

REPORT NUMBER: NCAP-CAL-11-018

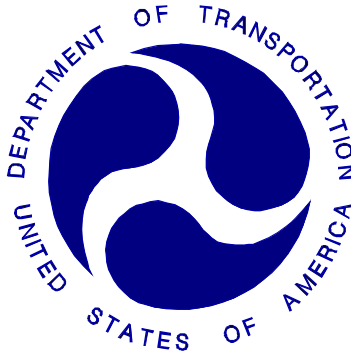
**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

**Chrysler Group LLC
2011 Ram 1500 ST Crew Cab
4 Door Pickup**

NHTSA NUMBER: MB0302

CALSPAN TEST NUMBER: tr2495

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



December 1, 2010

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: _____

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16. Abstract A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2011 Ram 1500 ST Crew Cab 4 Door Pickup 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 10/8/2010. The impact velocity of the vehicle was 56.1 km/h, and the ambient temperature at the barrier face at the time of impact was 20°C. The target vehicle post-test maximum crush was 541 mm of Vehicle. The test vehicle's performance is as follows:																																																																				
<table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Driver ATD</th> <th colspan="3">Pass. ATD</th> </tr> <tr> <th>Units</th> <th>Threshold</th> <th>Result</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>N/A</td> <td>700</td> <td>198.753</td> <td>N/A</td> <td>700</td> <td>444.800</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-32.470</td> <td>mm</td> <td>52</td> <td>-28.590</td> </tr> <tr> <td>Nij</td> <td>n/a</td> <td>1</td> <td>0.29</td> <td>n/a</td> <td>1</td> <td>0.71</td> </tr> <tr> <td>Neck Tension</td> <td>Newtons</td> <td>4170</td> <td>1,673.560</td> <td>Newtons</td> <td>2620</td> <td>1,596.937</td> </tr> <tr> <td>Neck Compression</td> <td>Newtons</td> <td>4000</td> <td>-171.422</td> <td>Newtons</td> <td>2520</td> <td>-417.480</td> </tr> <tr> <td>Left Femur Force</td> <td>Newtons</td> <td>10008</td> <td>5082.310</td> <td>Newtons</td> <td>6805</td> <td>3806.412</td> </tr> <tr> <td>Right Femur Force</td> <td>Newtons</td> <td>10008</td> <td>1515.127</td> <td>Newtons</td> <td>6805</td> <td>2153.627</td> </tr> </tbody> </table>							Measurement Description	Driver ATD			Pass. ATD			Units	Threshold	Result	Units	Threshold	Result	Head Injury Criteria (HIC ₁₅)	N/A	700	198.753	N/A	700	444.800	Maximum Chest Compression	mm	63	-32.470	mm	52	-28.590	Nij	n/a	1	0.29	n/a	1	0.71	Neck Tension	Newtons	4170	1,673.560	Newtons	2620	1,596.937	Neck Compression	Newtons	4000	-171.422	Newtons	2520	-417.480	Left Femur Force	Newtons	10008	5082.310	Newtons	6805	3806.412	Right Femur Force	Newtons	10008	1515.127	Newtons	6805	2153.627
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TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	Purpose and Summary of the Test	1-1
2	Occupant and Vehicle Information / Data Sheets	2-1
<u>Data Sheet No.</u>		<u>Page No.</u>
1	General Test and Vehicle Parameter Data	2-2
2	Seat Adjustment, Fuel System, and Steering Wheel Data	2-6
3	Dummy Longitudinal Clearance Dimensions	2-8
4	Dummy Lateral Clearance Dimensions	2-9
5	Seat Belt Positioning Data	2-10
6	High-Speed Camera Locations and Data	2-11
7	Vehicle Accelerometer Locations	2-13
8	Photographic Reference Target Locations	2-14
9	Load Cell Locations on Fixed Barrier	2-15
10	Test Vehicle Summary of Results	2-16
11	Post-Test Observations	2-17
12	Vehicle Profile Measurements	2-18
13	Accident Investigation Division Data	2-20
14	Vehicle Intrusion Measurements	2-21
15	Summary of FMVSS 212, FMVSS 219 (Partial) Data, and 301 Data	2-24
16	FMVSS 301 Static Rollover Results	2-26
17	Dummy/Vehicle Temperature Stabilization Chart	2-27
<u>Appendix</u>		<u>Page No.</u>
A	Photographs	A-1
B	Dummy Response Data Traces	B-1
C	Dummy Calibration and Performance Verification Data	C-1

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 2011 Ram 1500 ST Crew Cab 4 Door Pickup at a velocity of 56.1 kph. The test was performed at Calspan on 10/8/2010. 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 (ATD), 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 triaxial 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. 061) 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.

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 541 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	T ¹	T ²	Chest Disp. (mm)	Nij	Neck Tension (N)	Neck Comp (N)	Left Femur (N)	Right Femur (N)
Driver (50th)	198.753	74.450	89.450	-32.470	0.29	1,673.560	171,422	5082.310	1515.127
Passenger (5 th)	444.800	67.400	82.400	-28.590	0.71	1,596.937	417,480	3806.412	2153.627

**SECTION 2
DATA SHEETS**

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

Test Vehicle: 2011 Ram 1500 ST Crew Cab NHTSA No: MB0302
 Test Program: Frontal NCAP Test Date: 10/8/2010

TEST VEHICLE INFORMATION

NHTSA No.	MB0302
Make	Ram
Model	1500 ST Crew Cab
Body Style	4 Door Pickup
VIN	1D7RV1CP7BS506641
Color	Brown
Delivery Date	9/22/2010
Odometer Reading (mi)	9
Odometer Reading (km)	14.5
Dealer	Len Stoler
Transmission	5-speed Automatic
Final Drive	All Wheel Drive
Type/No. Cyl	V8
Engine Disp. (L)	4.7
Engine Placement	Transverse
Roof Rack	No
Sunroof/T-Top	No
Tinted Glass	Yes
Traction Control	Yes
Power Brakes	Yes
Front Disc	Yes
Rear Disc	Yes

TEST VEHICLE OPTIONS

Anti-Lock Brakes	Yes
All-Wheel Drive	Yes
Power Steering	Yes
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	No
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	No
Pass. Pelvis Airbag	No
Pass. Knee Airbag	No
Pretensioners	Yes
Load Limiters	No
Automatic Door Locks	No
Tilt Steering	Yes
Other	--

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

DATA FROM CERTIFICATION LABEL

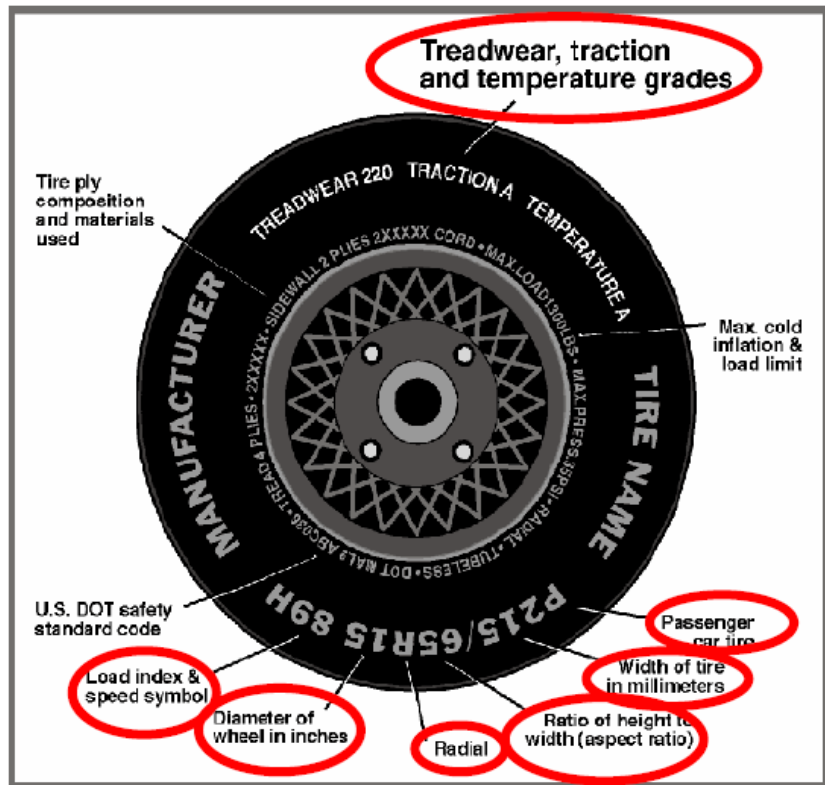
Manufactured By	Chrysler Group LLC	GVWR (kg)	3,085
Date of Manufacture	8/2010	GAWR Front (kg)	1,770
		GAWR Rear (kg)	1,770

VEHICLE SEATING AND WEIGHT CAPACITY

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Split Bench	Bench	NA	
Number of Occupants	3	3	0	6
Capacity Wt. (VCW) (kg)				499
Cargo Wt. (RCLW) (kg)				90.8

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

Test Vehicle: 2011 Ram 1500 ST Crew Cab NHTSA No: MB0302
 Test Program: Frontal NCAP Test Date: 10/8/2010



Measured Parameter	Front	Rear
Maximum Tire Pressure	300	300
Cold Pressure (kPa)	276	276
Recommended Tire Size	P265/70R17	P265/70R17
Tire Size on Vehicle	P65/70R17	P265/70R17
Tire Manufacturer	Goodyear	Goodyear
Tire Model	Wrangler SR-A	Wrangler SR-A
Treadwear	500	500
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2 Polyester Cord	2 Polyester Cord
Tire Plies Body	2 Polyester Cord, 2 Steel Cord	2 Polyester Cord, 2 Steel Cord
Load Index/Speed Symbol	113/R	113/R
Tire Material		
DOT Safety Code Right	4BT6EXWR2810	4BT6EXWR2810
DOT Safety Code Left	4BT6EXWR2810	4BT6EXWR2810

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

Test Vehicle: 2011 Ram 1500 ST Crew Cab NHTSA No: MB0302
 Test Program: Frontal NCAP Test Date: 10/8/2010

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	663	532		742	606	
Right	kg	690	501		719	588	
Ratio	%	57	43		55	45	
Totals	kg	1,353	1,033	2,386	1,461	1,194	2,655

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2,386
Weight of 1 P572E ATD & 1 P572O ATD	kg	140.6
Rated Cargo/Luggage Weight (RCLW)	kg	90.8
Calculated Vehicle Target Weight (TVTW)	kg	2,617

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	926	930	1,009	1,018	1541
As Tested	mm					
Post Test	mm	975	938	1003	976	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	3,561
Total Vehicle Length at Left Side	mm	5,316
Total Vehicle Length at Centerline	mm	5,835
Total Vehicle Length at Right Side	mm	5,309
Weight of Ballast in Cargo Area	kg	291
Weight of Vehicle Components Removed	kg	0
Amount of Stoddard Solvent in Fuel Tank	L	25

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT: None

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

Test Vehicle:	2011 Ram 1500 ST Crew Cab	NHTSA No:	MB0302
Test Program:	Frontal NCAP	Test Date	10/8/2010

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	5835
2	Total Width	2014
3	Bumper Top Height	712
4	Bumper Bottom Height	324
5	Longitudinal Member Top Height	634
6	Distance Between Longitudinal Members	871
7	Longitudinal Member Width	69
8	Engine Top Height	1162
9	Engine Bottom Height	273
10	Engine and Gearbox Width	0
11	Front Bumper-Engine Distance	782
12	Front Shock Absorber Fixing Height	599
13	Bonnet Leading Edge Height	1149
14	Front Shock Absorber Fixing Width	611
15	Front Bumper – Front Axle Distance	1035
16	Front Axle – A Pillar Distance	531
17	A- Pillar – B-Pillar Distance	1115
18	B-Pillar – Rear Axle Distance	1915
19	B-Pillar – C-Pillar Distance	1034
20	Roof Sill Bottom Height	1755
21	Roof Sill Top Height	1820
22	Floor Sill Bottom Height	579
23	Floor Sill Top Height	587

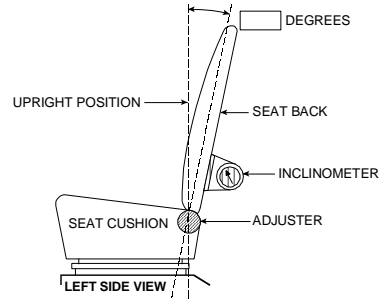
**DATA SHEET NO. 2
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL**

Test Vehicle: 2011 Ram 1500 ST Crew Cab NHTSA No: MB0302
 Test Program: Frontal NCAP Test Date: 10/8/2010

NORMAL DESIGN RIDING POSITION

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-II's dummy



FRONT SEAT ASSEMBLY

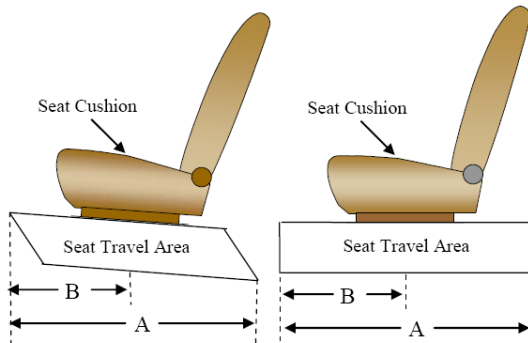
	Deg
Driver Seat Back Angle	4
Passenger Seat Back Angle	1

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.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	240	12
Passenger Seat	240	0



SEAT BELT UPPER ANCHORAGES

Driver upper belt anchorage position was placed at the midpoint of 5 detents.

Passenger upper belt anchorage position was placed at the uppermost position of 5 detents

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

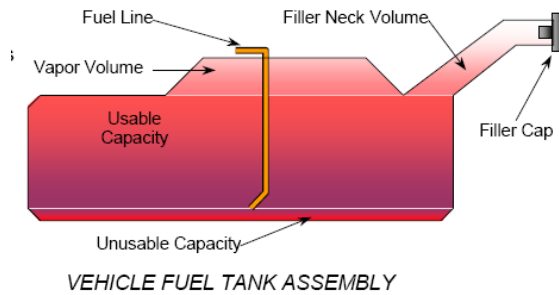
DATA SHEET NO. 2 (CONTINUED)
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle:	2011 Ram 1500 ST Crew Cab	NHTSA No:	MB0302
Test Program:	Frontal NCAP	Test Date	10/8/2010

FUEL TANK CAPACITY

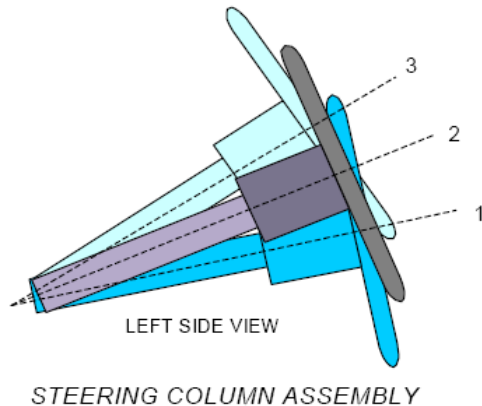
	Liters
Usable Capacity of "Standard Tank"	98.4
Usable Capacity of "Optional Tank"	121.1
92%-94% of Usable Capacity	90.5 - 92.5
Actual Amount of Solvent Used	94.6
1/3 of Usable Capacity	32.8

Fuel evacuated according to the specifications provided by the manufacturer in Form 1



STEERING COLUMN ADJUSTMENT

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

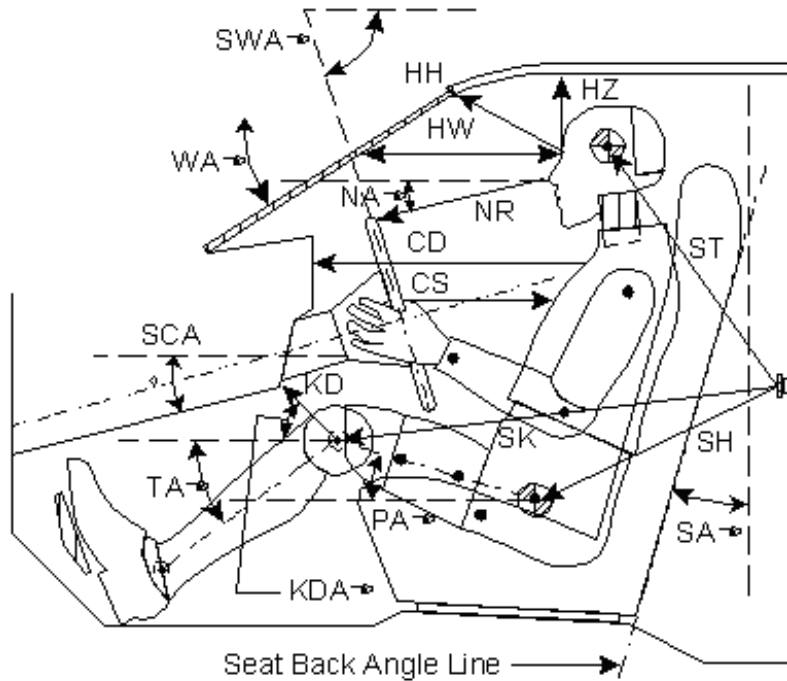


STEERING COLUMN POSITIONS

	Degrees	Fore/Aft Position (mm)
Lowermost position No. 1		
Geometric center position No. 2	66	
Uppermost position No. 3		
Telescoping Steering Wheel Travel		NA
Test Position	66	NA

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

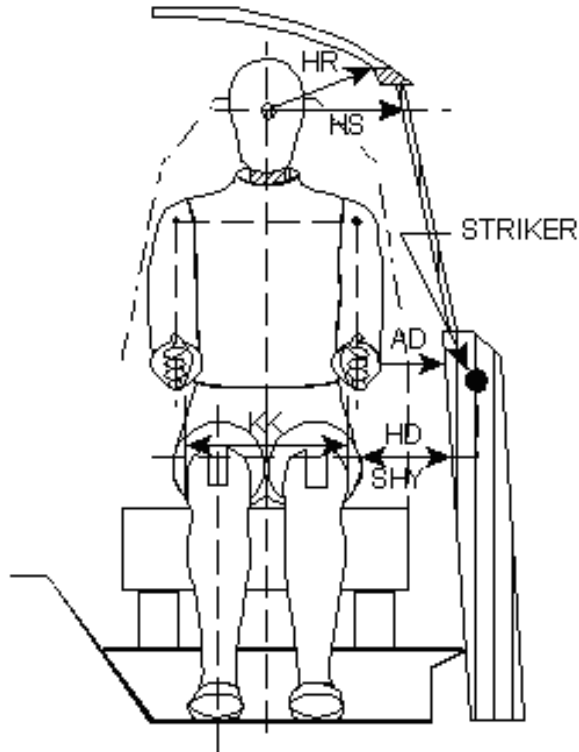
Test Vehicle:	2011 Ram 1500 ST Crew Cab	NHTSA No:	MB0302
Test Program:	Frontal NCAP	Test Date	10/8/2010



Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle(°)	Length (mm)	Angle (°)
WA°	Windshield Angle		32		
SWA°	Steering Wheel Angle		66		
SCA°	Steering Column Angle		26		
SA°	Seat Back Angle (on headrest post)		4		2
HZ	Head to Roof (Z)	276	90	265	90
HH	Head to Header	475	20	380	39
HW	Head to Windshield	748	0	715	0
NR	Nose to Rim	418	-9	504	-17
CD	Chest to Dash	599		493	
CS	Chest to Steering Hub	320	0		
RA	Rim to Abdomen	214	0		
KDL	Left Knee to Dash	130	14	11	30
KDR	Right Knee to Dash	116		17	32
PA°	Pelvic Angle		22		20
TA°	Tibia Angle		61		64
SK	Striker to Knee	106	90	79	90
ST	Striker to Head	-638	90	583	90
SH	Striker to H-Point	18	90	24	90

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

Test Vehicle:	2011 Ram 1500 ST Crew Cab	NHTSA No:	MB0302
Test Program:	Frontal NCAP	Test Date	10/8/2010

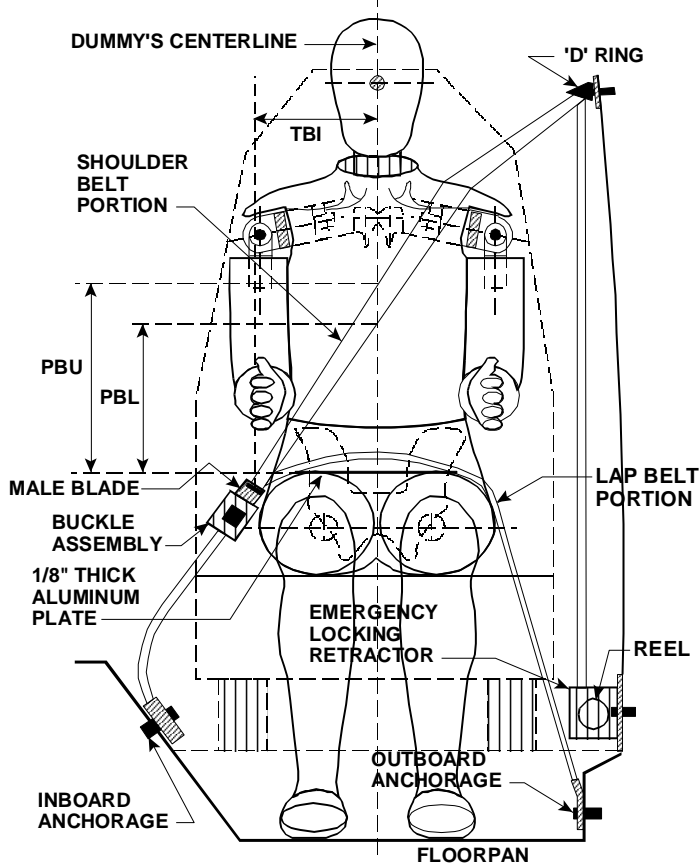


Code	Description	Driver	Passenger
AD	Arm to Door	147	52
HD	H-Point to Door	138	158
HR	Head to Side Header	235	267
HS	Head to Side Window	138	158
KK	Knee to Knee	277	221
SHY	Striker to H-Point (Y Direction)	240	246
AA	Ankle to Ankle	230	192

**DATA SHEET NO. 5
SEAT BELT POSITIONING DATA**

Test Vehicle:	<u>2011 Ram 1500 ST Crew Cab</u>	NHTSA No:	<u>MB0302</u>
Test Program:	<u>Frontal NCAP</u>	Test Date:	<u>10/8/2010</u>

SEAT BELT POSITIONING DATA



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU — Top surface of aluminum plate to belt upper edge	mm	388	338
PBL — Top surface of aluminum plate to belt lower edge	mm	329	269

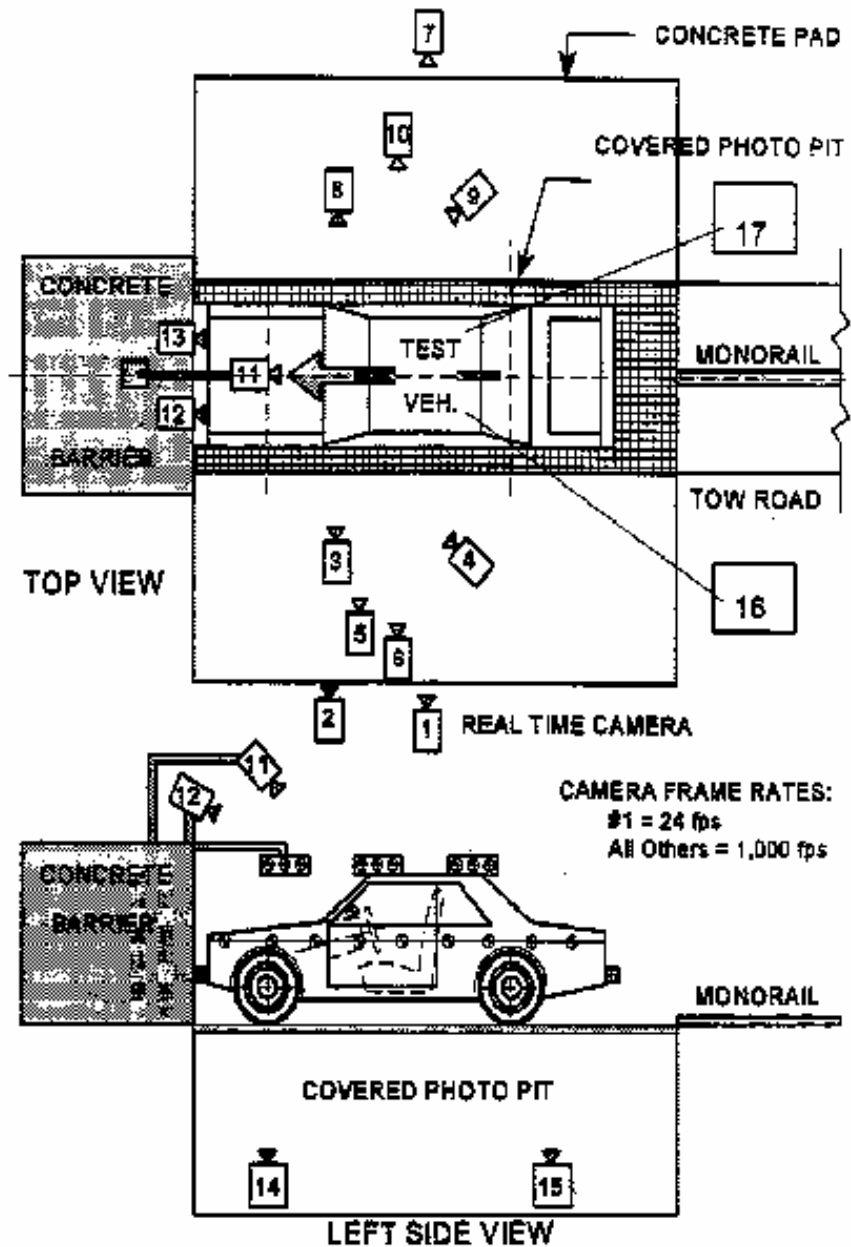
BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	810	870
Lap Belt Length as measured on ATD	mm	930	910
Remainder of belt on reel	mm	0	0
Total belt length for continuous webbing systems	mm	1740	1780

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

Test Vehicle:	2011 Ram 1500 ST Crew Cab	NHTSA No:	MB0302
Test Program:	Frontal NCAP	Test Date	10/8/2010

CAMERA POSITIONS FOR FRONTAL IMPACTS



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

Test Vehicle: 2011 Ram 1500 ST Crew Cab NHTSA No: MB0302
 Test Program: Frontal NCAP Test Date: 10/8/2010

CAMERA LOCATIONS

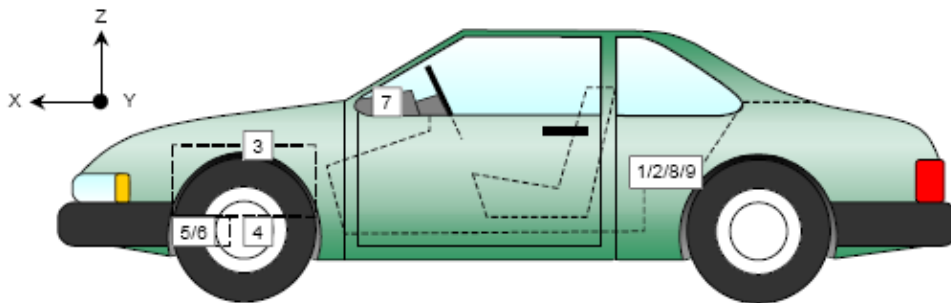
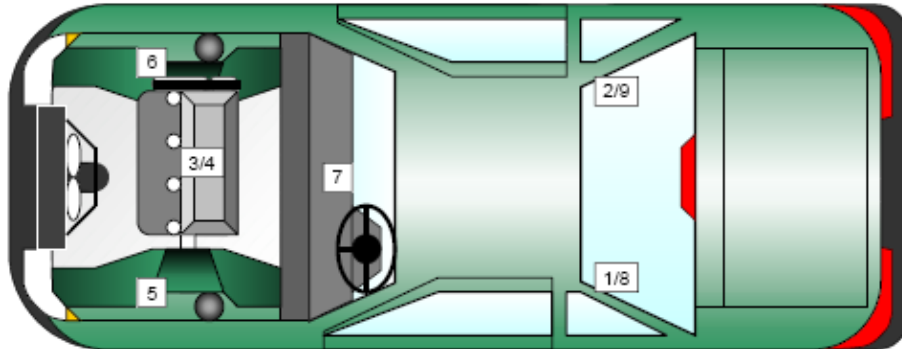
No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Camera				-	24
2	Driver Left Side View	1680	1760	1120	50	1000
3	Left Side View	850	790	940	50	1000
4	Overall Right Side	750	3730	1890	50	1000
5	Steering Column (Bottom)	710	1955	1205	28 - 70	1000
6	Steering Column (Top)	710	1955	1825	24 - 70	1000
7	Driver and Interior View	550	3730	1890	50	1000
8	Right Side View	1200	1270	940	50	1000
9	Right Passenger View	370	1910	1170	50	1000
10	Pass. And Interior View	240	3870	1790	50	1000
11	Passenger Front View	620	-92	1987	25	500
12	Driver Front View	620	-92	1987	25	500
13	Windshield View	0	-530	3374	25	500
14	Pit View of Engine	0	615	-3048	12.5	1000
15	Pit View of Fuel Tank	0		-3048	12.5	1000
16	Onboard Driver Side (Optional)	N/A	N/A	N/A	N/A	N/A
17	Onboard Passenger Side (Optional)	N/A	N/A	N/A	N/A	N/A

* COORDINATES:

- +X = forward of impact plane
- +Y = right of monorail center
- +Z = into ground

**DATA SHEET NO. 7
VEHICLE ACCELEROMETER DATA**

Test Vehicle: 2011 Ram 1500 ST Crew Cab NHTSA No: MB0302
 Test Program: Frontal NCAP Test Date: 10/8/2010



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear X-Member X	2634	-743	635
2	Right Rear X-Member X	4794	548	751
3	Engine Top X	5053	-36.36	1049
4	Engine Bottom X	NA	NA	NA
5	Left Brake Caliper X	4839	-571	752
6	Right Brake Caliper X	4840	577	750
7	Instrument Panel X	-	-	-
8	Left Rear X-Member Z	2634	-743	635
9	Right Rear X-Member Z	4794	548	751

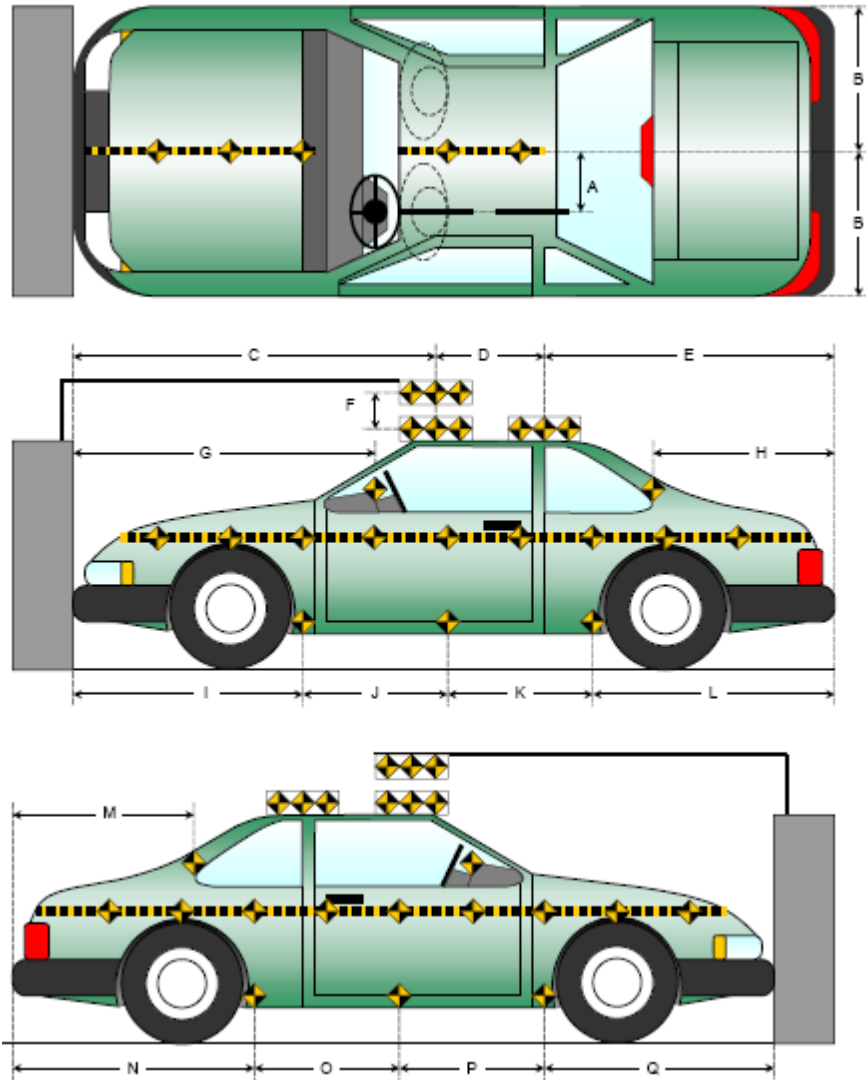
Reference Points: X – Rear Surface of Vehicle (+ forward)
 Y – Vehicle Centerline (+ to right)
 Z – Ground Plane (+ down)

**DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS**

Test Vehicle: 2011 Ram 1500 ST Crew Cab NHTSA No: MB0302
 Test Program: Frontal NCAP Test Date: 10/8/2010

Item	Value
A	482
B	1012
C	3275
D	483
E	2076
F	NA
G	2085
H	3302
I	1720
J	1239
K	3013
L	3302
M	2113
N	3314
O	1228
P	1229
Q	1719

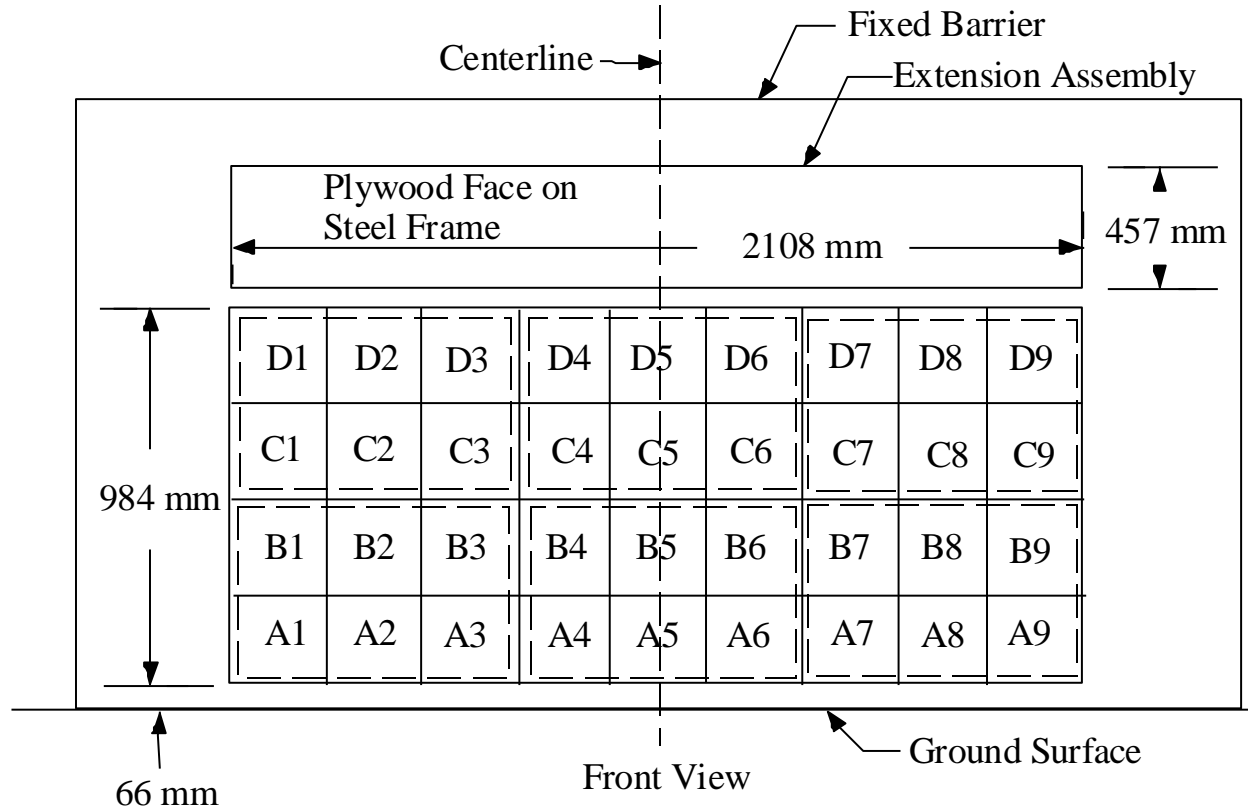
All units in millimeters



**DATA SHEET NO. 9
LOAD CELL LOCATIONS ON FIXED BARRIER**

Test Vehicle: 2011 Ram 1500 ST Crew Cab NHTSA No: MB0302
 Test Program: Frontal NCAP Test Date: 10/8/2010

36 Load Cells
 4 Rows
 9 Columns



DATA SHEET NO. 10
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2011 Ram 1500 ST Crew Cab NHTSA No: MB0302
Test Program: Frontal NCAP Test Date: 10/8/2010

INSTRUMENTATION

Driver Dummy Channels	42
Passenger Dummy Channels	42
Belt load cells	4
Vehicle Structure Accelerometers	8
Barrier load cells	36
Total	132

CAMERA COVERAGE

High-Speed Vehicle Onboard	0
High-Speed Offboard	14
Real-Time Panning	1
Total	15

**DATA SHEET NO. 11
POST TEST OBSERVATIONS**

Test Vehicle: 2011 Ram 1500 ST Crew Cab NHTSA No: MB0302
 Test Program: Frontal NCAP Test Date: 10/8/2010

TEST DUMMY INFORMATION AND CONTACT

Description	Driver	Passenger
Dummy Type/Serial No.	061	273
Head Contact	Frontal Airbag	Frontal Airbag
Upper Torso Contact	Frontal Airbag	Frontal Airbag
Lower Torso Contact	Frontal Airbag	Frontal Airbag
Left Knee Contact	Lower Dash Panel	Glove Box Door Panel
Right Knee Contact	Lower Dash Panel	Glove Box Door Panel

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked/Unlocked Doors	Unlocked	Unlocked
Front Door Opening	Closed & Operational	Closed & Operational
Rear Door Opening	Closed & Operational	Closed & Operational
Seat Track Shift (mm)	NA	73
Seat Back Failure	None	None
Glazing Damage	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

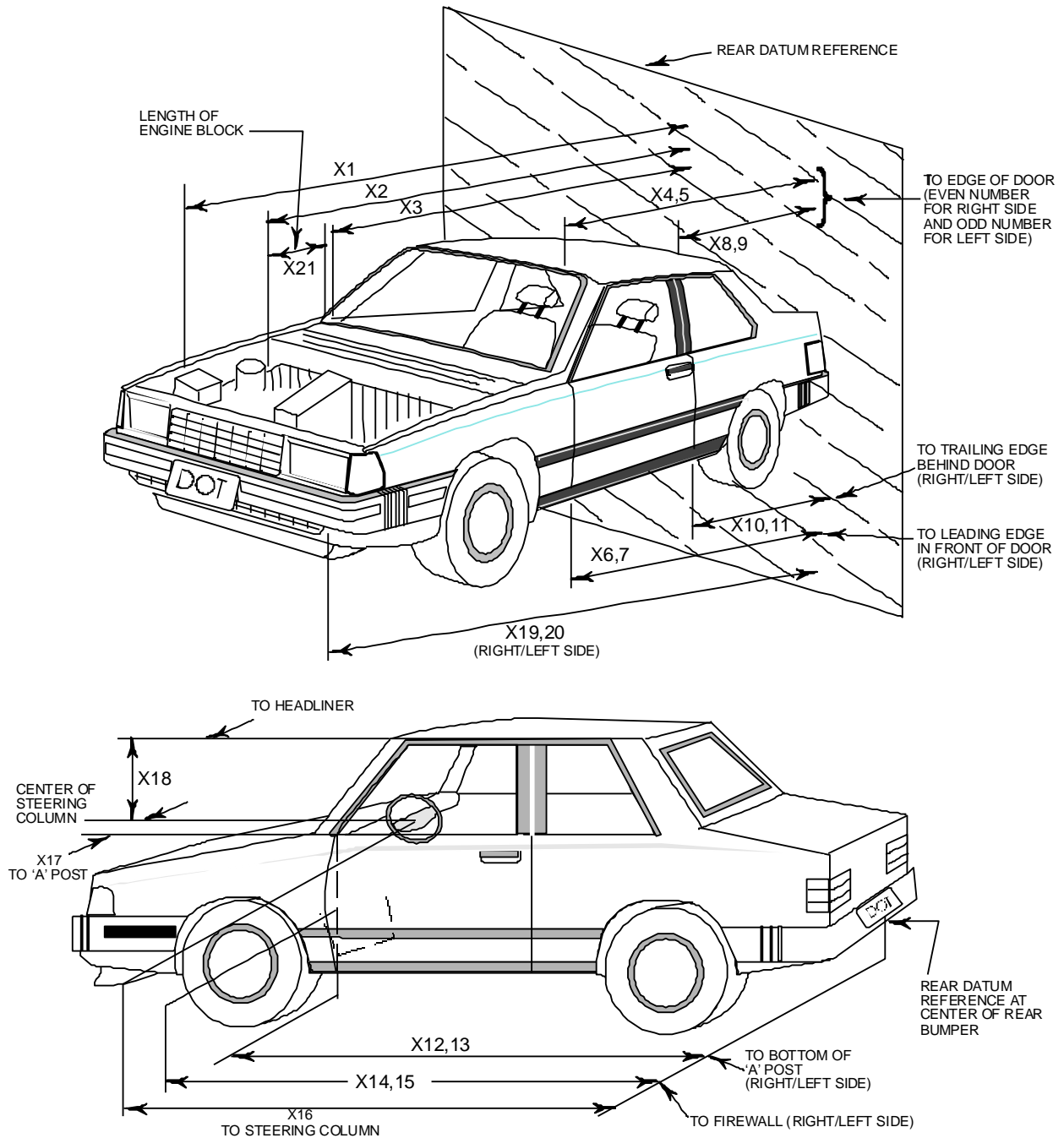
Measured Parameter	Units	Value
Left Side	mm	342
Center	mm	339
Right Side	mm	343
Average	mm	341

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Driver (Occupant 1)		Passenger (Occupant 2)	
	Installed	Operated	Installed	Operated
Front Airbag	Yes	Yes	Dash	Yes
Knee Airbag	No	NA	No	NA
Curtain Side Airbag	Yes	No	Yes	No
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	No	NA	No	NA

**DATA SHEET NO. 12
VEHICLE PROFILE MEASUREMENTS**

Test Vehicle:	<u>2011 Ram 1500 ST Crew Cab</u>	NHTSA No:	<u>MB0302</u>
Test Program:	<u>Frontal NCAP</u>	Test Date	<u>10/8/2010</u>



**DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2011 Ram 1500 ST Crew Cab NHTSA No: MB0302
 Test Program: Frontal NCAP Test Date: 10/8/2010

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	5835	5294	-541
2	Rear Surface of Vehicle (RSOV) to Front of Engine	5053	4923	-130
3	RSOV to Firewall	4674	4656	-17
4	RSOV to Upper Leading Edge of Right Door	4269	4247	-22
5	RSOV to Upper Leading Edge of Left Door	4208	4198	-10
6	RSOV to Lower Leading Edge of Right Door	3138	3115	-23
7	RSOV to Lower Leading Edge of Left Door	3124	3114	-10
8	RSOV to Upper Trailing Edge of Right Door	4243	4230	-13
9	RSOV to Upper Trailing Edge of Left Door	3143	3109	-34
10	RSOV to Lower Trailing Edge of Right Door	3124	3114	-10
11	RSOV to Lower Trailing Edge of Left Door	3126	3103	-23
12	RSOV to Bottom of "A" Post of Right Side	4243	4230	-13
13	RSOV to Bottom of "A" Post of Left Side	4257	4222	-36
14	RSOV to Firewall, Right Side	4658	4636	-22
15	RSOV to Firewall, Left Side	4665	4622	-42
16	RSOV to Steering Column	3750	3728	-22
17	Center of Steering Column to "A" Post	256	268	12
18	Center of Steering Column to Headliner	474	494	20
19	RSOV to Right Side of Front Bumper	5309	5005	-303
20	RSOV to Left Side of Front Bumper	5316	5043	-273
21	Length of Engine Block	318	271	-47
RD	RSOV to Right Side of Dash Panel	3963	3951	-12
CD	RSOV to Center of Dash Panel	3952	3932	-20
LD	RSOV to Left Side of Dash Panel	3971	3942	-29

All Dimensions in mm

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

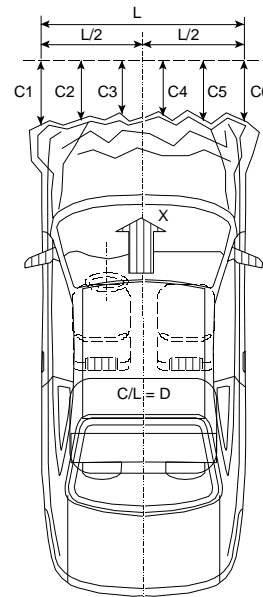
Test Vehicle: 2011 Ram 1500 ST Crew Cab NHTSA No: MB0302
 Test Program: Frontal NCAP Test Date: 10/8/2010

VEHICLE INFORMATION

VIN 1D7RV1CP7BS506641 Wheelbase (mm) 3561
 Vehicle Size Category 4 Door Pickup Test Weight (kg) 2655

ACCELEROMETER DATA

Accelerometer Locations: As Described in Data Sheet No. 7
 Cal. Procedure/Interval: Calspan Procedure / 6 month
 Integration Algorithm: Trapezoidal Linearity: >99%
 Impact Velocity (km/h): 56.1
 Velocity Change (km/h): 63.5
 Time of Separation (msec): 280



CRUSH PROFILE

Collision Deformation Classification: 12FDEW
 Midpoint of Damage: Vehicle Centerline
 Damage Region Length (mm): 1472
 Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	9025	8561	-464
C2	Crush zone 2 at left side	mm	9106	8602	-504
C3	Crush zone 3 at left side	mm	9134	8599	-535
C4	Crush zone 4 at right side	mm	9134	8600	-534
C5	Crush zone 5 at right side	mm	9104	8587	-517
C6	Crush zone 6 at right side	mm	9021	8545	-477
L	C1 to C6	mm	1472	1433	-39

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

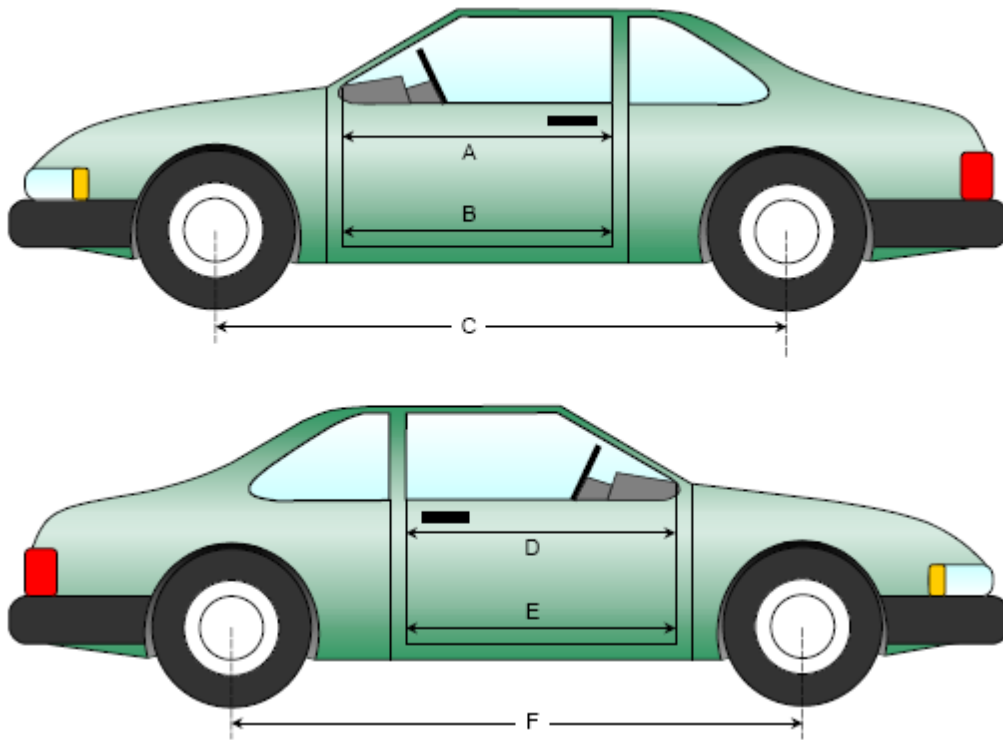
Test Vehicle: 2011 Ram 1500 ST Crew Cab NHTSA No: MB0302
 Test Program: Frontal NCAP Test Date: 10/8/2010

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	993	990	-3
B	Left Side Lower	mm	969	966	-3
D	Right Side Upper	mm	1009	1009	0
E	Right Side Lower	mm	913	912	-1

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3561	3530	-31
F	Right Side Wheelbase	mm	3571	3553	-19



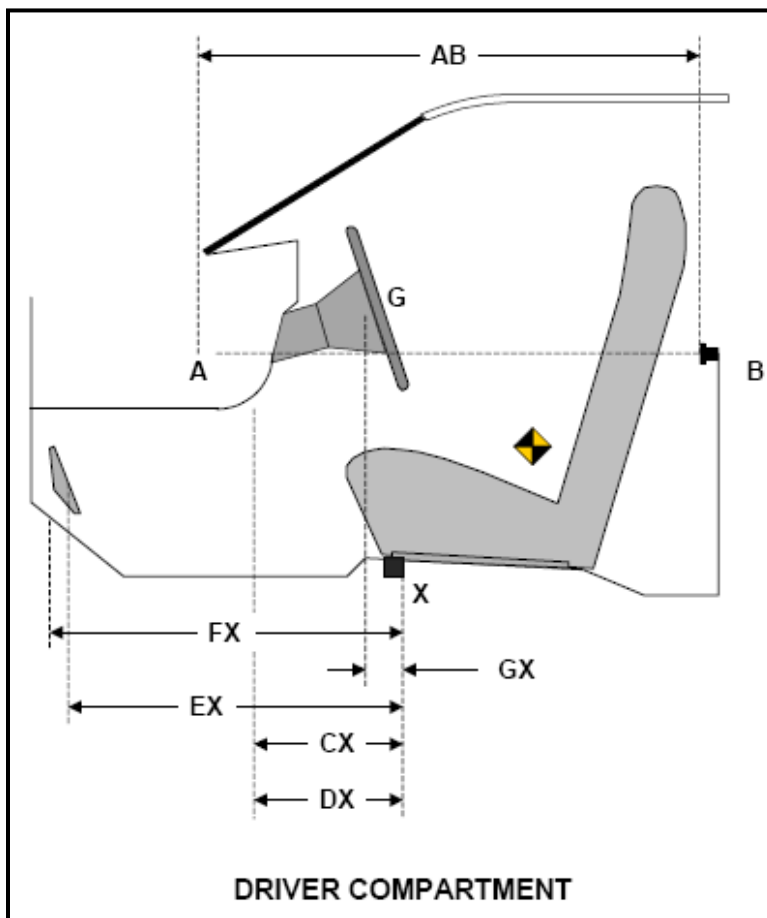
DATA SHEET NO.14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Ram 1500 ST Crew Cab NHTSA No: MB0302
 Test Program: Frontal NCAP Test Date: 10/8/2010

DRIVER COMPARTMENT INTRUSION

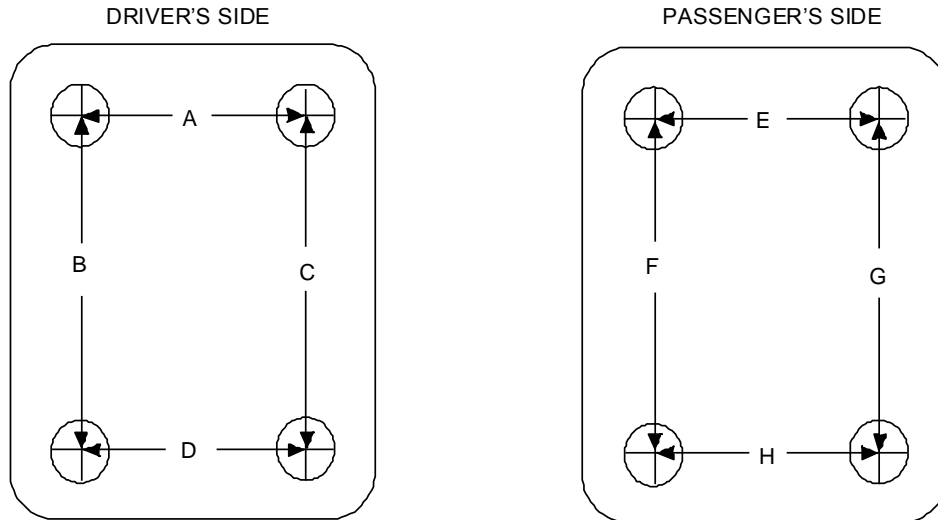
Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	819	813	-6
CX	Left Knee Bolster to X	mm	783	801	18
DX	Right Knee Bolster to X	mm	758	774	16
EX	Brake Pedal to X	mm	1013	1020	6
FX	Foot Rest to X	mm	NA	NA	NA
GX	Center of Steering Column Wheel Hub to X	mm	552	559	7

X = Driver Striker Bolt Top



**DATA SHEET NO.14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS**

Test Vehicle: 2011 Ram 1500 ST Crew Cab NHTSA No: MB0302
 Test Program: Frontal NCAP Test Date: 10/8/2010



TOP VIEW THROUGH FLOOR PAN

UNDERBODY FLOORBOARD DEFORMATION

Measurement	Pre-Test	Post-Test	Difference
A	455	452	-3
B	399	403	4
C	379	373	-7
D	NA	495	NA
E	449	452	2
F	199	205	6
G	204	199	-6
H	491	494	3

All units in millimeters

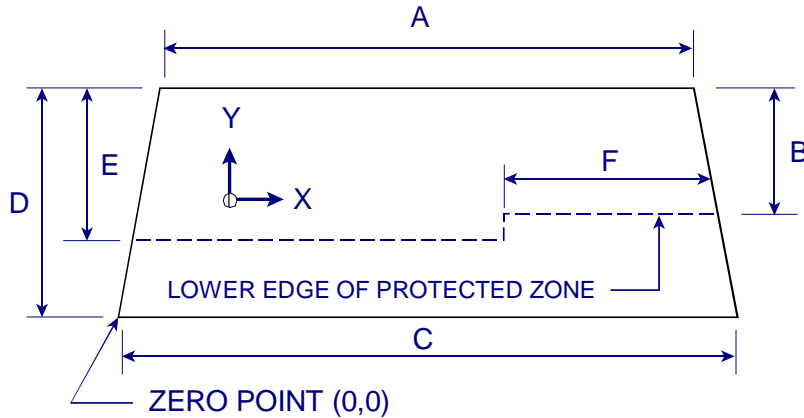
DATA SHEET NO. 15
SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2011 Ram 1500 ST Crew Cab NHTSA No: MB0302
 Test Program: Frontal NCAP Test Date: 10/8/2010

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	2270	2270	100%
Right Side	2270	2270	100%
Total	4539	4539	100%



Item	Units	Value
A	mm	1395
B	mm	430
C	mm	1636
D	mm	754
E	mm	498
F	mm	610

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:	<u>2011 Ram 1500 ST Crew Cab</u>	NHTSA No:	<u>MB0302</u>
Test Program:	<u>Frontal NCAP</u>	Test Date	<u>10/8/2010</u>

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

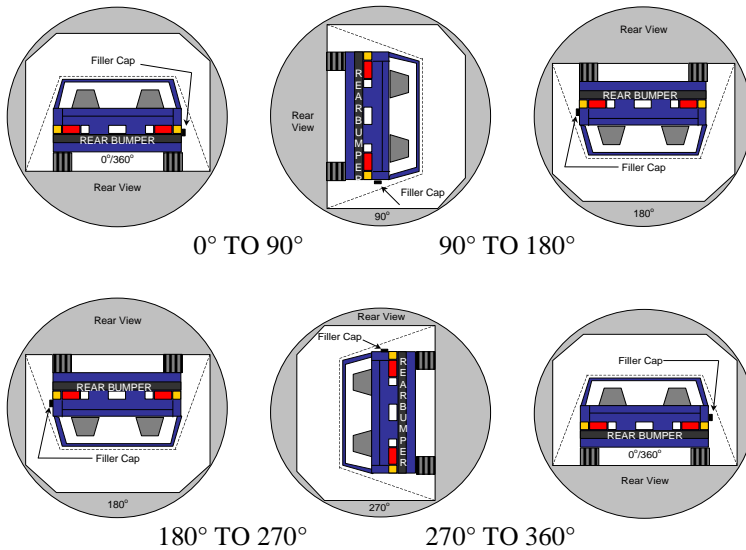
Temperature at Time of Impact: 23° C Test Time: 3:00pm

Stoddard Solvent Spillage Measurements

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

**DATA SHEET NO. 16
FMVSS 301 STATIC ROLLOVER RESULTS**

Test Vehicle: 2011 Ram 1500 ST Crew Cab NHTSA No: MB0302
 Test Program: Frontal NCAP Test Date: 10/8/2010



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).
2. Details of Stoddard Solvent spillage: None

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	1:10	5:00	6:10
90° to 180°	1:11	5:00	6:11
180° to 270°	1:09	5:00	6:09
270° to 360°	1:12	5:00	6:12

FMVSS 301 SPILLAGE TABLE

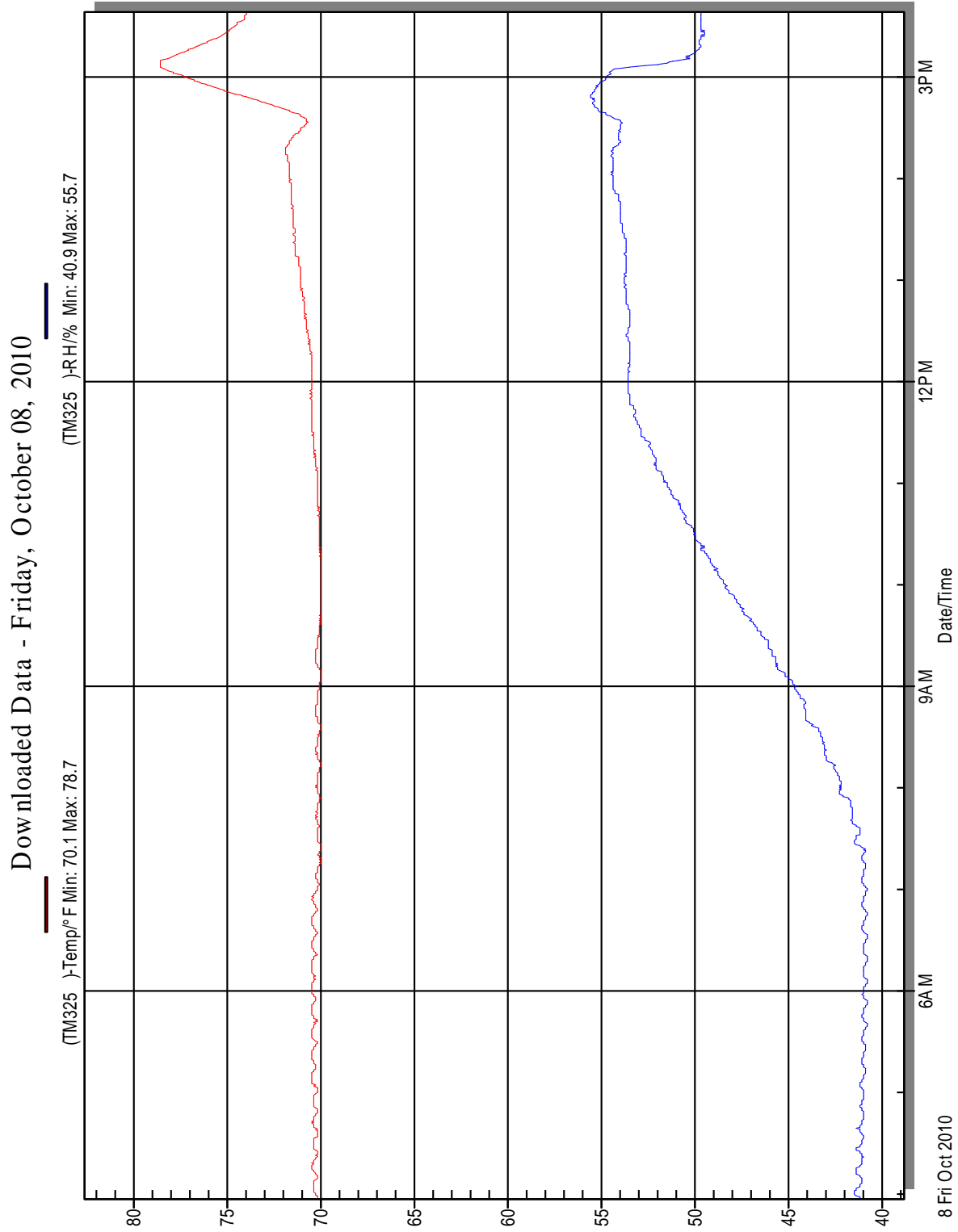
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° to 90°	0	NA	NA	NA
90° to 180°	0	NA	NA	NA
180° to 270°	0	NA	NA	NA
270° to 360°	0	NA	NA	NA

SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 17
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2011 Ram 1500 ST Crew Cab NHTSA No: MB0302
Test Program: Frontal NCAP Test Date: 10/8/2010



**APPENDIX A
PHOTOGRAPHS**

TABLE OF PHOTOGRAPHS		
No.		Page
1	Load Cell Location	A-5
2	Load Cell Wall	A-5
3	Manufacturer's Label	A-6
4	Tire Placard	A-6
5	Right Front $\frac{3}{4}$ View, as Received	A-7
6	Left Rear $\frac{3}{4}$ View, as Received	A-7
7	Pre-test Front View of Test Vehicle	A-8
8	Post-test Front View of Test Vehicle	A-8
9	Pre-test Left View of Test Vehicle	A-9
10	Post-test Left View of Test Vehicle	A-9
11	Pre-test Right View of Test Vehicle	A-10
12	Post-test Right View of Test Vehicle	A-10
13	Pre-test Right Front $\frac{3}{4}$ View	A-11
14	Post-test Right Front $\frac{3}{4}$ View	A-11
15	Pre-test Left Rear $\frac{3}{4}$ View	A-12
16	Post-test Left Rear $\frac{3}{4}$ View	A-12
17	Pre-test Windshield View	A-13
18	Pre-test Windshield View	A-13
19	Pre-test Engine Compartment View	A-14
20	Post-test Engine Compartment View	A-14
21	Pre-test Fuel Filler Cap View	A-15
22	Post-test Fuel Filler Cap View	A-15
23	Pre-test Front Underbody View	A-16
24	Post-test Front Underbody View	A-16
25	Pre-test Rear Underbody View	A-17
26	Post-test Rear Underbody View	A-17
27	Pre-test Dummy Cable Routing	A-18
28	Post-test Dummy Cable Routing	A-18
29	Pre-test Driver Dummy Front View	A-19
30	Post-test Driver Dummy Front View	A-19

31	Pre-test Driver Dummy Window View	A-20
32	Post-test Driver Dummy Window View	A-20
33	Pre-test Driver Dummy and Vehicle Interior View	A-21
34	Post-test Driver Dummy and Vehicle Interior View	A-21
35	Pre-test Driver's Seat Fore-Aft Markings	A-22
36	Post-test Driver's Seat Fore-Aft Markings	A-22
37	Pre-test Driver Dummy Feet	A-23
38	Post-test Driver Dummy Feet	A-23
39	Pre-test Driver's Side Knee Bolster	A-24
40	Post-test Driver's Side Knee Bolster	A-24
41	Pre-test Driver's Side Floorpan	A-25
42	Post-test Driver's Side Floorpan	A-25
43a	Post-test Driver Dummy Contact With Airbag	A-26
43b	Post-Test Driver Dummy Contact With Head Restraint	A-26
44	Pre-test View of the Steering Column Shear Capsule	A-27
45	Post-test View of the Steering Column Shear Capsule	A-27
46	Pre-test Passenger Dummy Front View	A-28
47	Post-test Passenger Dummy Front View	A-28
48	Pre-test Passenger Dummy Window View	A-29
49	Post-test Passenger Dummy Window View	A-29
50	Pre-test Passenger Dummy and Vehicle Interior View	A-30
51	Post-test Passenger Dummy and Vehicle Interior View	A-30
52	Pre-test Passenger's Seat Fore-Aft Markings	A-31
53	Post-test Passenger's Seat Fore-Aft Markings	A-31
54	Pre-test Passenger Dummy Feet	A-32
55	Post-test Passenger Dummy Feet	A-32
56	Pre-test Passenger's Side Knee Bolster	A-33
57	Post-test Passenger's Side Knee Bolster	A-33
58	Pre-test Passenger's Side Floorpan	A-34
59	Post-test Passenger's Side Floorpan	A-34
60a	Post-test Passenger Dummy Contact With Airbag	A-35
60b	Post-test Passenger Dummy Contact with Head Restraint	A-35
61	Photograph of ballast installed in vehicle	A-36

62	Post-test Stoddard solvent spillage location view, if required	A-36
63	Post-test Speed Trap Read-out	A-37
64	Vehicle at 0° on Static Rollover Device	A-37
65	Vehicle at 90° on Static Rollover Device	A-38
66	Vehicle at 180° on Static Rollover Device	A-38
67	Vehicle at 270° on Static Rollover Device	A-39
68	Vehicle at 360° on Static Rollover Device	A-39
69	Impact Photograph (video still)	A-40
70	Monronev Label Photograph	A-40

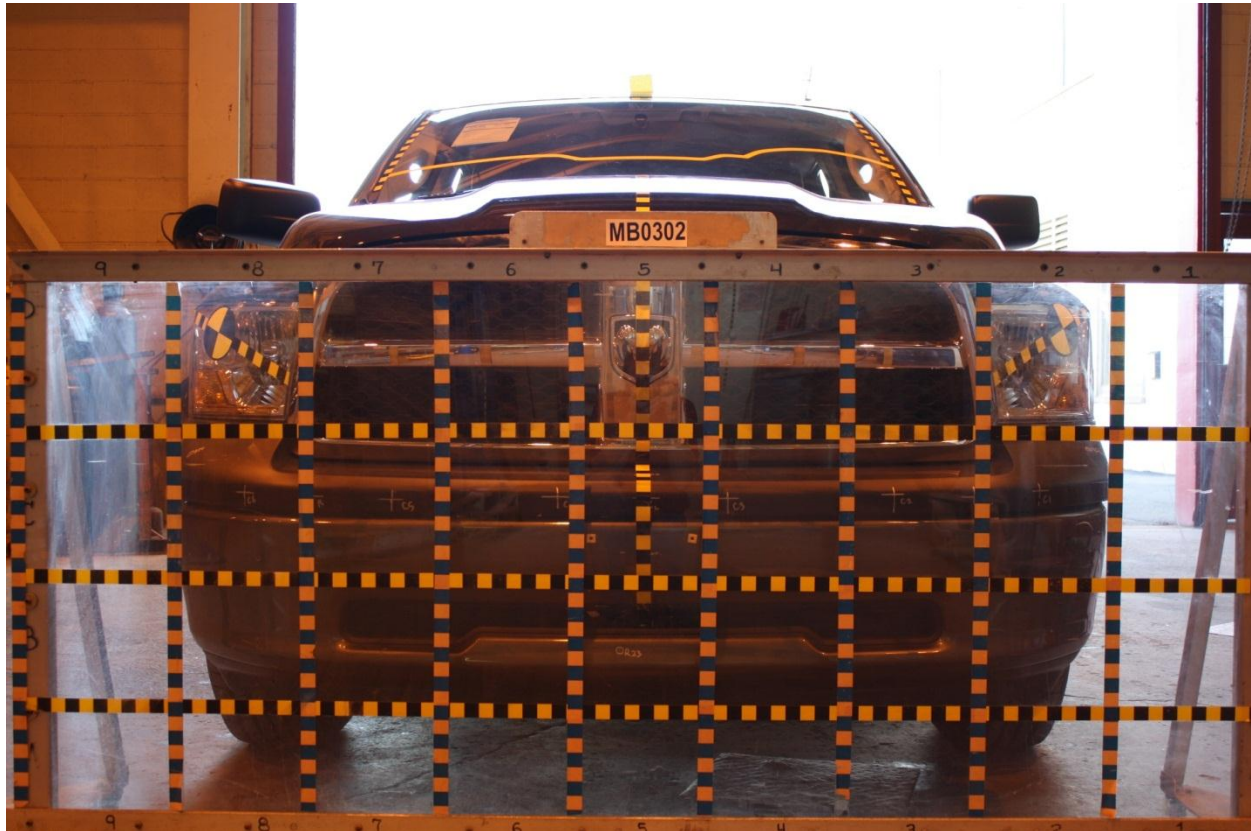


Figure A-1: Load Cell Location



Figure A-2: Load Cell Wall



Figure A-3: Manufacturer 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 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 3/4 View



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



Figure A-15: Pre-Test Left Rear $\frac{3}{4}$ View



Figure A-16: Post-Test Left Rear $\frac{3}{4}$ View



Figure A-17: Pre-Test Windshield View



Figure A-18: Post-Test Windshield View



Figure A-19: Pre-Test Engine Compartment View

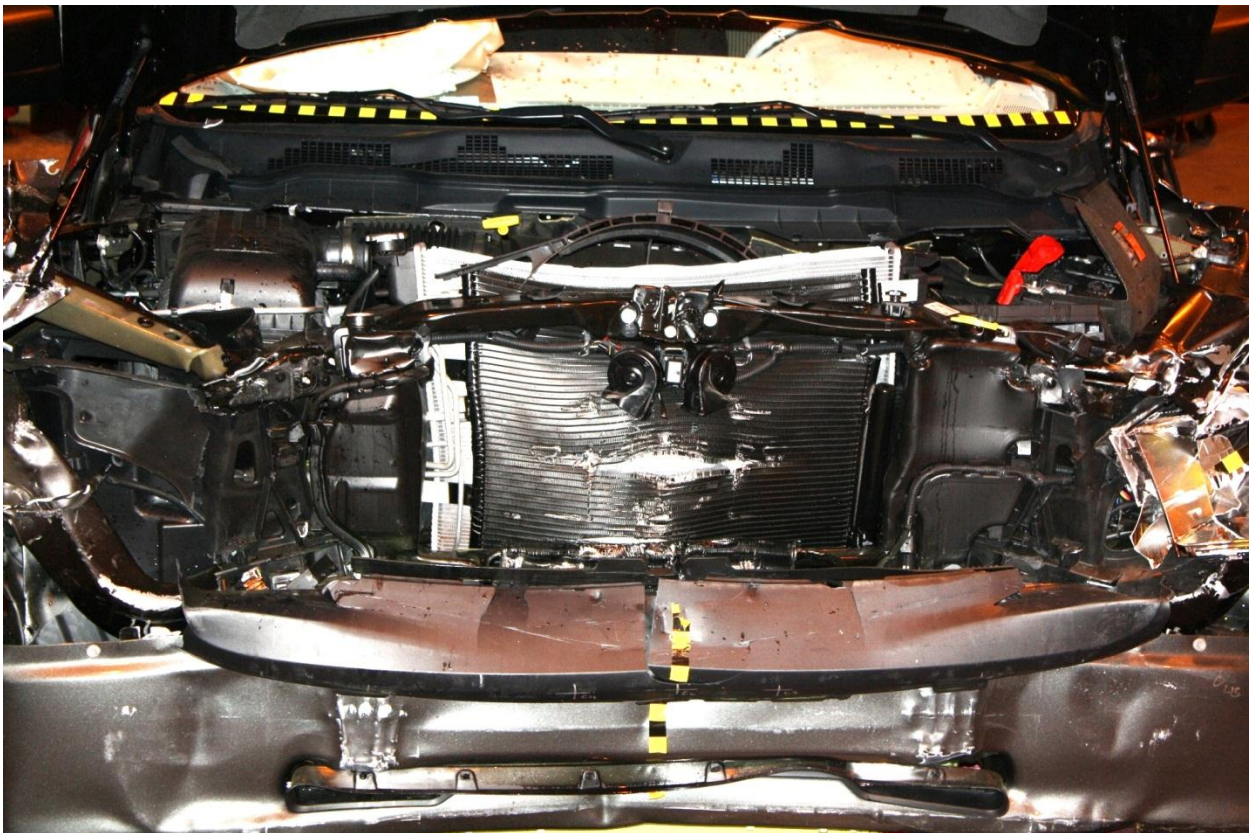


Figure A-20: Post-Test Engine Compartment View



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



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

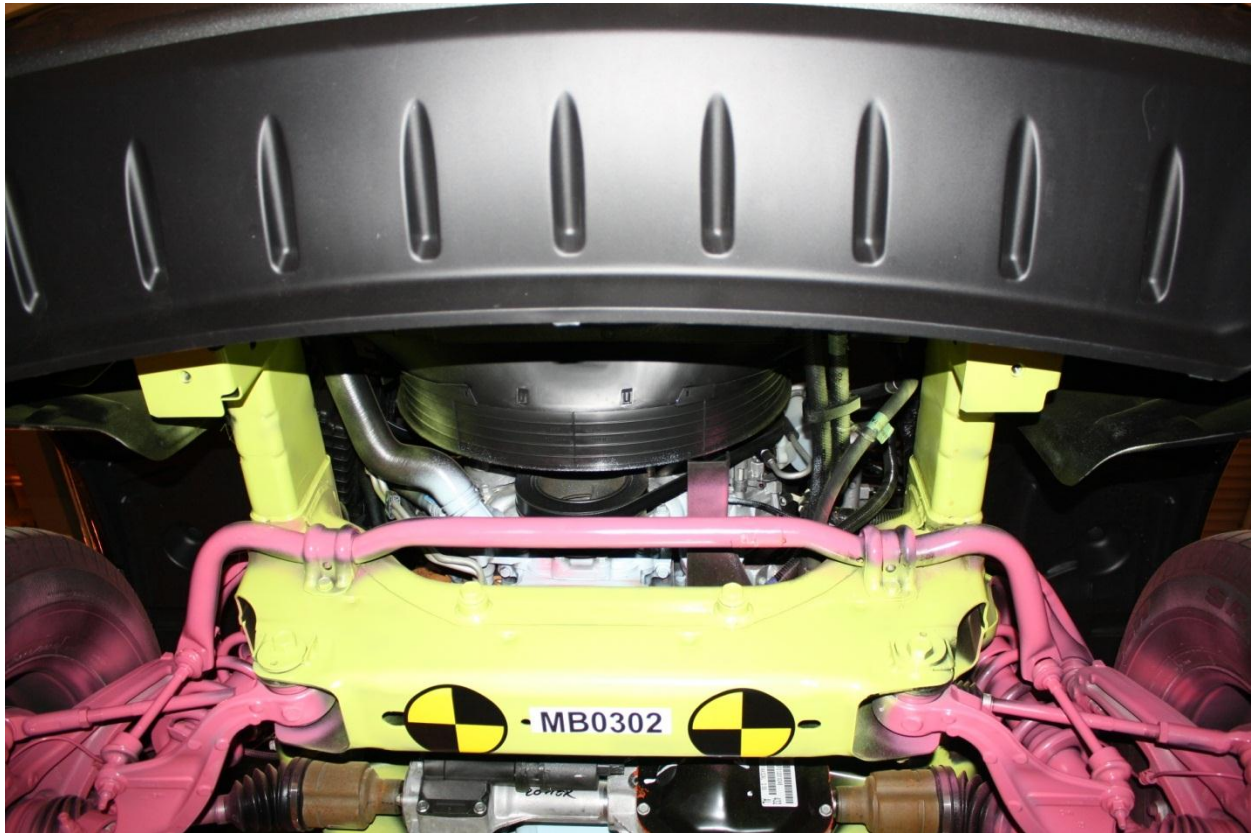


Figure A-23: Pre-Test Front Underbody View



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

Photo Not Available

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



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

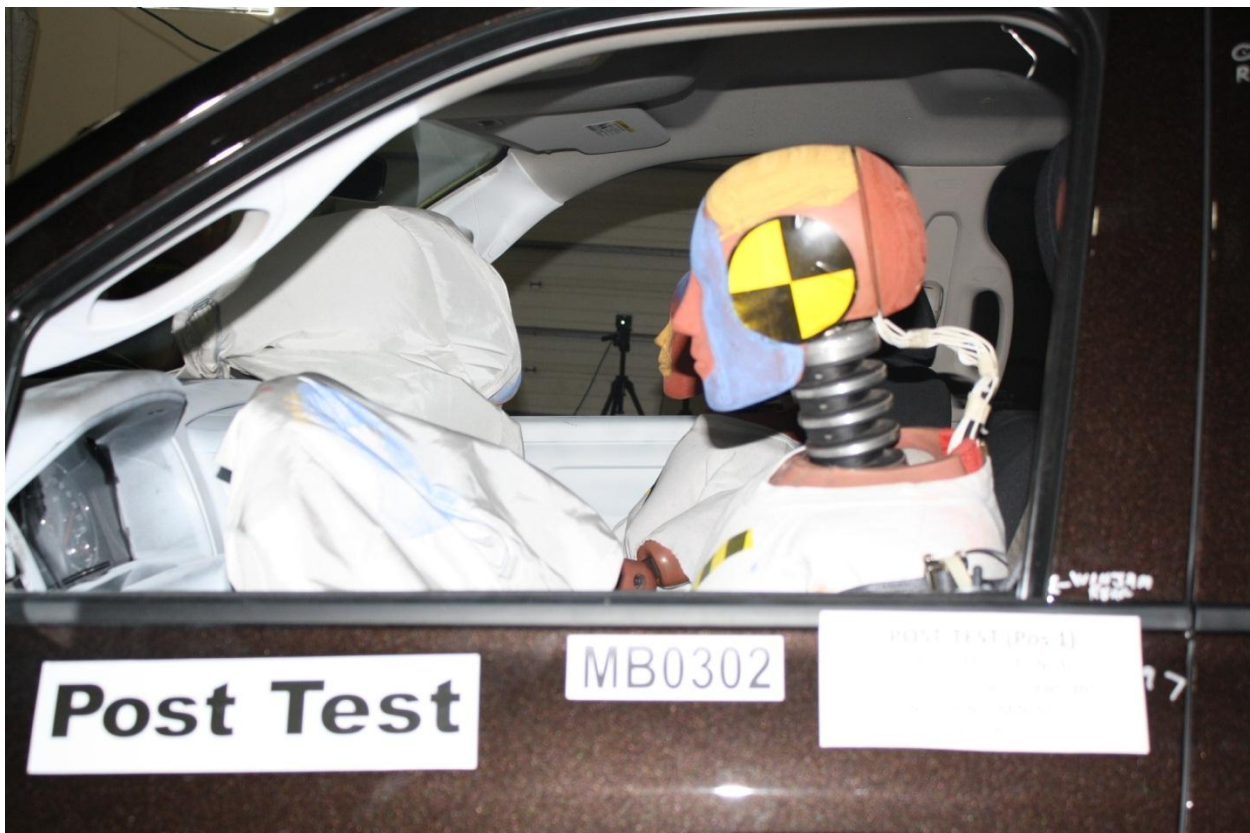


Figure A-32: Post-Test Driver Dummy Window View



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

Photo Not Available

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

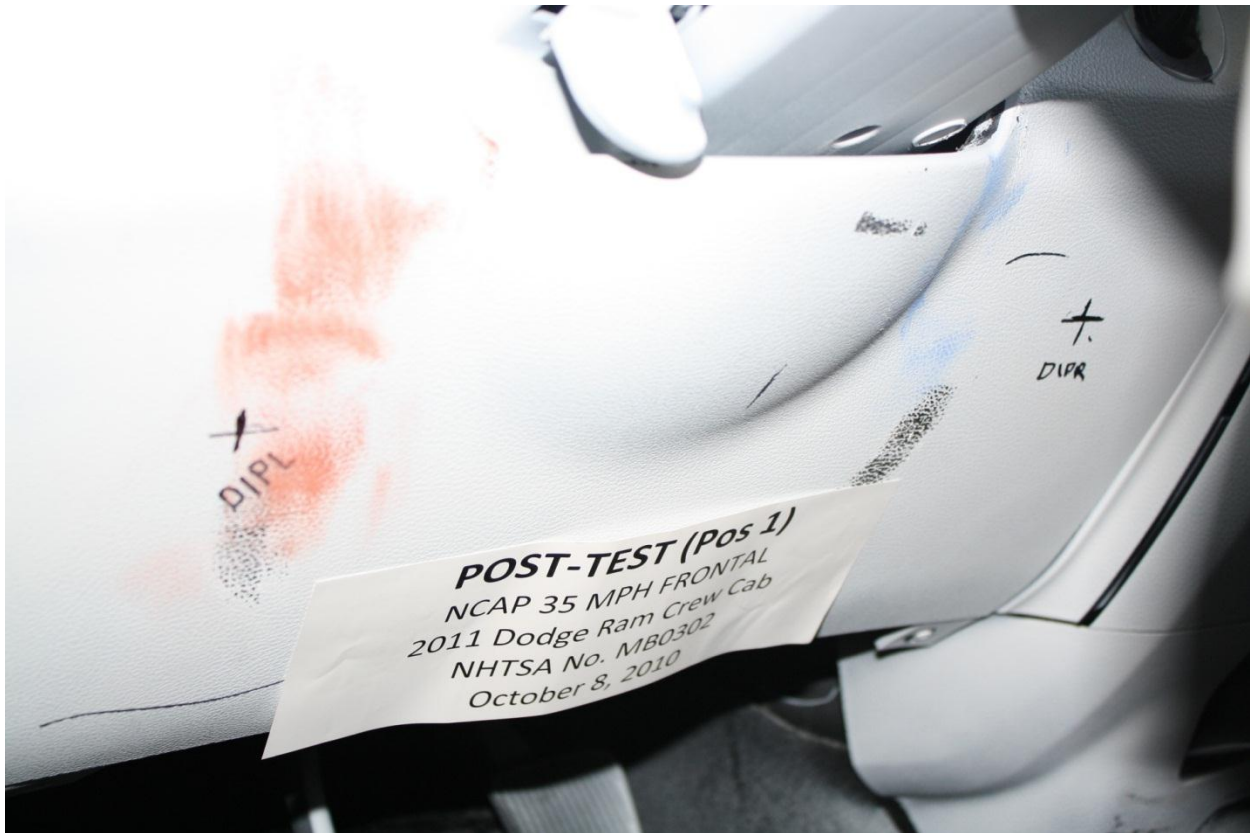


Figure A-40: Post-Test Driver's Side Knee Bolster

Photo Not Available

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

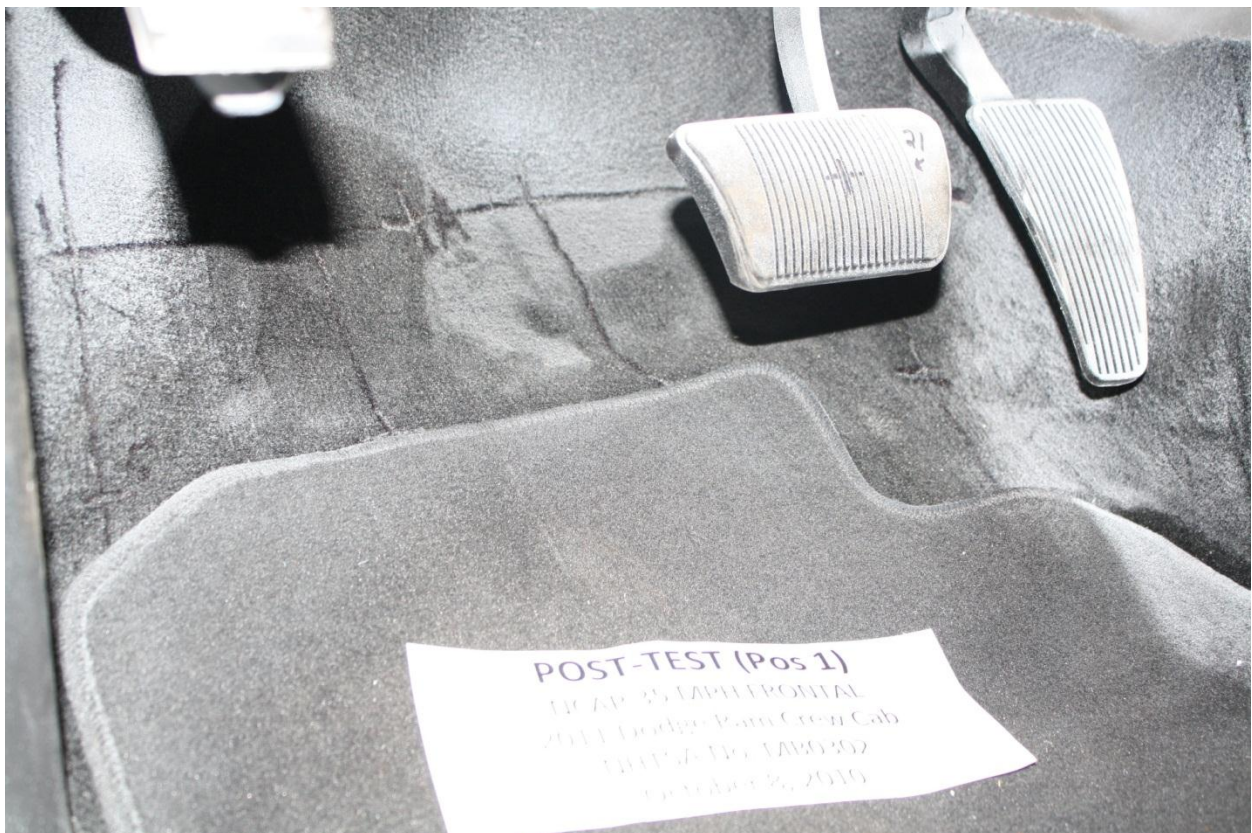


Figure A-42: Post-Test Driver's Side Floorplan



Figure A-43a: Post-Test Diver Dummy Contact with Airbag



Figure A-43b: Post-Test Driver Dummy Contact with Head Restraint

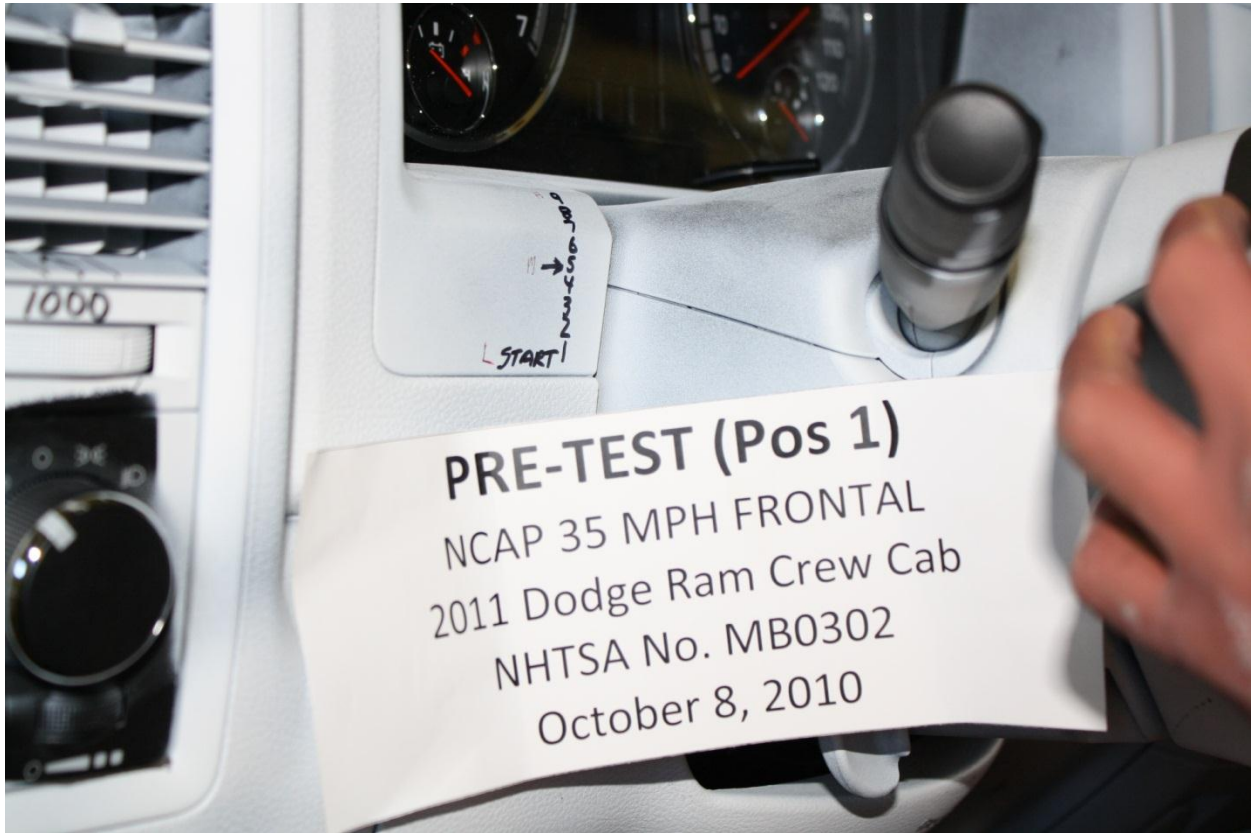


Figure A-44: Pre-Test View of the Steering Column Shear Capsule



Figure A-45: Post-Test View of the Steering Column Shear Capsule

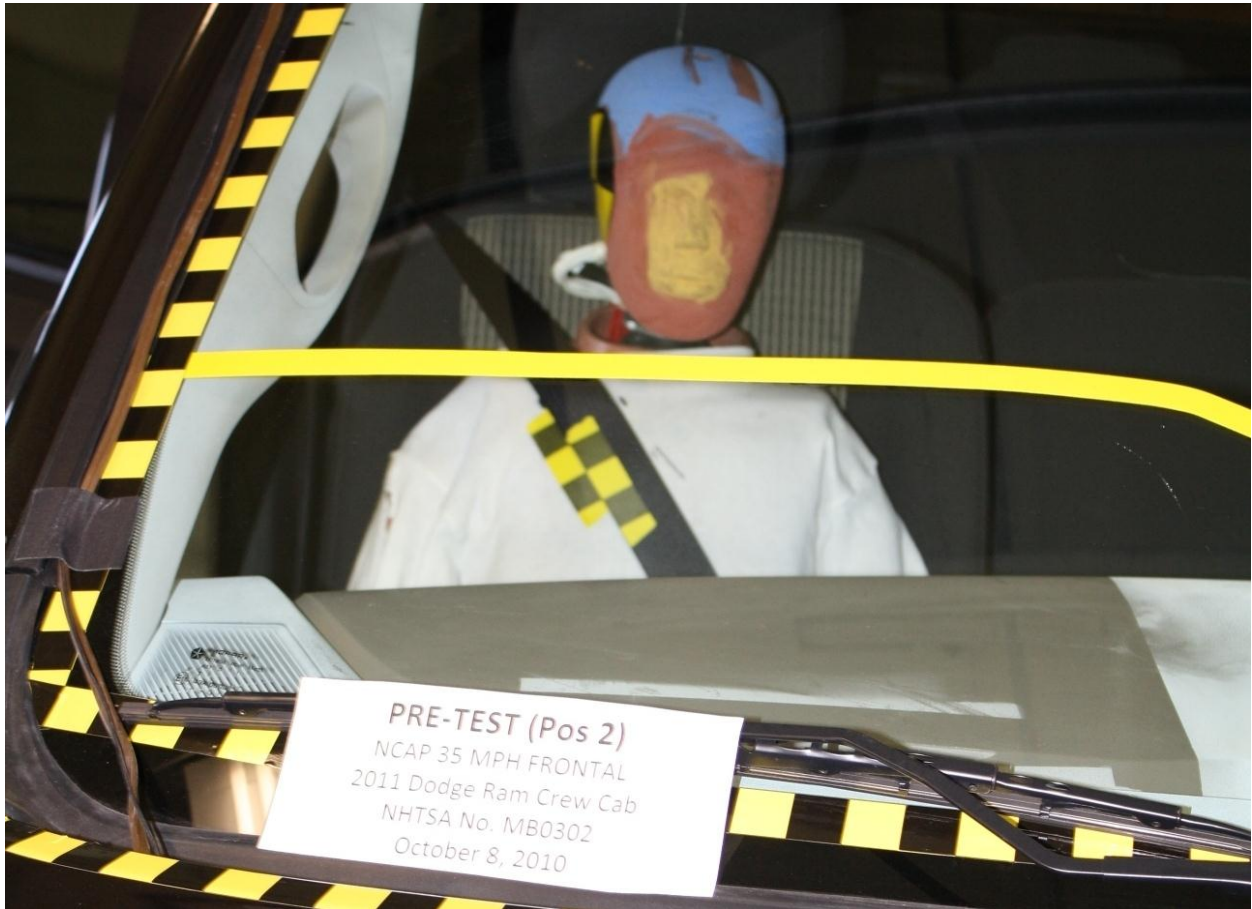


Figure A-46: Pre-Test Passenger Dummy Front View



Figure A-47: Post-Test Passenger Dummy Front View



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



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



Figure A-50: Pre-Test Passenger Dummy and Vehicle Interior View



Figure A-51: Post-Test Passenger Dummy and Vehicle Interior View



Figure A-52: Pre-Test Passenger's Seat Fore-Aft Markings



Figure A-53: Post-Test Passenger's Seat Fore-Aft Markings



Figure A-54: Pre-Test Passenger Dummy Feet



Figure A-54: Post-Test Passenger Dummy Feet

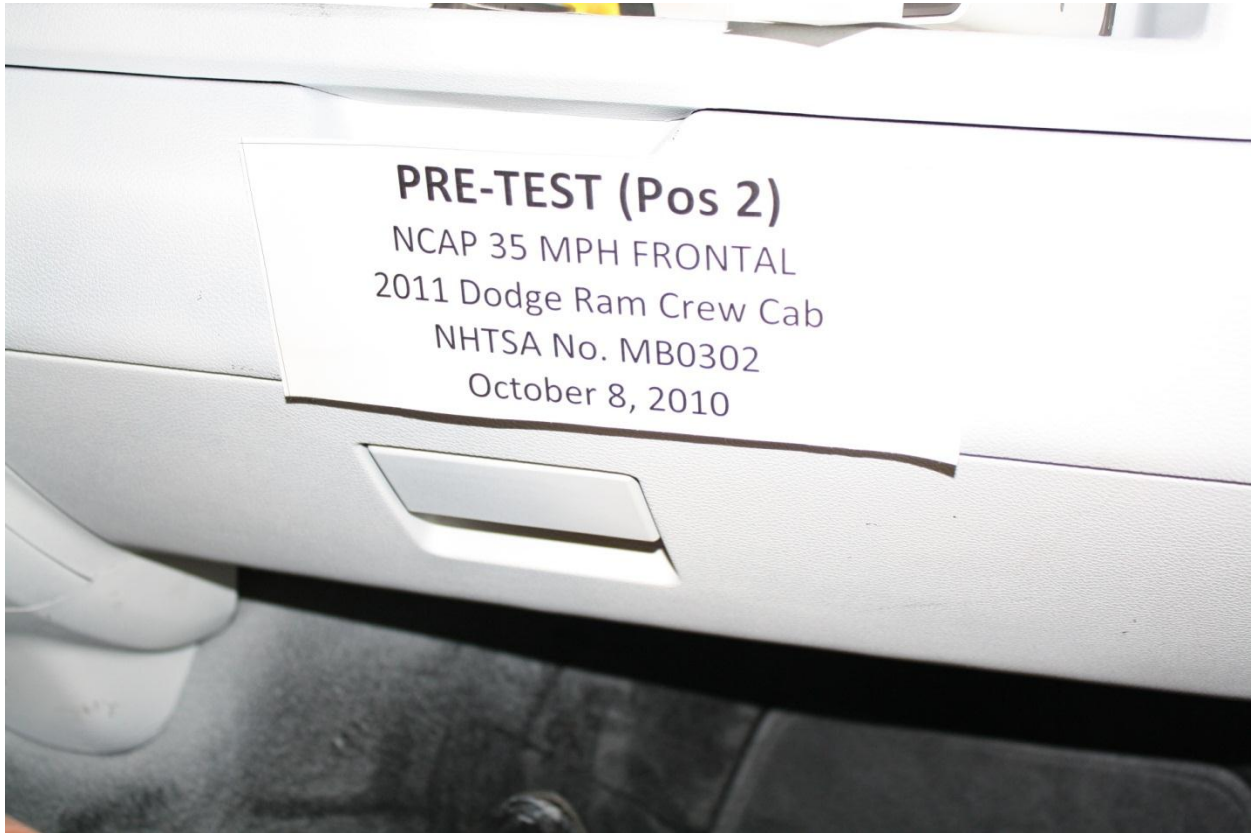


Figure A-56: Pre-Test Passenger's Side Knee Bolster



Figure A-57: Post-Test Passenger's Side Knee Bolster

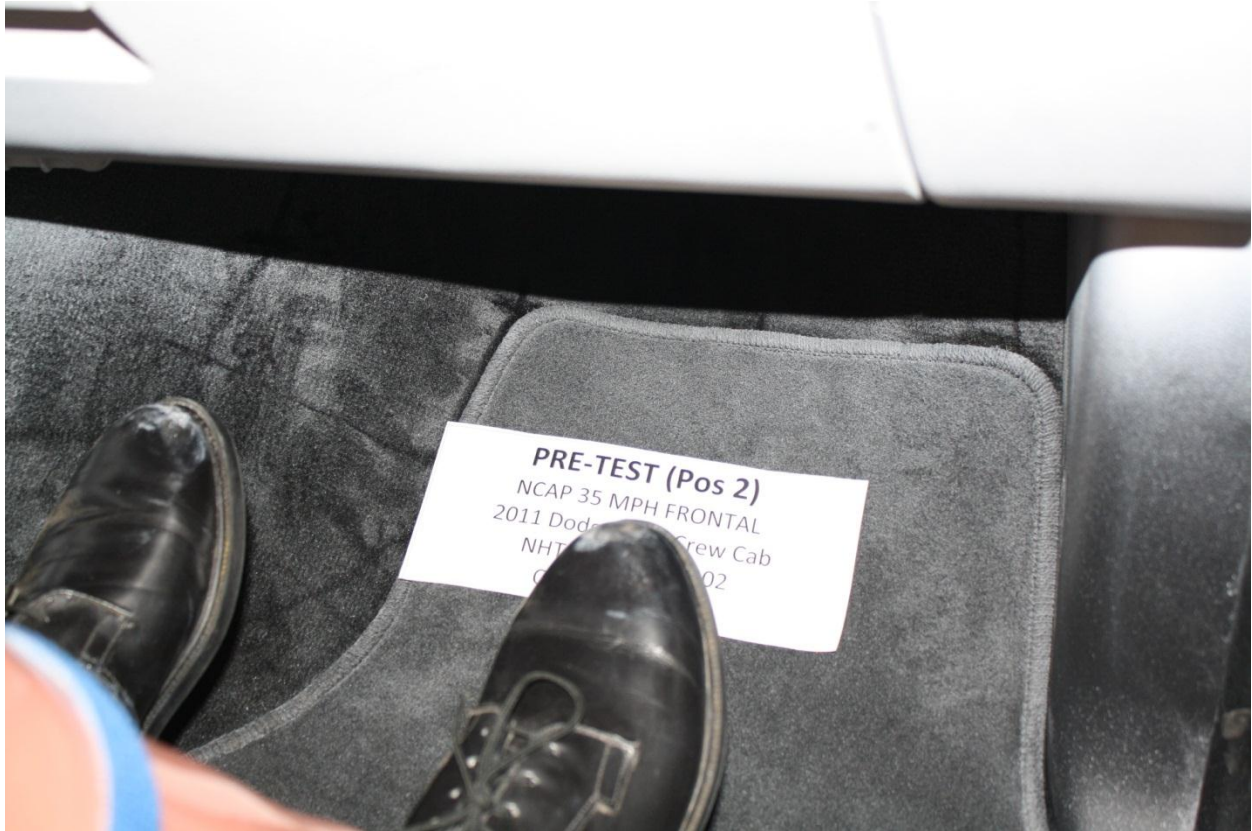


Figure A-58: Pre-Test Passenger's Side Floorplan

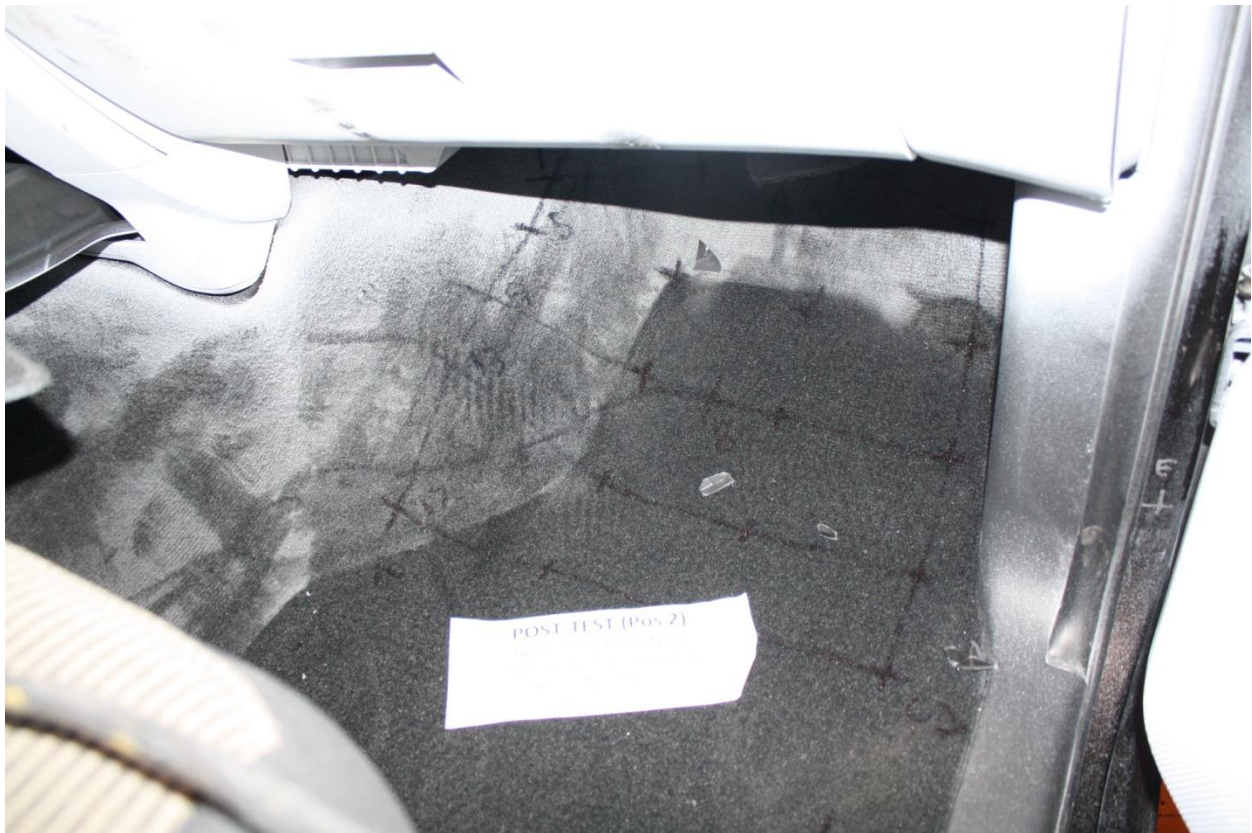


Figure A-59: Post-Test Passenger's Floorplan

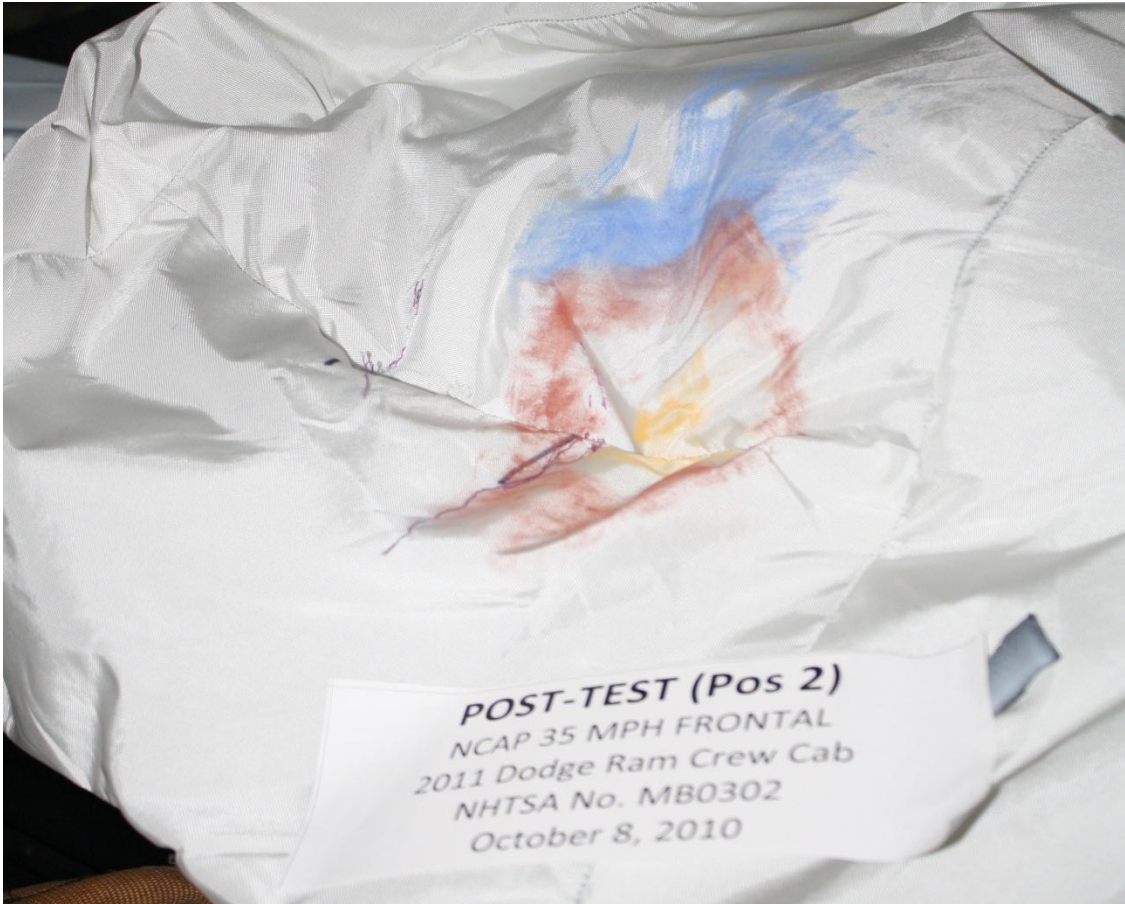


Figure A-60a: Post-Test Passenger Dummy Contact with Airbag

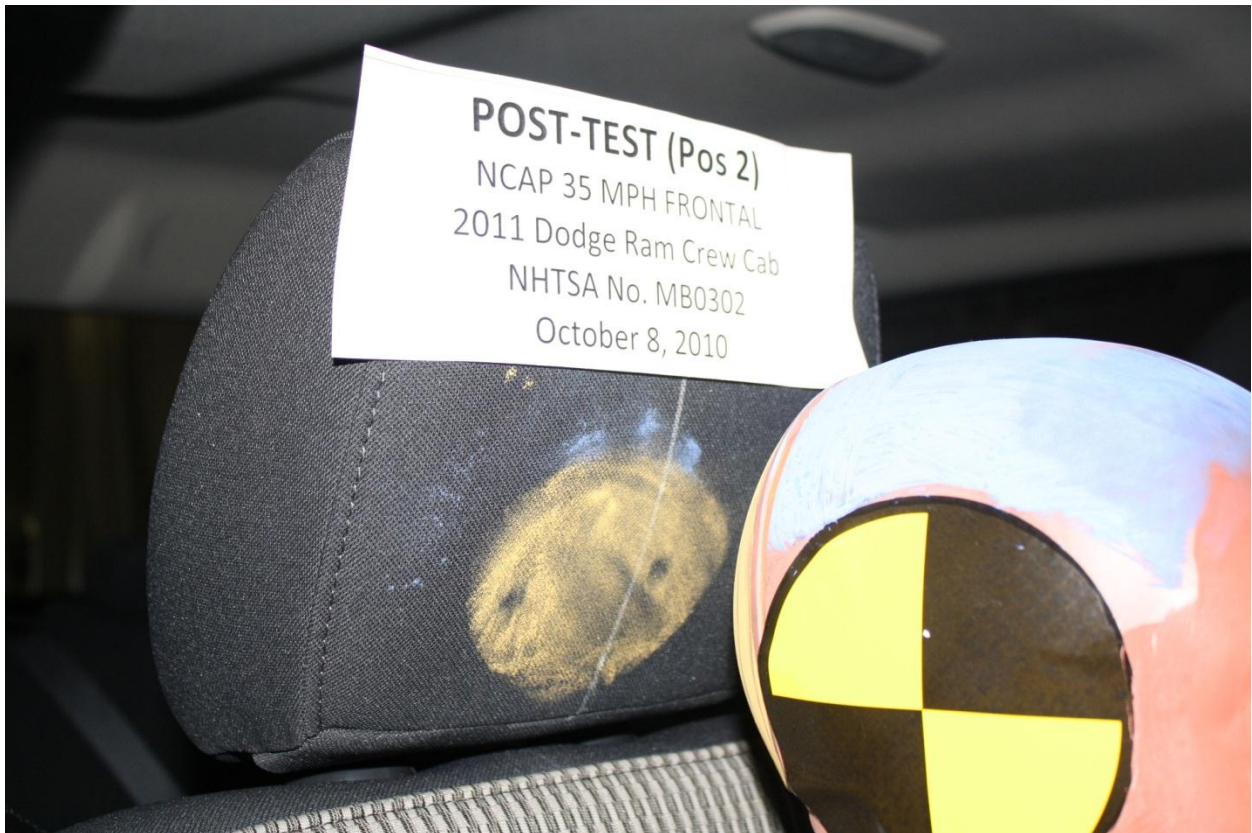


Figure A-60b: Post-Test Passenger Dummy Contact with Head Restraint

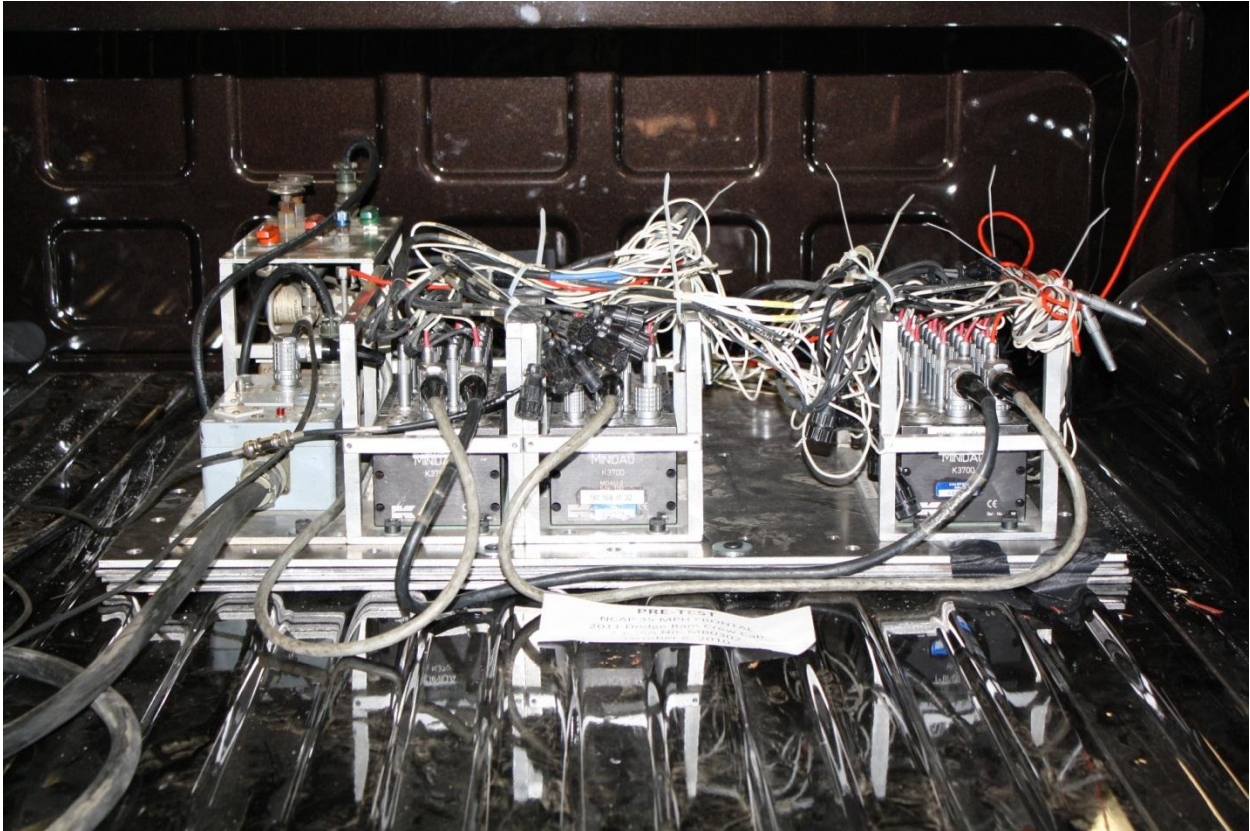


Figure A-61: Photograph of Ballast Installed Vehicle

Photo Not Applicable

Figure A-62: Post-Test Stoddard Solvent Spillage Location View

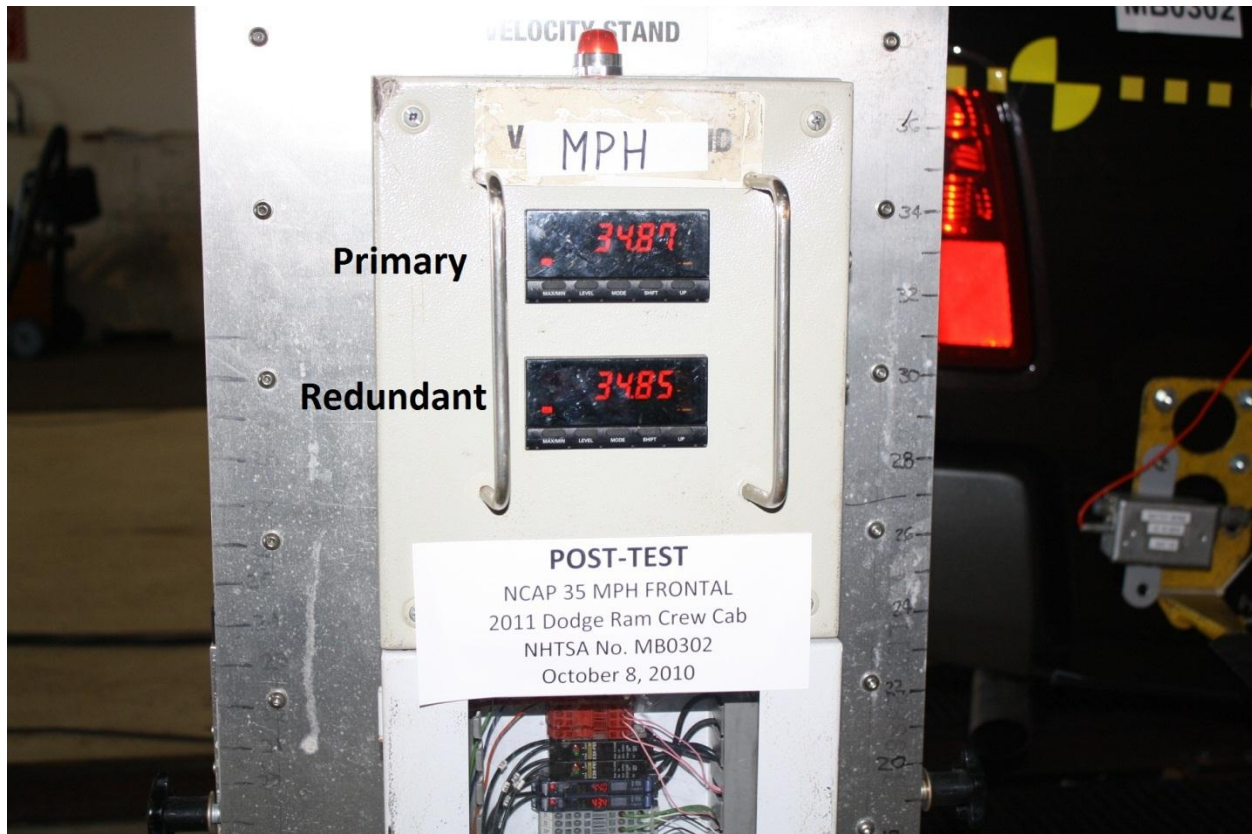


Figure A-63: Post-Test Speed Trap Read Out



Figure A-64: Vehicle at 0° on Static Rollover Device



Figure A-65: Vehicle at 90° on Static Rollover Device



Figure A-66: Vehicle at 180° on Static Rollover Device

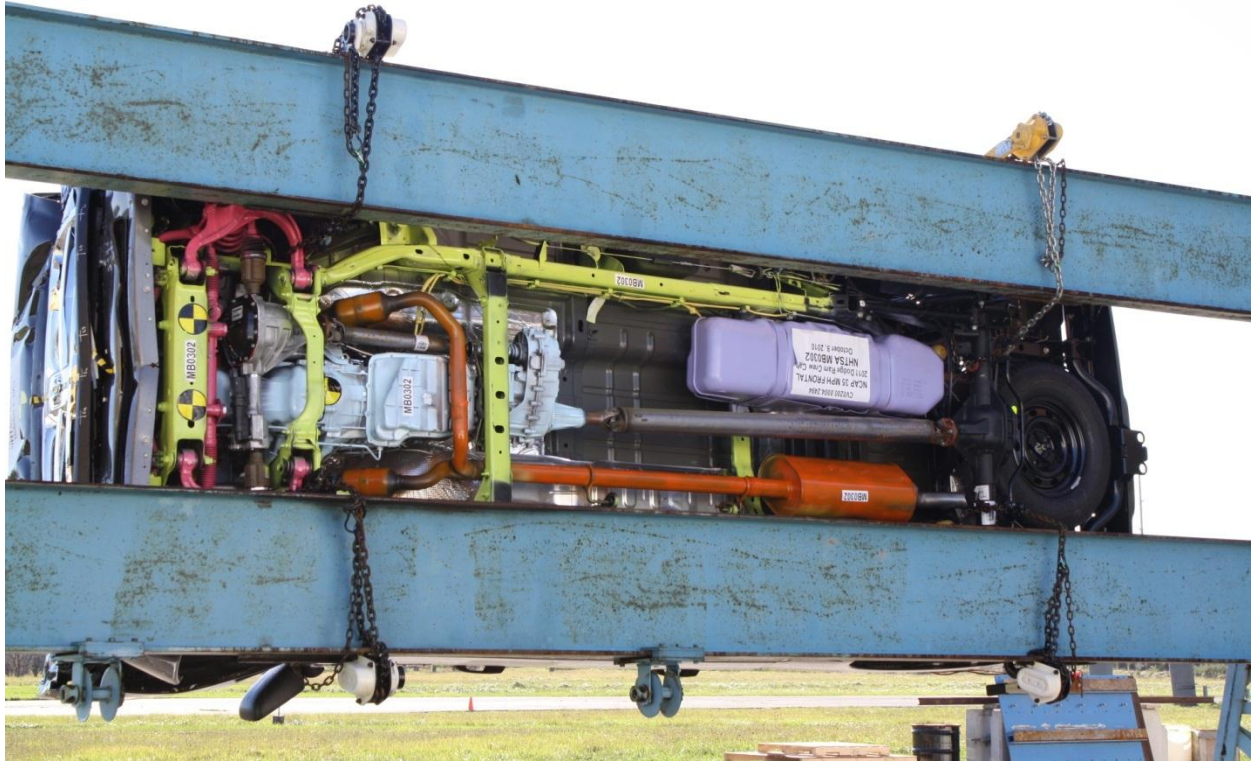


Figure A-67: Vehicle at 270° on Static Rollover Device



Figure A-68: Vehicle at 360° on Static Rollover Device



Figure A-69: Impact Photograph

2011 MODEL YEAR
RAM 1500 ST CREW CAB 4X4

MSRP: \$32,230

TOTAL PRICE: * \$34,535

WARRANTY COVERAGE
5 YEAR / 100,000 MILE
POWERTRAIN WARRANTY

EPA Fuel Economy Estimates

CITY 13 MPG	Highway 18 MPG
-----------------------	--------------------------

Annual Fuel Cost: \$2,801

MPG Combined: 15

GOVERNMENT SAFETY RATINGS

Frontal Crash	Driver Passenger	Not Rated
Side Crash	Front seat	Not Rated
	Rear seat	Not Rated

Roll-over: ★★

PARTS CONTENT INFORMATION

FOR PARTS IN THIS COUNTRY:
U.S. CANADIAN PARTS CONTENT: 76%

FOR THIS OFFICE:
FINAL ASSEMBLY POINT:
WARREN, MICHIGAN, U.S.A.
COUNTRY OF ORIGIN:
ENGINE: UNITED STATES
TRANSMISSION: UNITED STATES

