

FINAL REPORT NUMBER: NCAP-TRC-13-003

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

**Chrysler Group LLC
2013 Jeep Patriot Sport 4X4 MPV
NHTSA NUMBER: MD0310**

**PREPARED BY:
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Report Date: January 11, 2013

FINAL REPORT

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

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FINAL REPORT ACCEPTANCE BY OCWS:

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

Date _____

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

Date _____

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16. Abstract A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2013 Jeep Patriot Sport 4X4 MPV 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 19, 2012. The impact velocity was 56.51 km/h, and the ambient temperature at the barrier face at the time of impact was 21° C. The target vehicle post-test maximum crush was 500 millimeters. The test vehicle's performance is as follows: <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Driver ATD</th> <th colspan="3">Passenger ATD</th> </tr> <tr> <th>Units</th> <th>Threshold</th> <th>Result</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>N/A</td> <td>700</td> <td>300</td> <td>N/A</td> <td>700</td> <td>269</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>33</td> <td>mm</td> <td>52</td> <td>19</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>0.40</td> <td>N/A</td> <td>1</td> <td>0.46</td> </tr> <tr> <td>Neck Tension</td> <td>Newtons</td> <td>4170</td> <td>1598</td> <td>Newtons</td> <td>2620</td> <td>1232</td> </tr> <tr> <td>Neck Compression</td> <td>Newtons</td> <td>4000</td> <td>-130</td> <td>Newtons</td> <td>2520</td> <td>-371</td> </tr> <tr> <td>Left Femur Force</td> <td>Newtons</td> <td>10008</td> <td>-5375</td> <td>Newtons</td> <td>6805</td> <td>-1884</td> </tr> <tr> <td>Right Femur Force</td> <td>Newtons</td> <td>10008</td> <td>-4199</td> <td>Newtons</td> <td>6805</td> <td>-2689</td> </tr> </tbody> </table>							Measurement Description	Driver ATD			Passenger ATD			Units	Threshold	Result	Units	Threshold	Result	Head Injury Criteria (HIC ₁₅)	N/A	700	300	N/A	700	269	Maximum Chest Compression	mm	63	33	mm	52	19	Nij	N/A	1	0.40	N/A	1	0.46	Neck Tension	Newtons	4170	1598	Newtons	2620	1232	Neck Compression	Newtons	4000	-130	Newtons	2520	-371	Left Femur Force	Newtons	10008	-5375	Newtons	6805	-1884	Right Femur Force	Newtons	10008	-4199	Newtons	6805	-2689
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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 Jeep Patriot Sport 4X4 MPV at a velocity of 56.51 km/h. The test was performed at Transportation Research Center, Inc. on October 19, 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 136 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 100.0 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 500 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, headrest, and load cell knee bolster. The passenger's visible contact points were as follows: Airbag, headrest, and load cell 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)	300	0.40	1598	-130	46.2	32.9	-5375	-4199
Passenger (5 th Female)	269	0.46	1232	-371	40.0	19.3	-1884	-2689

2: OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV
 Test Program: NCAP Frontal Impact

NHTSA No.: MD0310
 Test Date: 10/19/12

TEST VEHICLE INFORMATION

NHTSA No.	MD0310
Model Year	2013
Make	Jeep
Model	Patriot Sport 4X4
Body Style	MPV
VIN	1C4NJRBB7DD119135
Body Color	Silver
Odometer Reading (miles)	72
Engine Displacement (L)	2.4
Number of Cylinders	4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	CVT
Overdrive	Yes
Final Drive	Front Wheel Drive
Roof Rack	Yes
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	Yes
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	Yes
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	Chrysler Group LLC
Date of Manufacture	8/12

GVWR (kg)	2076
GAWR Front (kg)	1080
GAWR Rear (kg)	1044

VEHICLE SEATING AND WEIGHT CAPACITY

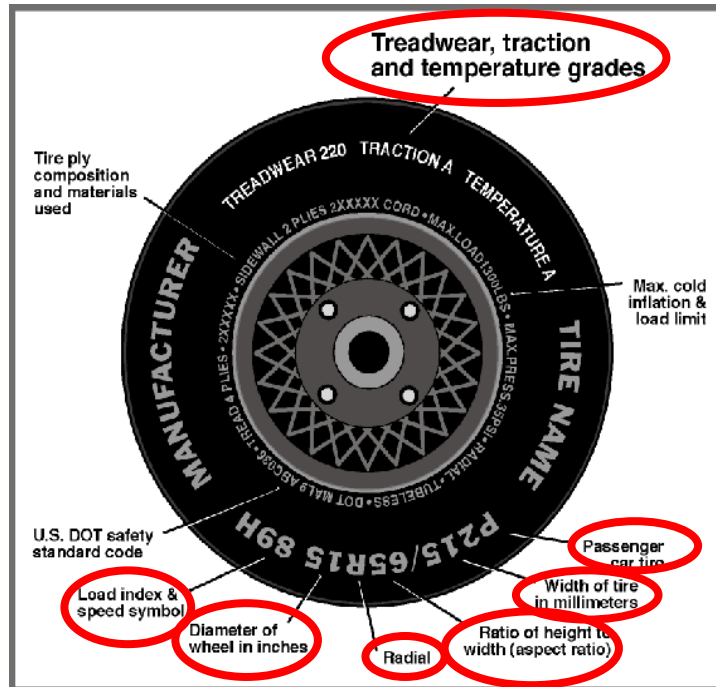
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench		
Number of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				419
Cargo Wt. (RCLW) (kg)				78.8

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV
 Test Program: NCAP Frontal Impact

NHTSA No.: MD0310
 Test Date: 10/19/12



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold / Test Pressure (kPa)	240	240
Recommended Tire Size	P215/65R17	P215/65R17
Tire Size on Vehicle	P215/65R17	P215/65R17
Tire Manufacturer	Goodyear	Goodyear
Tire Model	Wrangler SR-A	Wrangler SR-A
Treadwear	500	500
Traction Grade	A	A
Temperature Grade	B	B
Tire Plies Sidewall	2	2
Tire Plies Body	4	4
Load Index/Speed Symbol	98S	98S
Tire Material	Polyester & Steel	Polyester & Steel
DOT Safety Code Right	MDA DYWR 0712	MDA DYWR 0712
DOT Safety Code Left	MDA DYWR 0712	MDA DYWR 0712

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

Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV
 Test Program: NCAP Frontal Impact

NHTSA No.: MD0310
 Test Date: 10/19/12

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	449.4	333.0		482.4	398.6	
Right	kg	427.0	310.2		466.4	384.6	
Ratio	%	57.7	42.3		54.8	45.2	
Totals	kg	876.4	643.2	1519.6	948.8	783.2	1732.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1519.6
Weight of 1 P572E ATD & 1 P572O ATD	kg	139.3
Rated Cargo/Luggage Weight (RCLW)	kg	78.8
Vehicle Target Weight (TVTW)	kg	1737.7

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	807	819	828	836	1117.4
As Tested	mm	798	805	807	811	1193.8
Post Test	mm	809	832	801	814	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2640
Total Vehicle Length at Left Side	mm	4850
Total Vehicle Length at Centerline	mm	4955
Total Vehicle Length at Right Side	mm	4855
Weight of Ballast in Cargo Area	kg	0
Weight of Vehicle Components Removed	kg	31.4
Amount of Stoddard Solvent in Fuel Tank	liters	47.7

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:

Rear bumper reinforcement, rear fascia; rear door trim; tail lights, speakers, rear door panels, windows, trim and seals.

DATA SHEET NO. 1 (CONTINUED)**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV

NHTSA No.: MD0310

Test Program: NCAP Frontal ImpactTest Date: 10/19/12**TARGET VEHICLE STRUCTURAL MEASUREMENT**

	Elements	Pre-Test (mm)
1	Total Length	4955
2	Total Width	1780
3	Bumper Top Height	658
4	Bumper Bottom Height	558
5	Longitudinal Member Top Height	658
6	Distance Between Longitudinal Members	1035
7	Longitudinal Member Width	1020
8	Engine Top Height	885
9	Engine Bottom Height	288
10	Engine and Gearbox Width	850
11	Front Bumper-Engine Distance	410
12	Front Shock Absorber Fixing Height	945
13	Bonnet Leading Edge Height	1015
14	Front Shock Absorber Fixing Width	1100
15	Front Bumper – Front Axle Distance	890
16	Front Axle – A-Pillar Distance	560
17	A-Pillar – B-Pillar Distance	990
18	B-Pillar – Rear Axle Distance	1095
19	B-Pillar – C-Pillar Distance	810
20	Roof Sill Bottom Height	1485
21	Roof Sill Top Height	1550
22	Floor Sill Bottom Height	385
23	Floor Sill Top Height	460

DATA SHEET NO. 2

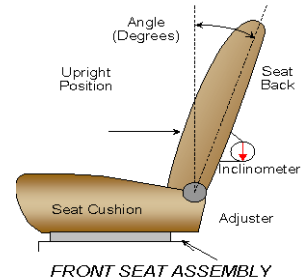
SEAT ADJUSTMENT, FUEL SYSTEM AND STEERING WHEEL DATA

Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV
 Test Program: NCAP Frontal Impact

NHTSA No.: MD0310
 Test Date: 10/19/12

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:	13.5
Passenger Seat back angle:	11.4

SEAT FORE/AFT POSITIONS

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

Driver: Mid position

Passenger: Full forward

	Total Fore/Aft Travel	Placed in Position No.
Driver Seat	260	130
Passenger Seat	260	1

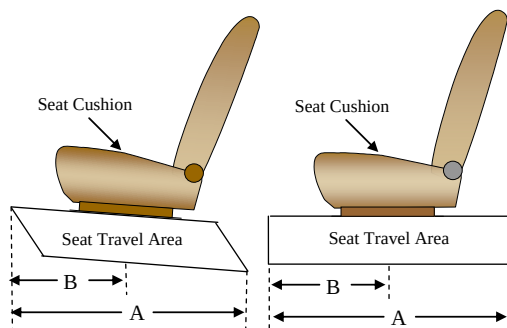
SEAT BELT UPPER ANCHORAGE

Describe the method of positioning seat belt upper anchorages.

Driver: Mid

Passenger: Full forward

	Total No. of Positions	Placed in Position No.
Driver Seat	4	0
Passenger Seat	4	0



DATA SHEET NO. 2 (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM AND STEERING WHEEL DATA

Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV

NHTSA No.: MD0310

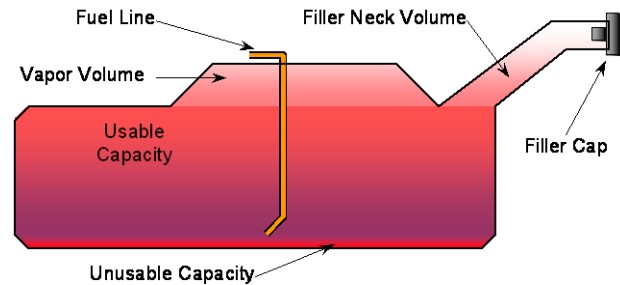
Test Program: NCAP Frontal Impact

Test Date: 10/19/12

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	51.48
Usable Capacity of "Optional" Tank	N/A
92%-94% of Usable Capacity	47.9
Actual Amount of Solvent used	47.7
1/3 of Usable Capacity	17.16

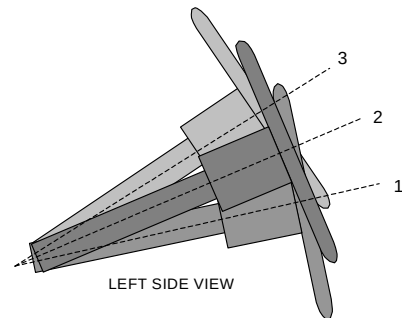
The test vehicle is equipped with an electric fuel pump. The fuel pump operates for approximately two seconds after the ignition is placed in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies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



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

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

STEERING COLUMN POSITIONS

	Degrees	Fore/Aft Position, mm
Lowermost Position No. 1	69.4	N/A
Geometric Center Position No. 2	66.5	N/A
Uppermost Position No. 3	63.5	N/A
Telescoping Steering Wheel Travel	No feature	N/A
Test Position	66.5	N/A

DATA SHEET NO. 3

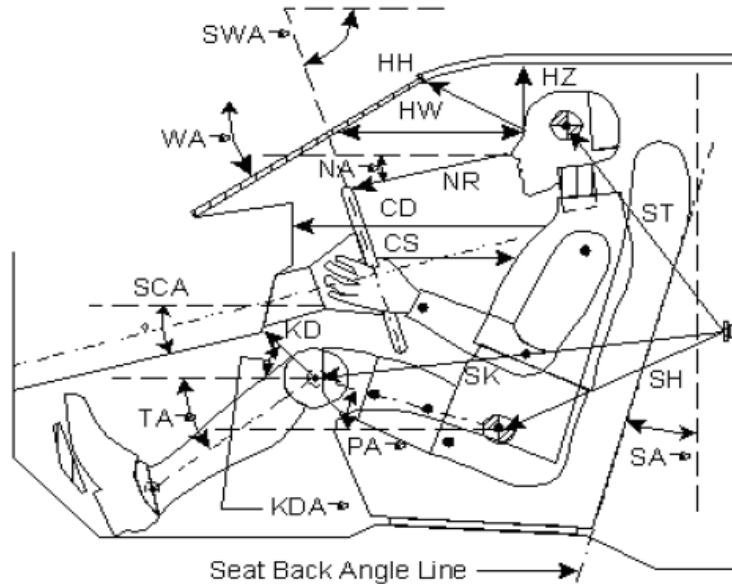
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV

NHTSA No.: MD0310

Test Program: NCAP Frontal Impact

Test Date: 10/19/12



Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		40.7		
SWA°	Steering Wheel Angle		66.5		
SCA°	Steering Column Angle		23.5		
SA°	Seat Back Angle (on headrest post)		13.6		11.4
HZ	Head to Roof (Z)	251		318	
HH	Head to Header	623		513	
HW	Head to Windshield	791		730	
NR	Nose to Rim	403	13.8		
CD	Chest to Dash	568		434	
CS	Chest to Steering Hub	288			
RA	Rim to Abdomen	201			
KDL	Left Knee to Dash	90	31.1	88	
KDR	Right Knee to Dash	90		95	25.7
PA°	Pelvic Angle		22.5		21.4
TA°	Tibia Angle		44.2		59.1
SK	Striker to Knee	584	4.1	725	6.0
ST	Striker to Head	526	-81.5	490	-65.8
SH	Striker to H-Point	238	36.0	372	18.6

DATA SHEET NO. 4

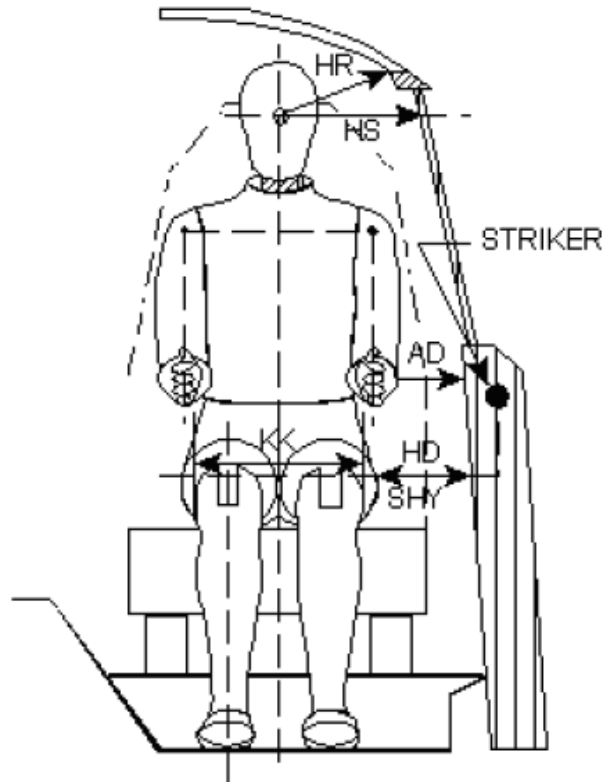
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV

NHTSA No.: MD0310

Test Program: NCAP Frontal Impact

Test Date: 10/19/12



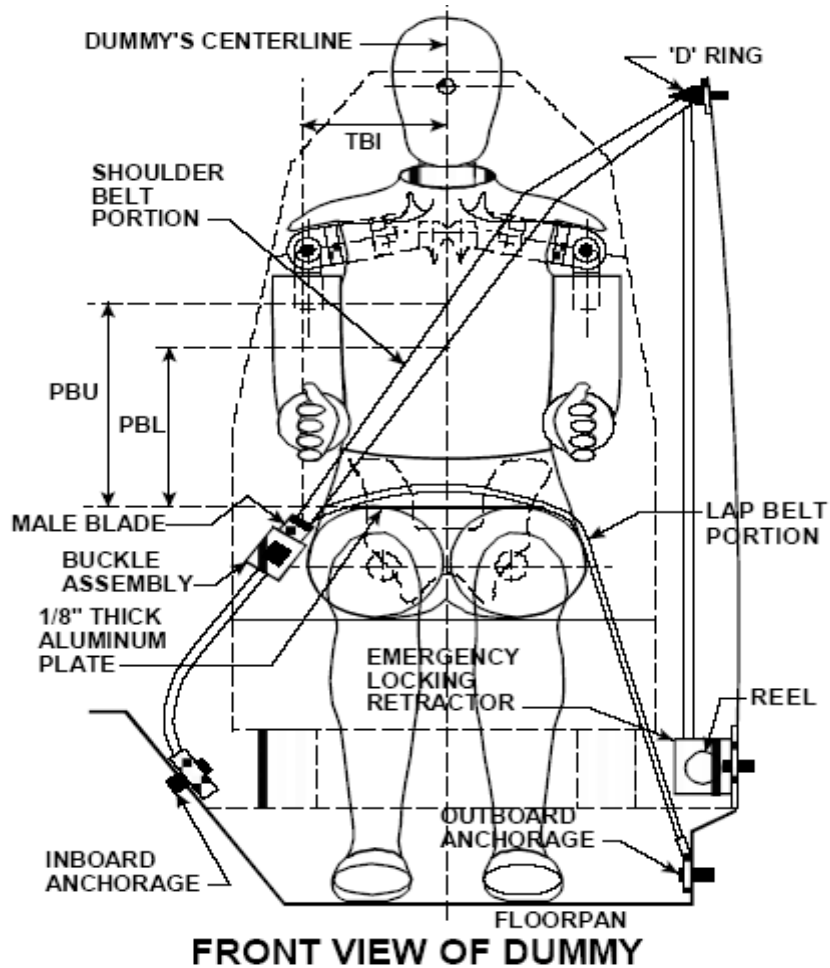
Code	Measurement Description	Driver	Passenger
AD	Arm to Door	52	95
HD	H-Point to Door	99	183
HR	Head to Side Header	246	266
HS	Head to Side Window	304	325
KK	Knee to Knee	270	160
SHY	Striker to H-Point (Y Direction)	196	115
AA	Ankle to Ankle	229	180

DATA SHEET NO. 5

SEAT BELT POSITIONING DATA

Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV
 Test Program: NCAP Frontal Impact

NHTSA No.: MD0310
 Test Date: 10/19/12



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU – Top surface of reference to belt upper edge	mm	325	261
PBL – Top surface of reference to belt lower edge	mm	250	182

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	797	890
Lap belt length as measured on ATD	mm	545	495
Remainder of belt on reel	mm	1040	1140
Total belt length for continuous webbing systems	mm	2382	2525

DATA SHEET NO. 6

HIGH SPEED CAMERA LOCATIONS AND DATA

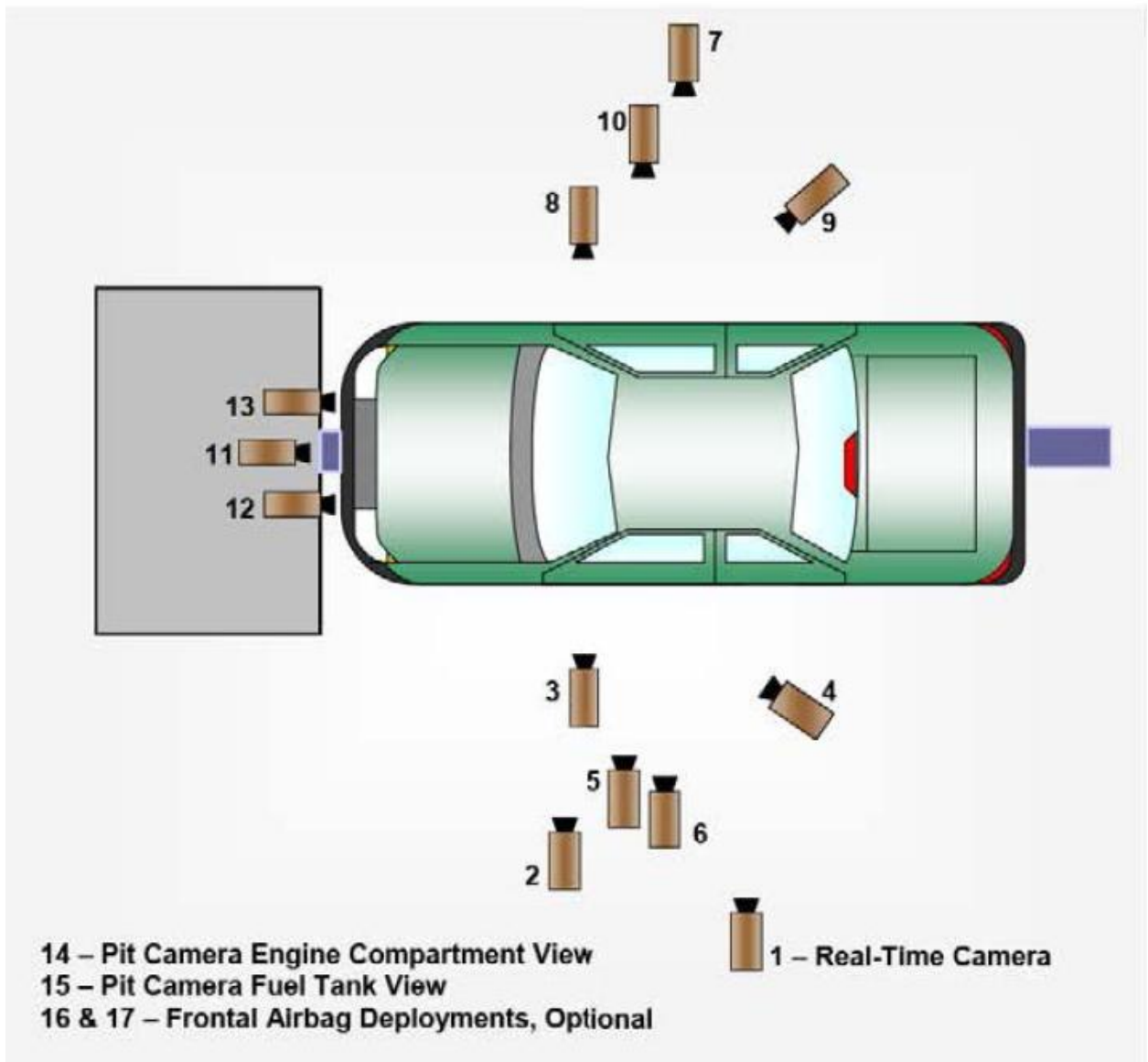
Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV

NHTSA No.: MD0310

Test Program: NCAP Frontal Impact

Test Date: 10/19/12

CAMERA POSITIONS FOR FRONTAL IMPACTS



DATA SHEET NO. 6 (CONTINUED)**HIGH SPEED CAMERA LOCATIONS AND DATA**Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV

NHTSA No.: MD0310

Test Program: NCAP Frontal ImpactTest Date: 10/19/12**CAMERA LOCATIONS**

No.	Camera View	Location (mm)			Lens (mm)	Frame Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	N/A	N/A	N/A	zoom	30
2	Driver Close-Up	-1065	-5670	-1275	50	1000
3	Left Front Half	-1842	-5313	-1374	16	1000
4	Left Angle	-4094	-3452	-1966	25	1000
5	Steering Column - Top	-1610	-5616	-1975	25	1000
6	Steering Column – Bottom	-1672	-5155	-1398	25	1000
7	Right Overall	-1966	4998	-1249	6	1000
8	Passenger Close-Up	-1389	5726	-1289	50	1000
9	Right Front Half	-947	5033	-1330	25	1000
10	Right Angle	-3823	3300	-1895	16	1000
11	Windshield	-97	0	-2558	8.5	1000
12	Driver Windshield	-97	-410	-2558	12.5	1000
13	Passenger Windshield	-114	455	-2558	12.5	1000
14	Pit Front	-582	0	2889	25	1000
15	Pit Rear	-2106	0	2889	8.5	1000
16	Onboard Driver Airbag (Optional)	N/A	N/A	N/A	8.5	1000
17	Onboard Passenger Airbag (Optional)	N/A	N/A	N/A	8.5	1000

Reference Points: +X – forward of impact plane

+Y – right of monorail center

+Z – into ground

DATA SHEET NO. 7

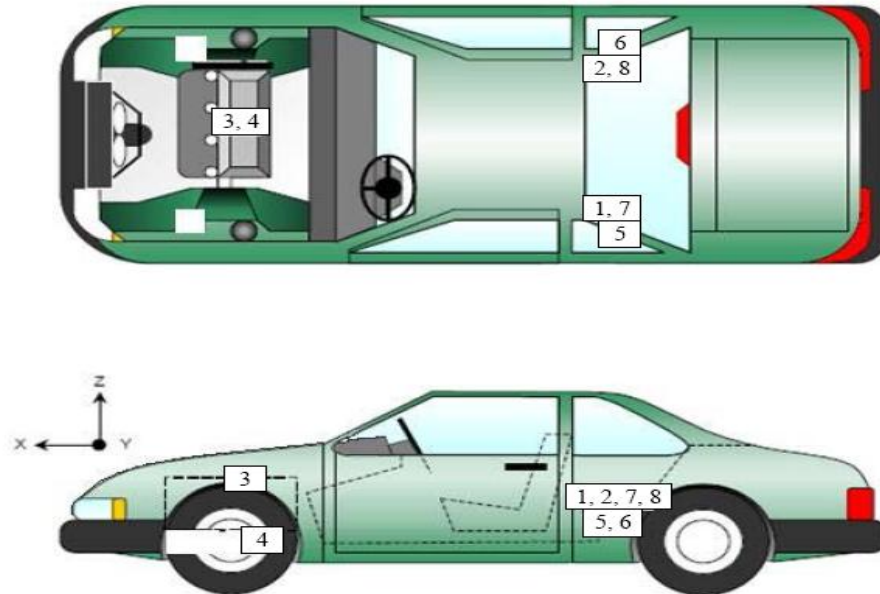
VEHICLE ACCELEROMETER DATA

Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV

NHTSA No.: MD0310

Test Program: NCAP Frontal Impact

Test Date: 10/19/12



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Camera View	Location (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	2158	-545	561
2	Right Rear Accelerometer – X Direction	2158	520	557
3	Engine Top X	4282	45	890
4	Engine Bottom X	4155	-244	341
5	Left Rear Accelerometer – Z Direction	2158	-470	561
6	Right Rear Accelerometer – Z Direction	2158	460	557

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

DATA SHEET NO. 8

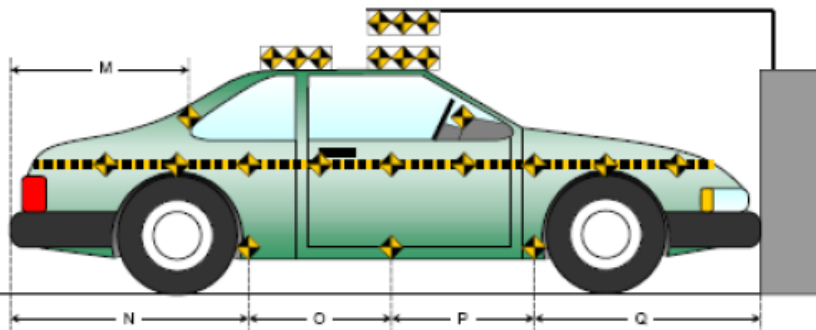
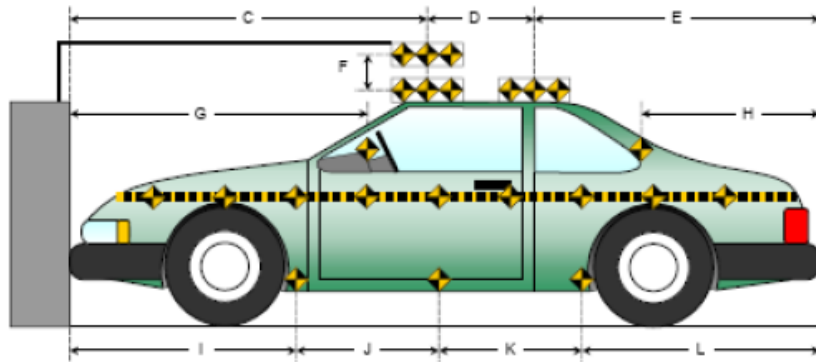
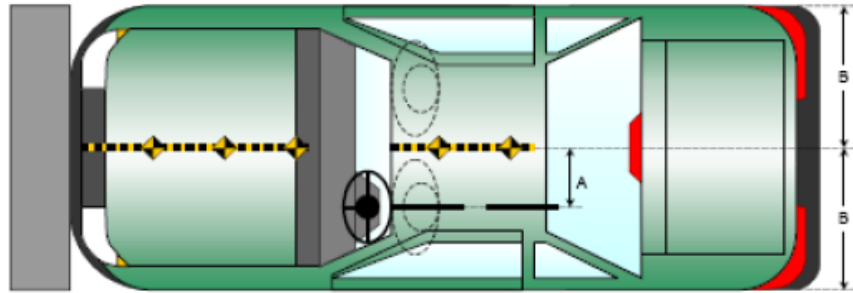
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV
 Test Program: NCAP Frontal Impact

NHTSA No.: MD0310
 Test Date: 10/19/12

Item	Value
A	320
B	890
C	2010
D	610
E	2365
F	205
G	3290
H	1645
I	1379
J	821
K	835
L	1920
M	1650
N	1905
O	839
P	823
Q	1386

All units in
millimeters



DATA SHEET NO. 9

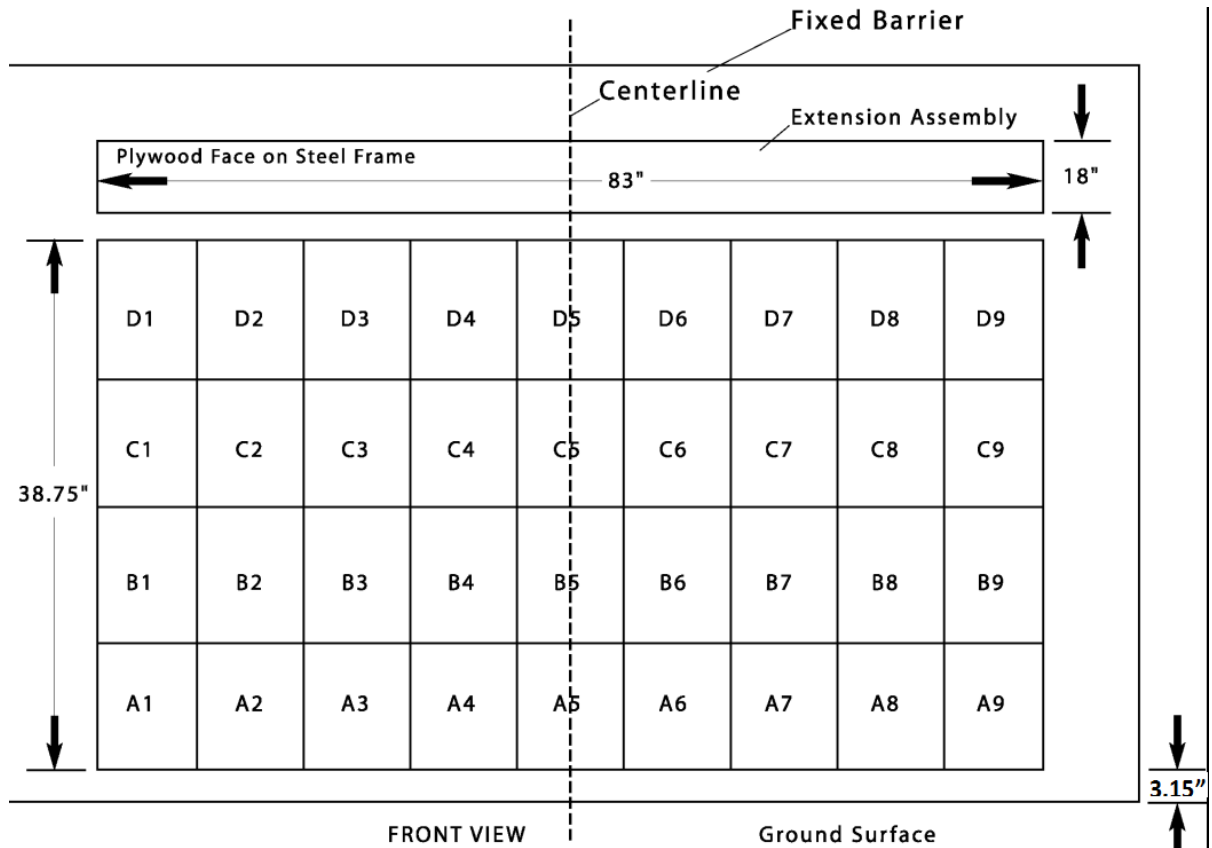
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV

NHTSA No.: MD0310

Test Program: NCAP Frontal Impact

Test Date: 10/19/12



DATA SHEET NO. 10

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV

NHTSA No.: MD0310

Test Program: NCAP Frontal Impact

Test Date: 10/19/12

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 Jeep Patriot Sport 4X4 MPVNHTSA No.: MD0310Test Program: NCAP Frontal ImpactTest Date: 10/19/12**TEST DUMMY INFORMATION AND CONTACT LOCATIONS**

Description	Driver	Passenger
Dummy Type / Serial No.	Hybrid III 50th/037	Hybrid III 5 th /426
Head Contact	Airbag, headrest	Airbag, headrest
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	Closed and operational	Closed and operational
Rear Door Opening	Closed and operational	Closed and operational
Seat Track Shift (mm)	None	None
Seat Back Failure	None	None
Glazing Damage	Broken	None

VEHICLE REBOUND FROM BARRIER

Measured Parameters	Units	Value
Left Side	mm	1595
Center	mm	1492
Right Side	mm	1492
Average	mm	1526

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 1		Right Front (Passenger) Occupant Location 2	
	Mounted	Deployed	Mounted	Deployed
Front Airbag	Yes	Yes	Yes	Yes
Side Curtain Airbag	Yes	No	Yes	No
Side Torso Airbag	No	NA	No	NA
Knee Airbag	No	NA	No	NA
Seat Belt Pretensioner	Yes	Yes	Yes	NA
Seat Belt Load Limiter	No	NA	No	NA
Other	NA	NA	NA	NA

DATA SHEET NO. 12

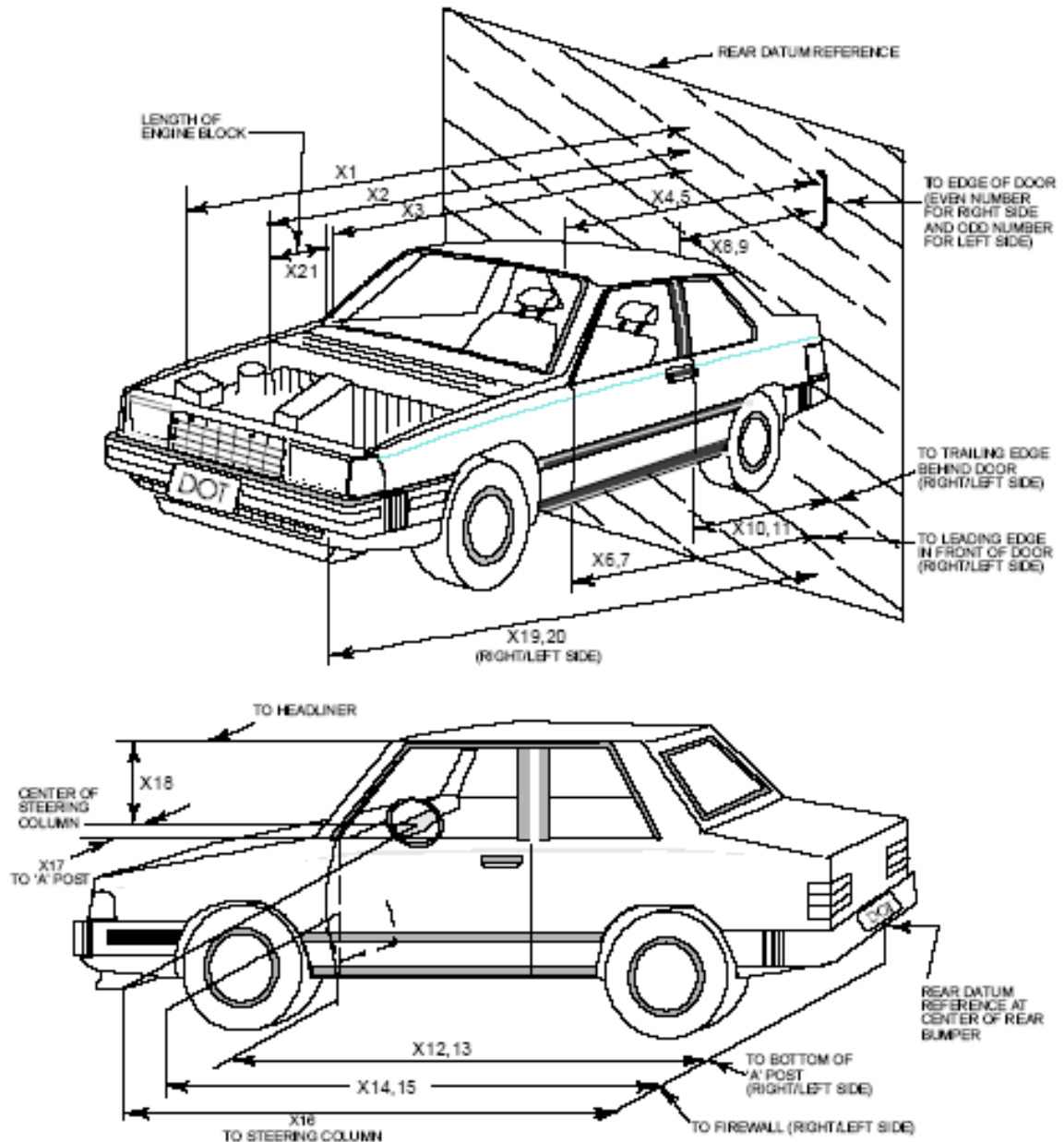
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV

NHTSA No.: MD0310

Test Program: NCAP Frontal Impact

Test Date: 10/19/12



DATA SHEET NO. 12 (CONTINUED)**VEHICLE PROFILE MEASUREMENTS**Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV

NHTSA No.: MD0310

Test Program: NCAP Frontal ImpactTest Date: 10/19/12

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4955	4455	500
2	Rear Surface of Vehicle (RSOV) to Front of Engine	3915	4080	-165
3	RSOV to Firewall	3525	3795	-270
4	RSOV to Upper Leading Edge of Right Door	2990	2990	0
5	RSOV to Upper Leading Edge of Left Door	2993	2984	9
6	RSOV to Lower Leading Edge of Right Door	2910	2890	20
7	RSOV to Lower Leading Edge of Left Door	2925	2897	28
8	RSOV to Upper Trailing Edge of Right Door	2000	1997	3
9	RSOV to Upper Trailing Edge of Left Door	2003	1994	9
10	RSOV to Lower Trailing Edge of Right Door	2005	1985	20
11	RSOV to Lower Trailing Edge of Left Door	2015	1986	29
12	RSOV to Bottom of "A" Post-of Right Side	2960	2956	4
13	RSOV to Bottom of "A" Post-of Left Side	2960	2945	15
14	RSOV to Firewall, Right Side	3540	3310	230
15	RSOV to Firewall, Left Side	3540	3765	-225
16	RSOV to Steering Column	2570	2575	-5
17	Center of Steering Column to "A" Post	315	335	-20
18	Center of Steering Column to Headliner	510	430	80
19	RSOV to Right Side of Front Bumper	4305	3870	435
20	RSOV to Left Side of Front Bumper	4300	3843	457
21	Length of Engine Block	850	850	0
RD	RSOV to Right Side of Dash Panel	2815	2810	5
CD	RSOV to Center of Dash Panel	2760	2745	15
LD	RSOV to Left Side of Dash Panel	2830	2820	10

All Dimensions in mm

DATA SHEET NO. 13

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV
Test Program: NCAP Frontal Impact

NHTSA No.: MD0310
Test Date: 10/19/12

VEHICLE INFORMATION

VIN: 1C4NJRBB7DD119135

Wheelbase: 2640

Vehicle Size Category: MPV

Test Weight (kg): 1732.0

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): 56.51

Velocity Change (km/h): 56.51

Time of Separation (ms): 160

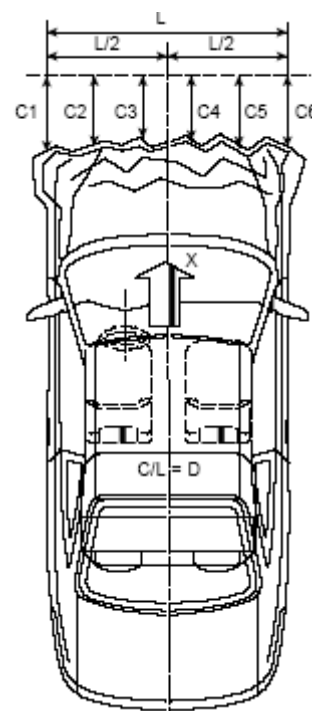
CRUSH PROFILE

Collision Deformation Classification: 12FDEW3

Midpoint of Damage: Centerline

Damage Region Length (mm): 1335

Impact Mode: Frontal



No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4300	3843	457
C2	Crush zone 1 at left side	mm	4370	3895	475
C3	Crush zone 1 at left side	mm	4400	3910	490
C4	Crush zone 1 at right side	mm	4400	3920	480
C5	Crush zone 1 at right side	mm	4370	3890	480
C6	Crush zone 1 at right side	mm	4305	3870	435
L	C1 to C6	mm	1335		

DATA SHEET NO. 14

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV

NHTSA No.: MD0310

Test Program: NCAP Frontal Impact

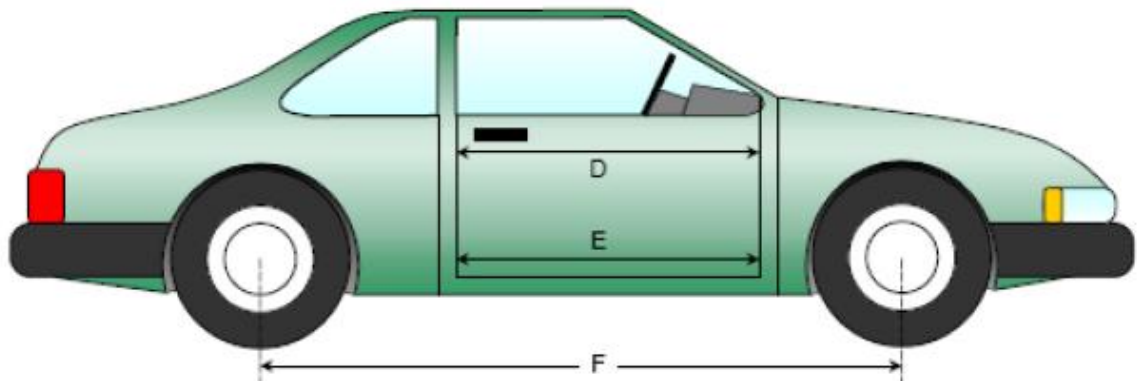
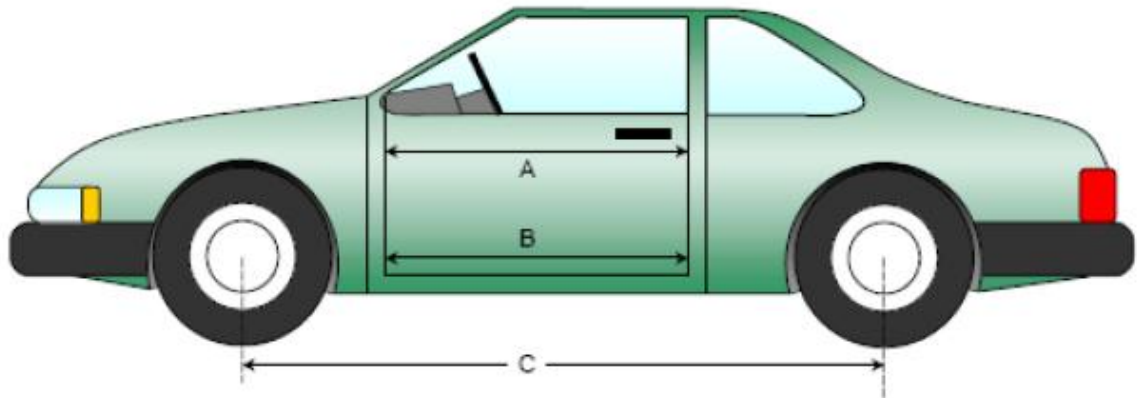
Test Date: 10/19/12

DOOR OPENING WIDTH

No.	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	930	926	4
B	Left Side Lower	mm	880	885	-5
C	Right Side Upper	mm	930	927	3
D	Right Side Lower	mm	880	880	0

WHEELBASE MEASUREMENTS

No.	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2640	2600	40
F	Right Side Wheelbase	mm	2640	2580	60



DATA SHEET NO. 14 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV

NHTSA No.: MD0310

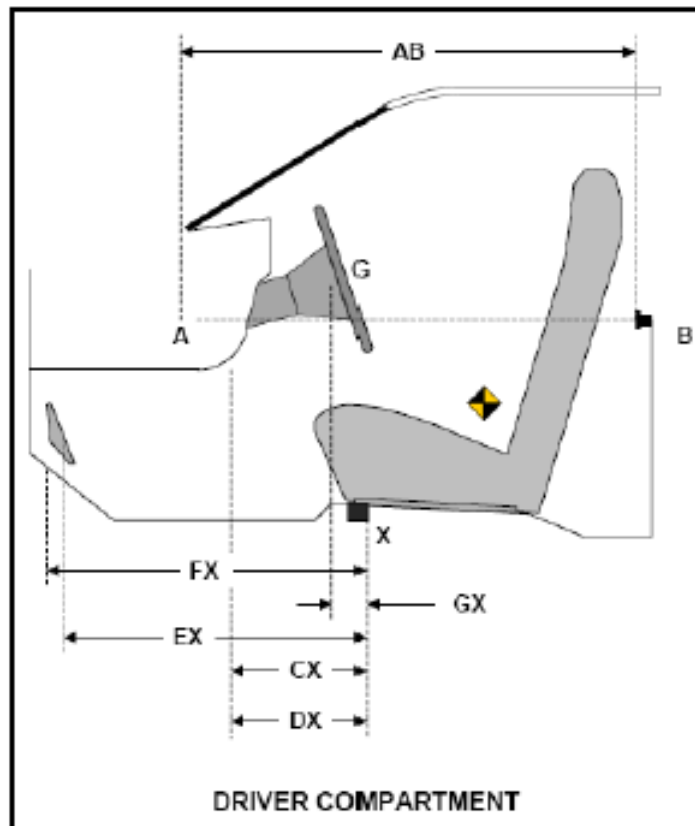
Test Program: NCAP Frontal Impact

Test Date: 10/19/12

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	922	916	6
CX	Left Knee Bolster to X	mm	262	270	-8
DX	Right Knee Bolster to X	mm	270	256	14
EX	Brake Pedal to X	mm	505	485	20
FX	Foot Rest to X	mm	555	535	20
GX	Center of Steering Column Wheel Hub to X	mm	70	130	-60

X = Front of Seat Track (Stationary)



DATA SHEET NO. 15

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

Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV
 Test Program: NCAP Frontal Impact

NHTSA No.: MD0310
 Test Date: 10/19/12

Please provide windshield mounting details.

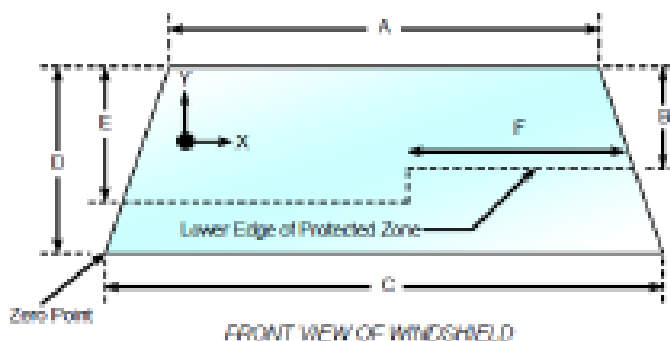
The standard requires that the post-test retention measurement be a minimum of 75% of the pre-test total periphery measurement for vehicle not equipped with occupant passive restraint and 50% for each side of the windshield for vehicle which are equipped with occupant passive restraints.

Temperature of windshield molding during test:

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2042.5	2042.5	100
Right Side	2042.5	2042.5	100
Total	4085.0	4085.0	100

Item	Units	Value
A	mm	1270
B	mm	445
C	mm	1555
D	mm	635
E	mm	420
F	mm	355



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
NA	NA
NA	NA
NA	NA
NA	NA

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
NA	NA
NA	NA
NA	NA
NA	NA

DATA SHEET NO. 15 (CONTINUED)

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

Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV NHTSA No.: MD0310
Test Program: NCAP Frontal Impact Test Date: 10/19/12

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: _____ Test Time: _____

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: _____ 0 _____

DATA SHEET NO. 16

FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV

NHTSA No.: MD0310

Test Program: NCAP Frontal Impact

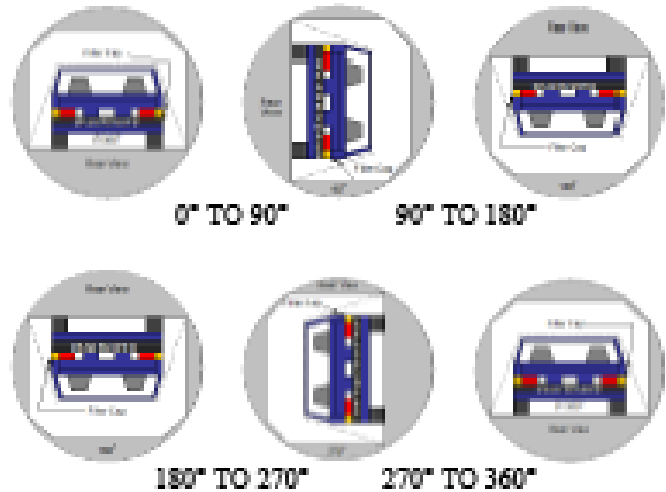
Test Date: 10/19/12

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

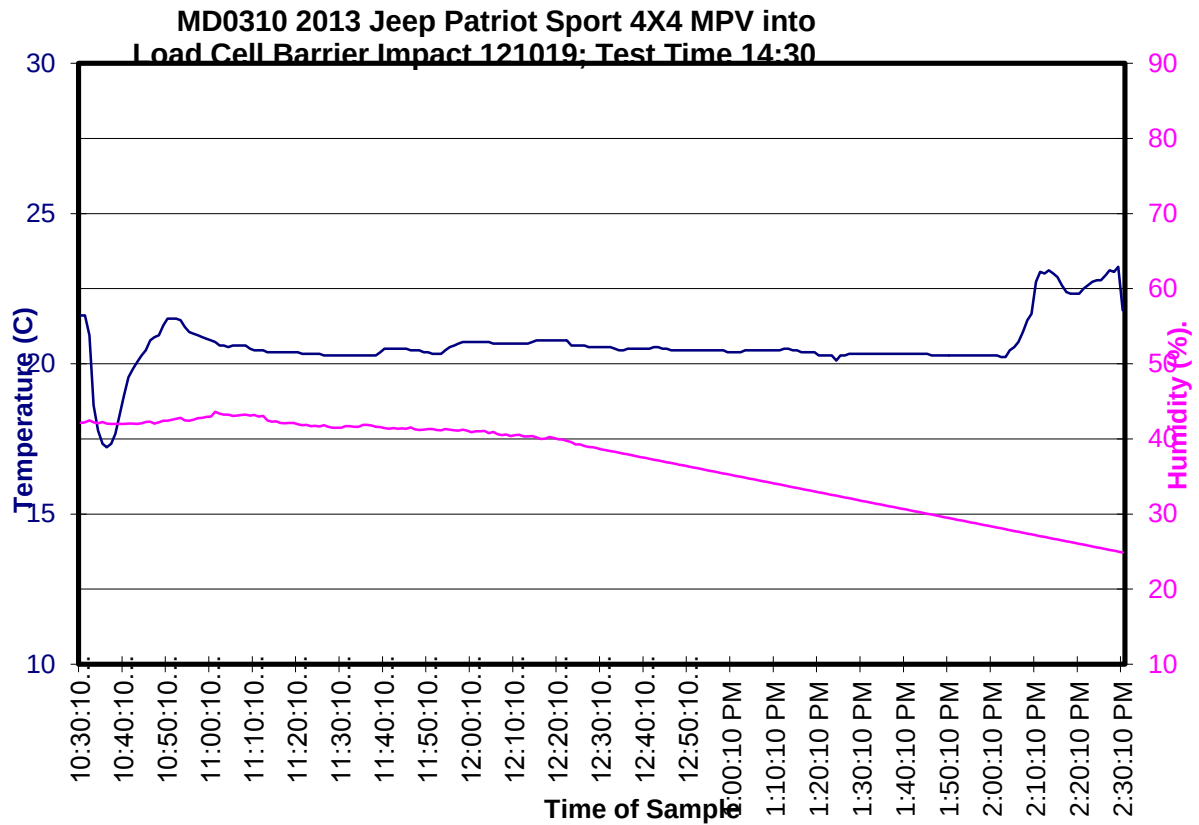
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2013 Jeep Patriot Sport 4X4 MPV

NHTSA No.: MD0310

Test Program: NCAP Frontal Impact

Test Date: 10/19/12



APPENDIX A
PHOTOGRAPHS

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4	Tire Placard	A-5
5	2013 Jeep Patriot Sport 4X4 Frontal as Delivered	A-6
6	Left Rear 3-4 View, as Received	A-6
7	Pre-Test Front View of Test Vehicle	A-7
8	Post-Test Front View of Test Vehicle	A-7
9	Pre-Test Left View of Test Vehicle	A-8
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23	Pre-Test Front Underbody View	A-15
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24a	Pre-Test Mid Underbody View	A-16
24b	Post-Test Mid Underbody View	A-16
25	Pre-Test Rear Underbody View	A-17
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30	Post-Test Driver Dummy Front View	A-19
31	Pre-Test Driver Dummy Window View	A-20
32	Post-Test Driver Dummy Window View	A-20
33	Pre-Test Driver Dummy and Vehicle Interior View	A-21
34	Post-Test Driver Dummy and Vehicle Interior View	A-21
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36	Post-Test Driver's Seat Fore-Aft Markings	A-22
37	Pre-Test View of Belt Anchorage for Driver Dummy	A-23
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41	Pre-Test Driver's Side Knee Bolster	A-25

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64	Pre-Test Passenger Side Floorpan	A-36
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001 Load Cell Location



002 Load Cell Wall



003 Manufacturer's Label



004 Tire Placard



005 2013 Jeep Patriot Sport 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



