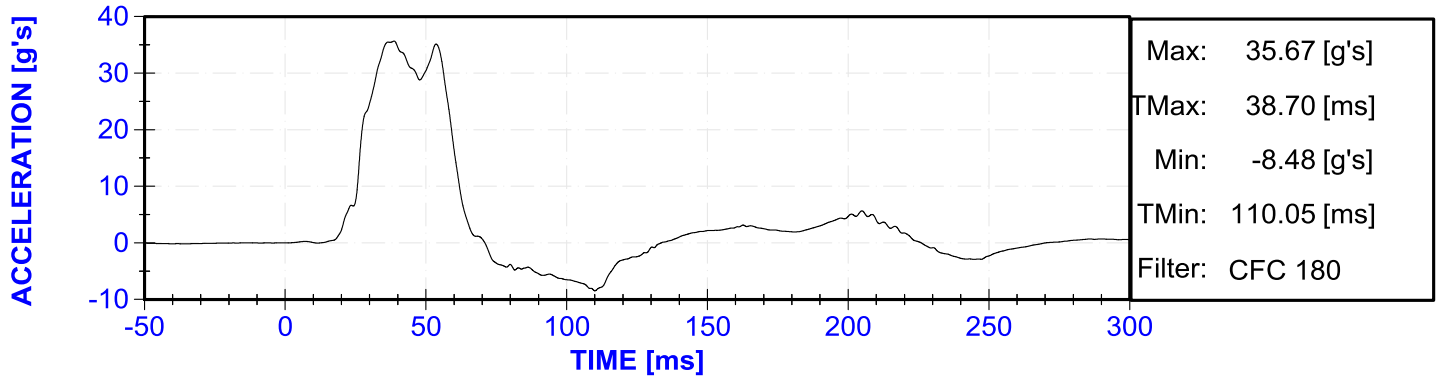
Driver Head Resultant Primary vs. Time



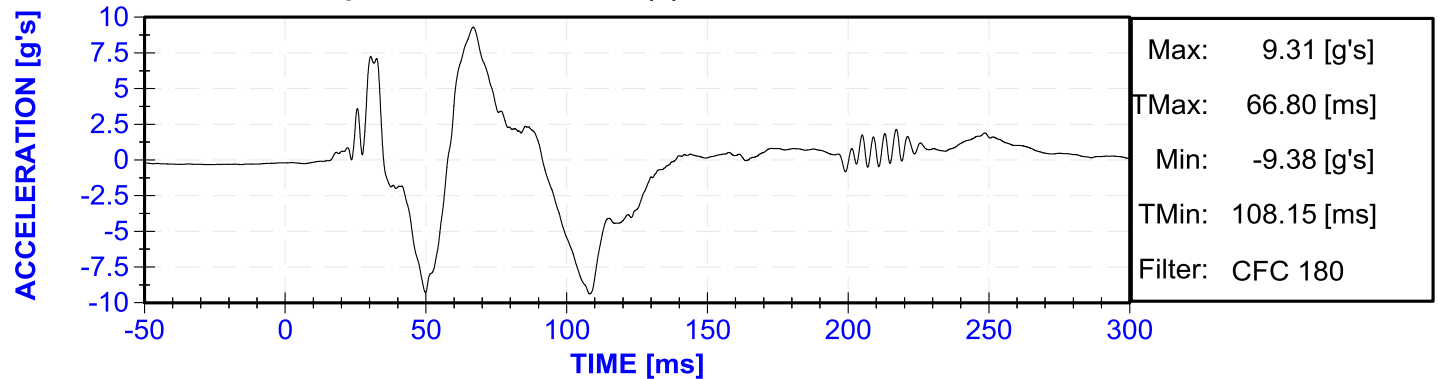
Driver Lower Spine T12 Acceleration (X) vs. Time



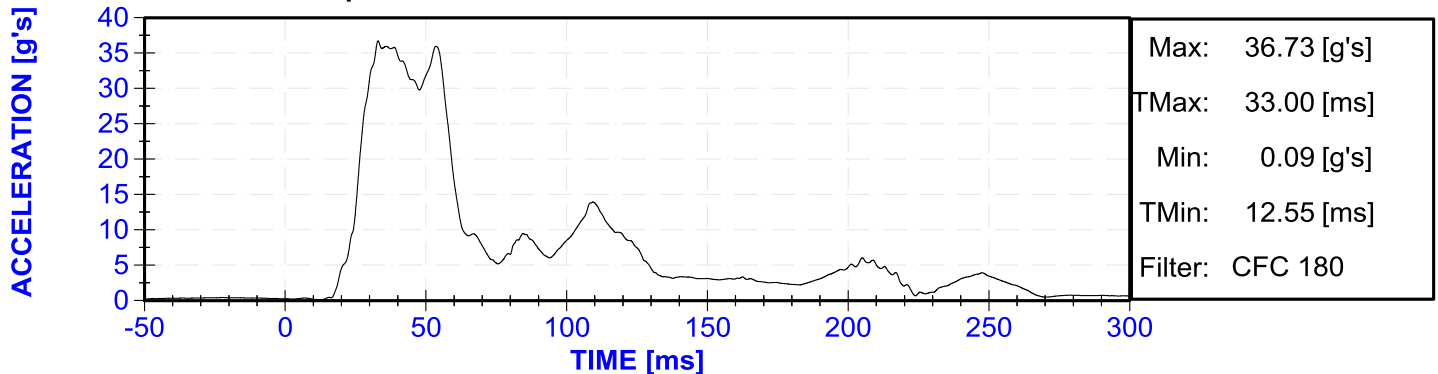
Driver Lower Spine T12 Acceleration (Y) vs. Time



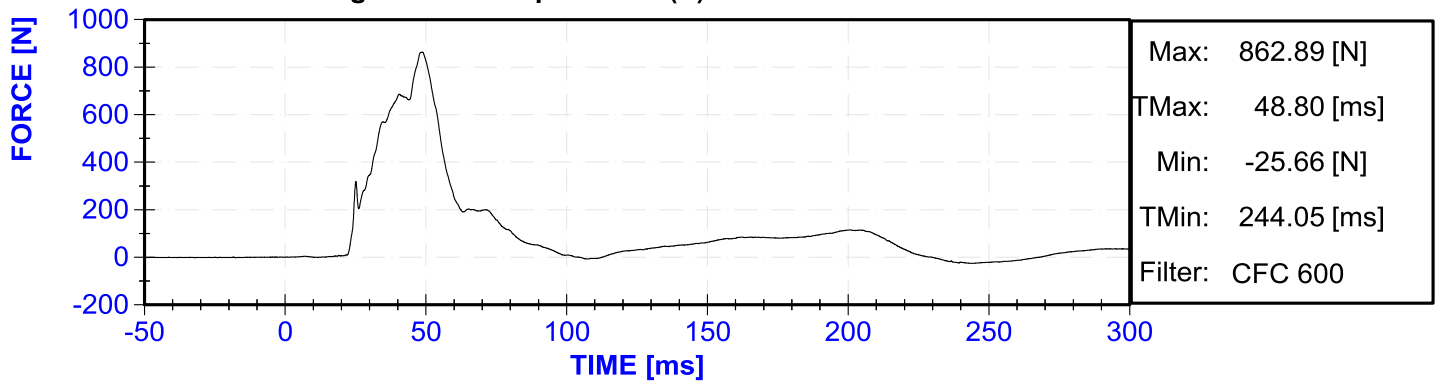
Driver Lower Spine T12 Acceleration (Z) vs. Time



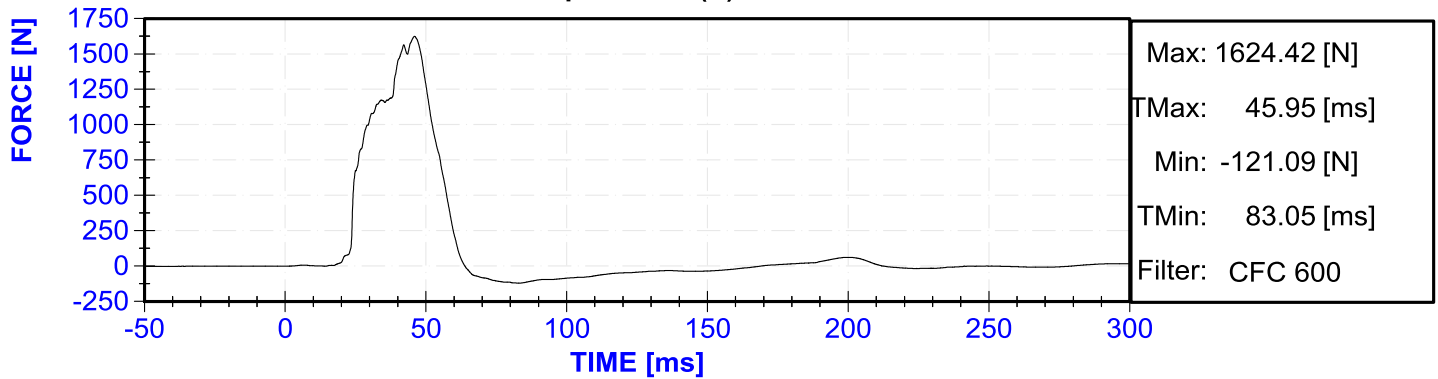
Driver Lower Spine T12 Resultant Acceleration vs. Time



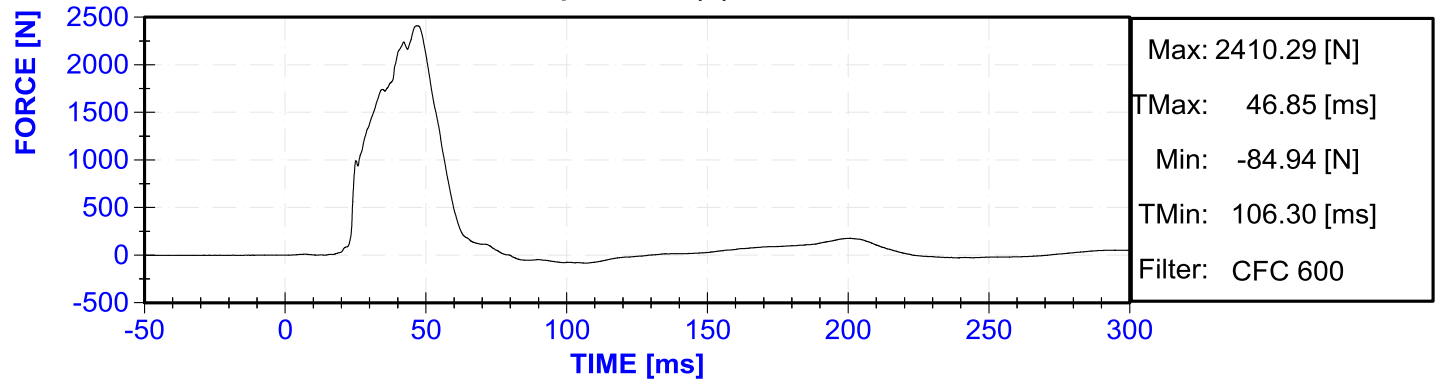
Driver Iliac Wing Force on Impact Side (Y) vs. Time



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



Driver Total Pelvis Force on Impact Side (Y) vs. Time



APPENDIX C

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

SERIAL NO: 303

(CONFIGURED FOR LEFT SIDE IMPACT)

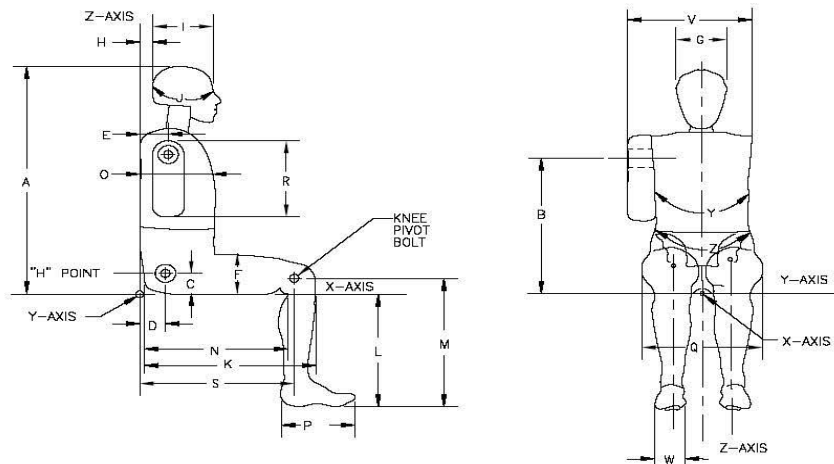


External Measurements - SID-IIs

Technician: M. Geesey

Date: 12/4/2014

Dummy Serial Number: 303



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	781	Pass
B	Shoulder Pivot Height	437	453	445	Pass
C	H-point Height	79	89	87	Pass
D	H-point from seatback	141	151	146	Pass
E	Shoulder Pivot from Backline	97	107	105	Pass
F	Thigh Clearance	119	135	129	Pass
G	Head Breadth	140	148	144	Pass
H	Head Back from Backline	40	46	43	Pass
I	Head Depth	178	188	181	Pass
J	Head Circumference	541	551	546	Pass
K	Buttock to Knee Length	514	540	530	Pass
L	Popliteal Height	343	369	358	Pass
M	Knee Pivot to floor height	392	409	403	Pass
N	Buttock Popliteal Length	416	442	437	Pass
O	Chest Depth w/o jacket	195	211	204	Pass
P	Foot Length	216	232	218	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	316	Pass
R	Arm Length	249	259	253	Pass
S	Knee Joint to seatback	477	493	486	Pass
V	Shoulder Width	341	357	350	Pass
W	Foot Width	78	94	85	Pass
Y	Chest Circumference w/jacket	851	881	870	Pass
Z	Waist Circumference	761	791	770	Pass



VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:			
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Head Drop	Test Date:	12/4/2014
		Test Time:	9:12:34 AM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	21.7 deg C	P
Humidity	10	--	70	18 %RH	P
Resultant Acceleration	115.0	--	137.0	125.8 g	P
Oscillation	0.0	--	15.0	3.3 %	P
Fore-Aft Acceleration	-15.0	--	15.0	2.9 g	P

All test parameters are within specifications

Technician: **M. Geesey**
Supervisor: **M. Goehle**



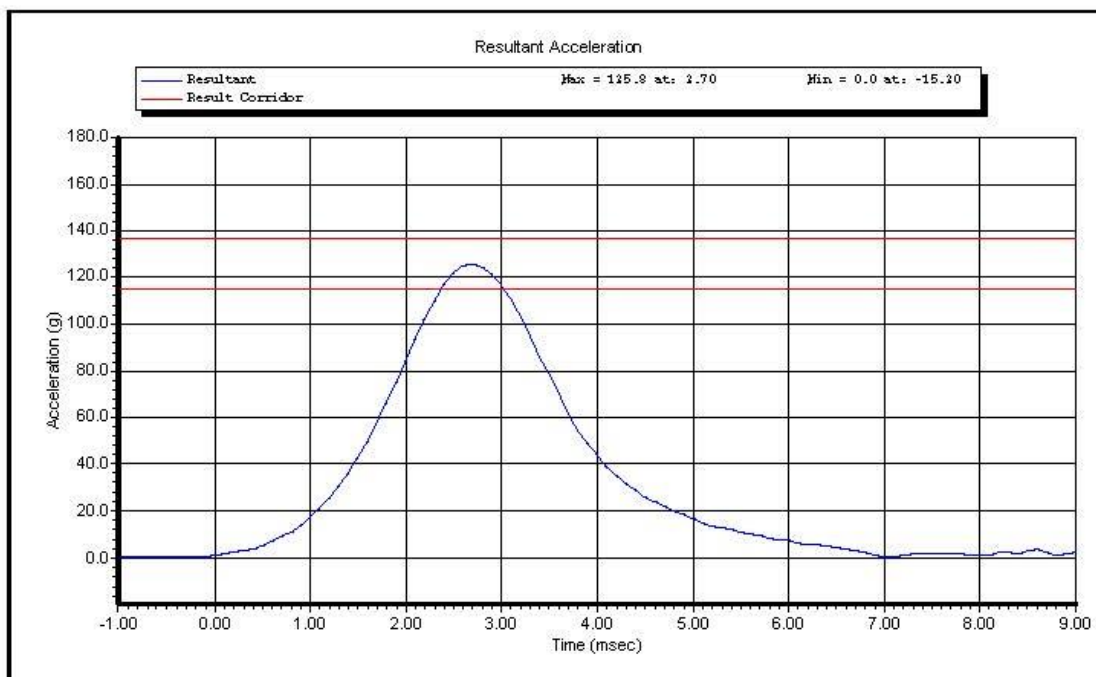
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P52022	10/8/2014
Endevco	7264-2000	P52040	10/8/2014
Endevco	7264-2000	P58737	10/8/2014