Figure A-70: Monroney Label Photograph

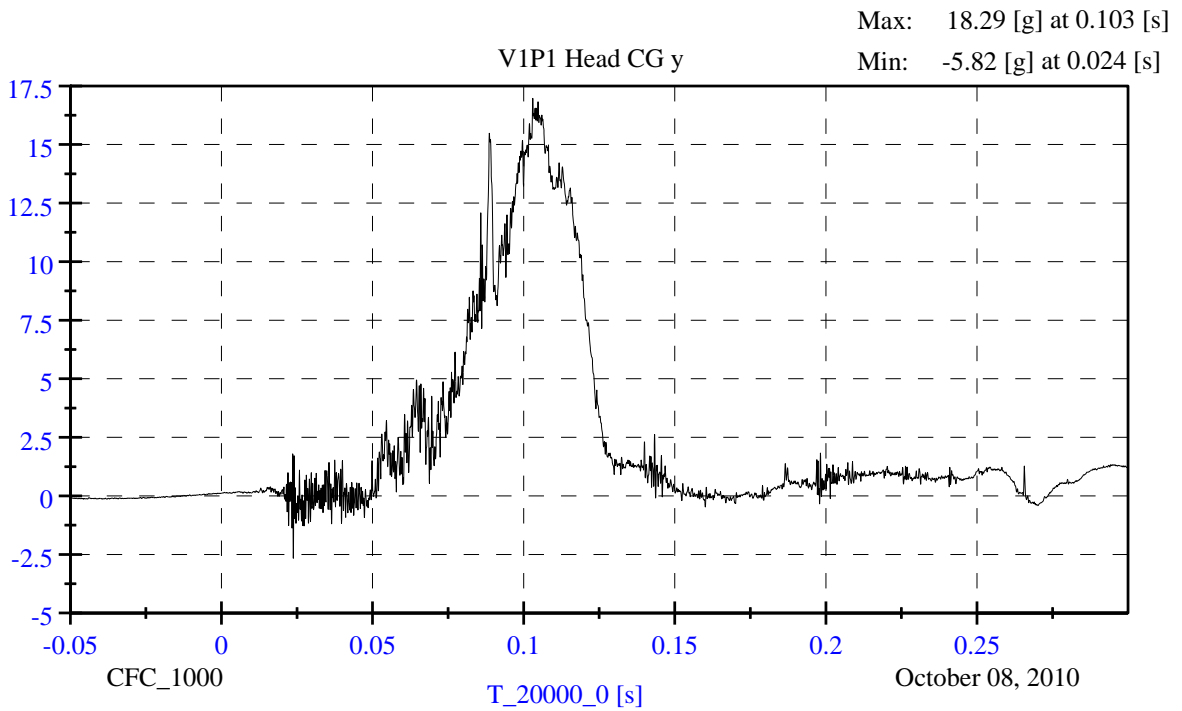
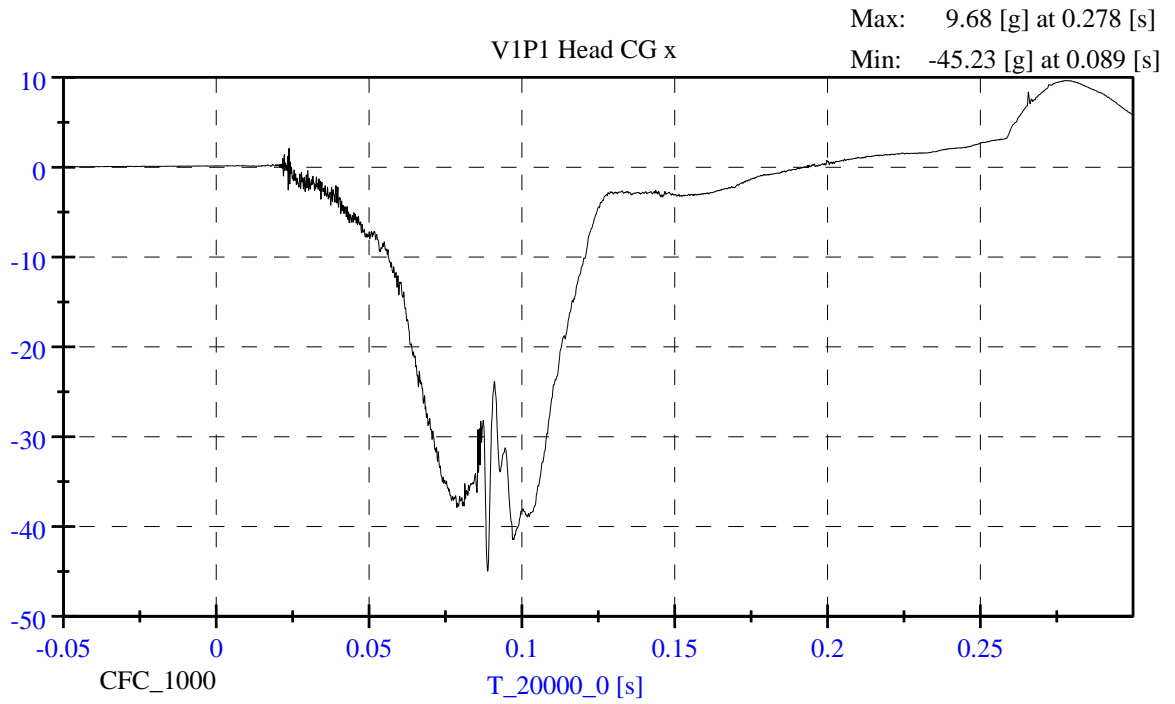
APPENDIX B
DUMMY RESPONSE DATA TRACES

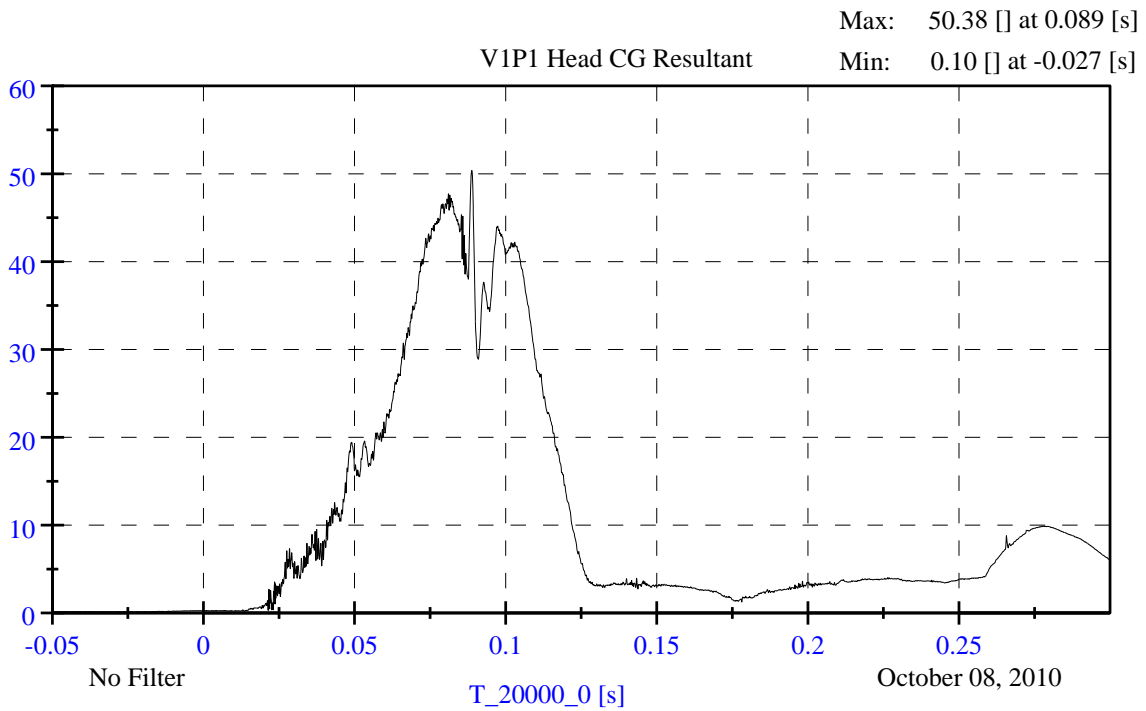
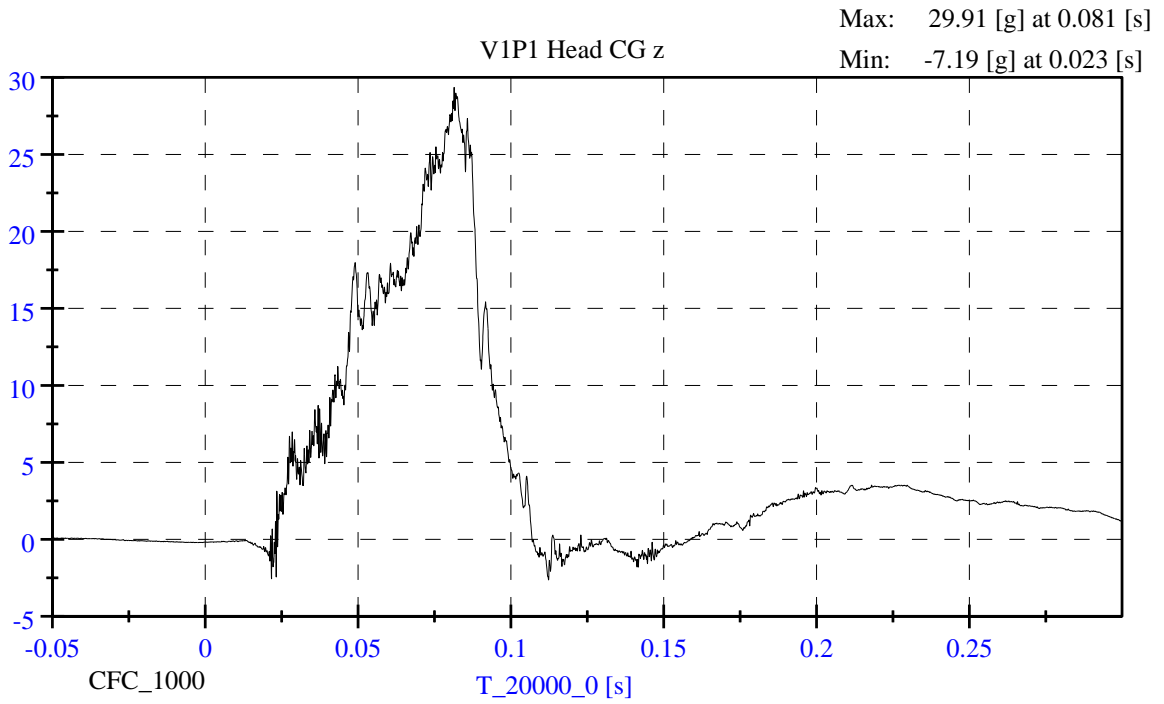
Fig. No.	List of Data Plots Provided In The Test Report	Page No.
1	Driver Head X Acceleration vs. Time Primary	B-5
2	Driver Head Y Acceleration vs. Time Primary	B-5
3	Driver Head Z Acceleration vs. Time Primary	B-6
4	Driver Head Resultant Acceleration vs. Time Primary	B-6
5	Driver Chest X Deflection vs. Time	B-7
6	Driver Chest X Acceleration vs. Time Primary	B-7
7	Driver Chest Y Acceleration vs. Time Primary	B-8
8	Driver Chest Z Acceleration vs. Time Primary	B-8
9	Driver Chest Resultant Acceleration vs. Time Primary	B-9
10	Driver Upper Neck Force X vs. Time Primary	B-9
11	Driver Upper Neck Force Z vs. Time Primary	B-10
12	Driver Upper Neck Moment Y vs. Time Primary	B-10
13	Driver Nij vs. Time Primary	B-11
14	Driver Left Femur Force vs. Time	B-11
15	Driver Right Femur Force vs. Time	B-12
16	Passenger Head X Acceleration vs. Time Primary	B-12
17	Passenger Head Y Acceleration vs. Time Primary	B-13
18	Passenger Head Z Acceleration vs. Time Primary	B-13
19	Passenger Head Resultant Acceleration vs. Time Primary	B-14
20	Passenger Chest X Deflection vs. Time	B-14
21	Passenger Chest X Acceleration vs. Time Primary	B-15
22	Passenger Chest Y Acceleration vs. Time Primary	B-15
23	Passenger Chest Z Acceleration vs. Time Primary	B-16
24	Passenger Chest Resultant Acceleration vs. Time Primary	B-16
25	Passenger Upper Neck Force X vs. Time Primary	B-17
26	Passenger Upper Neck Force Z vs. Time Primary	B-17
27	Passenger Upper Neck Moment Y vs. Time Primary	B-18
28	Passenger Nij vs. Time Primary	B-18
29	Passenger Left Femur Force vs. Time	B-19

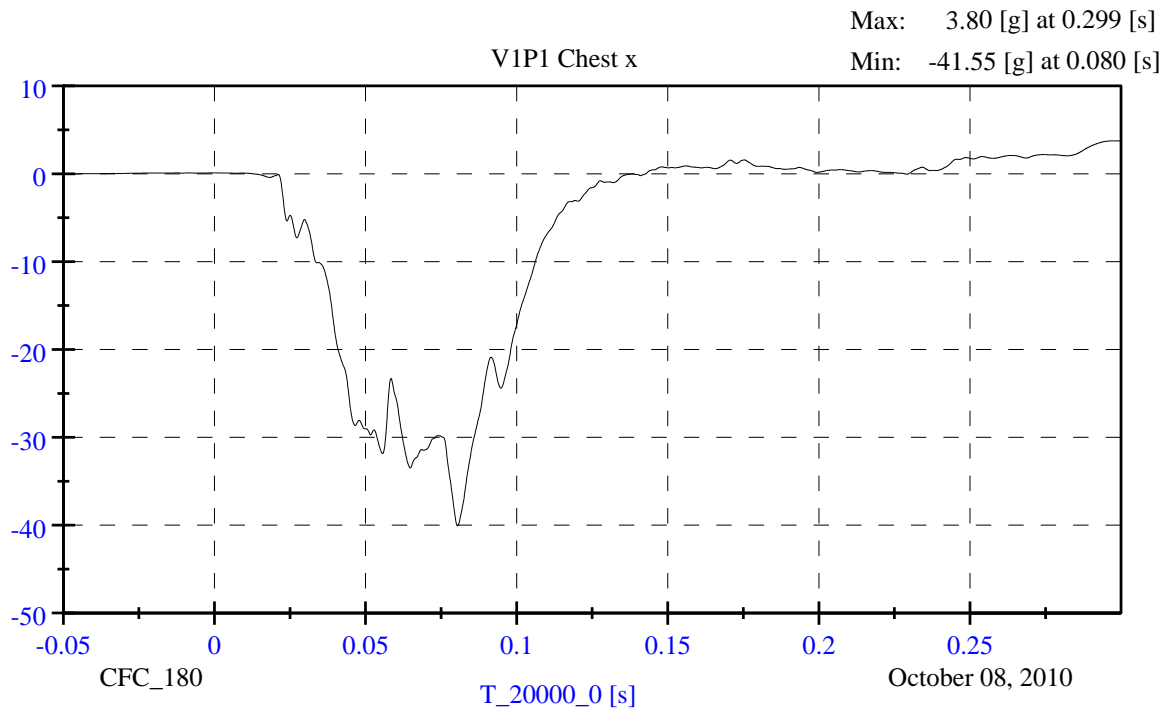
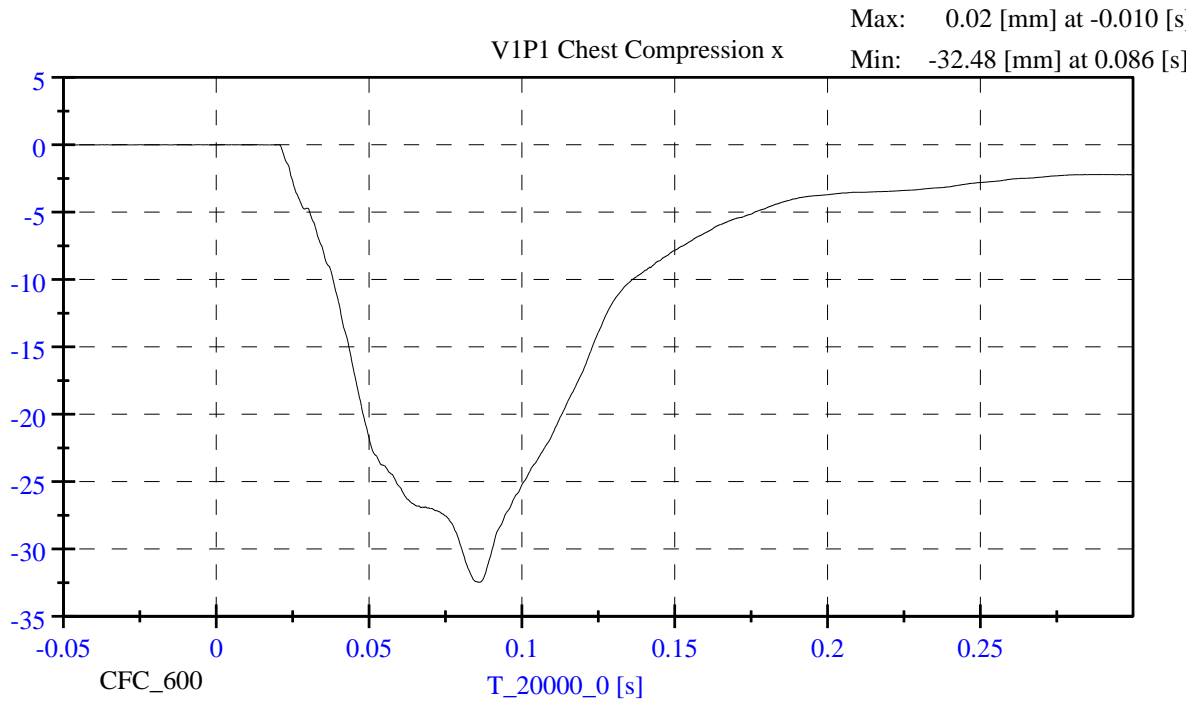
The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

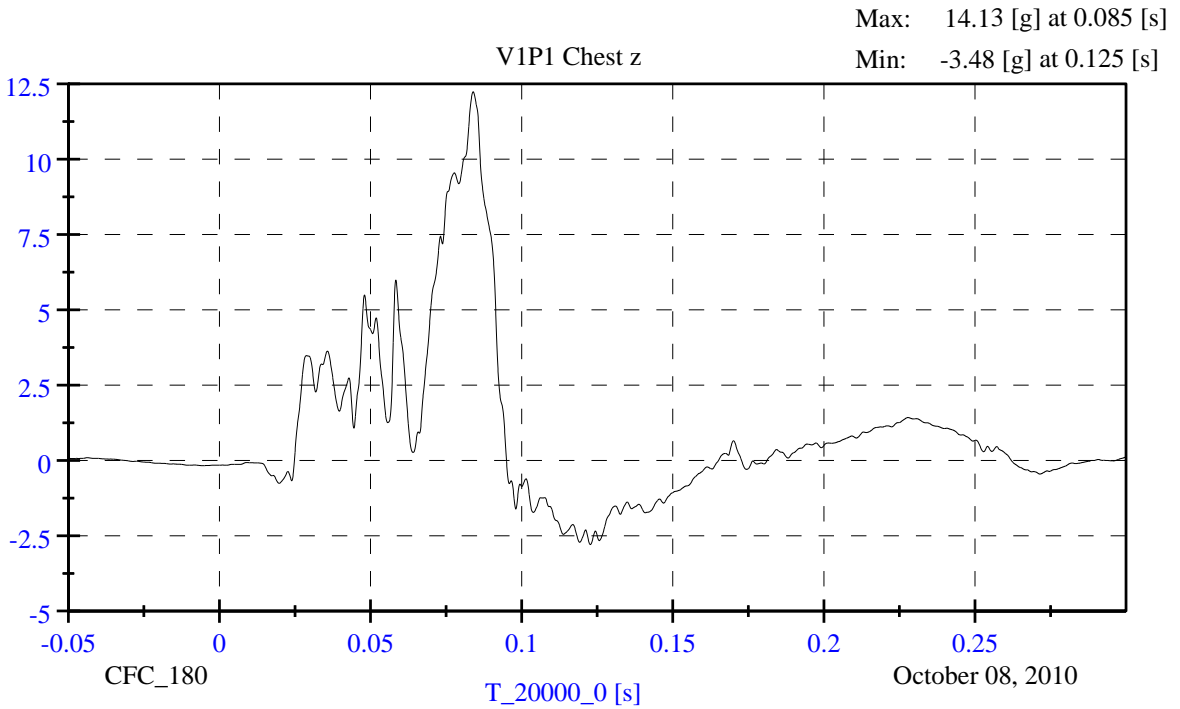
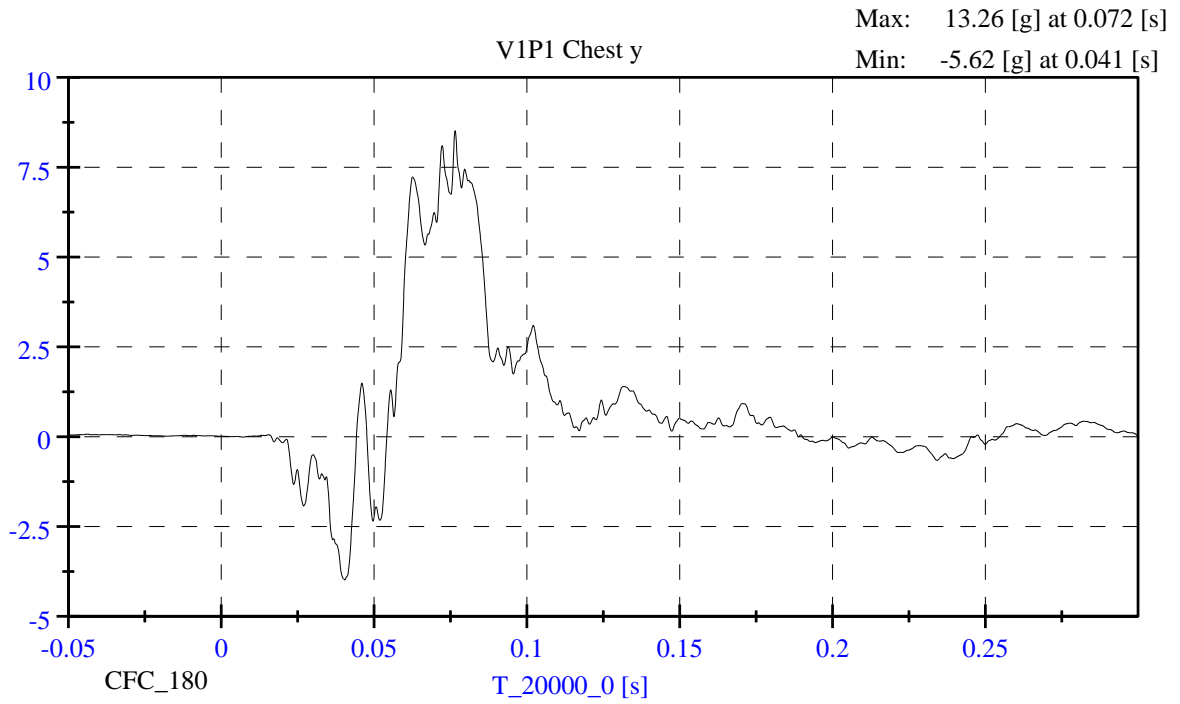
Driver Head X Acceleration Redundant
 Driver Head Y Acceleration Redundant
 Driver Head Z Acceleration Redundant
 Driver Upper Neck Force Y
 Driver Upper Neck Moment X
 Driver Upper Neck Moment Z
 Driver Chest X Acceleration Redundant
 Driver Chest Y Acceleration Redundant
 Driver Chest Z Acceleration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

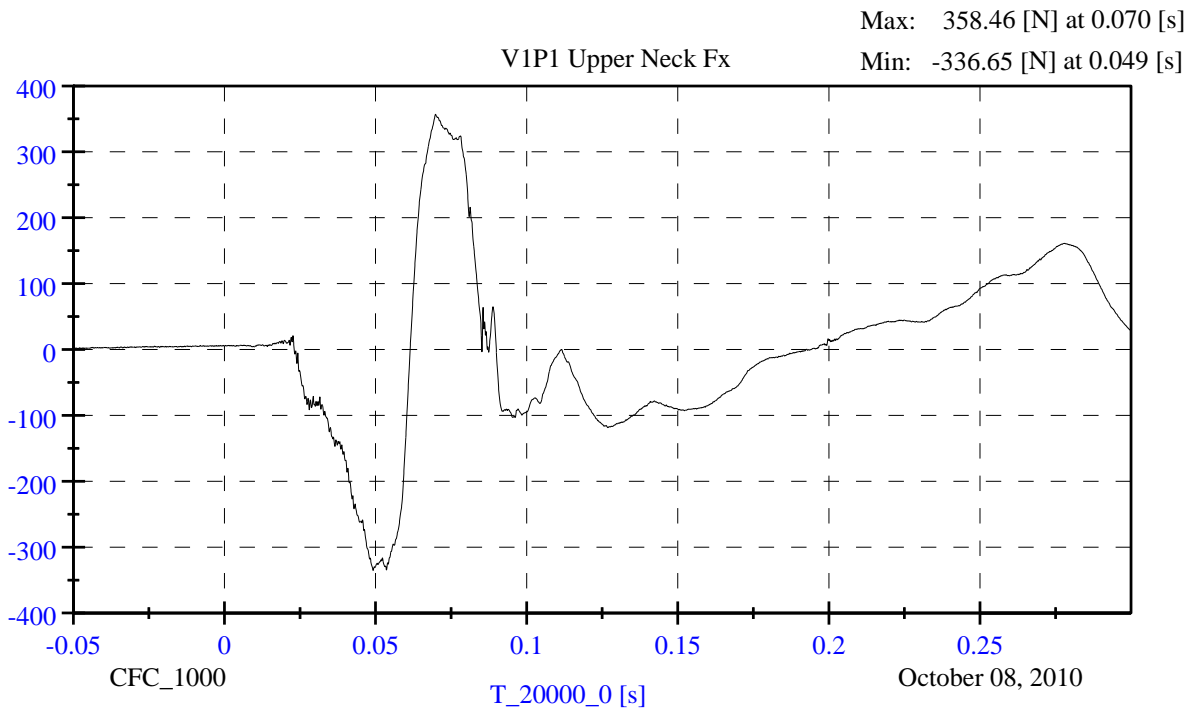
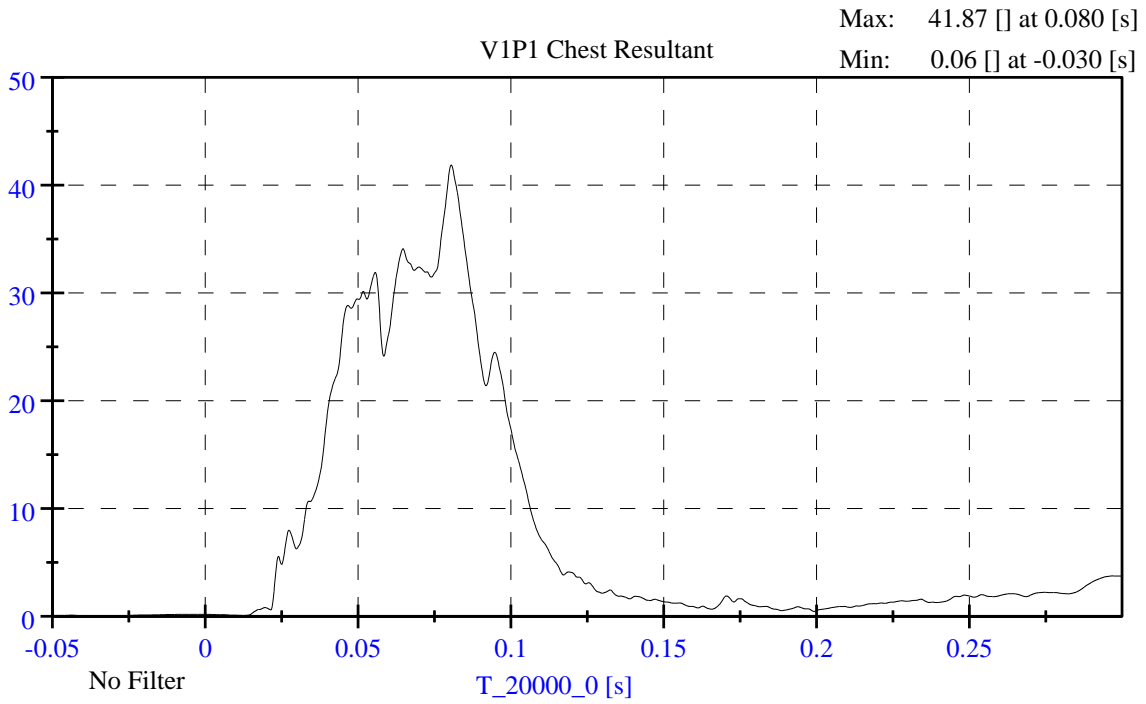
Passenger Right Upper Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger Left Foot Fore Z
Passenger Left Foot Aft X
Passenger Left Foot Aft Z
Passenger Right Foot Fore Z
Passenger Right Foot Aft X
Passenger Right Foot Aft Z
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

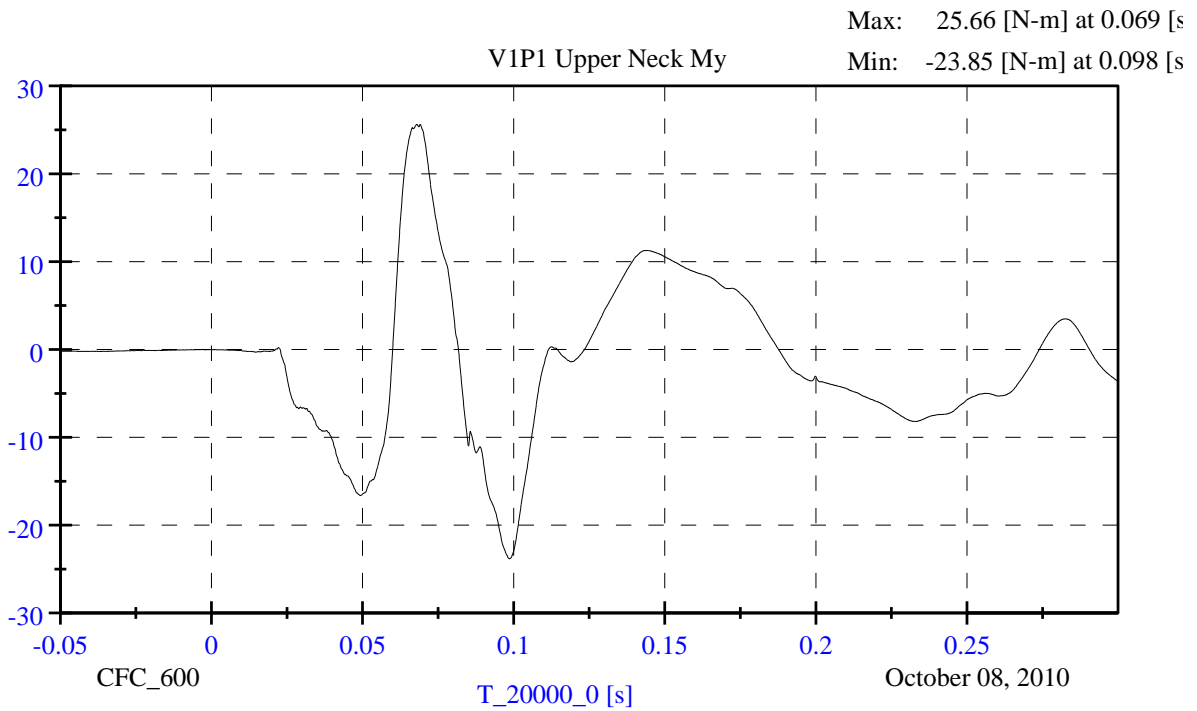
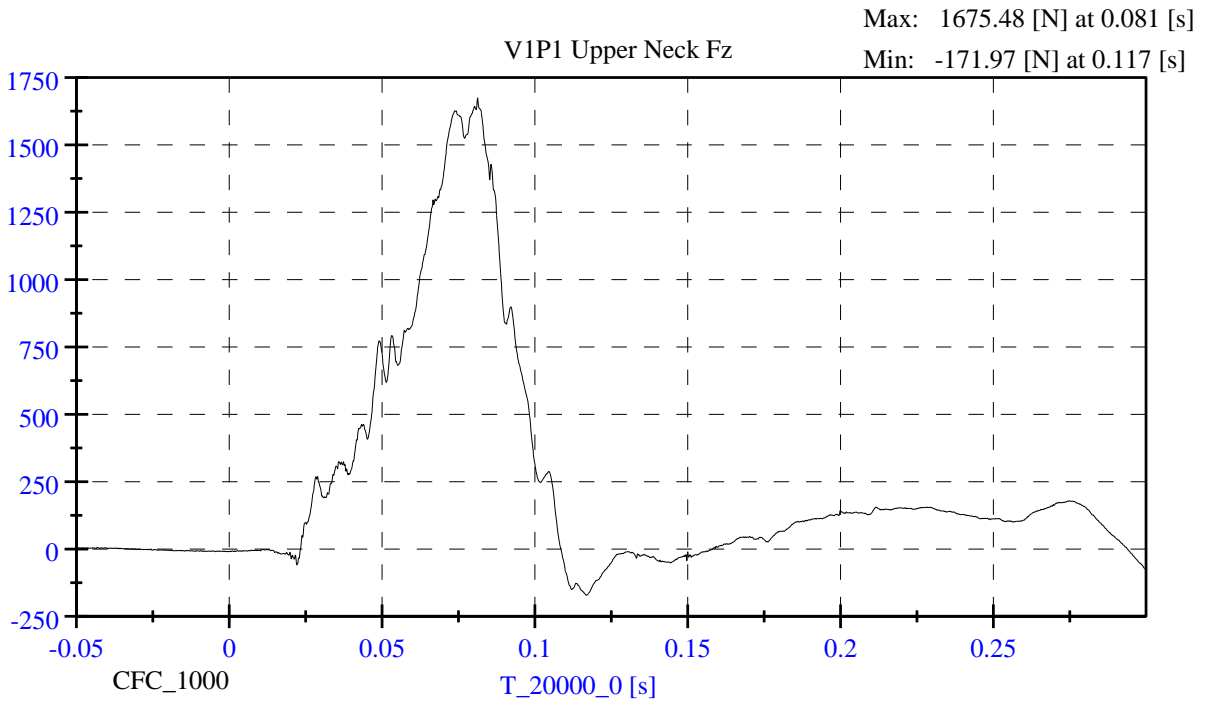


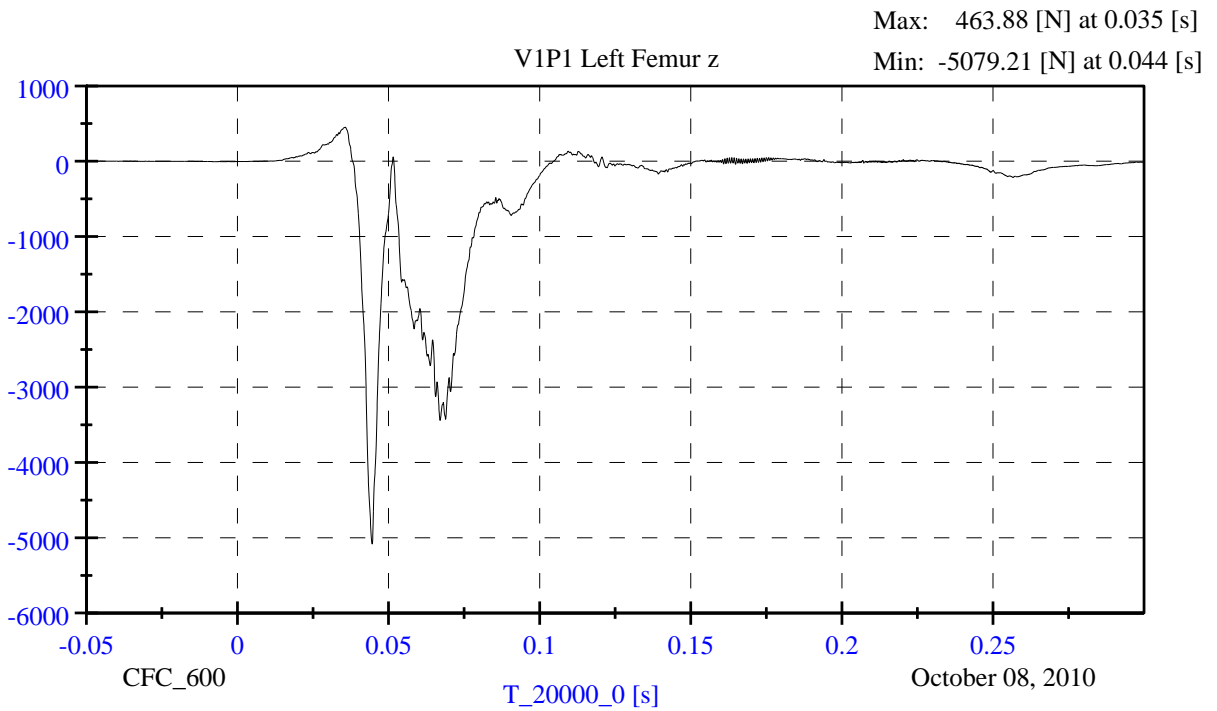
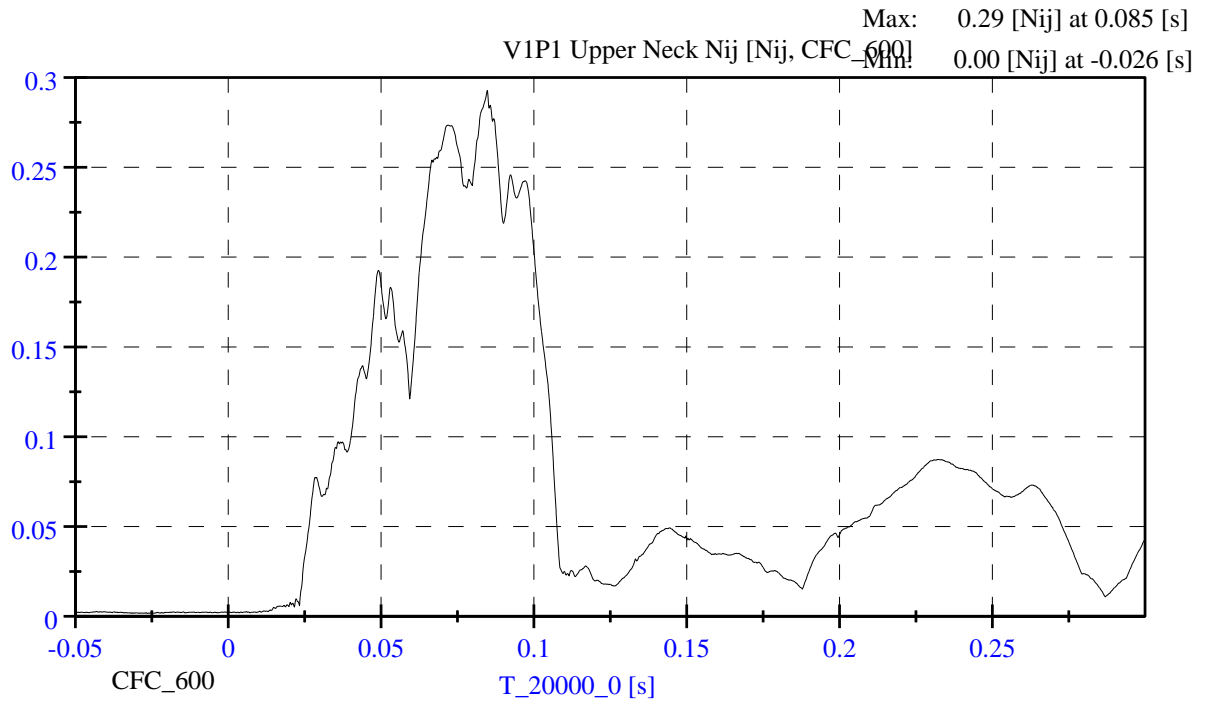


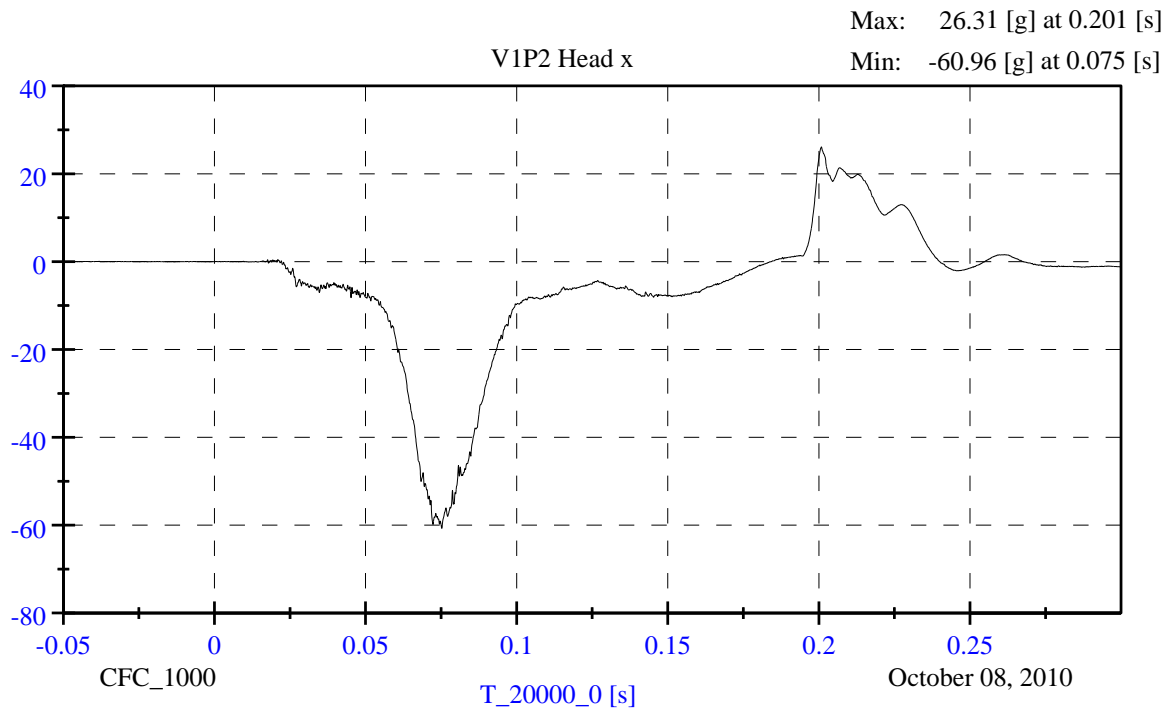
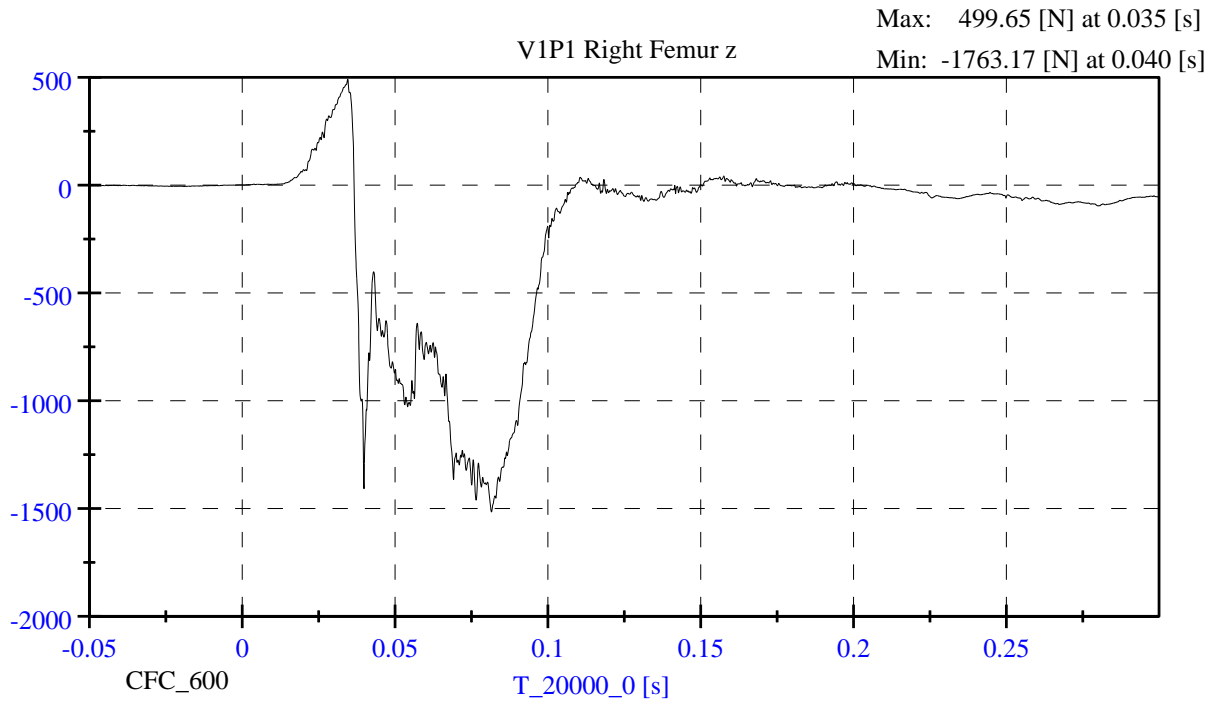


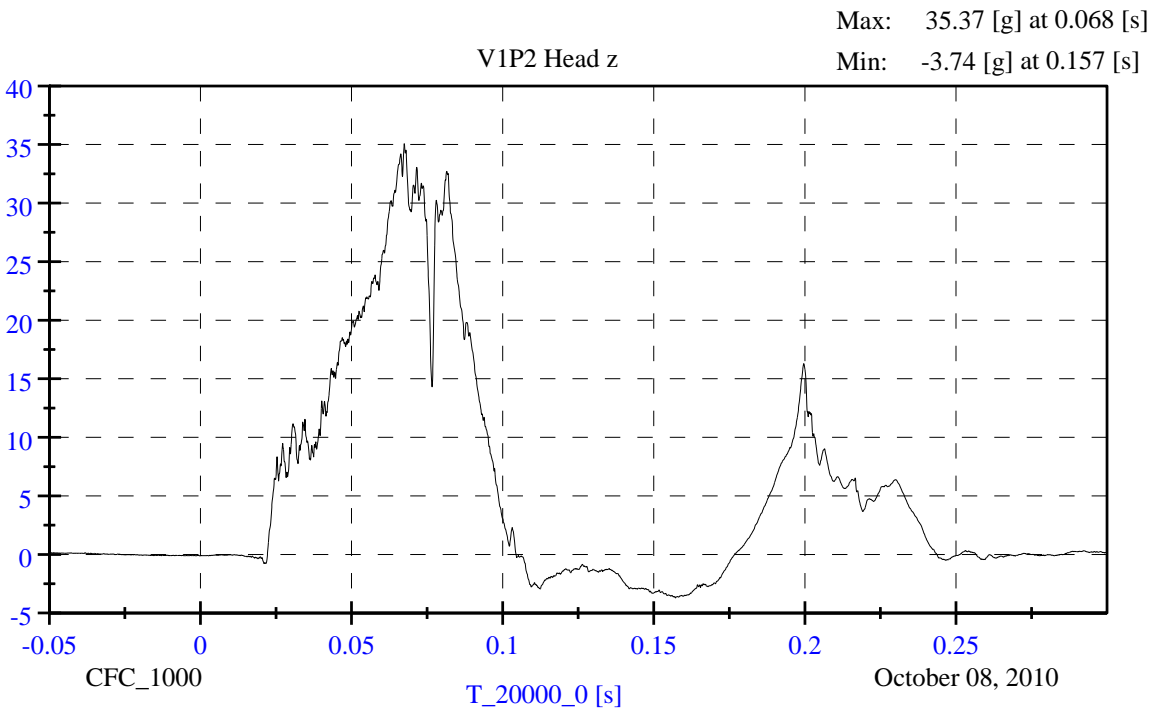
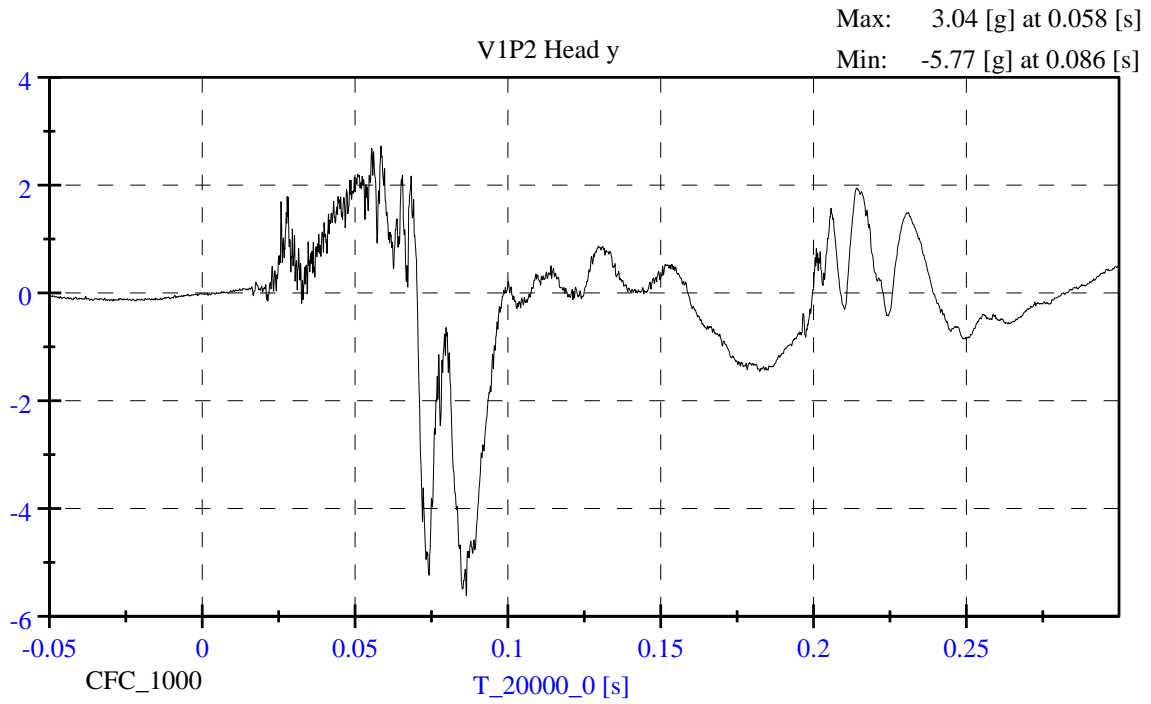


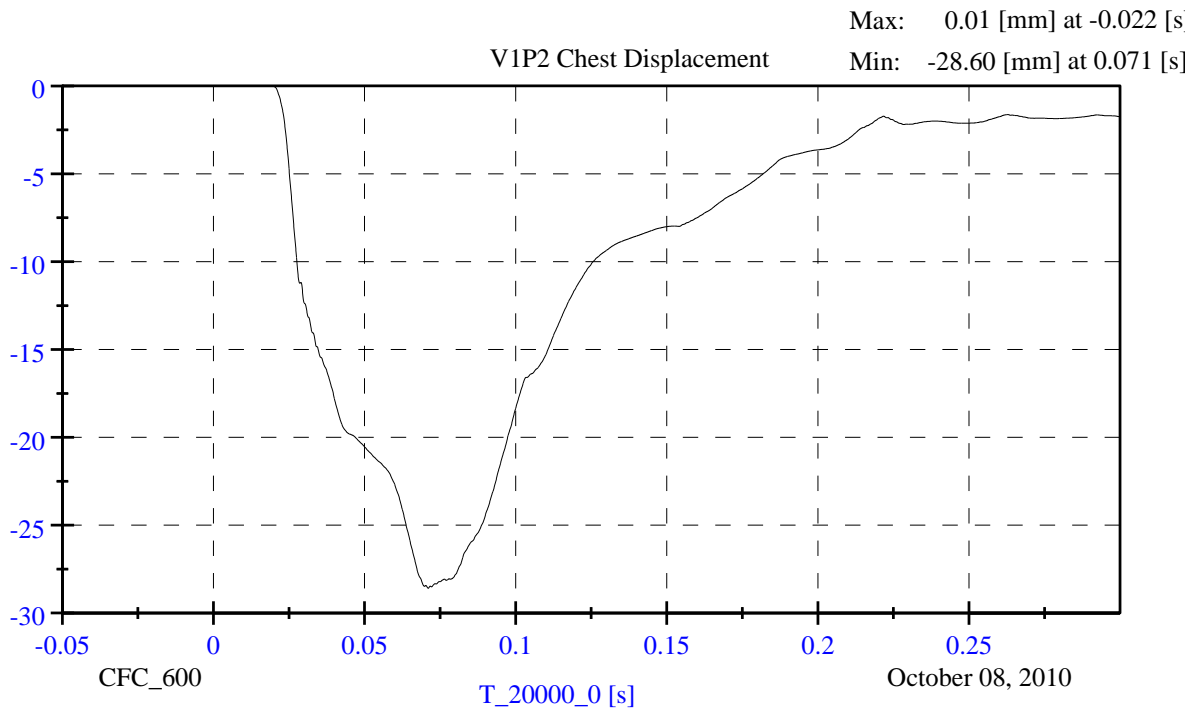
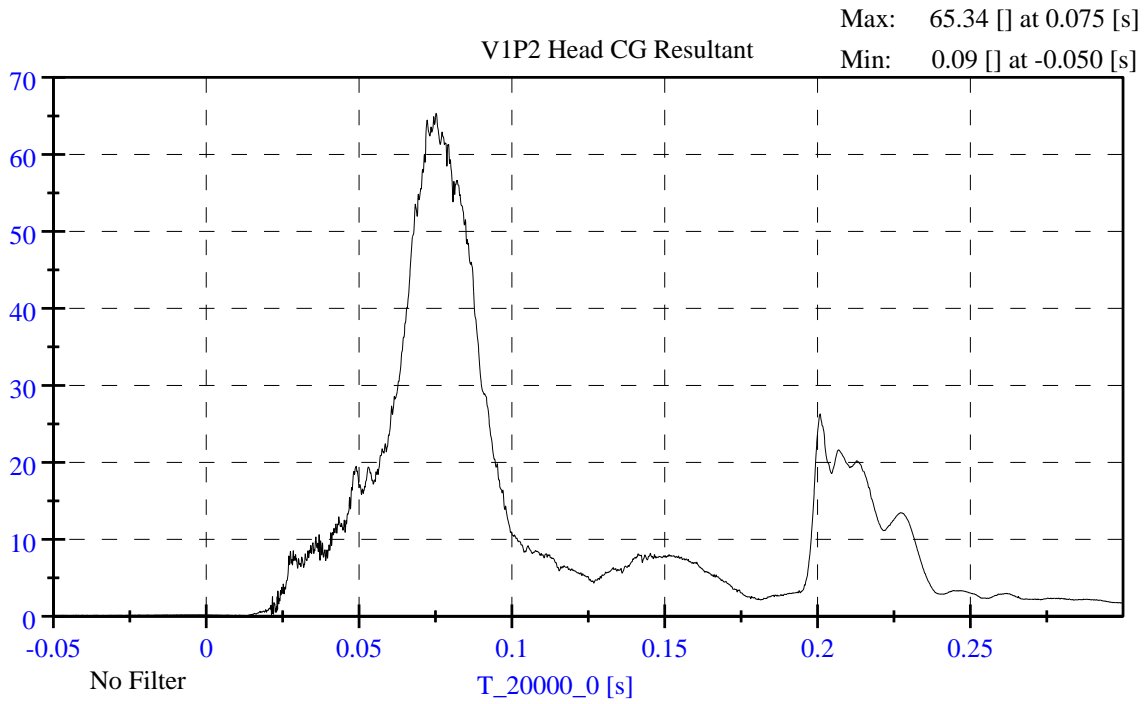




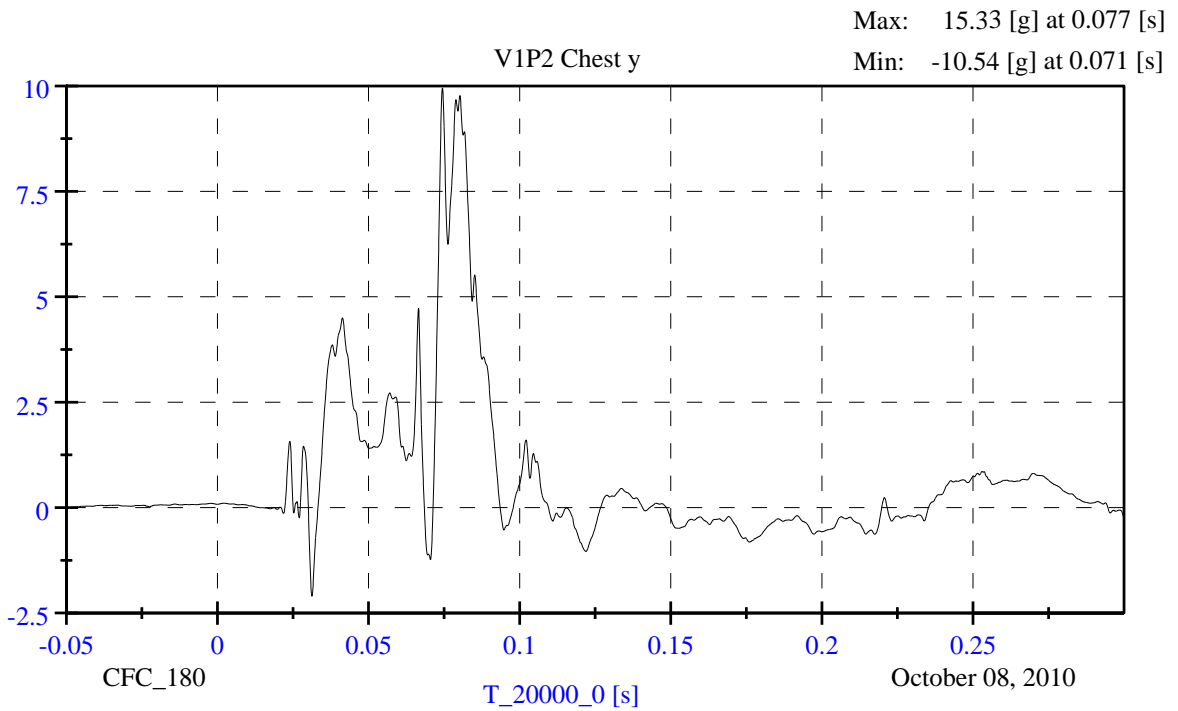
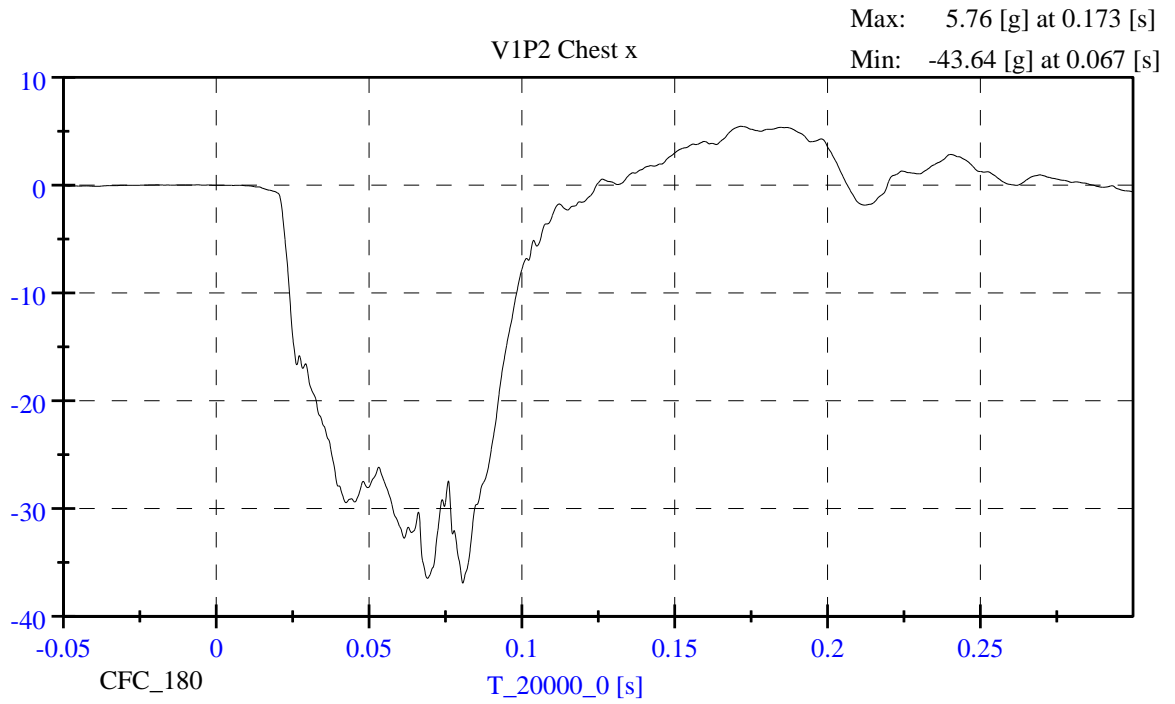


