FINAL REPORT NUMBER: NCAP-TRC-13-004

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

Chrysler Group LLC
2013 Jeep Compass Sport 4X4 MPV
NHTSA NUMBER: MD0307

PREPARED BY:
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Report Date: January 17, 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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Prepared By: Impact Laboratory Project Operations Group

Approved By: Jeffery W. Sankey

Approval Date: January 17, 2013

FINAL REPORT ACCEPTANCE BY OCWS:

_____

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

Date _____

_____

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

Date _____

Technical Report Documentation Page

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16. Abstract

A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2013 Jeep Compass 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 24, 2012

The impact velocity was 56.50 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 435 millimeters at vehicle centerline. The test vehicle's performance is as follows:

	Driver ATD			Passenger ATD		
Measurement Description	Units	Threshold	Result	Units	Threshold	Result
Head Injury Criteria (HIC_{15})	NA	700	323	NA	700	323
Maximum Chest Compression	mm	63	32	mm	52	24
3ms Chest Clip	Gs	60	46.3	Gs	60	45.3
Nij	NA	1	0.33	NA	1	0.46
Neck Tension	Newtons	4170	1459	Newtons	2620	1447
Neck Compression	Newtons	4000	200	Newtons	2520	388
Left Femur Force	Newtons	10008	-3700	Newtons	6805	-3294
Right Femur Force	Newtons	10008	-5155	Newtons	6805	-2406

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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 Compass Sport 4X4 MPV at a velocity of 56.50 km/h. The test was performed at Transportation Research Center, Inc. on October 24, 2012. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

One real-time camera and 16 high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in this report.

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

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

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

The 132 channels of data were recorded on an on-board data acquisition system. Appendix B contains the vehicle, load cell barrier and dummy response data traces.

There was 100.0 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 435 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 knee bolster. The passenger's visible contact points were as follows: airbag, headrest, and glove box.

The occupant data is summarized below:

ATD Position	**HIC_{15}**	**Nij**	**Neck Tension (N)**	**Neck Compression (N)**	**3 ms Chest Clip (Gs)**	**Chest Disp. (mm)**	**Left Femur (N)**	**Right Femur (N)**
Driver (50th Male)	323	0.33	1459	-200	46.3	32	-3700	-5155
Passenger (5th Female)	323	0.46	1447	-388	45.3	24	-3294	-2406

2: OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Jeep Compass Sport 4X4 MPV NHTSA No.: MD0307
Test Program: NCAP Frontal Impact Test Date: 10/24/12

TEST VEHICLE INFORMATION

NHTSA No.	MD0307
Model Year	2013
Make	Jeep
Model	Compass Sport
Body Style	MPV
VIN	1C4NJDBB0DD158488
Body Color	Silver
Odometer Reading (km/mi)	13
Engine Displacement (L)	2.4
Type/No. Cylinders	4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	CVT
Overdrive	No
Final Drive	All Wheel
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)	Yes

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

DATA FROM CERTIFICATION LABEL

Manufactured by	Chrysler Group LLC
Date of Manufacture	9/12

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

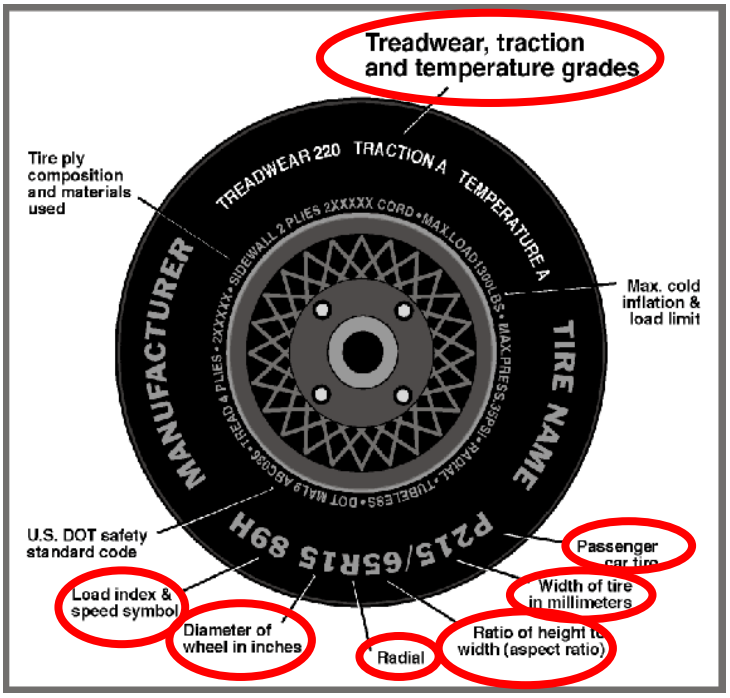
VEHICLE SEATING AND WEIGHT CAPACITY

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split bench		
Number of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				419.0
Cargo Wt. (RCLW) (kg)				78.8

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Jeep Compass Sport 4X4 MPV NHTSA No.: MD0307
Test Program: NCAP Frontal Impact Test Date: 10/24/12



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold / Test Pressure (kPa)	220	220
Recommended Tire Size	P215/60R17	P215/60R17
Tire Size on Vehicle	P215/60R17	P215/60R17
Tire Manufacturer	Firestone	Firestone
Tire Model	Affinity	Affinity
Treadwear	500	500
Traction Grade	A	A
Temperature Grade	B	B
Tire Plies Sidewall	1	1
Tire Plies Body	3	3
Load Index/Speed Symbol	95T	95T
Tire Material	Polyester & Steel	Polyester & Steel
DOT Safety Code Right	8XNV AFB 3412	8XNV AFB 3412
DOT Safety Code Left	8XNV AFB 3412	8XNV AFB 3412

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Jeep Compass Sport 4X4 MPV NHTSA No.: MD0307
Test Program: NCAP Frontal Impact Test Date: 10/24/12

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	446.0	320.2		483.4	391.8	
Right	kg	433.6	309.8		459.4	388.6	
Ratio	%	58.3	41.7		54.7	45.3	
Totals	kg	879.6	630.0	1509.6	942.8	780.4	1723.2

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1509.6
Weight of 1 P572E ATD & 1 P572O ATD	kg	139.3
Rated Cargo/Luggage Weight (RCLW)	kg	78.8
Vehicle Target Weight (TVTW)	kg	1727.7

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	788	788	800	807	1098
As Tested	mm	775	776	779	770	1191
Post Test	mm	781	747	771	760	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2630
Total Vehicle Length at Left Side	mm	4340
Total Vehicle Length at Centerline	mm	4440
Total Vehicle Length at Right Side	mm	4345
Weight of Ballast in Cargo Area	kg	0.0
Weight of Vehicle Components Removed	kg	34.8
Amount of Stoddard Solvent in Fuel Tank	liters	47.7

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:

Left and right rear door glass, window motors and regulators, door panels and seals; rear bumper beam; rear fascia, tail lights, right side outside rear view mirror.

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Jeep Compass Sport 4X4 MPV NHTSA No.: MD0307
Test Program: NCAP Frontal Impact Test Date: 10/24/12

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4440
2	Total Width	1810
3	Bumper Top Height	635
4	Bumper Bottom Height	520
5	Longitudinal Member Top Height	635
6	Distance Between Longitudinal Members	915
7	Longitudinal Member Width	73
8	Engine Top Height	898
9	Engine Bottom Height	255
10	Engine and Gearbox Width	850
11	Front Bumper-Engine Distance	450
12	Front Shock Absorber Fixing Height	930
13	Bonnet Leading Edge Height	880
14	Front Shock Absorber Fixing Width	1100
15	Front Bumper – Front Axle Distance	920
16	Front Axle – A-Pillar Distance	590
17	A-Pillar – B-Pillar Distance	980
18	B-Pillar – Rear Axle Distance	1080
19	B-Pillar – C-Pillar Distance	800
20	Roof Sill Bottom Height	1465
21	Roof Sill Top Height	1545
22	Floor Sill Bottom Height	370
23	Floor Sill Top Height	440

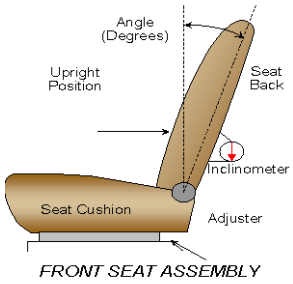
DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEM AND STEERING WHEEL DATA

Test Vehicle: 2013 Jeep Compass Sport 4X4 MPV NHTSA No.: MD0307
Test Program: NCAP Frontal Impact Test Date: 10/24/12

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:	13.0
Passenger Seat back angle:	10.7

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	20 of 39
Passenger Seat	260	1 of 39

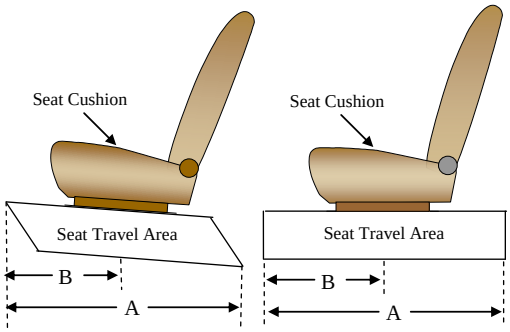
SEAT BELT UPPER ANCHORAGE

Describe the method of positioning seat belt upper anchorages.

Driver: Mid position

Passenger: Full forward

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



DATA SHEET NO. 2 (CONTINUED)

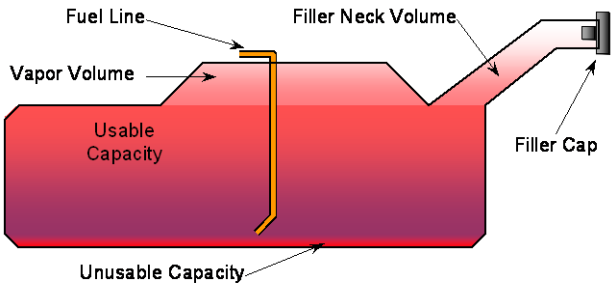
SEAT ADJUSTMENT, FUEL SYSTEM AND STEERING WHEEL DATA

Test Vehicle: 2013 Jeep Compass Sport 4X4 MPV NHTSA No.: MD0307
Test Program: NCAP Frontal Impact Test Date: 10/24/12

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	51.5
Usable Capacity of "Optional" Tank	NA
92%-94% of Usable Capacity	47.4-48.4
Actual Amount of Solvent used	47.7
1/3 of Usable Capacity	17.2

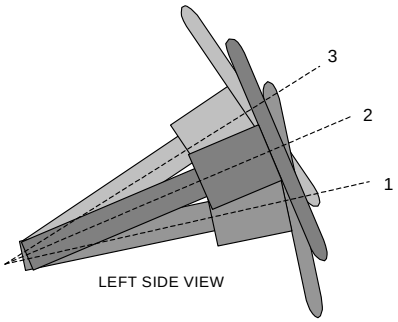
The test vehicle is equipped with an electric fuel pump. The fuel pump operates for approximately two seconds after the ignition is placed in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies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

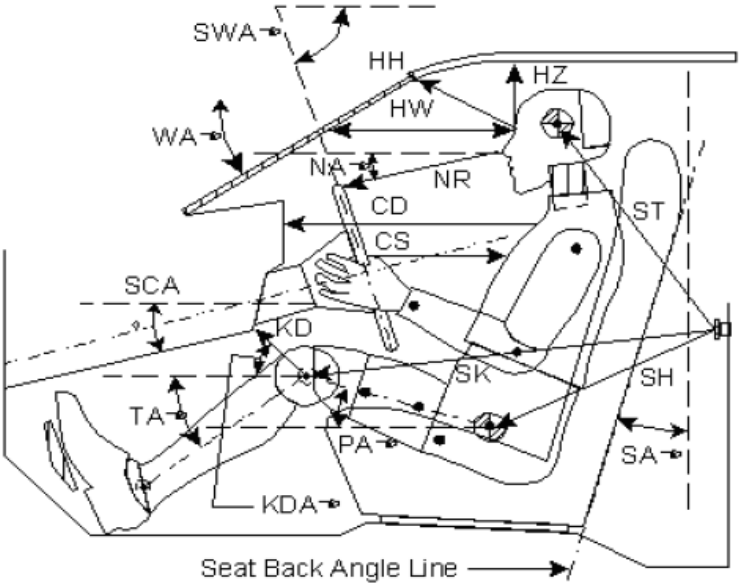
STEERING COLUMN POSITIONS

	Degrees	Fore/Aft Position, mm
Lowermost Position No. 1	69.2	NA
Geometric Center Position No. 2	66.1	NA
Uppermost Position No. 3	63.0	NA
Telescoping Steering Wheel Travel	No feature	NA
Test Position	66.1	NA

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Jeep Compass Sport 4X4 MPV NHTSA No.: MD0307
Test Program: NCAP Frontal Impact Test Date: 10/24/12

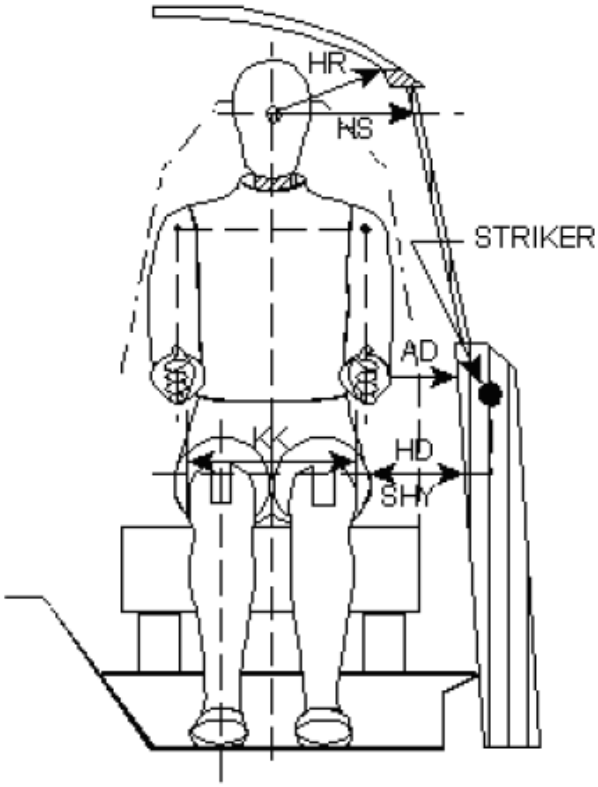


Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (º)	Length (mm)	Angle (º)
WAº	Windshield Angle		29.7		
SWAº	Steering Wheel Angle		66.1		
SCAº	Steering Column Angle		23.9		
SAº	Seat Back Angle (on headrest post)		13.0		10.7
HZ	Head to Roof (Z)	235	90.0	253	90.0
HH	Head to Header	478	18.0	393	34.9
HW	Head to Windshield	723	0.0	736	0.0
NR	Nose to Rim	393	13.0		
CD	Chest to Dash	550		372	
CS	Chest to Steering Hub	282	0.0		
RA	Rim to Abdomen	197	0.0		
KDL	Left Knee to Dash	158	35.0	93	37.0
KDR	Right Knee to Dash	150	35.0	95	37.0
PAº	Pelvic Angle		22.2		21.7
TAº	Tibia Angle		50.0		56.7
SK	Striker to Knee	589	5.8	700	4.0
ST	Striker to Head	531	-81.0	493	-66.5
SH	Striker to H-Point	240	39.5	367	18.8

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Jeep Compass Sport 4X4 MPV NHTSA No.: MD0307
Test Program: NCAP Frontal Impact Test Date: 10/24/12

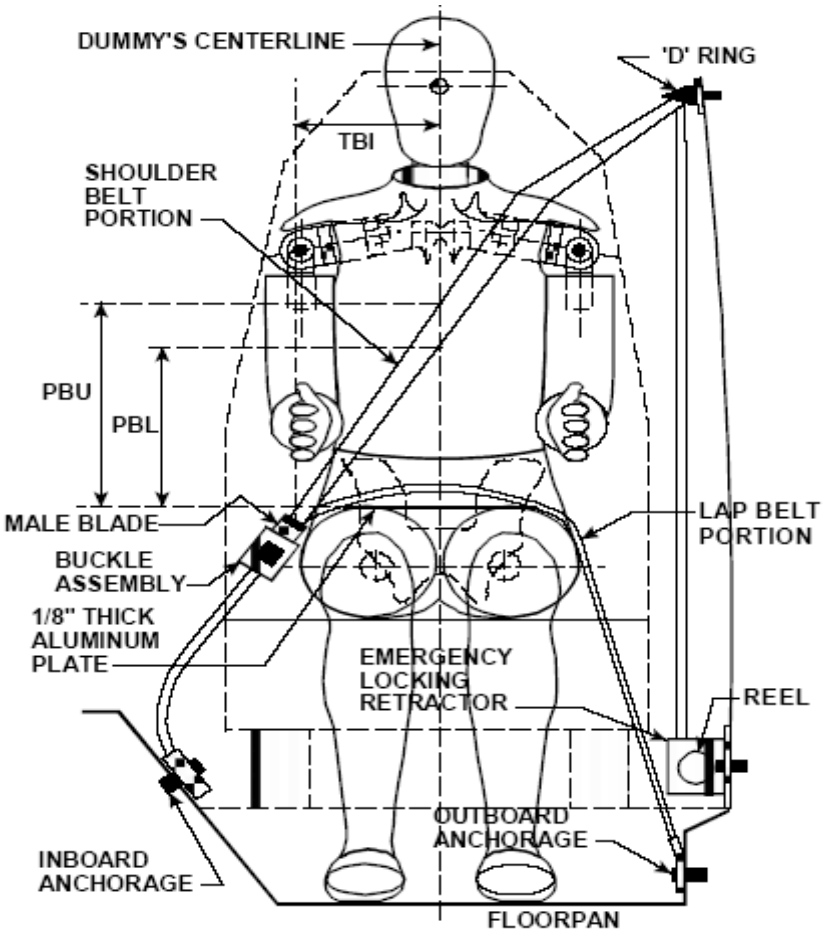


Code	Measurement Description	Driver	Passenger
AD	Arm to Door	104	88
HD	H-Point to Door	150	169
HR	Head to Side Header	243	262
HS	Head to Side Window	369	391
KK	Knee to Knee	295	165
SHY	Striker to H-Point (Y Direction)	248	273
AA	Ankle to Ankle	247	171

DATA SHEET NO. 5

SEAT BELT POSITIONING DATA

Test Vehicle:	2013 Jeep Compass Sport 4X4 MPV	NHTSA No.:	MD0307
Test Program:	NCAP Frontal Impact	Test Date:	10/24/12



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU – Top surface of reference to belt upper edge	mm	338	265
PBL – Top surface of reference to belt lower edge	mm	266	180

BELT LENGTH DATA

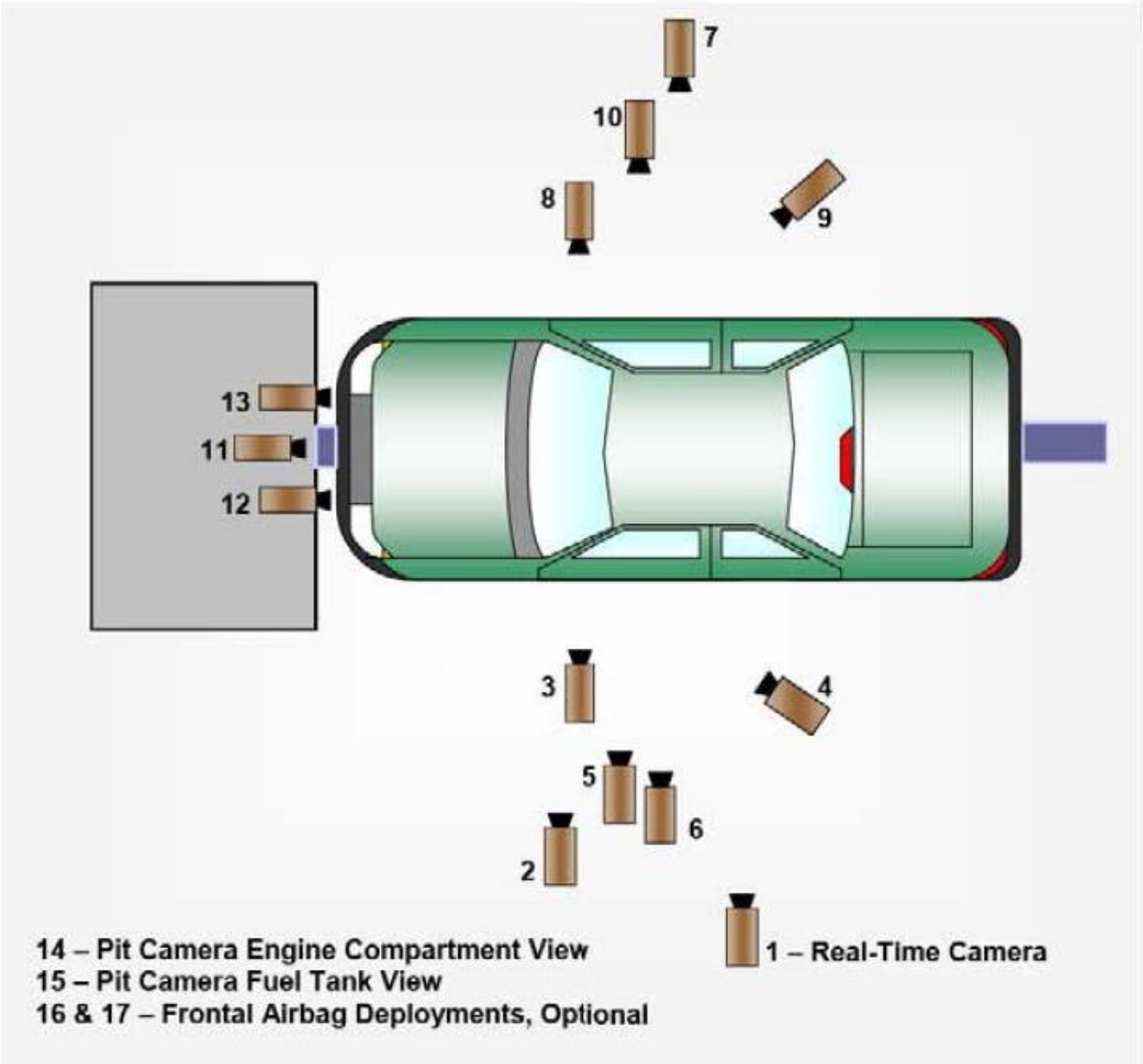
Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	824	920
Lap belt length as measured on ATD	mm	554	511
Remainder of belt on reel	mm	1112	1074
Total belt length for continuous webbing systems	mm	2490	2605

DATA SHEET NO. 6

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle:	2013 Jeep Compass Sport 4X4 MPV	NHTSA No.:	MD0307
Test Program:	NCAP Frontal Impact	Test Date:	10/24/12

CAMERA POSITIONS FOR FRONTAL IMPACTS



Note: The vehicle label viewed in the video states the vehicle to be a 2013 Jeep Compass Sport FWD. The vehicle is a 4WD or 4x4 model not FWD.