Test Name:	Head Drop
Sub Test Name:	
ATD Type:	SID-IIs
ATD Serial Number:	303

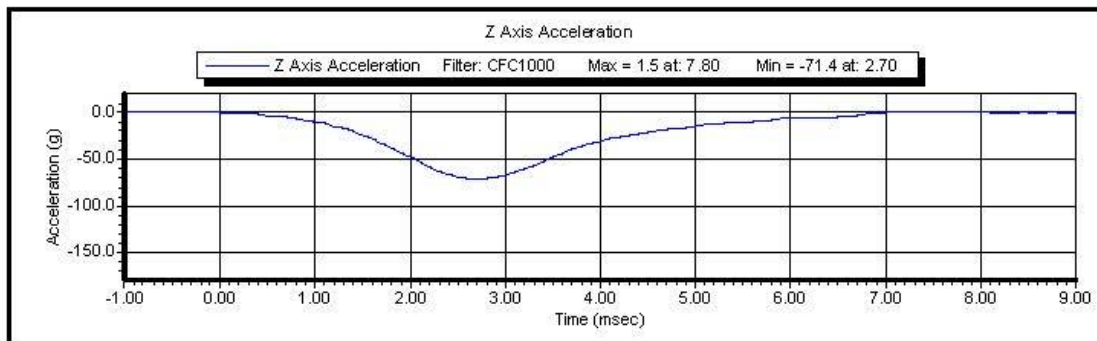
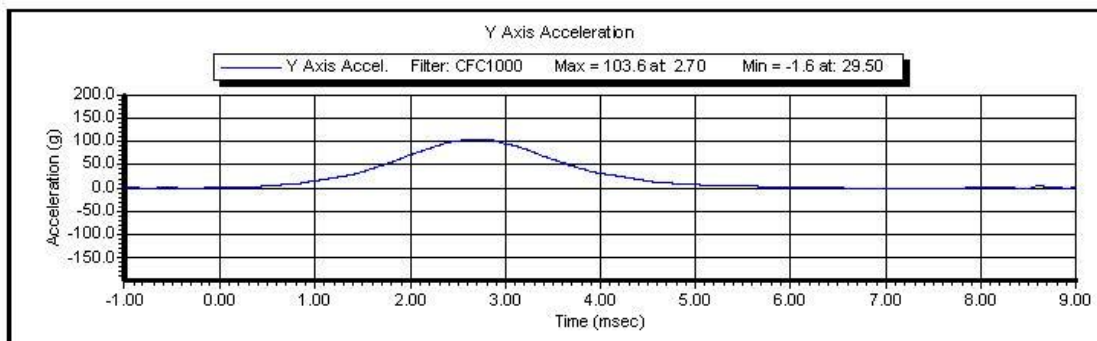
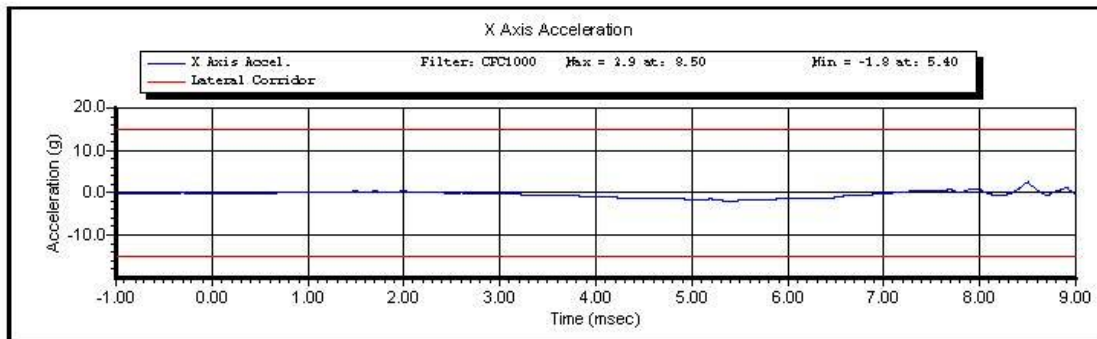


Test ID: **Head Drop**

Test Time: **9:12:34 AM**

Test Date: **12/4/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Head Drop**

Test Time: **9:12:34 AM**

Test Date: **12/4/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side		
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Neck Flexion	Test Date:	12/4/2014
		Test Time:	4:35:07 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.4 deg C P
Humidity	10 -- 70	17.7 %RH P
Velocity	5.51 -- 5.63	5.561 m/s P
Pendulum Impulse at 10 ms	2.2 -- 2.8	2.29 m/s P
Pendulum Impulse at 15 ms	3.3 -- 4.1	3.38 m/s P
Pendulum Impulse at 20 ms	4.4 -- 5.4	4.64 m/s P
Pendulum Impulse at 25 ms	5.4 -- 6.1	5.61 m/s P
Pendulum Impulse between 25 and 100 ms	5.5 -- 6.2	5.87 m/s P
Max D Plane Rotation	71 -- 81	77.9 degrees P
Time at Max Rotation	50 -- 70	61.8 ms P
Moment about OC	36 -- 44	42.5 Nm P
Moment Decay to Zero	102 -- 126	120.2 ms P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



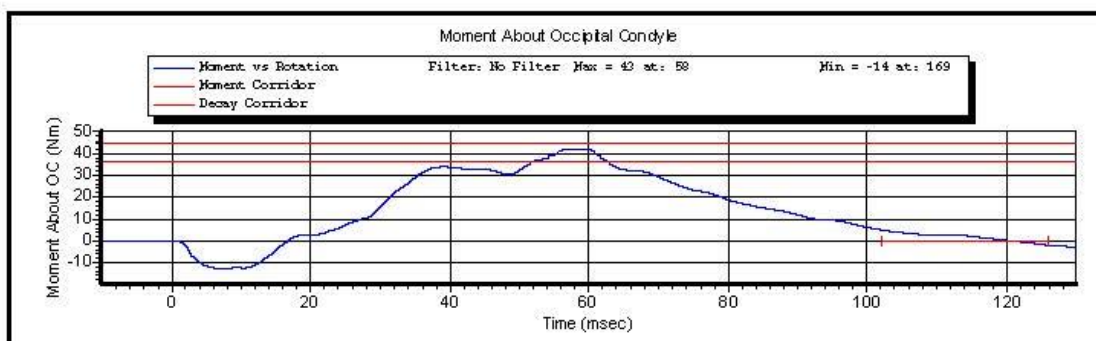
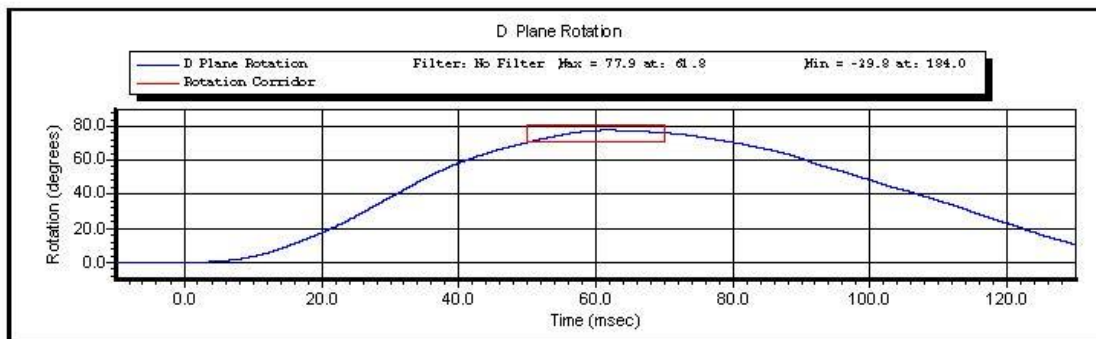
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	11/6/2014
Denton	1716A	LC-2019 Fy	5/19/2014
Denton	1716A	LC-2019 Mx	5/19/2014
DentonATD	78051-342	184	11/13/2014
DentonATD	78051-342	174	11/13/2014
DentonATD	78051-342	185	11/13/2014



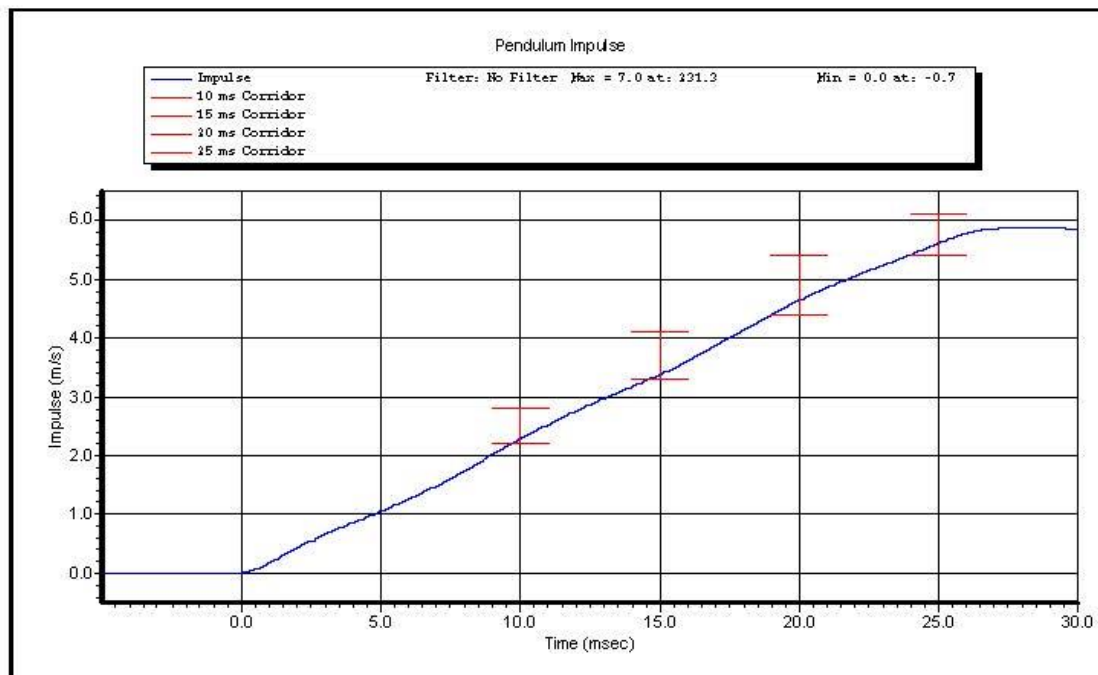
Test Name:	Neck Pendulum
Sub Test Name:	Left Side
ATD Type:	SID-IIs
ATD Serial Number:	303



Test ID: Neck Flexion Test Time: 4:35:07 PM

Test Date: 12/4/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Neck Flexion**

Test Time: **4:35:07 PM**

Test Date: **12/4/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:			
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Shoulder Impact	Test Date:	12/5/2014
		Test Time:	3:00:37 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	20.70 deg C	P
Humidity	10	--	70	23.6 %RH	P
Velocity	4.2	--	4.4	4.31 m/s	P
Probe Acceleration	13	--	18	15.2 g	P
Shoulder Deflection	28	--	37	30.5 mm	P
T1 Acceleration	17	--	22	20.1 g	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



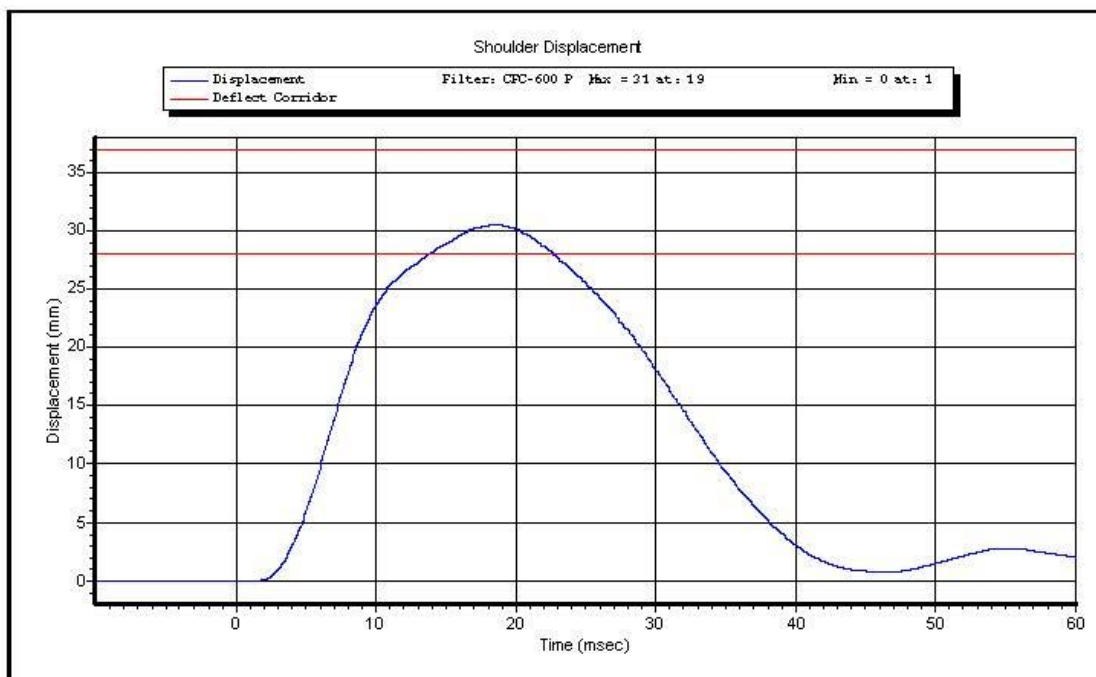
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	7/30/2014
Servo	180-3885	DS-8GFE	12/4/2014
Endevco	7264-2000	P63315	10/9/2014



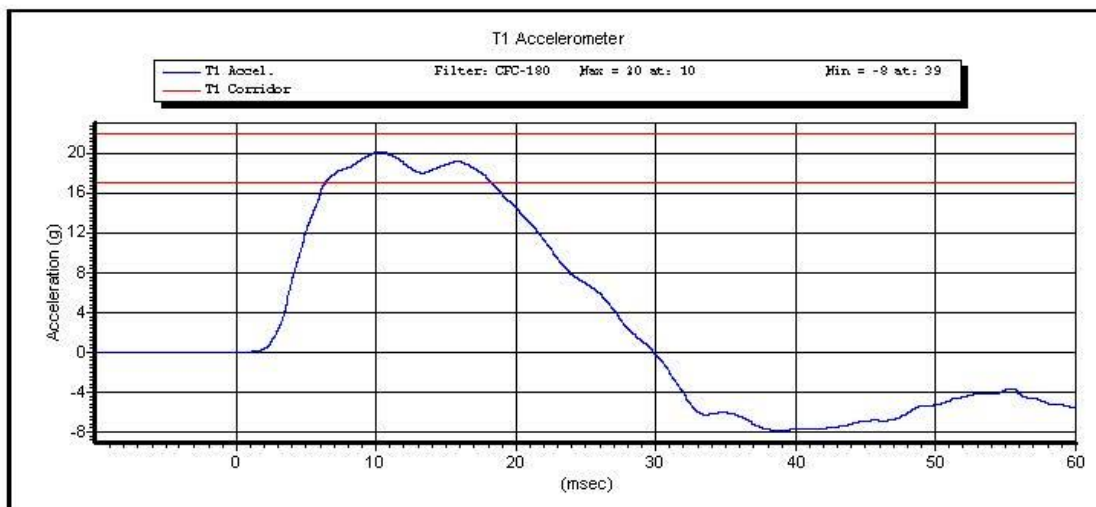
Test Name:	Shoulder Impact
Sub Test Name:	
ATD Type:	SID-IIs
ATD Serial Number:	303



Test ID: **Shoulder Impact** Test Time: **3:00:37 PM**

Test Date: **12/5/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Shoulder Impact** Test Time: **3:00:37 PM**

Test Date: **12/5/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:			
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Thorax With Arm	Test Date:	12/5/2014
		Test Time:	5:39:56 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	20.7 deg C	P
Humidity	10	--	70	25.1 %RH	P
Velocity	6.6	--	6.8	6.63 m/s	P
Probe Acceleration after 5ms	30	--	36	32.4 g	P
Upper Thorax Rib Deflection	25	--	32	28.2 mm	P
Mid Thorax Rib Deflection	30	--	36	32.3 mm	P
Lower Thorax Rib Deflection	32	--	38	33.8 mm	P
Upper Spine Acceleration ("y")	34	--	43	39.6 g	P
Lower Spine Acceleration ("y")	29	--	37	34.1 g	P
Shoulder Deflection	31	--	40	37.6 mm	P

All test parameters are within specifications

Technician: **M. Goehle**
Supervisor: **M. Goehle**



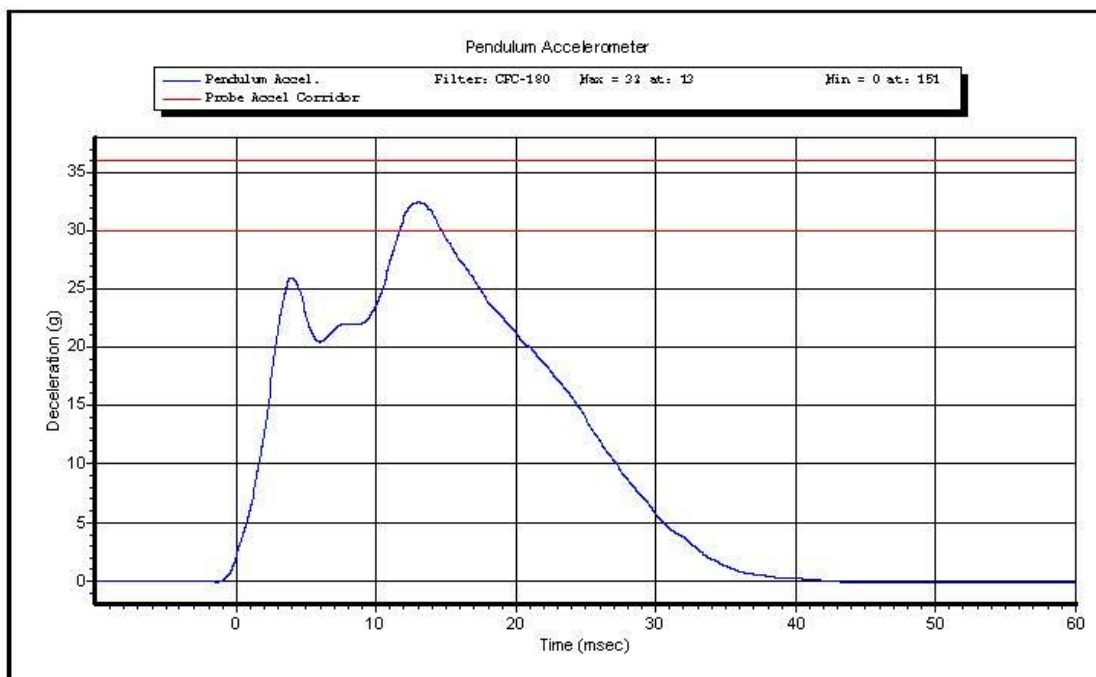
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	7/30/2014
Servo	180-3885	DS-1199GFE	8/6/2014
Servo	180-3885	DS-1246GFE	8/6/2014
Servo	180-3885	DS-1256GFE	8/6/2014
Endevco	7264-2000	P63315	10/9/2014
Endevco	7264-2000	P51974	10/9/2014
Servo	180-3885	DS-8GFE	12/4/2014