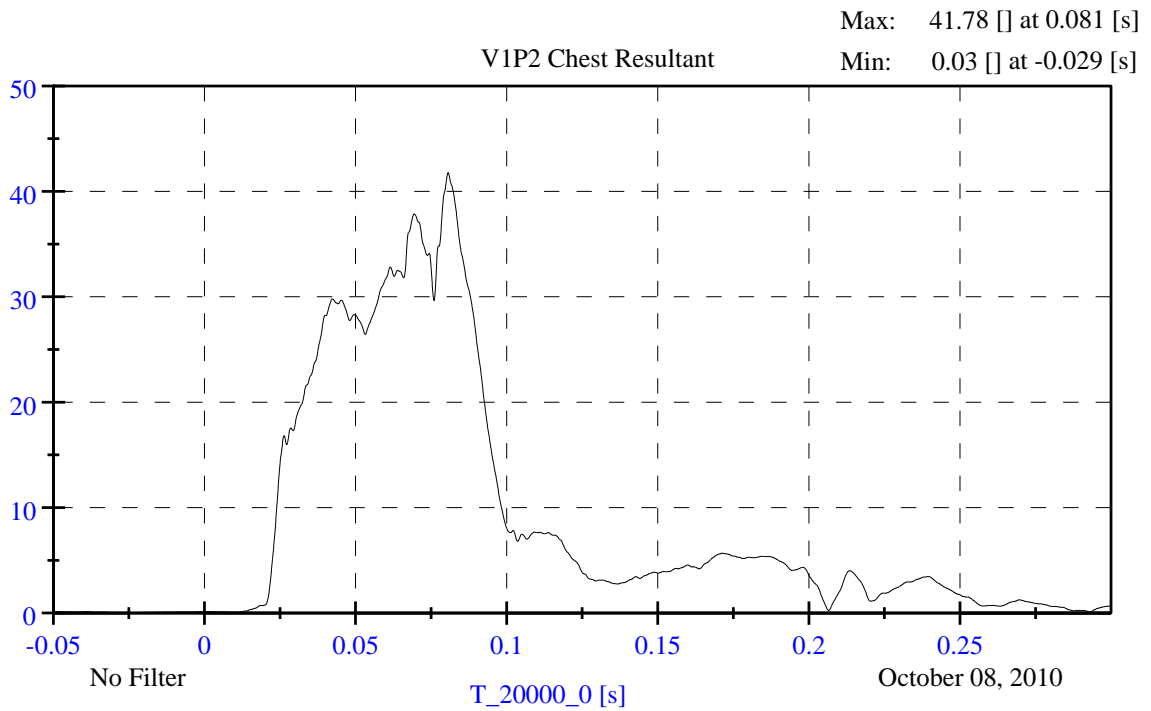
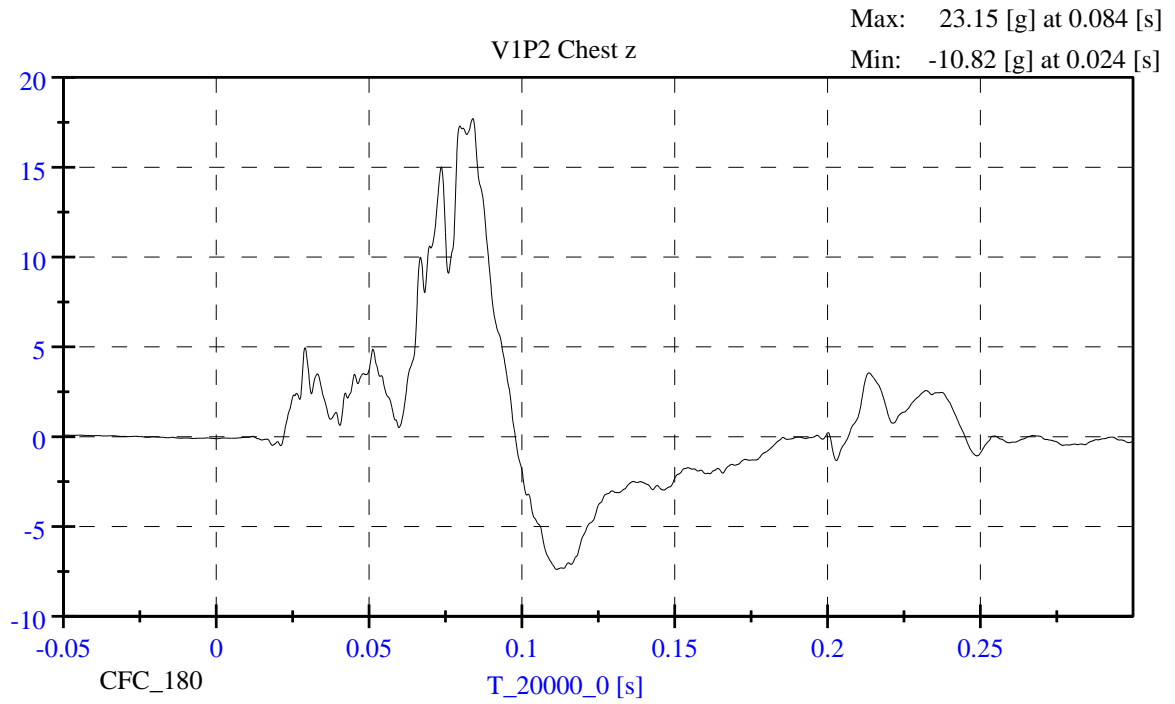


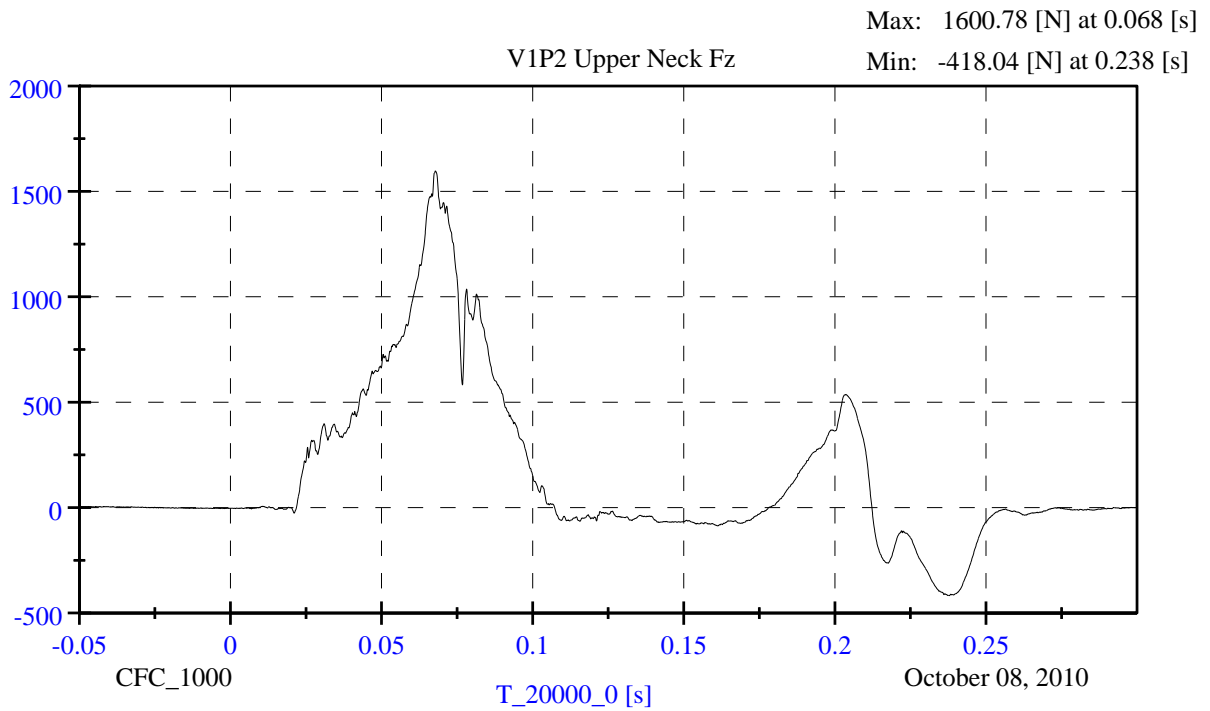
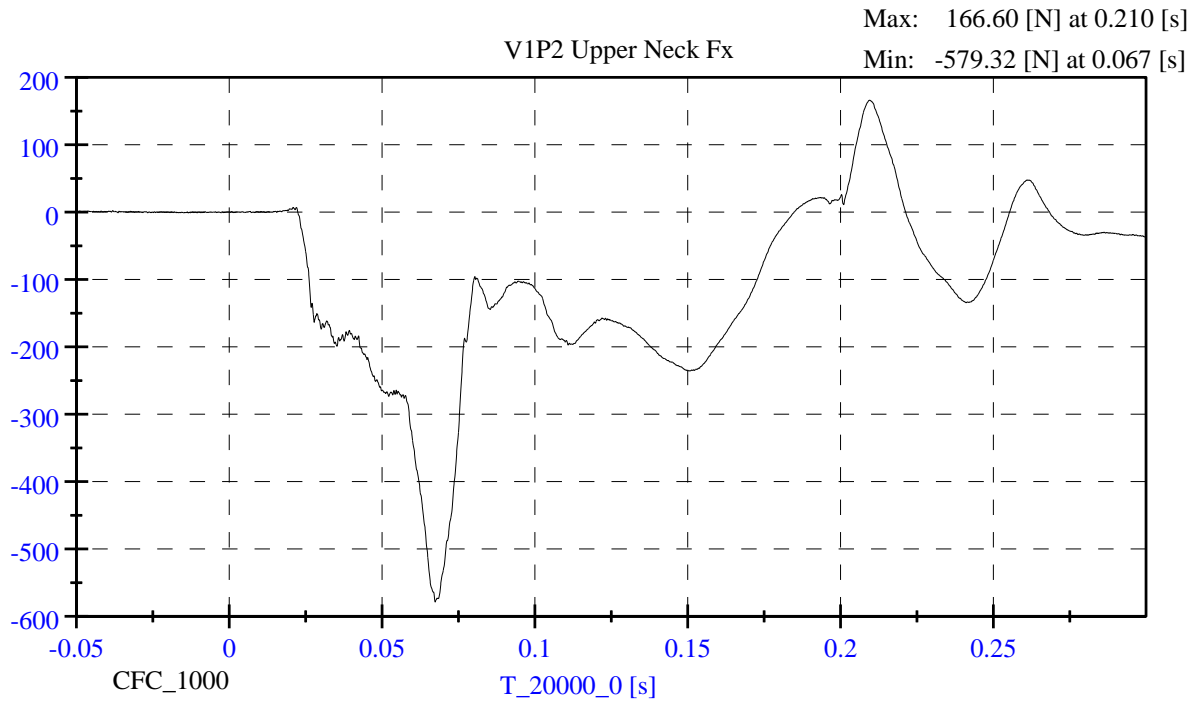


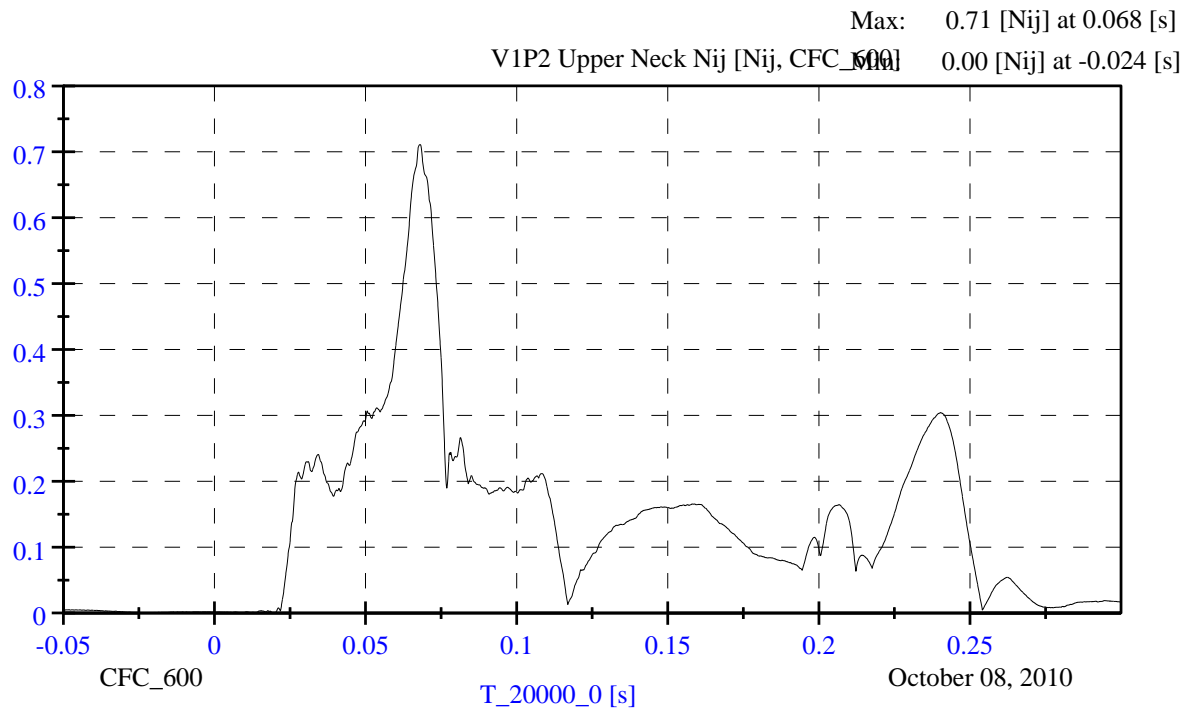
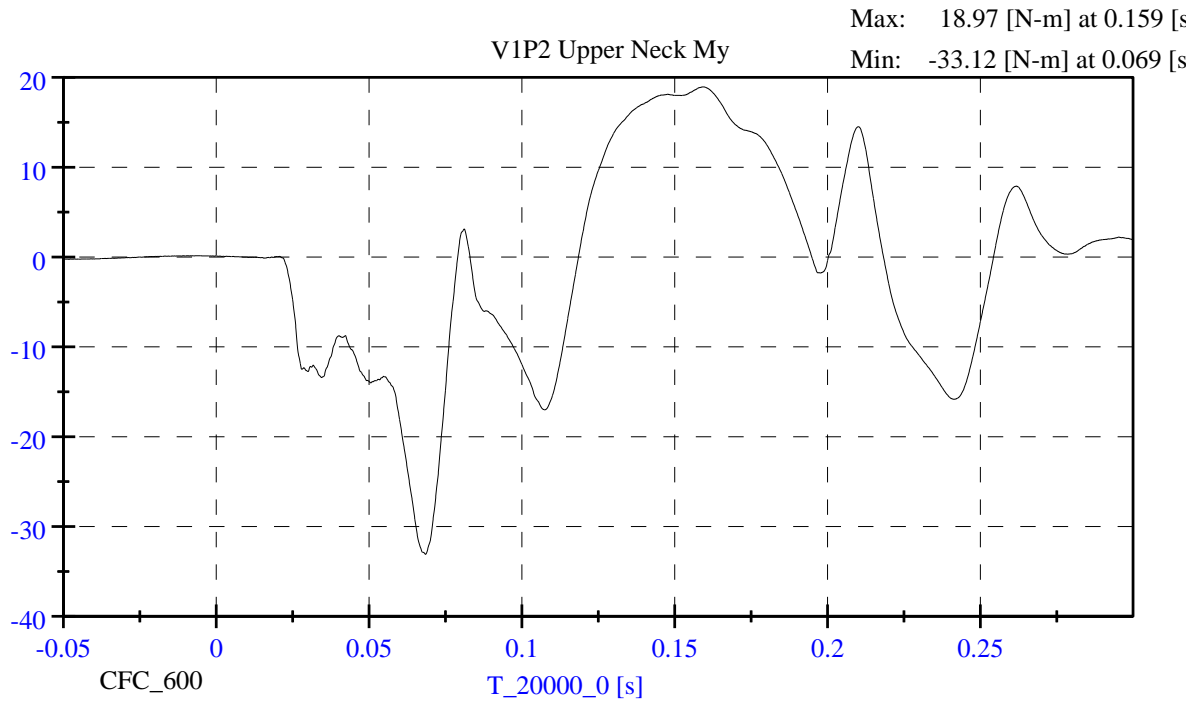


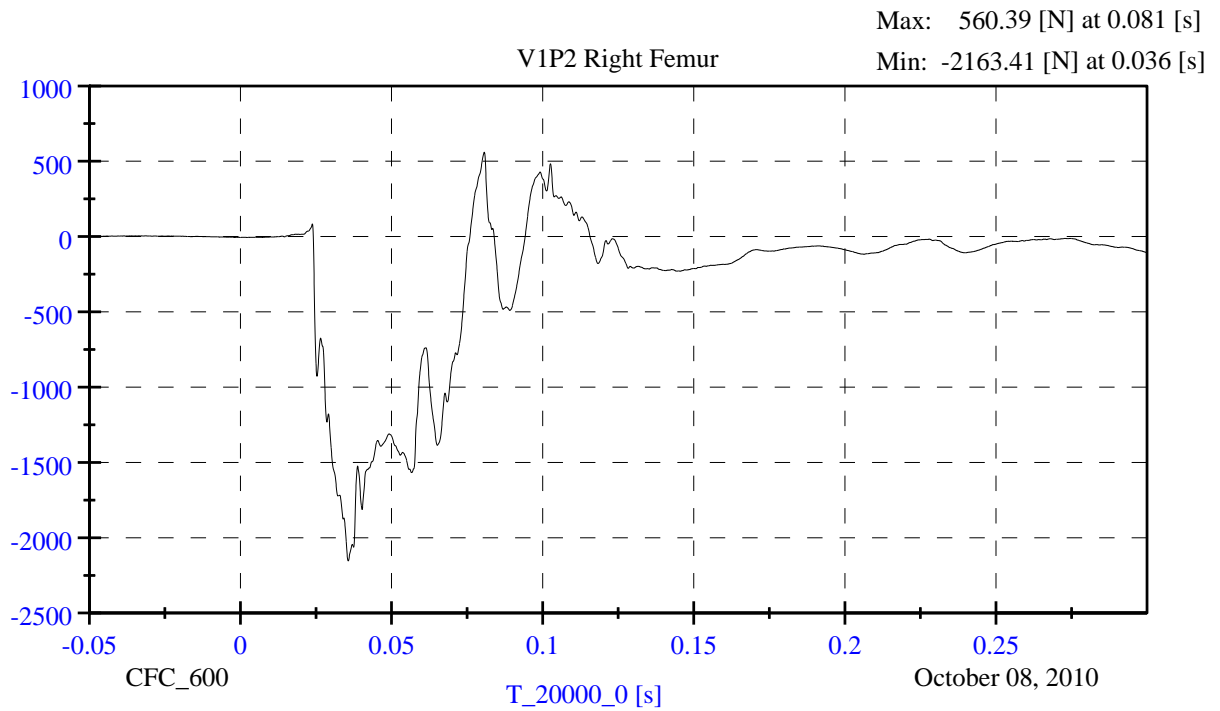
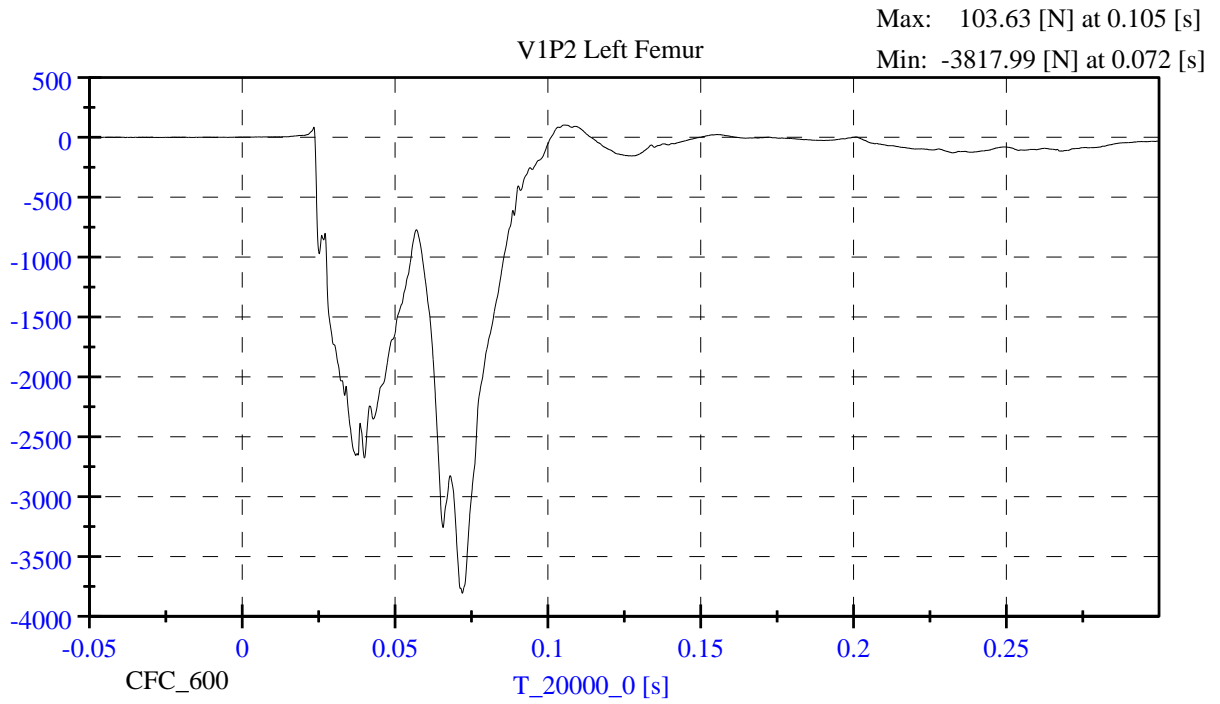
2011 NCAP 2011 Ram 1500 Crew Cab











APPENDIX C

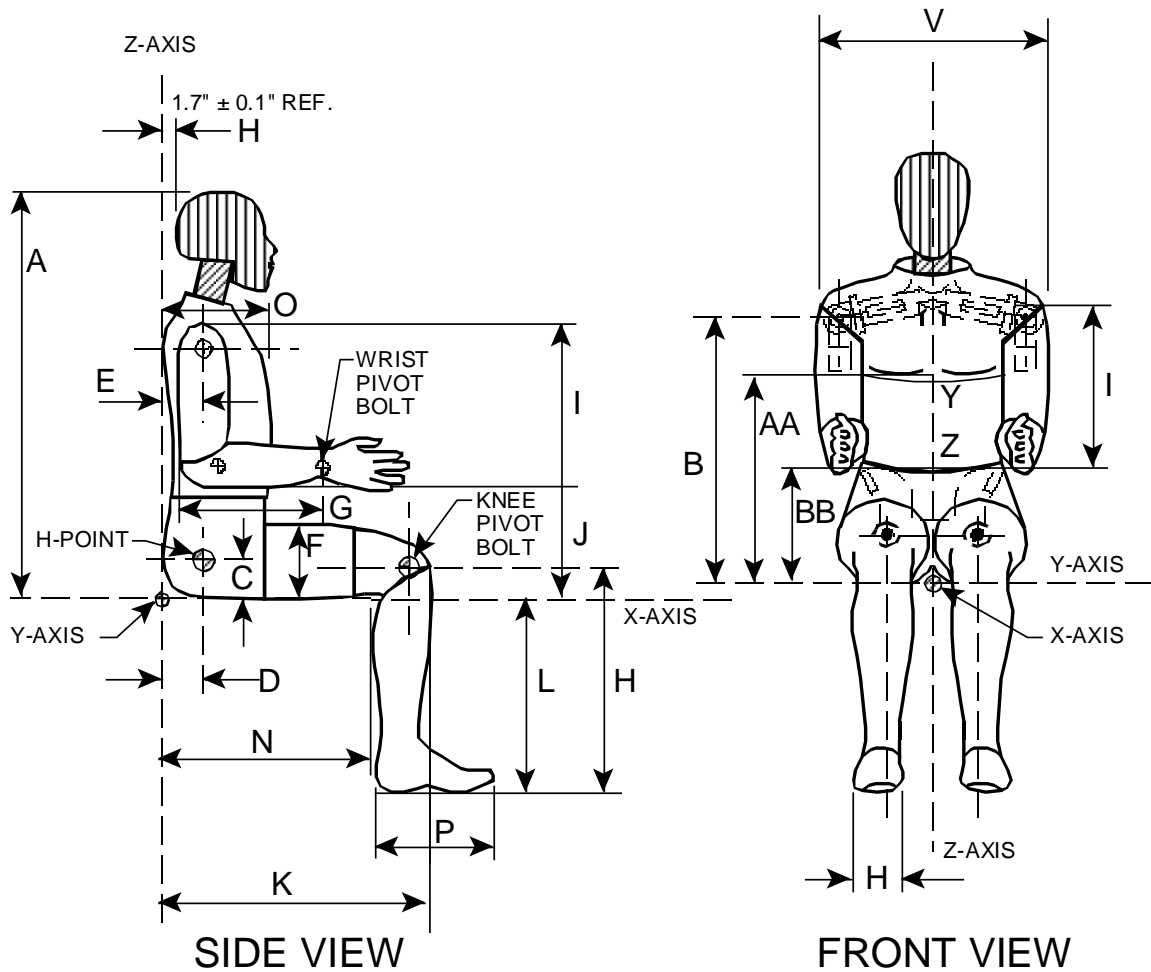
**PART 572 E/O DUMMY CONFIGURATION
AND PERFORMANCE VERIFICATION DATA SHEETS**

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:

<u>Position No./Location</u>	<u>Serial No.</u>	<u>Completion Date</u>
#1/Driver	061	
#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: 061

50th Male External Measurements

SN 061

Symbol	Description	Specification	Results	Pass
		in	in	
A	Sitting Height	34.6 - 35	34.7	Yes
B	Shoulder Pivot Height	19.9 - 20.5	2.04	Yes
C	H-Point Height	3.3 - 3.5	3.5	Yes
D	H-Point from Backline	5.3 - 5.5	5.3	Yes
E	Shoulder Pivot from Backline	3.3 - 3.7	3.7	Yes
F	Thigh Clearance	5.5 - 6.1	6.1	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	13.2	Yes
J	Elbow Rest Height	7.5 - 8.3	8.0	Yes
K	Buttock to Knee Length	22.8 - 23.8	23.4	Yes
L	Popliteal Height	16.9 - 17.9	17.5	Yes
M	Knee Pivot Height	19.1 - 19.7	19.2	Yes
N	Buttock Popliteal Length	17.8 - 18.8	18.7	Yes
O	Chest Depth without Jacket	8.4 - 9.0	8.5	Yes
P	Foot Length (right)	9.9 - 10.5	10.1	Yes
V	Shoulder Breadth	16.3 - 17.2	16.8	Yes
W	Foot Breadth	3.6 - 4.2	3.9	Yes
Y	Chest Circumference with Jacket	38.2 - 39.4	38.5	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: 10/7/2010



www.calspan.com

Calspan - Transportation Research Group

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:	061		
Test ID:	Head Drop	Test Date:	10/6/2010
Test Number:	1	Test Time:	10:30:21 AM

Component Part Number	Component Serial Number
Head Skin - 78051-228	243

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10 -- 70	50 %RH P
Resultant Acceleration	225 -- 275	265 g P
Oscillation	0.0 -- 10.0	8.3 % P
Lateral Acceleration	-15.00 -- 15.00	10.64 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Head Drop**

Test Time: **10:30:21 AM**

Test Date: **10/6/2010**



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4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P66943	7/27/2010
Endevco	7264-2000	P66931	4/20/2010
Endevco	7264-2000	P66926	4/20/2010

Test ID: **Head Drop**

Test Time: **10:30:21 AM**

Test Date: **10/6/2010**



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Calspan - Transportation Research Group

4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

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:	061		
Test ID:	Neck Extension	Test Date:	10/6/2010
Test Number:	1	Test Time:	12:45:14 PM

Component Part Number	Component Serial Number
Neck - 78051-336	4194

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	48 %RH P
Velocity	5.94 -- 6.19	6.14 m/s P
Pendulum Deceleration at 10 ms	17.2 -- 21.2	19.0 g P
Pendulum Deceleration at 20 ms	14.0 -- 19.0	16.8 g P
Pendulum Deceleration at 30 ms	11.0 -- 16.0	13.6 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	43.8 ms P
D Plane Rotation	81.0 -- 106.0	93.1 degrees P
Time at Max Rotation	72.0 -- 82.0	79.8 ms P
Rotation Decay to Zero	147.0 -- 174.0	160.7 ms P
Moment About Occipital Condyle	-80.0 -- -52.9	-65.3 Nm P
Time at Max Moment	65.0 -- 79.0	70.5 ms P
Moment Decay to Zero	120.0 -- 148.0	140.3 ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Extension** Test Time: **12:45:14 PM** Test Date: **10/6/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

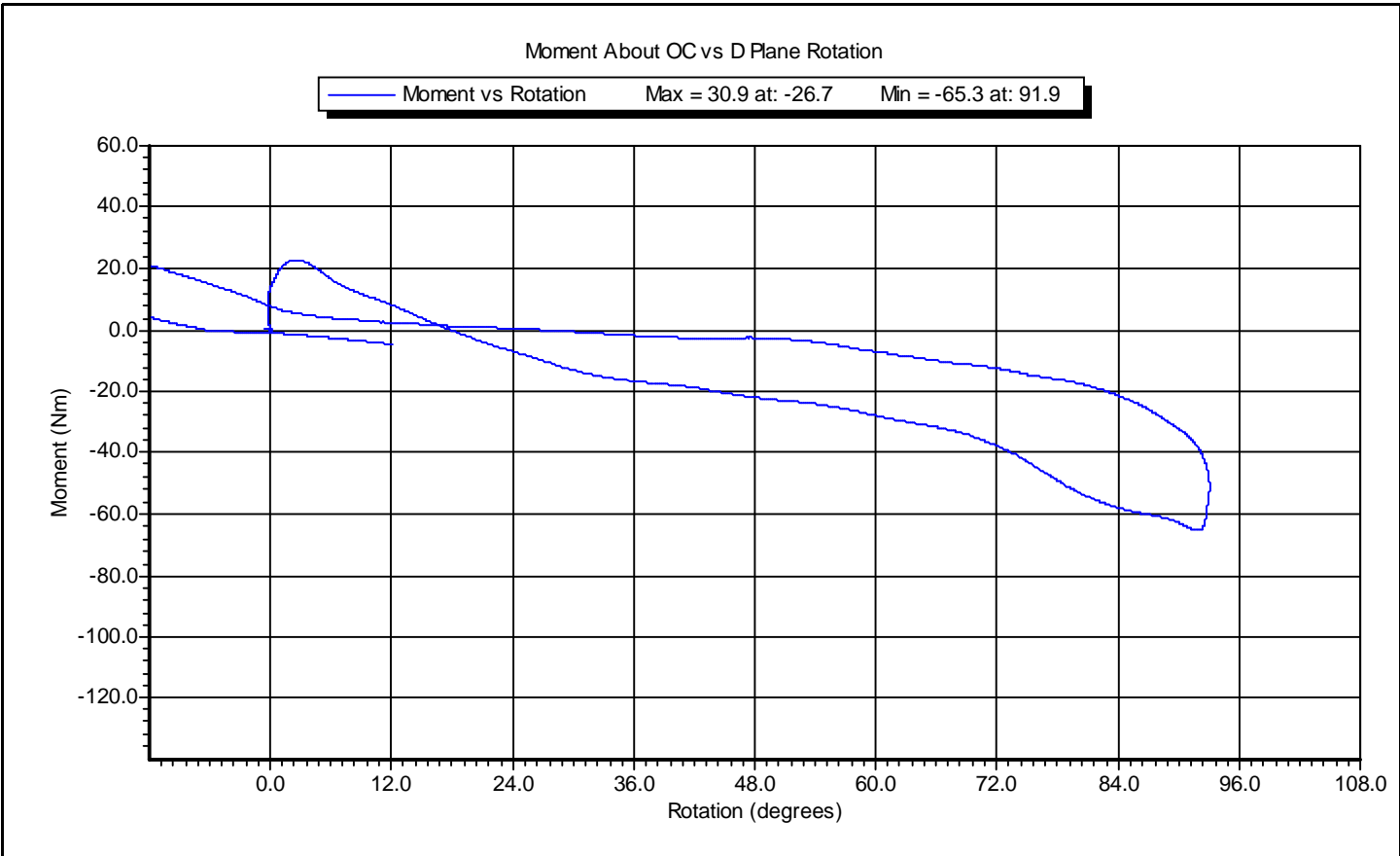
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
DentonATD	78051-342	PENDULUM POT	8/14/2010
DentonATD	78051-342	CONDYLE POT	8/14/2010
Denton	1716A	LC-1916 My	5/18/2010
Denton	1716A	LC-1916 Fx	5/18/2010

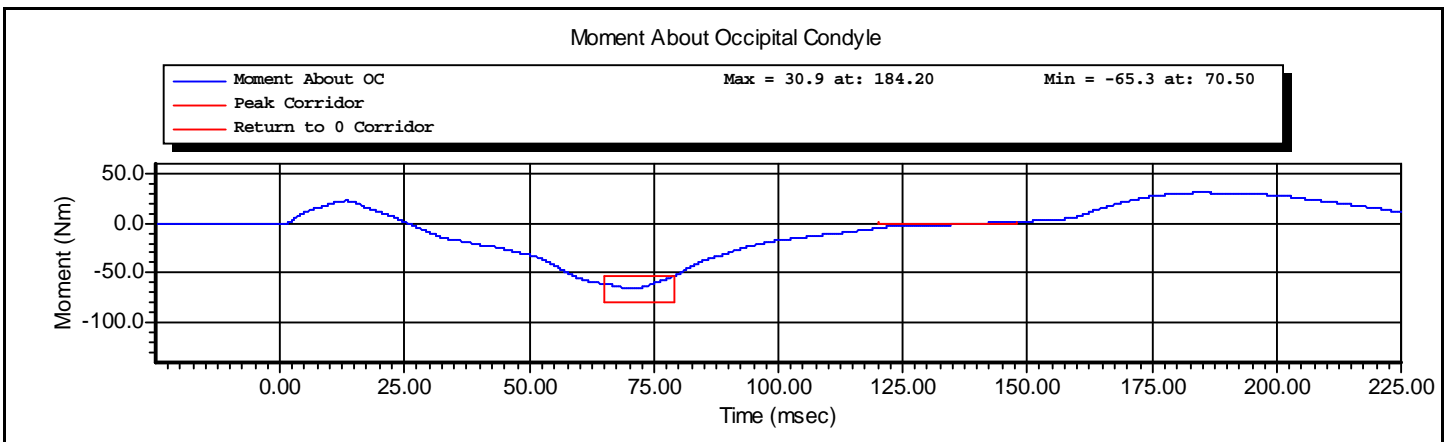
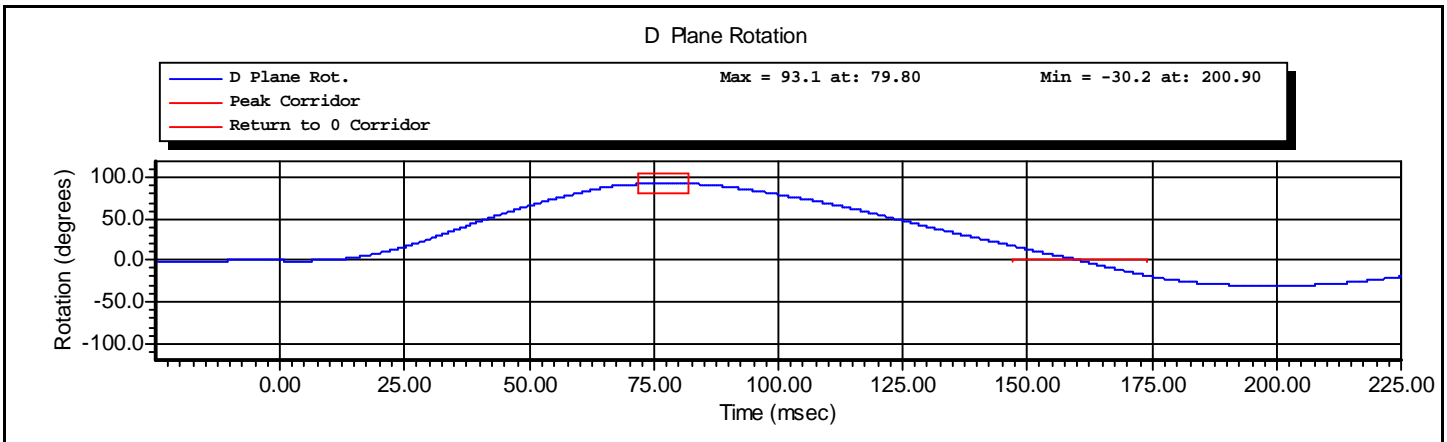
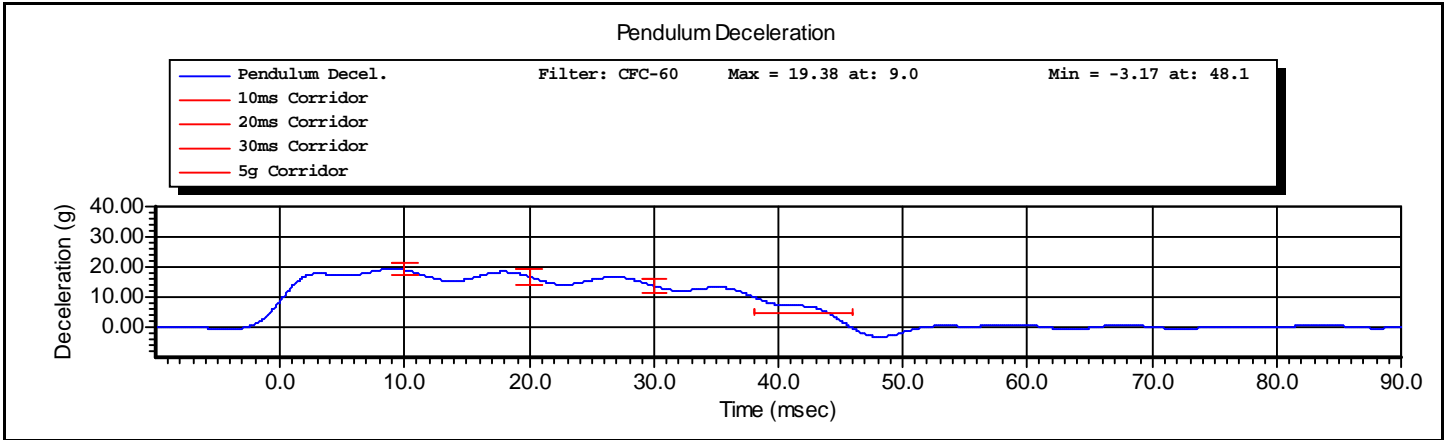
Test ID: **Neck Extension**

Test Time: **12:45:14 PM**

Test Date: **10/6/2010**

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:	061		
ID of Test:	Neck Extension	Date:	10/6/2010
Number of Test:	1	Time of Test:	12:45:14 PM







www.calspan.com

Calspan - Transportation Research Group

4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

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:	061		
Test ID:	Neck Flexion	Test Date:	10/6/2010
Test Number:	1	Test Time:	11:41:33 AM

Component Part Number	Component Serial Number
Neck - 78051-336	4194

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	7.10 m/s	P
Pendulum Deceleration at	10 ms	22.5	-- 27.5	25.5 g	P
Pendulum Deceleration at	20 ms	17.6	-- 22.6	19.4 g	P
Pendulum Deceleration at	30 ms	12.5	-- 18.5	14.0 g	P
Max Pendulum Deceleration After	30 ms	0.0	-- 29.0	14.5 g	P
Deceleration time to	5 g	34.0	-- 42.0	40.0 ms	P
D Plane Rotation		-78.0	-- -64.0	-72.1 degrees	P
Time at max rotation		57.0	-- 64.0	58.9 ms	P
Rotation Decay to Zero		113.0	-- 128.0	118.9 ms	P
Moment about OC		88.1	-- 108.4	102.0 Nm	P
Time at Max Moment		47.0	-- 58.0	53.5 ms	P
Moment Decay to Zero		97.0	-- 107.0	97.5 ms	P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Flexion**

Test Time: **11:41:33 AM**

Test Date: **10/6/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

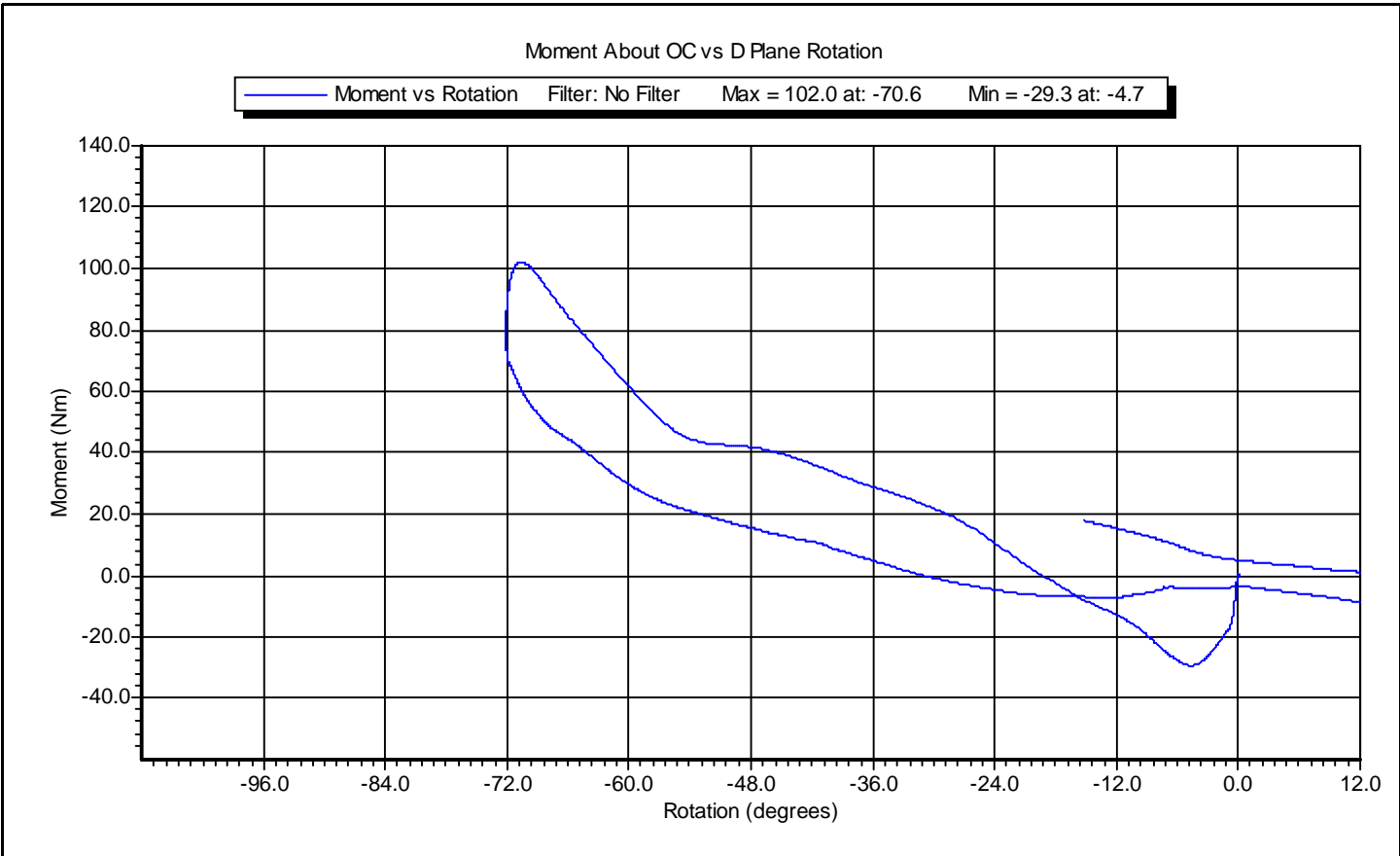
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
DentonATD	78051-342	PENDULUM POT	8/14/2010
DentonATD	78051-342	CONDYLE POT	8/14/2010
Denton	1716A	LC-1916 My	5/18/2010
Denton	1716A	LC-1916 Fx	5/18/2010

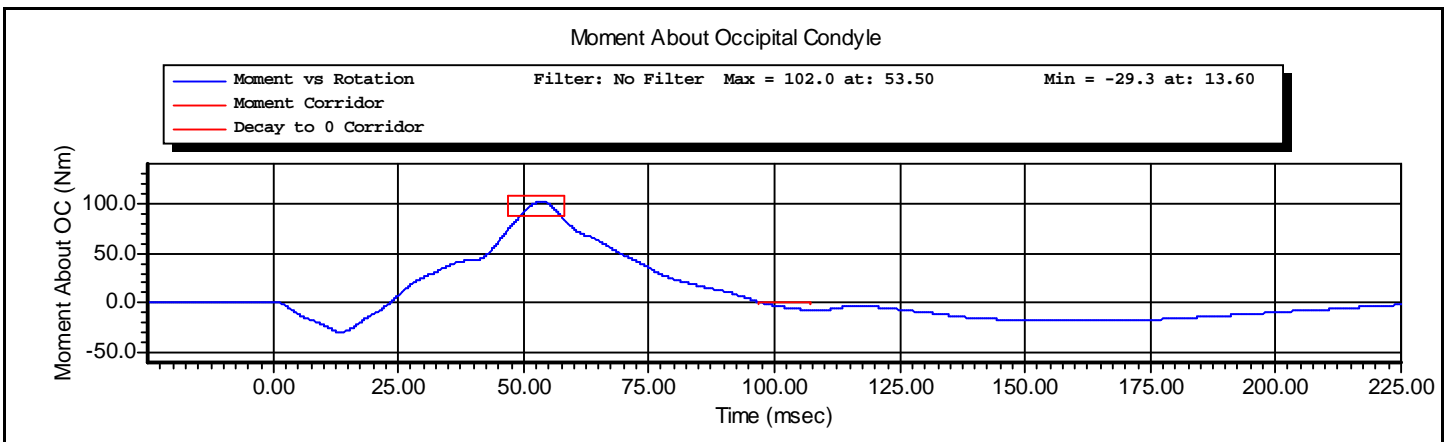
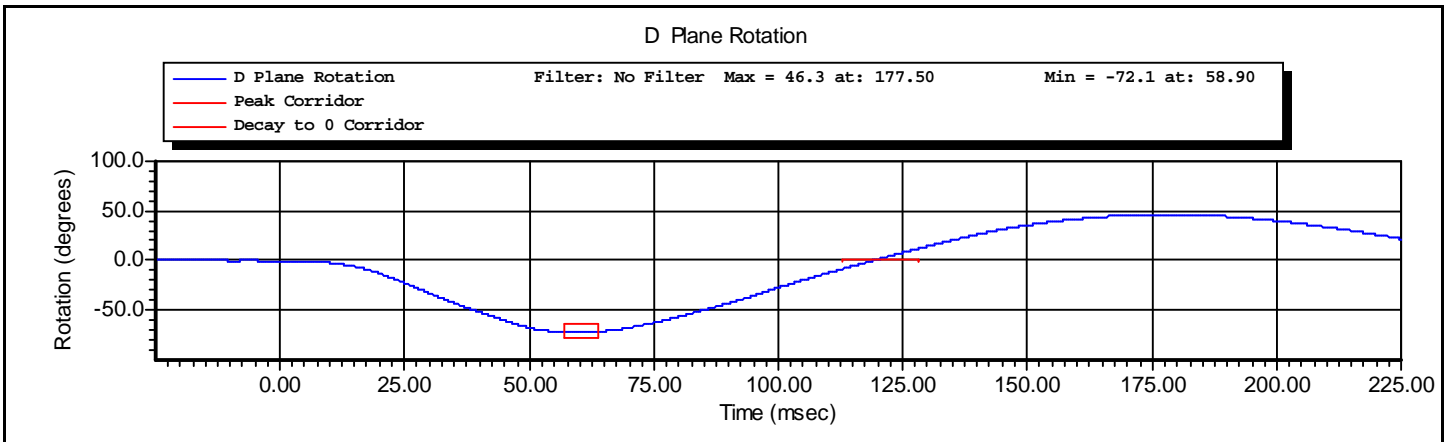
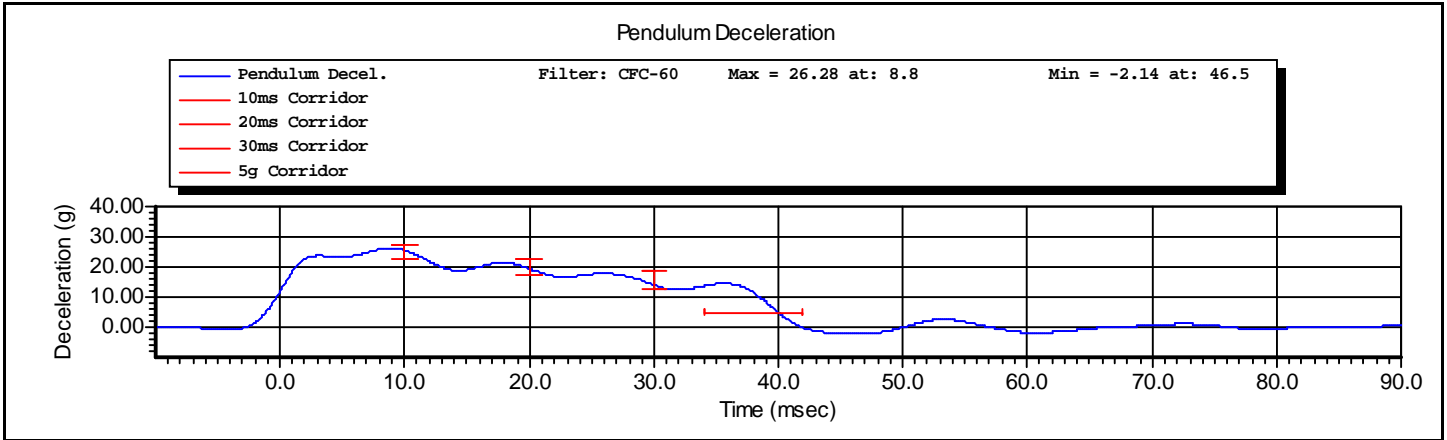
Test ID: **Neck Flexion**

Test Time: **11:41:33 AM**

Test Date: **10/6/2010**

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:	061		
ID of Test:	Neck Flexion	Date:	10/6/2010
Number of Test:	1	Time of Test:	11:41:33 AM







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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:	061		
Test ID:	Thorax	Test Date:	10/5/2010
Test Number:	1	Test Time:	1:27:02 PM

Component Part Number	Component Serial Number
Ribs 78051-RS	4273
Chest Jacket - 78051-169	2437

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	42.0 %RH P
Velocity	6.59 -- 6.83	6.73 m/s P
Resistive Force	-5.894 -- -5.160	-5.539 kN P
Sternum Displacement	-72.6 -- -63.5	-68.8 mm P
Hysteresis	69 -- 85	73 % P

All test parameters are within specifications

Technician: **S. Zito** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Thorax**

Test Time: **1:27:02 PM**

Test Date: **10/5/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

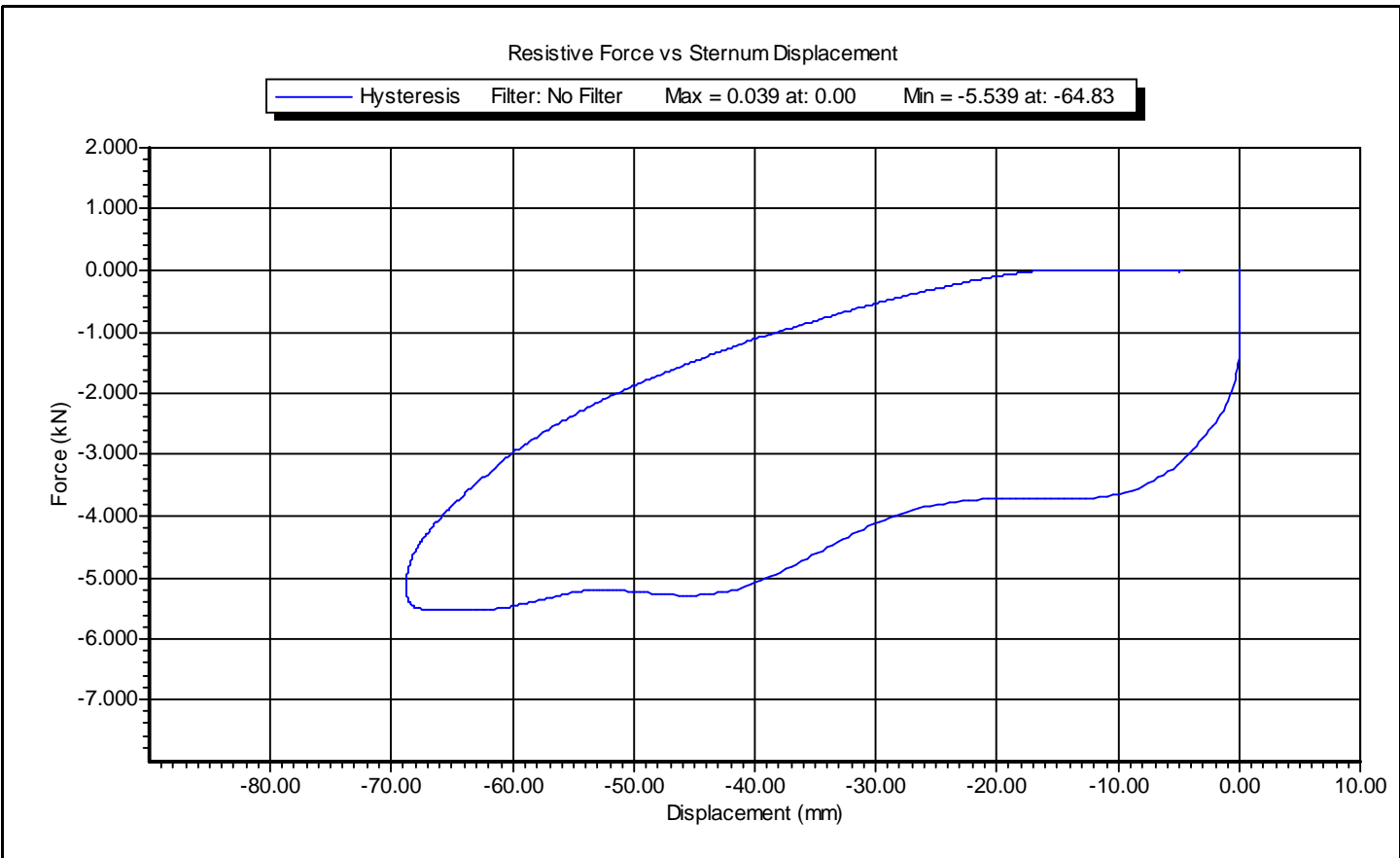
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
DentonATD	78051-342	DS-061	6/1/2010

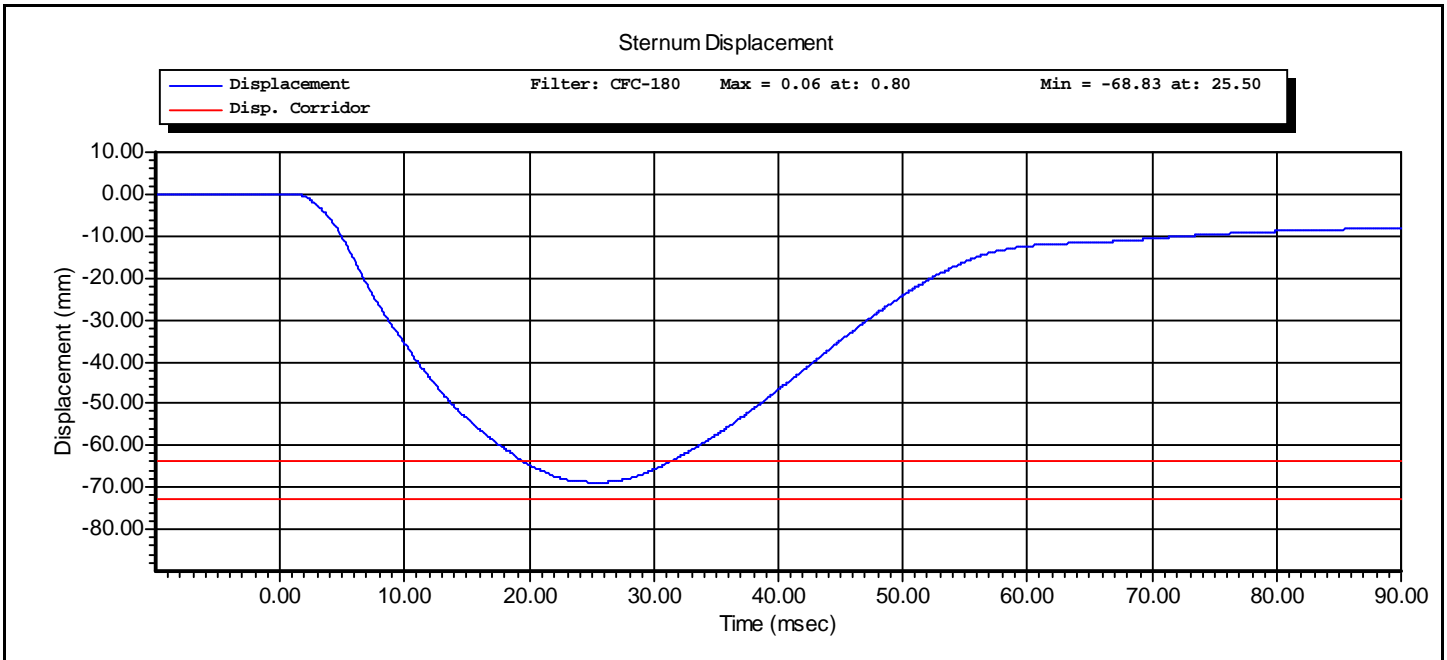
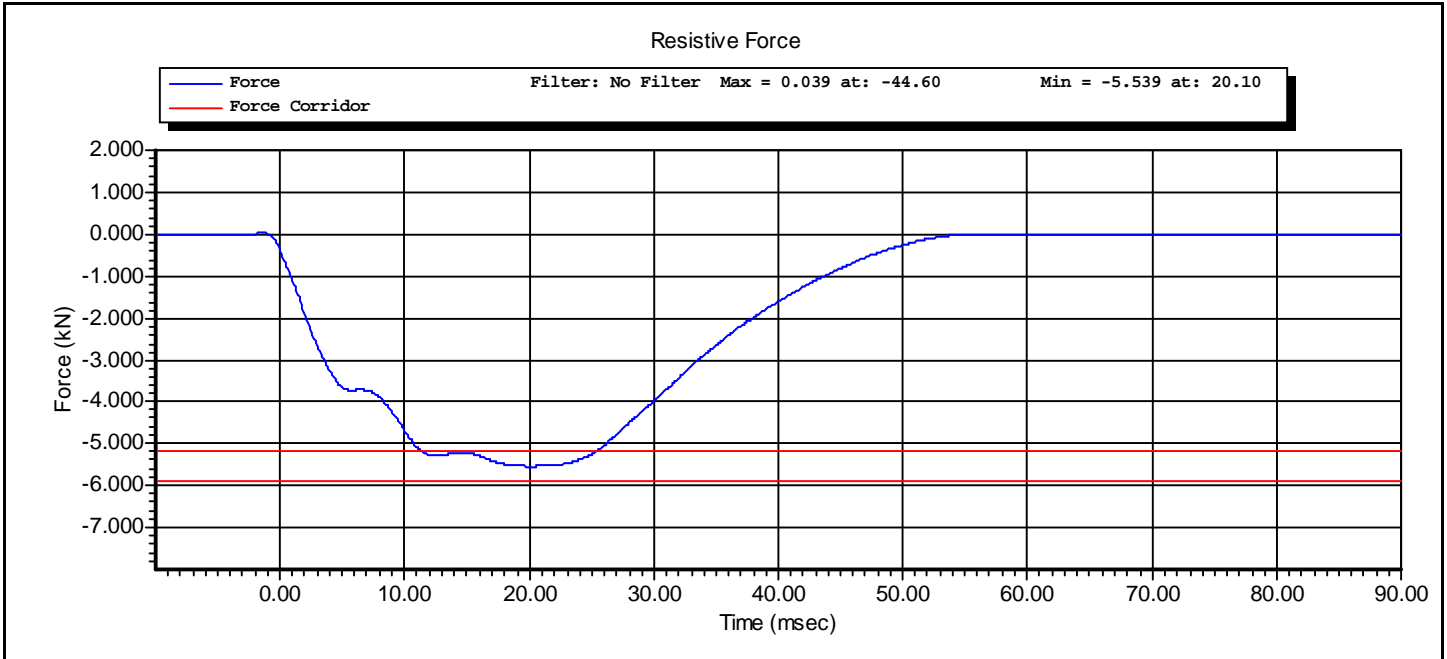
Test ID: **Thorax**

