REPORT NUMBER: NCAP-CAL-12-010

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

CHRYSLER GROUP LLC
2012 Dodge Durango SXT
Utility Vehicle

NHTSA No: MC0322

CALSPAN CORPORATION
TRANSPORTATION SCIENCES CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225

1/20/2012

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Rulemaking
Office of Crashworthiness Standards
1200 New Jersey Ave SE, Room W43-410
Washington, DC 20590

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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 STANDARD TITLE PAGE

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4. *Title and Subtitle* Final Report of NEW CAR ASSESSMENT PROGRAM Testing of a 2012 Dodge Durango SXT Utility Vehicle NHTSA No. MC0322		**5. *Report Date*** 1/20/2012 **6. *Performing Organization Code*** CAL
7. *Author(s)* David J. Travale, Technical Director Vanessa Walsh, Project Engineer		**8. *Performing Organization Report No.*** CAL-DOT-2012-010
9. *Performing Organization Name and Address* Calspan Corporation 4455 Genesee Street Buffalo, New York 14225		**10. *Work Unit No.*** **11. *Contract or Grant No.*** DTNH22-06-D-00024
12. *Sponsoring Agency Name and Address* U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards 1200 New Jersey Ave SE, Room W43-410 Washington, DC 20590		**13. *Type of Report and Period Covered*** Final Report, 1/20/2012 **14. *Sponsoring Agency Code*** NVS-111

15. *Supplementary Notes*

16. *Abstract*

A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2012 Dodge Durango SXT Utility Vehicle in accordance with the specifications of the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and foot well intrusion performance. The test was conducted at the Calspan Corporation's crash test facility in Buffalo, New York on 11/17/2011.

The impact velocity of the vehicle was 56.31 km/h, and the ambient temperature at the barrier face at the time of impact was 5℃. The target vehicle post-test maximum crush was 446 mm of Vehicle. The test vehicle's performance is as follows:

Measurement Description	Units	Driver ATD		Pass. ATD	
		Threshold	Result	Threshold	Result
Head Injury Criteria (HIC_{15})	N/A	700	138.87	700	449.08
Maximum Chest Displacement	mm	63	-28.04	52	-21.89
Nij	N/A	1	0.27	1	0.49
Neck Tension	N	4,170	1,172.92	2,620	318.07
Neck Compression	N	4,000	-81.51	2,520	-829.46
Left Femur Force	N	10,008	-3,723.89	6,805	-3,042.01
Right Femur Force	N	10,008	-2474.86	6,805	-2663.66

17. *Key Words* 35 mph Frontal Barrier Impact test New Car Assessment Program (NCAP)	**18. *Distribution Statement*** Copies of this report are available from: National Highway Traffic Safety Administration Technical Reference Division 1200 New Jersey Ave, SE Washington, DC 20590

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Form DOT F1700.7 (8-69)

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SECTION 1

PURPOSE AND SUMMARY OF TEST

1.1 PURPOSE

This 56.3 kph frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-06-D-00024. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

The 56.3 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standard Frontal NCAP Laboratory Test procedure.

1.2 TEST PROCEDURE

A load cell barrier consisting of 36 load cells was impacted by a 2012 Dodge Durango SXT Utility Vehicle at a velocity of 56.31 kph. The test was performed at Calspan on 11/17/2011. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

One real-time camera and 14 high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in this report.

One Part 572E, 50th percentile male anthropomorphic test device (ATDs), was placed in the driver seating position and one Part 572O 5th percentile female ATD was placed in the right-front passenger according to dummy placement instructions specified in the Frontal NCAP Laboratory Test Procedure.

Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were also on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver (position 1) ATD (Serial No. 064) and the right-front passenger (position 2) ATD (Serial No. 273) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C of this report.

The 129 channels of data were recorded on an on-board data acquisition system. Appendix B contains the dummy response data traces.

There was 100 percent windshield retention and no intrusion into the protected zone of the windshield during the event. There was no Stoddard solvent leakage after the event or during any phase of the static rollover.

The maximum static crush of the vehicle was 446 mm and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

The driver’s visible contact points were as follows: Face and Upper Torso with Frontal airbag with the back of head with the head restraint; both knees contacted the lower dash panel.

The passenger’s visible contact points were as follows: Face and Upper Torso with Frontal airbag with the back of head with the head restraint; both knees contacted the lower glovebox door.

The occupant data is summarized below.

ATD Position	HIC_{15}	Nij	Neck Tension (N)	Neck Compression (N)	3ms Chest Clip (Gs)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50th)	138.87	0.27	1,172.92	-81.51	41.08	-28.04	-3,723.89	-2,474.86
Passenger (5^{th})	449.08	0 .49	318.07	-829.46	47.25	-21.89	-3,042.01	-2,663.66

SECTION 2
DATA SHEETS

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011

NHTSA No.	MC0322
Model Year	2012
Make	Dodge
Model	Durango SXT
Body Style	Utility Vehicle
VIN	1C4RDJAG8CC122170
Body Color	Charcoal gray
Odometer Reading (km/mi)	125.5/78
Engine Displacement. (L)	3.6
Type/No. Cylinders	v6
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	5-Speed
Overdrive	Yes
Final Drive	All Wheel Drive
Roof Rack	No
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes
All-Wheel Drive (AWD)	Yes
Traction Control System (TCS)	Yes

Auto-Leveling System	No
Automatic Door Locks (ADL)	Yes
Power Window Auto-Reverse	Yes
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
Pass. Front Airbag	Yes
Pass. Curtain Airbag	Yes
Pass. Head/Torso Airbag	No
Pass. Torso Airbag	No
Pass. Torso/Pelvis Airbag	Yes
Pass. Pelvis Airbag	No
Pass. Knee Airbag	No
Driver Seat Belt Pretensioner	Yes
Pass. Seat Belt Pretensioner	Yes
Driver Load Limiter	Yes
Pass. Load Limiter	Yes
Other Safety Restraint	No

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Chrysler Group LLC
Date of Manufacture	8/2011

GVWR (kg)	2,949
GAWR Front (kg)	1,452
GAWR Rear (kg)	1,770

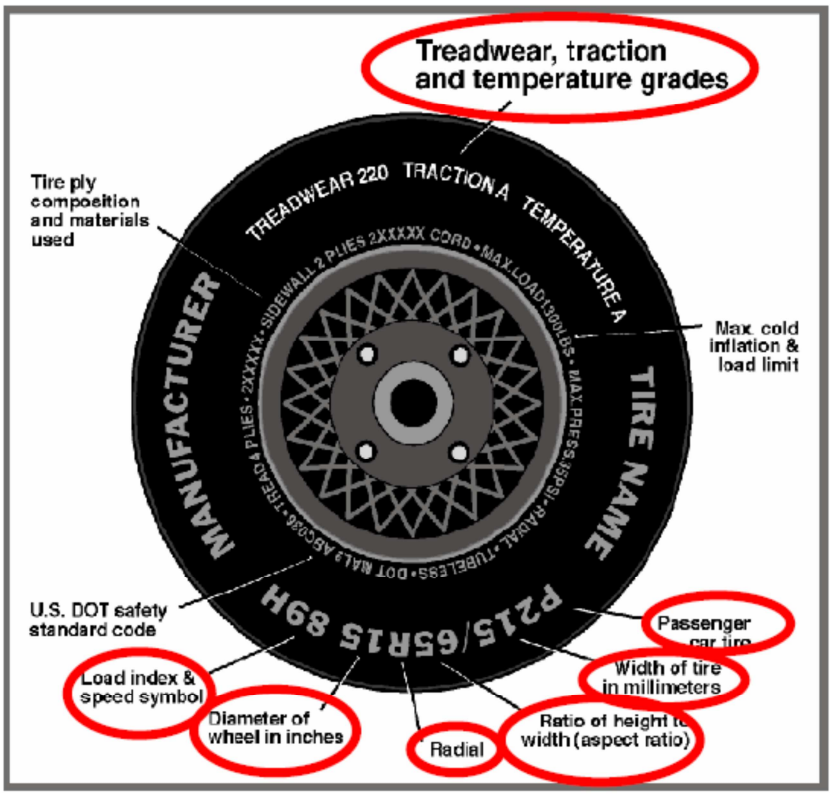
VEHICLE SEATING AND WEIGHT CAPACITY

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	Bench	
Number of Occupants	2	3	2	7
Capacity Wt. (VCW) (kg)				544.0
Cargo Wt. (RCLW) (kg)				67.7

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

Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011

Collect items circled in red, tire manufacturer, and tire name.



Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	228	228
Recommended Tire Size	P265/60R18	P265/60R18
Tire Size on Vehicle	P265/60R18	P265/60R18
Tire Manufacturer	Michelin	Michelin
Tire Model	Lattitude Tour	Lattitude Tour
Treadwear	720	720
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Polyamide, 2 Steel	2 Polyester, 2 Polyamide, 2 Steel
Load Index/Speed Symbol	109T	109T
Tire Material	Rubber	Rubber
DOT Safety Code Right	AP5E001X2911	AP5E001X2911
DOT Safety Code Left	AP5E001X2911	AP5E001X2911

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

Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	546	573		578	656	
Right	kg	578.5	543		590	617	
Ratio	%	50	50		48	52	
Totals	kg	1,124.5	1,116	2,240.5	1,168	1,273	2,441

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2,240.5
Weight of 1 P572E ATD & 1 P572O ATD	kg	140.6
Rated Cargo/Luggage Weight (RCLW)	kg	67.7
Calculated Vehicle Target Weight (TVTW)	kg	2,448.8

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	905	908	922	923	1515
As Tested	mm	903	905	898	898	1586
Post Test	mm	985	970	914	883	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	3,042
Total Vehicle Length at Left Side	mm	5,026
Total Vehicle Length at Centerline	mm	5,084
Total Vehicle Length at Right Side	mm	5,024
Weight of Ballast in Cargo Area	kg	94
Weight of Vehicle Components Removed	kg	-
Amount of Stoddard Solvent in Fuel Tank	L	87.1

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:

No components were removed to meet the required target test weight

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

Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	5,084
2	Total Width	1,915
3	Bumper Top Height	686
4	Bumper Bottom Height	485
5	Longitudinal Member Top Height	604
6	Distance Between Longitudinal Members	936
7	Longitudinal Member Width	78
8	Engine Top Height	1105
9	Engine Bottom Height	377
10	Engine and Gearbox Width	641
11	Front Bumper-Engine Distance	743
12	Front Shock Absorber Fixing Height	1034
13	Bonnet Leading Edge Height	1005
14	Front Shock Absorber Fixing Width	963
15	Front Bumper – Front Axle Distance	863
16	Front Axle – A Pillar Distance	679
17	A-Pillar – B-Pillar Distance	1,101
18	B-Pillar – Rear Axle Distance	1,263
19	B-Pillar – C-Pillar Distance	1,133
20	Roof Sill Bottom Height	1,670
21	Roof Sill Top Height	1,708
22	Floor Sill Bottom Height	474
23	Floor Sill Top Height	512

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

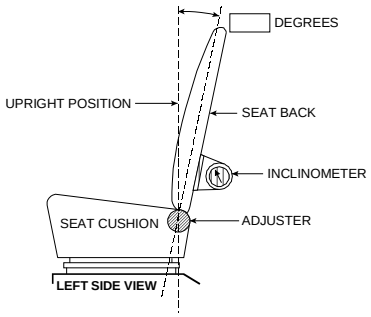
Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011

NORMAL DESIGN RIDING POSITION

For adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent, if applicable.

Driver seat: The driver seat back was positioned according to the Nominal Design Riding position listed in FORM 1

Passenger Seat: The passenger seat back as positioned to allow for a zero head angle of the passenger SID-IIs dummy



FRONT SEAT ASSEMBLY

	Deg.
Driver Seat Back Angle	14.4
Passenger Seat Back Angle	6.4

SEAT FORE/AFT POSITIONS

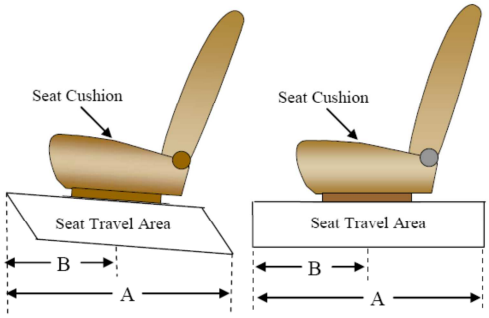
Describe the method used of determining seat fore/aft positions.
The driver's seat was positioned at the mid-point of fore/aft travel.
The passenger's seat was positioned at the most forward position of fore/aft travel.
For this test zero is defines and the foreword most position.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	278	21
Passenger Seat	280	0

SEAT BELT UPPER ANCHORAGES

Describe the method of positioning seat belt upper anchorages. The upper seat belt anchorage was set to the highest, lowest and mid-positions and marked on the B-Pillar. For this test zero is defined as the uppermost postion.

	Total # of Positions	Placed in Position #
Driver Seat	5	2
Passenger Seat	5	0



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

Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011

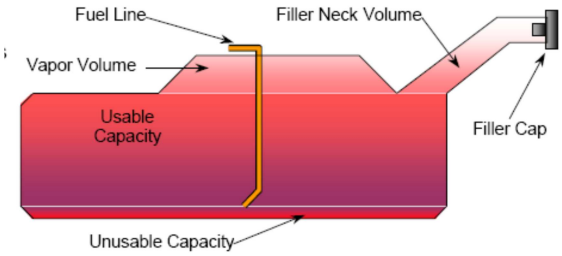
FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	93.5
Usable Capacity of "Optional Tank"	
92%-94% of Usable Capacity	86.0 - 87.9
Actual Amount of Solvent Used	87.1
1/3 of Usable Capacity	31.2

FUEL PUMP

Describe the fuel system - what type of fuel pump, details about how it operates, etc.

This vehicle was equipped with an Electric fuel pump which operates with the ignition in the 'on' position and the engine running. The fuel filler neck is located above the left rear wheel.

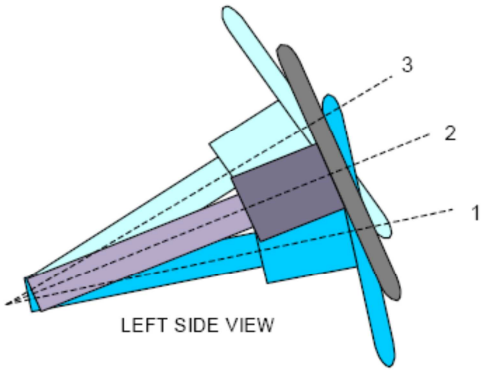


VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. Describe how this measurement was taken.

The steering wheel was adjusted to the midpoint of Tilt angle range and the midpoint of the telescoping Travel (if applicable)



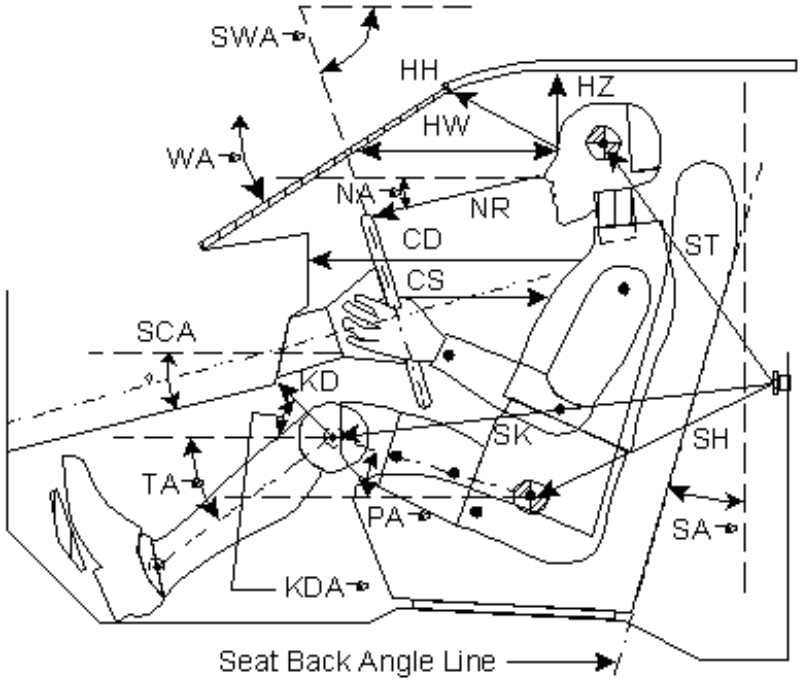
STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONS

	Degrees	Fore/Aft Position (mm)
Lowermost position No. 1	69.6	
Geometric center position No. 2	67.4	
Uppermost position No. 3	65.2	
Telescoping Steering Wheel Travel		60
Test Position	67.4	30

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

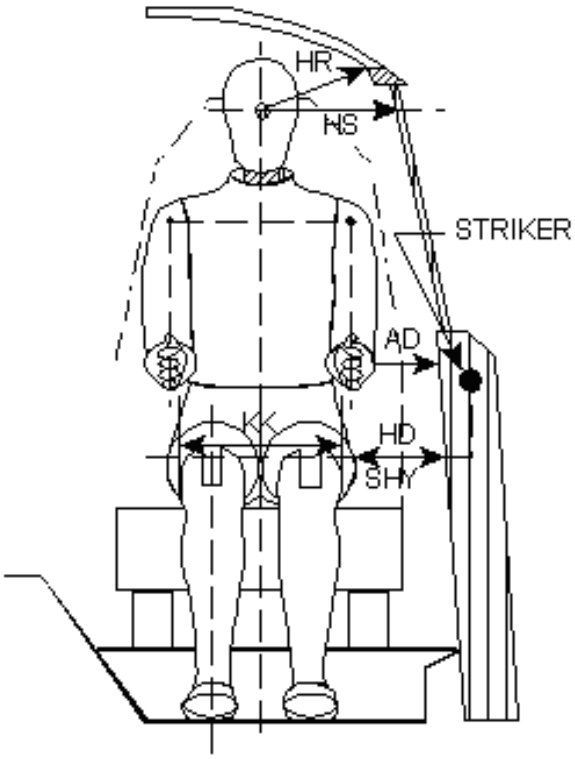
Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011



Code	Measurement Description	Driver (SN: 064)		Passenger (SN: 273)	
		Length (mm)	Angle(º)	Length (mm)	Angle (º)
WAº	Windshield Angle		-29.2		
SWAº	Steering Wheel Angle		22.7		
SCAº	Steering Column Angle		67.3		
SAº	Seat Back Angle (on headrest post)		14.5		6.4
HZ	Head to Roof (Z)	223	90.0	201	90.0
HH	Head to Header	428	22.4	308	44.3
HW	Head to Windshield	697	0.0	566	1.2
NR	Nose to Rim	428	-9.2	427	28.4
CD	Chest to Dash	568		374	
CS	Chest to Steering Hub	336	-1.6		
RA	Rim to Abdomen	231	10.0		
KDL	Left Knee to Dash	196	33.3	92	38.9
KDR	Right Knee to Dash	190	31.0	96	38.4
PAº	Pelvic Angle		23.6		21.3
TAº	Tibia Angle		-33.3		56.5
SK	Striker to Knee	572	-3.4	718	-2.1
ST	Striker to Head	562	80.7	598	57.4
SH	Striker to H-Point	213	-33.6	368	-15.1

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011

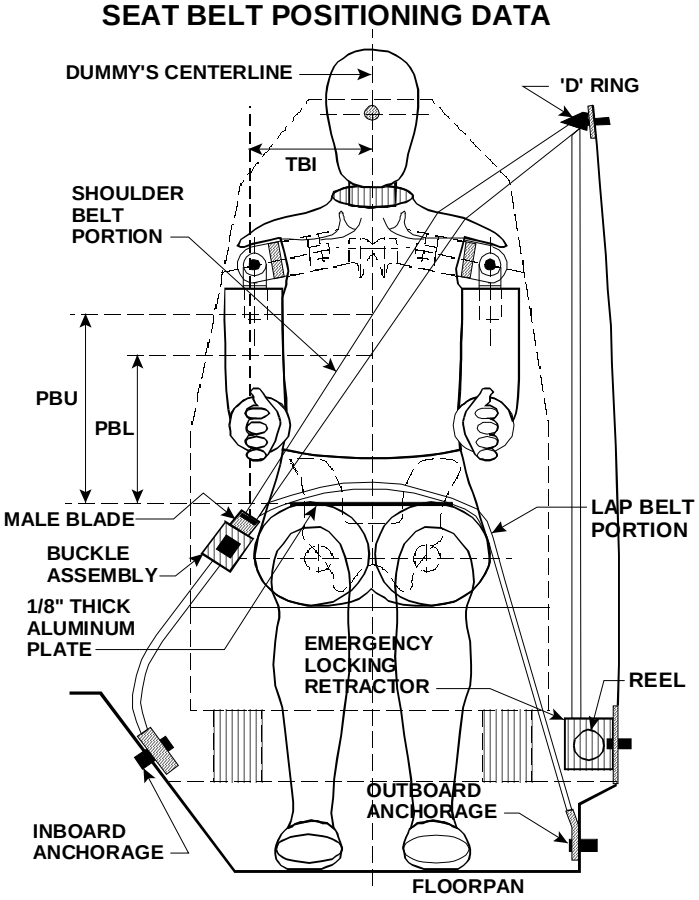


Code	Description	Driver	Passenger
AD	Arm to Door	126	100
HD	H-Point to Door	161	174
HR	Head to Side Header	235	272
HS	Head to Side Window	366	285
KK	Knee to Knee	325	232
SHY	Striker to H-Point (Y Direction)	235	265
AA	Ankle to Ankle	308	160

DATA SHEET NO. 5
SEAT BELT POSITIONING DATA

Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011

SEAT BELT POSITIONING DATA



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU — Top surface of reference to belt upper edge	mm	375	300
PBL — Top surface of reference to belt lower edge	mm	310	210

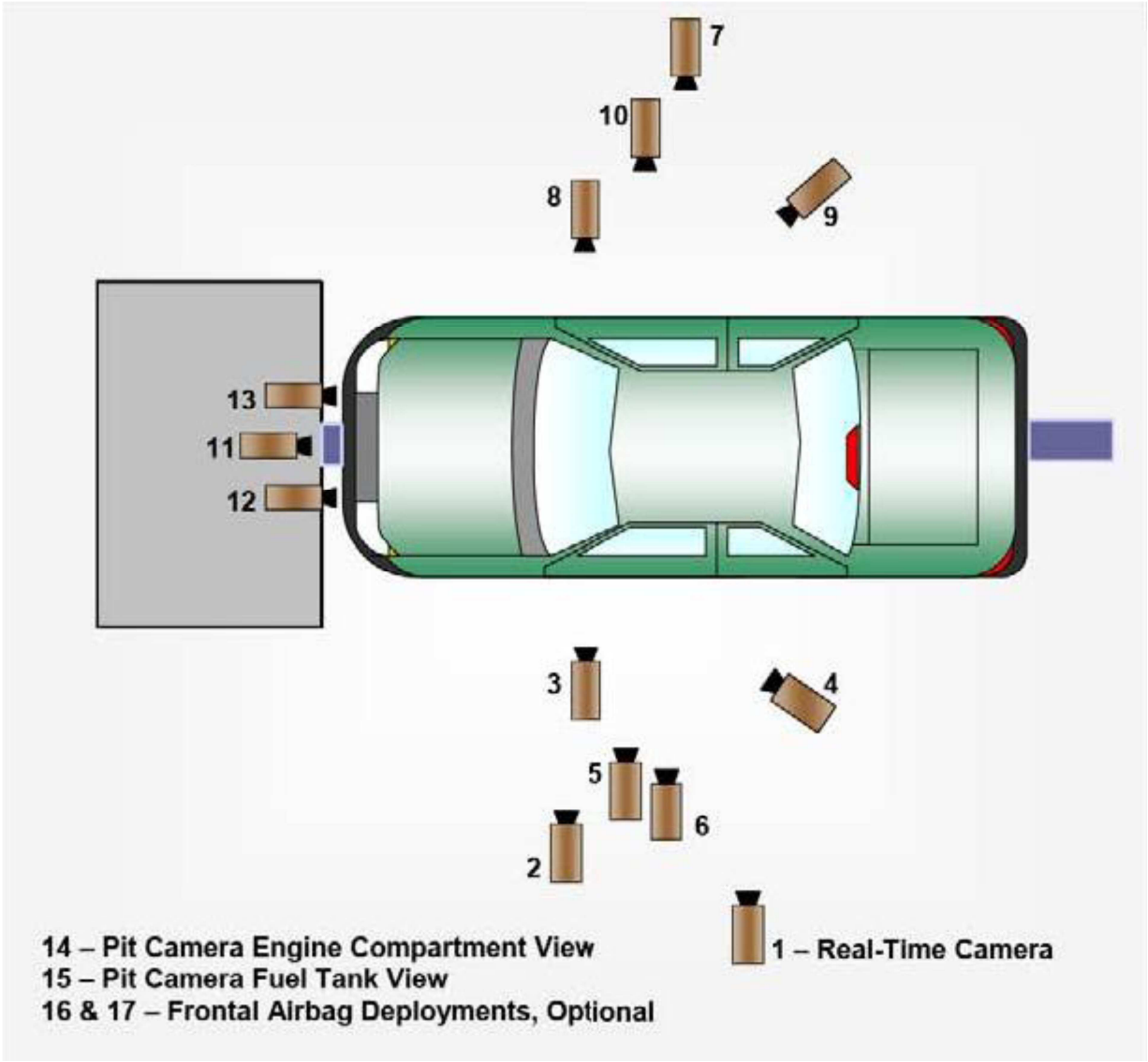
BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	870	962
Lap Belt Length as measured on ATD	mm	591	561
Remainder of belt on reel	mm	839	777
Total belt length for continuous webbing systems	mm	2,300	2,300

DATA SHEET NO. 6
HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011

CAMERA POSITIONS FOR FRONTAL IMPACTS



DATA SHEET NO. 6 (CONTINUED)
HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011

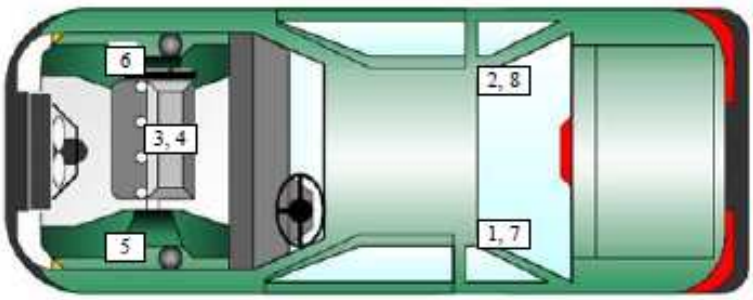
CAMERA LOCATIONS

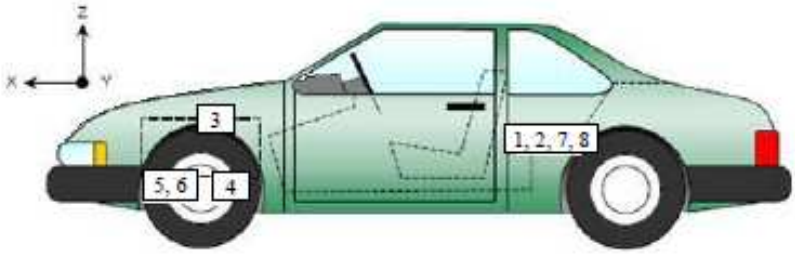
No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	-	-	-	-	24
2	Driver Close-Up	1530	-7523	1271	50	1000
3	Left Front Half	815	-8804	1075	50	1000
4	Left Angle	3050	-3050	2220	28	1000
5	Steering Column - Top	2058	-8793	1100	50	500
6	Steering Column - Bottom	2058	-8793	1181	50	500
7	Right Overall	2100	6800	1030	24	1000
8	Passenger Close-Up	1740	7600	1340	50	1000
9	Right Front Half	1220	8680	1120	50	1000
10	Right Angle	3000	3200	2240	28	1000
11	Windshield	517	0	3050	28	1000
12	Driver Windshield	0	-540	2025	24	1000
13	Passenger Windshield	0	513	2010	24	1000
14	Pit Front	850	0	1940	12.5	500
15	Pit Rear	2400	0	1940	12.5	500
16	Onboard Driver Airbag (Optional)					
17	Onboard Passenger Airbag (Optional)					

* COORDINATES:
+X = forward of impact plane
+Y = right of monorail center
+Z = into ground

DATA SHEET NO. 7
VEHICLE ACCELEROMETER DATA

Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011





VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	2077	-714	520
2	Right Rear Accelerometer – X Direction	2092	718	553
3	Engine Top X	4200	-44	1105
4	Engine Bottom X	4653	-326	257
5	Left Brake Caliper X	4041	-851	415
6	Right Brake Caliper X	4097	878	438
7	Left Rear Accelerometer – Z Direction	2,077	-714	520
8	Right Rear Accelerometer – Z Direction	2,092	718	553

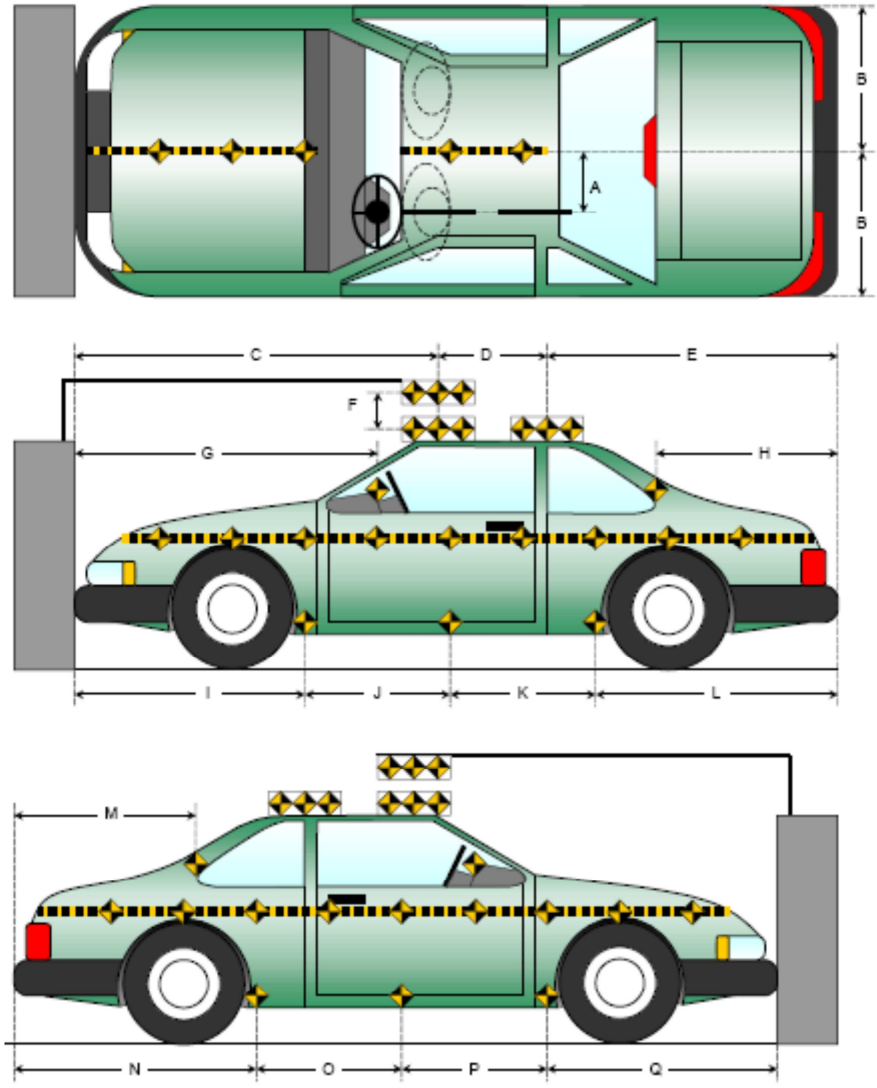
Reference Points:
X – Rear Surface of Vehicle (+ forward)
Y – Vehicle Centerline (+ to right)
Z – Ground Plane (+ down)

DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011

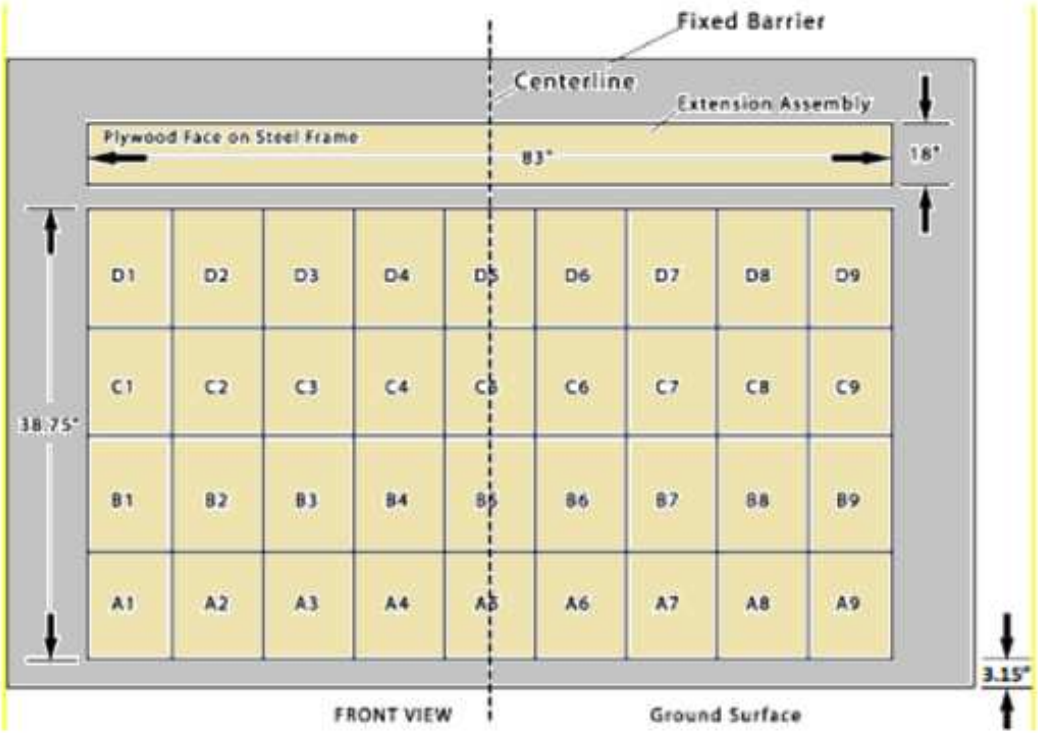
Item	Value
A	416
B	959
C	2,327
D	1,218
E	1,539
F	--
G	1,858
H	1,535
I	1,439
J	971
K	978
L	1,697
M	1,543
N	1,698
O	969
P	977
Q	1,441

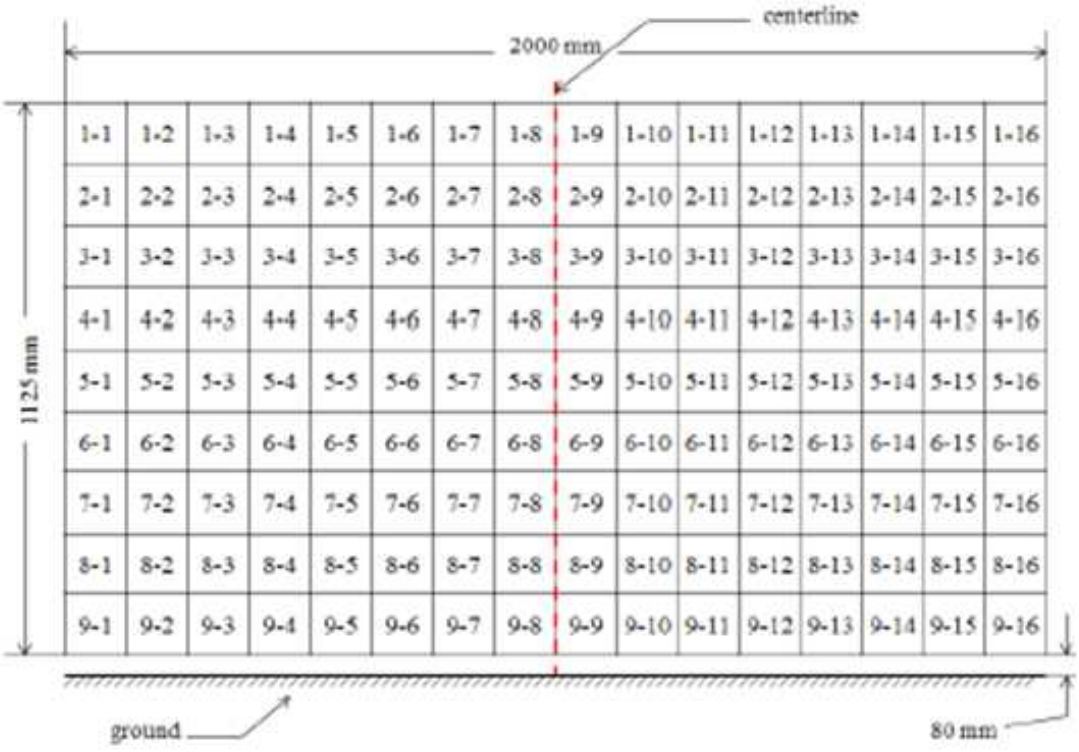
All units in millimeters



DATA SHEET NO. 9
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011





DATA SHEET NO. 10
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011

INSTRUMENTATION

Instrumentation	Number of Channels Collected
Driver Dummy Accelerometers	42
Passenger Dummy Accelerometers	42
Vehicle Structure Accelerometers	8
Total	132

CAMERA COVERAGE

Type of Camera	Number Used in this Test
High-Speed Vehicle Onboard	0
High-Speed Offboard	14
Real-Time Panning	1
Total	15

DATA SHEET NO. 11 - POST TEST OBSERVATIONS

Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type/Serial No.	064	273
Head Contact	Front Airbag and Headrest	Front Airbag and Headrest
Upper Torso Contact	Front Airbag	Front Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster	Glovebox
Right Knee Contact	Knee Bolster	Glovebox

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked/Unlocked Doors	Locked	Locked
Front Door Opening	None	None
Rear Door Opening	None	None
Seat Track Shift (mm)	None	None
Seat Back Failure	No Failure	No Failure
Glazing Damage	None	None

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Windshield Damage	None
Window Damage	None
Other Notable Effects	None

VEHICLE REBOUND FROM BARRIER

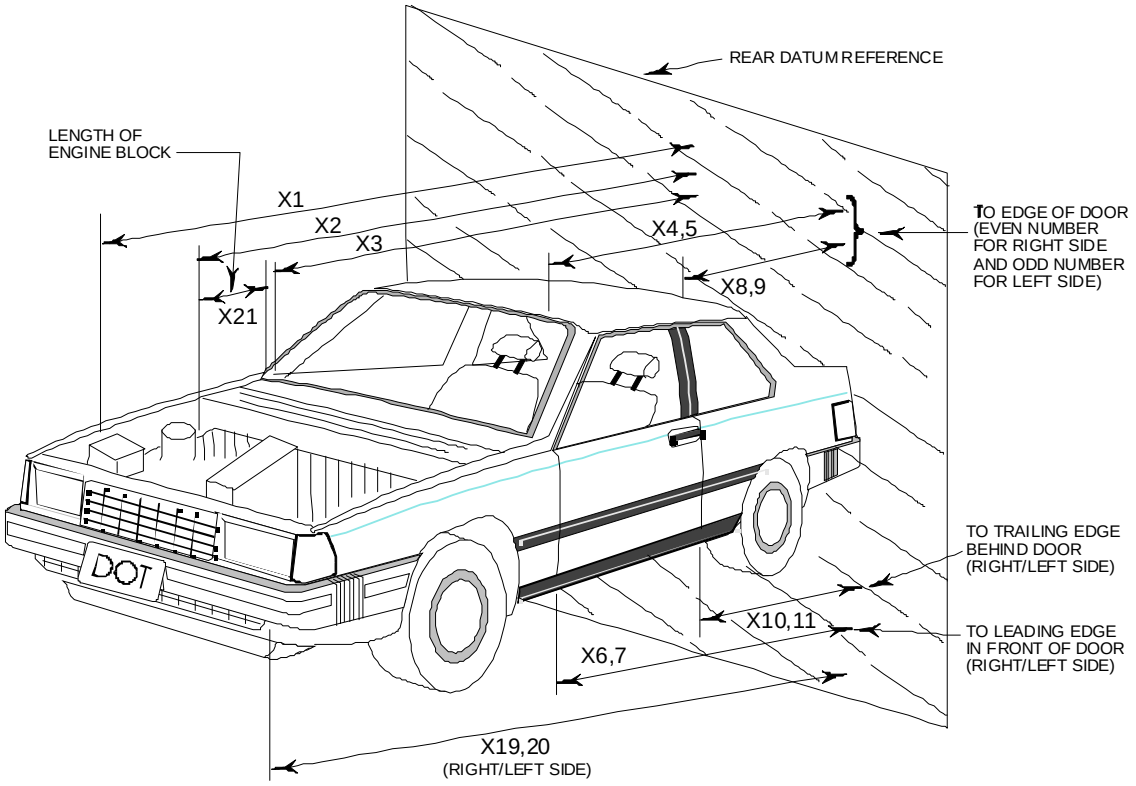
Measured Parameter	Units	Value
Left Side	mm	760
Center	mm	775
Right Side	mm	790
Average	mm	775

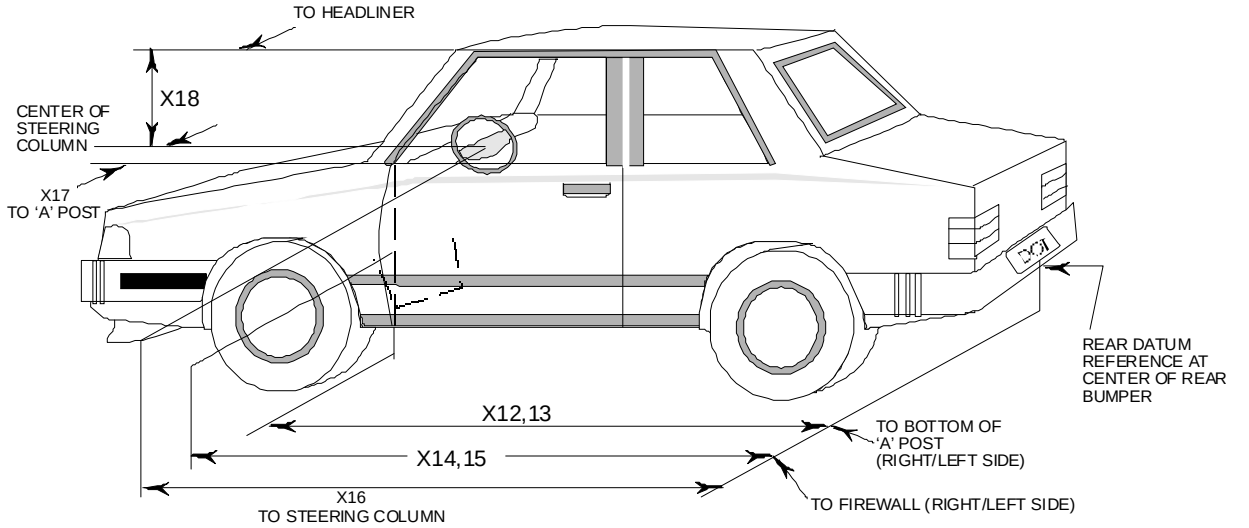
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Driver (Occupant 1)		Passenger (Occupant 2)	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	Yes	Yes	Yes
Curtain Airbag	Yes	No	Yes	No
Torso/ Pelvis Airbag	Yes	No	Yes	No
Knee Airbag	No	No	No	No
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes
Other				

DATA SHEET NO. 12
VEHICLE PROFILE MEASUREMENTS

Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011





DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	5084	4638	446
2	Rear Surface of Vehicle (RSOV) to Front of Engine	4341	4217	124
3	RSOV to Firewall	4046	4010	36
4	RSOV to Upper Leading Edge of Right Door	3585	3577	8
5	RSOV to Upper Leading Edge of Left Door	3584	3573	11
6	RSOV to Lower Leading Edge of Right Door	3554	3552	2
7	RSOV to Lower Leading Edge of Left Door	3553	3552	1
8	RSOV to Upper Trailing Edge of Right Door	2463	2460	3
9	RSOV to Upper Trailing Edge of Left Door	2459	2457	2
10	RSOV to Lower Trailing Edge of Right Door	2482	2482	0
11	RSOV to Lower Trailing Edge of Left Door	2478	2477	1
12	RSOV to Bottom of “A” Post of Right Side	3533	3529	4
13	RSOV to Bottom of “A” Post of Left Side	3531	3527	4
14	RSOV to Firewall, Right Side	4047	4009	38
15	RSOV to Firewall, Left Side	4053	4066	-13
16	RSOV to Steering Column	3067	3135	-68
17	Center of Steering Column to “A” Post	290	285	5
18	Center of Steering Column to Headliner	401	436	-35
19	RSOV to Right Side of Front Bumper	5024	4616	408
20	RSOV to Left Side of Front Bumper	5026	4606	420
21	Length of Engine Block	346	346	0
RD	RSOV to Right Side of Dash Panel	3275	3273	2
CD	RSOV to Center of Dash Panel	3272	3271	1
LD	RSOV to Left Side of Dash Panel	3273	3272	1