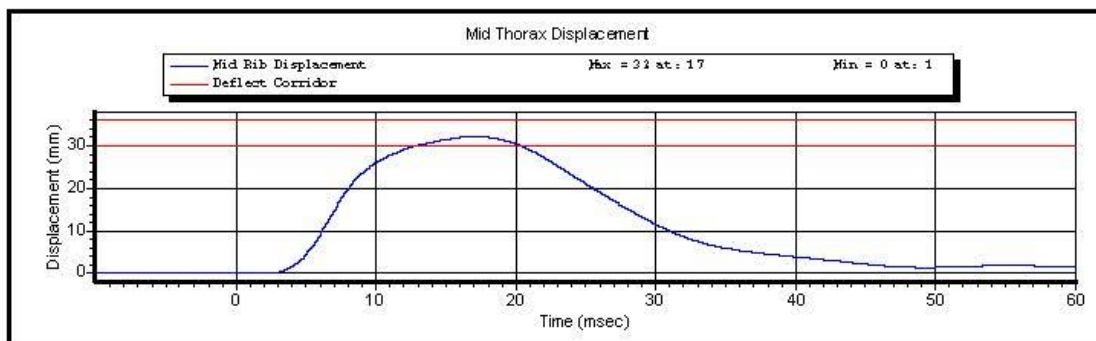
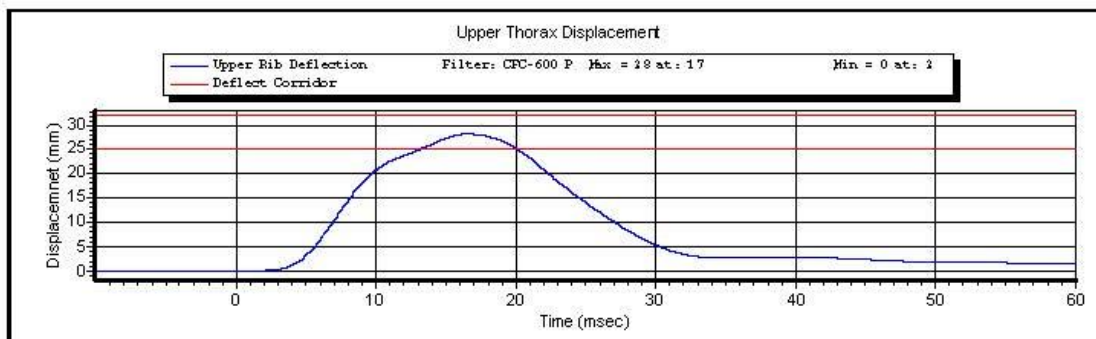
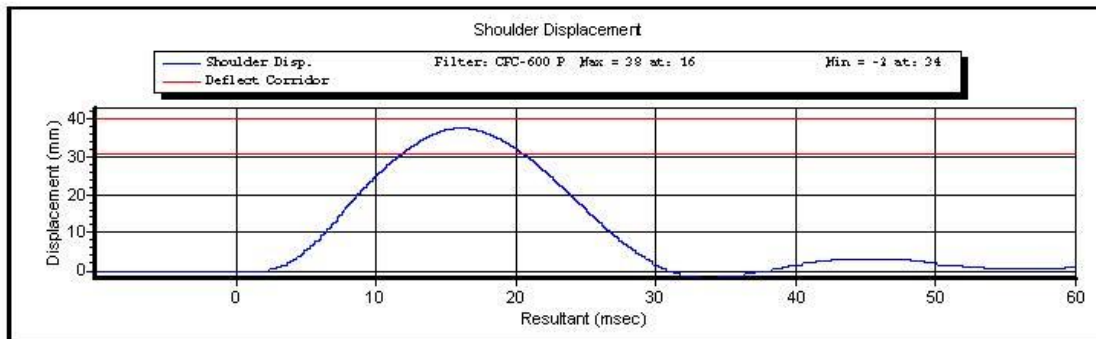
Test Name:	Thorax Impact with Arm
Sub Test Name:	
ATD Type:	SID-IIs
ATD Serial Number:	303



Test ID: **Thorax With Arm** Test Time: **5:39:56 PM**

Test Date: **12/5/2014**

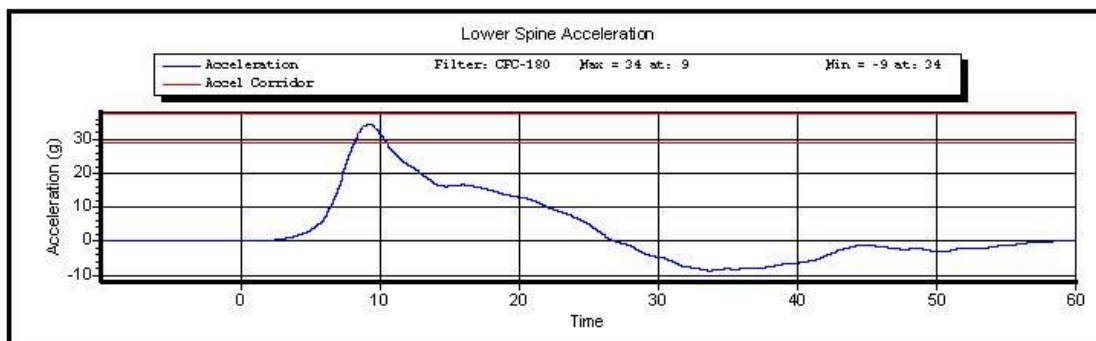
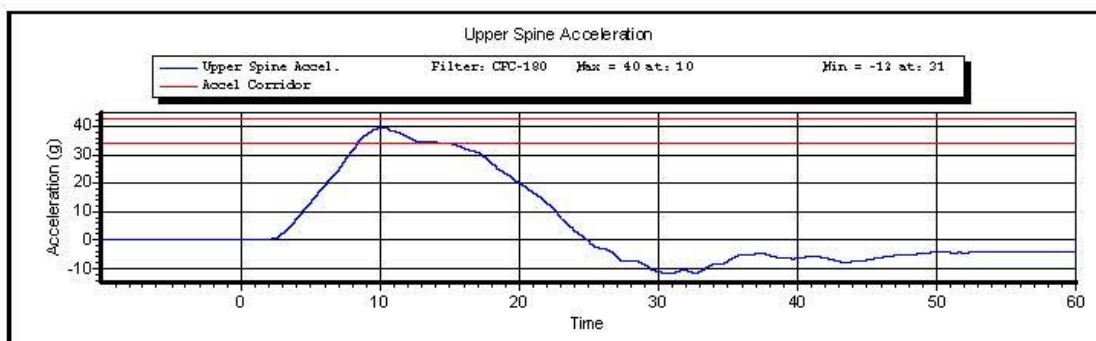
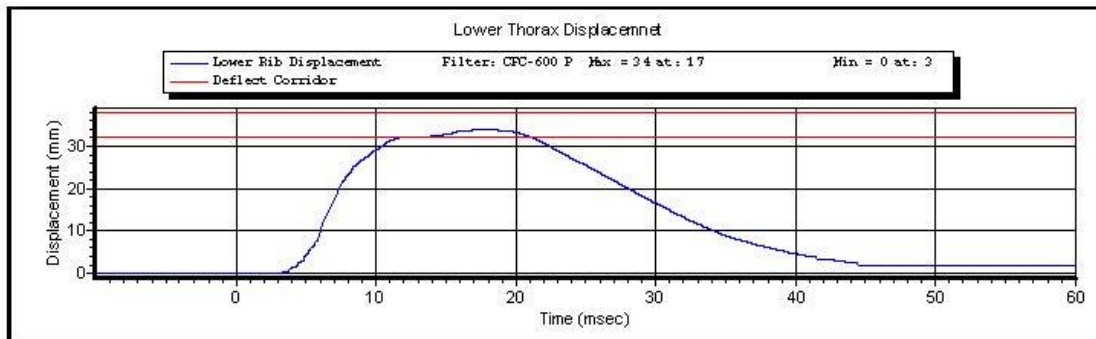
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Test ID: Thorax With Arm Test Time: 5:39:56 PM

Test Date: 12/5/2014

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Test ID: Thorax With Arm Test Time: 5:39:56 PM

Test Date: 12/5/2014

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VERIFICATION REPORT

Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:			
ATD Type:	SID-11s		
ATD Serial Number:	303		
Test ID:	Thorax w/o Arm	Test Date:	12/4/2014
		Test Time:	1:56:57 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	21.1 deg C	P
Humidity	10	--	70	17.9 %RH	P
Velocity	4.2	--	4.4	4.31 m/s	P
Probe Acceleration	14	--	18	16.3 g	P
Upper Thorax Rib Deflection	32	--	40	36.6 mm	P
Mid Thorax Rib Deflection	39	--	45	41.7 mm	P
Lower Thorax Rib Deflection	35	--	43	38.3 mm	P
Upper Spine Acceleration T1	13	--	17	16.9 g	P
Lower Spine Acceleration T12	7	--	11	10.3 g	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



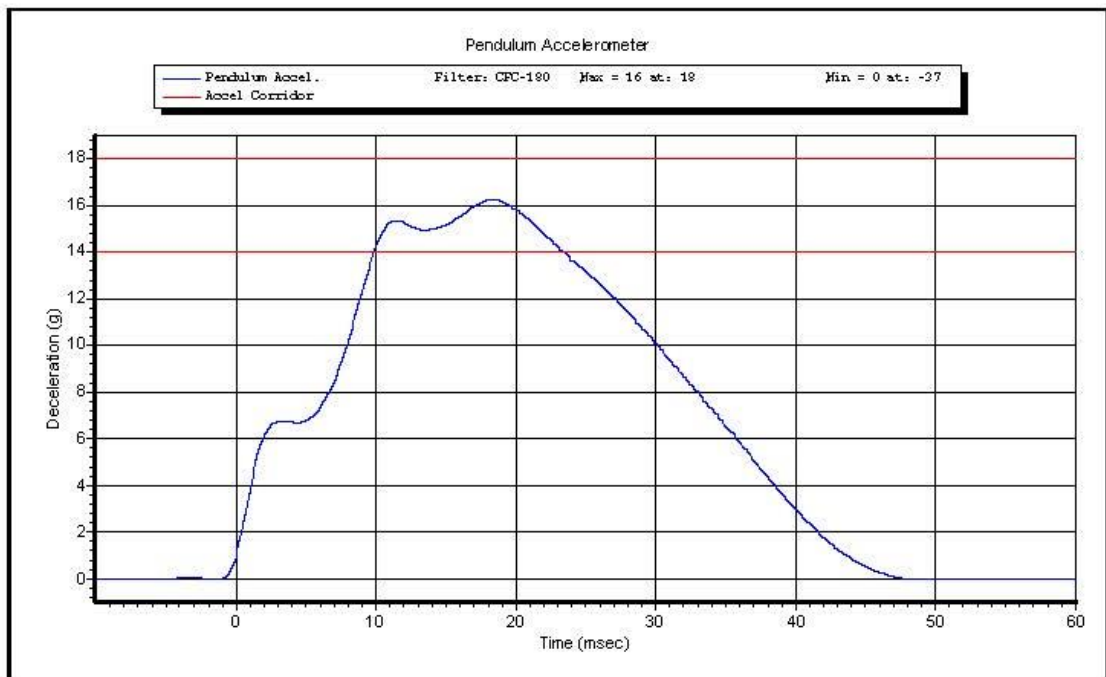
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	7/30/2014
Servo	180-3885	DS-1199GFE	8/6/2014
Servo	180-3885	DS-1246GFE	8/6/2014
Servo	180-3885	DS-1256GFE	8/6/2014
Endevco	7264-2000	P63315	10/9/2014
Endevco	7264-2000	P51974	10/9/2014



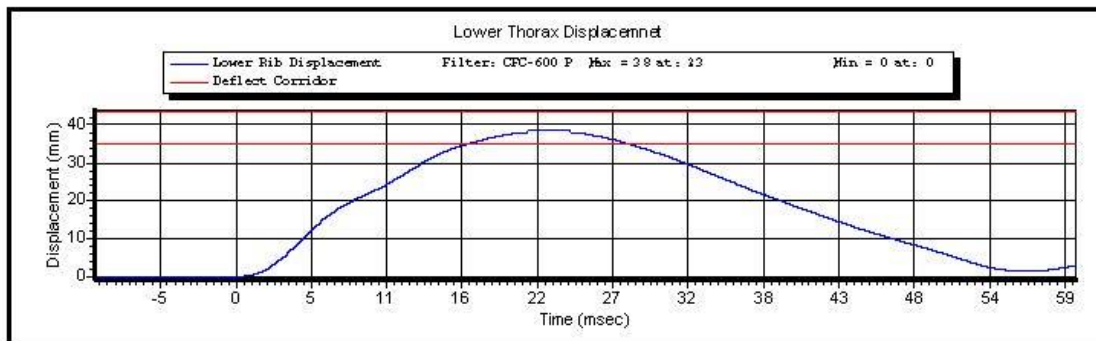
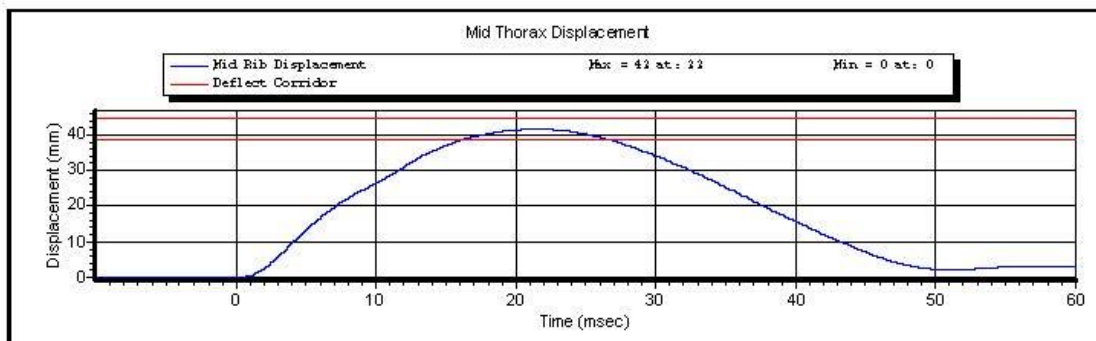
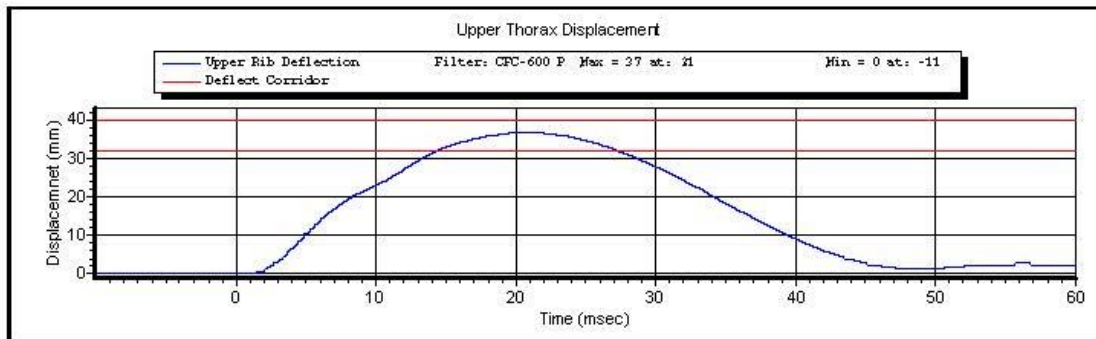
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Sub Test Name:	
ATD Type:	SID-IIs
ATD Serial Number:	303



Test ID: Thorax w/o Arm Test Time: 1:56:57 PM

Test Date: 12/4/2014

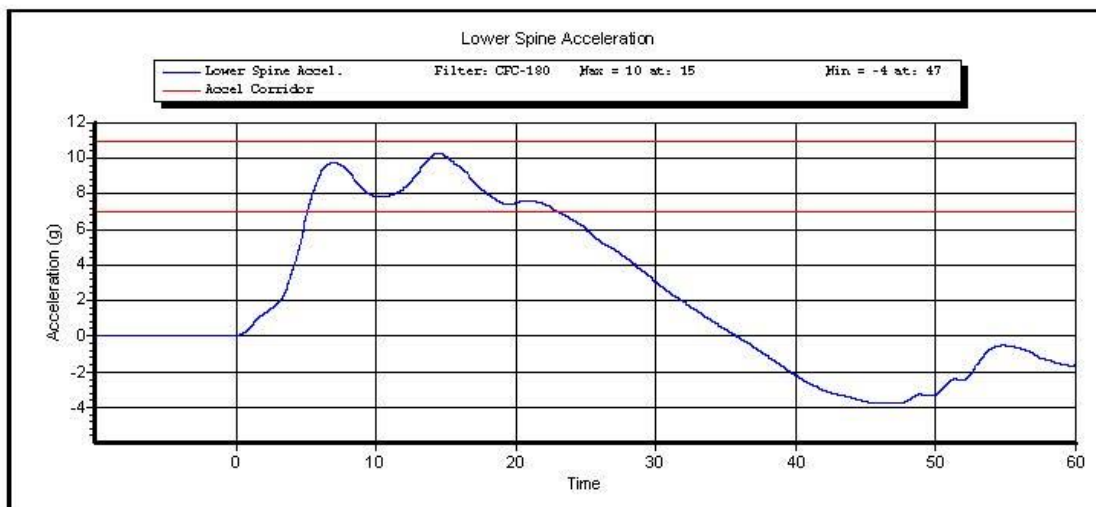
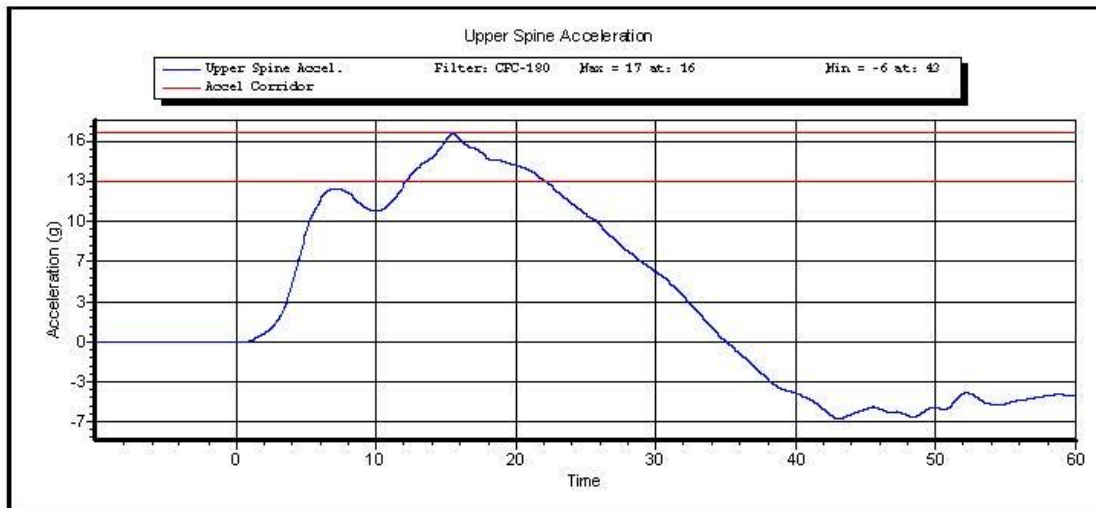
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: Thorax w/o Arm Test Time: 1:56:57 PM

Test Date: 12/4/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Thorax w/o Arm** Test Time: **1:56:57 PM**