Test Time: **1:27:02 PM**

Test Date: **10/5/2010**

Test Name:	Thorax Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Thorax	Test Date:	10/5/2010
Test Number:	1	Test Time:	1:27:02 PM





CALSPAN

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

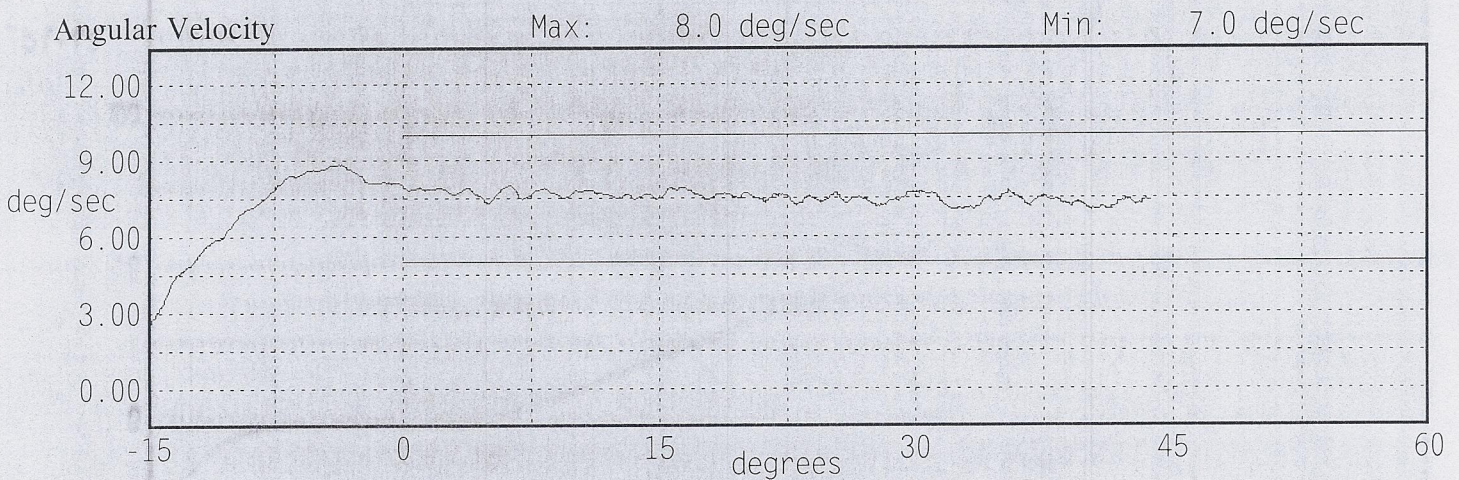
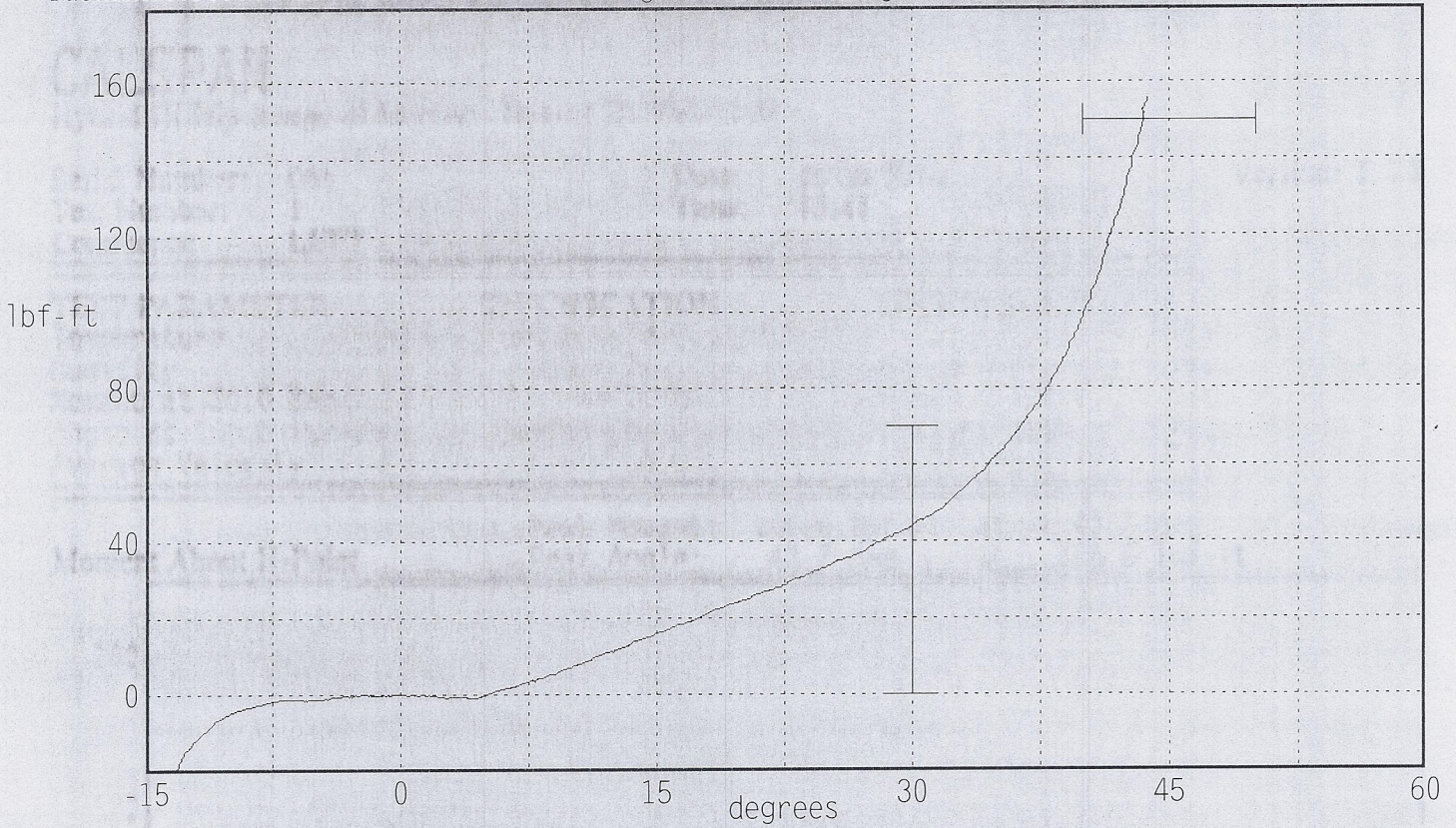
Serial Number: 061
Test Number: 1
Comments: LEFT

Date: 10/06/2010
Time: 15:41

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	44.3 lbf-ft Pass
Angle at 150.0 lbf-ft	40.0 - 50.0	43.5 deg Pass
Average Velocity	5.0 - 10.0	7.5 deg/sec Pass

Moment About H-Point
Peak Moment: 155.6 lbf-ft at 43.7 deg
Peak Angle: 43.7 deg at 155.6 lbf-ft



CALSPAN

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

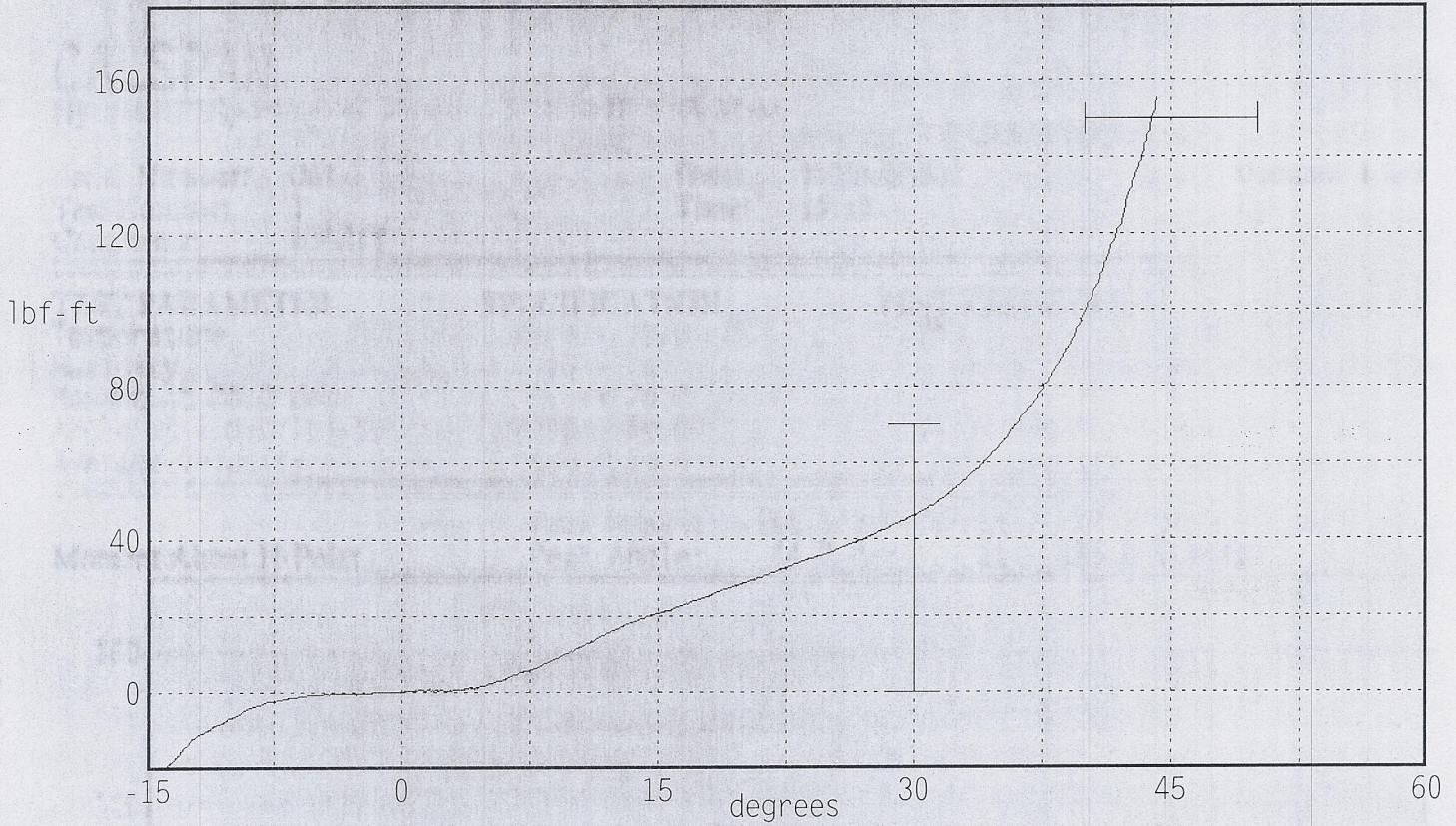
Serial Number: 061
Test Number: 1
Comments: RIGHT

Date: 10/06/2010
Time: 15:32

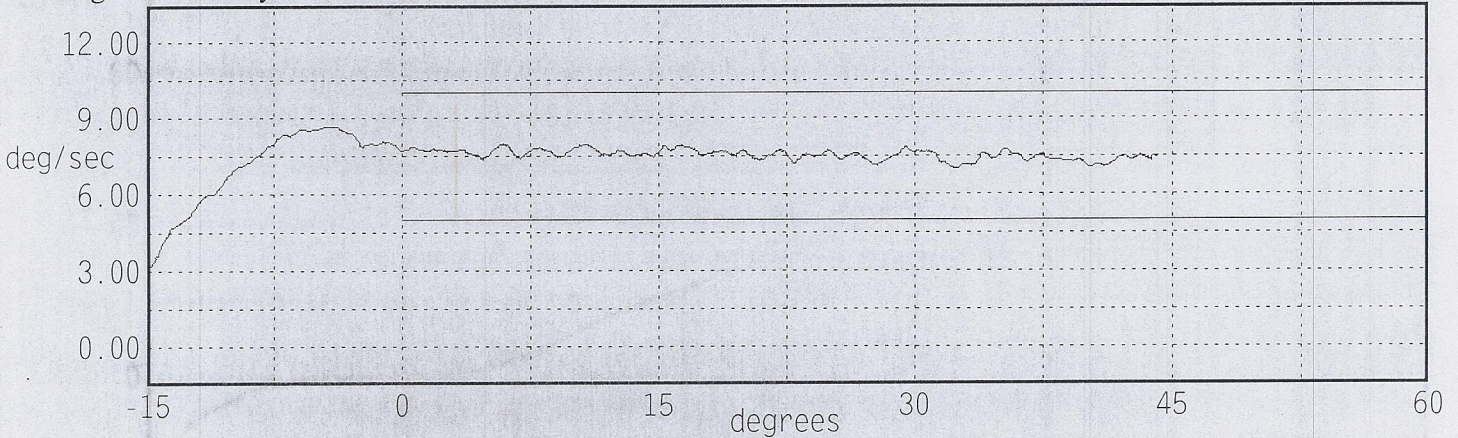
Version: 1.6.3

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	46.2 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: 155.3 lbf-ft at 44.2 deg
Peak Angle: 44.2 deg at 155.3 lbf-ft



Angular Velocity Max: 8.0 deg/sec Min: 7.0 deg/sec





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VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Left Knee	Test Date:	10/6/2010
Test Number:	1	Test Time:	3:54:08 PM

Component Part Number	Component Serial Number
Knee Skin - 78051(L) or 6(R)	077

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10.0 -- 70.0	49.0 %RH P
Velocity	2.07 -- 2.13	2.08 m/s P
Resistive Force	-5.78 -- -4.72	-5.00 kN P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Left Knee**

Test Time: **3:54:08 PM**

Test Date: **10/6/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

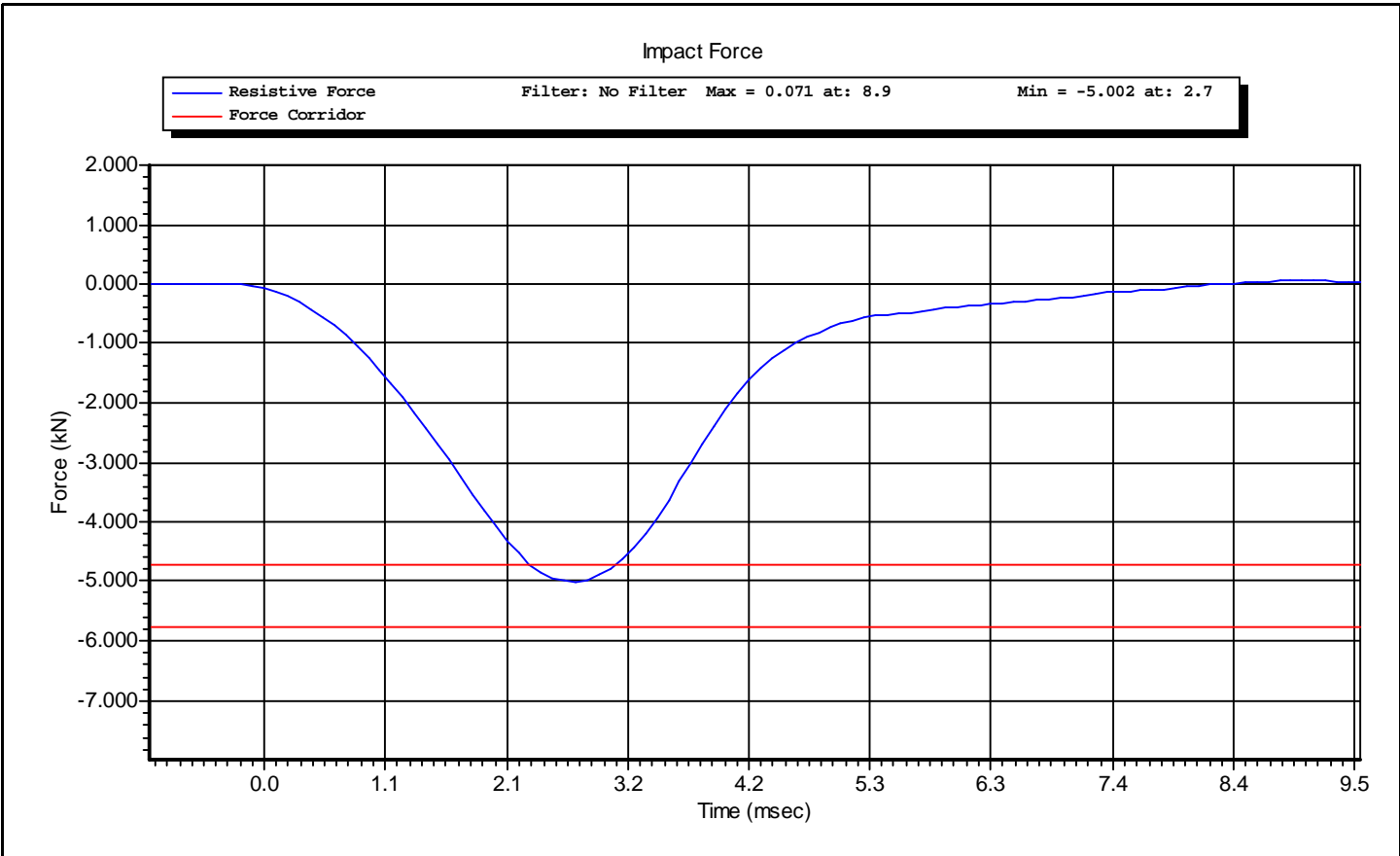
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
CEC	4-202	AC-A44	8/26/2010

Test ID: **Left Knee**

Test Time: **3:54:08 PM**

Test Date: **10/6/2010**

Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Left Knee	Test Date:	10/6/2010
Test Number:	1	Test Time:	3:54:08 PM





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VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Right Knee	Test Date:	10/6/2010
Test Number:	1	Test Time:	4:48:27 PM

Component Part Number	Component Serial Number
Knee Skin - 78051(L) or 6(R)	3266

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10.0 -- 70.0	49.0 %RH P
Velocity	2.07 -- 2.13	2.10 m/s P
Resistive Force	-5.78 -- -4.72	-5.36 kN P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Right Knee**

Test Time: **4:48:27 PM**

Test Date: **10/6/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
CEC	4-202	AC-A44	8/26/2010

Test ID: **Right Knee**

Test Time: **4:48:27 PM**

Test Date: **10/6/2010**

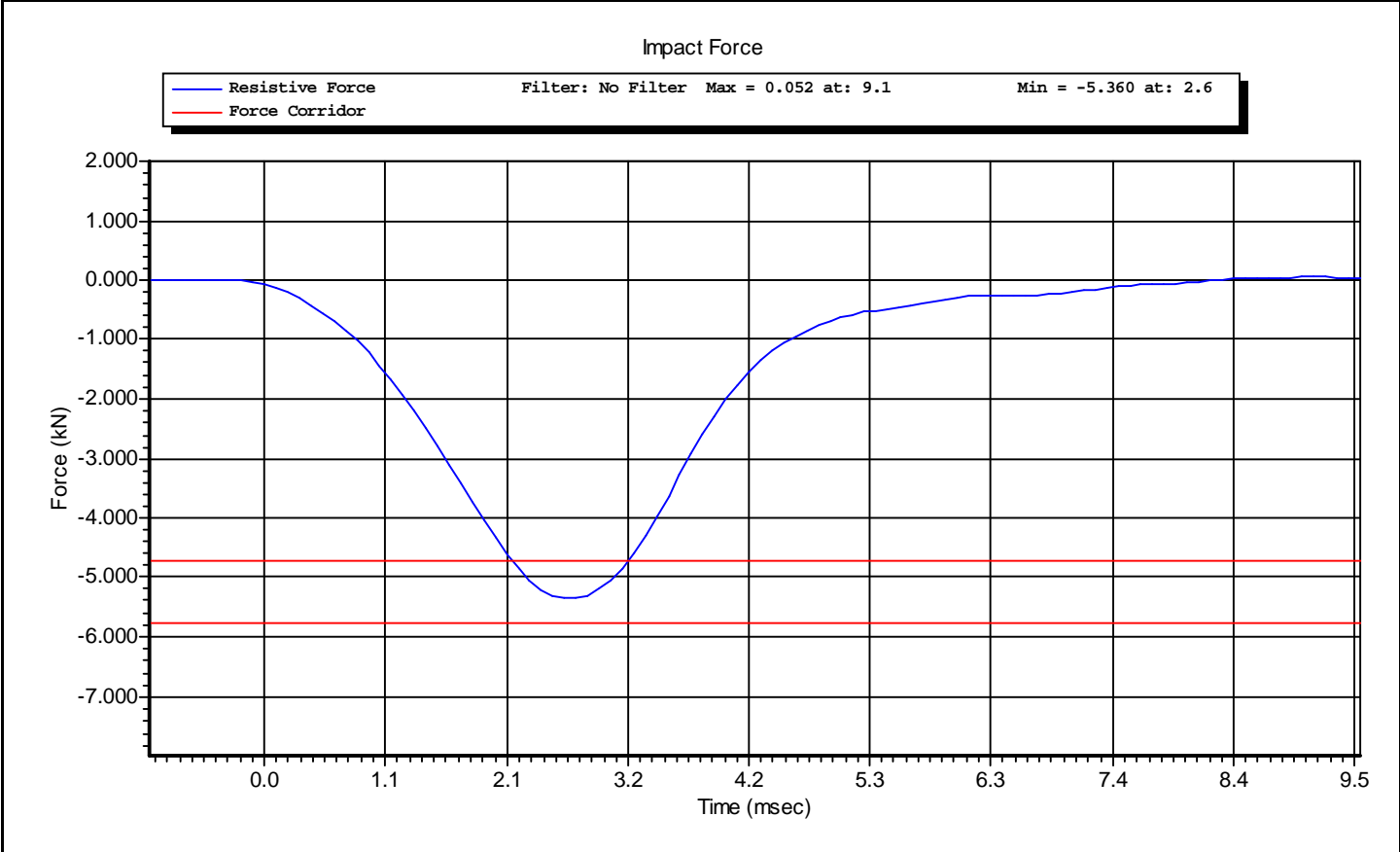


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Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Right Knee	Test Date:	10/6/2010
Test Number:	1	Test Time:	4:48:27 PM



CALIBRATION TEST RESULTS

PRE-TEST

RIGHT-FRONT PASSENGER DUMMY

S/N: 273

External Measurements

5th Female SN 273

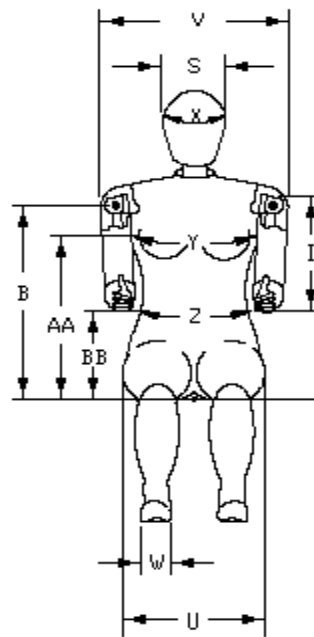
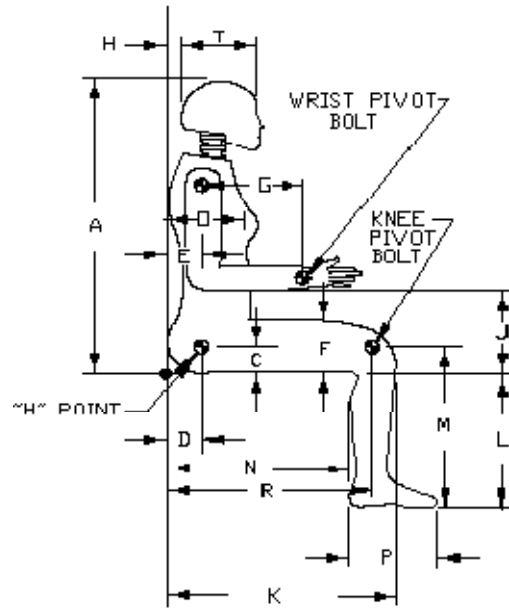
Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	774.7 – 800.1	785	Yes
B	Shoulder Pivot Height	431.8 – 457.2	449	Yes
C	H-Point Height	81.3 – 86.3	85	Yes
D	H-Point from Backline	144.8 – 149.8	148	Yes
E	Shoulder Pivot from Backline	68.6.83.8	78	Yes
F	Thigh Clearance	119.4 – 134.6	128	Yes
G	Back of Elbow to Wrist Pivot	243.9 – 259.1	250	Yes
H	Head Back to Backline	43.2 – 48.2	46	Yes
I	Shoulder to Elbow Length	276.8 – 297.2	282	Yes
J	Elbow Rest Height	182.8 – 203.2	195	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	401	Yes
N	Buttock Popliteal Length	414 – 439.4	425	Yes
O	Chest Depth without Jacket	175.3 – 190.5	184	Yes
P	Foot Length (right)	218.5 – 233.7	222	Yes
R	Buttock To Knee Pivot Length	457.2 – 482.6	479	Yes
S	Head Breadth	137.1 – 147.3	144	Yes
T	Head Depth	177.8 - 188	184	Yes
U	Hip Breadth	299.7 – 314.9	309	Yes
V	Shoulder Breadth	350.5 – 365.7	359	Yes
W	Foot Breadth	78.8 - 94	88	Yes
X	Head Circumference	528.3 – 548.7	539	Yes
Y	Chest Circumference with Jacket	850.9 – 881.3	859	Yes
Z	Waist Circumference	759.5 – 789.9	775	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: 10/7/2010

Hybrid 3 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:	Head Drop	Test Date:	10/7/2010
Test Number:	1	Test Time:	10:34:29 AM

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

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10 -- 70	46 %RH P
Resultant Acceleration	250 -- 300	282 g P
Oscillation	0.0 -- 10.0	9.2 % P
Lateral Acceleration	-15.00 -- 15.00	2.79 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Head Drop**

Test Time: **10:34:29 AM**

Test Date: **10/7/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P66943	7/27/2010
Endevco	7264-2000	P66931	4/20/2010
Endevco	7264-2000	P66926	4/20/2010

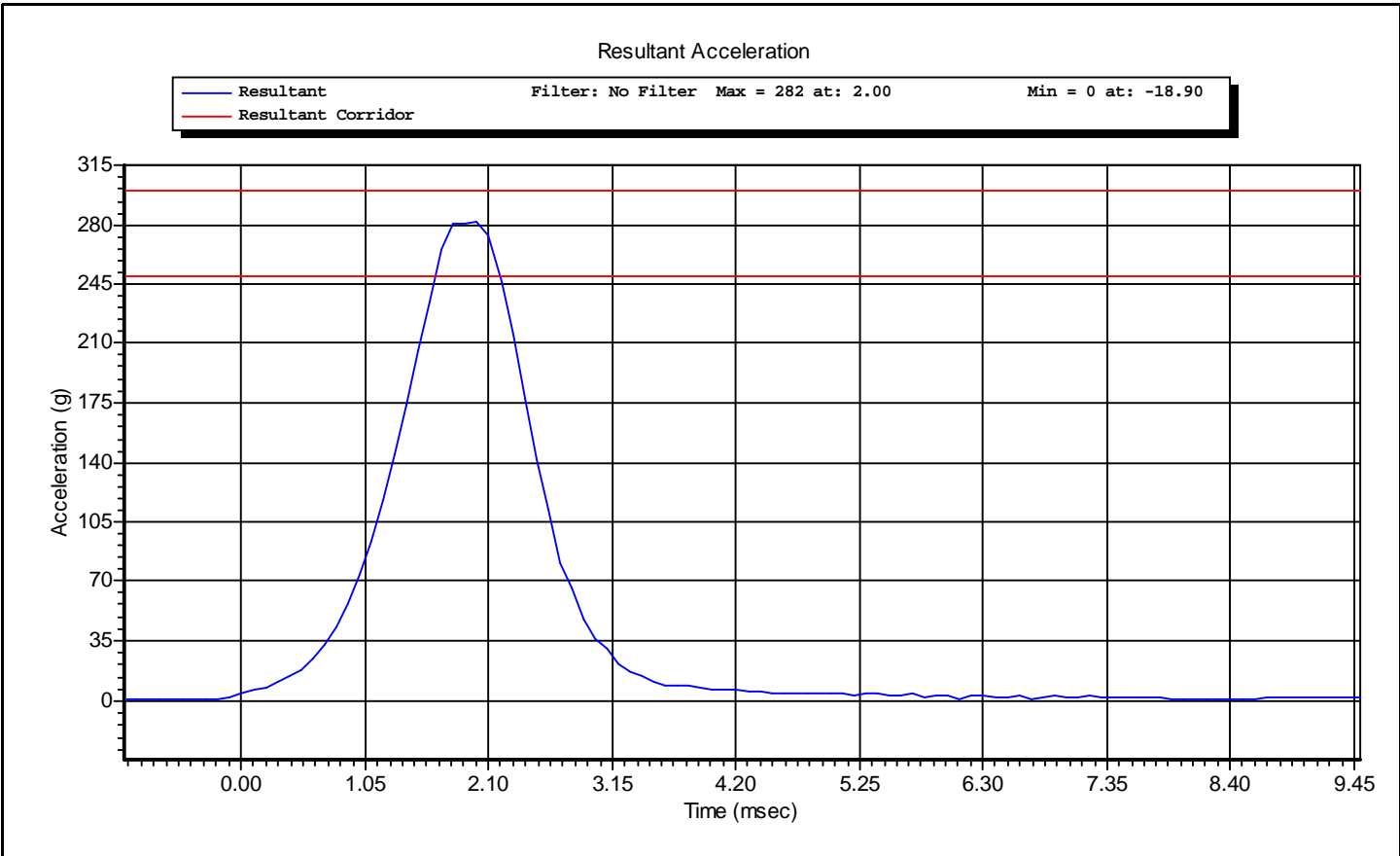
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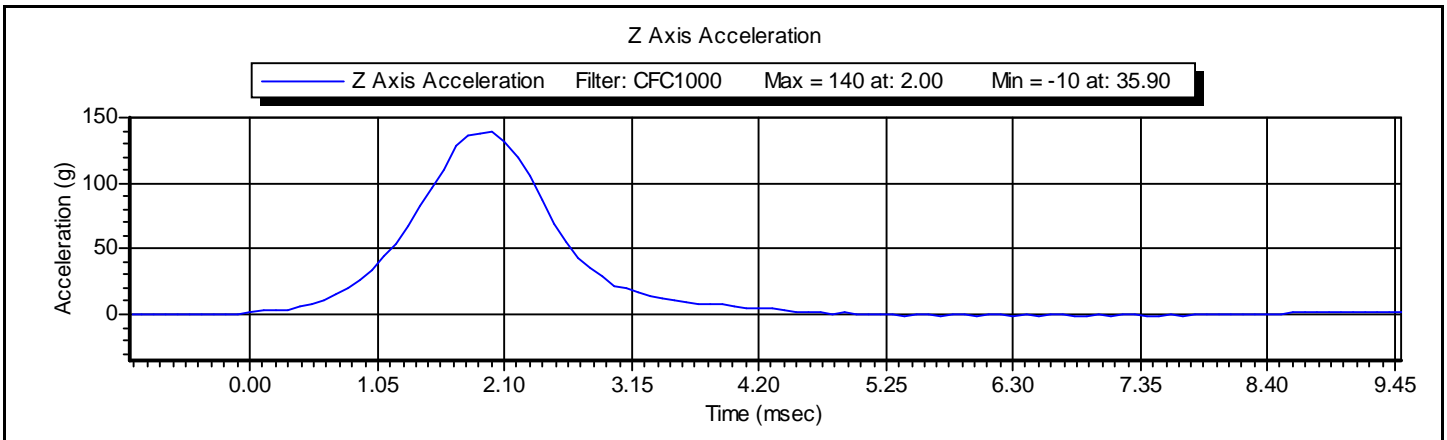
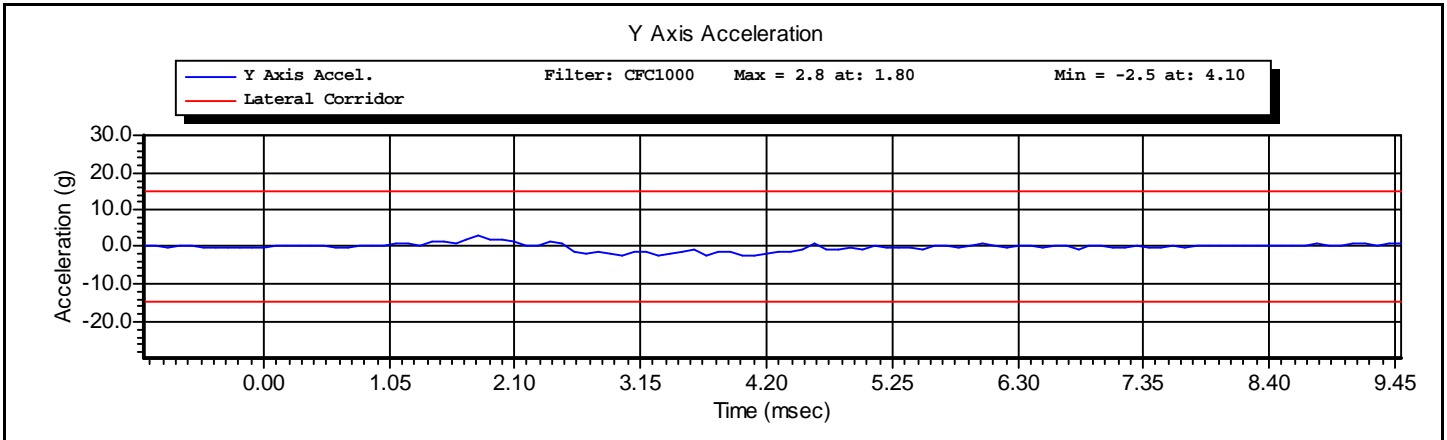
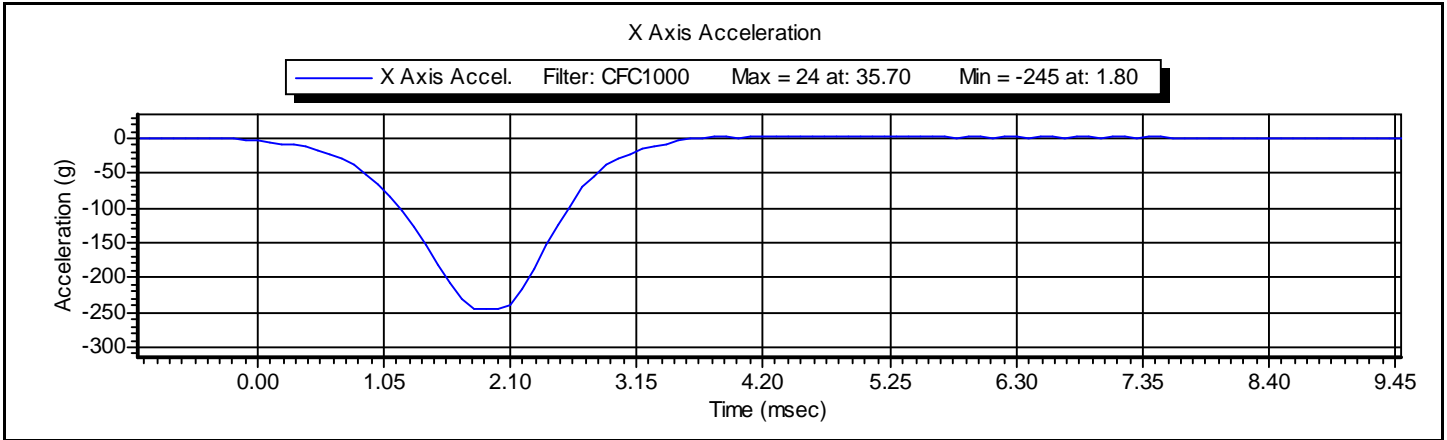
Test Time: **10:34:29 AM**

Test Date: **10/7/2010**



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:	Head Drop	Test Date:	10/7/2010
Test Number:	1	Test Time:	10:34:29 AM







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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:	Neck Extension	Test Date:	10/7/2010
Test Number:	1	Test Time:	1:20:30 PM

Component Part Number	Component Serial Number
Neck - 880105-255	713

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	43 %RH P
Velocity	5.95 -- 6.19	6.08 m/s P
Pendulum Impulse at 10 ms	1.50 -- 1.90	1.88 m/s P
Pendulum Impulse at 20 ms	3.10 -- 3.90	3.67 m/s P
Pendulum Impulse at 30 ms	4.60 -- 5.60	5.28 m/s P
D Plane Rotation	99.0 -- 114.0	108.1 degrees P
Moment During Rotation Interval	-65.0 -- -53.0	-56.2 Nm P
Moment Decay to -10.0 Nm	94.0 -- 114.0	104.5 ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Extension**

Test Time: **1:20:30 PM**

Test Date: **10/7/2010**



VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
DentonATD	78051-342	PENDULUM POT	8/14/2010
DentonATD	78051-342	CONDYLE POT	8/14/2010
Denton	1716A	LC-1632 My	7/14/2010
Denton	1716A	LC-1632 Fx	7/14/2010
Denton	1716A	LC-1632 Fy	7/14/2010
Denton	1716A	LC-1632 Fz	7/14/2010

Test ID: **Neck Extension**

Test Time: **1:20:30 PM**

Test Date: **10/7/2010**

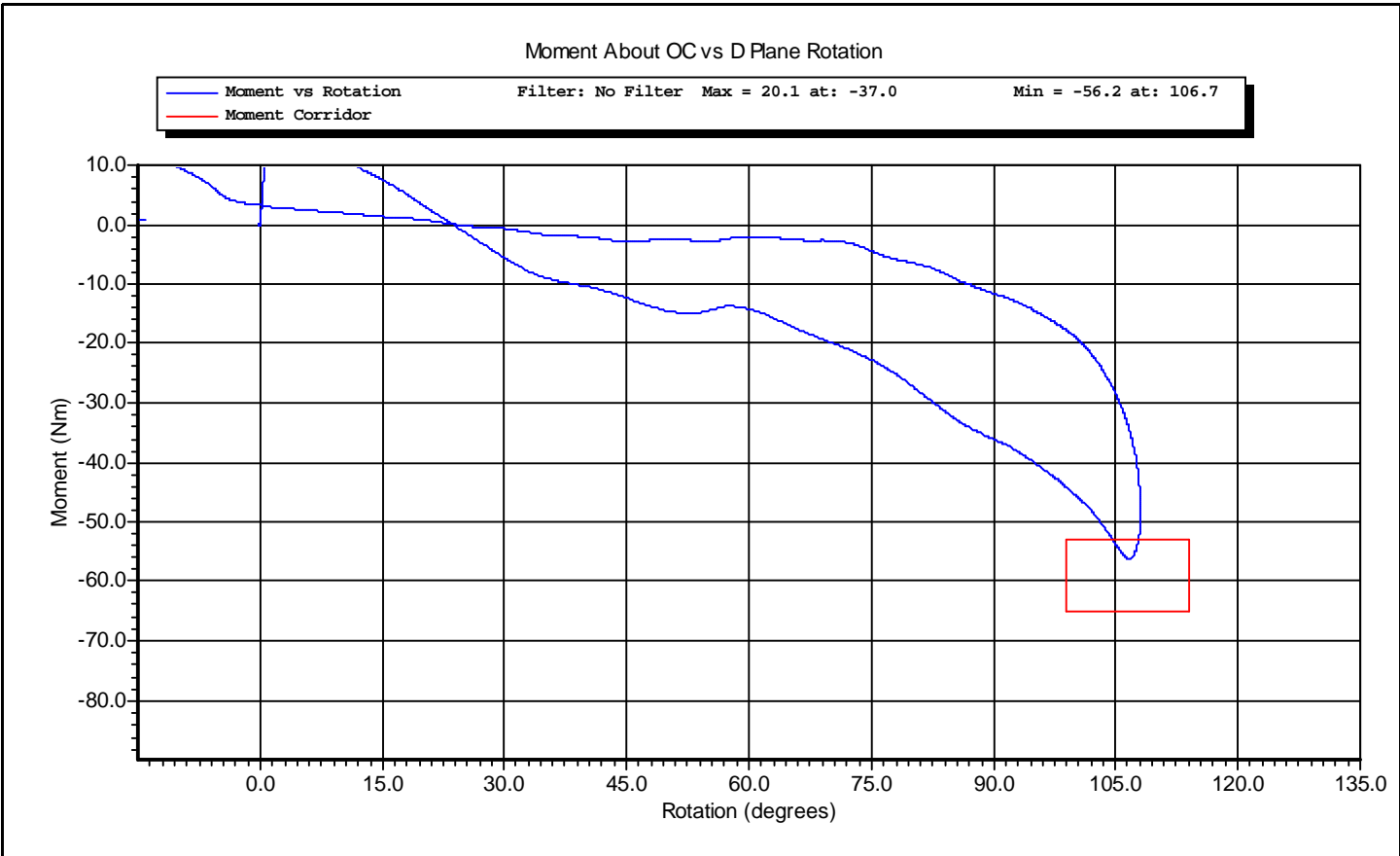


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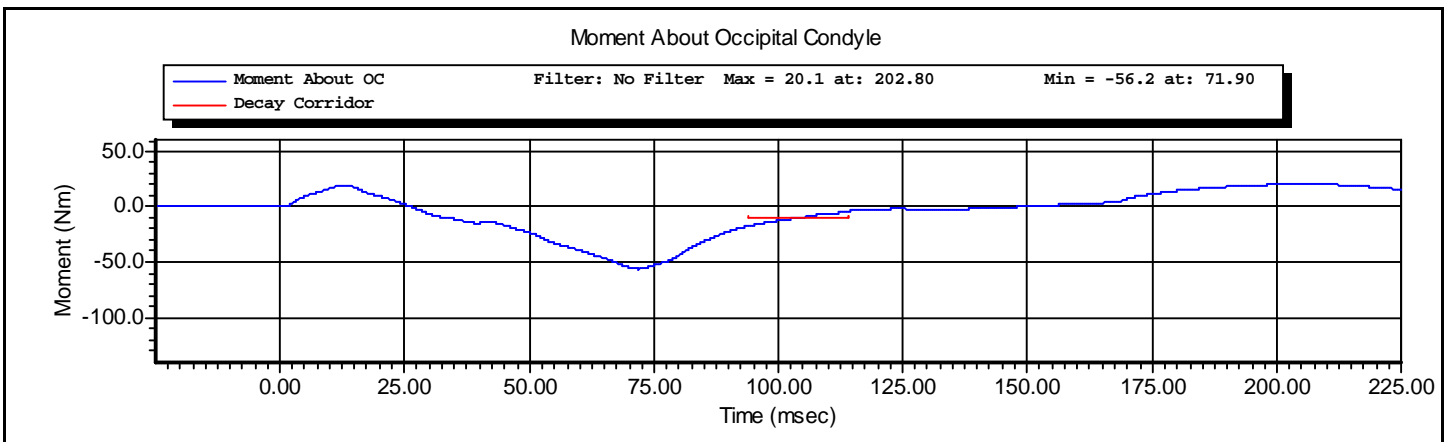
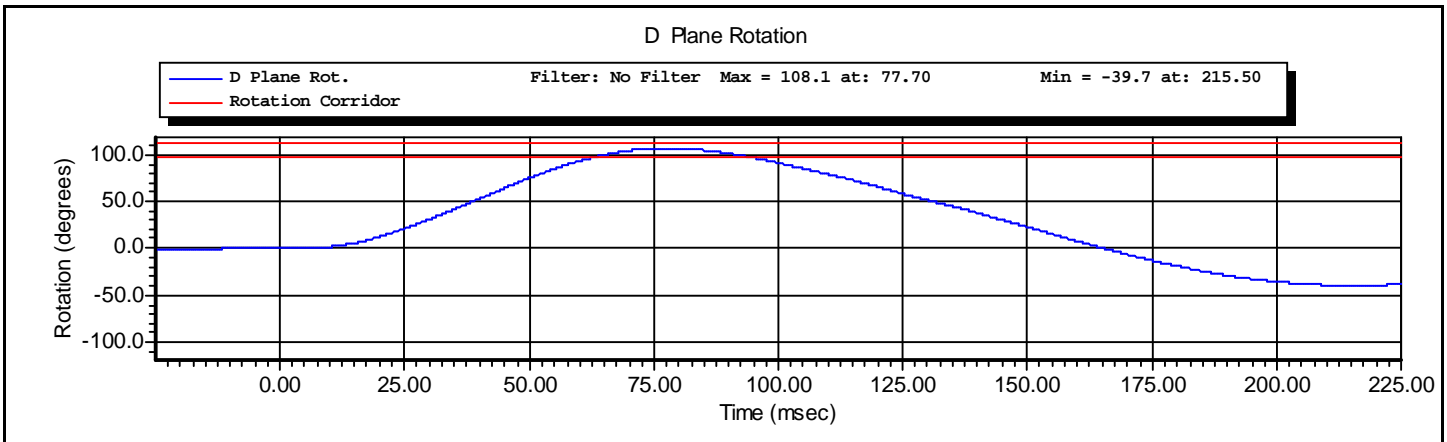
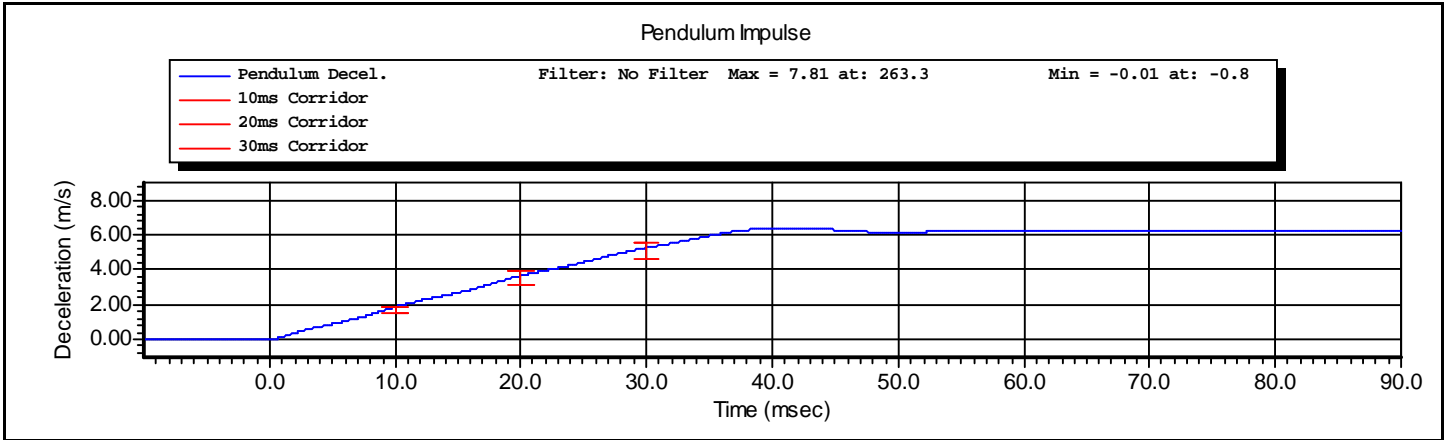
Test Name:	Neck Extension	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	273		
Test ID:	Neck Extension	Test Date:	10/7/2010
Test Number:	1	Test Time:	1:20:30 PM



Test ID: **Neck Extension**

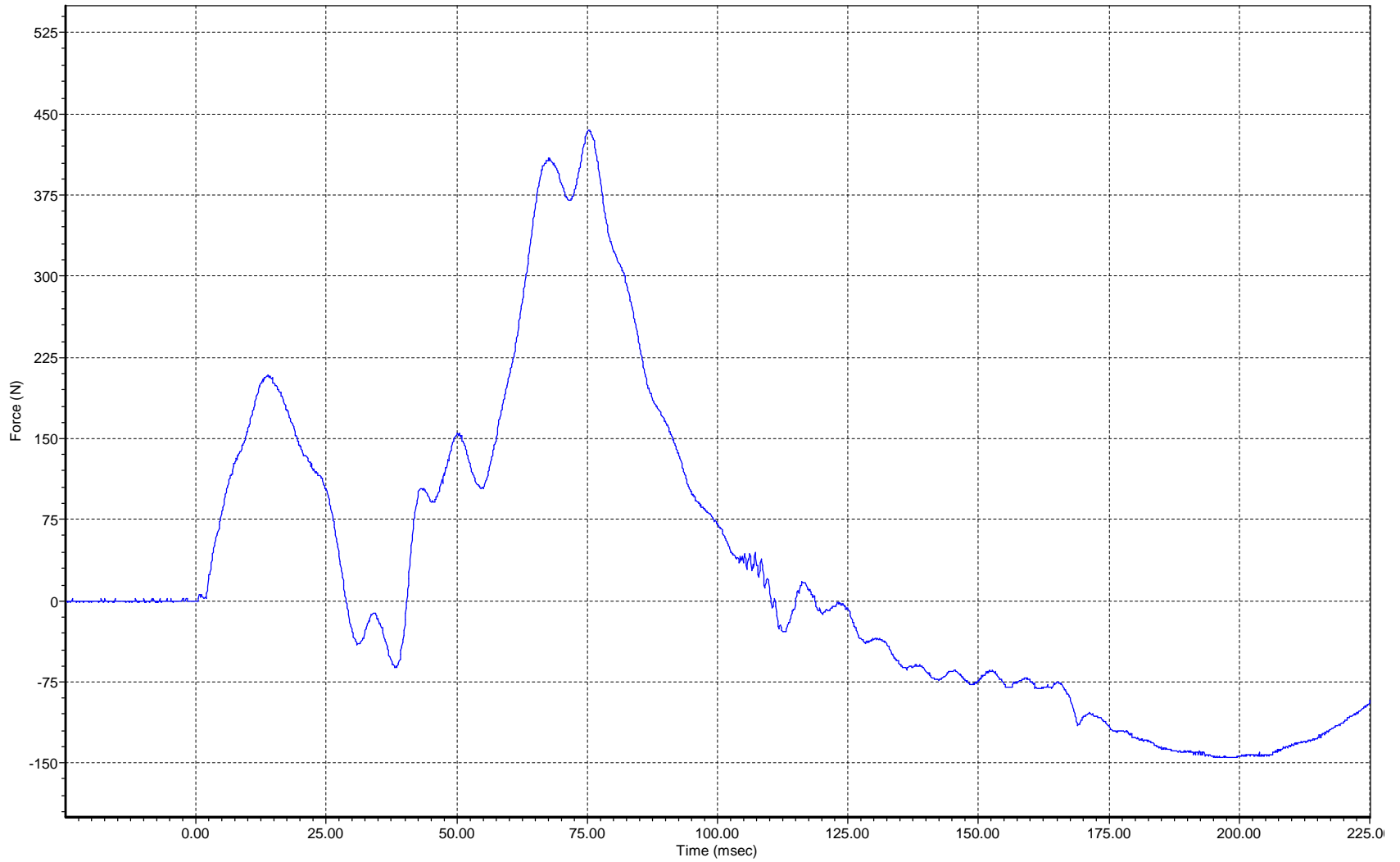
Test Time: **1:20:30 PM**

Test Date: **10/7/2010**



Force X Axis

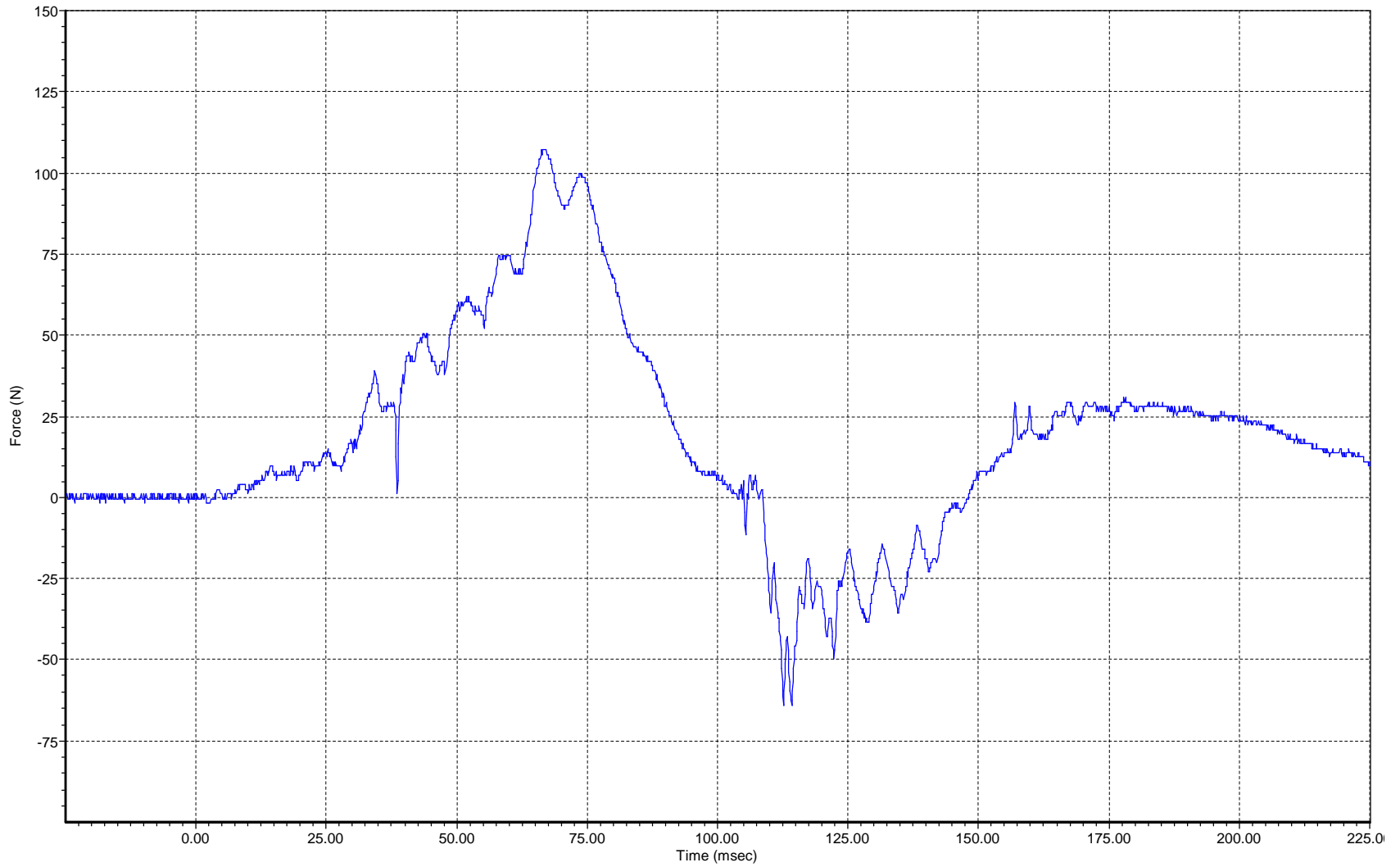
Force Y Axis Filter: CFC1000 Max = 435 at: 75.20 Min = -145 at: 195.10



Hybrid III 5th, Neck Extension, 10/7/2010, 1:20:30 PM

Force Y Axis

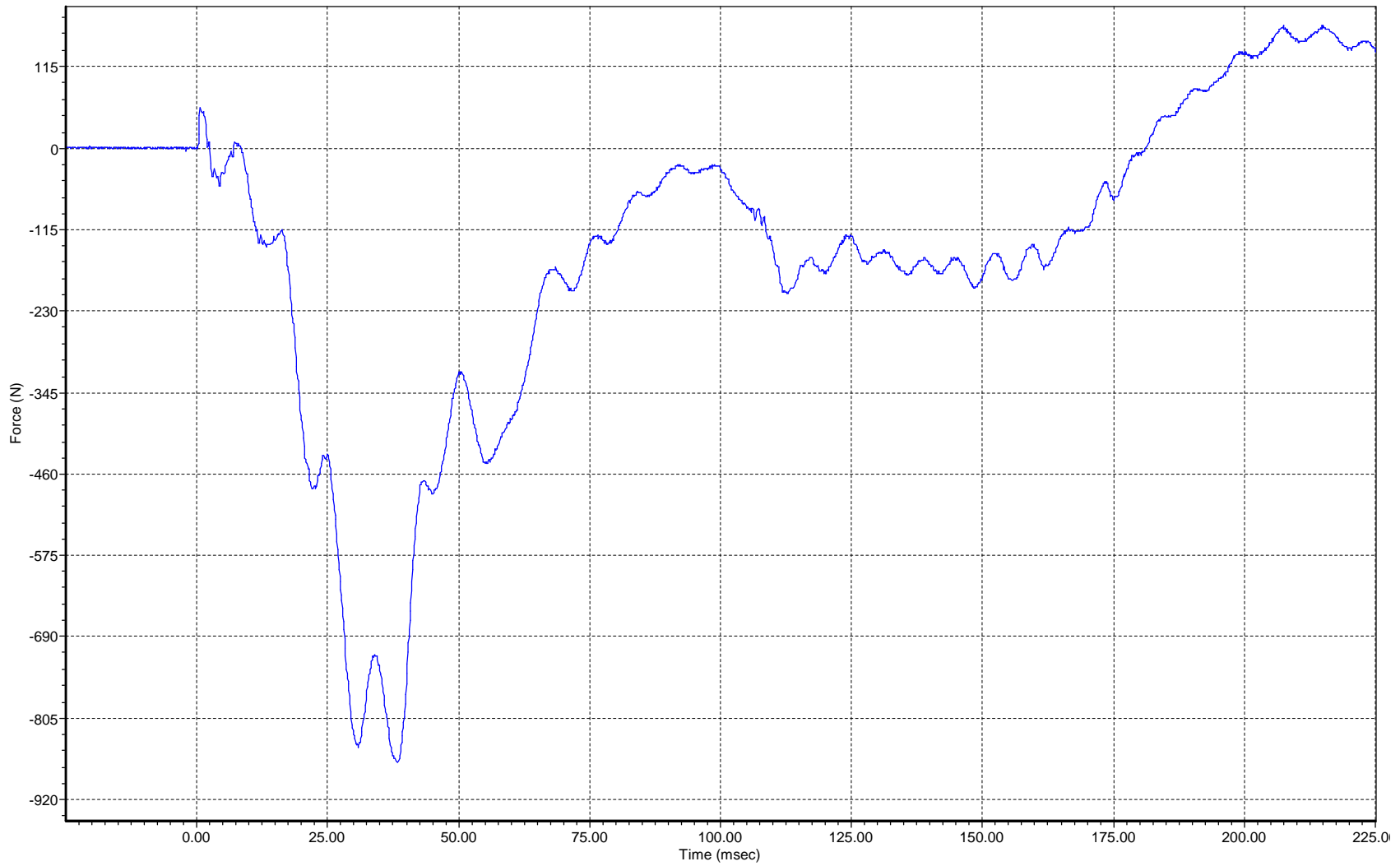
Force Y Axis Filter: CFC1000 Max = 107 at: 66.20 Min = -64 at: 112.60



Hybrid III 5'th, Neck Extension, 10/7/2010, 1:20:30 PM

Force Z Axis

Force Y Axis Filter: CFC1000 Max = 173 at: 207.50 Min = -868 at: 38.20



Hybrid III 5th, Neck Extension, 10/7/2010, 1:20:30 PM



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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:	Neck Flexion	Test Date:	10/7/2010
Test Number:	2	Test Time:	11:34:16 AM

Component Part Number	Component Serial Number
Neck - 880105-255	713

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	44 %RH P
Velocity	6.89 -- 7.13	7.03 m/s P
Pendulum Impulse at 10 ms	2.10 -- 2.50	2.25 m/s P
Pendulum Impulse at 20 ms	4.00 -- 5.00	4.59 m/s P
Pendulum Impulse at 30 ms	5.80 -- 7.00	6.74 m/s P
D Plane Rotation	-91.0 -- -77.0	-85.2 degrees P
Moment During Rotation Interval	69.0 -- 83.0	69.1 Nm P
Moment Decay to 10.0 Nm	80.0 -- 100.0	88.5 ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Flexion**

Test Time: **11:34:16 AM**

Test Date: **10/7/2010**



VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
DentonATD	78051-342	PENDULUM POT	8/14/2010
DentonATD	78051-342	CONDYLE POT	8/14/2010
Denton	1716A	LC-1632 My	7/14/2010
Denton	1716A	LC-1632 Fx	7/14/2010
Denton	1716A	LC-1632 Fy	7/14/2010
Denton	1716A	LC-1632 Fz	7/14/2010