All Dimensions in mm

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

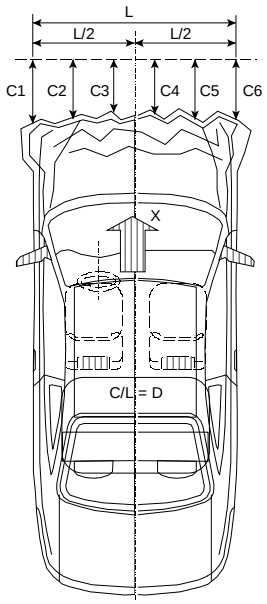
Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011

VEHICLE INFORMATION

VIN	1C4RDJAG8CC122170	Wheelbase (mm)	3,042
Vehicle Size Category	Passenger - Utility	Test Weight (kg)	2441

ACCELEROMETER DATA

Accelerometer Locations:	See Data Sheet No. 7
Cal. Procedure/Interval:	Calspan Procedure / 6 month
Integration Algorithm:	Trapezoidal
Linearity:	> 99%
Impact Velocity (km/h):	56.31
Velocity Change (km/h):	-
Time of Separation (ms):	180



CRUSH PROFILE

Collision Deformation Classification:	12FDEW4
Midpoint of Damage:	Vehicle Centerline
Damage Region Length (mm):	1456
Impact Mode:	Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4929	4572	357
C2	Crush zone 2 at left side	mm	5039	4614	425
C3	Crush zone 3 at left side	mm	5080	4643	437
C4	Crush zone 4 at right side	mm	5079	4642	437
C5	Crush zone 5 at right side	mm	5036	4623	413
C6	Crush zone 6 at right side	mm	4927	4572	355
L	C1 to C6	mm	1456	1475	-19

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

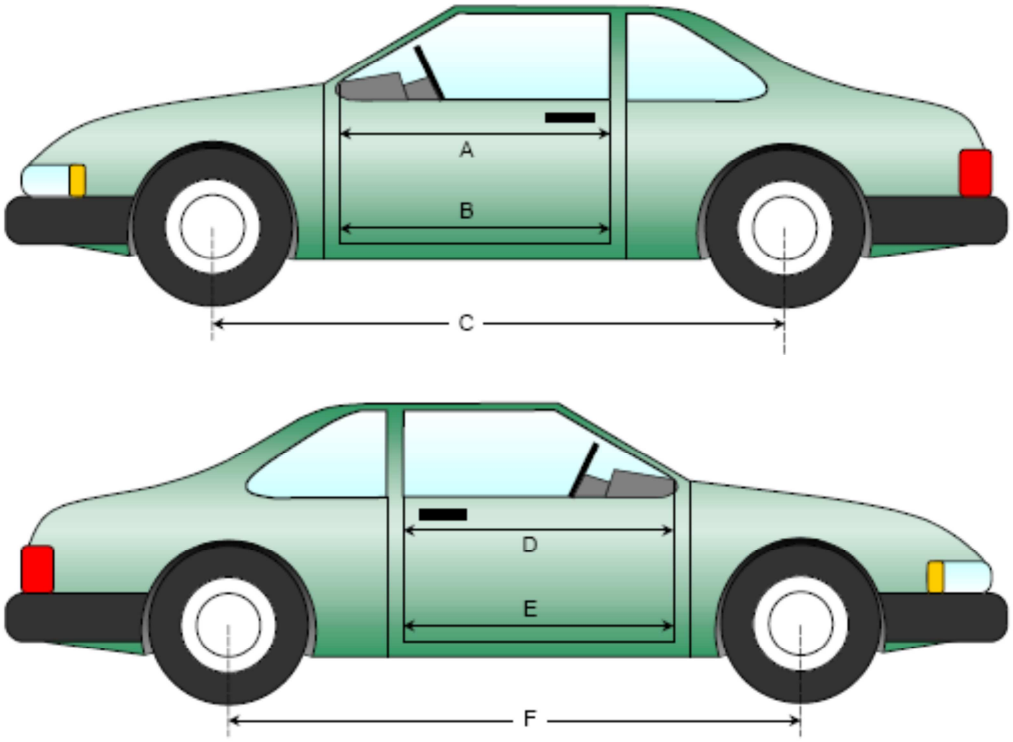
Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	961	960	-1
B	Left Side Lower	mm	869	870	1
D	Right Side Upper	mm	961	960	-1
E	Right Side Lower	mm	858	858	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3,042	2,917	-125
F	Right Side Wheelbase	mm	3,042	2,917	-123



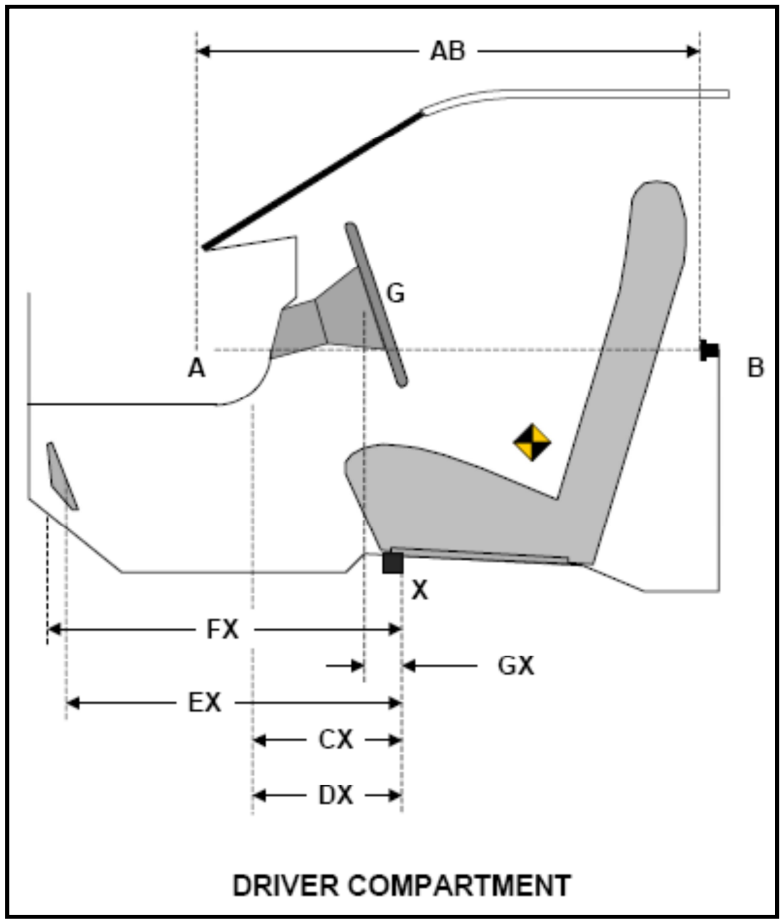
DATA SHEET NO.14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	786	787	1
CX	Left Knee Bolster to X	mm	290	291	1
DX	Right Knee Bolster to X	mm	275	278	3
EX	Brake Pedal to X	mm	510	501	-8
FX	Foot Rest to X	mm	-3056	-3054	2
GX	Center of Steering Column Wheel Hub to X	mm	11	80	69

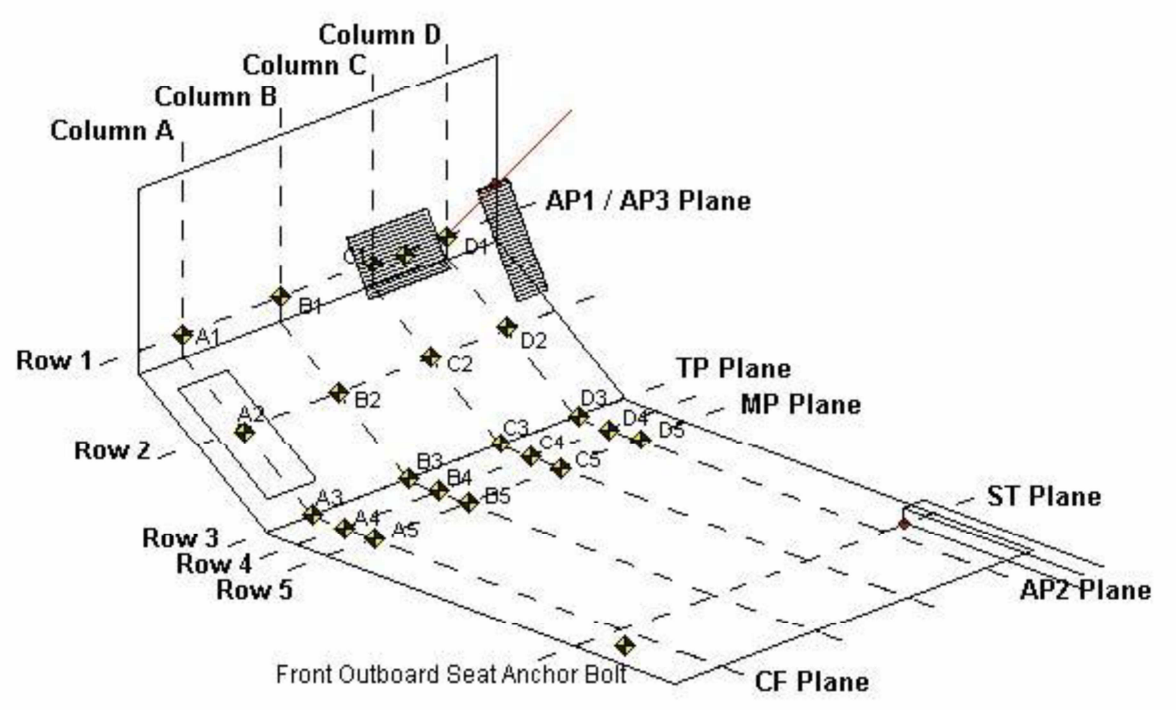
X = Front of Seat Track (Stationary)



DRIVER COMPARTMENT

DATA SHEET NO.14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011



AP1: Y-Z plane passing through D1
AP2: X-Z plane passing through D1
AP3: X-Y plane passing through D1
MP: Y-Z plane, halfway between the ST plane and AP1 plane
CF Plane: X-Z plane passes through center of footrest.
BP Plane: X-Z plane passes through center of brake pedal
TP Plane: Y-Z plane, intersection of BP Plane and the intersection of the toe pan and floorboard
Column A: intersection of vehicle and CF plane
Column D: Intersection of vehicle and AP2 plane
Row 1: intersection of the vehicle and the AP3 Plane
Row 3: intersection of the vehicle and TP plane
Row 5: intersection of the vehicle and MP plane
Row 2: evenly spaced between row 1 and 3
Row 4: evenly spaced between row 3 and 5

DATA SHEET NO. 15
SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

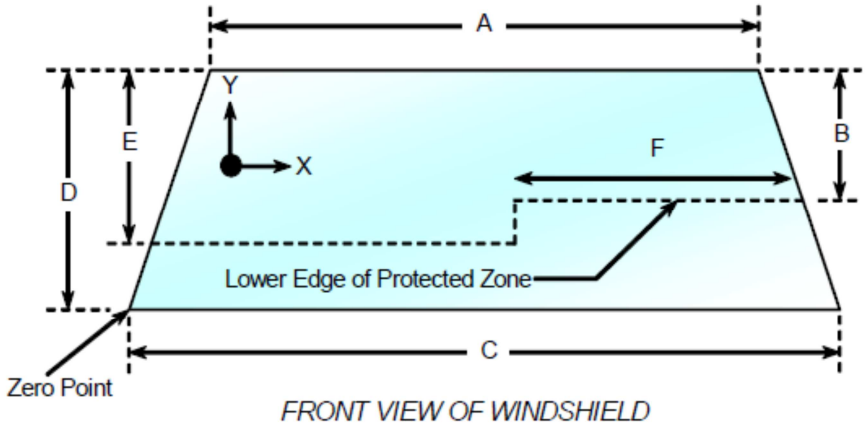
Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011

Please provide windshield mounting details. A 0.8 mm trim surrounds the top and side of windshield while a plastic shroud is on the bottom.
The standard requires that the post-test retention measurement be a minimum of 75% of the pre-test total periphery measurement for vehicles not equipped with occupant passive restraints and 50% for each side of the windshield for vehicles which are equipped with occupant passive restraints.

Temperature of windshield molding during test: 21.3°C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2184	2184	100%
Right Side	2184	2184	100%
Total	4367	4367	100%



FRONT VIEW OF WINDSHIELD

Item	Units	Value
A	mm	1330
B	mm	325
C	mm	1535
D	mm	751
E	mm	494
F	mm	535

AREAS OF PROTECTED ZONE FAILURES

A. Provide coordinates of the area that the protected zone was penetrated more than .25 inches by a vehicle component other than one that is normally in contact with the windshield.

X	Y
-	-
-	-
-	-
-	-

B. Provide coordinates of the area beneath the protected zone that the inner surface of the windshield was penetrated by a vehicle component.

X	Y
-	-
-	-
-	-
-	-

DATA SHEET NO. 15 (CONTINUED)
SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

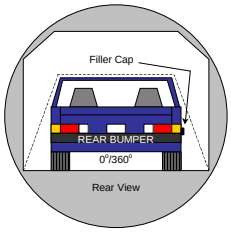
Temperature at Time of Impact: 5.0º C Test Time: 3:10 PM

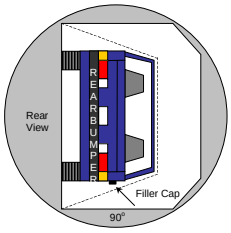
Stoddard Solvent Spillage Measurements

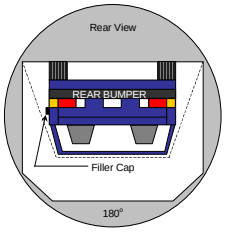
A.	From impact until vehicle motion ceases: (Maximum allowable = 1 oz.)	0	oz
B.	For the 5-minute period after motion ceases: (Maximum allowable = 5 oz.)	0	oz
C.	For the following 25 minutes: (Maximum allowable = 1 oz./minute)	0	oz
D.	Spillage	0	oz

DATA SHEET NO. 16
FMVSS 301 STATIC ROLLOVER RESULTS

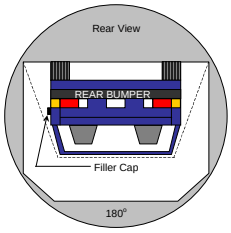
Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011

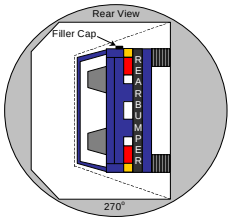


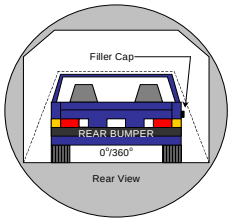




0°TO 90° 90°TO 180°







180°TO 270° 270°TO 360°

1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.
2. The position hold time at each position is 300 seconds (minimum).
3. Details of Stoddard Solvent spillage: None

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0°to 90°	72	300	372
90°to 180°	67	300	367
180°to 270°	65	300	365
270°to 360°	70	300	370

FMVSS 301 SPILLAGE TABLE

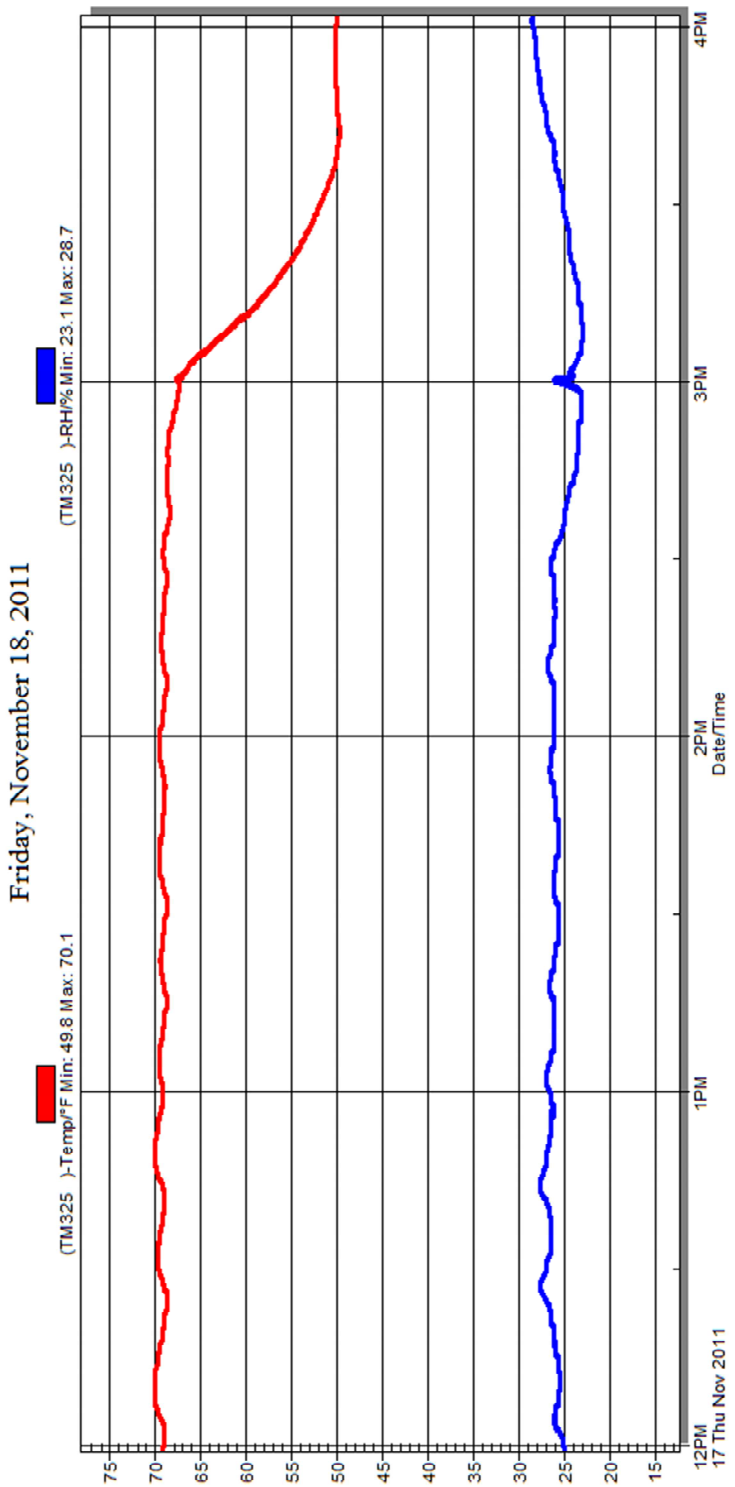
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0°to 90°	0	0	--	--
90°to 180°	0	0	--	--
180°to 270°	0	0	--	--
270°to 360°	0	0	--	--

SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0°to 90°	
90°to 180°	
180°to 270°	
270°to 360°	

DATA SHEET NO. 17
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle:	2012 Dodge Durango SXT	NHTSA No:	MC0322
Test Program:	NCAP Frontal Barrier Impact Test	Test Date	11/17/2011



Temperature Stabilization Chart/Data

APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

[1]**NOTE**: *The underbody views should include the following vehicle components: fuel pump, fuel lines, sender unit, fuel tank filler pipe and any other visible system components.*

