

FINAL REPORT NUMBER: NCAP-TRC-13-002

**NEW CAR ASSESSMENT PROGRAM (NCAP)
Frontal Barrier Impact Test**

**General Motors LLC
2013 Chevrolet Silverado 2500 HD 4X4 EXT
NHTSA Number: MD0114**

**PREPARED BY:
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P. O. Box B-67
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Report Date: October 29, 2012

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Office of Crashworthiness Standards
Mail Code: NVS-111
1200 New Jersey Ave, SE
Room W43-410
Washington, D.C. 20590**

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Approval Date: November 27, 2012

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 2013 Chevrolet Silverado 2500 HD 4X4 EXT 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. This test was conducted at the Transportation Research Center Inc. in East Liberty, Ohio on October 15, 2012 The impact velocity was 57.0 km/h, and the ambient temperature at the barrier face at the time of impact was 23° C. The target vehicle post-test maximum crush was 1195 millimeters at the vehicle centerline. The test vehicle's performance is as follows: <table border="1"> <thead> <tr> <th></th> <th colspan="3">Driver ATD</th> <th colspan="3">Passenger ATD</th> </tr> <tr> <th>Measurement Description</th> <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>692</td> <td>N/A</td> <td>700</td> <td>650</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>36</td> <td>mm</td> <td>52</td> <td>30</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>0.42</td> <td>N/A</td> <td>1</td> <td>0.95</td> </tr> <tr> <td>Neck Tension</td> <td>Newtons</td> <td>4170</td> <td>681</td> <td>Newtons</td> <td>2620</td> <td>415</td> </tr> <tr> <td>Neck Compression</td> <td>Newtons</td> <td>4000</td> <td>1903</td> <td>Newtons</td> <td>2520</td> <td>2037</td> </tr> <tr> <td>Left Femur Force</td> <td>Newtons</td> <td>10008</td> <td>2334</td> <td>Newtons</td> <td>6805</td> <td>1636</td> </tr> <tr> <td>Right Femur Force</td> <td>Newtons</td> <td>10008</td> <td>3230</td> <td>Newtons</td> <td>6805</td> <td>2154</td> </tr> </tbody> </table>								Driver ATD			Passenger ATD			Measurement Description	Units	Threshold	Result	Units	Threshold	Result	Head Injury Criteria (HIC ₁₅)	N/A	700	692	N/A	700	650	Maximum Chest Compression	mm	63	36	mm	52	30	Nij	N/A	1	0.42	N/A	1	0.95	Neck Tension	Newtons	4170	681	Newtons	2620	415	Neck Compression	Newtons	4000	1903	Newtons	2520	2037	Left Femur Force	Newtons	10008	2334	Newtons	6805	1636	Right Femur Force	Newtons	10008	3230	Newtons	6805	2154
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1: PURPOSE AND SUMMARY OF TEST

PURPOSE

This 56.3 km/h 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. DTNH22-12-D-00257. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

This 56.3 km/h frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure dated September, 2012.

SUMMARY

A load cell barrier consisting of 36 load cells was impacted by a 2013 Chevrolet Silverado 2500 HD 4X4 EXT at a velocity of 57.0 km/h. The test was performed at Transportation Research Center, Inc. on October 15, 2012. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

One real-time camera and 16 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 position according to dummy placement instructions specified in the Frontal NCAP Laboratory Test Procedure.

Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were also on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading.

The driver (position 1) ATD (Serial No. 037) and the right-front passenger (position 2) ATD (Serial No. 426) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C of this report.

The 132 channels of data were recorded on an on-board data acquisition system. Appendix B contains the vehicle, load cell barrier and 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 1195 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: airbag, head restraint, seat back, and knee bolster. The passenger's visible contact points were as follows: airbag, head restraint, seat back, and glove box.

The occupant data is summarized below:

ATD Position	HIC₁₅	Nij	Neck Tension (N)	Neck Compression (N)	3 ms Chest Clip (Gs)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50 th Male)	692	0.42	681	1903	49.163	36.0	2334	3230
Passenger (5 th Female)	650	0.95	415	2037	53.652	30.4	1636	2154

2: OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

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

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT NHTSA No.: MD0114
 Test Program: NCAP Frontal Impact Test Date: 10/15/12

TEST VEHICLE INFORMATION

NHTSA No.	MD0114
Model Year	2013
Make	Chevrolet
Model	Silverado 2500 HD 4X4
Body Style	EXT Pickup
VIN	1GC2KVC4DZ116568
Body Color	Red
Odometer Reading (miles)	21
Engine Displacement (L)	6
Number of Cylinders	8
Engine Placement	V
Transmission Type	Automatic
Transmission Speeds	6
Overdrive	Yes
Final Drive	All Wheel Drive
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes
Automatic Door Locks (ADLs)	No

TEST VEHICLE OPTIONS

Traction Control System (TCS)	Yes
Power Steering	Yes
Power Window Auto-Reverse	Yes
Driver Frontal Airbag	Yes
Driver Curtain Airbag	No
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	No
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Front Pass. Frontal Airbag	Yes
Front Pass. Curtain Airbag	No
Front Pass. Head/Torso Airbag	No
Front Pass. Torso Airbag	No
Front Pass. Torso/Pelvis Airbag	No
Front Pass. Pelvis Airbag	No
Front Pass. Knee Airbag	No
Driver Pretensioner	Yes
Driver Load Limiter	No
Front Pass. Pretensioner	Yes
Front Pass. Load Limiter	No
Other	NA

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

Yes

DATA FROM CERTIFICATION LABEL

Manufactured by	General Motors LLC
Date of Manufacture	7/12

GVWR (kg)	4309
GAWR Front (kg)	2177
GAWR Rear (kg)	2812

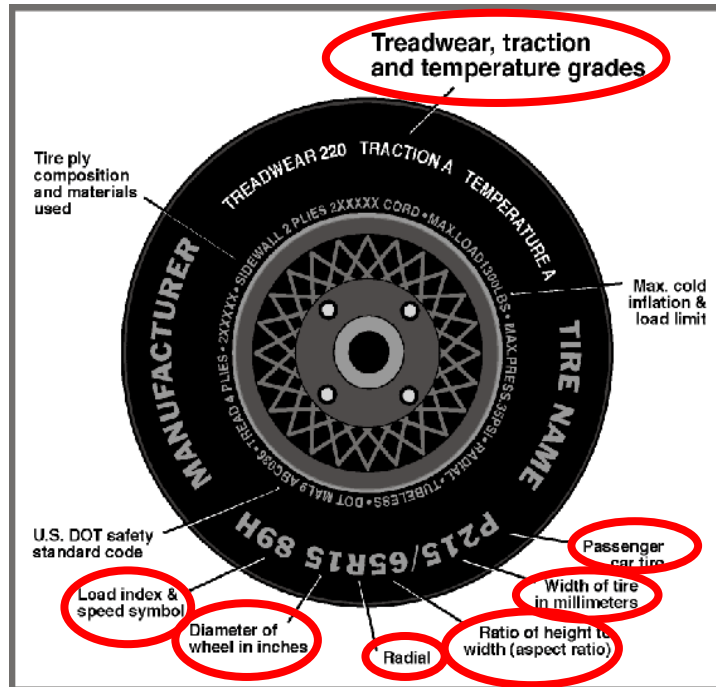
VEHICLE SEATING AND WEIGHT CAPACITY

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Split Bench	Bench		
Number of Occupants	3	3		6
Capacity Wt. (VCW) (kg)				1334
Cargo Wt. (RCLW) (kg)				136

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle:	2013 Chevrolet Silverado 2500 HD 4X4 EXT	NHTSA No.:	MD0114
Test Program:	NCAP Frontal Impact	Test Date:	10/15/12



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	550	550
Cold / Test Pressure (kPa)	420	550
Recommended Tire Size	LT245/75R17	LT245/75R17
Tire Size on Vehicle	LT245/75R17	LT245/75R17
Tire Manufacturer	Firestone	Firestone
Tire Model	Transforce H/T	Transforce H/T
Treadwear	N/A	N/A
Traction Grade	N/A	N/A
Temperature Grade	N/A	N/A
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index/Speed Symbol	121/118R	121/118R
Tire Material	Rubber	Rubber
DOT Safety Code Right	8X43 TH2 2122	8X43 TH2 2122
DOT Safety Code Left	8X43 TH2 2122	8X43 TH2 2122

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

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT NHTSA No.: MD0114
 Test Program: NCAP Frontal Impact Test Date: 10/15/12

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	848.6	640.8		905.2	732.8	
Right	kg	825.2	619.6		852.4	714.0	
Ratio	%	57.0	43.0		54.8	45.2	
Totals	kg	1673.8	1260.4	2934.2	1757.6	1446.8	3204.4

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2934.2
Weight of 1 P572E ATD & 1 P572O ATD	kg	139.3
Rated Cargo/Luggage Weight (RCLW)	kg	136.0
Vehicle Target Weight (TVTW)	kg	3209.5

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	1000	1008	1087	1085	1726.8
As Tested	mm	997	1002	1076	1067	1815.0
Post Test	mm	853	949	1044	1130	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	4020
Total Vehicle Length at Left Side	mm	6725
Total Vehicle Length at Centerline	mm	6810
Total Vehicle Length at Right Side	mm	6725
Weight of Ballast in Cargo Area	kg	34.0
Weight of Vehicle Components Removed	kg	0.0
Amount of Stoddard Solvent in Fuel Tank	liters	121.9

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:

None

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

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT NHTSA No.: MD0114
Test Program: NCAP Frontal Impact Test Date: 10/15/12

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	6810
2	Total Width	2034
3	Bumper Top Height	764
4	Bumper Bottom Height	541
5	Longitudinal Member Top Height	570
6	Distance Between Longitudinal Members	740
7	Longitudinal Member Width	100
8	Engine Top Height	1323
9	Engine Bottom Height	340
10	Engine and Gearbox Width	600
11	Front Bumper-Engine Distance	780
12	Front Shock Absorber Fixing Height	770
13	Bonnet Leading Edge Height	1135
14	Front Shock Absorber Fixing Width	955
15	Front Bumper – Front Axle Distance	975
16	Front Axle – A-Pillar Distance	600
17	A-Pillar – B-Pillar Distance	1100
18	B-Pillar – Rear Axle Distance	2300
19	B-Pillar – C-Pillar Distance	740
20	Roof Sill Bottom Height	1796
21	Roof Sill Top Height	1877
22	Floor Sill Bottom Height	595
23	Floor Sill Top Height	632

DATA SHEET NO. 2

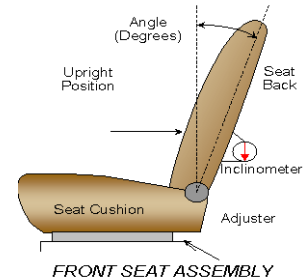
SEAT ADJUSTMENT, FUEL SYSTEM AND STEERING WHEEL DATA

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT
 Test Program: NCAP Frontal Impact

NHTSA No.: MD0114
 Test Date: 10/15/12

NORMAL DESIGN RIDING POSITION

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



	Degree
Driver Seat back angle:	7.8
Passenger Seat back angle:	4.8

SEAT FORE/AFT POSITIONS

Describe the method used of determining seat for/aft positions.

Driver: 13 of 25

Passenger: 1st of 22

	Total Fore/Aft Travel	Placed in Position No.
Driver Seat	240 mm	13 of 25
Passenger Seat	210 mm	1 of 22

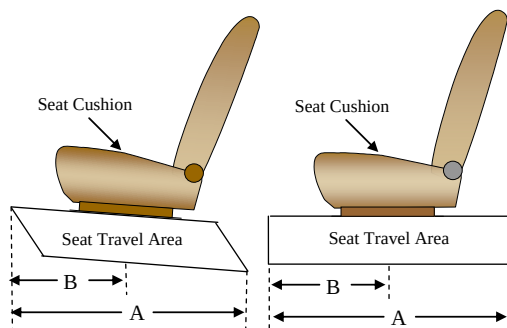
SEAT BELT UPPER ANCHORAGE

Describe the method of positioning seat belt upper anchorages.

Driver: 2nd of 3 notches

Passenger: 2nd of 3 notches

	Total No. of Positions	Placed in Position No.
Driver Seat	3	2
Passenger Seat	3	2



DATA SHEET NO. 2 (CONTINUED)

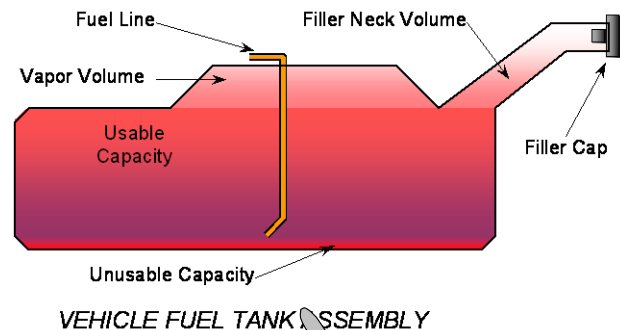
SEAT ADJUSTMENT, FUEL SYSTEM AND STEERING WHEEL DATA

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT NHTSA No.: MD0114
Test Program: NCAP Frontal Impact Test Date: 10/15/12

FUEL TANK CAPACITY

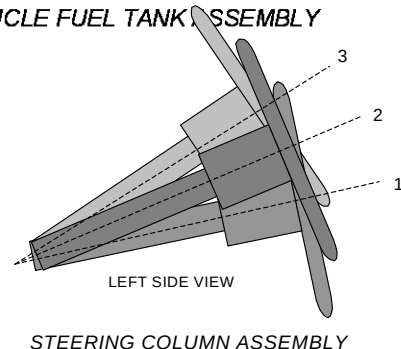
	Liters
Usable Capacity of "Standard Tank"	135.1
Usable Capacity of "Optional" Tank	NA
95% of Usable Capacity	128.3
Actual Amount of Solvent used	121.9
1/3 of Usable Capacity	45.0

The test vehicle is equipped with an electric fuel pump. The fuel pump operates for approximately two seconds after the ignition is placed in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies the area under the rear seat.



STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. An aluminum plate is placed across the rim of the steering wheel, an inclinometer is placed on the plate and the angle is measured.



STEERING COLUMN POSITIONS

	Degrees	Fore/Aft Position, mm
Lowermost Position No. 1	78.1	No feature
Geometric Center Position No. 2	68.3	No feature
Uppermost Position No. 3	58.3	No feature
Telescoping Steering Wheel Travel	No feature	No feature
Test Position	68.3	N/A

DATA SHEET NO. 3

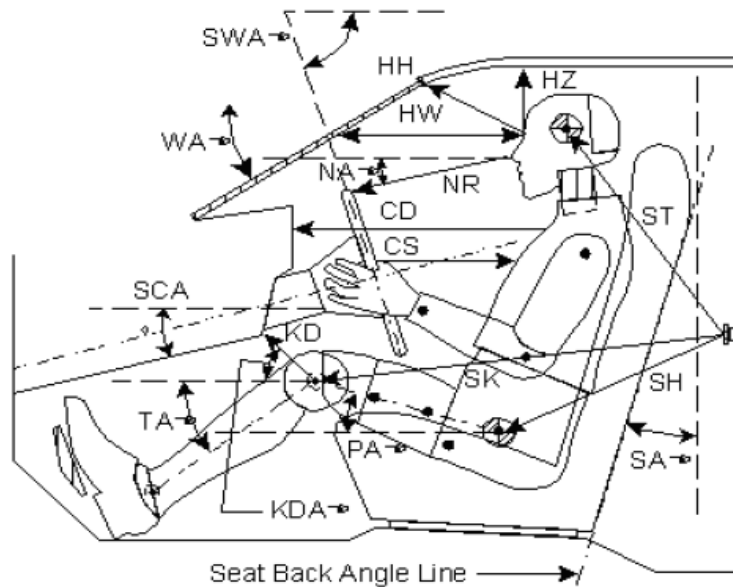
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT

NHTSA No.: MD0114

Test Program: NCAP Frontal Impact

Test Date: 10/15/12



Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		35.4		
SWA°	Steering Wheel Angle		68.3		
SCA°	Steering Column Angle		21.7		
SA°	Seat Back Angle (on headrest post)		7.8		5.4
HZ	Head to Roof (Z)	257	90.0	298	90.0
HH	Head to Header	489	20.4	446	35.0
HW	Head to Windshield	725	0.0	726	0.0
NR	Nose to Rim	403	10.0	N/A	N/A
CD	Chest to Dash	545		401	
CS	Chest to Steering Hub	329	0.0		
RA	Rim to Abdomen	221	0.0		
KDL	Left Knee to Dash	169	26.0	88	32.0
KDR	Right Knee to Dash	163	26.0	100	32.0
PA°	Pelvic Angle		22.2		19.7
TA°	Tibia Angle		45.8		66.4
SK	Striker to Knee	732	4.7	800	3.9
ST	Striker to Head	673	74.5	642	88.0
SH	Striker to H-Point	304	6.9	458	26.5

DATA SHEET NO. 4

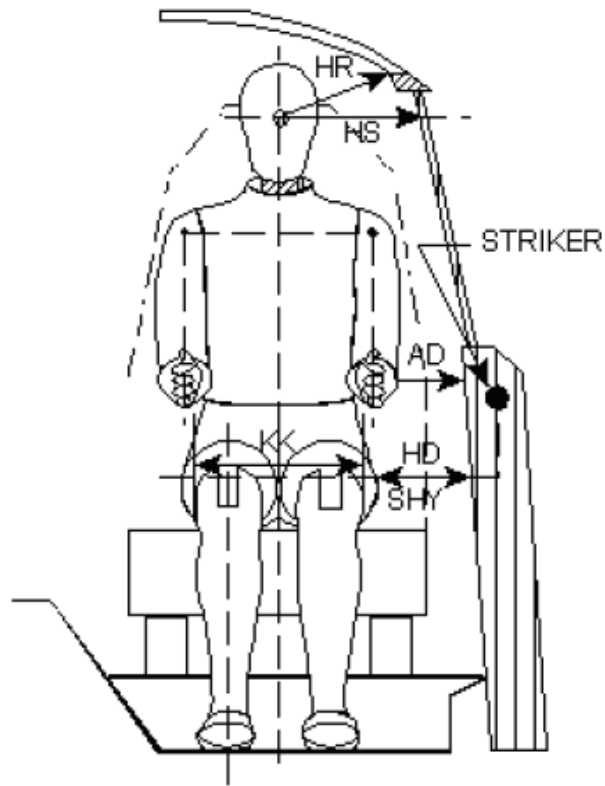
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT

NHTSA No.: MD0114

Test Program: NCAP Frontal Impact

Test Date: 10/15/12

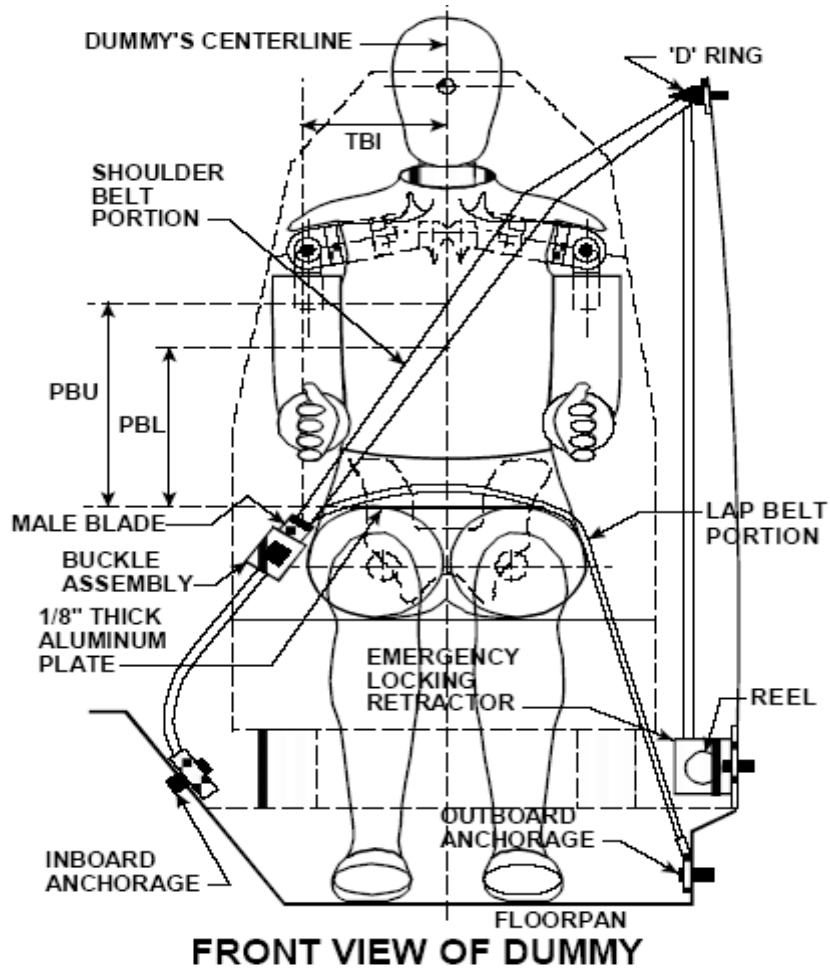


Code	Measurement Description	Driver	Passenger
AD	Arm to Door	159	101
HD	H-Point to Door	158	181
HR	Head to Side Header	225	286
HS	Head to Side Window	354	360
KK	Knee to Knee	270	175
SHY	Striker to H-Point (Y Direction)	280	292
AA	Ankle to Ankle	226	160

DATA SHEET NO. 5

SEAT BELT POSITIONING DATA

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT NHTSA No.: MD0114
 Test Program: NCAP Frontal Impact Test Date: 10/15/12



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU – Top surface of reference to belt upper edge	mm	343	296
PBL – Top surface of reference to belt lower edge	mm	270	204

BELT LENGTH DATA

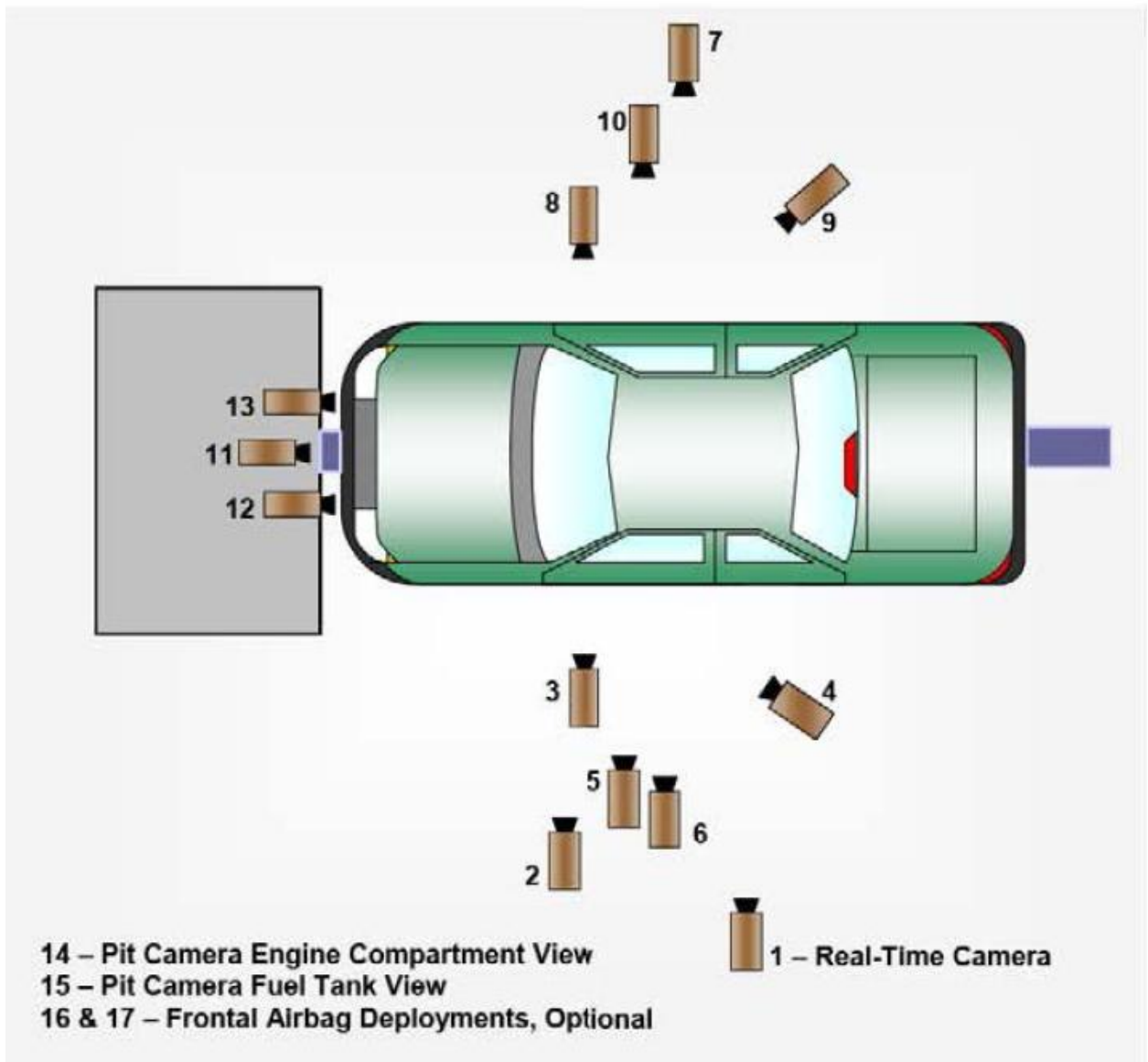
Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	800	900
Lap belt length as measured on ATD	mm	580	605
Remainder of belt on reel	mm	1540	1438
Total belt length for continuous webbing systems	mm	2920	2943

DATA SHEET NO. 6

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT NHTSA No.: MD0114
Test Program: NCAP Frontal Impact Test Date: 10/15/12

CAMERA POSITIONS FOR FRONTAL IMPACTS



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

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT NHTSA No.: MD0114
Test Program: NCAP Frontal Impact Test Date: 10/15/12

CAMERA LOCATIONS

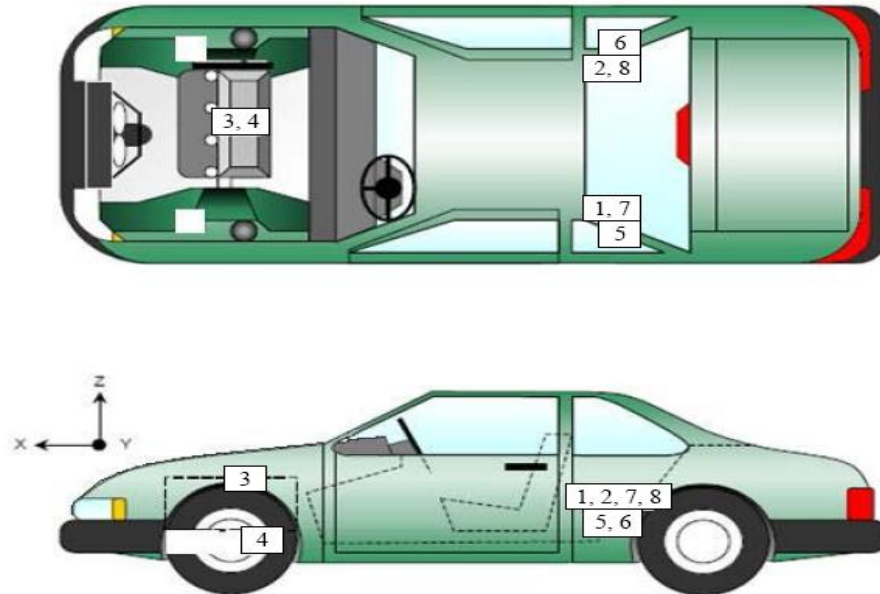
No.	Camera View	Location (mm)			Lens (mm)	Frame Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	437	7440	1374	Zoom	30
2	Driver Close-Up	1646	-5383	-1570	50	1000
3	Left Front Half	1033	-5663	-1250	16	1000
4	Left Angle	4042	-3292	-2049	8.5	1000
5	Steering Column - Top	1868	-5718	-2085	25	1000
6	Steering Column – Bottom	1855	-5410	-1548	25	1000
7	Right Overall	2300	5742	-1359	6	1000
8	Passenger Close-Up	1512	5786	-1519	50	1000
9	Right Angle	4450	3565	-1981	25	1000
10	Right Front Half	1149	5424	-1333	25	1000
11	Windshield	0	0	-2600	8.5	1000
12	Driver Windshield	0	-371	-2639	12.5	1000
13	Passenger Windshield	0	407	-2639	12.5	1000
14	Pit Front	289	0	3101	25	1000
15	Pit Rear	3002	0	3101	8.5	1000
16	Onboard Driver Airbag (Optional)	N/A	N/A	N/A	12.5	1000
17	Onboard Passenger Airbag (Optional)	N/A	N/A	N/A	12.5	1000

Reference Points: +X – forward of impact plane
+Y – right of monorail center
+Z – into ground

DATA SHEET NO. 7

VEHICLE ACCELEROMETER DATA

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT NHTSA No.: MD0114
Test Program: NCAP Frontal Impact Test Date: 10/15/12



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Camera View	Location (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	2978	-680	-682
2	Right Rear Accelerometer – X Direction	2981	655	-684
3	Engine Top X	5870	30	-1053
4	Engine Bottom X	5750	40	-390
5	Left Rear Accelerometer – Z Direction	2978	-640	-682
6	Right Rear Accelerometer – Z Direction	2981	615	-684

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

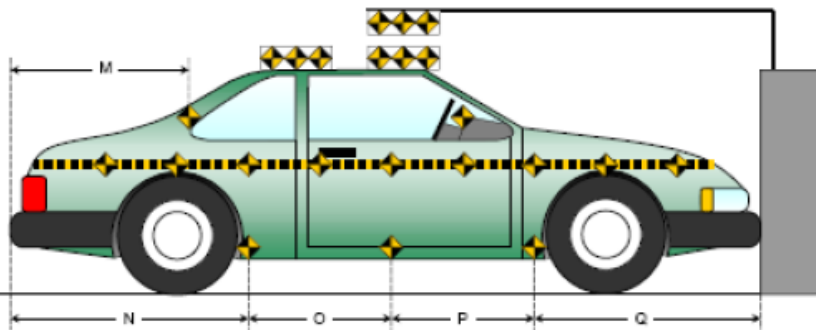
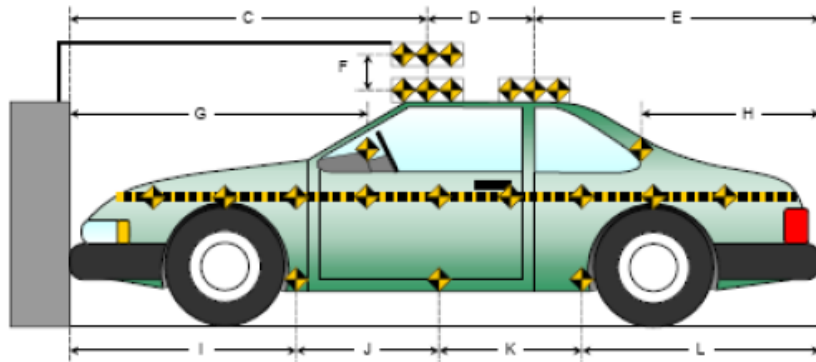
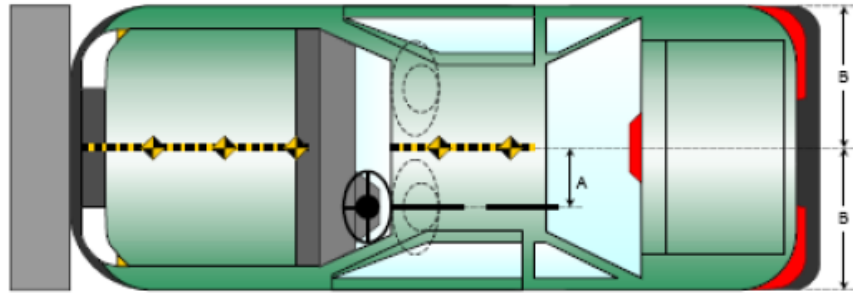
DATA SHEET NO. 8

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT NHTSA No.: MD0114
 Test Program: NCAP Frontal Impact Test Date: 10/15/12

Item	Value
A	472
B	990
C	2309
D	610
E	4140
F	295
G	1845
H	3654
I	1505
J	1377
K	1575
L	2620
M	3665
N	2608
O	1577
P	1379
Q	1515

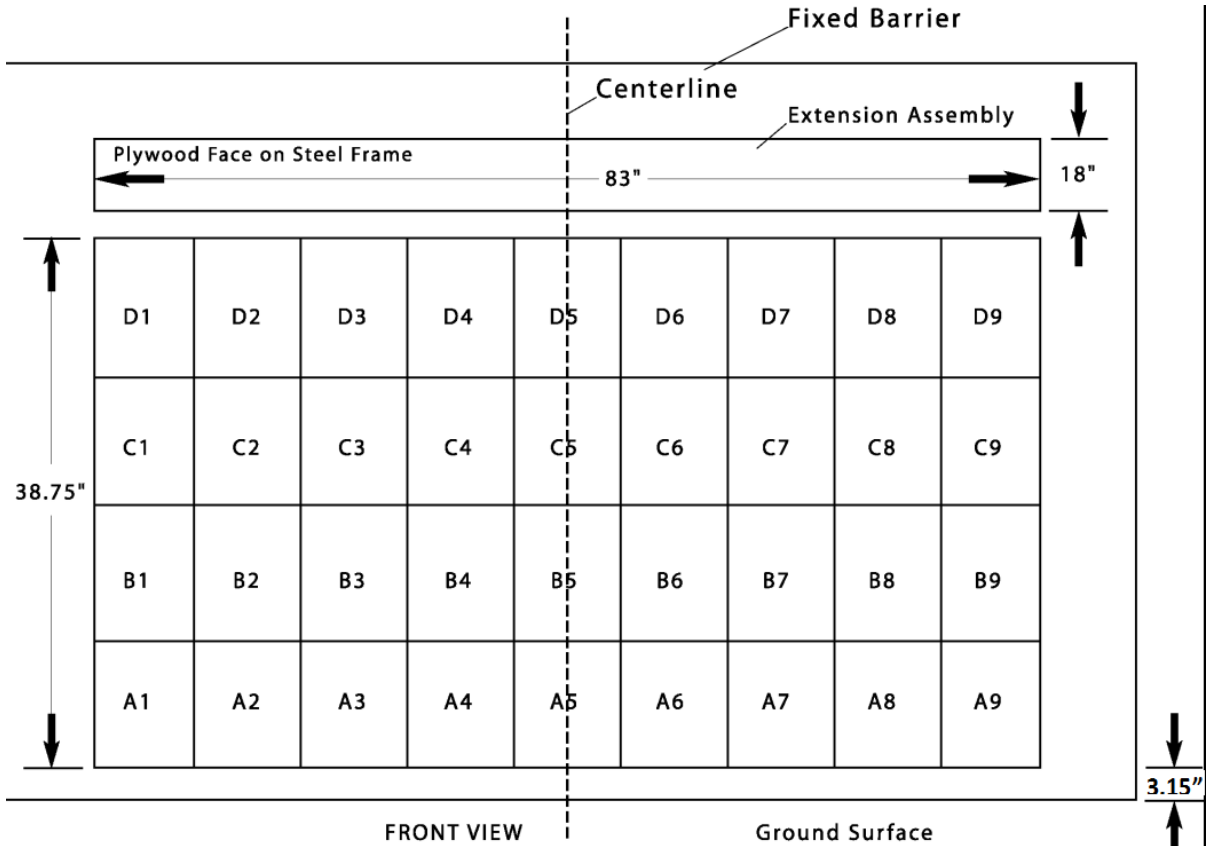
All units in
millimeters



DATA SHEET NO. 9

LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT NHTSA No.: MD0114
 Test Program: NCAP Frontal Impact Test Date: 10/15/12



DATA SHEET NO. 10

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT NHTSA No.: MD0114
Test Program: NCAP Frontal Impact Test Date: 10/15/12

INSTRUMENTATION

Instrumentation	Number of Channels Collected
Driver Dummy Accelerometers	42
Passenger Dummy Accelerometers	42
Vehicle Structure Accelerometers	8
Total	92

CAMERA COVERAGE

Type of Camera	Number Used in this Test
High-Speed Vehicle Onboard	2
High-Speed Offboard	14
Rear-Time Panning	2
Total	18

DATA SHEET NO. 11

POST-TEST OBSERVATIONS

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT NHTSA No.: MD0114
 Test Program: NCAP Frontal Impact Test Date: 10/15/12

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type / Serial No.	Hybrid III 50 th / 037	Hybrid III 5 th / 426
Head Contact	Airbag, head restraint, seat back	Airbag, head restraint, seat back
Upper Torso Contact	None	None
Lower Torso Contact	None	None
Left Knee Contact	Knee bolster	Glove box
Right Knee Contact	Knee bolster	Glove box

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Locked/Unlocked Doors	Unlocked	Unlocked
Front Door Opening	Door remained closed and latched: Door opened without tools	Door remained closed and latched: Door opened without tools
Rear Door Opening	Door remained closed and latched: Door opened without tools	Door remained closed and latched: Door opened without tools
Seat Track Shift (mm)	None	None
Seat Back Failure	None	None
Glazing Damage	Left front corner cracked	None

VEHICLE REBOUND FROM BARRIER

Measured Parameters	Units	Value
Left Side	mm	260
Center	mm	253
Right Side	mm	265
Average	mm	259