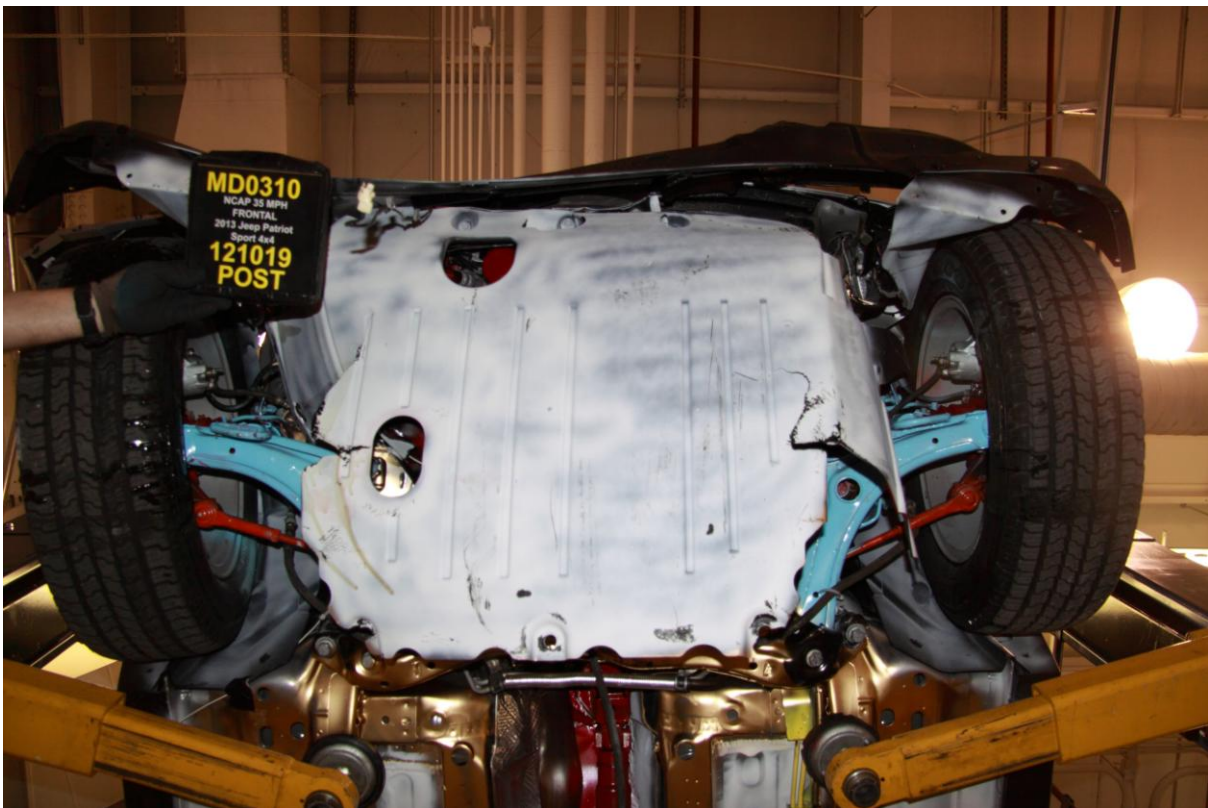
021 Pre-test Fuel Filler Cap View



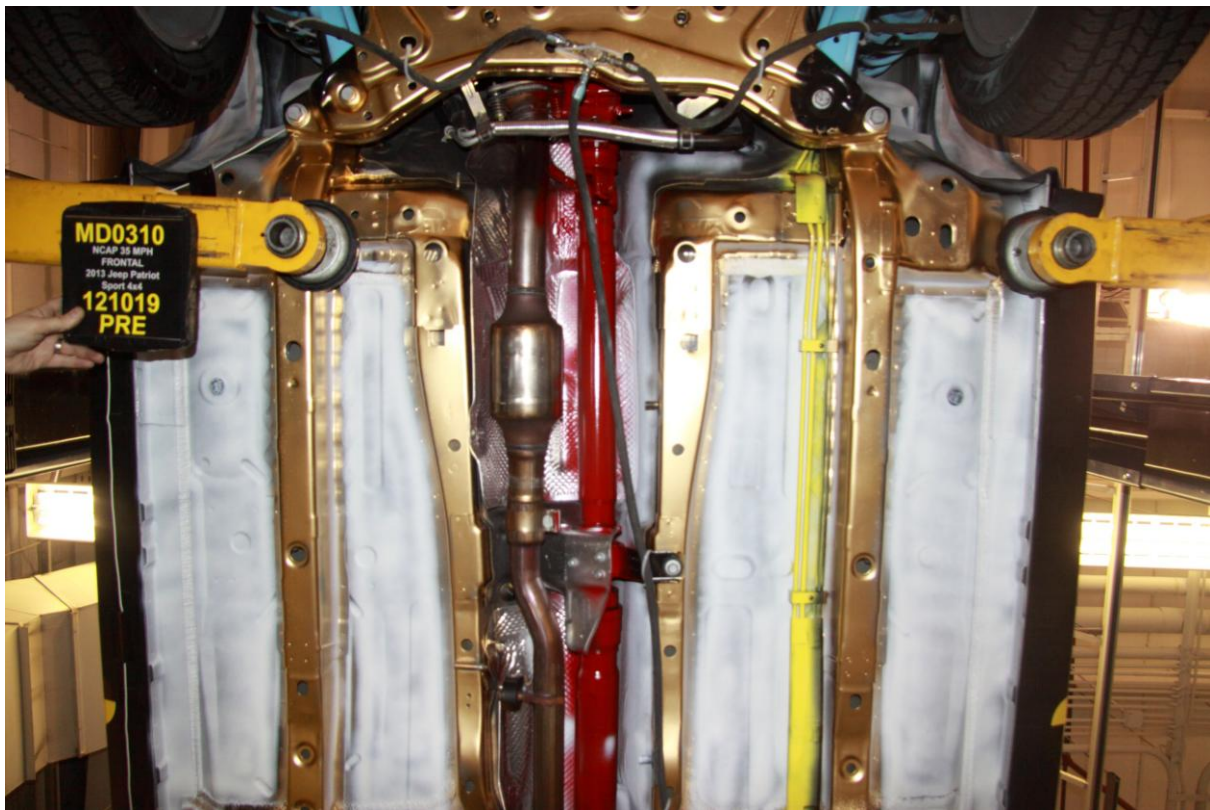
022 Post-test Fuel Filler Cap View



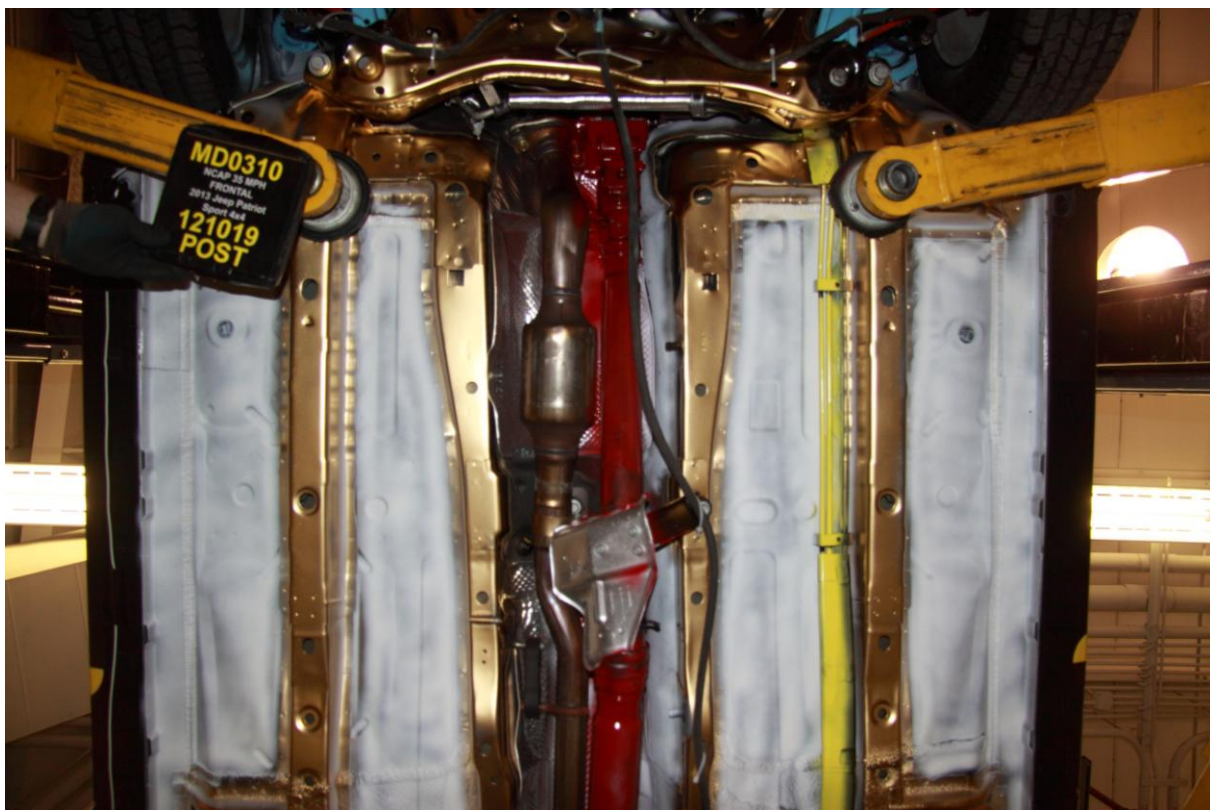
023 Pre-test Front Underbody View



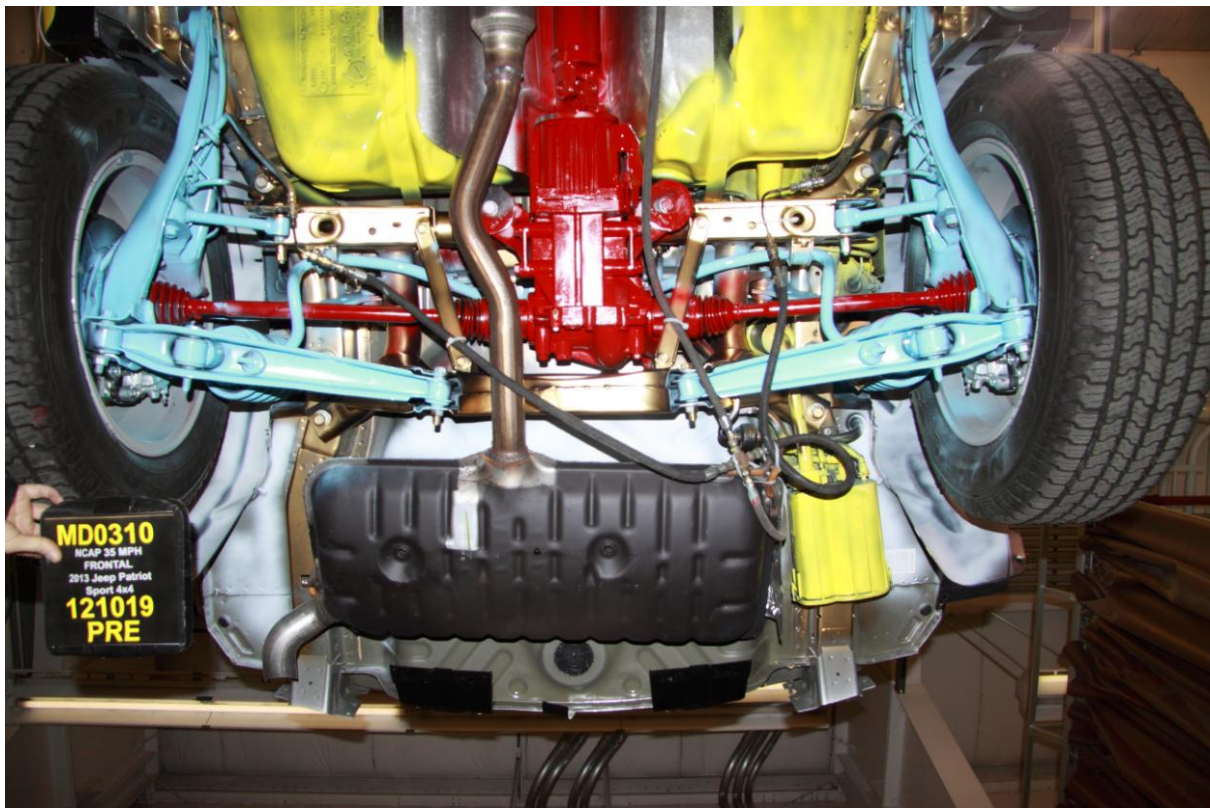
024 Post-test Front Underbody View



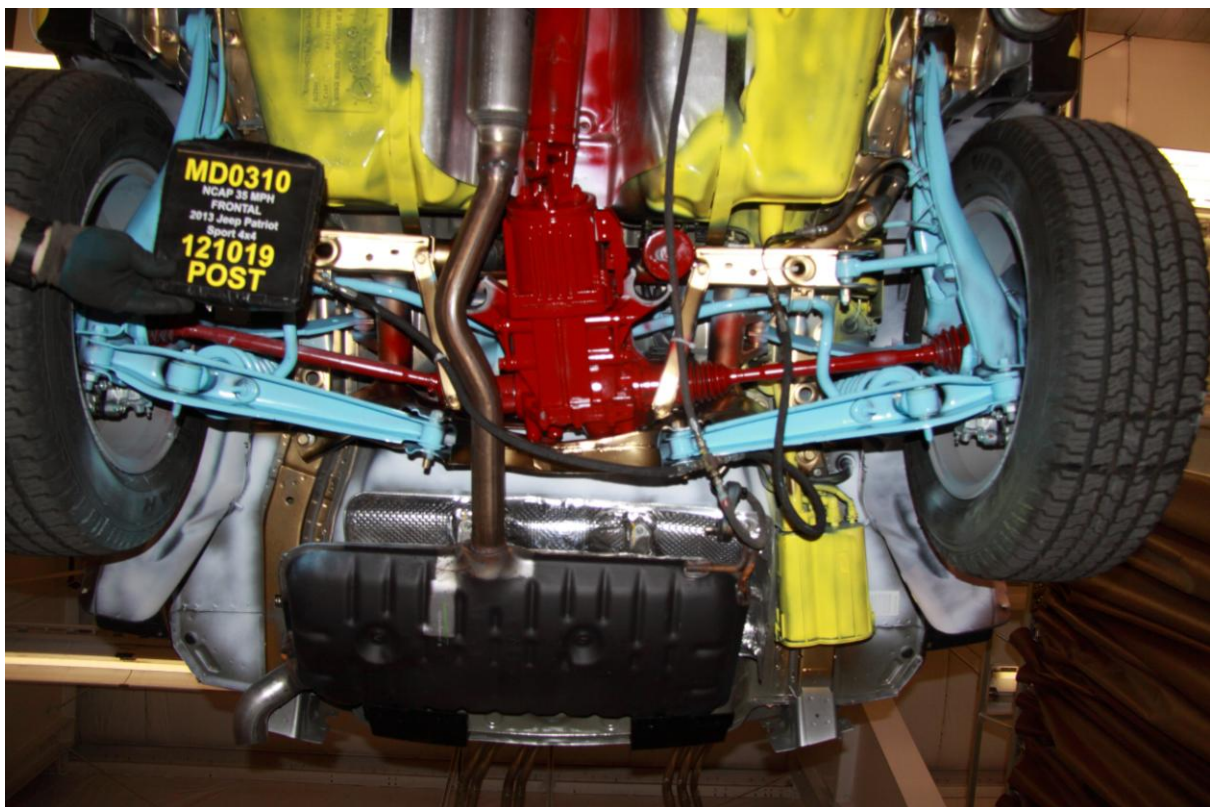
024a Pre-test Mid Underbody View



024b Post-test Mid 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



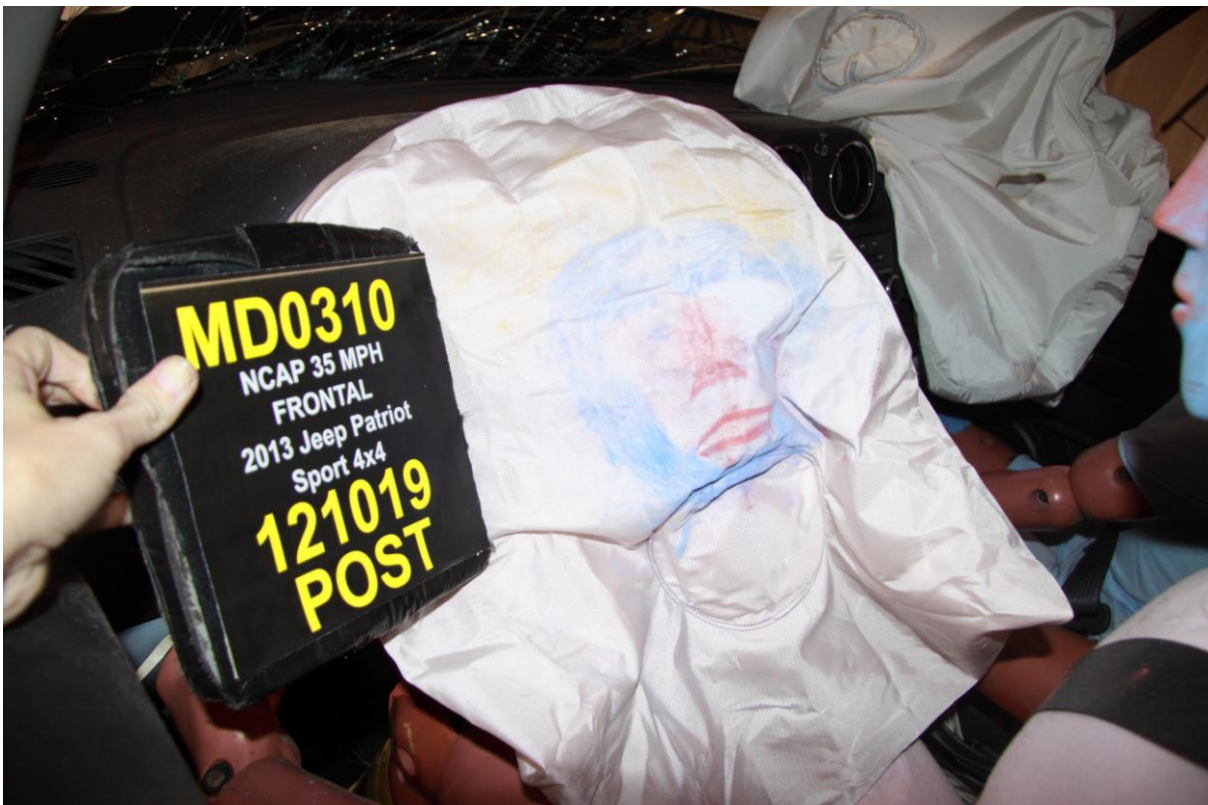
043 Pre-test Driver's Side Floorpan



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



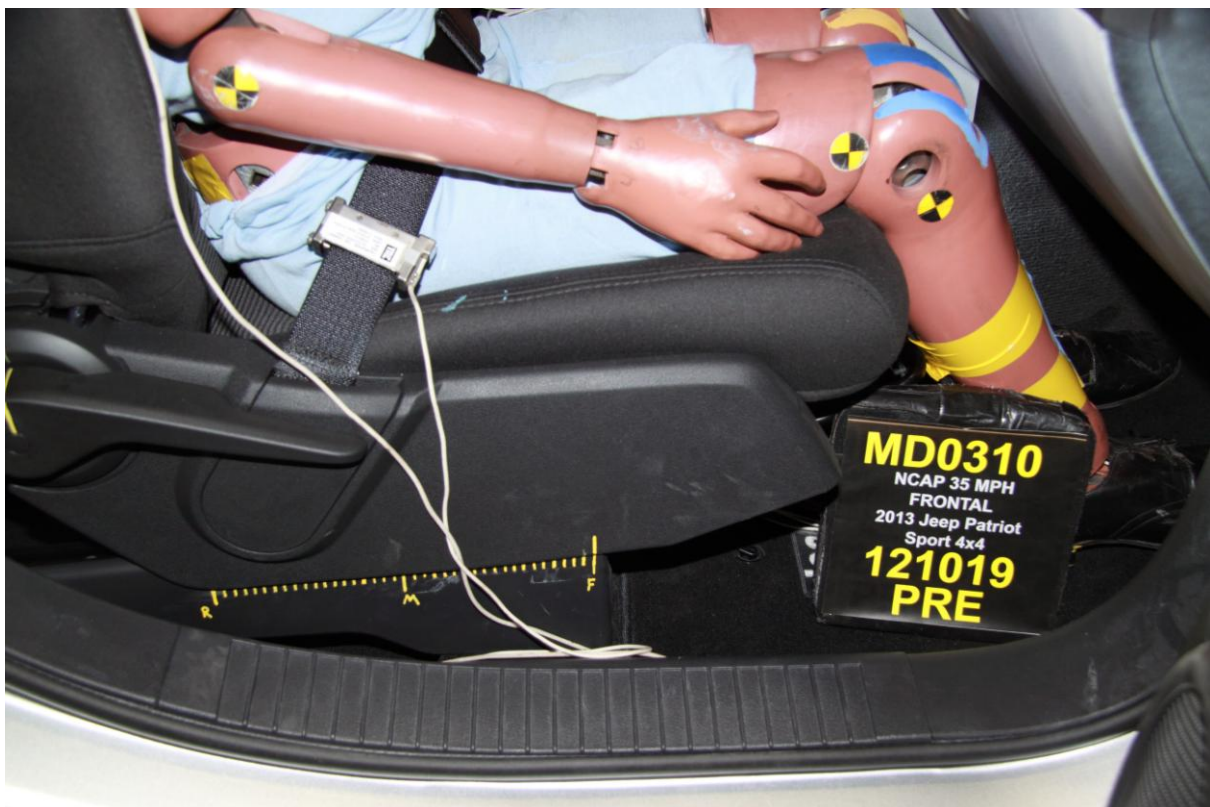
053 Post-test Passenger Dummy Window View



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



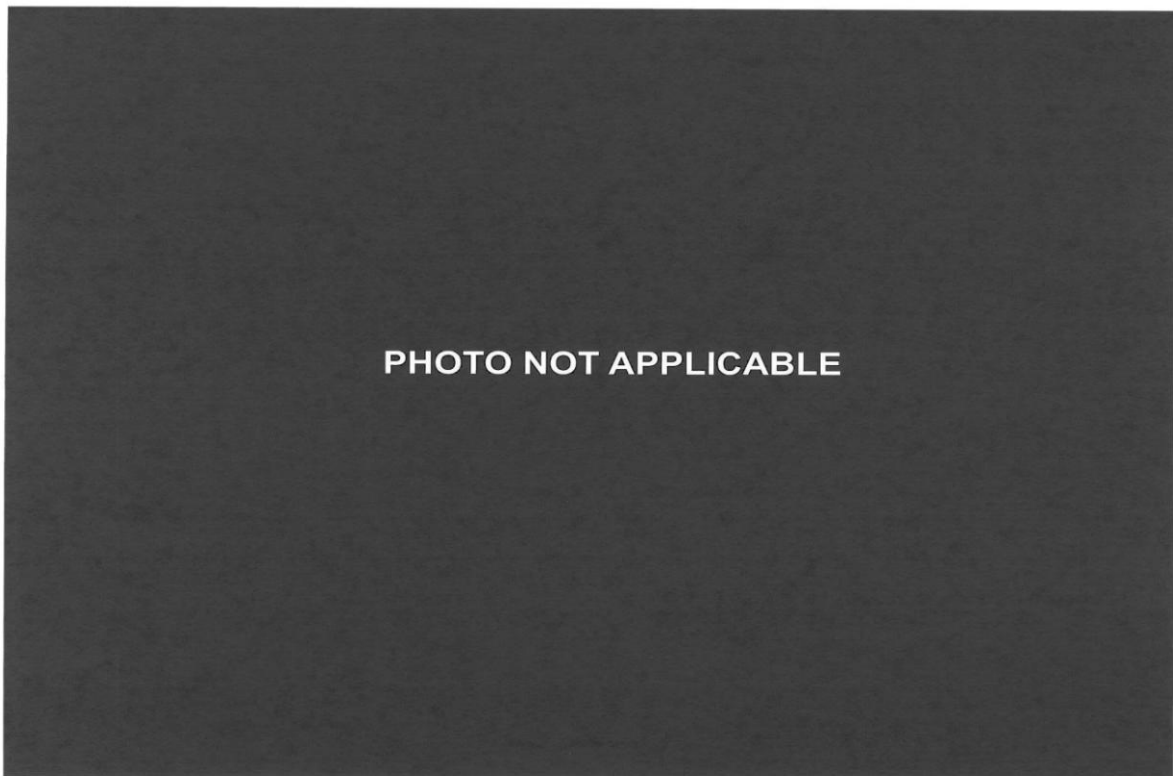
065 Post-test Passenger's Side Floorpan



066 Post-test Passenger Dummy Contact With Headrest



066a Post-test Passenger Dummy Contact With Airbag



067 Photograph of Ballast Installed in Vehicle

PHOTO NOT APPLICABLE

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



069 Post-test Speed Trap Read-out



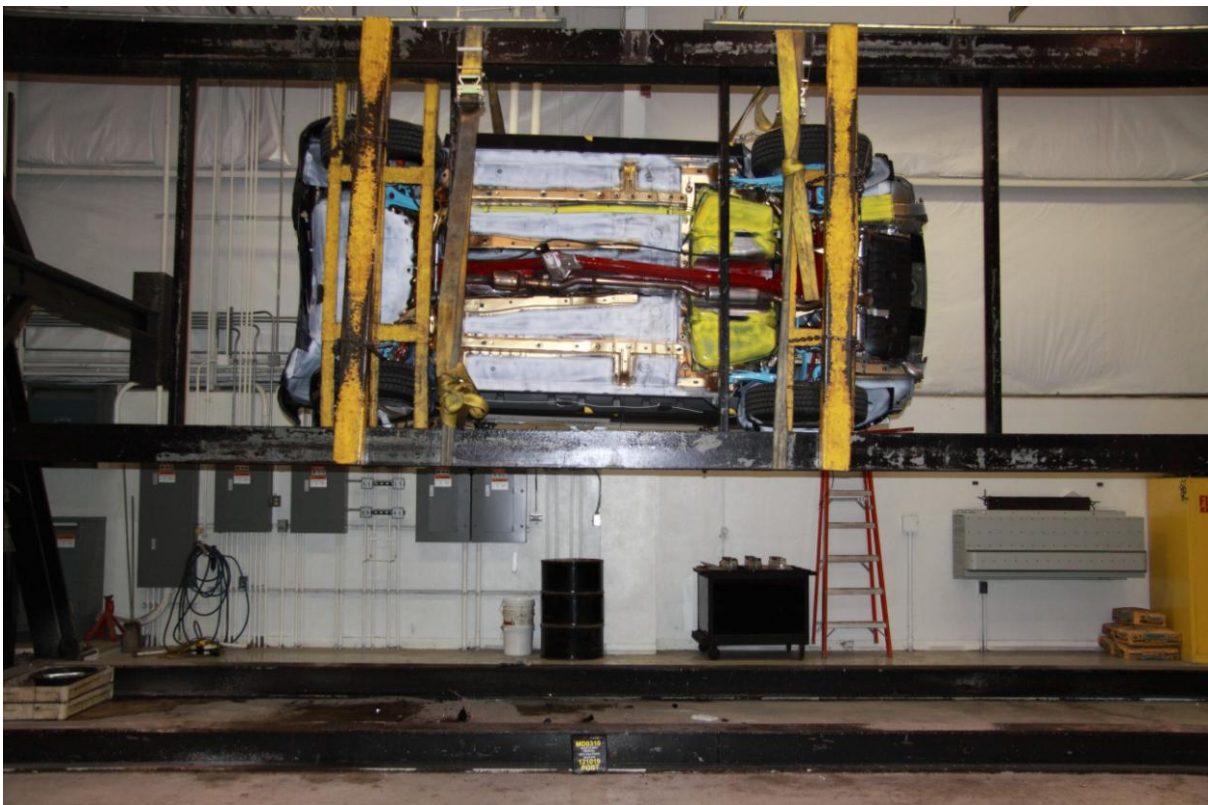
070 Vehicle at 0° on Static Rollover Device



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 Jeep Patriot Sport 4x4 Frontal Impact Event

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

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

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

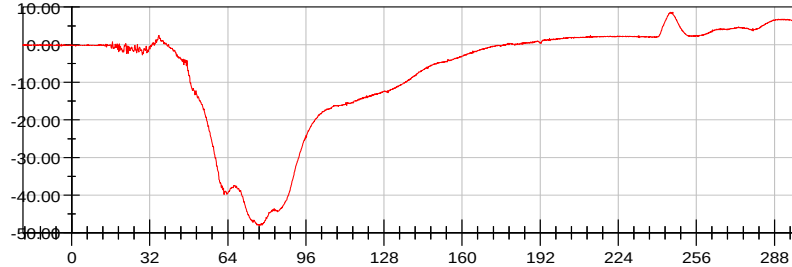
Test Number: 121019 (MD0310)

Test Date: 10/19/2012

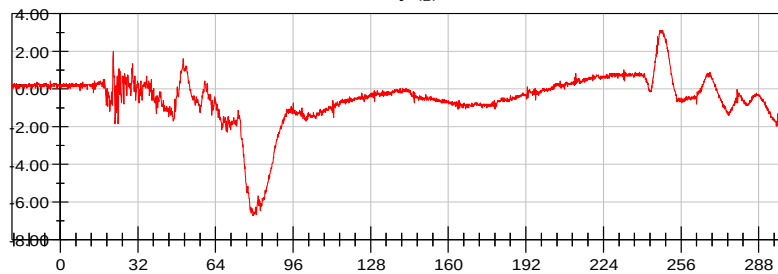
Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (426)

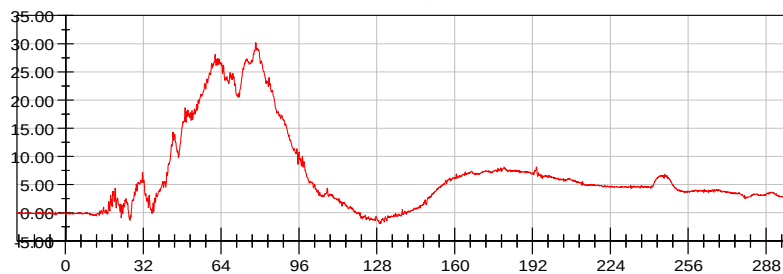
Driver Head X Acceleration vs. Time Primary (g) vs. Time [ms]



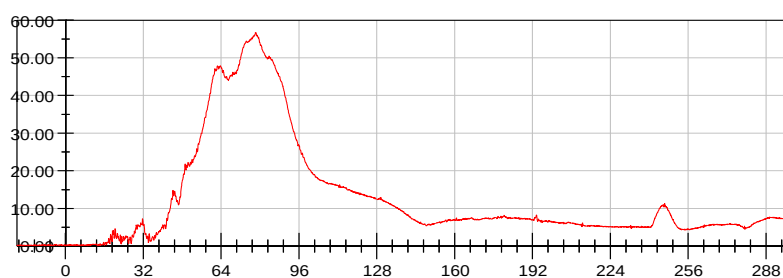
Driver Head Y Acceleration vs. Time Primary (g) vs. Time [ms]



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



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



NHTSA

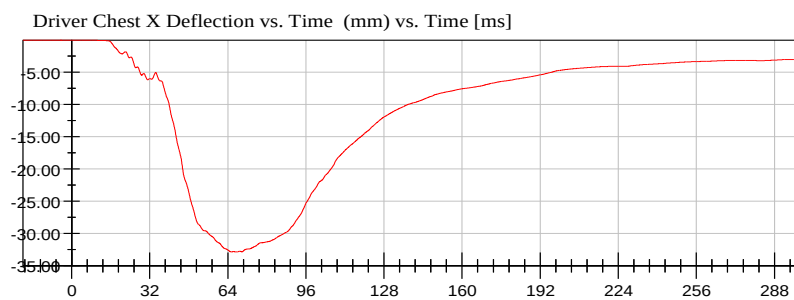
Test Lab: CTF

Test Number: 121019 (MD0310)

Test Date: 10/19/2012

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

Position #2 Hybrid III Small Adult Female (426)



<Max>

0.00 mm at -4.32 ms

<Min>

-32.86 mm at 67.52 ms

CFC_600



NHTSA

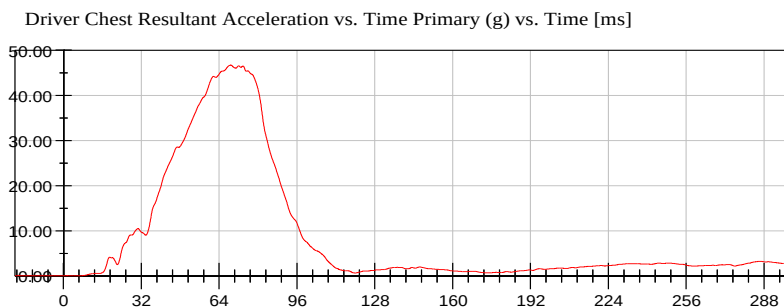
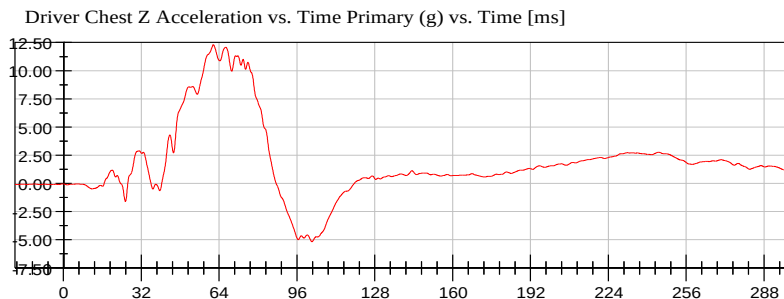
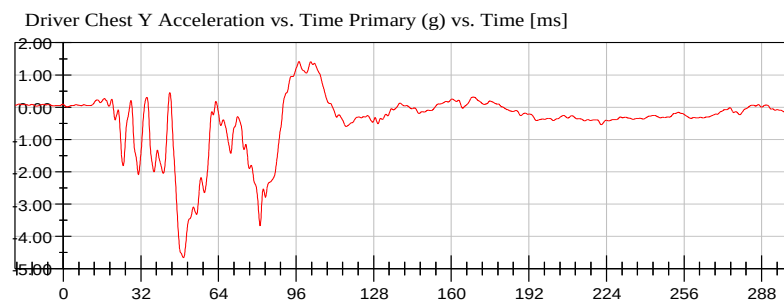
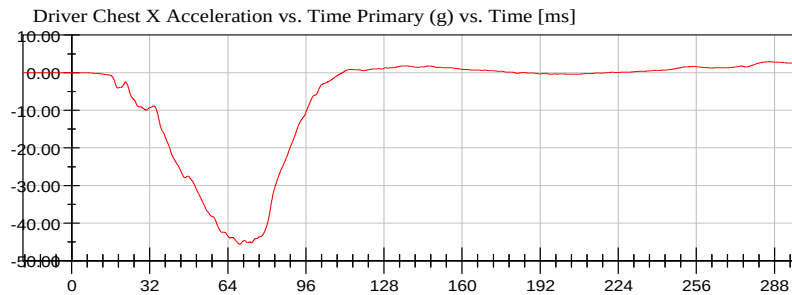
Test Lab: CTF

Test Number: 121019 (MD0310)

Test Date: 10/19/2012

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

Position #2 Hybrid III Small Adult Female (426)



NHTSA

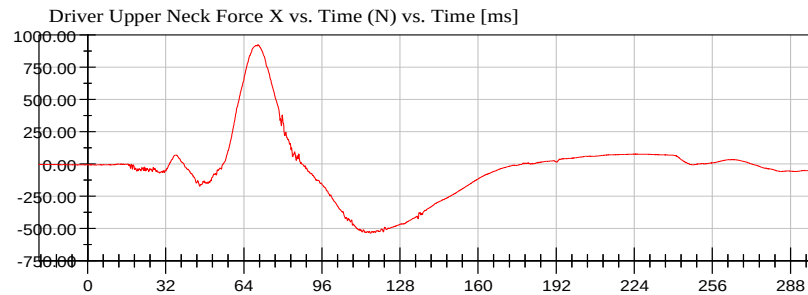
Test Lab: CTF

Test Number: 121019 (MD0310)

Test Date: 10/19/2012

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

Position #2 Hybrid III Small Adult Female (426)



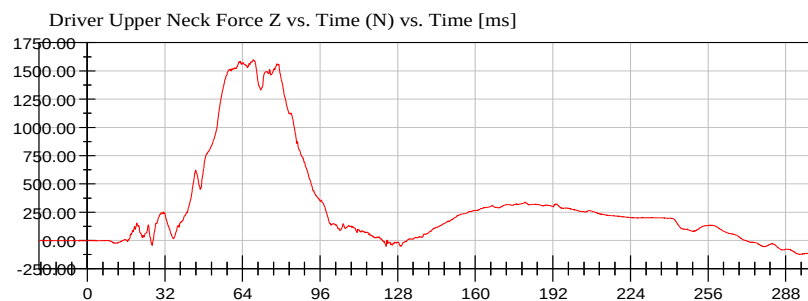
<Max>

926.57 N at 69.76 ms

<Min>

-537.36 N at 115.92 ms

CFC_1000



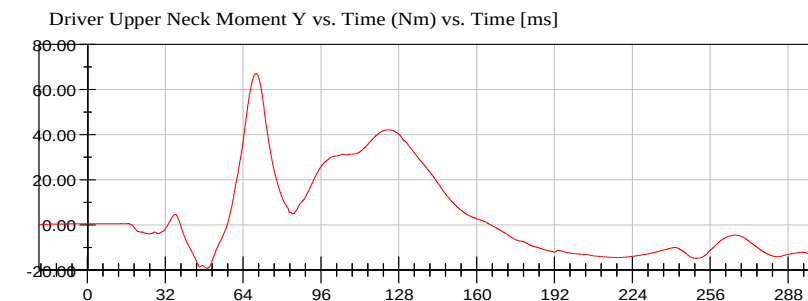
<Max>

1,597.97 N at 68.48 ms

<Min>

-129.70 N at 299.36 ms

CFC_1000



<Max>

67.08 Nm at 69.28 ms

<Min>

-19.24 Nm at 49.12 ms

CFC_600





2013 Jeep Patriot Sport 4X4 MPV into Load Cell Barrier

Date: 10/19/2012
Time: 13:59

Neck Injury Predictor (NIJ)

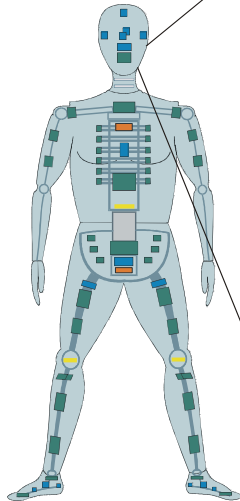
Customer: NHTSA

Test Number: MD0310

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

TRC Inc. Test Lab: CTF

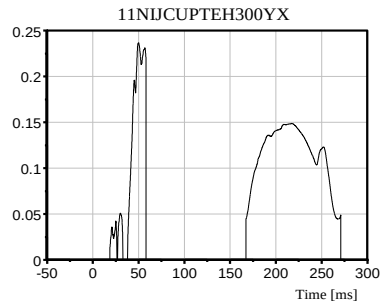
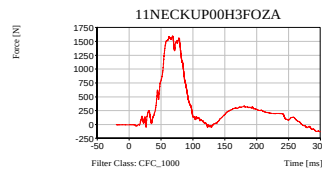
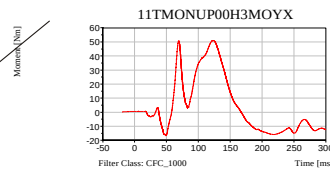
Test Number: 121019



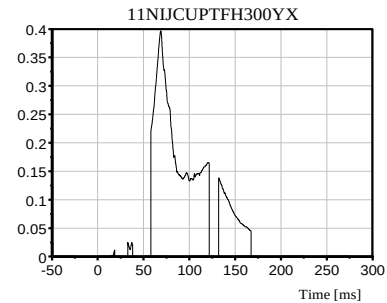
Dummy: HIII 50th Male
Seating Position:

Driver

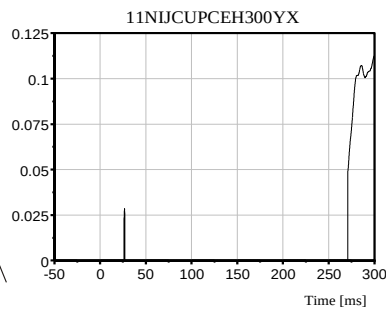
NIJ Source Code: (Fz/Fzc)+(Myc/Myc)



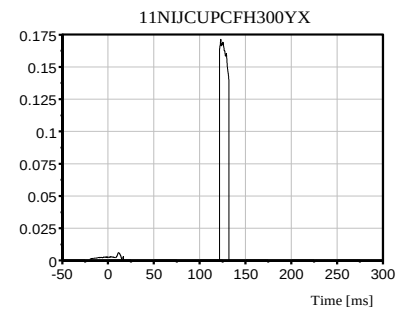
Max [NTE] 0.2368 at 50.00 ms



Max [NTF] 0.3967 at 68.88 ms



Max [NCE] 0.1128 at 300.00 ms



Max [NCF] 0.1714 at 123.12 ms

NHTSA

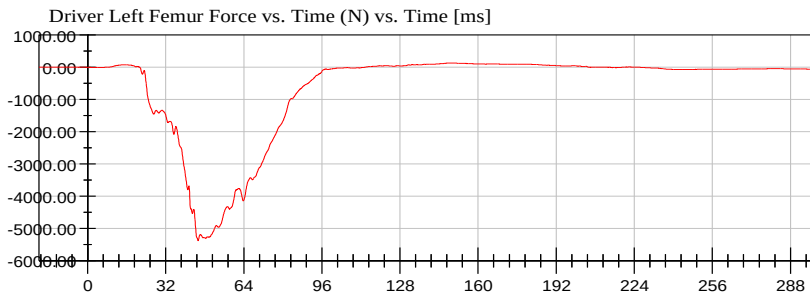
Test Lab: CTF

Test Number: 121019 (MD0310)

Test Date: 10/19/2012

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

Position #2 Hybrid III Small Adult Female (426)