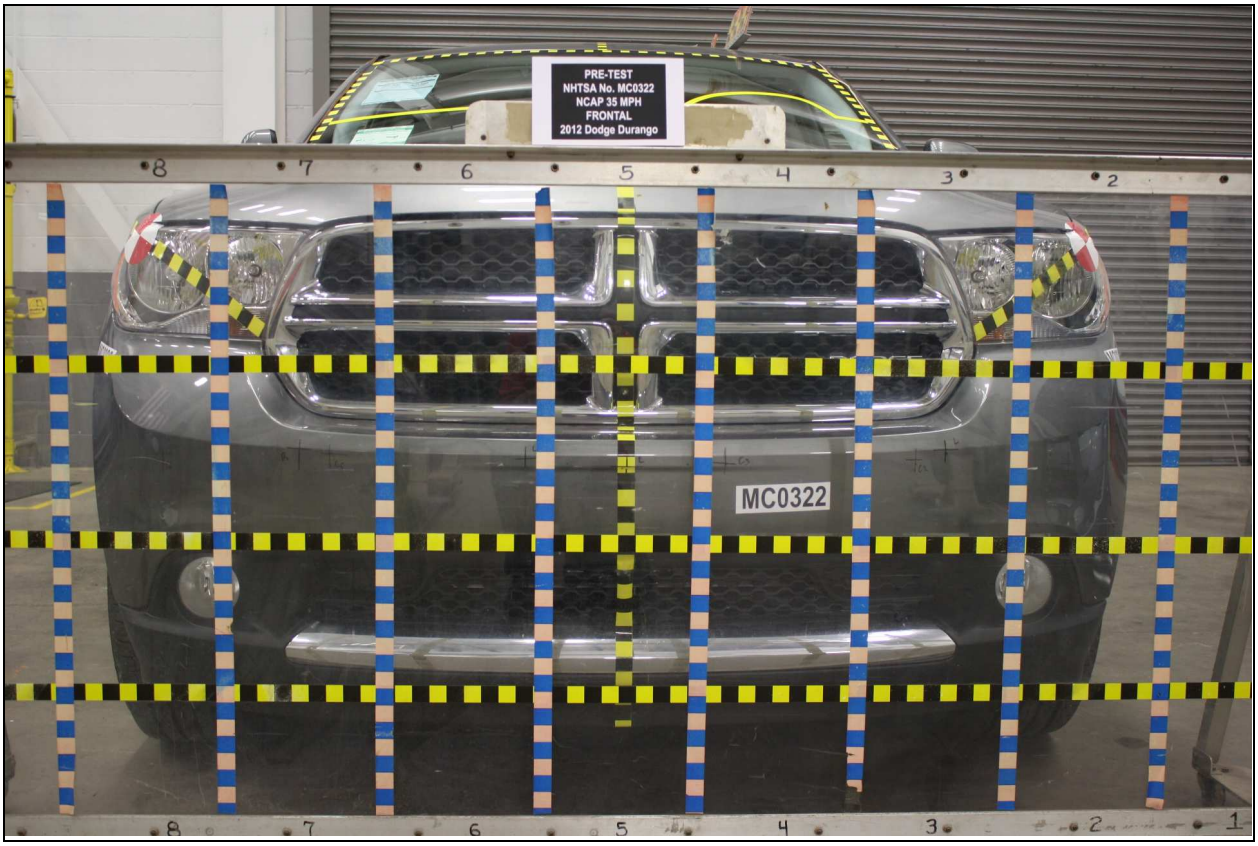


Figure A-1: Load Cell Location

Figure A-2: Load Cell Wall

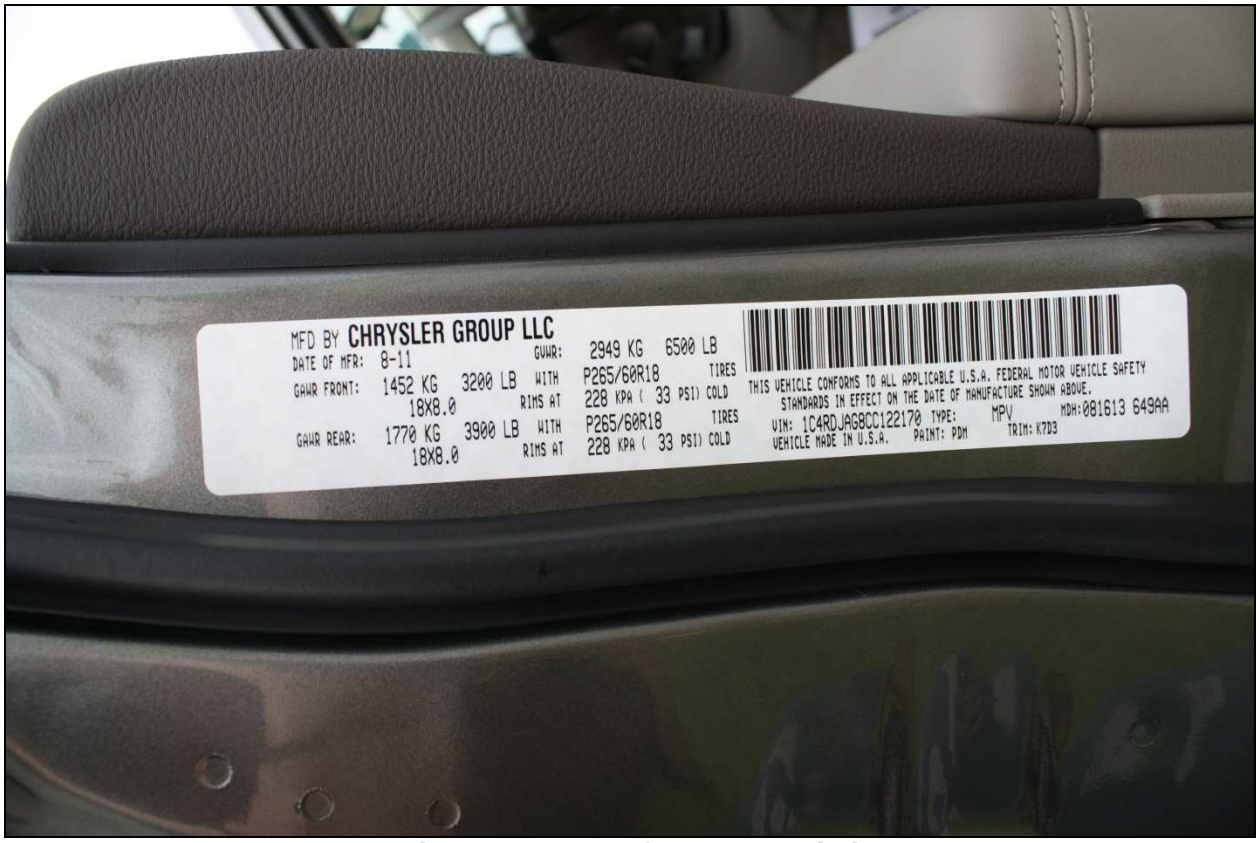


Figure A-3: Manufacturer's Label

Figure A-4: Tire Placard

Figure A-5: Right Front 3-4 View, as Received

Figure A-6: Left Rear 3-4 View, as Received

Figure A-7: Pre-Test Front View of Test Vehicle

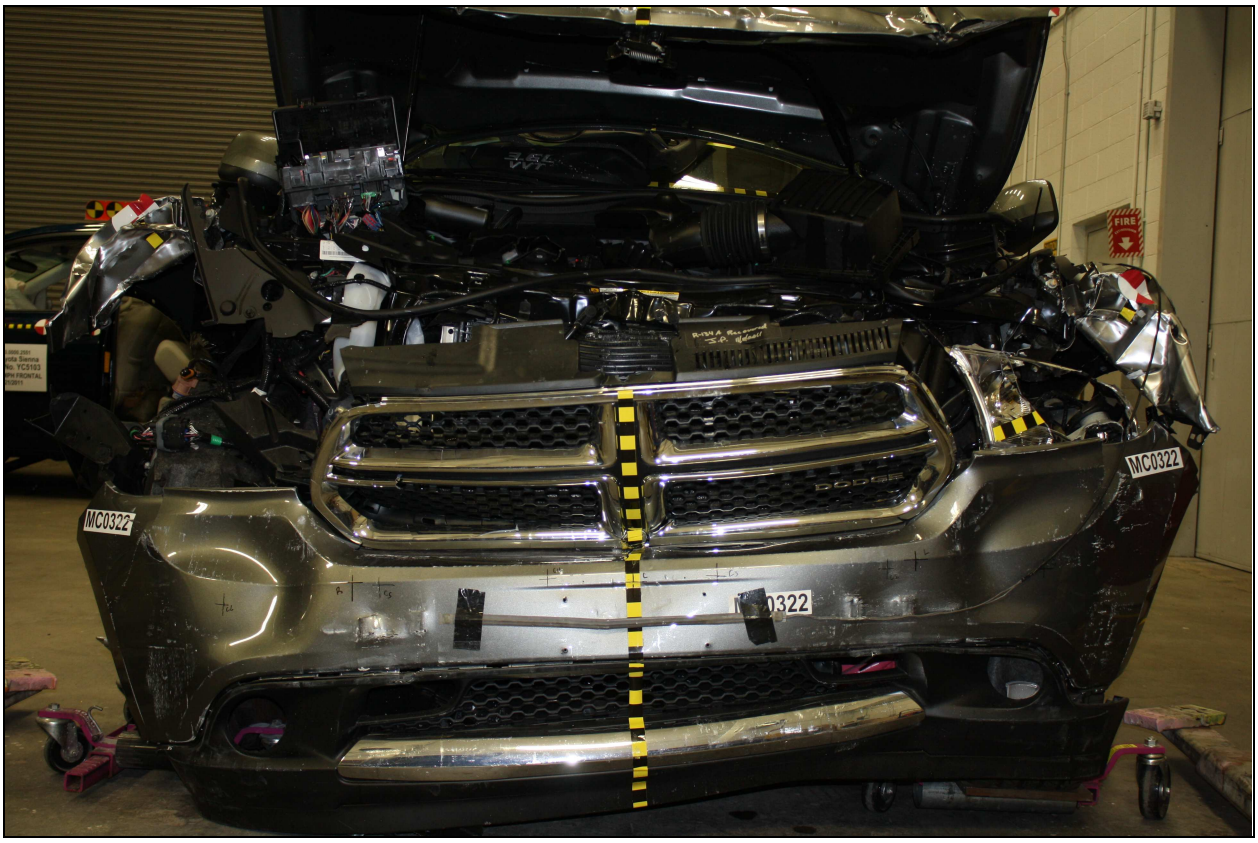


Figure A-8: Post-Test Front View of Test Vehicle

Figure A-9: Pre-Test Left View of Test Vehicle

Figure A-10: Post-Test Left View of Test Vehicle

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

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

Figure A-13: Pre-Test Right Front 3-4 View

Figure A-14: Post-Test Right Front 3-4 View

Figure A-15: Pre-Test Left Rear 3/4 View

Figure A-16: Post-Test Left Rear3/4 View

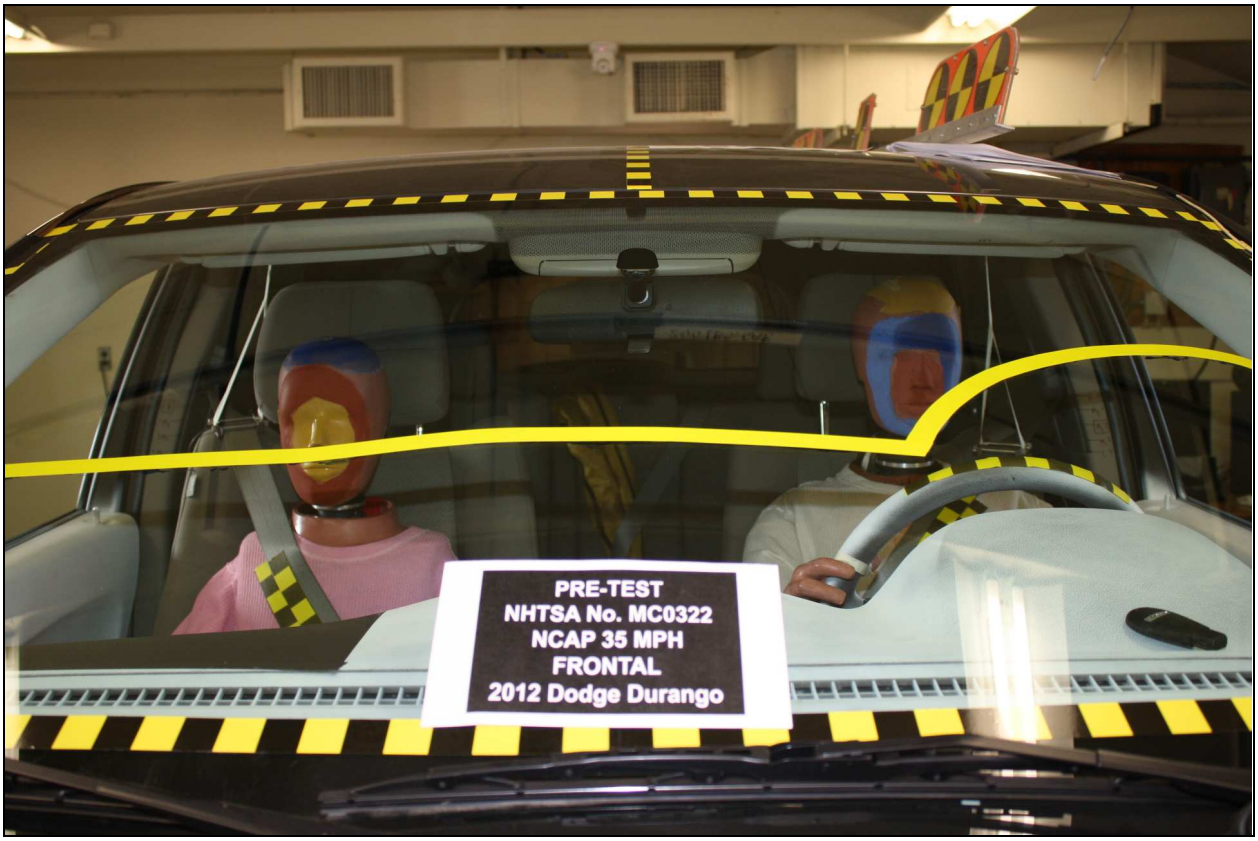


Figure A-17: Pre-Test Windshield View

Figure A-18: Post-Test Windshield View

Figure A-19: Pre-Test Engine Compartment View

Figure A-20: Post-Test Engine Compartment View

Figure A-21: Pre-Test Fuel Filler Cap View

Figure A-22: Post-Test Fuel Filler Cap View

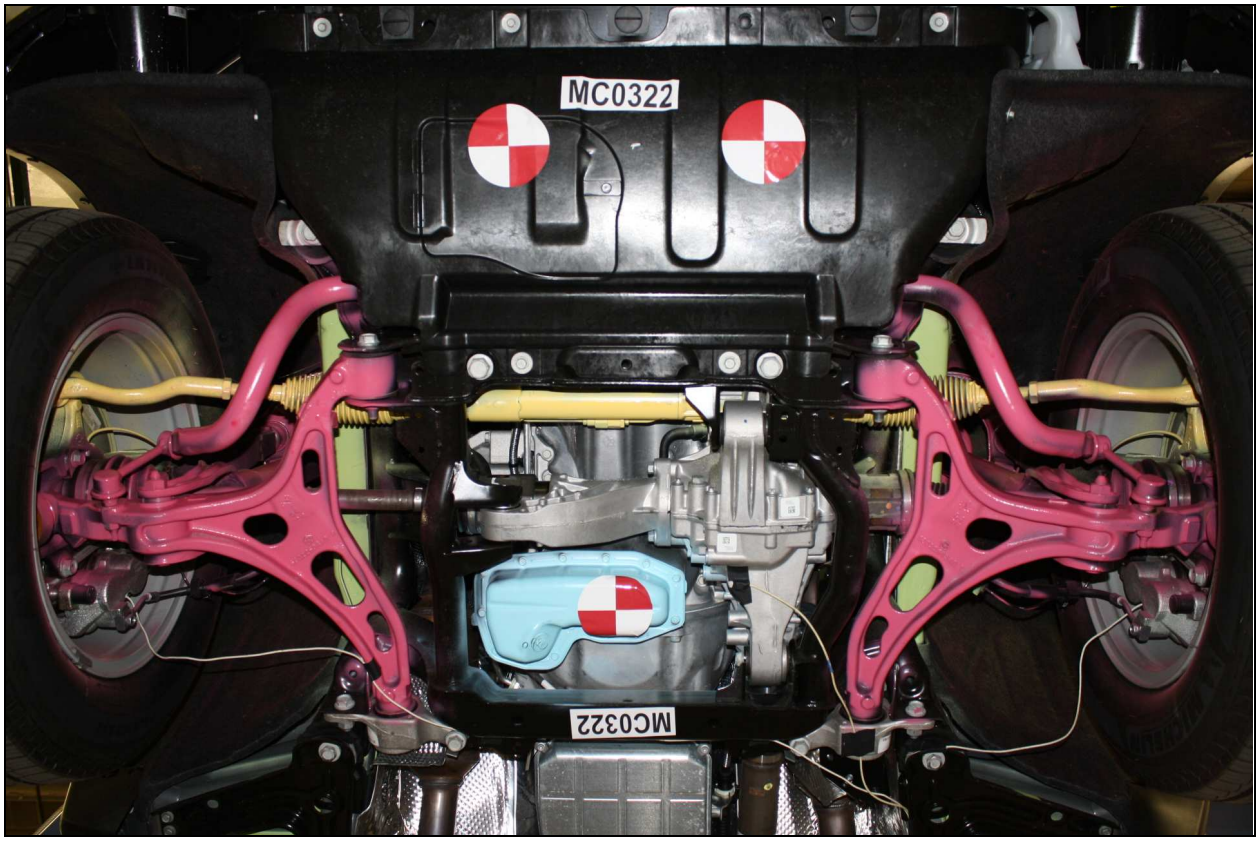


Figure A-23: Pre-Test Front Underbody View

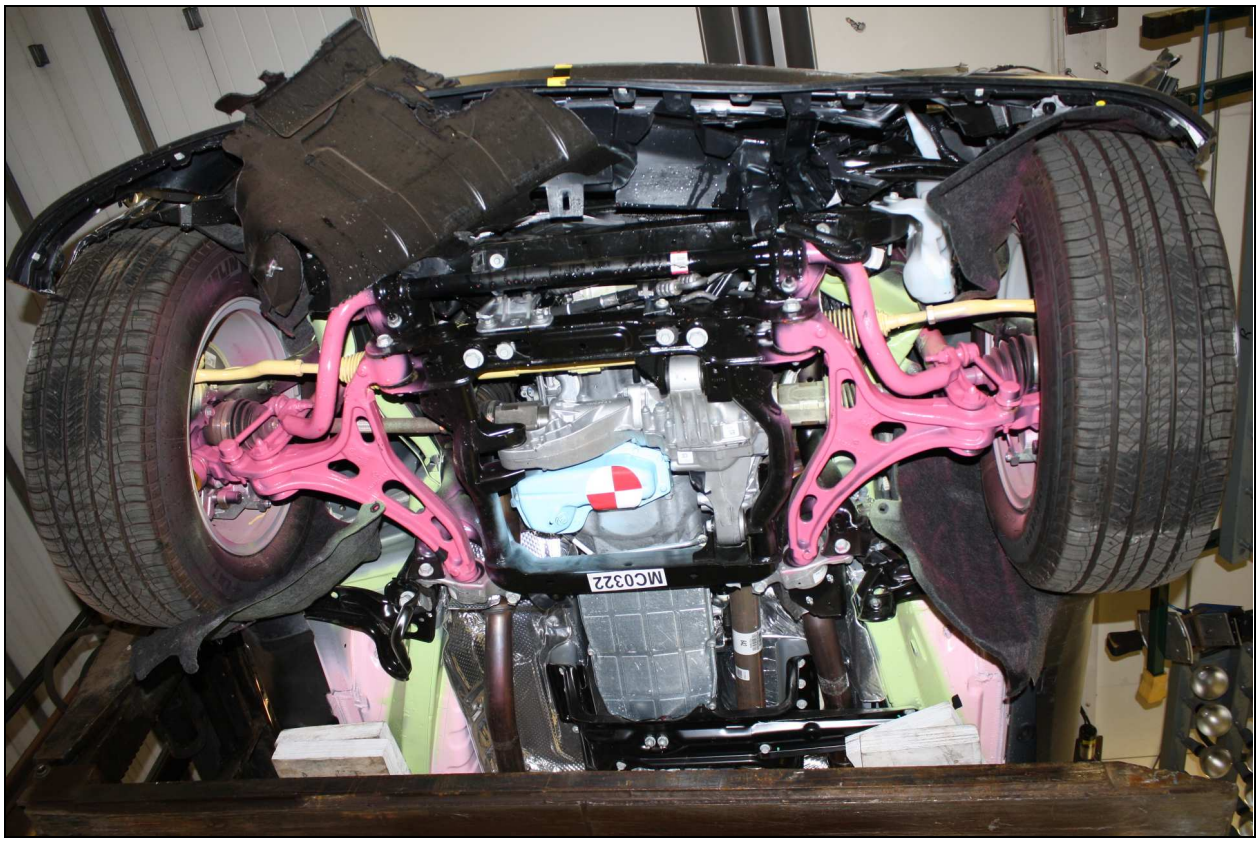


Figure A-24: Post-Test Front Underbody View

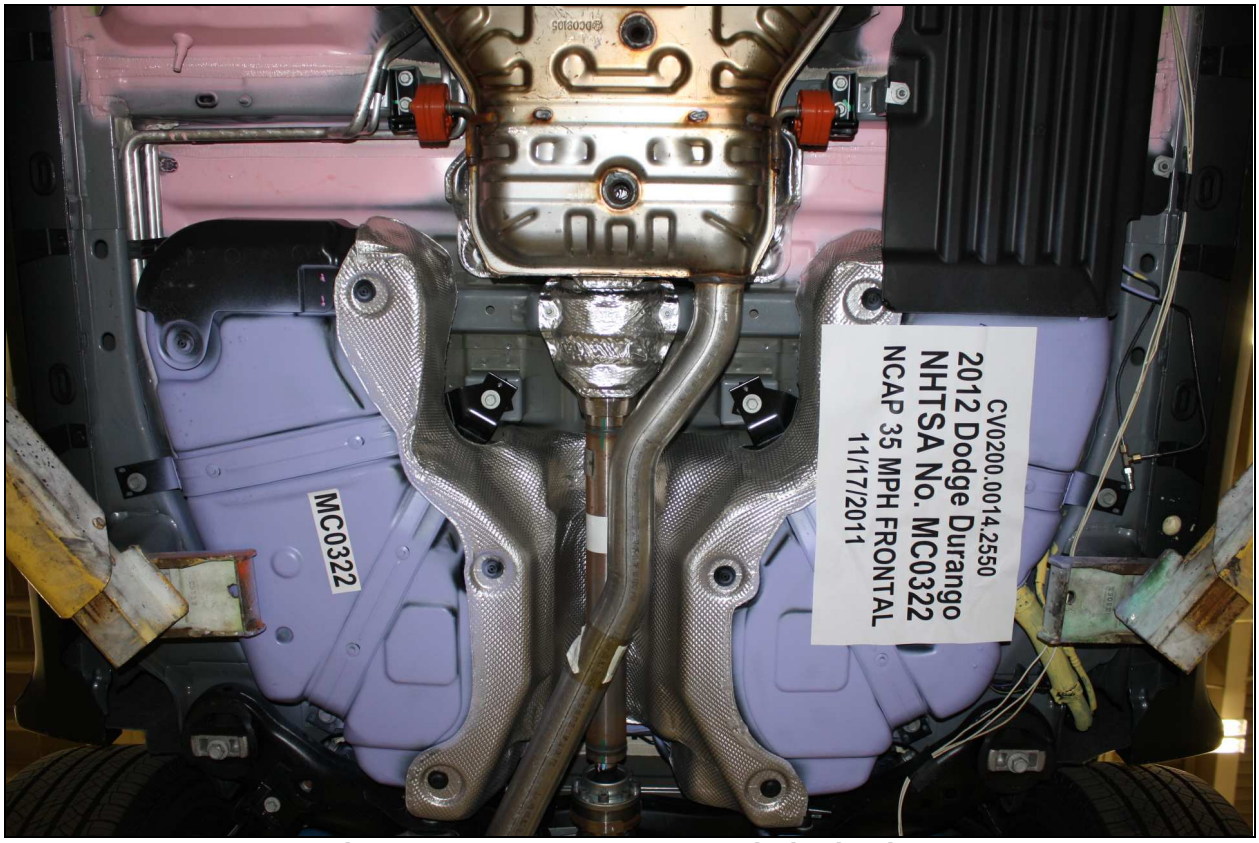


Figure A-25: Pre-Test Rear Underbody View

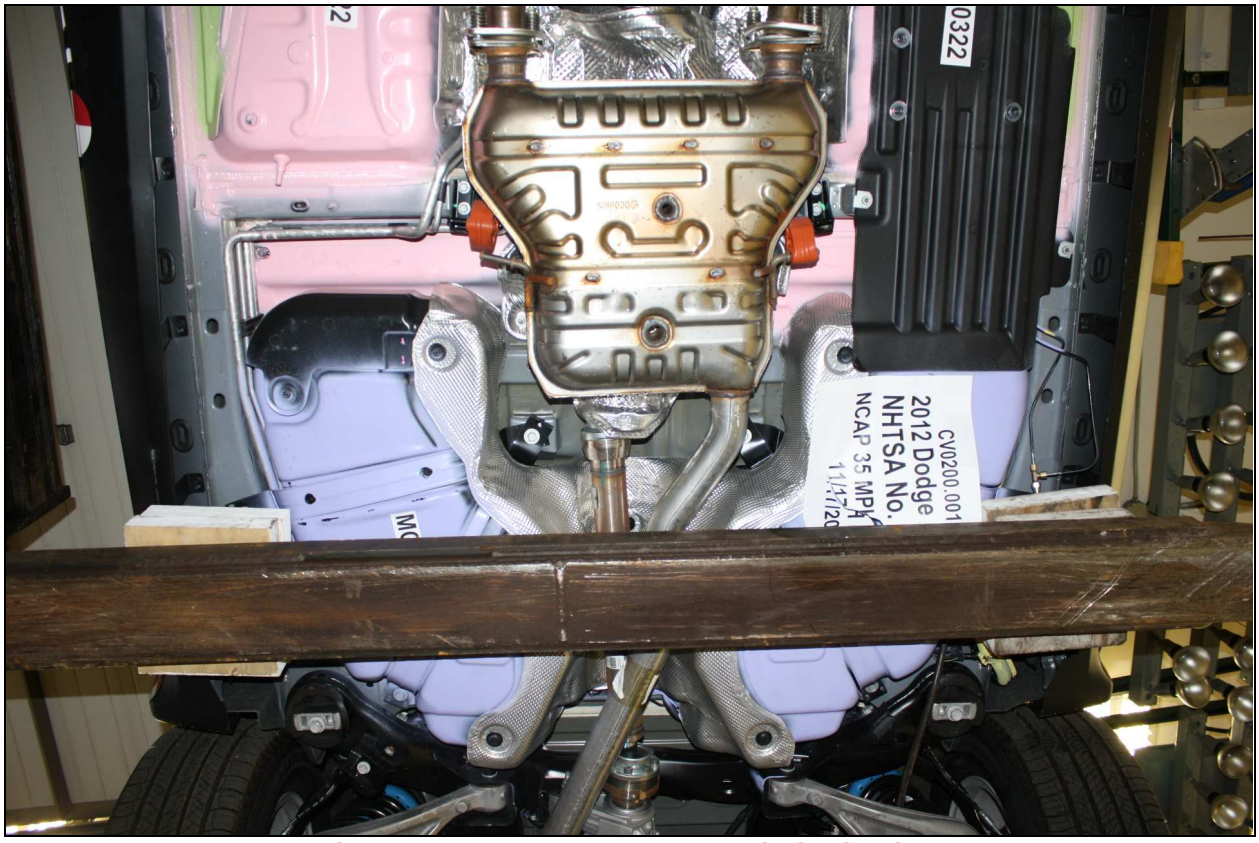


Figure A-26: Post-Test Rear Underbody View

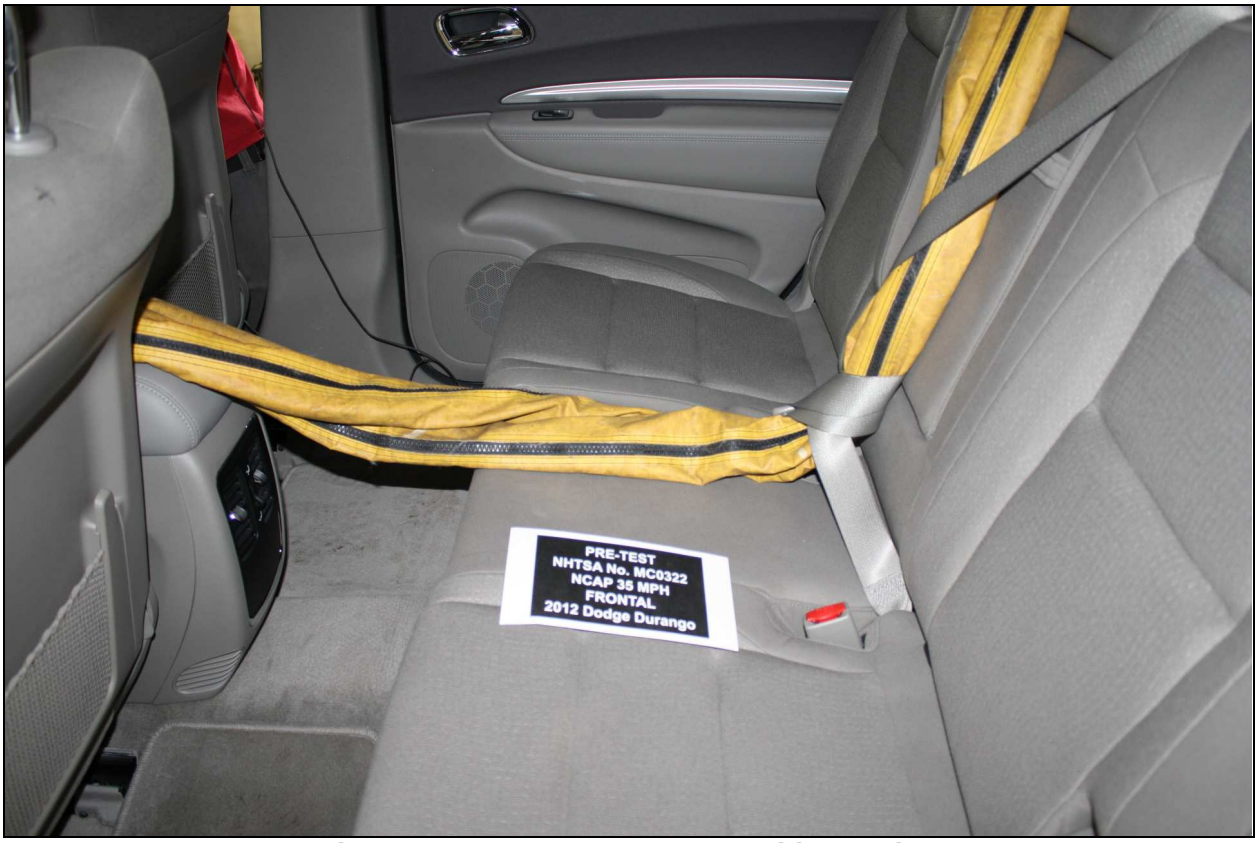


Figure A-27: Pre-Test Dummy Cable Routing

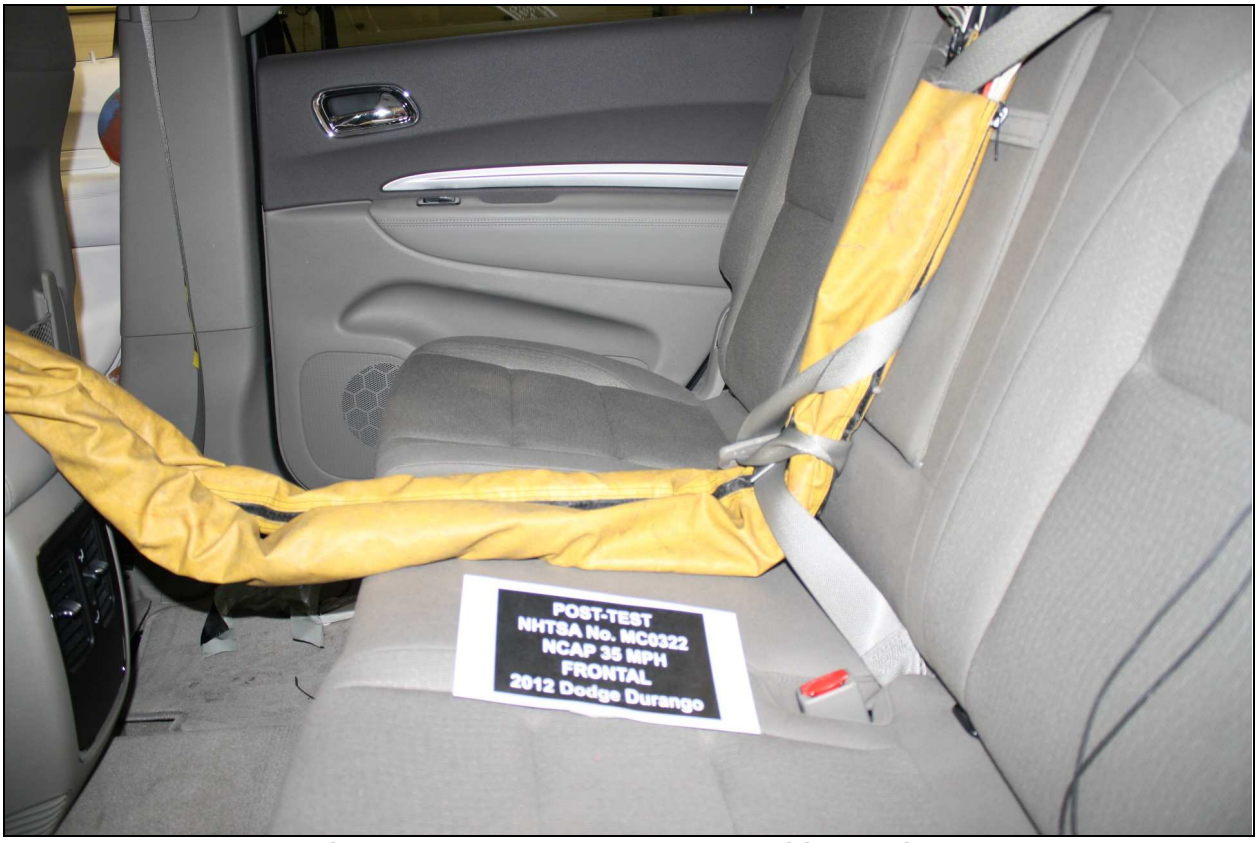


Figure A-28: Post-Test Dummy Cable Routing

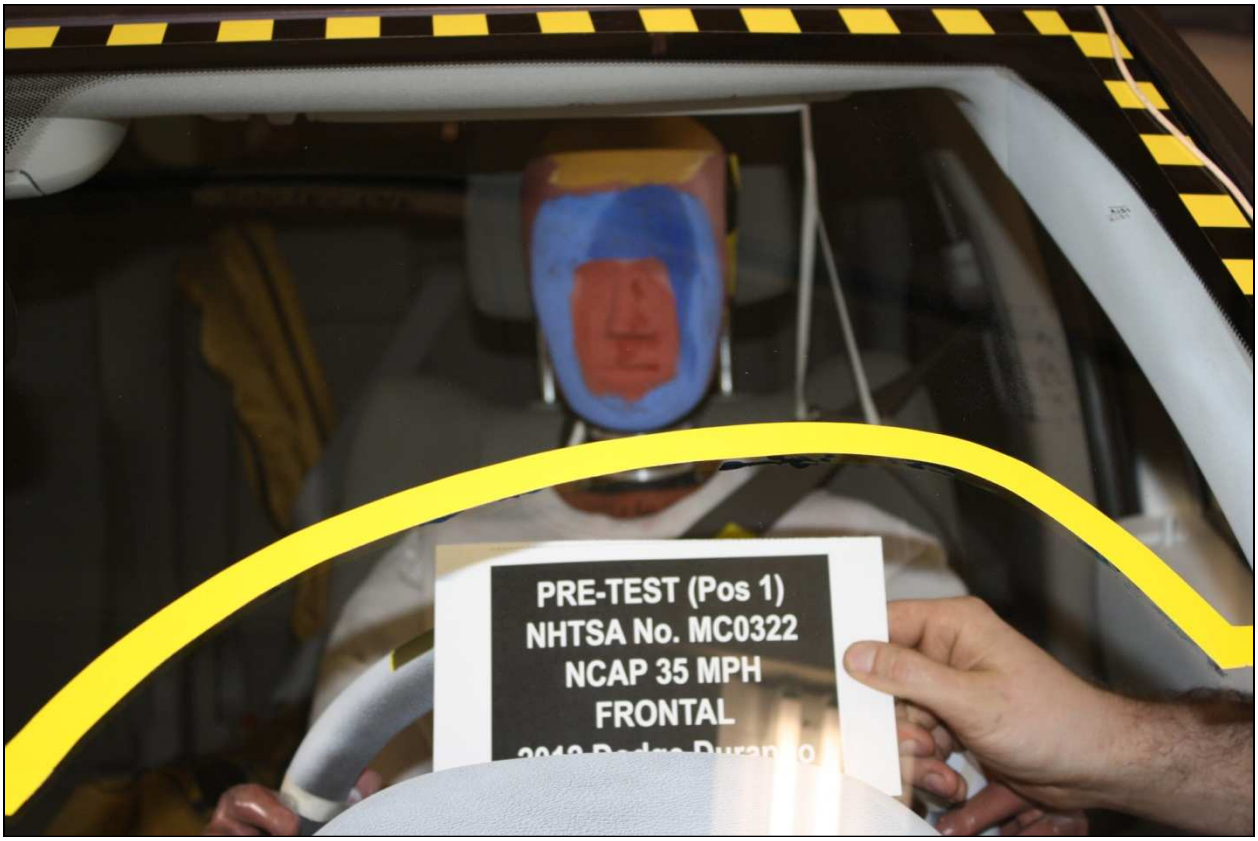


Figure A-29: Pre-Test Driver Dummy Front View

Figure A-30: Post-Test Driver Dummy Front View

Figure A-31: Pre-Test Driver Dummy Window View

Figure A-32: Post-Test Driver Dummy Window View

Figure A-33: Pre-Test Driver Dummy and Vehicle Interior View

Figure A-34: Post-Test Driver Dummy and Vehicle Interior View

Figure A-35: Pre-Test Driver's Seat Fore-Aft Markings

Figure A-36: Post-Test Driver's Seat Fore-Aft Markings

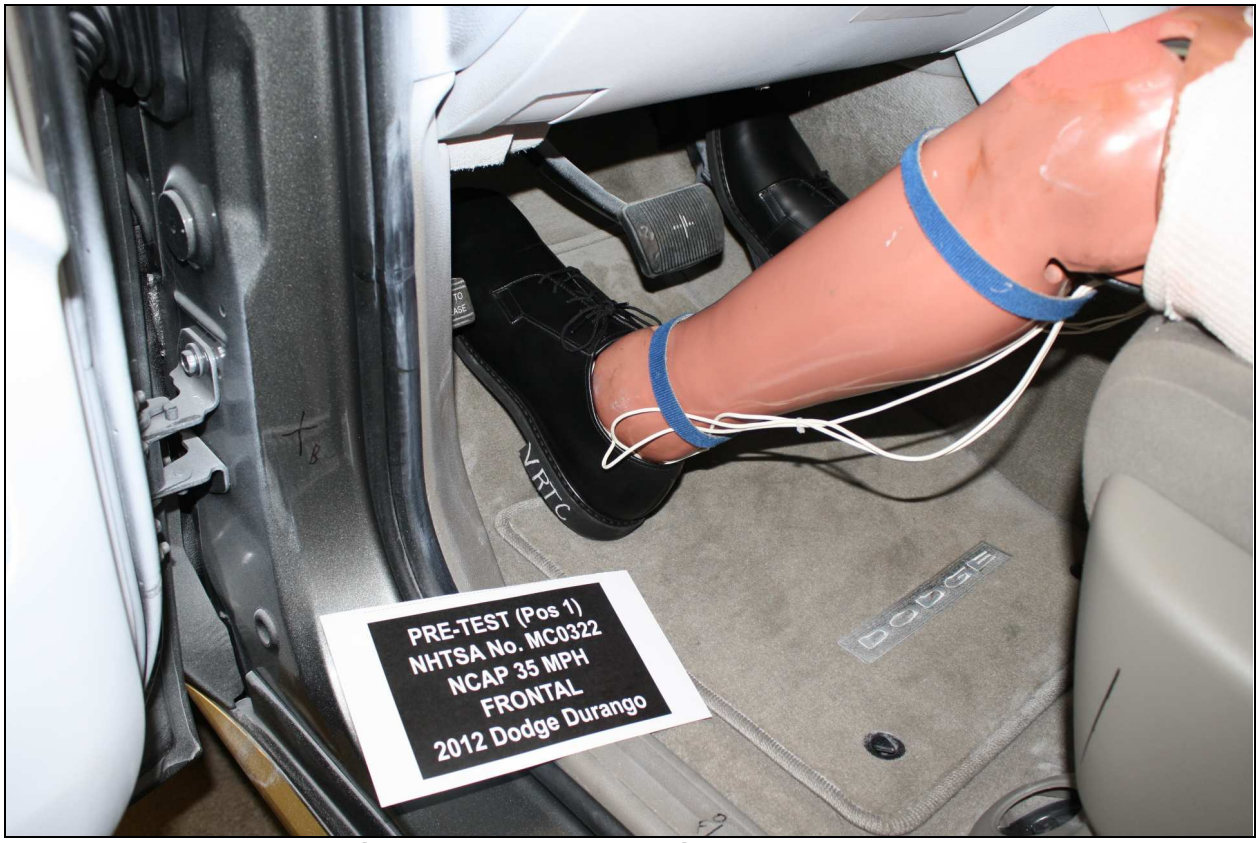


Figure A-37: Pre-Test Driver Dummy Feet

Figure A-38: Post-Test Driver Dummy Feet

Figure A-39: Pre-Test Driver's Side Knee Bolster

Figure A-40: Post-Test Driver's Side Knee Bolster

Figure A-41: Pre-Test Driver's Side Floorpan

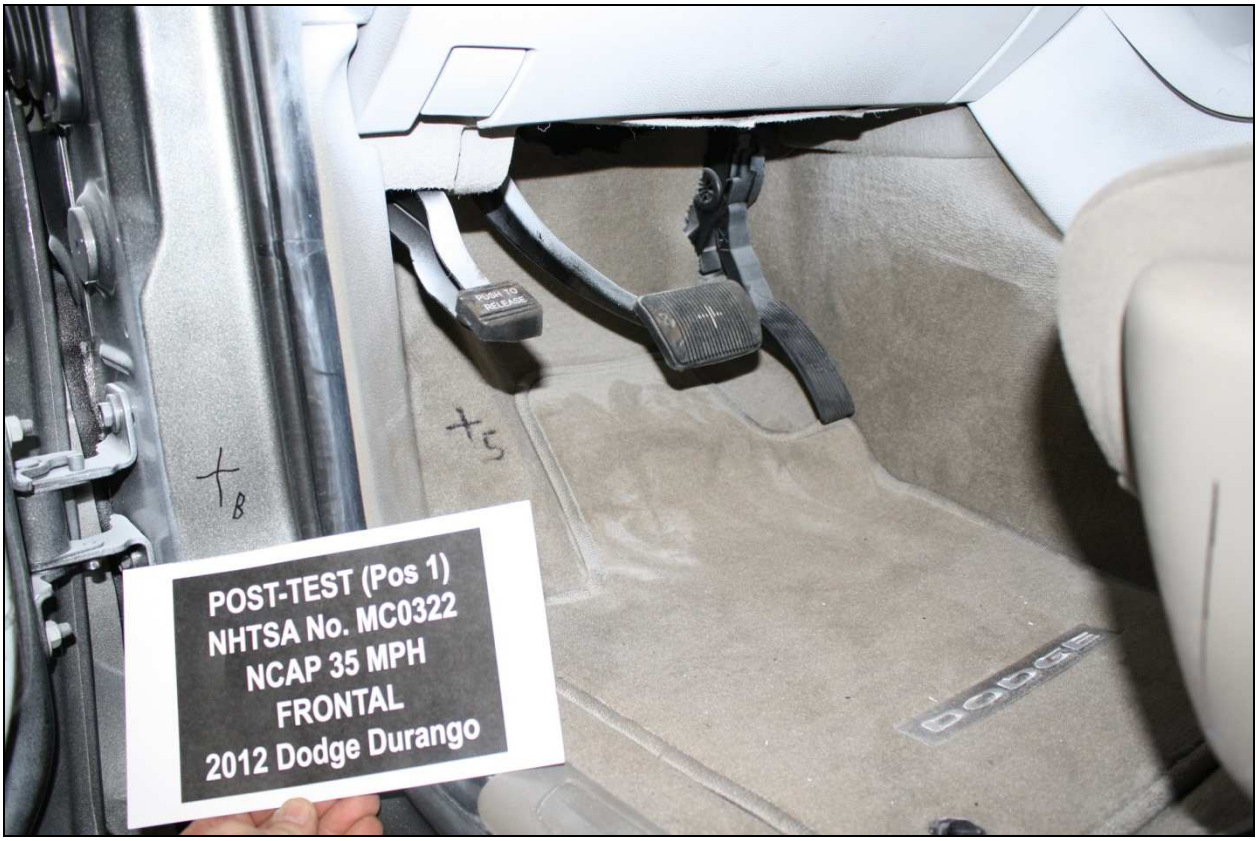


Figure A-42: Post-Test Driver's Side Floorpan

Figure A-43: Post-Test Driver Dummy Face

Figure A-44: Post-Test Diver Dummy Contact With Airbag

Figure A-45: Post-Test Driver Dummy Contact with Headrest

Figure A-46: Pre-Test View of the Steering Wheel

Figure A-47: Post-Test View of the Steering Wheel

Figure A-48: Pre-Test Passenger Dummy Front View

Figure A-49: Post-Test Passenger Dummy Front View

Figure A-50: Pre-Test Passenger Dummy Window View

Figure A-51: Post-Test Passenger Dummy Window View

Figure A-52: Pre-Test Passenger Dummy and Vehicle Interior View

Figure A-53: Post-Test Passenger Dummy and Vehicle Interior View

Figure A-54: Pre-Test Passenger's Seat Fore-Aft Markings

Figure A-55: Post-Test Passenger's Seat Fore-Aft Markings

Figure A-56: Pre-Test Passenger Dummy Feet

Figure A-57: Post-Test Passenger Dummy Feet

Figure A-58: Pre-Test Passenger's Side Knee Bolster

Figure A-59: Post-Test Passenger's Side Knee Bolster

Figure A-60: Pre-Test Passenger's Side Floorpan

Figure A-61: Post-Test Passenger's Side Floorpan

Figure A-62: Post-Test Passenger Dummy Contact with Airbag

Figure A-62a: Post-Test Passenger Dummy Contact with Headrest

Figure A-63: Photograph of Ballast Installed in Vehicle

Photo Not Applicable

Figure A-64: Post-Test Stoddard Solvent Spillage Location View, if required

Figure A-65: Post-Test Speed Trap Read-Out

Figure A-66: Vehicle at 0º on Static Rollover Device

Figure A-67: Vehicle at 90º on Static Rollover Device

Figure A-68: Vehicle at 180º on Static Rollover Device

Figure A-69: Vehicle at 270º on Static Rollover Device

Figure A-70: Vehicle at 360º on Static Rollover Device

Figure A-71: 2012 Dodge Durango SXT Frontal Impact Event

Figure A-72: Monroney Label Photograph

APPENDIX B
DUMMY RESPONSE DATA TRACES

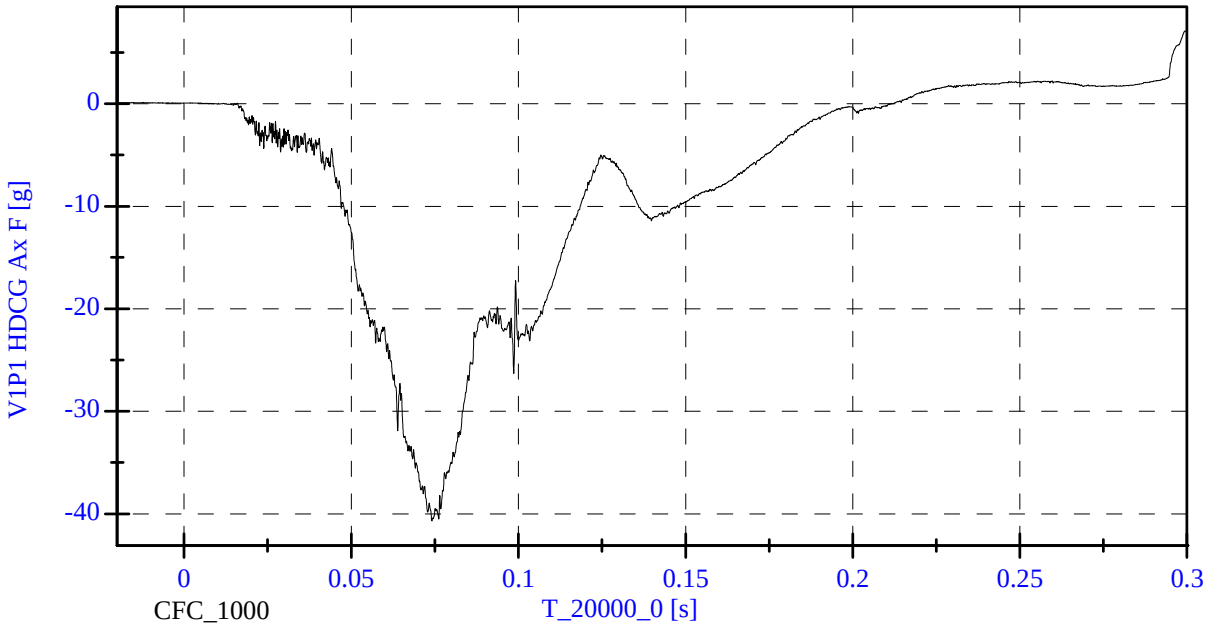
The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

Driver Head X Acceleration Redundant
Driver Head Y Acceleration Redundant
Driver Head Z Acceleration Redundant
Driver Upper Neck Force Y
Driver Upper Neck Moment X
Driver Upper Neck Moment Z
Driver Chest X Acceleration Redundant
Driver Chest Y Acceleration Redundant
Driver Chest Z Acceleration Redundant
Driver Pelvis X
Driver Pelvis Y
Driver Pelvis Z
Driver Left Femur Redundant
Driver Right Femur Redundant
Driver Left Upper Tibia Moment X
Driver Left Upper Tibia Moment Y
Driver Left Upper Tibia Force Z
Driver Left Lower Tibia Moment X
Driver Left Lower Tibia Moment Y
Driver Left Lower Tibia Force Z
Driver Right Upper Tibia Moment X
Driver Right Upper Tibia Moment Y
Driver Right Upper Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver Right Lower Tibia Force Z
Driver Left Foot Fore Z
Driver Left Foot Aft X
Driver Left Foot Aft Z
Driver Right Foot Fore Z
Driver Right Foot Aft X
Driver Right Foot Aft Z
Driver Shoulder Belt Force
Driver Lap Belt Force
Passenger Head X Acceleration Redundant
Passenger Head Y Acceleration Redundant
Passenger Head Z Acceleration Redundant
Passenger Upper Neck Force X
Passenger Upper Neck Force Z
Passenger Upper Neck Moment Y
Passenger Chest X Acceleration Redundant
Passenger Chest Y Acceleration Redundant
Passenger Chest Z Acceleration Redundant
Passenger Pelvis X
Passenger Pelvis Y
Passenger Pelvis Z
Passenger Left Femur Redundant
Passenger Right Femur Redundant
Passenger Left Upper Tibia Moment X
Passenger Left Upper Tibia Moment Y
Passenger Left Upper Tibia Force Z

Passenger Left Lower Tibia Moment X
Passenger Left Lower Tibia Moment Y
Passenger Left Lower Tibia Force Z
Passenger Right Upper Tibia Moment X
Passenger Right Upper Tibia Moment Y
Passenger Right Upper Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger Left Foot Fore Z
Passenger Left Foot Aft X
Passenger Left Foot Aft Z
Passenger Right Food Fore Z
Passenger Right Foot Aft X
Passenger Right Foot Aft Z
Passenger Shoulder Belt Force
Passenger Lap Belt Force
Left Rear Seat Crossmember X
Left Rear Seat Crossmember Z
Right Rear Seat Crossmember X
Right Rear Seat Crossmember Z
Vehicle Engine Top X
Vehicle Engine Bottom X
Vehicle Left Brake Caliper X
Vehicle Right Brake Caliper X
Load Cell Barrier A1-A9
Load Cell Barrier B1-A9
Load Cell Barrier C1-A9
Load Cell Barrier D1-A9

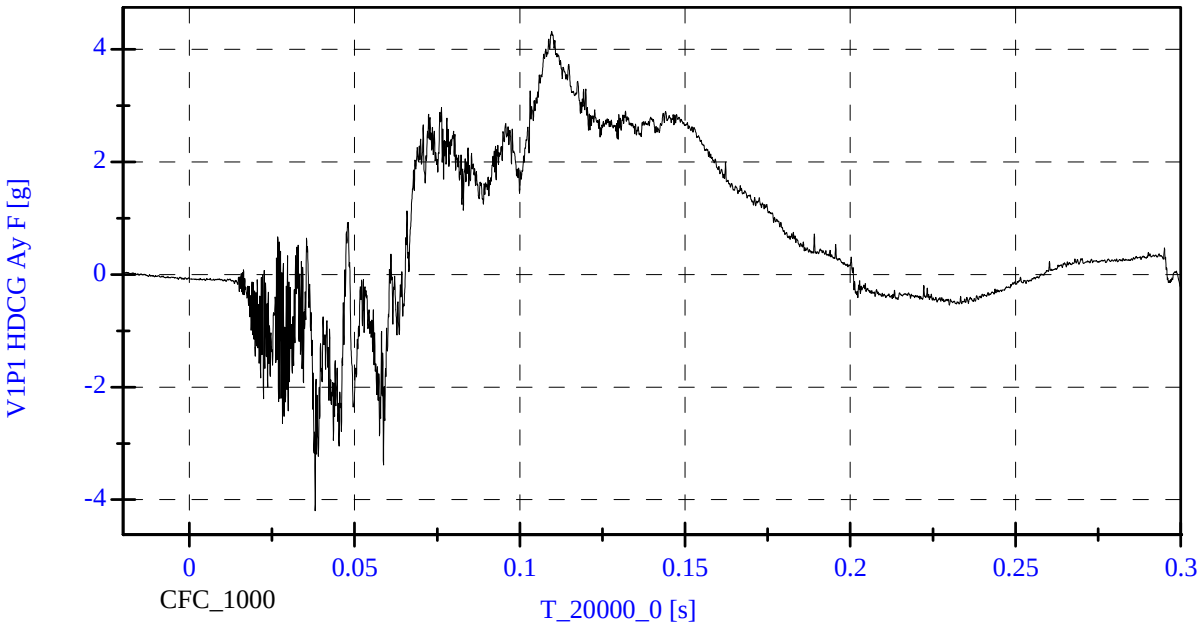
V1P1 Head CG x [g , CFC_1000]

Max: 7.09 [g] at 0.300 [s]
Min: -40.70 [g] at 0.074 [s]



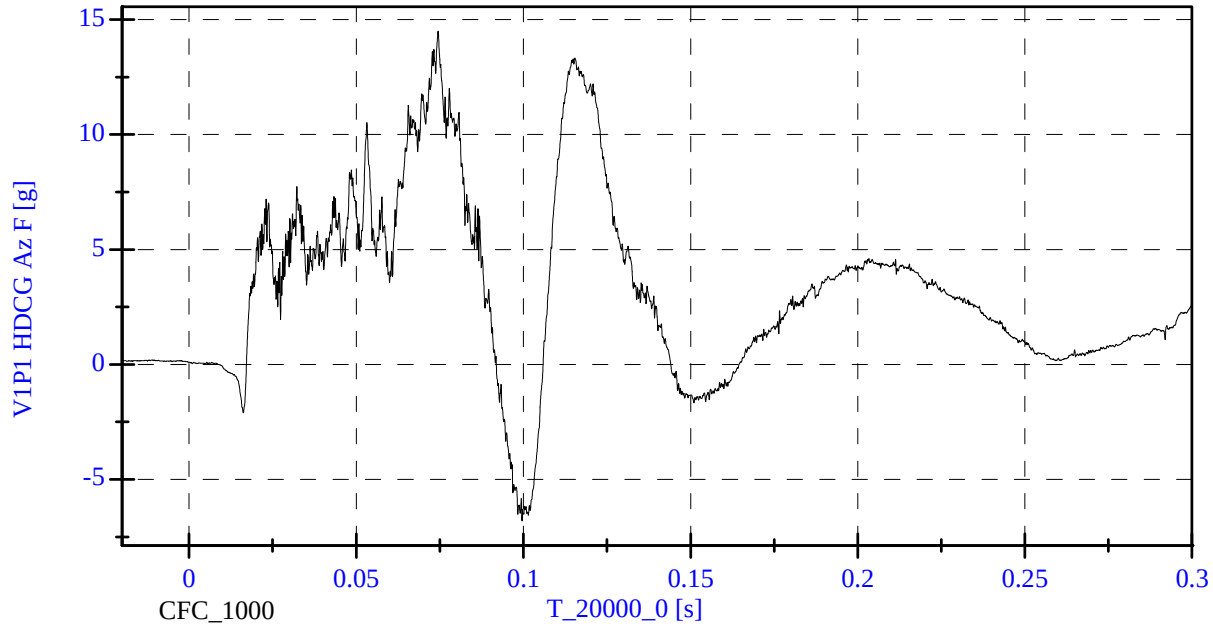
V1P1 Head CG y [g , CFC_1000]

Max: 4.32 [g] at 0.110 [s]
Min: -4.20 [g] at 0.038 [s]



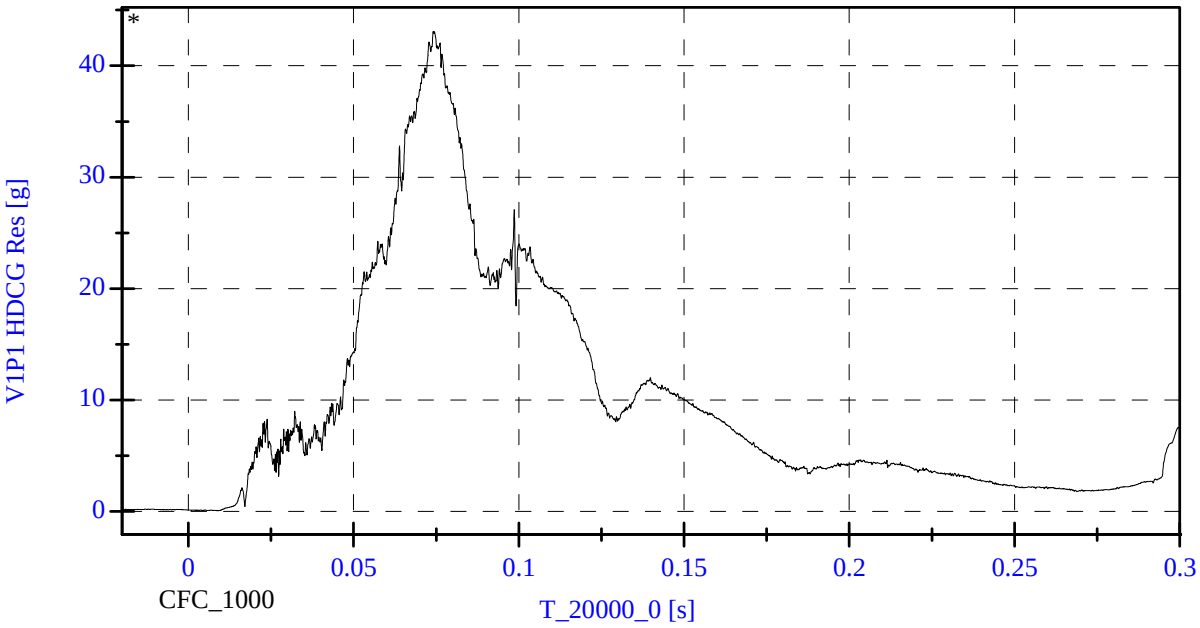
V1P1 Head CG z [g , CFC_1000]

Max: 14.51 [g] at 0.074 [s]
Min: -6.81 [g] at 0.100 [s]



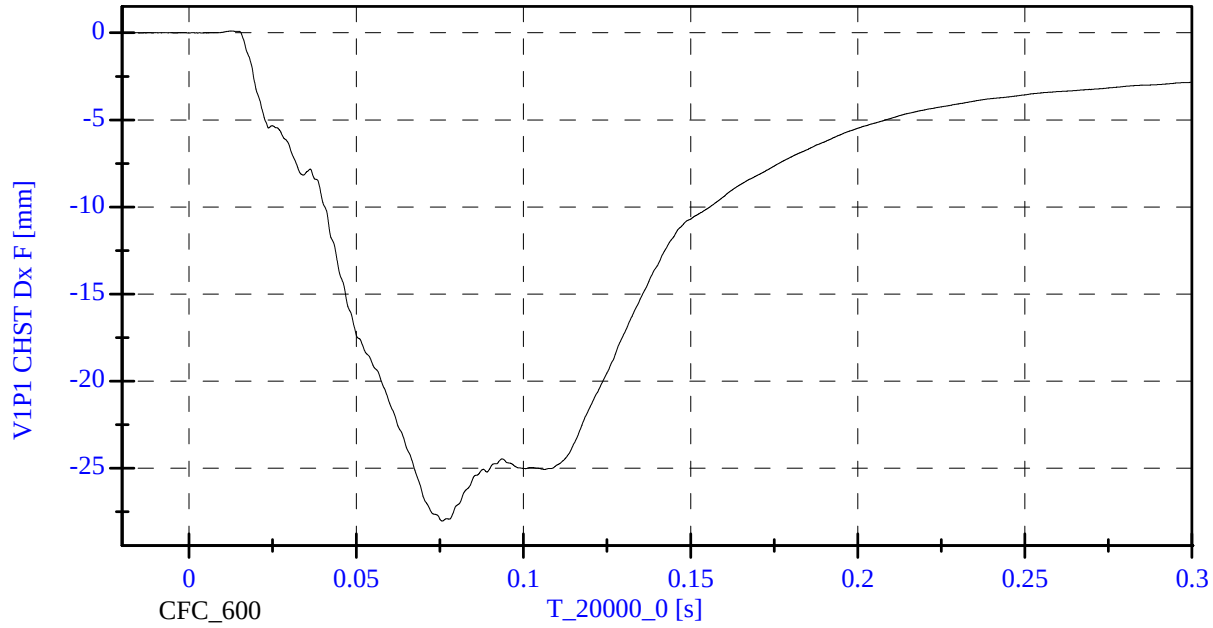
V1P1 Headform Resultant [g, CFC_1000]

Max: 43.08 [g] at 0.074 [s]
Min: 0.08 [g] at 0.009 [s]



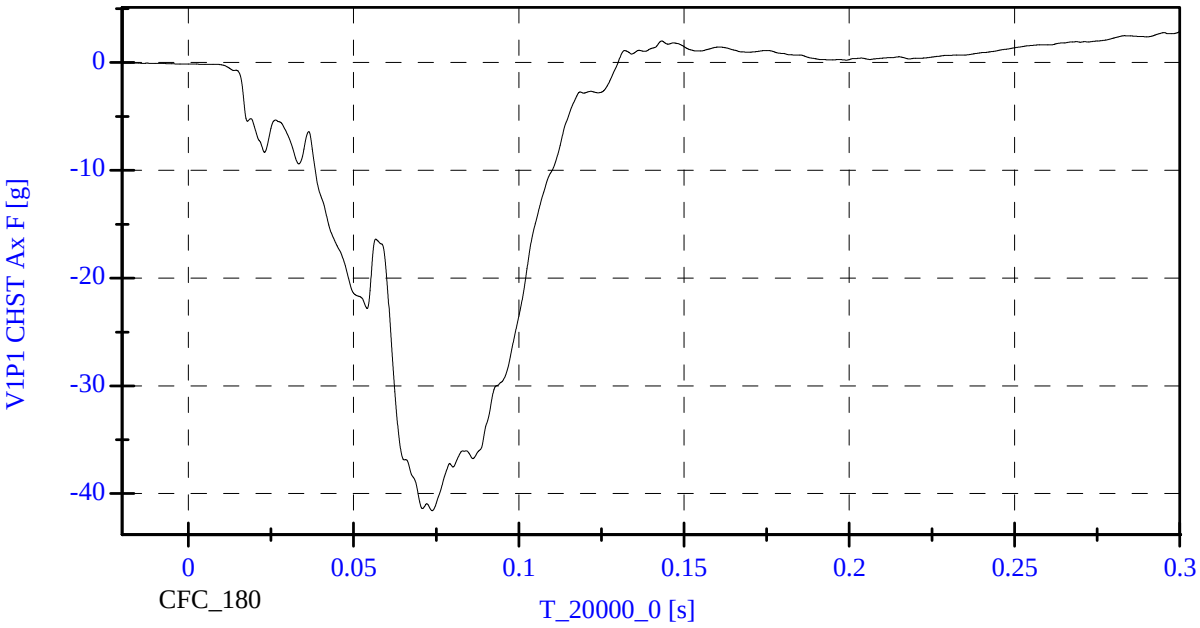
V1P1 Chest Displacement x [mm , CFC_600]

Max: 0.10 [mm] at 0.012 [s]
Min: -28.03 [mm] at 0.076 [s]



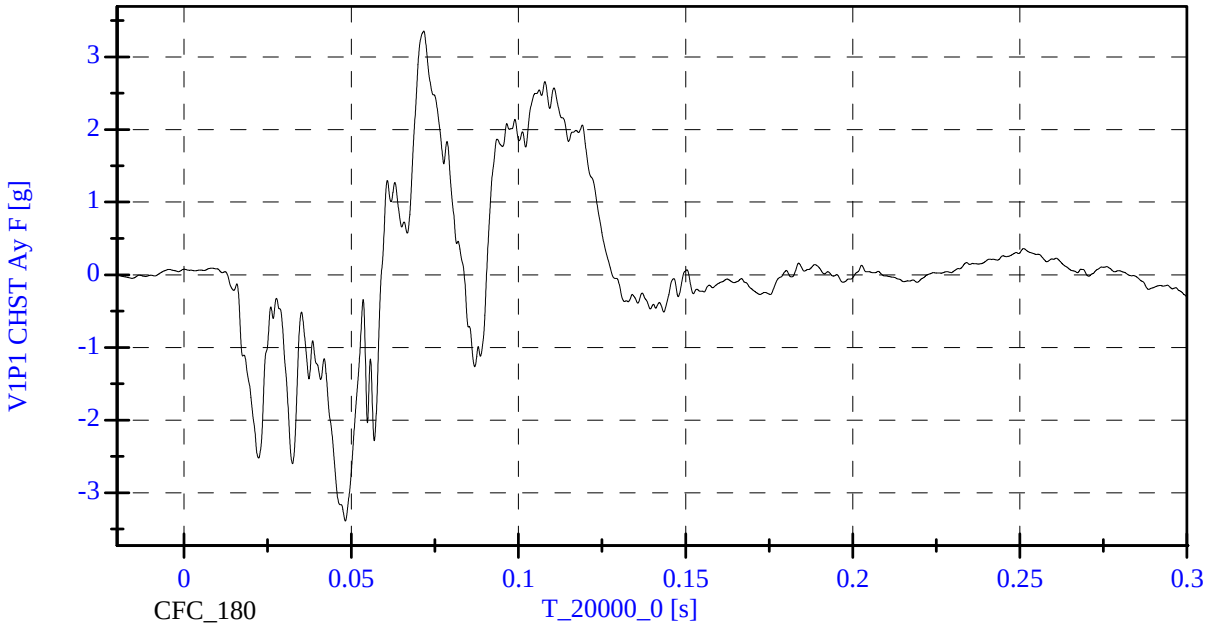
V1P1 Chest x [g , CFC_180]

Max: 2.89 [g] at 0.300 [s]
Min: -41.58 [g] at 0.074 [s]



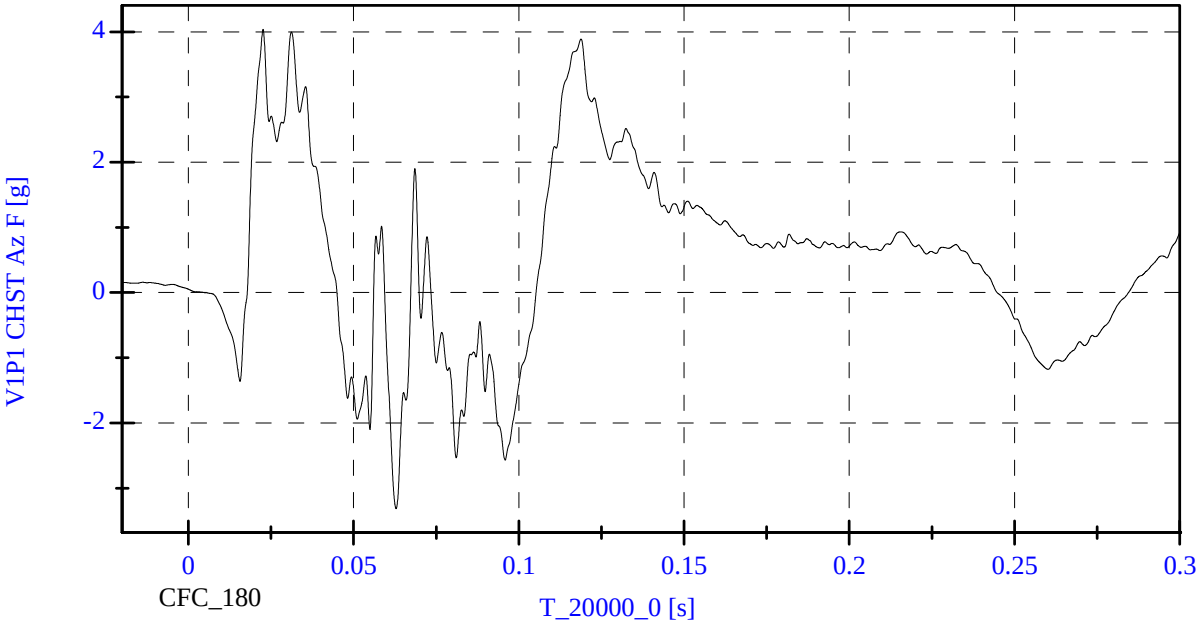
V1P1 Chest y [g , CFC_180]