Test ID: **Neck Flexion**

Test Time: **11:34:16 AM**

Test Date: **10/7/2010**

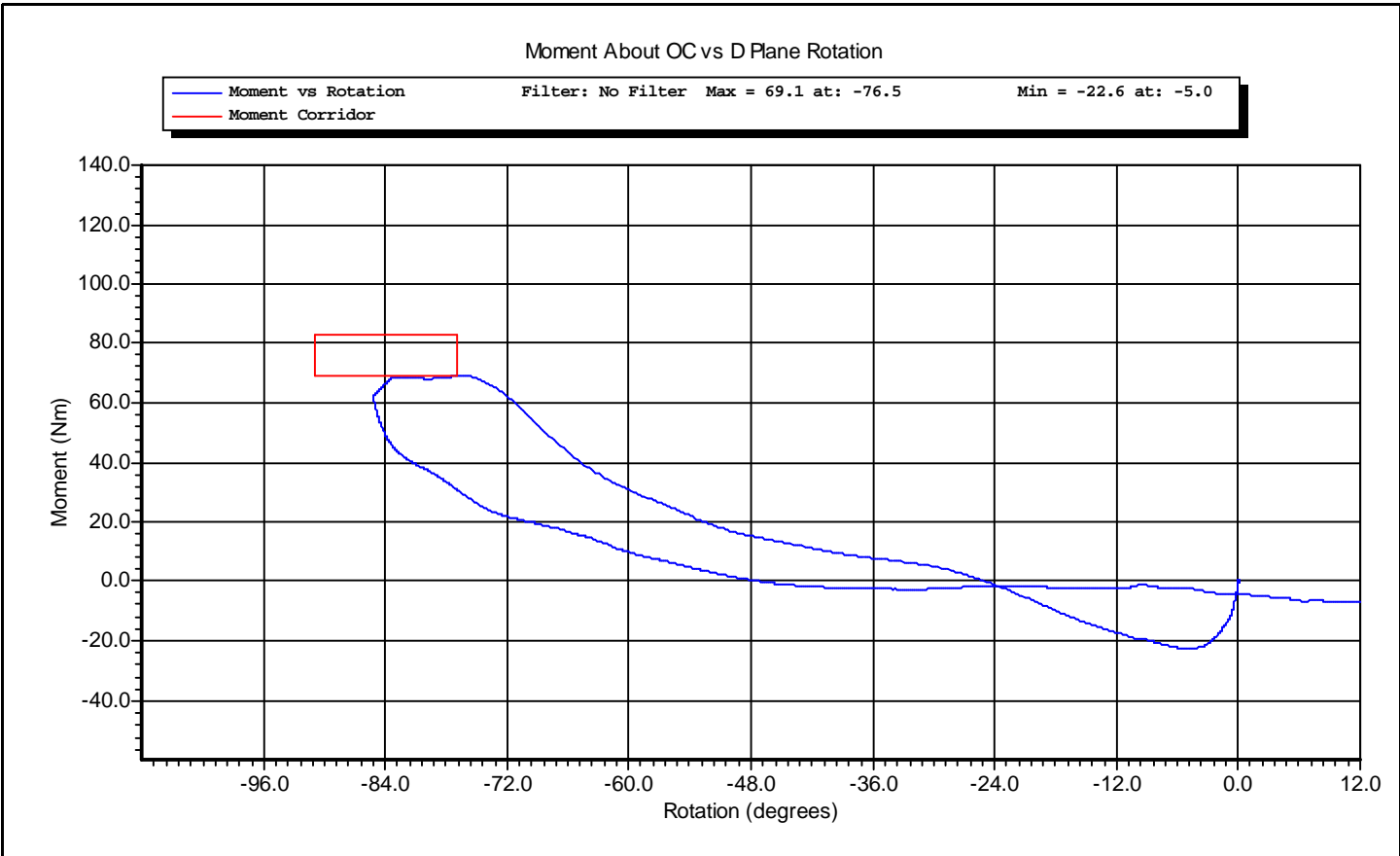


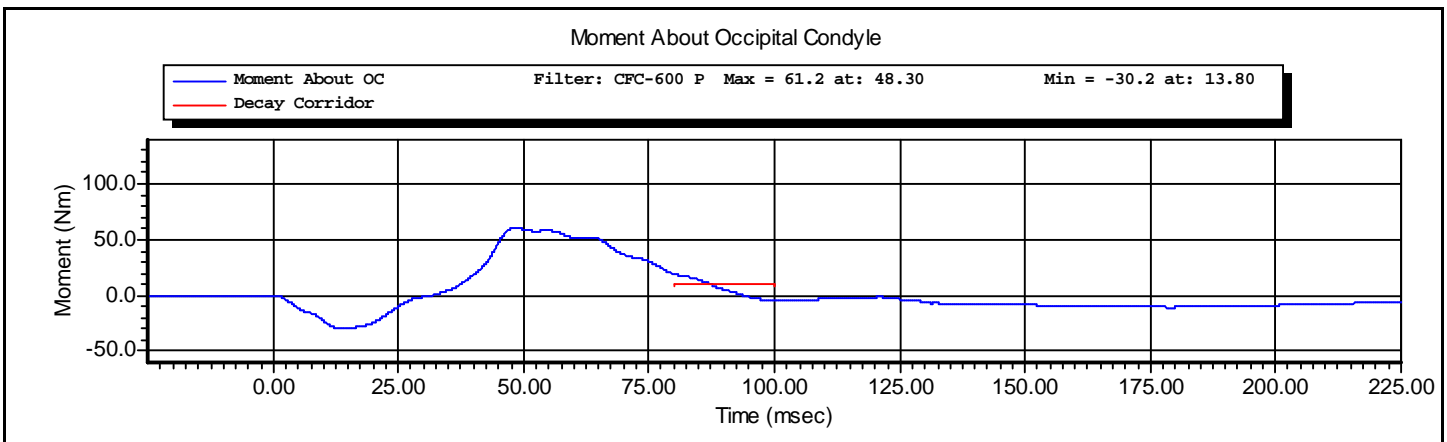
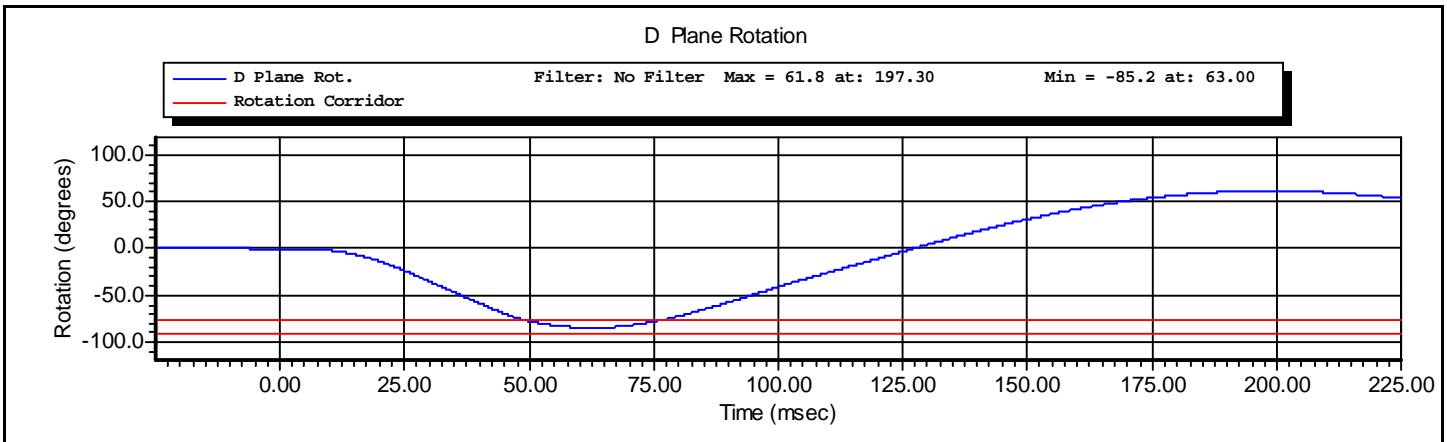
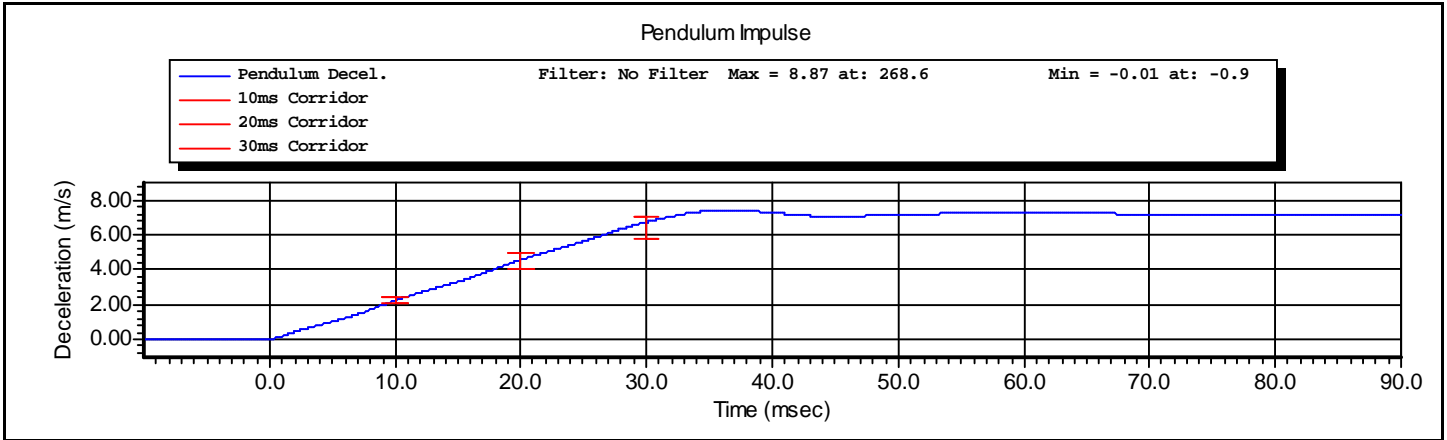
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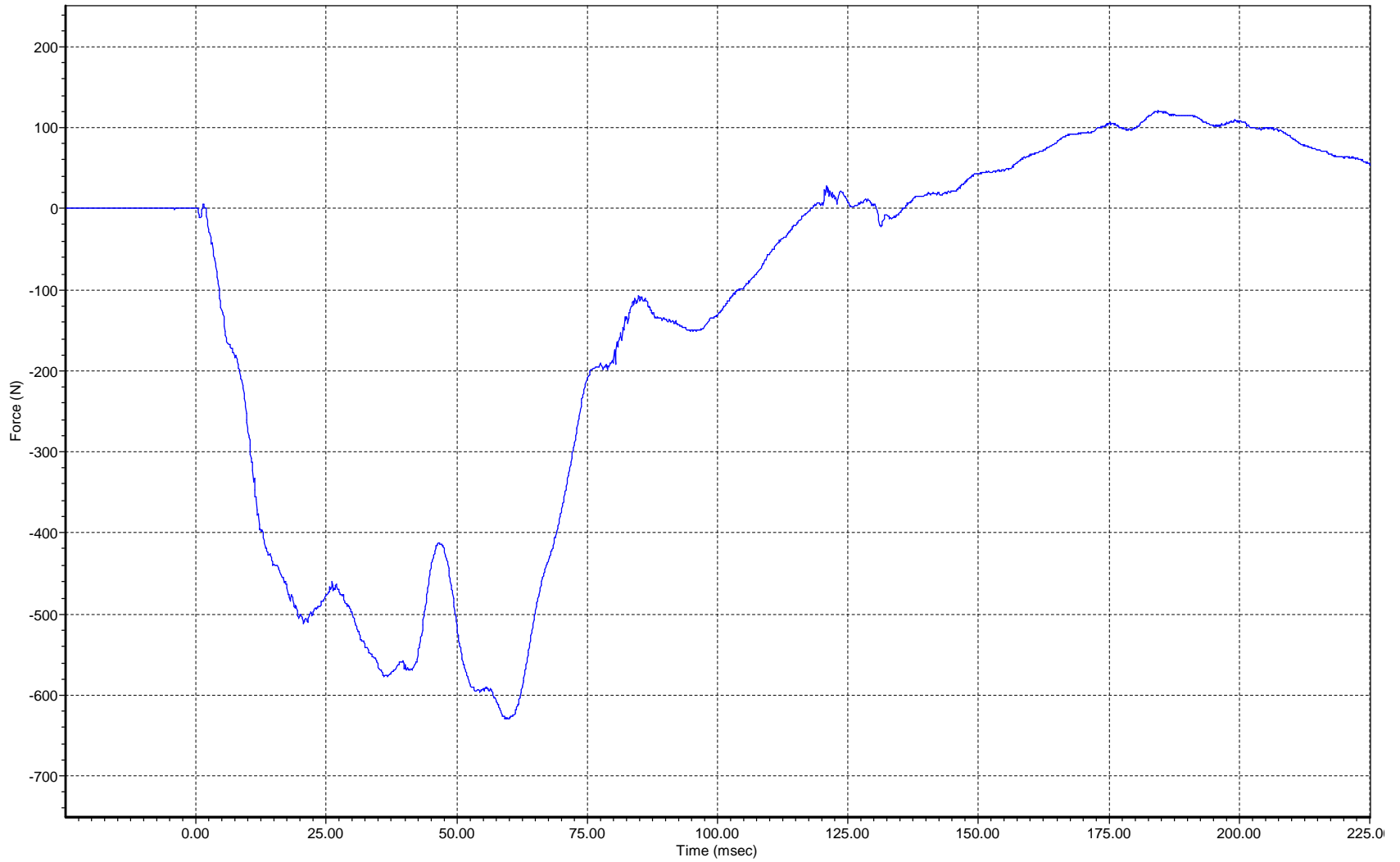
Test Name:	Neck Flexion	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	273		
Test ID:	Neck Flexion	Test Date:	10/7/2010
Test Number:	2	Test Time:	11:34:16 AM





Force X Axis

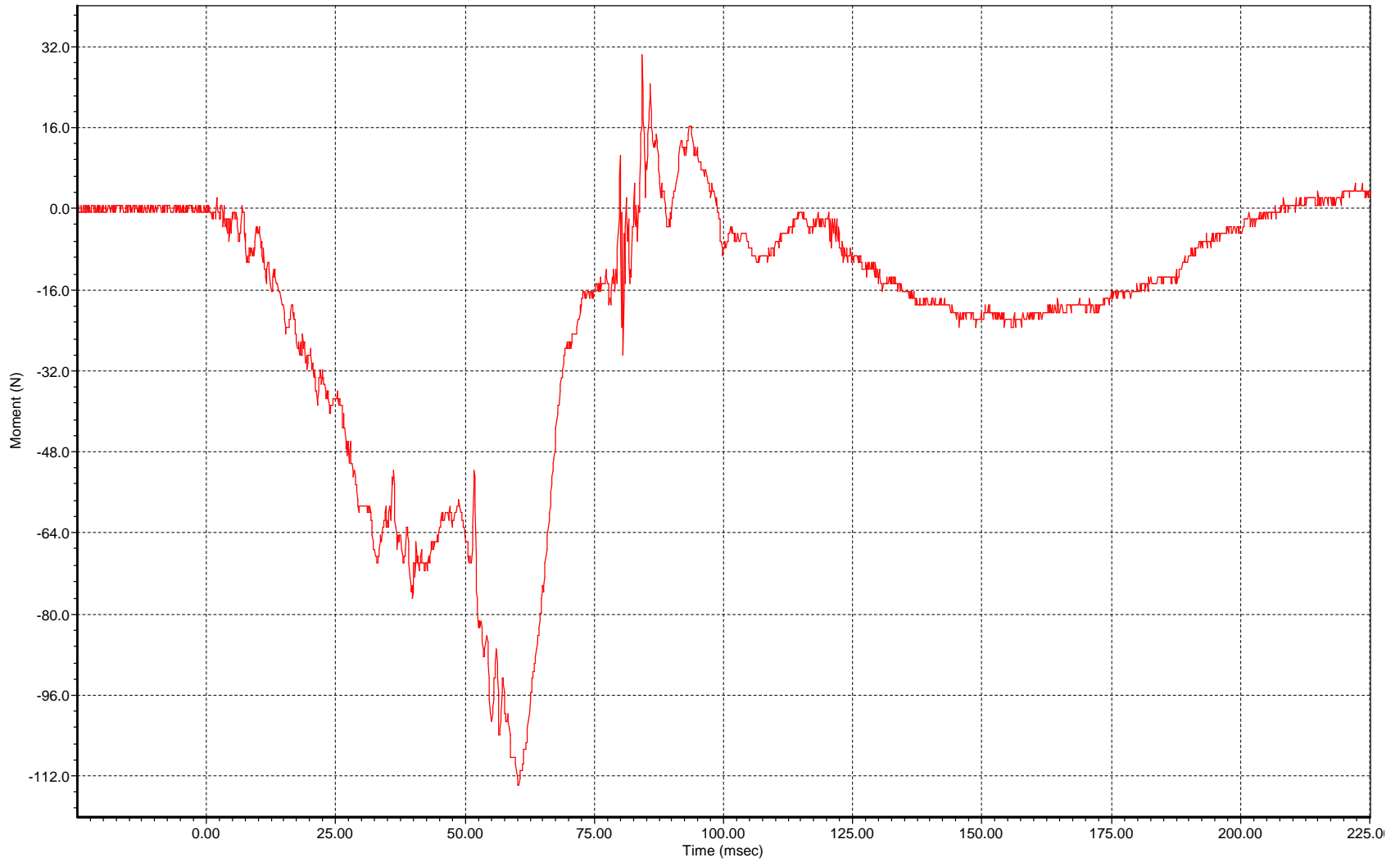
Force X Axis Max = 120 at: 184.50 Min = -629 at: 59.20



Hybrid III 5'th, Neck Flexion, 10/7/2010, 11:34:16 AM

Force Y Axis

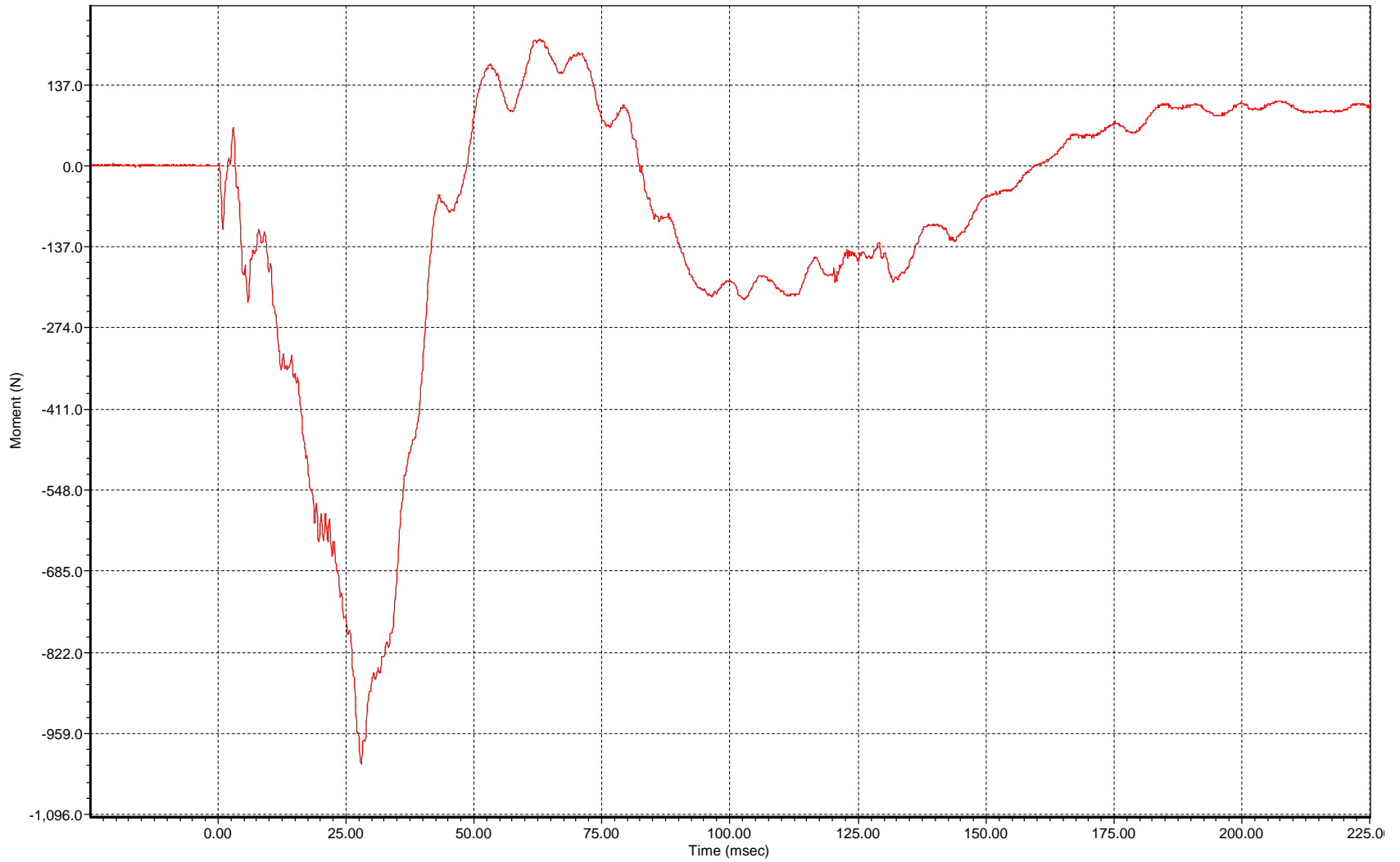
Force Y Axis



Hybrid III 5'th, Neck Flexion, 10/7/2010, 11:34:16 AM

Force Z Axis

Force Z Axis



Hybrid III 5'th, Neck Flexion, 10/7/2010, 11:34:16 AM



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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:	Thorax	Test Date:	10/6/2010
Test Number:	1	Test Time:	9:40:51 AM

Component Part Number	Component Serial Number
Chest Jacket - 880105-355-E	DG0304

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	49.0 %RH P
Velocity	6.59 -- 6.83	6.75 m/s P
Sternum Displacement	-58.0 -- -50.0	-50.5 mm P
Force During Displacement Interval	-4400 -- -3900	-4216 N P
Force -18.0 to -50.0 Displacement	-4600 -- 0	-4216 N P
Hysteresis	69 -- 85	73 % P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Thorax**

Test Time: **9:40:51 AM**

Test Date: **10/6/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
DentonATD	78051-342	DS-273	4/13/2010

Test ID: **Thorax**

Test Time: **9:40:51 AM**

Test Date: **10/6/2010**

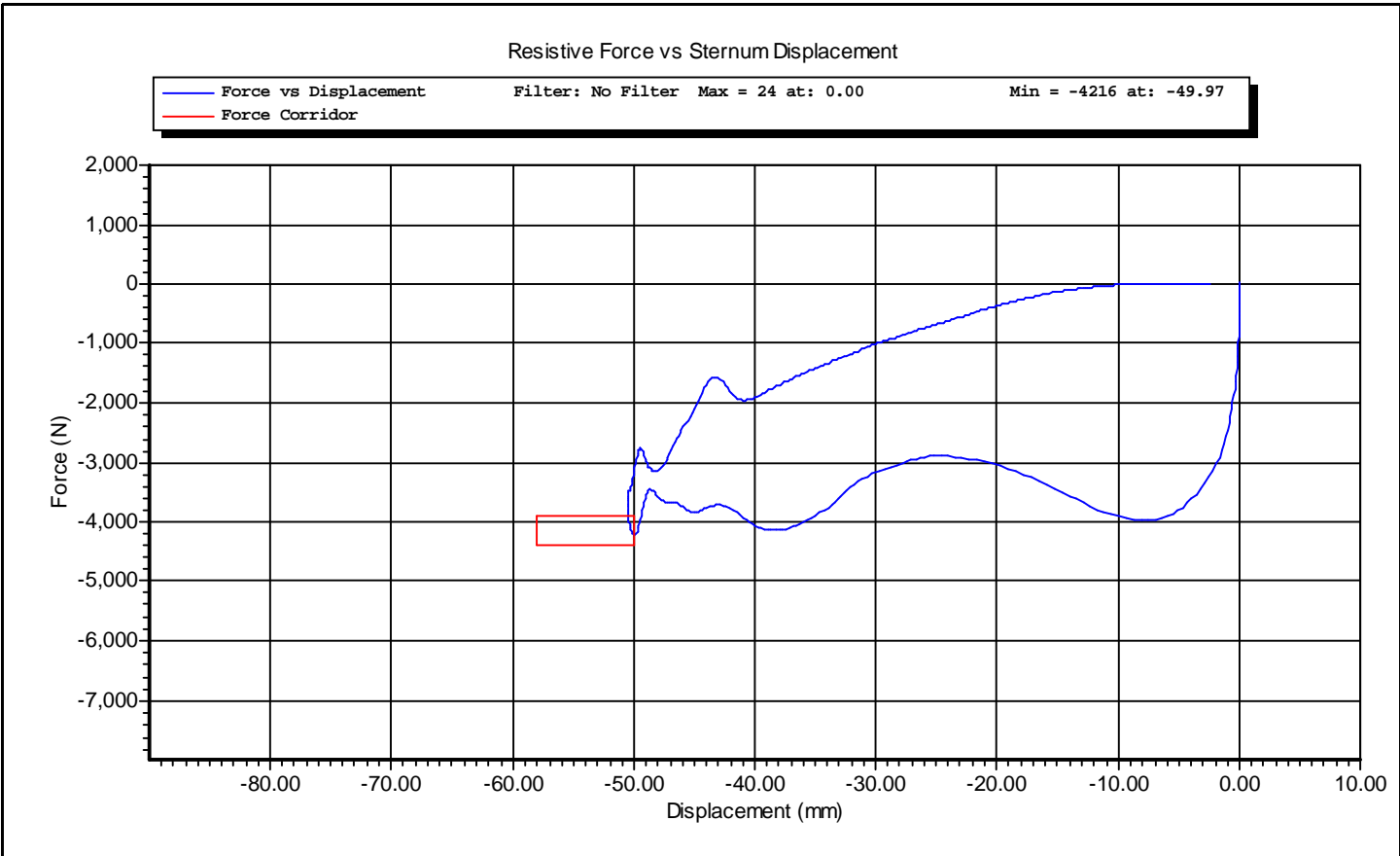


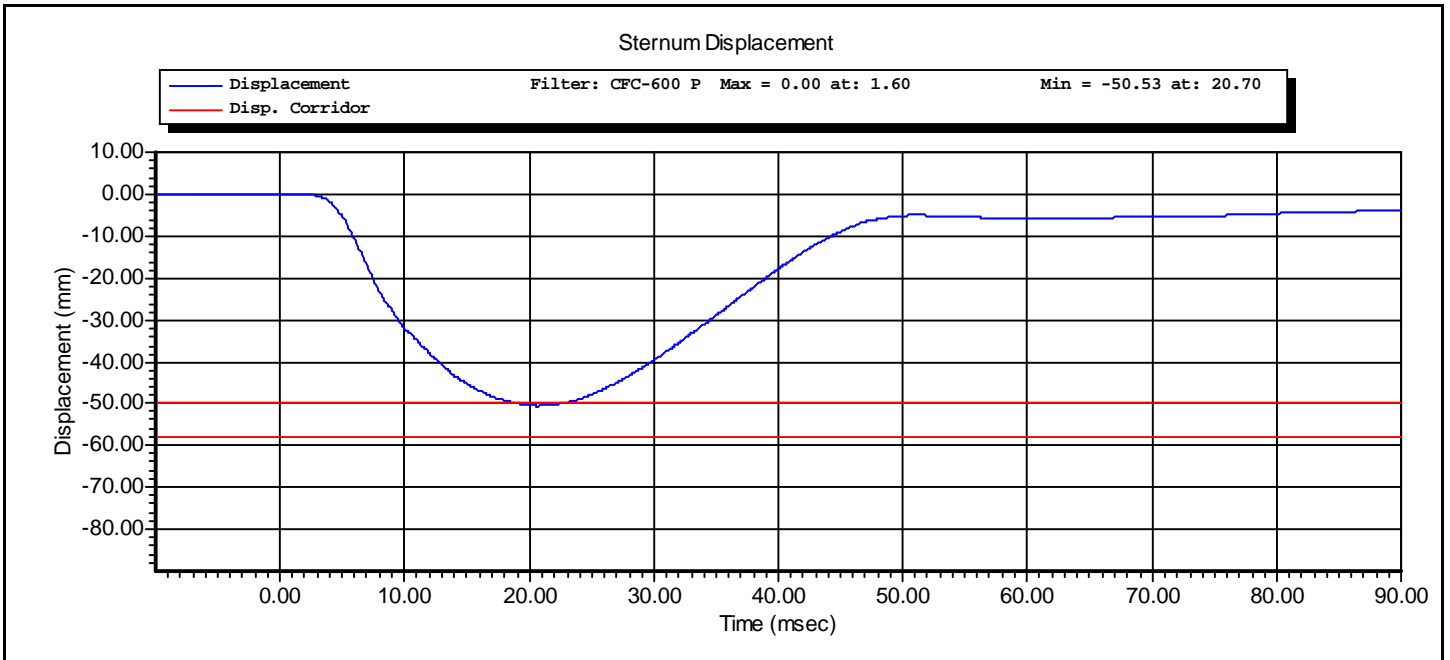
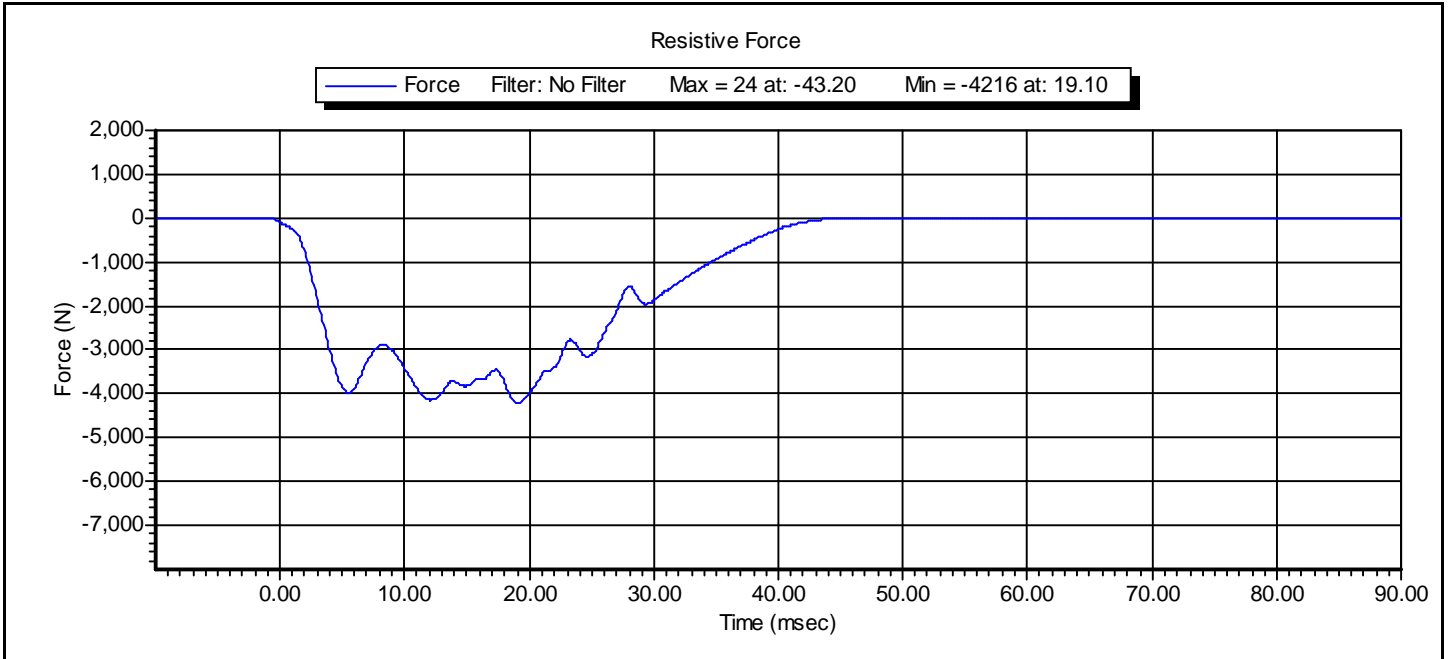
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Test Name:	Thorax Impact	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	273		
Test ID:	Thorax	Test Date:	10/6/2010
Test Number:	1	Test Time:	9:40:51 AM





Torso Flexion Test

Technician: AR

Calibration Date: 10/7/2010

ATD Serial Number: 5th Female 273

Test Results			
Test Condition	Parameters	Results	Status
Temperature	18.9-25.6° C	22.2° C	P
Lab Humidity: 38%	10-70%	40%	P
Max Force @ 45 deg	320 – 390N	360N	P
Torso Rotation Rate	0.5 °/s ≤ rate ≤ 1.5 °/s	1.0 °/s	P
Initial reference angle	≤20 deg	14°	P
Final ref plan angle	Initial ref plane ± 8 deg	21°	P

P = Pass

F = Fail



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VERIFICATION REPORT

Test Name:	Knee Impact	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:	10/7/2010
Test Number:	1	Test Time:	3:30:53 PM

Component Part Number	Component Serial Number
Knee Skin - 880105-508	1726

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10.0 -- 70.0	40.0 %RH P
Velocity	2.07 -- 2.13	2.09 m/s P
Resistive Force	-4060 -- -3450	-3666 N P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Left Knee**

Test Time: **3:30:53 PM**

Test Date: **10/7/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

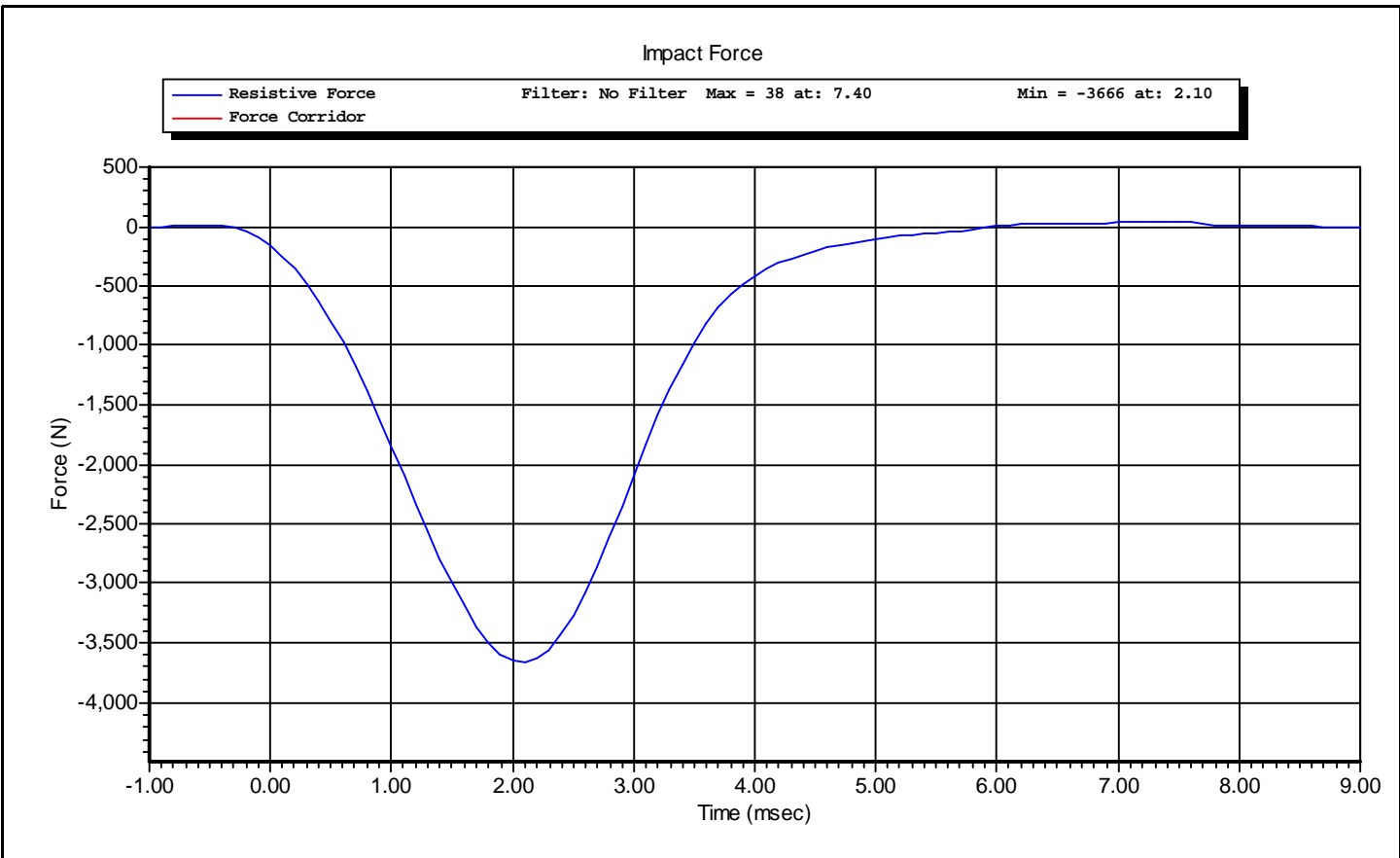
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DentonATD	Velocity Trap	1	1/11/2010
CEC	4-202	AC-A44	8/26/2010

Test ID: **Left Knee**

Test Time: **3:30:53 PM**

Test Date: **10/7/2010**

Test Name:	Knee Impact	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:	10/7/2010
Test Number:	1	Test Time:	3:30:53 PM



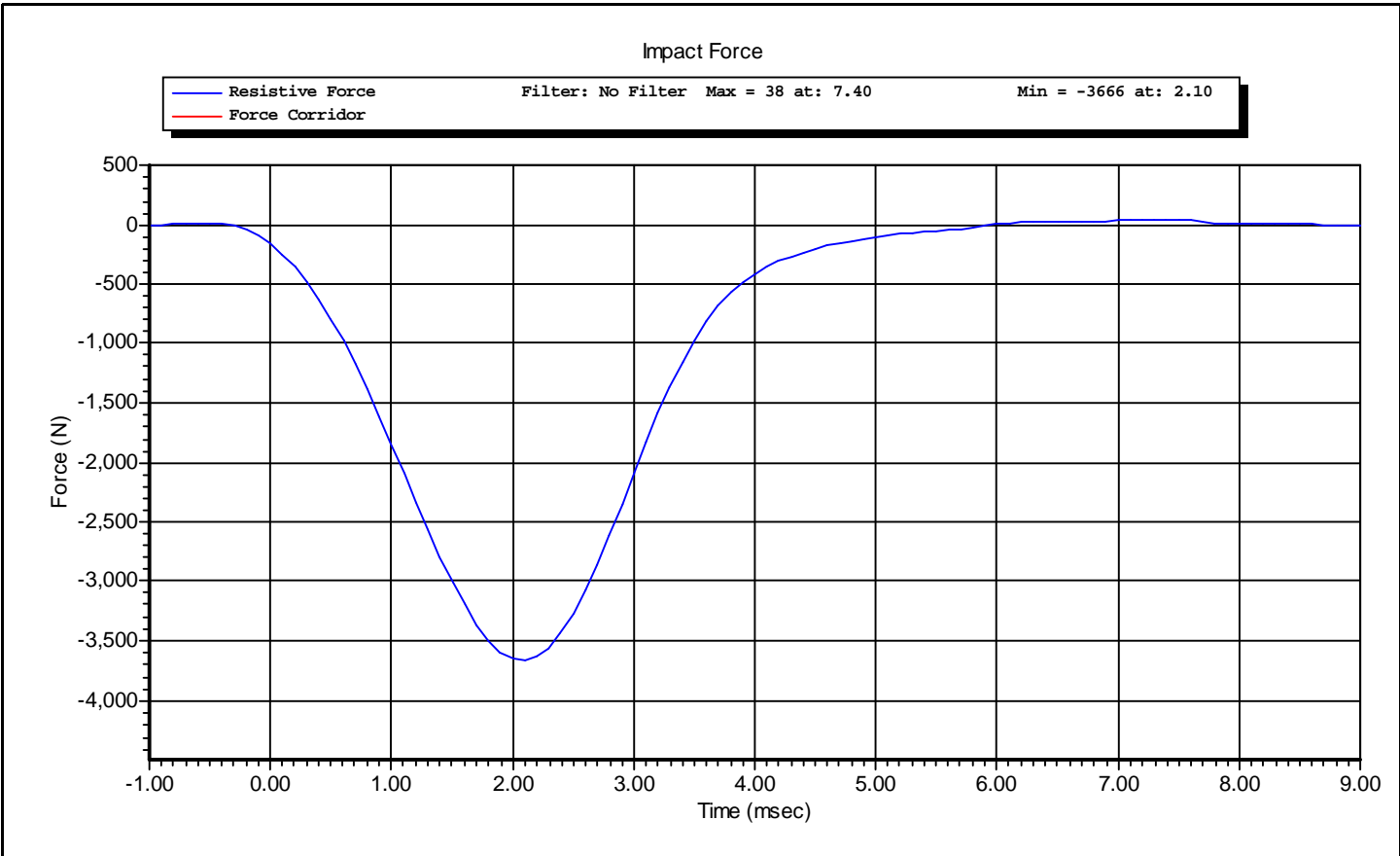


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Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	273		
Test ID:	Left Knee	Test Date:	10/7/2010
Test Number:	1	Test Time:	3:30:53 PM



Test ID: **Left Knee**

Test Time: **3:30:53 PM**

Test Date: **10/7/2010**



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VERIFICATION REPORT

Test Name:	Knee Impact	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:	10/7/2010
Test Number:	1	Test Time:	3:15:29 PM

Component Part Number	Component Serial Number
Knee Skin - 880105-508	1051

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10.0 -- 70.0	40.0 %RH P
Velocity	2.07 -- 2.13	2.10 m/s P
Resistive Force	-4060 -- -3450	-3538 N P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Right Knee**

Test Time: **3:15:29 PM**

Test Date: **10/7/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

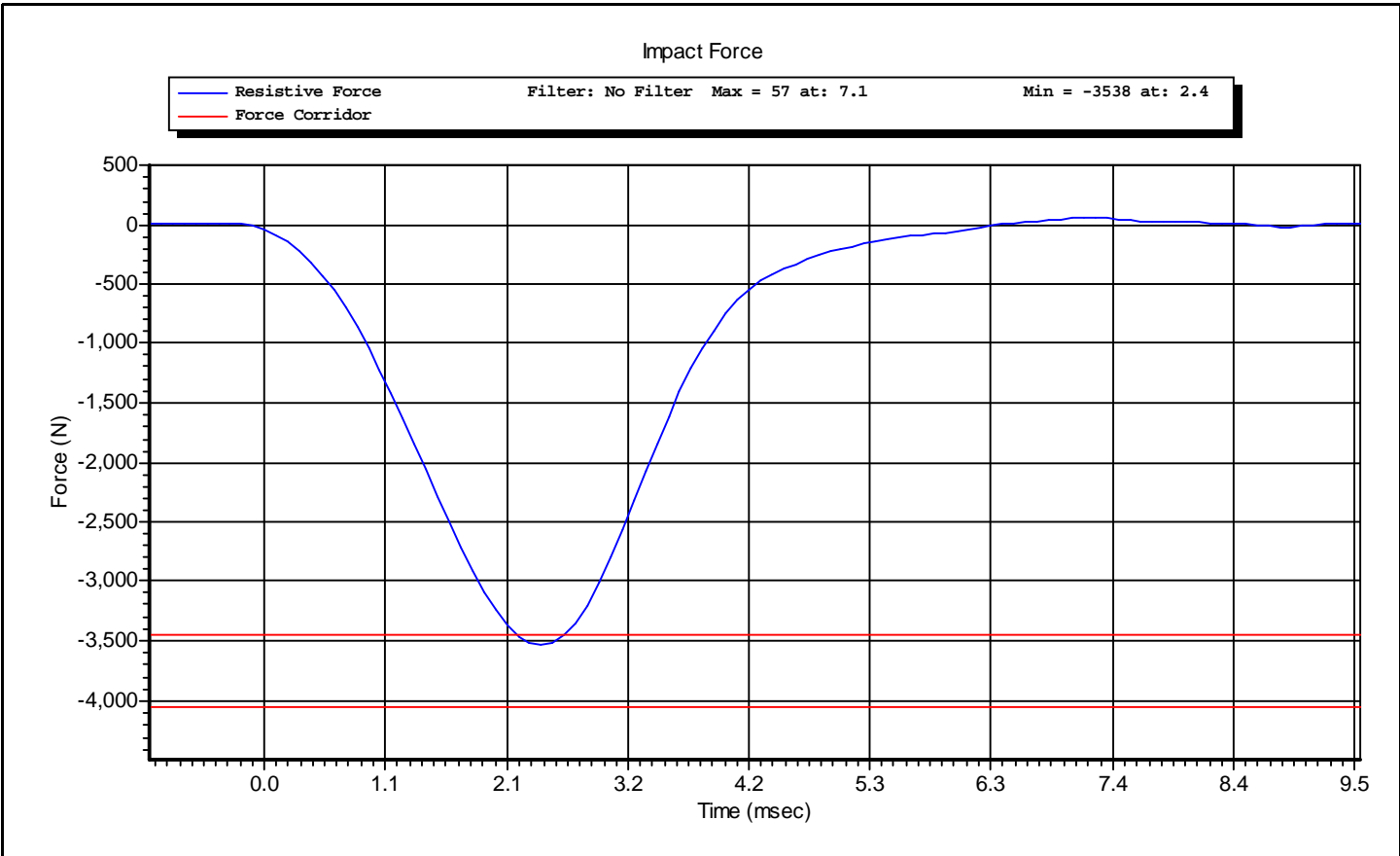
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
CEC	4-202	AC-A44	8/26/2010

Test ID: **Right Knee**

Test Time: **3:15:29 PM**

Test Date: **10/7/2010**

Test Name:	Knee Impact	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:	10/7/2010
Test Number:	1	Test Time:	3:15:29 PM



CALIBRATION TEST RESULTS

POST-TEST

DRIVER DUMMY

S/N: 061

50th Male External Measurements

SN 061

Symbol	Description	Specification	Results	Pass
		in	in	
A	Sitting Height	34.6 - 35	34.7	Yes
B	Shoulder Pivot Height	19.9 - 20.5	2.04	Yes
C	H-Point Height	3.3 - 3.5	3.5	Yes
D	H-Point from Backline	5.3 - 5.5	5.3	Yes
E	Shoulder Pivot from Backline	3.3 - 3.7	3.7	Yes
F	Thigh Clearance	5.5 - 6.1	6.1	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	13.2	Yes
J	Elbow Rest Height	7.5 - 8.3	8.0	Yes
K	Buttock to Knee Length	22.8 - 23.8	23.4	Yes
L	Popliteal Height	16.9 - 17.9	17.5	Yes
M	Knee Pivot Height	19.1 - 19.7	19.2	Yes
N	Buttock Popliteal Length	17.8 - 18.8	18.7	Yes
O	Chest Depth without Jacket	8.4 - 9.0	8.6	Yes
P	Foot Length (right)	9.9 - 10.5	10.1	Yes
V	Shoulder Breadth	16.3 - 17.2	16.8	Yes
W	Foot Breadth	3.6 - 4.2	3.9	Yes
Y	Chest Circumference with Jacket	38.2 - 39.4	38.5	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: SZ

Date: 10/15/2010



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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:	061		
Test ID:	Head Drop	Test Date:	10/13/2010
Test Number:	1	Test Time:	2:30:34 PM

Component Part Number	Component Serial Number
Head Skin - 78051-228	243

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10 -- 70	33 %RH P
Resultant Acceleration	225 -- 275	248 g P
Oscillation	0.0 -- 10.0	1.2 % P
Lateral Acceleration	-15.00 -- 15.00	-10.20 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Head Drop**

Test Time: **2:30:34 PM**

Test Date: **10/13/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P66943	7/27/2010
Endevco	7264-2000	P66931	4/20/2010
Endevco	7264-2000	P66926	4/20/2010

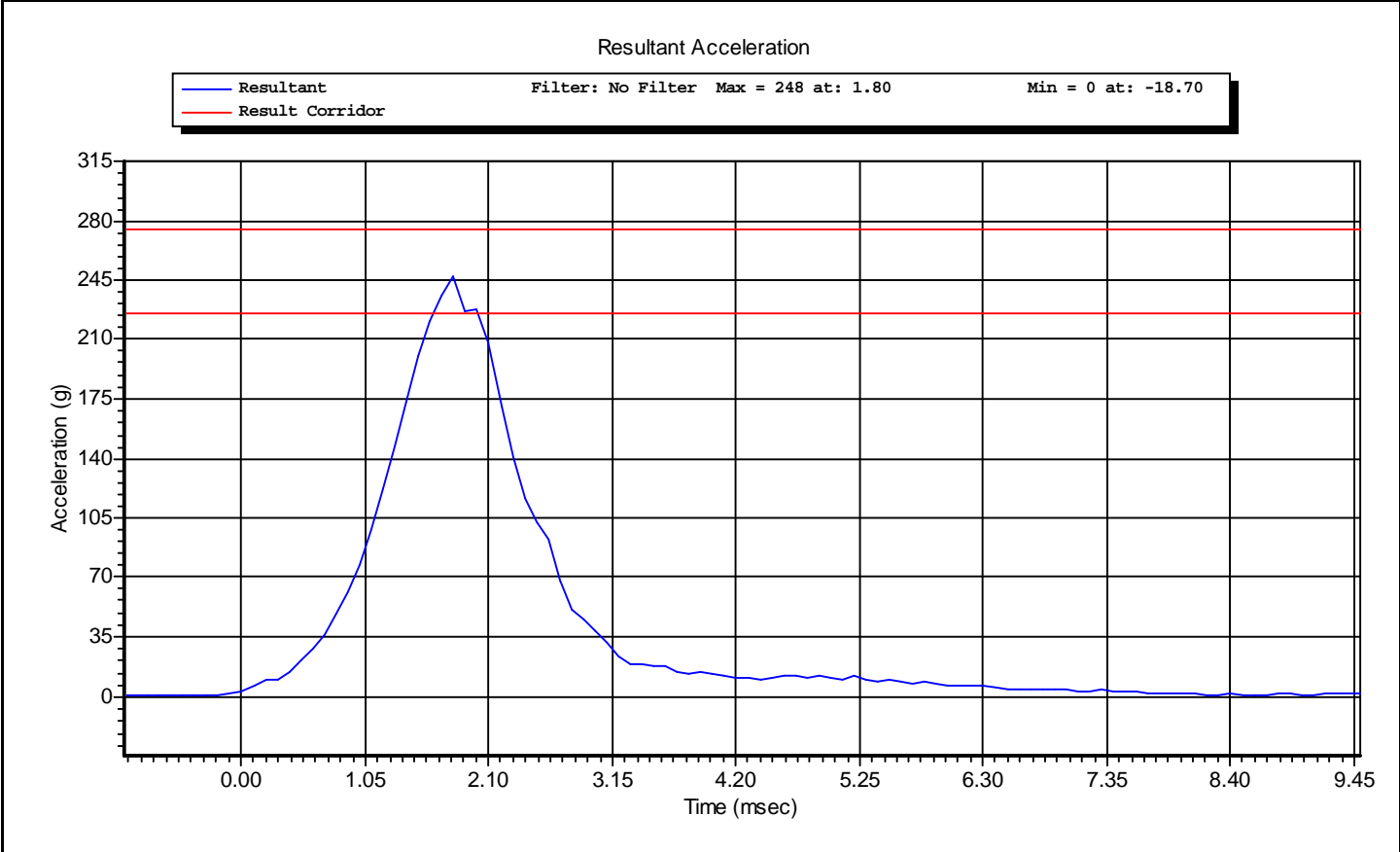
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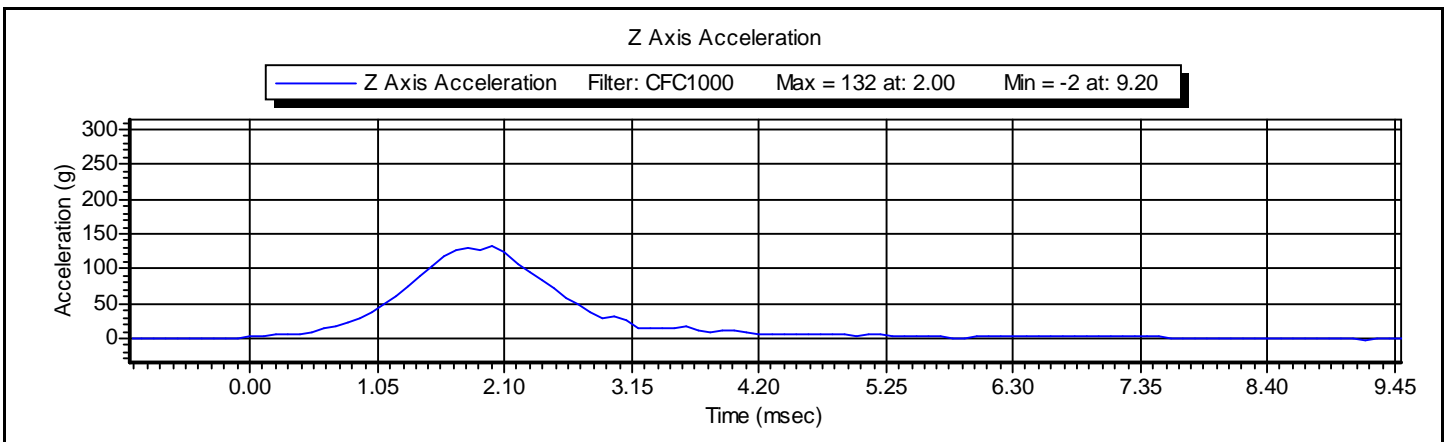
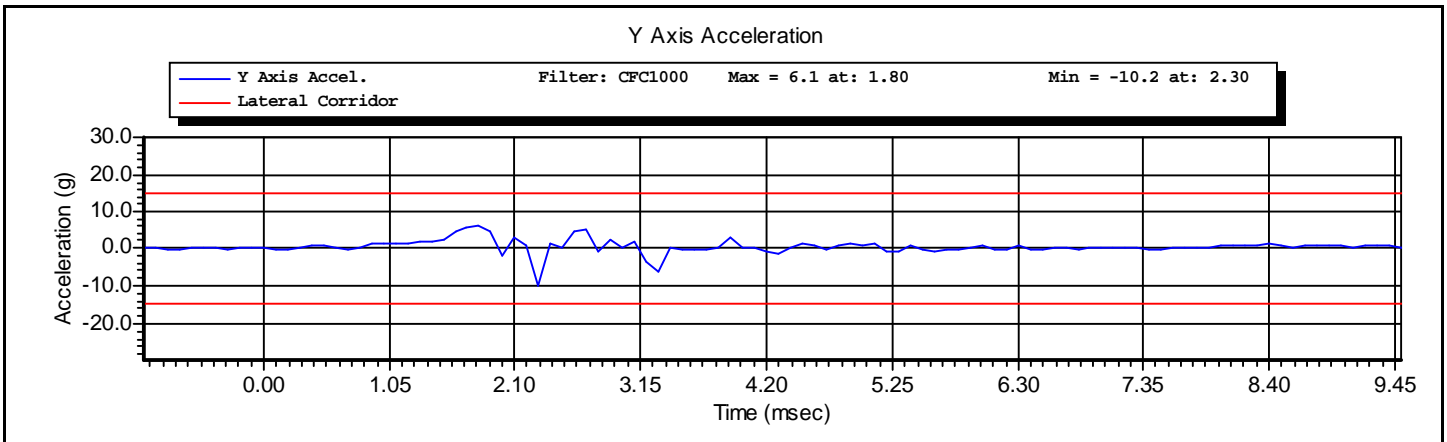
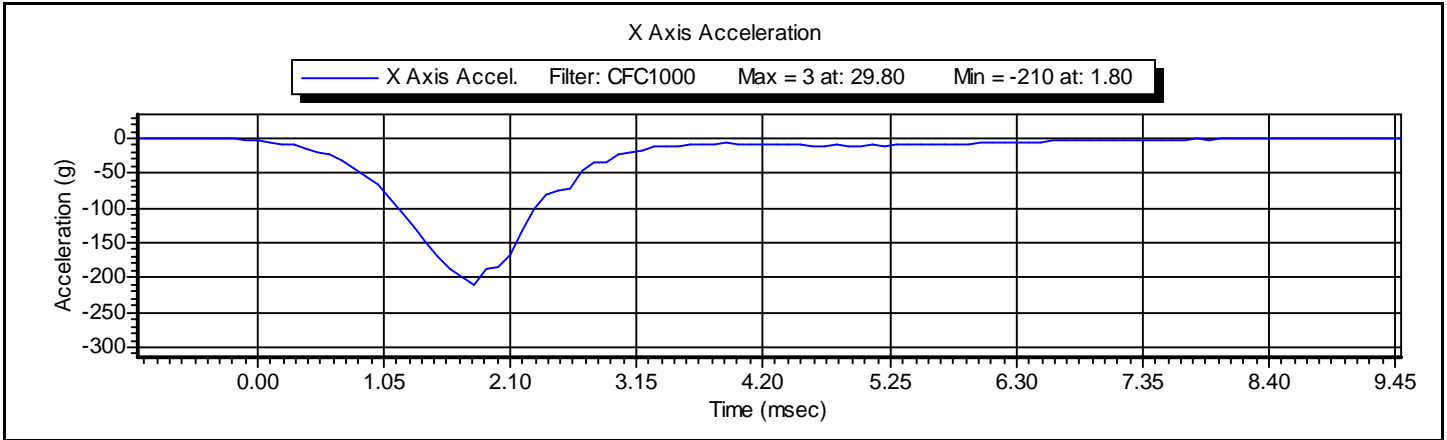
Test Time: **2:30:34 PM**

Test Date: **10/13/2010**



Test Name:	Head Drop	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Head Drop	Test Date:	10/13/2010
Test Number:	1	Test Time:	2:30:34 PM







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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:	061		
Test ID:	Neck Flexion	Test Date:	10/13/2010
Test Number:	1	Test Time:	1:07:37 PM

Component Part Number	Component Serial Number
Neck - 78051-336	4194

Test Parameters		Test Specifications		Test Results	
Temperature		20.6	-- 22.2	22.2 deg C	P
Humidity		10	-- 70	33 %RH	P
Velocity		6.89	-- 7.13	7.09 m/s	P
Pendulum Deceleration at	10 ms	22.5	-- 27.5	24.9 g	P
Pendulum Deceleration at	20 ms	17.6	-- 22.6	20.0 g	P
Pendulum Deceleration at	30 ms	12.5	-- 18.5	15.6 g	P
Max Pendulum Deceleration After	30 ms	0.0	-- 29.0	15.6 g	P
Deceleration time to	5 g	34.0	-- 42.0	39.3 ms	P
D Plane Rotation		-78.0	-- -64.0	-66.8 degrees	P
Time at max rotation		57.0	-- 64.0	59.3 ms	P
Rotation Decay to Zero		113.0	-- 128.0	118.8 ms	P
Moment about OC		88.1	-- 108.4	102.0 Nm	P
Time at Max Moment		47.0	-- 58.0	53.4 ms	P
Moment Decay to Zero		97.0	-- 107.0	97.5 ms	P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Flexion** Test Time: **1:07:37 PM** Test Date: **10/13/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