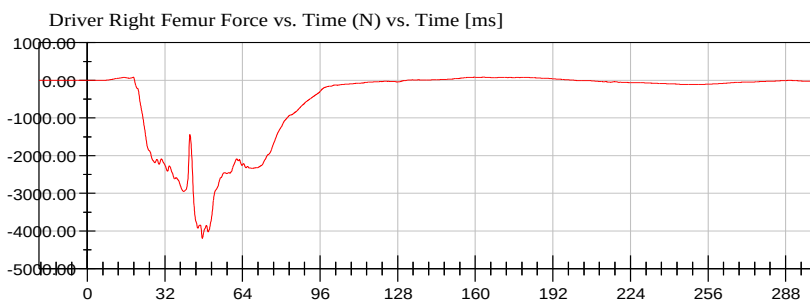
<Max>

131.04 N at 148.88 ms

<Min>

-5,375.37 N at 45.28 ms

CFC_600



<Max>

82.12 N at 163.20 ms

<Min>

-4,198.72 N at 47.44 ms

CFC_600



NHTSA

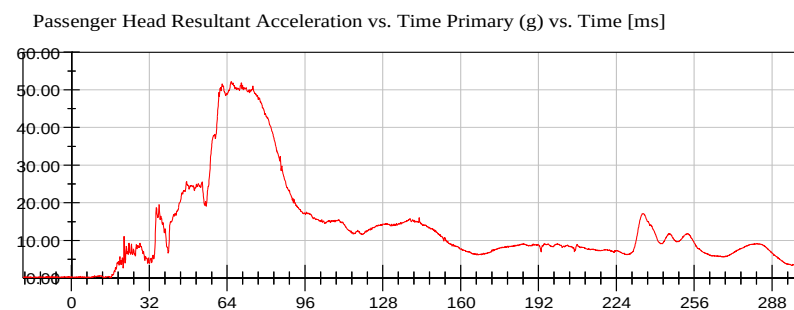
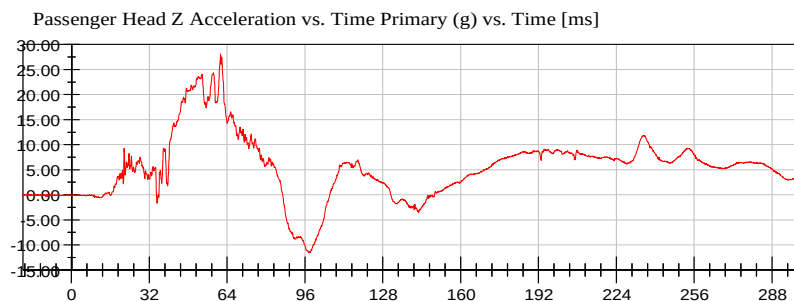
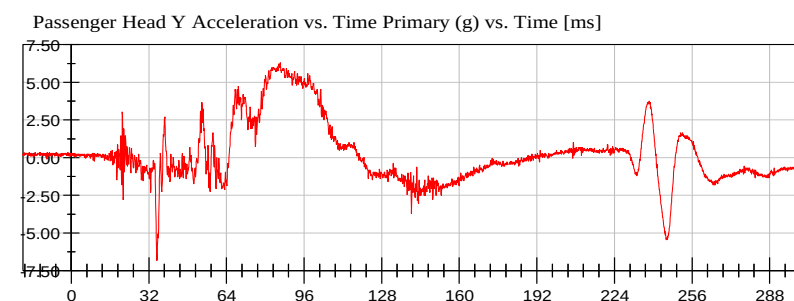
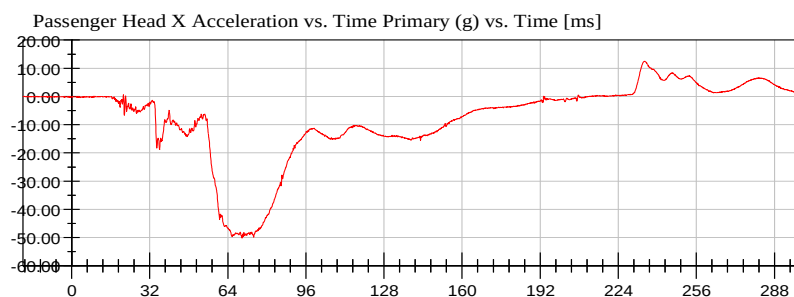
Test Lab: CTF

Test Number: 121019 (MD0310)

Test Date: 10/19/2012

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

Position #2 Hybrid III Small Adult Female (426)



NHTSA

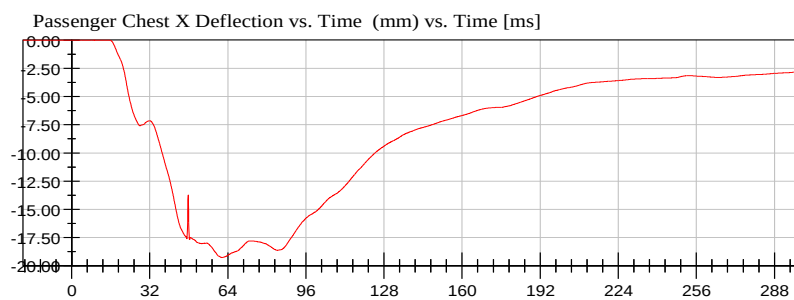
Test Lab: CTF

Test Number: 121019 (MD0310)

Test Date: 10/19/2012

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

Position #2 Hybrid III Small Adult Female (426)



<Max>

0.00 mm at 9.36 ms

<Min>

-19.26 mm at 61.60 ms

CFC_600



NHTSA

Test Lab: CTF

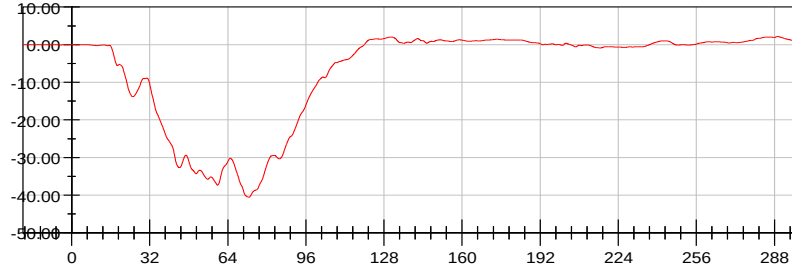
Test Number: 121019 (MD0310)

Test Date: 10/19/2012

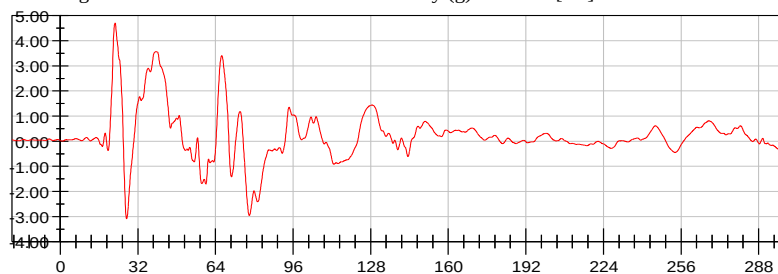
Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (426)

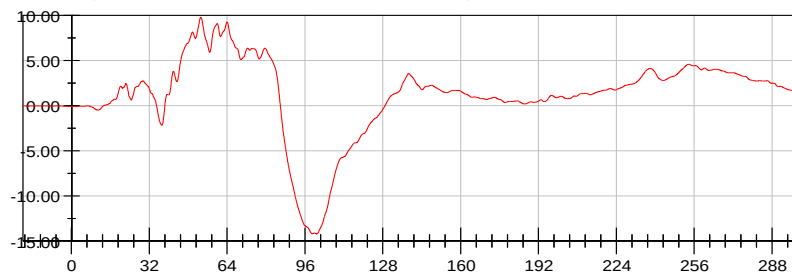
Passenger Chest X Acceleration vs. Time Primary (g) vs. Time [ms]



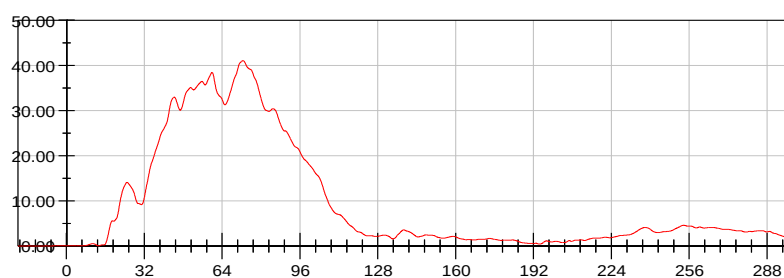
Passenger Chest Y Acceleration vs. Time Primary (g) vs. Time [ms]



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

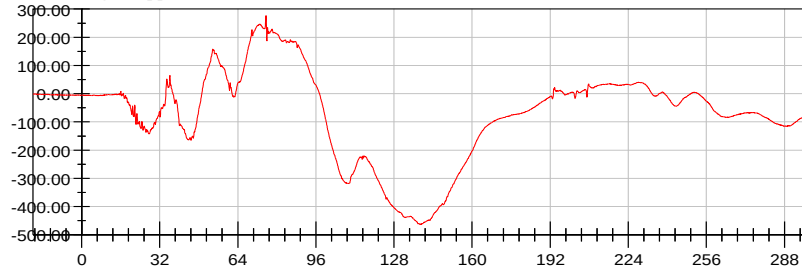
Test Number: 121019 (MD0310)

Test Date: 10/19/2012

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>

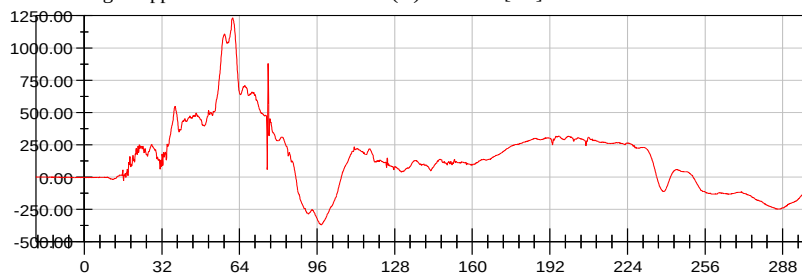
276.66 N at 75.52 ms

<Min>

-463.36 N at 138.64 ms

CFC_1000

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



<Max>

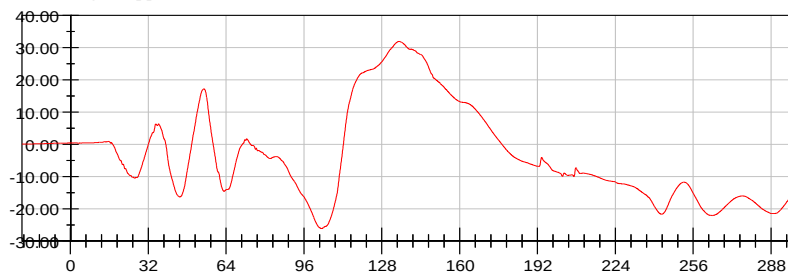
1,231.82 N at 61.20 ms

<Min>

-370.56 N at 97.68 ms

CFC_1000

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



<Max>

31.95 Nm at 135.12 ms

<Min>

-26.12 Nm at 103.28 ms

CFC_600





2013 Jeep Patriot Sport 4X4 MPV into Load Cell Barrier

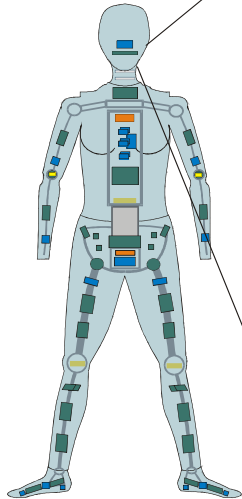
Date: 10/19/2012
Time: 13:59

Neck Injury Predictor (NIJ)

Customer: NHTSA

Test Number: MD0310

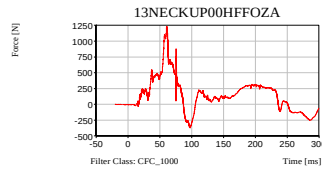
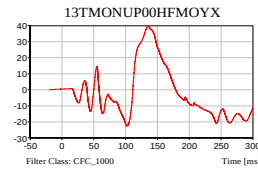
Test Orientation = Frontal
Fzc(Tension) = 4287
Fzc(Compression) = 3880
Myc(Extension) = 67
Myc(Flexion) = 155



Dummy: HIII 5th Female
Seating Position:

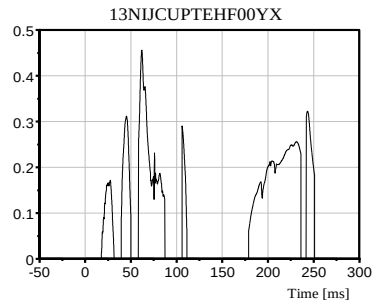
Right Front Passenger

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

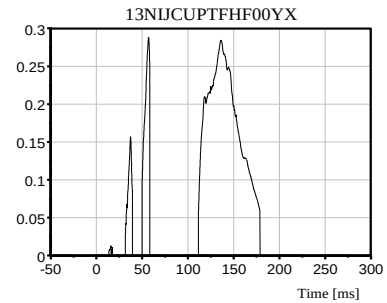


TRC Inc. Test Lab: CTF

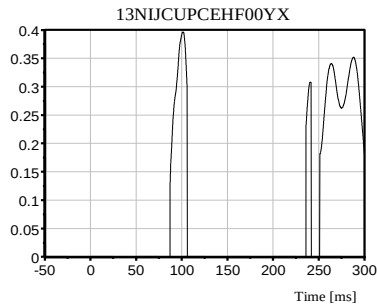
Test Number: 121019



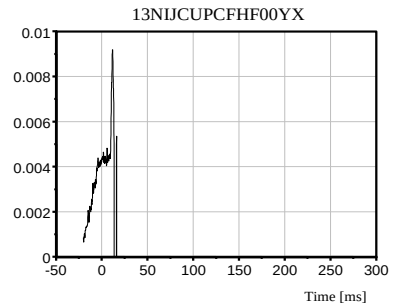
Max [NTE] 0.4562 at 61.92 ms



Max [NTF] 0.2880 at 57.04 ms



Max [NCE] 0.3964 at 101.92 ms



Max [NCF] 0.0092 at 11.92 ms

NHTSA

Test Lab: CTF

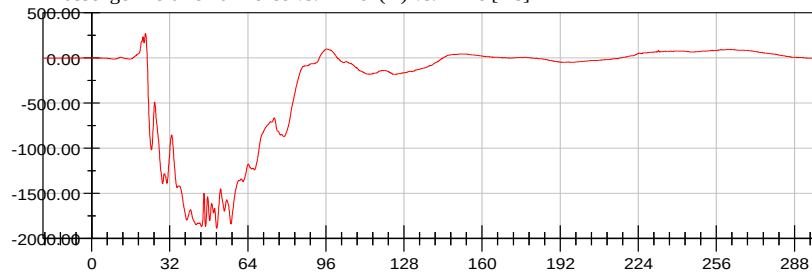
Test Number: 121019 (MD0310)

Test Date: 10/19/2012

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

Position #2 Hybrid III Small Adult Female (426)

Passenger Left Femur Force vs. Time (N) vs. Time [ms]



<Max>

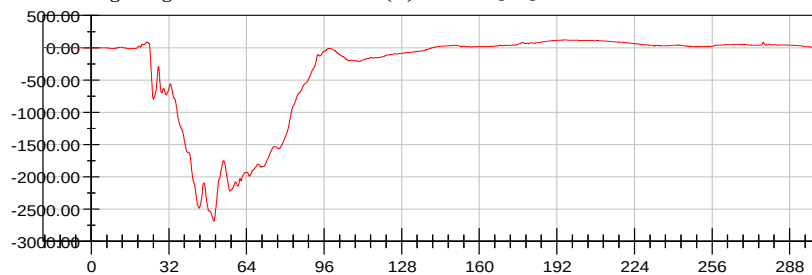
272.47 N at 22.08 ms

<Min>

-1,884.09 N at 51.28 ms

CFC_600

Passenger Right Femur Force vs. Time (N) vs. Time [ms]



<Max>

120.03 N at 195.12 ms

<Min>

-2,688.55 N at 50.48 ms

CFC_600



APPENDIX C
DUMMY CALIBRATION AND PERFORMANCE VERIFICATION

Pre-Test Calibration Sheets
Driver S/N 037

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

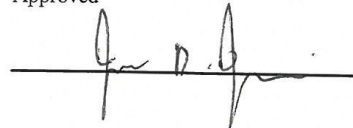
Test meets specifications.

Comments:

Technician



Approved



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

10.16.2012 07:22:53 614

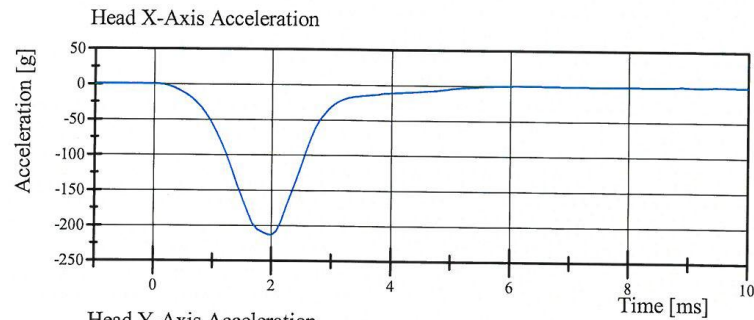


Transportation Research Center Inc.

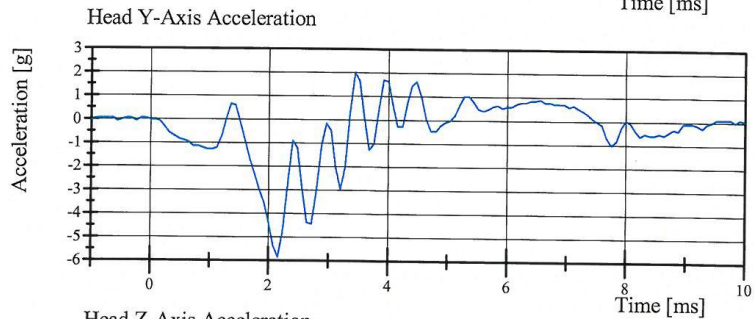
Front Head Drop

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

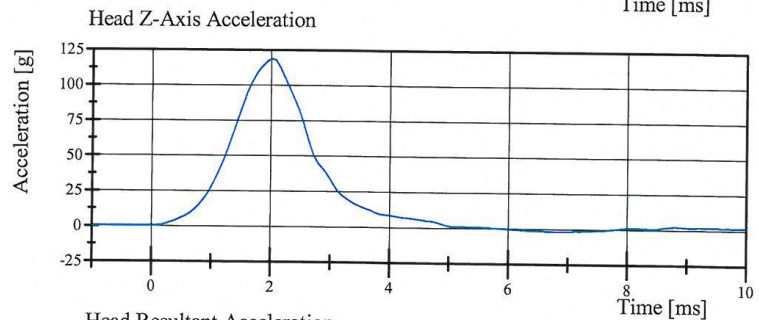
Test Date: 10/16/2012



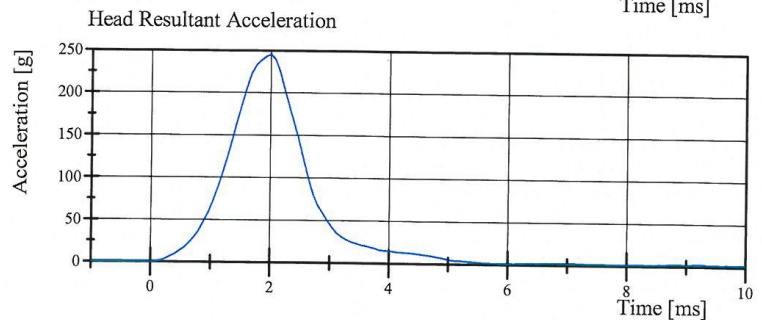
Filter Class: CFC_1000
Max: 0.3 gn at 6.2 ms
Min: -213.9 gn at 2.0 ms



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

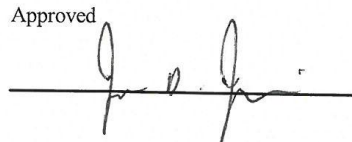
Test Date: 10/16/2012

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

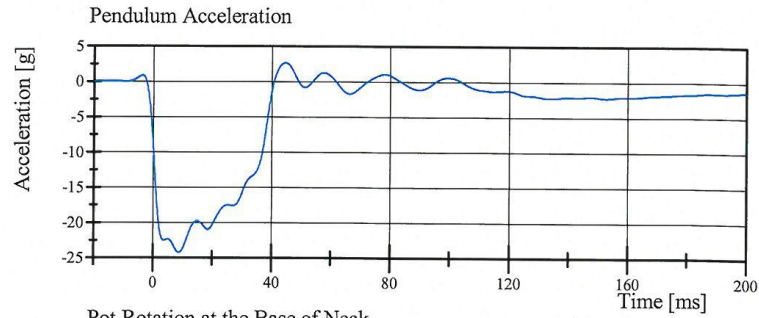


Transportation Research Center Inc.

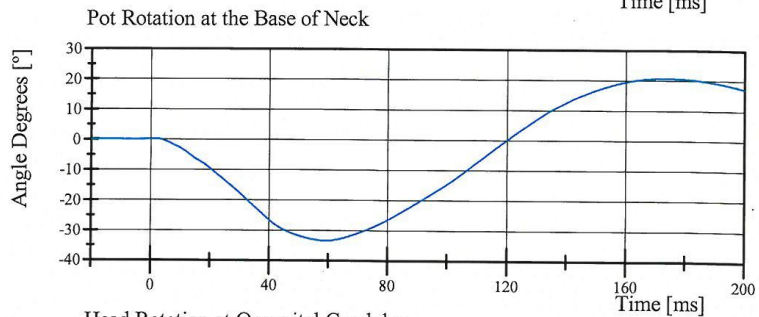
Neck Flexion

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

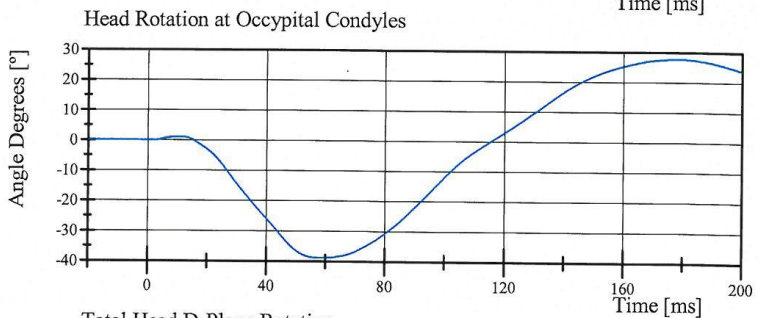
Test Date: 10/16/2012



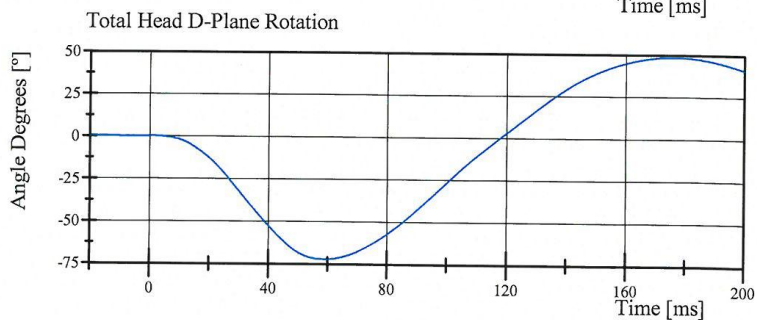
Filter Class: CFC_60
Max: 2.6 gn at 44.5 ms
Min: -24.3 gn at 8.9 ms



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

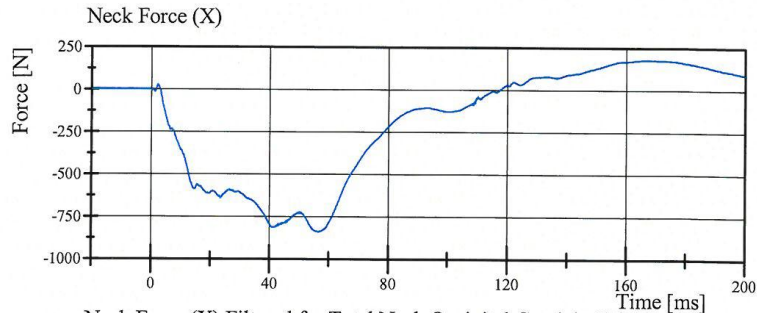


Transportation Research Center Inc.

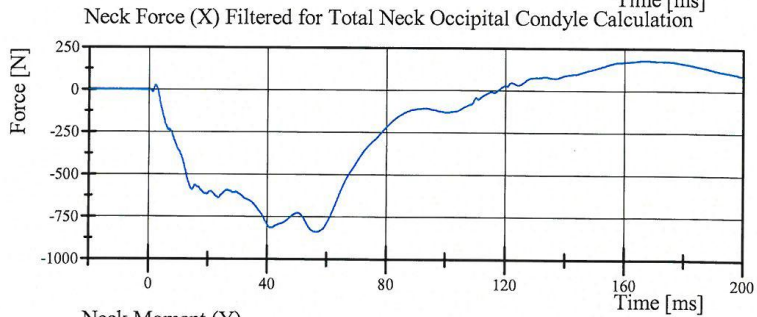
Neck Flexion

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

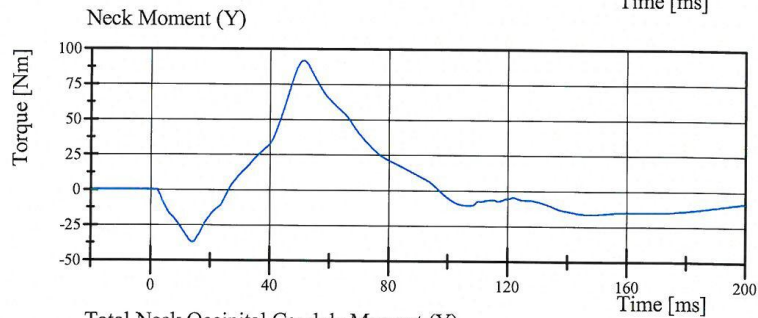
Test Date: 10/16/2012



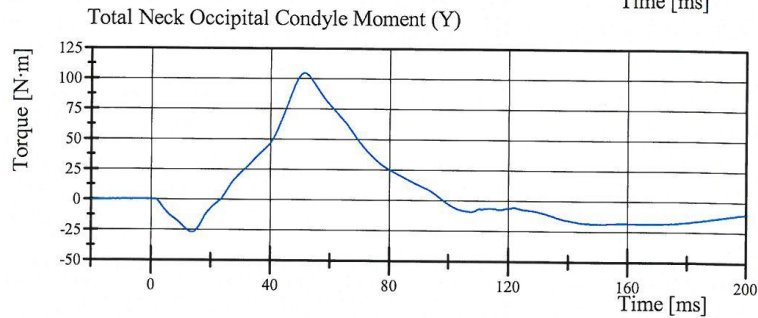
Filter Class: CFC_1000
Max: 179.9 N at 166.0 ms
Min: -839.9 N at 56.6 ms



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

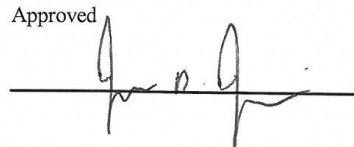
Test meets specifications.

Comments:

Technician



Approved



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

10.16.2012 08:38:44 3027

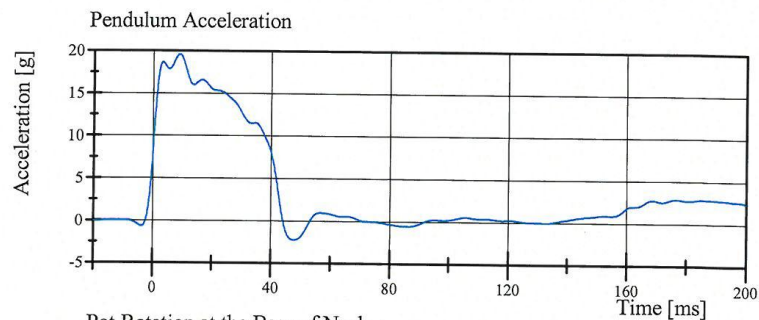


Transportation Research Center Inc.

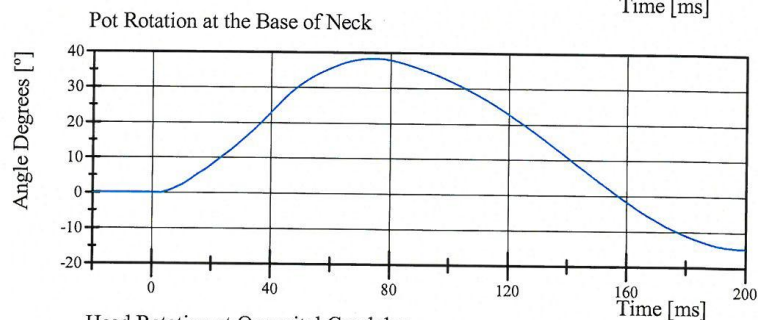
Neck Extension

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

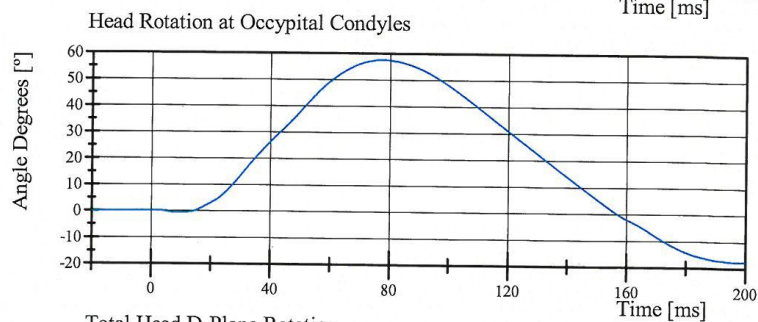
Test Date: 10/16/2012



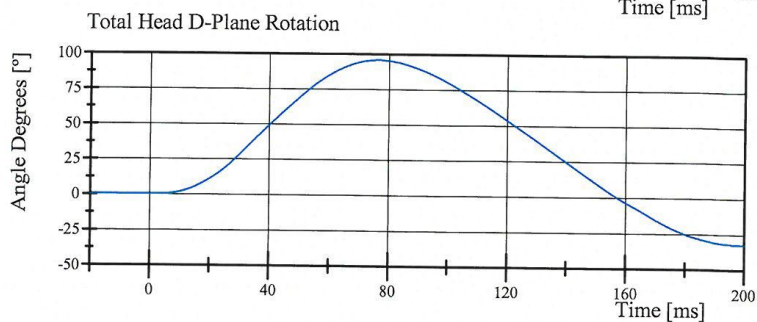
Filter Class: CFC_60
Max: 19.5 gn at 8.9 ms
Min: -2.3 gn at 47.7 ms



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

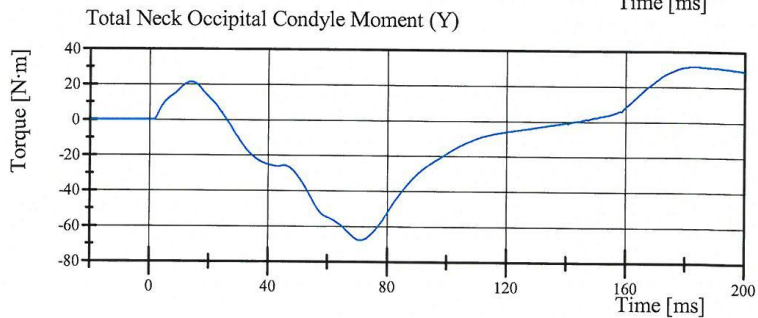
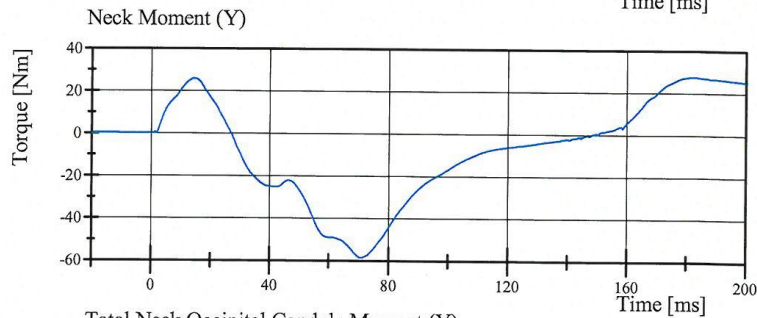
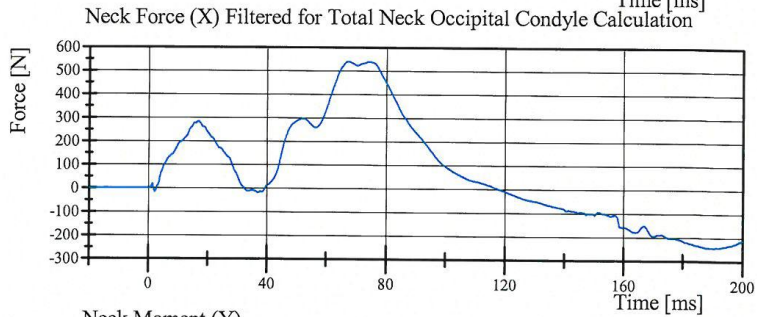
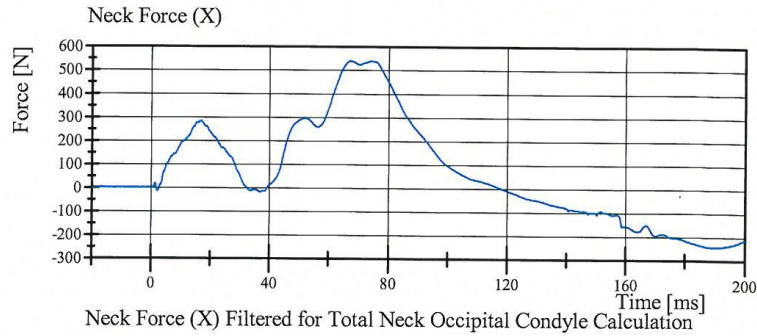


Transportation Research Center Inc.

Neck Extension

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

Test Date: 10/16/2012



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

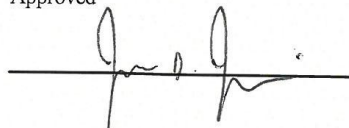
Test meets specifications.