DATA SHEET NO. 6 (CONTINUED)

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2013 Jeep Compass Sport 4X4 MPV NHTSA No.: MD0307
Test Program: NCAP Frontal Impact Test Date: 10/24/12

CAMERA LOCATIONS

No.	Camera View	Location (mm)			Lens (mm)	Frame Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	NA	NA	NA	zoom	30
2	Driver Close-Up	-1294	-5190	-1350	50	1000
3	Left Front Half	-1422	-4975	-1206	25	1000
4	Left Angle	-3862	-3108	-1963	16	1000
5	Steering Column - Top	-1787	-5167	-2078	25	1000
6	Steering Column – Bottom	-1739	-4655	-1388	25	1000
7	Right Overall[1]	-1025	5527	-1237	12.5	1000
8	Passenger Close-Up	-1415	5823	-1269	50	1000
9	Right Front Half	-1172	5418	-1353	25	1000
10	Right Angle	-4199	3238	-1921	25	1000
11	Windshield	-76	0	-2563	8.5	1000
12	Driver Windshield	-76	-457	-2563	12.5	1000
13	Passenger Windshield	-76	457	-2563	12.5	1000
14	Pit Front	-122	-50	3008	25	1000
15	Pit Rear	-2471	0	2953	8.5	1000
16	Onboard Driver Airbag (Optional)	NA	NA	NA	8.5	1000
17	Onboard Passenger Airbag (Optional)	NA	NA	NA	12.5	1000

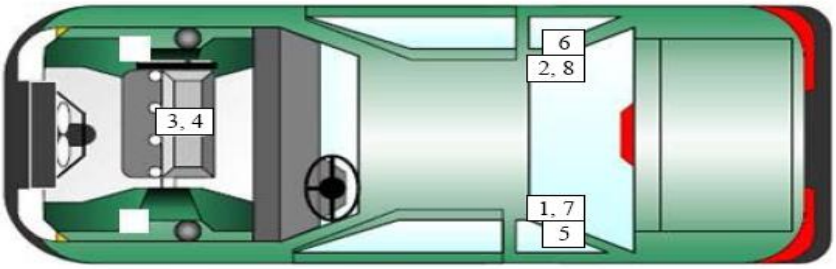
Reference Points: +X – forward of impact plane
+Y – right of monorail center
+Z – into ground

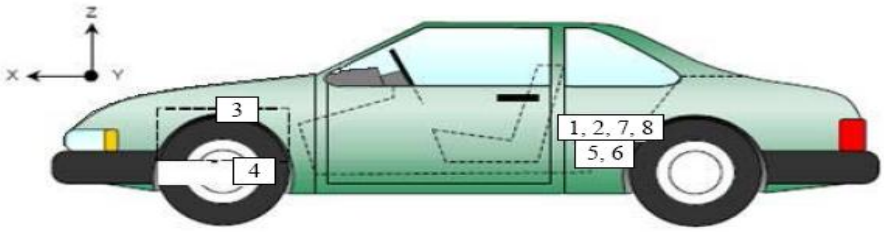
[1] Camera view number 7 was inadvertently recorded out of focus.

DATA SHEET NO. 7

VEHICLE ACCELEROMETER DATA

Test Vehicle:	2013 Jeep Compass Sport 4X4 MPV	NHTSA No.:	MD0307
Test Program:	NCAP Frontal Impact	Test Date:	10/24/12





VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Camera View	Location (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	2140	-475	950
2	Right Rear Accelerometer – X Direction	2140	475	950
3	Engine Top X	4320	55	885
4	Engine Bottom X	4225	250	285
7	Left Rear Accelerometer – Z Direction	2140	-532	950
8	Right Rear Accelerometer – Z Direction	2140	535	950

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

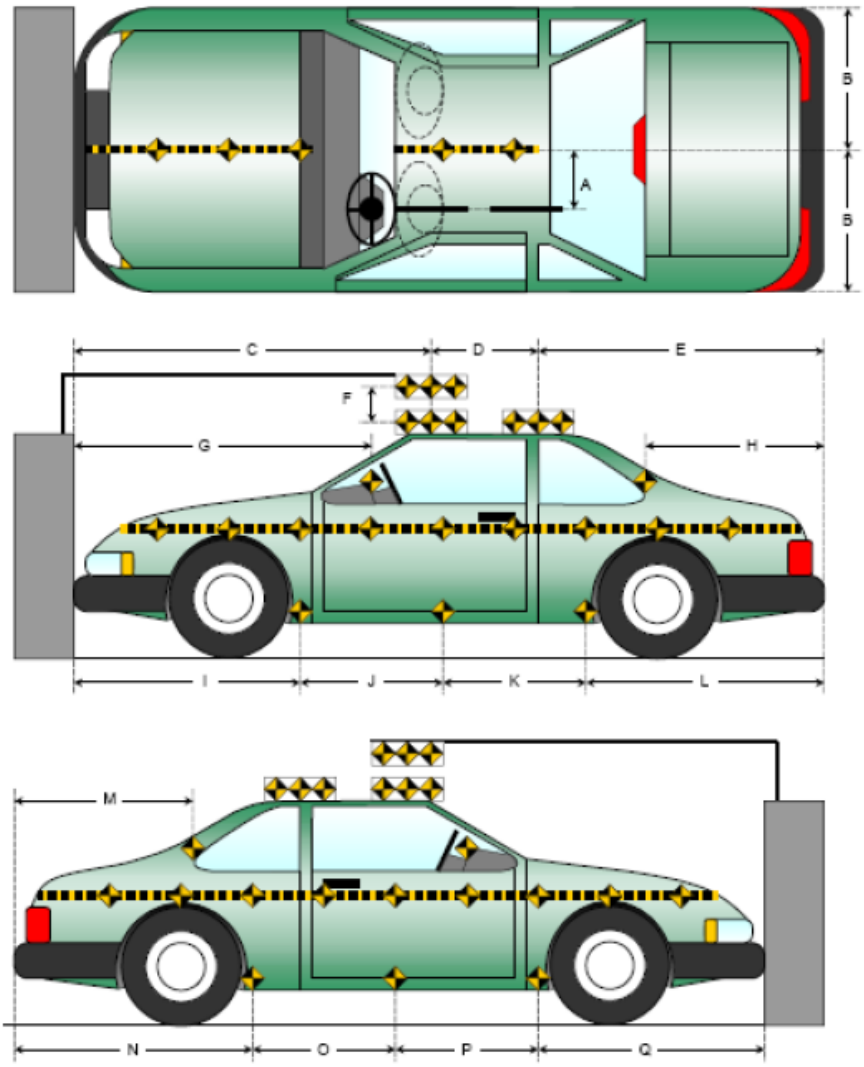
DATA SHEET NO. 8

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2013 Jeep Compass Sport 4X4 MPV NHTSA No.: MD0307
Test Program: NCAP Frontal Impact Test Date: 10/24/12

Item	Value
A	350
B	NA
C	NA
D	610
E	1675
F	NA
G	2760
H	1110
I	1363
J	796
K	810
L	1385
M	1118
N	1365
O	815
P	815
Q	1345

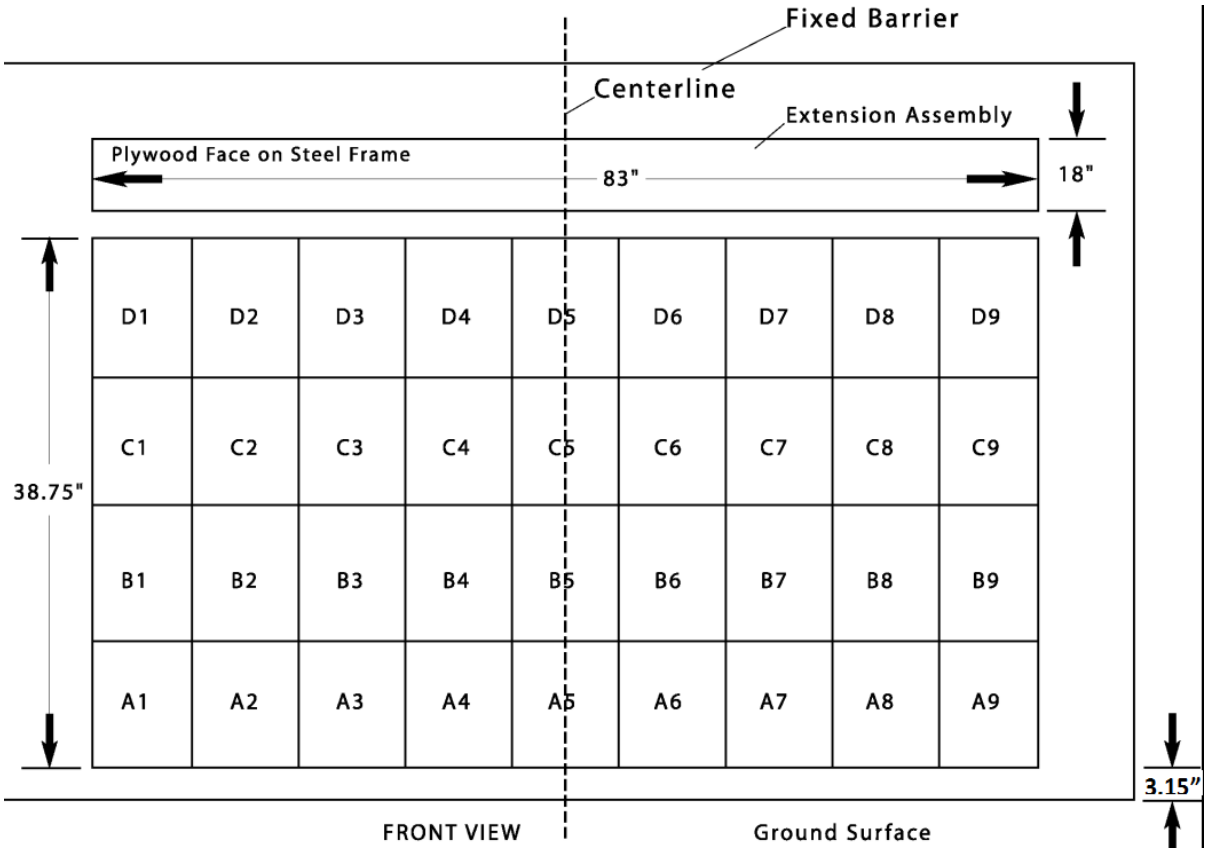
All units in millimeters



DATA SHEET NO. 9

LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle:	2013 Jeep Compass Sport 4X4 MPV	NHTSA No.:	MD0307
Test Program:	NCAP Frontal Impact	Test Date:	10/24/12



DATA SHEET NO. 10

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2013 Jeep Compass Sport 4X4 MPV NHTSA No.: MD0307
Test Program: NCAP Frontal Impact Test Date: 10/24/12

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 Compass Sport 4X4 MPV NHTSA No.: MD0307
Test Program: NCAP Frontal Impact Test Date: 10/24/12

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type / Serial No.	Hybrid III 50th/ 037	Hybrid III 5th/ 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	Numerous cracks	None

VEHICLE REBOUND FROM BARRIER

Measured Parameters	Units	Value
Left Side	mm	1676
Center	mm	1593
Right Side	mm	1667
Average	mm	1645

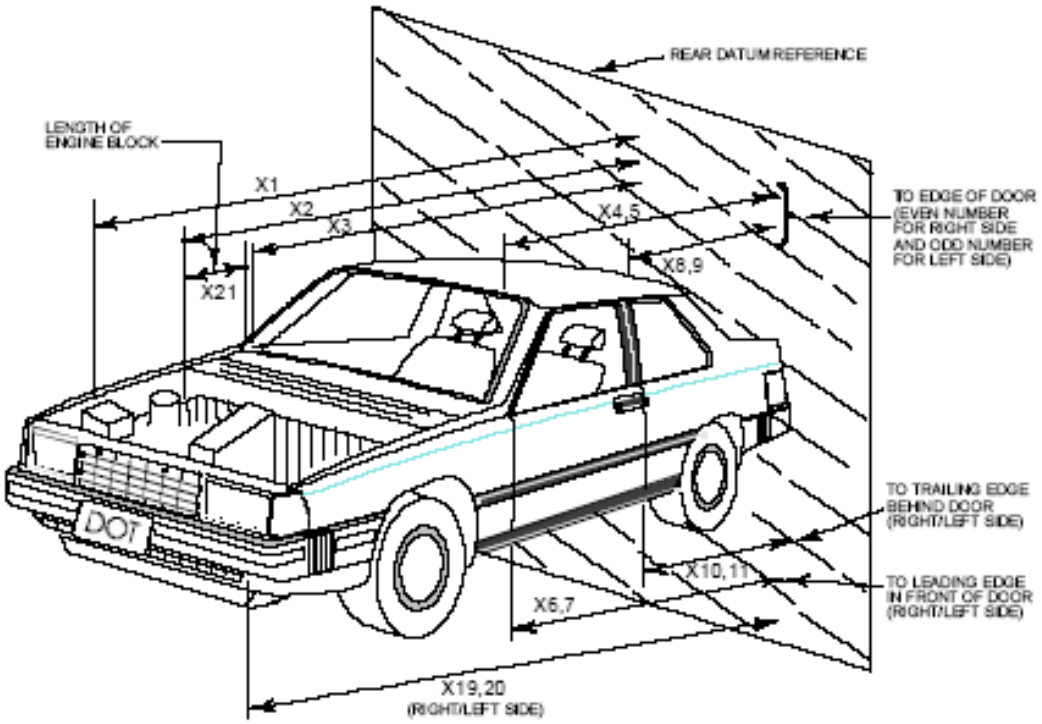
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

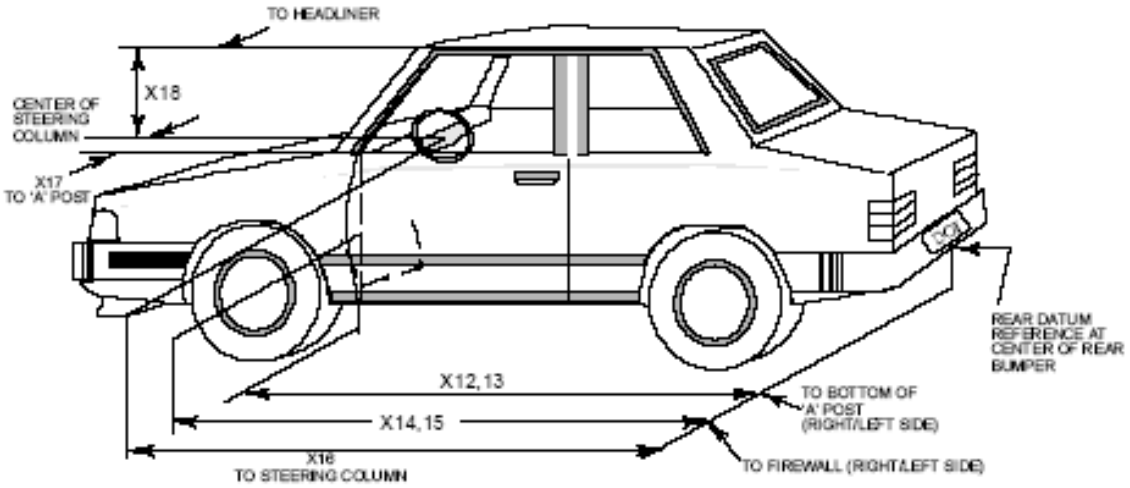
Restraint Type	Driver (Occupant 1)		Passenger (Occupant 2)	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	Yes	Yes	Yes
Curtain	Yes	No	Yes	No
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	No	NA	No	NA
Other	NA	NA	NA	NA

DATA SHEET NO. 12

VEHICLE PROFILE MEASUREMENTS

Test Vehicle:	2013 Jeep Compass Sport 4X4 MPV	NHTSA No.:	MD0307
Test Program:	NCAP Frontal Impact	Test Date:	10/24/12





DATA SHEET NO. 12 (CONTINUED)

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2013 Jeep Compass Sport 4X4 MPV NHTSA No.: MD0307
Test Program: NCAP Frontal Impact Test Date: 10/24/12

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4440	4005	435
2	Rear Surface of Vehicle (RSOV) to Front of Engine	3950	3705	245
3	RSOV to Firewall	3495	3415	80
4	RSOV to Upper Leading Edge of Right Door	3007	3007	0
5	RSOV to Upper Leading Edge of Left Door	3010	3005	5
6	RSOV to Lower Leading Edge of Right Door	2935	2934	1
7	RSOV to Lower Leading Edge of Left Door	2920	2923	-3
8	RSOV to Upper Trailing Edge of Right Door	1994	1992	2
9	RSOV to Upper Trailing Edge of Left Door	1994	1990	4
10	RSOV to Lower Trailing Edge of Right Door	1994	1989	5
11	RSOV to Lower Trailing Edge of Left Door	2002	1980	22
12	RSOV to Bottom of “A” Post-of Right Side	2960	2970	-10
13	RSOV to Bottom of “A” Post-of Left Side	2960	2970	-10
14	RSOV to Firewall, Right Side	3437	3390	47
15	RSOV to Firewall, Left Side	3425	3393	32
16	RSOV to Steering Column	2565	2610	-45
17	Center of Steering Column to “A” Post	320	320	0
18	Center of Steering Column to Headliner	460	400	60
19	RSOV to Right Side of Front Bumper	4345	3970	375
20	RSOV to Left Side of Front Bumper	4340	3980	360
21	Length of Engine Block	850	850	0
RD	RSOV to Right Side of Dash Panel	2818	2825	-7
CD	RSOV to Center of Dash Panel	2760	2755	5
LD	RSOV to Left Side of Dash Panel	2800	2815	-15

All Dimensions in mm

DATA SHEET NO. 13

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2013 Jeep Compass Sport 4X4 MPV NHTSA No.: MD0307
Test Program: NCAP Frontal Impact Test Date: 10/24/12

VEHICLE INFORMATION

VIN: 1C4NJDBB0DD158488 Wheelbase: 2630
Vehicle Size Category: MPV Test Weight (kg): 1723.2

ACCELEROMETER DATA

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

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

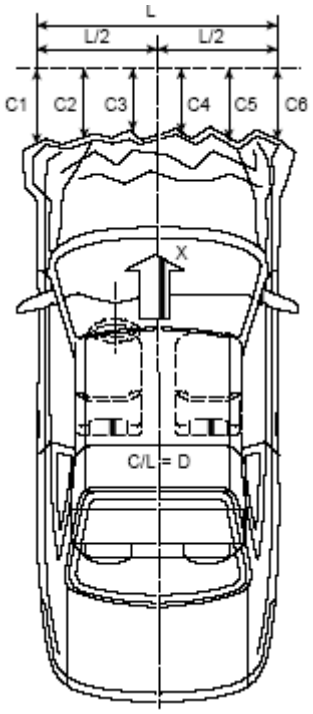
Integration Algorithm: Trapezoidal

Linearity: > 99%

Impact Velocity (km/h): 56.50

Velocity Change (km/h): 65.37

Time of Separation (ms): 87



CRUSH PROFILE

Collision Deformation Classification: 12FDEW2

Midpoint of Damage: Centerline

Damage Region Length (mm): 1115

Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4340	3980	360
C2	Crush zone 1 at left side	mm	4395	4010	385
C3	Crush zone 1 at left side	mm	4425	4030	395
C4	Crush zone 1 at right side	mm	4425	4010	415
C5	Crush zone 1 at right side	mm	4395	4003	392
C6	Crush zone 1 at right side	mm	4345	3970	375
L	C1 to C6	mm	1115		

DATA SHEET NO. 14

VEHICLE INTRUSION MEASUREMENTS

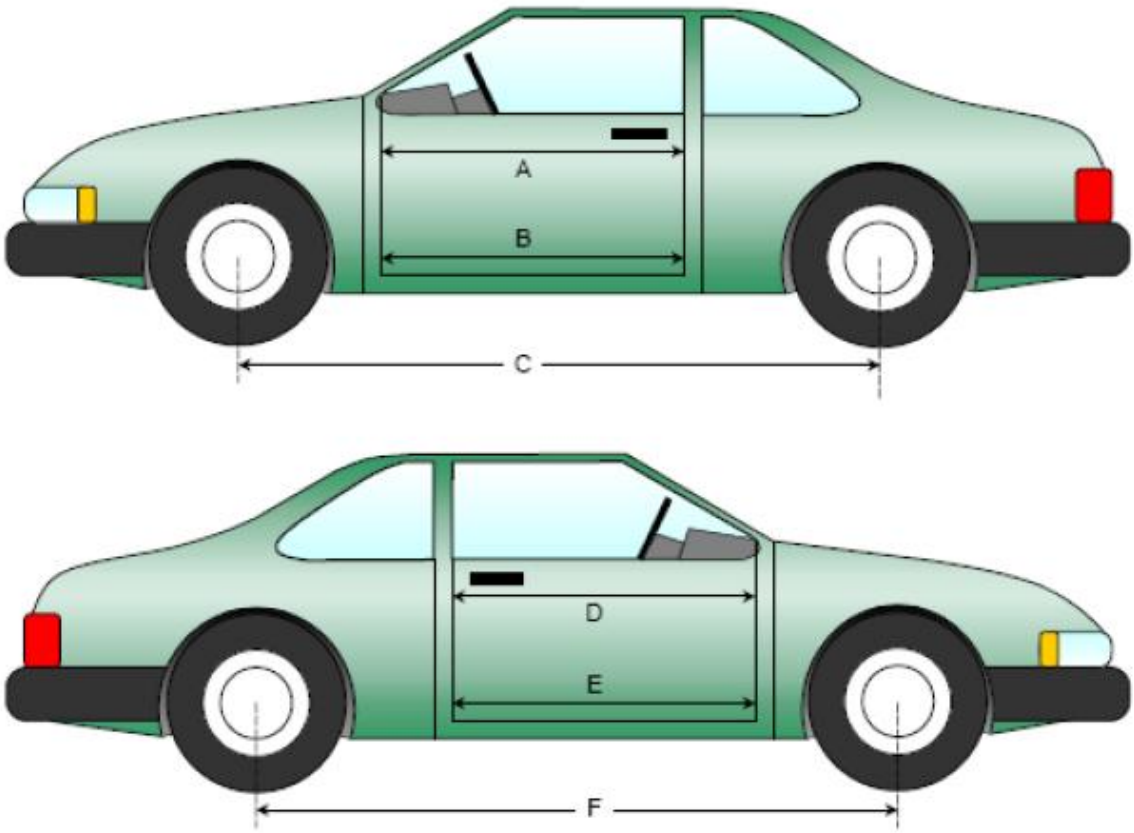
Test Vehicle: 2013 Jeep Compass Sport 4X4 MPV NHTSA No.: MD0307
Test Program: NCAP Frontal Impact Test Date: 10/24/12

DOOR OPENING WIDTH

No.	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	930	930	0
B	Left Side Lower	mm	880	878	2
C	Right Side Upper	mm	930	930	0
D	Right Side Lower	mm	880	880	0

WHEELBASE MEASUREMENTS

No.	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2630	2580	50
F	Right Side Wheelbase	mm	2630	2595	35



DATA SHEET NO. 14 (CONTINUED)

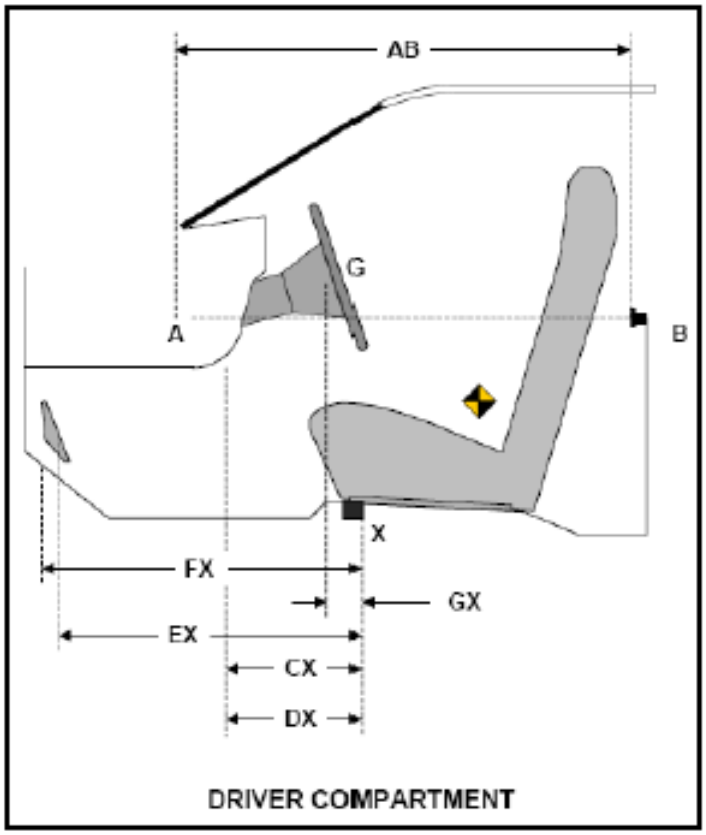
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2013 Jeep Compass Sport 4X4 MPV NHTSA No.: MD0307
Test Program: NCAP Frontal Impact Test Date: 10/24/12

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	930	930	0
CX	Left Knee Bolster to X	mm	265	245	20
DX	Right Knee Bolster to X	mm	260	280	-20
EX	Brake Pedal to X	mm	510	535	-25
FX	Foot Rest to X	mm	540	520	20
GX	Center of Steering Column Wheel Hub to X	mm	72	88	-16

X = Front of Seat Track (Stationary)



DATA SHEET NO. 15

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

Test Vehicle:	2013 Jeep Compass Sport 4X4 MPV	NHTSA No.:	MD0307
Test Program:	NCAP Frontal Impact	Test Date:	10/24/12

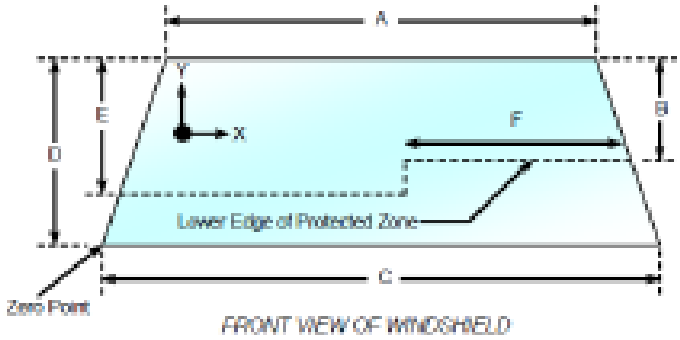
Please provide windshield mounting details.