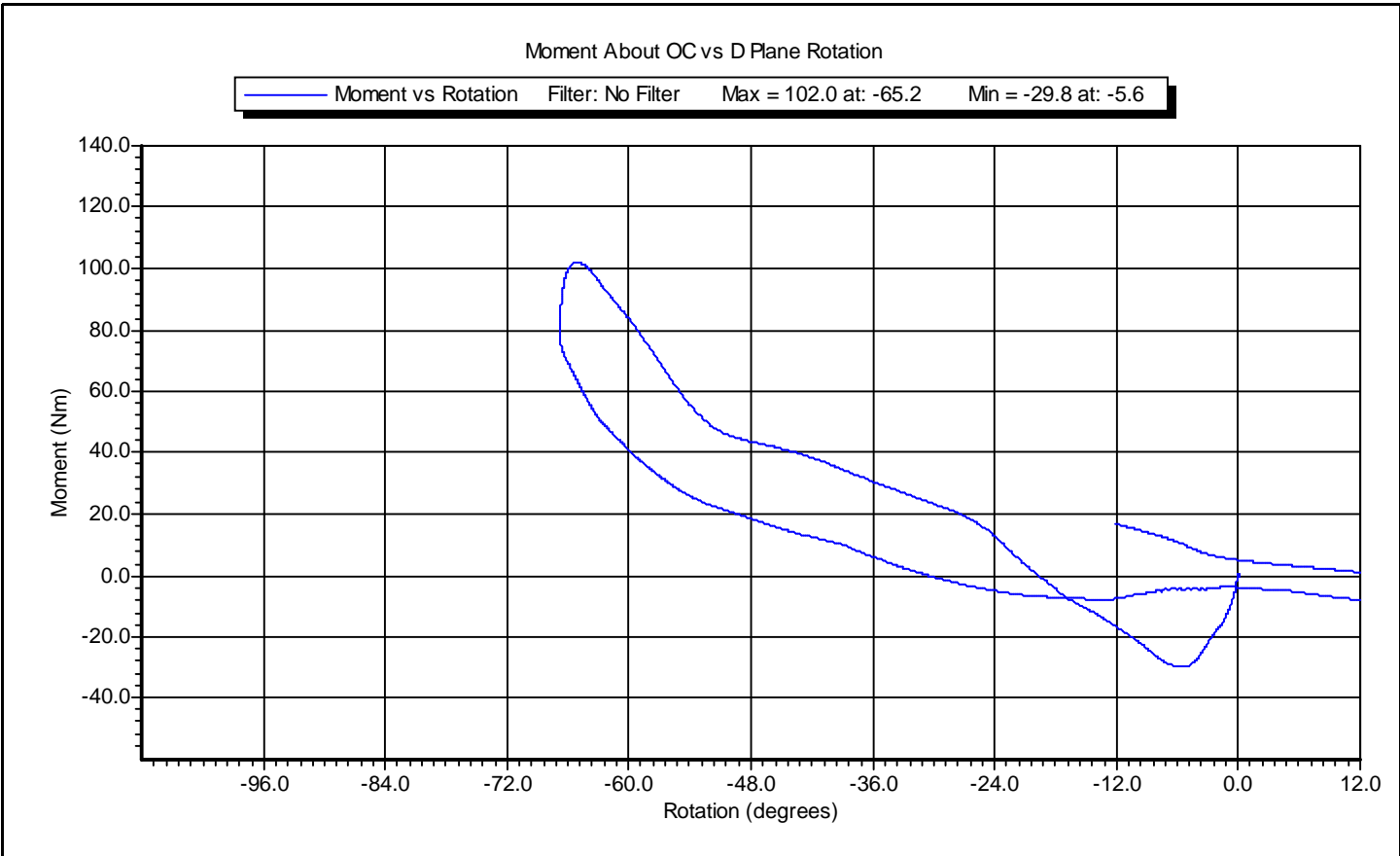
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
DentonATD	78051-342	PENDULUM POT	8/14/2010
DentonATD	78051-342	CONDYLE POT	8/14/2010
Denton	1716A	LC-1916 My	5/18/2010
Denton	1716A	LC-1916 Fx	5/18/2010

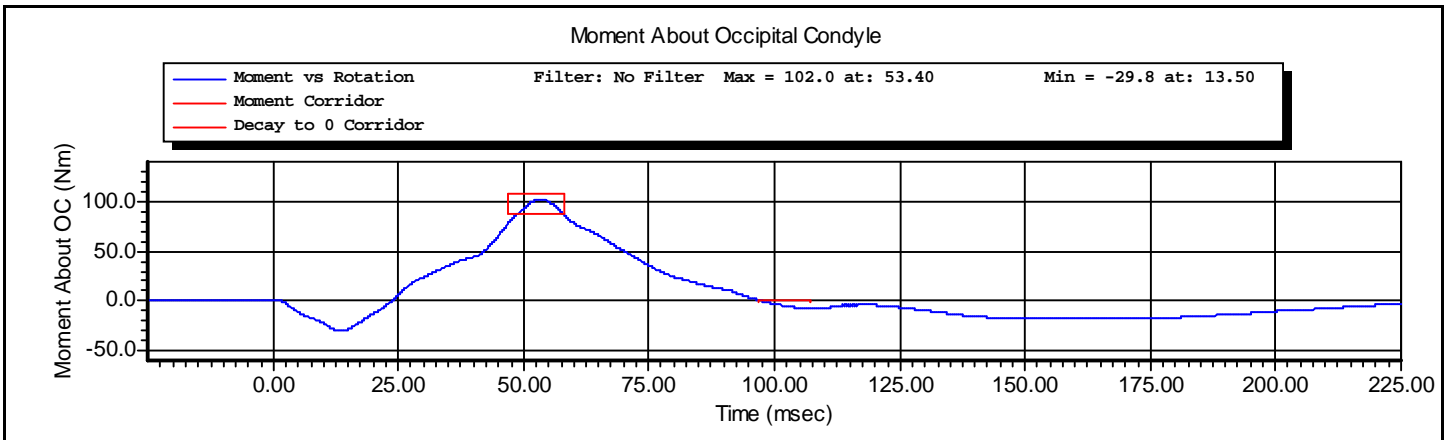
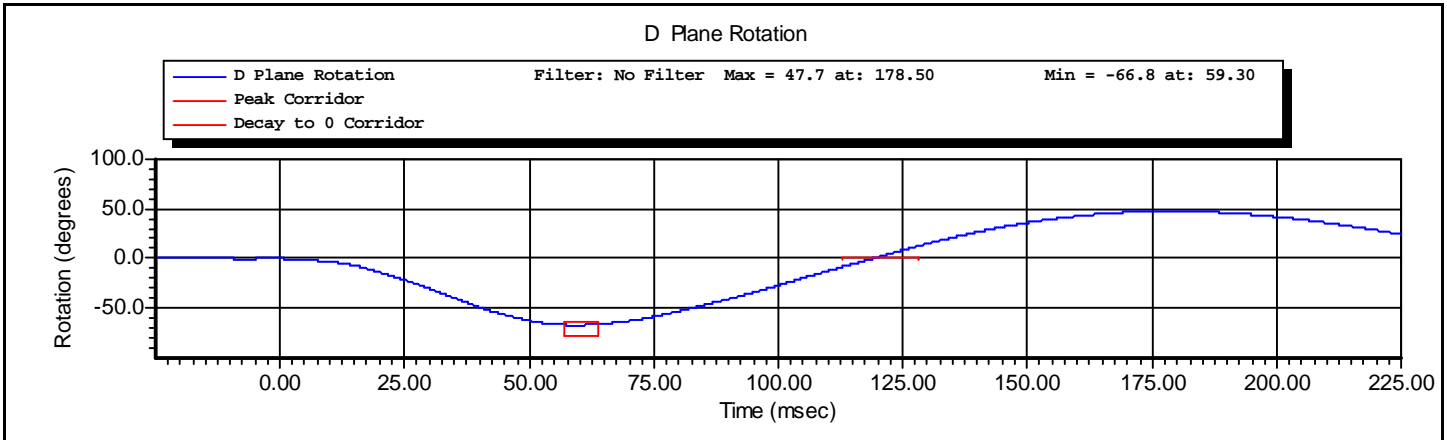
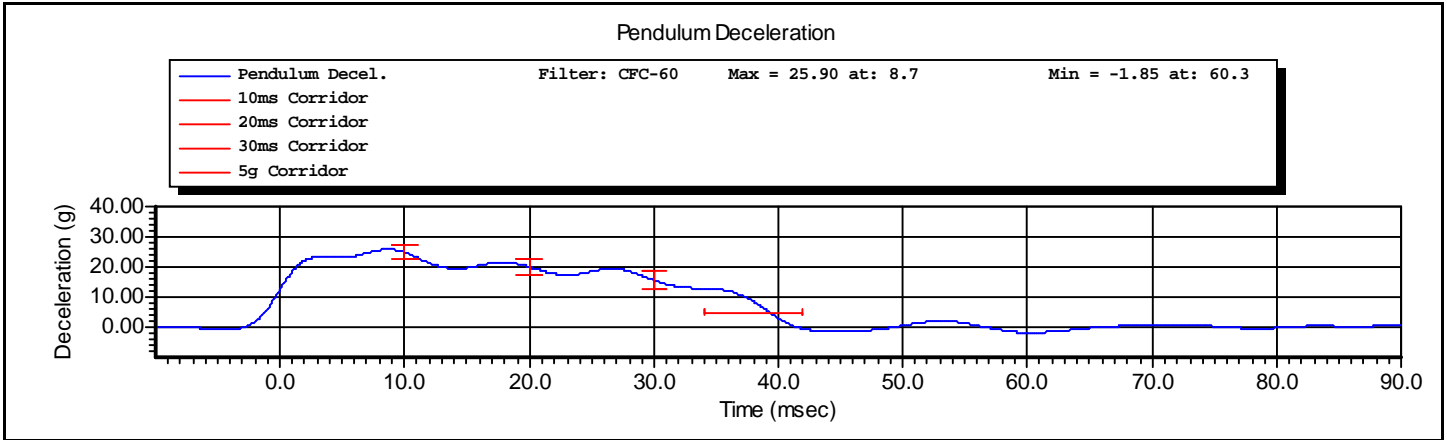
Test ID: **Neck Flexion**

Test Time: **1:07:37 PM**

Test Date: **10/13/2010**

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:	061		
ID of Test:	Neck Flexion	Date:	10/13/2010
Number of Test:	1	Time of Test:	1:07:37 PM







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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:	061		
Test ID:	Neck Extension	Test Date:	10/13/2010
Test Number:	1	Test Time:	1:45:29 PM

Component Part Number	Component Serial Number
Neck - 78051-336	4194

Test Parameters		Test Specifications		Test Results	
Temperature		20.6	-- 22.2	22.2 deg C	P
Humidity		10	-- 70	33 %RH	P
Velocity		5.94	-- 6.19	6.00 m/s	P
Pendulum Deceleration at	10 ms	17.2	-- 21.2	18.7 g	P
Pendulum Deceleration at	20 ms	14.0	-- 19.0	16.4 g	P
Pendulum Deceleration at	30 ms	11.0	-- 16.0	12.9 g	P
Max Pendulum Deceleration after	30 ms	0.0	-- 22.0	13.4 g	P
Decel Time to	5 g	38.0	-- 46.0	42.6 ms	P
D Plane Rotation		81.0	-- 106.0	90.2 degrees	P
Time at Max Rotation		72.0	-- 82.0	76.9 ms	P
Rotation Decay to Zero		147.0	-- 174.0	158.2 ms	P
Moment About Occipital Condyle		-80.0	-- -52.9	-66.7 Nm	P
Time at Max Moment		65.0	-- 79.0	72.1 ms	P
Moment Decay to Zero		120.0	-- 148.0	141.4 ms	P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Extension** Test Time: **1:45:29 PM** Test Date: **10/13/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

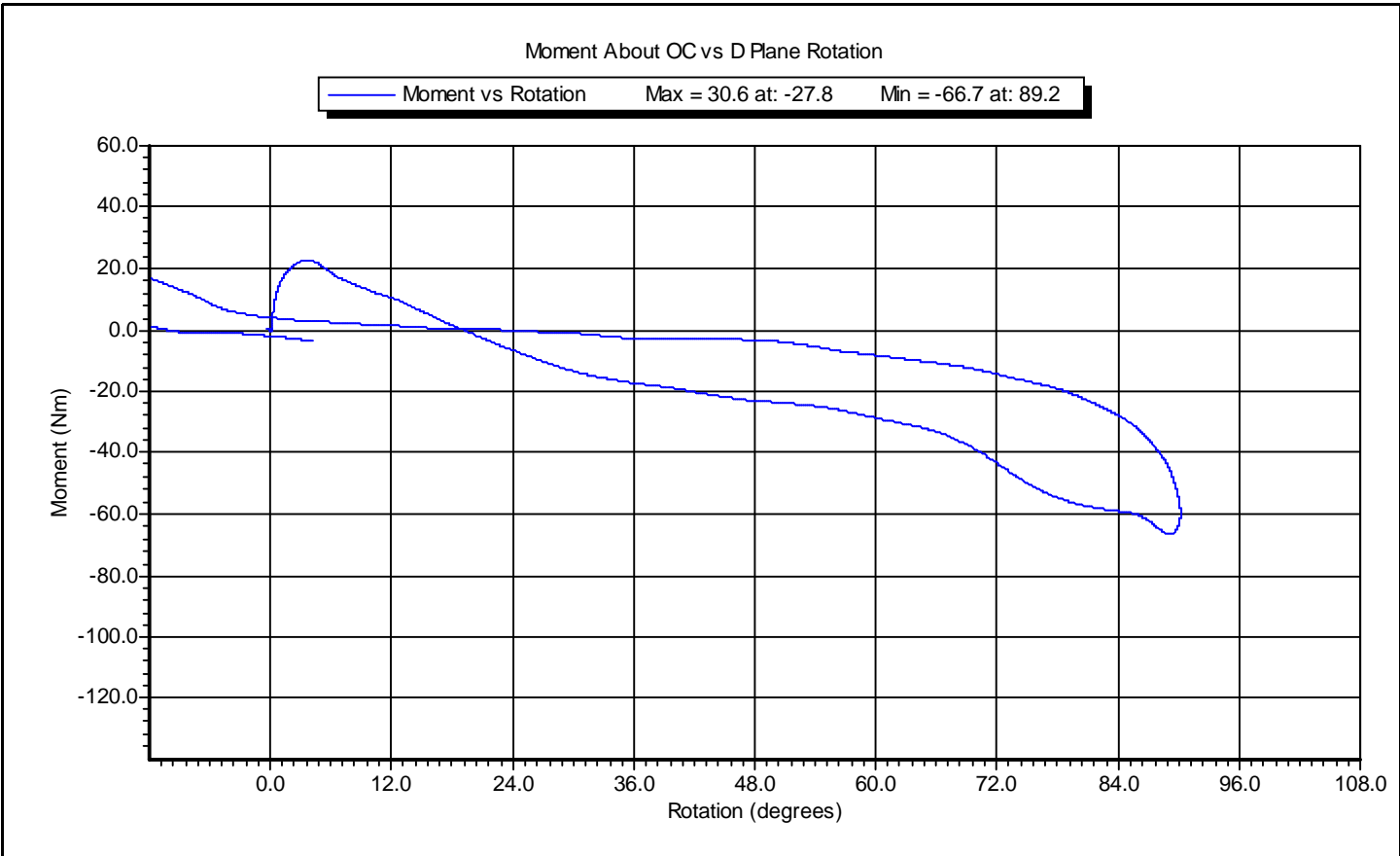
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
DentonATD	78051-342	PENDULUM POT	8/14/2010
DentonATD	78051-342	CONDYLE POT	8/14/2010
Denton	1716A	LC-1916 My	5/18/2010
Denton	1716A	LC-1916 Fx	5/18/2010

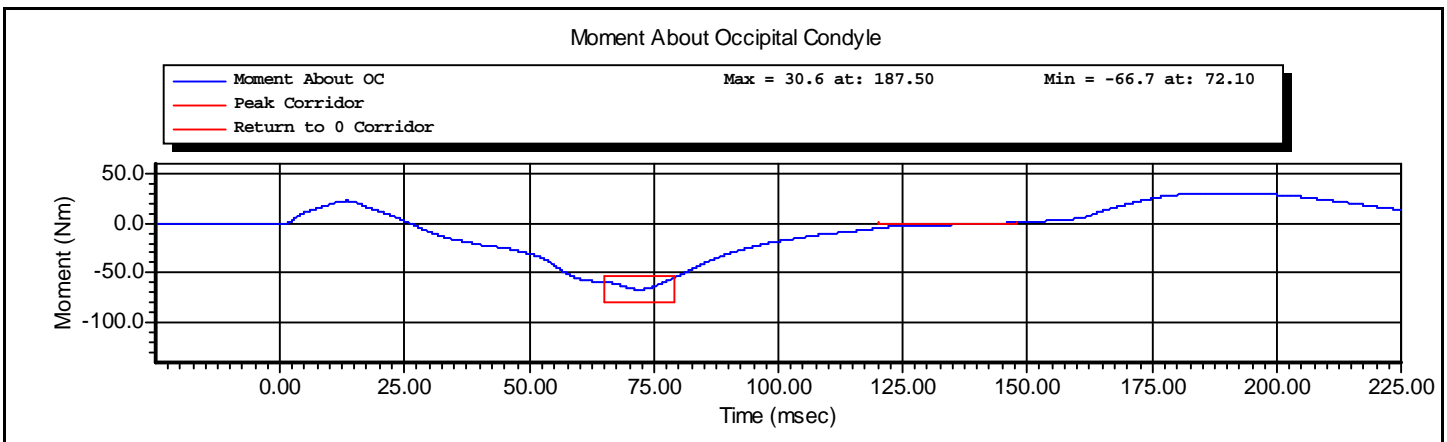
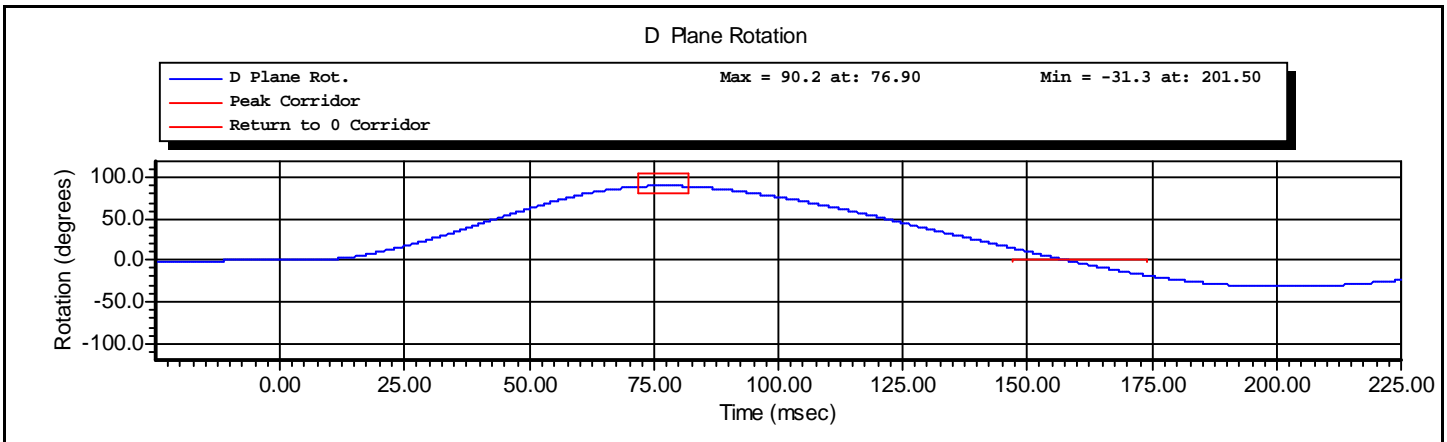
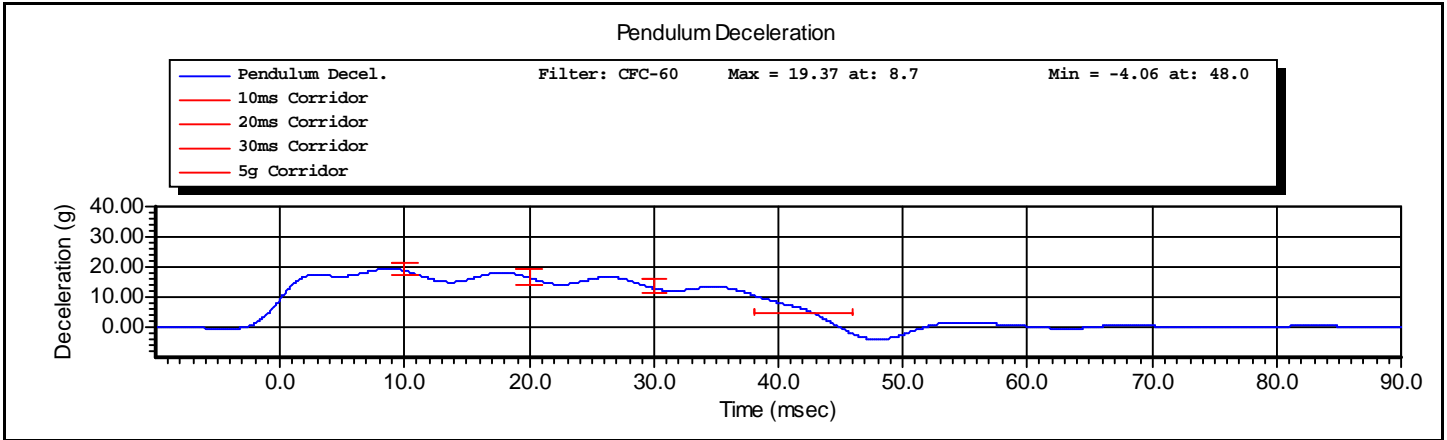
Test ID: **Neck Extension**

Test Time: **1:45:29 PM**

Test Date: **10/13/2010**

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:	061		
ID of Test:	Neck Extension	Date:	10/13/2010
Number of Test:	1	Time of Test:	1:45:29 PM







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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:	061		
Test ID:	Thorax	Test Date:	10/15/2010
Test Number:	1	Test Time:	5:52:03 PM

Component Part Number	Component Serial Number
Ribs 78051-RS	4273
Chest Jacket - 78051-169	2437

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	39.0 %RH P
Velocity	6.59 -- 6.83	6.71 m/s P
Resistive Force	-5.894 -- -5.160	-5.655 kN P
Sternum Displacement	-72.6 -- -63.5	-70.3 mm P
Hysteresis	69 -- 85	72 % P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Thorax**

Test Time: **5:52:03 PM**

Test Date: **10/15/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

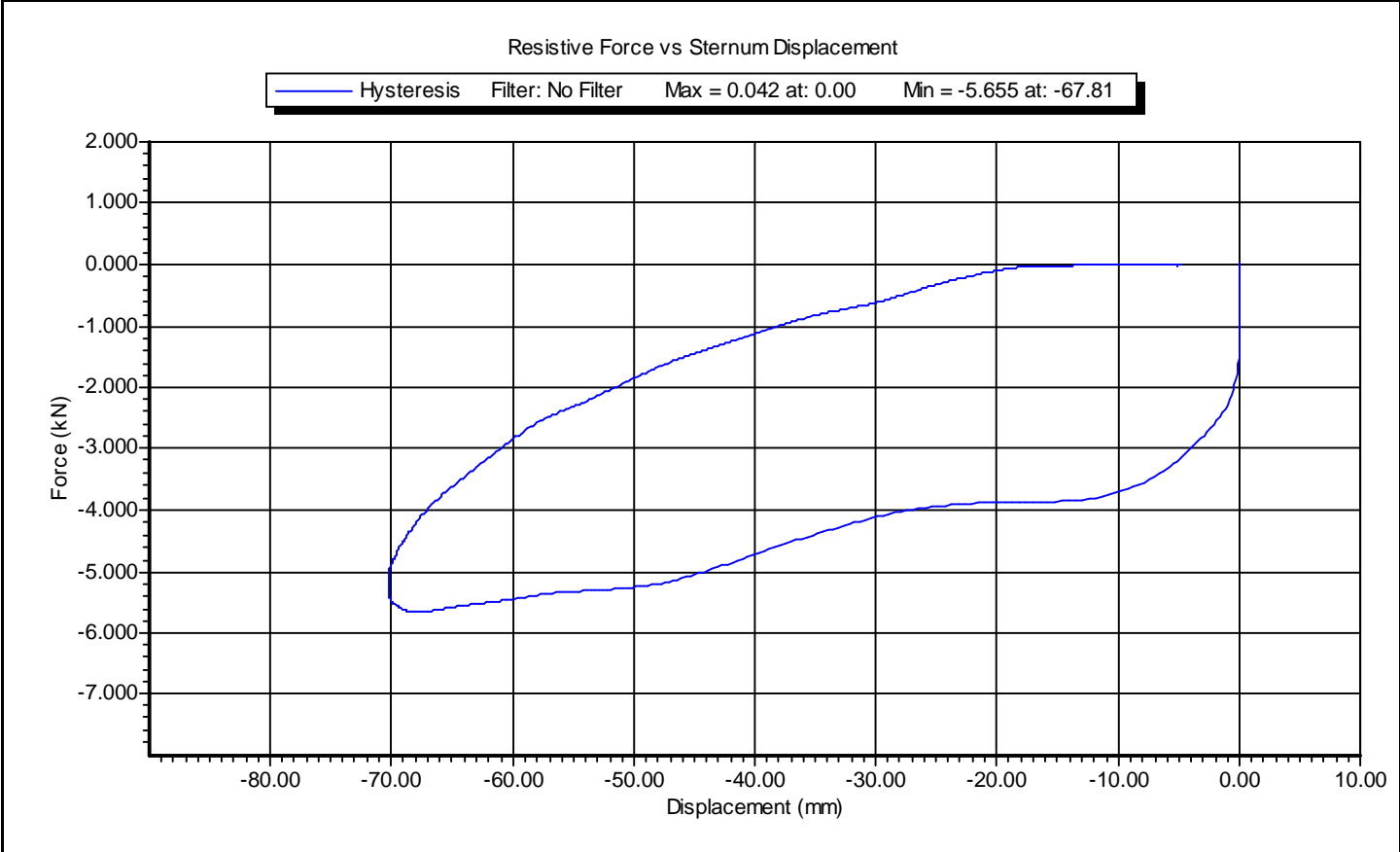
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
DentonATD	78051-342	DS-061	6/1/2010

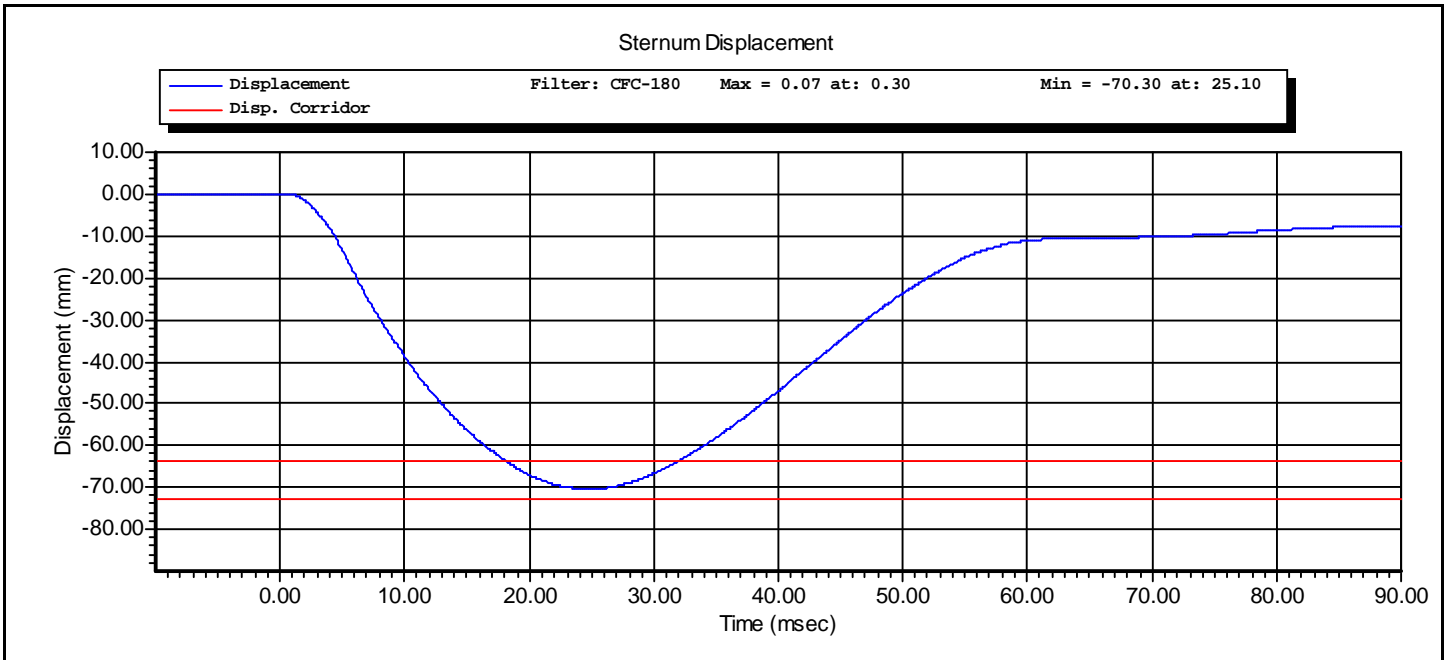
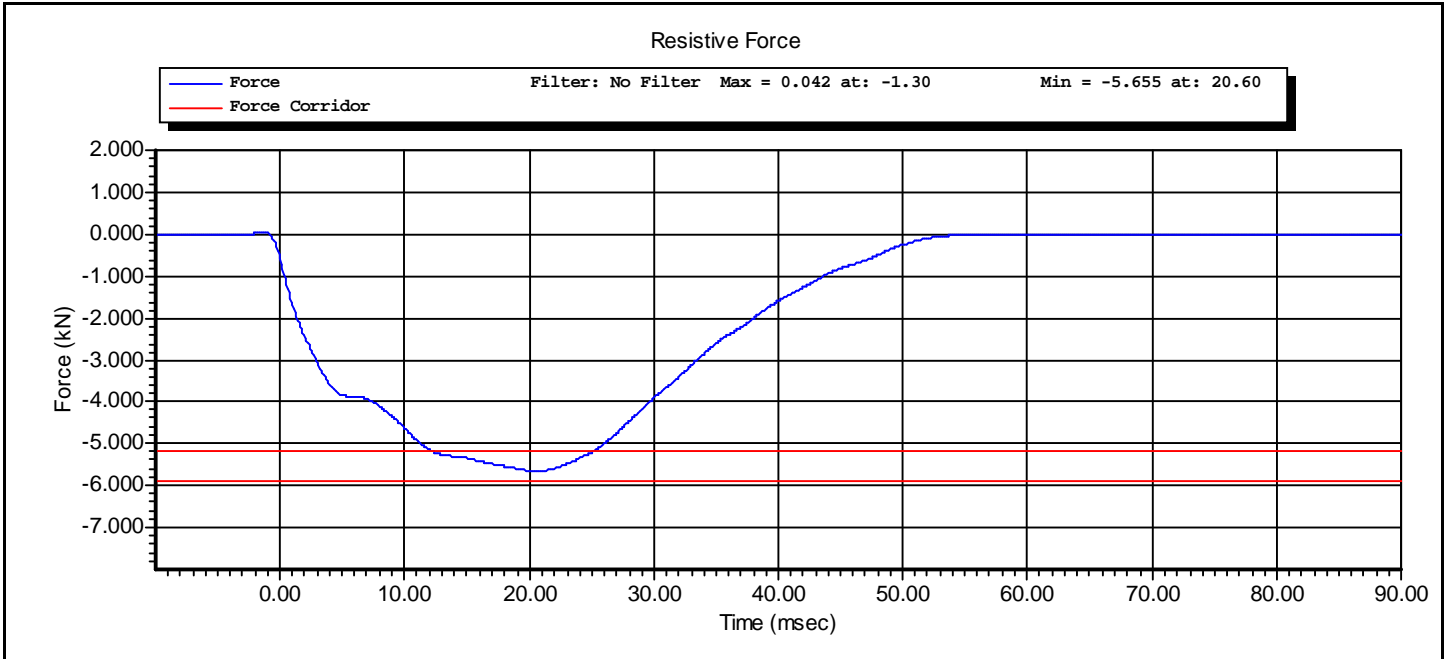
Test ID: **Thorax**

Test Time: **5:52:03 PM**

Test Date: **10/15/2010**

Test Name:	Thorax Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Thorax	Test Date:	10/15/2010
Test Number:	1	Test Time:	5:52:03 PM





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

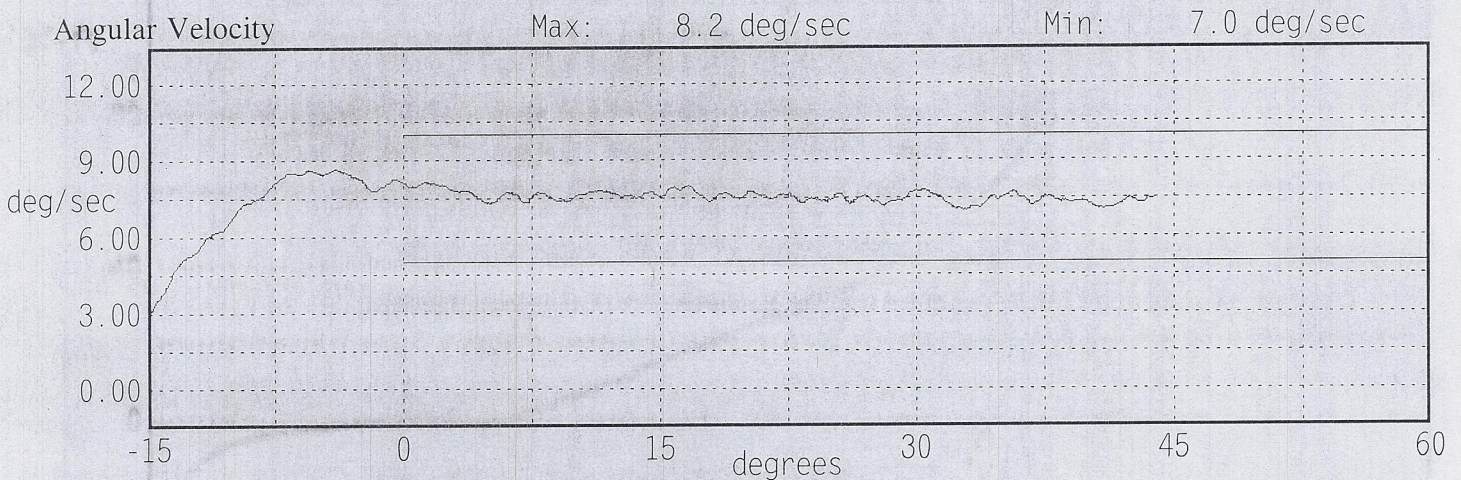
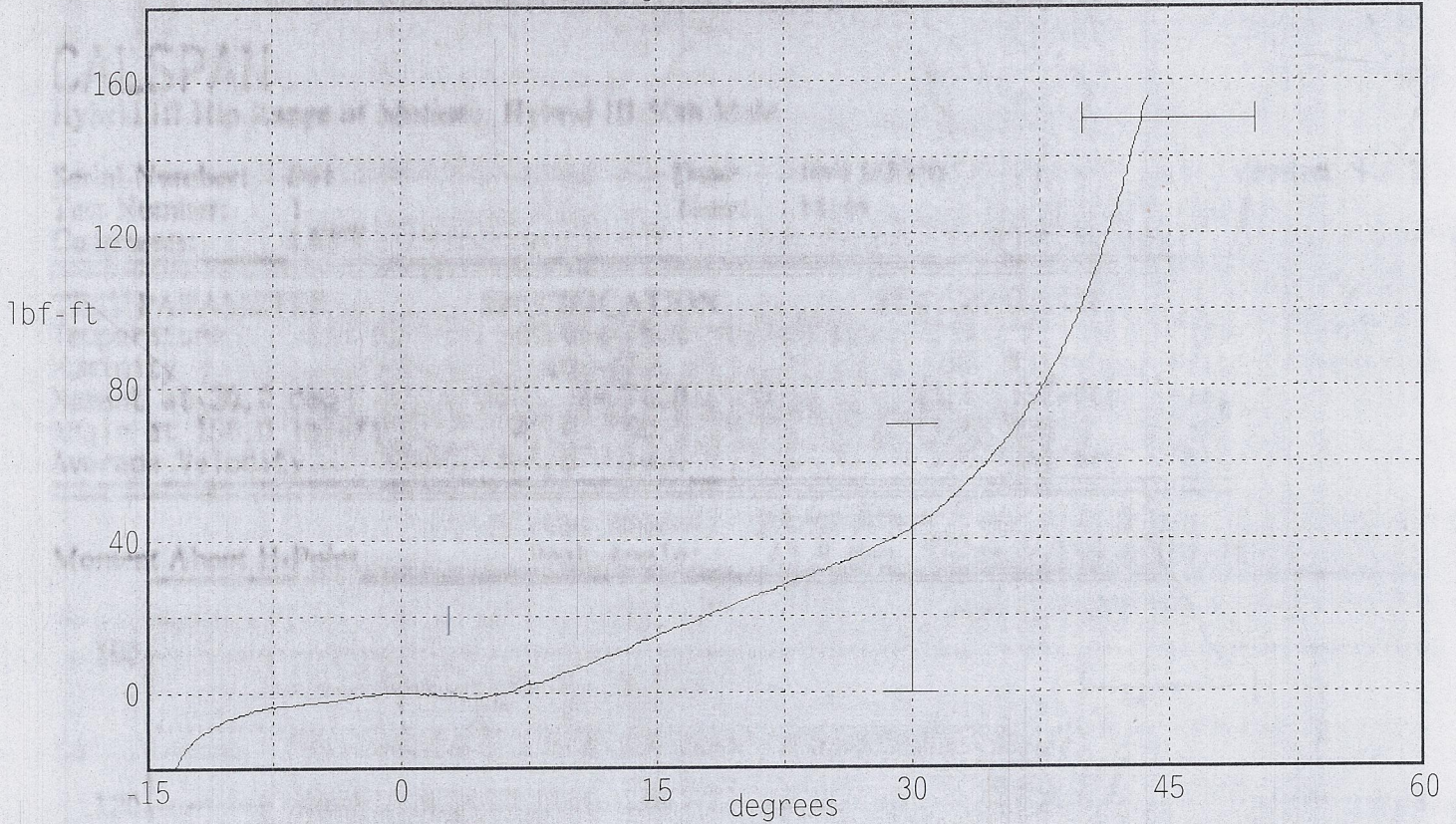
Serial Number: 061
Test Number: 1
Comments: LEFT

Date: 10/13/2010
Time: 11:46

Version: 1.6.3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66.0 - 78.0	72.0 °F Pass
Humidity	10 - 70	33 % Pass
Moment at 30.0 deg	<= 70.0	43.2 lbf-ft Pass
Angle at 150.0 lbf-ft	40.0 - 50.0	43.4 deg Pass
Average Velocity	5.0 - 10.0	7.5 deg/sec Pass

Moment About H-Point
Peak Moment: 155.6 lbf-ft at 43.8 deg
Peak Angle: 43.8 deg at 155.6 lbf-ft



CALSPAN

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

Serial Number: 061

Date: 10/13/2010

Version: 1.6.3

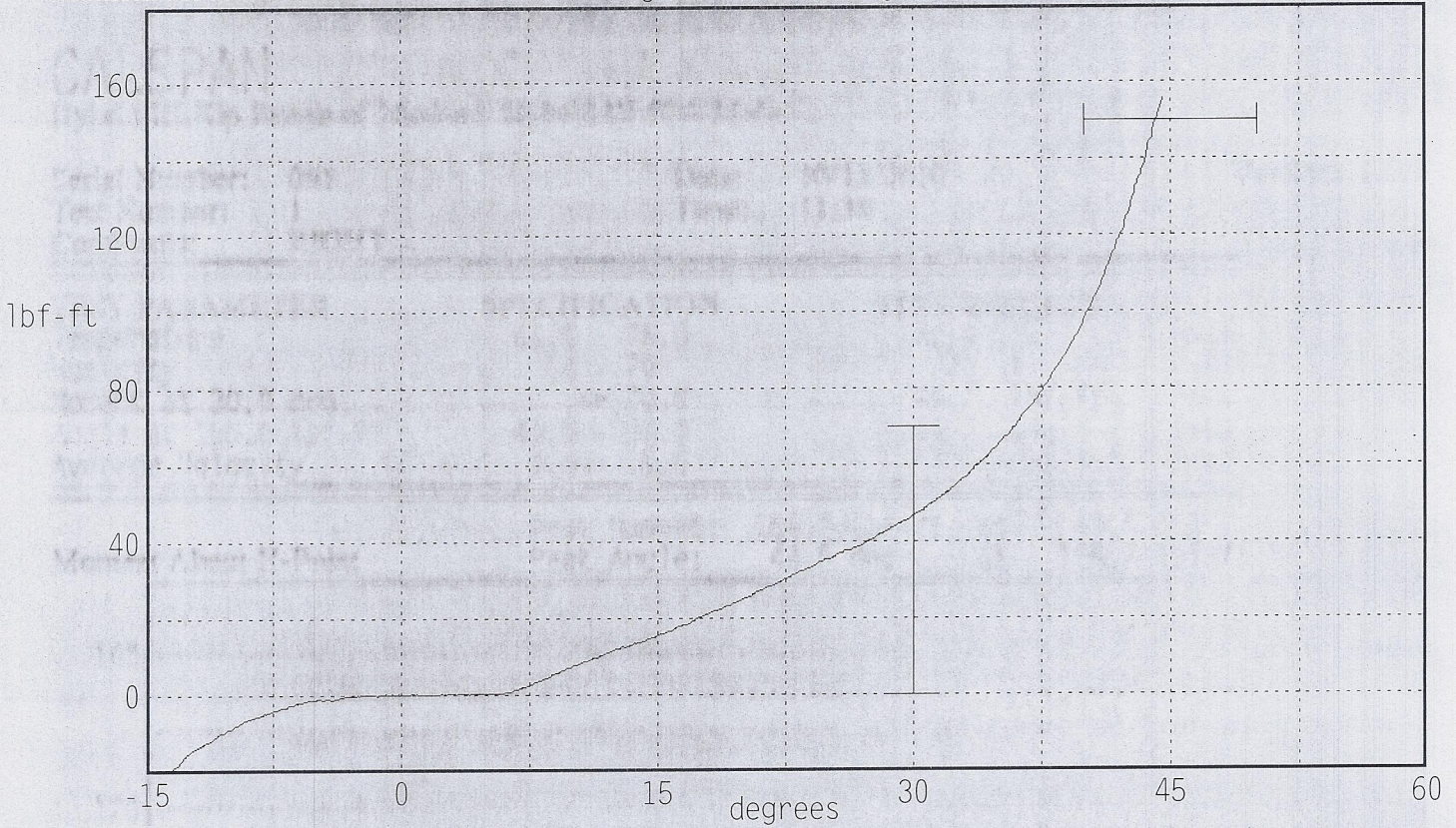
Test Number: 1

Time: 11:38

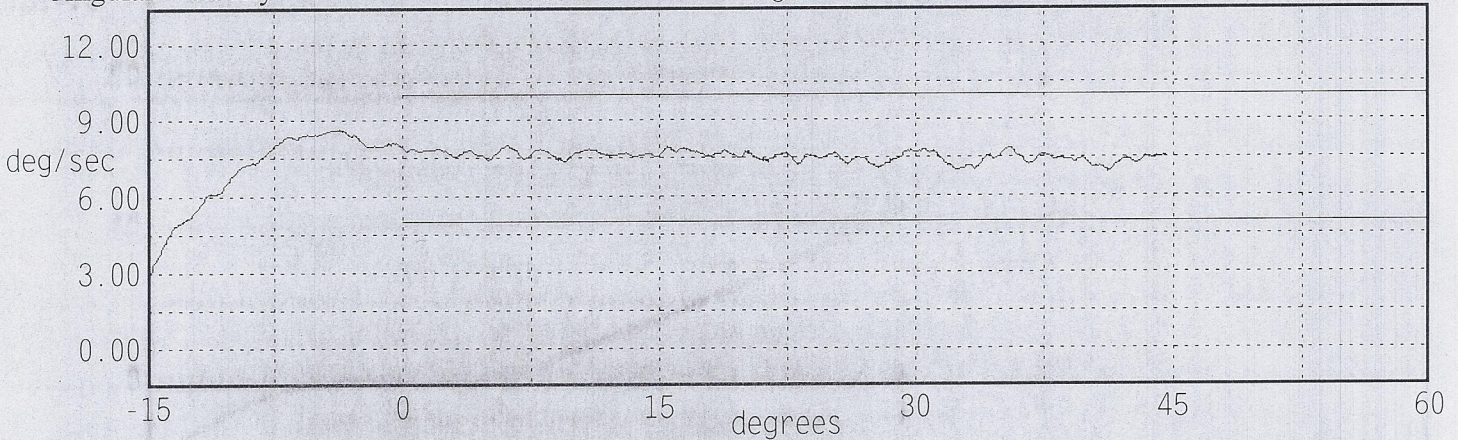
Comments: RIGHT

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66.0 - 78.0	72.0 °F Pass
Humidity	10 - 70	33 % Pass
Moment at 30.0 deg	<= 70.0	46.7 lbf-ft Pass
Angle at 150.0 lbf-ft	40.0 - 50.0	44.2 deg Pass
Average Velocity	5.0 - 10.0	7.5 deg/sec Pass

Moment About H-Point
Peak Moment: 155.7 lbf-ft at 44.5 deg
Peak Angle: 44.5 deg at 155.7 lbf-ft



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





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VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Left Knee	Test Date:	10/13/2010
Test Number:	1	Test Time:	4:22:52 PM

Component Part Number	Component Serial Number
Knee Skin - 78051(L) or 6(R)	077

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10.0 -- 70.0	29.0 %RH P
Velocity	2.07 -- 2.13	2.11 m/s P
Resistive Force	-5.78 -- -4.72	-5.31 kN P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Left Knee**

Test Time: **4:22:52 PM**

Test Date: **10/13/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
CEC	4-202	AC-A44	8/26/2010

Test ID: **Left Knee**

Test Time: **4:22:52 PM**

Test Date: **10/13/2010**

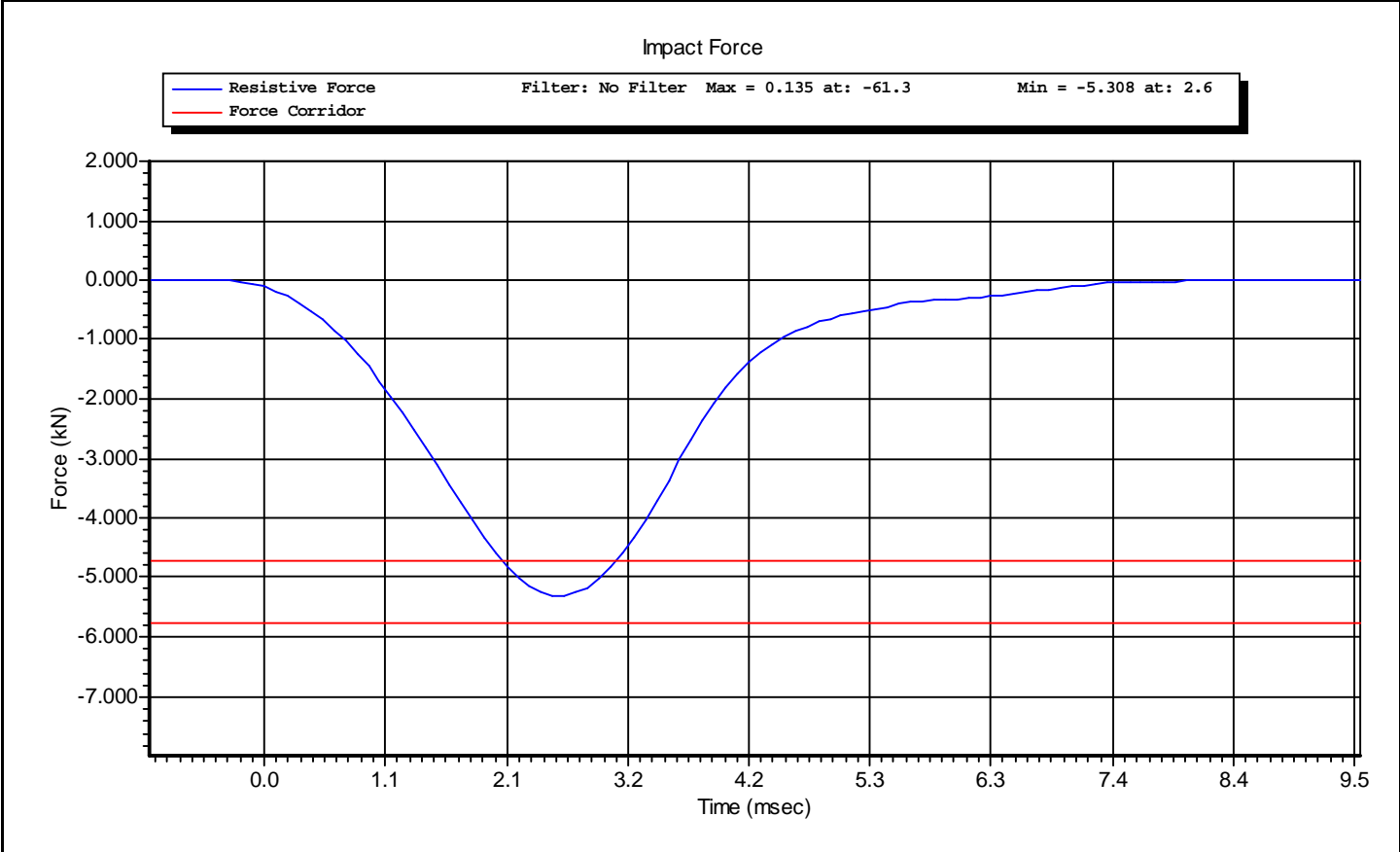


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Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Left Knee	Test Date:	10/13/2010
Test Number:	1	Test Time:	4:22:52 PM





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VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Right Knee	Test Date:	10/13/2010
Test Number:	1	Test Time:	3:58:02 PM

Component Part Number	Component Serial Number
Knee Skin - 78051(L) or 6(R)	3266

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10.0 -- 70.0	29.0 %RH P
Velocity	2.07 -- 2.13	2.07 m/s P
Resistive Force	-5.78 -- -4.72	-5.02 kN P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Right Knee** Test Time: **3:58:02 PM** Test Date: **10/13/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
CEC	4-202	AC-A44	8/26/2010

Test ID: **Right Knee**

Test Time: **3:58:02 PM**

Test Date: **10/13/2010**

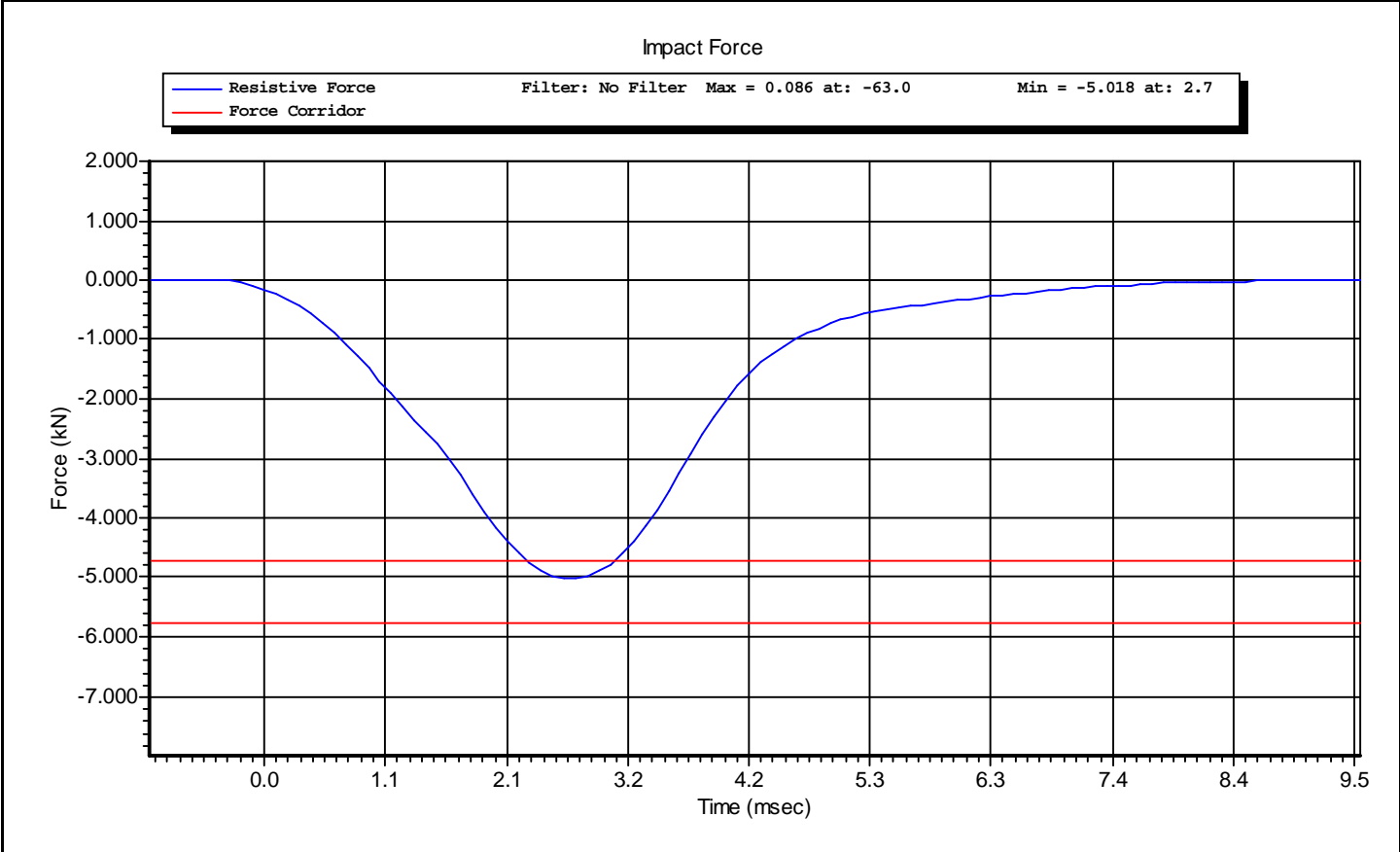


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Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Right Knee	Test Date:	10/13/2010
Test Number:	1	Test Time:	3:58:02 PM



CALIBRATION TEST RESULTS

POST-TEST

RIGHT-FRONT PASSENGER DUMMY

S/N: 273

External Measurements

5th Female SN 273

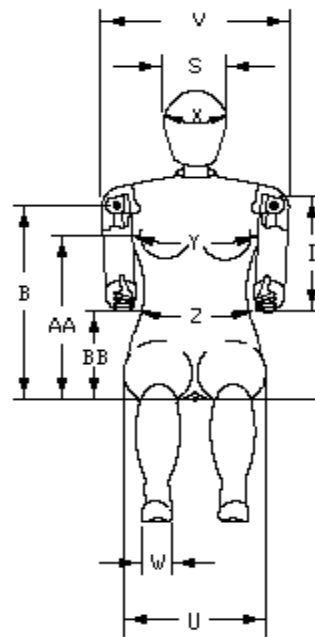
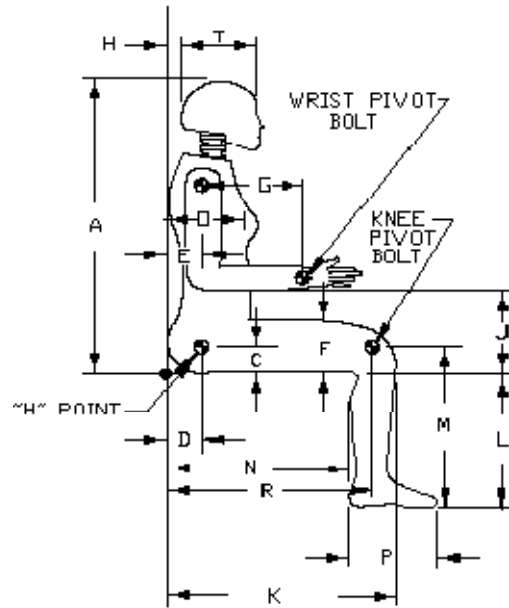
Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	774.7 – 800.1	785	Yes
B	Shoulder Pivot Height	431.8 – 457.2	449	Yes
C	H-Point Height	81.3 – 86.3	85	Yes
D	H-Point from Backline	144.8 – 149.8	148	Yes
E	Shoulder Pivot from Backline	68.6.83.8	78	Yes
F	Thigh Clearance	119.4 – 134.6	128	Yes
G	Back of Elbow to Wrist Pivot	243.9 – 259.1	250	Yes
H	Head Back to Backline	43.2 – 48.2	46	Yes
I	Shoulder to Elbow Length	276.8 – 297.2	282	Yes
J	Elbow Rest Height	182.8 – 203.2	195	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	401	Yes
N	Buttock Popliteal Length	414 – 439.4	425	Yes
O	Chest Depth without Jacket	175.3 – 190.5	184	Yes
P	Foot Length (right)	218.5 – 233.7	222	Yes
R	Buttock To Knee Pivot Length	457.2 – 482.6	479	Yes
S	Head Breadth	137.1 – 147.3	144	Yes
T	Head Depth	177.8 - 188	184	Yes
U	Hip Breadth	299.7 – 314.9	309	Yes
V	Shoulder Breadth	350.5 – 365.7	359	Yes
W	Foot Breadth	78.8 - 94	88	Yes
X	Head Circumference	528.3 – 548.7	539	Yes
Y	Chest Circumference with Jacket	850.9 – 881.3	859	Yes
Z	Waist Circumference	759.5 – 789.9	775	Yes
AA	Reference Location (Chest Circumference)	332.7 – 358.1	345	Yes
BB	Reference Location (Waist Circumference)	160.1 – 170.2	165	Yes

Technician: SZ

Date: 10/15/2010

Hybrid 3 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:	Head Drop	Test Date:	10/15/2010
Test Number:	1	Test Time:	8:35:34 AM

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

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.0 deg C P
Humidity	10 -- 70	39 %RH P
Resultant Acceleration	250 -- 300	277 g P
Oscillation	0.0 -- 10.0	2.5 % P
Lateral Acceleration	-15.00 -- 15.00	-3.77 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Head Drop**

Test Time: **8:35:34 AM**

Test Date: **10/15/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P66943	7/27/2010
Endevco	7264-2000	P66931	4/20/2010
Endevco	7264-2000	P66926	4/20/2010