Comments:

Technician



Approved



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

10.16.2012 10:30:11 399

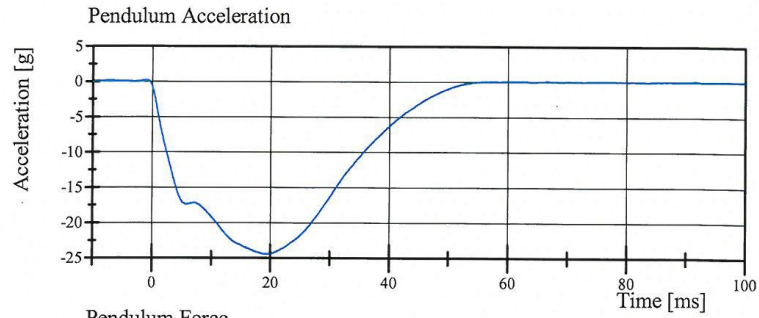


Transportation Research Center Inc.

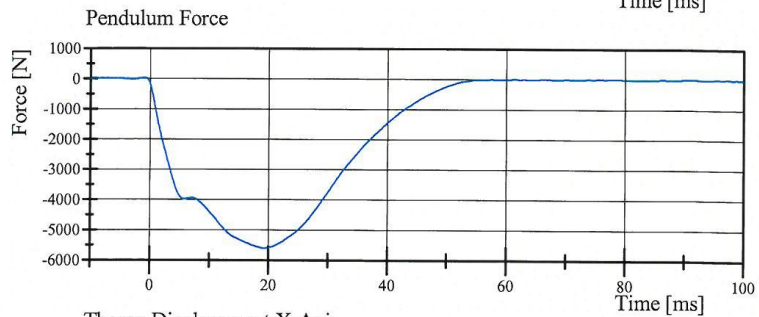
Front Thorax

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

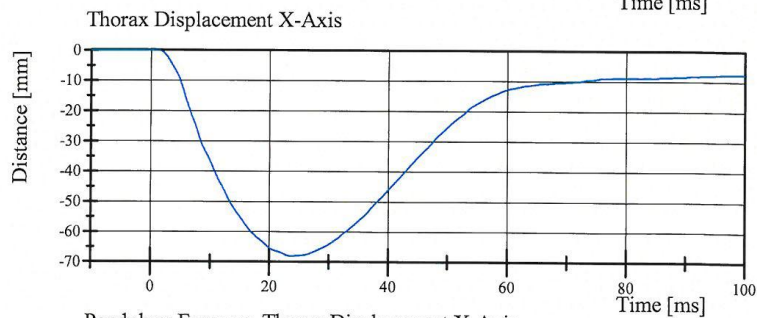
Test Date: 10/16/2012



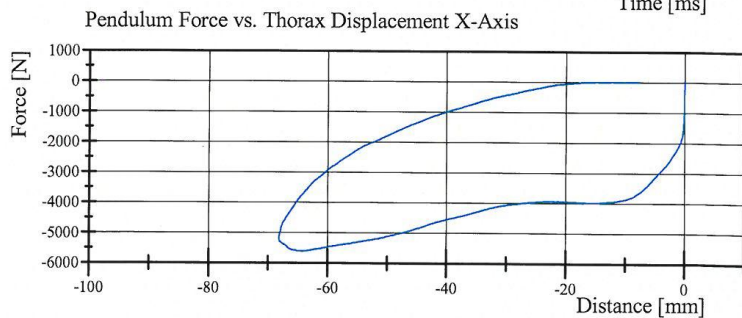
Filter Class: CFC_180
Max: 0.1 gn at -1.0 ms
Min: -24.5 gn at 19.3 ms



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

Date: 10/16/2012

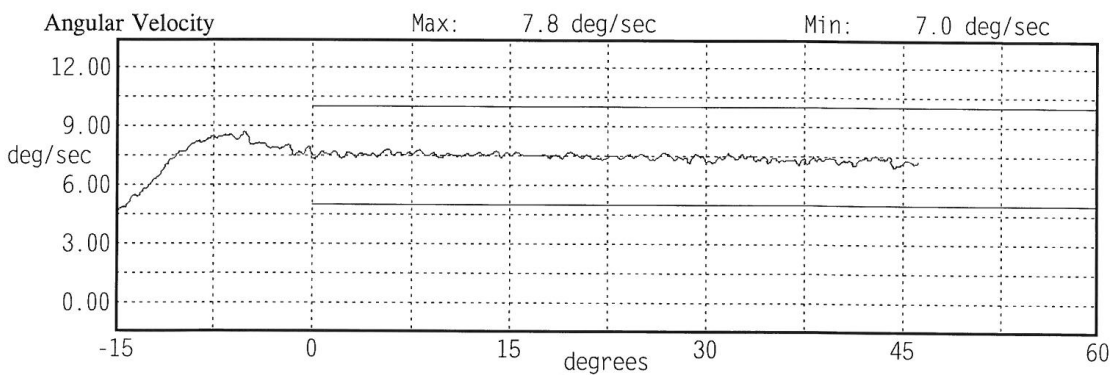
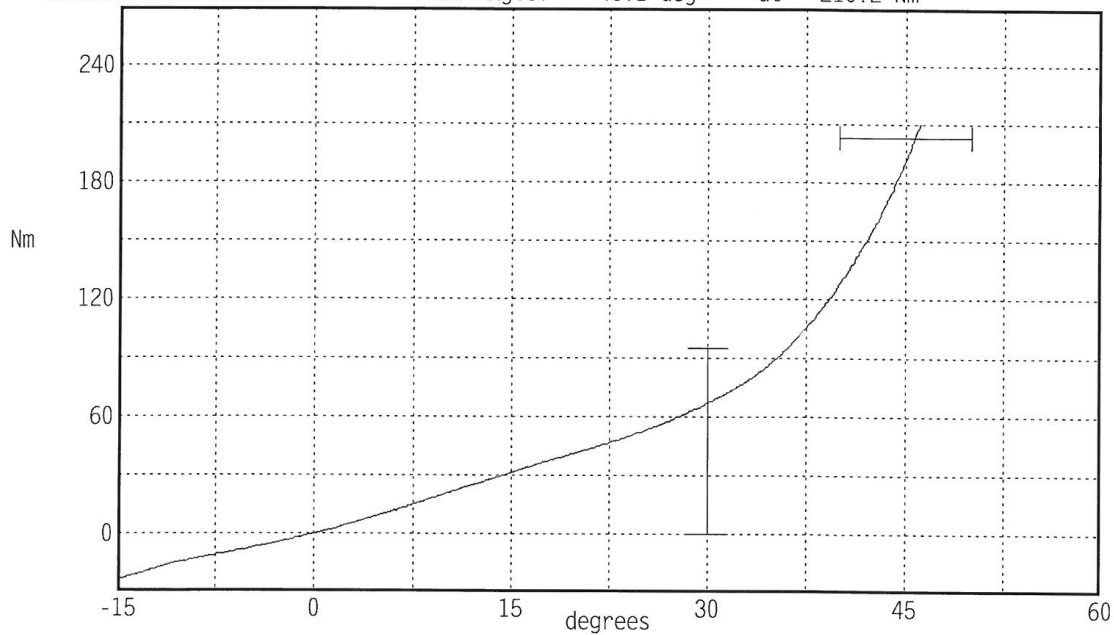
Test Number: 037C10

Time: 07:55

Comments:

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

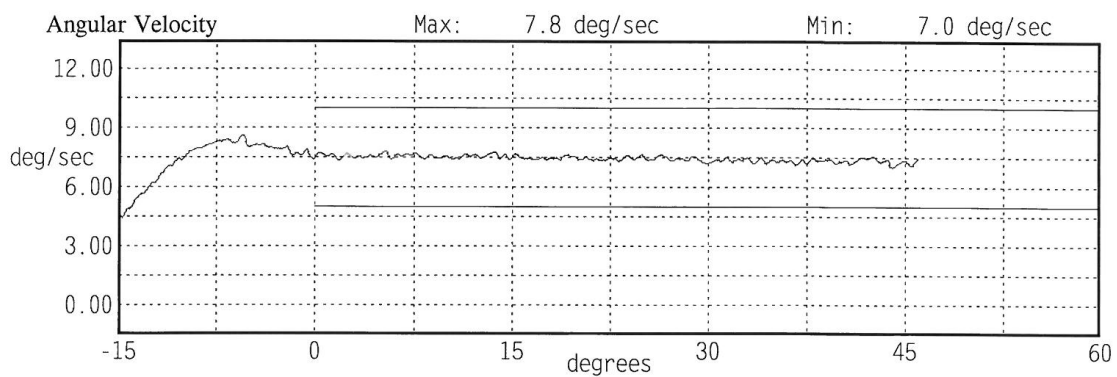
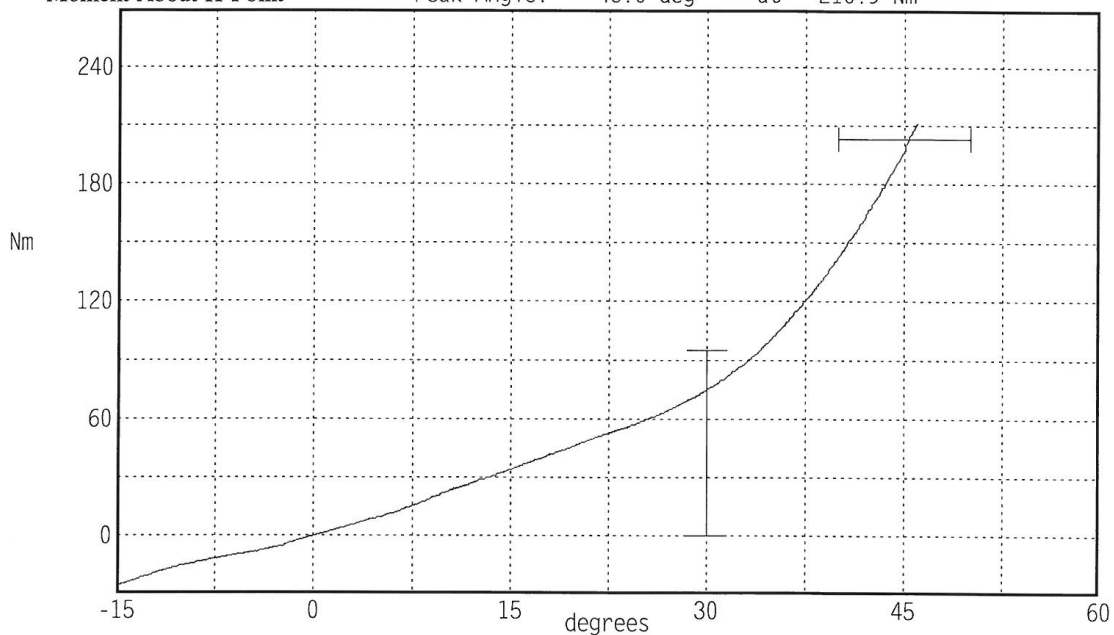
Hybrid III Hip Range of Motion

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

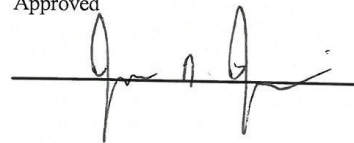
Test meets specifications.

Comments:

Technician



Approved



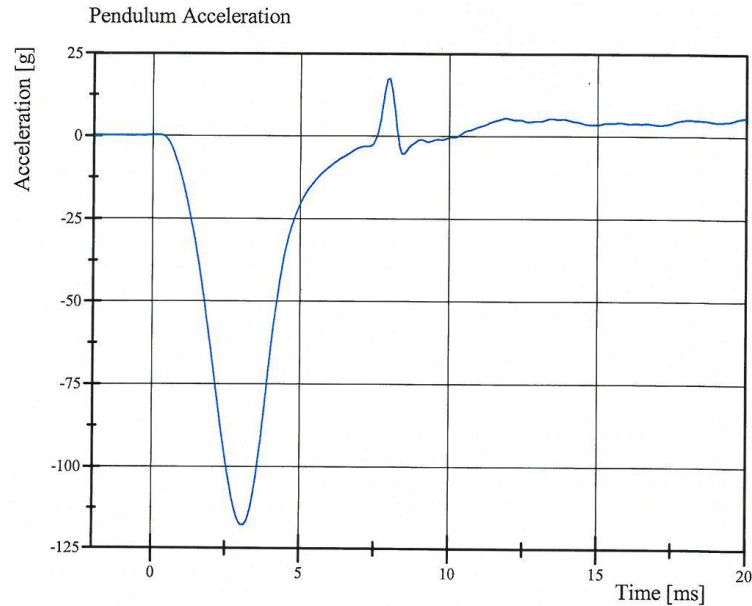
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.16.2012 08:54:30 1824

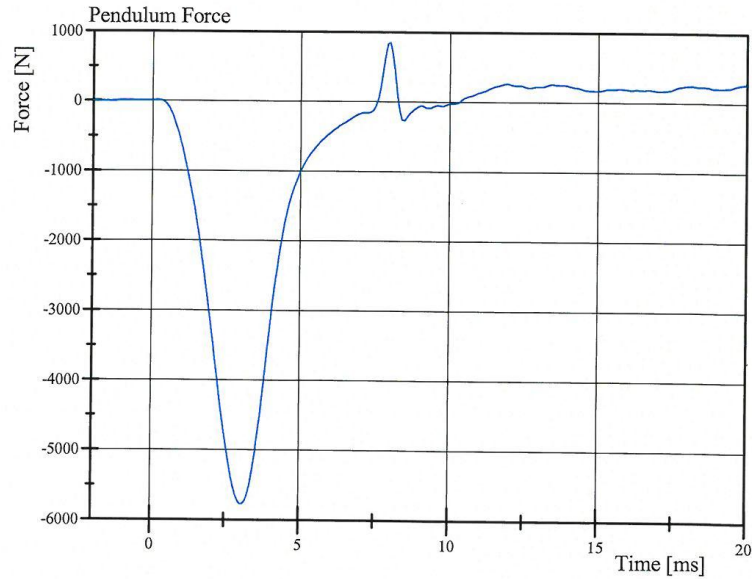


Transportation Research Center Inc.

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

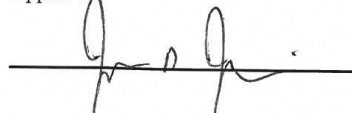
Test meets specifications.

Comments:

Technician



Approved



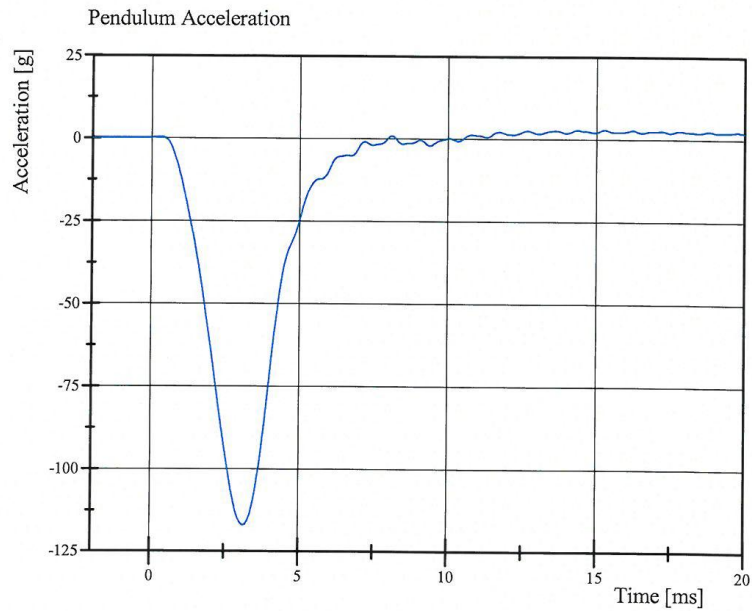
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.16.2012 09:06:19 1859

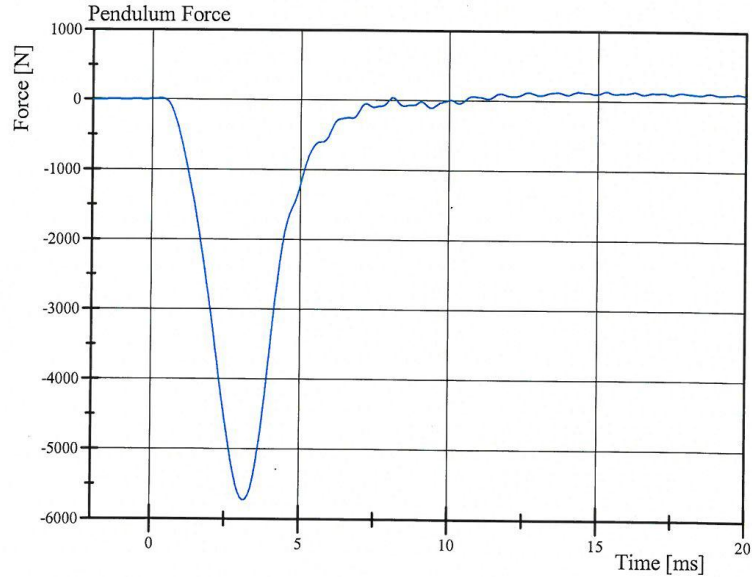


Transportation Research Center Inc.

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

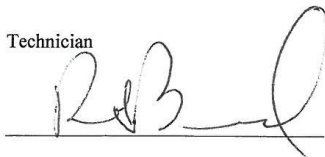


Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 037
Calibration No. 10

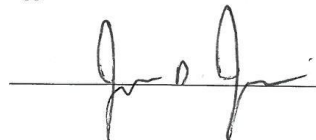
Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	886	Yes
B	Shoulder Pivot Height	505.5 - 520.7	519	Yes
C	H-Point Height	83.8 - 88.9	86	Yes
D	H-Point From Seatback	134.6 - 139.7	138	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	92	Yes
F	Thigh Clearance	139.7 - 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



Driver S/N 037

Post-Test Calibration Sheets

Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 037 Certification No. 11-1

Test Date: 10/20/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	248.9 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	2.4 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

10.20.2012 09:27:36 612

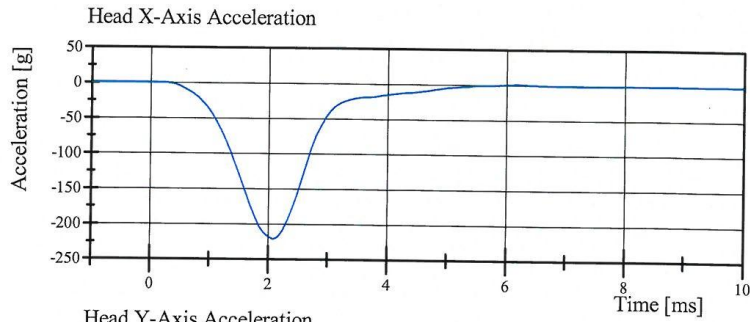


Transportation Research Center Inc.

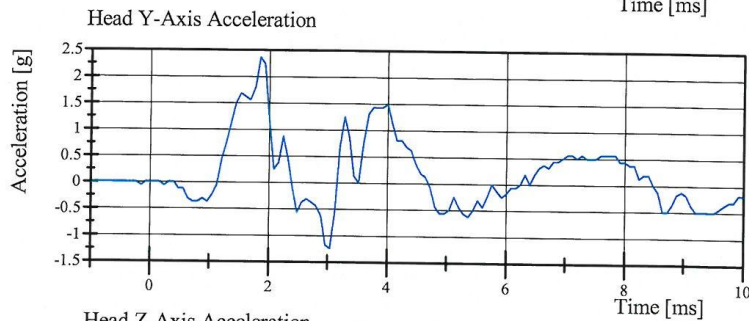
Front Head Drop

HIII 50th Serial No. 037 Certification No. 11-1

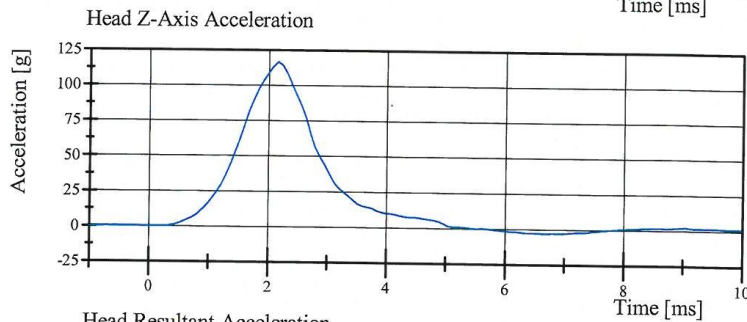
Test Date: 10/20/2012



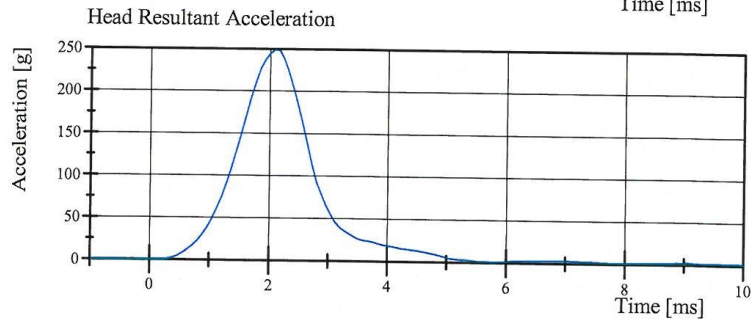
Filter Class: CFC_1000
Max: 0.9 gn at 6.2 ms
Min: -221.5 gn at 2.1 ms



Filter Class: CFC_1000
Max: 2.4 gn at 1.8 ms
Min: -1.2 gn at 3.0 ms



Filter Class: CFC_1000
Max: 116.4 gn at 2.2 ms
Min: -3.0 gn at 6.6 ms



Filter Class: CFC_1000
Max: 248.9 gn at 2.1 ms
Min: 0.0 gn at -1.0 ms

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

10.20.2012 09:27:43 612



Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 11-1

Test Date: 10/20/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.941 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	37.4 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-23.89 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-21.84 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-15.50 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-15.50 g	Yes
Total Head D-Plane Rotation			
Peak	(-64) - (-78) °	-67.3 °	Yes
Time of Peak	57 - 64 ms	59.7 ms	Yes
Total Head D-Plane Rotation Decay to 0°	113 - 128 ms	118.2 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	88 - 108 N·m	104.5 N·m	Yes
Time of Peak	47 - 58 ms	50.5 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	97 - 107 ms	98.6 ms	Yes

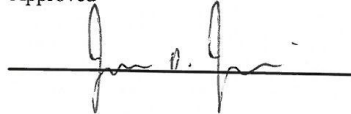
Test meets specifications.

Comments:

Technician



Approved



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

10.20.2012 13:30:52 2947

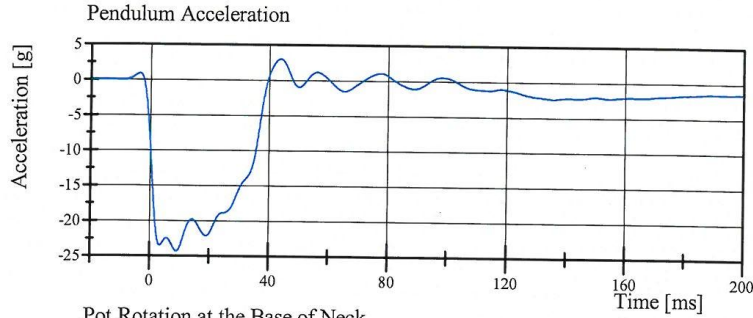


Transportation Research Center Inc.

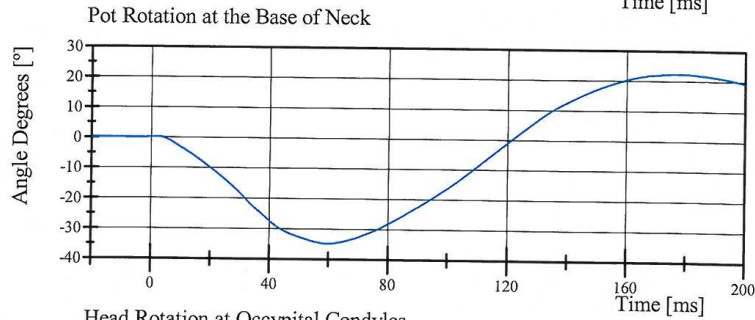
Neck Flexion

HIII 50th Serial No. 037 Certification No. 11-1

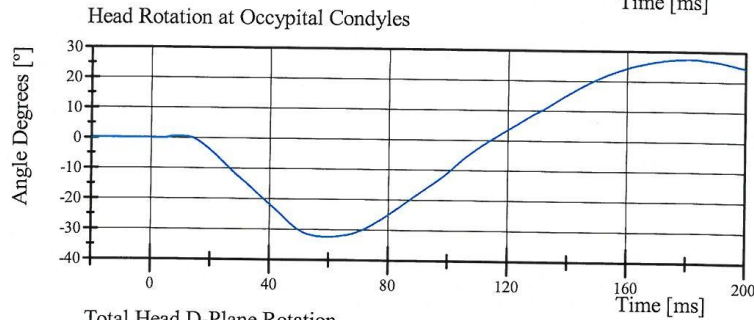
Test Date: 10/20/2012



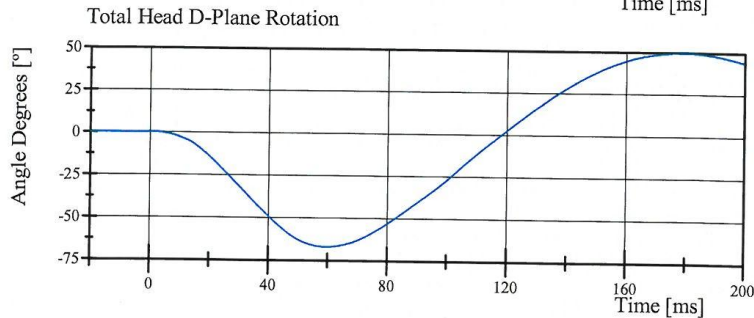
Filter Class: CFC_60
Max: 3.0 gn at 43.8 ms
Min: -24.3 gn at 9.0 ms



Filter Class: CFC_60
Max: 22.4 ° at 177.2 ms
Min: -34.8 ° at 59.8 ms



Filter Class: CFC_60
Max: 27.4 ° at 181.0 ms
Min: -32.5 ° at 59.6 ms



Filter Class: CFC_60
Max: 49.7 ° at 179.1 ms
Min: -67.3 ° at 59.7 ms

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

10.20.2012 13:31:00 2947

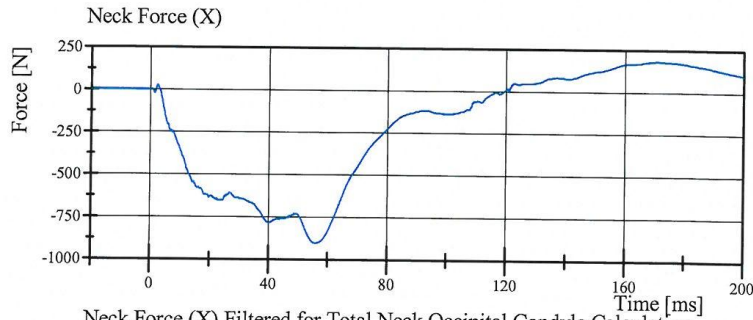


Transportation Research Center Inc.

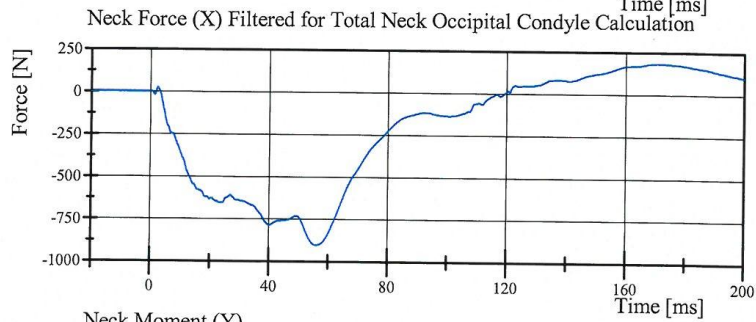
Neck Flexion

HIII 50th Serial No. 037 Certification No. 11-1

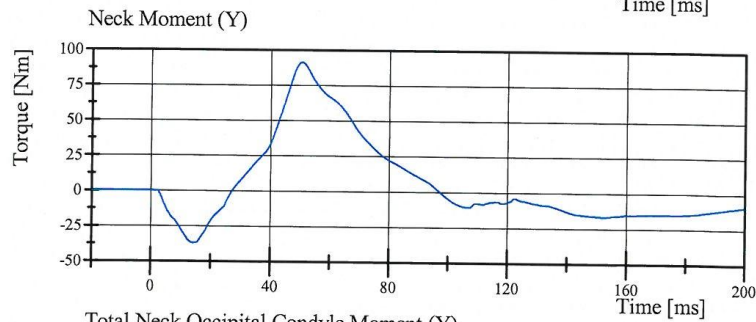
Test Date: 10/20/2012



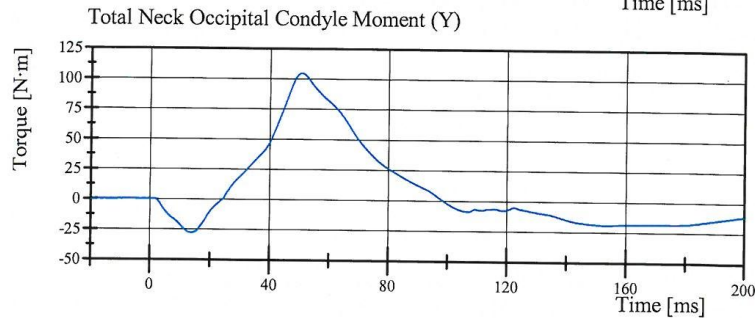
Filter Class: CFC_1000
Max: 182.8 N at 170.4 ms
Min: -904.5 N at 55.8 ms



Filter Class: CFC_600
Max: 182.6 N at 170.5 ms
Min: -903.8 N at 55.9 ms



Filter Class: CFC_600
Max: 91.3 Nm at 50.3 ms
Min: -37.4 Nm at 14.2 ms



Filter Class: Without_(Consta
Max: 104.5 N·m at 50.5 ms
Min: -27.8 N·m at 13.7 ms

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

10.20.2012 13:31:01 2947



Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 11-1

Test Date: 10/20/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-5.974 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	41.5 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	18.65 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	15.74 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	14.24 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	14.24 g	Yes
Total Head D-Plane Rotation			
Peak	81 - 106 °	91.8 °	Yes
Time of Peak	72 - 82 ms	78.4 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	159.4 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	(-53) - (-80) N·m	-67.3 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	145.7 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



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

10.20.2012 14:10:13 3029

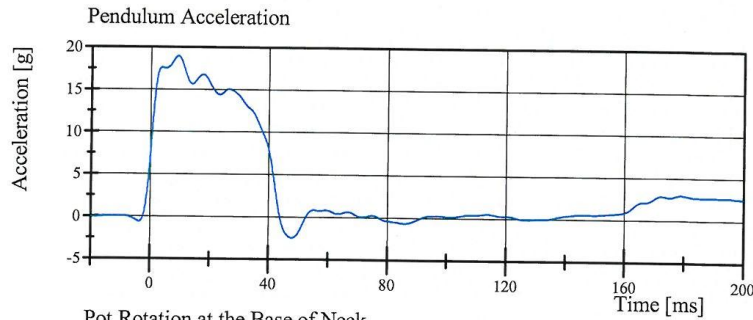


Transportation Research Center Inc.