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	2052.5	2052.5	100
Right Side	2052.5	2052.5	100
Total	4105.0	4105.0	100

Item	Units	Value
A	mm	1200
B	mm	475
C	mm	1455
D	mm	725
E	mm	470
F	mm	335



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 Compass Sport 4X4 MPV	NHTSA No.:	MD0307
Test Program:	NCAP Frontal Impact	Test Date:	10/24/12

FMVSS 301 FUEL SYSTEM INTEGRTY POST IMPACT DATA

Temperature at Time of Impact: Test Time:

Stoddard Solvent Spillage Measurements

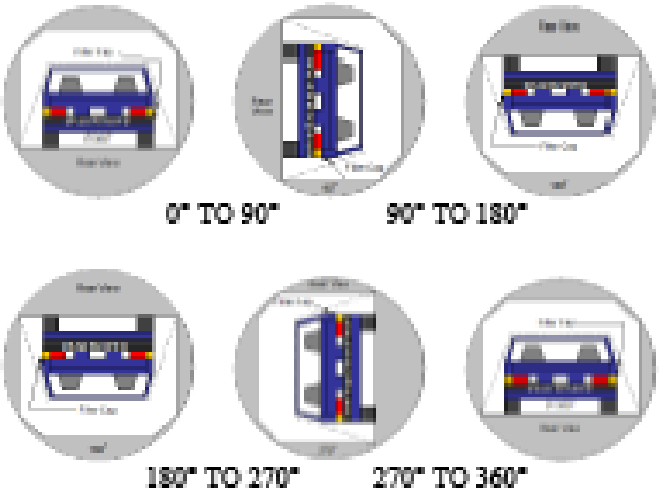
A	From impact until vehicle motion ceases: (maximum allowable – 1 oz.)	0	oz.
B	For the 5-minute period after motion ceases: (maximum allowable – 5 oz.)	0	oz.
C	For the following 25 minutes: (maximum allowable – 1 oz./minutes)	0	oz.
D	Spillage: 0		

DATA SHEET NO. 16

FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2013 Jeep Compass Sport 4X4 MPV NHTSA No.: MD0307
Test Program: NCAP Frontal Impact Test Date: 10/24/12

1. The specified fixture rollover rate for each 90º 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
0º to 90º	120	300	420
90º to 180º	120	300	420
180º to 270º	120	300	420
270º to 360º	120	300	420

FMVSS 301 SPILLAGE TABLE

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

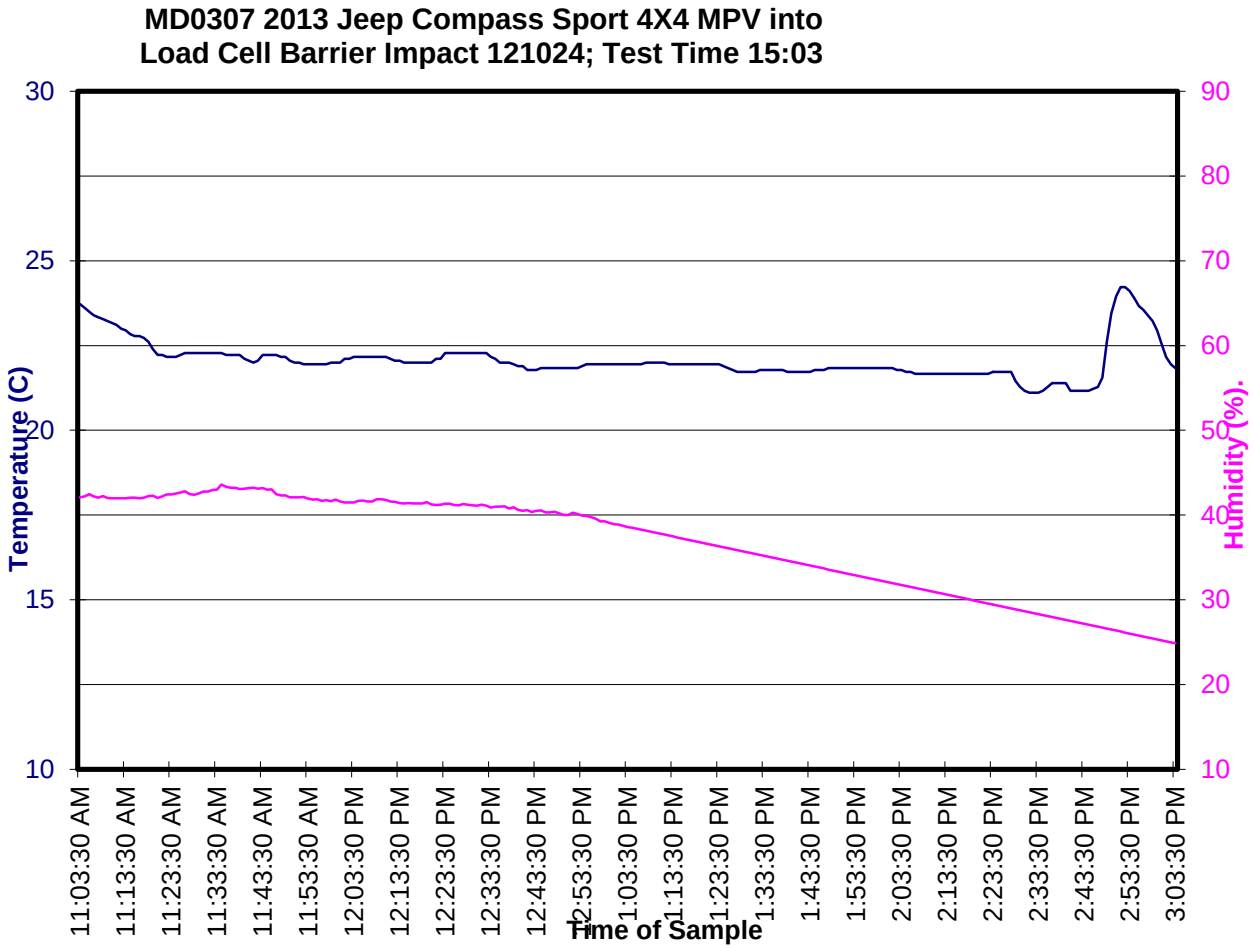
SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 17

DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle:	2013 Jeep Compass Sport 4X4 MPV	NHTSA No.:	MD0307
Test Program:	NCAP Frontal Impact	Test Date:	10/24/12



APPENDIX A

PHOTOGRAPHS

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7	Pre-Test Front View of Test Vehicle	**A-7**
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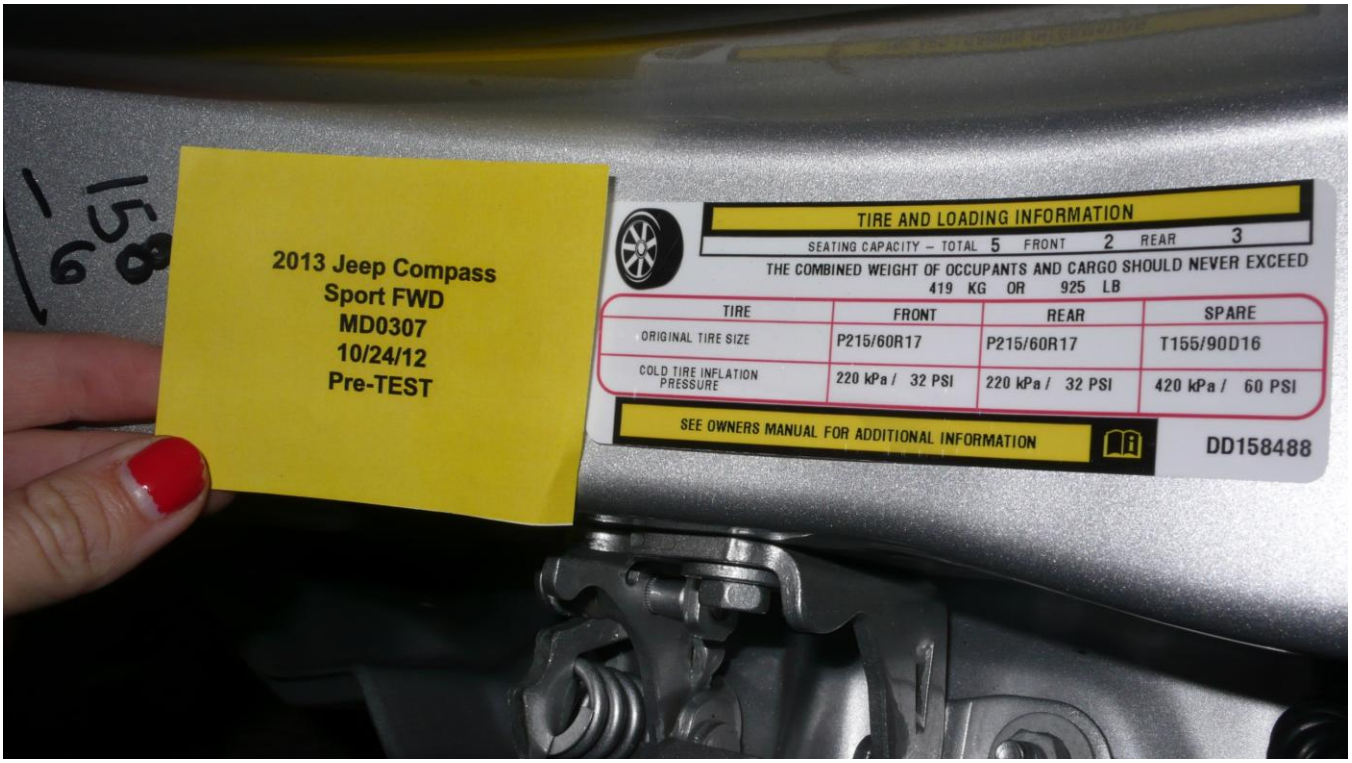
76	Monroney Label Photograph	**A-43**

Note: The vehicle label and the still photograph placard states the vehicle to be a 2013 Jeep Compass Sport FWD. The vehicle is a 4WD or 4x4 model not FWD.

001 Load Cell Location

002 Load Cell Wall

003 Manufacturer's Label



004 Tire Placard

005 2013 Jeep Compass Sport 4X4 Frontal As Delivered

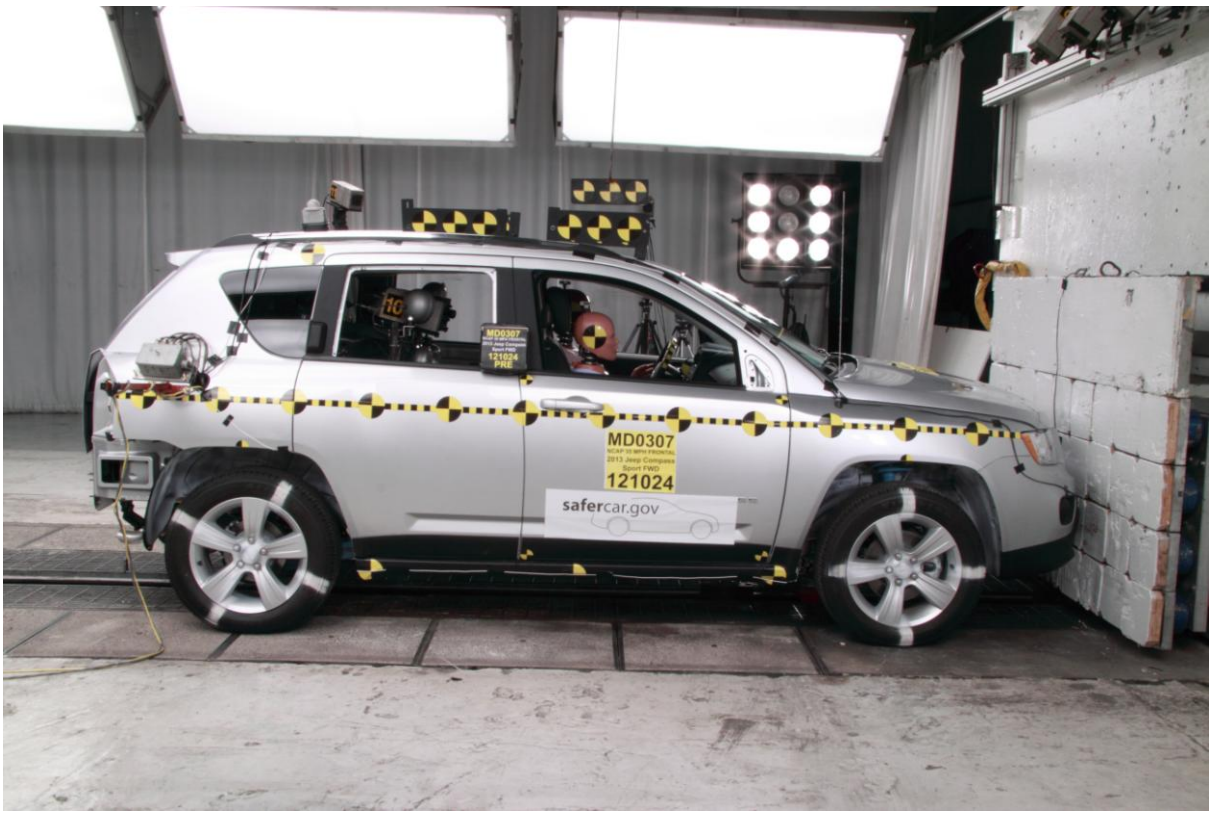
006 Left Rear 3-4 View, as Received

007 Pre-test Front View of Test Vehicle

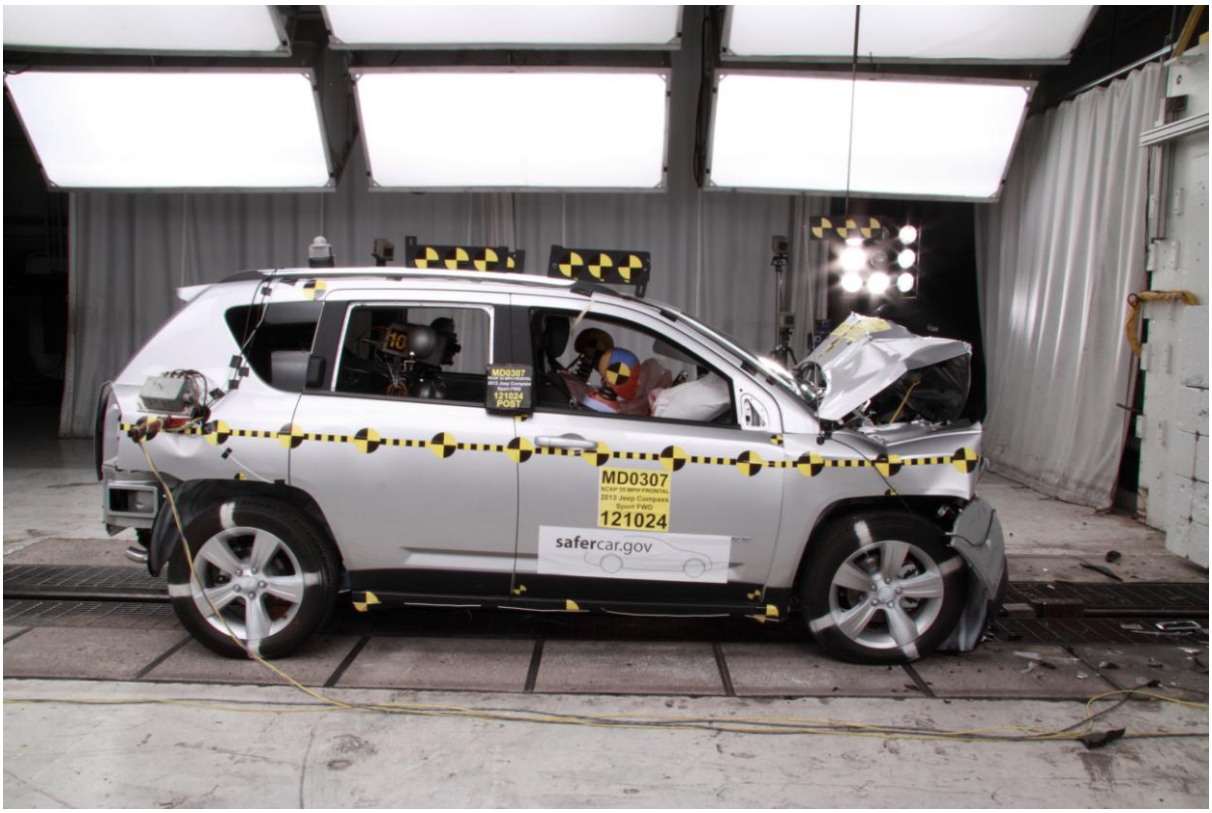
008 Post-test Front View of Test Vehicle