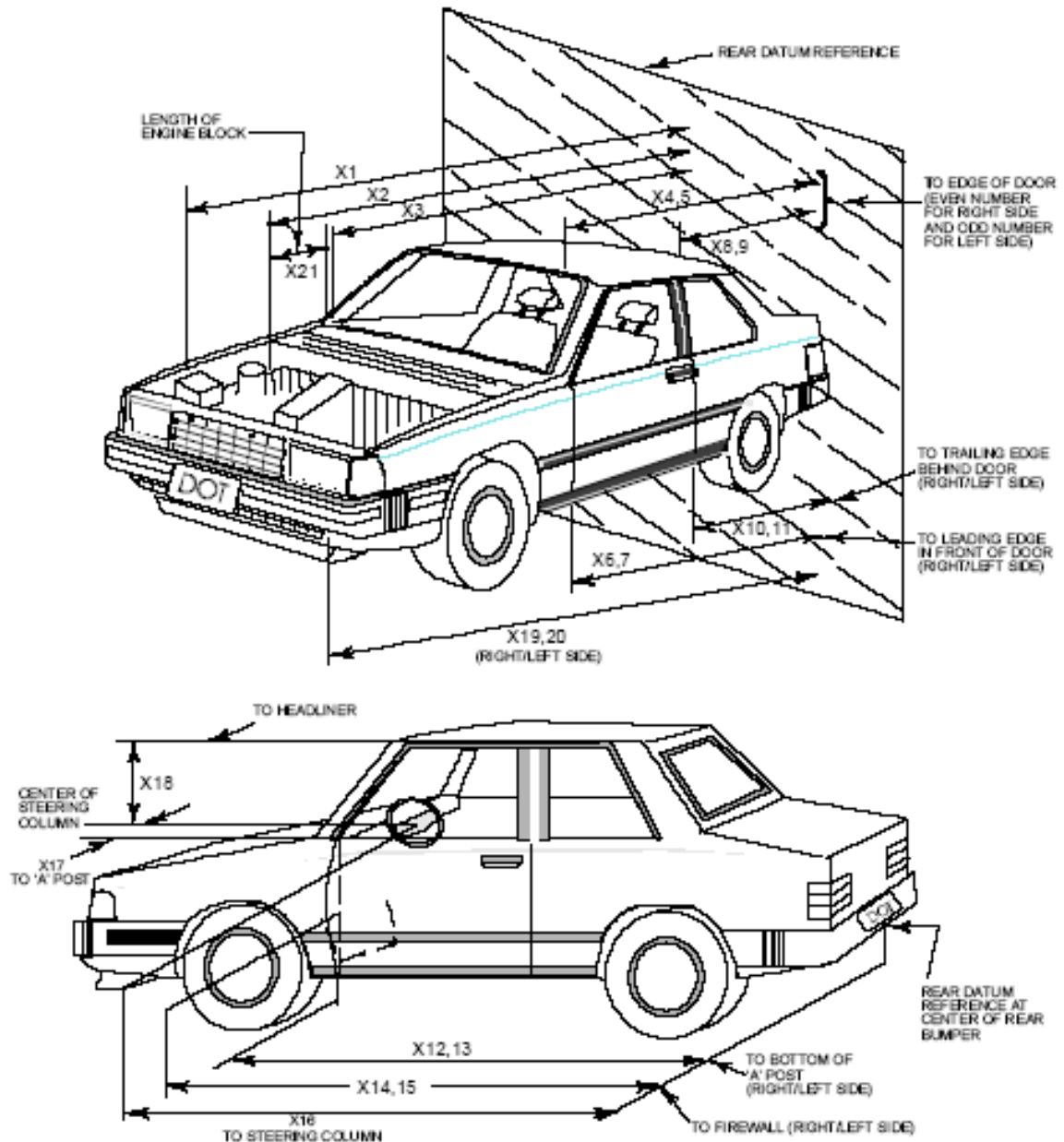
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Driver (Occupant 1)		Passenger (Occupant 2)	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	Yes	Yes	Yes
Side Airbag	NA	NA	NA	NA
Knee Airbag	NA	NA	NA	NA
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	NA	NA	NA	NA
Other	NA	NA	NA	NA

DATA SHEET NO. 12

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT NHTSA No.: MD0114
Test Program: NCAP Frontal Impact Test Date: 10/15/12



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

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT NHTSA No.: MD0114
Test Program: NCAP Frontal Impact Test Date: 10/15/12

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	6810	5632	1178
2	Rear Surface of Vehicle (RSOV) to Front of Engine	6080	5588	492
3	RSOV to Firewall	5620	5130	490
4	RSOV to Upper Leading Edge of Right Door	4953	4457	496
5	RSOV to Upper Leading Edge of Left Door	4954	4466	488
6	RSOV to Lower Leading Edge of Right Door	5185	4671	514
7	RSOV to Lower Leading Edge of Left Door	5200	4682	518
8	RSOV to Upper Trailing Edge of Right Door	4105	3617	488
9	RSOV to Upper Trailing Edge of Left Door	4105	3620	485
10	RSOV to Lower Trailing Edge of Right Door	4084	3570	514
11	RSOV to Lower Trailing Edge of Left Door	4093	3578	515
12	RSOV to Bottom of "A" Post-of Right Side	5245	4750	495
13	RSOV to Bottom of "A" Post-of Left Side	5245	4760	485
14	RSOV to Firewall, Right Side	5570	5068	502
15	RSOV to Firewall, Left Side	5575	5083	492
16	RSOV to Steering Column	4965	4332	633
17	Center of Steering Column to "A" Post	310	342	-32
18	Center of Steering Column to Headliner	450	480	-30
19	RSOV to Right Side of Front Bumper	6725	5673	1052
20	RSOV to Left Side of Front Bumper	6725	5648	1077
21	Length of Engine Block	600	600	0
RD	RSOV to Right Side of Dash Panel	4995	4511	484
CD	RSOV to Center of Dash Panel	4977	4412	565
LD	RSOV to Left Side of Dash Panel	4985	4513	472

All Dimensions in mm

DATA SHEET NO. 13

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT NHTSA No.: MD0114
Test Program: NCAP Frontal Impact Test Date: 10/15/12

VEHICLE INFORMATION

VIN: 1GC2KVCG4DZ116568

Wheelbase: 4020

Vehicle Size Category: Pickup

Test Weight (kg): 3204

ACCELEROMETER DATA

Accelerometer Locations: As listed on page 15 of this report.

Cal. Procedure/Interval: TRC procedure / 6 month interval.

Integration Algorithm: Trapezoidal

Linearity: >99%

Impact Velocity (km/h): 57.0

Velocity Change (km/h): 63.6

Time of Separation (ms): 84

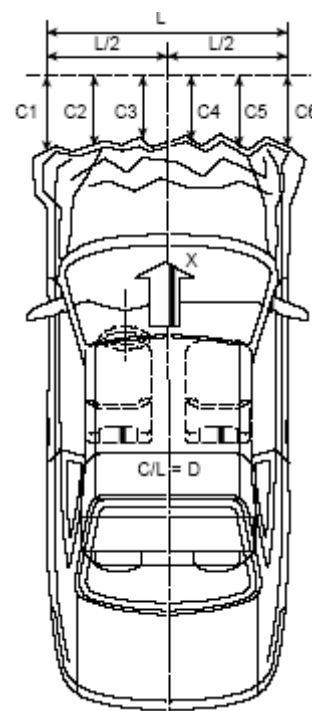
CRUSH PROFILE

Collision Deformation Classification: 12FDEW3

Midpoint of Damage: Centerline

Damage Region Length (mm): 1260

Impact Mode: Frontal



No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	6725	5648	1077
C2	Crush zone 1 at left side	mm	6785	5670	1115
C3	Crush zone 1 at left side	mm	6810	5624	1186
C4	Crush zone 1 at right side	mm	6810	5615	1195
C5	Crush zone 1 at right side	mm	6788	5660	1128
C6	Crush zone 1 at right side	mm	6725	5673	1052
L	C1 to C6	mm	6810	5632	1178

DATA SHEET NO. 14

VEHICLE INTRUSION MEASUREMENTS

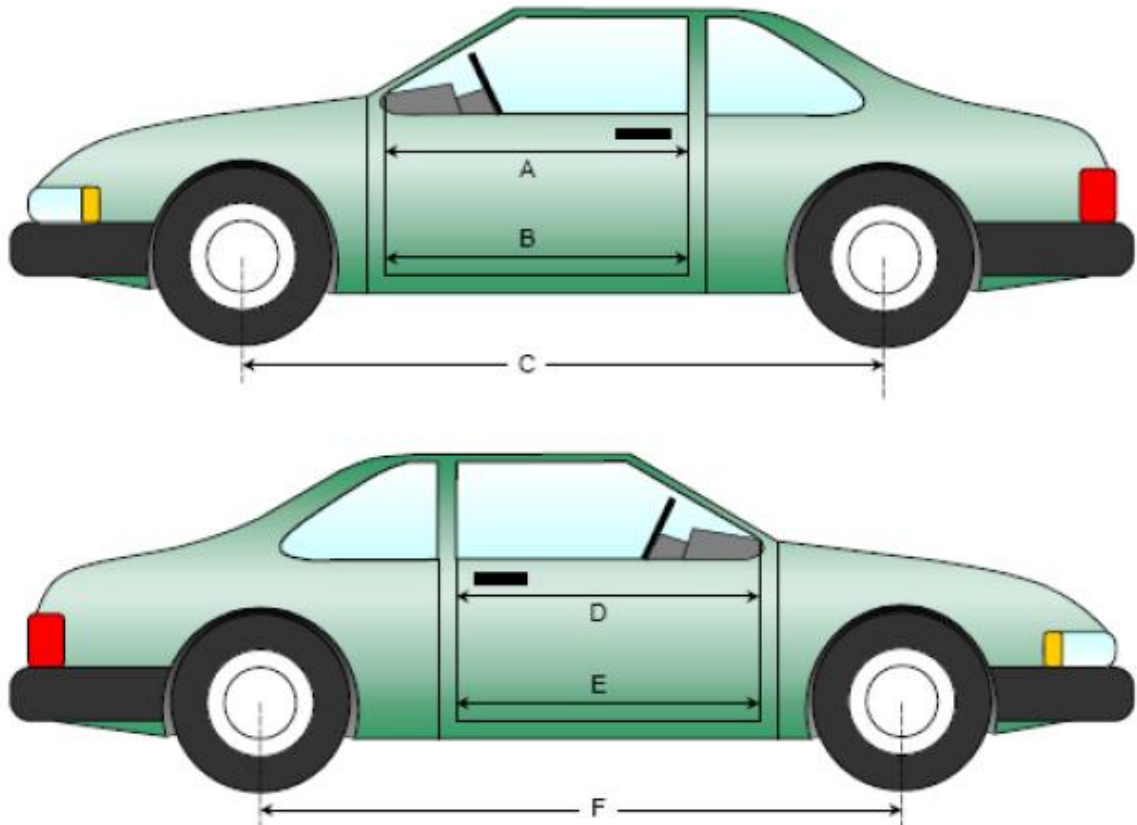
Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT NHTSA No.: MD0114
Test Program: NCAP Frontal Impact Test Date: 10/15/12

DOOR OPENING WIDTH

No.	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1147	1133	14
B	Left Side Lower	mm	1140	1131	9
C	Right Side Upper	mm	1147	1133	14
D	Right Side Lower	mm	1140	1135	5

WHEELBASE MEASUREMENTS

No.	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	4020	3890	130
F	Right Side Wheelbase	mm	4020	3930	90



DATA SHEET NO. 14 (CONTINUED)

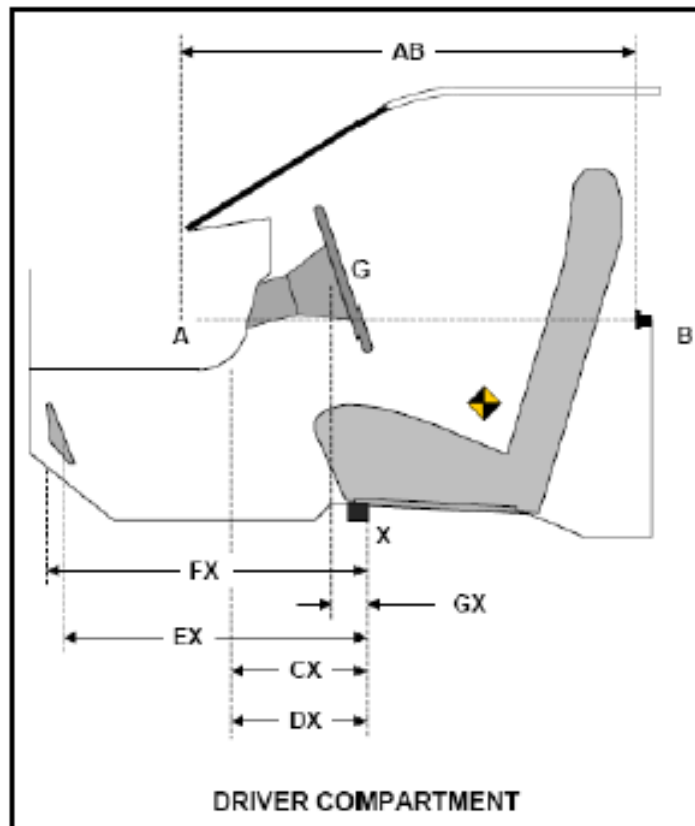
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT NHTSA No.: MD0114
 Test Program: NCAP Frontal Impact Test Date: 10/15/12

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	1135	1130	5
CX	Left Knee Bolster to X	mm	307	333	-26
DX	Right Knee Bolster to X	mm	300	303	-3
EX	Brake Pedal to X	mm	505	480	25
FX	Foot Rest to X	mm	655	635	20
GX	Center of Steering Column Wheel Hub to X	mm	80	140	-60

X = Front of Seat Track (Stationary)



DATA SHEET NO. 15

SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT NHTSA No.: MD0114
 Test Program: NCAP Frontal Impact Test Date: 10/15/12

Please provide windshield mounting details.

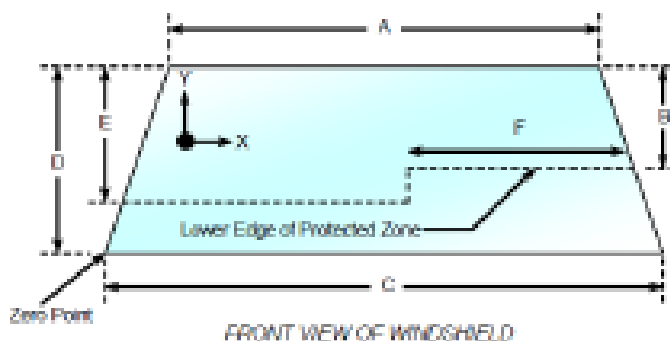
The standard requires that the post-test retention measurement be a minimum of 75% of the pre-test total periphery measurement for vehicle not equipped with occupant passive restraint and 50% for each side of the windshield for vehicle which are equipped with occupant passive restraints.

Temperature of windshield molding during test:

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2295	2295	100
Right Side	2295	2295	100
Total	4590	4590	100

Item	Units	Value
A	mm	1380
B	mm	420
C	mm	1740
D	mm	735
E	mm	480
F	mm	345



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
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

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
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

DATA SHEET NO. 15 (CONTINUED)

SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT NHTSA No.: MD0114
Test Program: NCAP Frontal Impact Test Date: 10/15/12

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 20.8

Test Time: 16:35

Stoddard Solvent Spillage Measurements

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

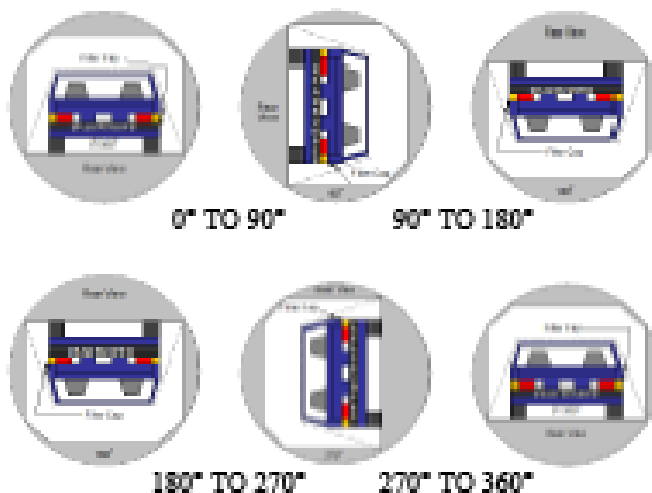
DATA SHEET NO. 16

FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT
 Test Program: NCAP Frontal Impact

NHTSA No.: MD0114
 Test Date: 10/15/12

1. The specified fixture rollover rate for each 90° of rotation is 50 to 180 seconds.
2. The position hold time at each position is 300 seconds (minimum).
3. Details of Stoddard Solvent spillage:
None



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	120	300	420
90° to 180°	120	300	420
180° to 270°	120	300	420
270° to 360°	120	300	420

FMVSS 301 SPILLAGE TABLE

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

SOLVENT SPILLAGE LOCATION TABLE

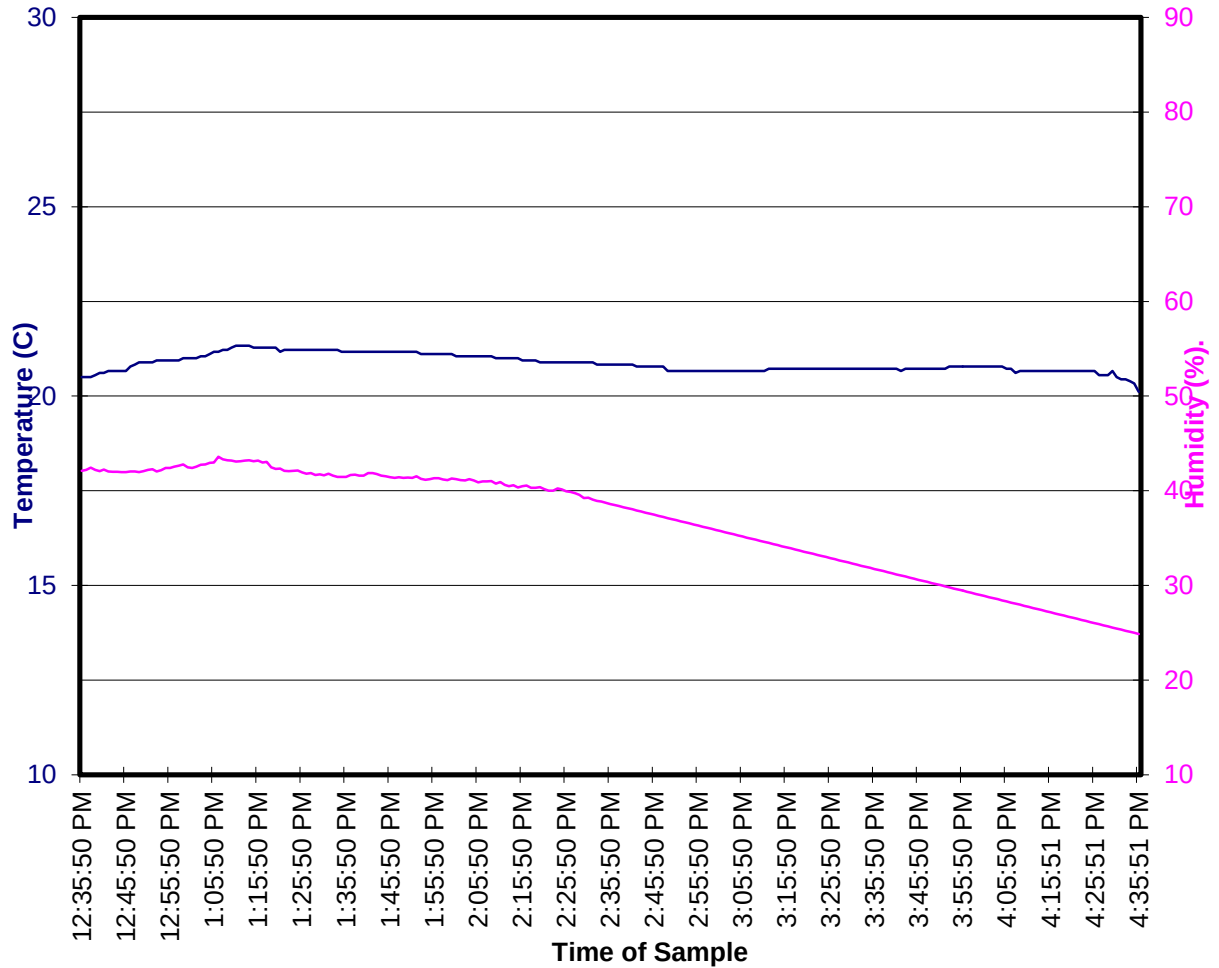
Test Phase	Spillage Location
0° to 90°	None
90° to 180°	None
180° to 270°	None
270° to 360°	None

DATA SHEET NO. 17

DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2013 Chevrolet Silverado 2500 HD 4X4 EXT NHTSA No.: MD0114
Test Program: NCAP Frontal Impact Test Date: 10/15/12

MD0114 2013 Chevrolet Silverado 2500 HD 4X4 Pickup into Load Cell Barrier Impact 121015; Test Time 16:35



APPENDIX A
PHOTOGRAPHS

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4	Tire Placard	A-5
5	2013 Chevrolet Silverado 2500 HD 4X4 EXT Frontal as Delivered	A-6
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8	Post-Test Front View of Test Vehicle	A-7
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10	Post-Test Left View of Test Vehicle	A-8
11	Pre-Test Right View of Test Vehicle	A-9
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28	Post-Test Dummy Cable Routing	A-17
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31	Pre-Test Driver Dummy Window View	A-19
32	Post-Test Driver Dummy Window View	A-19
33	Pre-Test Driver Dummy and Vehicle Interior View	A-20
34	Post-Test Driver Dummy and Vehicle Interior View	A-20
35	Pre-Test Driver's Seat Fore-Aft Markings	A-21
36	Post-Test Driver's Seat Fore-Aft Markings	A-21
37	Pre-Test View of Belt Anchorage for Driver Dummy	A-22
38	Post-Test View of Belt Anchorage for Driver Dummy	A-22
39	Pre-Test Driver Dummy Feet	A-23
40	Post-Test Driver Dummy Feet	A-23
41	Pre-Test Driver's Side Knee Bolster	A-24
42	Post-Test Driver's Side Knee Bolster	A-24

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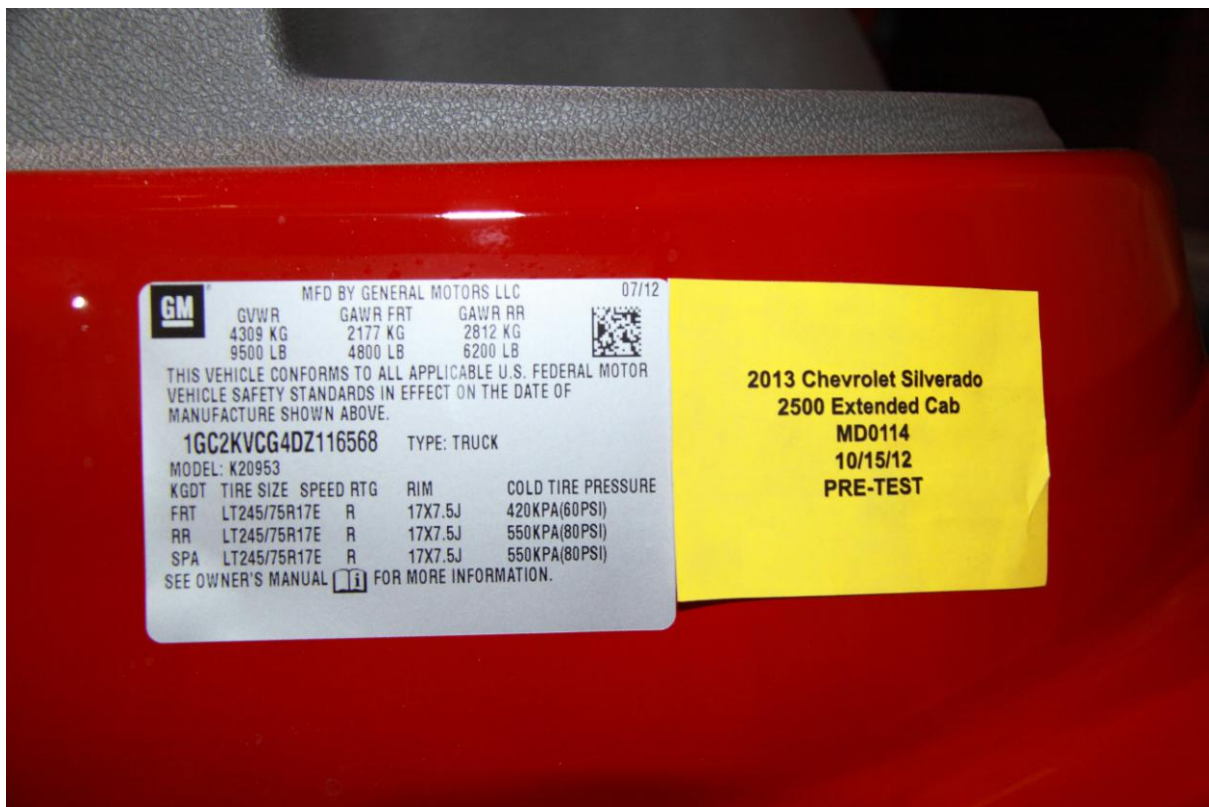
No.	Description	Page
43	Pre-Test Driver's Side Floorpan	A-25
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45	Post-Test Driver Dummy Face	A-26
46	Post-Test Driver Dummy Contact with Airbag	A-26
47	Post-Test Driver Dummy Contact with Headrest	A-27
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58	Pre-Test View of Belt Anchorage for Passenger Dummy	A-32
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64	Pre-Test Passenger Side Floorpan	A-35
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75	2013 Chevrolet Silverado Frontal Impact Event	A-42
76	Monroney Label Photograph	A-42