Max: 3.36 [g] at 0.072 [s]
Min: -3.39 [g] at 0.048 [s]



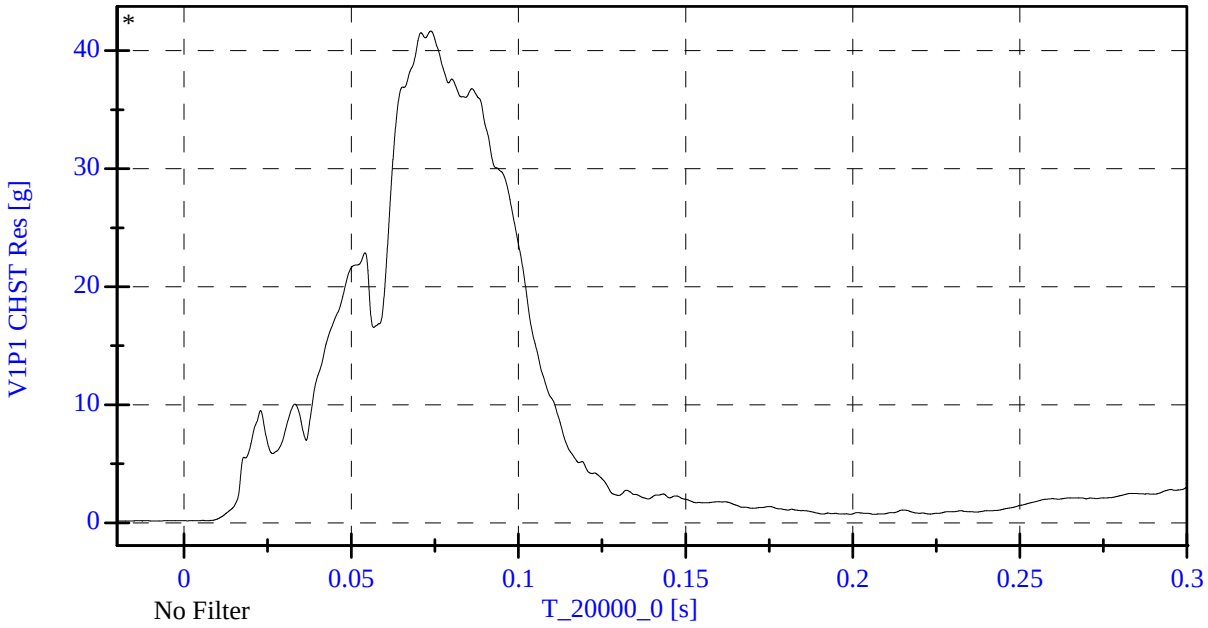
V1P1 Chest z [g , CFC_180]

Max: 4.04 [g] at 0.023 [s]
Min: -3.31 [g] at 0.063 [s]



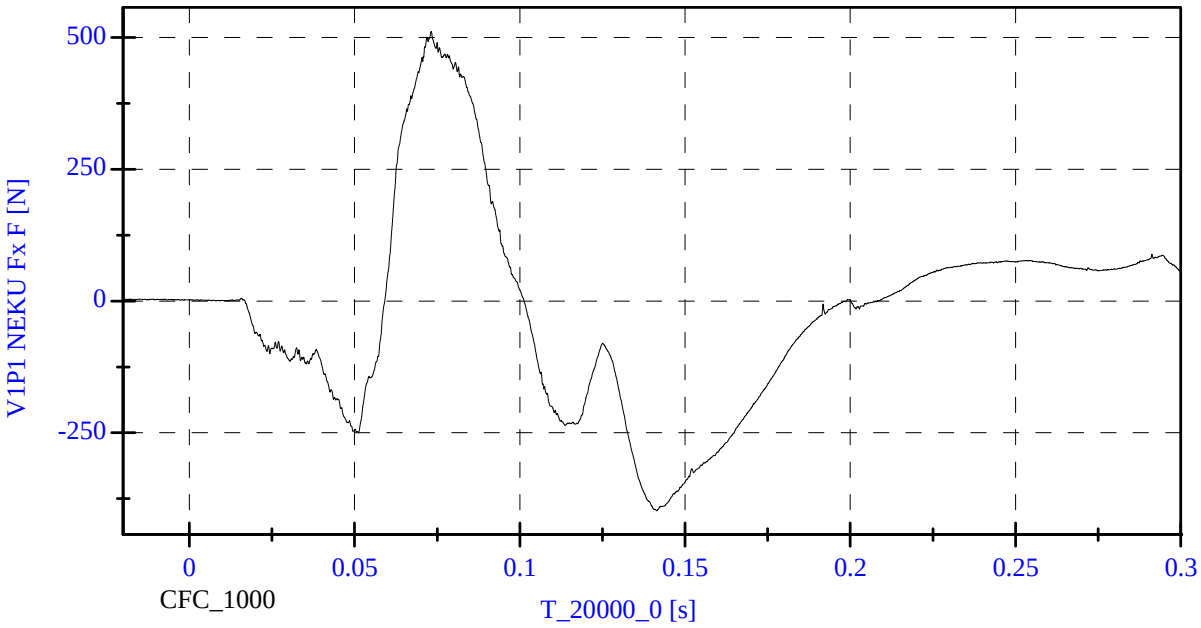
V1P1 Chest Resultant

Max: 41.66 [g] at 0.074 [s]
Min: 0.15 [g] at -0.007 [s]



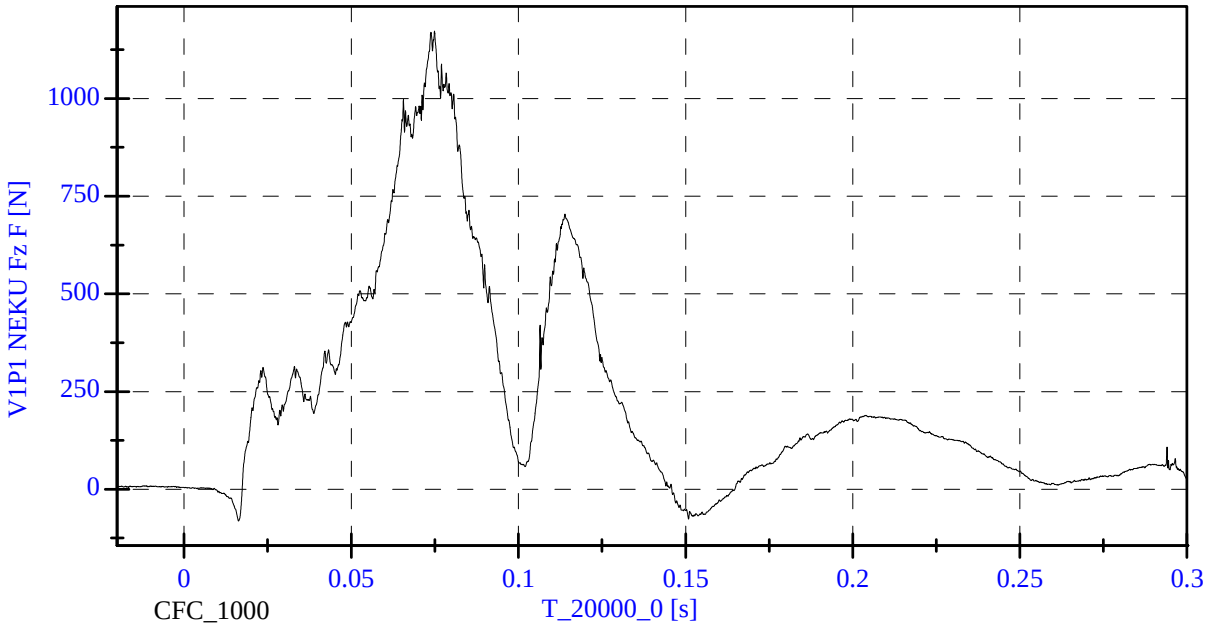
V1P1 Upper Neck Fx [N , CFC_1000]

Max: 511.51 [N] at 0.073 [s]
Min: -397.70 [N] at 0.141 [s]



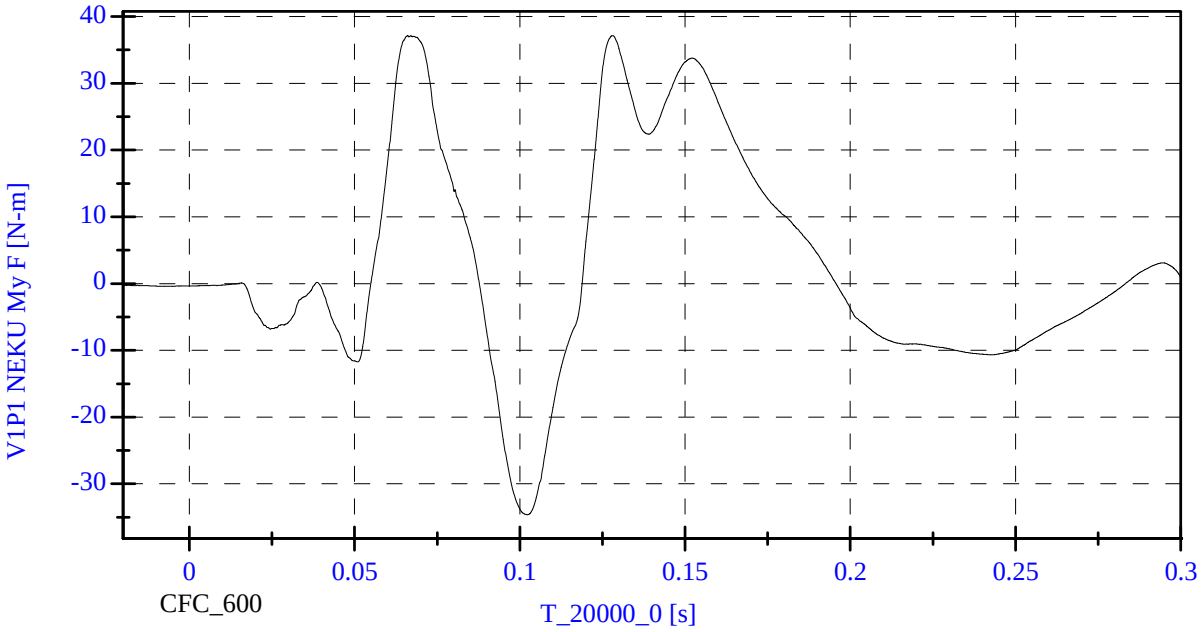
V1P1 Upper Neck Fz [N , CFC_1000]

Max: 1172.92 [N] at 0.075 [s]
Min: -81.51 [N] at 0.016 [s]



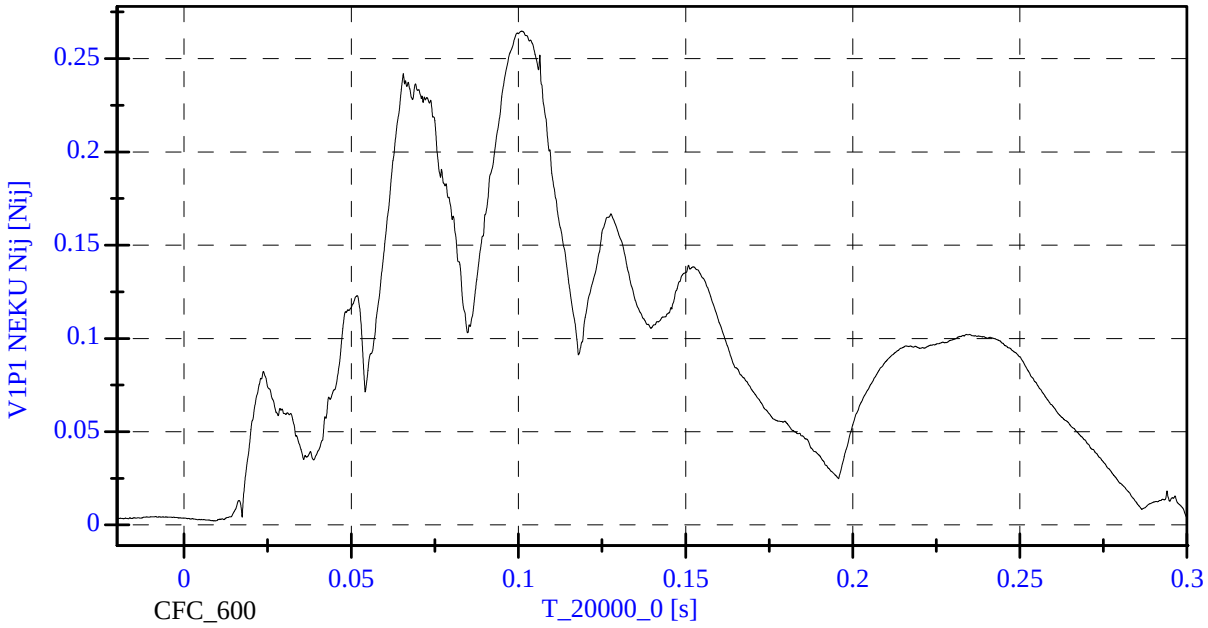
V1P1 Upper Neck My [N-m , CFC_600]

Max: 37.16 [N-m] at 0.066 [s]
Min: -34.61 [N-m] at 0.102 [s]



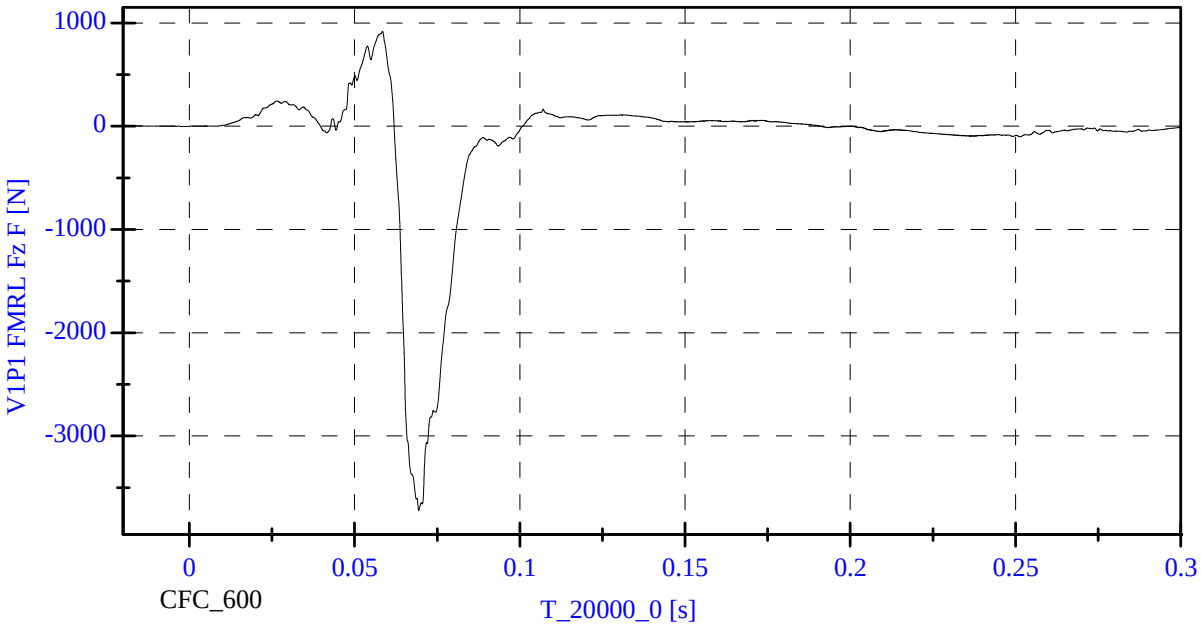
V1P1 Upper Neck Nij [Nij, CFC_600]

Max: 0.26 [Nij] at 0.101 [s]
Min: 0.00 [Nij] at 0.009 [s]



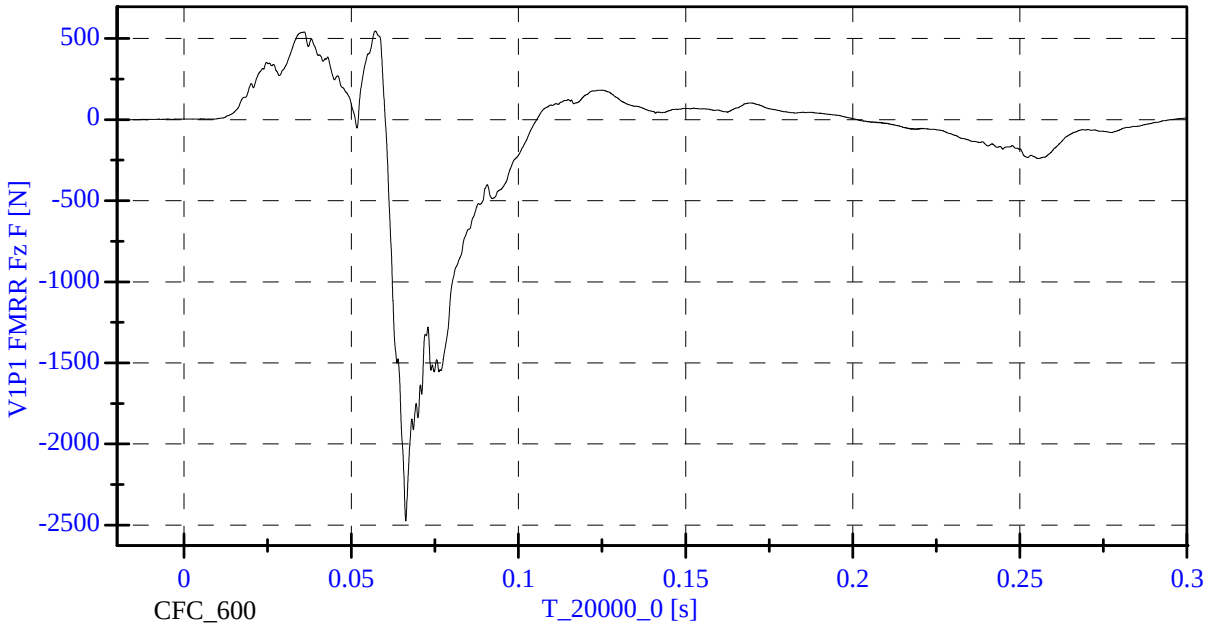
V1P1 Left Femur Fz [N , CFC_600]

Max: 917.60 [N] at 0.058 [s]
Min: -3723.89 [N] at 0.069 [s]



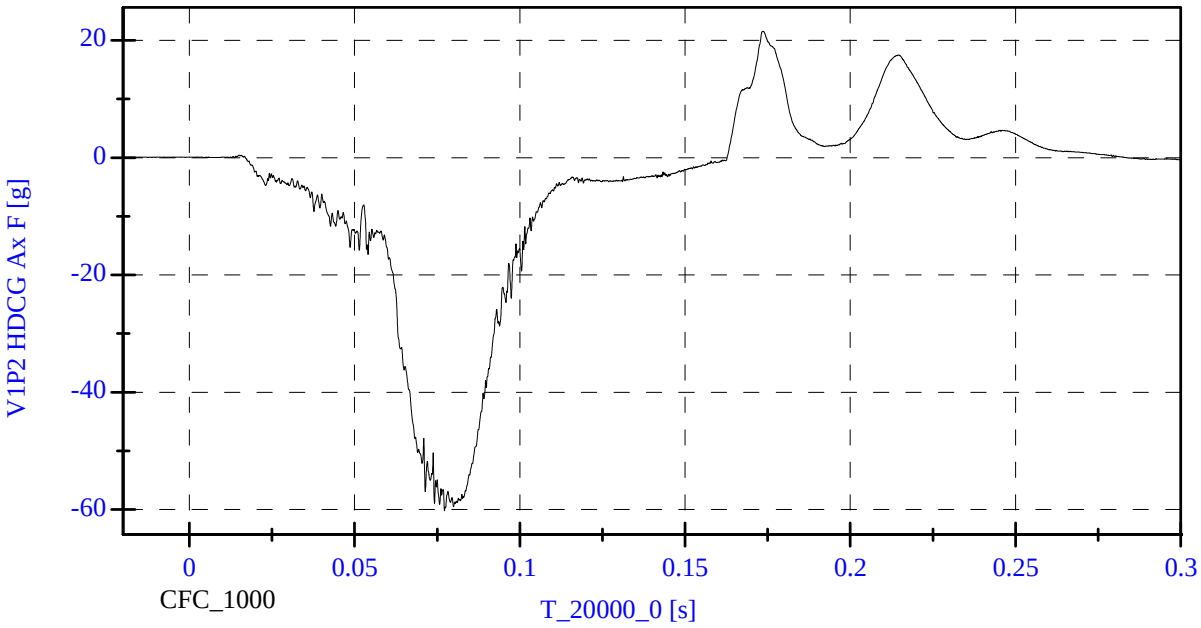
V1P1 Right Femur Fz [N , CFC_600]

Max: 545.55 [N] at 0.057 [s]
Min: -2474.86 [N] at 0.066 [s]



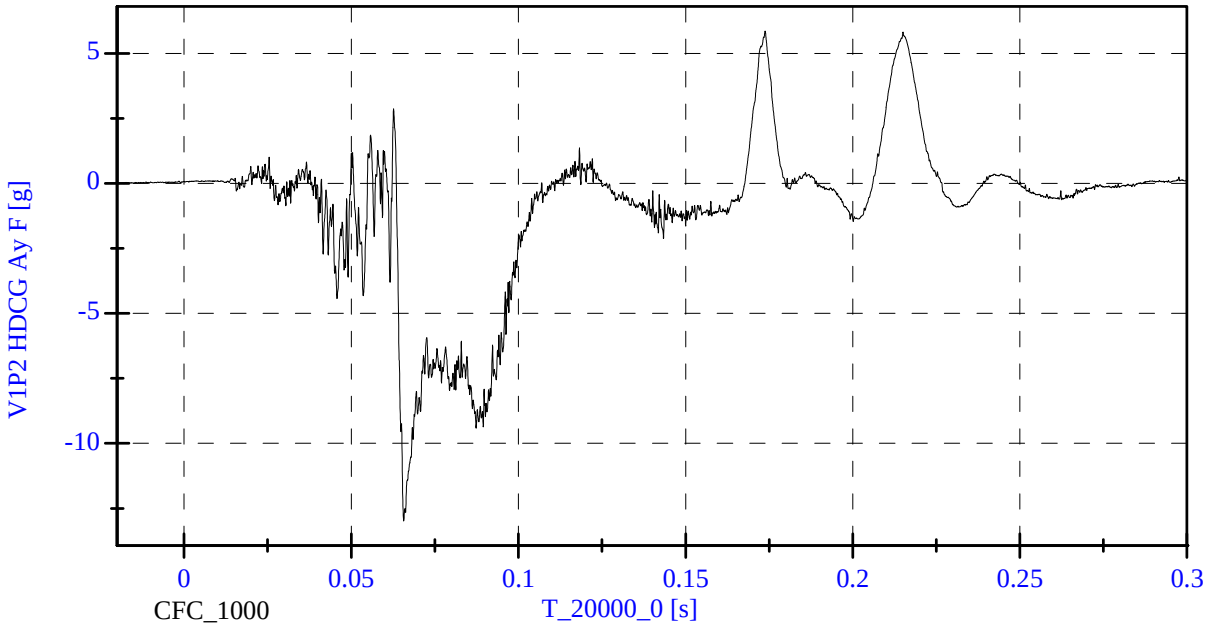
V1P2 Head x [g , CFC_1000]

Max: 21.55 [g] at 0.174 [s]
Min: -60.20 [g] at 0.077 [s]



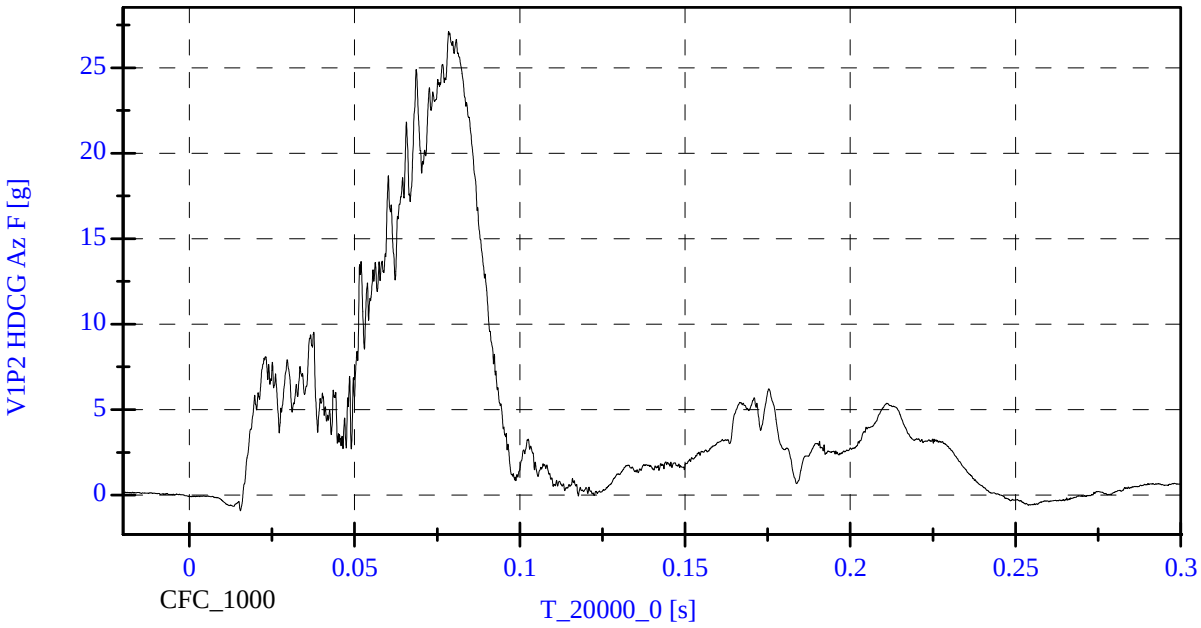
V1P2 Head y [g , CFC_1000]

Max: 5.86 [g] at 0.174 [s]
Min: -12.99 [g] at 0.066 [s]



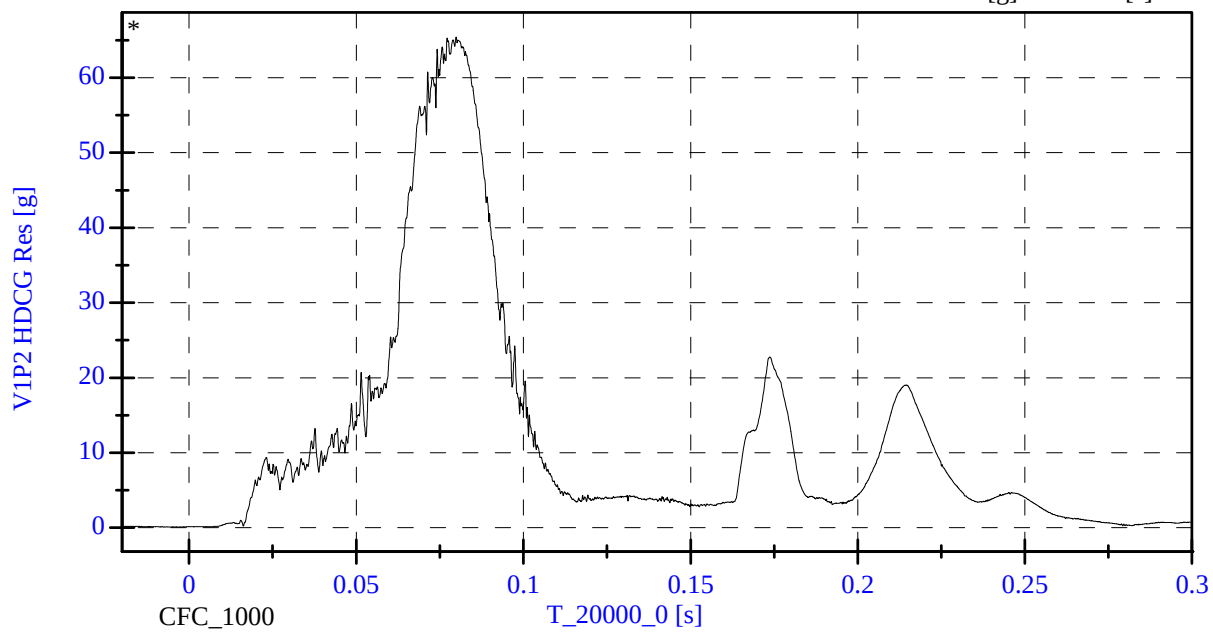
V1P2 Head z [g , CFC_1000]

Max: 27.13 [g] at 0.078 [s]
Min: -0.91 [g] at 0.015 [s]



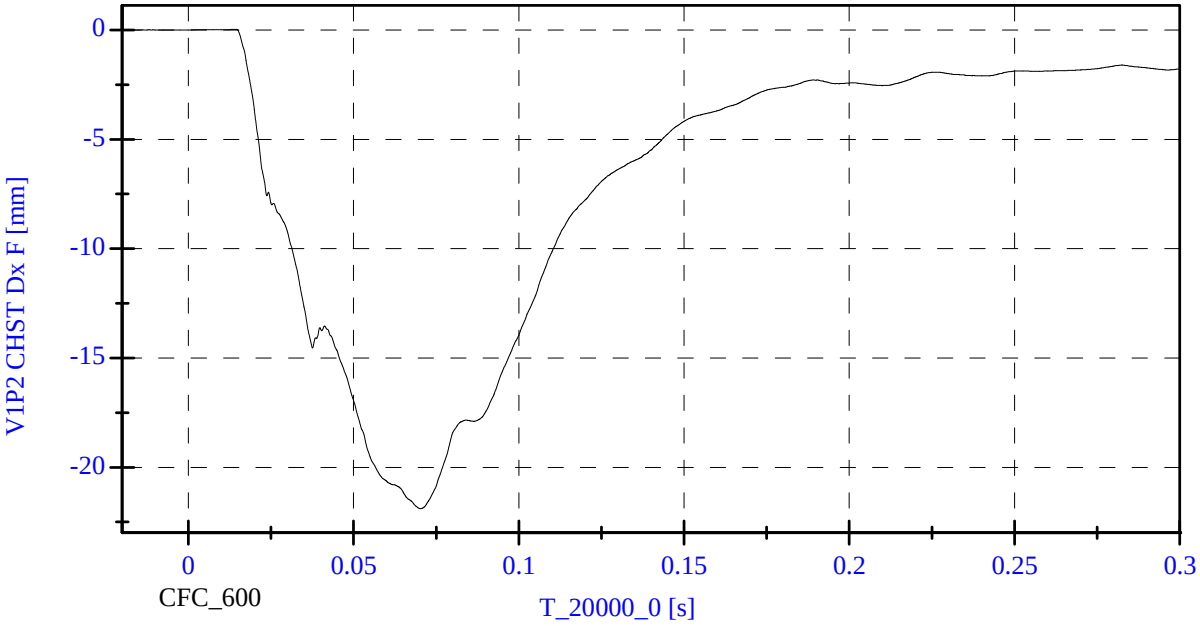
V1P2 Headform Resultant [g, CFC_1000]

Max: 65.41 [g] at 0.080 [s]
Min: 0.09 [g] at -0.001 [s]



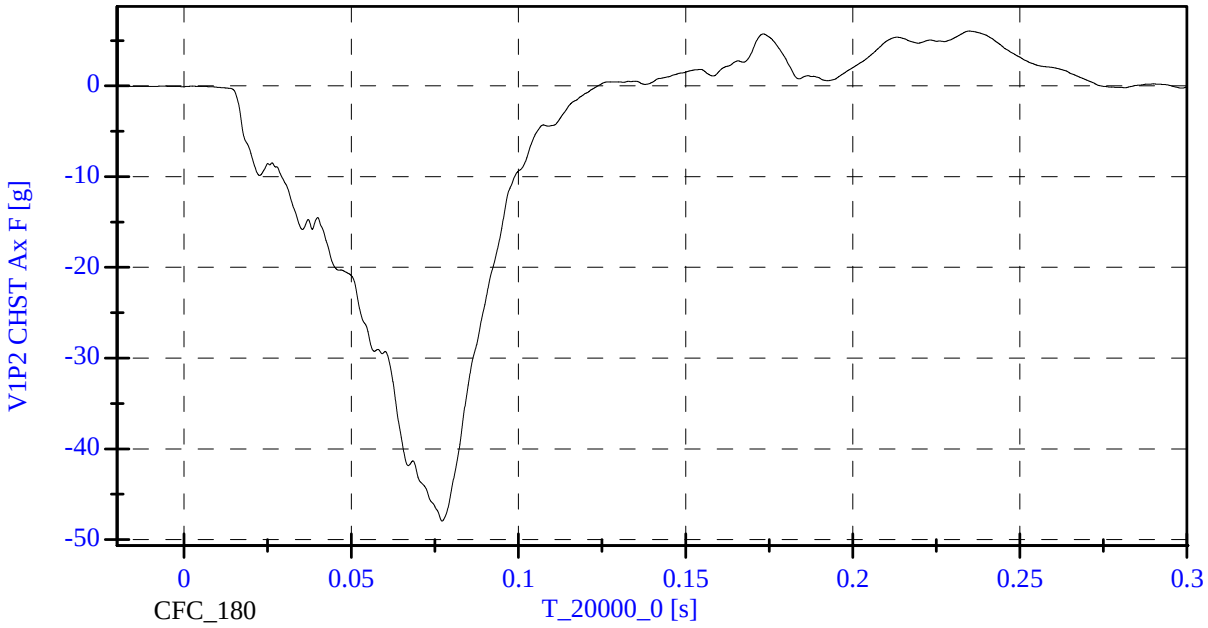
V1P2 Chest Displacement [mm , CFC_600]

Max: 0.03 [mm] at 0.014 [s]
Min: -21.89 [mm] at 0.070 [s]



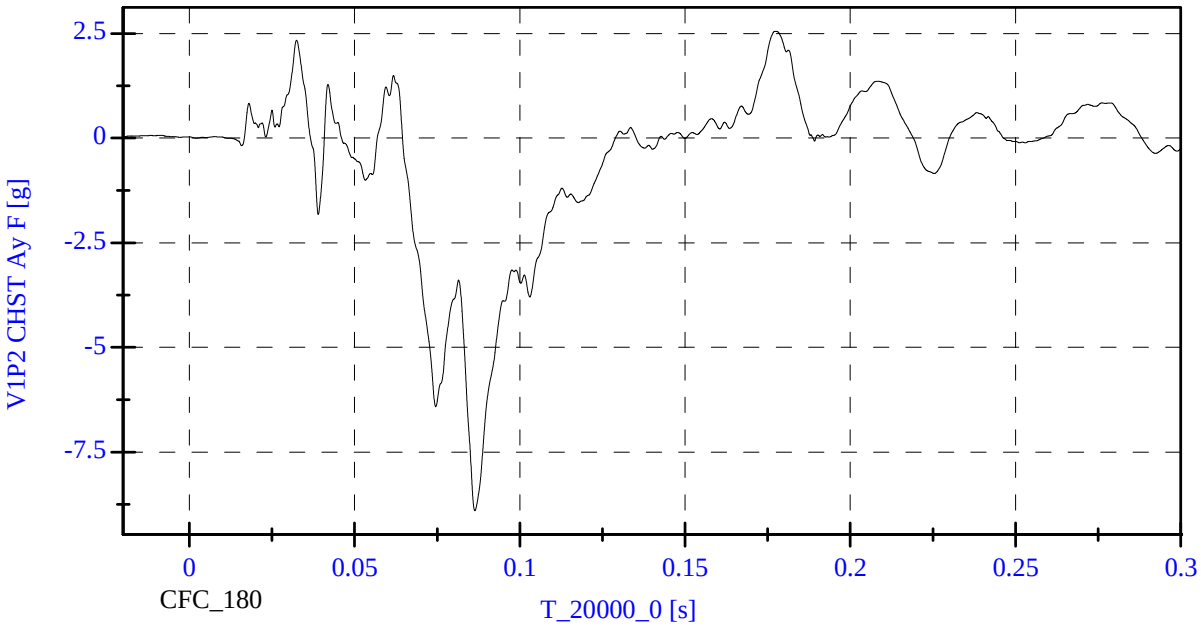
V1P2 Chest x [g , CFC_180]

Max: 6.05 [g] at 0.235 [s]
Min: -47.96 [g] at 0.077 [s]



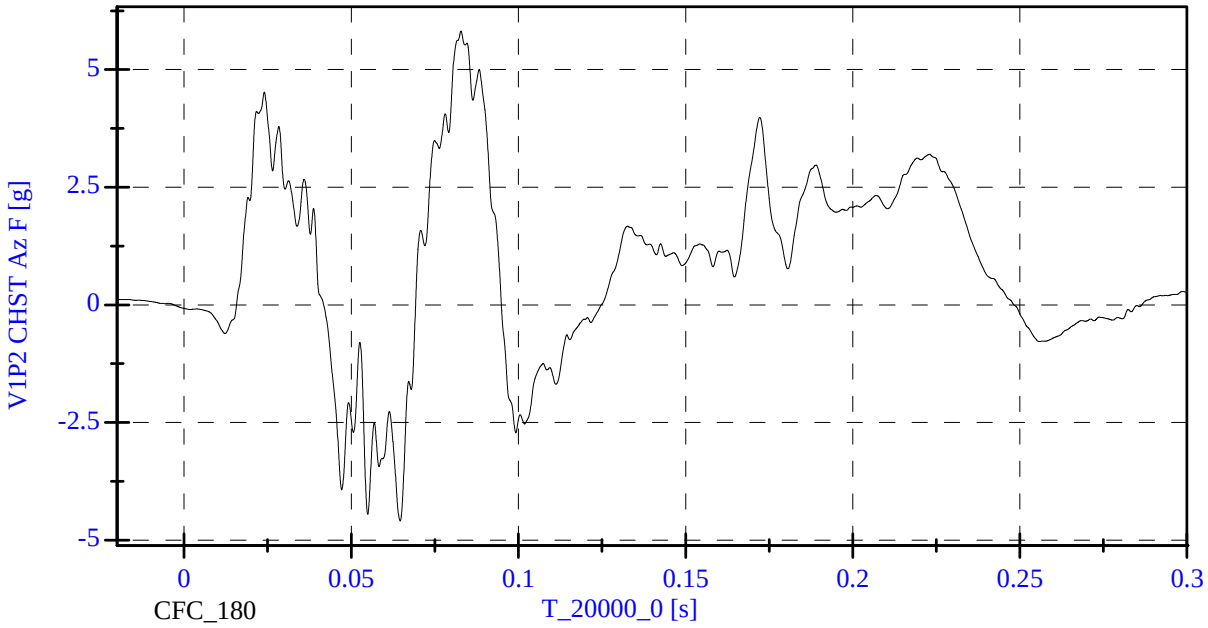
V1P2 Chest y [g , CFC_180]

Max: 2.55 [g] at 0.178 [s]
Min: -8.90 [g] at 0.086 [s]



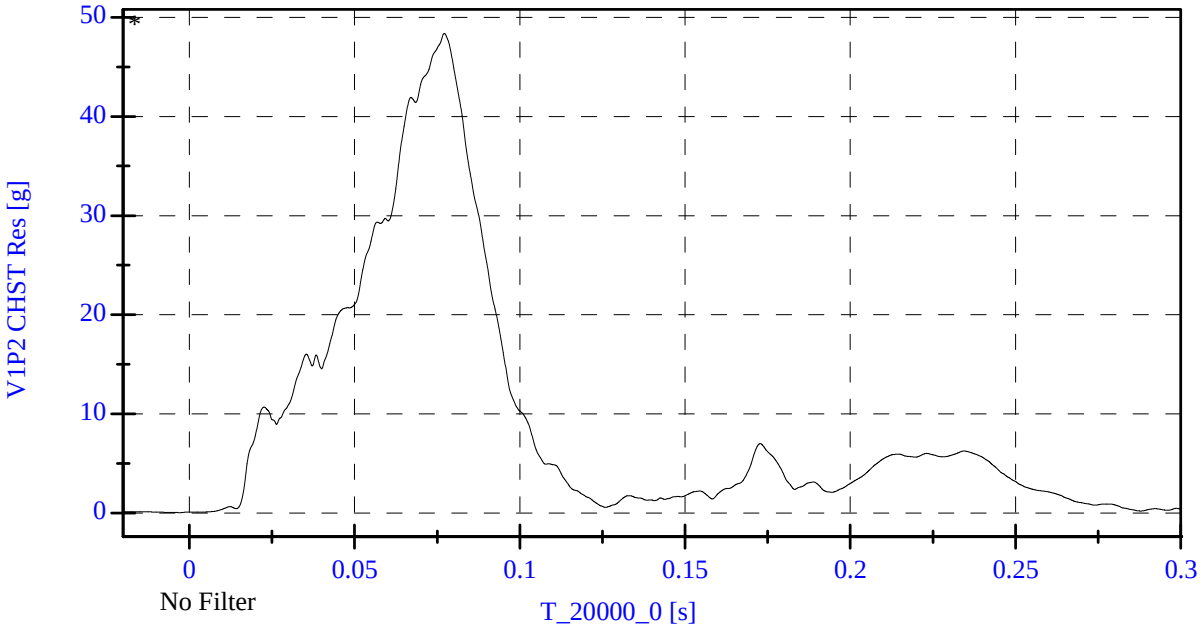
V1P2 Chest z [g , CFC_180]

Max: 5.82 [g] at 0.083 [s]
Min: -4.59 [g] at 0.065 [s]



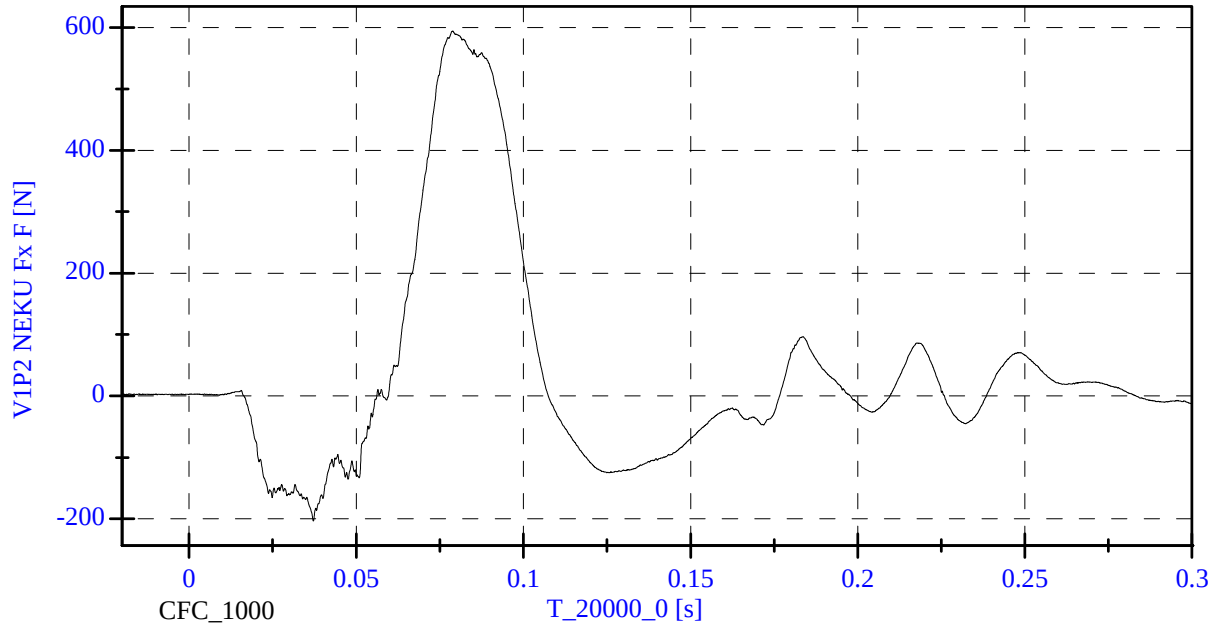
V1P2 Chest Resultant

Max: 48.38 [g] at 0.077 [s]
Min: 0.04 [g] at -0.003 [s]