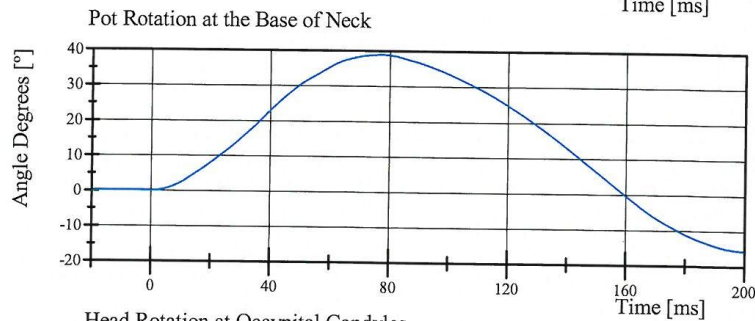
Neck Extension

HIII 50th Serial No. 037 Certification No. 11-1

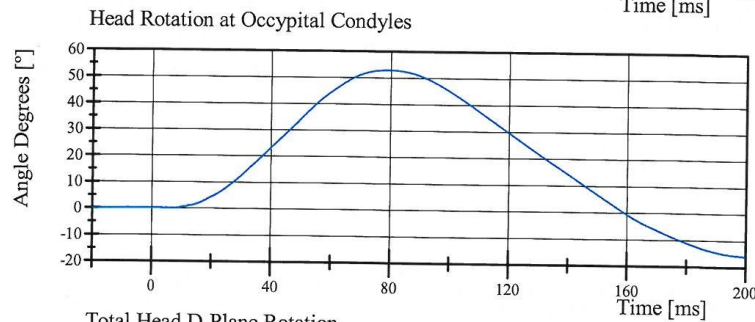
Test Date: 10/20/2012



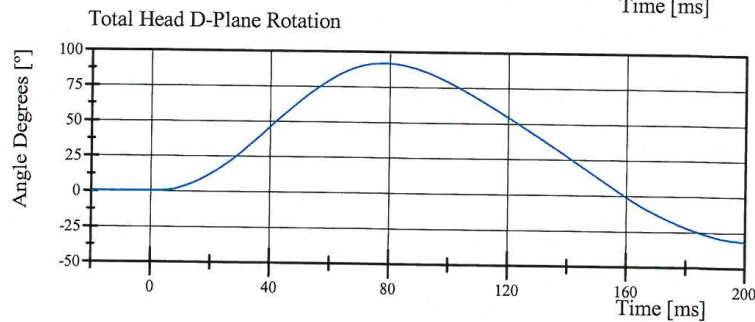
Filter Class: CFC_60
Max: 18.9 gn at 9.1 ms
Min: -2.5 gn at 47.9 ms



Filter Class: CFC_60
Max: 38.9 ° at 77.2 ms
Min: -15.7 ° at 200.0 ms



Filter Class: CFC_60
Max: 52.9 ° at 79.3 ms
Min: -15.9 ° at 200.0 ms



Filter Class: CFC_60
Max: 91.8 ° at 78.4 ms
Min: -31.7 ° at 200.0 ms

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

10.20.2012 14:10:21 3029

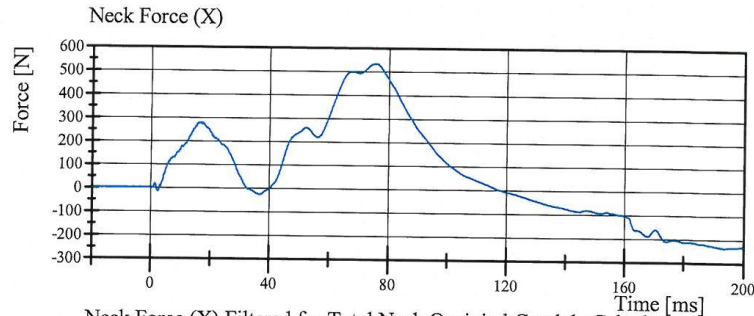


Transportation Research Center Inc.

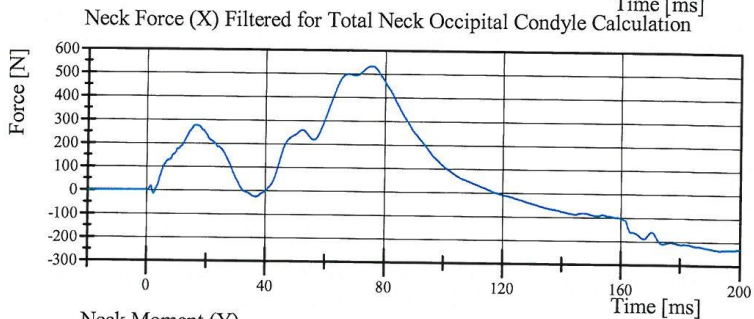
Neck Extension

HIII 50th Serial No. 037 Certification No. 11-1

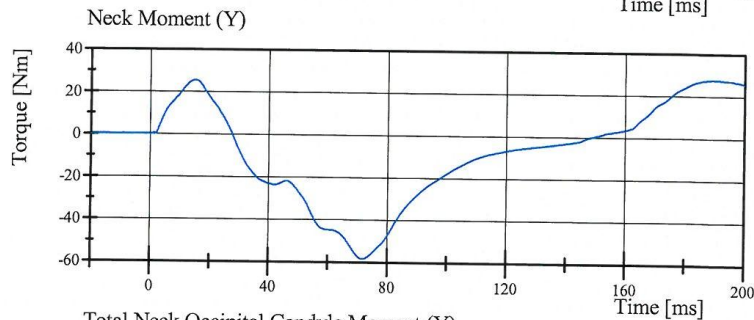
Test Date: 10/20/2012



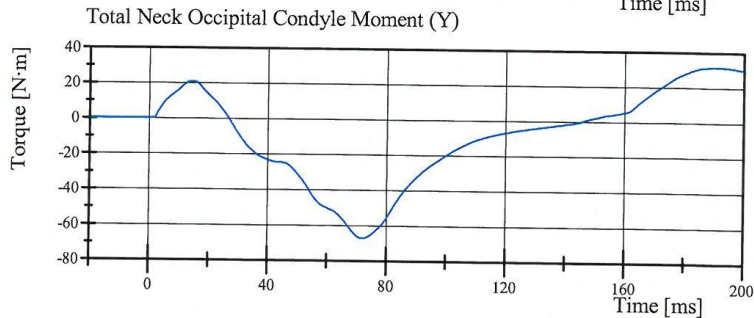
Filter Class: CFC_1000
Max: 533.5 N at 75.8 ms
Min: -236.3 N at 193.4 ms



Filter Class: CFC_600
Max: 533.1 N at 75.8 ms
Min: -236.1 N at 193.4 ms



Filter Class: CFC_600
Max: 27.6 Nm at 189.3 ms
Min: -58.4 Nm at 71.7 ms



Filter Class: Without_(Consta
Max: 31.6 N·m at 190.2 ms
Min: -67.3 N·m at 71.8 ms

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

10.20.2012 14:10:22 3029



Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 037 Certification No. 11-1

Test Date: 10/20/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.659 m/s	Yes
Probe Force Peak	(-5,160) - (-5,893) N	-5,689.3 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-68.41 mm	Yes
Internal Hysteresis	65 - 85 %	73.2 %	Yes

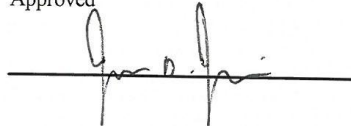
Test meets specifications.

Comments:

Technician



Approved



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

10.20.2012 11:11:37 406

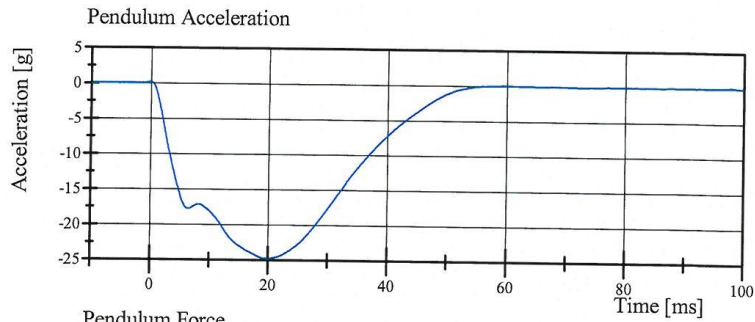


Transportation Research Center Inc.

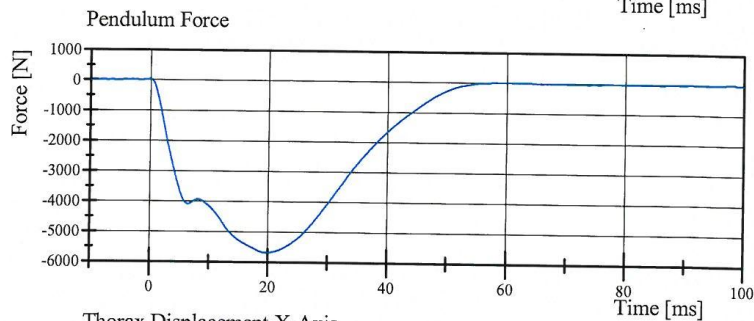
Front Thorax

HIII 50th Serial No. 037 Certification No. 11-1

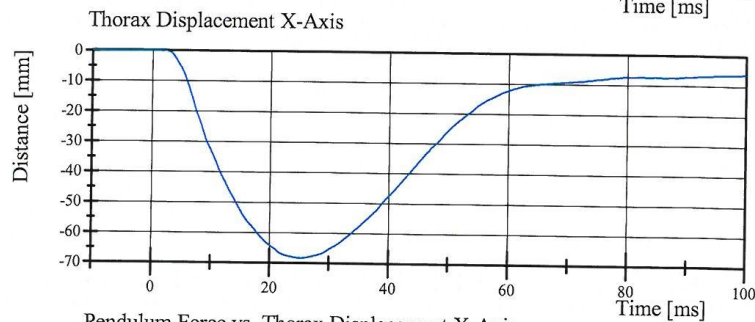
Test Date: 10/20/2012



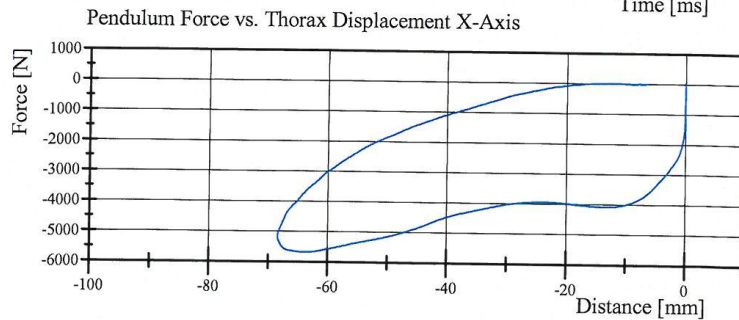
Filter Class: CFC_180
Max: 0.1 gn at -0.2 ms
Min: -24.8 gn at 19.8 ms



Filter Class: CFC_180
Max: 21.4 N at -0.2 ms
Min: -5,689.3 N at 19.8 ms



Filter Class: CFC_600
Max: 0.0 mm at -9.4 ms
Min: -68.4 mm at 25.3 ms



Filter Class: CFC_180
Max: 21.4 N at -0.0 mm
Min: -5,689.3 N at -63.9 mm

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

10.20.2012 11:11:49 406



Transportation Research Center Inc

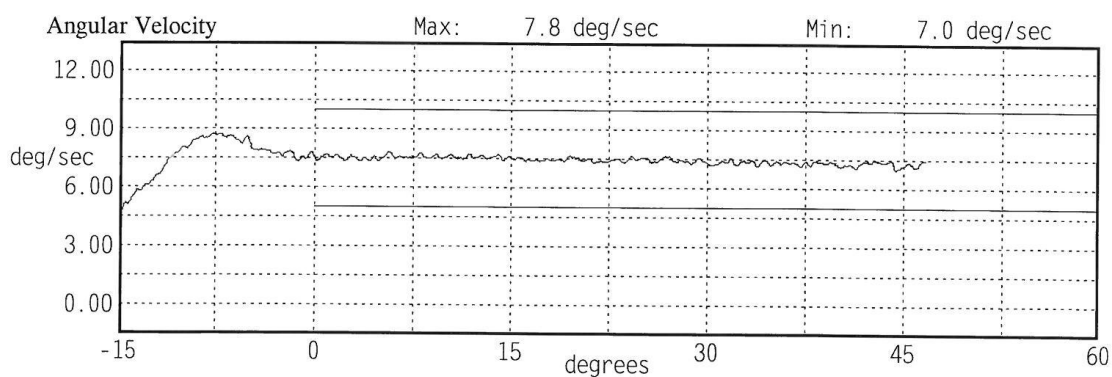
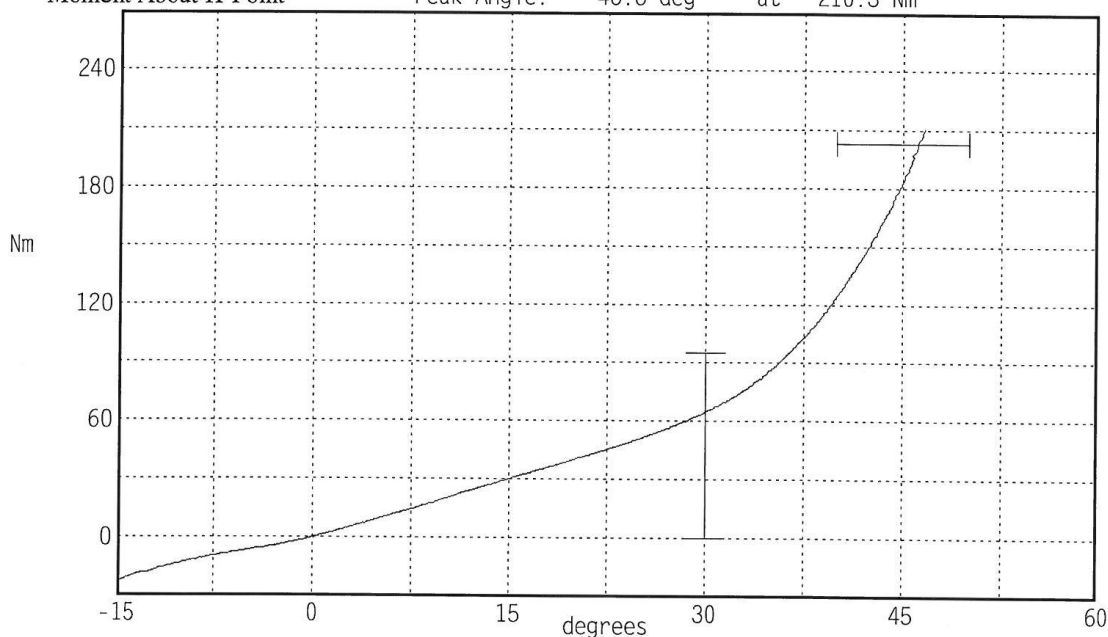
Hybrid III Hip Range of Motion

Serial Number: 037L
 Test Number: 037C11
 Comments:

Date: 10/20/2012
 Time: 08:13

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.4 °C Pass
Humidity	10 - 70	36 % Pass
Moment at 30 deg	<= 94.9	64.5 Nm Pass
Angle at 203 Nm	40.0 - 50.0	46.2 deg Pass
Average Velocity	5.0 - 10.0	7.4 deg/sec Pass

Moment About H-Point
 Peak Moment: 210.3 Nm at 46.6 deg
 Peak Angle: 46.6 deg at 210.3 Nm



Transportation Research Center Inc

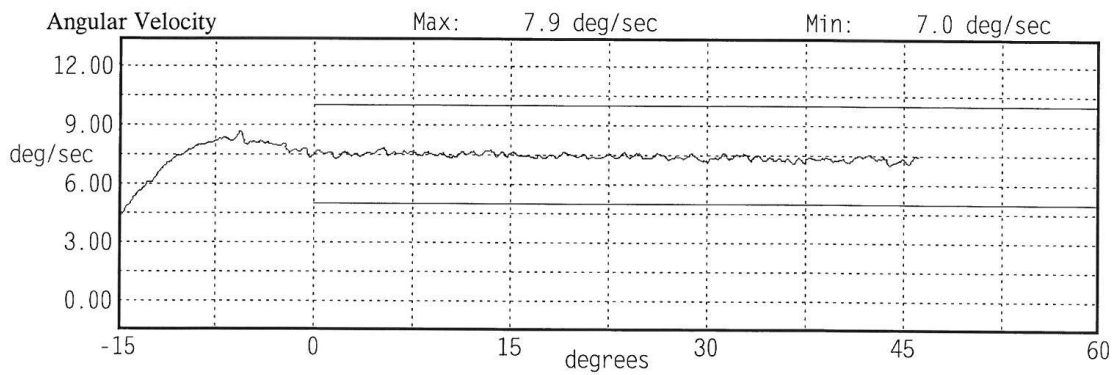
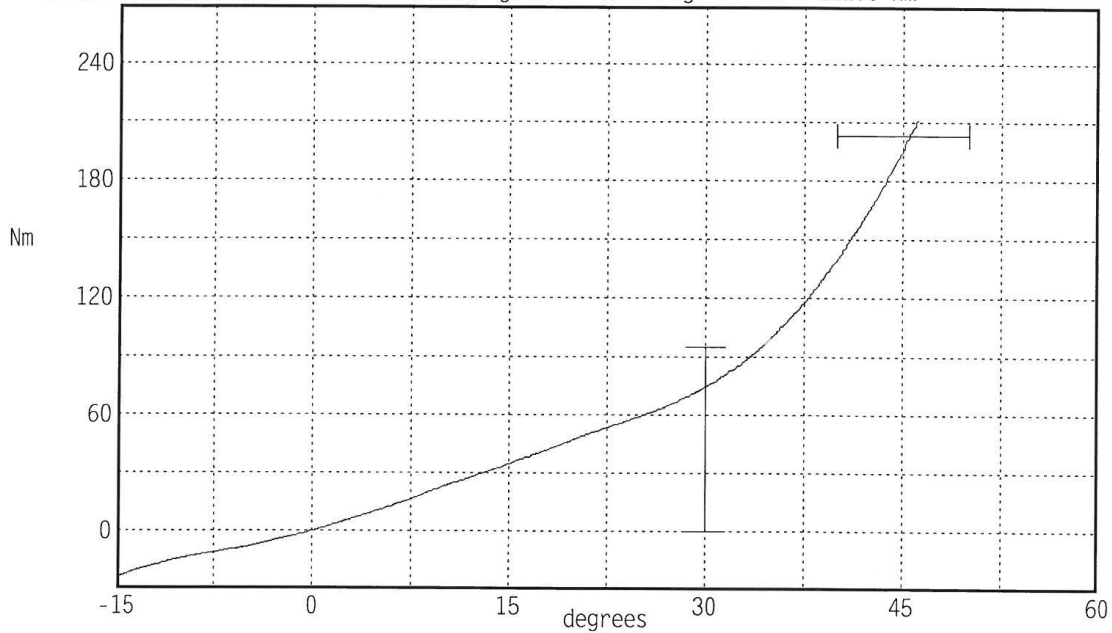
Hybrid III Hip Range of Motion

Serial Number: 037R
 Test Number: 037C11
 Comments:

Date: 10/20/2012
 Time: 08:44

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
Temperature	18.9 - 25.6	21.2 °C	Pass
Humidity	10 - 70	37 %	Pass
Moment at 30 deg	<= 94.9	75.0 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: 211.0 Nm at 46.1 deg
 Peak Angle: 46.1 deg at 211.0 Nm



Transportation Research Center Inc.

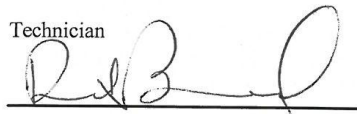
Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 11-1
Test Date: 10/20/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.104 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,702.01 N	Yes

Test meets specifications.

Comments:

Technician



Approved



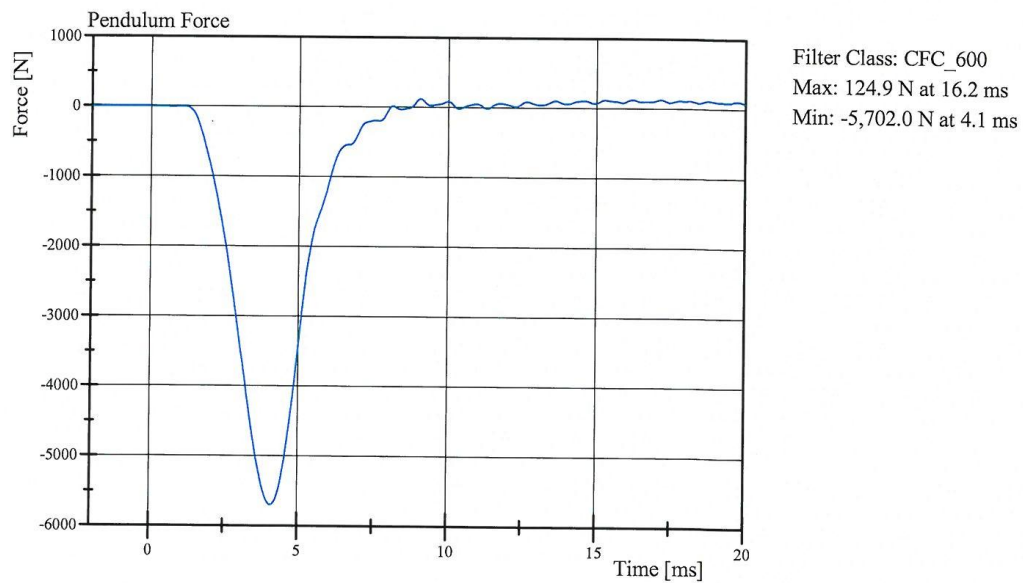
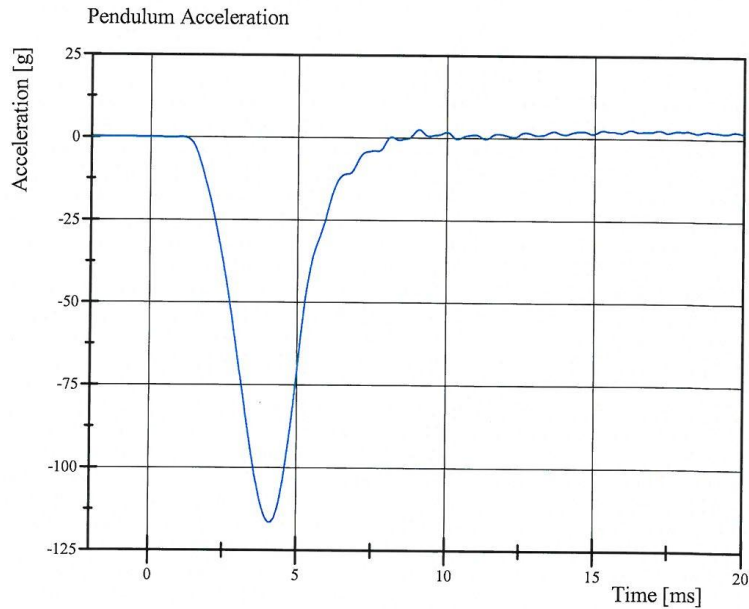
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.20.2012 08:41:27 1683



Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 11-1
Test Date: 10/20/2012



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

10.20.2012 08:41:35 1683



Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 11-1
Test Date: 10/20/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.102 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,518.35 N	Yes

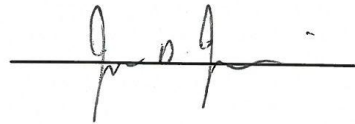
Test meets specifications.

Comments:

Technician



Approved



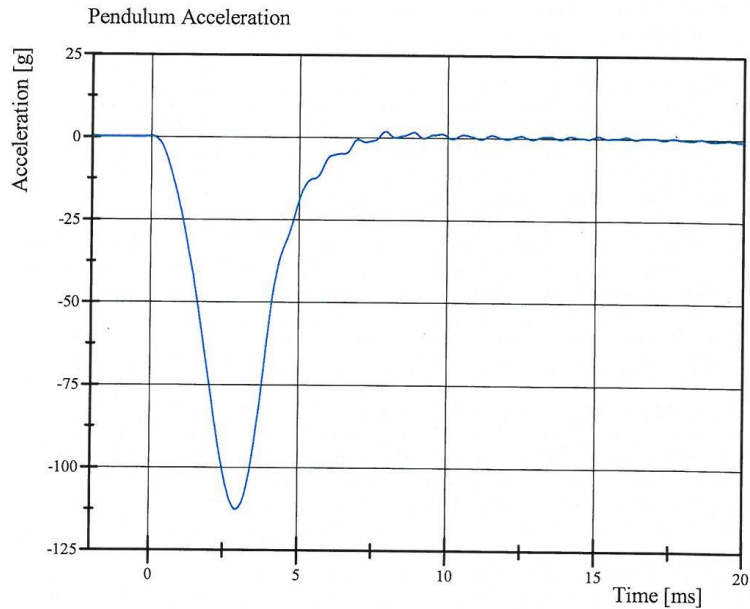
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.20.2012 08:44:59 1697

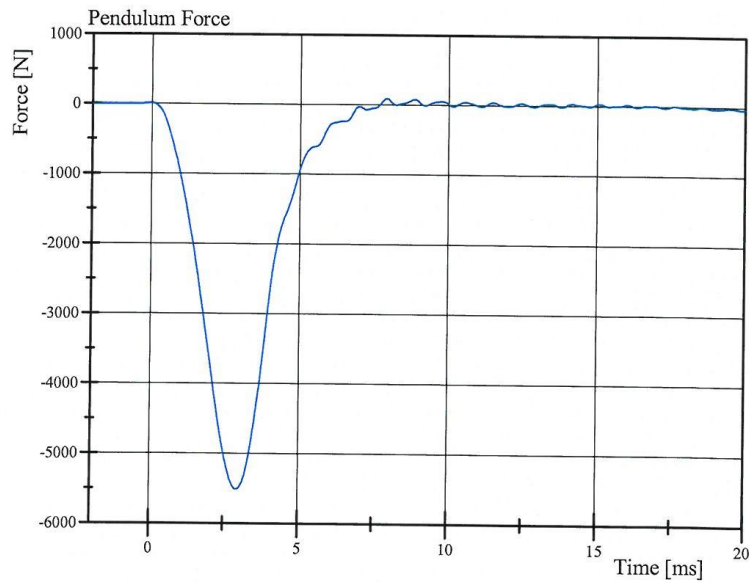


Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 11-1
Test Date: 10/20/2012



Filter Class: CFC_600
Max: 1.9 gn at 7.9 ms
Min: -112.8 gn at 3.0 ms



Filter Class: CFC_600
Max: 91.3 N at 7.9 ms
Min: -5,518.3 N at 3.0 ms

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

10.20.2012 08:45:05 1697



Pre-Test Calibration Sheets
Front Passenger S/N 426

Transportation Research Center Inc.

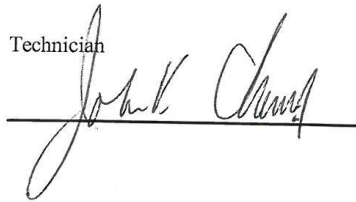
Front Head Drop
HIII 5th Serial No. 426 Certification No. 12-1
Test Date: 10/17/2012

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

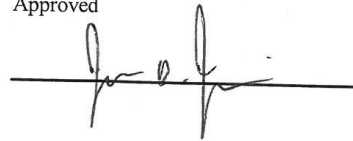
Test meets specifications.

Comments:

Technician



Approved



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

10.17.2012 11:06:57 611

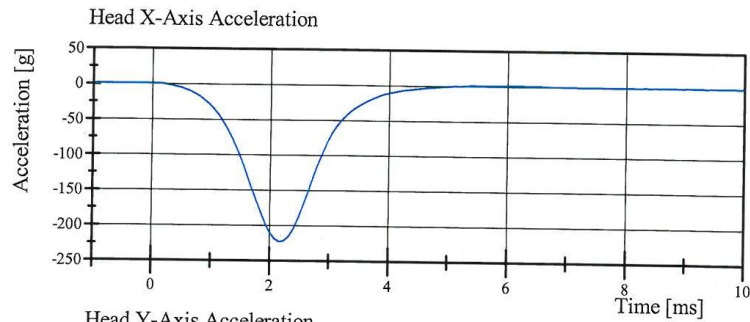


Transportation Research Center Inc.

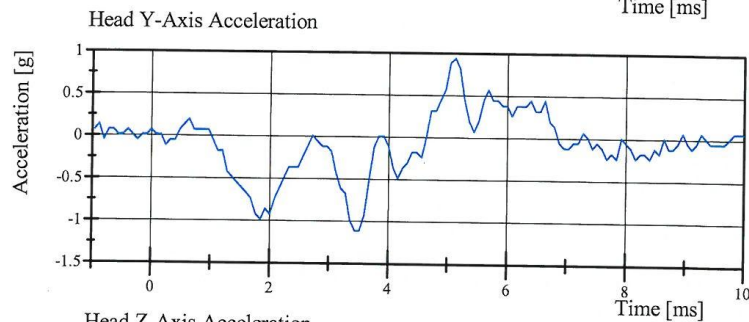
Front Head Drop

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

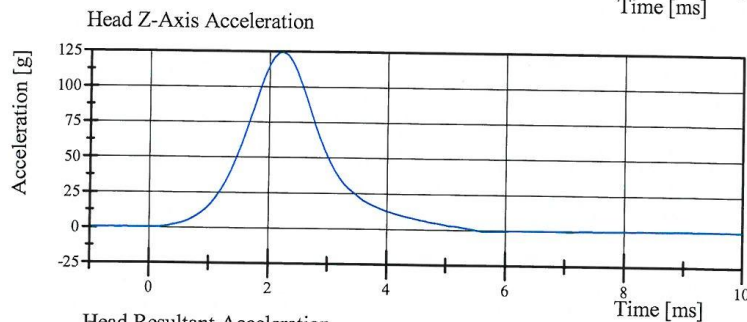
Test Date: 10/17/2012



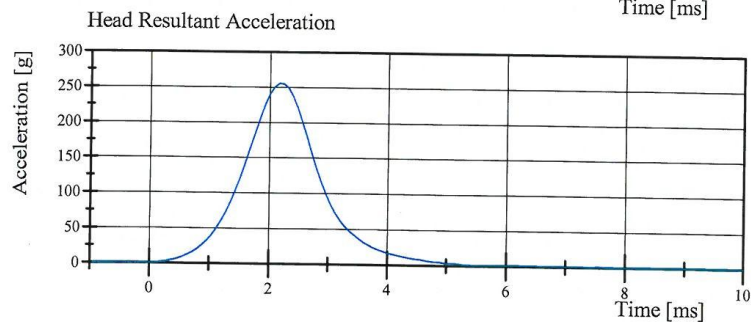
Filter Class: CFC_1000
Max: 0.9 gn at 6.1 ms
Min: -223.2 gn at 2.2 ms



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

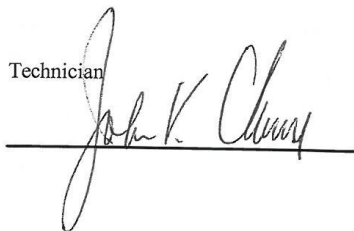
HIII 5th Serial No. 426 Certification No. 12-2

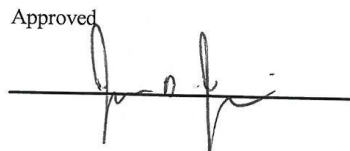
Test Date: 10/17/2012

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

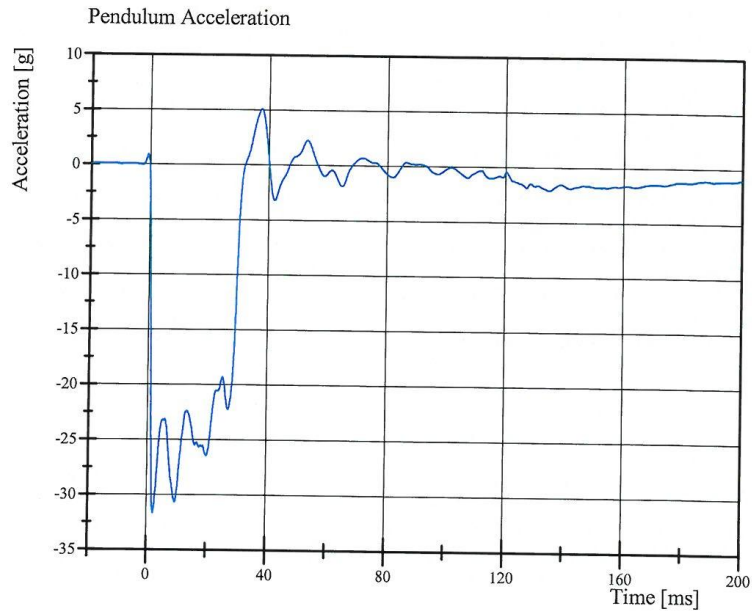


Transportation Research Center Inc.

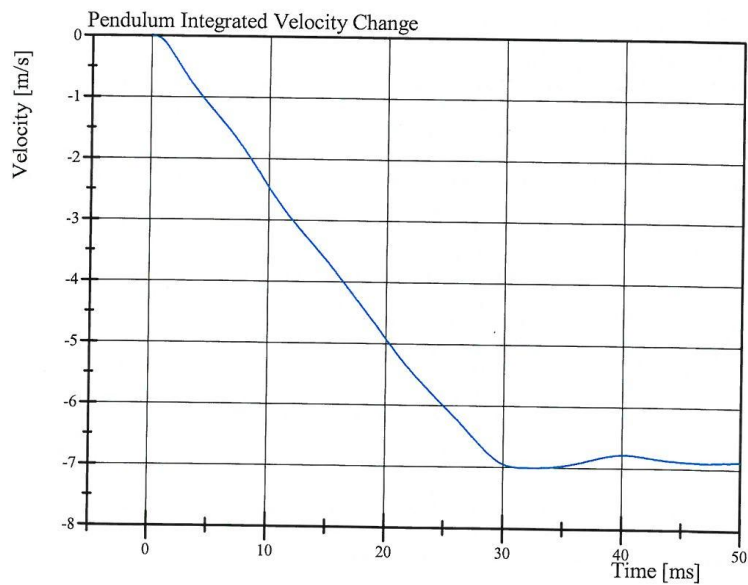
Neck Flexion

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



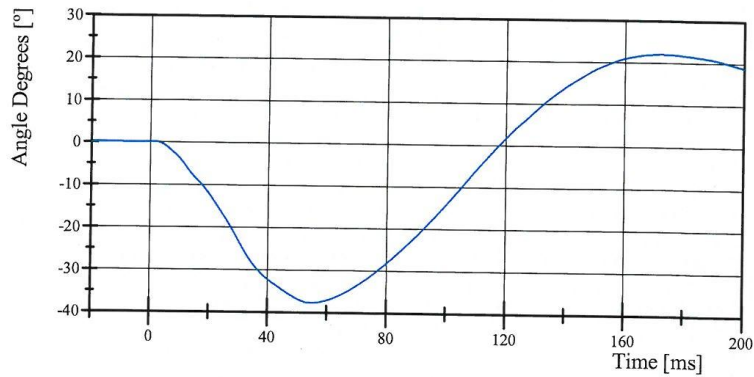
Transportation Research Center Inc.