001 Load Cell Location



002 Load Cell Wall



003 Manufacturer's Label



004 Tire Placard



005 2013 Chevrolet Silverado 2500 HD 4X4 Frontal As Delivered



006 Left Rear 3-4 View, as Received



007 Pre-test Front View of Test Vehicle



008 Post-test Front View of Test Vehicle



009 Pre-test Left View of Test Vehicle



010 Post-test Left View of Test Vehicle



011 Pre-test Right View of Test Vehicle



012 Post-test Right View of Test Vehicle



013 Pre-test Right Front 3-4 View



014 Post-test Right Front 3-4 View



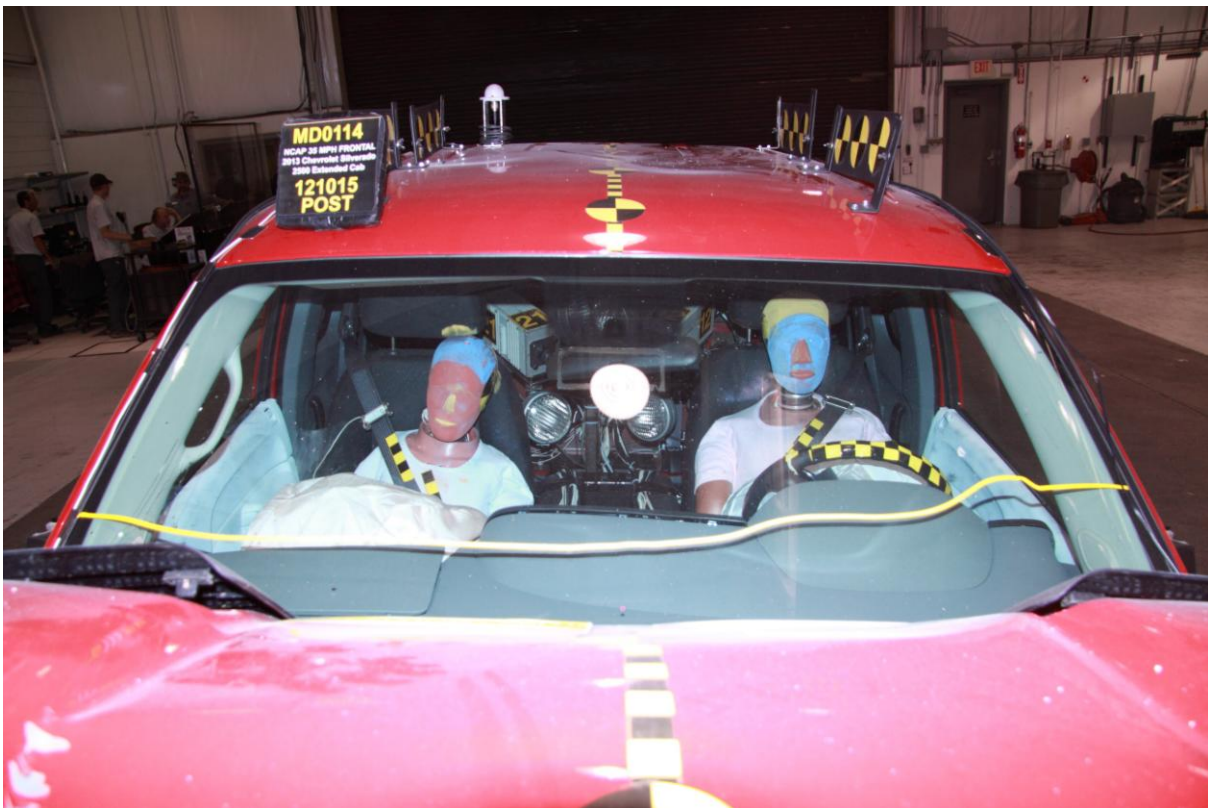
015 Pre-test Left Rear 3-4 View



016 Post-test Left Rear 3-4 View



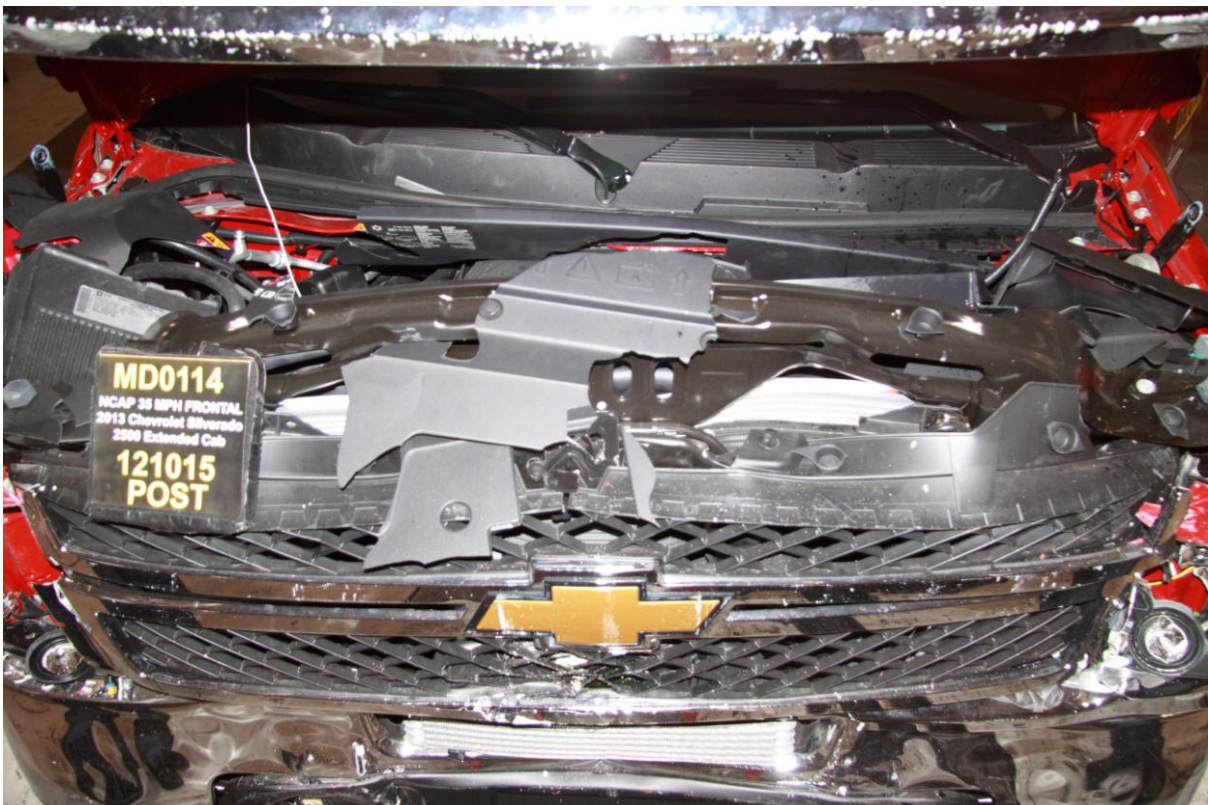
017 Pre-test Windshield View



018 Post-test Windshield View



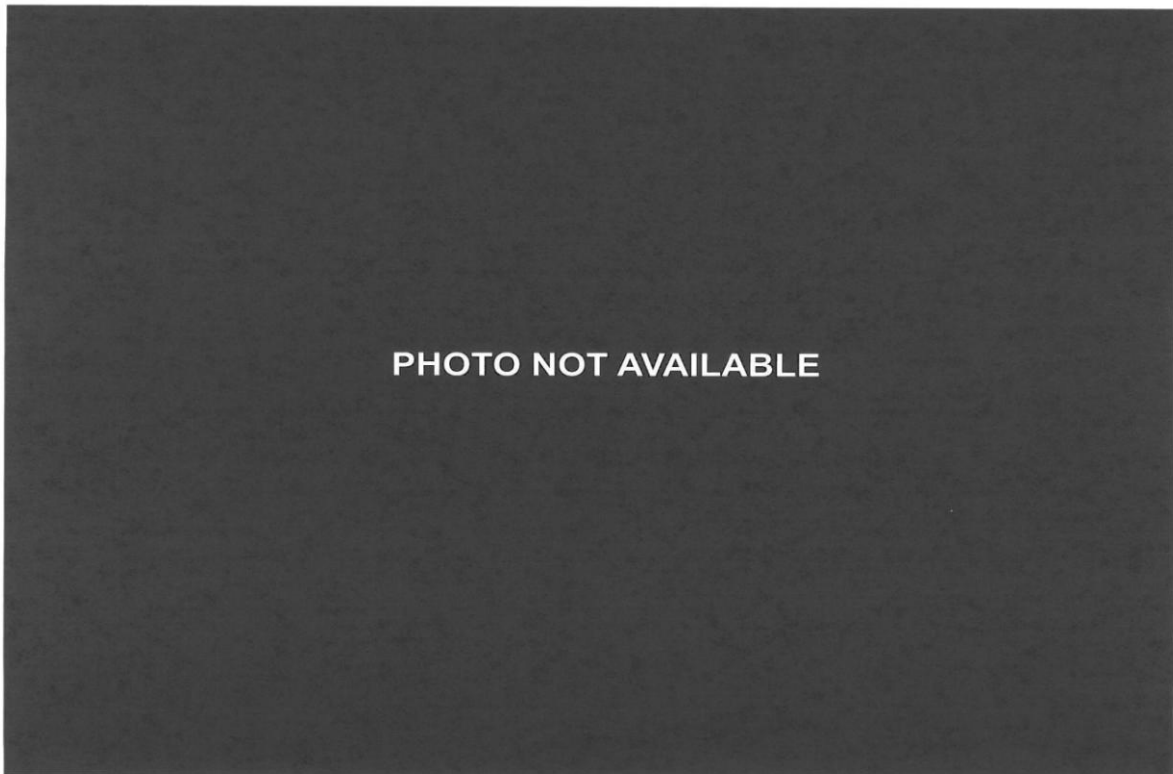
019 Pre-test Engine Compartment View



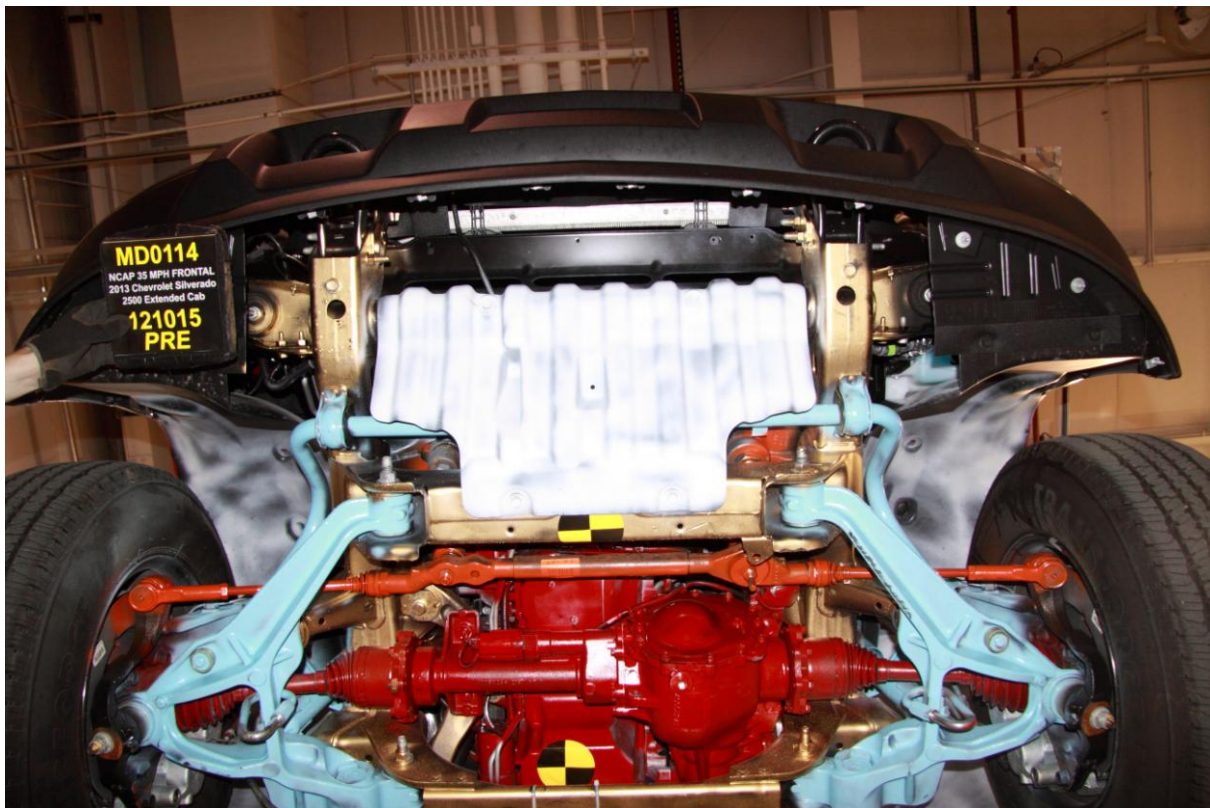
020 Post-test Engine Compartment View



021 Pre-test Fuel Filler Cap View



022 Post-test Fuel Filler Cap View



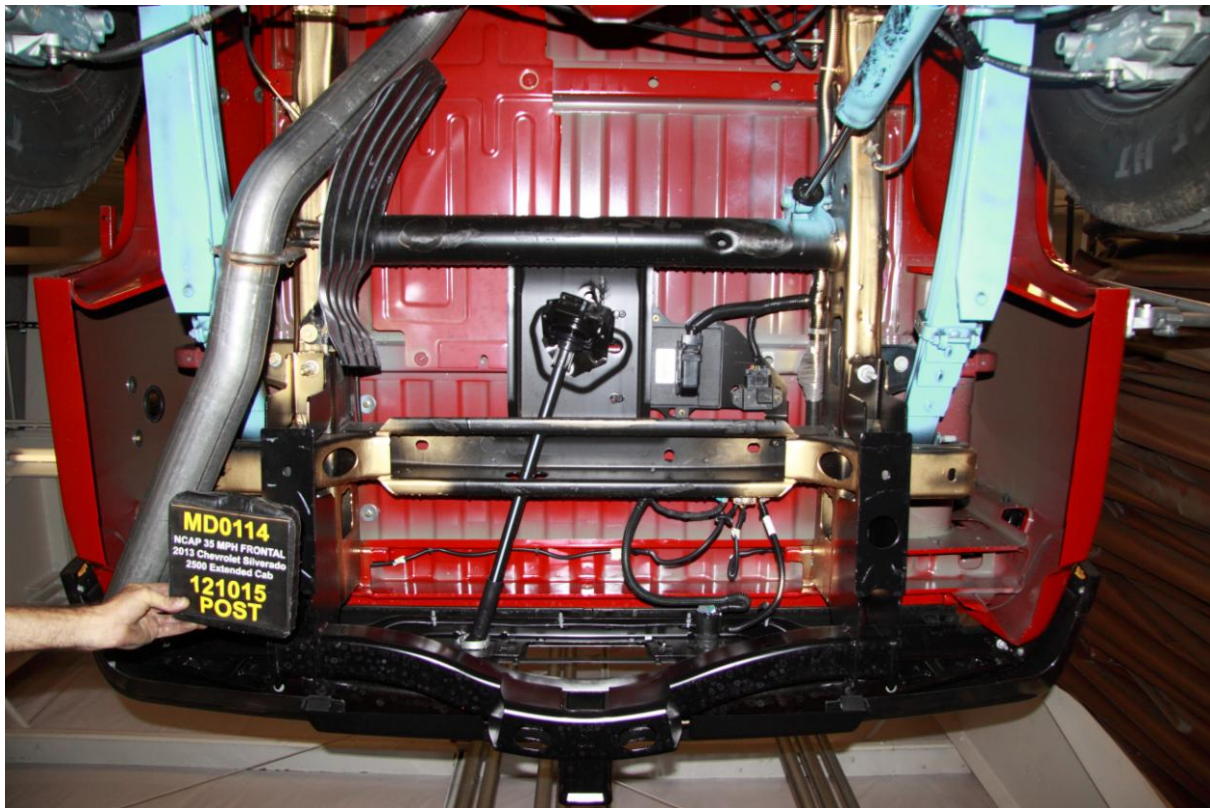
023 Pre-test Front Underbody View



024 Post-test Front Underbody View



025 Pre-test Rear Underbody View



026 Post-test Rear Underbody View



027 Pre-test Dummy Cable Routing



028 Post-test Dummy Cable Routing



029 Pre-test Driver Dummy Front View



030 Post-test Driver Dummy Front View



031 Pre-test Driver Dummy Window View



032 Post-test Driver Dummy Window View



033 Pre-test Driver Dummy and Vehicle Interior View



034 Post-test Driver Dummy and Vehicle Interior View



035 Pre-test Driver's Seat Fore-Aft Markings



036 Post-test Driver's Seat Fore-Aft Markings



037 Pre-Test View of Belt Anchorage for Driver Dummy



038 Post-Test View of Belt Anchorage for Driver Dummy



039 Pre-test Driver Dummy Feet



040 Post-test Driver Dummy Feet



041 Pre-test Driver's Side Knee Bolster



042 Post-test Driver's Side Knee Bolster



043 Pre-test Driver's Side Floorpan



044 Post-test Driver's Side Floorpan



045 Post-Test Driver Dummy Face



046 Post-test Driver Dummy Contact With Airbag



047 Post-test Driver Dummy Contact With Headrest



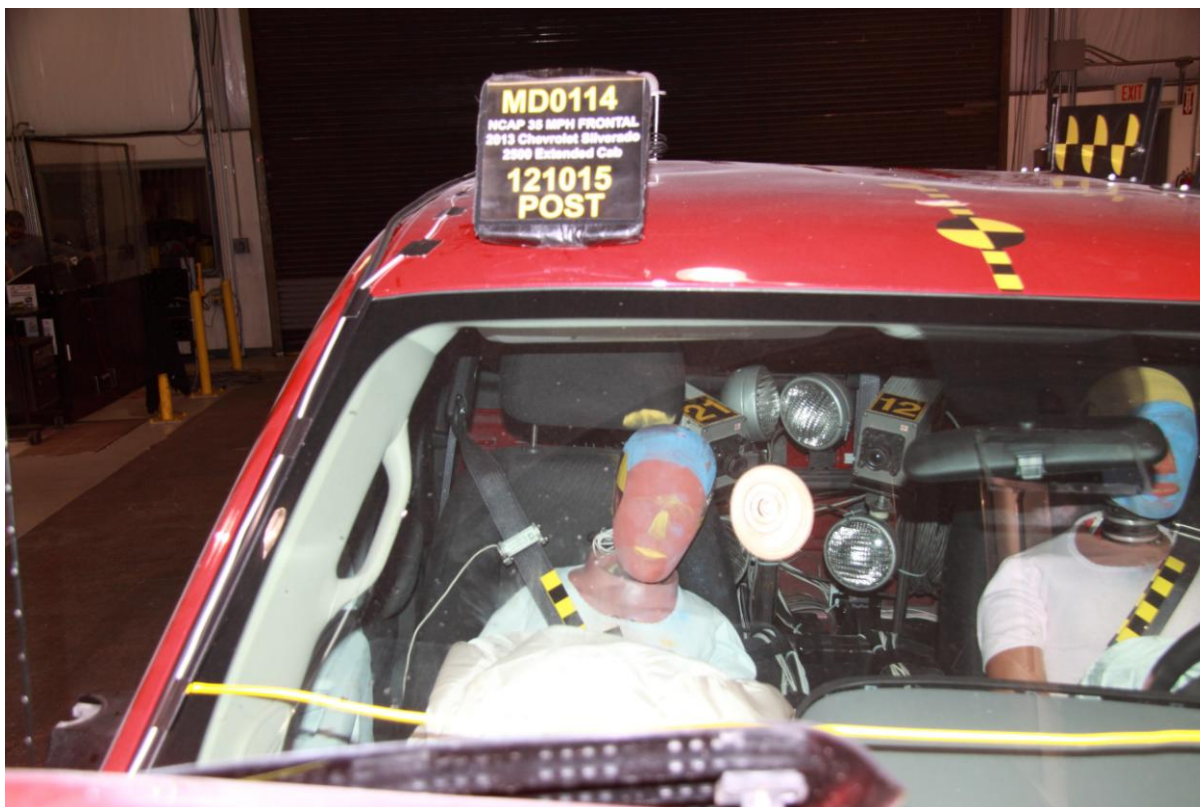
048 Pre-test View of the Steering Wheel



049 Post-test View of the Steering Wheel



050 Pre-test Passenger Dummy Front View



051 Post-test Passenger Dummy Front View



052 Pre-test Passenger Dummy Window View



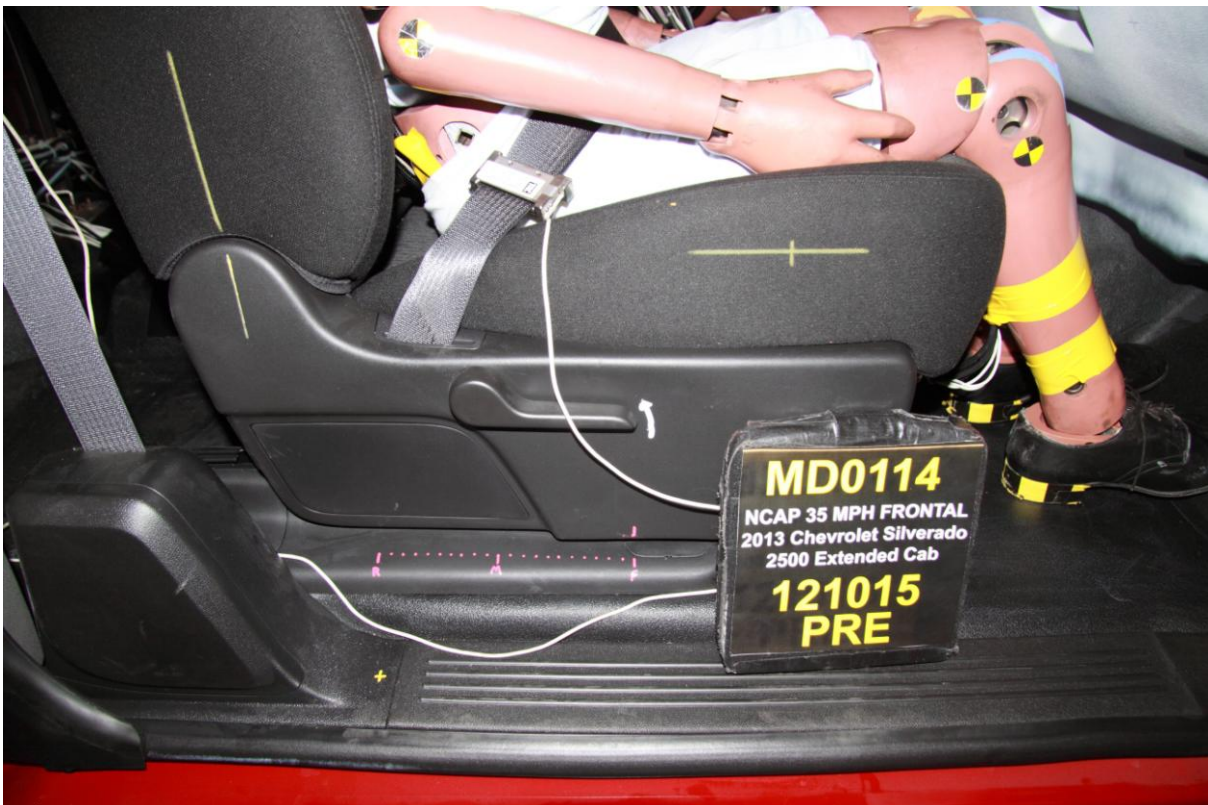
053 Post-test Passenger Dummy Window View



054 Pre-test Passenger Dummy and Vehicle Interior View



055 Post-test Passenger Dummy and Vehicle Interior View



056 Pre-test Passenger's Seat Fore-Aft Markings



057 Post-test Passenger's Seat Fore-Aft Markings



058 Pre-Test View of Belt Anchorage for Passenger Dummy



059 Post-Test View of Belt Anchorage for Passenger Dummy



060 Pre-test Passenger Dummy Feet



061 Post-test Passenger Dummy Feet



062 Pre-test Passenger's Side Knee Bolster



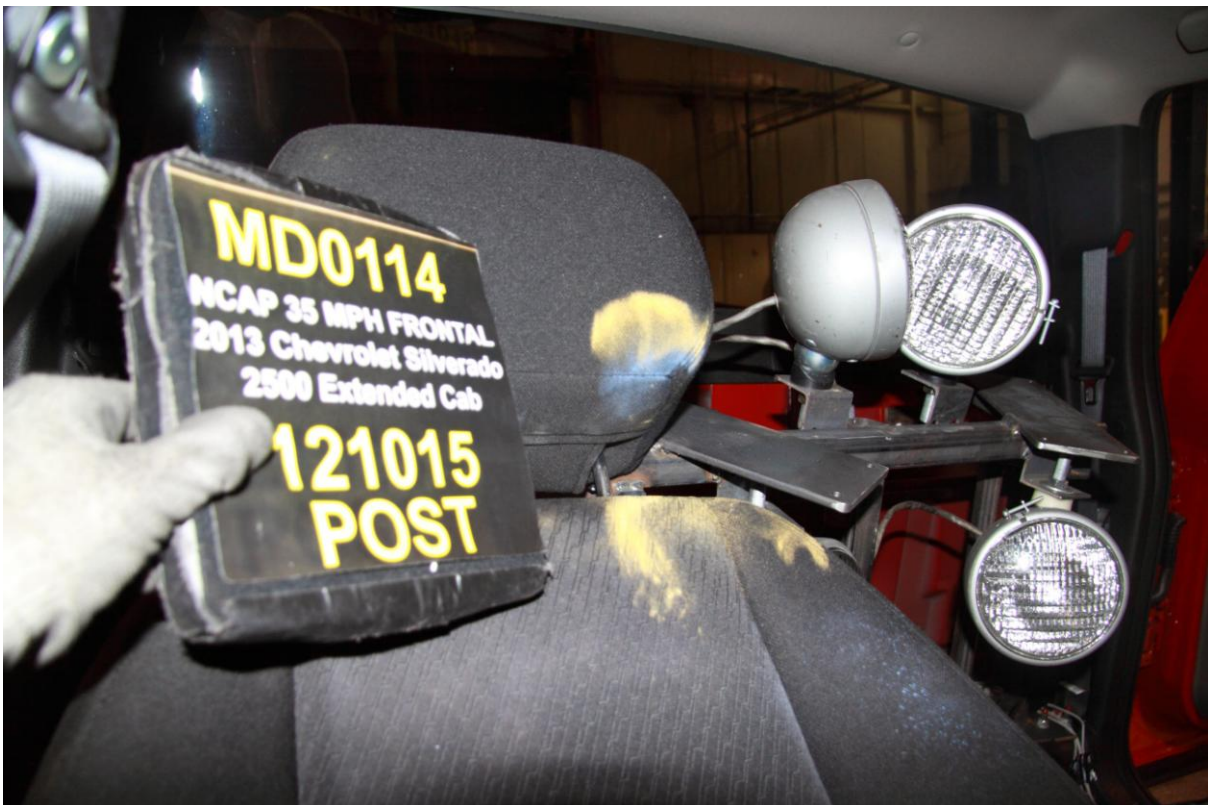
063 Post-test Passenger's Side Knee Bolster



064 Pre-test Passenger's Side Floorpan



065 Post-test Passenger's Side Floorpan



066 Post-test Passenger Dummy Contact With Headrest



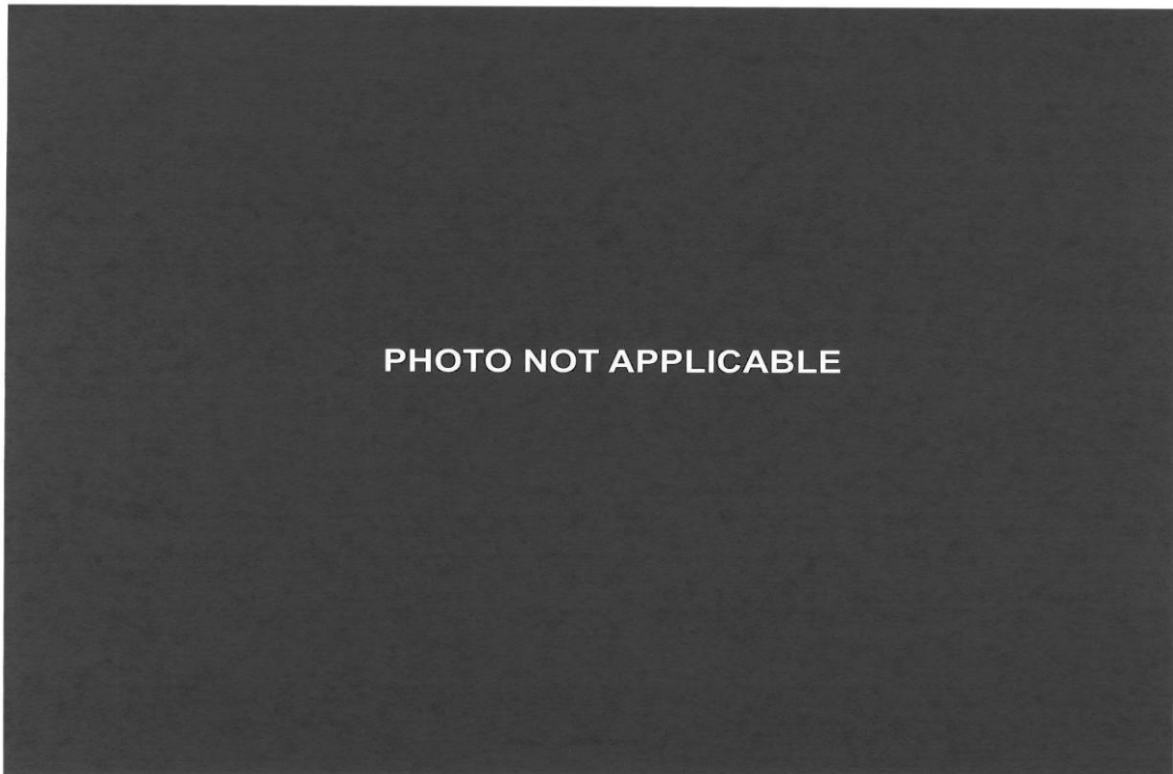
066a Post-test Passenger Dummy Contact With Airbag



067 Photograph of Ballast Installed in Vehicle



067a Photograph of Ballast Installed in Vehicle



068 Post-test Stoddard Solvent Spillage Location View, if required



069 Post-test Speed Trap Read-out



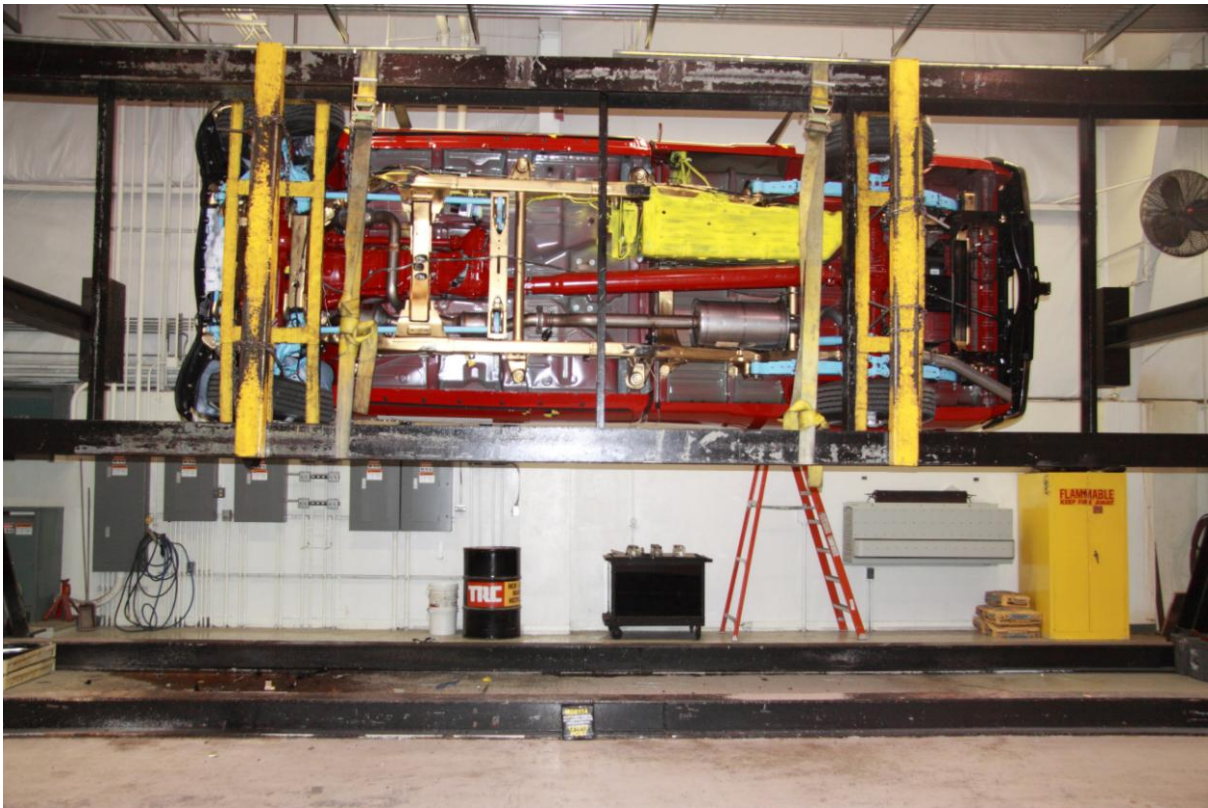
070 Vehicle at 0° on Static Rollover Device



071 Vehicle at 90° on Static Rollover Device



072 Vehicle at 180° on Static Rollover Device



073 Vehicle at 270° on Static Rollover Device



074 Vehicle at 360° on Static Rollover Device



075 2013 Chevrolet Silverado 2500 HD 4X4 Frontal Impact Event

CHEVROLET		2013 SILVERADO 2500 4WD WT EXT CAB		EXTERIOR: VICTORY RED INTERIOR: DARK TITANIUM		VORTEC 6.0L V8 SFI GAS ENGINE 6-SPEED AUTOMATIC TRANSMISSION			
Visit us at www.chevy.com									
STANDARD EQUIPMENT ITEMS LISTED BELOW ARE INCLUDED AT NO EXTRA CHARGE IN THE STANDARD VEHICLE PRICE SHOWN. •5 YEAR / 100,000 MILE POWERTRAIN LIMITED WARRANTY SEE DEALER FOR DETAILS		MECHANICAL •VORTEC 6.0L V8 ENGINE •6-SPEED H.O. AUTO TRANSMISSION •TORSION BAR FRONT SUSPENSION •MULTI-LEAF REAR SPRING SUSP •285 HANDLING TRAILERING SUSP •FULLY BOXED FRAME DESIGN •125 AMP ALTERNATOR •RE-CIRCULATING BALL STEERING		SAFETY & SECURITY •4-WHEEL ABS BRAKES •DRIVER AND RIGHT FRONT AIR BAGS •DAYTIME RUNNING LAMPS •STABILITRAK-STABILITY CONTROL WITH TRAILER SWAY CONTROL		EXTERIOR •CHROME REAR BUMPER •170 DEGREE WIDE OPENING REAR DOORS •17" STEEL WHEELS •17" ALL-SEASON TIRES •FRONT RECOVERY HOOKS •FOLDING OUTSIDE MIRRORS •CHROME SURROUND GRILLE •CARGO BOX ILLUMINATION •SOLAR-RAY TINTED GLASS		INTERIOR •AIR CONDITIONING •40/20/40 SPLIT BENCH FRT SEAT •DUAL GLOVE BOX STORAGE •AM/FM STEREO •DRIVER INFO CENTER DISPLAY	
OTHER •INTERMITTENT WIPERS •6-GAUGE CLUSTER W/ TACHOMETER •12-VOLT AUX PWR OUTLET •TILT STEERING WHEEL •CRUISE CONTROL •RUBBERIZED VINYL FLR COVERING		OTHER •BATTERY RUN DOWN PROTECTION •OL LIFE MONITOR SYSTEM •24-HOUR ROADSIDE ASSISTANCE		17" CHROME-CLAD STEEL WHEELS 310.00 DEEP TINTED GLASS 150.00 CAMPER STYLE EXTERIOR MIRRORS 70.00 GVW RATING - 9,500 LBS INC. REAR AXLE - 3.73 RATIO INC. VORTEC 6.0L V8 SFI GAS ENGINE INC.		TOTAL OPTIONS \$1,410.00 TOTAL VEHICLE & OPTIONS \$35,890.00 DESTINATION CHARGE 995.00 TOTAL VEHICLE PRICE* \$38,885.00			
STANDARD VEHICLE PRICE \$34,480.00 (OPTIONS INSTALLED BY THE MANUFACTURER MAY REPLACE STANDARD EQUIPMENT SHOWN)		HO TRAILERING EQUIPMENT PNG: 880.00 •LOCKING REAR DIFFERENTIAL •INTEGRATED TRAILER BRAKE CONTROLLER							
EPA DOT Fuel Economy and Environment NOT APPLICABLE TO THIS VEHICLE		GOVERNMENT 5-STAR SAFETY RATINGS Overall Vehicle Score Not Rated Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.		This label has been applied pursuant to Federal law. Do not remove prior to delivery to the ultimate purchaser. The NHTSA's New Carstar's Recommended Pre-Delivery Service. Does not include dealer installed options and accessories not listed above. Read Owner's Manual for details.					
Frontal Crash Driver Not Rated Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.		Side Crash Front seat Not Rated Based on the risk of injury in a side impact.		Rollover ★ ★ ★ ★ Based on the risk of rollover in a single-vehicle crash.					
Star ratings range from 1 to 5 stars (★ ★ ★ ★ ★) with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA) www.safercar.gov or 1-888-327-4236		ORDER NO. 0149391 SALES CODE E SALES CODE CODE 010393 DEALER NO. 4008 TRAIL ASSEMBLY ROCKFORD, IL U.S.A. VIN 1GCG2KVG64Z116568 DELIVER TO: ROGER MCINTOSH CHEVROLET, L.L.C. PO BOX 808 LINCOLNWOOD, MI 48634-0608		RO 1FA1627616					
fuel economy.gov Calculate personalized estimates and compare vehicles									

076 Monroney Label Photograph

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

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3	Driver Head Z Acceleration vs. Time Primary	B-6
4	Driver Head Resultant Acceleration vs. Time Primary	B-6
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6	Driver Chest X Acceleration vs. Time Primary	B-8
7	Driver Chest Y Acceleration vs. Time Primary	B-8
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11	Driver Upper Neck Force Z vs. Time	B-9
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20	Passenger Chest X Deflection vs. Time	B-13
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24	Passenger Chest Resultant Acceleration vs. Time Primary	B-14
25	Passenger Upper Neck Force X vs. Time	B-15
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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 Acceleration X Redundant
Driver Head Acceleration Y Redundant
Driver Head Acceleration Z Redundant
Driver Upper Neck Force Y

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

Passenger Left Upper Tibia Moment Y
Passenger Left Upper Tibia Force Z
Passenger Left Lower Tibia Moment X
Passenger Left Lower Tibia Moment Y
Passenger Left Lower Tibia Force Z
Passenger Right Upper Tibia Moment X
Passenger Right Upper Tibia Moment Y
Passenger Right Upper Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger Left Foot Fore Z
Passenger Left Foot Aft X
Passenger Left Foot Aft Z
Passenger Right Foot Fore Z
Passenger Right Foot Aft X
Passenger Right Foot Aft Z
Passenger Shoulder Belt Force
Passenger Lap Belt Force
Left Rear Seat Crossmember X
Left Rear Seat Crossmember Z
Right Rear Seat Crossmember X
Right Rear Seat Crossmember Z
Left Rear Seat Crossmember X Redundant
Right Rear Seat Crossmember X Redundant
Vehicle Engine Top X
Vehicle Engine Bottom X
BARRIER LOAD A1
BARRIER LOAD A2
BARRIER LOAD A3
BARRIER LOAD A4
BARRIER LOAD A5
BARRIER LOAD A6
BARRIER LOAD A7
BARRIER LOAD A8
BARRIER LOAD A9
BARRIER LOAD B1
BARRIER LOAD B2
BARRIER LOAD B3
BARRIER LOAD B4
BARRIER LOAD B5

BARRIER LOAD B6
BARRIER LOAD B7
BARRIER LOAD B8
BARRIER LOAD B9
BARRIER LOAD C1
BARRIER LOAD C2
BARRIER LOAD C3
BARRIER LOAD C4
BARRIER LOAD C5
BARRIER LOAD C6
BARRIER LOAD C7
BARRIER LOAD C8
BARRIER LOAD C9
BARRIER LOAD D1
BARRIER LOAD D2
BARRIER LOAD D3
BARRIER LOAD D4
BARRIER LOAD D5
BARRIER LOAD D6
BARRIER LOAD D7
BARRIER LOAD D8
BARRIER LOAD D9

NHTSA

Test Lab: CTF

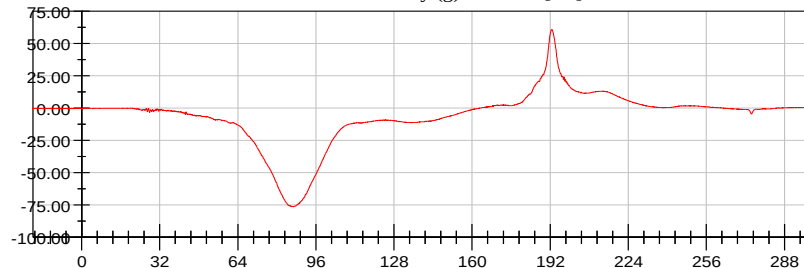
Test Number: 121015 (MD0114)

Test Date: 10/15/2012

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

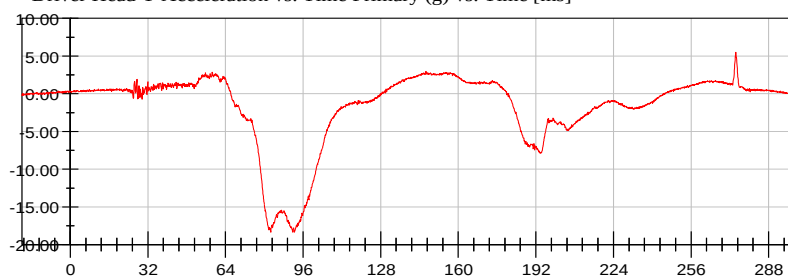
60.88 g at 192.64 ms

<Min>

-76.32 g at 86.72 ms

CFC_1000

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



<Max>

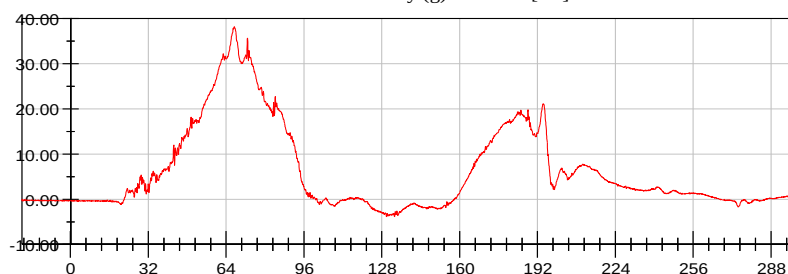
5.50 g at 274.40 ms

<Min>

-18.40 g at 82.64 ms

CFC_1000

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



<Max>

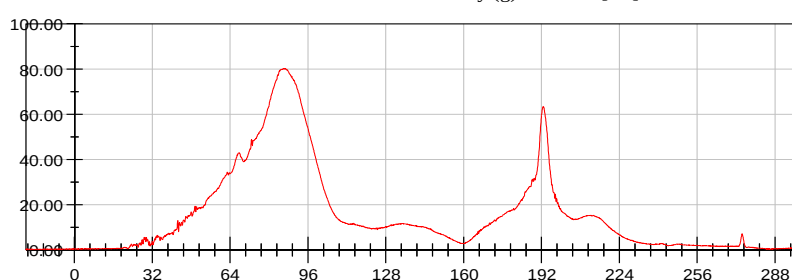
38.23 g at 67.36 ms

<Min>

-3.82 g at 129.92 ms

CFC_1000

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



<Max>

80.24 g at 86.72 ms

<Min>

0.08 g at -19.68 ms

CFC_1000



NHTSA

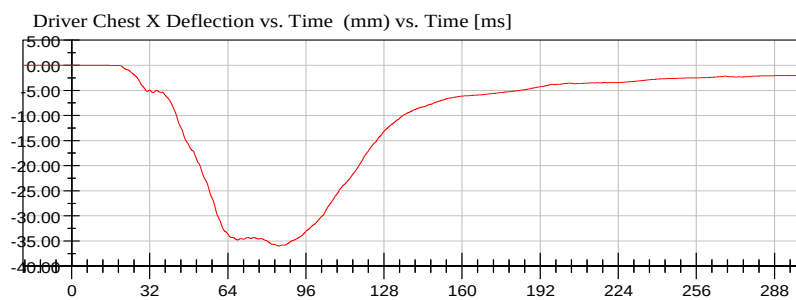
Test Lab: CTF

Test Number: 121015 (MD0114)

Test Date: 10/15/2012

Position #1 Hybrid III Mid-Sized Adult Male Dummy ('037)

Position #2 Hybrid III Small Adult Female (426)



<Max>

0.01 mm at -19.84 ms

<Min>

-36.00 mm at 84.88 ms

CFC_600



NHTSA

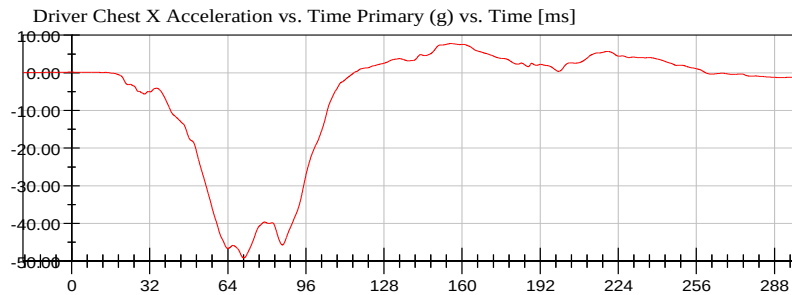
Test Lab: CTF

Test Number: 121015 (MD0114)

Test Date: 10/15/2012

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (426)



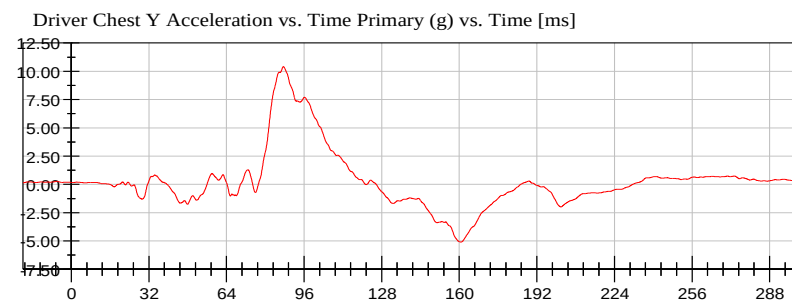
<Max>

7.80 g at 155.52 ms

<Min>

-49.15 g at 70.56 ms

CFC_180



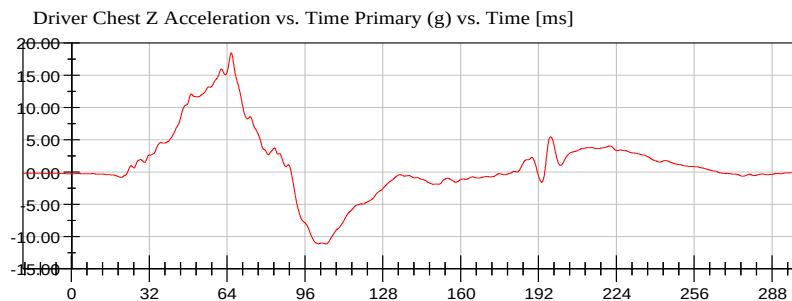
<Max>

10.40 g at 87.44 ms

<Min>

-5.11 g at 160.72 ms

CFC_180



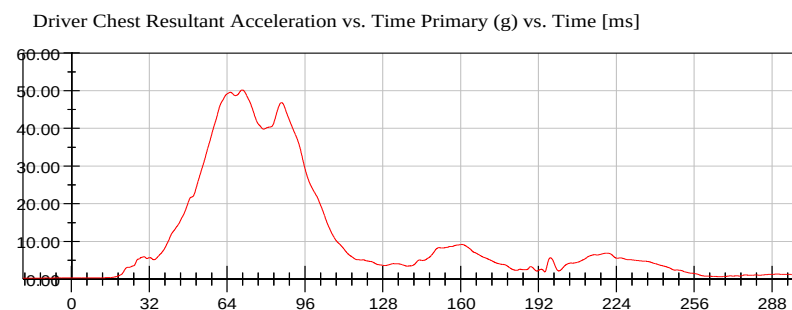
<Max>

18.48 g at 65.68 ms

<Min>

-11.15 g at 104.72 ms

CFC_180



<Max>

50.18 g at 70.24 ms

<Min>

0.25 g at -19.04 ms

CFC_180



NHTSA

Test Lab: CTF

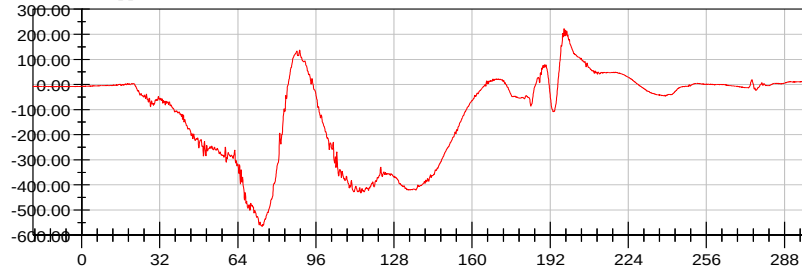
Test Number: 121015 (MD0114)

Test Date: 10/15/2012

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (426)

Driver Upper Neck Force X vs. Time (N) vs. Time [ms]