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

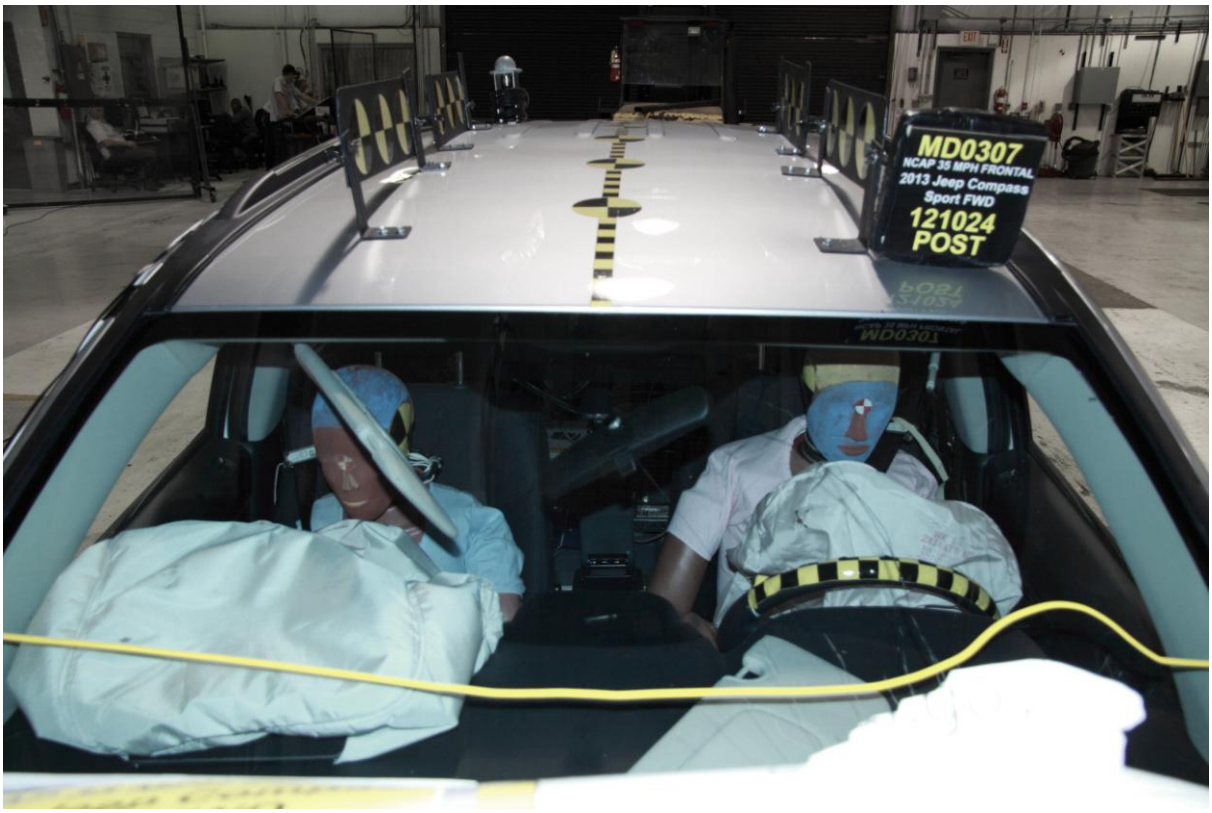
013 Pre-test Right Front 3-4 View

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

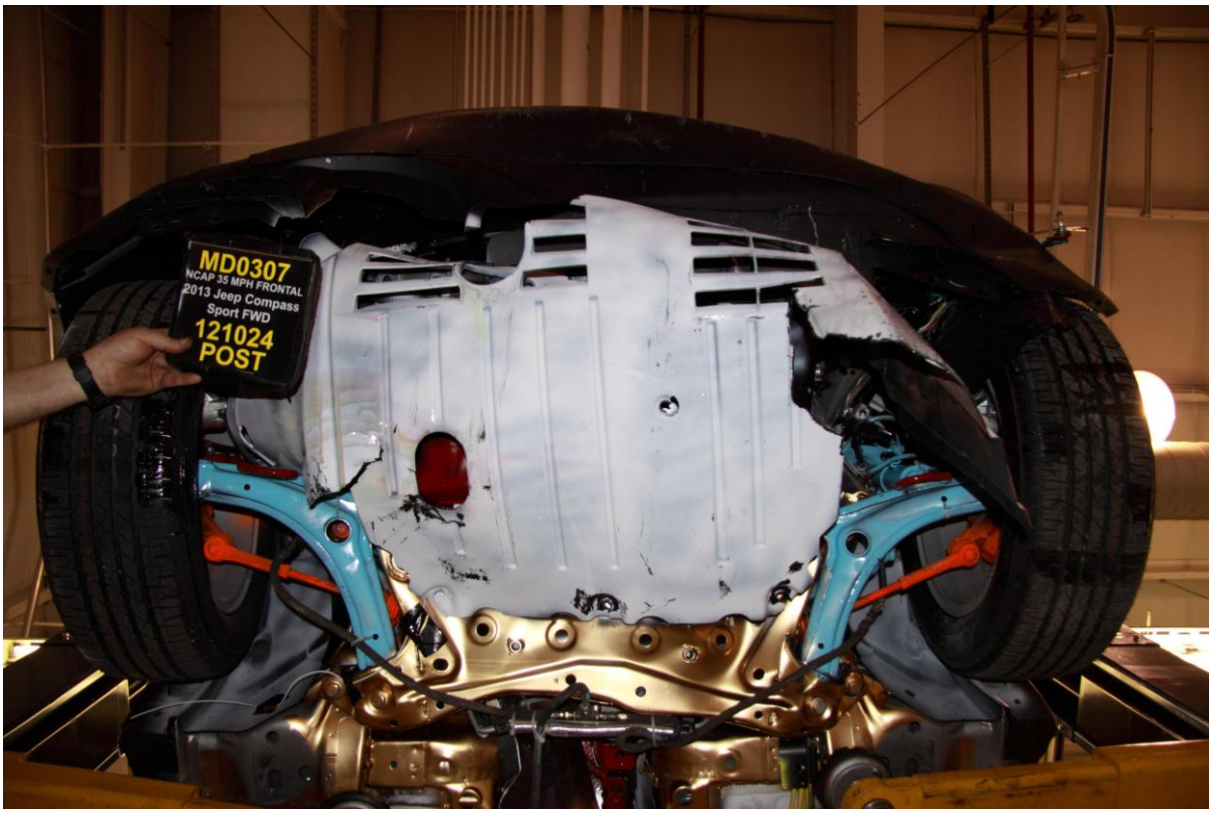
019 Pre-test Engine Compartment View

020 Post-test Engine Compartment View

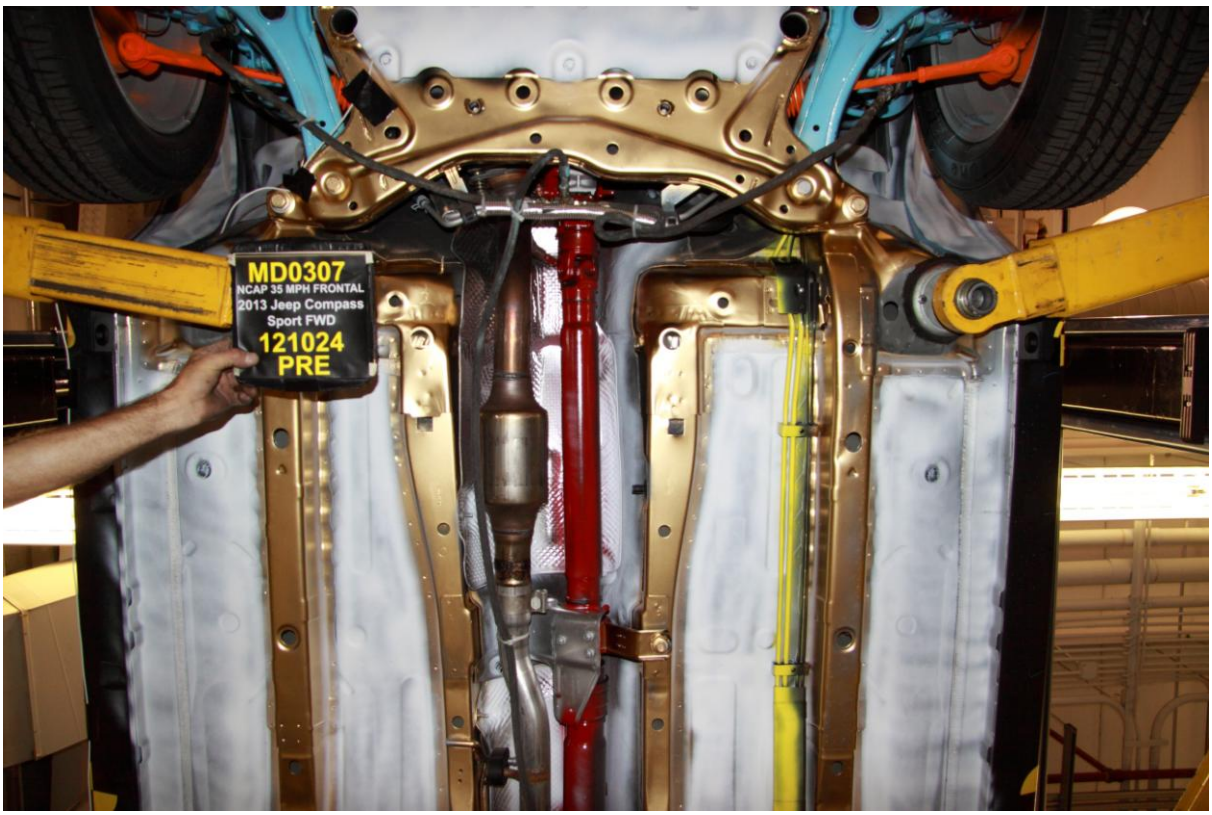
021 Pre-test Fuel Filler Cap View

022 Post-test Fuel Filler Cap View

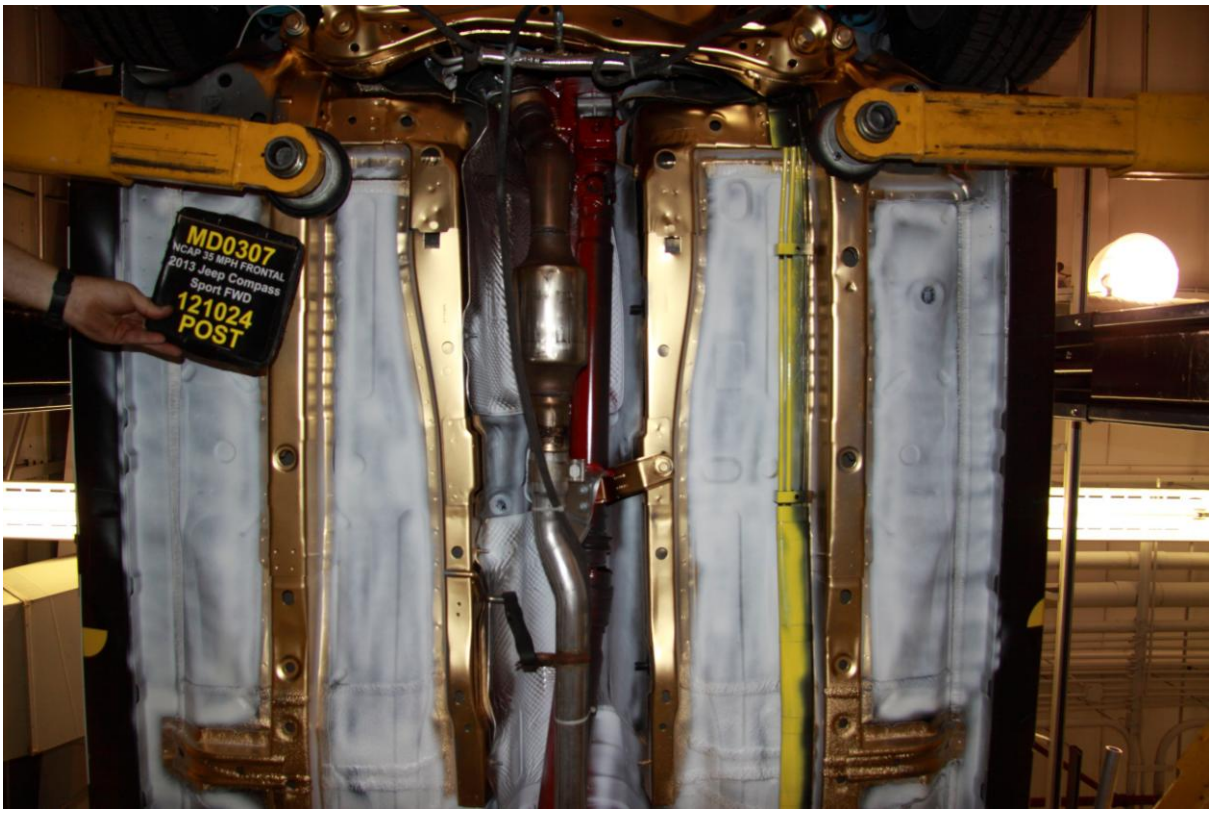
023 Pre-test Front Underbody View



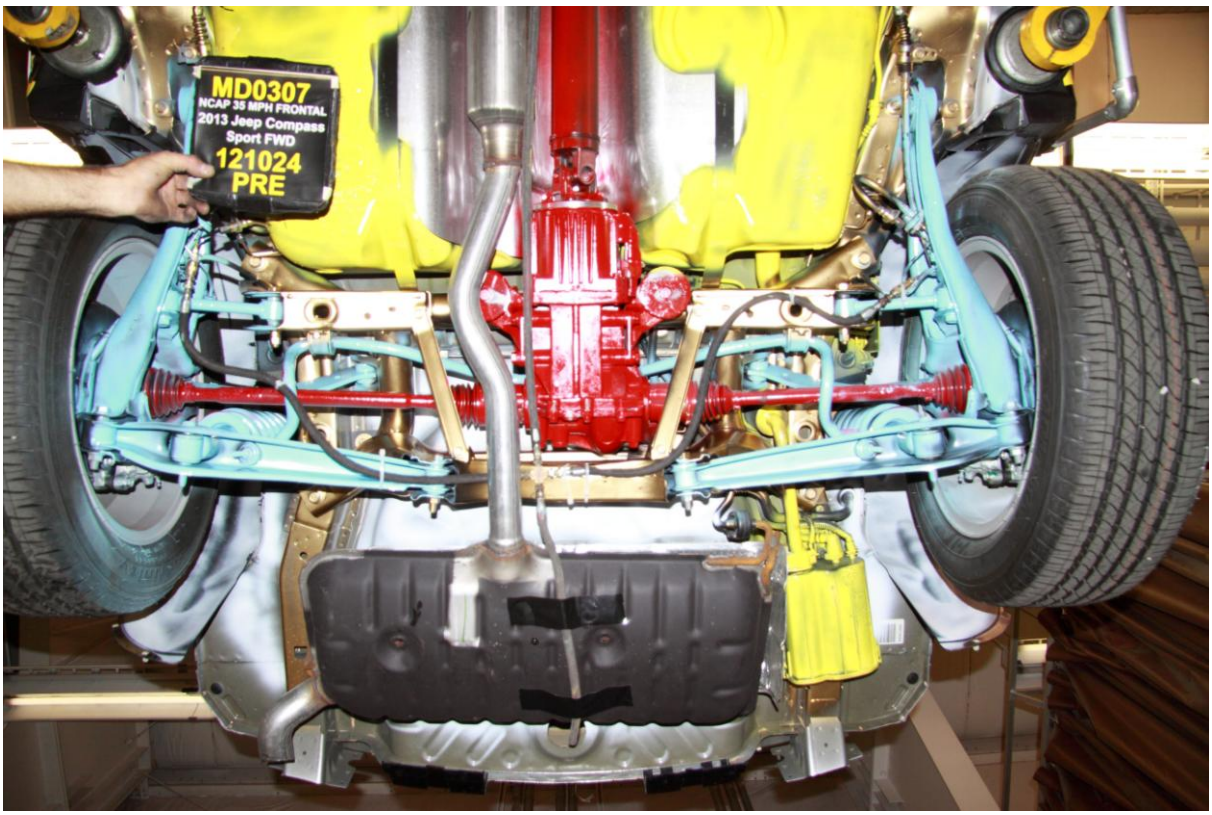
024 Post-test Front Underbody View



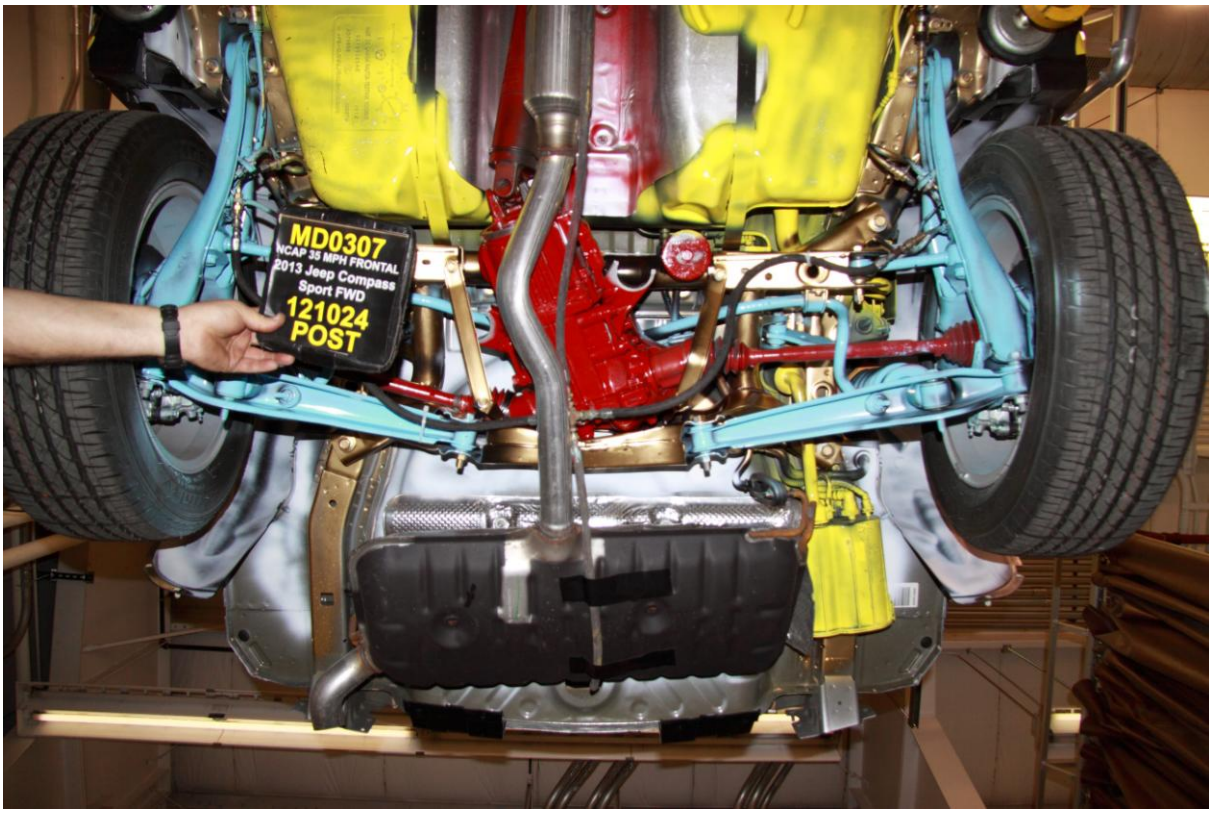
024a Pre-test Mid Underbody View



024b Post-test Mid Underbody View

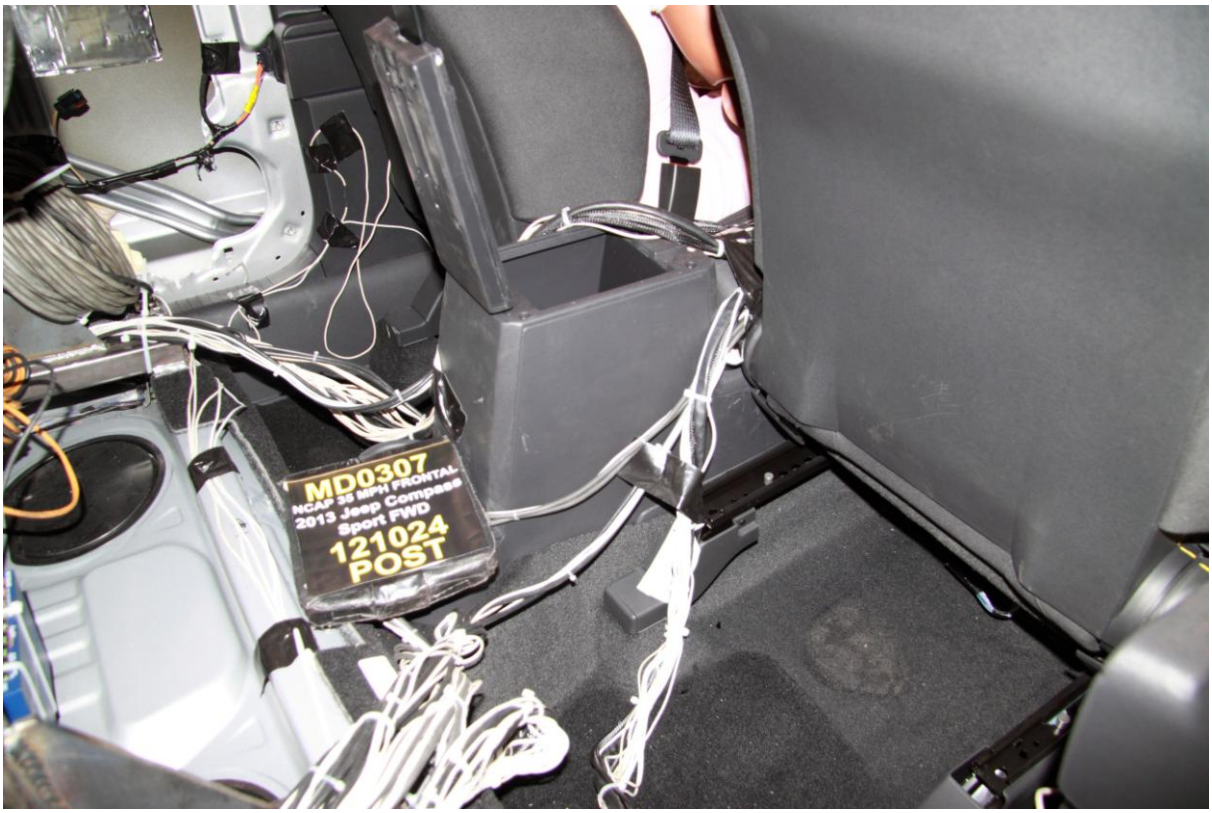


025 Pre-test Rear Underbody View



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

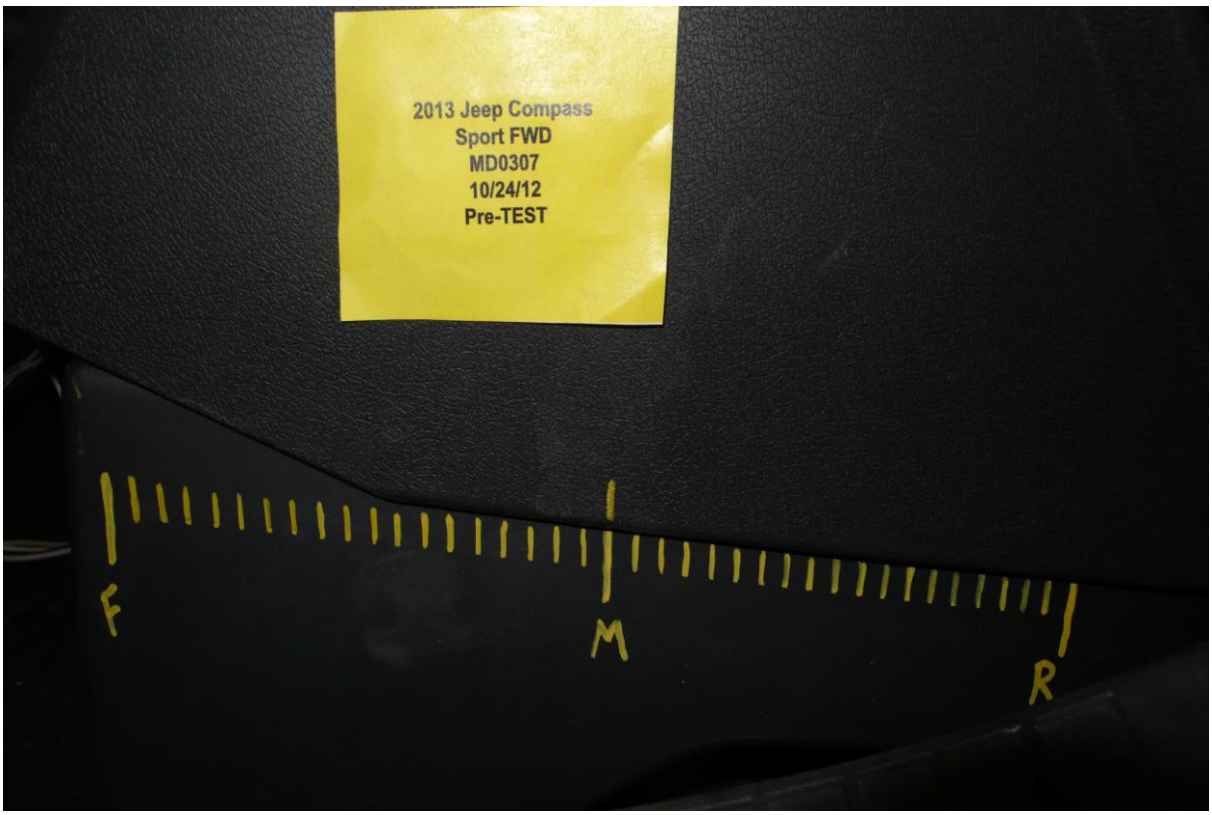
030 Post-test Driver Dummy Front View

031 Pre-test Driver Dummy Window View

032 Post-test Driver Dummy Window View

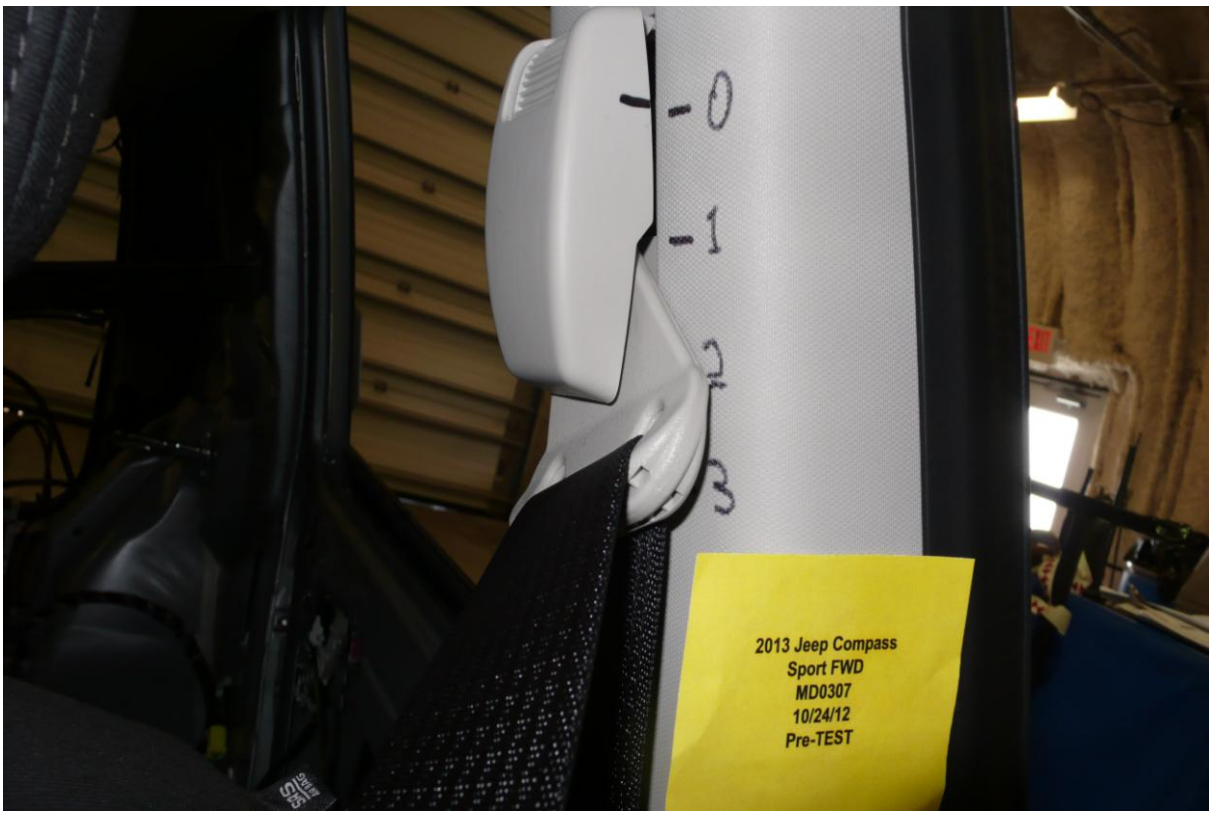
033 Pre-test Driver Dummy and Vehicle Interior View

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



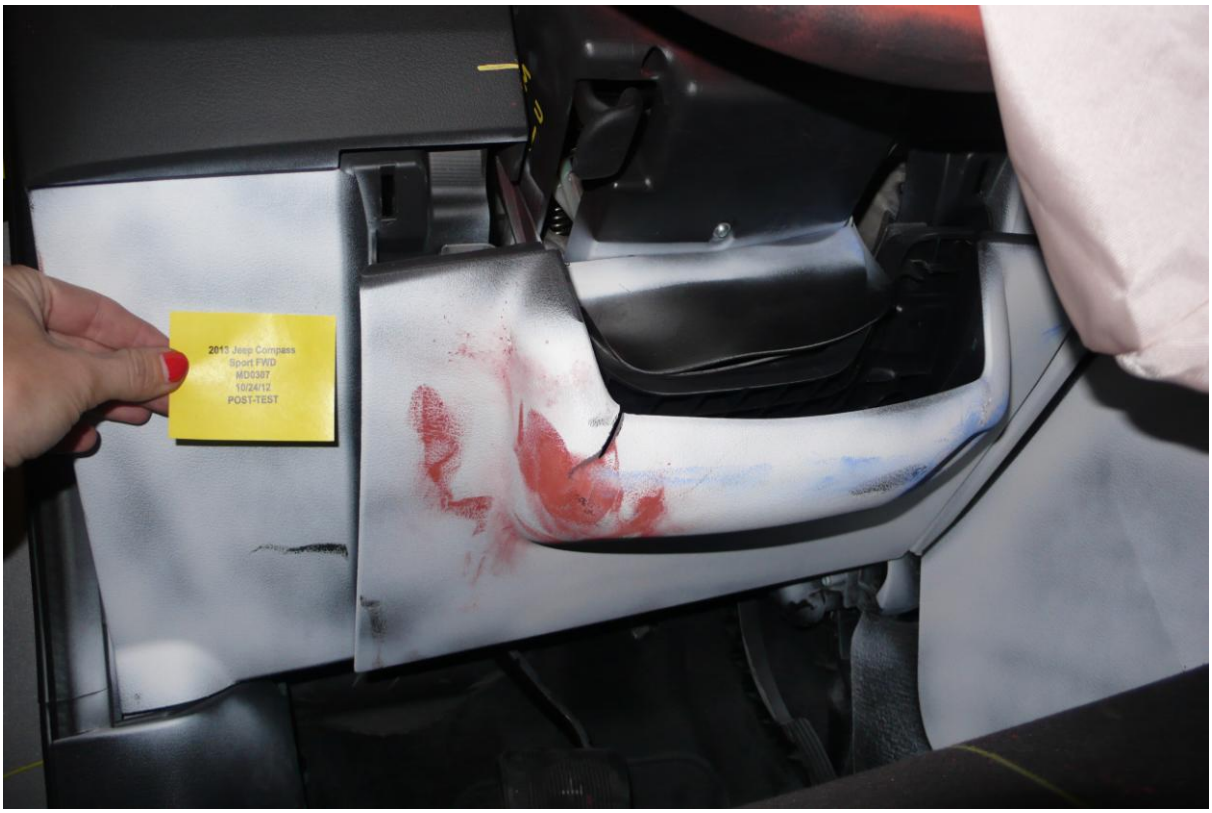
037 Pre-Test View of Belt Anchorage for Driver Dummy