Test Date: **12/4/2014**

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VERIFICATION REPORT

Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:			
ATD Type:	SID-11s		
ATD Serial Number:	303		
Test ID:	Abdomen Impact	Test Date:	12/4/2014
		Test Time:	1:30:01 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	21.30 deg C	P
Humidity	10	--	70	18.10 %RH	P
Velocity	4.2	--	4.4	4.31 m/s	P
Probe Deceleration	12	--	16	15.3 G's	P
Upper Abdominal Rib Deflection	36	--	47	36.1 mm	P
Lower Abdominal Rib Deflection	33	--	44	35.5 mm	P
Lower Spine Acceleration - T12	9	--	14	11.8 G's	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



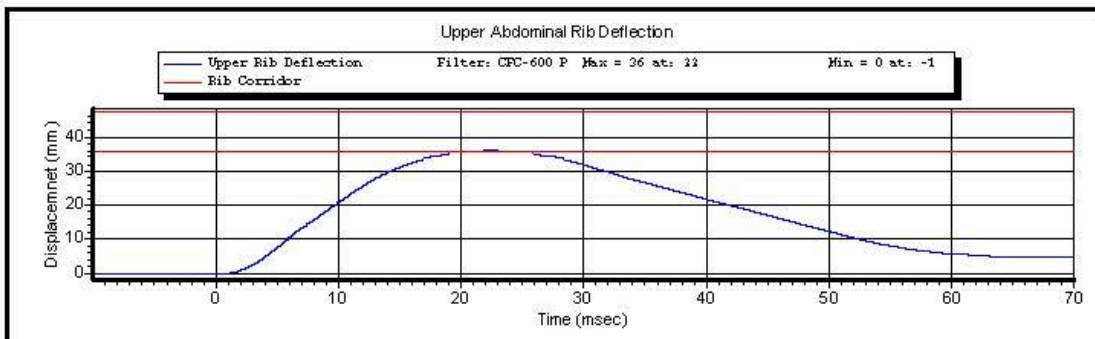
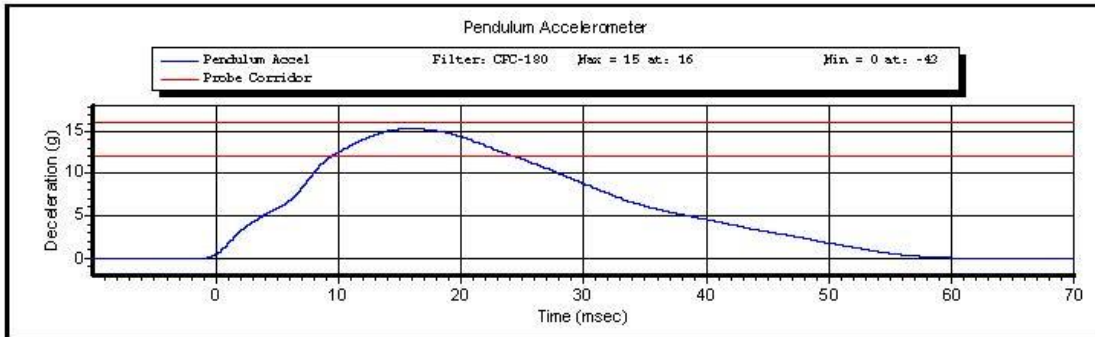
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	7/30/2014
Servo	180-3885	DS-1274GFE	8/6/2014
Servo	180-3885	DS-1285GFE	8/6/2014
Endevco	7264-2000	P51974	10/9/2014



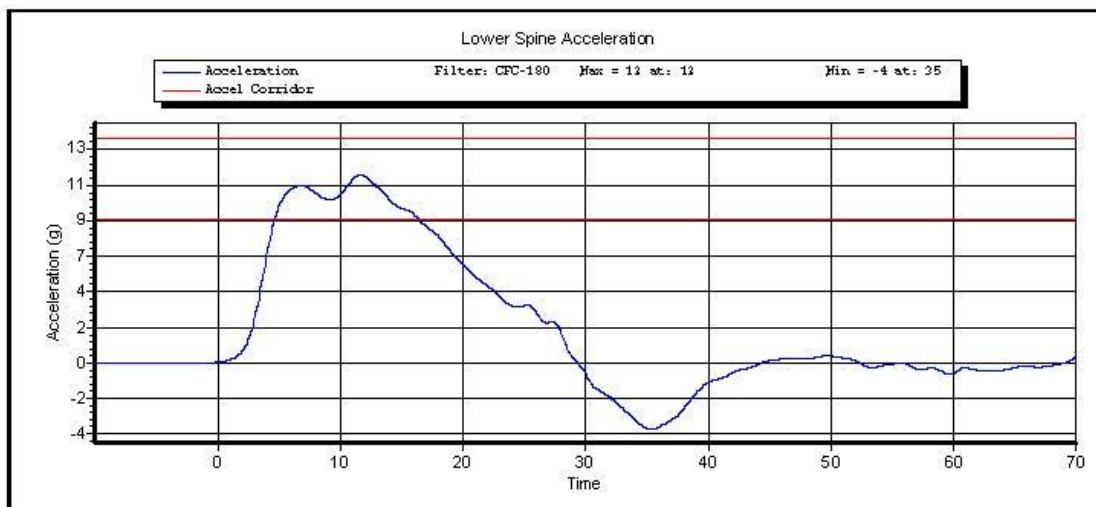
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Sub Test Name:	
ATD Type:	SID-IIs
ATD Serial Number:	303



Test ID: **Abdomen Impact** Test Time: **1:30:01 PM**

Test Date: **12/4/2014**

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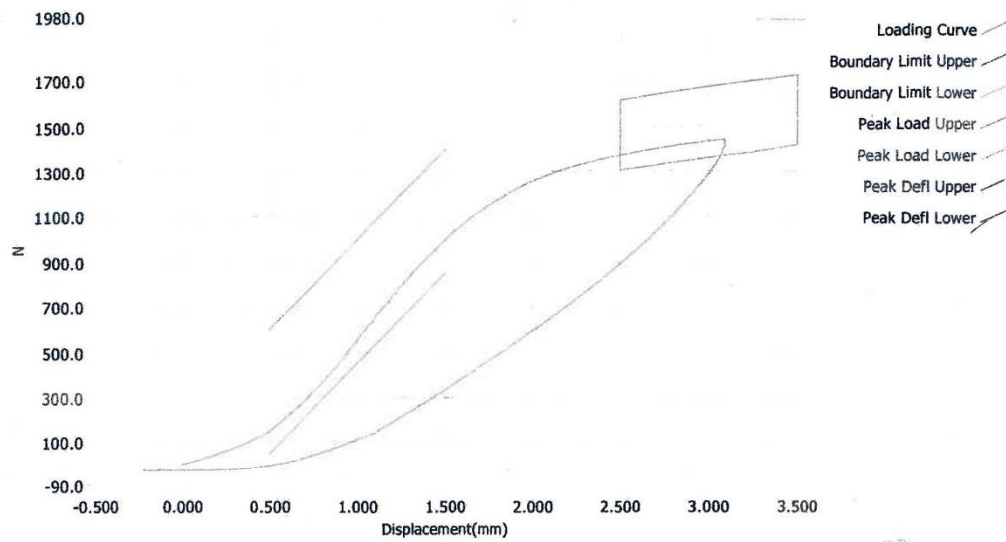


Test ID: **Abdomen Impact** Test Time: **1:30:01 PM**

Test Date: **12/4/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Resultant Data - SIDIIs Plug Compression **CERTIFICATION**



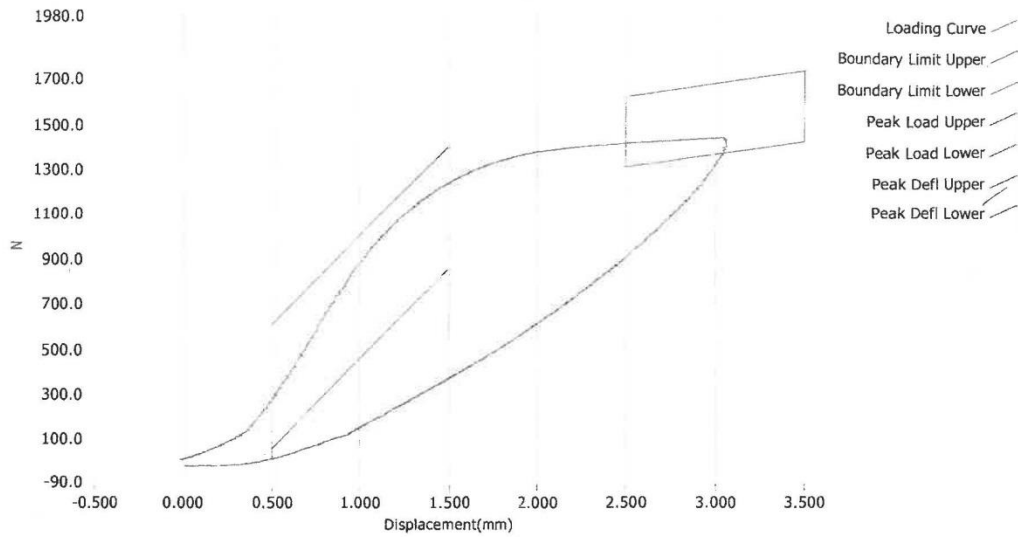
ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
	46084	9/21/2011	12:34 AM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

Current Date : 9/21/2011

Current Time : 00:34:43

Resultant Data - SIDIIs Plug Compression *CRASH*



ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
		9/22/2010	11:08 AM
Cert ID	ATD Serial Number	ATD Type	
	36283	SIDIIs	

Current Date : 9/22/2010

Current Time : 11:10:07



VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact		
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Acetabulum Impact	Test Date:	12/4/2014
		Test Time:	11:04:10 AM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	20.6 deg C	P
Humidity	10	--	70	19.5 %RH	P
Velocity	6.6	--	6.8	6.64 m/s	P
Peak Probe Acceleration	38	--	47	44.6 g	P
Peak Pelvis Acceleration	34	--	42	40.6 g	P
Peak Acetabulum Force	3.6	--	4.3	3.99 kN	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



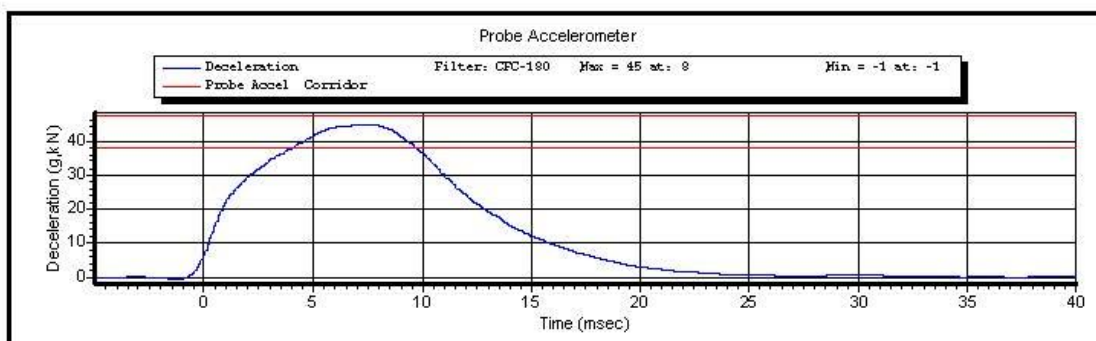
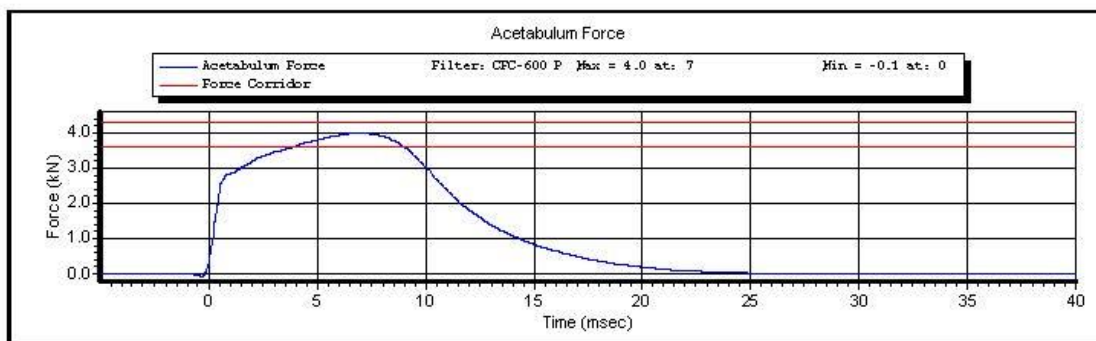
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	7/30/2014
Endevco	7264-2000	P51259	7/7/2014
FTSS	IF-520	LC-236Fy	5/13/2014



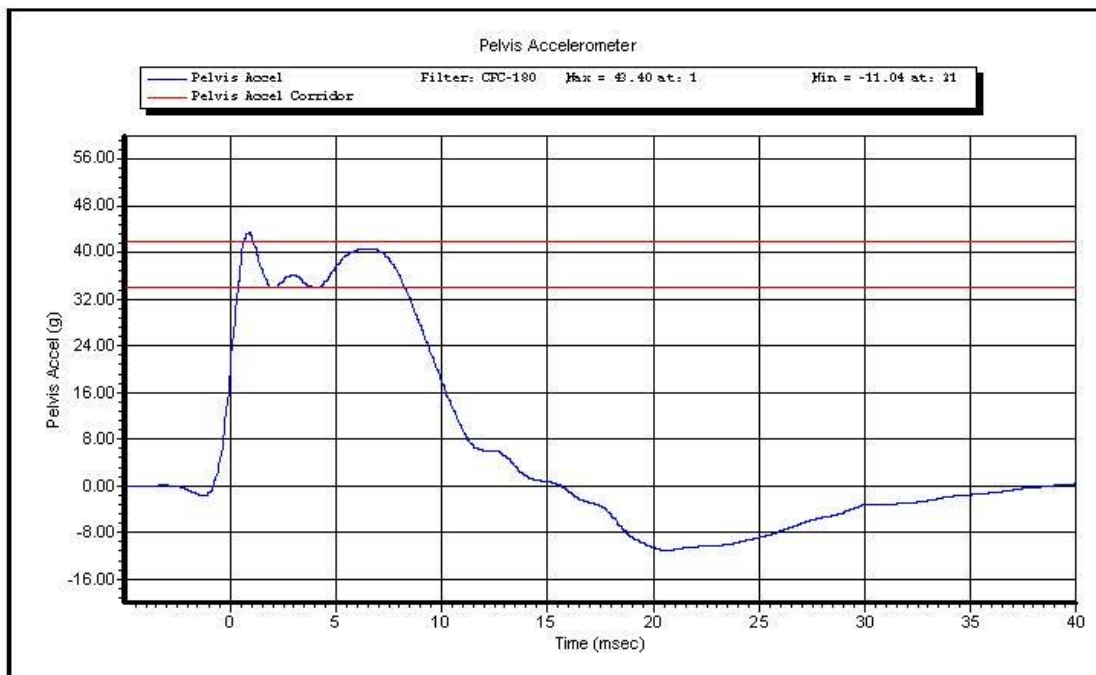
Test Name:	Pelvis
Sub Test Name:	Acetabulum Impact
ATD Type:	SID-IIs
ATD Serial Number:	303



Test ID: **Acetabulum Impact** Test Time: **11:04:10 AM**

Test Date: **12/4/2014**

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Test ID: **Acetabulum Impact** Test Time: **11:04:10 AM**

Test Date: **12/4/2014**

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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact		
ATD Type:	SID-Ils		
ATD Serial Number:	303		
Test ID:	Pelvis Iliac Impact	Test Date:	12/4/2014
		Test Time:	3:24:42 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	21.1 deg C	P
Humidity	10	--	70	18.2 %RH	P
Velocity	4.2	--	4.4	4.36 m/s	P
Peak Probe Acceleration	36	--	45	40.5 g	P
Peak Pelvis Acceleration	28	--	39	33.2 g	P
Peak Iliac Force	4.1	--	5.1	4.42 kN	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



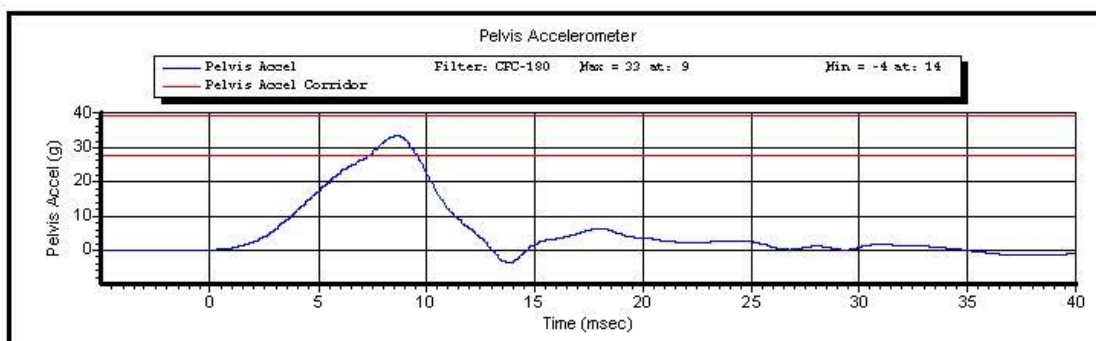
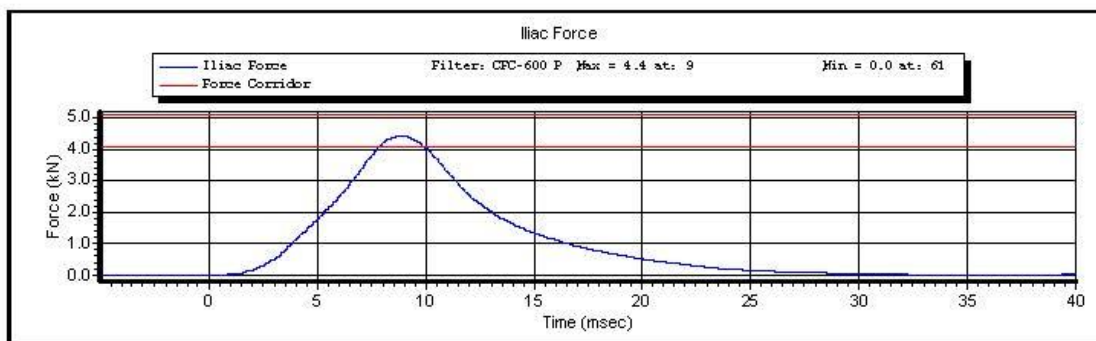
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	7/30/2014
Endevco	7264-2000	P51259	7/7/2014
DentonATD	3228J	LC-280 Fy	5/14/2014