<Max>

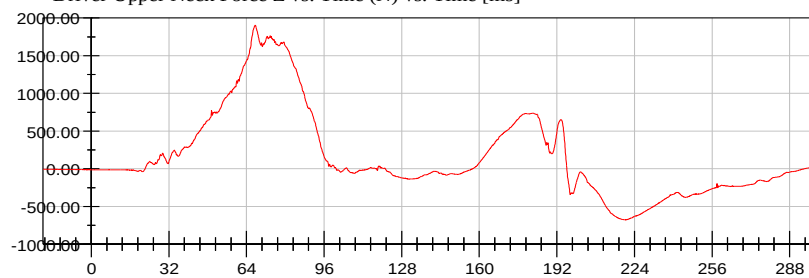
222.37 N at 197.68 ms

<Min>

-565.69 N at 73.92 ms

CFC_1000

Driver Upper Neck Force Z vs. Time (N) vs. Time [ms]



<Max>

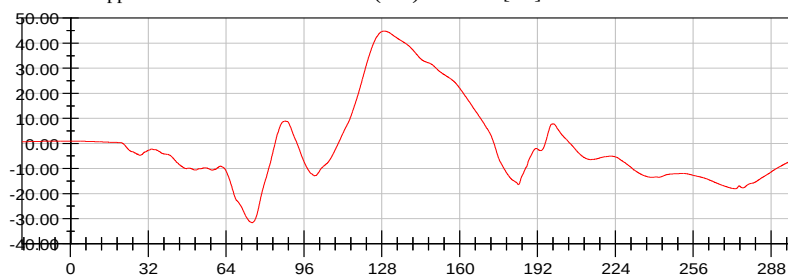
1,902.74 N at 67.60 ms

<Min>

-680.62 N at 220.32 ms

CFC_1000

Driver Upper Neck Moment Y vs. Time (Nm) vs. Time [ms]



<Max>

44.81 Nm at 128.80 ms

<Min>

-31.62 Nm at 74.64 ms

CFC_600





2013 Chevrolet Silverado 2500 HD 4X4 into Load Cell Barrier

Date: 10/15/2012
Time: 16:41

Neck Injury Predictor (NIJ)

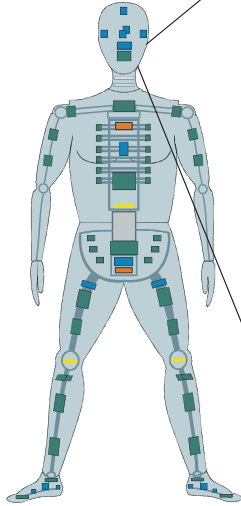
Customer: NHTSA

Test Number: MD0114

Test Orientation = Frontal
Fzc(Tension) = 6806
Fzc(Compression) = 6160
Myc(Extension) = 135
Myc(Flexion) = 310

TRC Inc. Test Lab: CTF

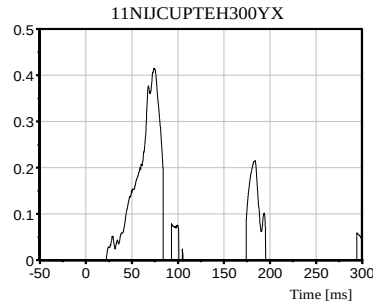
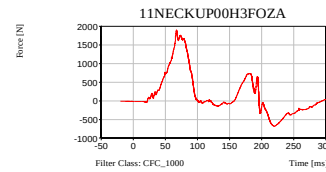
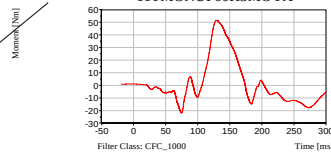
Test Number: 121015



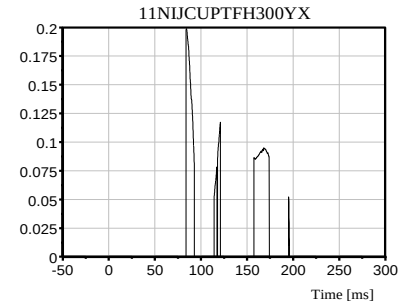
Dummy: HIII 50th Male
Seating Position:

Driver

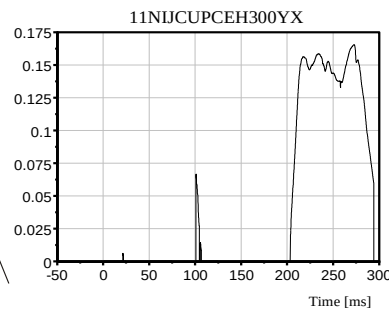
NIJ Source Code: (Fz/Fzc)+(Myc/Myc)



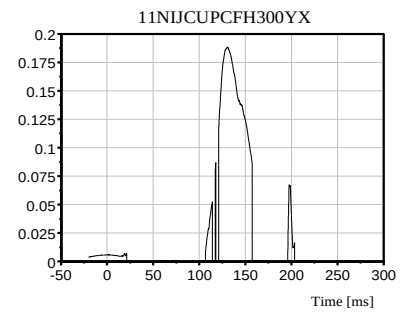
Max [NTE] 0.4154 at 74.00 ms



Max [NTF] 0.1989 at 84.24 ms



Max [NCE] 0.1656 at 272.64 ms



Max [NCF] 0.1883 at 131.04 ms

NHTSA

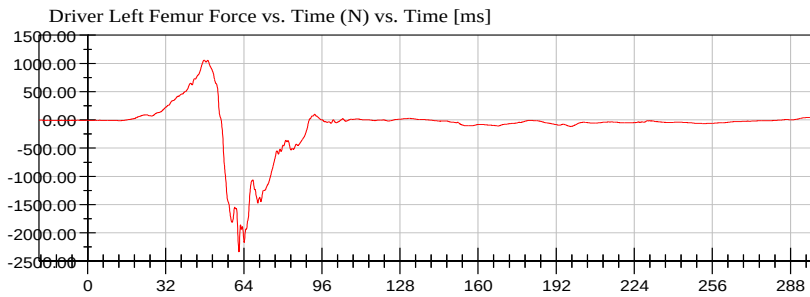
Test Lab: CTF

Test Number: 121015 (MD0114)

Test Date: 10/15/2012

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (426)



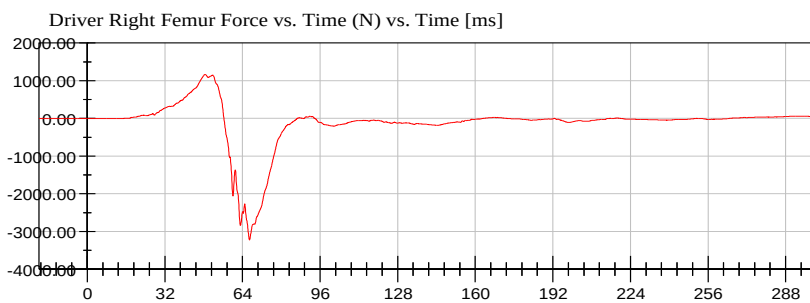
<Max>

1,058.02 N at 47.76 ms

<Min>

-2,333.80 N at 62.00 ms

CFC_600



<Max>

1,161.76 N at 48.64 ms

<Min>

-3,230.04 N at 66.88 ms

CFC_600



NHTSA

Test Lab: CTF

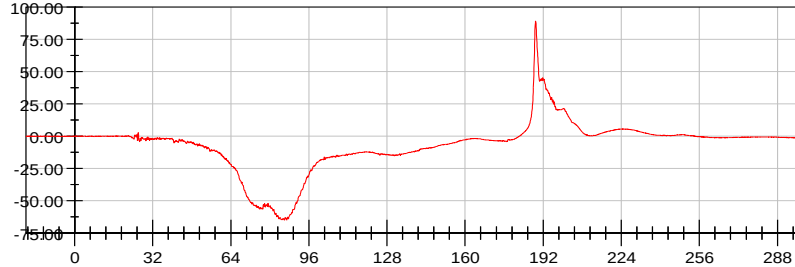
Test Number: 121015 (MD0114)

Test Date: 10/15/2012

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

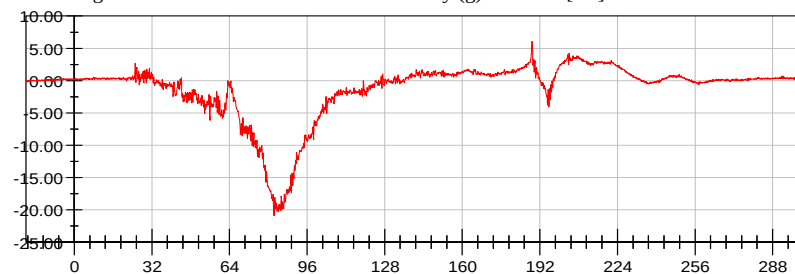
89.20 g at 188.88 ms

<Min>

-65.00 g at 86.00 ms

CFC_1000

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



<Max>

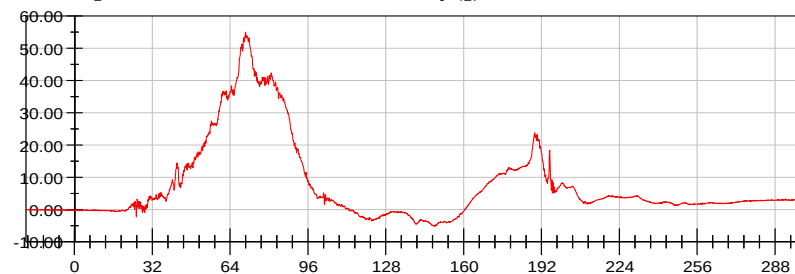
6.07 g at 188.80 ms

<Min>

-20.94 g at 82.40 ms

CFC_1000

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



<Max>

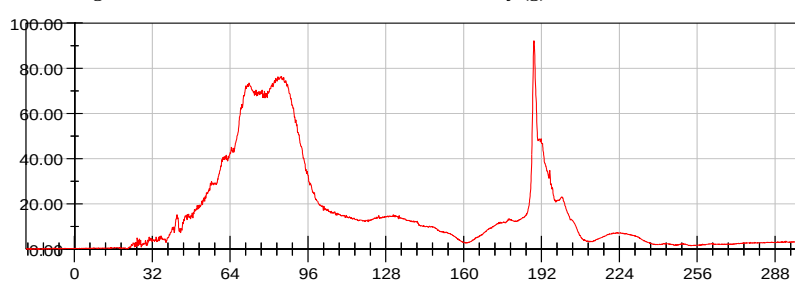
55.03 g at 70.32 ms

<Min>

-5.28 g at 148.16 ms

CFC_1000

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



<Max>

92.13 g at 188.88 ms

<Min>

0.03 g at -14.96 ms

CFC_1000



NHTSA

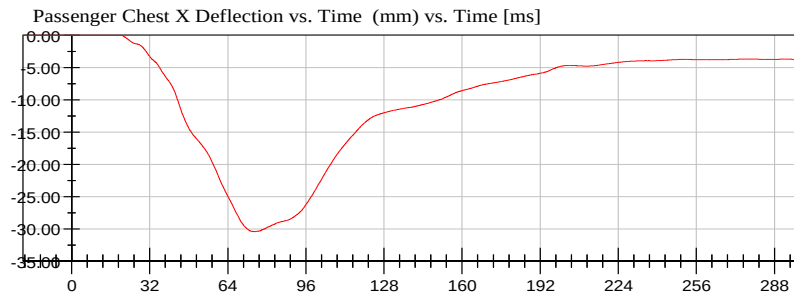
Test Lab: CTF

Test Number: 121015 (MD0114)

Test Date: 10/15/2012

Position #1 Hybrid III Mid-Sized Adult Male Dummy ('037)

Position #2 Hybrid III Small Adult Female (426)



<Max>

0.00 mm at -18.88 ms

<Min>

-30.44 mm at 74.88 ms

CFC_600



NHTSA

Test Lab: CTF

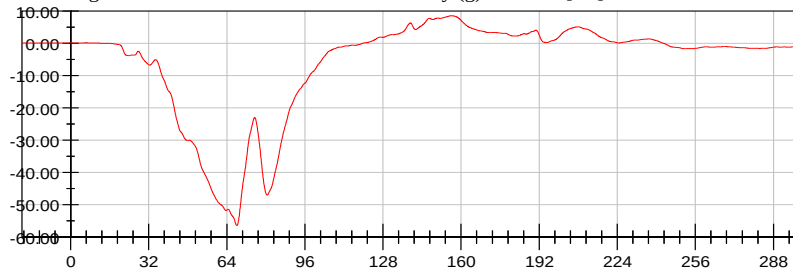
Test Number: 121015 (MD0114)

Test Date: 10/15/2012

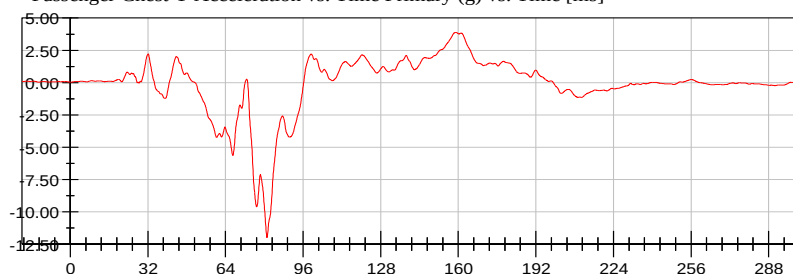
Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (426)

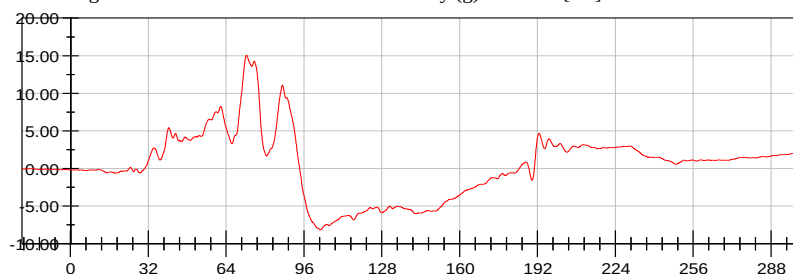
Passenger Chest X Acceleration vs. Time Primary (g) vs. Time [ms]



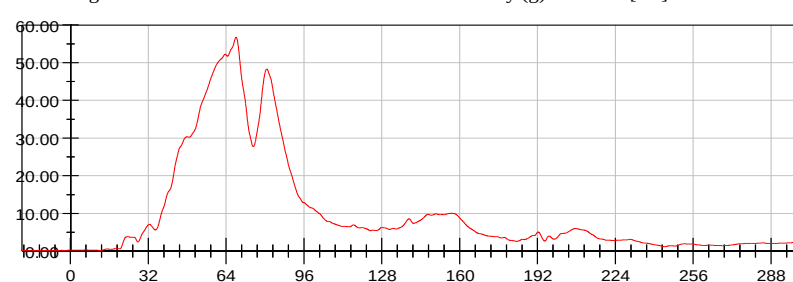
Passenger Chest Y Acceleration vs. Time Primary (g) vs. Time [ms]



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



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



NHTSA

Test Lab: CTF

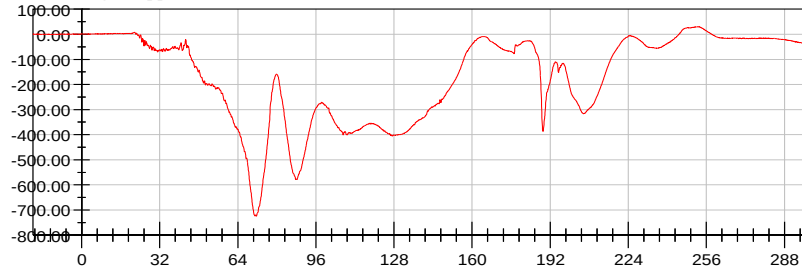
Test Number: 121015 (MD0114)

Test Date: 10/15/2012

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (426)

Passenger Upper Neck Force X vs. Time (N) vs. Time [ms]



<Max>

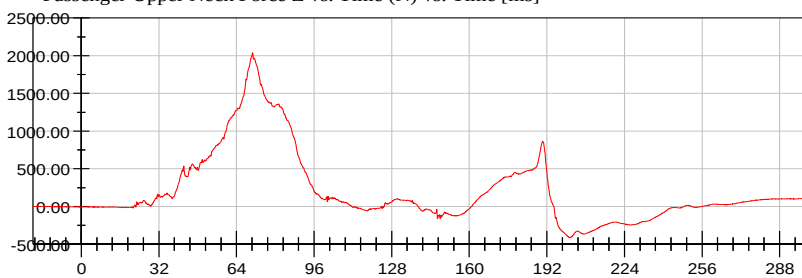
30.47 N at 253.04 ms

<Min>

-724.26 N at 71.60 ms

CFC_1000

Passenger Upper Neck Force Z vs. Time (N) vs. Time [ms]



<Max>

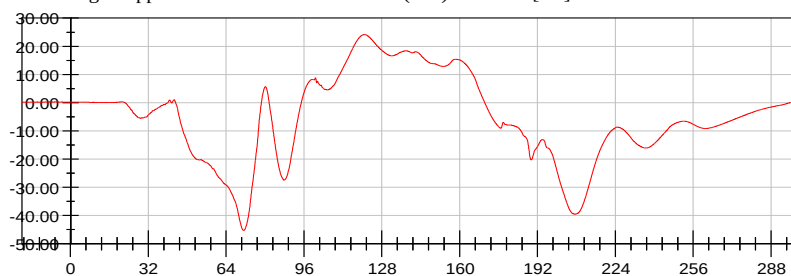
2,036.97 N at 70.64 ms

<Min>

-414.74 N at 201.52 ms

CFC_1000

Passenger Upper Neck Moment Y vs. Time (Nm) vs. Time [ms]



<Max>

24.15 Nm at 121.04 ms

<Min>

-45.28 Nm at 71.36 ms

CFC_600





2013 Chevrolet Silverado 2500 HD 4X4 into Load Cell Barrier

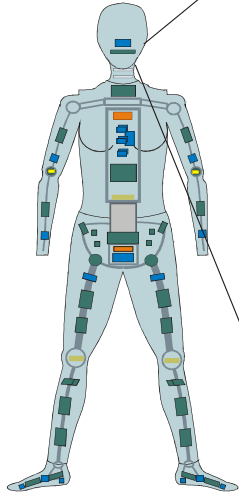
Date: 10/15/2012
Time: 16:41

Neck Injury Predictor (NIJ)

Customer: NHTSA

Test Number: MD0114

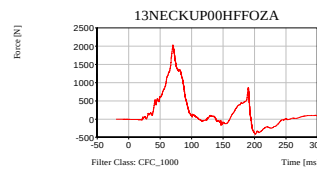
Test Orientation = Frontal
Fzc(Tension) = 4287
Fzc(Compression) = 3880
Myc(Extension) = 67
Myc(Flexion) = 155



Dummy: HIII 5th Female
Seating Position:

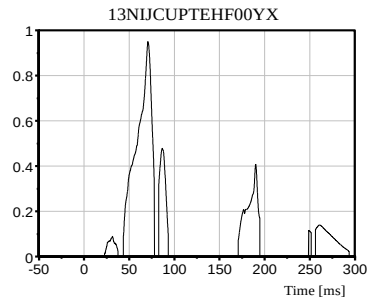
Right Front Passenger

NIJ Source Code: (Fz/Fzc)+(Myc/Myc)

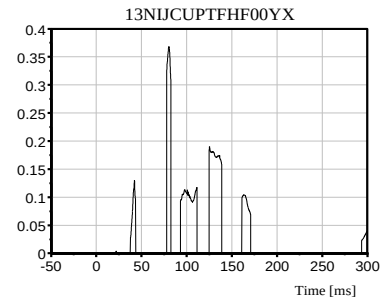


TRC Inc. Test Lab: CTF

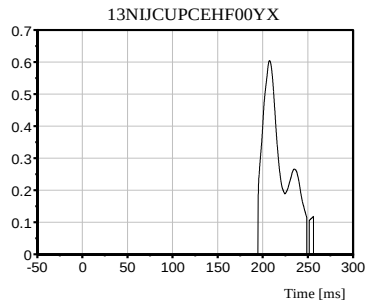
Test Number: 121015



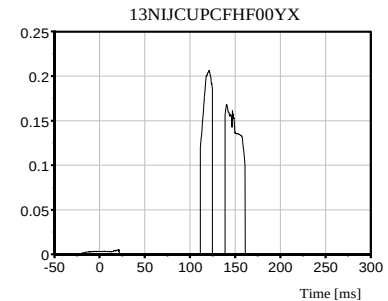
Max [NTE] 0.9509 at 70.64 ms



Max [NTF] 0.3683 at 80.32 ms



Max [NCE] 0.6047 at 207.44 ms



Max [NCF] 0.2065 at 121.12 ms

NHTSA

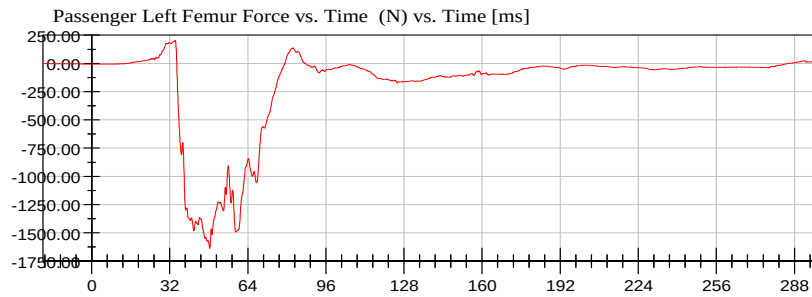
Test Lab: CTF

Test Number: 121015 (MD0114)

Test Date: 10/15/2012

Position #1 Hybrid III Mid-Sized Adult Male Dummy ('037)

Position #2 Hybrid III Small Adult Female (426)



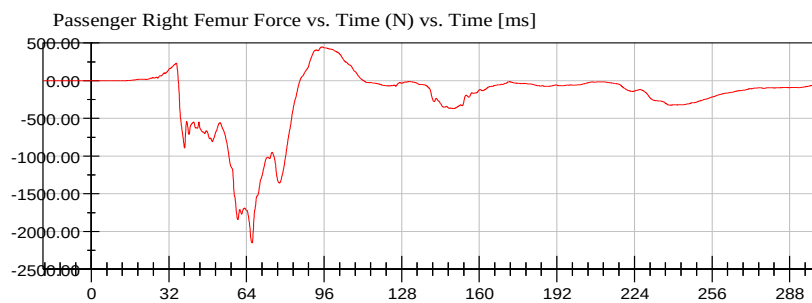
<Max>

204.18 N at 34.24 ms

<Min>

-1,636.02 N at 48.40 ms

CFC_600



<Max>

448.13 N at 95.12 ms

<Min>

-2,153.64 N at 66.32 ms

CFC_600



APPENDIX C
DUMMY CALIBRATION AND PERFORMANCE VERIFICATION

Pre-Test Calibration Sheets
Driver S/N 037

Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 037
Calibration No. 09

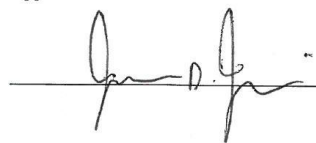
Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	885	Yes
B	Shoulder Pivot Height	505.5 - 520.7	518	Yes
C	H-Point Height	83.8 - 88.9	86	Yes
D	H-Point From Seatback	134.6 - 139.7	138	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	92	Yes
F	Thigh Clearance	139.7 - 154.9	152	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	294	Yes
H	Skull Cap To Backline	40.6 - 45.7	45	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	339	Yes
J	Elbow Rest Height	190.5 - 210.8	200	Yes
K	Buttock Knee Length	579.1 - 604.5	600	Yes
L	Popliteal Height	429.3 - 454.7	441	Yes
M	Knee Pivot Height	485.1 - 500.4	495	Yes
N	Buttock Popliteal Length	452.1 - 477.5	470	Yes
O	Chest Depth	213.4 - 228.6	225	Yes
P	Foot Length	251.5 - 266.7	264	Yes
V	Shoulder Breadth	421.6 - 436.9	430	Yes
W	Foot Breadth	91.4 - 106.7	97	Yes
Y	Chest Circumference	970.3 - 1000.8	990	Yes
Z	Waist Circumference	835.7 - 866.1	863	Yes
AA	Location For Chest Circumference	429.3 - 434.3	431	Yes
BB	Location For Waist Circumference	226.1 - 231.1	230	Yes

Comments:

Technician



Approved




Revised 3/13/3003

Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 037 Certification No. 9-1

Test Date: 10/4/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	56 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	249.9 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	8.4 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician



Approved



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

10.04.2012 13:40:44 611

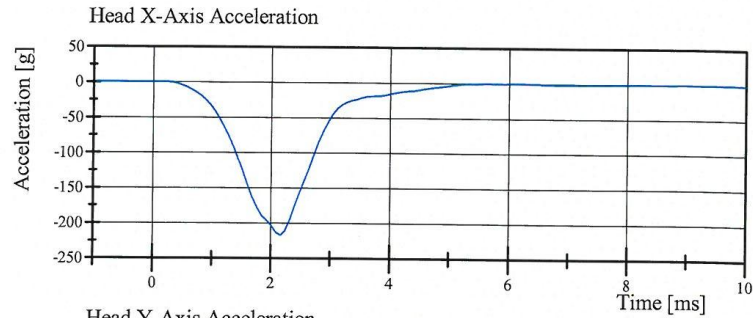


Transportation Research Center Inc.

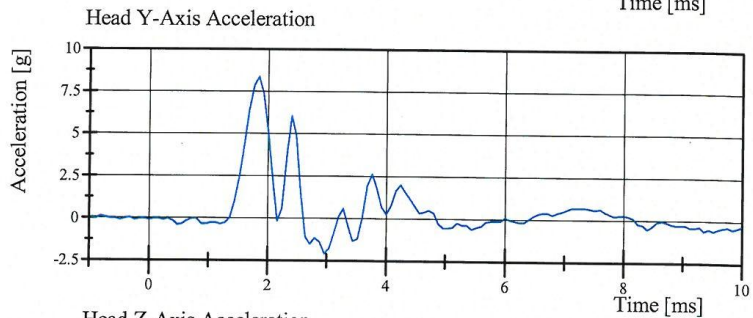
Front Head Drop

HIII 50th Serial No. 037 Certification No. 9-1

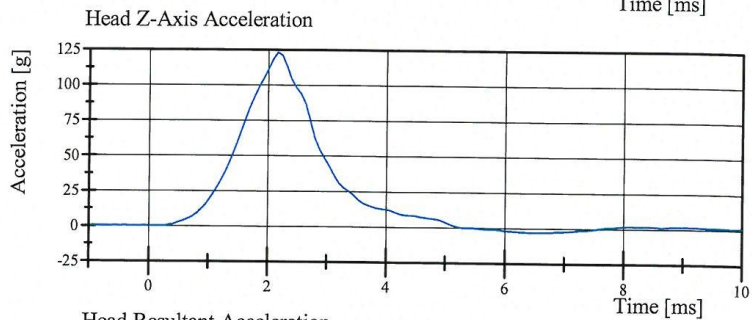
Test Date: 10/4/2012



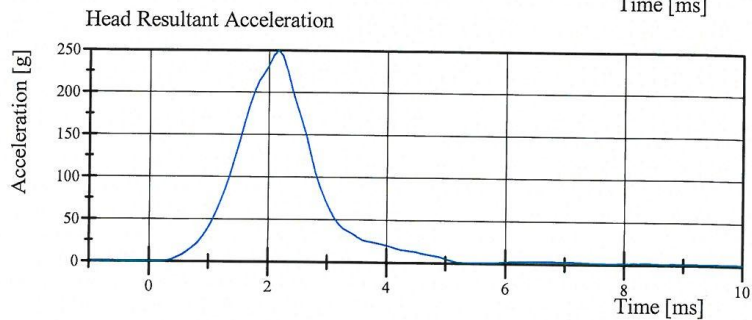
Filter Class: CFC_1000
Max: 0.2 gn at 6.2 ms
Min: -217.4 gn at 2.2 ms



Filter Class: CFC_1000
Max: 8.4 gn at 1.8 ms
Min: -2.1 gn at 3.0 ms



Filter Class: CFC_1000
Max: 123.2 gn at 2.2 ms
Min: -3.0 gn at 6.5 ms



Filter Class: CFC_1000
Max: 249.9 gn at 2.2 ms
Min: 0.0 gn at -0.2 ms

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

10.04.2012 13:40:51 611



Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 9-1

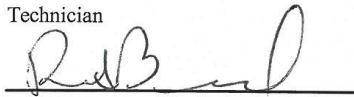
Test Date: 10/5/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.941 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	37.3 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-23.81 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-21.73 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-17.10 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-17.10 g	Yes
Total Head D-Plane Rotation			
Peak	(-64) - (-78) °	-73.4 °	Yes
Time of Peak	57 - 64 ms	59.2 ms	Yes
Total Head D-Plane Rotation Decay to 0°	113 - 128 ms	121.0 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	88 - 108 N·m	106.3 N·m	Yes
Time of Peak	47 - 58 ms	49.8 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	97 - 107 ms	97.8 ms	Yes

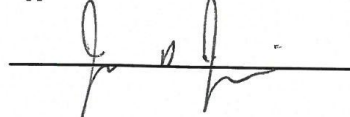
Test meets specifications.

Comments:

Technician



Approved



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

10.05.2012 07:56:06 2942

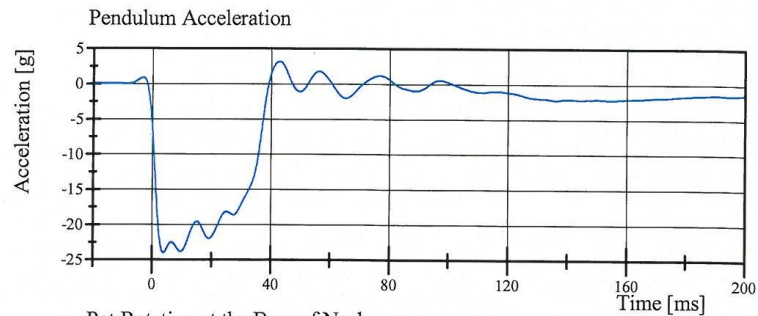


Transportation Research Center Inc.

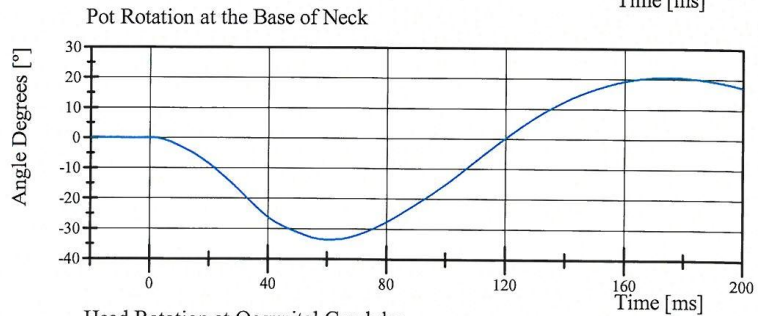
Neck Flexion

HIII 50th Serial No. 037 Certification No. 9-1

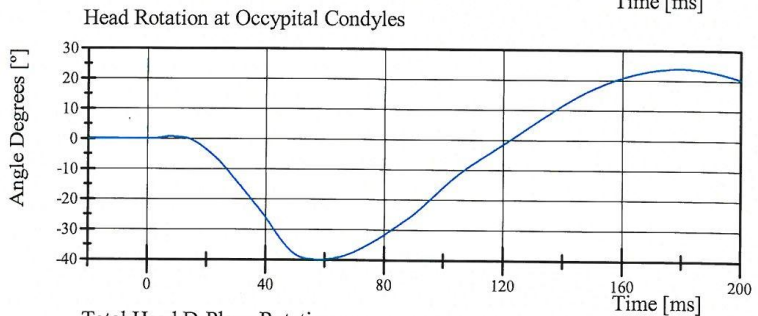
Test Date: 10/5/2012



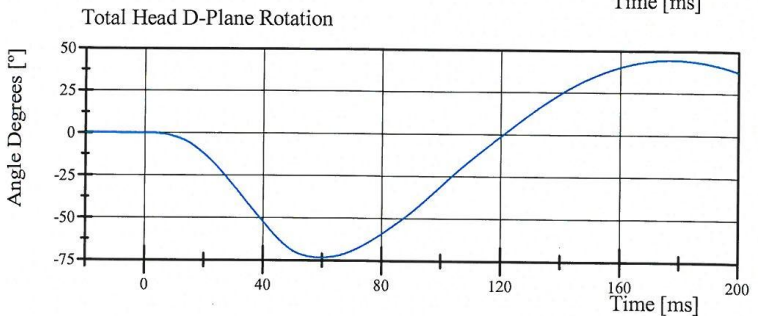
Filter Class: CFC_60
Max: 3.1 gn at 42.7 ms
Min: -24.0 gn at 3.9 ms



Filter Class: CFC_60
Max: 20.7 ° at 173.9 ms
Min: -33.5 ° at 60.3 ms



Filter Class: CFC_60
Max: 23.9 ° at 179.2 ms
Min: -39.9 ° at 58.2 ms



Filter Class: CFC_60
Max: 44.5 ° at 177.4 ms
Min: -73.4 ° at 59.2 ms

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

10.05.2012 07:56:13 2942

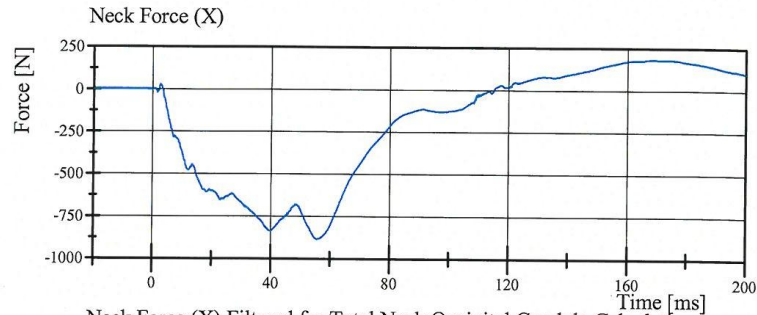


Transportation Research Center Inc.

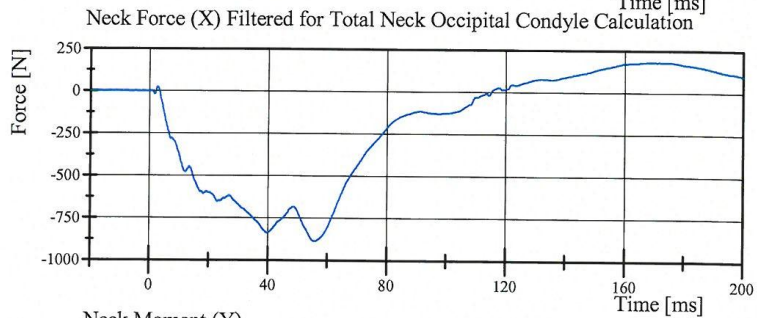
Neck Flexion

HIII 50th Serial No. 037 Certification No. 9-1

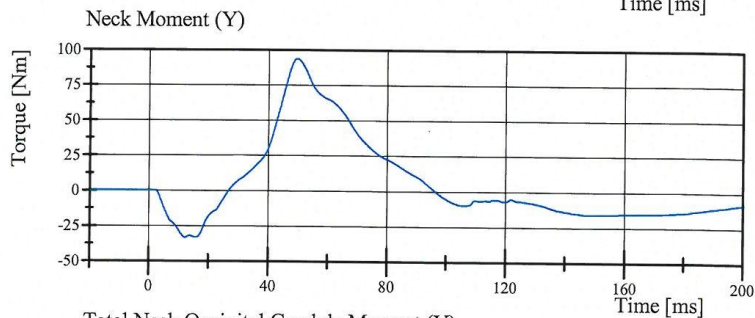
Test Date: 10/5/2012



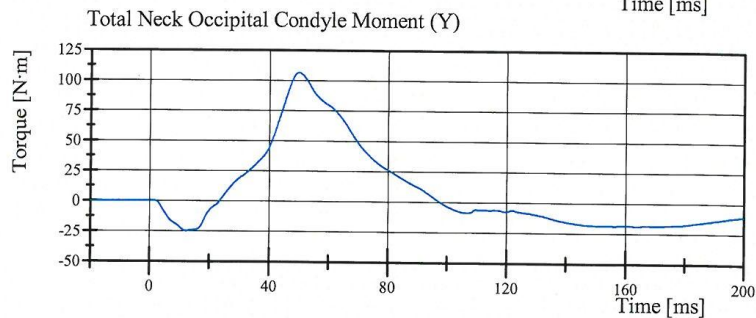
Filter Class: CFC_1000
Max: 183.8 N at 168.8 ms
Min: -885.6 N at 55.6 ms



Filter Class: CFC_600
Max: 183.4 N at 168.9 ms
Min: -885.1 N at 55.7 ms



Filter Class: CFC_600
Max: 93.9 Nm at 49.6 ms
Min: -33.5 Nm at 12.2 ms



Filter Class: Without_(Consta
Max: 106.3 N·m at 49.8 ms
Min: -25.0 N·m at 12.3 ms

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

10.05.2012 07:56:13 2942



Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 9-1

Test Date: 10/5/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	58 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-5.969 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	41.2 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	19.65 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	15.40 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	14.05 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	14.05 g	Yes
Total Head D-Plane Rotation Peak	81 - 106 °	93.2 °	Yes
Time of Peak	72 - 82 ms	77.1 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	157.0 ms	Yes
Total Neck Occipital Condyles Moment Peak	(-53) - (-80) N·m	-71.1 N·m	Yes
Time of Peak	65 - 79 ms	71.8 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	120 - 148 ms	143.8 ms	Yes

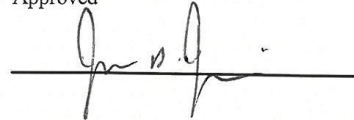
Test meets specifications.

Comments:

Technician



Approved



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

10.05.2012 08:32:56 3028

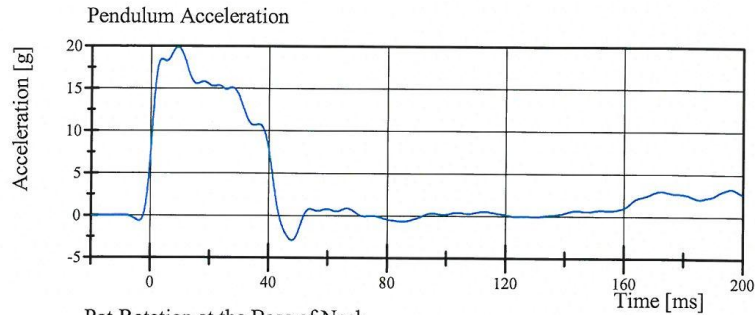


Transportation Research Center Inc.