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

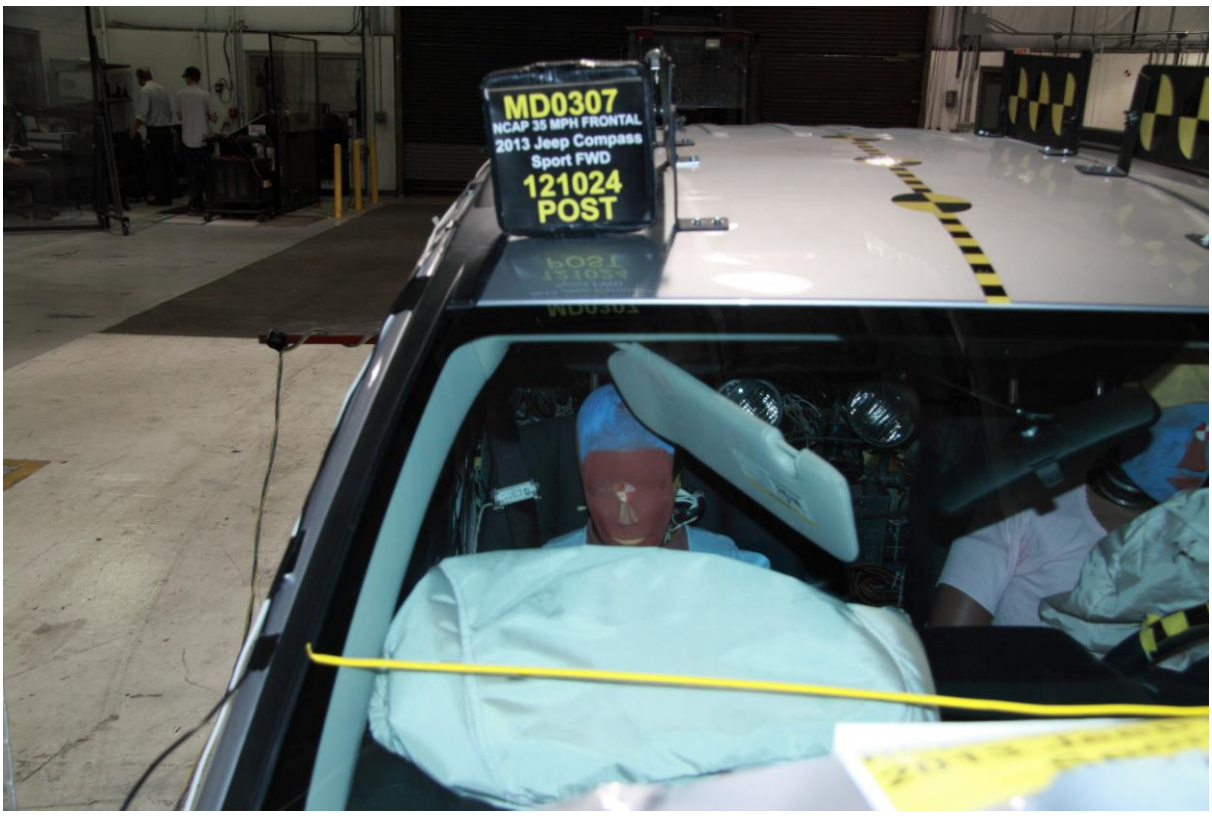
046 Post-test Driver Dummy Contact With Airbag

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

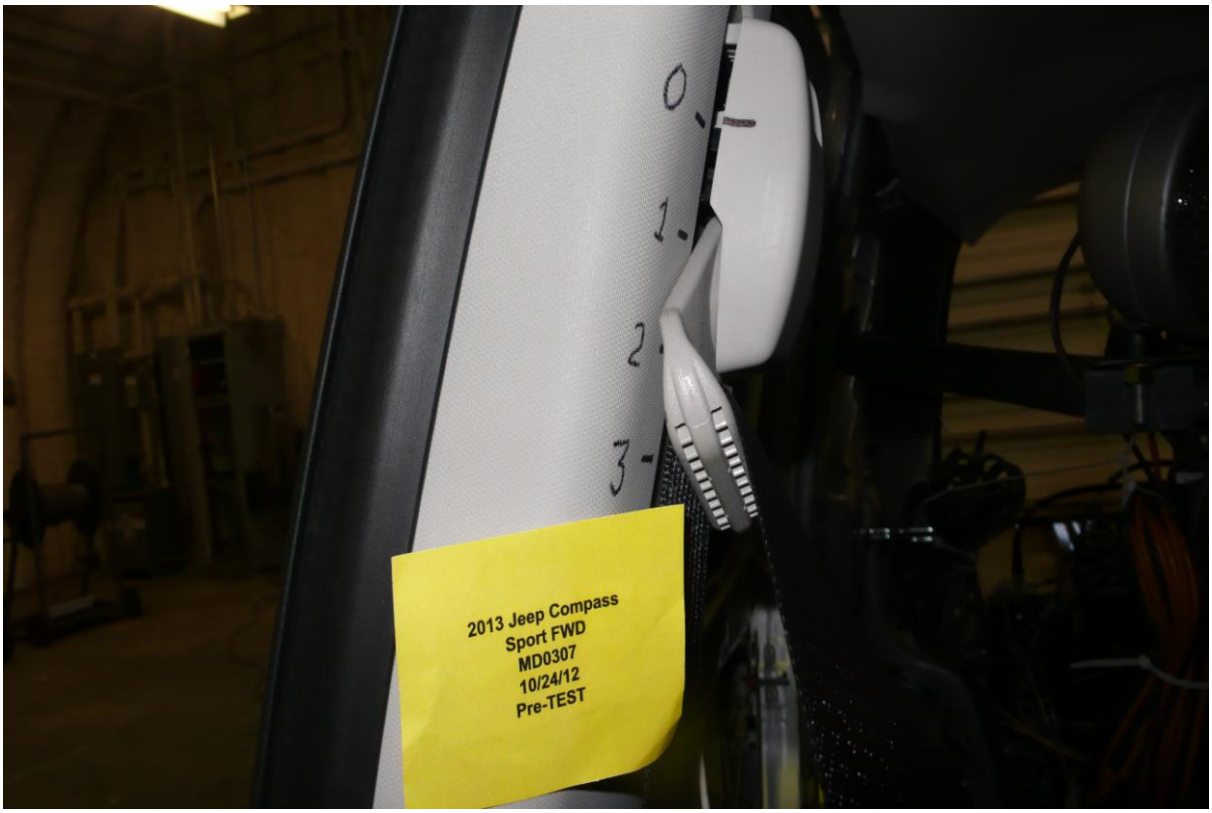
053 Post-test Passenger Dummy Window View

054 Pre-test Passenger Dummy and Vehicle Interior View

055 Post-test Passenger Dummy and Vehicle Interior View

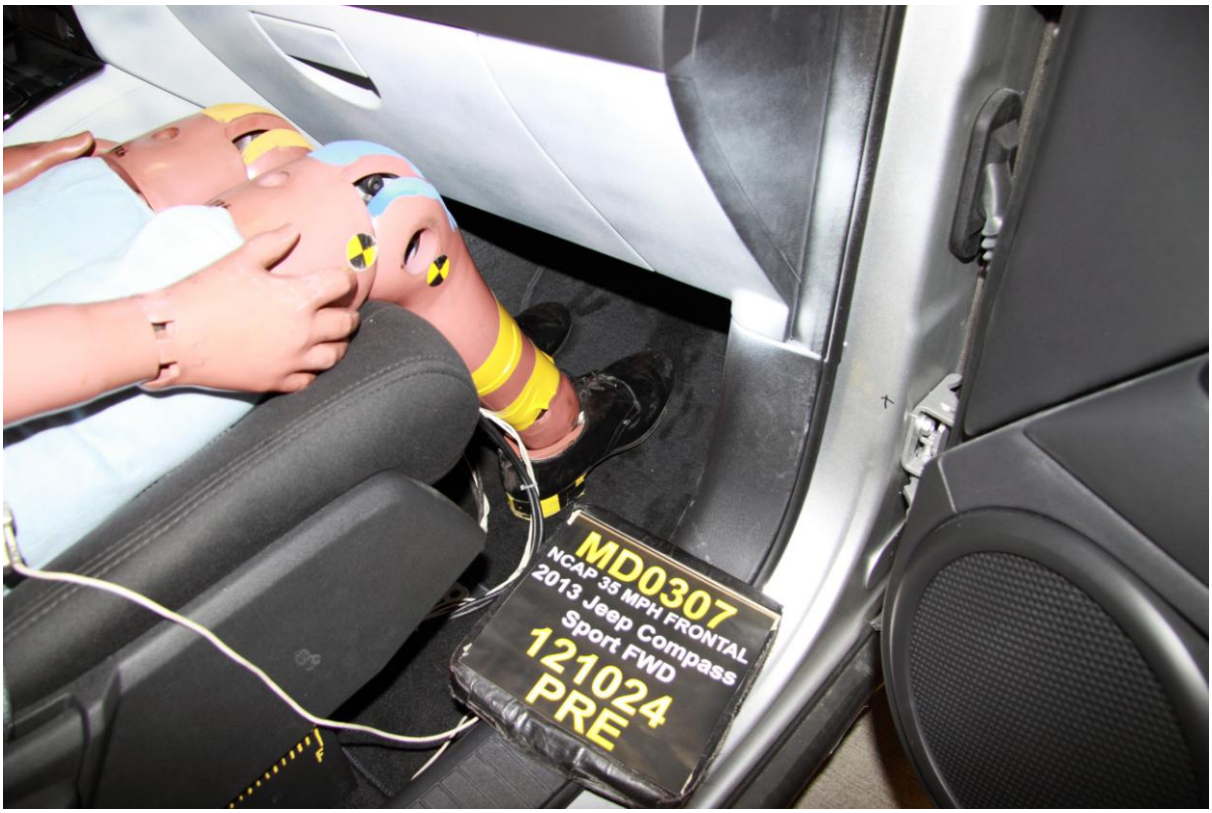
056 Pre-test Passenger's Seat Fore-Aft Markings

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



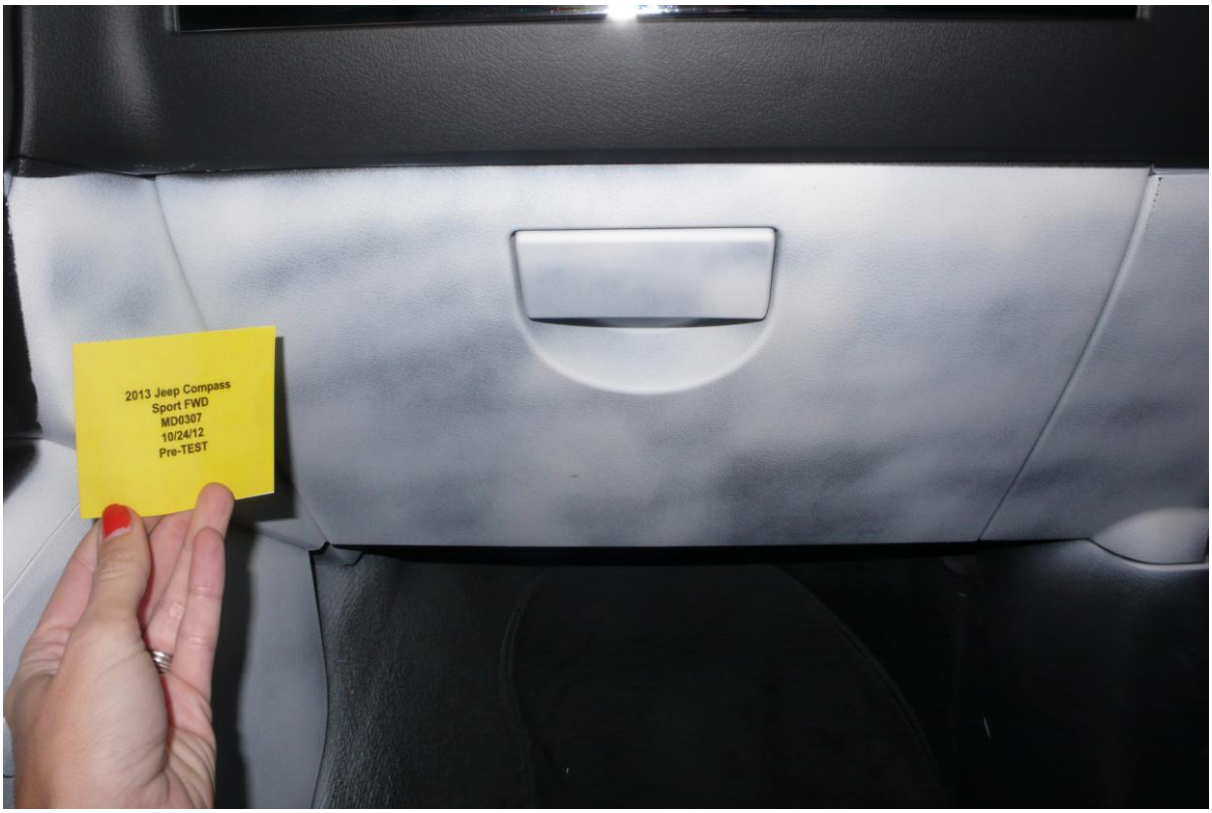
058 Pre-Test View of Belt Anchorage for Passenger Dummy

059 Post-Test View of Belt Anchorage for Passenger Dummy



060 Pre-test Passenger Dummy Feet

061 Post-test Passenger Dummy Feet



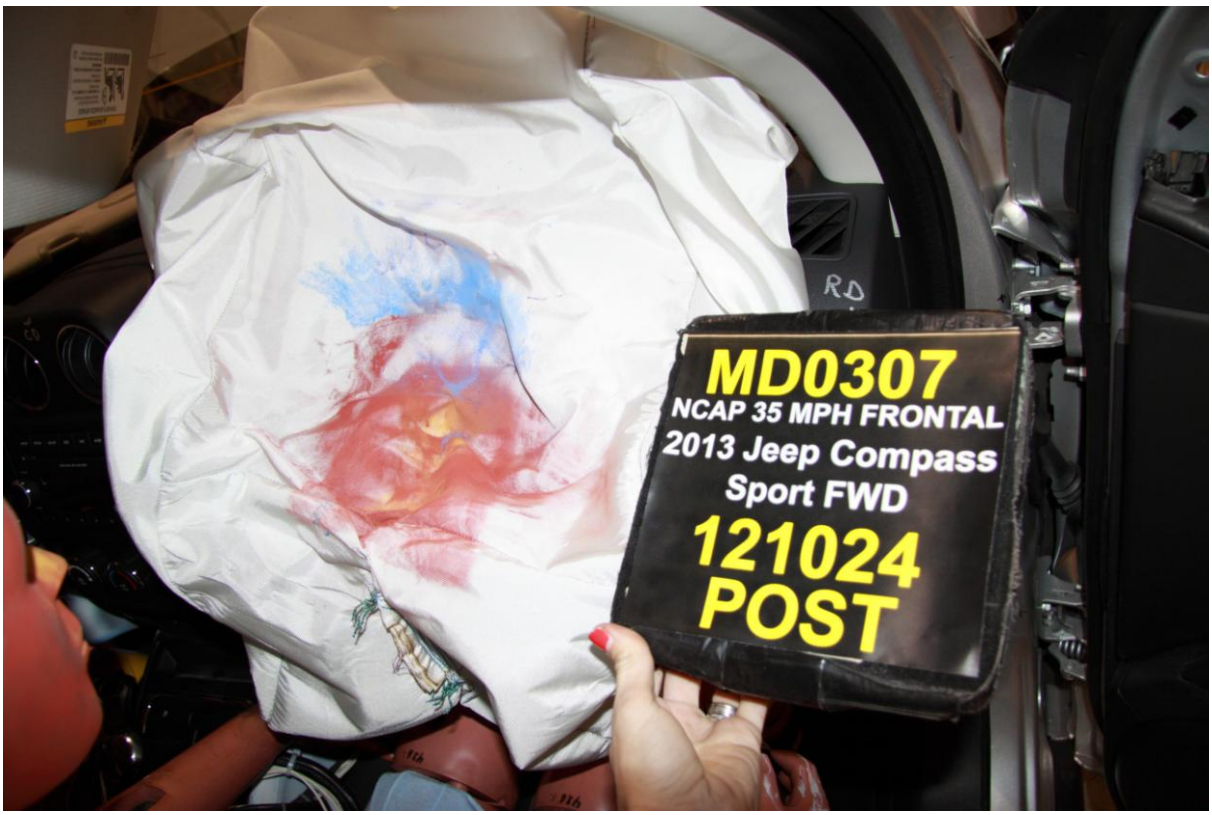
062 Pre-test Passenger's Side Knee Bolster

063 Post-test Passenger's Side Knee Bolster

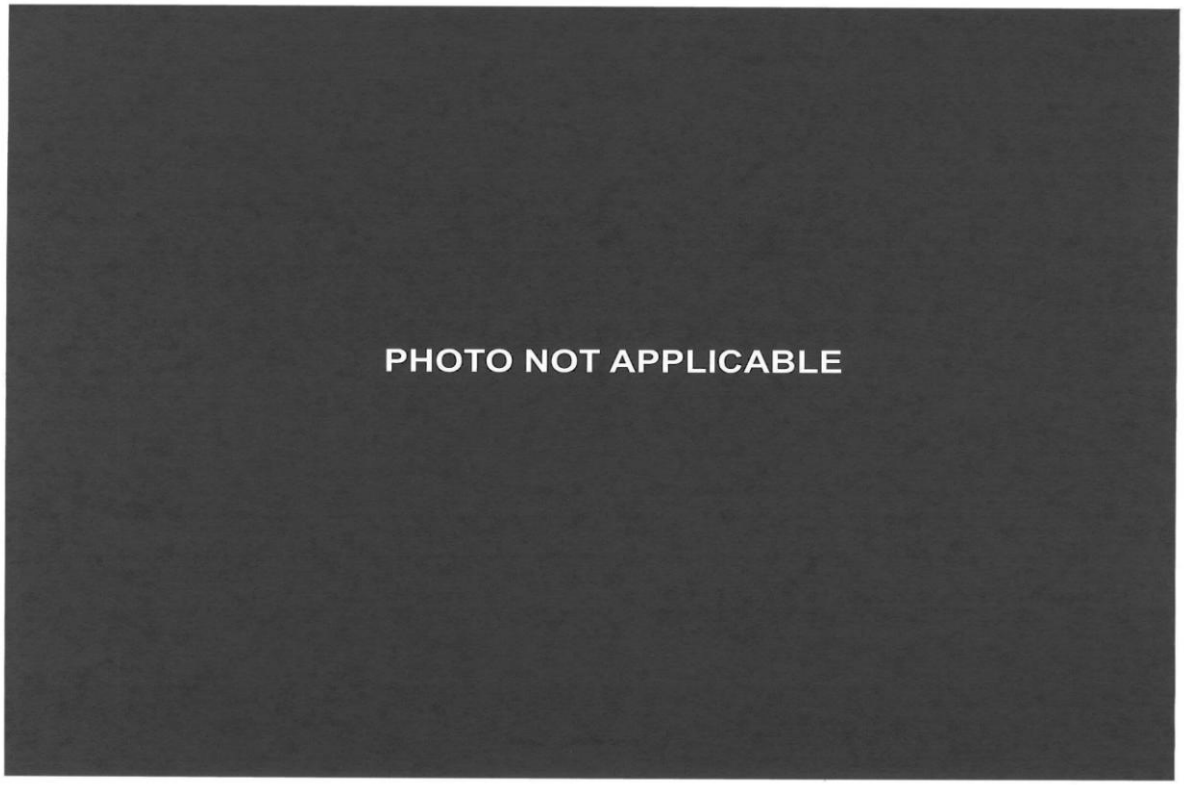
064 Pre-test Passenger's Side Floorpan

065 Post-test Passenger's Side Floorpan

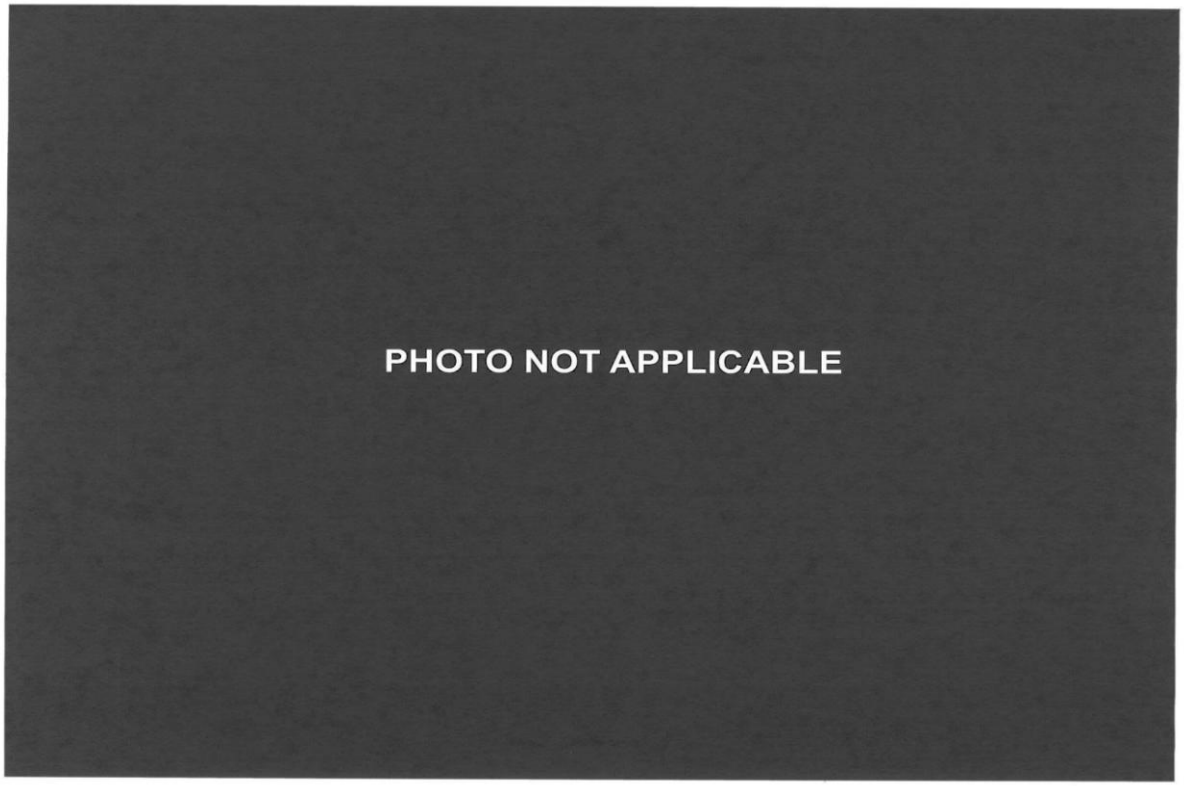
066 Post-test Passenger Dummy Contact With Headrest