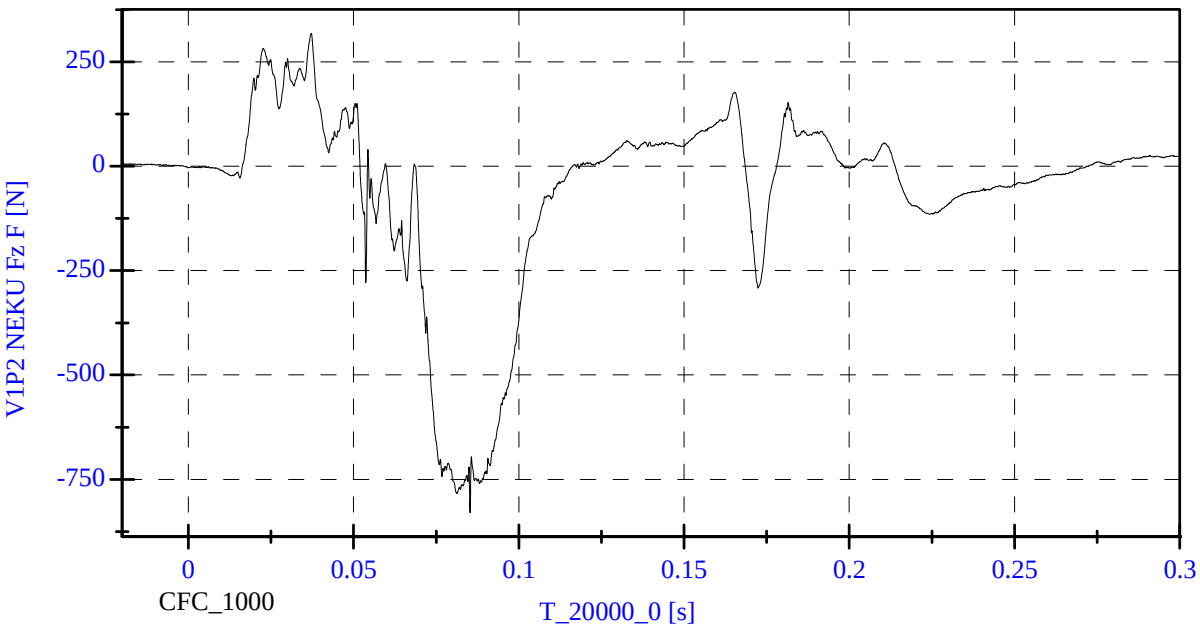
V1P2 Upper Neck Fx [N , CFC_1000]

Max: 594.22 [N] at 0.079 [s]
Min: -203.58 [N] at 0.037 [s]



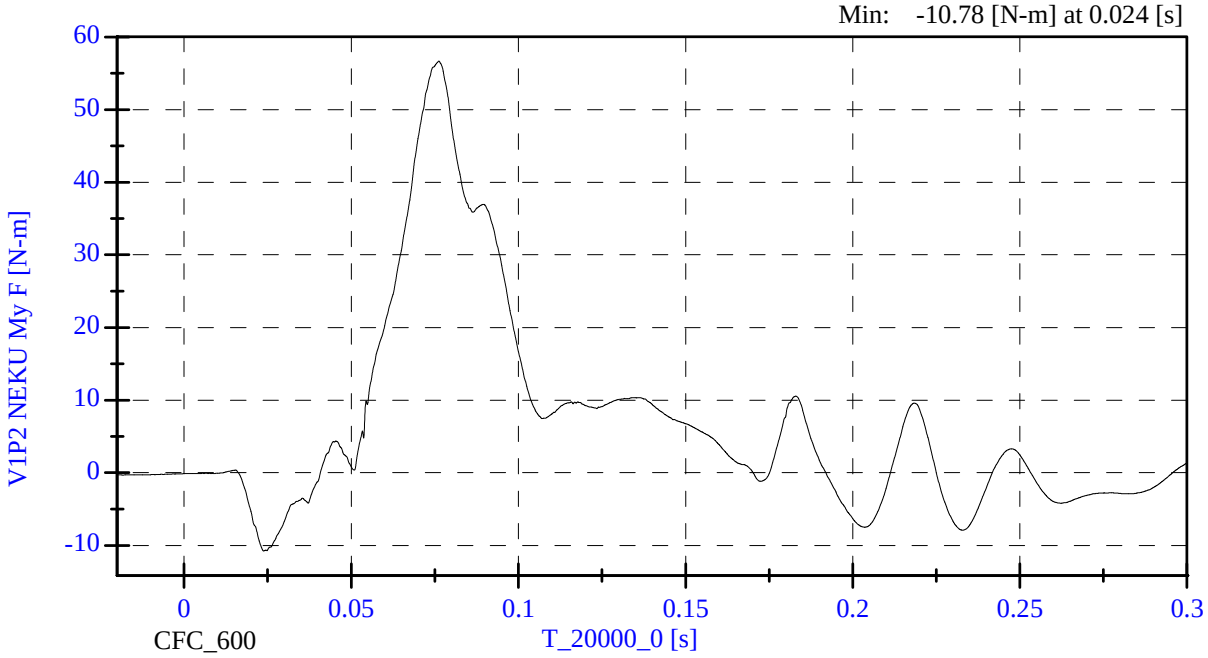
V1P2 Upper Neck Fz [N , CFC_1000]

Max: 318.07 [N] at 0.037 [s]
Min: -829.46 [N] at 0.085 [s]



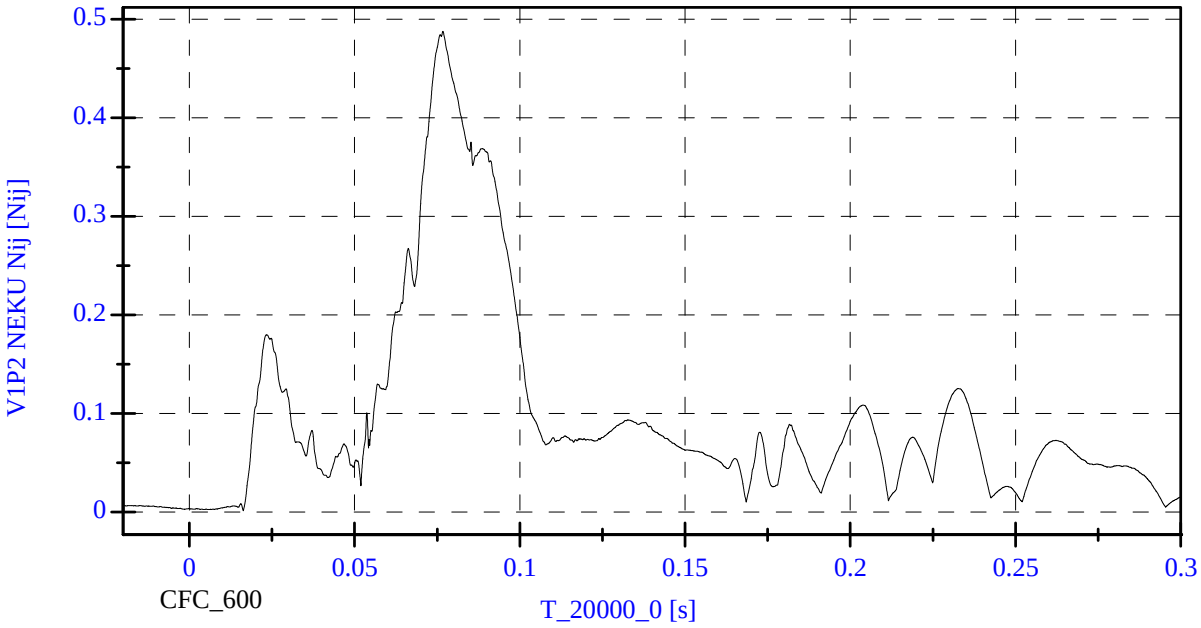
V1P2 Upper Neck My [N-m , CFC_600]

Max: 56.69 [N-m] at 0.076 [s]
Min: -10.78 [N-m] at 0.024 [s]



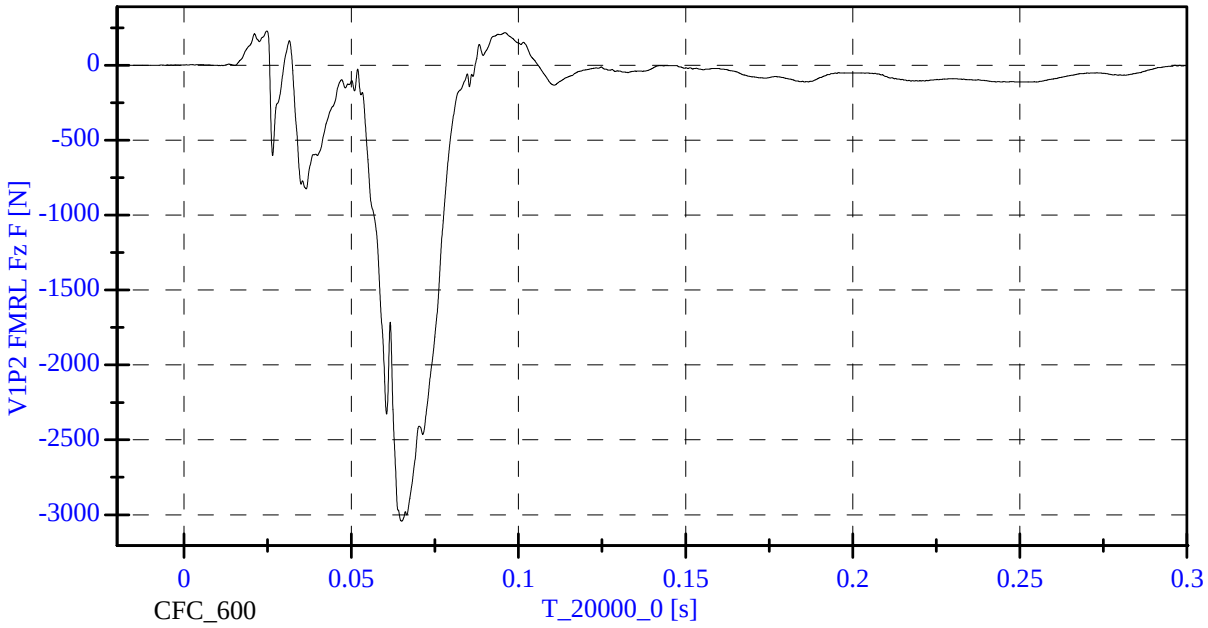
V1P2 Upper Neck Nij [Nij, CFC_600]

Max: 0.49 [Nij] at 0.077 [s]
Min: 0.00 [Nij] at 0.016 [s]



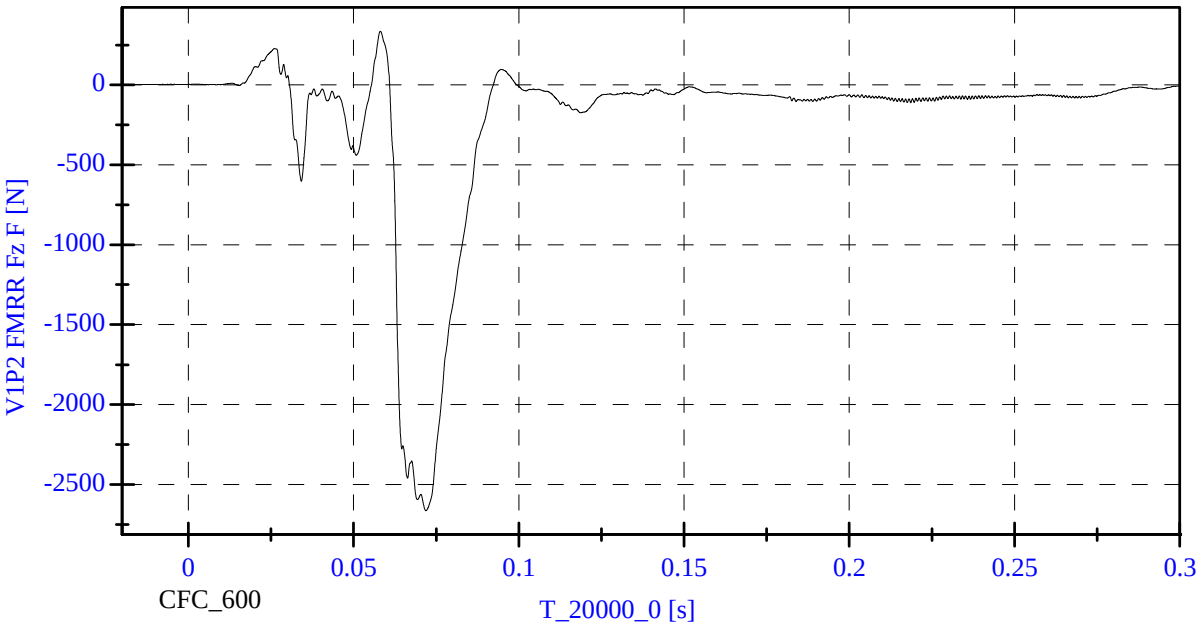
V1P2 Left Femur [N , CFC_600]

Max: 229.13 [N] at 0.025 [s]
Min: -3042.01 [N] at 0.065 [s]



V1P2 Right Femur [N , CFC_600]

Max: 335.02 [N] at 0.058 [s]
Min: -2663.66 [N] at 0.072 [s]



APPENDIX C

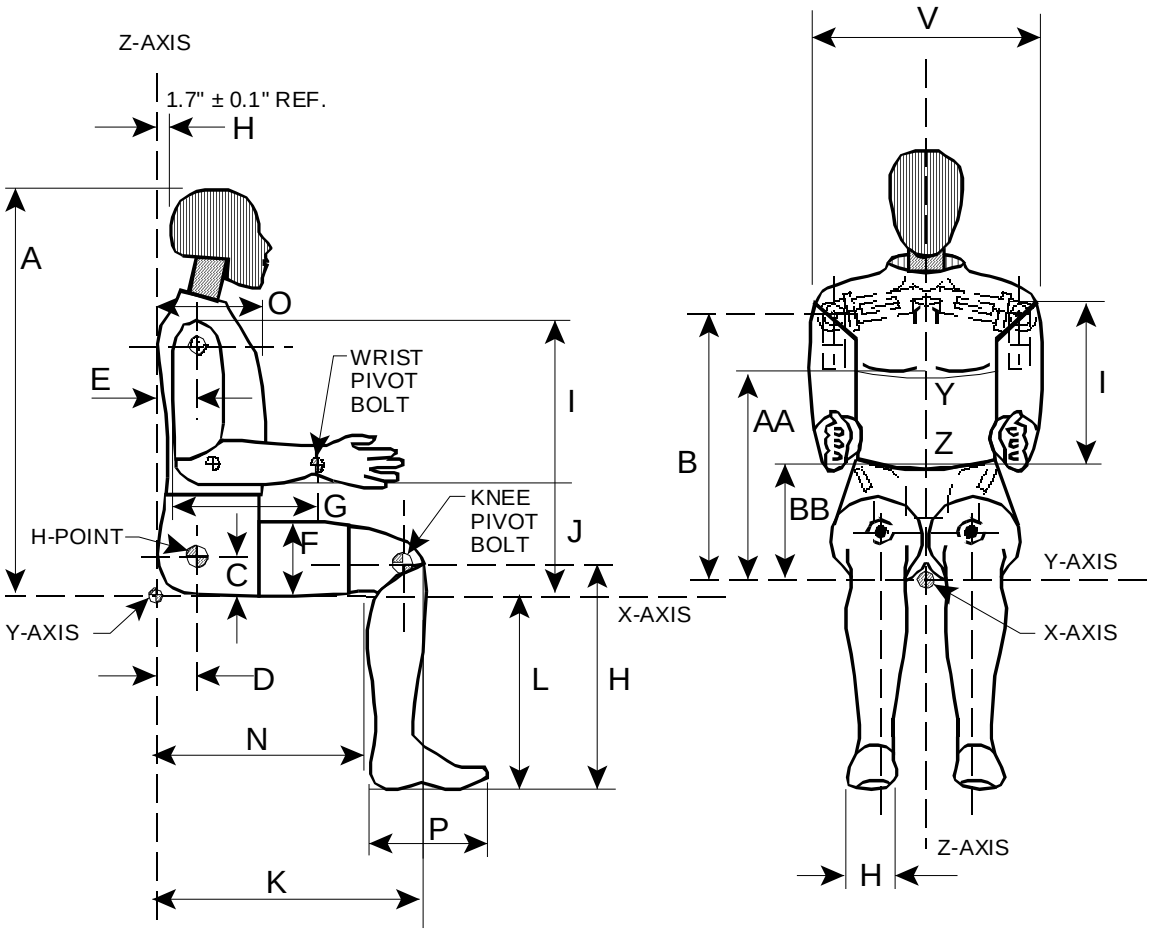
PART 572 E/O DUMMY CONFIGURATION
AND PERFORMANCE VERIFICATION DATA SHEETS

The tests were conducted at the Dummy Certification Test Facility of Calspan. A summary of the test results, and Part 572 specifications are included in this Appendix.

Dummy serial numbers and certification dates are:

Position No./Location	Serial No.	Completion Date
#1/Driver	064	
#2/Right Front Passenger	273	

EXTERNAL DIMENSIONS SPECIFICATIONS



NOTE: Figure is referenced to the erect seated position. The curved lumbar does not allow the Hybrid III to be positioned in a perfect erect attitude. (REF: S572.31(A)(6))

CALIBRATION TEST RESULTS

PRE-TEST

DRIVER DUMMY

S/N: 064

Calspan - Transportation Research Group
www.calspan.com
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

50th Male External Measurements

S/N 064

Symbol	Description	Specification	Results	Pass
		in	in	
A	Sitting Height	34.6 – 35.0	35.0	Yes
B	Shoulder Pivot Height	19.9 - 20.5	20.4	Yes
C	H-Point Height	3.3 – 3.5	3.5	Yes
D	H-Point from Backline	5.3 – 5.5	5.5	Yes
E	Shoulder Pivot from Backline	3.3 – 3.7	3.5	Yes
F	Thigh Clearance	5.5 – 6.1	6.0	Yes
G	Back of Elbow to Wrist Pivot	11.4 – 12.0	11.5	Yes
H	Head Back to Backline	1.6 – 1.8	1.7	Yes
I	Shoulder to Elbow Length	13.0 – 13.6	13.3	Yes
J	Elbow Rest Height	7.5 – 8.3	7.9	Yes
K	Buttock to Knee Length	22.8 – 23.8	23.5	Yes
L	Popliteal Height	16.9 – 17.9	17.2	Yes
M	Knee Pivot Height	19.1 – 19.7	19.1	Yes
N	Buttock Popliteal Length	17.8 – 18.8	18.5	Yes
O	Chest Depth without Jacket	8.4 – 9.0	8.5	Yes
P	Foot Length (right)	9.9 – 10.5	10.2	Yes
V	Shoulder Breadth	16.3 – 17.2	16.7	Yes
W	Foot Breadth	3.6 – 4.2	3.9	Yes
Y	Chest Circumference with Jacket	38.2 – 39.4	38.8	Yes
Z	Waist Circumference	32.9 – 34.1	33.4	Yes
AA	Reference Location (Chest Circumference)	16.9 – 17.1	17.0	Yes
BB	Reference Location (Waist Circumference)	8.9 – 9.1	9.0	Yes

Technician: AR

Date: 11/14/2011

Calspan - Transportation Research Group
www.calspan.com
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

VERIFICATION REPORT

Test Name:	**Head Drop**	Revision:	**10/1/2001**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
Test ID:		Test Date:	**11/15/2011**
Test Number:	**5**	Test Time:	**2:29:34 PM**

Component Part Number	Component Serial Number
Head Skin - 78051-228	**7997**

Test Parameters	Test Specifications			Test Results		
Temperature	18.9	--	25.6	**21.6**	deg C	P
Humidity	10	--	70	**45**	%RH	P
Resultant Acceleration	225	--	275	**249**	g	P
Oscillation	0.0	--	10.0	**1.9**	%	P
Lateral Acceleration	-15.00	--	15.00	**-7.58**	g	P

All test parameters are within specifications

Technician: **S Zito**

Supervisor: **D Travale**

Calspan - Transportation Research Group
www.calspan.com
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

VERIFICATION REPORT

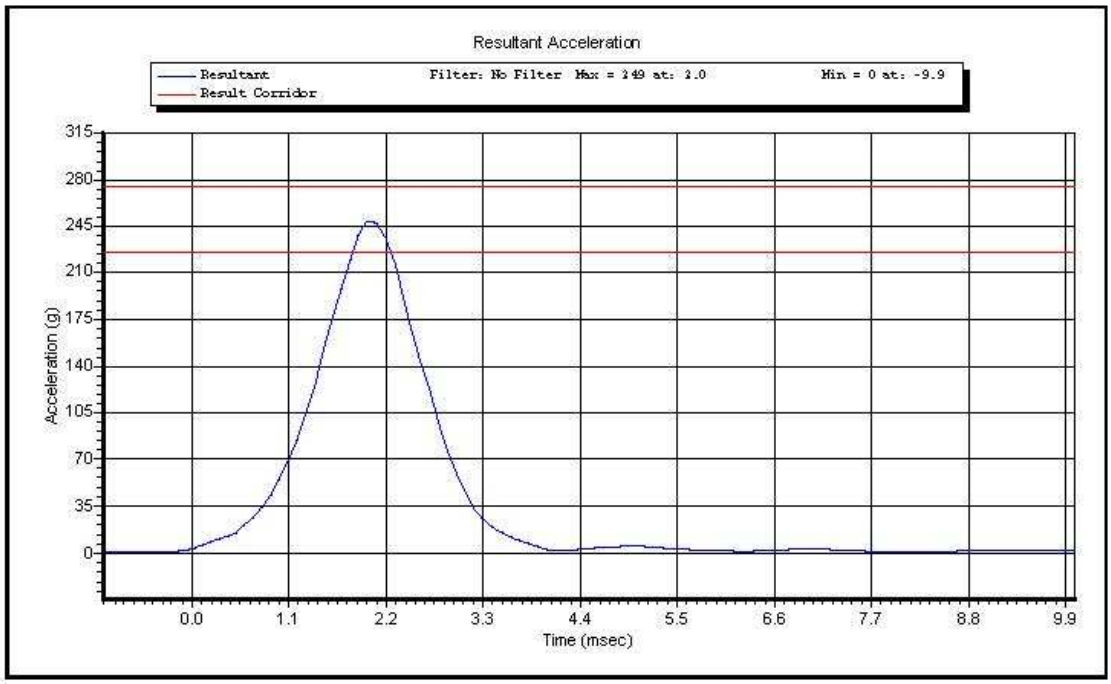
REFERENCE EQUIPMENT

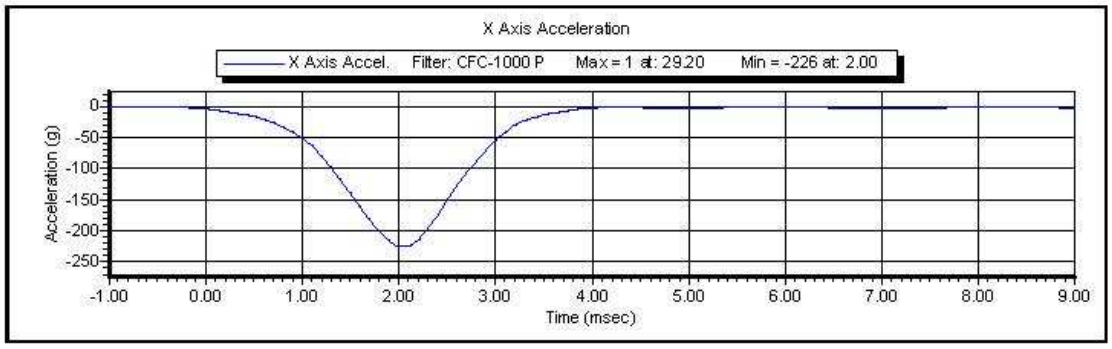
Manufacturer	Model	Serial Number	Calibration Date
Endevco	**7264-2000**	**P66931**	**6/13/2011**
Endevco	**7264-2000**	**P66926**	**6/13/2011**
Endevco	**7264-2000**	**P66943**	**6/13/2011**

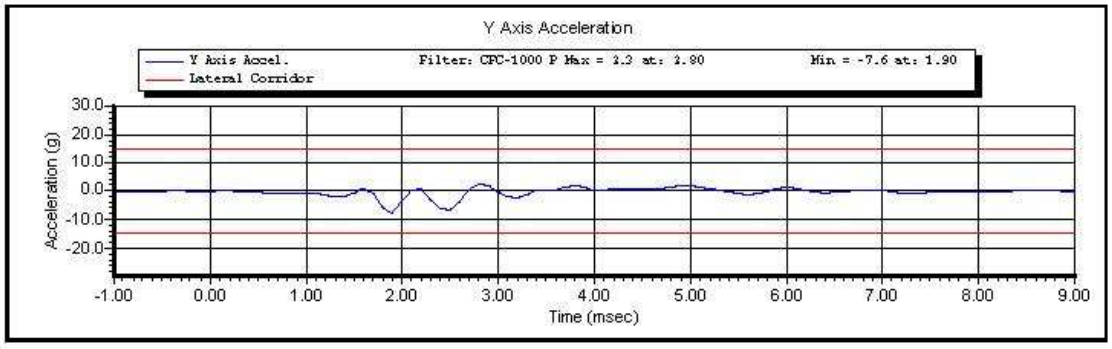
Test ID: Test Time: **2:29:34 PM** Test Date: **11/15/2011**

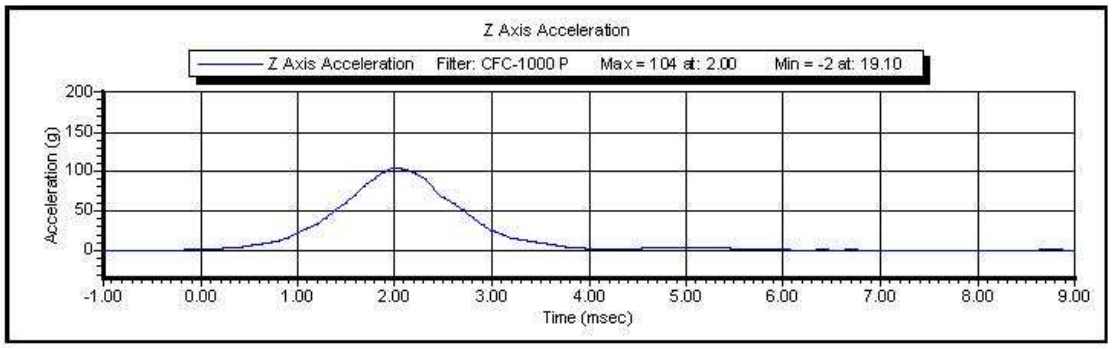
Calspan - Transportation Research Group
www.calspan.com
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	**Head Drop**	Revision:	**10/1/2001**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
Test ID:		Test Date:	**11/15/2011**
Test Number:	**5**	Test Time:	**2:29:34 PM**









Test ID: Test Time: **2:29:34 PM** Test Date: **11/15/2011**

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VERIFICATION REPORT

Test Name:	**Neck Flexion**	Revision:	**10/1/2001**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
Test ID:		Test Date:	**11/14/2011**
Test Number:	**2**	Test Time:	**12:57:46 PM**

Component Part Number	Component Serial Number
Neck - 78051-336	**02-1692**

Test Parameters		Test Specifications		Test Results	
Temperature		20.6 -- 22.2		**22.2** deg C	P
Humidity		10 -- 70		**48** %RH	P
Velocity		6.89 -- 7.13		**7.09** m/s	P
Pendulum Deceleration at	10 ms	22.5 -- 27.5		**26.2** g	P
Pendulum Deceleration at	20 ms	17.6 -- 22.6		**20.6** g	P
Pendulum Deceleration at	30 ms	12.5 -- 18.5		**18.4** g	P
Max Pendulum Deceleration After	30 ms	0.0 -- 29.0		**18.4** g	P
Deceleration time to	5 g	34.0 -- 42.0		**36.5** ms	P
D Plane Rotation		-78.0 -- -64.0		**-73.4** degrees	P
Time at max rotation		57.0 -- 64.0		**59.5** ms	P
Rotation Decay to Zero		113.0 -- 128.0		**115.6** ms	P
Moment about OC		88.1 -- 108.4		**93.4** Nm	P
Time at Max Moment		47.0 -- 58.0		**48.6** ms	P
Moment Decay to Zero		97.0 -- 107.0		**98.9** ms	P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID: Test Time: **12:57:46 PM** Test Date: **11/14/2011**

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VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7231CT	C16510	10/3/2011
DentonATD	78051-342	PENDULUM POT	2/7/2011
DentonATD	78051-342	CONDYLE POT	2/7/2011
Denton	1716A	LC-2018My	6/3/2011
Denton	1716A	LC-2018Fx	6/3/2011

Test ID: Test Time: **12:57:46 PM** Test Date: **11/14/2011**

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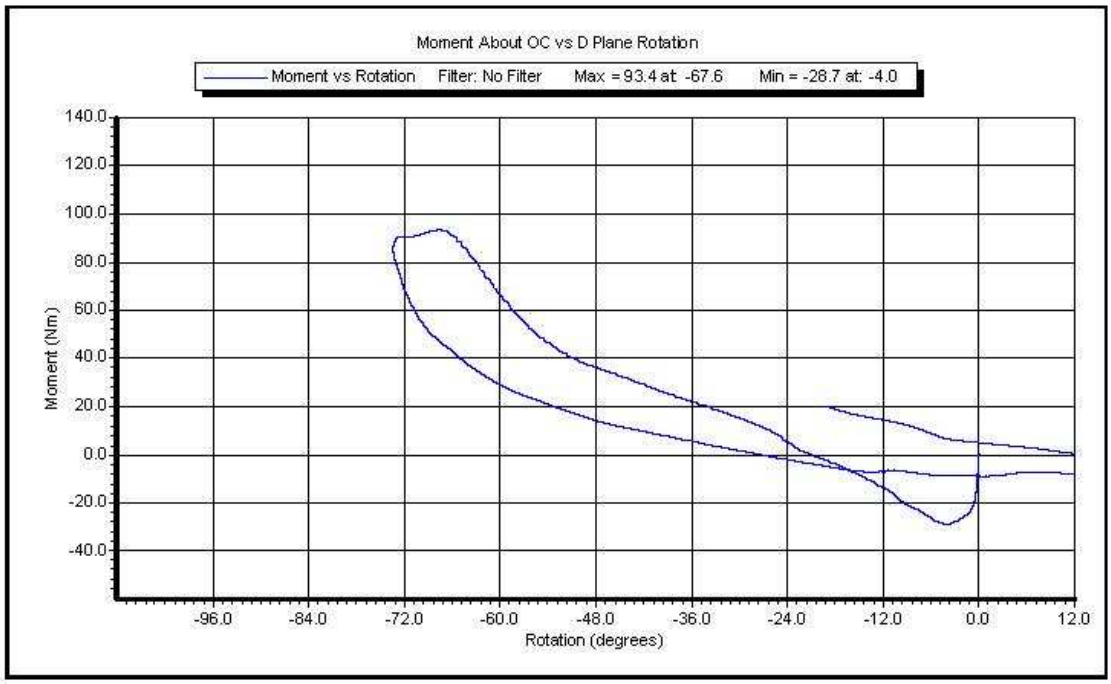
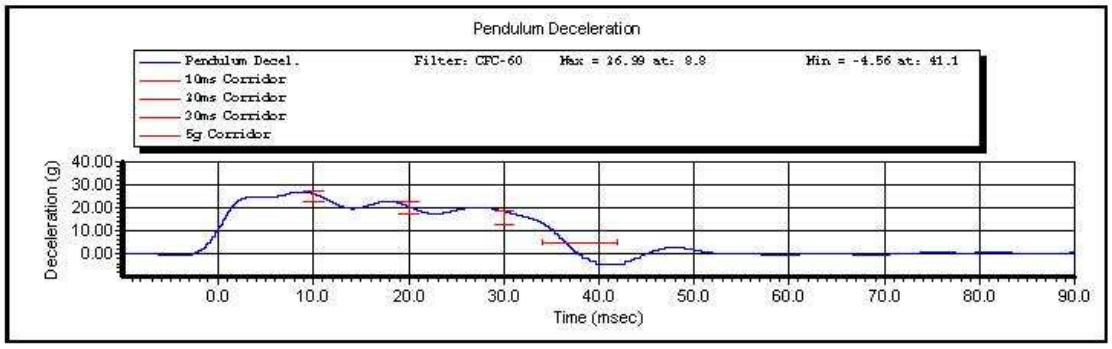
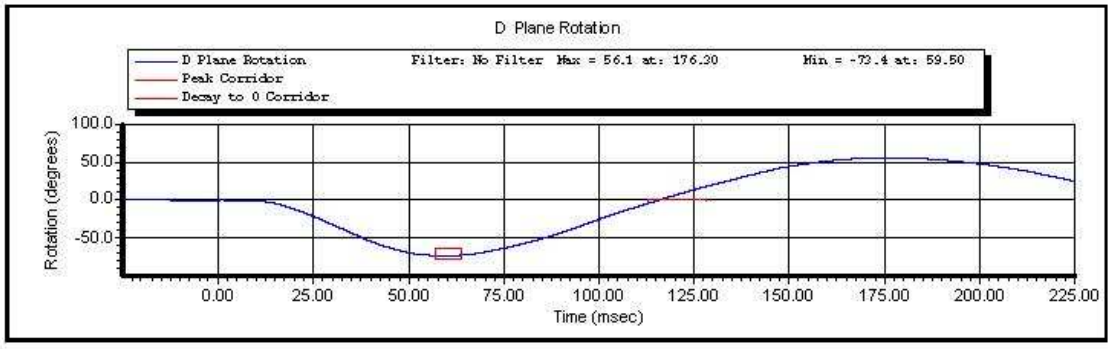
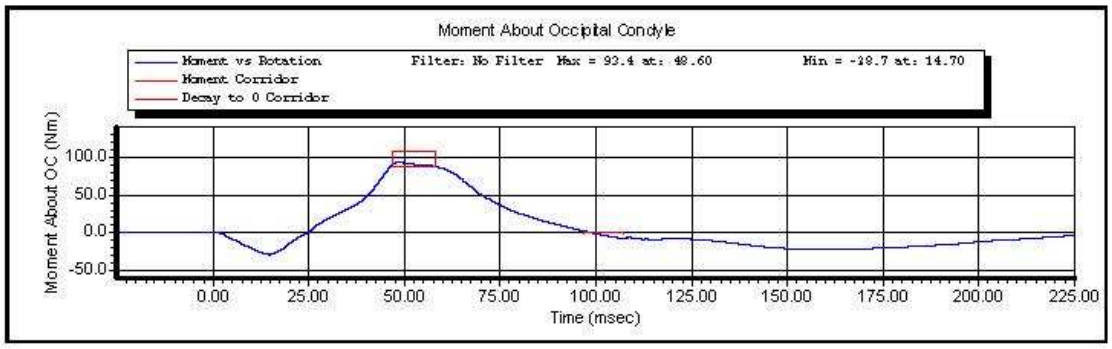
Name of Test:	**Neck Flexion**	REVISION:	**10/1/2001**
Name of Sub Test:		Type of Spec:	**NHTSA**
Type of ATD:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
ID of Test:		Date:	**11/14/2011**
Number of Test:	**2**	Time of Test:	**12:57:46 PM**









ID of Test:

Time of Test: **12:57:46 PM**

Date of Test: **11/14/2011**

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VERIFICATION REPORT

Test Name:	**Neck Extension**	Revision:	**10/1/2001**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
Test ID:	**Neck Extension**	Test Date:	**11/14/2011**
Test Number:	**1**	Test Time:	**1:47:03 PM**

Component Part Number	Component Serial Number
Neck - 78051-336	**02-1692**

Test Parameters		Test Specifications		Test Results		
Temperature		20.6 -- 22.2		**22.2**	deg C	P
Humidity		10 -- 70		**49**	%RH	P
Velocity		5.94 -- 6.19		**6.13**	m/s	P
Pendulum Deceleration at	10 ms	17.2 -- 21.2		**18.9**	g	P
Pendulum Deceleration at	20 ms	14.0 -- 19.0		**16.4**	g	P
Pendulum Deceleration at	30 ms	11.0 -- 16.0		**12.6**	g	P
Max Pendulum Deceleration after	30 ms	0.0 -- 22.0		**13.6**	g	P
Decel Time to	5 g	38.0 -- 46.0		**44.0**	ms	P
D Plane Rotation		81.0 -- 106.0		**96.6**	degrees	P
Time at Max Rotation		72.0 -- 82.0		**78.4**	ms	P
Rotation Decay to Zero		147.0 -- 174.0		**157.9**	ms	P
Moment About Occipital Condyle		-80.0 -- -52.9		**-66.6**	Nm	P
Time at Max Moment		65.0 -- 79.0		**74.2**	ms	P
Moment Decay to Zero		120.0 -- 148.0		**142.2**	ms	P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID: **Neck Extension** Test Time: **1:47:03 PM** Test Date: **11/14/2011**

VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7231CT	C16510	10/3/2011
DentonATD	78051-342	PENDULUM POT	2/7/2011
DentonATD	78051-342	CONDYLE POT	2/7/2011
Denton	1716A	LC-1916 My	11/18/2010
Denton	1716A	LC-1916 Fx	11/18/2010

Test ID: **Neck Extension** Test Time: **1:47:03 PM** Test Date: **11/14/2011**

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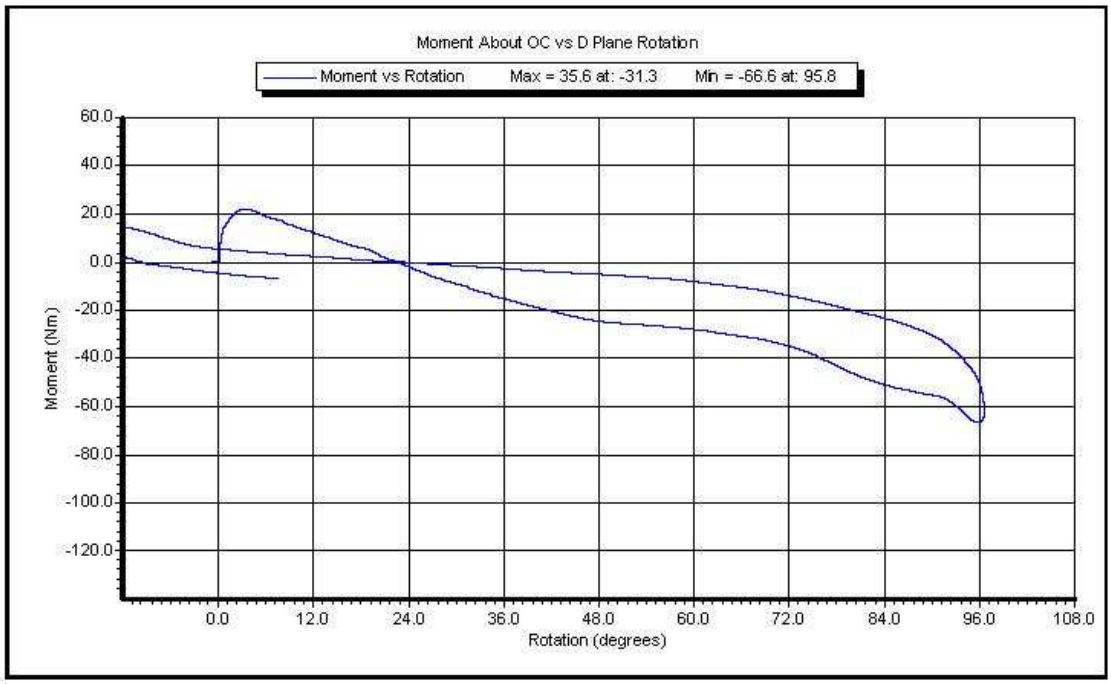
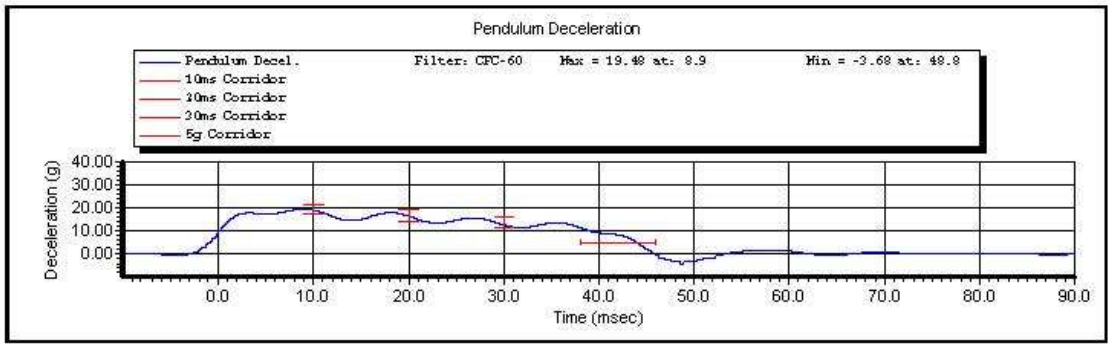
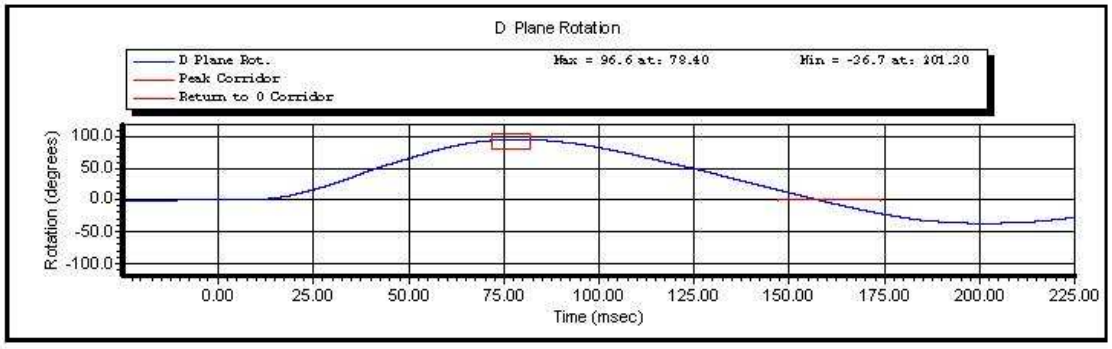
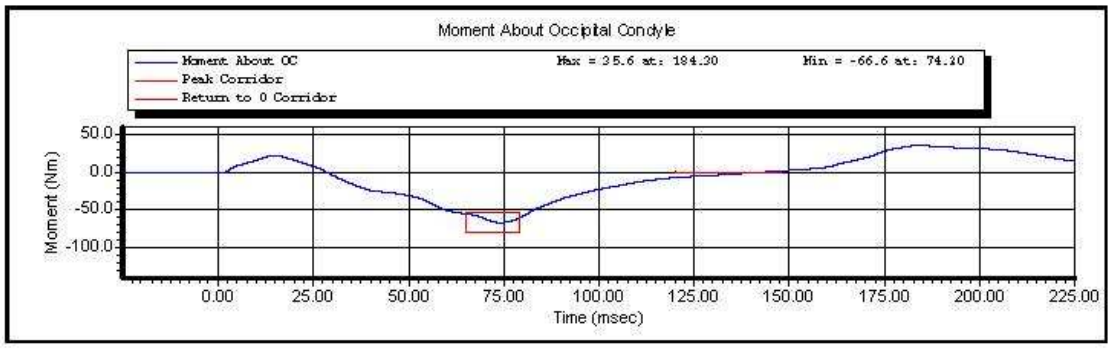
Name of Test:	**Neck Extension**	REVISION:	**10/1/2001**
Name of Sub Test:		Type of Spec:	**NHTSA**
Type of ATD:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
ID of Test:	**Neck Extension**	Date:	**11/14/2011**
Number of Test:	**1**	Time of Test:	**1:47:03 PM**









ID of Test: **Neck Extension** Time of Test: **1:47:03 PM** Date of Test: **11/14/2011**

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VERIFICATION REPORT

Test Name:	**Thorax Impact**	Revision:	**10/1/2001**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
Test ID:		Test Date:	**11/16/2011**
Test Number:	**1**	Test Time:	**8:23:44 AM**

Component Part Number	Component Serial Number
Ribs 78051-RS **Chest Jacket - 78051-169** **Lumbar Spine - 78051-66**	**3964**

Test Parameters	Test Specifications			Test Results		
Temperature	20.6	--	22.2	**22.2**	deg C	P
Humidity	10.0	--	70.0	**43.0**	%RH	P
Velocity	6.59	--	6.83	**6.75**	m/s	P
Resistive Force	-5.894	--	-5.160	**-5.743**	kN	P
Sternum Displacement	-72.6	--	-63.5	**-64.3**	mm	P
Hysteresis	69	--	85	**76**	%	P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID: Test Time: **8:23:44 AM** Test Date: **11/16/2011**

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VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
DentonATD	**Velocity Trap**	**1**	**1/11/2011**
Endevco	**7231CT**	**AH5M8**	**11/8/2011**
DentonATD	**78051-342**	**DS-064**	**10/13/2011**