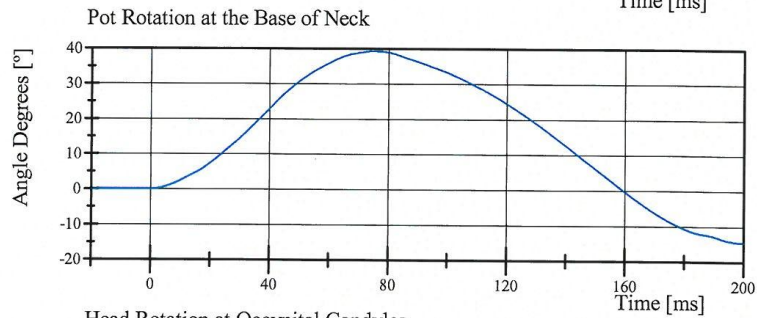
Neck Extension

HIII 50th Serial No. 037 Certification No. 9-1

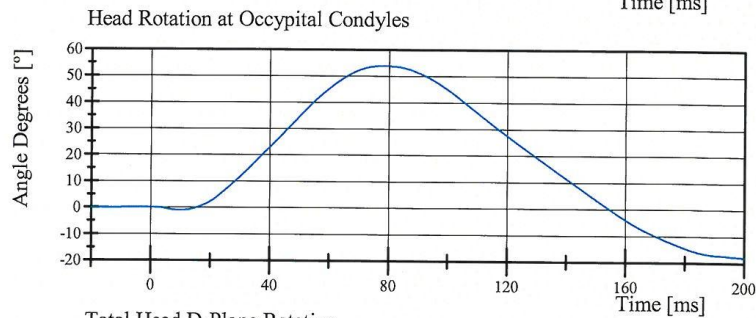
Test Date: 10/5/2012



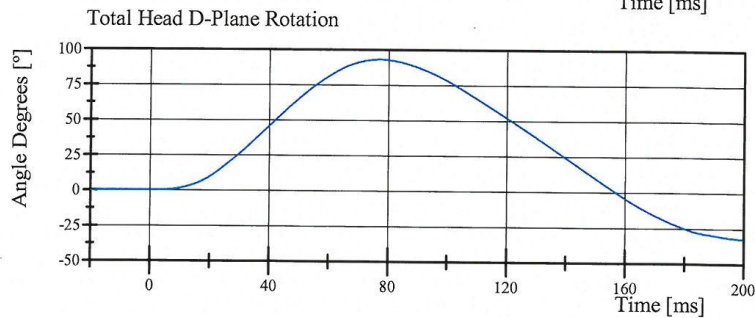
Filter Class: CFC_60
Max: 19.9 gn at 9.0 ms
Min: -2.9 gn at 47.9 ms



Filter Class: CFC_60
Max: 39.3 ° at 75.8 ms
Min: -14.6 ° at 200.0 ms



Filter Class: CFC_60
Max: 53.9 ° at 78.2 ms
Min: -17.9 ° at 200.0 ms



Filter Class: CFC_60
Max: 93.2 ° at 77.1 ms
Min: -32.5 ° at 200.0 ms

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

10.05.2012 08:33:05 3028

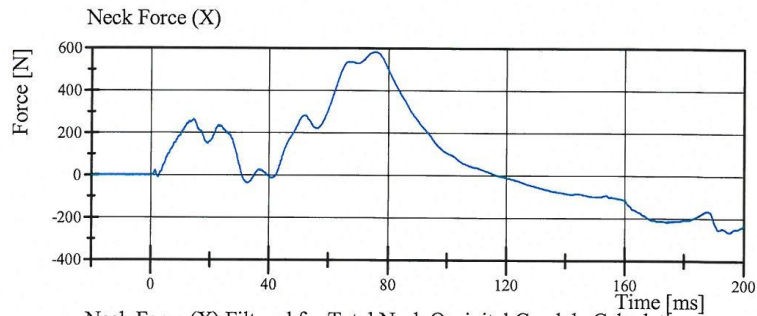


Transportation Research Center Inc.

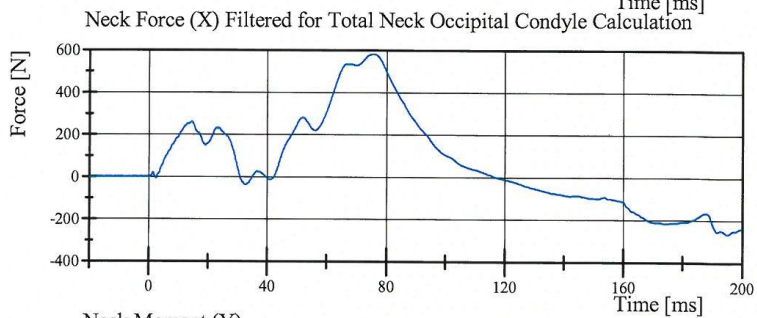
Neck Extension

HIII 50th Serial No. 037 Certification No. 9-1

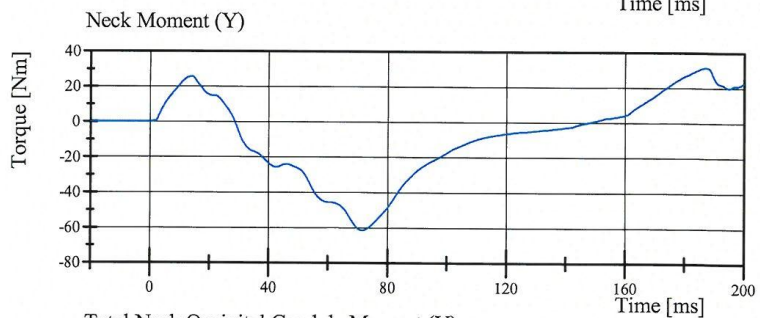
Test Date: 10/5/2012



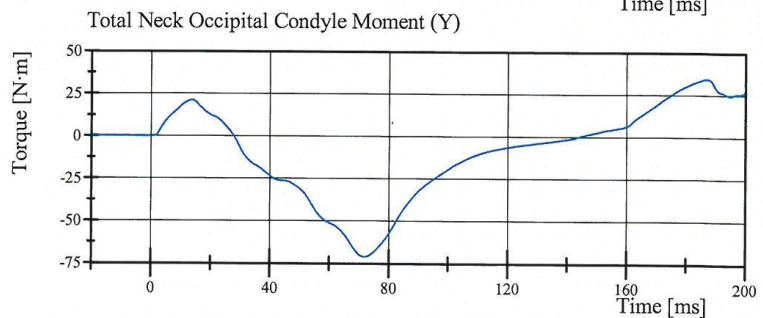
Filter Class: CFC_1000
Max: 583.2 N at 75.4 ms
Min: -264.5 N at 194.9 ms



Filter Class: CFC_600
Max: 583.0 N at 75.6 ms
Min: -264.0 N at 194.9 ms



Filter Class: CFC_600
Max: 31.5 Nm at 187.2 ms
Min: -61.5 Nm at 71.5 ms



Filter Class: Without_(Consta
Max: 34.5 N·m at 187.0 ms
Min: -71.1 N·m at 71.8 ms

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

10.05.2012 08:33:06 3028



Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 037 Certification No. 9-3

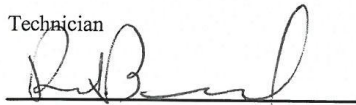
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.670 m/s	Yes
Probe Force Peak	(-5,160) - (-5,893) N	-5,862.3 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-66.52 mm	Yes
Internal Hysteresis	65 - 85 %	74.1 %	Yes

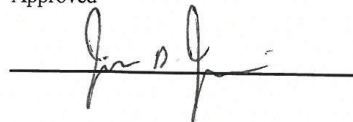
Test meets specifications.

Comments:

Technician



Approved



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

10.09.2012 12:32:35 383

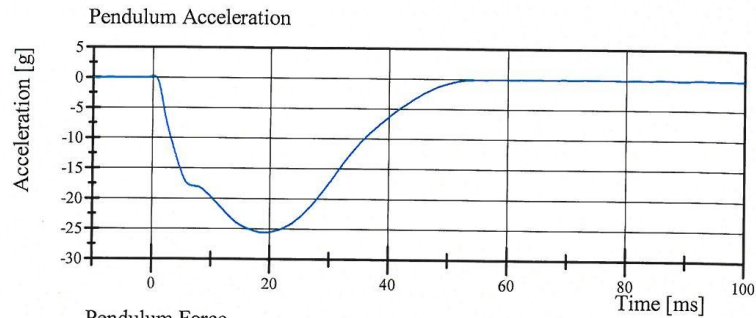


Transportation Research Center Inc.

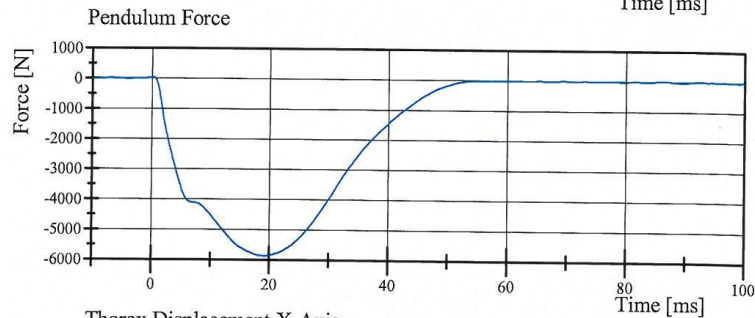
Front Thorax

HIII 50th Serial No. 037 Certification No. 9-3

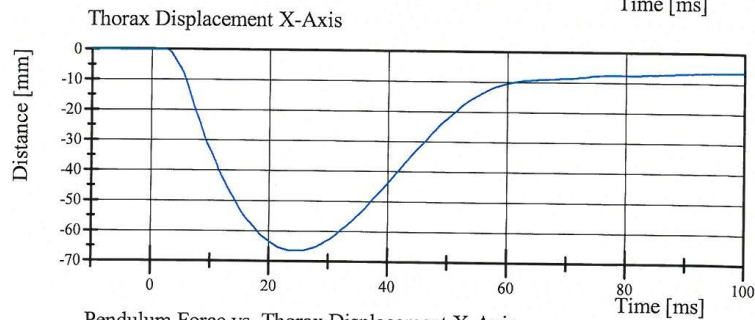
Test Date: 10/9/2012



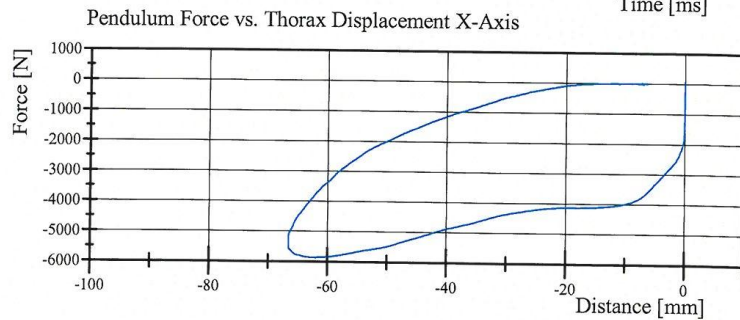
Filter Class: CFC_180
Max: 0.2 gn at 0.1 ms
Min: -25.6 gn at 19.4 ms



Filter Class: CFC_180
Max: 38.3 N at 0.1 ms
Min: -5,862.3 N at 19.4 ms



Filter Class: CFC_600
Max: 0.0 mm at -2.4 ms
Min: -66.5 mm at 23.5 ms



Filter Class: CFC_180
Max: 38.3 N at -0.0 mm
Min: -5,862.3 N at -62.6 mm

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

10.09.2012 12:32:43 383



Transportation Research Center Inc

Hybrid III Hip Range of Motion

Serial Number: 037L

Date: 10/04/2012

Test Number: 037C09

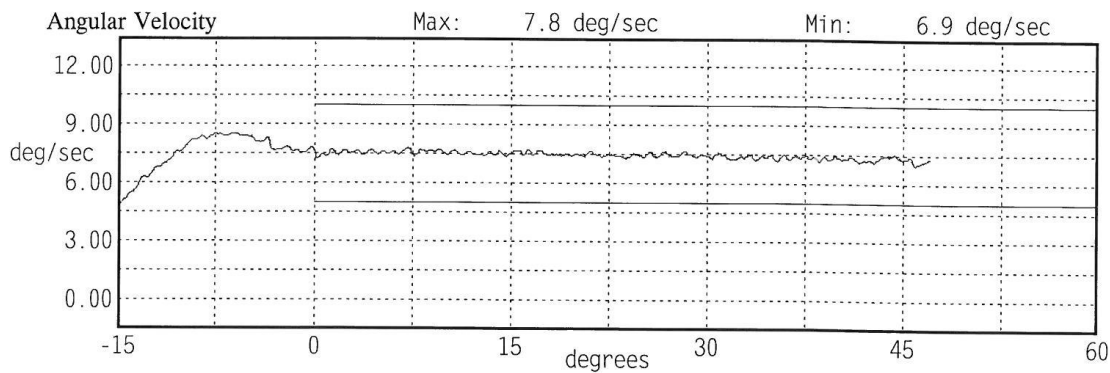
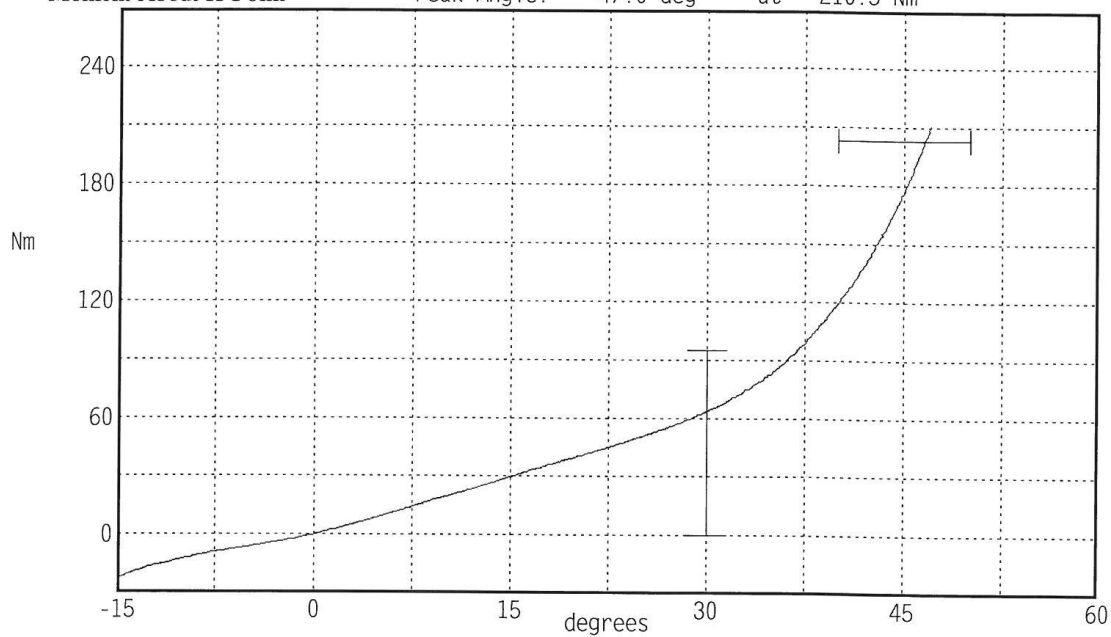
Time: 14:34

Comments:

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
Temperature	18.9 - 25.6	21.5 °C	Pass
Humidity	10 - 70	56 %	Pass
Moment at 30 deg	<= 94.9	63.8 Nm	Pass
Angle at 203 Nm	40.0 - 50.0	46.6 deg	Pass
Average Velocity	5.0 - 10.0	7.4 deg/sec	Pass

Moment About H-Point

Peak Moment: 210.5 Nm at 47.0 deg
Peak Angle: 47.0 deg at 210.5 Nm



Transportation Research Center Inc

Hybrid III Hip Range of Motion

Serial Number: 037R

Date: 10/04/2012

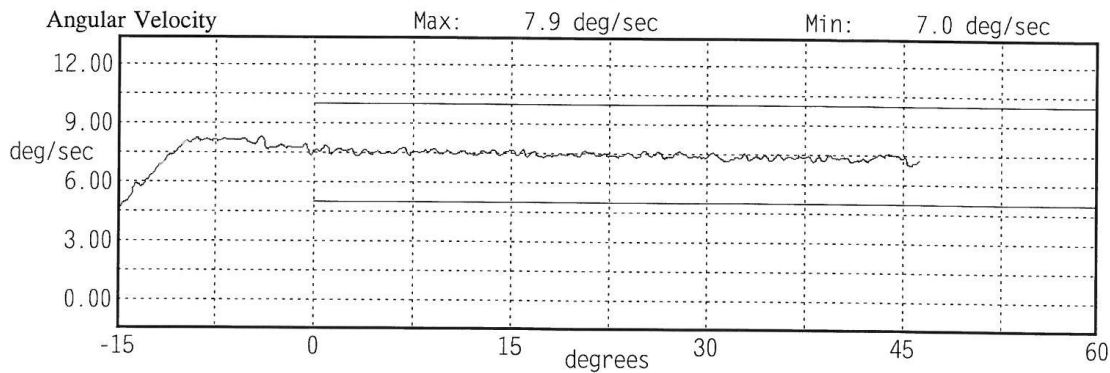
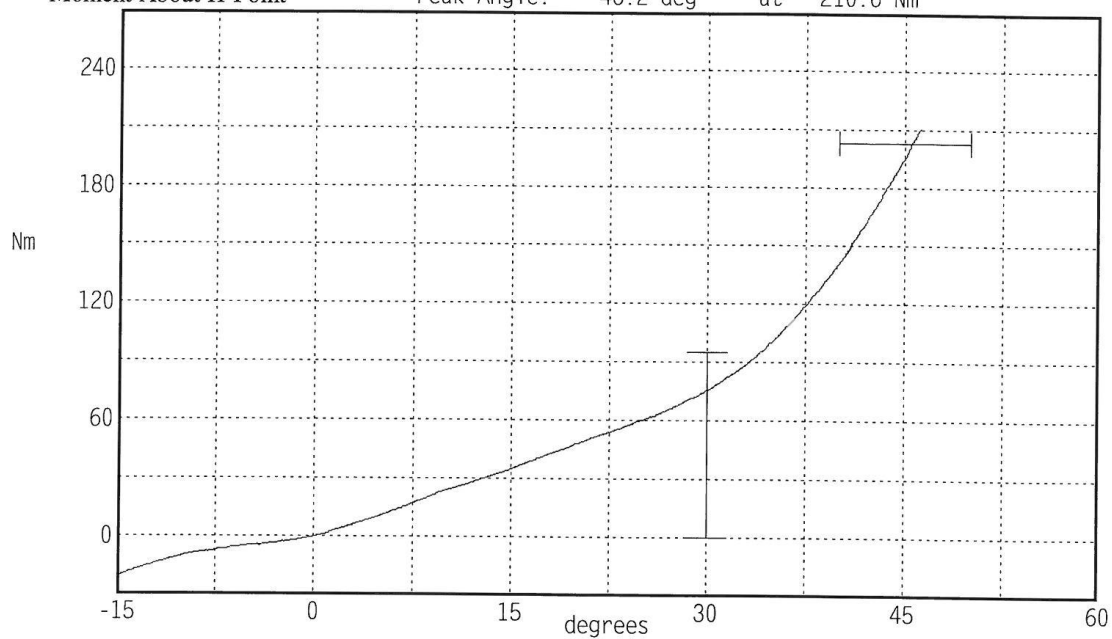
Test Number: 037C09

Time: 13:32

Comments:

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
Temperature	18.9 - 25.6	21.0 °C	Pass
Humidity	10 - 70	53 %	Pass
Moment at 30 deg	<= 94.9	75.4 Nm	Pass
Angle at 203 Nm	40.0 - 50.0	45.6 deg	Pass
Average Velocity	5.0 - 10.0	7.4 deg/sec	Pass

Moment About H-Point
 Peak Moment: 210.6 Nm at 46.2 deg
 Peak Angle: 46.2 deg at 210.6 Nm



Transportation Research Center Inc.

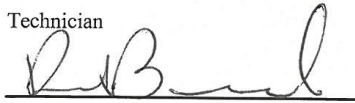
Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 9-1
Test Date: 10/4/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.109 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,715.35 N	Yes

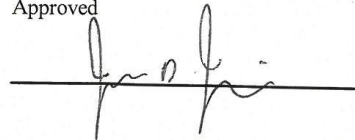
Test meets specifications.

Comments:

Technician



Approved



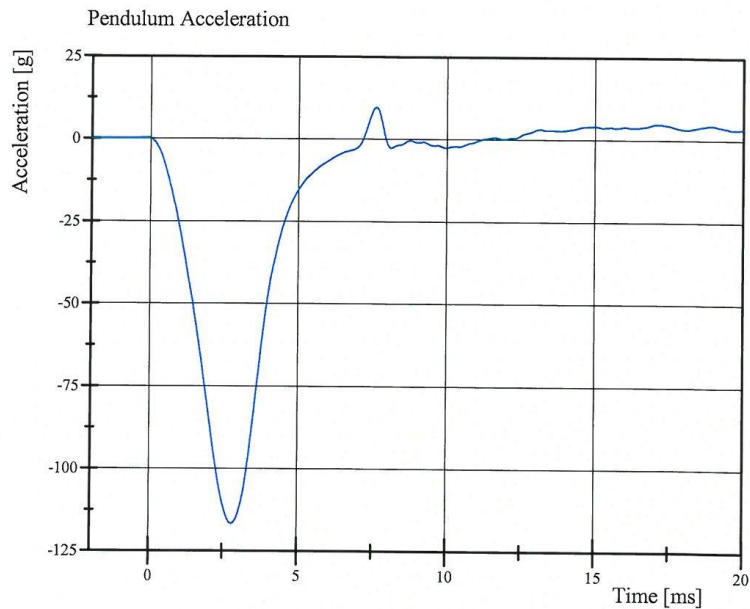
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.04.2012 13:44:28 1690

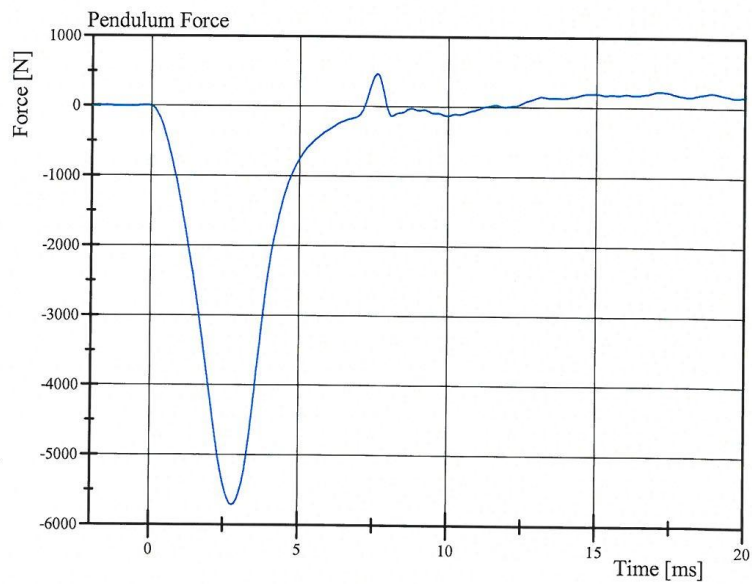


Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 9-1
Test Date: 10/4/2012



Filter Class: CFC_600
Max: 9.7 gn at 7.6 ms
Min: -116.8 gn at 2.8 ms



Filter Class: CFC_600
Max: 472.3 N at 7.6 ms
Min: -5,715.4 N at 2.8 ms

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

10.04.2012 13:44:35 1690



Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 9-1
Test Date: 10/4/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.110 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,599.19 N	Yes

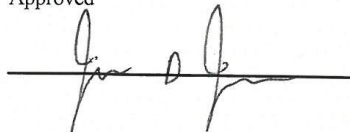
Test meets specifications.

Comments:

Technician



Approved



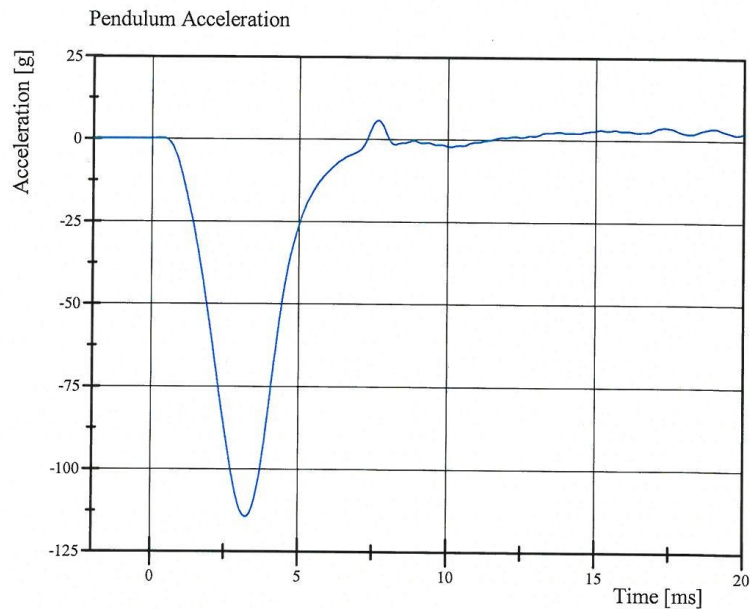
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.04.2012 13:45:30 1686

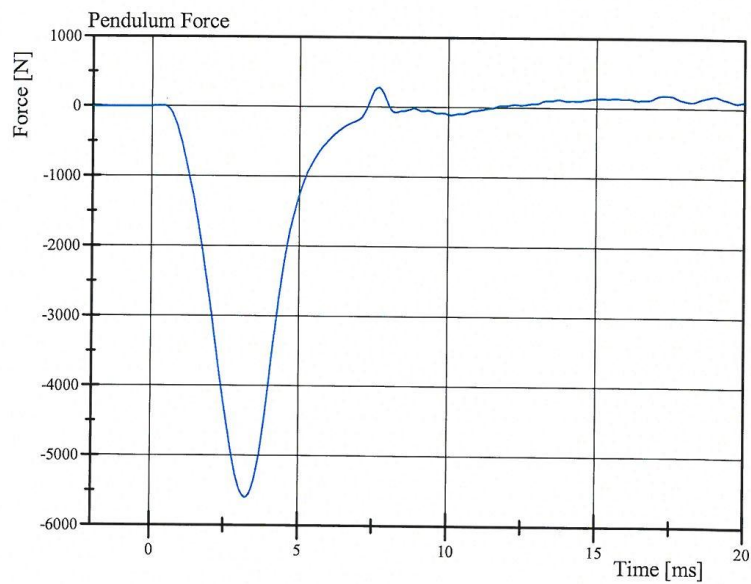


Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 9-1
Test Date: 10/4/2012



Filter Class: CFC_600
Max: 5.8 gn at 7.7 ms
Min: -114.4 gn at 3.2 ms



Filter Class: CFC_600
Max: 282.4 N at 7.7 ms
Min: -5,599.2 N at 3.2 ms

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

10.04.2012 13:45:37 1686



Driver S/N 037

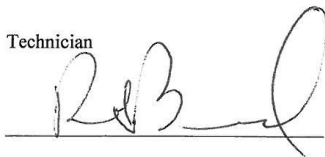
Post-Test Calibration Sheets

Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 037
Calibration No. 10

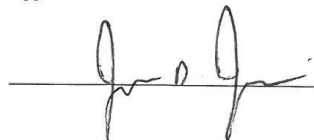
Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	886	Yes
B	Shoulder Pivot Height	505.5 - 520.7	519	Yes
C	H-Point Height	83.8 - 88.9	86	Yes
D	H-Point From Seatback	134.6 - 139.7	138	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	92	Yes
F	Thigh Clearance	139.7 - 154.9	152	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	294	Yes
H	Skull Cap To Backline	40.6 - 45.7	45	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	339	Yes
J	Elbow Rest Height	190.5 - 210.8	200	Yes
K	Buttock Knee Length	579.1 - 604.5	600	Yes
L	Popliteal Height	429.3 - 454.7	441	Yes
M	Knee Pivot Height	485.1 - 500.4	495	Yes
N	Buttock Popliteal Length	452.1 - 477.5	470	Yes
O	Chest Depth	213.4 - 228.6	225	Yes
P	Foot Length	251.5 - 266.7	264	Yes
V	Shoulder Breadth	421.6 - 436.9	430	Yes
W	Foot Breadth	91.4 - 106.7	97	Yes
Y	Chest Circumference	970.3 - 1000.8	990	Yes
Z	Waist Circumference	835.7 - 866.1	863	Yes
AA	Location For Chest Circumference	429.3 - 434.3	431	Yes
BB	Location For Waist Circumference	226.1 - 231.1	230	Yes

Comments:

Technician



Approved



Revised 3/13/3003



Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 037 Certification No. 10-1

Test Date: 10/16/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	29 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	244.6 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-5.9 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

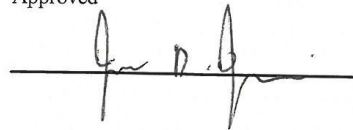
Test meets specifications.

Comments:

Technician



Approved



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

10.16.2012 07:22:53 614

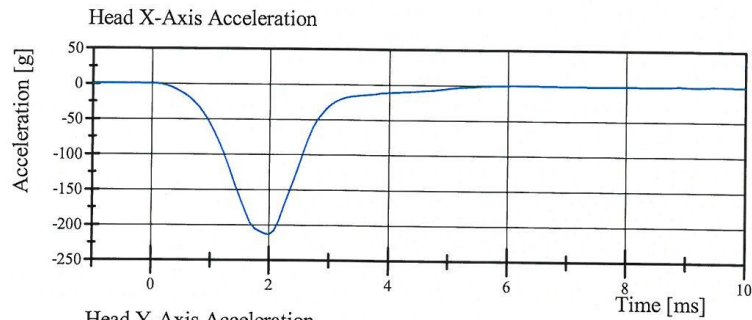


Transportation Research Center Inc.

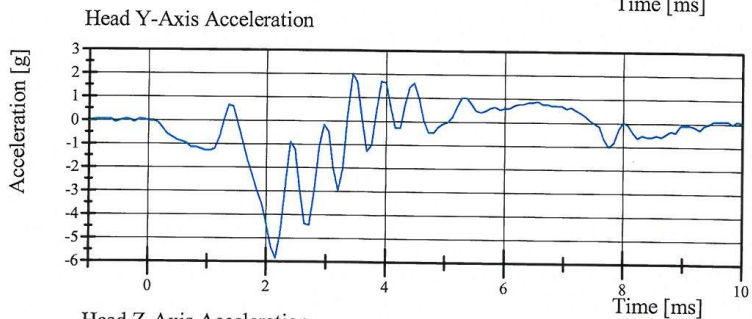
Front Head Drop

HIII 50th Serial No. 037 Certification No. 10-1

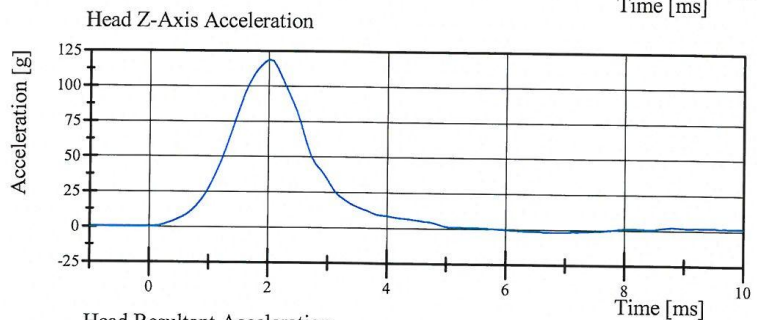
Test Date: 10/16/2012



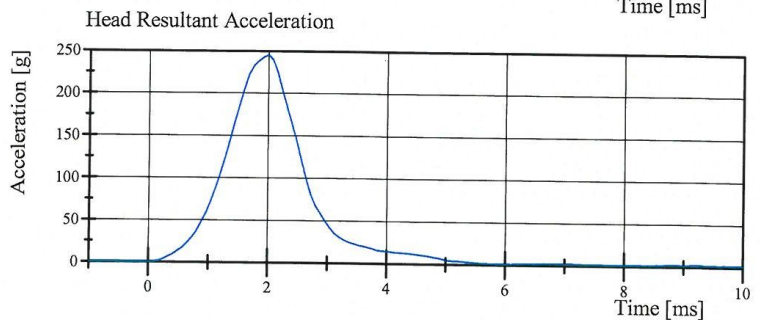
Filter Class: CFC_1000
Max: 0.3 gn at 6.2 ms
Min: -213.9 gn at 2.0 ms



Filter Class: CFC_1000
Max: 2.0 gn at 3.4 ms
Min: -5.9 gn at 2.2 ms



Filter Class: CFC_1000
Max: 118.7 gn at 2.0 ms
Min: -1.7 gn at 6.7 ms



Filter Class: CFC_1000
Max: 244.6 gn at 2.0 ms
Min: 0.0 gn at -1.0 ms

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

10.16.2012 07:22:59 614



Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 10-2

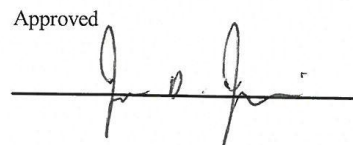
Test Date: 10/16/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.941 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	38.7 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-23.82 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-20.39 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-15.89 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-15.89 g	Yes
Total Head D-Plane Rotation			
Peak	(-64) - (-78) °	-72.3 °	Yes
Time of Peak	57 - 64 ms	58.8 ms	Yes
Total Head D-Plane Rotation			
Decay to 0°	113 - 128 ms	117.9 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	88 - 108 N·m	104.5 N·m	Yes
Time of Peak	47 - 58 ms	51.4 ms	Yes
Total Neck Occipital Condyles Moment			
Decay to 0 N·m	97 - 107 ms	98.2 ms	Yes

Test meets specifications.

Comments:

Technician


Approved


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

10.16.2012 08:06:59 2948

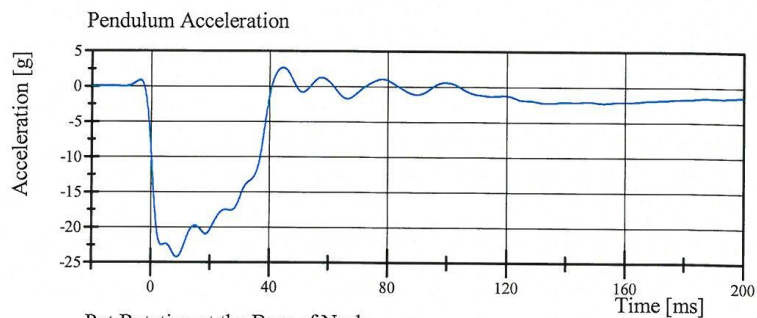


Transportation Research Center Inc.

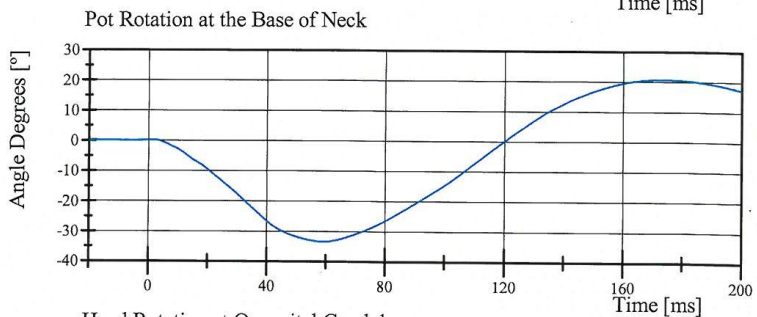
Neck Flexion

HIII 50th Serial No. 037 Certification No. 10-2

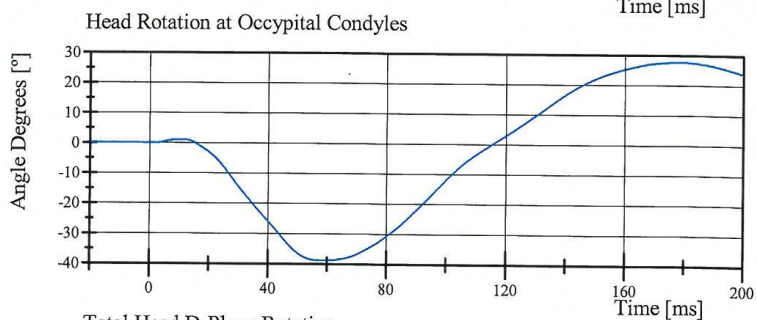
Test Date: 10/16/2012



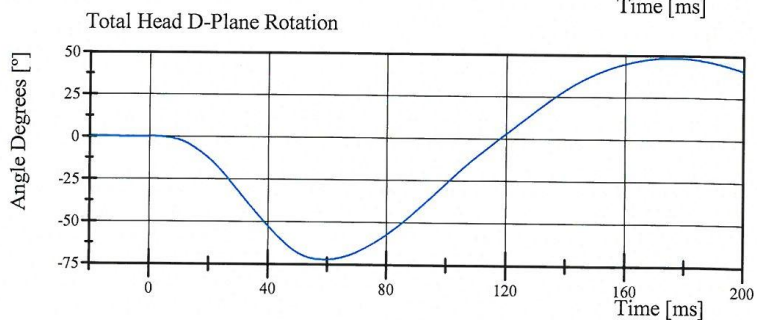
Filter Class: CFC_60
Max: 2.6 gn at 44.5 ms
Min: -24.3 gn at 8.9 ms



Filter Class: CFC_60
Max: 20.8 ° at 173.3 ms
Min: -33.5 ° at 59.0 ms



Filter Class: CFC_60
Max: 27.7 ° at 178.2 ms
Min: -38.9 ° at 58.5 ms



Filter Class: CFC_60
Max: 48.4 ° at 175.8 ms
Min: -72.3 ° at 58.8 ms

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

10.16.2012 08:07:07 2948

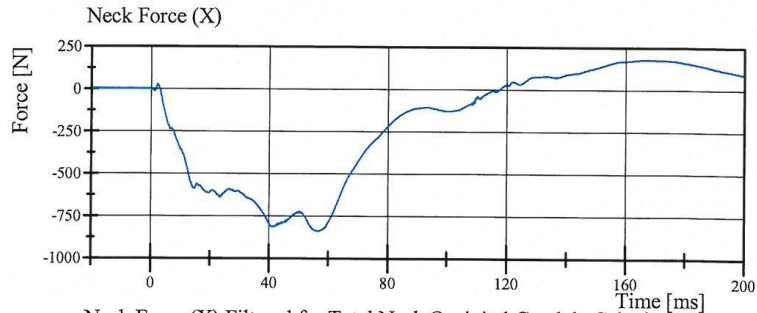


Transportation Research Center Inc.