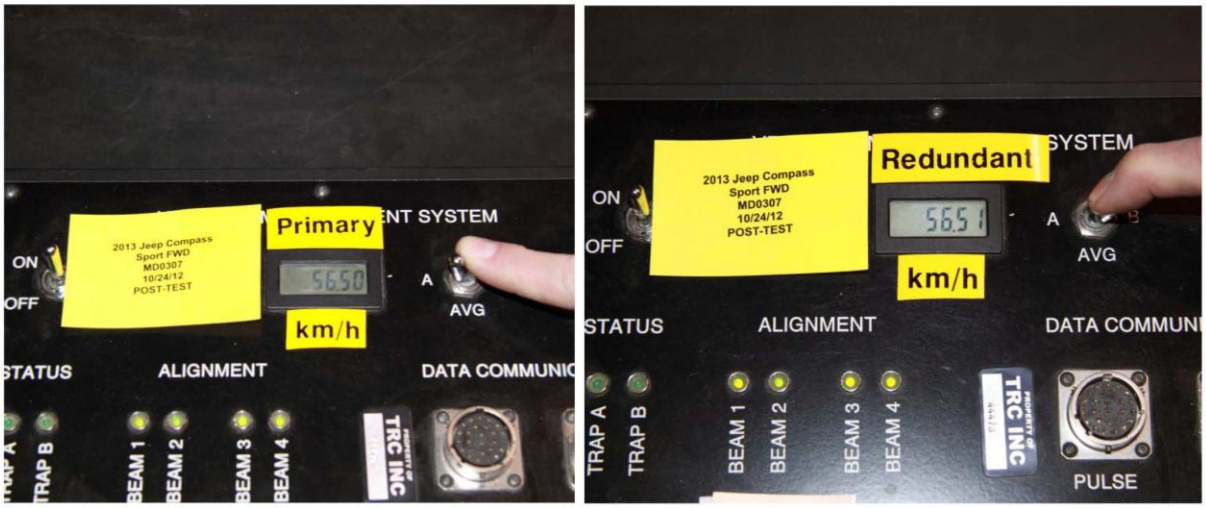
066a Post-test Passenger Dummy Contact With Airbag



067 Photograph of Ballast Installed in Vehicle



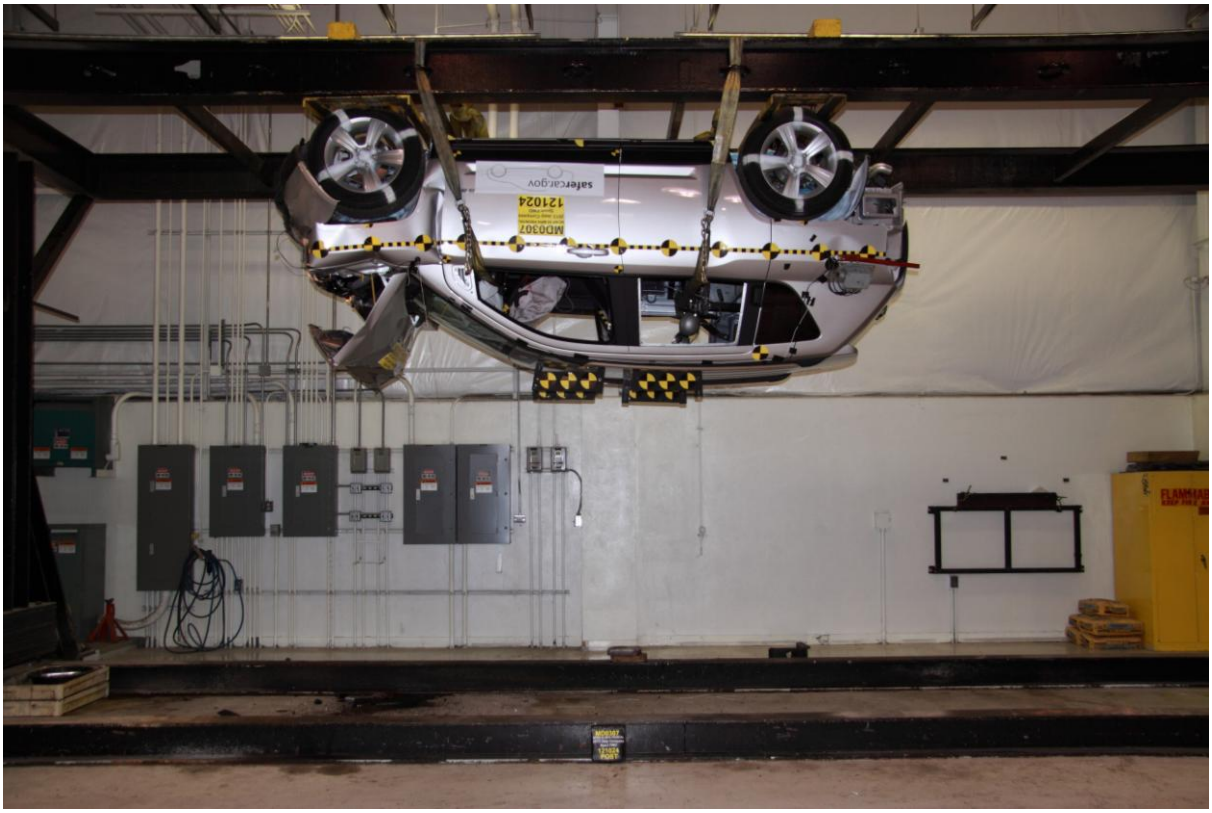
068 Post-test Stoddard Solvent Spillage Location View, if required



069 Post-test Speed Trap Read-out

070 Vehicle at 0º on Static Rollover Device

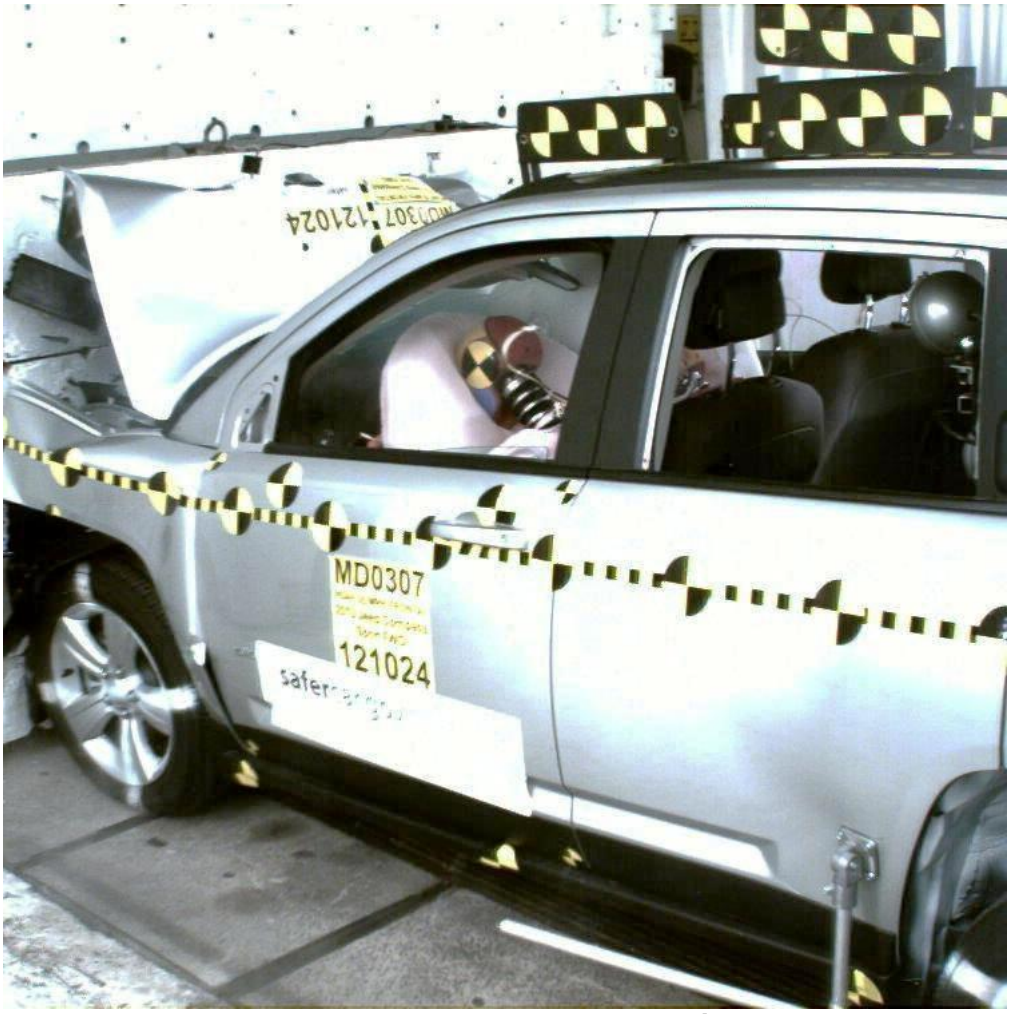
071 Vehicle at 90º on Static Rollover Device



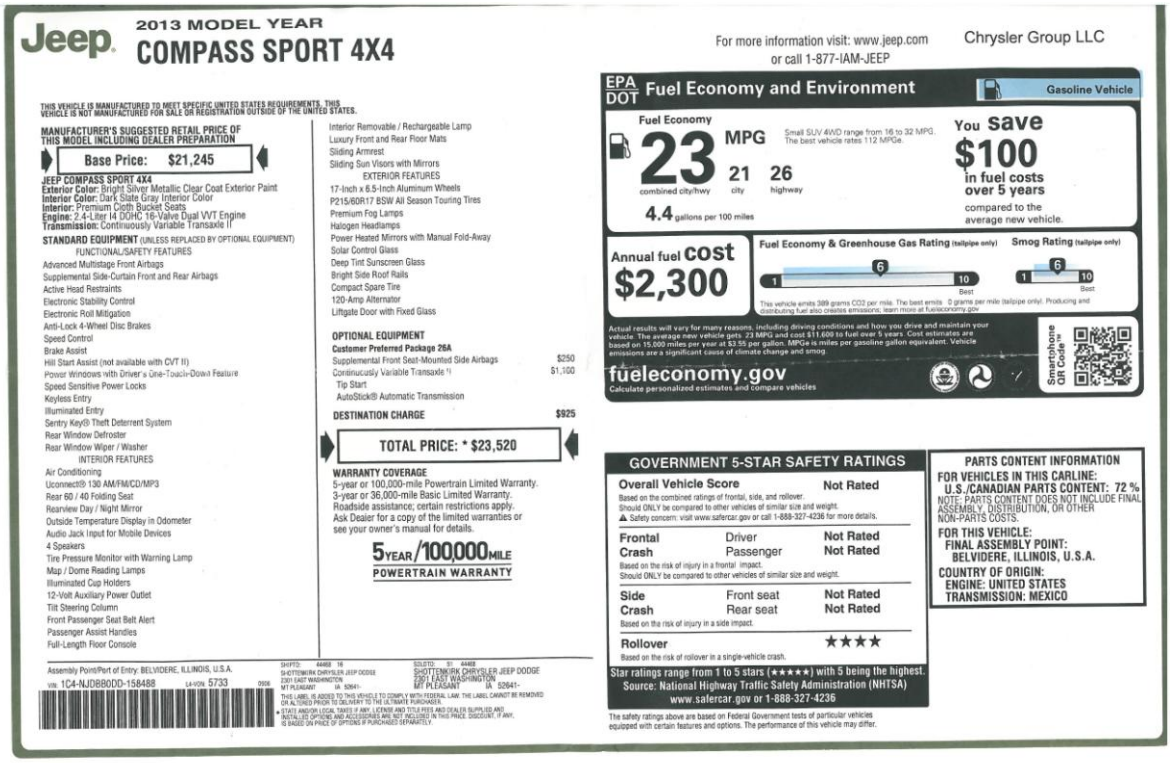
072 Vehicle at 180º on Static Rollover Device

073 Vehicle at 270º on Static Rollover Device

074 Vehicle at 360º on Static Rollover Device



075 2013 Jeep Compass Sport 4X4 Frontal Impact Event



Jeep. 2013 MODEL YEAR
COMPASS SPORT 4X4

For more information visit: www.jeep.com
or call 1-877-IAM-JEEP

Chrysler Group LLC

THIS VEHICLE IS MANUFACTURED TO MEET SPECIFIC UNITED STATES REQUIREMENTS. THIS VEHICLE IS NOT MANUFACTURED FOR SALE OR REGISTRATION OUTSIDE OF THE UNITED STATES.

MANUFACTURER'S SUGGESTED RETAIL PRICE OF THIS MODEL INCLUDING DEALER PREPARATION

Base Price: $21,245

JEEP COMPASS SPORT 4X4
Exterior Color: Bright Silver Metallic Clear Coat Exterior Paint
Interior Color: Dark Slate Gray Interior Color
Interior: Premium Cloth Bucket Seats
Engine: 2.4-Liter I4 DOHC 16-Valve Dual VVT Engine
Transmission: Continuously Variable Transaxle II

STANDARD EQUIPMENT (UNLESS REPLACED BY OPTIONAL EQUIPMENT)
FUNCTIONAL/SAFETY FEATURES
Advanced Multistage Front Airbags
Supplemental Side-Curtain Front and Rear Airbags
Active Head Restraints
Electronic Stability Control
Electronic Roll Mitigation
Anti-Lock 4-Wheel Disc Brakes
Speed Control
Brake Assist
Hill Start Assist (not available with CVT II)
Power Windows with Driver's One-Touch-Down Feature
Speed Sensitive Power Locks
Keyless Entry
Illuminated Entry
Sentry Key® Theft Deterrent System
Rear Window Defroster
Rear Window Wiper / Washer
INTERIOR FEATURES
Air Conditioning
Uconnect® 130 AM/FM/CD/MP3
Rear 60 / 40 Folding Seat
Rearview Day / Night Mirror
Outside Temperature Display in Odometer
Audio Jack Input for Mobile Devices
4 Speakers
Tire Pressure Monitor with Warning Lamp
Map / Dome Reading Lamps
Illuminated Cup Holders
12-Volt Auxiliary Power Outlet
Tilt Steering Column
Front Passenger Seat Belt Alert
Passenger Assist Handles
Full-Length Floor Console
Interior Removable / Rechargeable Lamp
Luxury Front and Rear Floor Mats
Sliding Armrest
Sliding Sun Visors with Mirrors
EXTERIOR FEATURES
17-Inch x 6.5-Inch Aluminum Wheels
P215/60R17 BSW All Season Touring Tires
Premium Fog Lamps
Halogen Headlamps
Power Heated Mirrors with Manual Fold-Away
Solar Control Glass
Deep Tint Sunscreen Glass
Bright Side Roof Rails
Compact Spare Tire
120-Amp Alternator
Liftgate Door with Fixed Glass

OPTIONAL EQUIPMENT
Customer Preferred Package 26A
Supplemental Front Seat-Mounted Side Airbags $250
Continuously Variable Transaxle II $1,100
Tip Start
AutoStick® Automatic Transmission

DESTINATION CHARGE $925

TOTAL PRICE: * $23,520

WARRANTY COVERAGE
5-year or 100,000-mile Powertrain Limited Warranty.
3-year or 36,000-mile Basic Limited Warranty.
Roadside assistance; certain restrictions apply.
Ask Dealer for a copy of the limited warranties or see your owner's manual for details.

5 YEAR / 100,000 MILE
POWERTRAIN WARRANTY

Assembly Point/Port of Entry: BELVIDERE, ILLINOIS, U.S.A.
VIN: 1C4-NJDB8DD-158488 L4-VIN: 5733 0906

SHIPTO: 44468 16
SHOTTENKIRK CHRYSLER JEEP DODGE
2301 EAST WASHINGTON
MT PLEASANT IA 52641-

SOLDTO: 51 44468
SHOTTENKIRK CHRYSLER JEEP DODGE
2301 EAST WASHINGTON
MT PLEASANT IA 52641-

THIS LABEL IS AFIXED TO THIS VEHICLE TO COMPLY WITH FEDERAL LAW. THE LABEL CANNOT BE REMOVED OR ALTERED PRIOR TO DELIVERY TO THE ULTIMATE PURCHASER.
* STATE AND/OR LOCAL TAXES IF ANY, LICENSE AND TITLE FEES AND DEALER SUPPLIED AND INSTALLED OPTIONS AND ACCESSORIES ARE NOT INCLUDED IN THIS PRICE. DISCOUNT, IF ANY, IS BASED ON PRICE OF OPTIONS IF PURCHASED SEPARATELY.

EPA DOT Fuel Economy and Environment — Gasoline Vehicle

Fuel Economy
23 MPG combined city/hwy
21 city
26 highway
4.4 gallons per 100 miles
Small SUV 4WD range from 16 to 32 MPG. The best vehicle rates 112 MPGe.

You save $100 in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost $2,300

Fuel Economy & Greenhouse Gas Rating (tailpipe only): 6 (1–10, Best)
Smog Rating (tailpipe only): 6 (1–10, Best)
This vehicle emits 389 grams CO2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions; learn more at fueleconomy.gov

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 23 MPG and cost $11,600 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $3.55 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

Smartphone QR Code™

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score — Not Rated
Based on the combined ratings of frontal, side, and rollover.
Should ONLY be compared to other vehicles of similar size and weight.
▲ Safety concern: visit www.safercar.gov or call 1-888-327-4236 for more details.

Frontal Crash — Driver: Not Rated; Passenger: Not Rated
Based on the risk of injury in a frontal impact.
Should ONLY be compared to other vehicles of similar size and weight.

Side Crash — Front seat: Not Rated; Rear seat: Not Rated
Based on the risk of injury in a side impact.

Rollover — ★★★★
Based on the risk of rollover in a single-vehicle crash.

Star ratings range from 1 to 5 stars (★★★★★) with 5 being the highest.
Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4236

The safety ratings above are based on Federal Government tests of particular vehicles equipped with certain features and options. The performance of this vehicle may differ.

PARTS CONTENT INFORMATION
FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 72 %
NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.
FOR THIS VEHICLE:
FINAL ASSEMBLY POINT: BELVIDERE, ILLINOIS, U.S.A.
COUNTRY OF ORIGIN:
ENGINE: UNITED STATES
TRANSMISSION: MEXICO

076 Monroney Label Photograph

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 vs. 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 vs. 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

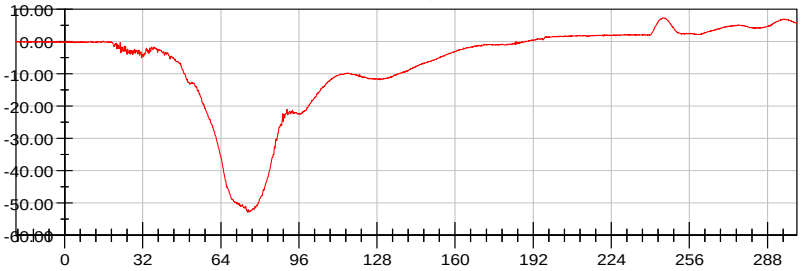
BARRIER LOAD B6
BARRIER LOAD B7
BARRIER LOAD B8
BARRIER LOAD B9
BARRIER LOAD C1
BARRIER LOAD C2
BARRIER LOAD C3
BARRIER LOAD C4
BARRIER LOAD C5
BARRIER LOAD C6
BARRIER LOAD C7
BARRIER LOAD C8
BARRIER LOAD C9
BARRIER LOAD D1
BARRIER LOAD D2
BARRIER LOAD D3
BARRIER LOAD D4
BARRIER LOAD D5
BARRIER LOAD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

NHTSA

Test Lab: CTF
Test Number: 121024 (MD0307)

Test Date: 10/24/2012
Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)
Position #2 Hybrid III Small Adult Female (426)

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



<Max>

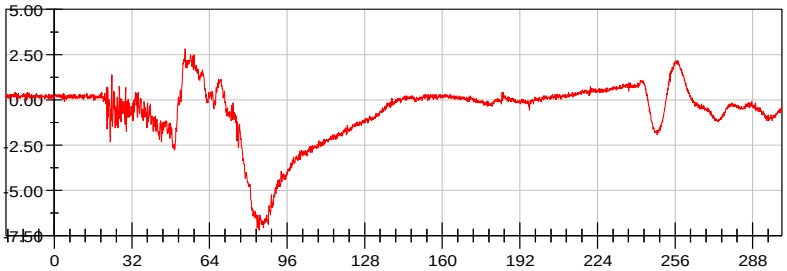
7.35 g at 245.04 ms

<Min>

-52.85 g at 75.04 ms

CFC_1000

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



<Max>

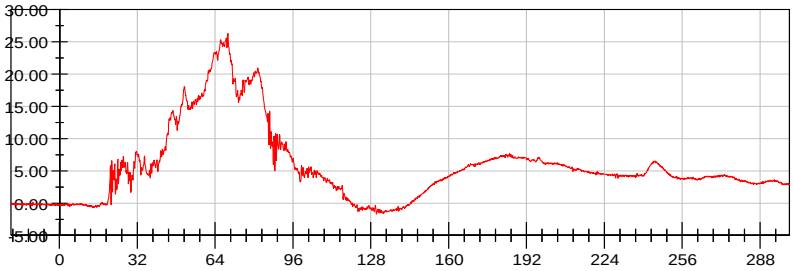
2.82 g at 53.92 ms

<Min>

-7.21 g at 84.40 ms

CFC_1000

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



<Max>

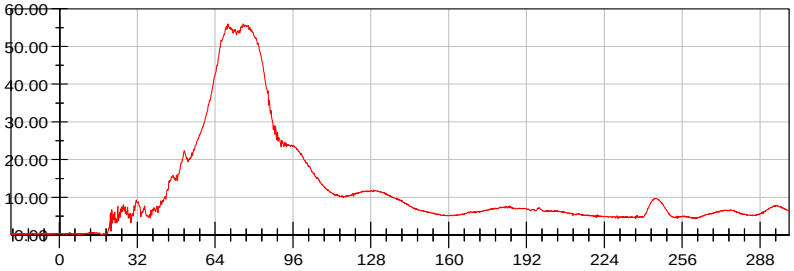
26.28 g at 69.20 ms

<Min>

-1.70 g at 130.32 ms

CFC_1000

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



<Max>

56.01 g at 75.52 ms

<Min>

0.10 g at 17.84 ms

CFC_1000

NHTSA

Test Date: 10/24/2012

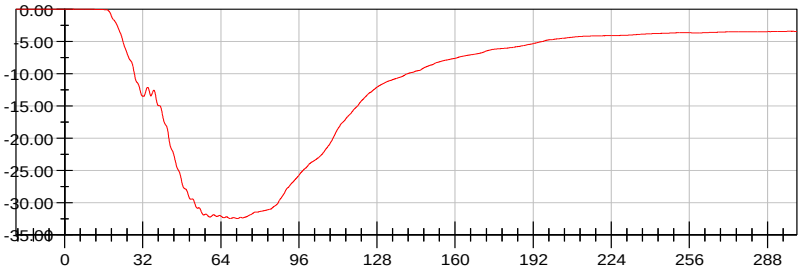
Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)

Position #2 Hybrid III Small Adult Female (426)

Test Lab: CTF

Test Number: 121024 (MD0307)

Driver Chest X Deflection vs. Time (mm) vs. Time [ms]



<Max>

0.00 mm at 3.68 ms

<Min>

-32.50 mm at 70.80 ms

CFC_600

NHTSA

Test Lab: CTF

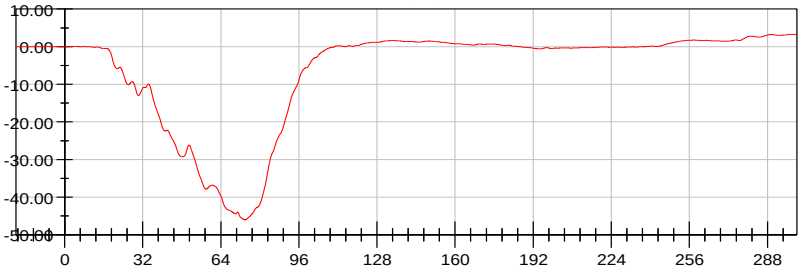
Test Number: 121024 (MD0307)