Test ID: Test Time: **8:23:44 AM** Test Date: **11/16/2011**

CALSPAN

Hybrid III Hip Range of Motion: Hybrid III 50th Male

Serial Number: 064
Test Number: 1
Comments: RIGHT

Date: 11/14/2011
Time: 17:52

Version: 1.6.3

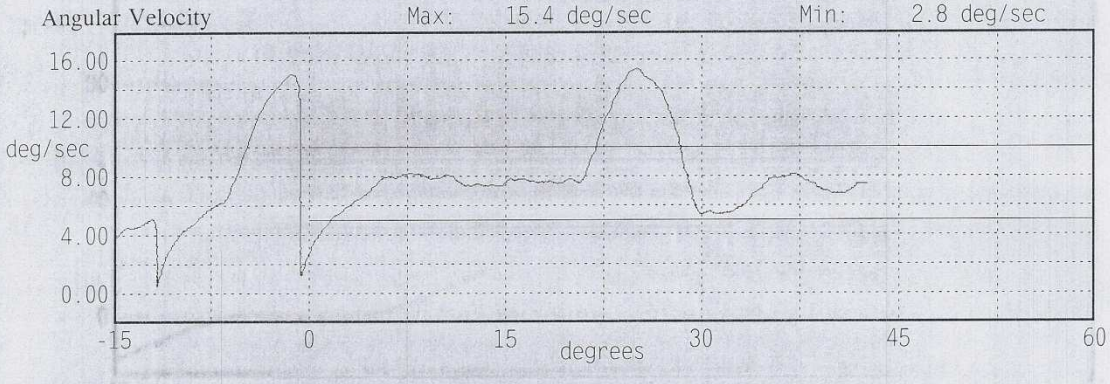
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
Temperature	66.0 - 78.0	72.0 °F	Pass
Humidity	10 - 70	49 %	Pass
Moment at 30.0 deg	<= 70.0	56.6 lbf-ft	Pass
Angle at 150.0 lbf-ft	40.0 - 50.0	42.2 deg	Pass
Average Velocity	5.0 - 10.0	7.5 deg/sec	Pass

Moment About H-Point

Peak Moment: 155.7 lbf-ft at 42.6 deg
Peak Angle: 42.6 deg at 155.7 lbf-ft

Angular Velocity

Max: 15.4 deg/sec Min: 2.8 deg/sec



CALSPAN

Hybrid III Hip Range of Motion: Hybrid III 50th Male

Serial Number: 064
Test Number: 1
Comments: LEFT

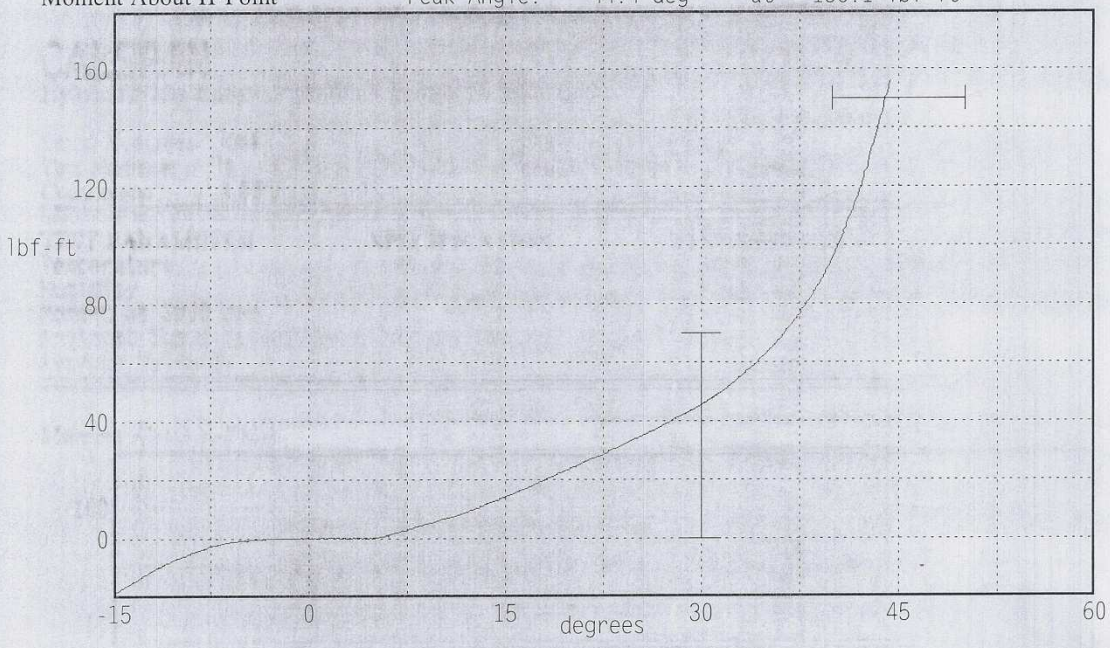
Date: 11/14/2011
Time: 17:37

Version: 1.6.3

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	66.0 - 78.0	72.0	°F	Pass
Humidity	10 - 70	49	%	Pass
Moment at 30.0 deg	<= 70.0	45.6	lbf-ft	Pass
Angle at 150.0 lbf-ft	40.0 - 50.0	44.0	deg	Pass
Average Velocity	5.0 - 10.0	7.5	deg/sec	Pass

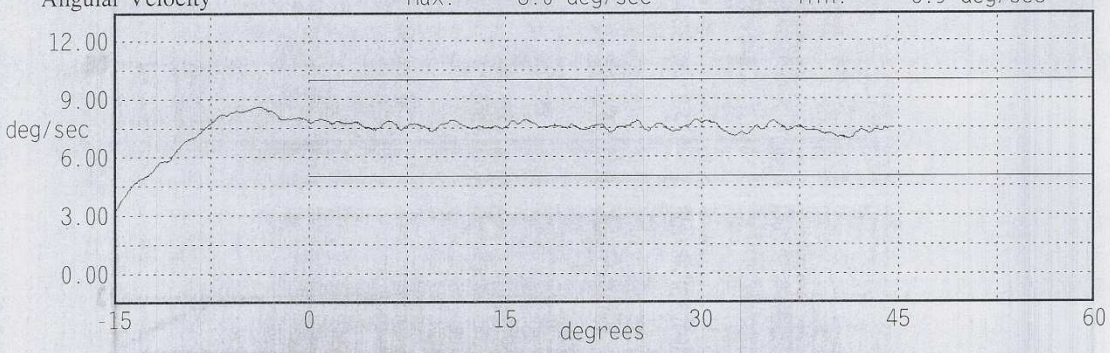
Moment About H-Point

Peak Moment: 156.1 lbf-ft at 44.4 deg
Peak Angle: 44.4 deg at 156.1 lbf-ft



Angular Velocity

Max: 8.0 deg/sec Min: 6.9 deg/sec



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VERIFICATION REPORT

Test Name:	**Knee Impact PENDULUM**	Revision:	**10/1/2001**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
Test ID:	**Left Knee**	Test Date:	**11/15/2011**
Test Number:	**1**	Test Time:	**10:55:33 AM**

Component Part Number	Component Serial Number
Knee Skin - 78051	**2792**

Test Parameters	Test Specifications			Test Results		
Temperature	18.9	--	25.6	**21.7**	deg C	P
Humidity	10.0	--	70.0	**46.0**	%RH	P
Velocity	2.07	--	2.13	**2.11**	m/s	P
Resistive Force	-5.78	--	-4.72	**-5.37**	kN	P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID: **Left Knee** Test Time: **10:55:33 AM** Test Date: **11/15/2011**

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VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
DentonATD	**Velocity Trap**	**1**	**1/11/2011**
Endevco	**7264-2000**	**P71267**	**11/2/2011**

Test ID: **Left Knee** Test Time: **10:55:33 AM** Test Date: **11/15/2011**

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Test Name:	**Knee Impact PENDULUM**	Revision:	**10/1/2001**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
Test ID:	**Left Knee**	Test Date:	**11/15/2011**
Test Number:	**1**	Test Time:	**10:55:33 AM**

Test ID: **Left Knee** Test Time: **10:55:33 AM** Test Date: **11/15/2011**

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VERIFICATION REPORT

Test Name:	**Knee Impact PENDULUM**	Revision:	**10/1/2001**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
Test ID:	**Right Knee**	Test Date:	**11/15/2011**
Test Number:	**1**	Test Time:	**11:04:03 AM**

Component Part Number	Component Serial Number
Knee Skin - 78056	**2880**

Test Parameters	Test Specifications			Test Results		
Temperature	18.9	--	25.6	**21.7** deg C		P
Humidity	10.0	--	70.0	**46.0** %RH		P
Velocity	2.07	--	2.13	**2.11** m/s		P
Resistive Force	-5.78	--	-4.72	**-5.35** kN		P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID: **Right Knee** Test Time: **11:04:03 AM** Test Date: **11/15/2011**

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VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
DentonATD	**Velocity Trap**	**1**	**1/11/2011**
Endevco	**7264-2000**	**P71267**	**11/2/2011**

Test ID: **Right Knee** Test Time: **11:04:03 AM** Test Date: **11/15/2011**

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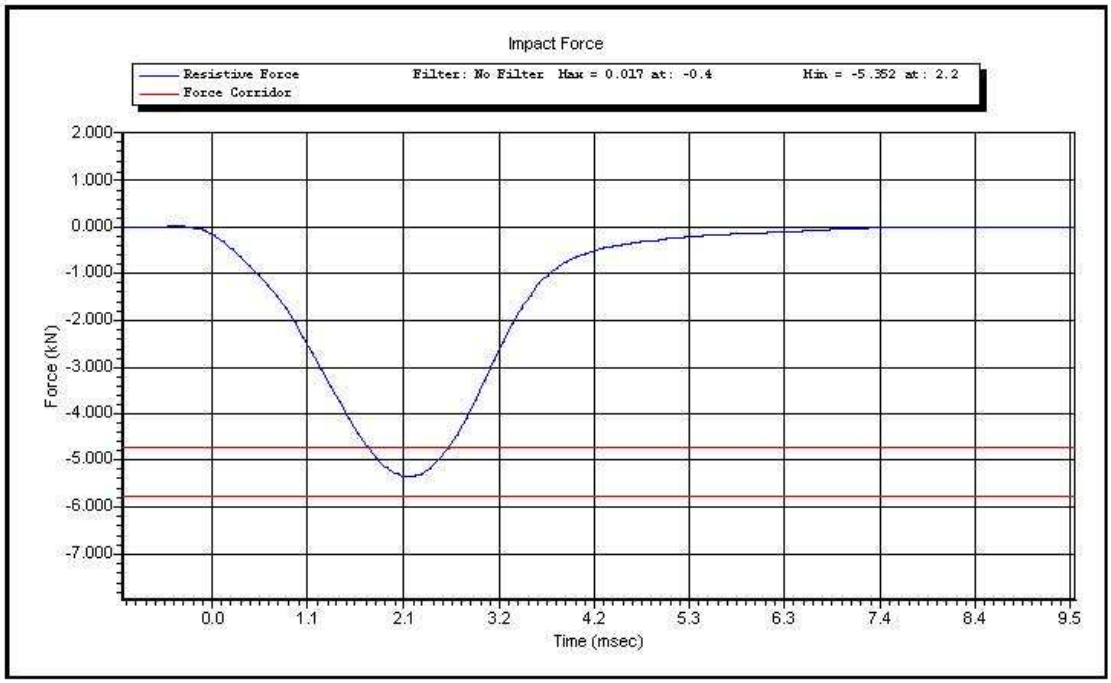
Test Name:	**Knee Impact PENDULUM**	Revision:	**10/1/2001**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
Test ID:	**Right Knee**	Test Date:	**11/15/2011**
Test Number:	**1**	Test Time:	**11:04:03 AM**



Test ID: **Right Knee** Test Time: **11:04:03 AM** Test Date: **11/15/2011**

CALIBRATION TEST RESULTS

PRE-TEST

RIGHT-FRONT PASSENGER DUMMY

S/N: 273

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External Measurements

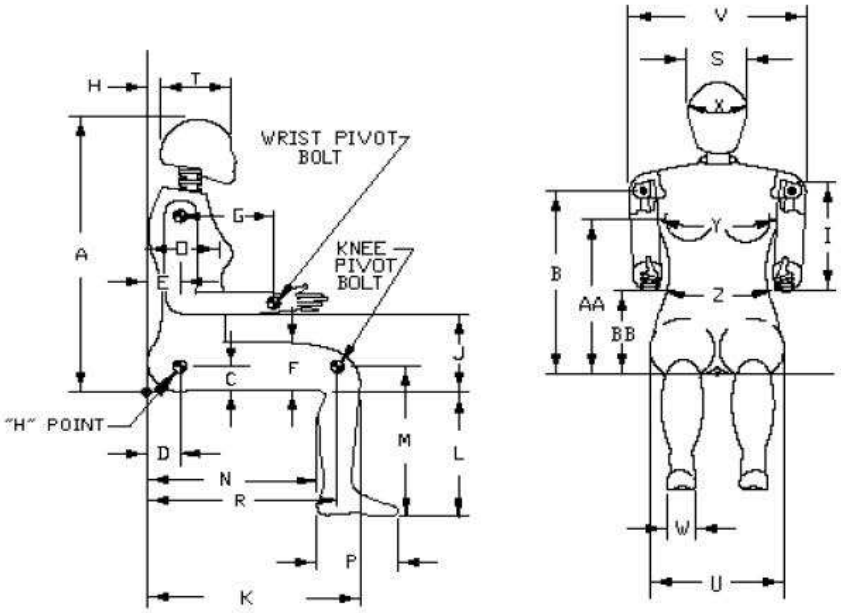
5th Female SN 273

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	774.7 – 800.1	785	Yes
B	Shoulder Pivot Height	431.8 – 457.2	450	Yes
C	H-Point Height	81.3 – 86.3	84	Yes
D	H-Point from Backline	144.8 – 149.8	147	Yes
E	Shoulder Pivot from Backline	68.6.83.8	77	Yes
F	Thigh Clearance	119.4 – 134.6	132	Yes
G	Back of Elbow to Wrist Pivot	243.9 – 259.1	249	Yes
H	Head Back to Backline	43.2 – 48.2	46	Yes
I	Shoulder to Elbow Length	276.8 – 297.2	285	Yes
J	Elbow Rest Height	182.8 – 203.2	192	Yes
K	Buttock to Knee Length	520.7 – 546.1	530	Yes
L	Popliteal Height	355.6 - 376	360	Yes
M	Knee Pivot Height	393.7 – 419.1	397	Yes
N	Buttock Popliteal Length	414 – 439.4	422	Yes
O	Chest Depth without Jacket	175.3 – 190.5	184	Yes
P	Foot Length (right)	218.5 – 233.7	220	Yes
R	Buttock To Knee Pivot Length	457.2 – 482.6	465	Yes
S	Head Breadth	137.1 – 147.3	143	Yes
T	Head Depth	177.8 - 188	183	Yes
U	Hip Breadth	299.7 – 314.9	310	Yes
V	Shoulder Breadth	350.5 – 365.7	357	Yes
W	Foot Breadth	78.8 - 94	82	Yes
X	Head Circumference	528.3 – 548.7	539	Yes
Y	Chest Circumference with Jacket	850.9 – 881.3	861	Yes
Z	Waist Circumference	759.5 – 789.9	770	Yes
AA	Reference Location (Chest Circumference)	332.7 – 358.1	345	Yes
BB	Reference Location (Waist Circumference)	160.1 – 170.2	165	Yes

Technician: AR Date: 11/15/2011

Hybrid III 5th Female External Measurements

Reference Diagram



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VERIFICATION REPORT

Test Name:	**Head Drop**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:		Test Date:	**11/15/2011**
Test Number:	**1**	Test Time:	**9:25:29 AM**

Component Part Number	Component Serial Number
Head Skin - 78051-228	**780**

Test Parameters	Test Specifications			Test Results		
Temperature	18.9	--	25.6	**21.3** deg C		P
Humidity	10	--	70	**47** %RH		P
Resultant Acceleration	250	--	300	**297** g		P
Oscillation	0.0	--	10.0	**2.4** %		P
Lateral Acceleration	-15.00	--	15.00	**-3.27** g		P

All test parameters are within specifications

Technician: **S Zito**

Supervisor: **D Travale**

Test ID: Test Time: **9:25:29 AM** Test Date: **11/15/2011**

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VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
Endevco	**7264-2000**	**P66931**	**6/13/2011**
Endevco	**7264-2000**	**P66926**	**6/13/2011**
Endevco	**7264-2000**	**P66943**	**6/13/2011**

Test ID: Test Time: **9:25:29 AM** Test Date: **11/15/2011**

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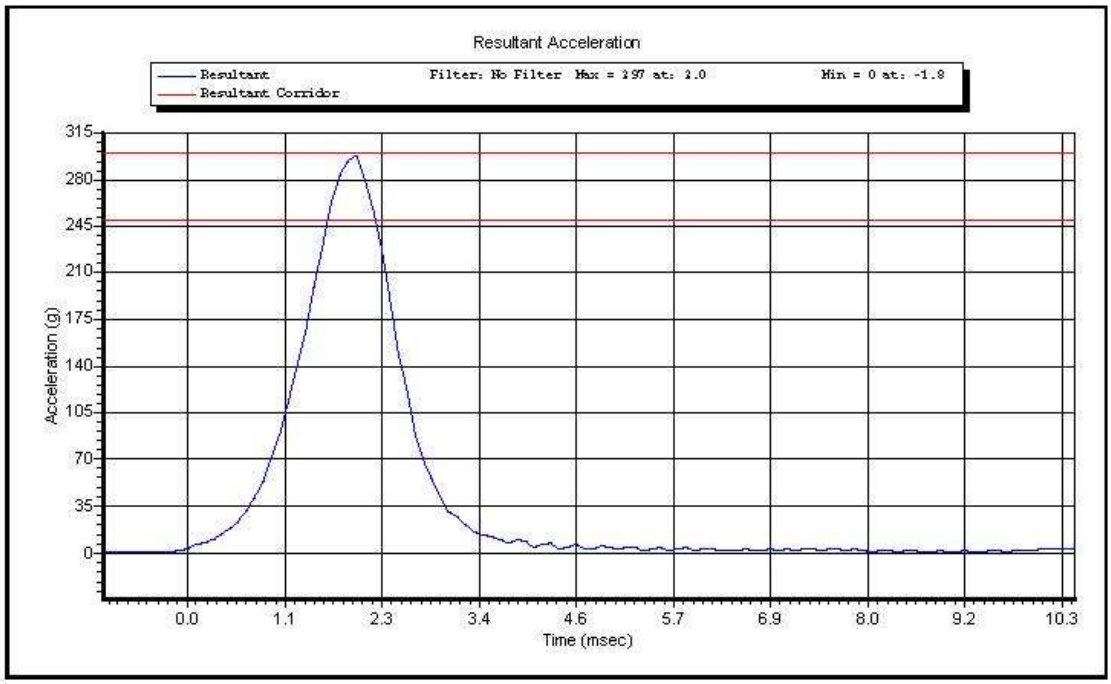
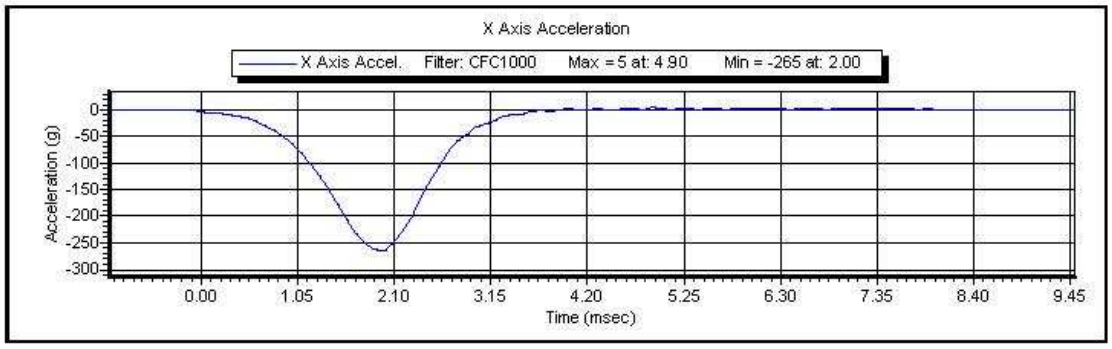
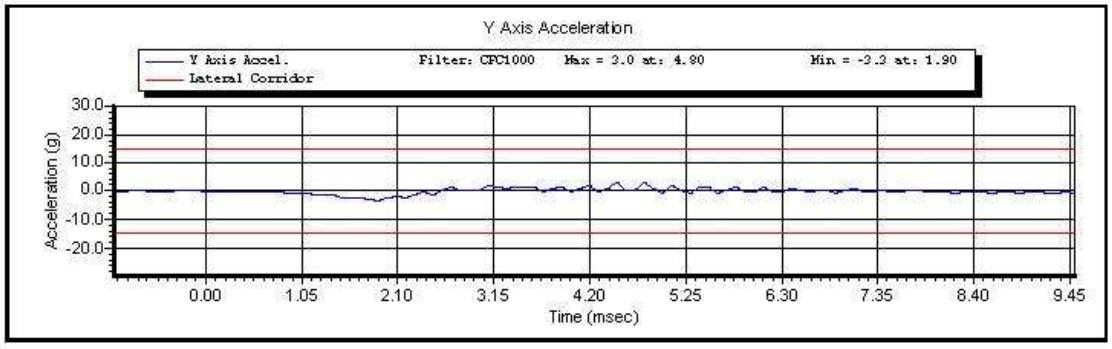
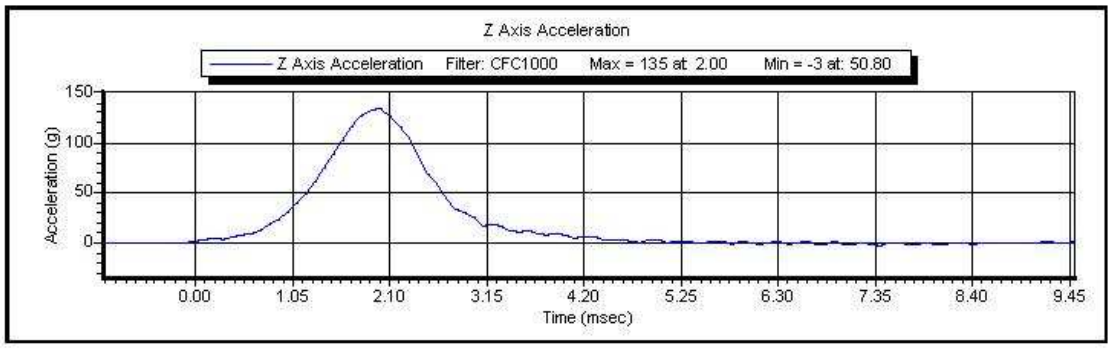
Test Name:	**Head Drop**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:		Test Date:	**11/15/2011**
Test Number:	**1**	Test Time:	**9:25:29 AM**









Test ID: Test Time: **9:25:29 AM** Test Date: **11/15/2011**

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VERIFICATION REPORT

Test Name:	**Neck Flexion**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:		Test Date:	**11/15/2011**
Test Number:	**5**	Test Time:	**4:51:07 PM**

Component Part Number	Component Serial Number
Neck - 880105-255	**660**

Test Parameters		Test Specifications			Test Results		
Temperature		20.6	--	22.2	**21.6**	deg C	P
Humidity		10	--	70	**45**	%RH	P
Velocity		6.89	--	7.13	**7.11**	m/s	P
Pendulum Impulse at	10 ms	2.10	--	2.50	**2.29**	m/s	P
Pendulum Impulse at	20 ms	4.00	--	5.00	**4.43**	m/s	P
Pendulum Impulse at	30 ms	5.80	--	7.00	**6.27**	m/s	P
D Plane Rotation		-91.0	--	-77.0	**-79.6**	degrees	P
Moment During Rotation Interval		69.0	--	83.0	**71.1**	Nm	P
Moment Decay to 10.0 Nm		80.0	--	100.0	**86.8**	ms	P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID: Test Time: **4:51:07 PM** Test Date: **11/15/2011**

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VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7231CT	C16510	10/3/2011
DentonATD	78051-342	PENDULUM POT	2/7/2011
DentonATD	78051-342	CONDYLE POT	2/7/2011
Denton	1716A	LC-1629My	6/3/2011
Denton	1716A	LC-1629Fx	6/3/2011

Test ID: Test Time: **4:51:07 PM** Test Date: **11/15/2011**

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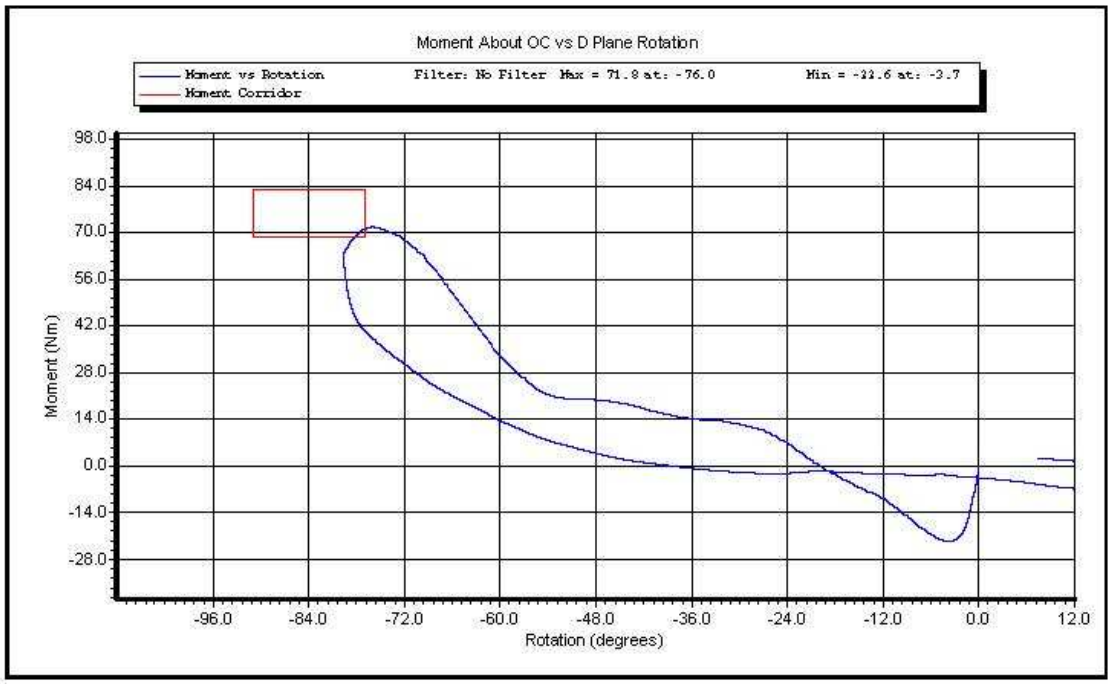
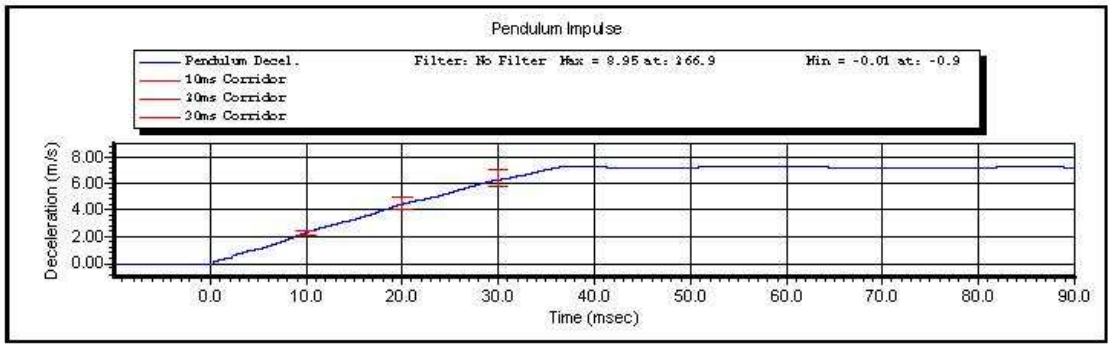
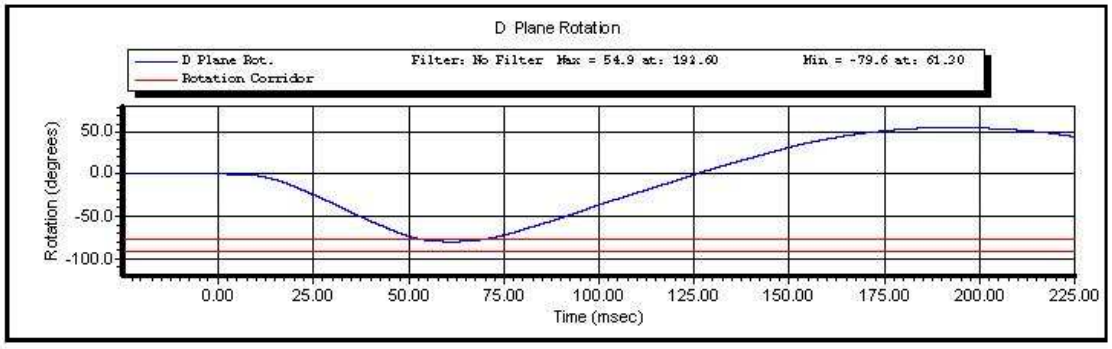
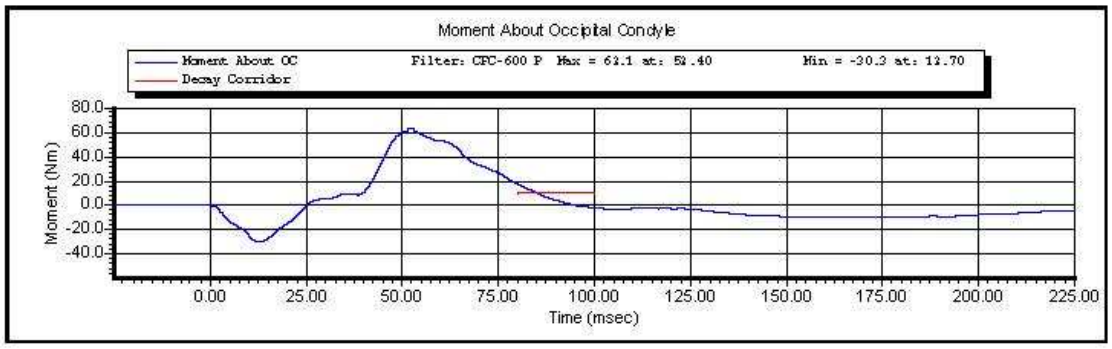
Test Name:	**Neck Flexion**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:		Test Date:	**11/15/2011**
Test Number:	**5**	Test Time:	**4:51:07 PM**









Test ID: Test Time: **4:51:07 PM** Test Date: **11/15/2011**

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VERIFICATION REPORT

Test Name:	**Neck Extension**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:		Test Date:	**11/15/2011**
Test Number:	**2**	Test Time:	**5:59:20 PM**

Component Part Number	Component Serial Number
Neck - 880105-255	**660**

Test Parameters	Test Specifications	Test Results	
Temperature	20.6 -- 22.2	**21.7** deg C	P
Humidity	10 -- 70	**45** %RH	P
Velocity	5.95 -- 6.19	**6.12** m/s	P
Pendulum Impulse at 10 ms	1.50 -- 1.90	**1.80** m/s	P
Pendulum Impulse at 20 ms	3.10 -- 3.90	**3.53** m/s	P
Pendulum Impulse at 30 ms	4.60 -- 5.60	**5.16** m/s	P
D Plane Rotation	99.0 -- 114.0	**107.5** degrees	P
Moment During Rotation Interval	-65.0 -- -53.0	**-55.6** Nm	P
Moment Decay to -10.0 Nm	94.0 -- 114.0	**103.3** ms	P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID: Test Time: **5:59:20 PM** Test Date: **11/15/2011**

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VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7231CT	C16510	10/3/2011
DentonATD	78051-342	PENDULUM POT	2/7/2011
DentonATD	78051-342	CONDYLE POT	2/7/2011
Denton	1716A	LC-1629My	6/3/2011
Denton	1716A	LC-1629Fx	6/3/2011

Test ID: Test Time: **5:59:20 PM** Test Date: **11/15/2011**

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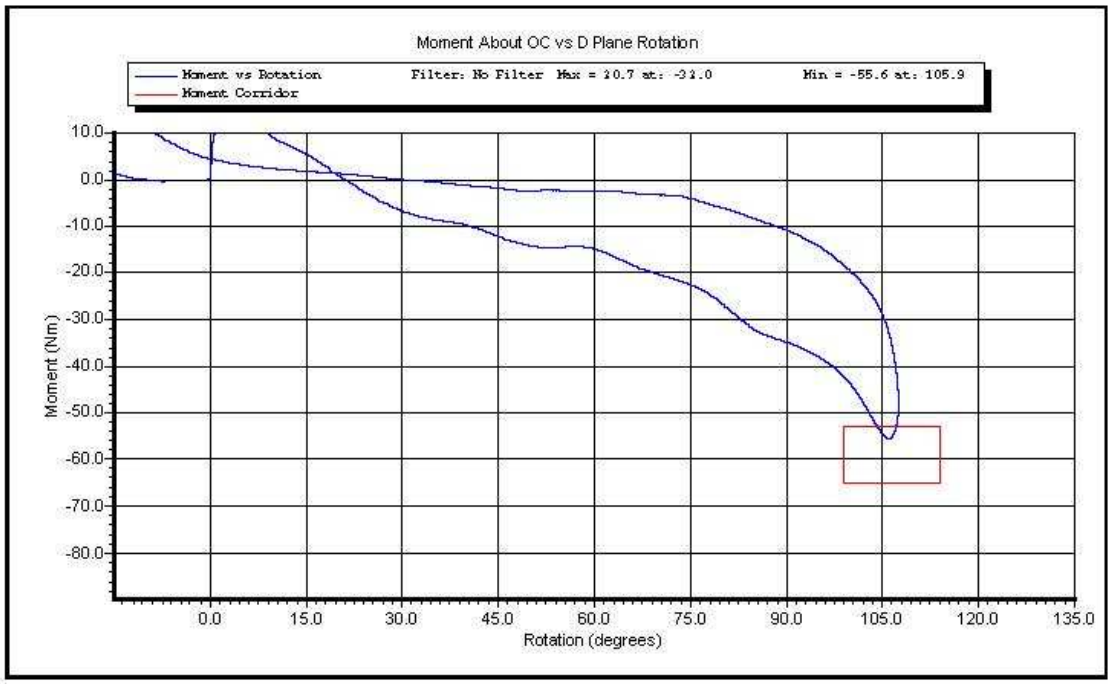
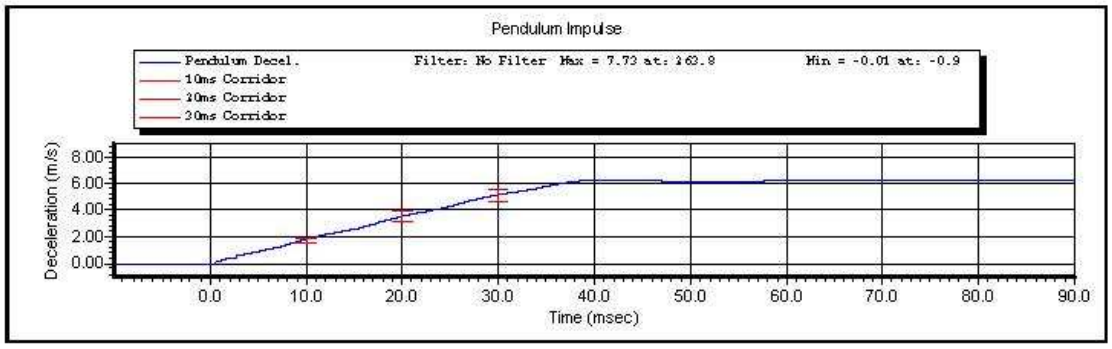
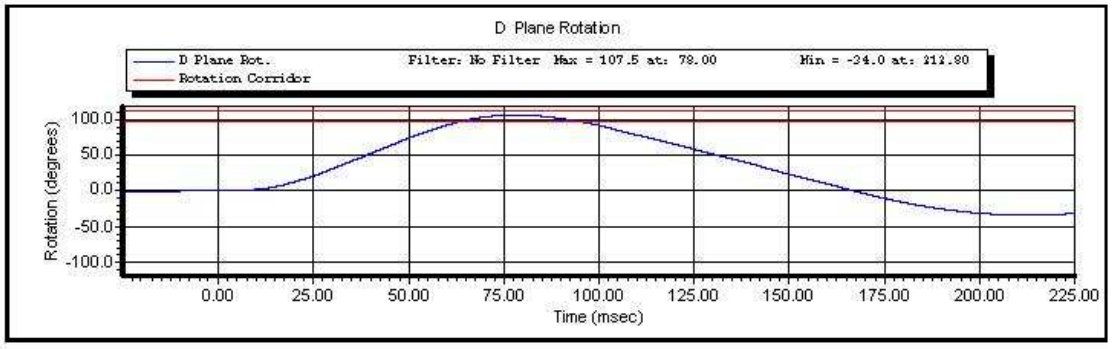
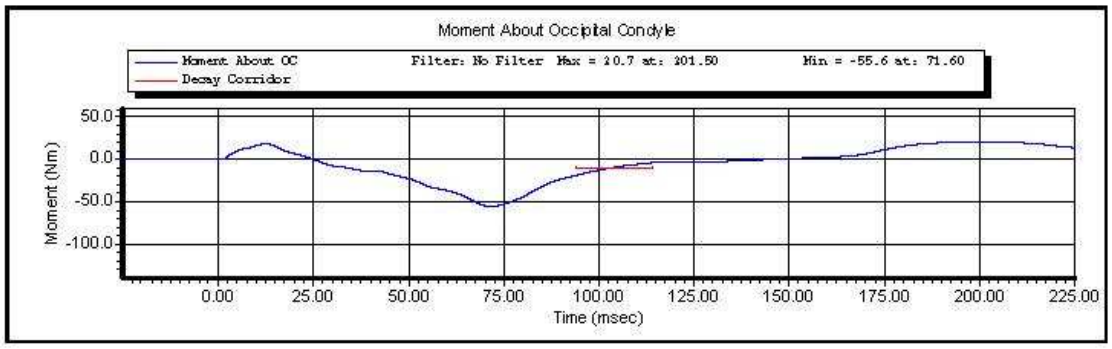
Test Name:	**Neck Extension**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:		Test Date:	**11/15/2011**
Test Number:	**2**	Test Time:	**5:59:20 PM**









Test ID: Test Time: **5:59:20 PM** Test Date: **11/15/2011**

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VERIFICATION REPORT

Test Name:	**Thorax Impact**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:		Test Date:	**11/16/2011**
Test Number:	**1**	Test Time:	**11:25:13 AM**

Component Part Number	Component Serial Number
Ribs 880105-RS	**670**
Chest Jacket - 880105-355-E	**DH0069**
Lumbar Spine - 880105-1095	

Test Parameters	Test Specifications			Test Results		
Temperature	20.6	--	22.2	**22.0**	deg C	P
Humidity	10.0	--	70.0	**45.0**	%RH	P
Velocity	6.59	--	6.83	**6.62**	m/s	P
Sternum Displacement	-58.0	--	-50.0	**-55.1**	mm	P
Force During Displacement Interval	-4400	--	-3900	**-4311**	N	P
Force -18.0 to -50.0 Displacement	-4600	--	0	**-4060**	N	P
Hysteresis	69	--	85	**69**	%	P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID: Test Time: **11:25:13 AM** Test Date: **11/16/2011**

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VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
DentonATD	**Velocity Trap**	**1**	**1/11/2011**
Endevco	**7231CT**	**AH5M8**	**11/8/2011**
DentonATD	**78051-342**	**DS-273**	**10/10/2011**
Endevco	**7264-2000**	**P58884**	**10/31/2011**

Test ID: Test Time: **11:25:13 AM** Test Date: **11/16/2011**

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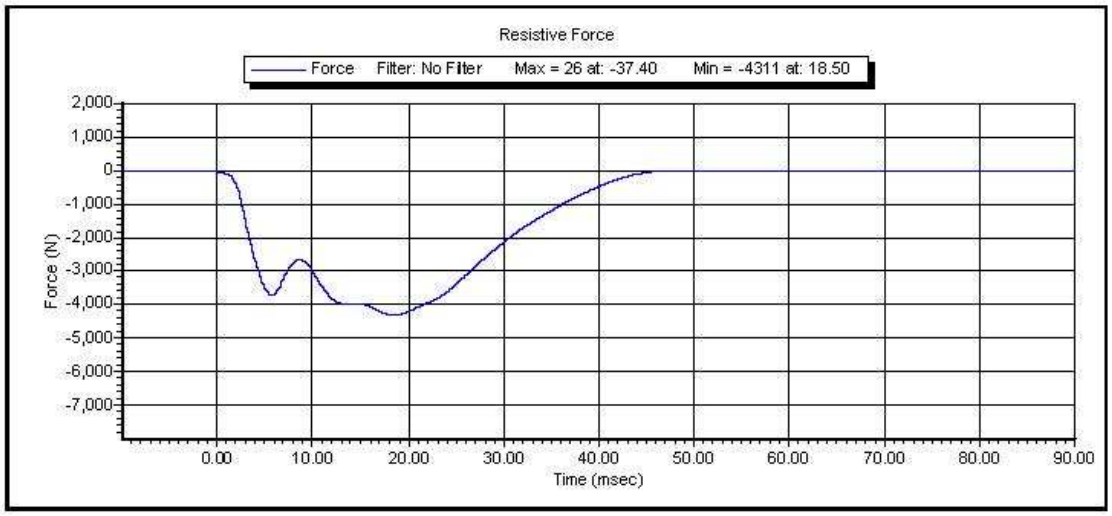
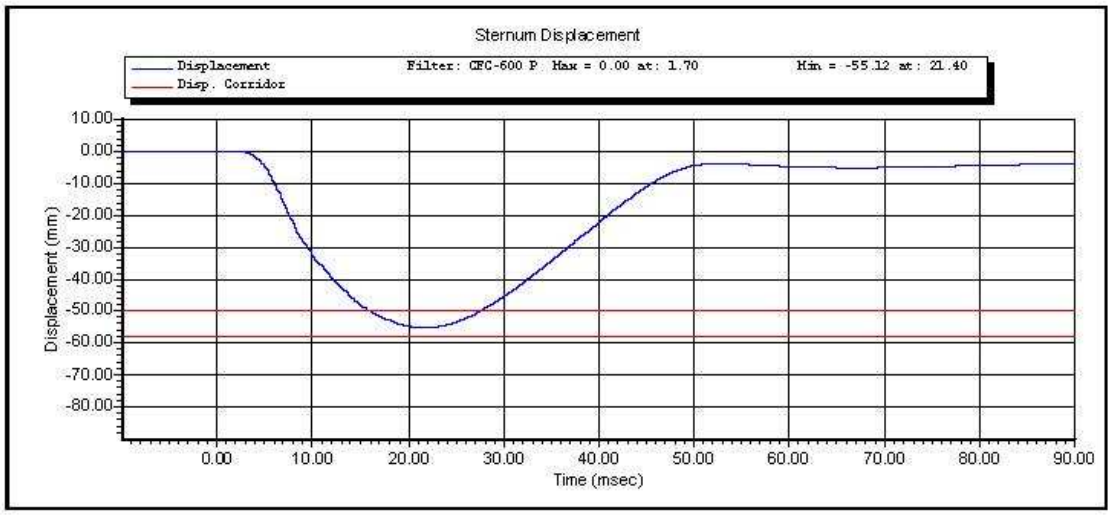
Test Name:	**Thorax Impact**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:		Test Date:	**11/16/2011**
Test Number:	**1**	Test Time:	**11:25:13 AM**





Test ID: Test Time: **11:25:13 AM** Test Date: **11/16/2011**

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VERIFICATION REPORT

Test Name:	**Knee Impact PENDULUM**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:	**Left Knee**	Test Date:	**11/15/2011**
Test Number:	**1**	Test Time:	**9:35:01 AM**

Component Part Number	Component Serial Number
Knee Skin - 880105-508	**1726**
Knee Insert - 880105-511	**1039**
Knee Cap - 880105-510	

Test Parameters	Test Specifications			Test Results		
Temperature	18.9	--	25.6	**21.6**	deg C	P
Humidity	10.0	--	70.0	**47.0**	%RH	P
Velocity	2.07	--	2.13	**2.11**	m/s	P
Resistive Force	-4060	--	-3450	**-3752**	N	P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID: **Left Knee** Test Time: **9:35:01 AM** Test Date: **11/15/2011**

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VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
DentonATD	**Velocity Trap**	**1**	**1/11/2011**
Endevco	**7264-2000**	**P71267**	**11/2/2011**

Test ID: **Left Knee** Test Time: **9:35:01 AM** Test Date: **11/15/2011**

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Test Name:	**Knee Impact PENDULUM**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:	**Left Knee**	Test Date:	**11/15/2011**
Test Number:	**1**	Test Time:	**9:35:01 AM**