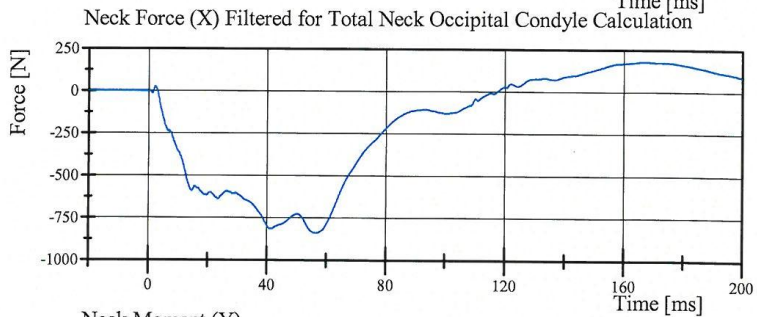
Neck Flexion

HIII 50th Serial No. 037 Certification No. 10-2

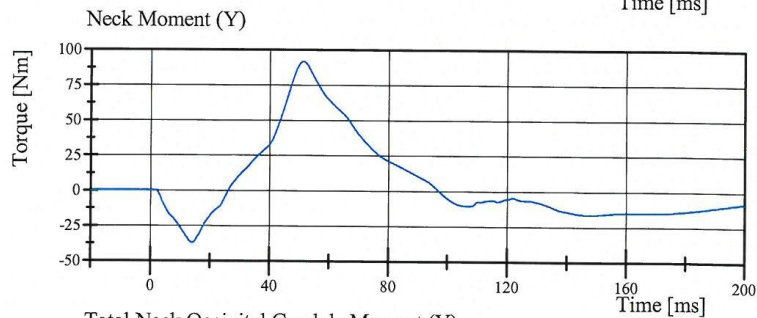
Test Date: 10/16/2012



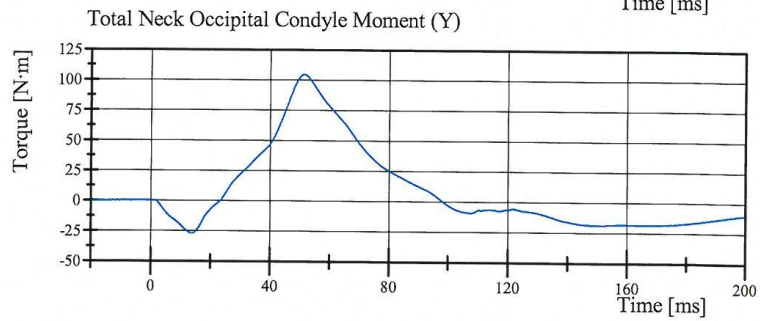
Filter Class: CFC_1000
Max: 179.9 N at 166.0 ms
Min: -839.9 N at 56.6 ms



Filter Class: CFC_600
Max: 179.7 N at 167.2 ms
Min: -839.6 N at 56.5 ms



Filter Class: CFC_600
Max: 91.5 Nm at 51.3 ms
Min: -37.4 Nm at 14.2 ms



Filter Class: Without_(Consta
Max: 104.5 N·m at 51.4 ms
Min: -27.2 N·m at 13.7 ms

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

10.16.2012 08:07:08 2948



Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 10-1

Test Date: 10/16/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	29 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-5.974 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	41.8 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	19.10 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	15.48 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	12.78 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	12.78 g	Yes
Total Head D-Plane Rotation			
Peak	81 - 106 °	95.8 °	Yes
Time of Peak	72 - 82 ms	76.5 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	157.0 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	(-53) - (-80) N·m	-67.9 N·m	Yes
Time of Peak	65 - 79 ms	71.0 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	120 - 148 ms	142.9 ms	Yes

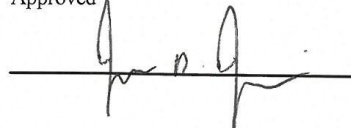
Test meets specifications.

Comments:

Technician



Approved



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

10.16.2012 08:38:44 3027

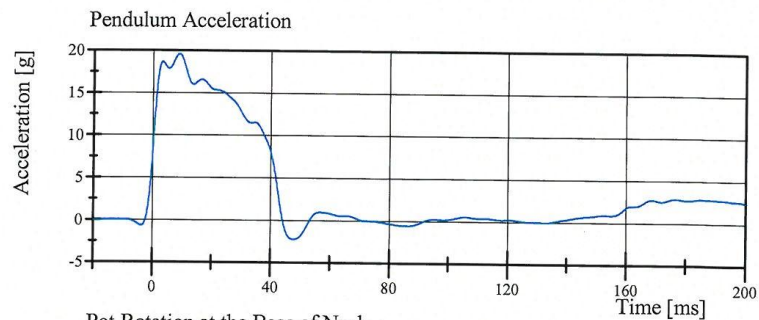


Transportation Research Center Inc.

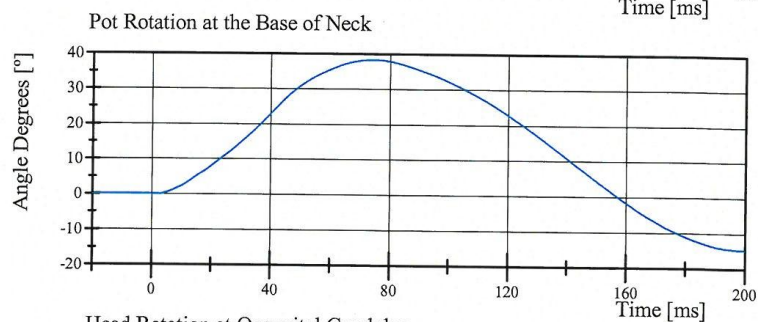
Neck Extension

HIII 50th Serial No. 037 Certification No. 10-1

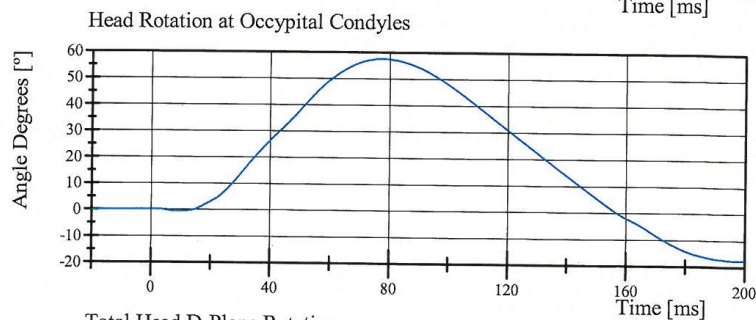
Test Date: 10/16/2012



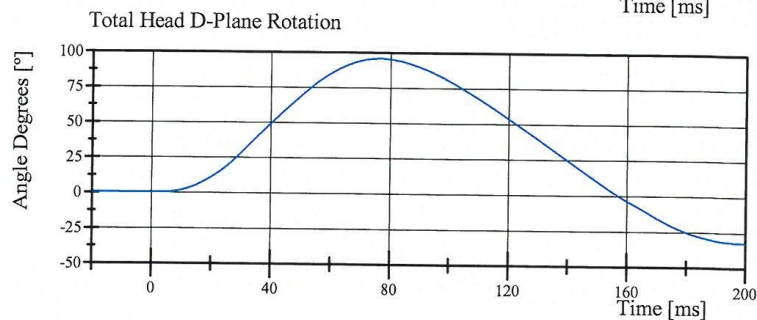
Filter Class: CFC_60
Max: 19.5 gn at 8.9 ms
Min: -2.3 gn at 47.7 ms



Filter Class: CFC_60
Max: 38.3 ° at 74.8 ms
Min: -14.7 ° at 199.4 ms



Filter Class: CFC_60
Max: 57.5 ° at 77.3 ms
Min: -17.7 ° at 198.5 ms



Filter Class: CFC_60
Max: 95.8 ° at 76.5 ms
Min: -32.5 ° at 198.9 ms

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

10.16.2012 08:38:51 3027

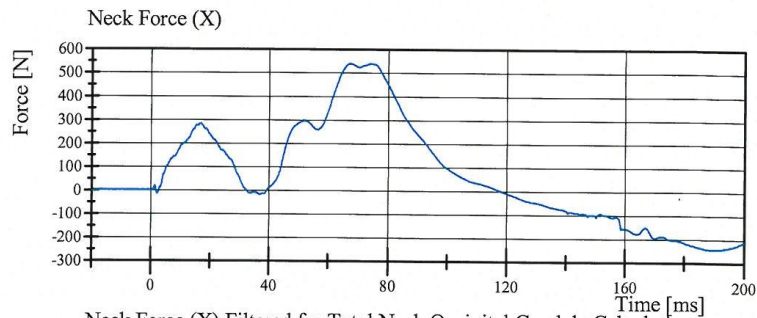


Transportation Research Center Inc.

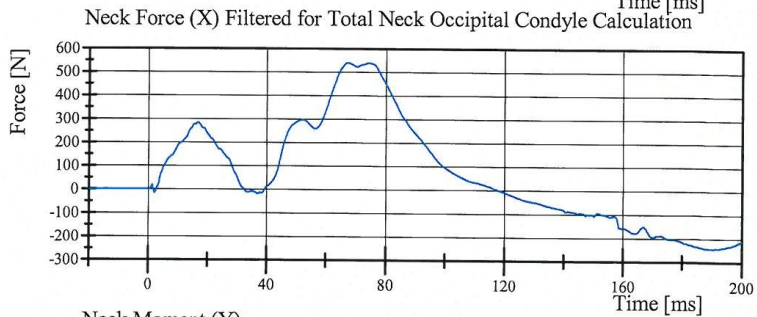
Neck Extension

HIII 50th Serial No. 037 Certification No. 10-1

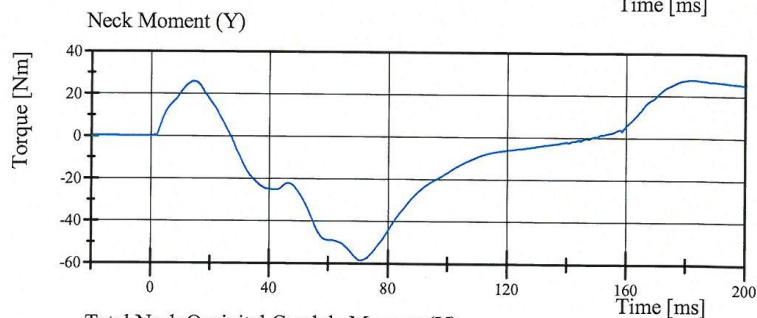
Test Date: 10/16/2012



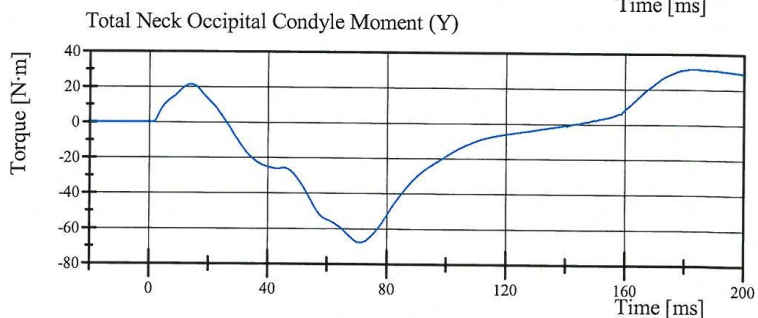
Filter Class: CFC_1000
Max: 539.2 N at 67.2 ms
Min: -244.8 N at 189.6 ms



Filter Class: CFC_600
Max: 538.7 N at 74.0 ms
Min: -244.6 N at 189.5 ms



Filter Class: CFC_600
Max: 27.6 Nm at 181.7 ms
Min: -58.6 Nm at 70.9 ms



Filter Class: Without (Constant)
Max: 31.5 N·m at 182.9 ms
Min: -67.9 N·m at 71.0 ms

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

10.16.2012 08:38:51 3027



Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 037 Certification No. 10-1

Test Date: 10/16/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.665 m/s	Yes
Probe Force Peak	(-5,160) - (-5,893) N	-5,611.1 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-68.17 mm	Yes
Internal Hysteresis	65 - 85 %	74.2 %	Yes

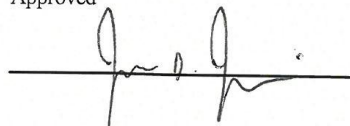
Test meets specifications.

Comments:

Technician



Approved



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

10.16.2012 10:30:11 399

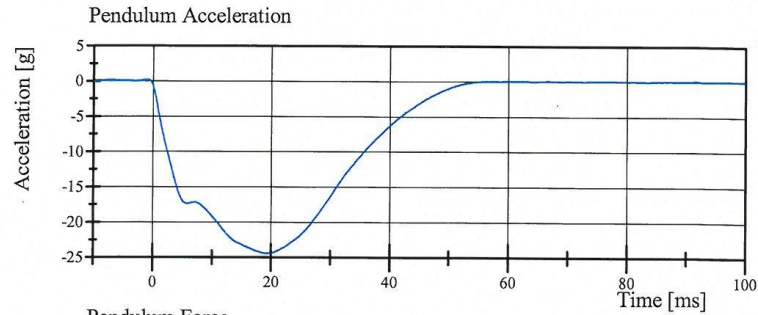


Transportation Research Center Inc.

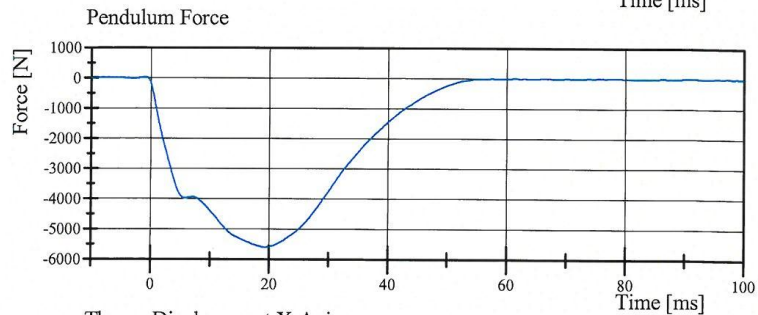
Front Thorax

HIII 50th Serial No. 037 Certification No. 10-1

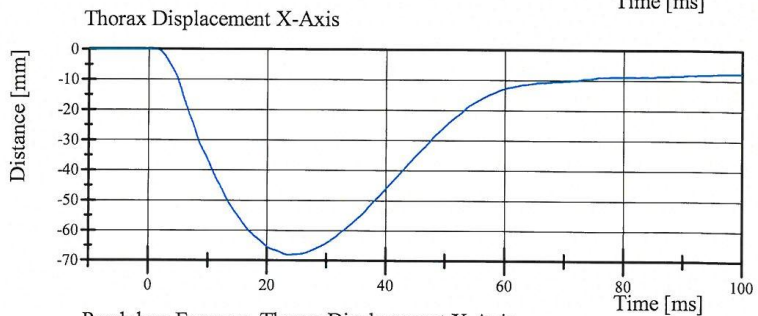
Test Date: 10/16/2012



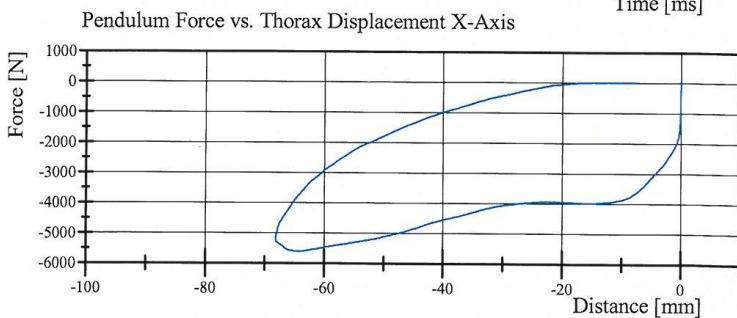
Filter Class: CFC_180
Max: 0.1 gn at -1.0 ms
Min: -24.5 gn at 19.3 ms



Filter Class: CFC_180
Max: 26.0 N at -1.0 ms
Min: -5,611.1 N at 19.3 ms



Filter Class: CFC_600
Max: 0.0 mm at -9.3 ms
Min: -68.2 mm at 23.8 ms



Filter Class: CFC_180
Max: 26.0 N at -0.0 mm
Min: -5,611.1 N at -64.2 mm

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

10.16.2012 10:30:18 399



Transportation Research Center Inc

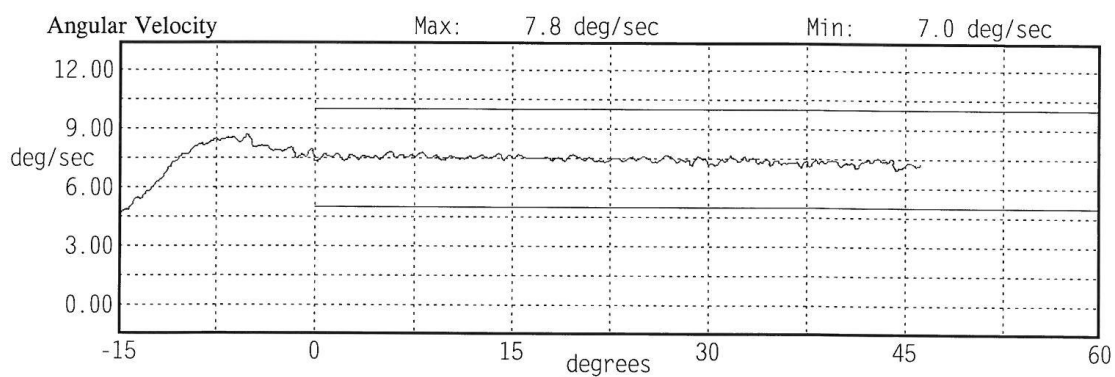
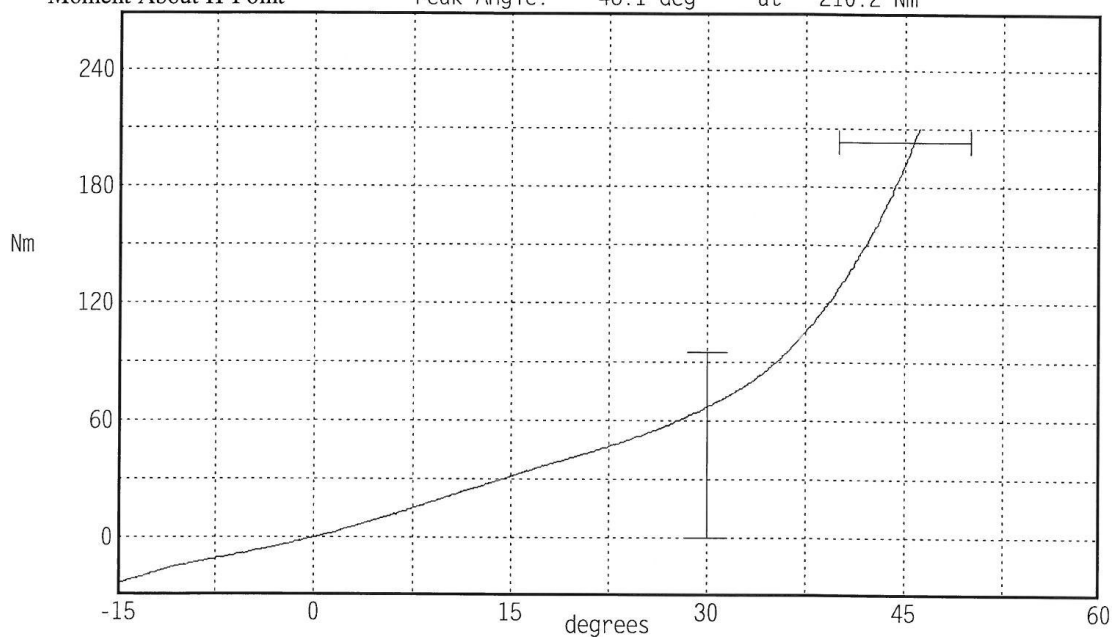
Hybrid III Hip Range of Motion

Serial Number: 037L
 Test Number: 037C10
 Comments:

Date: 10/16/2012
 Time: 07:55

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.4 °C Pass
Humidity	10 - 70	29 % Pass
Moment at 30 deg	<= 94.9	67.2 Nm Pass
Angle at 203 Nm	40.0 - 50.0	45.7 deg Pass
Average Velocity	5.0 - 10.0	7.4 deg/sec Pass

Moment About H-Point
 Peak Moment: 210.2 Nm at 46.1 deg
 Peak Angle: 46.1 deg at 210.2 Nm



Transportation Research Center Inc

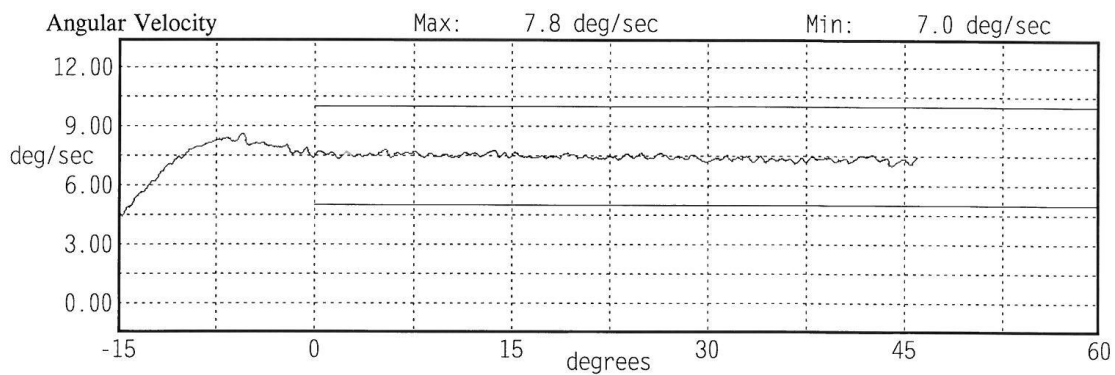
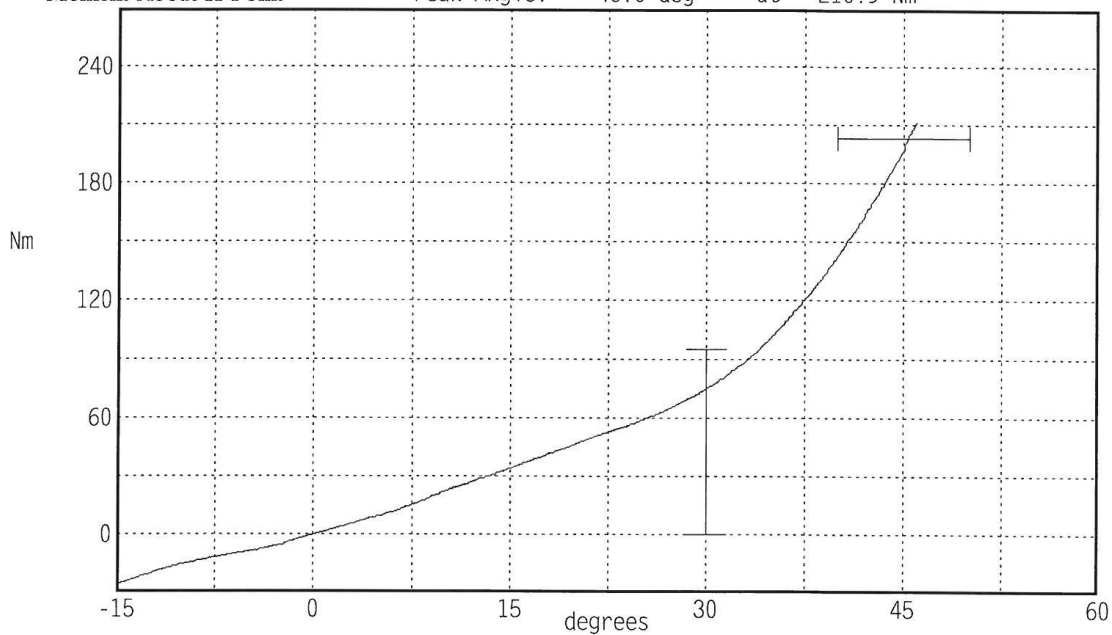
Hybrid III Hip Range of Motion

Serial Number: 037R
 Test Number: 037C10
 Comments:

Date: 10/16/2012
 Time: 08:31

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
Temperature	18.9 - 25.6	21.9 °C	Pass
Humidity	10 - 70	29 %	Pass
Moment at 30 deg	<= 94.9	75.0 Nm	Pass
Angle at 203 Nm	40.0 - 50.0	45.4 deg	Pass
Average Velocity	5.0 - 10.0	7.4 deg/sec	Pass

Moment About H-Point
 Peak Moment: 210.9 Nm at 46.0 deg
 Peak Angle: 46.0 deg at 210.9 Nm



Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 10-1
Test Date: 10/16/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.109 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,771.66 N	Yes

Test meets specifications.

Comments:

Technician



Approved



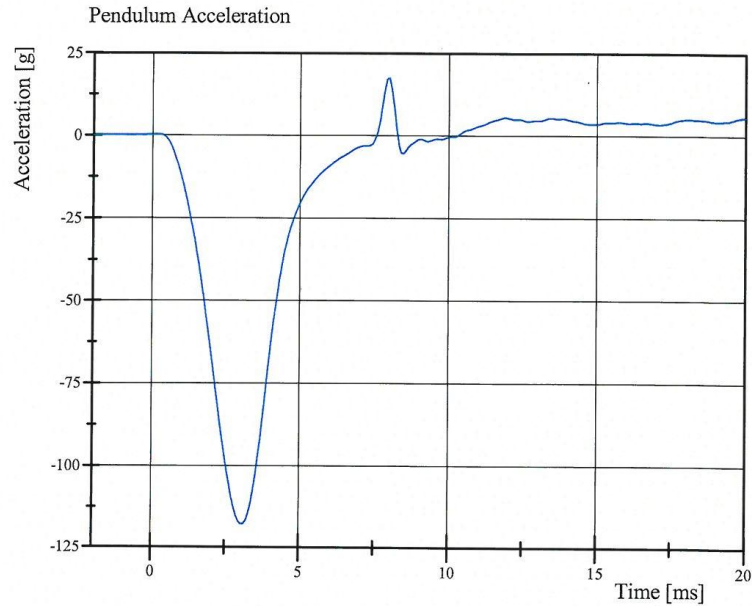
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.16.2012 08:54:30 1824

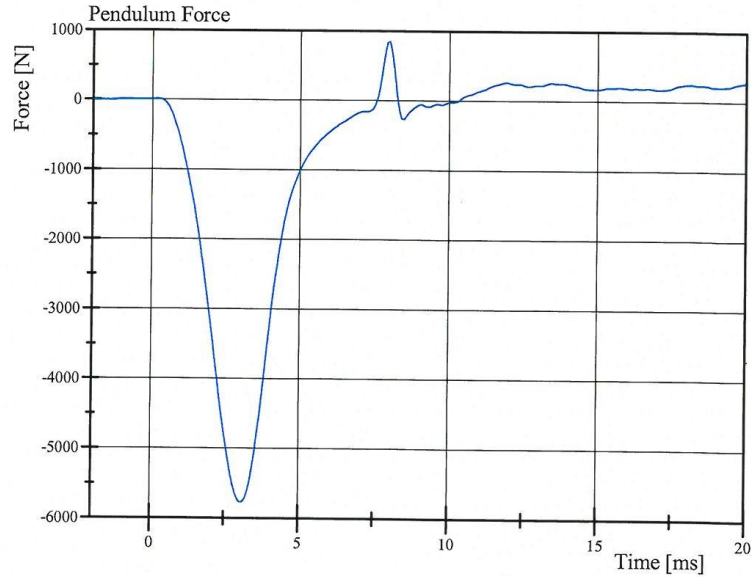


Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 10-1
Test Date: 10/16/2012



Filter Class: CFC_600
Max: 17.4 gn at 8.0 ms
Min: -118.0 gn at 3.0 ms



Filter Class: CFC_600
Max: 852.6 N at 8.0 ms
Min: -5,771.7 N at 3.0 ms

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

10.16.2012 08:54:37 1824



Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 10-1
Test Date: 10/16/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	29 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.098 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,729.41 N	Yes

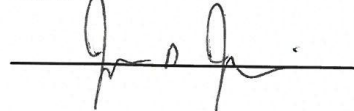
Test meets specifications.

Comments:

Technician



Approved



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

10.16.2012 09:06:19 1859

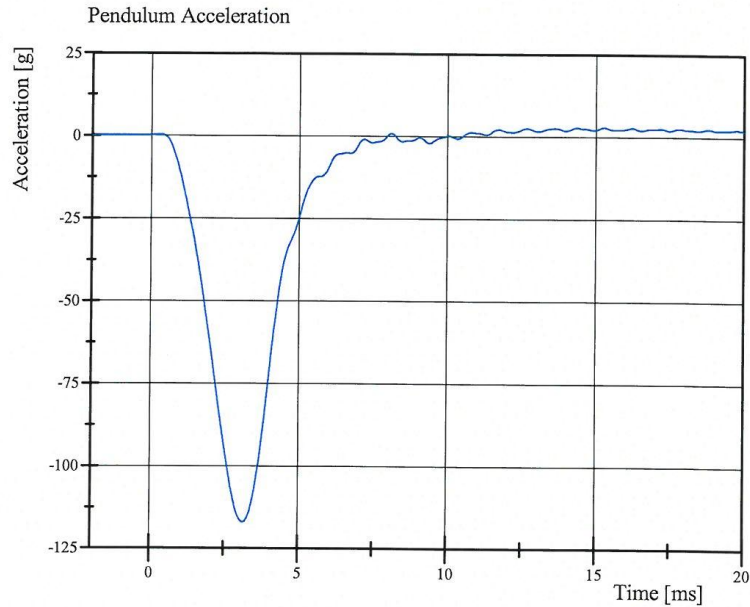


Transportation Research Center Inc.

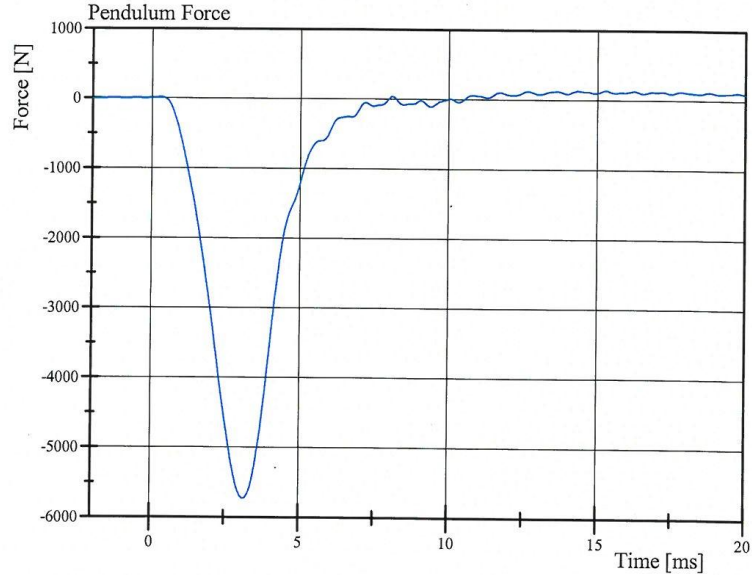
Right Knee Femur Response Test

HIII 50th Serial No. 037 Certification No. 10-1

Test Date: 10/16/2012



Filter Class: CFC_600
Max: 2.8 gn at 15.3 ms
Min: -117.1 gn at 3.1 ms



Filter Class: CFC_600
Max: 138.5 N at 15.3 ms
Min: -5,729.4 N at 3.1 ms

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

10.16.2012 09:06:26 1859



Pre-Test Calibration Sheets
Front Passenger S/N 426

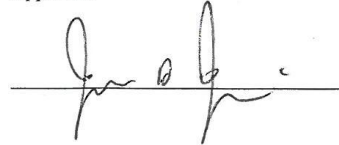
Transportation Research Center Inc.
5720 HIII 5th Dummy
External Dimensions
Serial No. 426 Calibration No. 11

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	774.7 - 800.1	783	Yes
B	Shoulder Pivot Height	431.8 - 457.2	446	Yes
C	Hip Pivot Height	81.3 - 86.3	85	Yes
D	Hip Pivot from Backline	144.8 - 149.8	148	Yes
E	Shoulder Pivot from Backline	68.6 - 83.8	81	Yes
F	Thigh Clearance	119.4 - 134.6	127	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	283	Yes
J	Elbow Rest Height	182.8 - 203.2	195	Yes
K	Buttock Knee Length	520.7 - 546.1	535	Yes
L	Popliteal Height	355.6 - 376.0	370	Yes
M	Knee Pivot Height	393.7 - 419.1	415	Yes
N	Buttock Popliteal Length	414.0 - 439.4	436	Yes
O	Chest Depth without Jacket	175.3 - 190.5	187	Yes
P	Foot Length	218.5 - 233.7	222	Yes
R	Buttock to Knee Pivot Length	457.2 - 482.6	475	Yes
S	Head Breadth	137.1 - 147.3	140	Yes
T	Head Depth	177.8 - 188.0	182	Yes
U	Hip Breadth	299.7 - 314.9	304	Yes
V	Shoulder Breadth	350.5 - 365.7	361	Yes
W	Foot Breadth	78.8 - 94.0	83	Yes
X	Head Circumference	528.3 - 548.7	539	Yes
Y	Chest Circumference with Jacket	850.9 - 881.3	864	Yes
Z	Waist Circumference	759.5 - 789.9	770	Yes
AA	Reference Location for Chest Circumference	332.7 - 358.1	345	Yes
BB	Reference Location for Waist Circumference	160.0 - 170.2	165	Yes

Technician



Approved




Revised 3/19/3003

Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 426 Certification No. 11-1

Test Date: 10/8/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Peak Head Resultant Acceleration	250 - 300 g	256.0 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-1.8 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

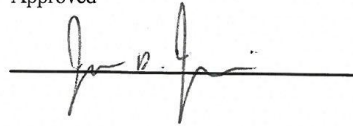
Test meets specifications.

Comments:

Technician



Approved



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

10.08.2012 10:15:12 613

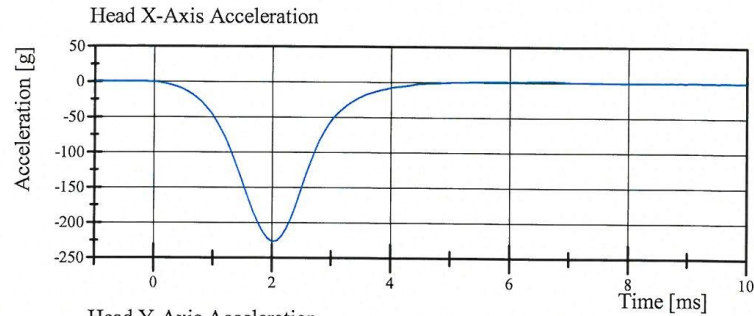


Transportation Research Center Inc.

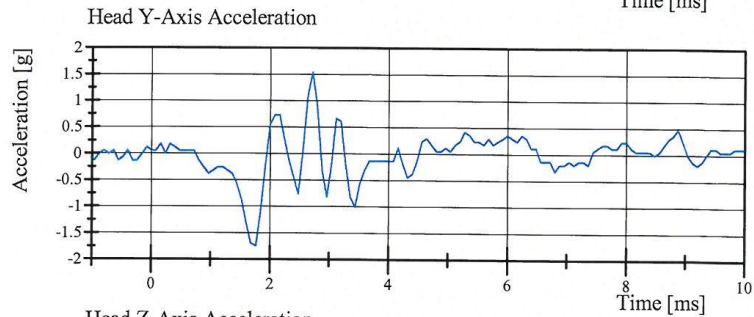
Front Head Drop

HIII 5th Serial No. 426 Certification No. 11-1

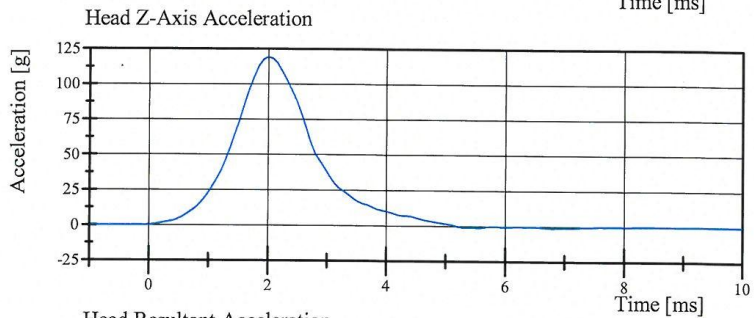
Test Date: 10/8/2012



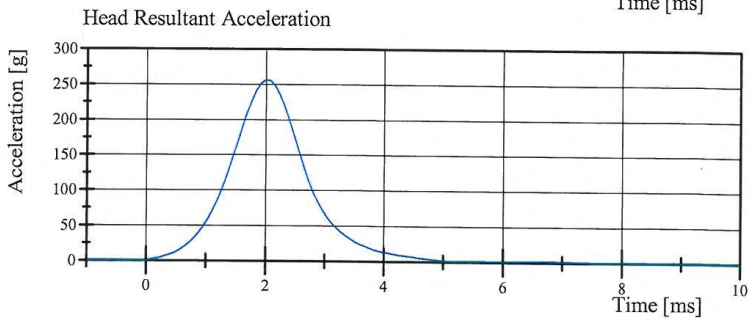
Filter Class: CFC_1000
Max: 1.6 gn at 6.6 ms
Min: -226.6 gn at 2.0 ms



Filter Class: CFC_1000
Max: 1.5 gn at 2.7 ms
Min: -1.8 gn at 1.8 ms



Filter Class: CFC_1000
Max: 119.1 gn at 2.0 ms
Min: -1.0 gn at 6.8 ms



Filter Class: CFC_1000
Max: 256.0 gn at 2.0 ms
Min: 0.1 gn at -0.8 ms

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

10.08.2012 10:15:19 613



Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 11-3

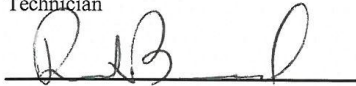
Test Date: 10/8/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.920 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	(-2.1) - (-2.5) m/s	-2.35 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	(-4.0) - (-5.0) m/s	-4.72 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	(-5.8) - (-7.0) m/s	-6.79 m/s	Yes
Total Head D-Plane Rotation	(-77) - (-91) °	-77.6 °	Yes
Total Neck Occipital Condyles Moment Between -77° and -91° Rotation	69 - 83 N·m	70.7 N·m	Yes
Total Neck Occipital Condyles Moment Decay to 10 N·m	80 - 100 ms	83.0 ms	Yes

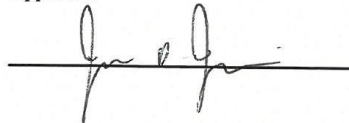
Test meets specifications.