Neck Flexion

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

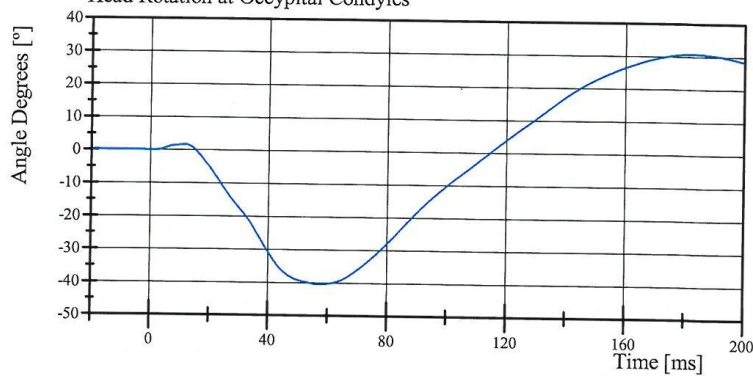
Test Date: 10/17/2012

Pot Rotation at the Base of Neck



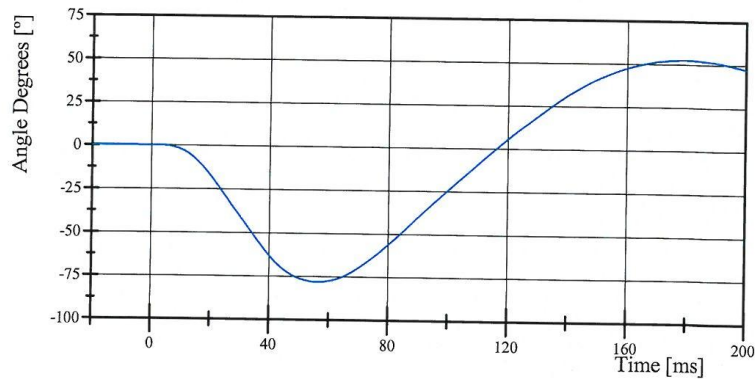
Filter Class: CFC_60
Max: 22.0 ° at 172.1 ms
Min: -37.8 ° at 54.7 ms

Head Rotation at Occypital 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

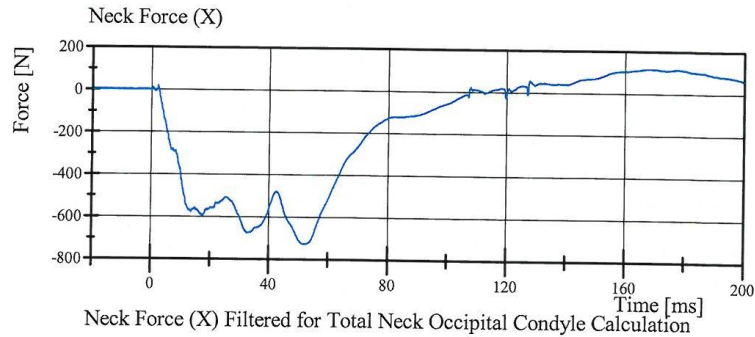


Transportation Research Center Inc.

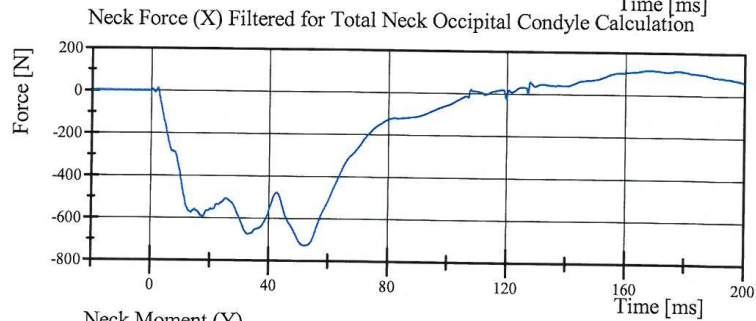
Neck Flexion

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

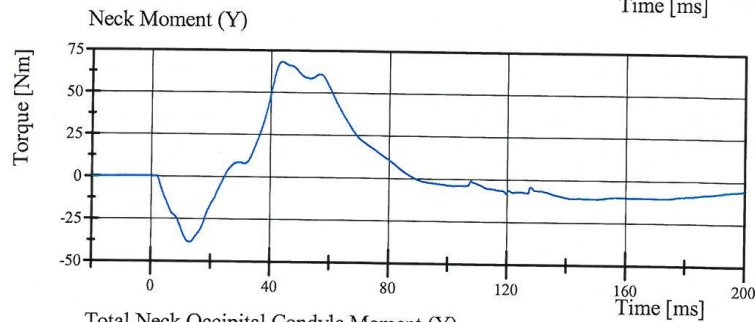
Test Date: 10/17/2012



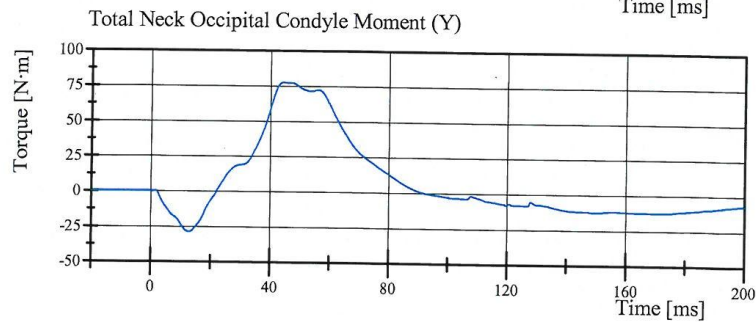
Filter Class: CFC_1000
Max: 117.1 N at 169.4 ms
Min: -728.5 N at 52.4 ms



Filter Class: CFC_600
Max: 116.5 N at 167.9 ms
Min: -728.0 N at 52.4 ms



Filter Class: CFC_600
Max: 68.1 Nm at 43.8 ms
Min: -38.9 Nm at 12.9 ms



Filter Class: Without (Consta
Max: 77.3 N·m at 44.4 ms
Min: -28.8 N·m at 12.9 ms

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

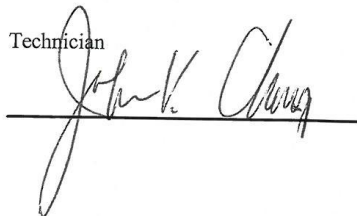
Test Date: 10/17/2012

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

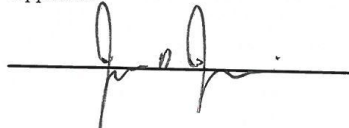
Test meets specifications.

Comments:

Technician



Approved



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

10.17.2012 14:44:10 1832



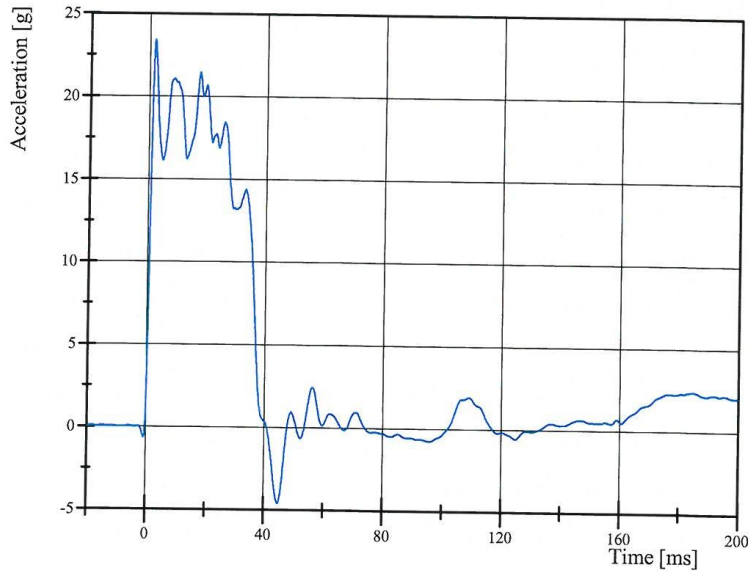
Transportation Research Center Inc.

Neck Extension

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

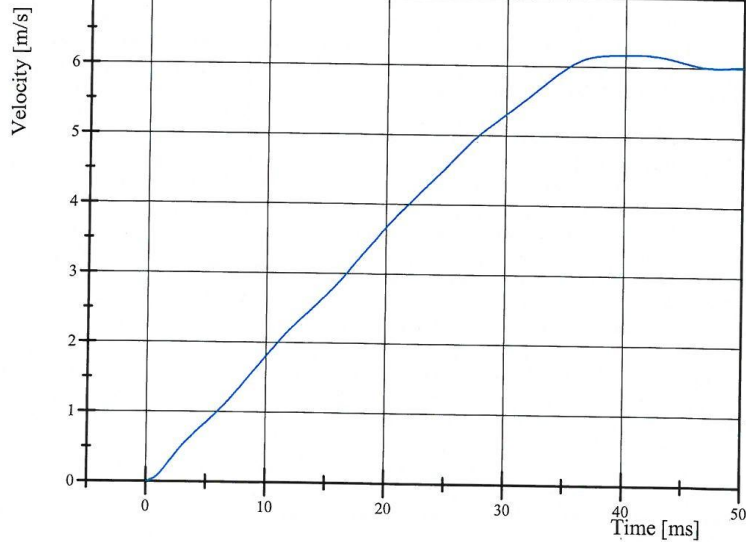
Test Date: 10/17/2012

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



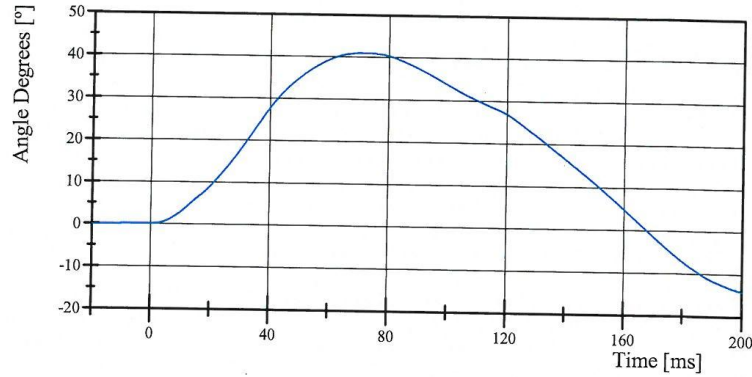
Transportation Research Center Inc.

Neck Extension

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

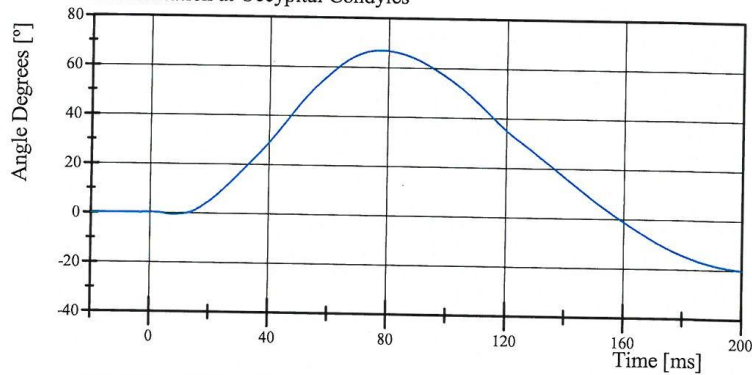
Test Date: 10/17/2012

Pot Rotation at the Base of Neck



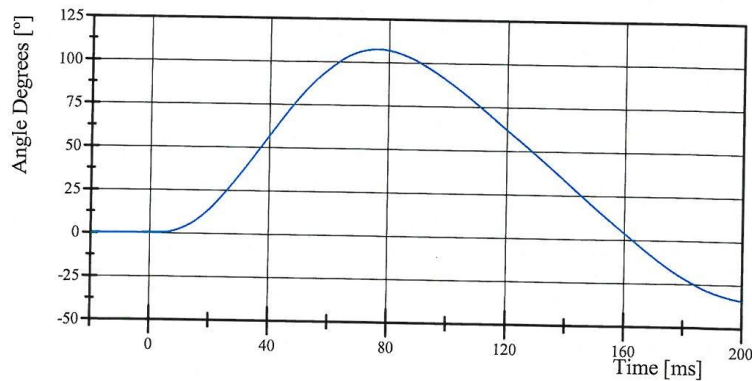
Filter Class: CFC_60
Max: 40.9 ° at 71.7 ms
Min: -14.2 ° at 200.0 ms

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

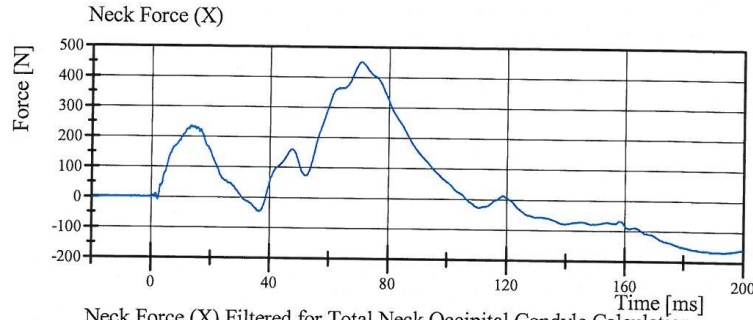


Transportation Research Center Inc.

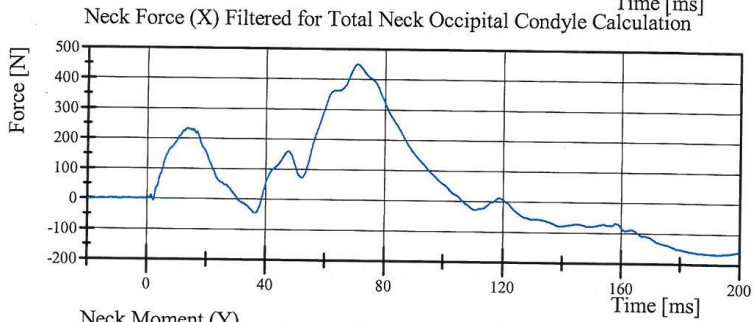
Neck Extension

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

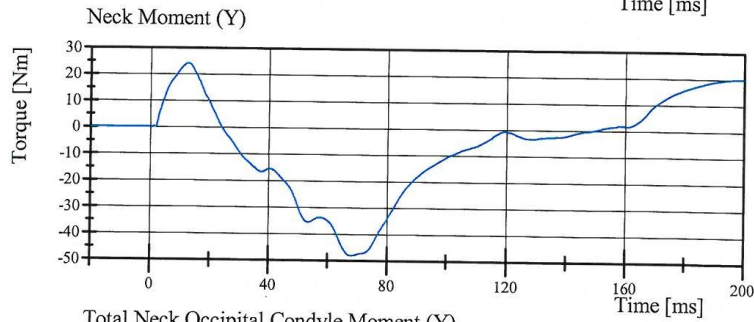
Test Date: 10/17/2012



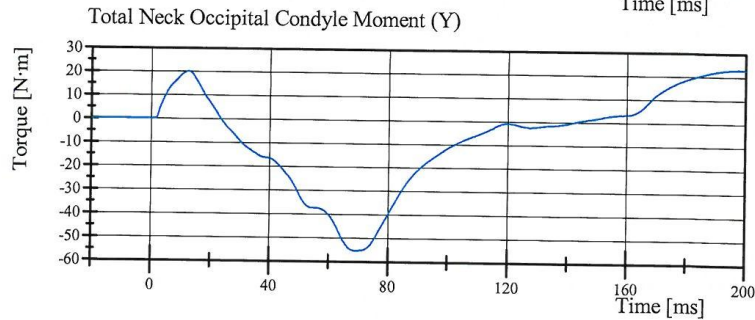
Filter Class: CFC_1000
Max: 451.1 N at 70.7 ms
Min: -168.4 N at 192.8 ms



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

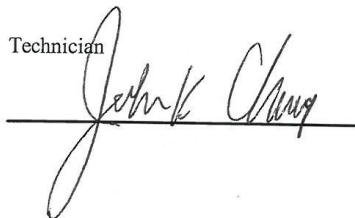
Test Date: 10/18/2012

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

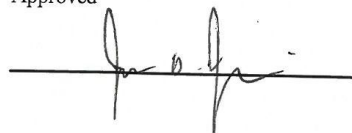
Test meets specifications.

Comments:

Technician



Approved



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

10.18.2012 10:31:45 379

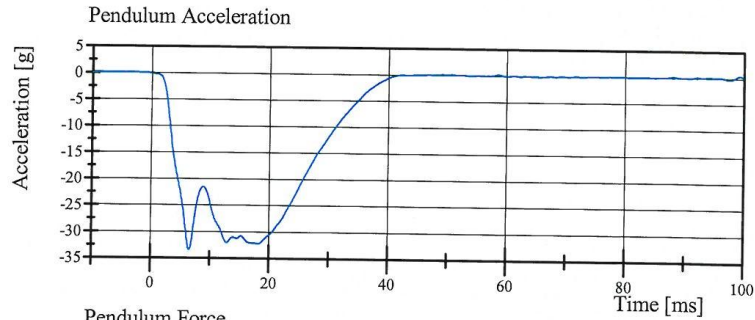


Transportation Research Center Inc.

Front Thorax

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

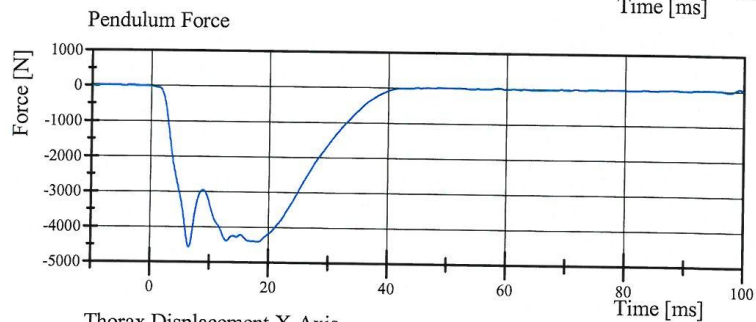
Test Date: 10/18/2012



Filter Class: CFC_180

Max: 0.4 gn at 99.3 ms

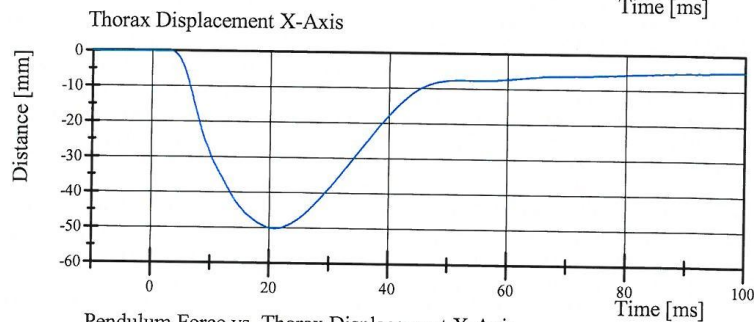
Min: -33.5 gn at 6.6 ms



Filter Class: CFC_180

Max: 59.3 N at 99.3 ms

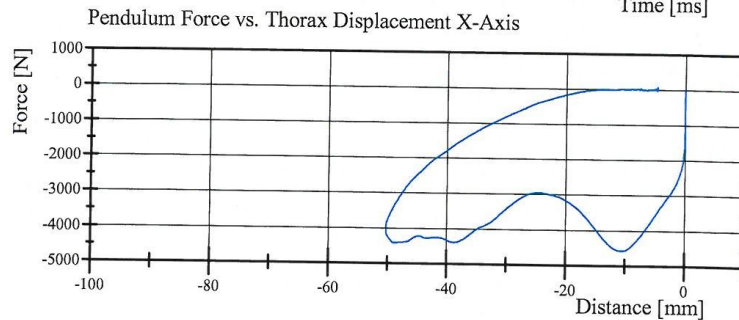
Min: -4,587.6 N at 6.6 ms



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.

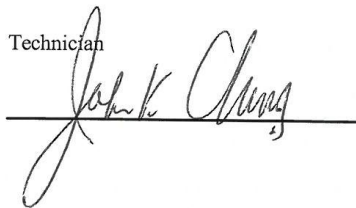
Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 12-1
Test Date: 10/17/2012

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

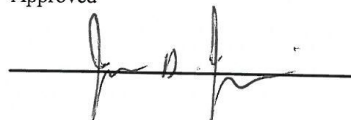
Test meets specifications.

Comments:

Technician



Approved



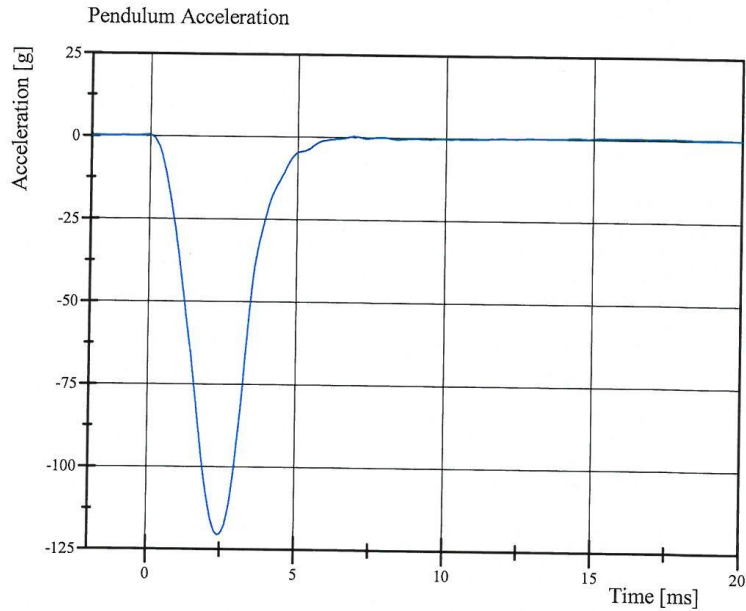
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.17.2012 13:59:57 1823

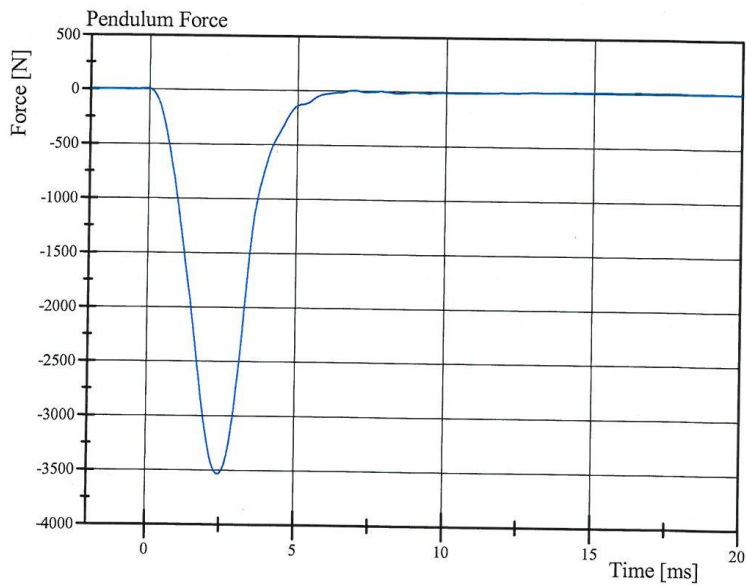


Transportation Research Center Inc.

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.

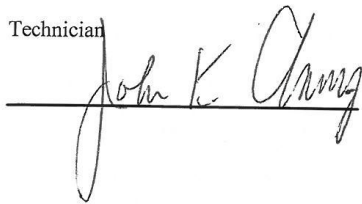
Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 12-1
Test Date: 10/17/2012

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

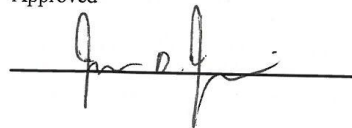
Test meets specifications.

Comments:

Technician



Approved



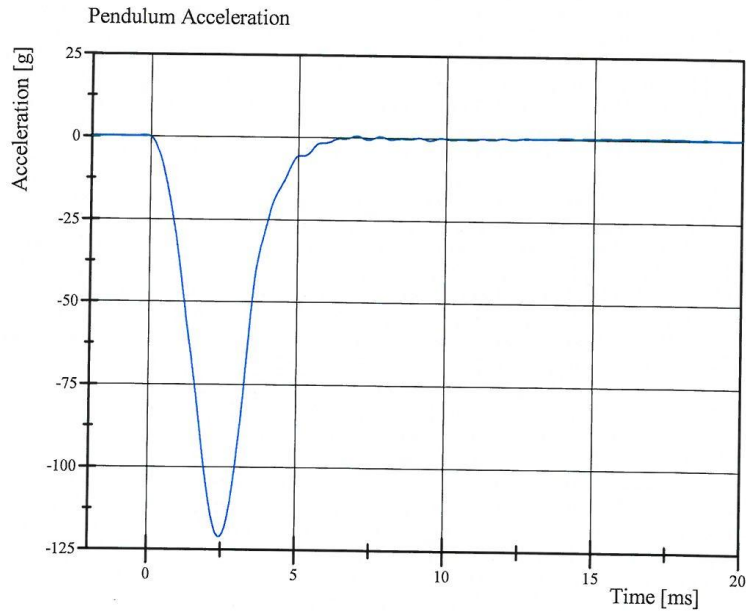
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.17.2012 14:47:32 1821

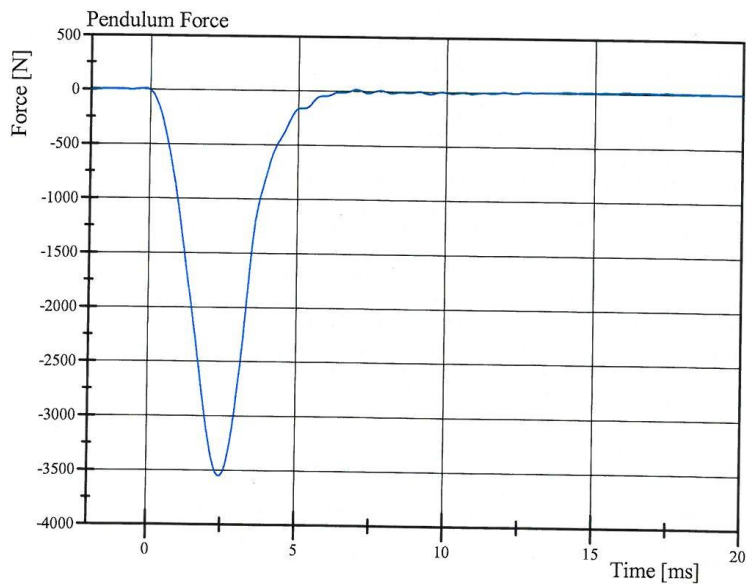


Transportation Research Center Inc.

Right 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 7.0 ms
Min: -121.1 gn at 2.5 ms



Filter Class: CFC_600
Max: 12.9 N at 7.0 ms
Min: -3,552.1 N at 2.5 ms

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

10.17.2012 14:47:41 1821



Passenger **S/N 426**

Post-Test Calibration Sheets

Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 426 Certification No. 13-1

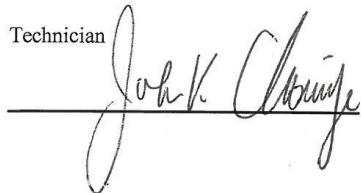
Test Date: 10/20/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Peak Head Resultant Acceleration	250 - 300 g	253.5 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	2.5 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

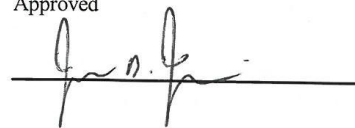
Test meets specifications.

Comments:

Technician



Approved



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

10.20.2012 08:23:12 610

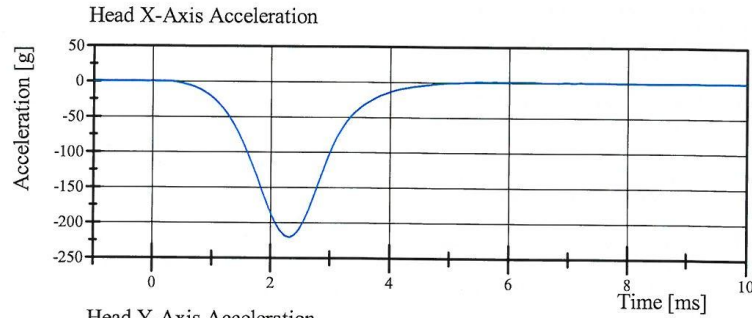


Transportation Research Center Inc.