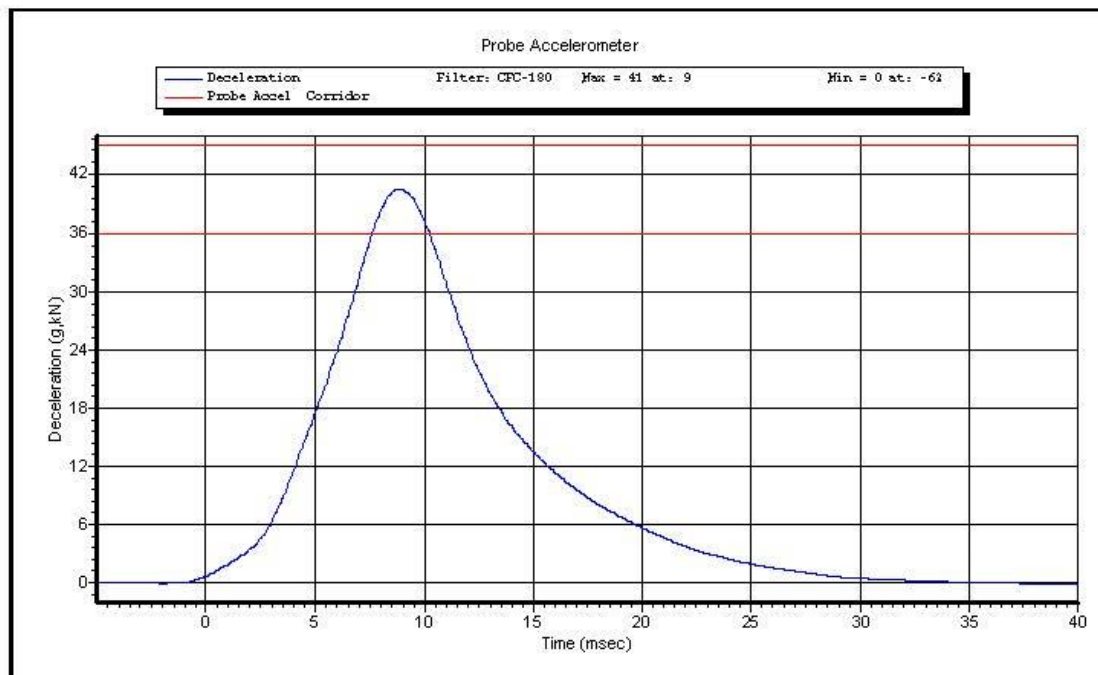
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Sub Test Name:	Iliac Impact
ATD Type:	SID-IIs
ATD Serial Number:	303



Test ID: Pelvis Iliac Impact Test Time: 3:24:42 PM

Test Date: 12/4/2014

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Test ID: **Pelvis Iliac Impact** Test Time: **3:24:42 PM**

Test Date: **12/4/2014**

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CALIBRATION TEST RESULTS

POST-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

SERIAL NO: 303

(CONFIGURED FOR LEFT SIDE IMPACT)

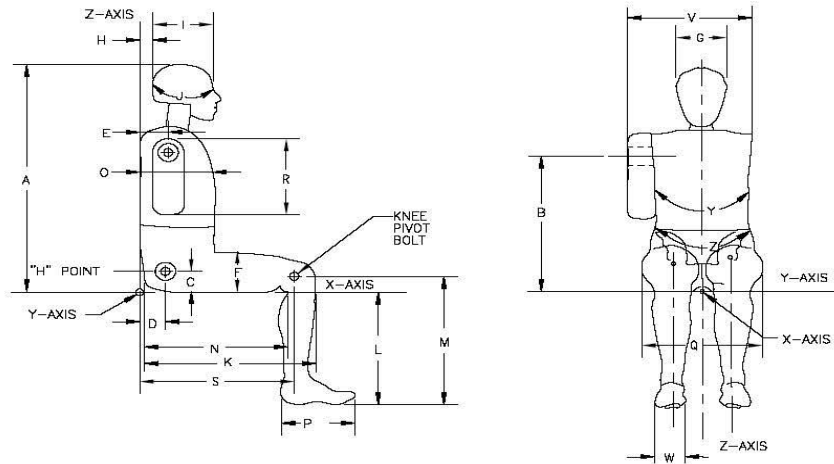


External Measurements - SID-IIs

Technician: M. Geesey

Date: 12/10/2014

Dummy Serial Number: 303



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	781	Pass
B	Shoulder Pivot Height	437	453	446	Pass
C	H-point Height	79	89	87	Pass
D	H-point from seatback	141	151	146	Pass
E	Shoulder Pivot from Backline	97	107	104	Pass
F	Thigh Clearance	119	135	129	Pass
G	Head Breadth	140	148	144	Pass
H	Head Back from Backline	40	46	43	Pass
I	Head Depth	178	188	181	Pass
J	Head Circumference	541	551	546	Pass
K	Buttock to Knee Length	514	540	530	Pass
L	Popliteal Height	343	369	358	Pass
M	Knee Pivot to floor height	392	409	404	Pass
N	Buttock Popliteal Length	416	442	438	Pass
O	Chest Depth w/o jacket	195	211	203	Pass
P	Foot Length	216	232	220	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	316	Pass
R	Arm Length	249	259	253	Pass
S	Knee Joint to seatback	477	493	486	Pass
V	Shoulder Width	341	357	351	Pass
W	Foot Width	78	94	84	Pass
Y	Chest Circumference w/jacket	851	881	870	Pass
Z	Waist Circumference	761	791	770	Pass



VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:			
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Head Drop	Test Date:	12/10/2014
		Test Time:	9:54:39 AM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	21.5 deg C	P
Humidity	10	--	70	23 %RH	P
Resultant Acceleration	115.0	--	137.0	127.4 g	P
Oscillation	0.0	--	15.0	2.1 %	P
Fore-Aft Acceleration	-15.0	--	15.0	-8.5 g	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



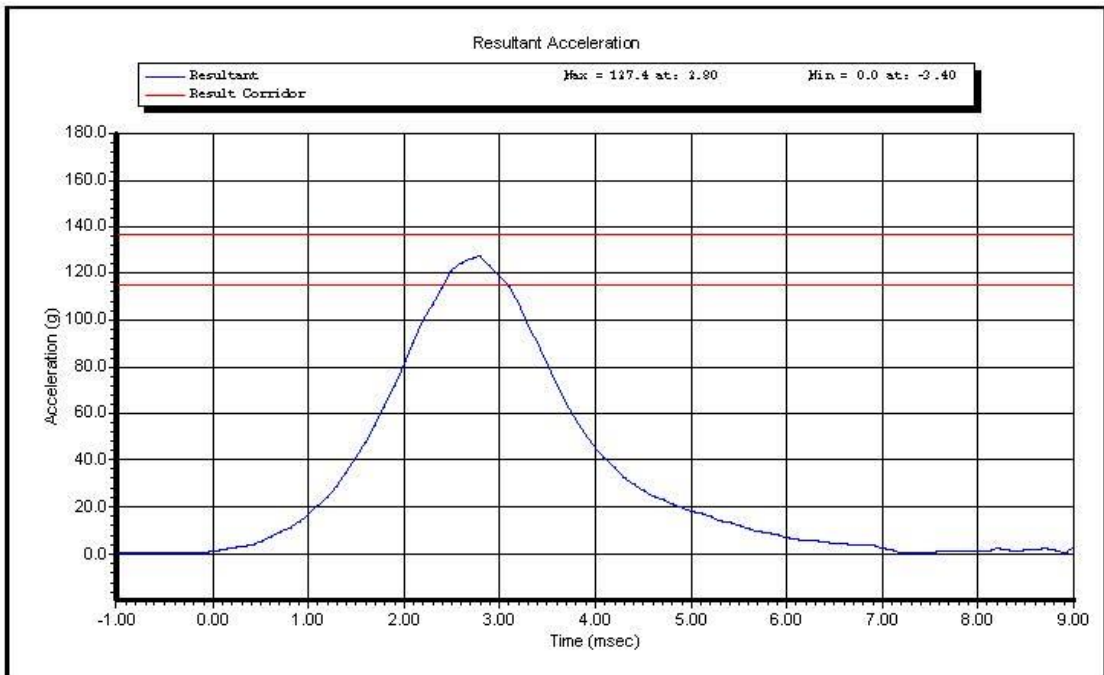
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P52022	10/8/2014
Endevco	7264-2000	P52040	10/8/2014
Endevco	7264-2000	P58737	10/8/2014



Test Name:	Head Drop
Sub Test Name:	
ATD Type:	SID-IIs
ATD Serial Number:	303

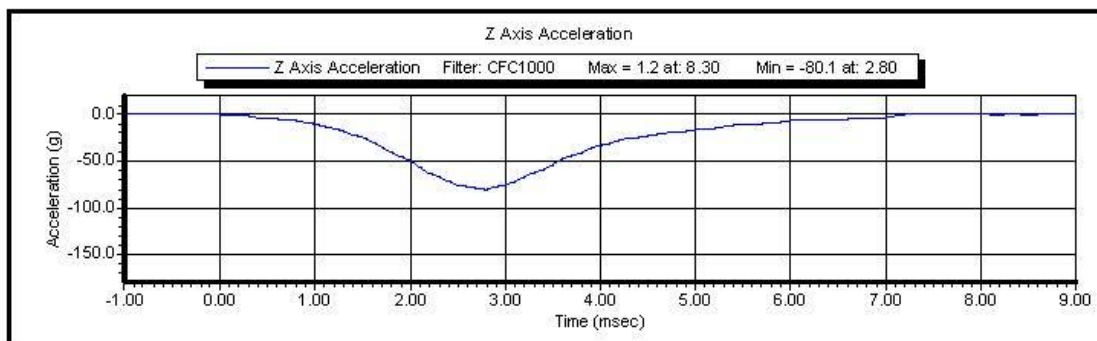
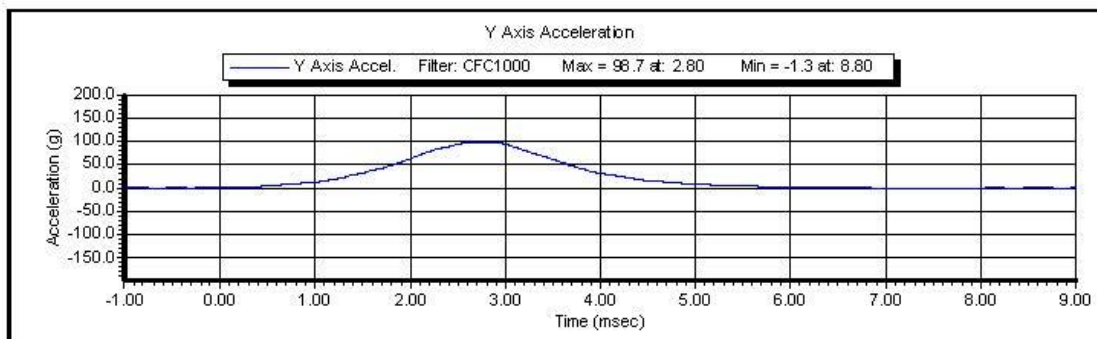
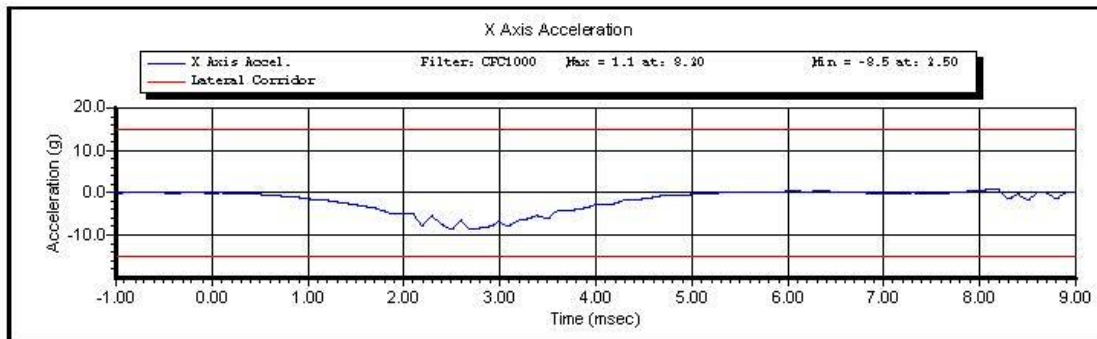


Test ID: **Head Drop**

Test Time: **9:54:39 AM**

Test Date: **12/10/2014**

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Test ID: **Head Drop**

Test Time: **9:54:39 AM**

Test Date: **12/10/2014**

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VERIFICATION REPORT

Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side		
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Neck Flexion	Test Date:	12/10/2014
		Test Time:	10:54:39 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.6 deg C P
Humidity	10 -- 70	22.6 %RH P
Velocity	5.51 -- 5.63	5.557 m/s P
Pendulum Impulse at 10 ms	2.2 -- 2.8	2.32 m/s P
Pendulum Impulse at 15 ms	3.3 -- 4.1	3.46 m/s P
Pendulum Impulse at 20 ms	4.4 -- 5.4	4.69 m/s P
Pendulum Impulse at 25 ms	5.4 -- 6.1	5.67 m/s P
Pendulum Impulse between 25 and 100 ms	5.5 -- 6.2	5.88 m/s P
Max D Plane Rotation	71 -- 81	77.4 degrees P
Time at Max Rotation	50 -- 70	64.0 ms P
Moment about OC	36 -- 44	42.9 Nm P
Moment Decay to Zero	102 -- 126	118.0 ms P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



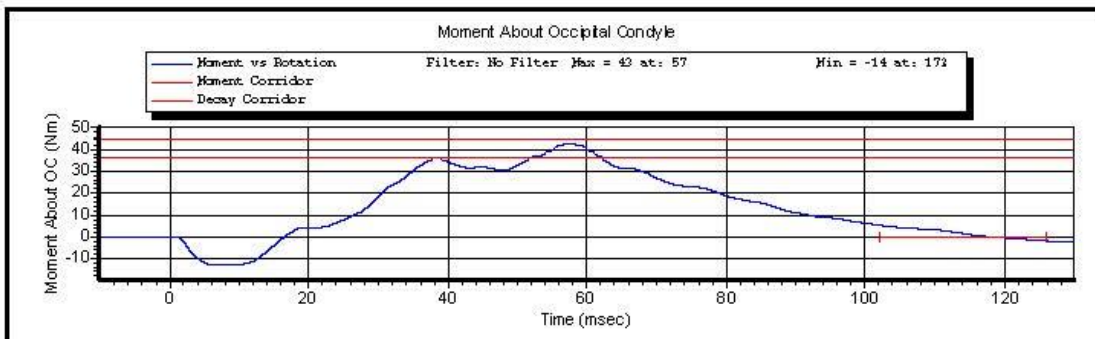
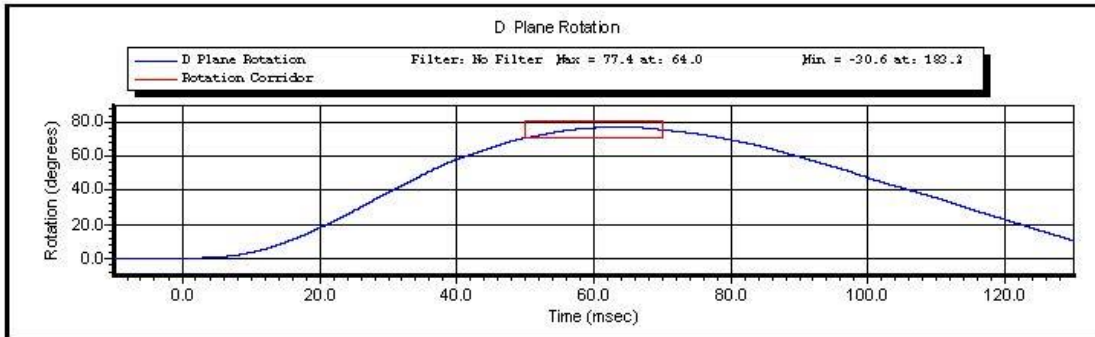
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	11/6/2014
Denton	1716A	LC-2019 Fy	5/19/2014
Denton	1716A	LC-2019 Mx	5/19/2014
DentonATD	78051-342	184	11/13/2014
DentonATD	78051-342	174	11/13/2014
DentonATD	78051-342	185	11/13/2014

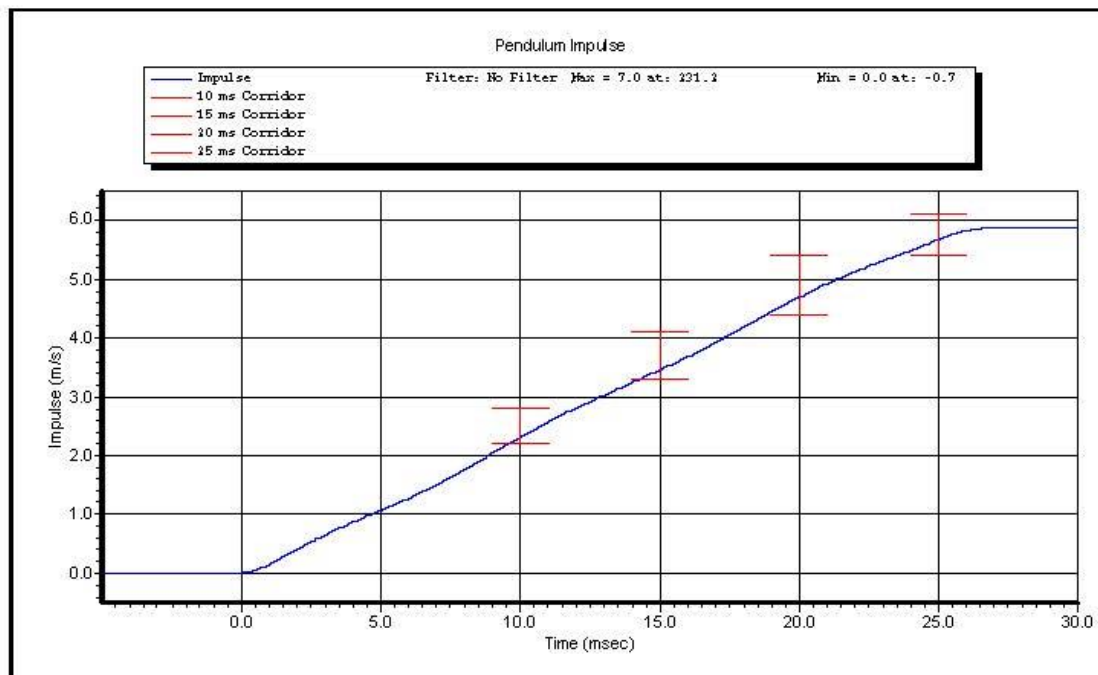


Test Name:	Neck Pendulum
Sub Test Name:	Left Side
ATD Type:	SID-IIs
ATD Serial Number:	303