Comments:

Technician



Approved



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

10.08.2012 12:53:08 1717

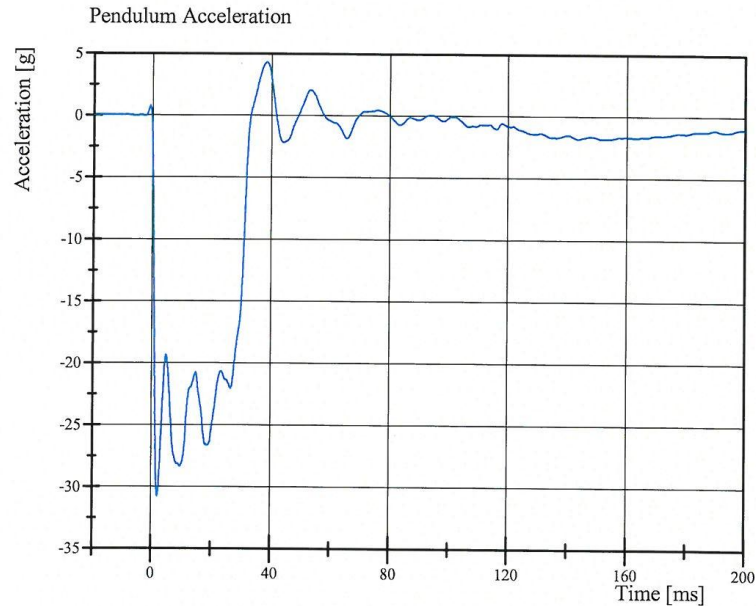


Transportation Research Center Inc.

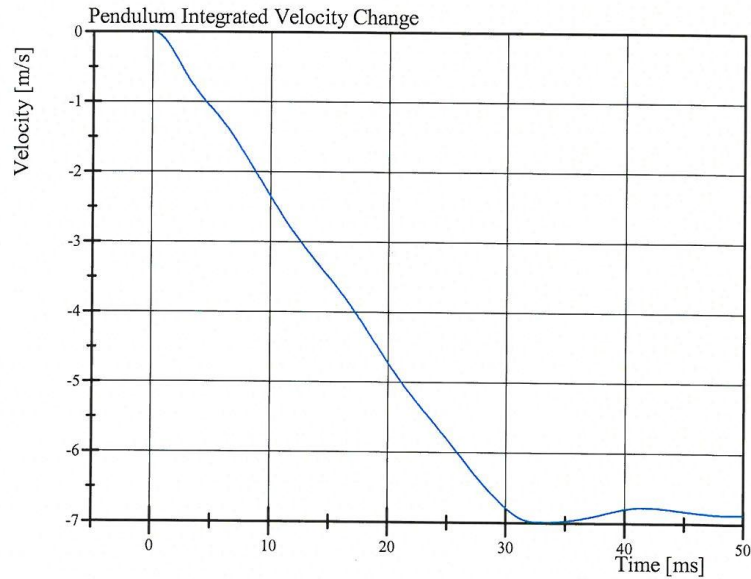
Neck Flexion

HIII 5th Serial No. 426 Certification No. 11-3

Test Date: 10/8/2012



Filter Class: CFC_180
Max: 4.3 gn at 38.5 ms
Min: -30.8 gn at 2.2 ms



Filter Class: CFC_180
Max: 0.0 m/s at 0.0 ms
Min: -7.0 m/s at 33.1 ms

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

10.08.2012 12:53:16 1717



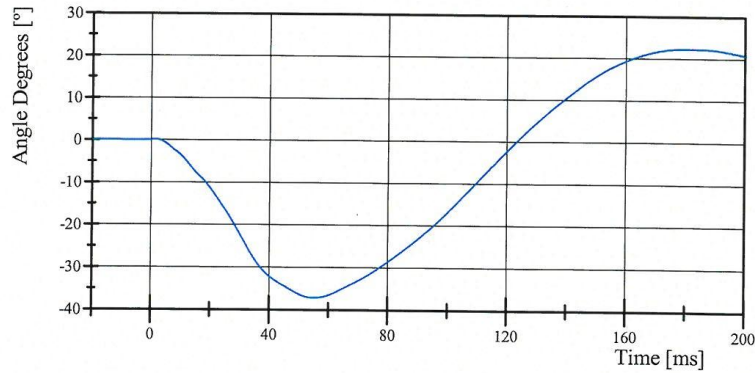
Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 11-3

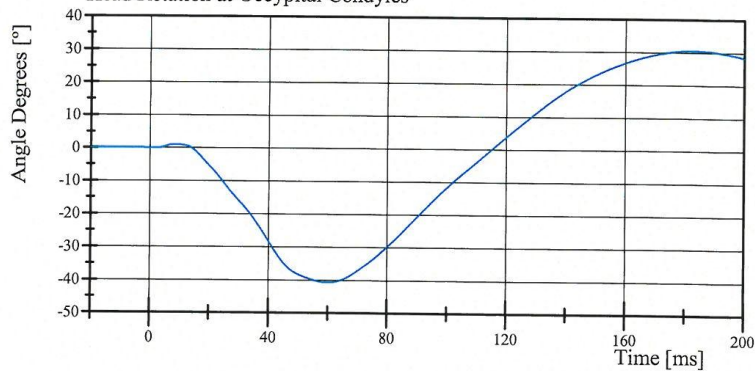
Test Date: 10/8/2012

Pot Rotation at the Base of Neck



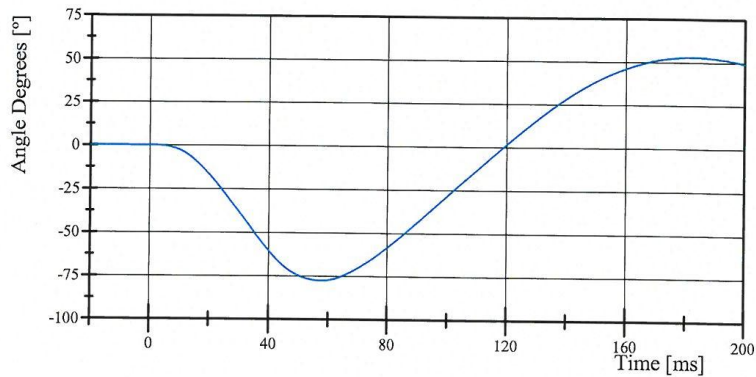
Filter Class: CFC_60
Max: 22.3 ° at 180.5 ms
Min: -37.2 ° at 55.1 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 30.6 ° at 182.4 ms
Min: -40.7 ° at 59.9 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 52.9 ° at 182.4 ms
Min: -77.6 ° at 57.7 ms

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

10.08.2012 12:53:16 1717

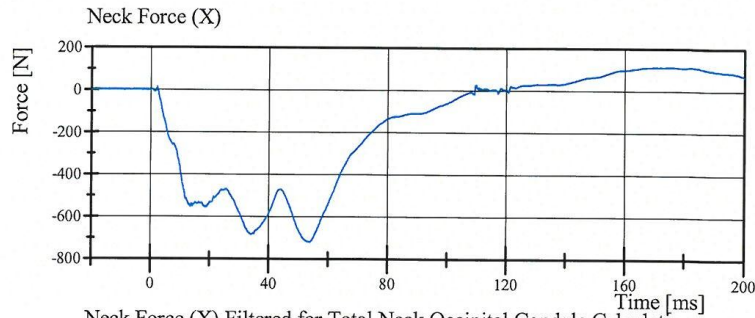


Transportation Research Center Inc.

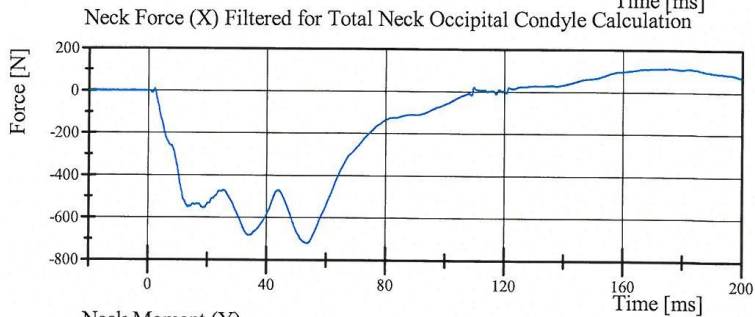
Neck Flexion

HIII 5th Serial No. 426 Certification No. 11-3

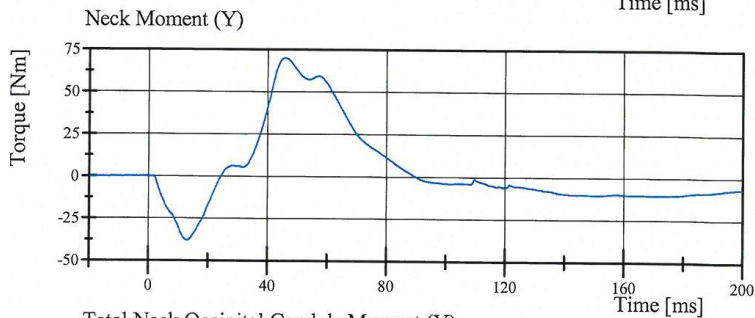
Test Date: 10/8/2012



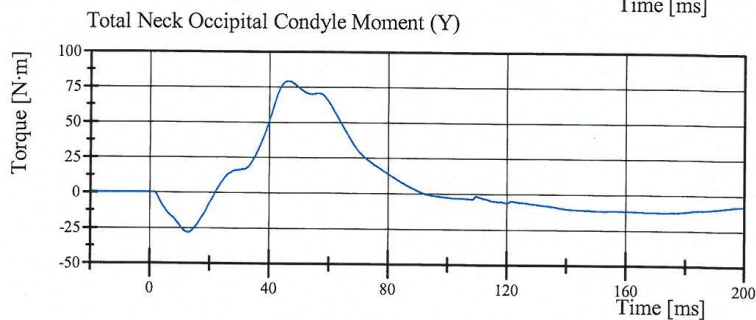
Filter Class: CFC_1000
Max: 113.9 N at 174.2 ms
Min: -720.6 N at 53.8 ms



Filter Class: CFC_600
Max: 113.1 N at 176.2 ms
Min: -720.0 N at 53.8 ms



Filter Class: CFC_600
Max: 70.0 Nm at 45.8 ms
Min: -38.1 Nm at 13.2 ms



Filter Class: Without (Consta
Max: 79.2 N·m at 46.3 ms
Min: -28.4 N·m at 13.0 ms

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

10.08.2012 12:53:17 1717



Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 11-1

Test Date: 10/8/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Pendulum Velocity	(-5.95) - (-6.19) m/s	-6.055 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	1.5 - 1.9 m/s	1.65 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	3.1 - 3.9 m/s	3.34 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	4.6 - 5.6 m/s	4.93 m/s	Yes
Total Head D-Plane Rotation	99 - 114 °	106.4 °	Yes
Total Neck Occipital Condyles Moment Between 99° and 114° Rotation	(-53) - (-65) N·m	-55.1 N·m	Yes
Total Neck Occipital Condyles Moment Decay to -10 N·m	94 - 114 ms	105.7 ms	Yes

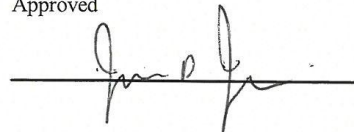
Test meets specifications.

Comments:

Technician



Approved



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

10.08.2012 13:25:24 1839

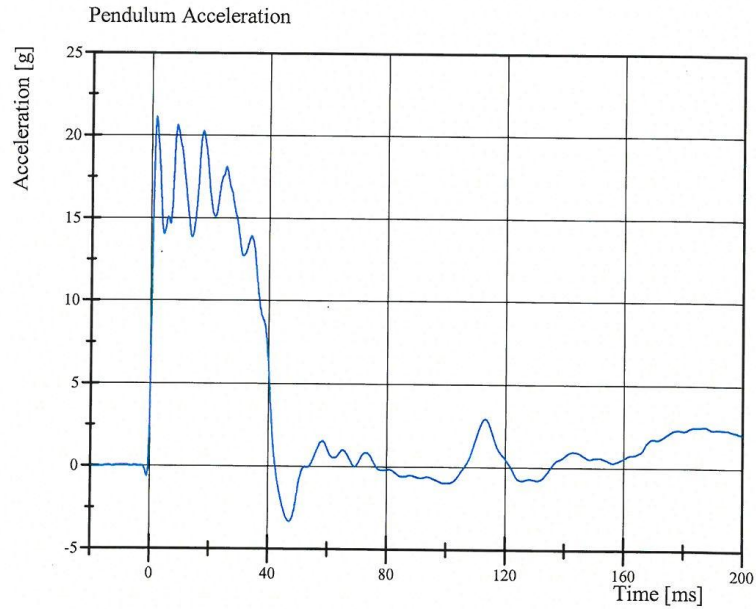


Transportation Research Center Inc.

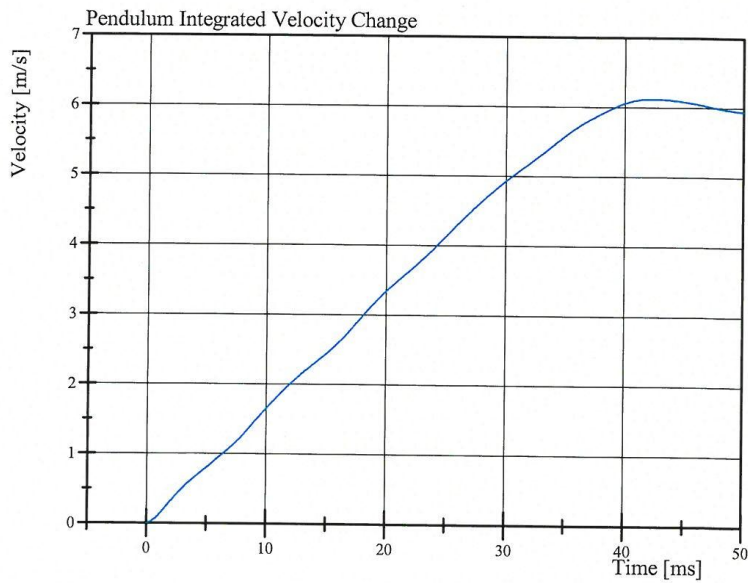
Neck Extension

HIII 5th Serial No. 426 Certification No. 11-1

Test Date: 10/8/2012



Filter Class: CFC_180
Max: 21.1 gn at 1.7 ms
Min: -3.3 gn at 47.2 ms



Filter Class: CFC_180
Max: 6.1 m/s at 42.4 ms
Min: 0.0 m/s at 0.0 ms

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

10.08.2012 13:25:30 1839

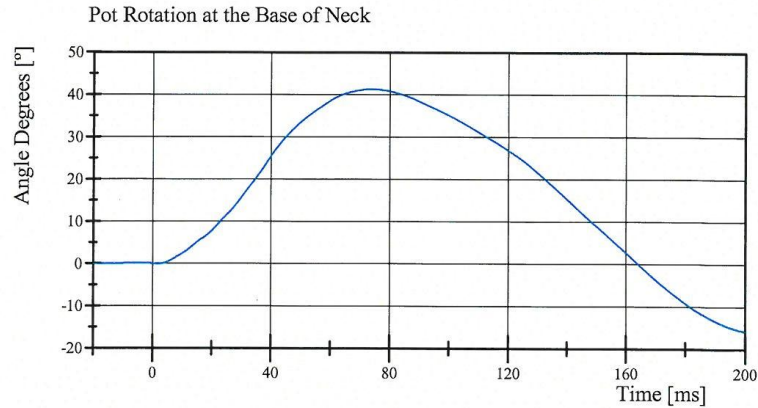


Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 11-1

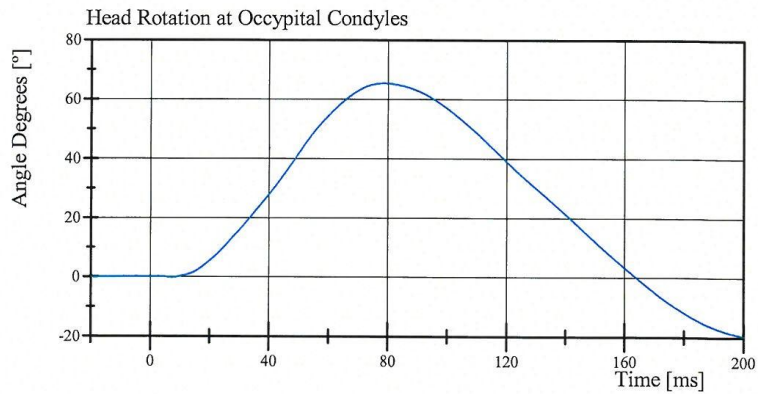
Test Date: 10/8/2012



Filter Class: CFC_60

Max: 41.2 ° at 74.0 ms

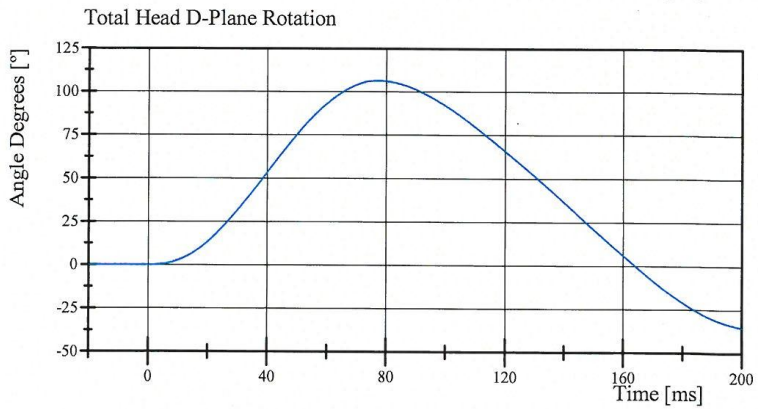
Min: -15.8 ° at 200.0 ms



Filter Class: CFC_60

Max: 65.4 ° at 78.7 ms

Min: -19.6 ° at 200.0 ms



Filter Class: CFC_60

Max: 106.4 ° at 77.3 ms

Min: -35.4 ° at 200.0 ms

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

10.08.2012 13:25:31 1839

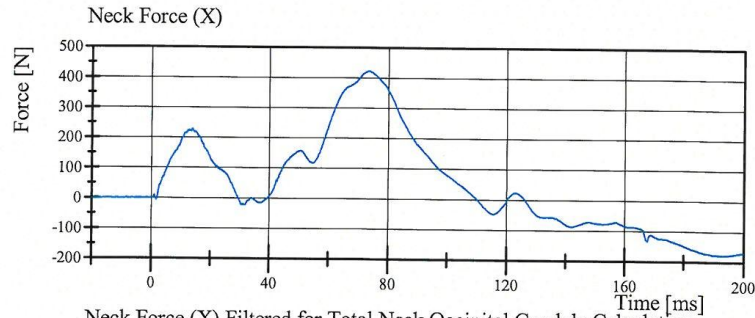


Transportation Research Center Inc.

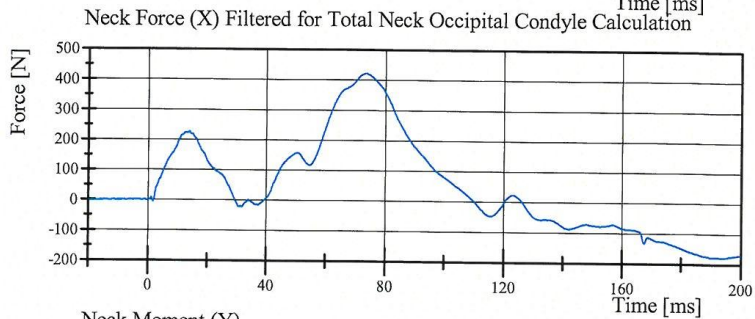
Neck Extension

HIII 5th Serial No. 426 Certification No. 11-1

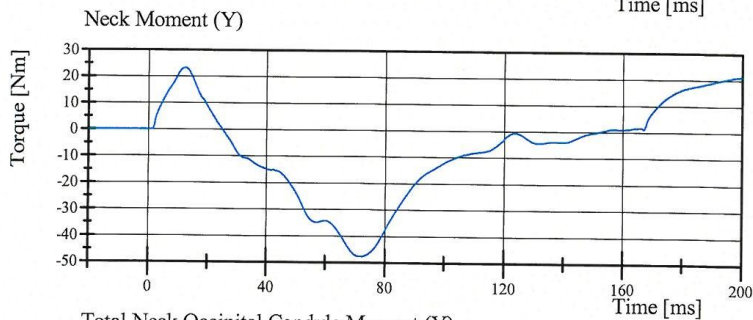
Test Date: 10/8/2012



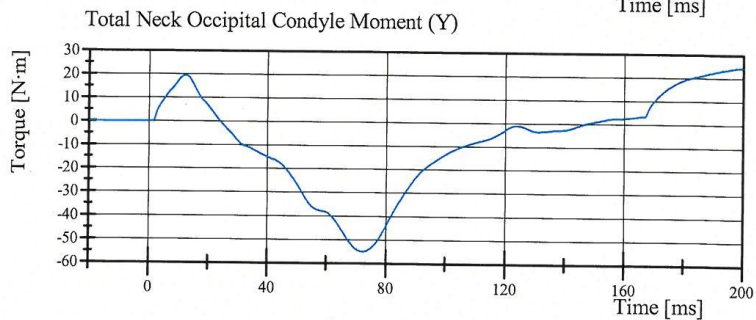
Filter Class: CFC_1000
Max: 422.5 N at 73.5 ms
Min: -178.4 N at 193.0 ms



Filter Class: CFC_600
Max: 422.3 N at 73.5 ms
Min: -178.2 N at 193.1 ms



Filter Class: CFC_600
Max: 23.3 Nm at 12.6 ms
Min: -47.7 Nm at 72.1 ms



Filter Class: Without_Constant
Max: 24.3 N·m at 199.6 ms
Min: -55.1 N·m at 72.4 ms

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

10.08.2012 13:25:32 1839



Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. 426 Certification No. 11-2

Test Date: 10/8/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.754 m/s	Yes
Probe Force Peak Between 50.0 mm and 58.0 mm Chest Deflection	(-3,900) - (-4,400) N	-4,304.6 N	Yes
Probe Force Peak Between 18.0 mm and 50.0 mm Chest Deflection	$\geq$ (-4,600) N	-4,291.9 N	Yes
Maximum Chest Compression	(-50) - (-58) mm	-53.3 mm	Yes
Internal Hysteresis	69 - 85 %	75.8 %	Yes

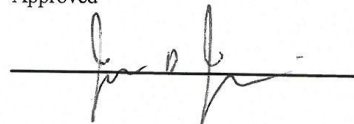
Test meets specifications.

Comments:

Technician



Approved



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

10.08.2012 15:19:10 407

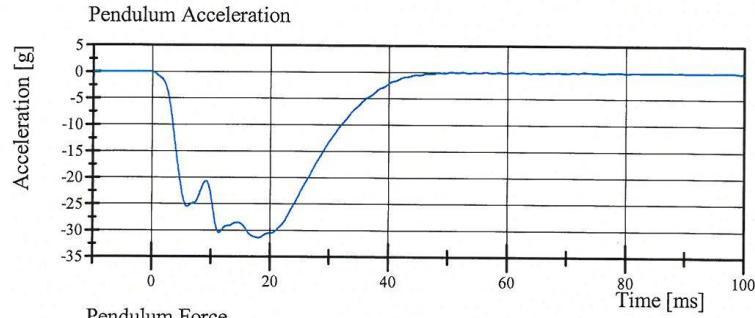


Transportation Research Center Inc.

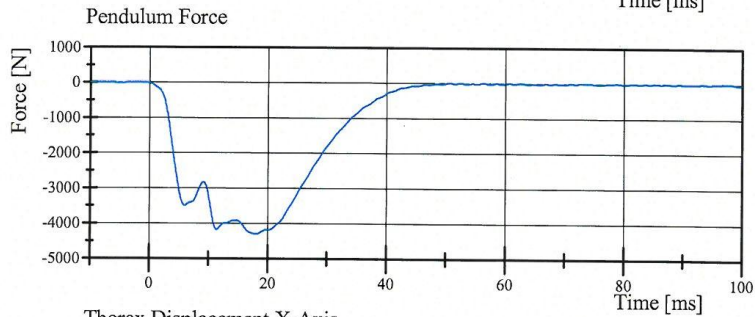
Front Thorax

HIII 5th Serial No. 426 Certification No. 11-2

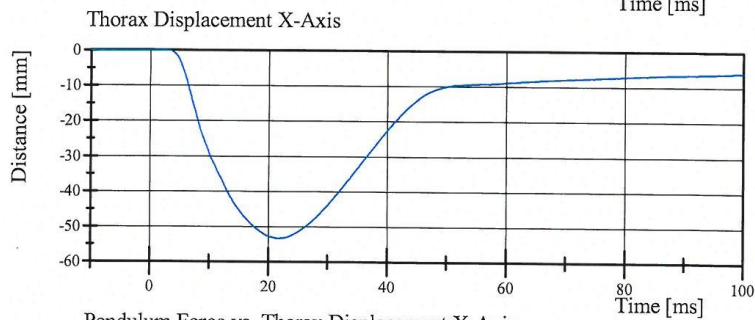
Test Date: 10/8/2012



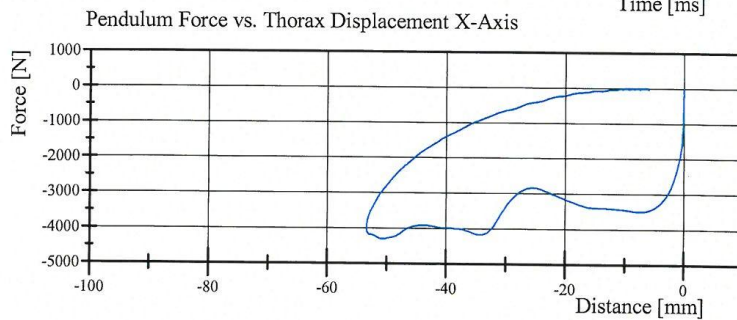
Filter Class: CFC_180
Max: 0.1 gn at 73.0 ms
Min: -31.4 gn at 18.0 ms



Filter Class: CFC_180
Max: 13.7 N at 73.0 ms
Min: -4,304.6 N at 18.0 ms



Filter Class: CFC_600
Max: 0.0 mm at -4.6 ms
Min: -53.3 mm at 21.6 ms



Filter Class: CFC_180
Max: 13.7 N at -7.7 mm
Min: -4,304.6 N at -50.7 mm

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

10.08.2012 15:19:18 407



TRANSPORTATION RESEARCH CENTER INC.

TORSO FLEXION TEST

HYBRID III SMALL FEMALE

CAL DATE: 05-Oct-12

TRC, INC. TEST NO: TOFL-01 572 O SN426 TORSO FLEX CAL 11

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TIME		1330
TEMPERATURE	20.6 – 22.2° C	21.2 ° C
RELATIVE HUMIDITY	10 – 70 %	53 %
INITIAL ANGLE OF UNSUPPORTRED DUMMY <u>START ANGLE</u>	<= 20° REFERENCED TO VERTICAL	17.0 °
DIFFERENCE BETWEEN <u>RETURN</u> <u>ANGLE</u> & INTIAL ANGLE	+/- 8 ° OF INTIAL ANGLE	5.2 °
MAXIMUM FORCE AT 45 DEG. DURING 10 SECOND PERIOD	320 – 390 N	388.8 N
RATE	0.5° - 1.5 °/sec	.97°/sec

TEST MEETS SPECIFICATIONS

Comments:

TECHNICIAN



Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 11-1
Test Date: 10/8/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.104 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,700.3 N	Yes

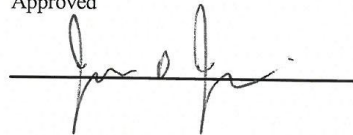
Test meets specifications.

Comments:

Technician



Approved



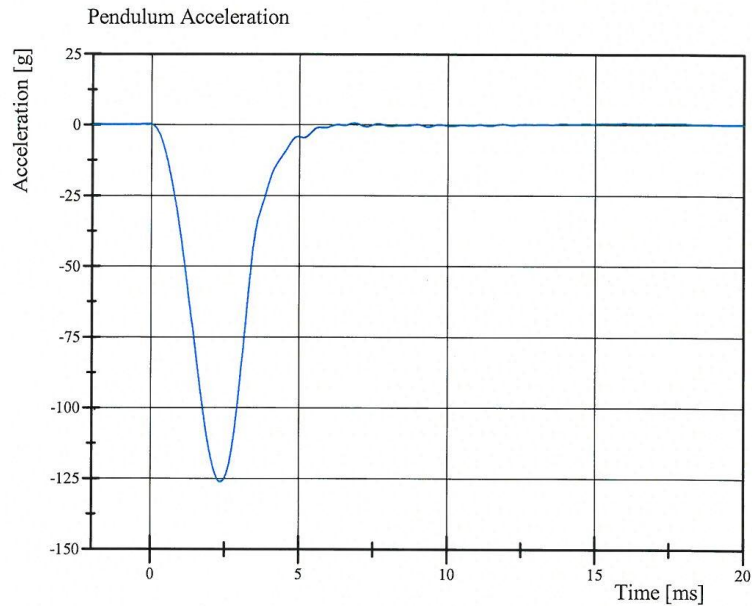
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.08.2012 12:42:48 1787

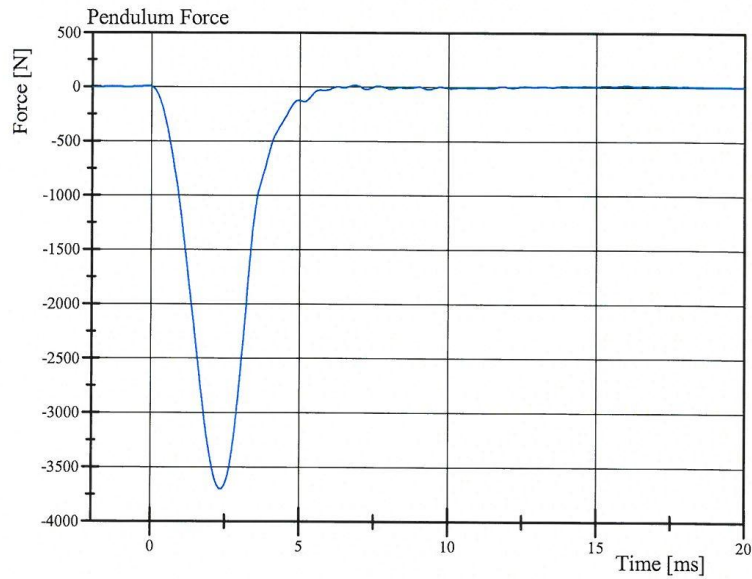


Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 11-1
Test Date: 10/8/2012



Filter Class: CFC_600
Max: 0.5 gn at 6.9 ms
Min: -126.2 gn at 2.4 ms



Filter Class: CFC_600
Max: 15.9 N at 6.9 ms
Min: -3,700.3 N at 2.4 ms

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

10.08.2012 12:42:57 1787



Transportation Research Center Inc.

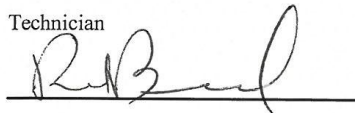
Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 11-1
Test Date: 10/8/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.101 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,587.8 N	Yes

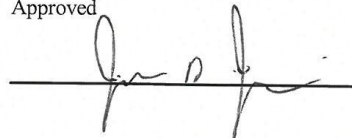
Test meets specifications.

Comments:

Technician



Approved



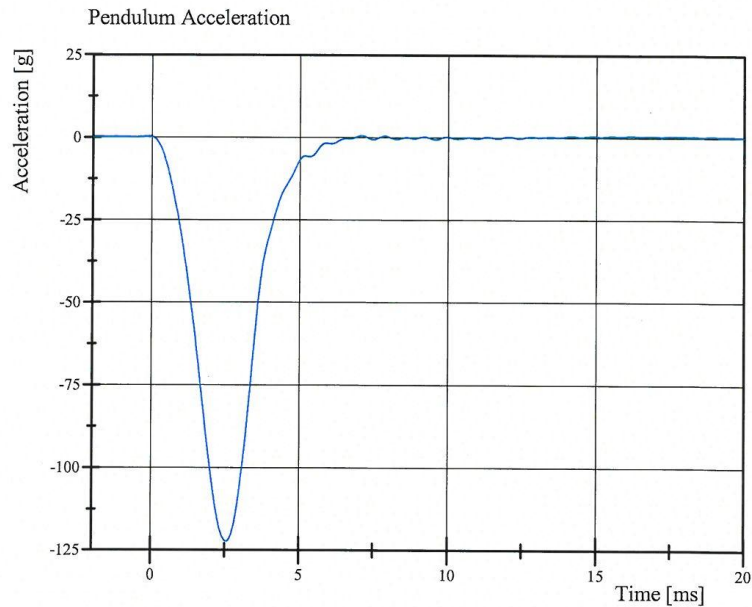
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.08.2012 12:46:36 1785

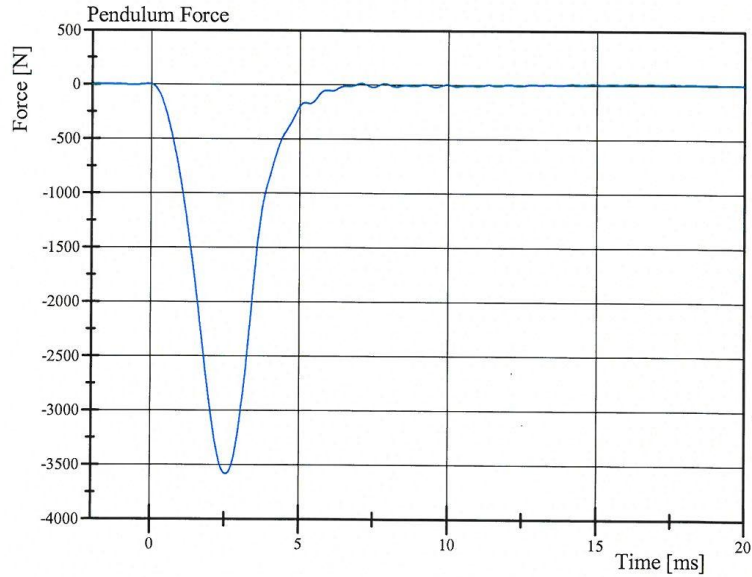


Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 11-1
Test Date: 10/8/2012



Filter Class: CFC_600
Max: 0.4 gn at 16.2 ms
Min: -122.4 gn at 2.6 ms



Filter Class: CFC_600
Max: 13.0 N at 16.2 ms
Min: -3,587.8 N at 2.6 ms

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

10.08.2012 12:46:43 1785

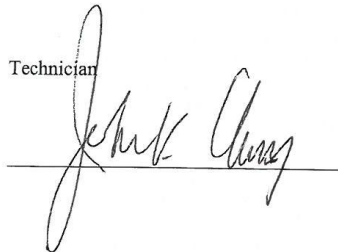


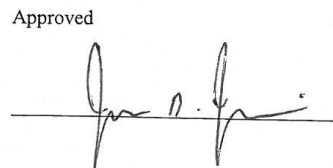
Passenger **S/N 426**

Post-Test Calibration Sheets

Transportation Research Center Inc.
5720 HIII 5th Dummy
External Dimensions
Serial No. 426 Calibration No. 12

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	774.7 - 800.1	784	Yes
B	Shoulder Pivot Height	431.8 - 457.2	445	Yes
C	Hip Pivot Height	81.3 - 86.3	85	Yes
D	Hip Pivot from Backline	144.8 - 149.8	148	Yes
E	Shoulder Pivot from Backline	68.6 - 83.8	81	Yes
F	Thigh Clearance	119.4 - 134.6	127	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	283	Yes
J	Elbow Rest Height	182.8 - 203.2	194	Yes
K	Buttock Knee Length	520.7 - 546.1	535	Yes
L	Popliteal Height	355.6 - 376.0	370	Yes
M	Knee Pivot Height	393.7 - 419.1	414	Yes
N	Buttock Popliteal Length	414.0 - 439.4	436	Yes
O	Chest Depth without Jacket	175.3 - 190.5	186	Yes
P	Foot Length	218.5 - 233.7	222	Yes
R	Buttock to Knee Pivot Length	457.2 - 482.6	475	Yes
S	Head Breadth	137.1 - 147.3	140	Yes
T	Head Depth	177.8 - 188.0	182	Yes
U	Hip Breadth	299.7 - 314.9	305	Yes
V	Shoulder Breadth	350.5 - 365.7	361	Yes
W	Foot Breadth	78.8 - 94.0	83	Yes
X	Head Circumference	528.3 - 548.7	539	Yes
Y	Chest Circumference with Jacket	850.9 - 881.3	865	Yes
Z	Waist Circumference	759.5 - 789.9	769	Yes
AA	Reference Location for Chest Circumference	332.7 - 358.1	345	Yes
BB	Reference Location for Waist Circumference	160.0 - 170.2	165	Yes

Technician


Approved


Revised 3/19/3003



Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 426 Certification No. 12-1

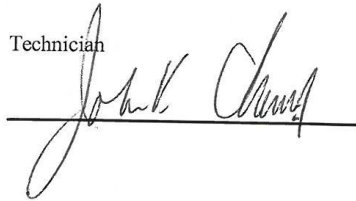
Test Date: 10/17/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Peak Head Resultant Acceleration	250 - 300 g	255.4 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-1.1 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

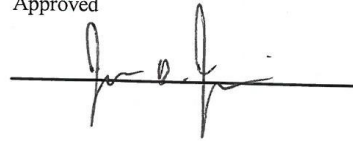
Test meets specifications.