Test ID: **Head Drop**

Test Time: **8:35:34 AM**

Test Date: **10/15/2010**

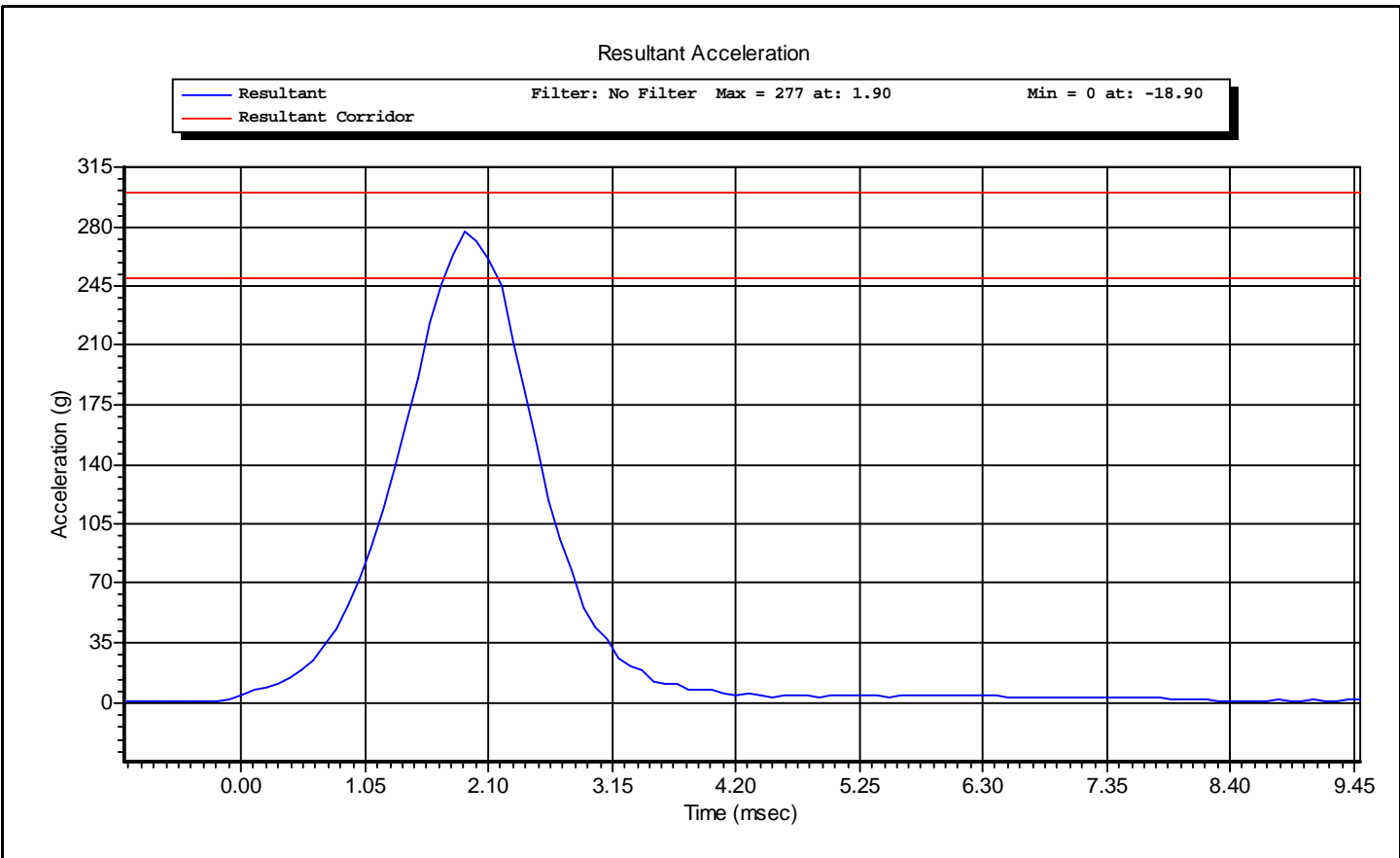


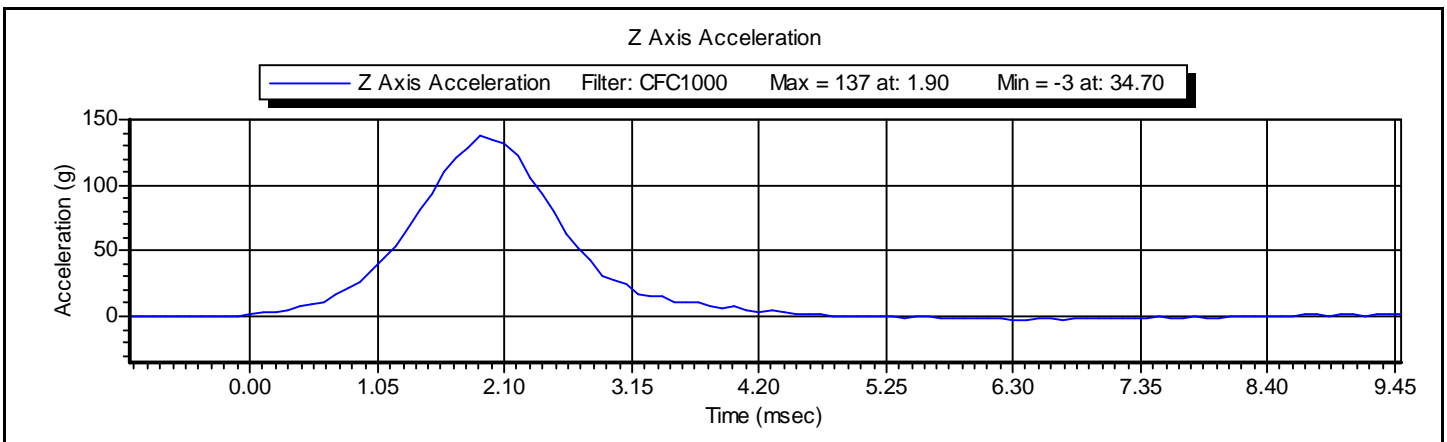
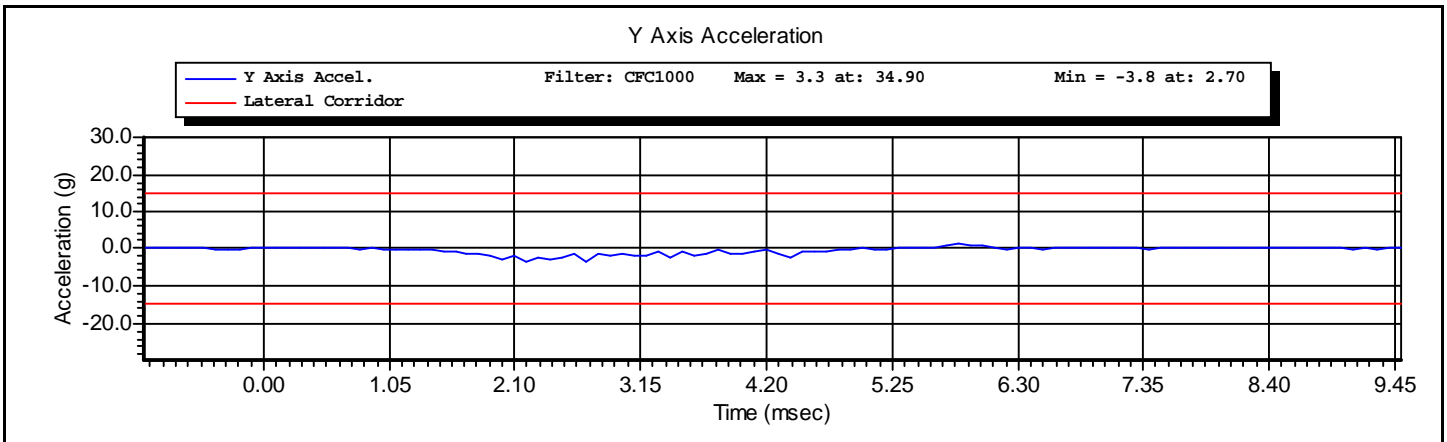
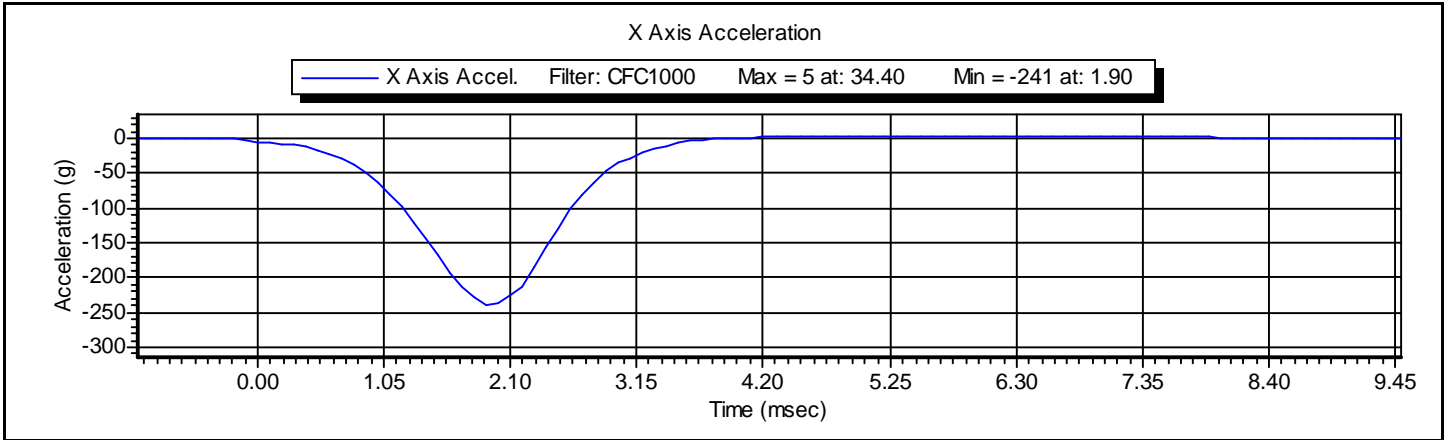
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Test Name:	Head Drop	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	273		
Test ID:	Head Drop	Test Date:	10/15/2010
Test Number:	1	Test Time:	8:35:34 AM







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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:	Neck Flexion	Test Date:	10/14/2010
Test Number:	3	Test Time:	2:40:13 PM

Component Part Number	Component Serial Number
Neck - 880105-255	713

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	43 %RH P
Velocity	6.89 -- 7.13	7.08 m/s P
Pendulum Impulse at 10 ms	2.10 -- 2.50	2.27 m/s P
Pendulum Impulse at 20 ms	4.00 -- 5.00	4.49 m/s P
Pendulum Impulse at 30 ms	5.80 -- 7.00	6.41 m/s P
D Plane Rotation	-91.0 -- -77.0	-78.0 degrees P
Moment During Rotation Interval	69.0 -- 83.0	70.8 Nm P
Moment Decay to 10.0 Nm	80.0 -- 100.0	90.0 ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Flexion**

Test Time: **2:40:13 PM**

Test Date: **10/14/2010**



VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
DentonATD	78051-342	PENDULUM POT	8/14/2010
DentonATD	78051-342	CONDYLE POT	8/14/2010
FTSS	1716A	LC-296 My	2/1/2010
FTSS	1716A	LC-296 Fx	2/1/2010
FTSS	1716A	LC-296 Fy	2/1/2010
FTSS	1716A	LC-296 Fz	2/1/2010

Test ID: **Neck Flexion**

Test Time: **2:40:13 PM**

Test Date: **10/14/2010**

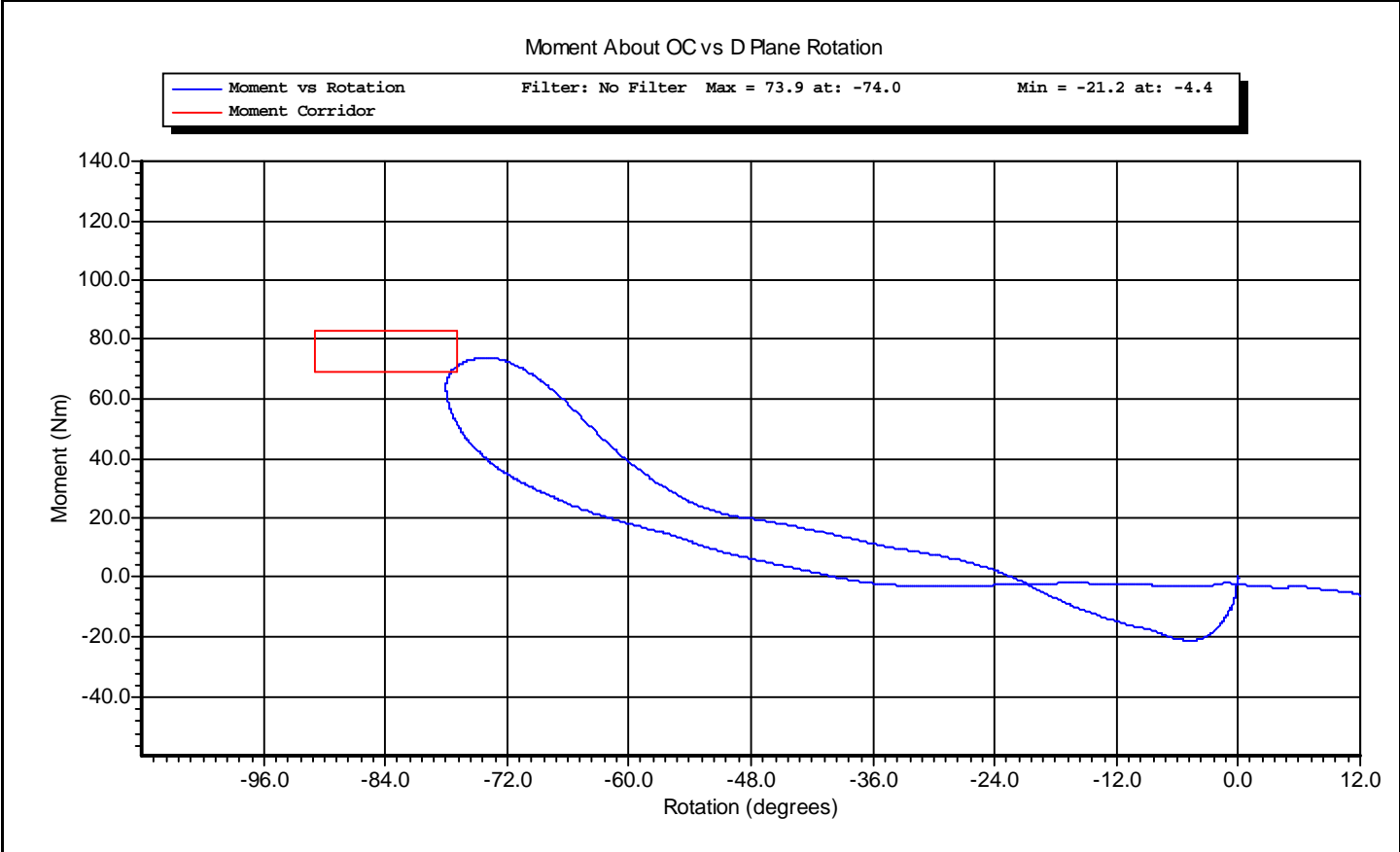


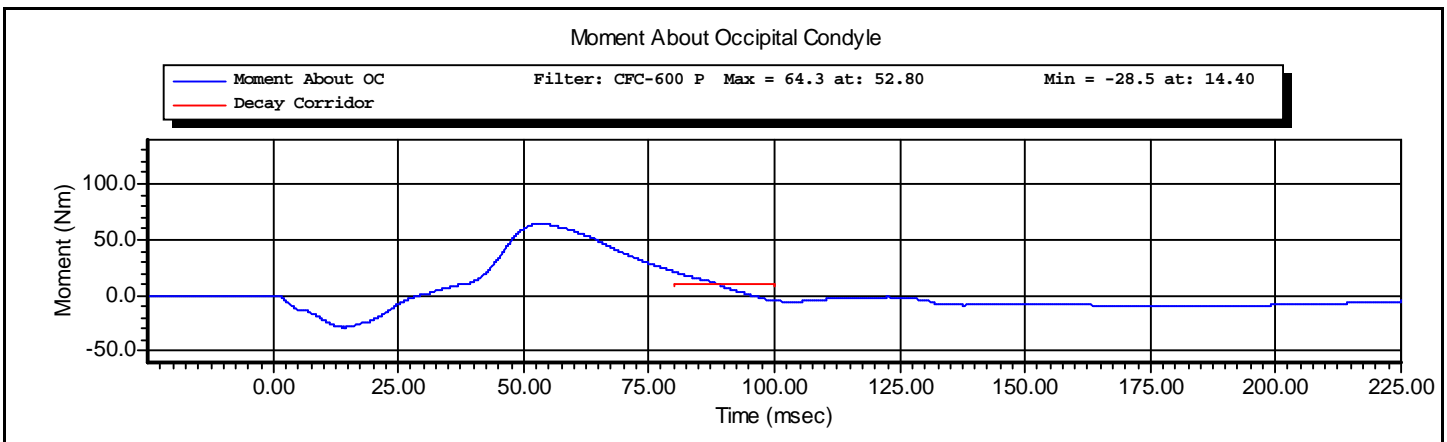
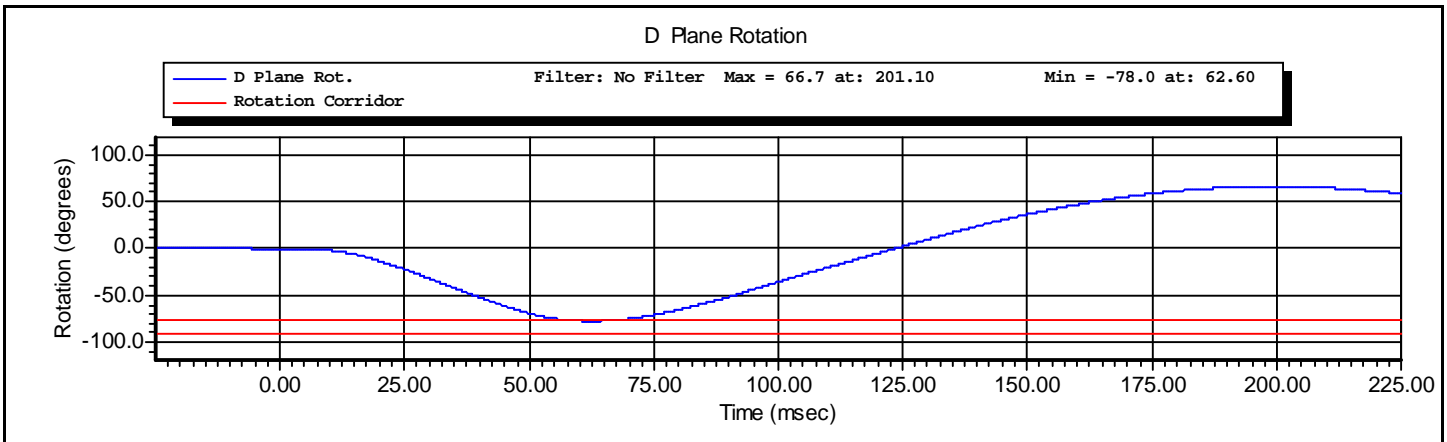
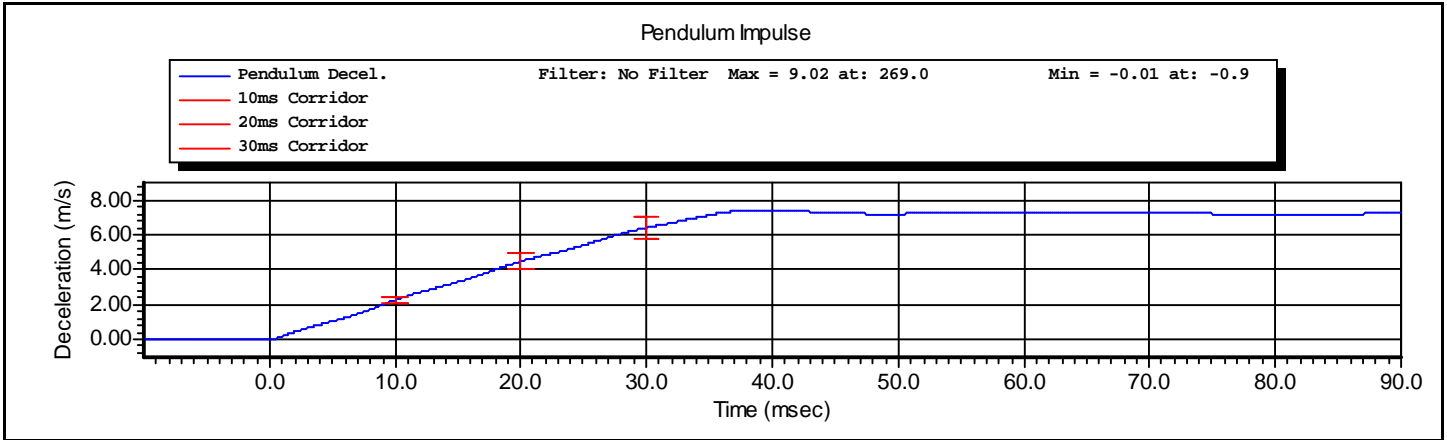
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Test Name:	Neck Flexion	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	273		
Test ID:	Neck Flexion	Test Date:	10/14/2010
Test Number:	3	Test Time:	2:40:13 PM







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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:	Neck Extension	Test Date:	10/14/2010
Test Number:	1	Test Time:	3:12:50 PM

Component Part Number	Component Serial Number
Neck - 880105-255	713

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	43 %RH P
Velocity	5.95 -- 6.19	6.09 m/s P
Pendulum Impulse at 10 ms	1.50 -- 1.90	1.83 m/s P
Pendulum Impulse at 20 ms	3.10 -- 3.90	3.61 m/s P
Pendulum Impulse at 30 ms	4.60 -- 5.60	5.20 m/s P
D Plane Rotation	99.0 -- 114.0	109.2 degrees P
Moment During Rotation Interval	-65.0 -- -53.0	-58.8 Nm P
Moment Decay to -10.0 Nm	94.0 -- 114.0	104.7 ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Extension**

Test Time: **3:12:50 PM**

Test Date: **10/14/2010**



VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
DentonATD	78051-342	PENDULUM POT	8/14/2010
DentonATD	78051-342	CONDYLE POT	8/14/2010
FTSS	1716A	LC-296 My	2/1/2010
FTSS	1716A	LC-296 Fx	2/1/2010
FTSS	1716A	LC-296 Fy	2/1/2010
FTSS	1716A	LC-296 Fz	2/1/2010

Test ID: **Neck Extension**

Test Time: **3:12:50 PM**

Test Date: **10/14/2010**

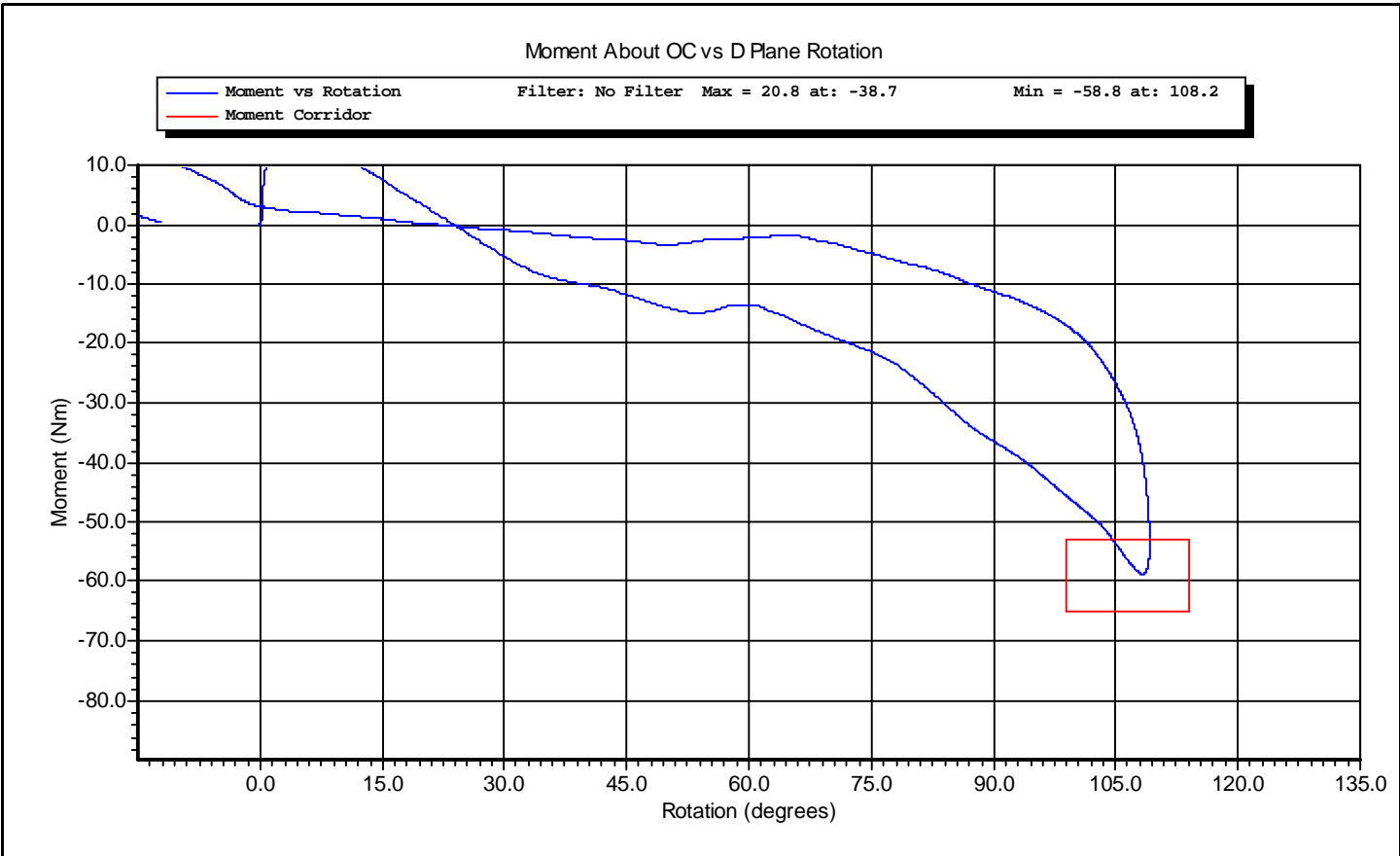


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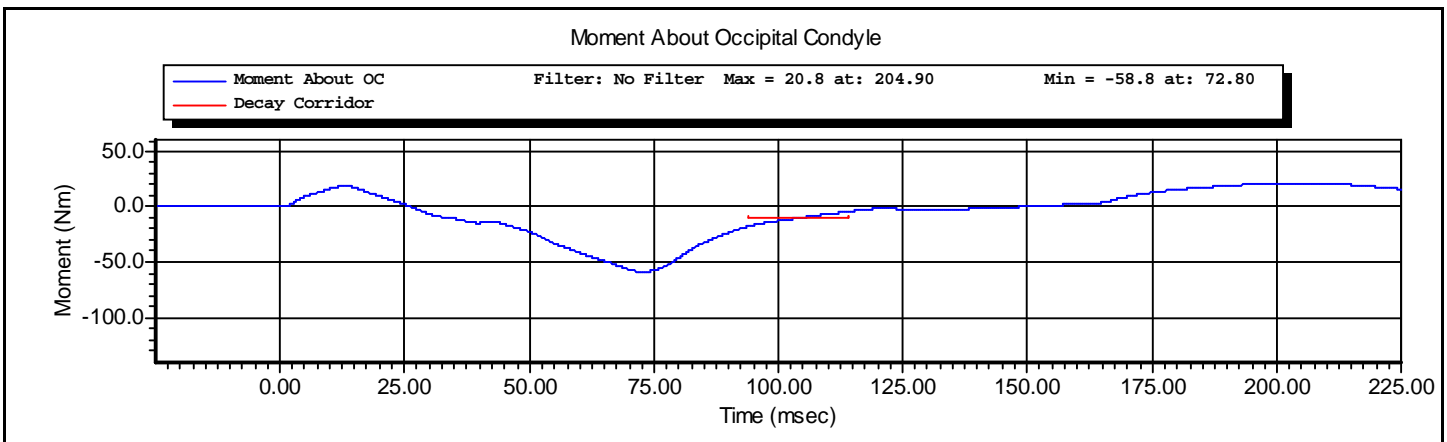
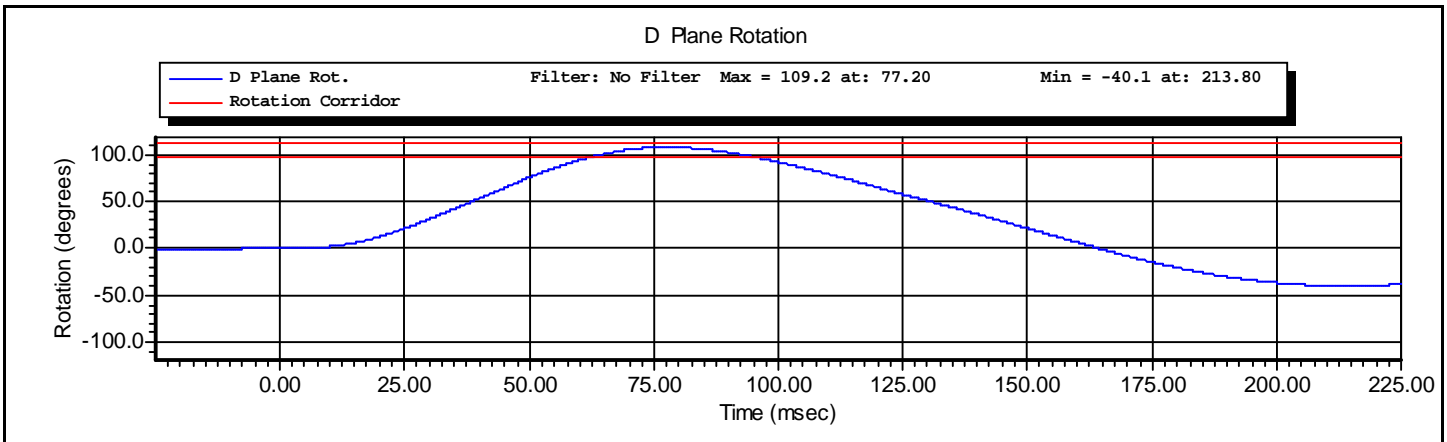
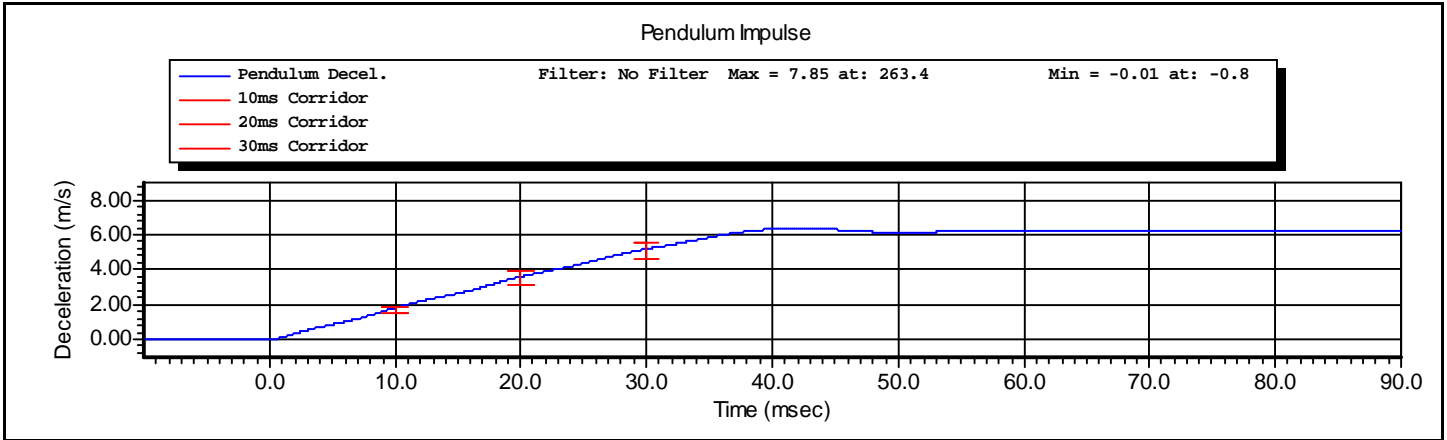
Test Name:	Neck Extension	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	273		
Test ID:	Neck Extension	Test Date:	10/14/2010
Test Number:	1	Test Time:	3:12:50 PM



Test ID: **Neck Extension**

Test Time: **3:12:50 PM**

Test Date: **10/14/2010**





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Torso Flexion Test

Technician: AR

Calibration Date: 10/15/2010

ATD Serial Number: 5th Female 273

Test Results			
Test Condition	Parameters	Results	Status
Temperature	18.9-25.6° C	22.2° C	P
Lab Humidity: 38%	10-70%	39%	P
Max Force @ 45 deg	320 – 390N	362N	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	21°	P

P = Pass

F = Fail



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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:	Thorax Impact	Test Date:	10/15/2010
Test Number:	4	Test Time:	4:59:41 PM

Component Part Number	Component Serial Number
Ribs 880105-RS	
Chest Jacket - 880105-355-E	948
Lumbar Spine - 880105-1095	

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	39.0 %RH P
Velocity	6.59 -- 6.83	6.70 m/s P
Sternum Displacement	-58.0 -- -50.0	-52.1 mm P
Force During Displacement Interval	-4400 -- -3900	-4393 N P
Force -18.0 to -50.0 Displacement	-4600 -- 0	-4383 N P
Hysteresis	69 -- 85	69 % P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Thorax Impact**

Test Time: **4:59:41 PM**

Test Date: **10/15/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
DentonATD	78051-342	DS-273	4/13/2010

Test ID: **Thorax Impact**

Test Time: **4:59:41 PM**

Test Date: **10/15/2010**

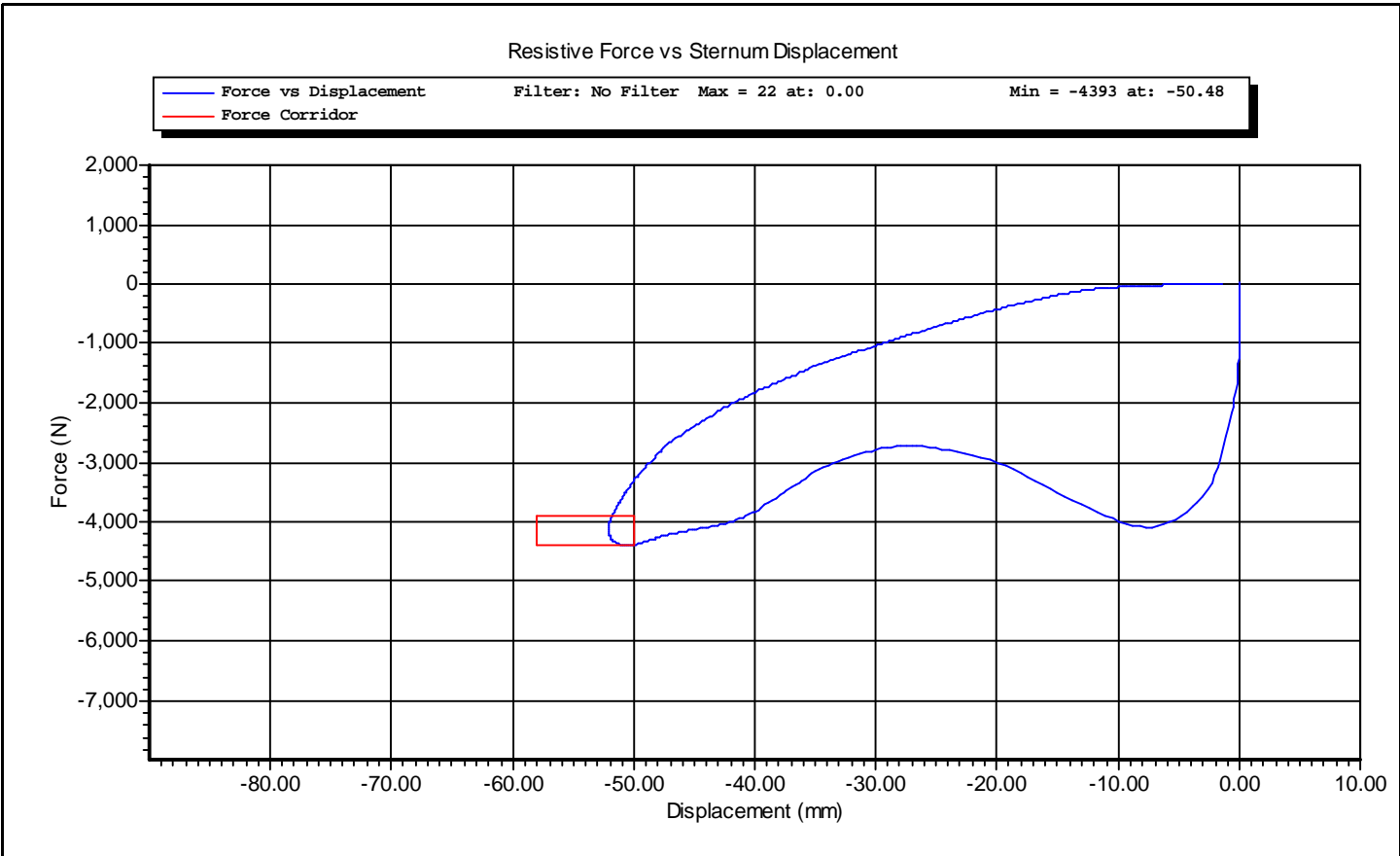


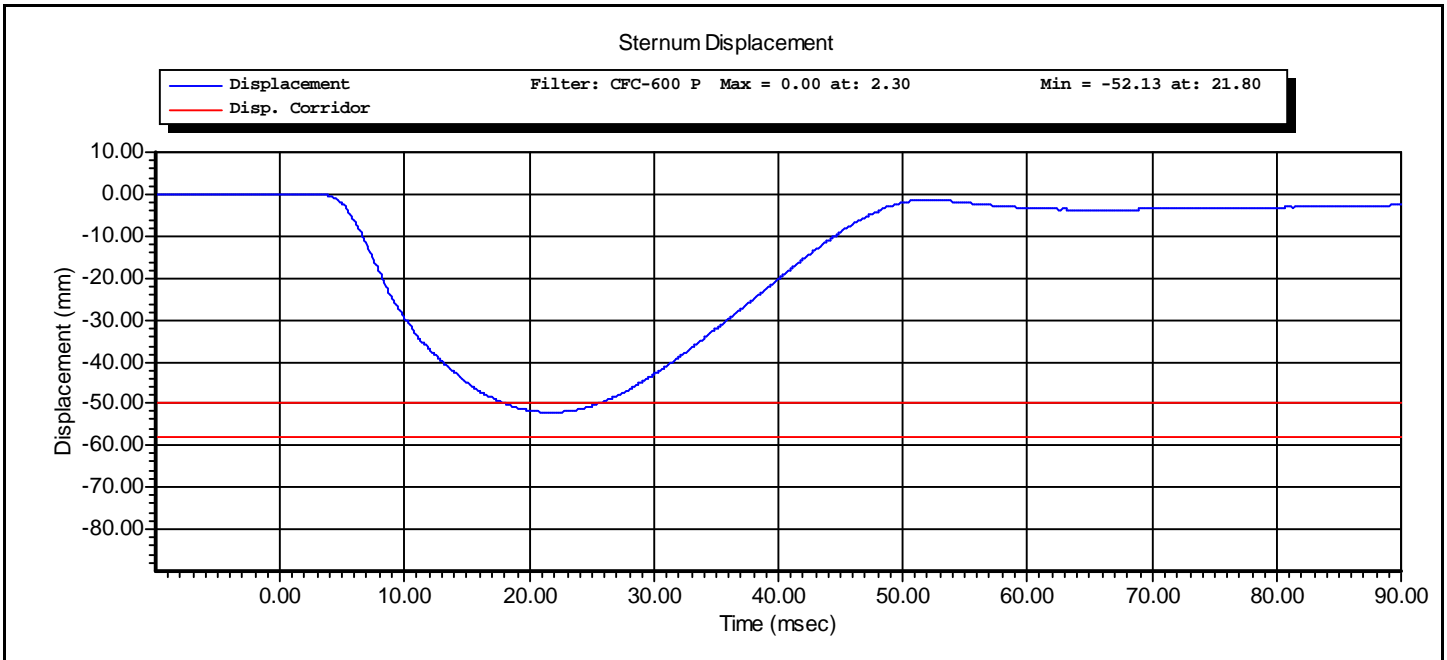
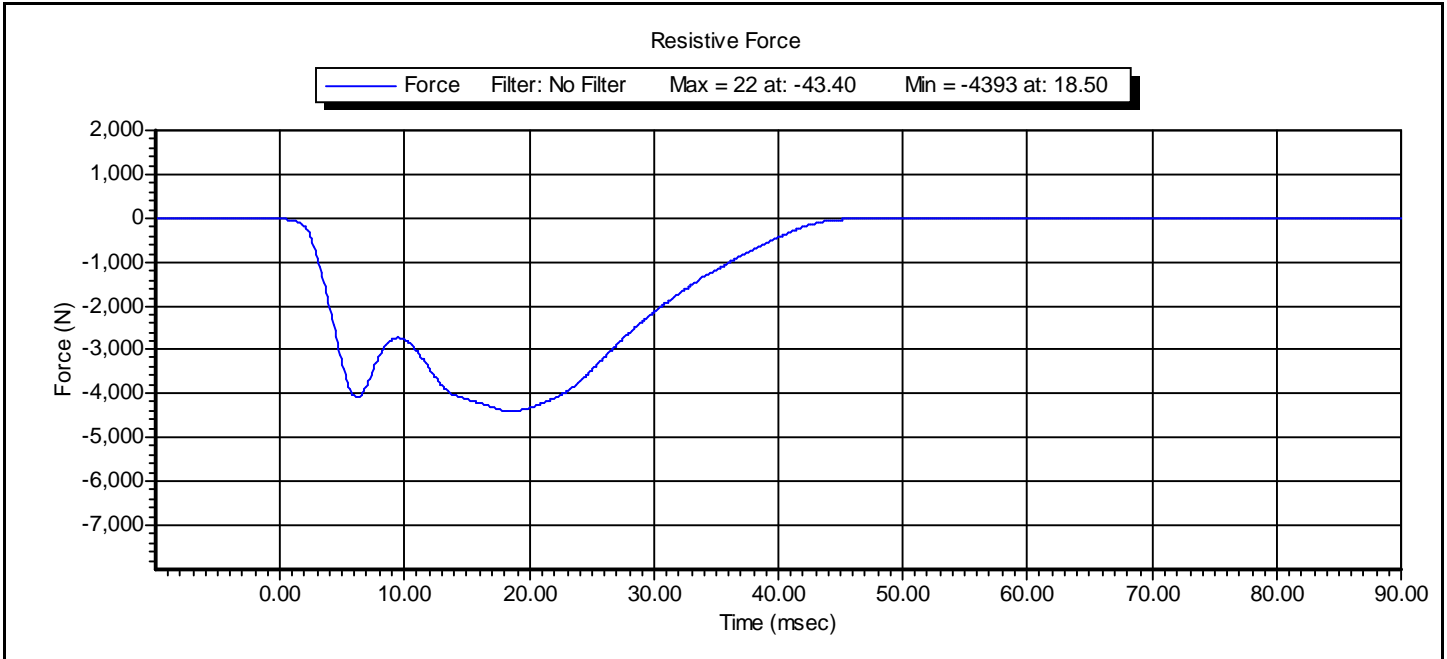
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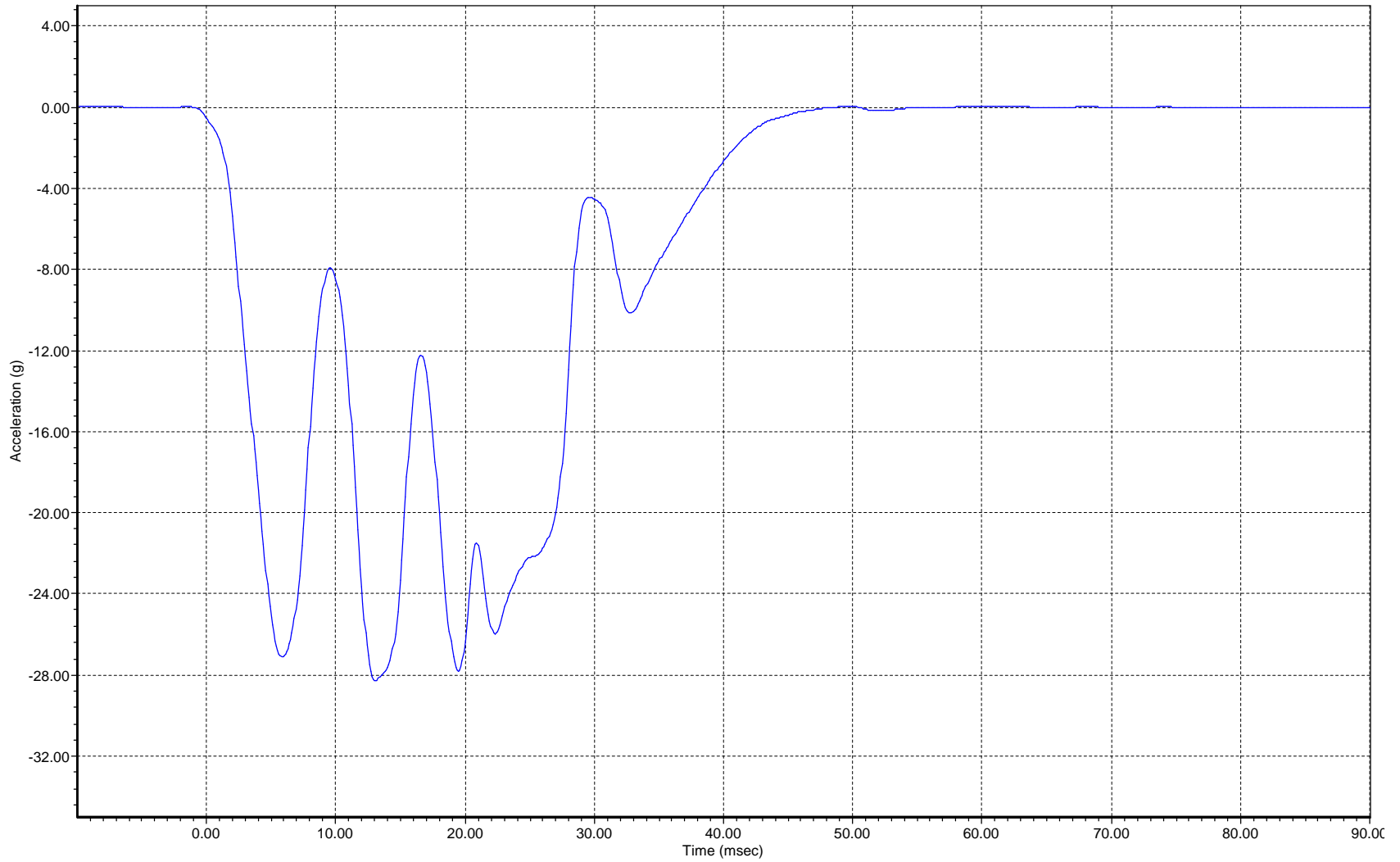
Test Name:	Thorax Impact	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	273		
Test ID:	Thorax Impact	Test Date:	10/15/2010
Test Number:	4	Test Time:	4:59:41 PM





Probe Accelerometer

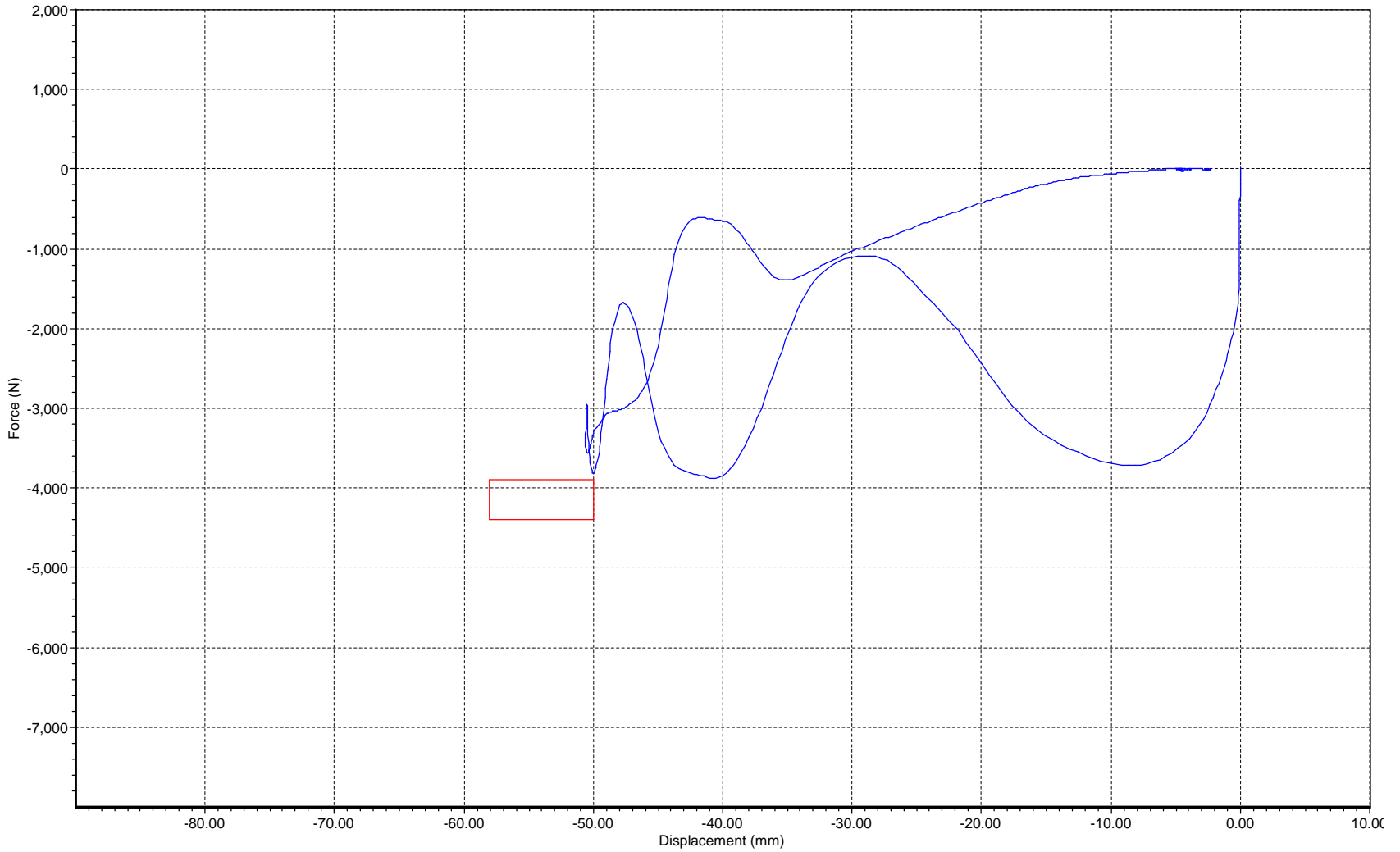
Probe Accel. Filter: CFC-180 Max = 0.16 at: -43.20 Min = -28.28 at: 13.10



Hybrid III 5th, Thorax Impact, 10/12/2010, 4:21:05 PM

Resistive Force vs Sternum Displacement

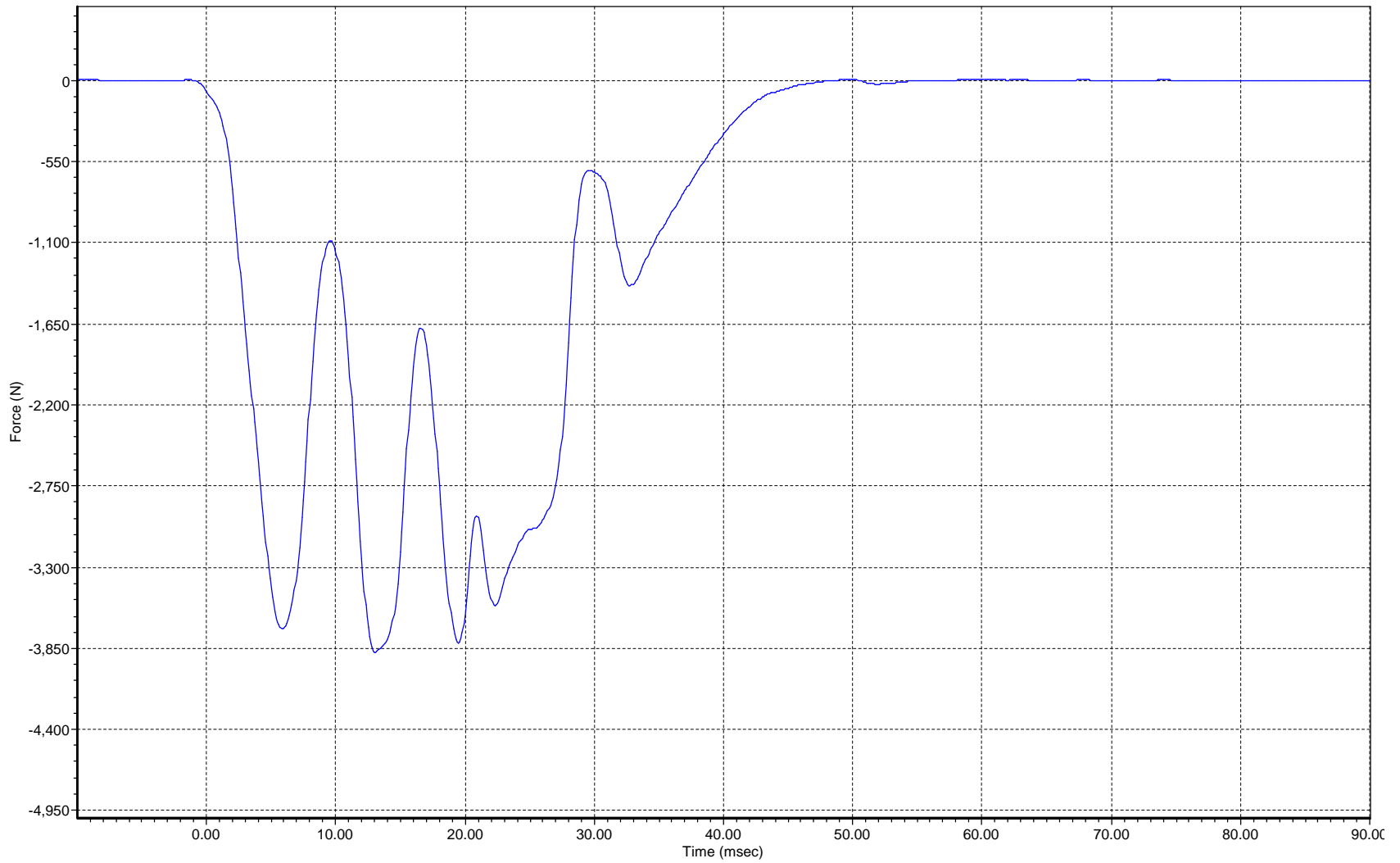
Force vs Displacement Filter: No Filter Max = 22 at: 0.00 Min = -3878 at: -40.80
Force Corridor



Hybrid III 5th, Thorax Impact, 10/12/2010, 4:21:05 PM

Resistive Force

Force Filter: No Filter Max = 22 at: -43.20 Min = -3878 at: 13.10



Hybrid III 5th, Thorax Impact, 10/12/2010, 4:21:05 PM



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VERIFICATION REPORT

Test Name:	Knee Impact	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:	10/14/2010
Test Number:	1	Test Time:	4:02:18 PM

Component Part Number	Component Serial Number
Knee Skin - 880105-508	1726

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10.0 -- 70.0	43.0 %RH P
Velocity	2.07 -- 2.13	2.11 m/s P
Resistive Force	-4060 -- -3450	-3714 N P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Left Knee**

Test Time: **4:02:18 PM**

Test Date: **10/14/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

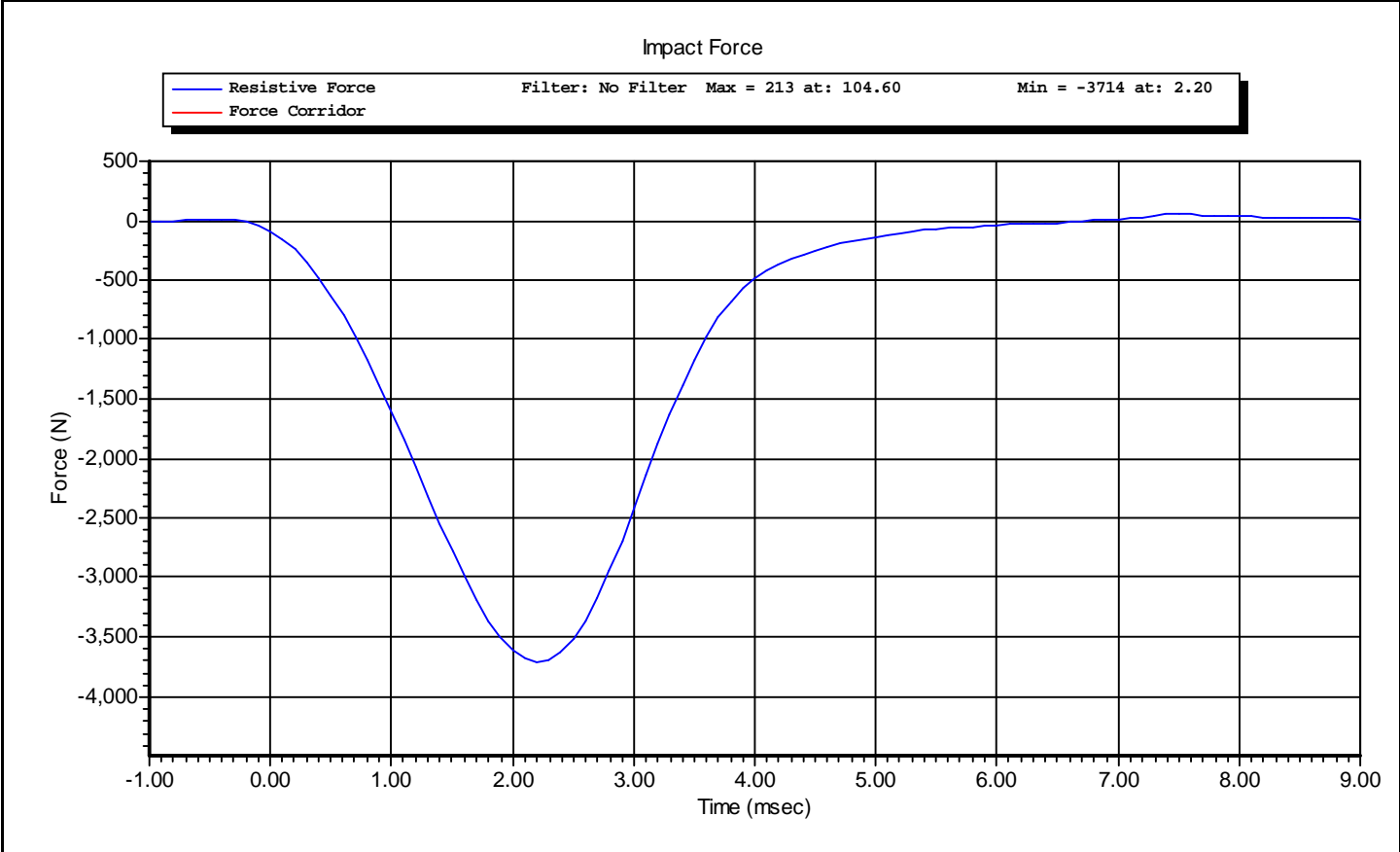
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
CEC	4-202	AC-A44	8/26/2010

Test ID: **Left Knee**

Test Time: **4:02:18 PM**

Test Date: **10/14/2010**

Test Name:	Knee Impact	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:	10/14/2010
Test Number:	1	Test Time:	4:02:18 PM





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VERIFICATION REPORT

Test Name:	Knee Impact	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:	10/14/2010
Test Number:	1	Test Time:	4:09:39 PM

Component Part Number	Component Serial Number
Knee Skin - 880105-508	1051

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10.0 -- 70.0	43.0 %RH P
Velocity	2.07 -- 2.13	2.11 m/s P
Resistive Force	-4060 -- -3450	-3710 N P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Right Knee** Test Time: **4:09:39 PM** Test Date: **10/14/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
CEC	4-202	AC-A44	8/26/2010

Test ID: **Right Knee**

Test Time: **4:09:39 PM**

Test Date: **10/14/2010**

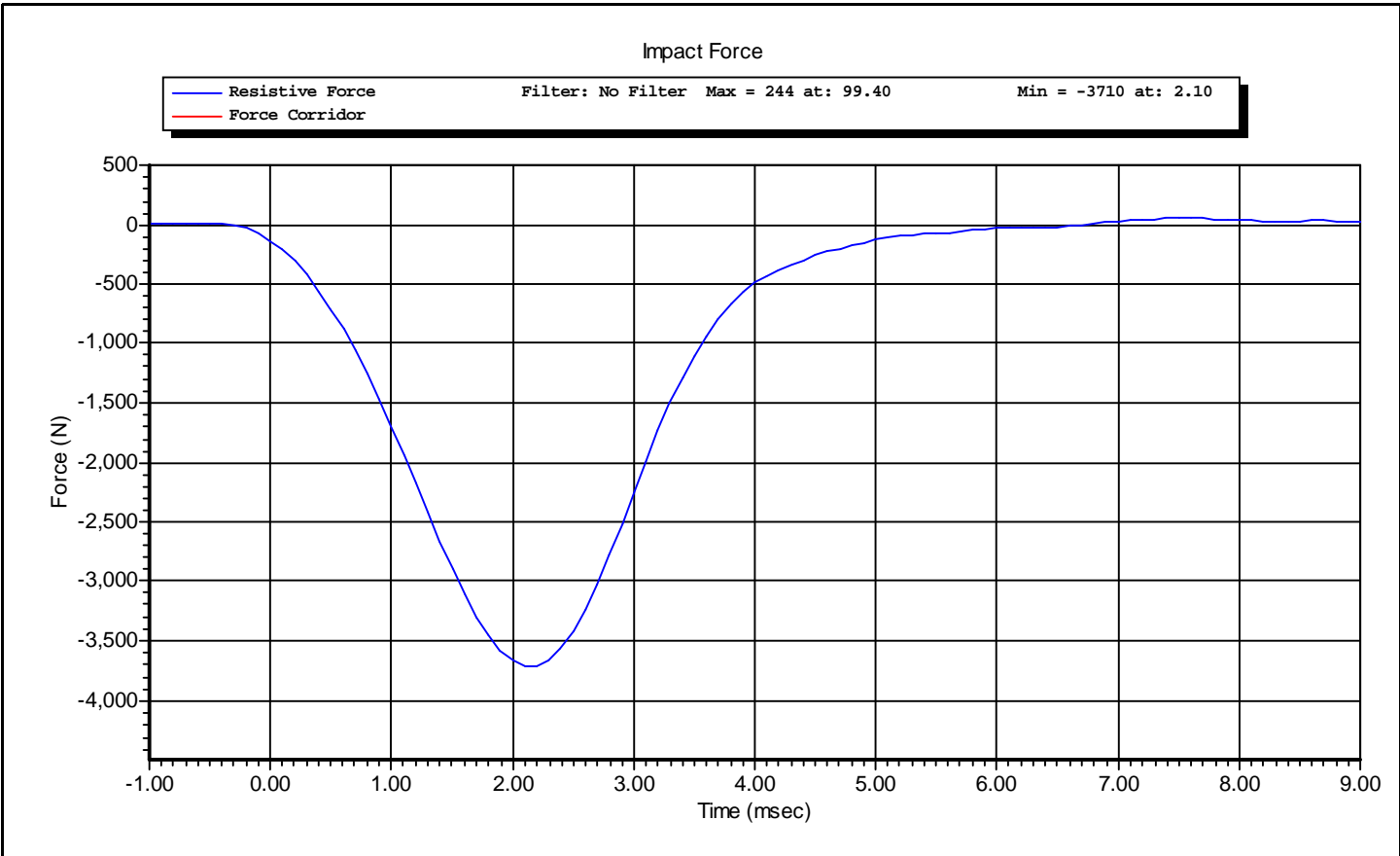


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Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	273		
Test ID:	Right Knee	Test Date:	10/14/2010
Test Number:	1	Test Time:	4:09:39 PM



Test ID: **Right Knee**

Test Time: **4:09:39 PM**

Test Date: **10/14/2010**