Test ID: Neck Flexion Test Time: 10:54:39 AM Test Date: 12/10/2014

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Test ID: **Neck Flexion**

Test Time: **10:54:39 AM**

Test Date: **12/10/2014**

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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:			
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Shoulder Impact	Test Date:	12/11/2014
		Test Time:	11:43:01 AM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	21.30 deg C	P
Humidity	10	--	70	20.7 %RH	P
Velocity	4.2	--	4.4	4.31 m/s	P
Probe Acceleration	13	--	18	15.6 g	P
Shoulder Deflection	28	--	37	31.3 mm	P
T1 Acceleration	17	--	22	20.4 g	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



VERIFICATION REPORT

REFERENCE EQUIPMENT

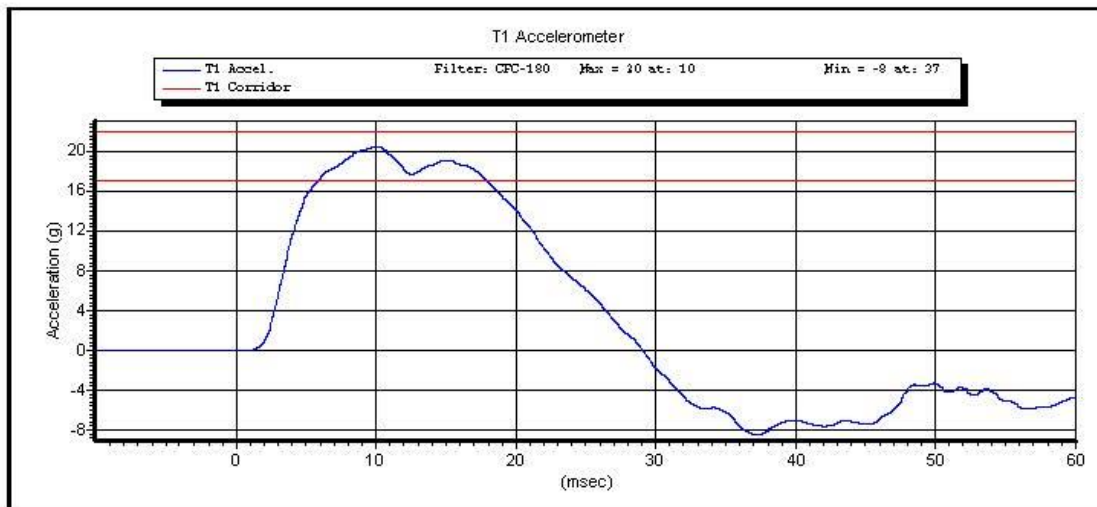
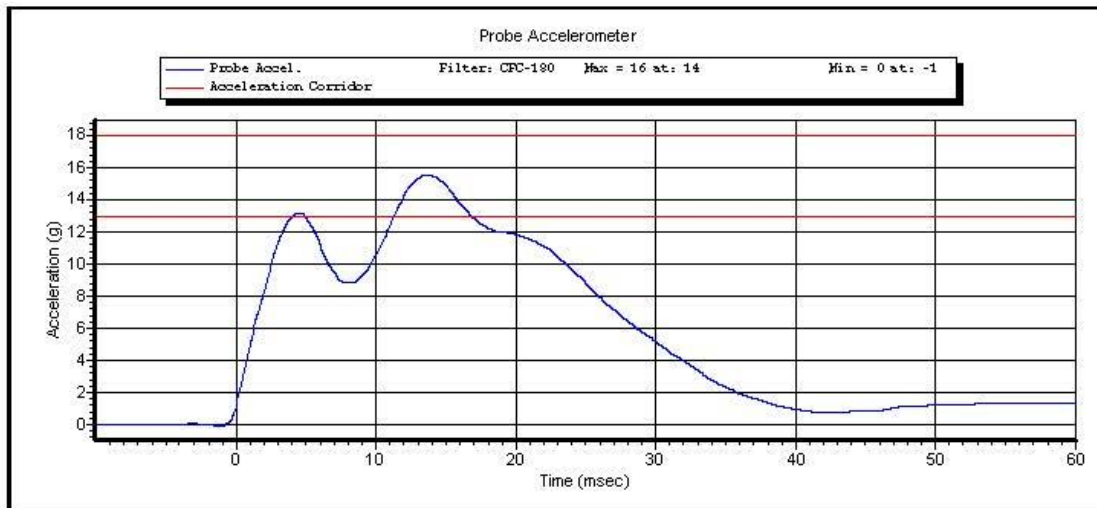
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	7/30/2014
Servo	180-3885	DS-8GFE	12/4/2014
Endevco	7264-2000	P63315	10/9/2014



Test Name:	Shoulder Impact
Sub Test Name:	
ATD Type:	SID-IIs
ATD Serial Number:	303



Test ID: **Shoulder Impact** Test Time: **11:43:01 AM** Test Date: **12/11/2014**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Shoulder Impact** Test Time: **11:43:01 AM**

Test Date: **12/11/2014**

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VERIFICATION REPORT

Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:			
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Thorax w/Arm Impact	Test Date:	12/11/2014
		Test Time:	1:15:32 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	20.8 deg C	P
Humidity	10	--	70	20.9 %RH	P
Velocity	6.6	--	6.8	6.69 m/s	P
Probe Acceleration after 5ms	30	--	36	34.2 g	P
Upper Thorax Rib Deflection	25	--	32	27.5 mm	P
Mid Thorax Rib Deflection	30	--	36	31.0 mm	P
Lower Thorax Rib Deflection	32	--	38	32.4 mm	P
Upper Spine Acceleration ("y")	34	--	43	42.5 g	P
Lower Spine Acceleration ("y")	29	--	37	36.3 g	P
Shoulder Deflection	31	--	40	36.5 mm	P

All test parameters are within specifications

Technician: **M. Geesey**
Supervisor: **M. Goehle**



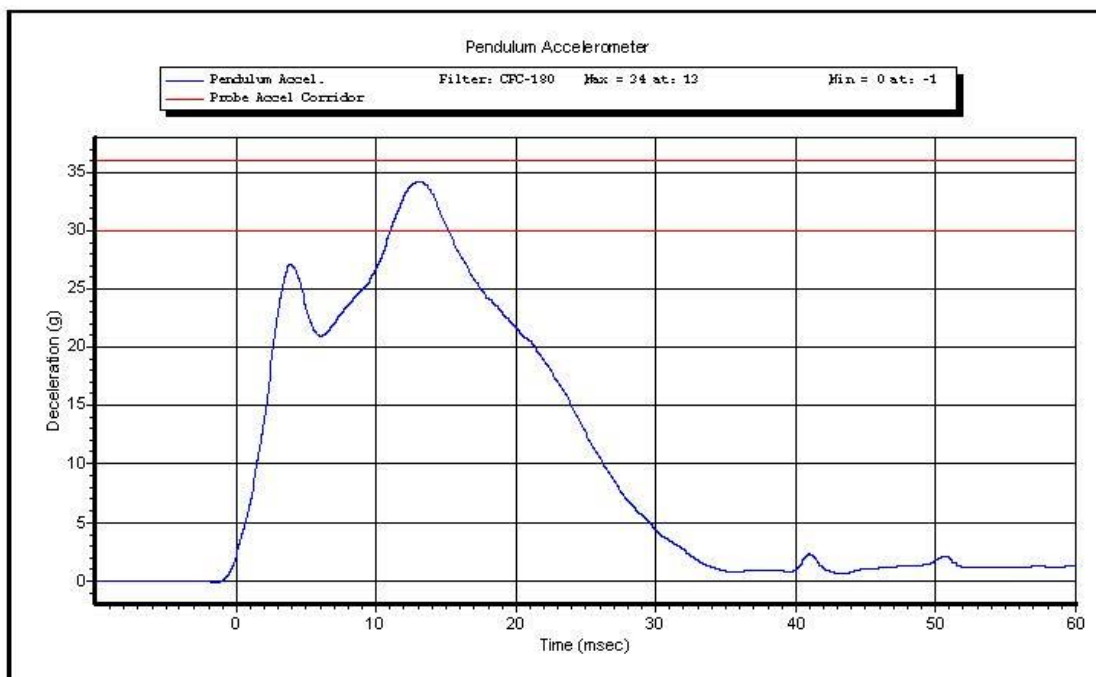
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	7/30/2014
Servo	180-3885	DS-1199GFE	8/6/2014
Servo	180-3885	DS-1246GFE	8/6/2014
Servo	180-3885	DS-1256GFE	8/6/2014
Endevco	7264-2000	P63315	10/9/2014
Endevco	7264-2000	P51974	10/9/2014
Servo	180-3885	DS-8GFE	12/4/2014



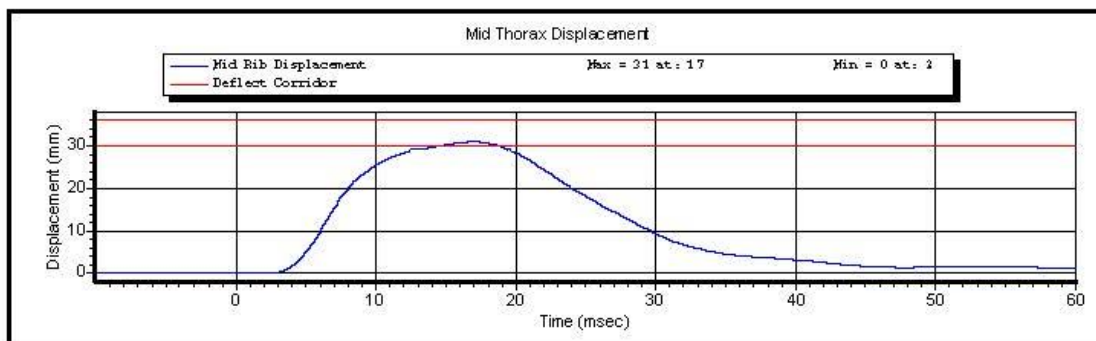
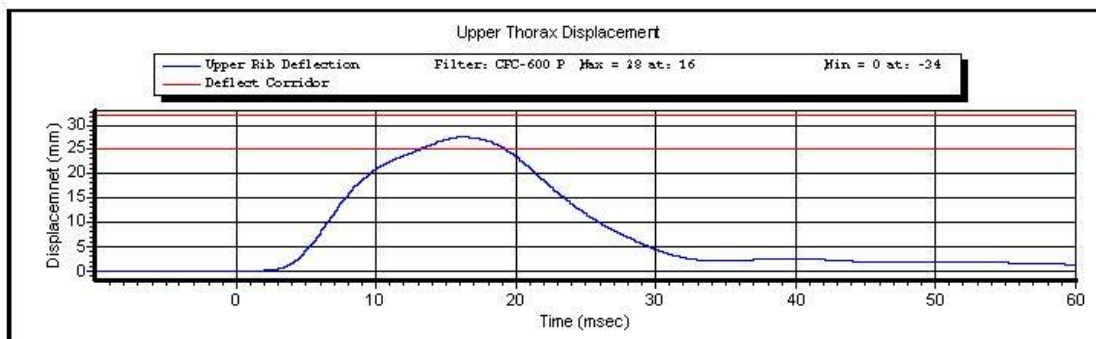
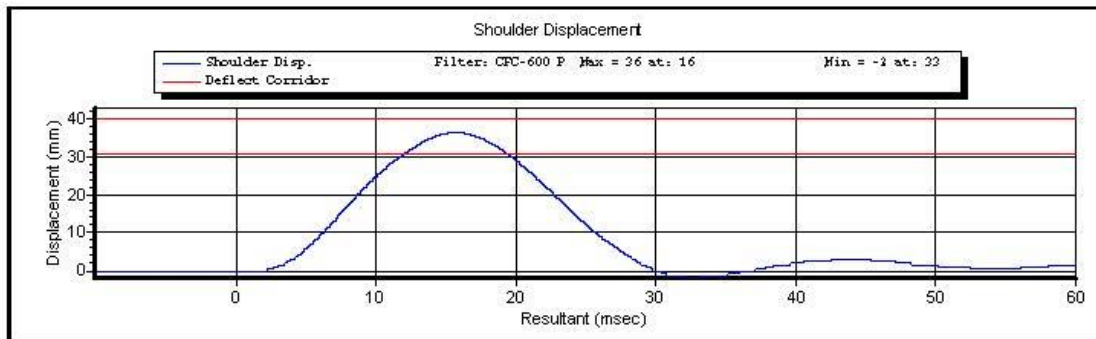
Test Name:	Thorax Impact with Arm
Sub Test Name:	
ATD Type:	SID-IIs
ATD Serial Number:	303



Test ID: Thorax w/Arm Impact Test Time: 1:15:32 PM

Test Date: 12/11/2014

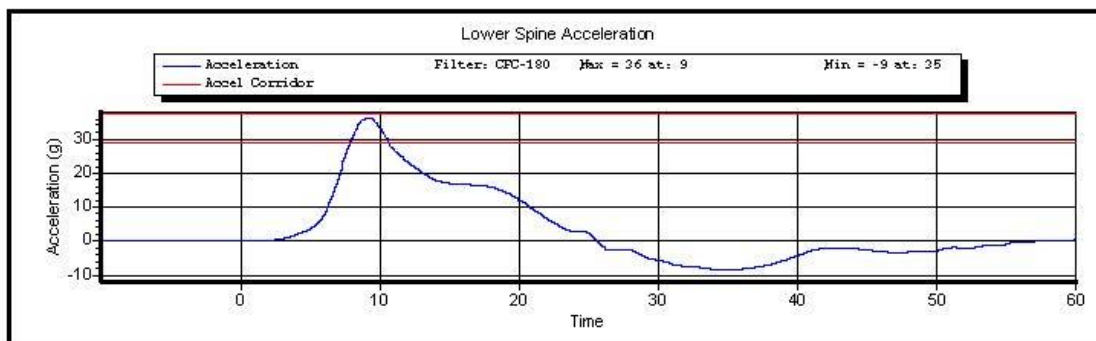
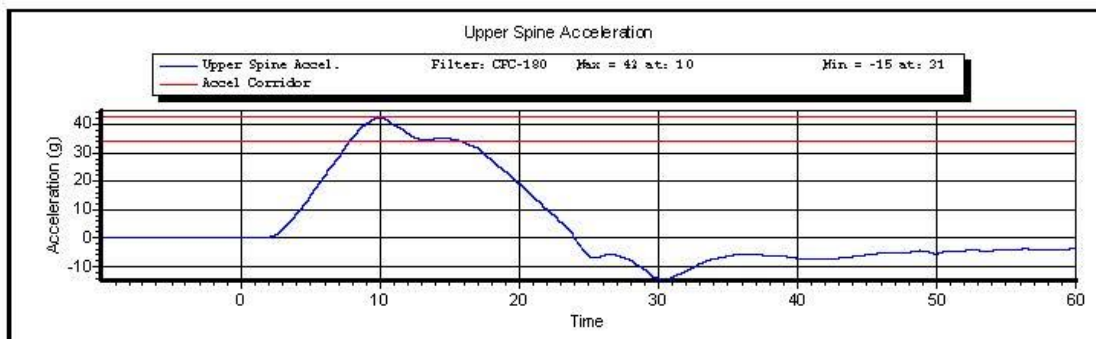
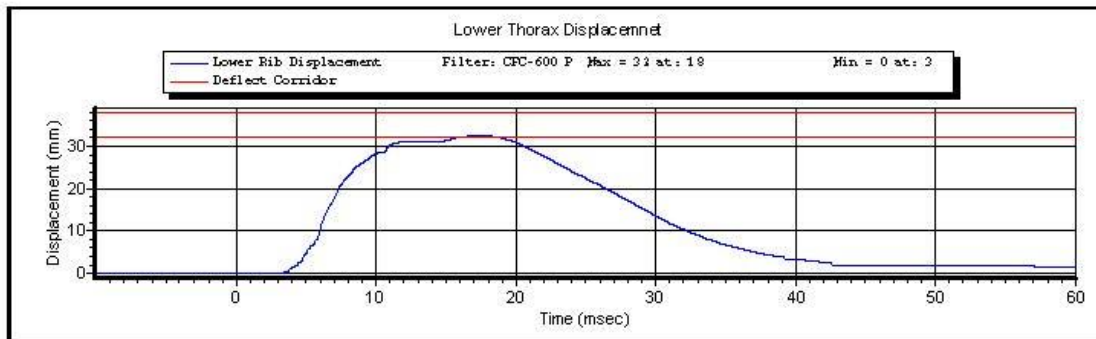
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Test ID: Thorax w/Arm Impact Test Time: 1:15:32 PM

Test Date: 12/11/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: Thorax w/Arm Impact Test Time: 1:15:32 PM

Test Date: 12/11/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:			
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Thorax w/o Arm	Test Date:	12/11/2014
		Test Time:	11:05:28 AM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	20.9 deg C	P
Humidity	10	--	70	21.1 %RH	P
Velocity	4.2	--	4.4	4.31 m/s	P
Probe Acceleration	14	--	18	16.0 g	P
Upper Thorax Rib Deflection	32	--	40	38.8 mm	P
Mid Thorax Rib Deflection	39	--	45	42.2 mm	P
Lower Thorax Rib Deflection	35	--	43	35.7 mm	P
Upper Spine Acceleration T1	13	--	17	17.0 g	P
Lower Spine Acceleration T12	7	--	11	9.9 g	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