Test Date: 10/24/2012

Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

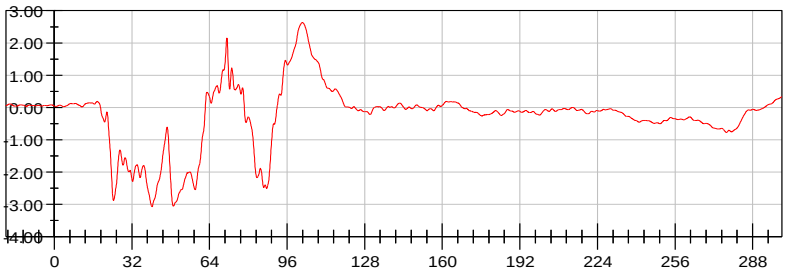
3.29 g at 297.44 ms

<Min>

-46.05 g at 74.08 ms

CFC_180

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



<Max>

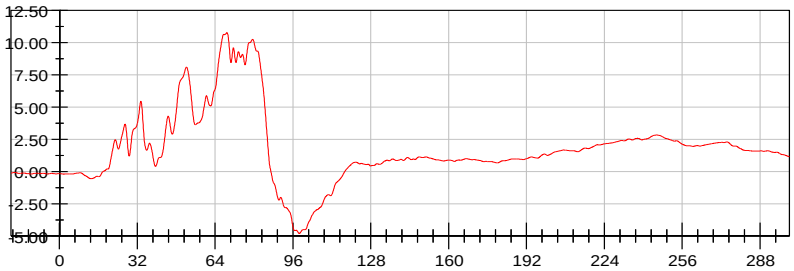
2.63 g at 102.24 ms

<Min>

-3.08 g at 40.32 ms

CFC_180

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



<Max>

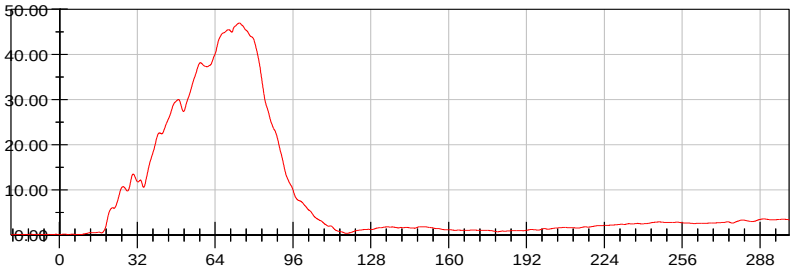
10.77 g at 68.80 ms

<Min>

-4.80 g at 98.56 ms

CFC_180

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



<Max>

46.94 g at 73.92 ms

<Min>

0.12 g at -20.00 ms

CFC_180

NHTSA

Test Date: 10/24/2012

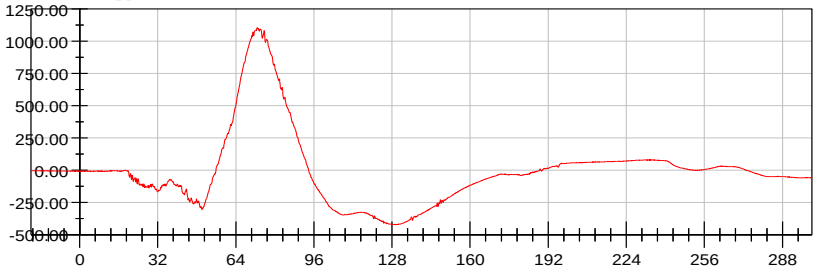
Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)

Position #2 Hybrid III Small Adult Female (426)

Test Lab: CTF

Test Number: 121024 (MD0307)

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



<Max>

1,104.59 N at 72.80 ms

<Min>

-422.51 N at 129.76 ms

CFC_1000

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

<Max>

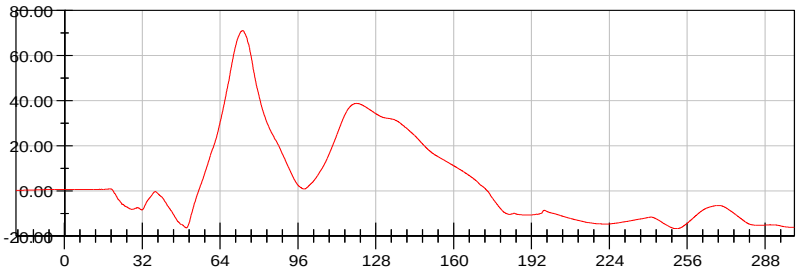
1,458.52 N at 64.24 ms

<Min>

-199.88 N at 295.92 ms

CFC_1000

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



<Max>

71.15 Nm at 73.28 ms

<Min>

-16.74 Nm at 251.68 ms

CFC_600

2013 Jeep Compass Sport FWD into Load Cell Barrier

Neck Injury Predictor (NIJ)

Date: 10/24/2012
Time: 15:10

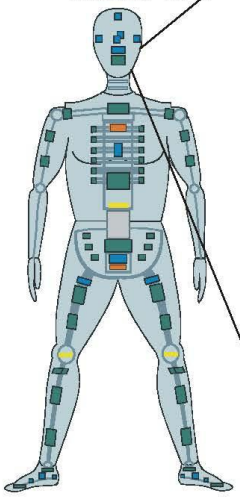
Customer: NHTSA

Test Number: MD0307

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

TRC Inc. Test Lab: CTF

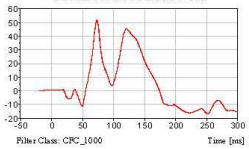
Test Number: 121024



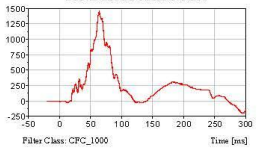
Dummy:HIII 50th Male
Seating Position:
Driver

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

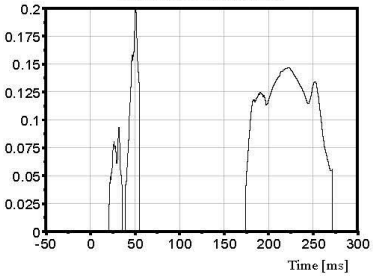
11TMONUP00H3MOYX



11NECKUP00H3FOZA

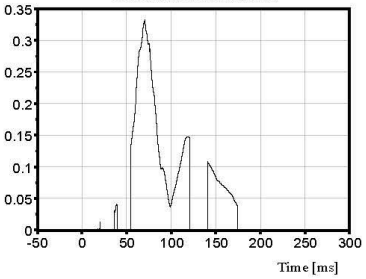


11NIJCUPTEH300YX



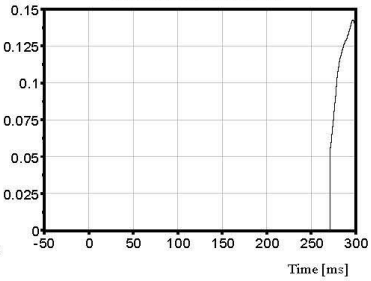
Max [NTE] 0.1997 at 50.56 ms

11NIJCUPTFH300YX



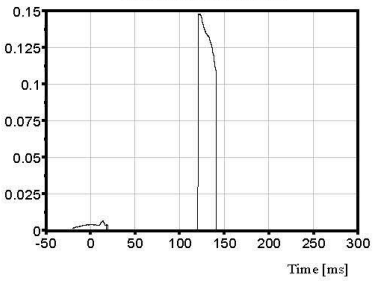
Max [NTF] 0.3320 at 70.40 ms

11NIJCUPCEH300YX



Max [NCE] 0.1425 at 297.12 ms

11NIJCUPCFH300YX



Max [NCF] 0.1479 at 122.24 ms

NHTSA

Test Date: 10/24/2012

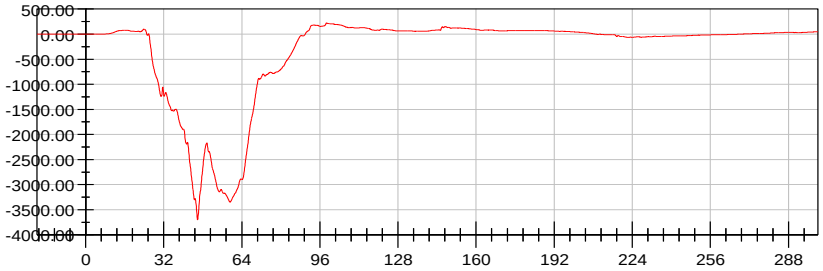
Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)

Position #2 Hybrid III Small Adult Female (426)

Test Lab: CTF

Test Number: 121024 (MD0307)

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



<Max>

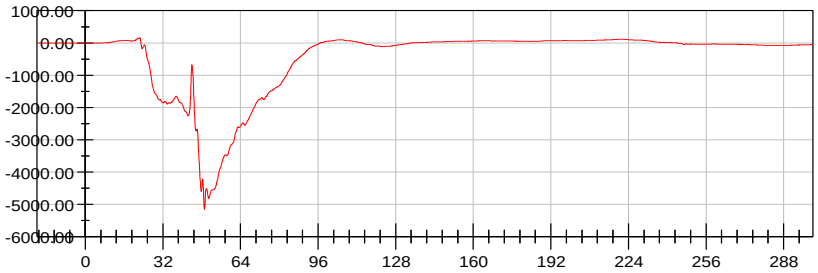
221.89 N at 98.72 ms

<Min>

-3,699.80 N at 45.84 ms

CFC_600

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



<Max>

163.21 N at 22.48 ms

<Min>

-5,154.90 N at 49.12 ms

CFC_600

NHTSA

Test Date: 10/24/2012

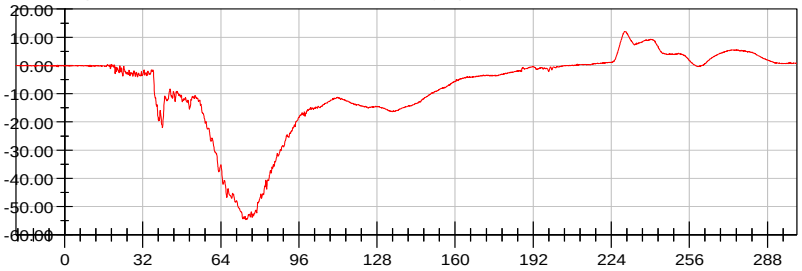
Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)

Position #2 Hybrid III Small Adult Female (426)

Test Lab: CTF

Test Number: 121024 (MD0307)

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



<Max>

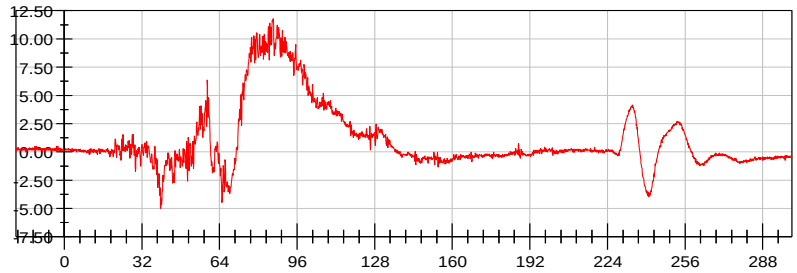
12.10 g at 229.44 ms

<Min>

-54.69 g at 74.24 ms

CFC_1000

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



<Max>

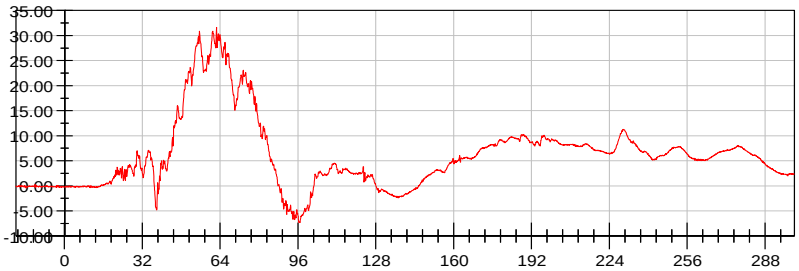
11.79 g at 86.08 ms

<Min>

-5.01 g at 39.76 ms

CFC_1000

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



<Max>

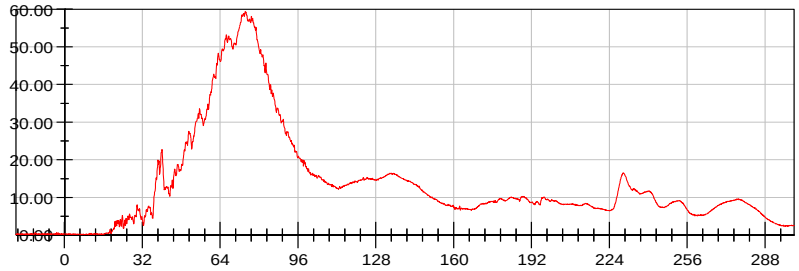
31.65 g at 62.48 ms

<Min>

-7.35 g at 96.40 ms

CFC_1000

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



<Max>

59.30 g at 74.40 ms

<Min>

0.09 g at -15.92 ms

CFC_1000

NHTSA

Test Date: 10/24/2012

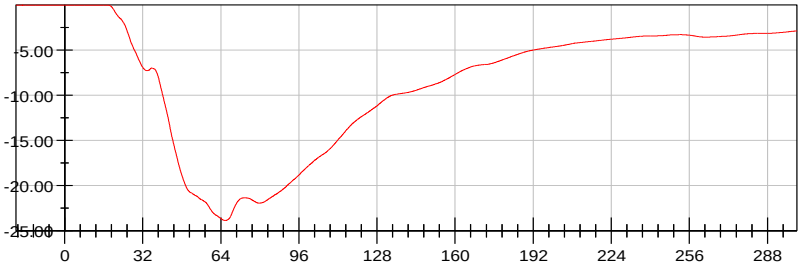
Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)

Position #2 Hybrid III Small Adult Female (426)

Test Lab: CTF

Test Number: 121024 (MD0307)

Passenger Chest X Deflection vs. Time (mm) vs. Time [ms]



<Max>

0.00 mm at -17.28 ms

<Min>

-23.85 mm at 65.84 ms

CFC_600

NHTSA

Test Date: 10/24/2012

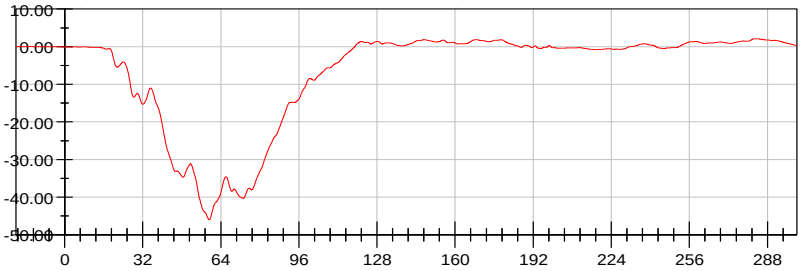
Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)

Position #2 Hybrid III Small Adult Female (426)

Test Lab: CTF

Test Number: 121024 (MD0307)

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



<Max>

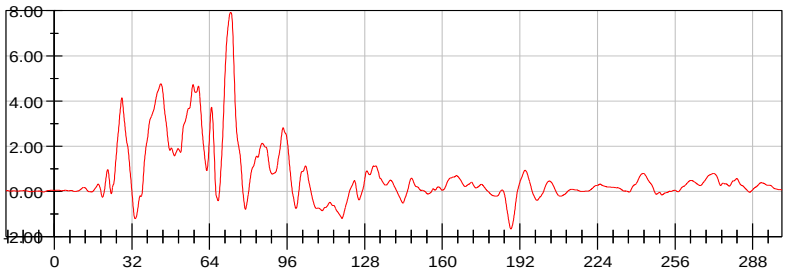
2.12 g at 282.72 ms

<Min>

-46.01 g at 59.28 ms

CFC_180

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



<Max>

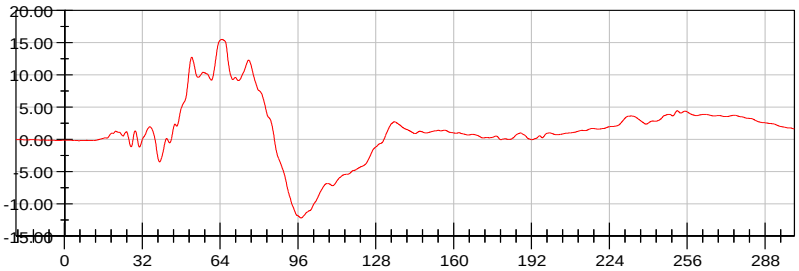
7.92 g at 72.80 ms

<Min>

-1.67 g at 188.32 ms

CFC_180

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



<Max>

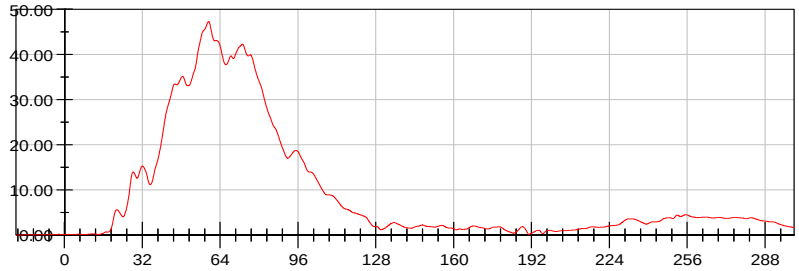
15.50 g at 64.72 ms

<Min>

-12.21 g at 97.28 ms

CFC_180

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



<Max>

47.28 g at 59.28 ms

<Min>

0.04 g at -19.92 ms

CFC_180

NHTSA

Test Date: 10/24/2012

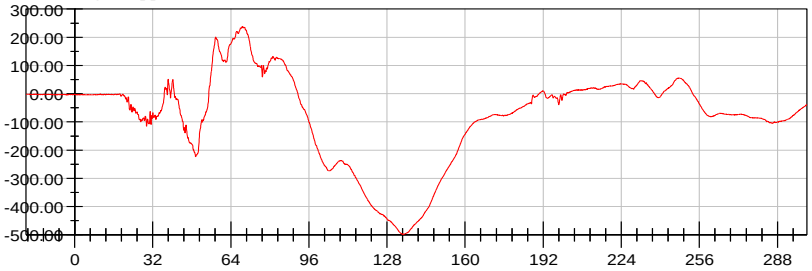
Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)

Position #2 Hybrid III Small Adult Female (426)

Test Lab: CTF

Test Number: 121024 (MD0307)

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



<Max>

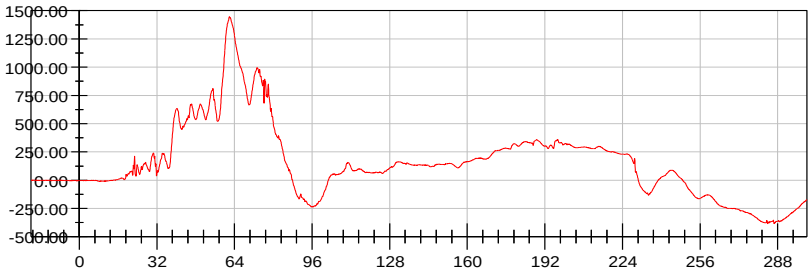
237.73 N at 68.80 ms

<Min>

-498.21 N at 134.72 ms

CFC_1000

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



<Max>

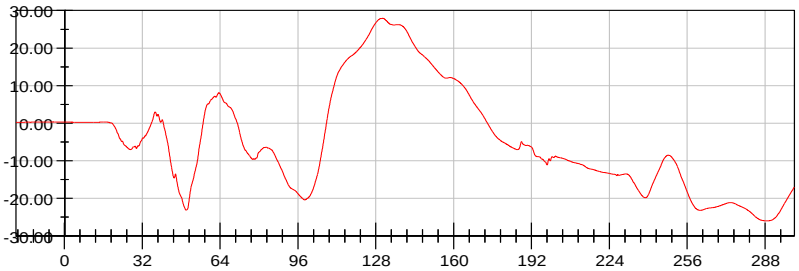
1,446.65 N at 61.84 ms

<Min>

-388.26 N at 286.56 ms

CFC_1000

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



<Max>

27.92 Nm at 130.80 ms

<Min>

-26.00 Nm at 288.96 ms

CFC_600

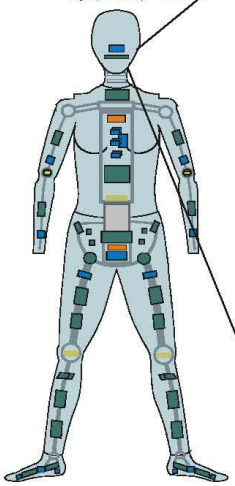
2013 Jeep Compass Sport FWD into Load Cell Barrier

Neck Injury Predictor (NIJ)

Date: 10/24/2012
Time: 15:10

Customer: NHTSA
Test Number: MD0307

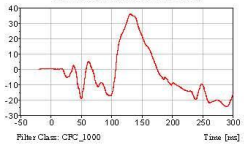
Test Orientation = Frontal
Fzc(Tension) = 4287
Fzc(Compression) = 3880
Myc(Extension) = 67
Myc(Flexion) = 155



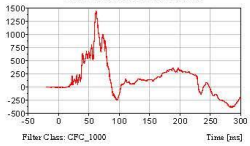
Dummy:HIII 5th Female
Seating Position:
Right Front Passenger

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

13TMONUP00HFMOYX

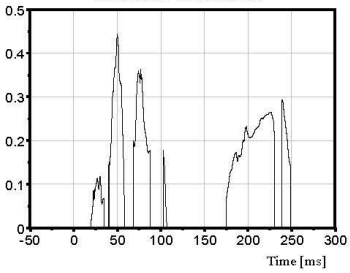


13NECKUP00HFFOZA



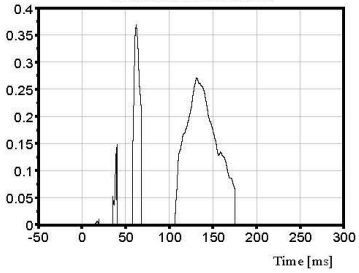
TRC Inc. Test Lab: CTF
Test Number: 121024

13NIJCUPTEHF00YX



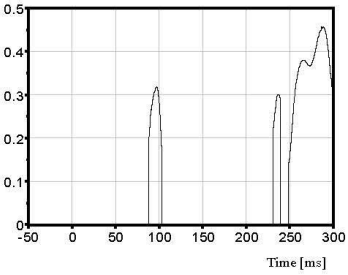
Max [NTE] 0.4438 at 50.00 ms

13NIJCUPTFHF00YX



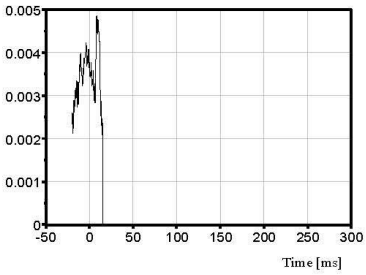
Max [NTF] 0.3696 at 61.92 ms

13NIJCUPCEHF00YX



Max [NCE] 0.4578 at 286.72 ms

13NIJCUPCFHF00YX



Max [NCF] 0.0049 at 8.24 ms

NHTSA

Test Date: 10/24/2012

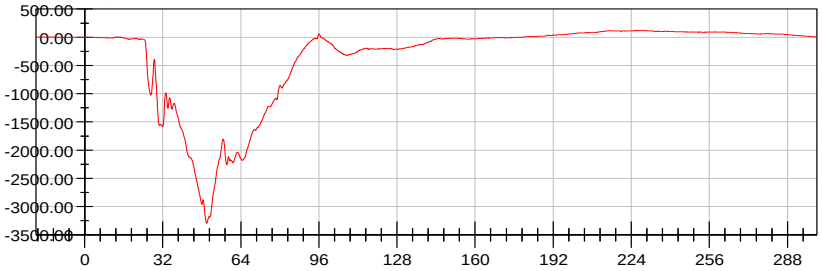
Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)

Position #2 Hybrid III Small Adult Female (426)

Test Lab: CTF

Test Number: 121024 (MD0307)

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



<Max>

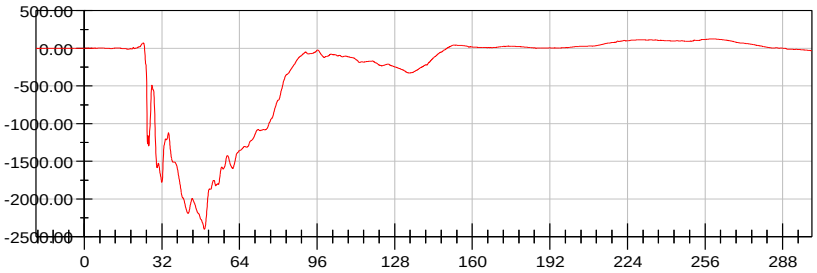
118.91 N at 227.12 ms

<Min>

-3,293.87 N at 50.00 ms

CFC_600

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



<Max>

123.28 N at 259.20 ms

<Min>

-2,406.41 N at 49.44 ms

CFC_600

APPENDIX C

DUMMY CALIBRATION AND PERFORMANCE VERIFICATION

Pre-Test Calibration Sheets
Driver S/N 037

Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 037
Calibration No. 11

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	884	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	199	Yes
K	Buttock Knee Length	579.1 - 604.5	600	Yes
L	Popliteal Height	429.3 - 454.7	441	Yes
M	Knee Pivot Height	485.1 - 500.4	495	Yes
N	Buttock Popliteal Length	452.1 - 477.5	470	Yes
O	Chest Depth	213.4 - 228.6	225	Yes
P	Foot Length	251.5 - 266.7	264	Yes
V	Shoulder Breadth	421.6 - 436.9	430	Yes
W	Foot Breadth	91.4 - 106.7	97	Yes
Y	Chest Circumference	970.3 - 1000.8	990	Yes
Z	Waist Circumference	835.7 - 866.1	863	Yes
AA	Location For Chest Circumference	429.3 - 434.3	431	Yes
BB	Location For Waist Circumference	226.1 - 231.1	230	Yes

Comments:

Technician

Approved

Revised 3/13/3003

Transportation Research Center Inc.