Comments:

Technician



Approved



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

10.17.2012 11:06:57 611

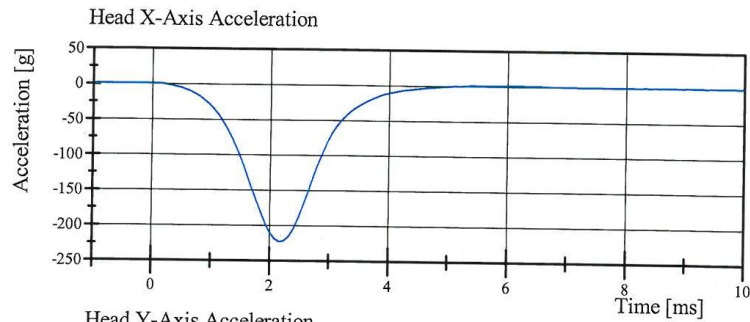


Transportation Research Center Inc.

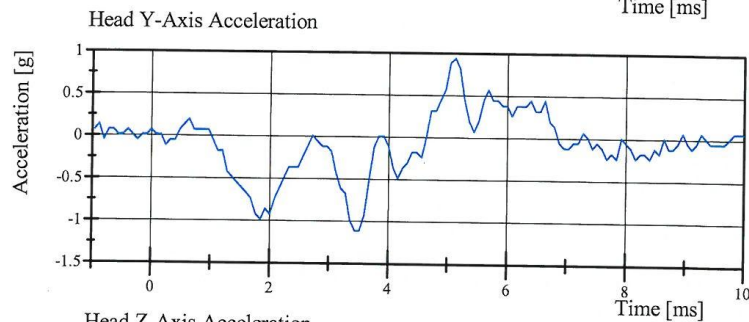
Front Head Drop

HIII 5th Serial No. 426 Certification No. 12-1

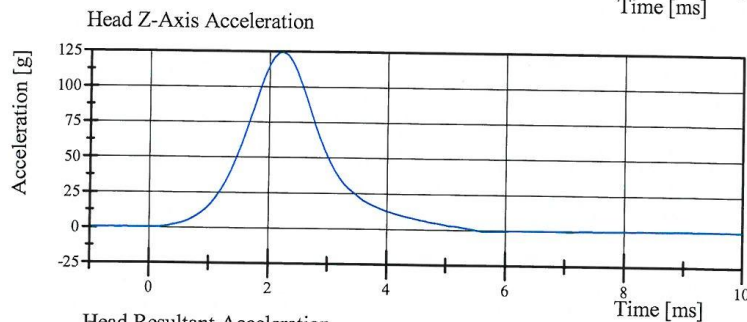
Test Date: 10/17/2012



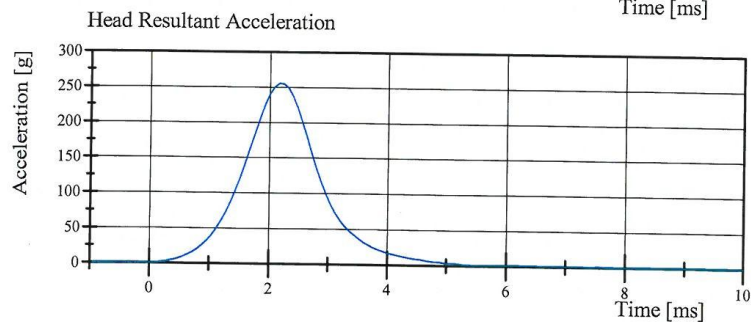
Filter Class: CFC_1000
Max: 0.9 gn at 6.1 ms
Min: -223.2 gn at 2.2 ms



Filter Class: CFC_1000
Max: 0.9 gn at 5.1 ms
Min: -1.1 gn at 3.4 ms



Filter Class: CFC_1000
Max: 124.5 gn at 2.2 ms
Min: -0.9 gn at 5.7 ms



Filter Class: CFC_1000
Max: 255.4 gn at 2.2 ms
Min: 0.0 gn at -0.6 ms

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

10.17.2012 11:07:12 611



Transportation Research Center Inc.

Neck Flexion

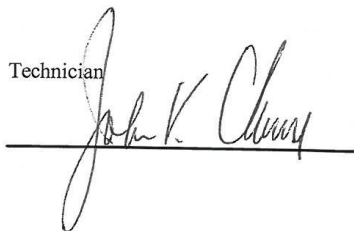
HIII 5th Serial No. 426 Certification No. 12-2

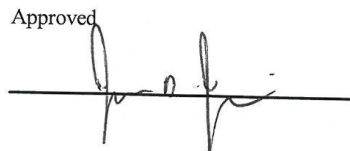
Test Date: 10/17/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.924 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	(-2.1) - (-2.5) m/s	-2.47 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	(-4.0) - (-5.0) m/s	-4.92 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	(-5.8) - (-7.0) m/s	-6.95 m/s	Yes
Total Head D-Plane Rotation	(-77) - (-91) °	-78.2 °	Yes
Total Neck Occipital Condyles Moment Between -77° and -91° Rotation	69 - 83 N·m	72.2 N·m	Yes
Total Neck Occipital Condyles Moment Decay to 10 N·m	80 - 100 ms	82.2 ms	Yes

Test meets specifications.

Comments:

Technician


Approved


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

10.17.2012 13:41:20 1716

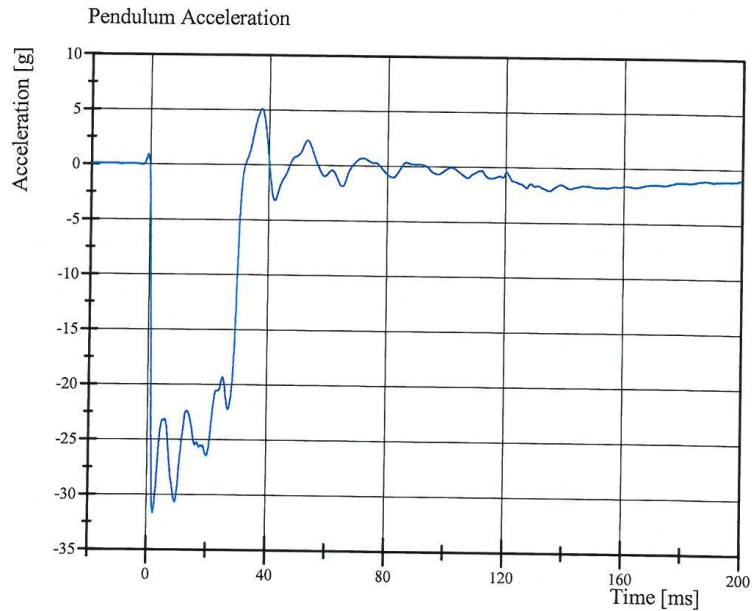


Transportation Research Center Inc.

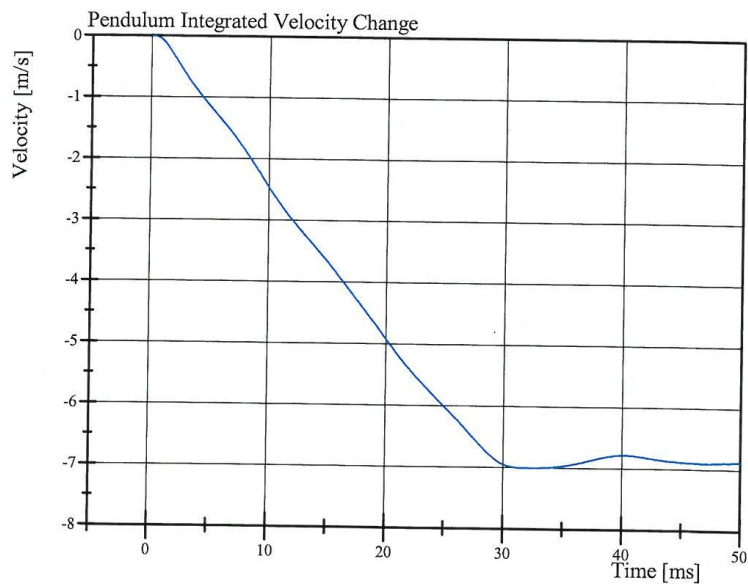
Neck Flexion

HIII 5th Serial No. 426 Certification No. 12-2

Test Date: 10/17/2012



Filter Class: CFC_180
Max: 5.0 gn at 37.5 ms
Min: -31.7 gn at 2.2 ms



Filter Class: CFC_180
Max: 0.0 m/s at 0.0 ms
Min: -7.0 m/s at 32.1 ms

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

10.17.2012 13:41:29 1716



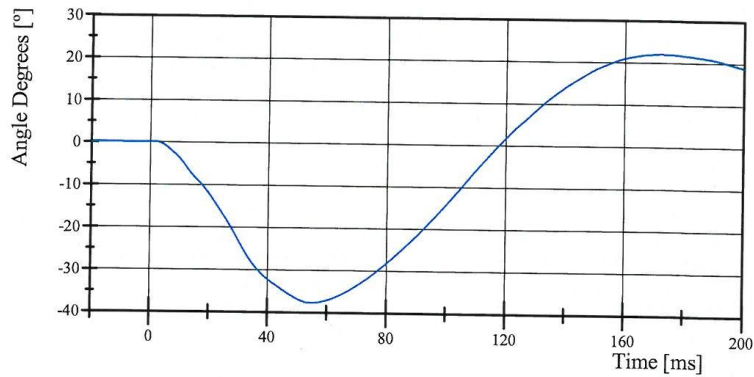
Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 12-2

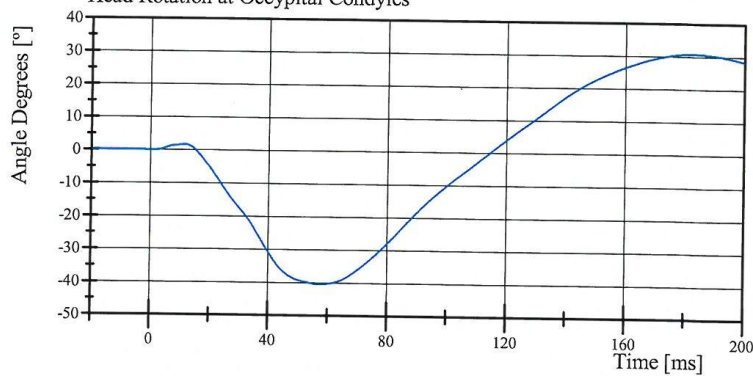
Test Date: 10/17/2012

Pot Rotation at the Base of Neck



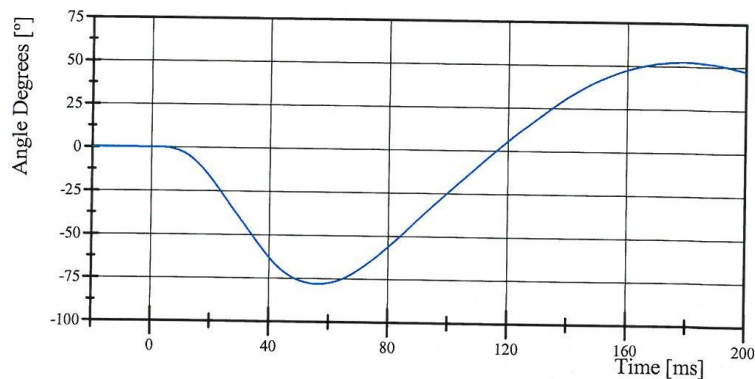
Filter Class: CFC_60
Max: 22.0 ° at 172.1 ms
Min: -37.8 ° at 54.7 ms

Head Rotation at Occipital Condyles



Filter Class: CFC_60
Max: 30.8 ° at 182.4 ms
Min: -40.5 ° at 57.4 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 52.4 ° at 179.8 ms
Min: -78.2 ° at 56.3 ms

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

10.17.2012 13:41:29 1716

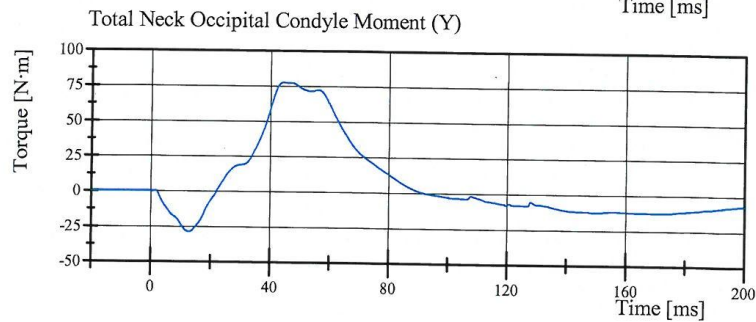
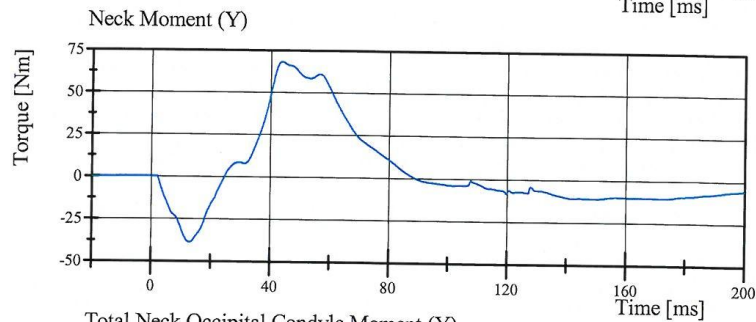
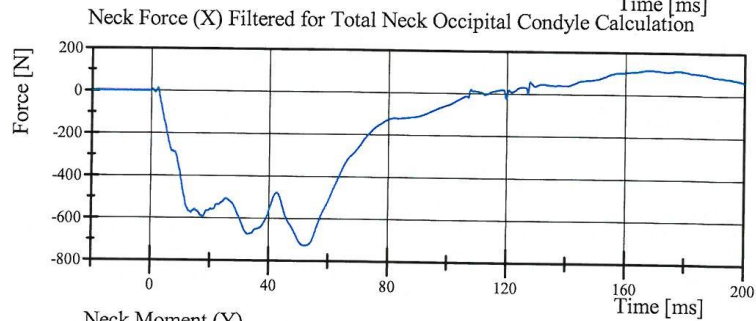
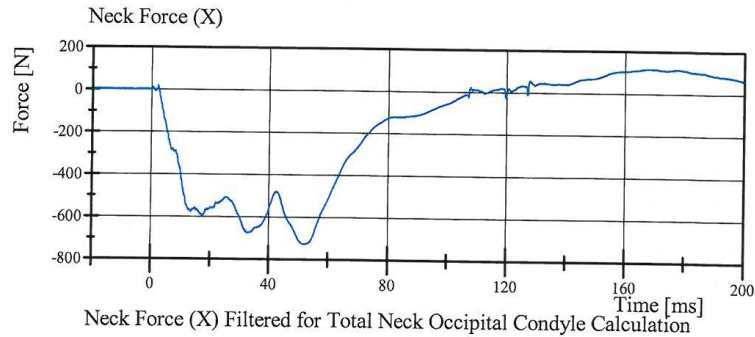


Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 12-2

Test Date: 10/17/2012



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

10.17.2012 13:41:30 1716



Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 12-1

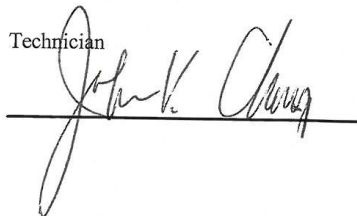
Test Date: 10/17/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Pendulum Velocity	(-5.95) - (-6.19) m/s	-6.066 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	1.5 - 1.9 m/s	1.80 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	3.1 - 3.9 m/s	3.66 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	4.6 - 5.6 m/s	5.30 m/s	Yes
Total Head D-Plane Rotation	99 - 114 °	107.5 °	Yes
Total Neck Occipital Condyles Moment Between 99° and 114° Rotation	(-53) - (-65) N·m	-55.6 N·m	Yes
Total Neck Occipital Condyles Moment Decay to -10 N·m	94 - 114 ms	102.4 ms	Yes

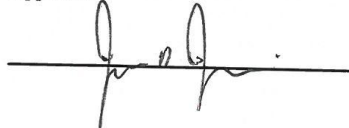
Test meets specifications.

Comments:

Technician



Approved



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

10.17.2012 14:44:10 1832



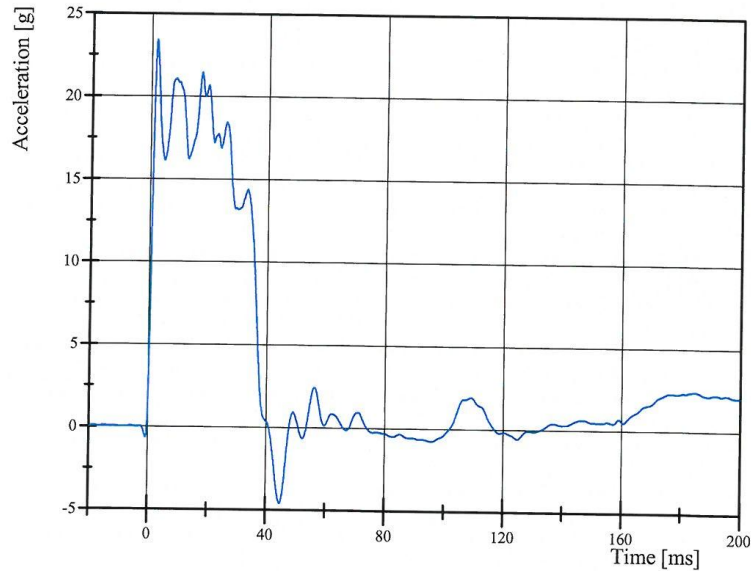
Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 12-1

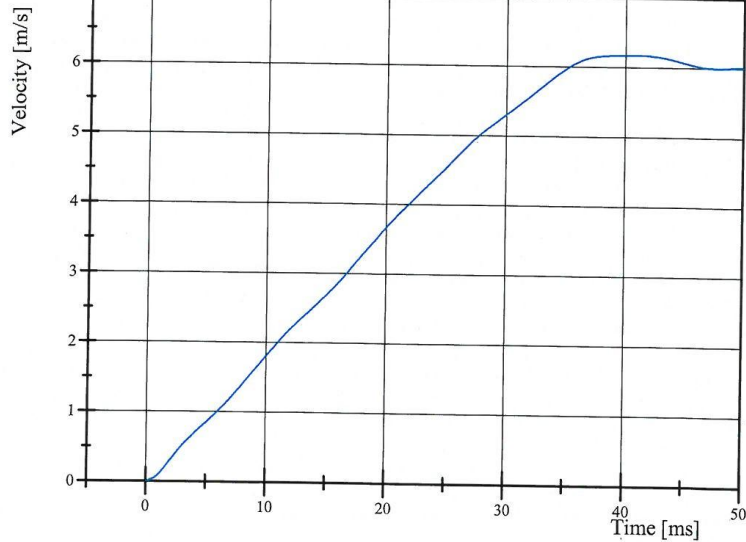
Test Date: 10/17/2012

Pendulum Acceleration



Filter Class: CFC_180
Max: 23.4 gn at 1.9 ms
Min: -4.6 gn at 44.8 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 6.2 m/s at 40.8 ms
Min: 0.0 m/s at 0.0 ms

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

10.17.2012 14:44:19 1832



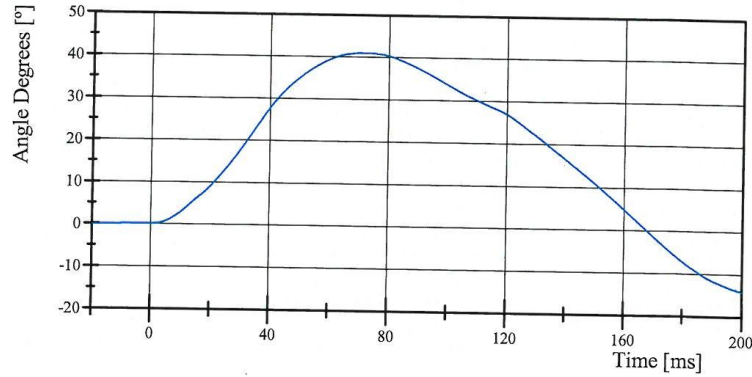
Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 12-1

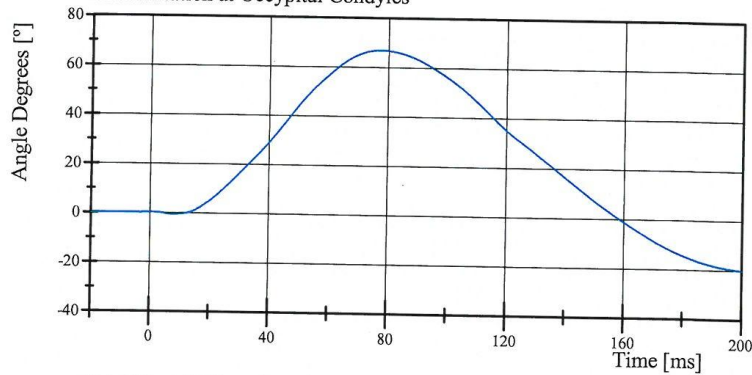
Test Date: 10/17/2012

Pot Rotation at the Base of Neck



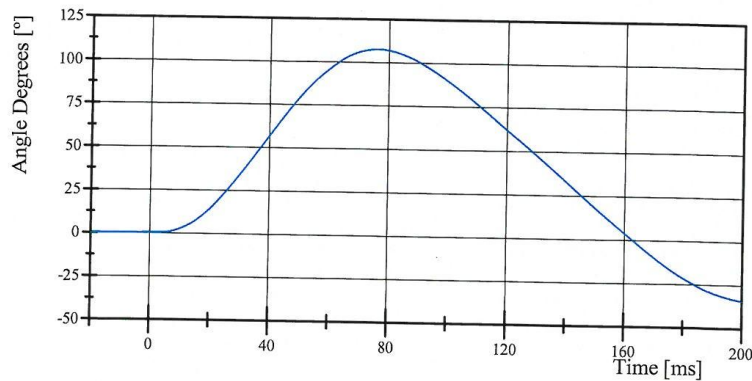
Filter Class: CFC_60
Max: 40.9 ° at 71.7 ms
Min: -14.2 ° at 200.0 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 66.7 ° at 77.3 ms
Min: -20.1 ° at 200.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 107.5 ° at 76.2 ms
Min: -34.3 ° at 200.0 ms

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

10.17.2012 14:44:20 1832

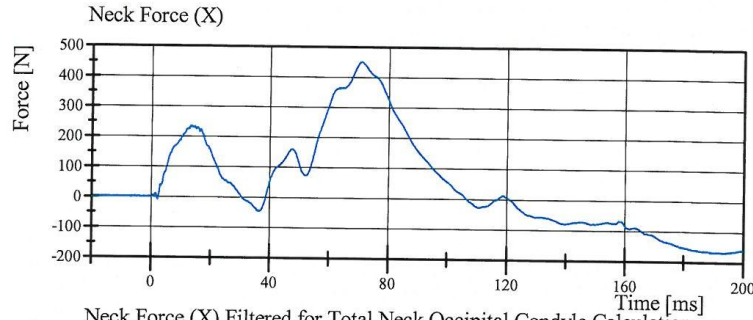


Transportation Research Center Inc.

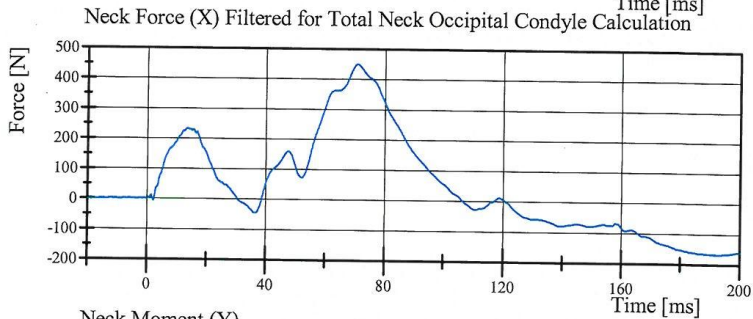
Neck Extension

HIII 5th Serial No. 426 Certification No. 12-1

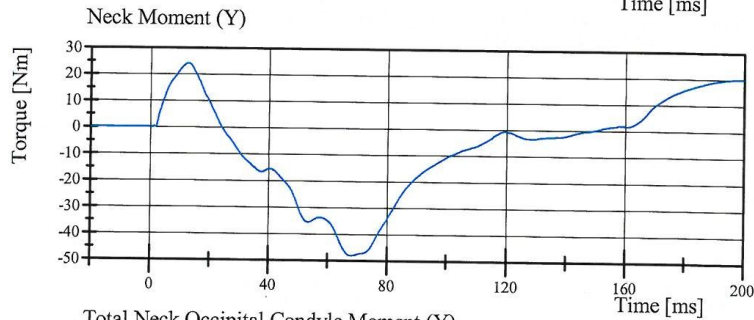
Test Date: 10/17/2012



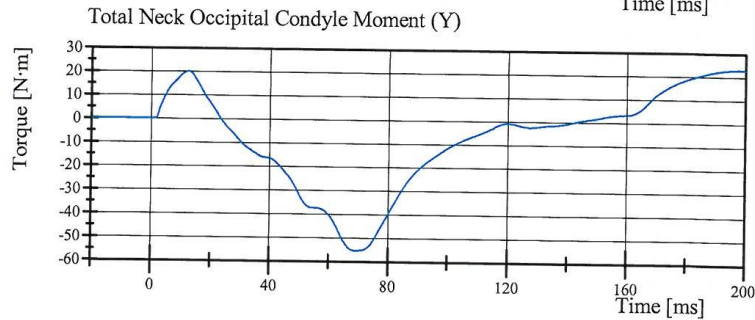
Filter Class: CFC_1000
Max: 451.1 N at 70.7 ms
Min: -168.4 N at 192.8 ms



Filter Class: CFC_600
Max: 450.7 N at 70.7 ms
Min: -167.8 N at 192.8 ms



Filter Class: CFC_600
Max: 24.0 Nm at 12.8 ms
Min: -48.2 Nm at 68.0 ms



Filter Class: Without_(Consta
Max: 22.9 N·m at 197.7 ms
Min: -55.6 N·m at 69.3 ms

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

10.17.2012 14:44:21 1832



Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. 426 Certification No. 12-1

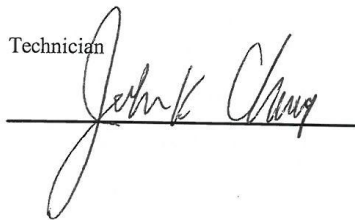
Test Date: 10/18/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.779 m/s	Yes
Probe Force Peak Between 50.0 mm and 58.0 mm Chest Deflection	(-3,900) - (-4,400) N	-4,230.8 N	Yes
Probe Force Peak Between 18.0 mm and 50.0 mm Chest Deflection	$\geq$ (-4,600) N	-4,587.6 N	Yes
Maximum Chest Compression	(-50) - (-58) mm	-50.2 mm	Yes
Internal Hysteresis	69 - 85 %	76.7 %	Yes

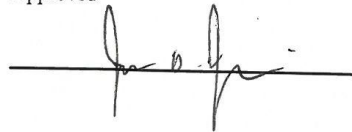
Test meets specifications.

Comments:

Technician



Approved



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

10.18.2012 10:31:45 379

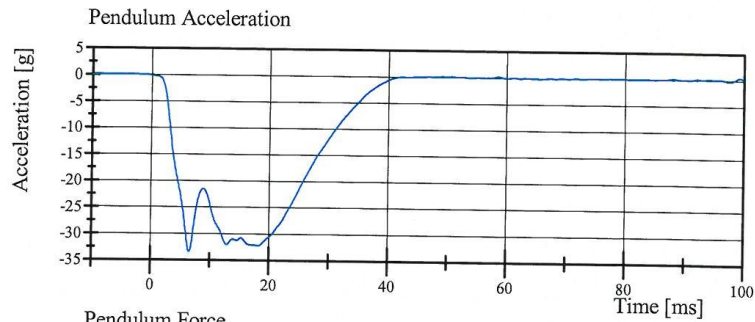


Transportation Research Center Inc.

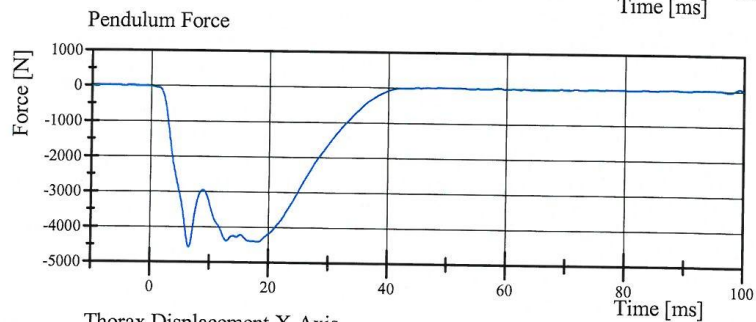
Front Thorax

HIII 5th Serial No. 426 Certification No. 12-1

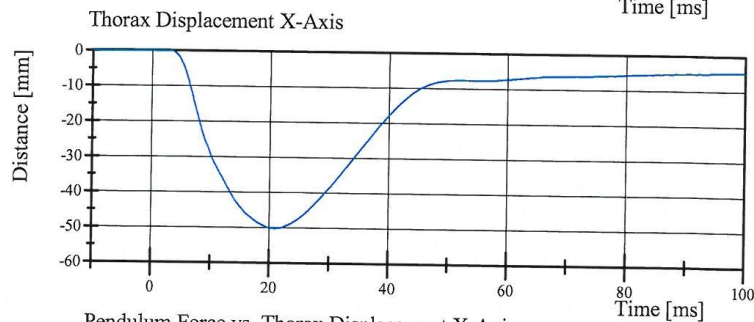
Test Date: 10/18/2012



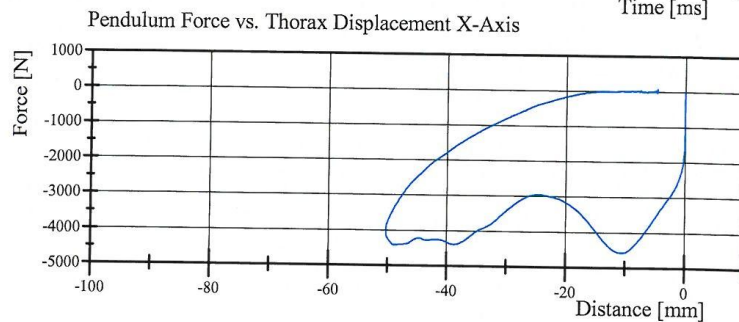
Filter Class: CFC_180
Max: 0.4 gn at 99.3 ms
Min: -33.5 gn at 6.6 ms



Filter Class: CFC_180
Max: 59.3 N at 99.3 ms
Min: -4,587.6 N at 6.6 ms



Filter Class: CFC_600
Max: 0.0 mm at -9.9 ms
Min: -50.2 mm at 20.9 ms



Filter Class: CFC_180
Max: 59.3 N at -4.7 mm
Min: -4,587.6 N at -10.8 mm

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

10.18.2012 10:31:57 379



TRANSPORTATION RESEARCH CENTER INC.

TORSO FLEXION TEST

HYBRID III SMALL FEMALE

CAL DATE: 16-Oct-12

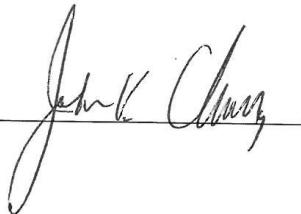
TRC, INC. TEST NO: TOFL-01 572 O SN426 TORSO FLEX CAL 12

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TIME		1330
TEMPERATURE	20.6 – 22.2° C	21.7 ° C
RELATIVE HUMIDITY	10 – 70 %	30 %
INITIAL ANGLE OF UNSUPPORTED DUMMY <u>START ANGLE</u>	<= 20° REFERENCED TO VERTICAL	15.2 °
DIFFERENCE BETWEEN <u>RETURN</u> <u>ANGLE</u> & INTIAL ANGLE	+/- 8 ° OF INTIAL ANGLE	4.3 °
MAXIMUM FORCE AT 45 DEG. DURING 10 SECOND PERIOD	320 – 390 N	386.4 N
RATE	0.5° - 1.5 °/sec	0.98°/sec

TEST MEETS SPECIFICATIONS

Comments:

TECHNICIAN



Transportation Research Center Inc.

Left Knee Femur Response Test

HIII 5th Serial No. 426 Certification No. 12-1

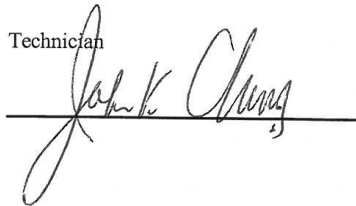
Test Date: 10/17/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.082 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,534.5 N	Yes

Test meets specifications.

Comments:

Technician



Approved



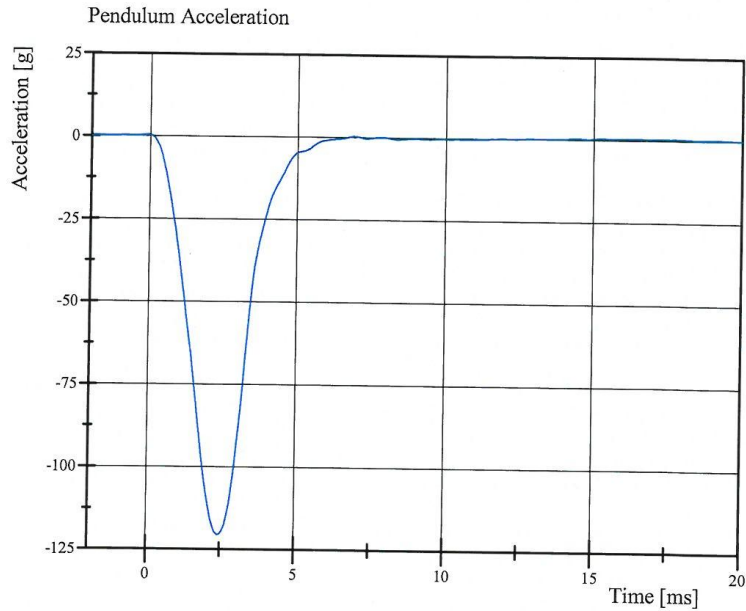
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.17.2012 13:59:57 1823

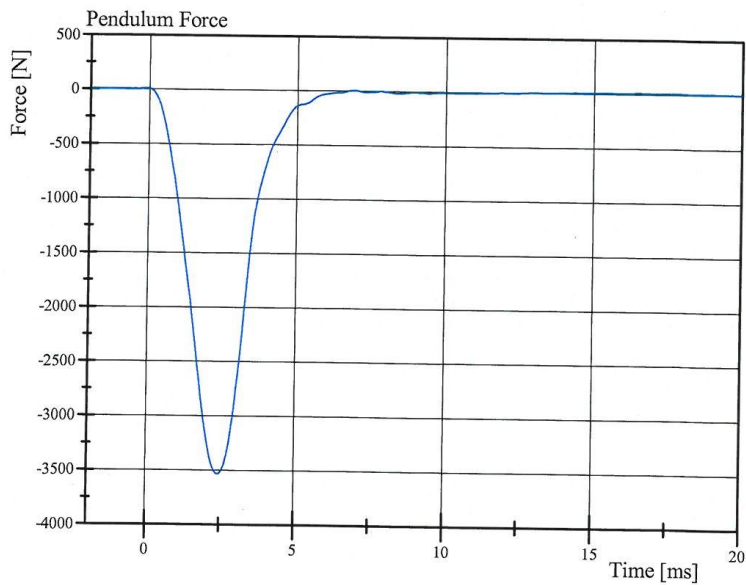


Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 12-1
Test Date: 10/17/2012



Filter Class: CFC_600
Max: 0.4 gn at 16.5 ms
Min: -120.5 gn at 2.4 ms



Filter Class: CFC_600
Max: 10.7 N at 16.5 ms
Min: -3,534.5 N at 2.4 ms

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

10.17.2012 14:00:10 1823



Transportation Research Center Inc.

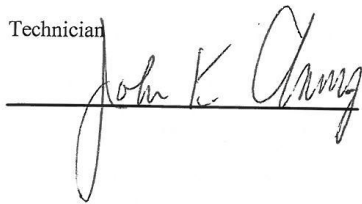
Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 12-1
Test Date: 10/17/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.083 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,552.1 N	Yes

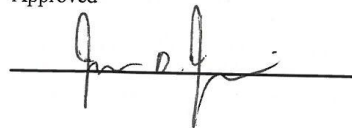
Test meets specifications.

Comments:

Technician



Approved



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

10.17.2012 14:47:32 1821