Test ID: **Left Knee** Test Time: **9:35:01 AM** Test Date: **11/15/2011**

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VERIFICATION REPORT

Test Name:	**Knee Impact PENDULUM**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:	**Right Knee**	Test Date:	**11/15/2011**
Test Number:	**1**	Test Time:	**9:45:44 AM**

Component Part Number	Component Serial Number
Knee Skin - 880105-508	**1051**
Knee Insert - 880105-511	**1038**
Knee Cap - 880105-510	

Test Parameters	Test Specifications			Test Results		
Temperature	18.9	--	25.6	**21.6**	deg C	P
Humidity	10.0	--	70.0	**47.0**	%RH	P
Velocity	2.07	--	2.13	**2.12**	m/s	P
Resistive Force	-4060	--	-3450	**-3617**	N	P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID: **Right Knee** Test Time: **9:45:44 AM** Test Date: **11/15/2011**

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VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
DentonATD	**Velocity Trap**	**1**	**1/11/2011**
Endevco	**7264-2000**	**P71267**	**11/2/2011**

Test ID: **Right Knee** Test Time: **9:45:44 AM** Test Date: **11/15/2011**

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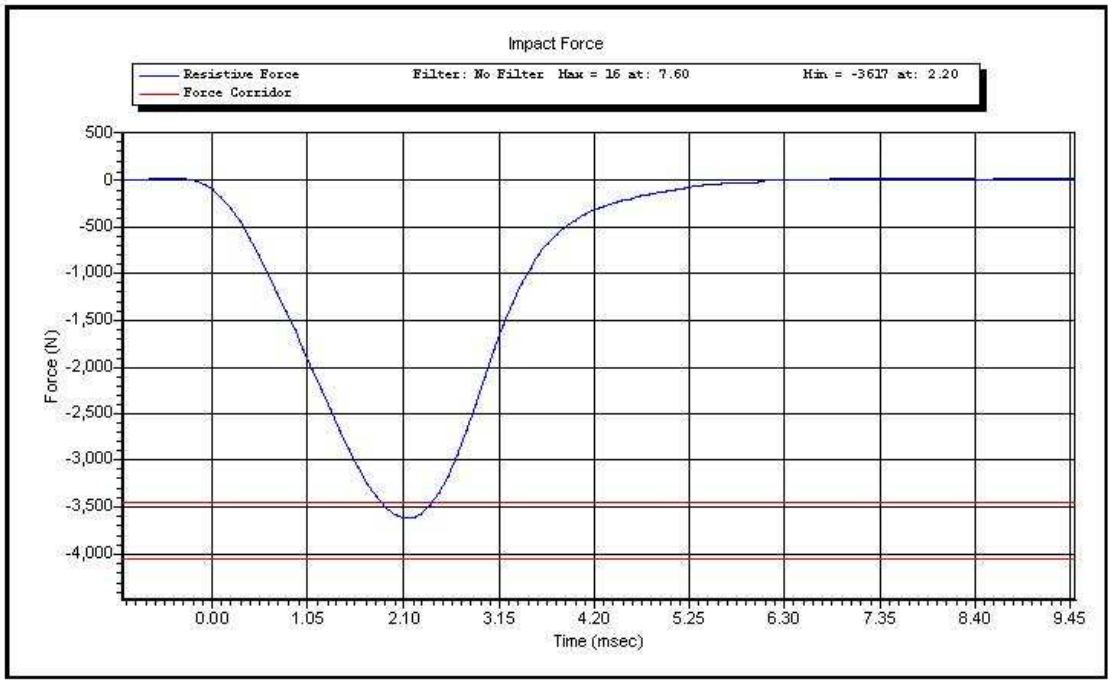
Test Name:	**Knee Impact PENDULUM**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:	**Right Knee**	Test Date:	**11/15/2011**
Test Number:	**1**	Test Time:	**9:45:44 AM**



Test ID: **Right Knee** Test Time: **9:45:44 AM** Test Date: **11/15/2011**

CALIBRATION TEST RESULTS

POST-TEST

DRIVER DUMMY

S/N: 064

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50th Male External Measurements

S/N 064

Symbol	Description	Specification	Results	Pass
		in	in	
A	Sitting Height	34.6 – 35.0	35.0	Yes
B	Shoulder Pivot Height	19.9 - 20.5	20.4	Yes
C	H-Point Height	3.3 – 3.5	3.5	Yes
D	H-Point from Backline	5.3 – 5.5	5.5	Yes
E	Shoulder Pivot from Backline	3.3 – 3.7	3.5	Yes
F	Thigh Clearance	5.5 – 6.1	6.0	Yes
G	Back of Elbow to Wrist Pivot	11.4 – 12.0	11.5	Yes
H	Head Back to Backline	1.6 – 1.8	1.7	Yes
I	Shoulder to Elbow Length	13.0 – 13.6	13.3	Yes
J	Elbow Rest Height	7.5 – 8.3	7.9	Yes
K	Buttock to Knee Length	22.8 – 23.8	23.5	Yes
L	Popliteal Height	16.9 – 17.9	17.2	Yes
M	Knee Pivot Height	19.1 – 19.7	19.1	Yes
N	Buttock Popliteal Length	17.8 – 18.8	18.5	Yes
O	Chest Depth without Jacket	8.4 – 9.0	8.5	Yes
P	Foot Length (right)	9.9 – 10.5	10.2	Yes
V	Shoulder Breadth	16.3 – 17.2	16.7	Yes
W	Foot Breadth	3.6 – 4.2	3.9	Yes
Y	Chest Circumference with Jacket	38.2 – 39.4	38.8	Yes
Z	Waist Circumference	32.9 – 34.1	33.4	Yes
AA	Reference Location (Chest Circumference)	16.9 – 17.1	17.0	Yes
BB	Reference Location (Waist Circumference)	8.9 – 9.1	9.0	Yes

Technician: AR

Date: 11/18/2011

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VERIFICATION REPORT

Test Name:	**Head Drop**	Revision:	**10/1/2001**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
Test ID:		Test Date:	**11/18/2011**
Test Number:	**1**	Test Time:	**1:39:43 PM**

Component Part Number	Component Serial Number
Head Skin - 78051-228	**7997**

Test Parameters	Test Specifications			Test Results		
Temperature	18.9	--	25.6	**21.7**	deg C	P
Humidity	10	--	70	**24**	%RH	P
Resultant Acceleration	225	--	275	**249**	g	P
Oscillation	0.0	--	10.0	**2.0**	%	P
Lateral Acceleration	-15.00	--	15.00	**-6.87**	g	P

All test parameters are within specifications

Technician: **S Zito**

Supervisor: **D Travale**

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VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
Endevco	**7264-2000**	**P66931**	**6/13/2011**
Endevco	**7264-2000**	**P66926**	**6/13/2011**
Endevco	**7264-2000**	**P66943**	**6/13/2011**

Test ID: Test Time: **1:39:43 PM** Test Date: **11/18/2011**

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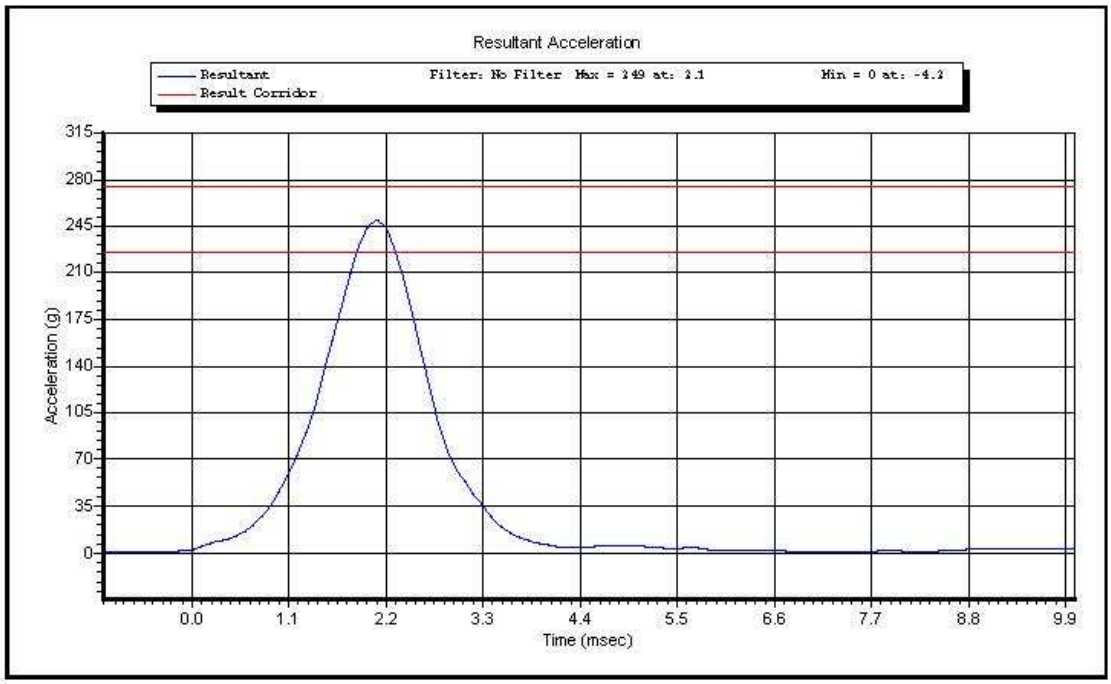
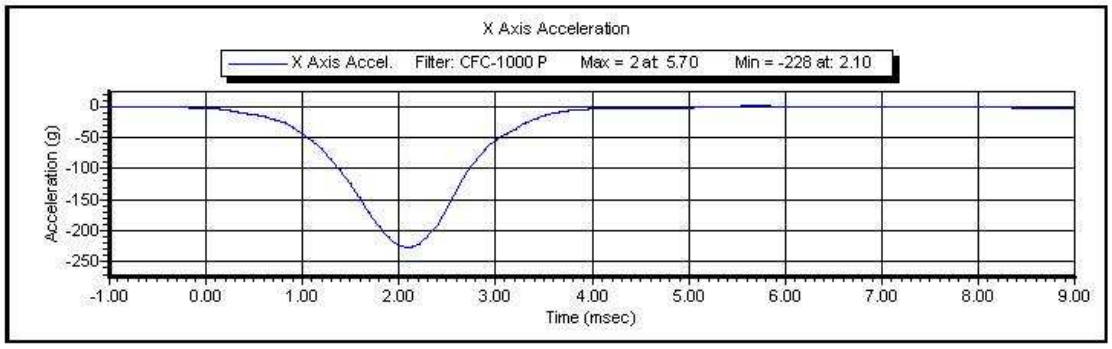
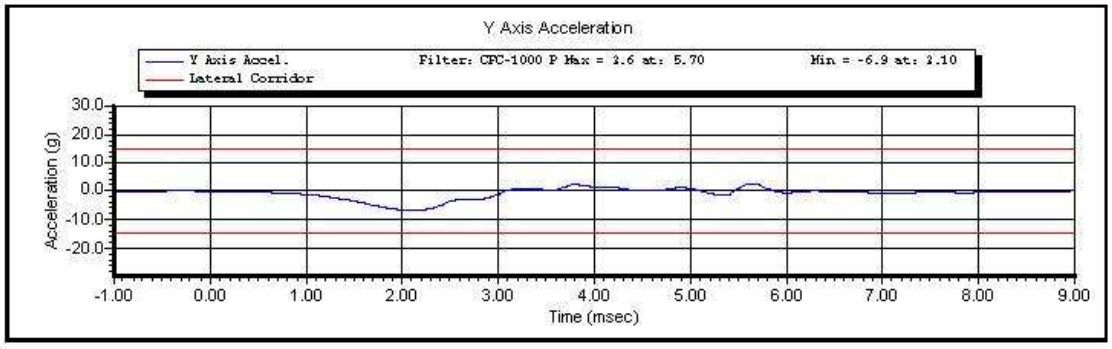
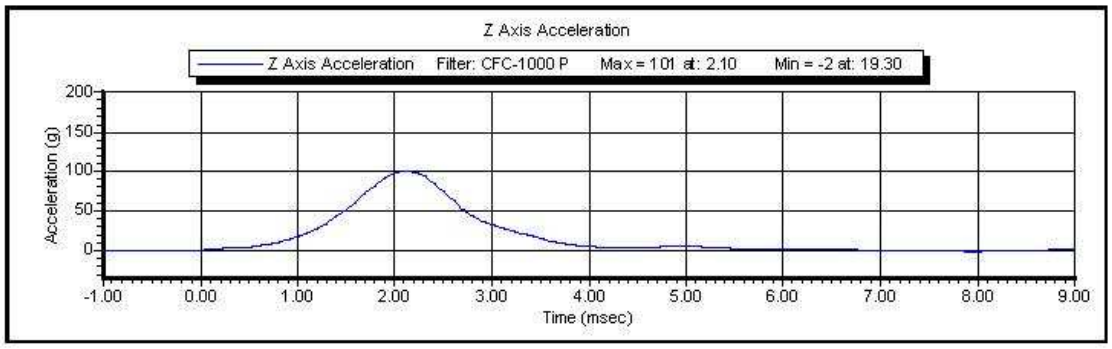
Test Name:	**Head Drop**	Revision:	**10/1/2001**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
Test ID:		Test Date:	**11/18/2011**
Test Number:	**1**	Test Time:	**1:39:43 PM**









Test ID: Test Time: **1:39:43 PM** Test Date: **11/18/2011**

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VERIFICATION REPORT

Test Name:	**Neck Flexion**	Revision:	**10/1/2001**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
Test ID:		Test Date:	**11/19/2011**
Test Number:	**1**	Test Time:	**11:23:34 AM**

Component Part Number	Component Serial Number
Neck - 78051-336	**02-1692**

Test Parameters		Test Specifications		Test Results		
Temperature		20.6 -- 22.2		**22.2**	deg C	P
Humidity		10 -- 70		**20**	%RH	P
Velocity		6.89 -- 7.13		**7.12**	m/s	P
Pendulum Deceleration at	10 ms	22.5 -- 27.5		**26.5**	g	P
Pendulum Deceleration at	20 ms	17.6 -- 22.6		**20.3**	g	P
Pendulum Deceleration at	30 ms	12.5 -- 18.5		**15.9**	g	P
Max Pendulum Deceleration After	30 ms	0.0 -- 29.0		**15.9**	g	P
Deceleration time to	5 g	34.0 -- 42.0		**37.7**	ms	P
D Plane Rotation		-78.0 -- -64.0		**-71.3**	degrees	P
Time at max rotation		57.0 -- 64.0		**58.7**	ms	P
Rotation Decay to Zero		113.0 -- 128.0		**113.6**	ms	P
Moment about OC		88.1 -- 108.4		**91.3**	Nm	P
Time at Max Moment		47.0 -- 58.0		**51.7**	ms	P
Moment Decay to Zero		97.0 -- 107.0		**103.8**	ms	P

All test parameters are within specifications

Technician: **S Zito**

Supervisor: **D Travale**

Test ID: Test Time: **11:23:34 AM** Test Date: **11/19/2011**

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VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7231CT	C16510	10/3/2011
DentonATD	78051-342	PENDULUM POT	2/7/2011
DentonATD	78051-342	CONDYLE POT	2/7/2011
Denton	1716A	LC-2186 My	6/3/2011
Denton	1716A	LC-2186 Fx	6/3/2011

Test ID: Test Time: **11:23:34 AM** Test Date: **11/19/2011**

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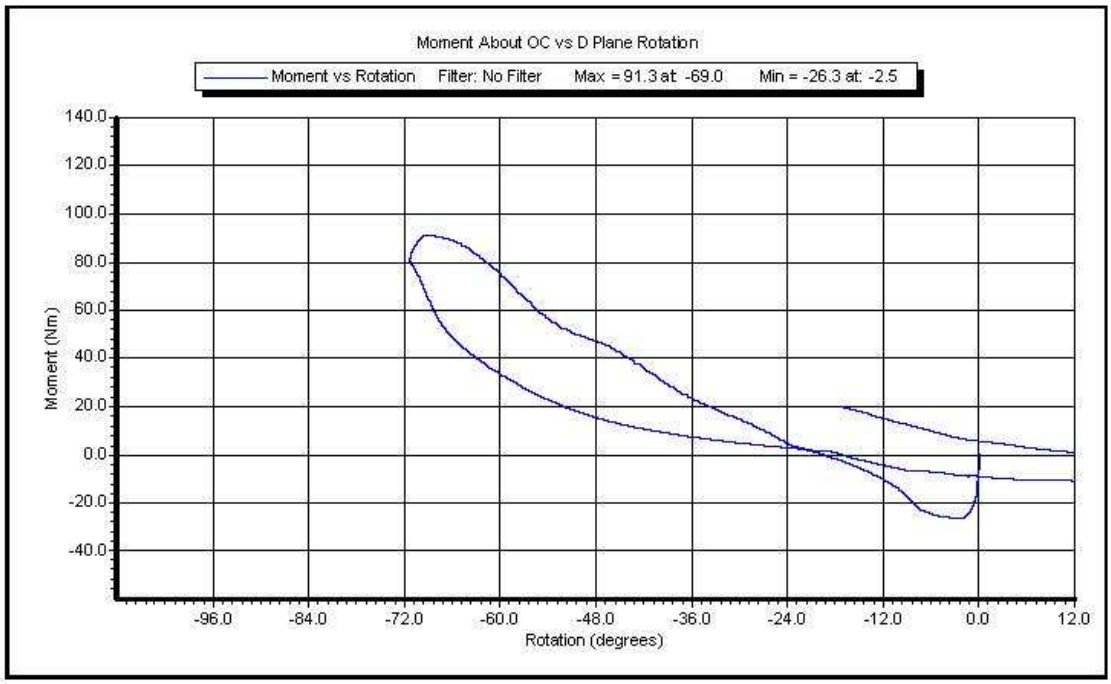
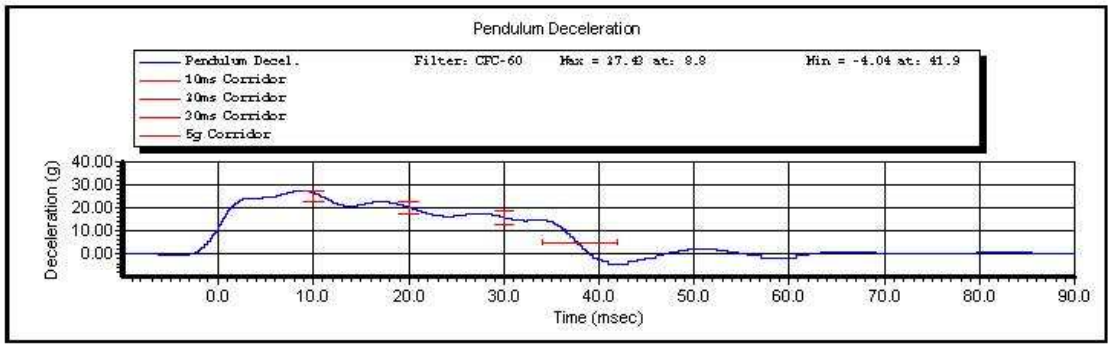
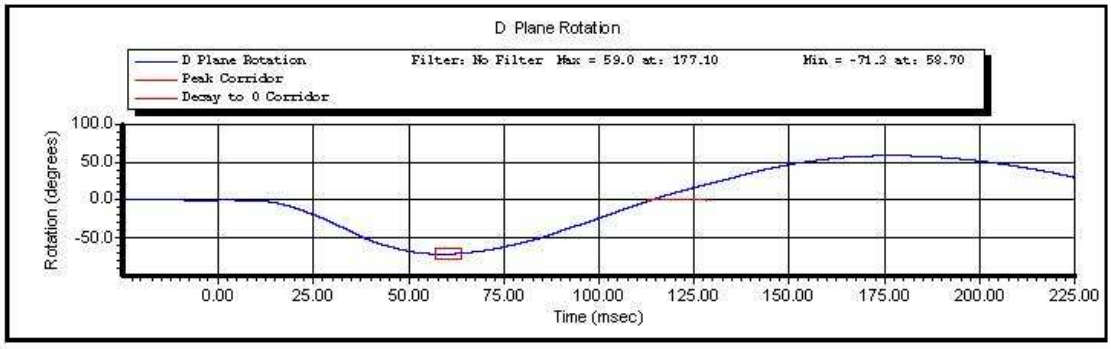
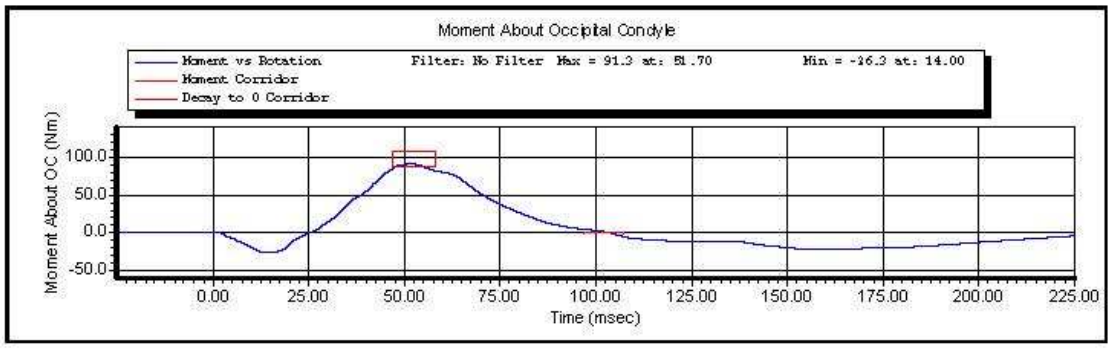
Name of Test:	**Neck Flexion**	REVISION:	**10/1/2001**
Name of Sub Test:		Type of Spec:	**NHTSA**
Type of ATD:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
ID of Test:		Date:	**11/19/2011**
Number of Test:	**1**	Time of Test:	**11:23:34 AM**









ID of Test:

Time of Test: **11:23:34 AM**

Date of Test: **11/19/2011**

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VERIFICATION REPORT

Test Name:	**Neck Extension**	Revision:	**10/1/2001**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
Test ID:		Test Date:	**11/19/2011**
Test Number:	**3**	Test Time:	**10:48:59 AM**

Component Part Number	Component Serial Number
Neck - 78051-336	**02-1692**

Test Parameters		Test Specifications		Test Results	
Temperature		20.6 -- 22.2		**22.2** deg C	P
Humidity		10 -- 70		**20** %RH	P
Velocity		5.94 -- 6.19		**6.12** m/s	P
Pendulum Deceleration at	10 ms	17.2 -- 21.2		**17.7** g	P
Pendulum Deceleration at	20 ms	14.0 -- 19.0		**16.0** g	P
Pendulum Deceleration at	30 ms	11.0 -- 16.0		**12.5** g	P
Max Pendulum Deceleration after	30 ms	0.0 -- 22.0		**13.7** g	P
Decel Time to	5 g	38.0 -- 46.0		**44.7** ms	P
D Plane Rotation		81.0 -- 106.0		**96.8** degrees	P
Time at Max Rotation		72.0 -- 82.0		**80.1** ms	P
Rotation Decay to Zero		147.0 -- 174.0		**158.1** ms	P
Moment About Occipital Condyle		-80.0 -- -52.9		**-62.5** Nm	P
Time at Max Moment		65.0 -- 79.0		**74.7** ms	P
Moment Decay to Zero		120.0 -- 148.0		**146.0** ms	P

All test parameters are within specifications

Technician: **S Zito**

Supervisor: **D Travale**

Test ID: Test Time: **10:48:59 AM** Test Date: **11/19/2011**

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VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7231CT	C16510	10/3/2011
DentonATD	78051-342	PENDULUM POT	2/7/2011
DentonATD	78051-342	CONDYLE POT	2/7/2011
Denton	1716A	LC-2186 My	6/3/2011
Denton	1716A	LC-2186 Fx	6/3/2011

Test ID: Test Time: **10:48:59 AM** Test Date: **11/19/2011**

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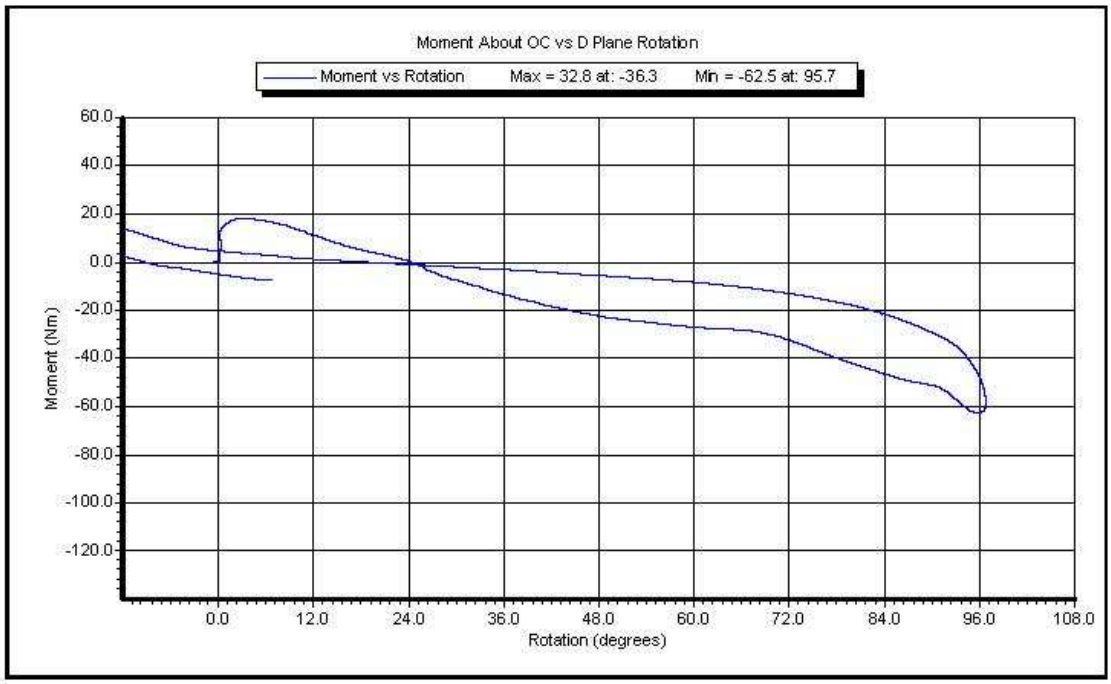
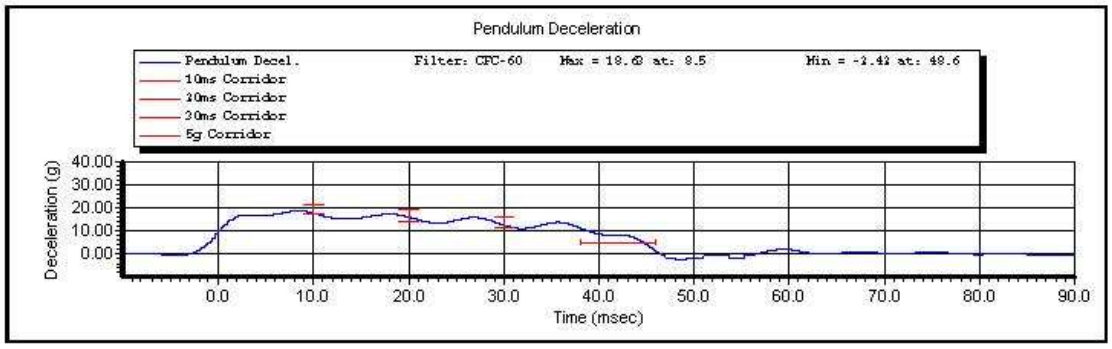
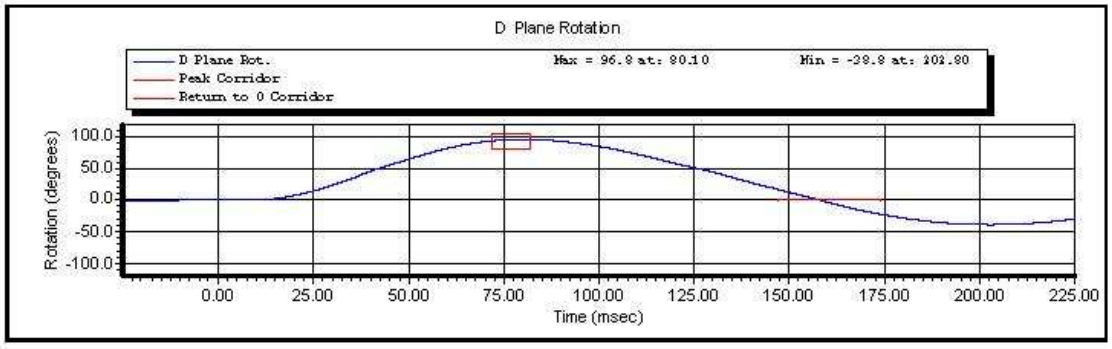
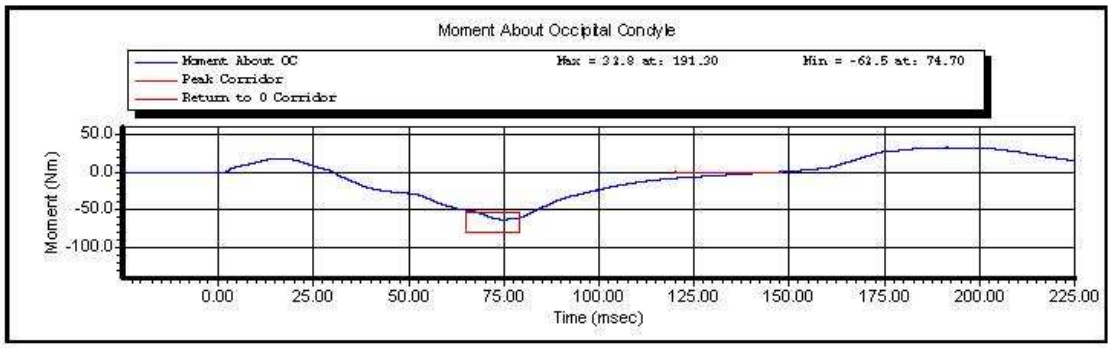
Name of Test:	**Neck Extension**	REVISION:	**10/1/2001**
Name of Sub Test:		Type of Spec:	**NHTSA**
Type of ATD:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
ID of Test:		Date:	**11/19/2011**
Number of Test:	**3**	Time of Test:	**10:48:59 AM**



ID of Test: Time of Test: **10:48:59 AM** Date of Test: **11/19/2011**







ID of Test:

Time of Test: **10:48:59 AM**

Date of Test: **11/19/2011**

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VERIFICATION REPORT

Test Name:	**Thorax Impact**	Revision:	**10/1/2001**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
Test ID:		Test Date:	**11/19/2011**
Test Number:	**1**	Test Time:	**3:44:53 PM**

Component Part Number	Component Serial Number
Ribs 78051-RS	**3964**

Test Parameters	Test Specifications			Test Results		
Temperature	20.6	--	22.2	**22.2**	deg C	P
Humidity	10.0	--	70.0	**20.0**	%RH	P
Velocity	6.59	--	6.83	**6.79**	m/s	P
Resistive Force	-5.894	--	-5.160	**-5.742**	kN	P
Sternum Displacement	-72.6	--	-63.5	**-65.6**	mm	P
Hysteresis	69	--	85	**76**	%	P

All test parameters are within specifications

Technician: **S Zito**

Supervisor: **D Travale**

Test ID: Test Time: **3:44:53 PM** Test Date: **11/19/2011**

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VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
DentonATD	**Velocity Trap**	**1**	**1/11/2011**
Endevco	**7231CT**	**AF5B3**	**11/18/2011**
DentonATD	**78051-342**	**DS-064**	**10/13/2011**

Test ID:

Test Time: **3:44:53 PM**

Test Date: **11/19/2011**

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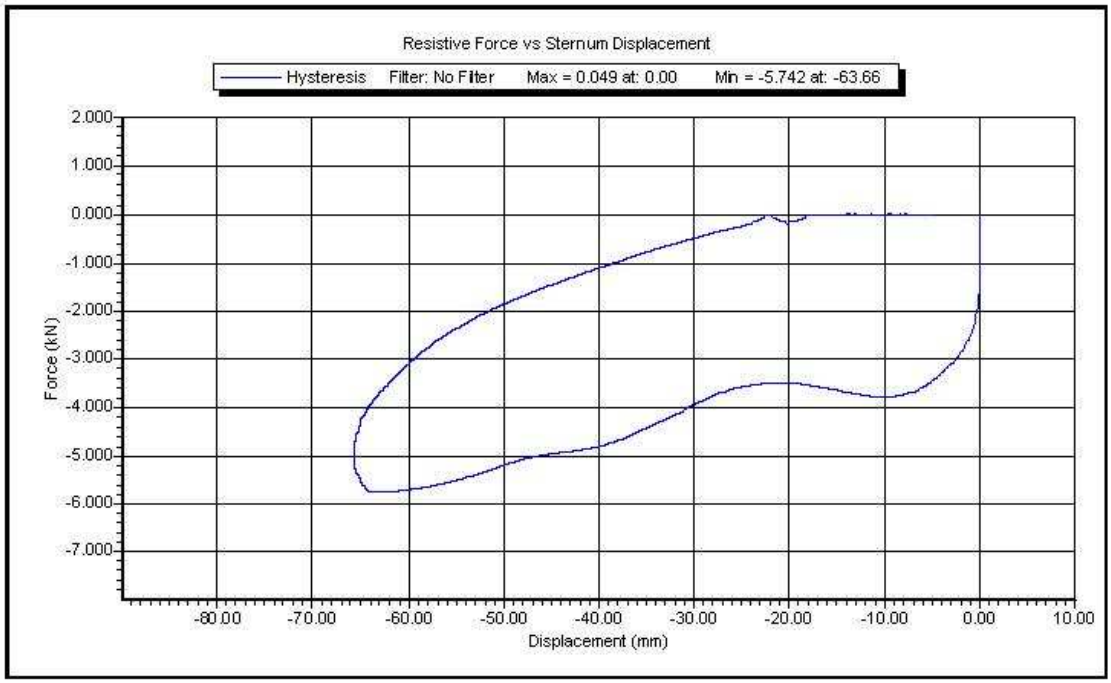
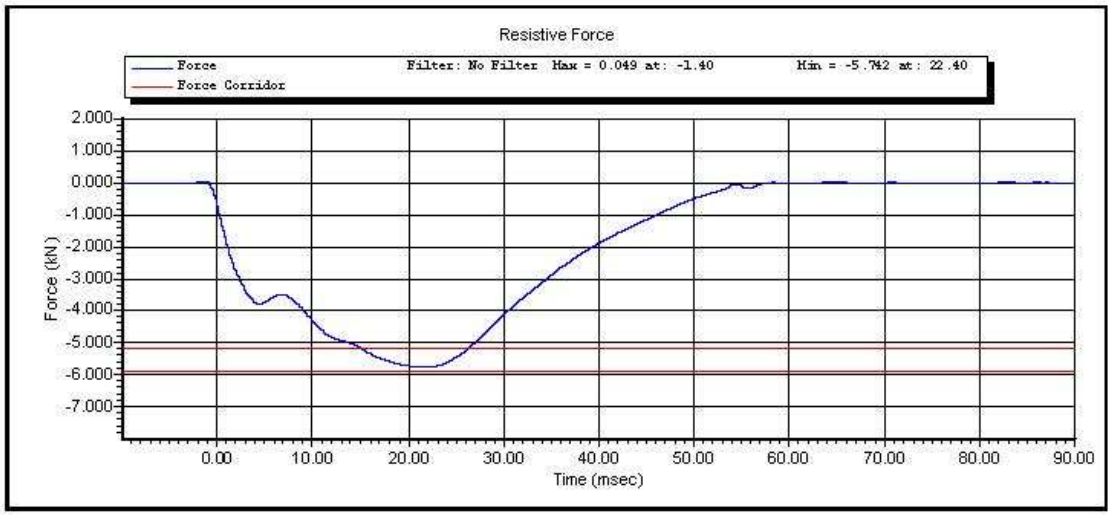
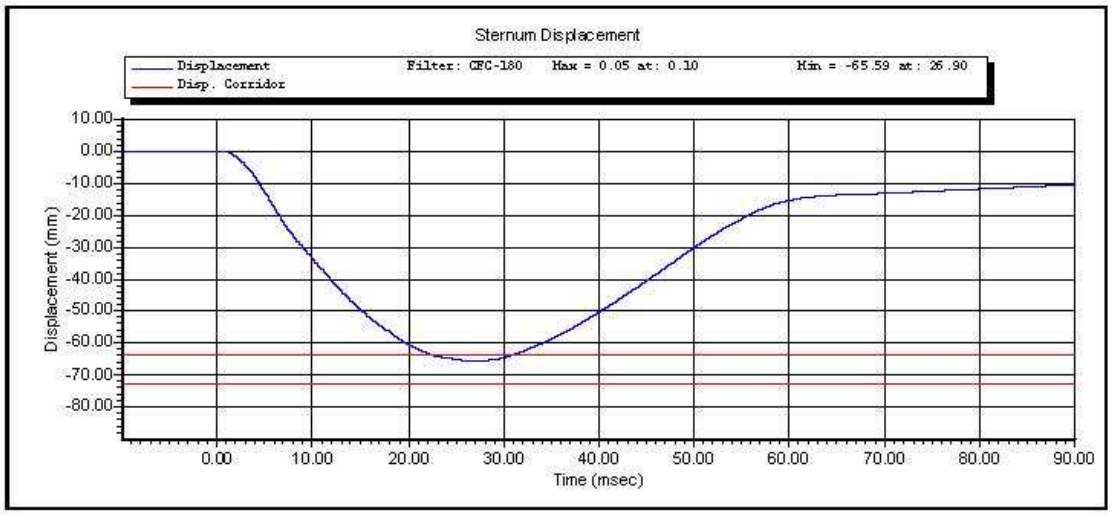
Test Name:	**Thorax Impact**	Revision:	**10/1/2001**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
Test ID:		Test Date:	**11/19/2011**
Test Number:	**1**	Test Time:	**3:44:53 PM**







Test ID: Test Time: **3:44:53 PM** Test Date: **11/19/2011**

CALSPAN

Hybrid III Hip Range of Motion: Hybrid III 50th Male

Serial Number: 064
Test Number: 1
Comments: RIGHT

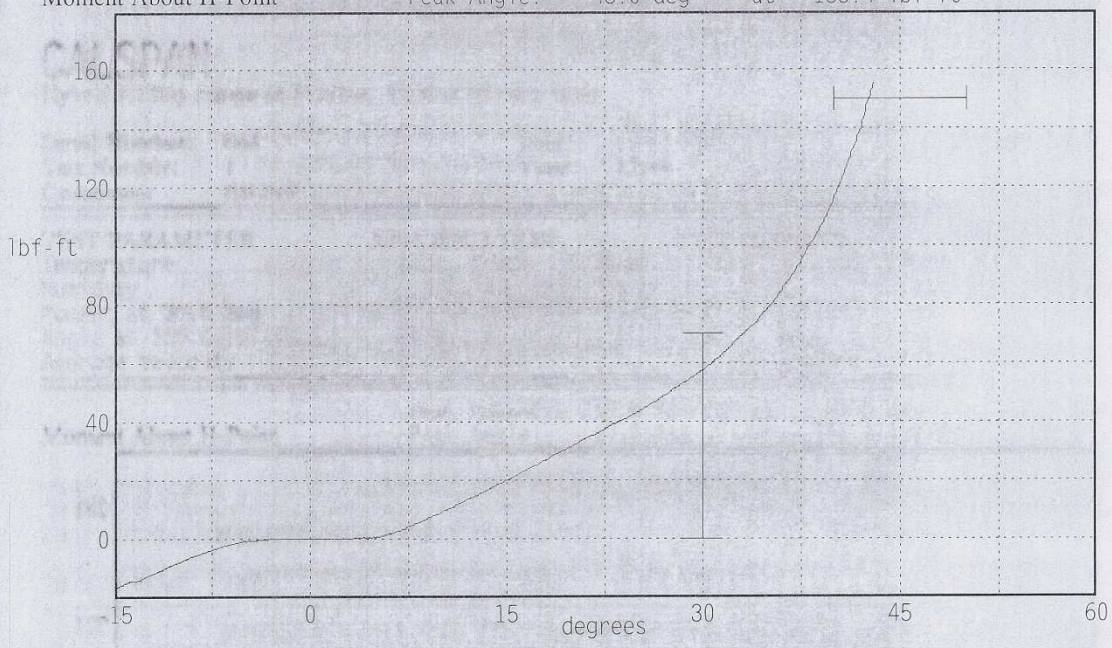
Date: 11/19/2011
Time: 12:46

Version: 1.6.3

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	66.0 - 78.0	72.0	°F	Pass
Humidity	10 - 70	20	%	Pass
Moment at 30.0 deg	<= 70.0	57.8	lbf-ft	Pass
Angle at 150.0 lbf-ft	40.0 - 50.0	42.7	deg	Pass
Average Velocity	5.0 - 10.0	7.5	deg/sec	Pass

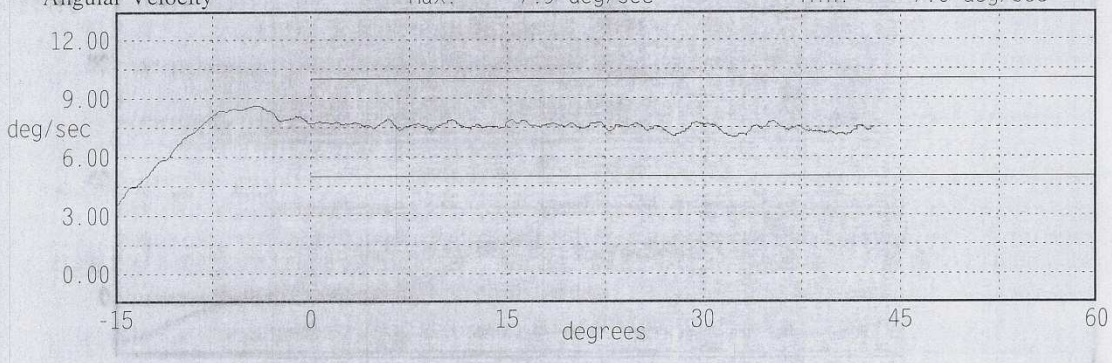
Moment About H-Point

Peak Moment: 155.4 lbf-ft at 43.0 deg
Peak Angle: 43.0 deg at 155.4 lbf-ft



Angular Velocity

Max: 7.9 deg/sec Min: 7.0 deg/sec



CALSPAN

Hybrid III Hip Range of Motion: Hybrid III 50th Male

Serial Number: 064
Test Number: 1
Comments: LEFT

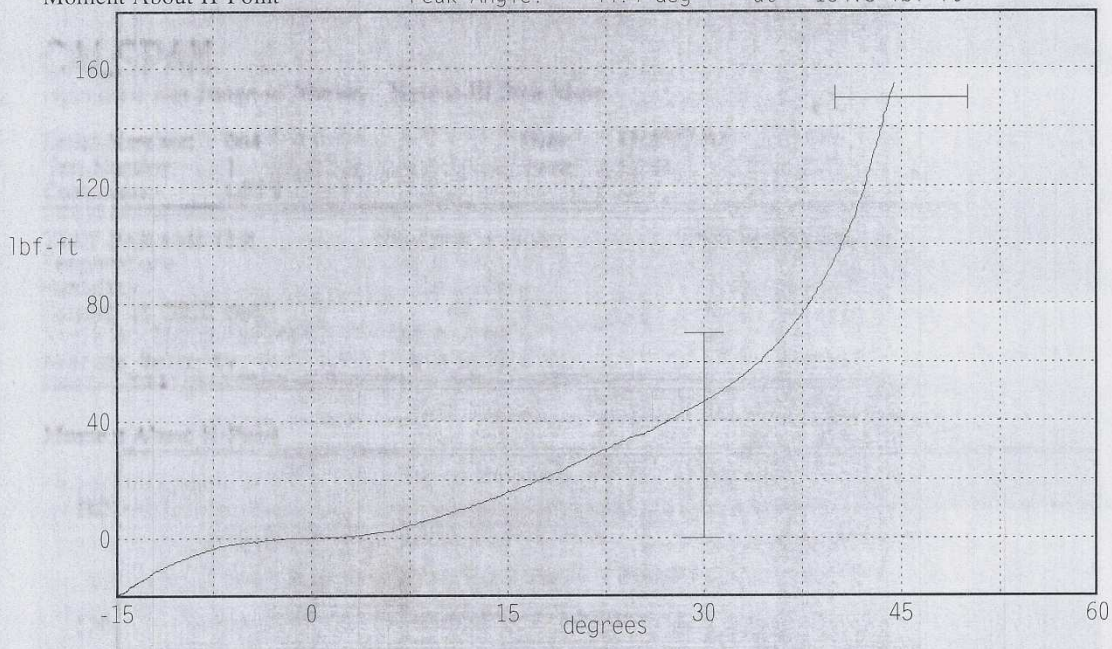
Date: 11/19/2011
Time: 12:42

Version: 1.6.3

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	66.0 - 78.0	72.0	°F	Pass
Humidity	10 - 70	20	%	Pass
Moment at 30.0 deg	<= 70.0	46.5	lbf-ft	Pass
Angle at 150.0 lbf-ft	40.0 - 50.0	44.1	deg	Pass
Average Velocity	5.0 - 10.0	7.5	deg/sec	Pass