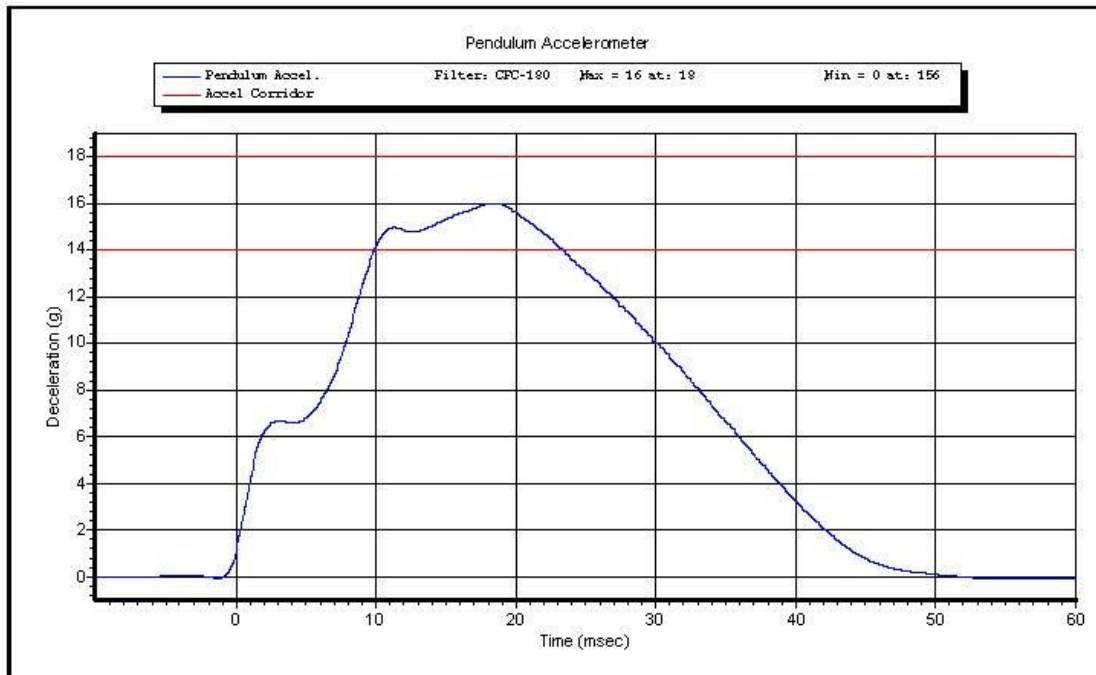
VERIFICATION REPORT

REFERENCE EQUIPMENT

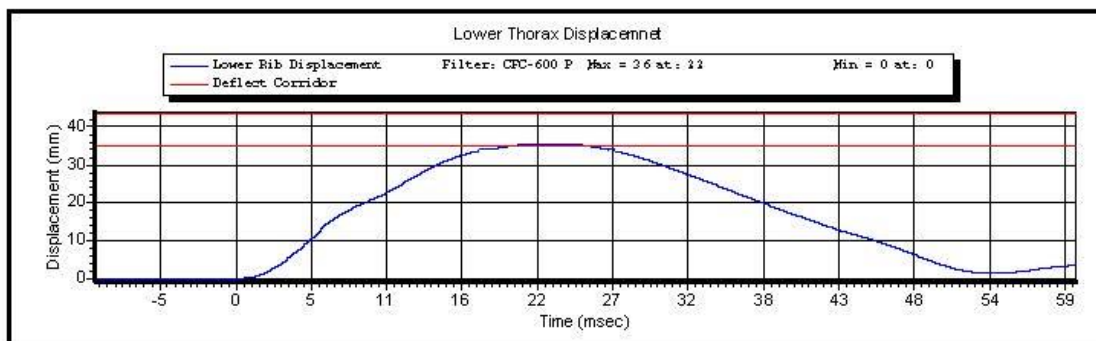
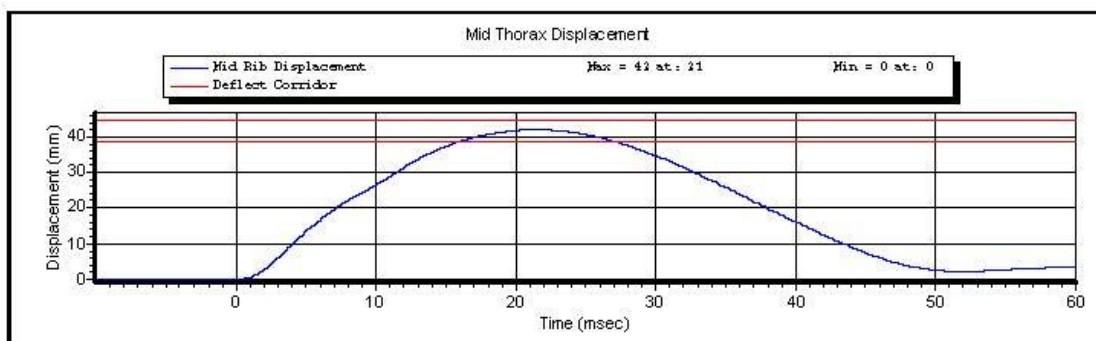
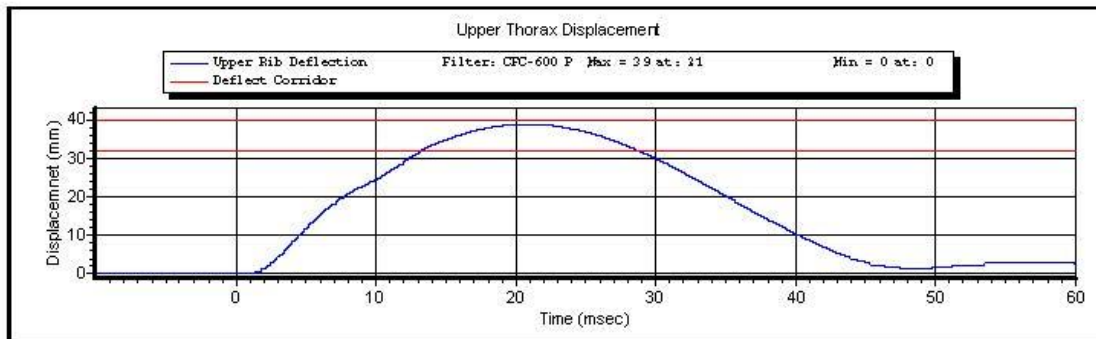
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DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	7/30/2014
Servo	180-3885	DS-1199GFE	8/6/2014
Servo	180-3885	DS-1246GFE	8/6/2014
Servo	180-3885	DS-1256GFE	8/6/2014
Endevco	7264-2000	P63315	10/9/2014
Endevco	7264-2000	P51974	10/9/2014



Test Name:	Thorax Impact without Arm
Sub Test Name:	
ATD Type:	SID-IIs
ATD Serial Number:	303



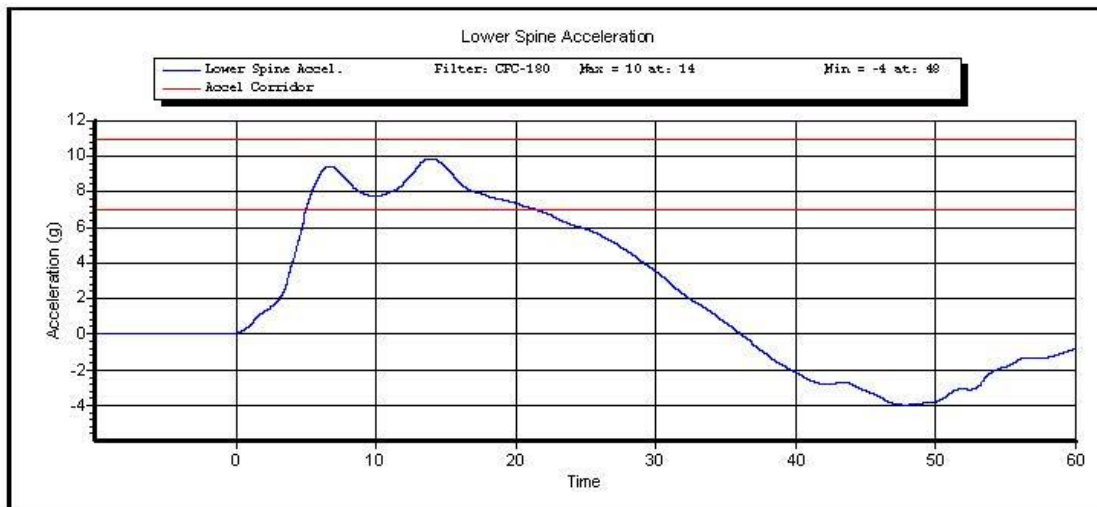
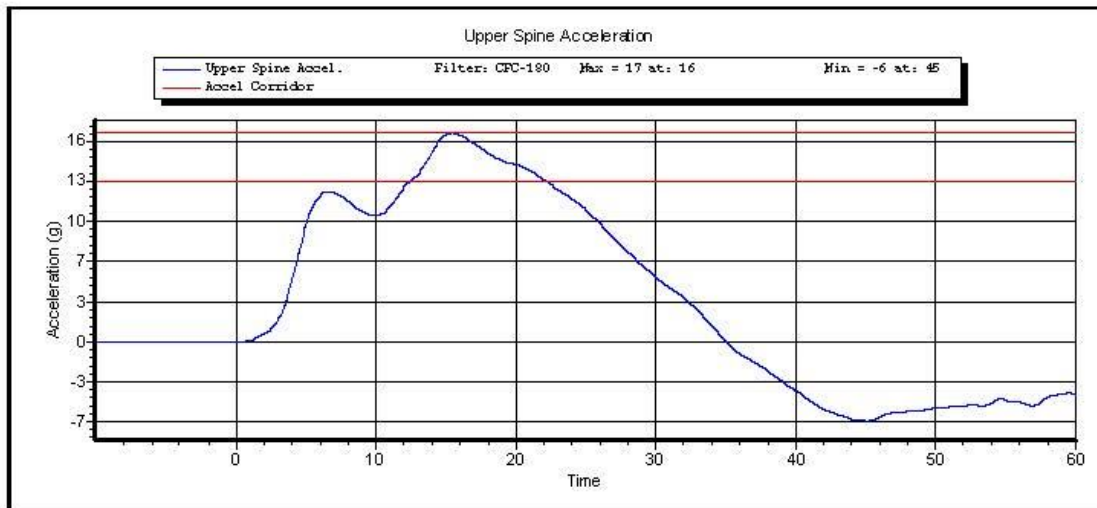
Test ID: **Thorax w/o Arm** Test Time: **11:05:28 AM** Test Date: **12/11/2014**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: Thorax w/o Arm Test Time: 11:05:28 AM

Test Date: 12/11/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Thorax w/o Arm** Test Time: **11:05:28 AM** Test Date: **12/11/2014**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:			
ATD Type:	SID-11s		
ATD Serial Number:	303		
Test ID:	Abdomen Impact	Test Date:	12/11/2014
		Test Time:	10:39:57 AM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	21.30 deg C	P
Humidity	10	--	70	20.80 %RH	P
Velocity	4.2	--	4.4	4.35 m/s	P
Probe Deceleration	12	--	16	15.5 G's	P
Upper Abdominal Rib Deflection	36	--	47	38.1 mm	P
Lower Abdominal Rib Deflection	33	--	44	37.0 mm	P
Lower Spine Acceleration - T12	9	--	14	11.7 G's	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



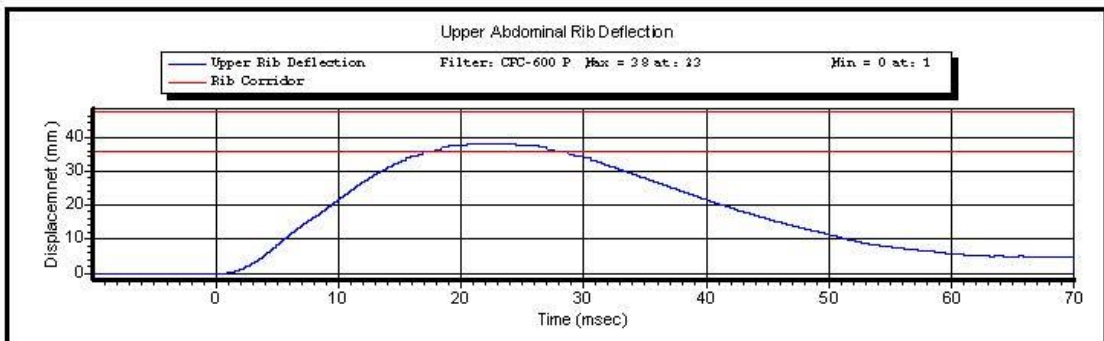
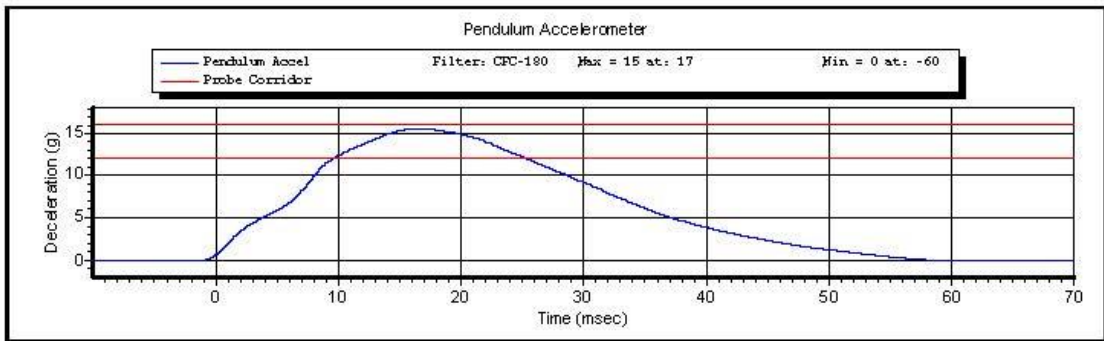
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	7/30/2014
Servo	180-3885	DS-1274GFE	8/6/2014
Servo	180-3885	DS-1285GFE	8/6/2014
Endevco	7264-2000	P51974	10/9/2014

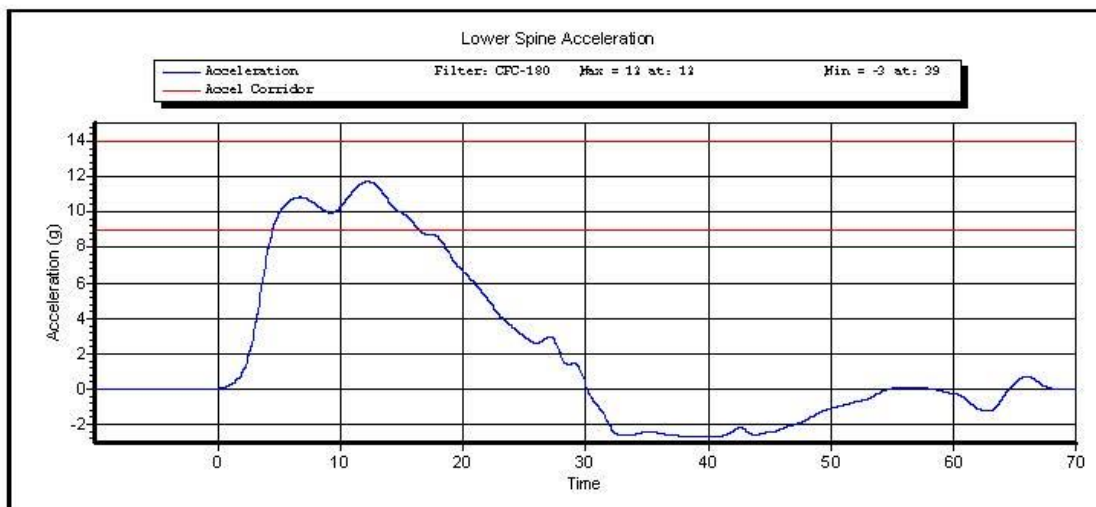
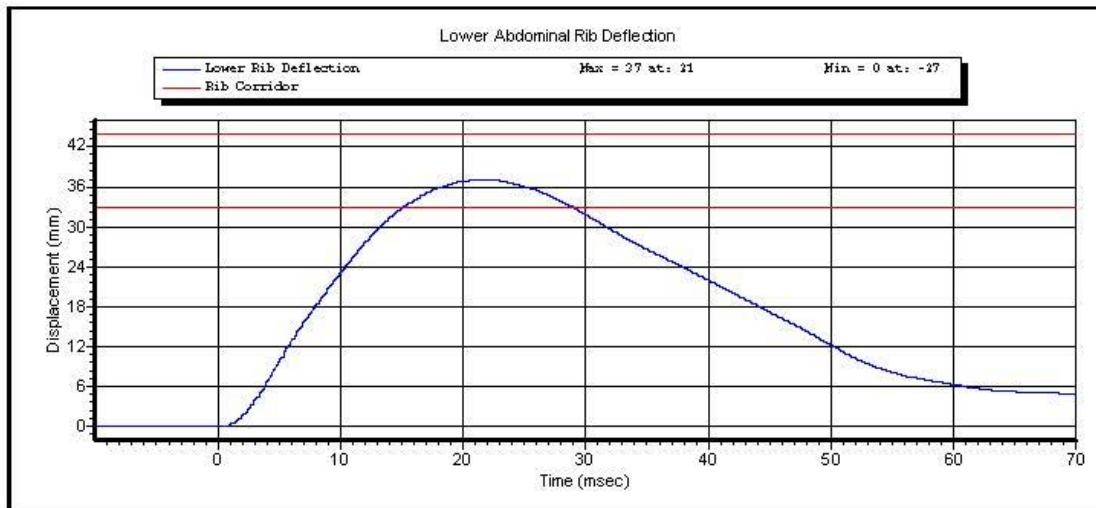


Test Name:	Abdominal Impact
Sub Test Name:	
ATD Type:	SID-IIs
ATD Serial Number:	303



Test ID: **Abdomen Impact** Test Time: **10:39:57 AM** Test Date: **12/11/2014**

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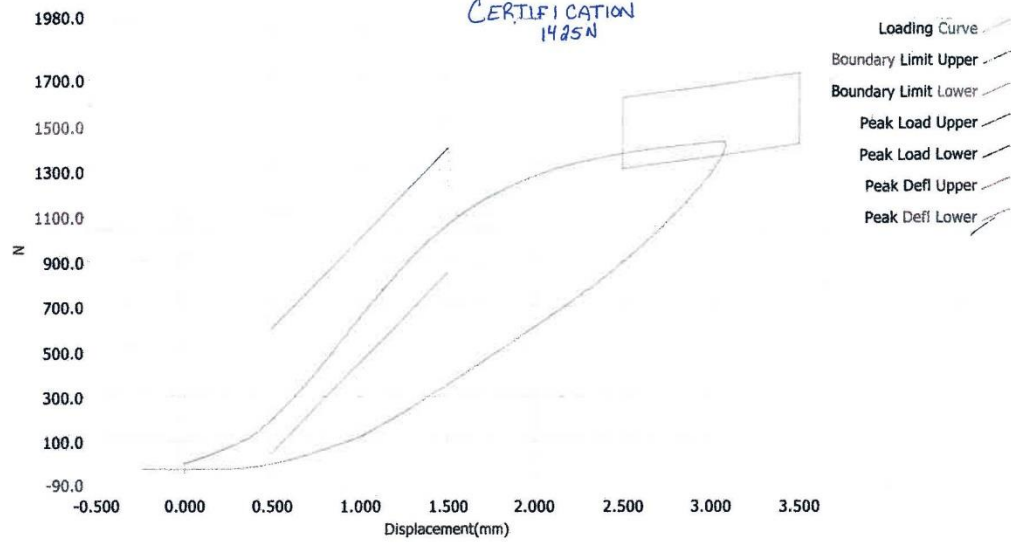