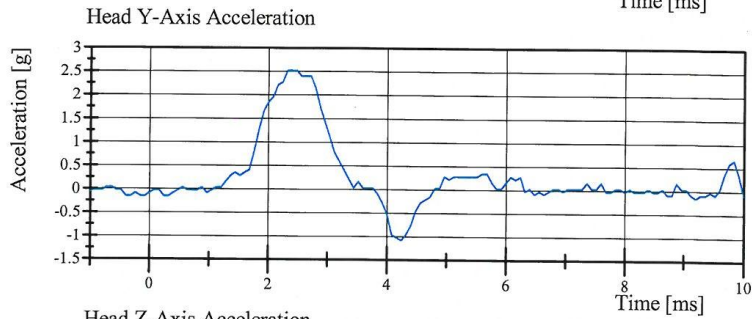
Front Head Drop

HIII 5th Serial No. 426 Certification No. 13-1

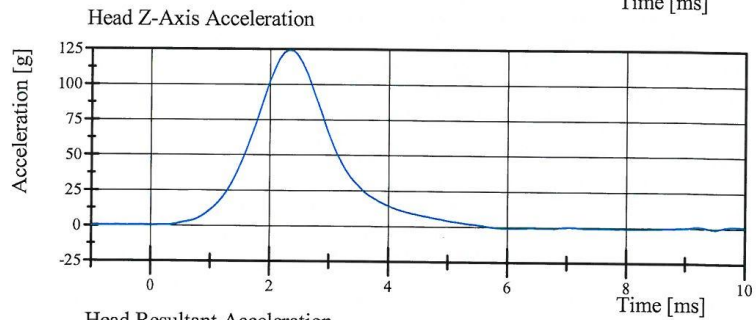
Test Date: 10/20/2012



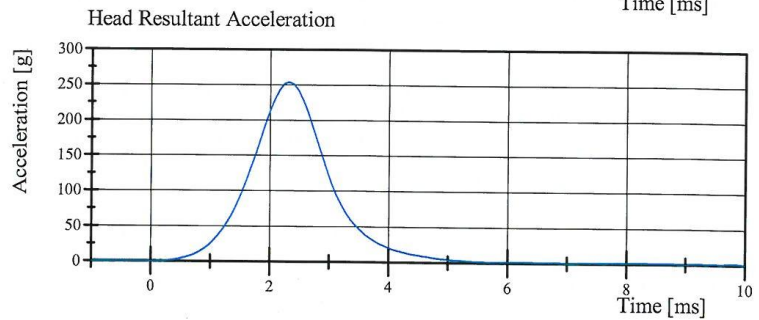
Filter Class: CFC_1000
Max: 1.1 gn at 6.2 ms
Min: -220.9 gn at 2.3 ms



Filter Class: CFC_1000
Max: 2.5 gn at 2.3 ms
Min: -1.1 gn at 4.2 ms



Filter Class: CFC_1000
Max: 124.3 gn at 2.3 ms
Min: -1.0 gn at 6.0 ms



Filter Class: CFC_1000
Max: 253.5 gn at 2.3 ms
Min: 0.1 gn at -0.7 ms

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

10.20.2012 08:23:24 610



Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 13-3

Test Date: 10/22/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.915 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	(-2.1) - (-2.5) m/s	-2.32 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	(-4.0) - (-5.0) m/s	-4.55 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	(-5.8) - (-7.0) m/s	-6.56 m/s	Yes
Total Head D-Plane Rotation	(-77) - (-91) °	-79.1 °	Yes
Total Neck Occipital Condyles Moment Between -77° and -91° Rotation	69 - 83 N·m	74.3 N·m	Yes
Total Neck Occipital Condyles Moment Decay to 10 N·m	80 - 100 ms	85.6 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



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

10.22.2012 11:10:05 1724

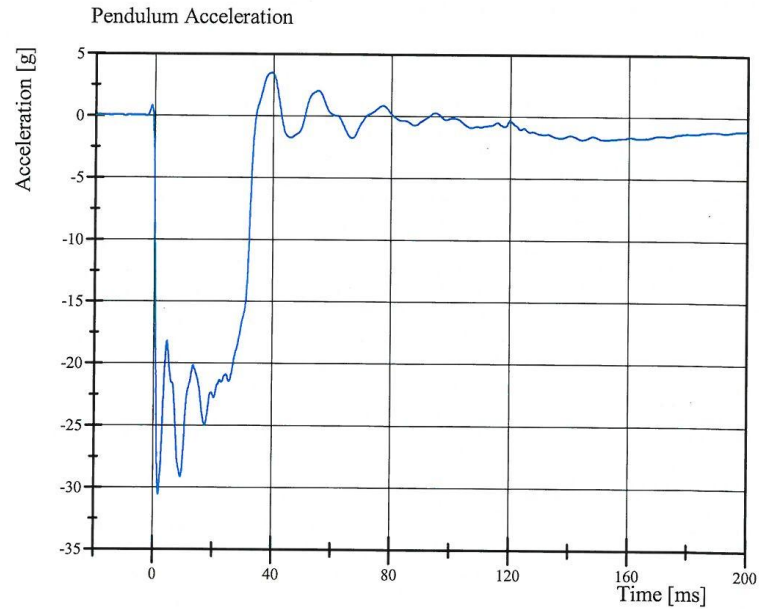


Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 13-3

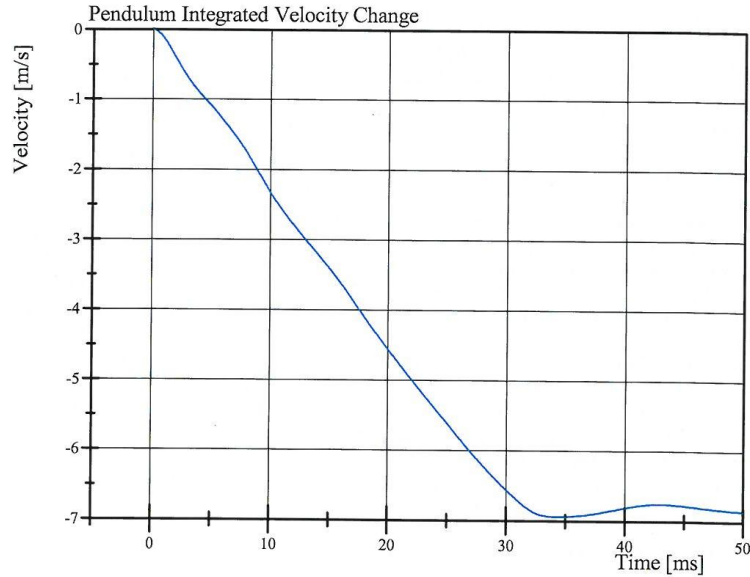
Test Date: 10/22/2012



Filter Class: CFC_180

Max: 3.5 gn at 39.5 ms

Min: -30.6 gn at 1.9 ms



Filter Class: CFC_180

Max: 0.0 m/s at 0.0 ms

Min: -6.9 m/s at 34.3 ms

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

10.22.2012 11:10:12 1724



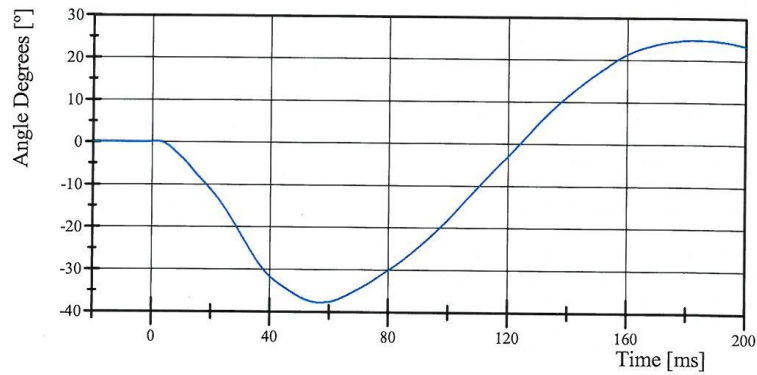
Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 13-3

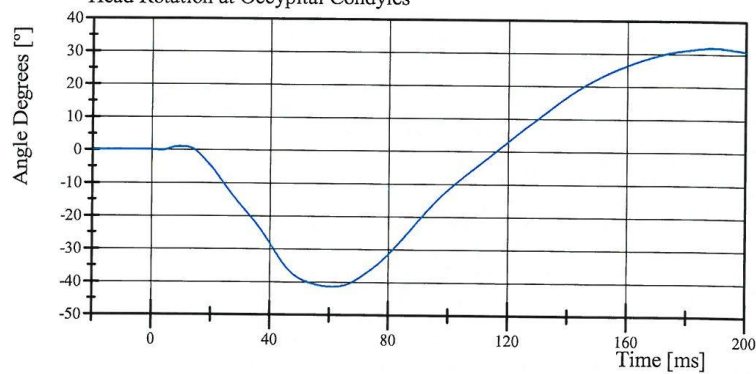
Test Date: 10/22/2012

Pot Rotation at the Base of Neck



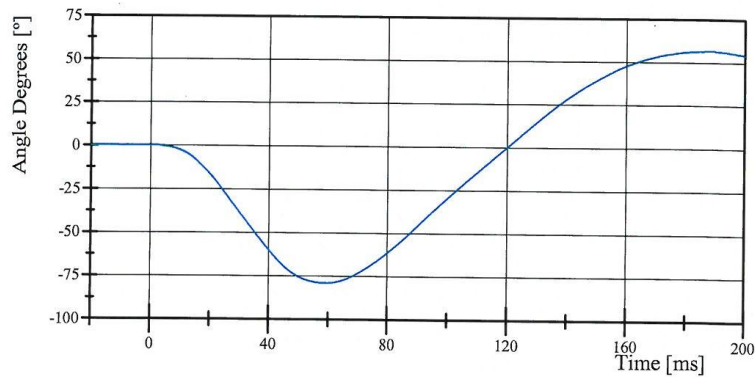
Filter Class: CFC_60
Max: 24.7 ° at 181.8 ms
Min: -37.8 ° at 57.0 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 32.0 ° at 188.9 ms
Min: -41.5 ° at 60.9 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 56.6 ° at 188.1 ms
Min: -79.1 ° at 59.3 ms

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

10.22.2012 11:10:13 1724

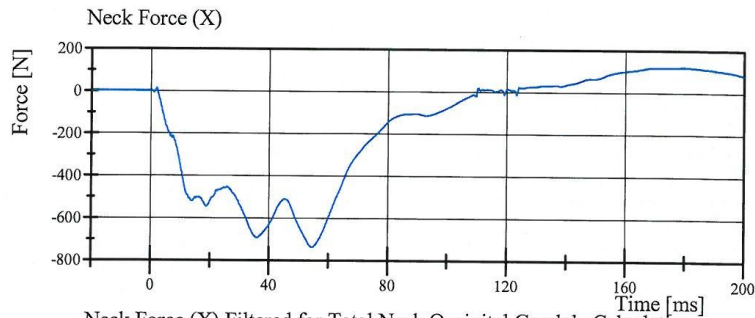


Transportation Research Center Inc.

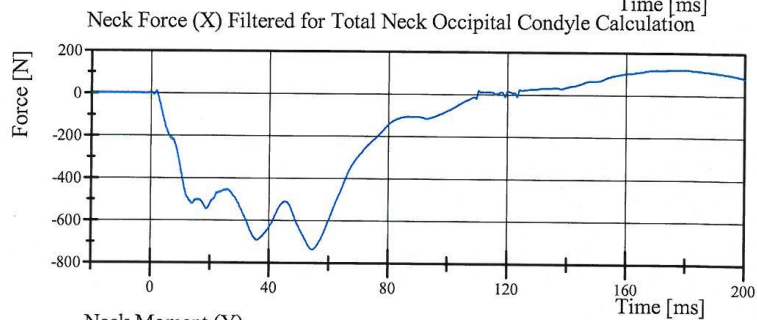
Neck Flexion

HIII 5th Serial No. 426 Certification No. 13-3

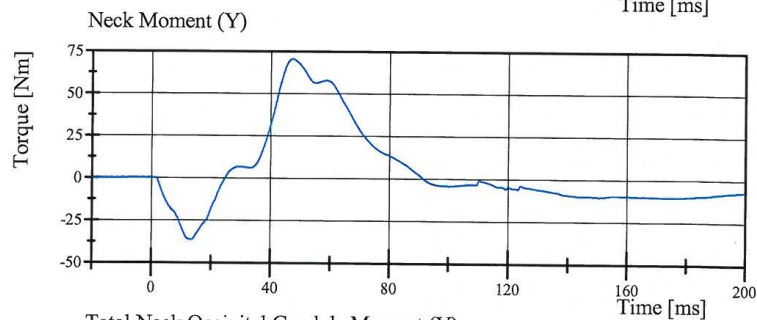
Test Date: 10/22/2012



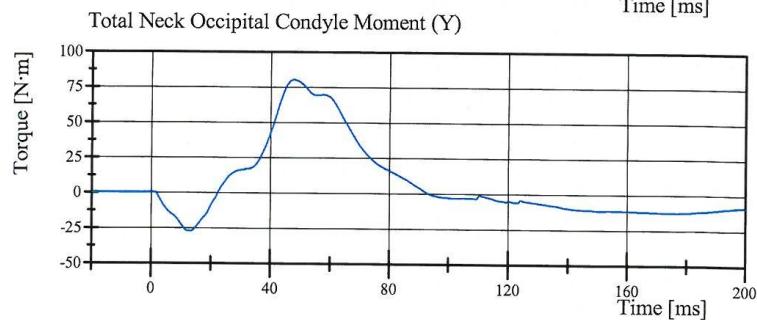
Filter Class: CFC_1000
Max: 120.7 N at 179.7 ms
Min: -736.7 N at 54.3 ms



Filter Class: CFC_600
Max: 120.2 N at 179.9 ms
Min: -736.5 N at 54.6 ms



Filter Class: CFC_600
Max: 70.4 Nm at 47.3 ms
Min: -36.5 Nm at 12.9 ms



Filter Class: Without (Consta
Max: 80.1 N·m at 47.7 ms
Min: -27.5 N·m at 12.8 ms

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

10.22.2012 11:10:14 1724



Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 13-1

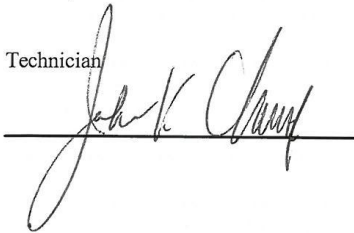
Test Date: 10/22/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Pendulum Velocity	(-5.95) - (-6.19) m/s	-6.049 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	1.5 - 1.9 m/s	1.79 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	3.1 - 3.9 m/s	3.60 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	4.6 - 5.6 m/s	5.25 m/s	Yes
Total Head D-Plane Rotation	99 - 114 °	108.2 °	Yes
Total Neck Occipital Condyles Moment Between 99° and 114° Rotation	(-53) - (-65) N·m	-59.8 N·m	Yes
Total Neck Occipital Condyles Moment Decay to -10 N·m	94 - 114 ms	104.3 ms	Yes

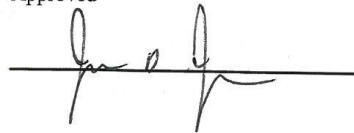
Test meets specifications.

Comments:

Technician



Approved



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

10.22.2012 12:34:11 1839

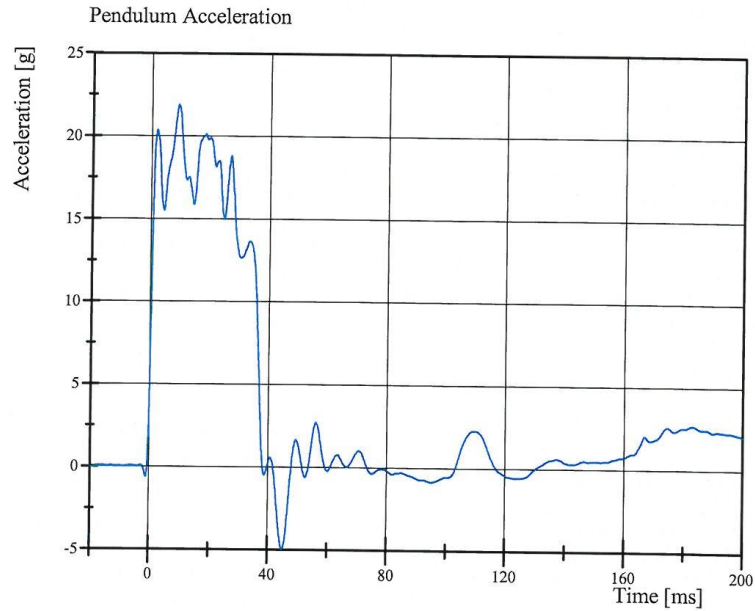


Transportation Research Center Inc.

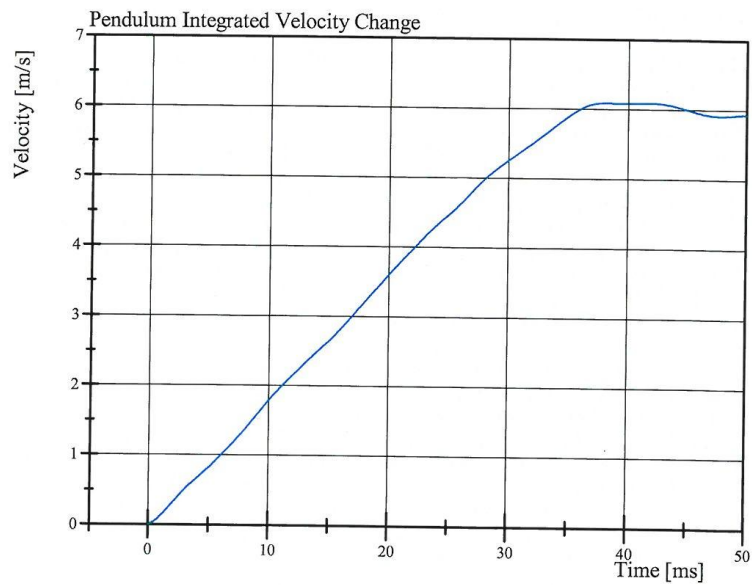
Neck Extension

HIII 5th Serial No. 426 Certification No. 13-1

Test Date: 10/22/2012



Filter Class: CFC_180
Max: 21.9 gn at 8.9 ms
Min: -5.0 gn at 45.0 ms



Filter Class: CFC_180
Max: 6.1 m/s at 41.7 ms
Min: 0.0 m/s at 0.0 ms

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

10.22.2012 12:34:21 1839



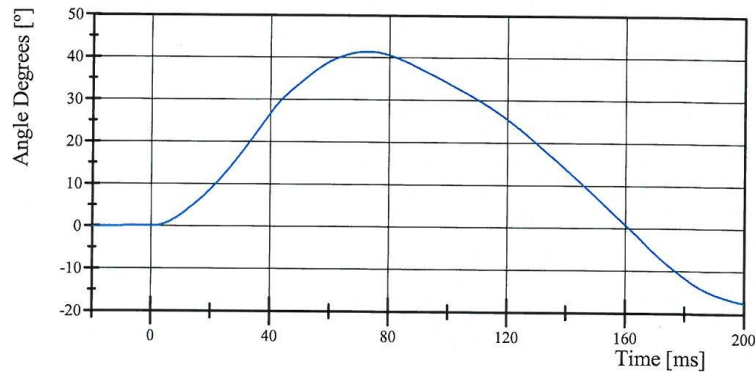
Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 13-1

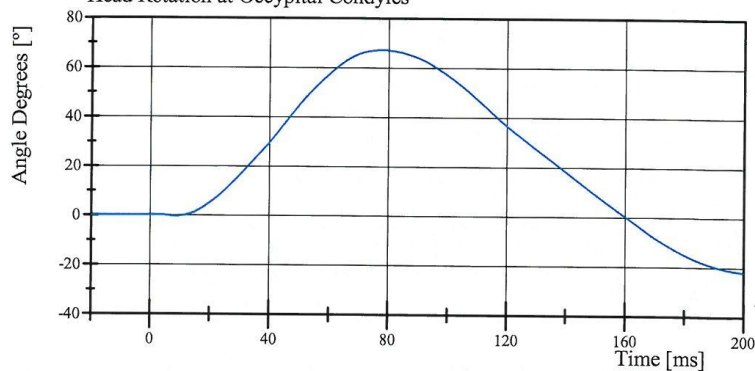
Test Date: 10/22/2012

Pot Rotation at the Base of Neck



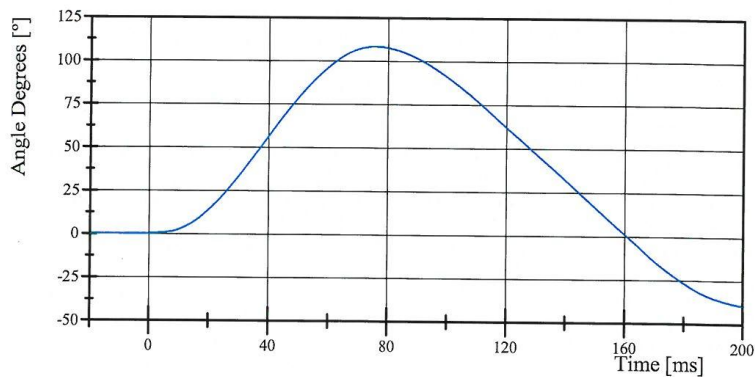
Filter Class: CFC_60
Max: 41.4 ° at 72.8 ms
Min: -17.5 ° at 200.0 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 67.1 ° at 77.8 ms
Min: -22.0 ° at 200.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 108.2 ° at 76.0 ms
Min: -39.6 ° at 200.0 ms

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

10.22.2012 12:34:22 1839

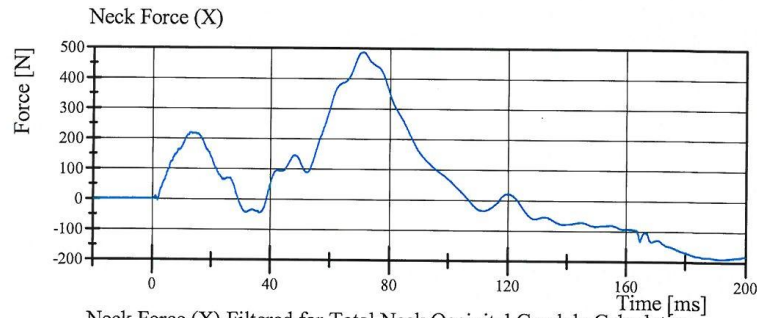


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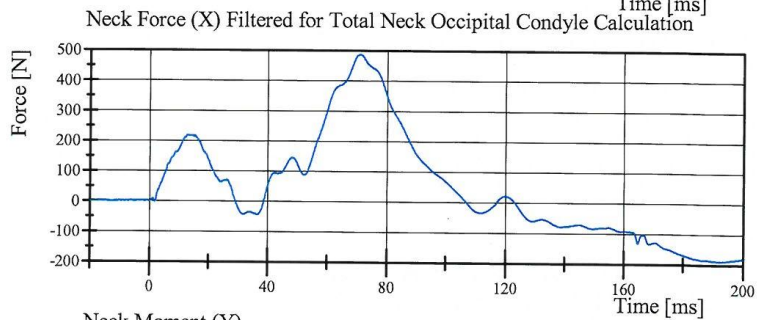
Neck Extension

HIII 5th Serial No. 426 Certification No. 13-1

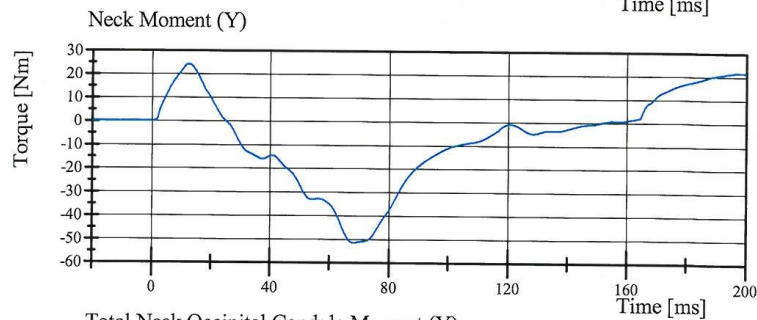
Test Date: 10/22/2012



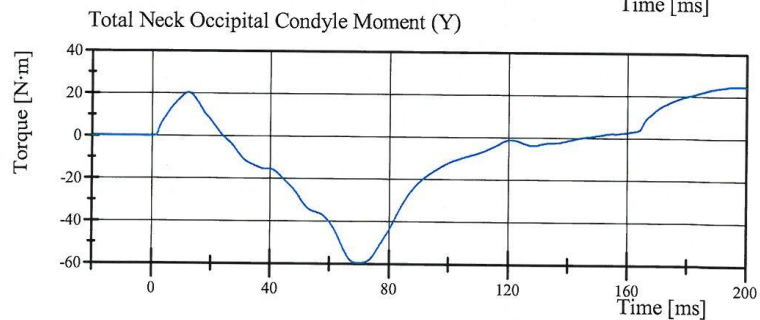
Filter Class: CFC_1000
Max: 487.0 N at 71.0 ms
Min: -190.1 N at 191.4 ms



Filter Class: CFC_600
Max: 486.7 N at 71.0 ms
Min: -189.6 N at 191.5 ms



Filter Class: CFC_600
Max: 24.0 Nm at 12.3 ms
Min: -51.6 Nm at 68.3 ms



Filter Class: Without_(Consta
Max: 24.8 N·m at 197.3 ms
Min: -59.8 N·m at 69.6 ms

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

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Front Thorax

HIII 5th Serial No. 426 Certification No. 13-3

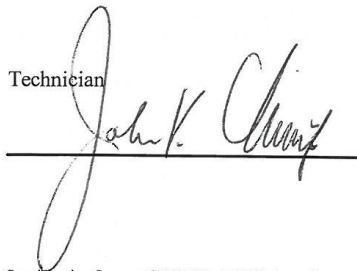
Test Date: 10/22/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.746 m/s	Yes
Probe Force Peak Between 50.0 mm and 58.0 mm Chest Deflection	(-3,900) - (-4,400) N	-4,363.1 N	Yes
Probe Force Peak Between 18.0 mm and 50.0 mm Chest Deflection	$\geq$ (-4,600) N	-4,474.4 N	Yes
Maximum Chest Compression	(-50) - (-58) mm	-51.6 mm	Yes
Internal Hysteresis	69 - 85 %	77.5 %	Yes

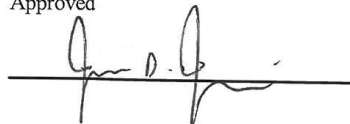
Test meets specifications.

Comments:

Technician



Approved



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

10.22.2012 10:19:49 356

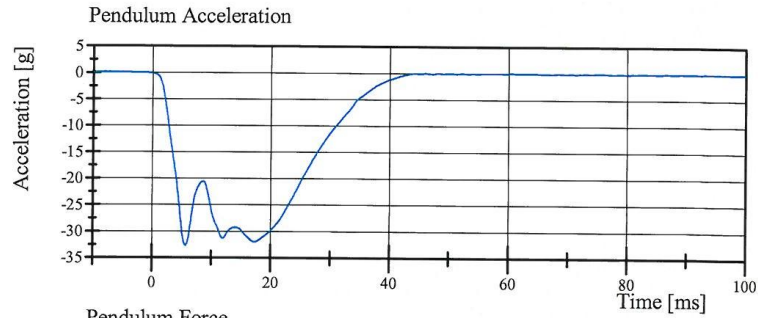


Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. 426 Certification No. 13-3

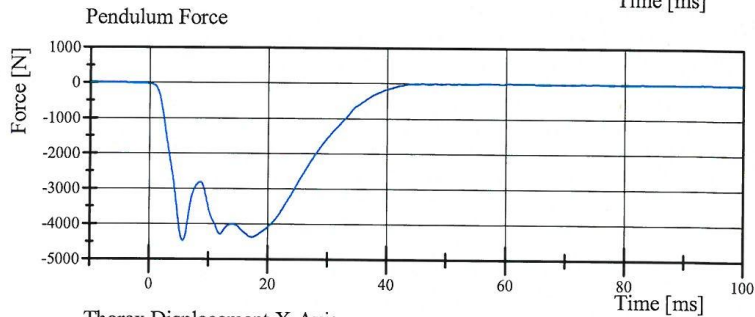
Test Date: 10/22/2012



Filter Class: CFC_180

Max: 0.1 gn at 60.6 ms

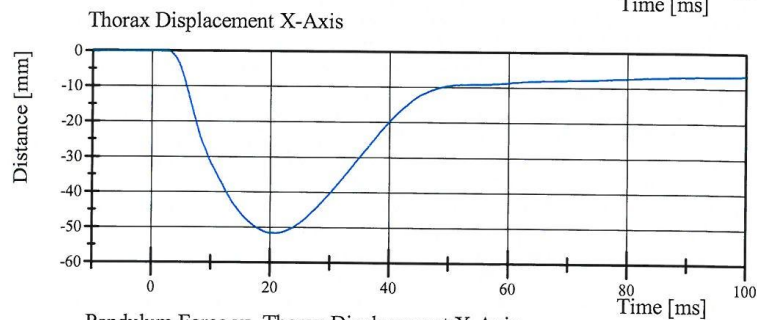
Min: -32.7 gn at 5.7 ms



Filter Class: CFC_180

Max: 10.0 N at 60.6 ms

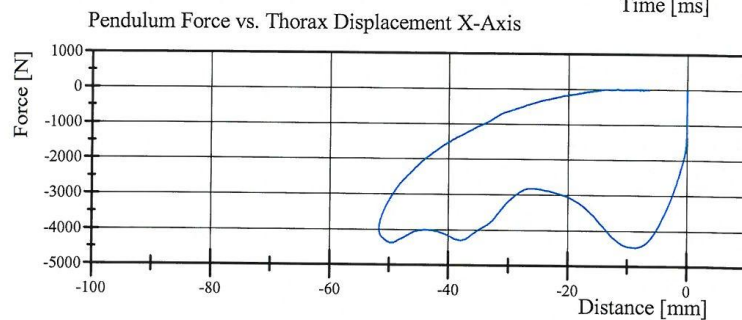
Min: -4,474.4 N at 5.7 ms



Filter Class: CFC_600

Max: 0.0 mm at -0.6 ms

Min: -51.6 mm at 20.8 ms



Filter Class: CFC_180

Max: 10.0 N at -8.5 mm

Min: -4,474.4 N at -8.9 mm

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

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Transportation Research Center Inc.

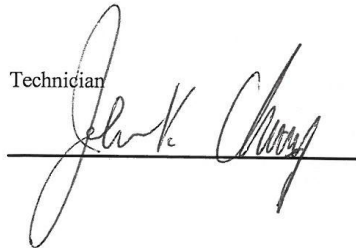
Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 13-1
Test Date: 10/20/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.118 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,651.5 N	Yes

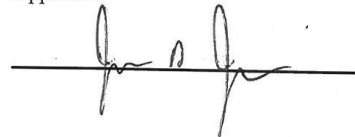
Test meets specifications.

Comments:

Technician



Approved



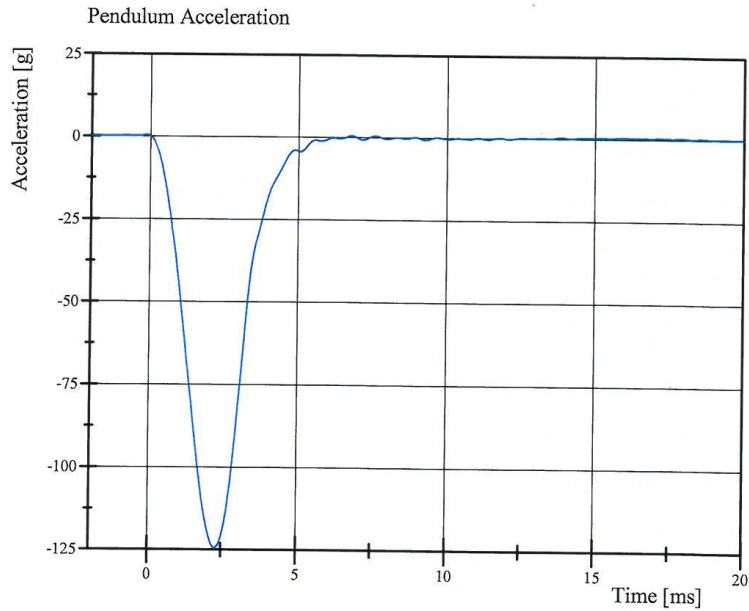
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.20.2012 07:57:23 1804

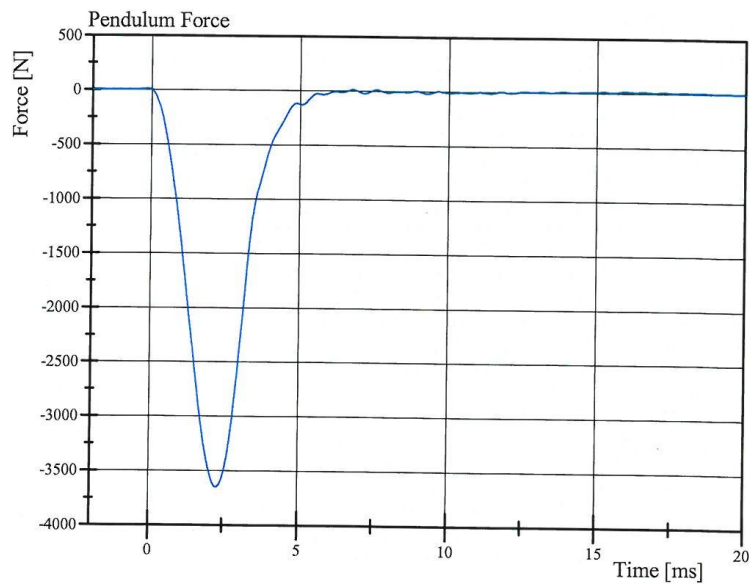


Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 13-1
Test Date: 10/20/2012



Filter Class: CFC_600
Max: 0.5 gn at 15.9 ms
Min: -124.5 gn at 2.3 ms



Filter Class: CFC_600
Max: 14.4 N at 15.9 ms
Min: -3,651.5 N at 2.3 ms

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

10.20.2012 07:57:37 1804



Transportation Research Center Inc.

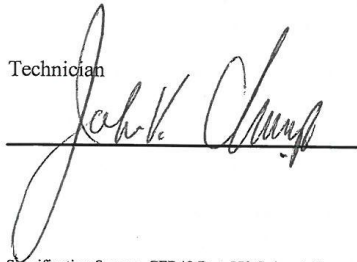
Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 13-1
Test Date: 10/20/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.121 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,725.9 N	Yes

Test meets specifications.

Comments:

Technician



Approved



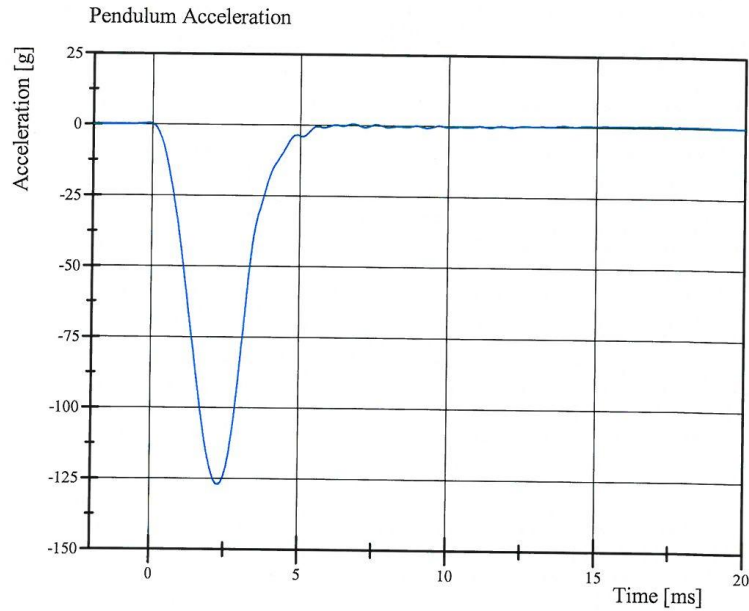
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.20.2012 08:02:25 1803

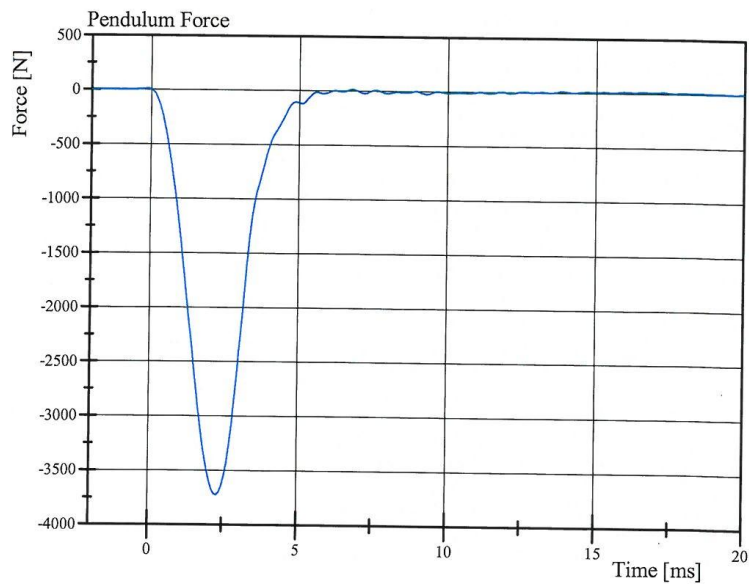


Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 13-1
Test Date: 10/20/2012



Filter Class: CFC_600
Max: 0.5 gn at 6.8 ms
Min: -127.1 gn at 2.3 ms



Filter Class: CFC_600
Max: 13.8 N at 6.8 ms
Min: -3,725.9 N at 2.3 ms

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

10.20.2012 08:02:36 1803