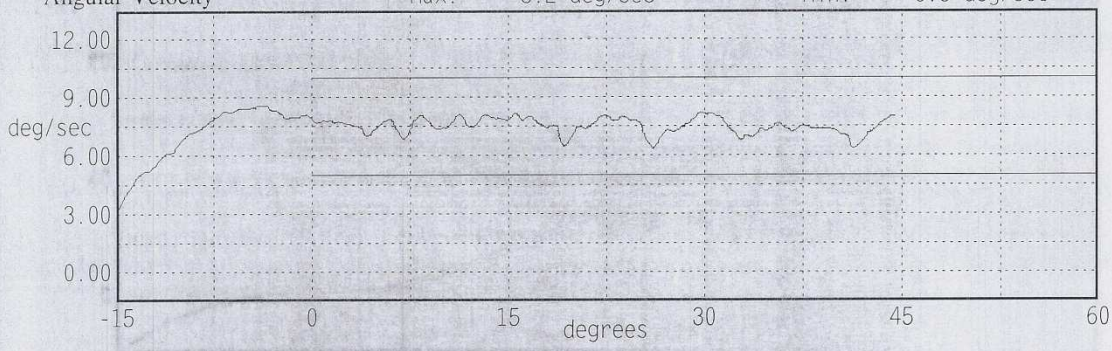
Moment About H-Point

Peak Moment: 154.8 lbf-ft at 44.4 deg
Peak Angle: 44.4 deg at 154.8 lbf-ft



Angular Velocity

Max: 8.2 deg/sec Min: 6.3 deg/sec



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VERIFICATION REPORT

Test Name:	**Knee Impact PENDULUM**	Revision:	**10/1/2001**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
Test ID:	**Left Knee**	Test Date:	**11/18/2011**
Test Number:	**1**	Test Time:	**3:55:14 PM**

Component Part Number	Component Serial Number
Knee Skin - 78051	**2792**

Test Parameters	Test Specifications			Test Results		
Temperature	18.9	--	25.6	**21.8**	deg C	P
Humidity	10.0	--	70.0	**24.0**	%RH	P
Velocity	2.07	--	2.13	**2.08**	m/s	P
Resistive Force	-5.78	--	-4.72	**-5.35**	kN	P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID: **Left Knee** Test Time: **3:55:14 PM** Test Date: **11/18/2011**

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VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
DentonATD	**Velocity Trap**	**1**	**1/11/2011**
Endevco	**7264-2000**	**P71267**	**11/2/2011**

Test ID: **Left Knee** Test Time: **3:55:14 PM** Test Date: **11/18/2011**

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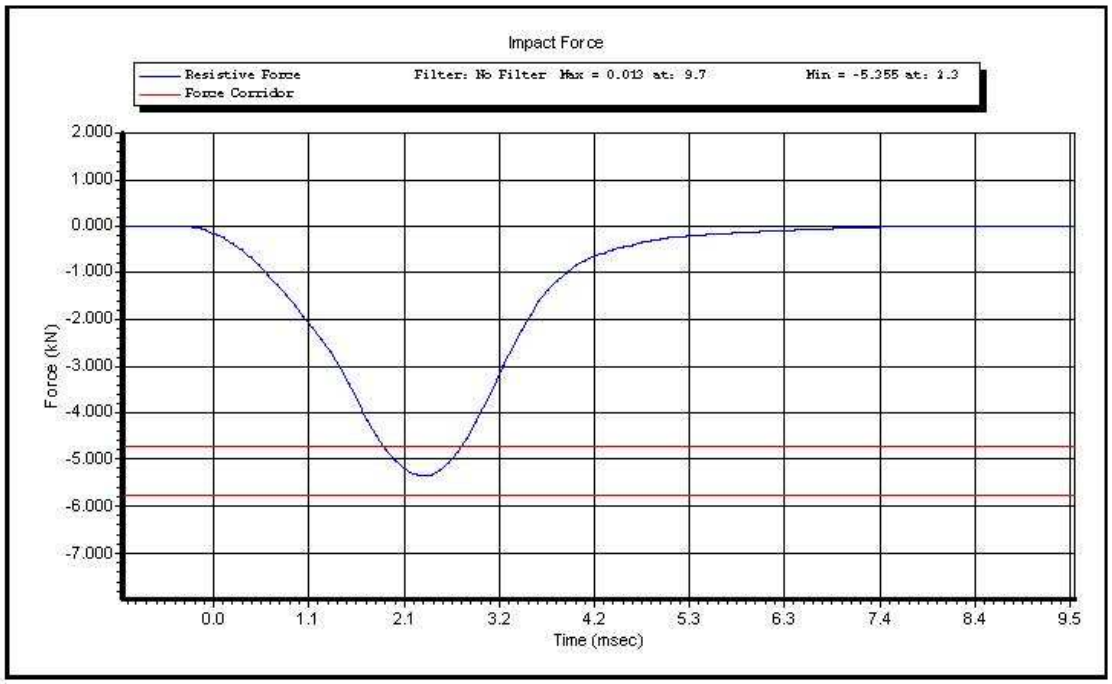
Test Name:	**Knee Impact PENDULUM**	Revision:	**10/1/2001**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
Test ID:	**Left Knee**	Test Date:	**11/18/2011**
Test Number:	**1**	Test Time:	**3:55:14 PM**



Test ID: **Left Knee** Test Time: **3:55:14 PM** Test Date: **11/18/2011**

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VERIFICATION REPORT

Test Name:	**Knee Impact PENDULUM**	Revision:	**10/1/2001**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
Test ID:	**Right Knee**	Test Date:	**11/18/2011**
Test Number:	**1**	Test Time:	**4:11:34 PM**

Component Part Number	Component Serial Number
Knee Skin - 78051(L) or 6(R)	**2880**

Test Parameters	Test Specifications			Test Results		
Temperature	18.9	--	25.6	**21.7**	deg C	P
Humidity	10.0	--	70.0	**24.0**	%RH	P
Velocity	2.07	--	2.13	**2.08**	m/s	P
Resistive Force	-5.78	--	-4.72	**-5.29**	kN	P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID: **Right Knee** Test Time: **4:11:34 PM** Test Date: **11/18/2011**

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VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
DentonATD	**Velocity Trap**	**1**	**1/11/2011**
Endevco	**7264-2000**	**P71267**	**11/2/2011**

Test ID: **Right Knee** Test Time: **4:11:34 PM** Test Date: **11/18/2011**

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Test Name:	**Knee Impact PENDULUM**	Revision:	**10/1/2001**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 50'th**		
ATD Serial Number:	**064**		
Test ID:	**Right Knee**	Test Date:	**11/18/2011**
Test Number:	**1**	Test Time:	**4:11:34 PM**

CALIBRATION TEST RESULTS

POST-TEST

RIGHT-FRONT PASSENGER DUMMY

S/N: 273

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External Measurements

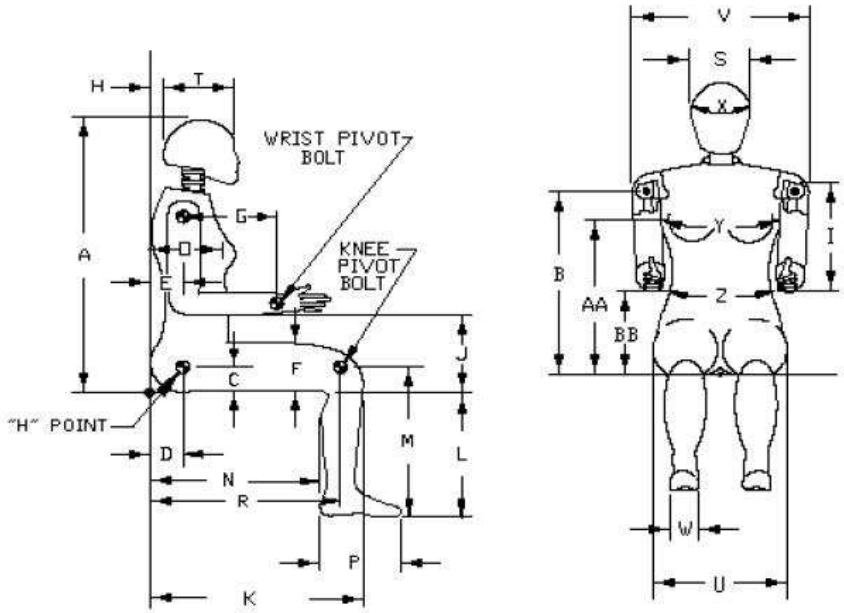
5th Female SN 273

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	774.7 – 800.1	785	Yes
B	Shoulder Pivot Height	431.8 – 457.2	450	Yes
C	H-Point Height	81.3 – 86.3	84	Yes
D	H-Point from Backline	144.8 – 149.8	147	Yes
E	Shoulder Pivot from Backline	68.6.83.8	77	Yes
F	Thigh Clearance	119.4 – 134.6	132	Yes
G	Back of Elbow to Wrist Pivot	243.9 – 259.1	249	Yes
H	Head Back to Backline	43.2 – 48.2	46	Yes
I	Shoulder to Elbow Length	276.8 – 297.2	285	Yes
J	Elbow Rest Height	182.8 – 203.2	192	Yes
K	Buttock to Knee Length	520.7 – 546.1	530	Yes
L	Popliteal Height	355.6 - 376	360	Yes
M	Knee Pivot Height	393.7 – 419.1	397	Yes
N	Buttock Popliteal Length	414 – 439.4	422	Yes
O	Chest Depth without Jacket	175.3 – 190.5	184	Yes
P	Foot Length (right)	218.5 – 233.7	220	Yes
R	Buttock To Knee Pivot Length	457.2 – 482.6	465	Yes
S	Head Breadth	137.1 – 147.3	143	Yes
T	Head Depth	177.8 - 188	183	Yes
U	Hip Breadth	299.7 – 314.9	310	Yes
V	Shoulder Breadth	350.5 – 365.7	357	Yes
W	Foot Breadth	78.8 - 94	82	Yes
X	Head Circumference	528.3 – 548.7	539	Yes
Y	Chest Circumference with Jacket	850.9 – 881.3	861	Yes
Z	Waist Circumference	759.5 – 789.9	770	Yes
AA	Reference Location (Chest Circumference)	332.7 – 358.1	345	Yes
BB	Reference Location (Waist Circumference)	160.1 – 170.2	165	Yes

Technician: AR Date: 11/21/2011

Hybrid III 5th Female External Measurements

Reference Diagram



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VERIFICATION REPORT

Test Name:	**Head Drop**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:		Test Date:	**11/21/2011**
Test Number:	**1**	Test Time:	**11:57:22 AM**

Component Part Number	Component Serial Number
Head Skin - 78051-228	**780**

Test Parameters	Test Specifications			Test Results		
Temperature	18.9	--	25.6	**21.8**	deg C	P
Humidity	10	--	70	**25**	%RH	P
Resultant Acceleration	250	--	300	**271**	g	P
Oscillation	0.0	--	10.0	**1.4**	%	P
Lateral Acceleration	-15.00	--	15.00	**-8.72**	g	P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID: Test Time: **11:57:22 AM** Test Date: **11/21/2011**

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VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
Endevco	**7264-2000**	**P66931**	**6/13/2011**
Endevco	**7264-2000**	**P66926**	**6/13/2011**
Endevco	**7264-2000**	**P66943**	**6/13/2011**

Test ID: Test Time: **11:57:22 AM** Test Date: **11/21/2011**

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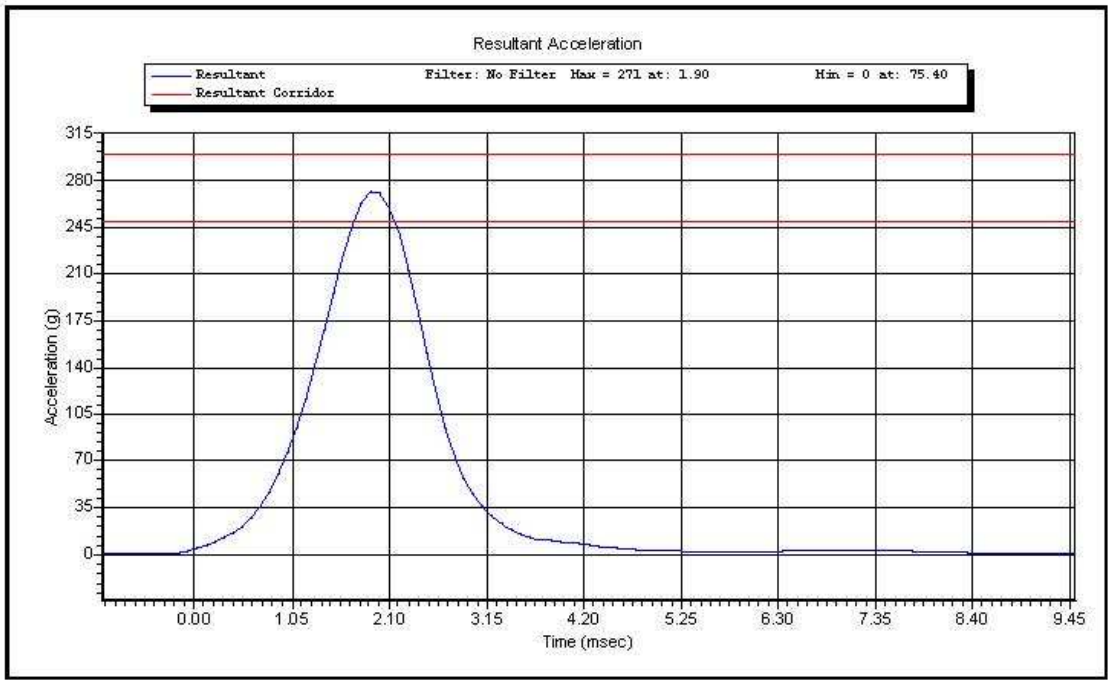
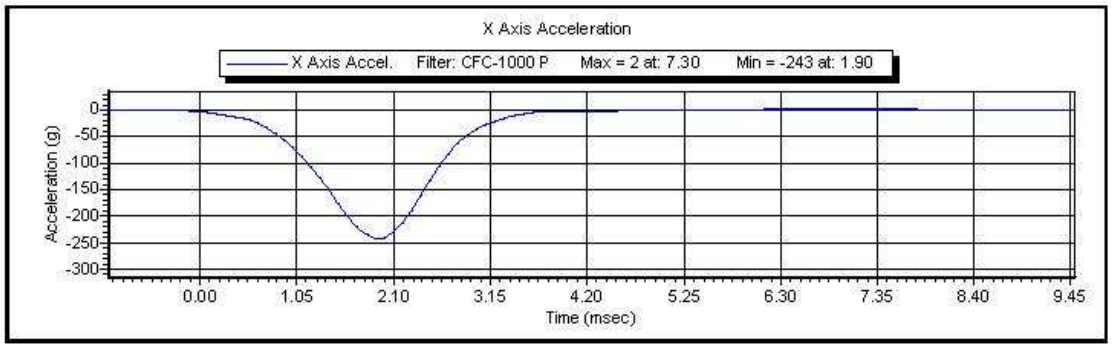
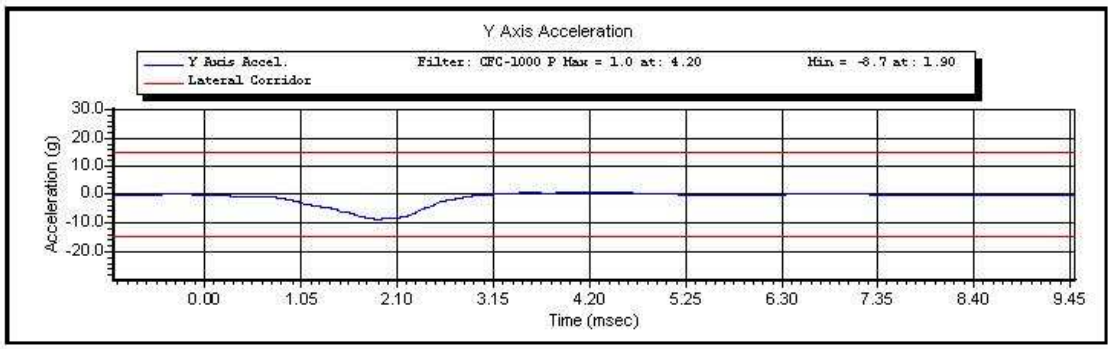
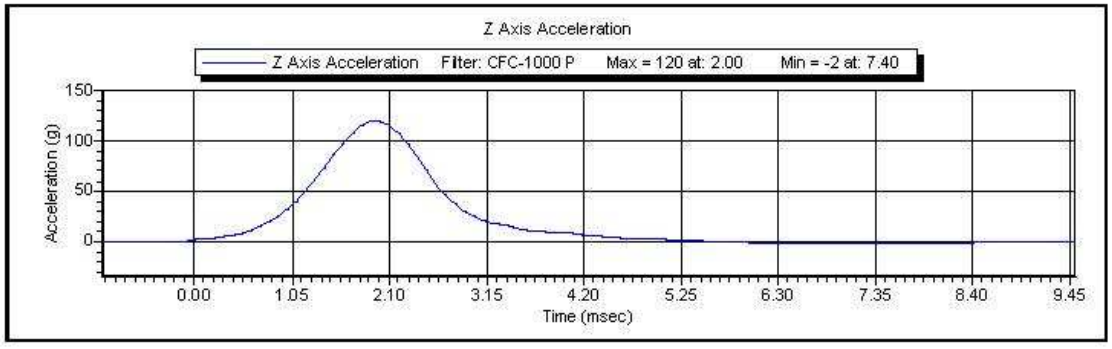
Test Name:	**Head Drop**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:		Test Date:	**11/21/2011**
Test Number:	**1**	Test Time:	**11:57:22 AM**









Test ID: Test Time: **11:57:22 AM** Test Date: **11/21/2011**

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VERIFICATION REPORT

Test Name:	**Neck Flexion**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:		Test Date:	**11/28/2011**
Test Number:	**3**	Test Time:	**10:02:54 AM**

Component Part Number	Component Serial Number
Neck - 880105-255	**660**

Test Parameters		Test Specifications			Test Results		
Temperature		20.6	--	22.2	**22.0**	deg C	P
Humidity		10	--	70	**37**	%RH	P
Velocity		6.89	--	7.13	**7.11**	m/s	P
Pendulum Impulse at	10 ms	2.10	--	2.50	**2.46**	m/s	P
Pendulum Impulse at	20 ms	4.00	--	5.00	**4.81**	m/s	P
Pendulum Impulse at	30 ms	5.80	--	7.00	**6.72**	m/s	P
D Plane Rotation		-91.0	--	-77.0	**-78.0**	degrees	P
Moment During Rotation Interval		69.0	--	83.0	**69.4**	Nm	P
Moment Decay to 10.0 Nm		80.0	--	100.0	**84.9**	ms	P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID: Test Time: **10:02:54 AM** Test Date: **11/28/2011**

VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7231CT	C16510	10/3/2011
DentonATD	78051-342	PENDULUM POT	2/7/2011
DentonATD	78051-342	CONDYLE POT	2/7/2011
Denton	1716A	LC-1629My	6/3/2011
Denton	1716A	LC-1629Fx	6/3/2011

Test ID: Test Time: **10:02:54 AM** Test Date: **11/28/2011**

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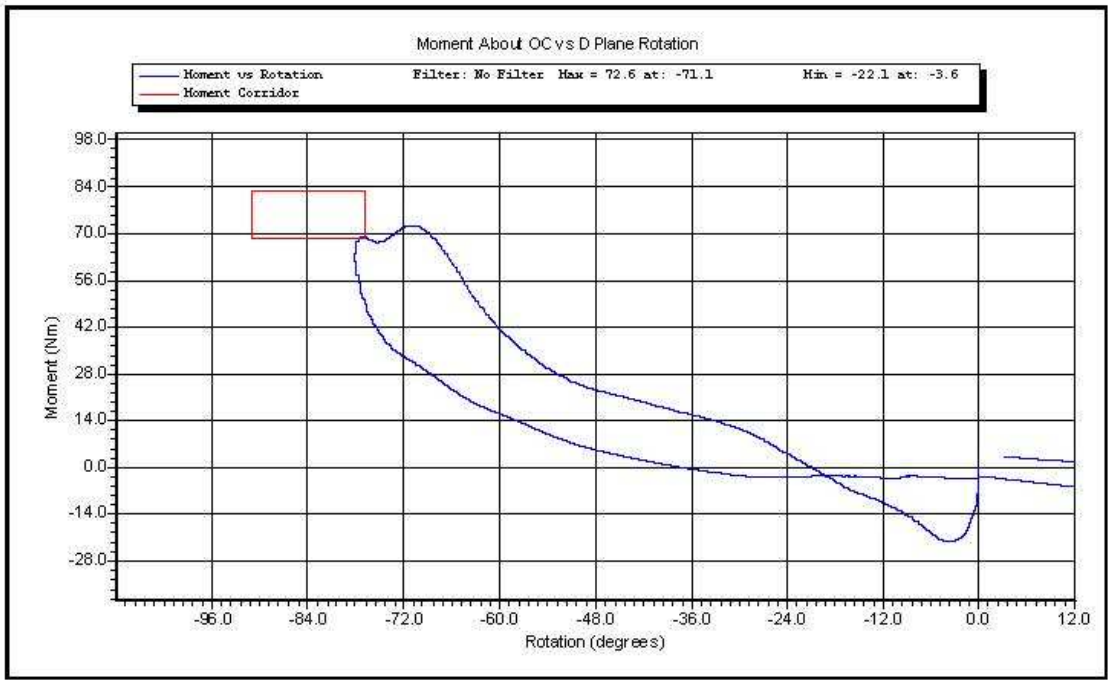
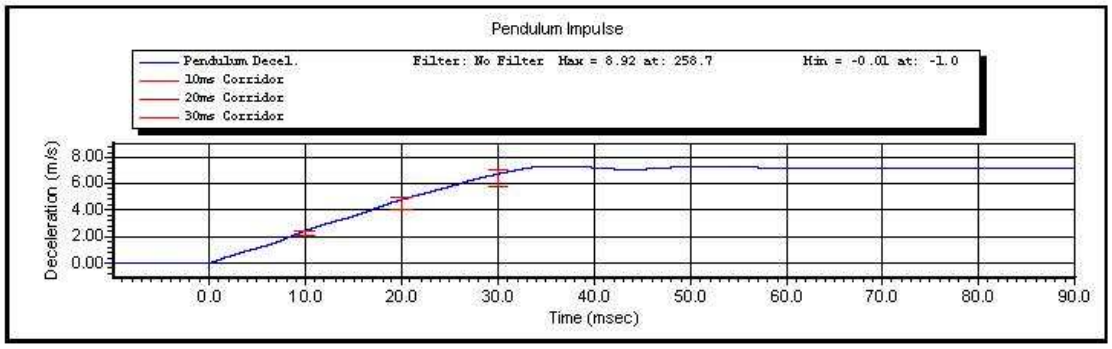
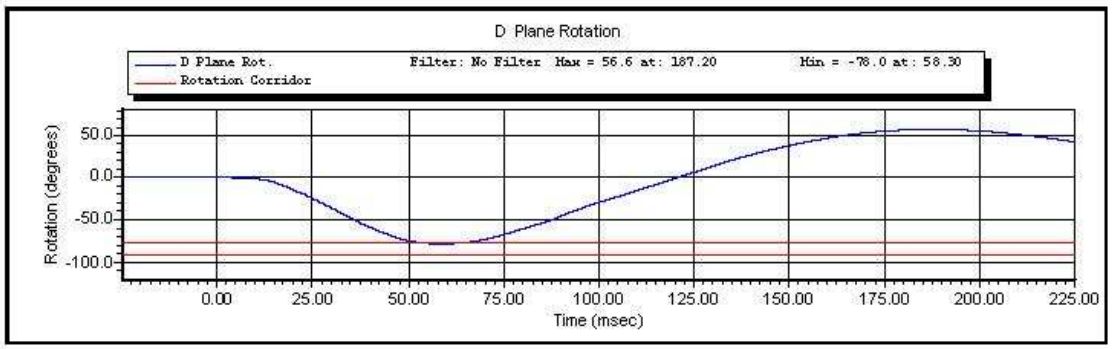
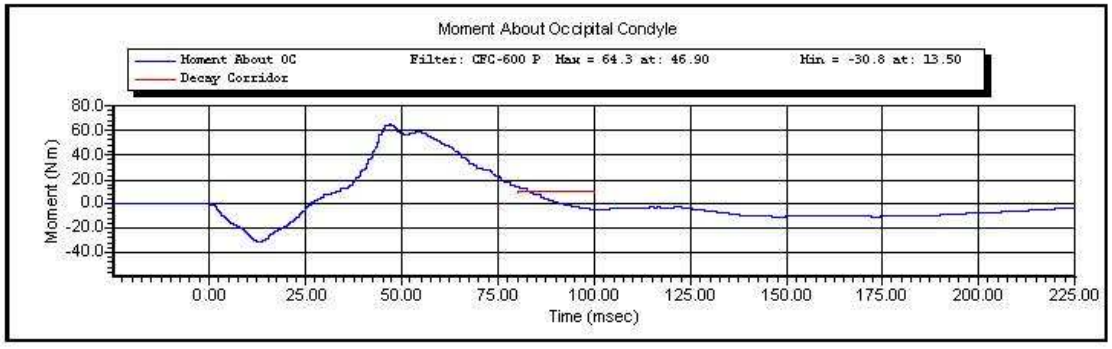
Test Name:	**Neck Flexion**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:		Test Date:	**11/28/2011**
Test Number:	**3**	Test Time:	**10:02:54 AM**









Test ID: Test Time: **10:02:54 AM** Test Date: **11/28/2011**

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VERIFICATION REPORT

Test Name:	**Neck Extension**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:		Test Date:	**11/28/2011**
Test Number:	**1**	Test Time:	**9:31:15 AM**

Component Part Number	Component Serial Number
Neck - 880105-255	**660**

Test Parameters		Test Specifications			Test Results		
Temperature		20.6	--	22.2	**22.1**	deg C	P
Humidity		10	--	70	**37**	%RH	P
Velocity		5.95	--	6.19	**6.07**	m/s	P
Pendulum Impulse at	10 ms	1.50	--	1.90	**1.90**	m/s	P
Pendulum Impulse at	20 ms	3.10	--	3.90	**3.73**	m/s	P
Pendulum Impulse at	30 ms	4.60	--	5.60	**5.37**	m/s	P
D Plane Rotation		99.0	--	114.0	**107.1**	degrees	P
Moment During Rotation Interval		-65.0	--	-53.0	**-54.8**	Nm	P
Moment Decay to -10.0 Nm		94.0	--	114.0	**102.6**	ms	P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID: Test Time: **9:31:15 AM** Test Date: **11/28/2011**

VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
DentonATD	Velocity Trap	1	1/11/2011
Endevco	7231CT	C16510	10/3/2011
DentonATD	78051-342	PENDULUM POT	2/7/2011
DentonATD	78051-342	CONDYLE POT	2/7/2011
Denton	1716A	LC-1629My	6/3/2011
Denton	1716A	LC-1629Fx	6/3/2011

Test ID: Test Time: **9:31:15 AM** Test Date: **11/28/2011**

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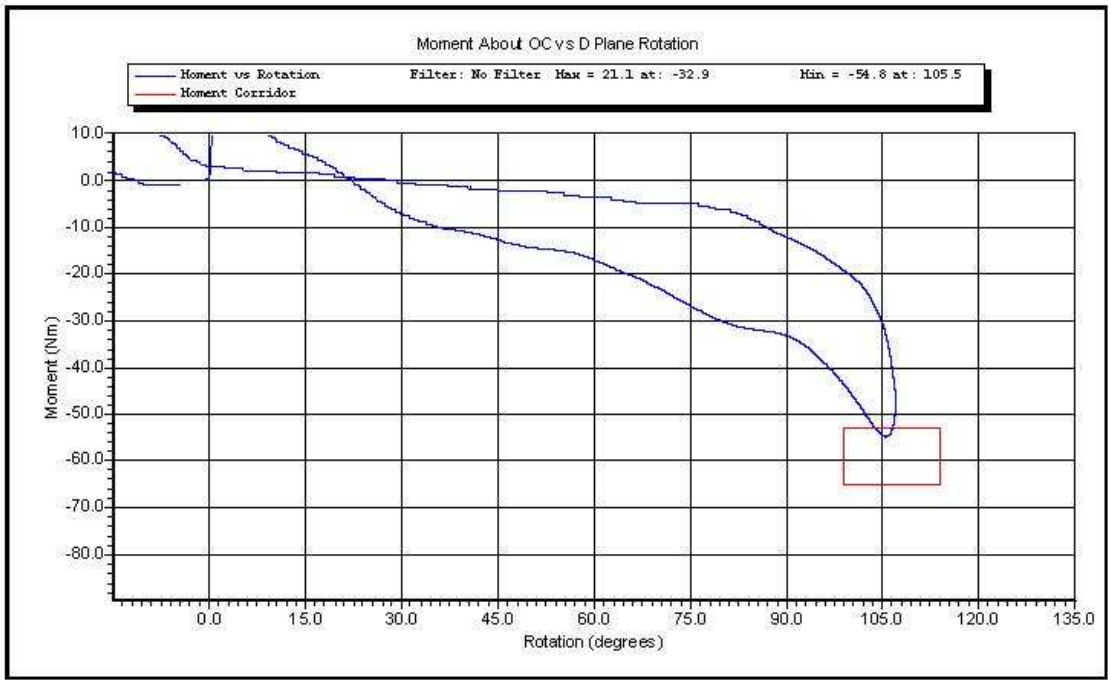
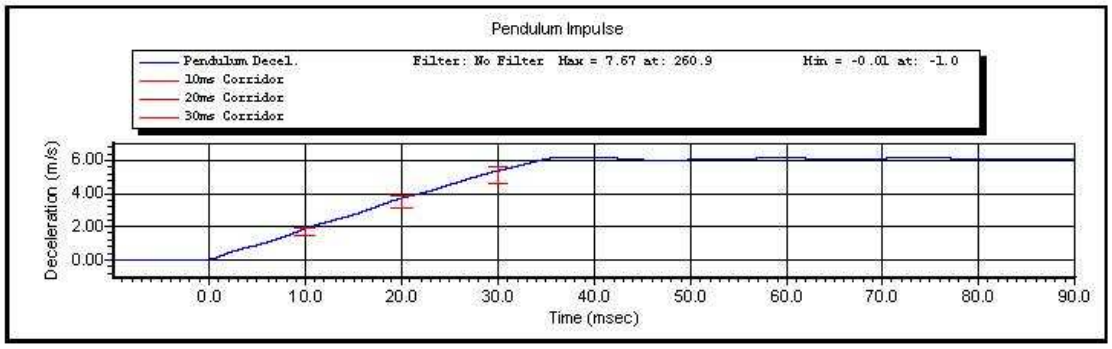
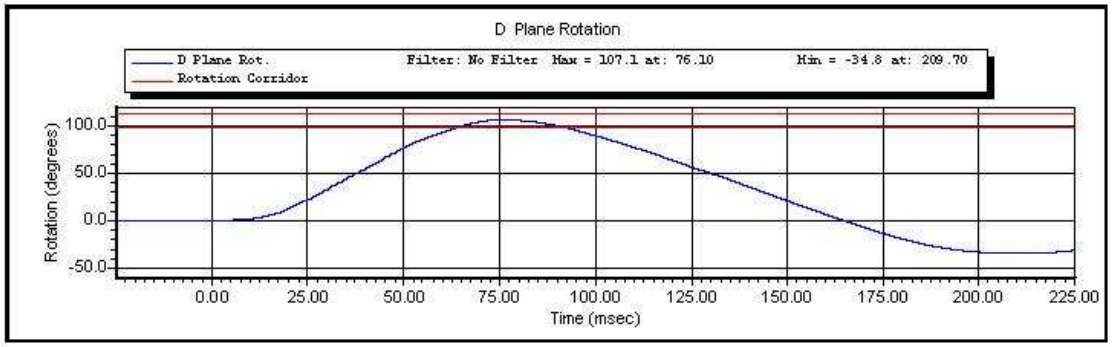
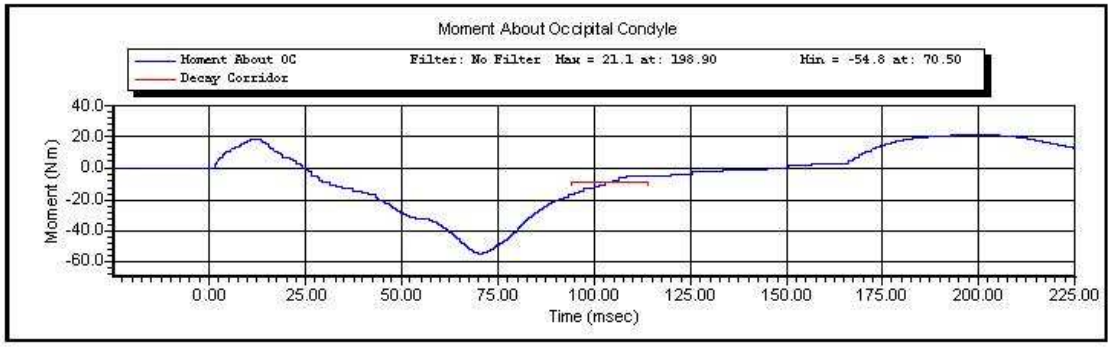
Test Name:	**Neck Extension**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:		Test Date:	**11/28/2011**
Test Number:	**1**	Test Time:	**9:31:15 AM**









Test ID: Test Time: **9:31:15 AM** Test Date: **11/28/2011**

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VERIFICATION REPORT

Test Name:	**Thorax Impact**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:		Test Date:	**11/28/2011**
Test Number:	**1**	Test Time:	**11:31:22 AM**

Component Part Number	Component Serial Number
Ribs 880105-RS	**670**
Chest Jacket - 880105-355-E	**DH0069**

Test Parameters	Test Specifications			Test Results		
Temperature	20.6	--	22.2	**22.1**	deg C	P
Humidity	10.0	--	70.0	**36.0**	%RH	P
Velocity	6.59	--	6.83	**6.64**	m/s	P
Sternum Displacement	-58.0	--	-50.0	**-54.7**	mm	P
Force During Displacement Interval	-4400	--	-3900	**-4116**	N	P
Force -18.0 to -50.0 Displacement	-4600	--	0	**-3943**	N	P
Hysteresis	69	--	85	**69**	%	P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID: Test Time: **11:31:22 AM** Test Date: **11/28/2011**

VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
DentonATD	**Velocity Trap**	**1**	**1/11/2011**
Endevco	**7231CT**	**AH5M8**	**11/8/2011**
DentonATD	**78051-342**	**DS-273**	**10/10/2011**
Endevco	**7264-2000**	**P58884**	**10/31/2011**

Test ID: Test Time: **11:31:22 AM** Test Date: **11/28/2011**

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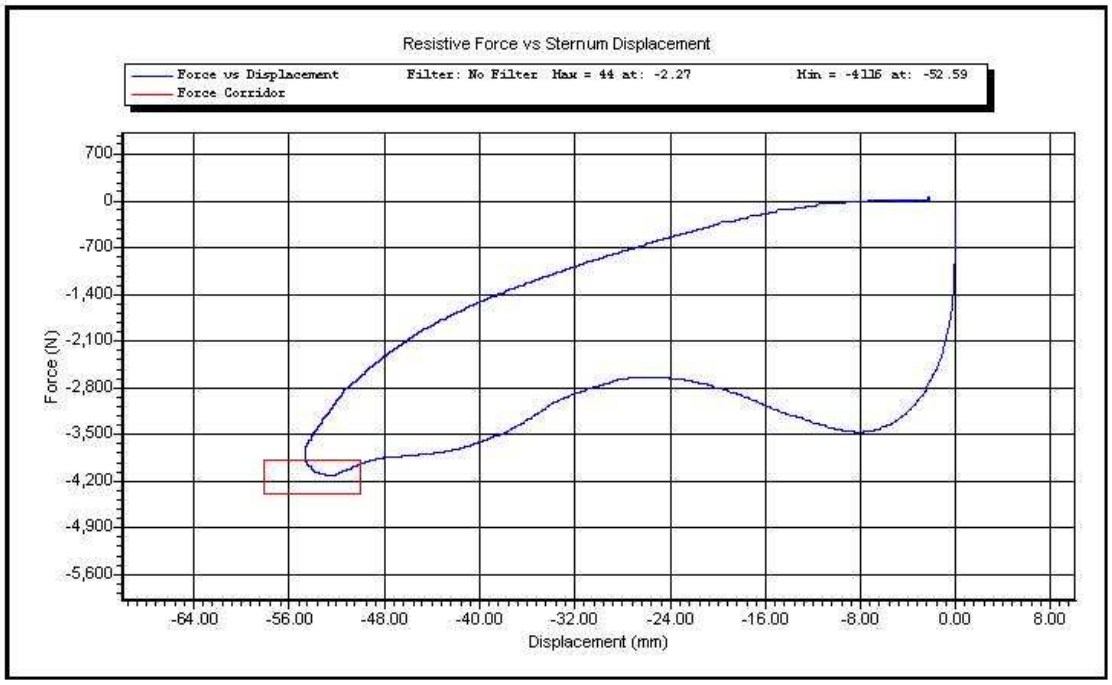
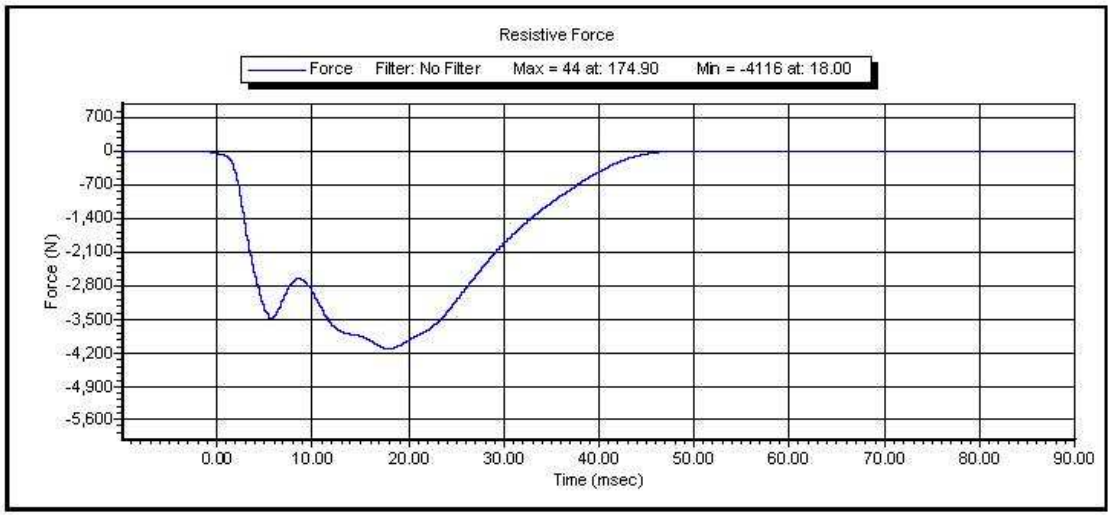
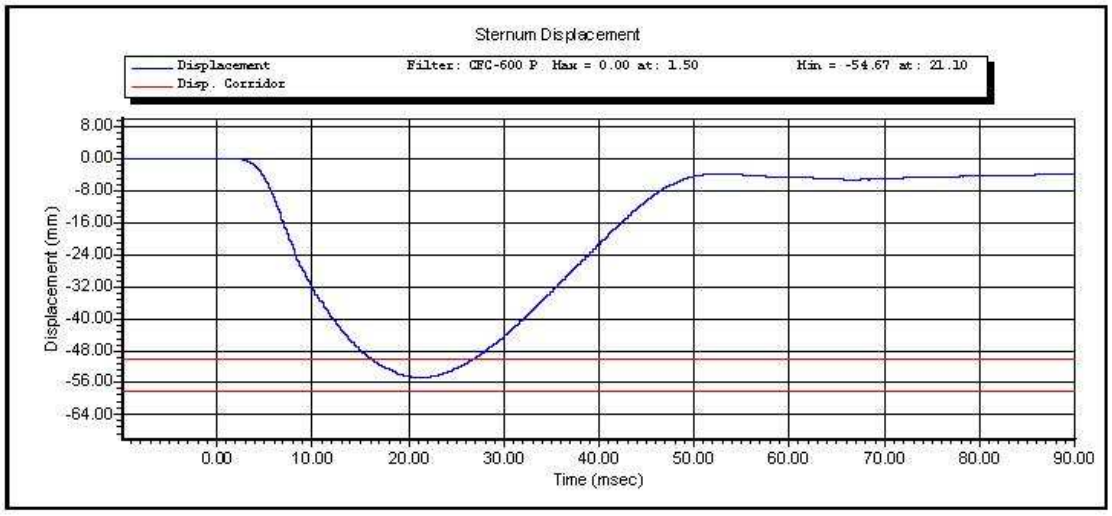
Test Name:	**Thorax Impact**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:		Test Date:	**11/28/2011**
Test Number:	**1**	Test Time:	**11:31:22 AM**







Test ID: Test Time: **11:31:22 AM** Test Date: **11/28/2011**

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Torso Flexion Test

Technician: SZ
Calibration Date: 11/29/2011

ATD Serial Number: NHTSA 5th Female 273

Test Results

Test Condition	Parameters	Results	Status
Temperature	18.9-25.6° C	21.7° C	P
Lab Humidity	10-70%	44%	P
Max Force @ 45 deg	320 – 390N	370N	P
Torso Rotation Rate	0.5 °/s ≤ rate ≤ 1.5 °/s	1.0 °/s	P
Initial reference angle	≤20 deg	15°	P
Final ref plan angle	Initial ref plane ± 8 deg	22°	P

P = Pass
F= Fail

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VERIFICATION REPORT

Test Name:	**Knee Impact PENDULUM**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:	**Left Knee**	Test Date:	**11/28/2011**
Test Number:	**2**	Test Time:	**2:57:34 PM**

Component Part Number	Component Serial Number
Knee Skin - 880105-508	**1726**
Knee Insert - 880105-511	**1039**

Test Parameters	Test Specifications			Test Results		
Temperature	18.9	--	25.6	**22.1**	deg C	P
Humidity	10.0	--	70.0	**36.0**	%RH	P
Velocity	2.07	--	2.13	**2.09**	m/s	P
Resistive Force	-4060	--	-3450	**-3894**	N	P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID: **Left Knee** Test Time: **2:57:34 PM** Test Date: **11/28/2011**

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VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
DentonATD	**Velocity Trap**	**1**	**1/11/2011**
Endevco	**7264-2000**	**P71267**	**11/2/2011**

Test ID: **Left Knee** Test Time: **2:57:34 PM** Test Date: **11/28/2011**

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Test Name:	**Knee Impact PENDULUM**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:	**Left Knee**	Test Date:	**11/28/2011**
Test Number:	**2**	Test Time:	**2:57:34 PM**

Test ID: **Left Knee** Test Time: **2:57:34 PM** Test Date: **11/28/2011**

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VERIFICATION REPORT

Test Name:	**Knee Impact PENDULUM**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:	**Right Knee**	Test Date:	**11/28/2011**
Test Number:	**2**	Test Time:	**3:05:20 PM**

Component Part Number	Component Serial Number
Knee Skin - 880105-508	**1051**
Knee Insert - 880105-511	**1038**

Test Parameters	Test Specifications			Test Results		
Temperature	18.9	--	25.6	**22.1**	deg C	P
Humidity	10.0	--	70.0	**36.0**	%RH	P
Velocity	2.07	--	2.13	**2.09**	m/s	P
Resistive Force	-4060	--	-3450	**-3775**	N	P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID: **Right Knee** Test Time: **3:05:20 PM** Test Date: **11/28/2011**

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VERIFICATION REPORT

REFERENCE EQUIPMENT

Manufacturer	Model	Serial Number	Calibration Date
DentonATD	**Velocity Trap**	**1**	**1/11/2011**
Endevco	**7264-2000**	**P71267**	**11/2/2011**

Test ID: **Right Knee** Test Time: **3:05:20 PM** Test Date: **11/28/2011**

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Test Name:	**Knee Impact PENDULUM**	Revision:	**7/15/2002**
Sub Test Name:		Spec Type:	**NHTSA**
ATD Type:	**Hybrid III 5'th**		
ATD Serial Number:	**273**		
Test ID:	**Right Knee**	Test Date:	**11/28/2011**
Test Number:	**2**	Test Time:	**3:05:20 PM**