Test ID: **Abdomen Impact** Test Time: **10:39:57 AM**

Test Date: **12/11/2014**

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Resultant Data - SIDIIs Plug Compression



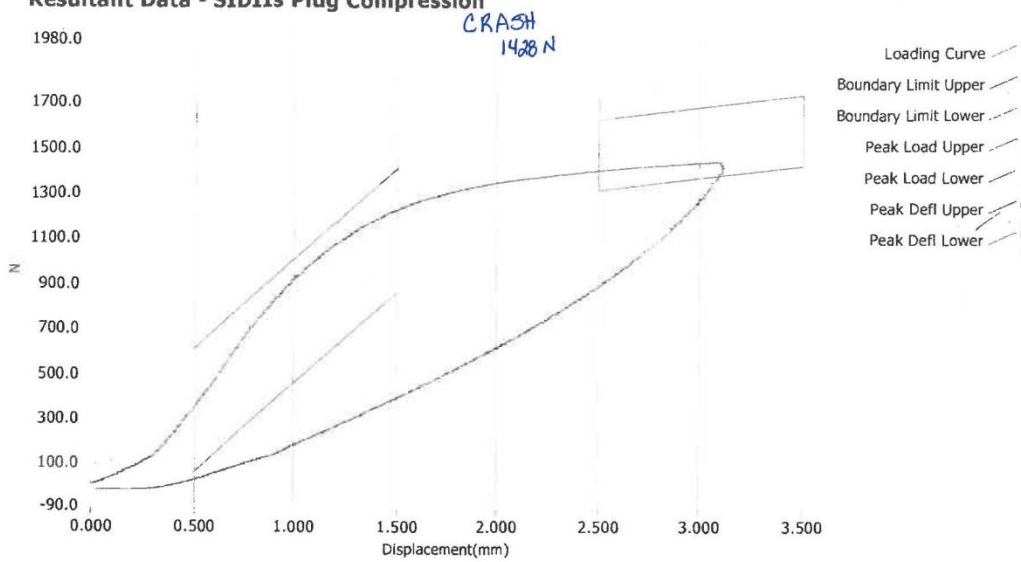
ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
	45962	9/20/2011	8:25 PM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

Current Date : 9/20/2011

Current Time : 20:25:52

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
		9/23/2010	8:59 AM
Cert ID	ATD Serial Number	ATD Type	
	36431	SIDIIs	

Current Date : 9/23/2010

Current Time : 09:00:30



VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact		
ATD Type:	SID-11s		
ATD Serial Number:	303		
Test ID:	Acetabulum Impact	Test Date:	12/11/2014
		Test Time:	8:31:56 AM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	21.8 deg C	P
Humidity	10	--	70	20.3 %RH	P
Velocity	6.6	--	6.8	6.64 m/s	P
Peak Probe Acceleration	38	--	47	44.1 g	P
Peak Pelvis Acceleration	34	--	42	40.5 g	P
Peak Acetabulum Force	3.6	--	4.3	3.98 kN	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



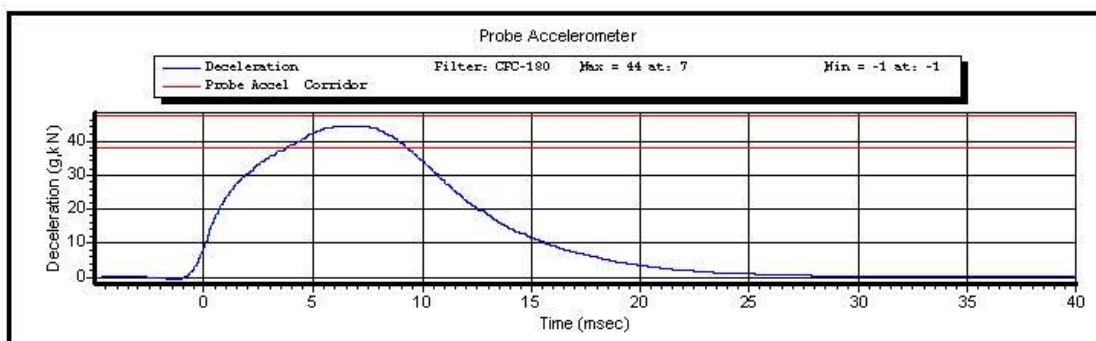
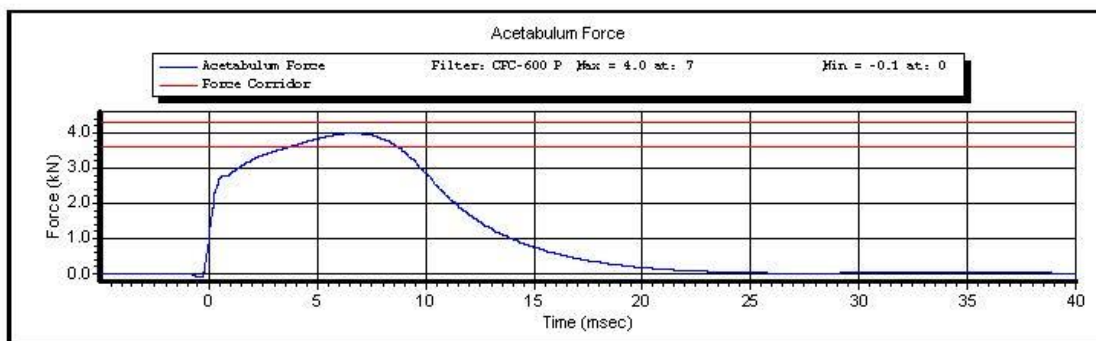
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	7/30/2014
Endevco	7264-2000	P51259	7/7/2014
FTSS	IF-520	LC-236Fy	5/13/2014



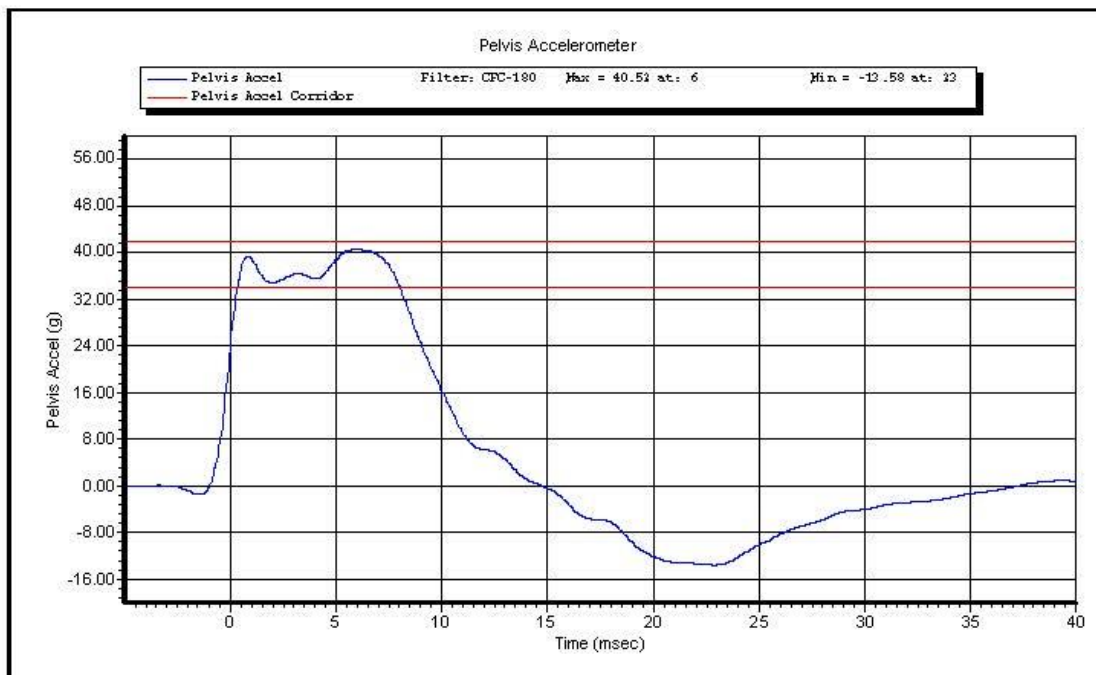
Test Name:	Pelvis
Sub Test Name:	Acetabulum Impact
ATD Type:	SID-IIs
ATD Serial Number:	303



Test ID: **Acetabulum Impact** Test Time: **8:31:56 AM**

Test Date: **12/11/2014**

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Test ID: **Acetabulum Impact** Test Time: **8:31:56 AM**

Test Date: **12/11/2014**

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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact		
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Pelvis Iliac Impact	Test Date:	12/11/2014
		Test Time:	2:04:43 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	21.3 deg C	P
Humidity	10	--	70	20.6 %RH	P
Velocity	4.2	--	4.4	4.36 m/s	P
Peak Probe Acceleration	36	--	45	40.3 g	P
Peak Pelvis Acceleration	28	--	39	31.7 g	P
Peak Iliac Force	4.1	--	5.1	4.32 kN	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



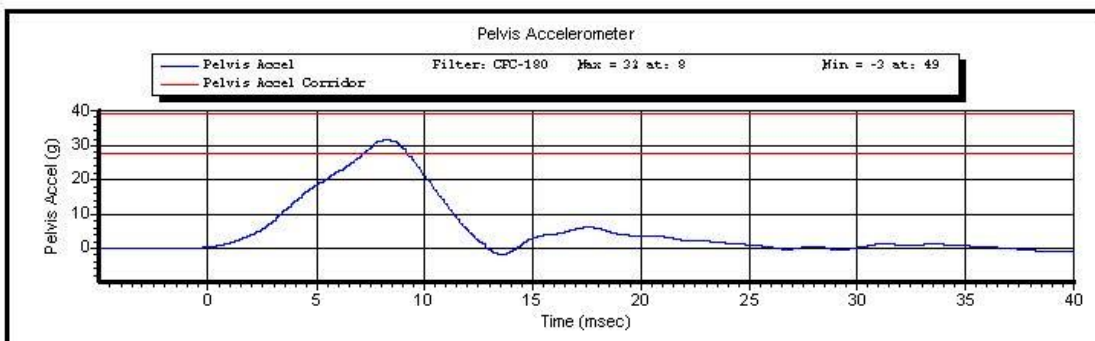
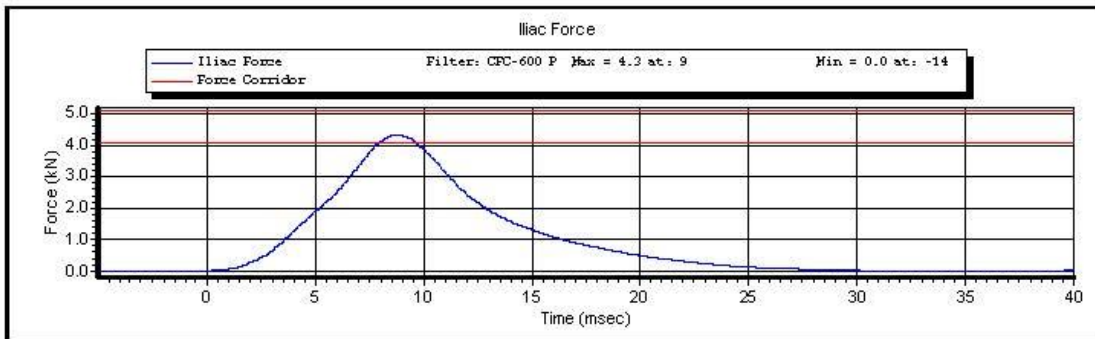
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	7/30/2014
Endevco	7264-2000	P51259	7/7/2014
DentonATD	3228J	LC-280 Fy	5/14/2014



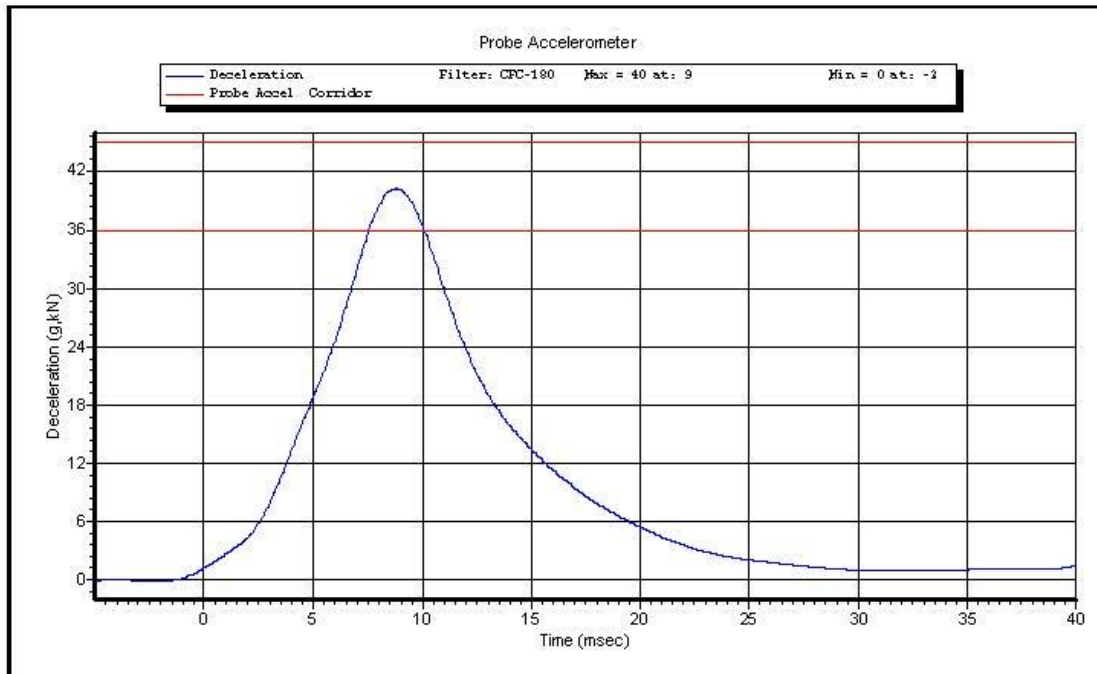
Test Name:	Pelvis
Sub Test Name:	Iliac Impact
ATD Type:	SID-Ils
ATD Serial Number:	303



Test ID: Pelvis Iliac Impact Test Time: 2:04:43 PM

Test Date: 12/11/2014

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Test ID: **Pelvis Iliac Impact** Test Time: **2:04:43 PM**

Test Date: **12/11/2014**

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APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

Table 1 – Dummy Instrumentation (SID-IIs)

			SID-IIs S/N: 303			
			Serial Number	Manufacturer	Calibration Date	
Head Accelerometers			X	AC-P52022	ENDEVCO	10/8/2014
			Y	AC-P52040	ENDEVCO	10/8/2014
			Z	AC-P58737	ENDEVCO	10/8/2014
Head Accelerometers - Redundant			X	AC-P51668	ENDEVCO	10/8/2014
			Y	AC-P51327	ENDEVCO	10/8/2014
			Z	AC-P51695	ENDEVCO	10/8/2014
Displacement Potentiometer	Shoulder		Y			
	Thoracic Rib	Upper	Y	DS-1199GFE	SERVO	8/6/2014
		Middle	Y	DS-1246GFE	SERVO	8/6/2014
		Lower	Y	DS-1256GFE	SERVO	8/6/2014
	Abdominal Rib	Upper	Y	DS-1274GFE	SERVO	8/6/2014
		Lower	Y	DS-1285GFE	SERVO	8/6/2014
Lower Spine Accelerometers (T12)			X	AC-P51945	ENDEVCO	10/9/2014
			Y	AC-P51974	ENDEVCO	10/9/2014
			Z	AC-P51946	ENDEVCO	10/9/2014
Acetabulum Load Cell			Y	LC-236Fy	DENTON	5/13/2014
Lilac Wing Load Cell			Y	LC-280Fy	DENTON	5/14/2014
Pelvis Plug (Struck Side)				36283	HUMANETICS	9/22/2010
Pelvis Plug (Non-Struck Side)						

Table 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	AC-A120614	MSI 1201	11/5/2014
Vehicle Center of Gravity	Y	AC-A081432	MSI 1201	11/5/2014
Vehicle Center of Gravity	Z	AC-A081451	MSI 1201	11/5/2014
Left Floor Sill	Y	AC-A112915	MSI 1201	9/18/2014
A-Pillar Sill	Y	AC-A126794	MSI 1201	9/18/2014
A-Pillar Low	Y	AC-A120629	MSI 1201	9/18/2014
A-Pillar Mid	Y	AC-A127679	MSI 1201	9/18/2014
B-Pillar Sill	Y	AC-A081415	MSI 1201	11/5/2014
B-Pillar Low	Y	AC-A120603	MSI 1201	9/18/2014
B-Pillar Mid	Y	AC-A120619	MSI 1201	9/18/2014
Driver Seat	Y	AC-A081458	MSI 1201	11/5/2014
Engine Top	X	AC-A126821	MSI 1201	11/5/2014
Engine Top	Y	AC-A120621	MSI 1201	9/18/2014
Firewall	Y	AC-A126839	MSI 1201	9/18/2014
Right Roof	Y	AC-A126816	MSI 1201	9/18/2014
Right Floor Sill	Y	AC-A127654	MSI 1201	9/18/2014
Rear Floorpan	X	AC-A079084	MSI 1201	11/5/2014
Rear Floorpan	Y	AC-A002369	MSI 1201	11/5/2014

Table 3 – Pole Instrumentation

Pole Instrumentation	Serial Number	Manufacturer	Calibration Date
Load Cell 1	LC-18867	INTERFACE	8/25/2014
Load Cell 2	LC-18850	INTERFACE	8/25/2014
Load Cell 3	LC-46979	INTERFACE	8/25/2014
Load Cell 4	LC-18882	INTERFACE	8/25/2014
Load Cell 5	LC-62094	INTERFACE	8/25/2014
Load Cell 6	LC-46933	INTERFACE	8/25/2014
Load Cell 7	LC-18866	INTERFACE	8/25/2014
Load Cell 8	LC-46949	INTERFACE	8/25/2014