Front Head Drop
HIII 50th Serial No. 037 Certification No. 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

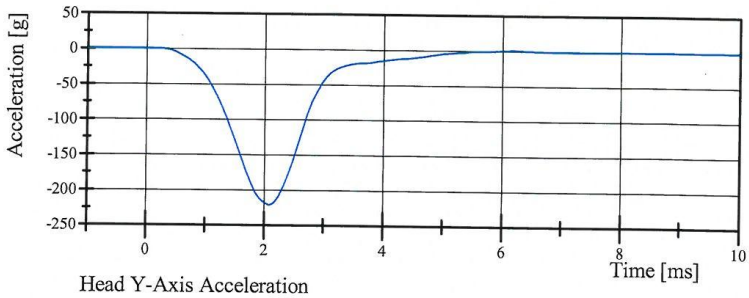
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.20.2012 09:27:36 612

Transportation Research Center Inc.

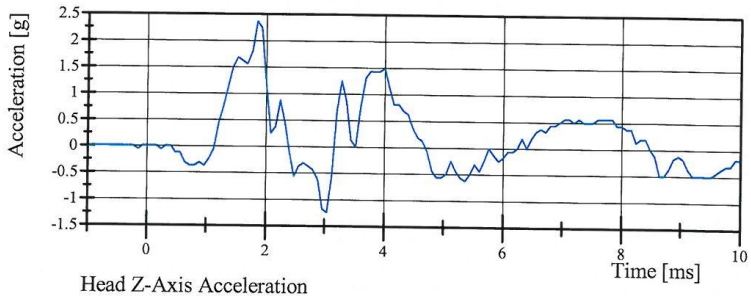
Front Head Drop
HIII 50th Serial No. 037 Certification No. 11-1
Test Date: 10/20/2012

Head X-Axis Acceleration



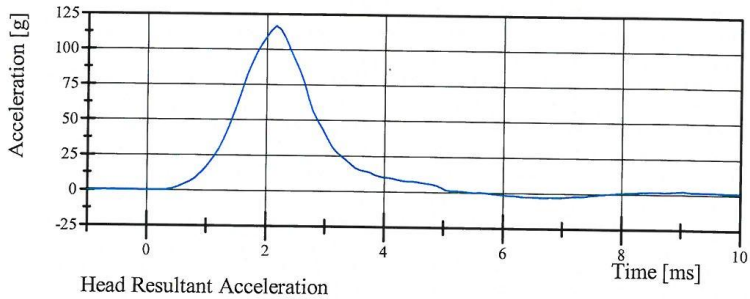
Filter Class: CFC_1000
Max: 0.9 gn at 6.2 ms
Min: -221.5 gn at 2.1 ms

Head Y-Axis Acceleration



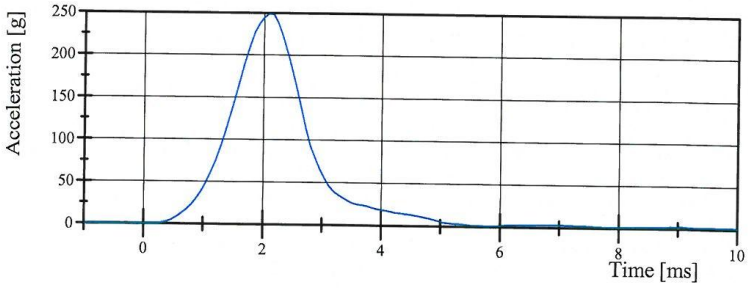
Filter Class: CFC_1000
Max: 2.4 gn at 1.8 ms
Min: -1.2 gn at 3.0 ms

Head Z-Axis Acceleration



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

Head Resultant Acceleration



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

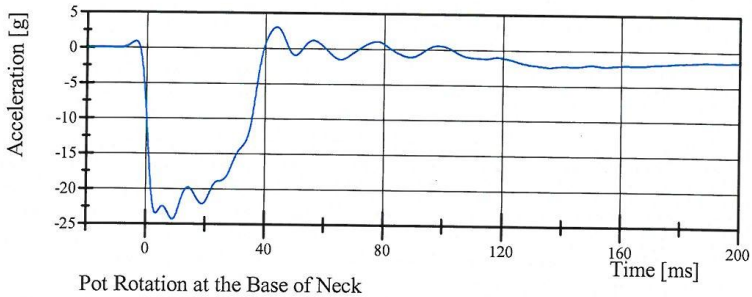
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.20.2012 13:30:52 2947

Transportation Research Center Inc.

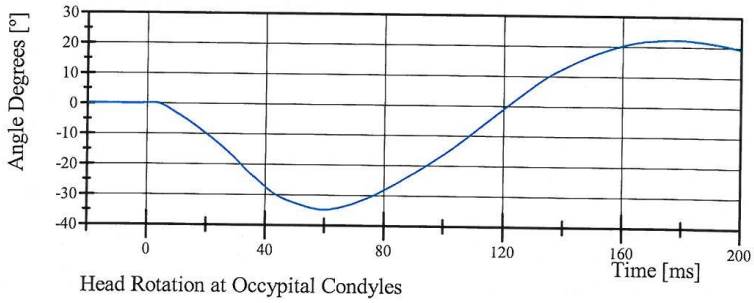
Neck Flexion
HIII 50th Serial No. 037 Certification No. 11-1
Test Date: 10/20/2012

Pendulum Acceleration



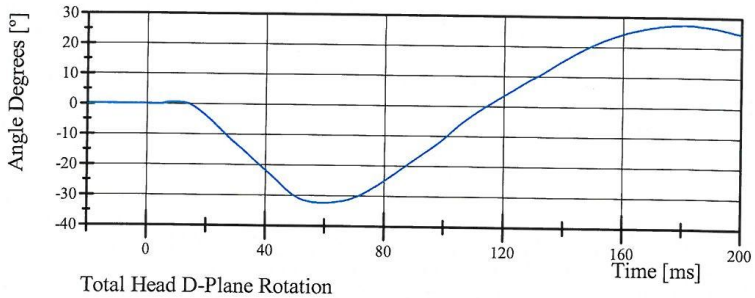
Filter Class: CFC_60
Max: 3.0 gn at 43.8 ms
Min: -24.3 gn at 9.0 ms

Pot Rotation at the Base of Neck



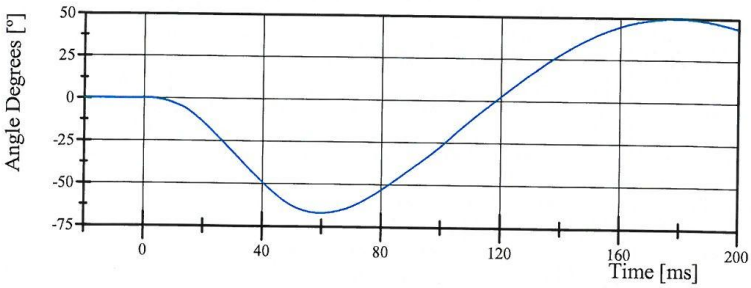
Filter Class: CFC_60
Max: 22.4 ° at 177.2 ms
Min: -34.8 ° at 59.8 ms

Head Rotation at Occypital Condyles



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

Total Head D-Plane Rotation



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

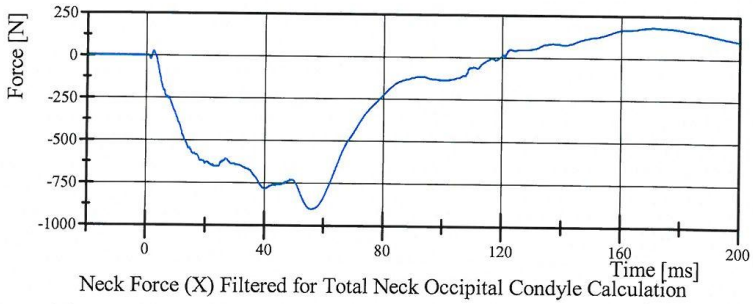
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.20.2012 13:31:00 2947

Transportation Research Center Inc.

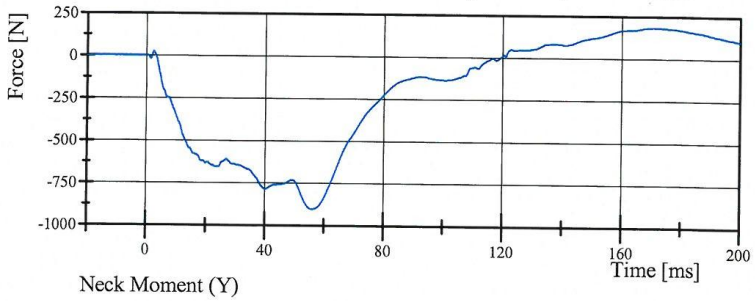
Neck Flexion
HIII 50th Serial No. 037 Certification No. 11-1
Test Date: 10/20/2012

Neck Force (X)



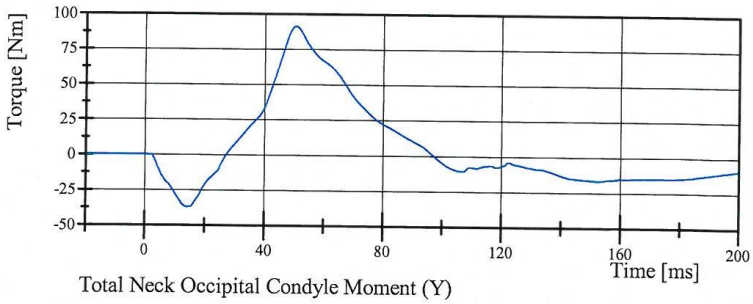
Filter Class: CFC_1000
Max: 182.8 N at 170.4 ms
Min: -904.5 N at 55.8 ms

Neck Force (X) Filtered for Total Neck Occipital Condyle Calculation



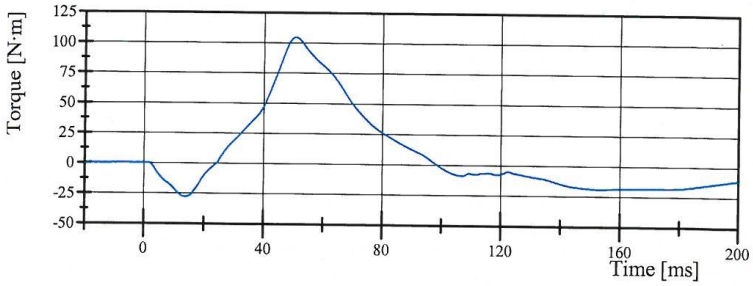
Filter Class: CFC_600
Max: 182.6 N at 170.5 ms
Min: -903.8 N at 55.9 ms

Neck Moment (Y)



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

Total Neck Occipital Condyle Moment (Y)



Filter Class: Without_(Constai
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

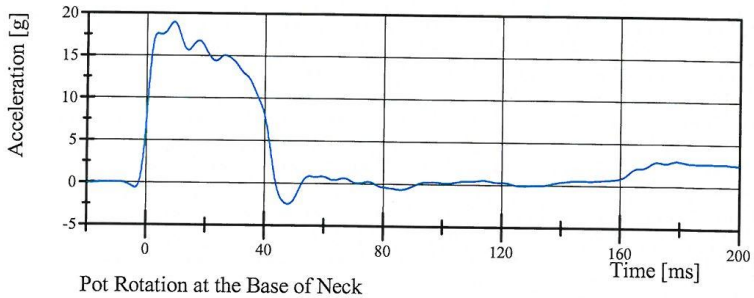
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.20.2012 14:10:13 3029

Transportation Research Center Inc.

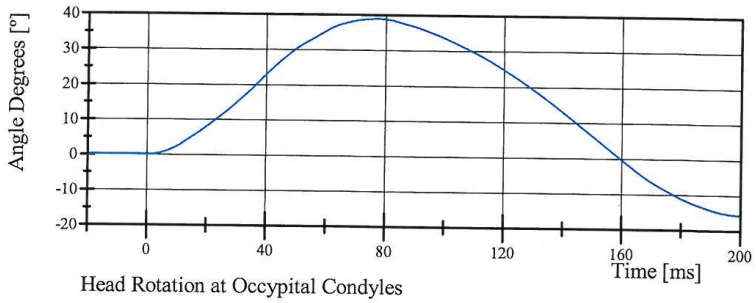
Neck Extension
HIII 50th Serial No. 037 Certification No. 11-1
Test Date: 10/20/2012

Pendulum Acceleration



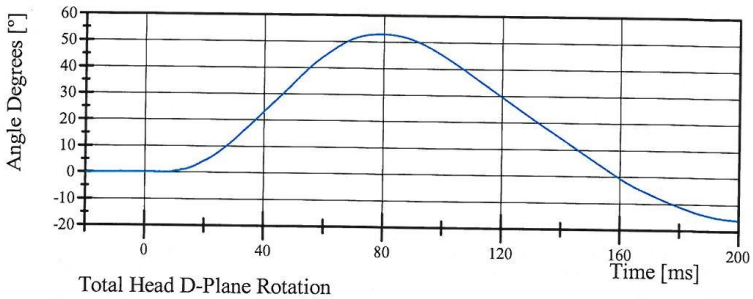
Filter Class: CFC_60
Max: 18.9 gn at 9.1 ms
Min: -2.5 gn at 47.9 ms

Pot Rotation at the Base of Neck



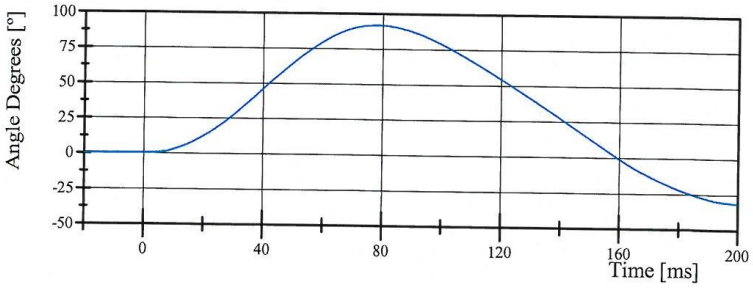
Filter Class: CFC_60
Max: 38.9 ° at 77.2 ms
Min: -15.7 ° at 200.0 ms

Head Rotation at Occypital Condyles



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

Total Head D-Plane Rotation



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

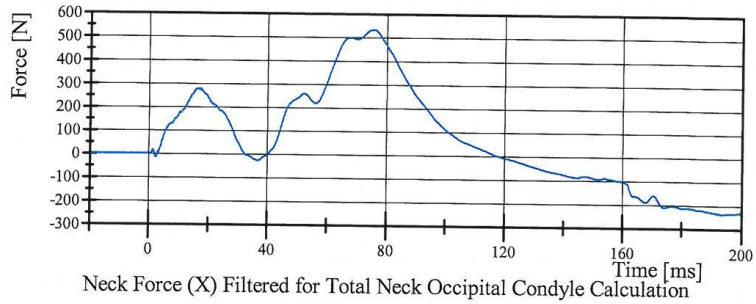
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.20.2012 14:10:21 3029

Transportation Research Center Inc.

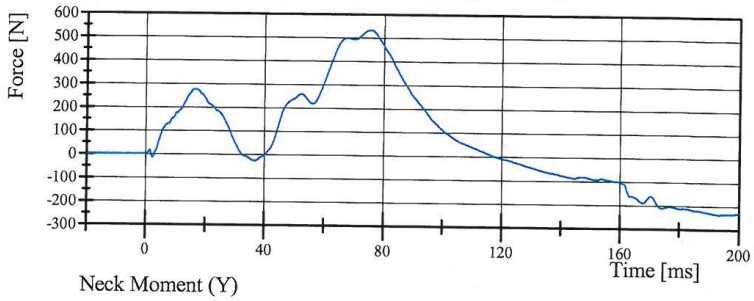
Neck Extension
HIII 50th Serial No. 037 Certification No. 11-1
Test Date: 10/20/2012

Neck Force (X)



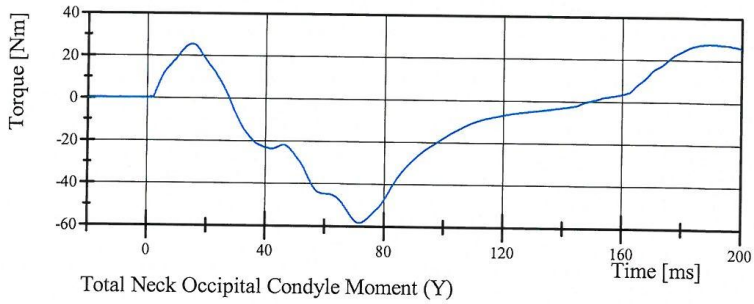
Filter Class: CFC_1000
Max: 533.5 N at 75.8 ms
Min: -236.3 N at 193.4 ms

Neck Force (X) Filtered for Total Neck Occipital Condyle Calculation



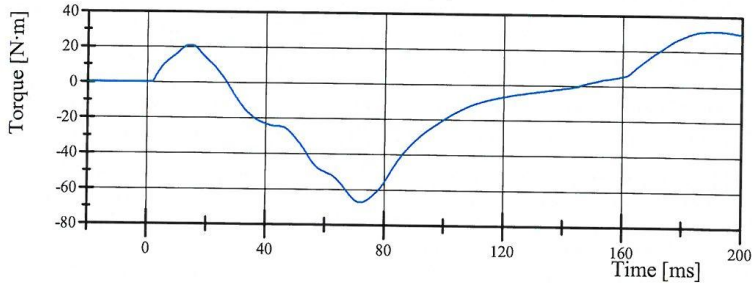
Filter Class: CFC_600
Max: 533.1 N at 75.8 ms
Min: -236.1 N at 193.4 ms

Neck Moment (Y)



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

Total Neck Occipital Condyle Moment (Y)



Filter Class: Without_(Constai
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

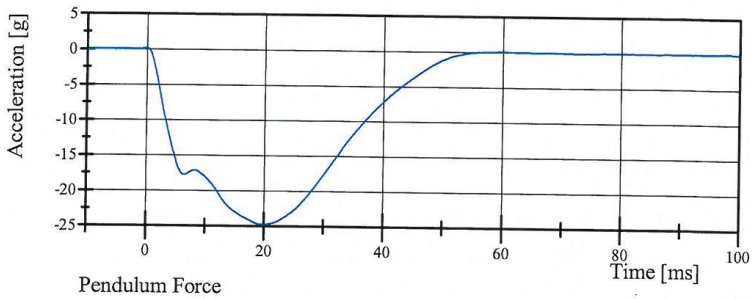
Specification Source: CFR49 Part 572 Subpart P
with Polarity in accordance with J211

10.20.2012 11:11:37 406

Transportation Research Center Inc.

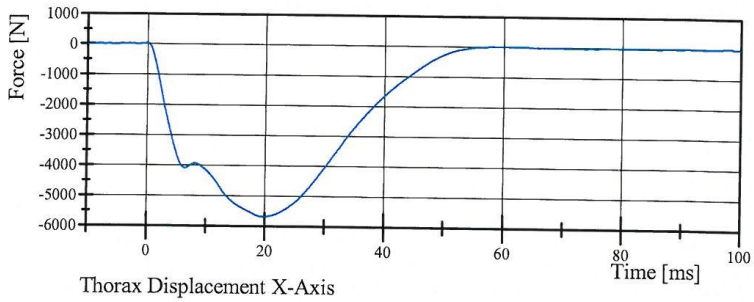
Front Thorax
HIII 50th Serial No. 037 Certification No. 11-1
Test Date: 10/20/2012

Pendulum Acceleration



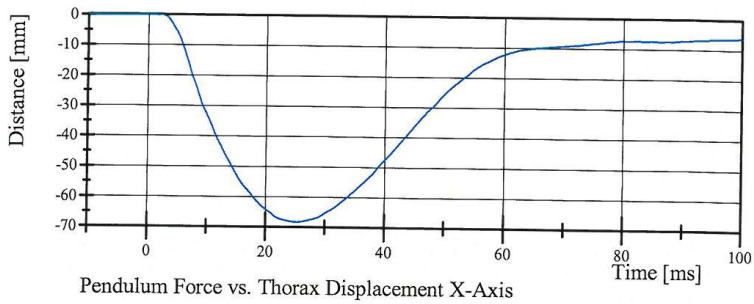
Filter Class: CFC_180
Max: 0.1 gn at -0.2 ms
Min: -24.8 gn at 19.8 ms

Pendulum Force



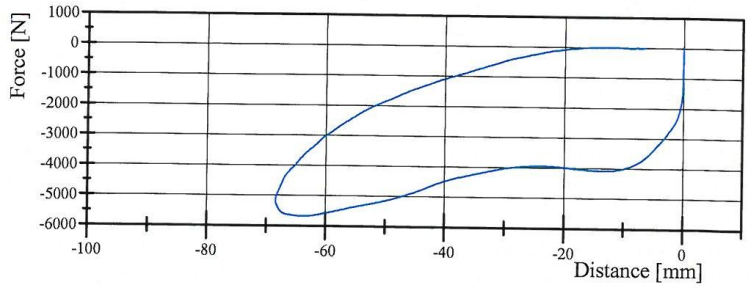
Filter Class: CFC_180
Max: 21.4 N at -0.2 ms
Min: -5,689.3 N at 19.8 ms

Thorax Displacement X-Axis



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

Pendulum Force vs. Thorax Displacement X-Axis



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

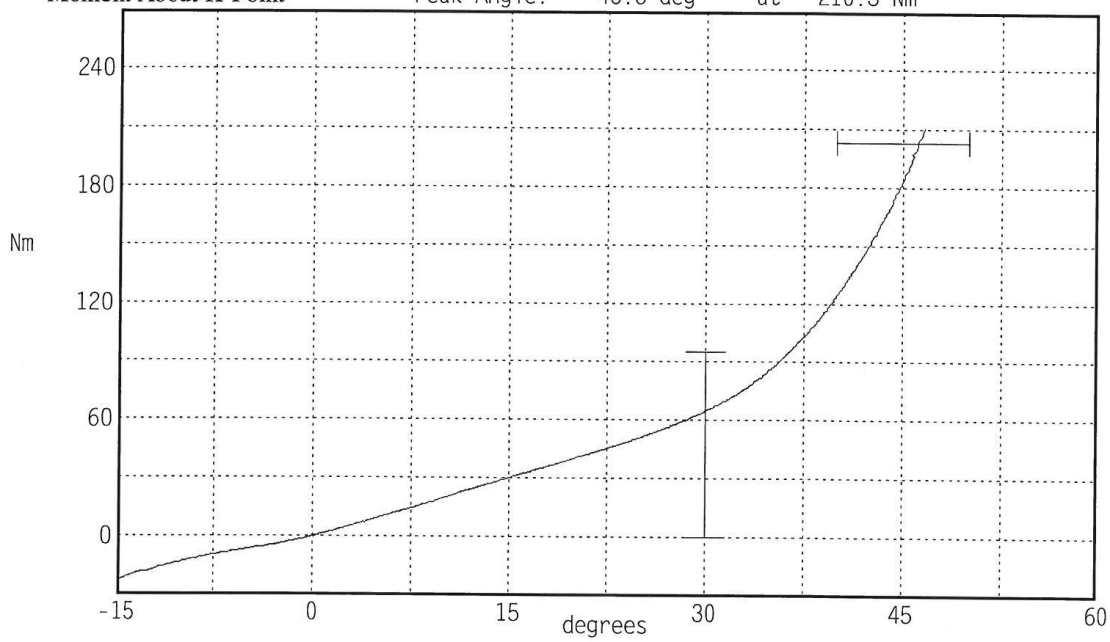
Serial Number: 037L
Test Number: 037C11
Comments:

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

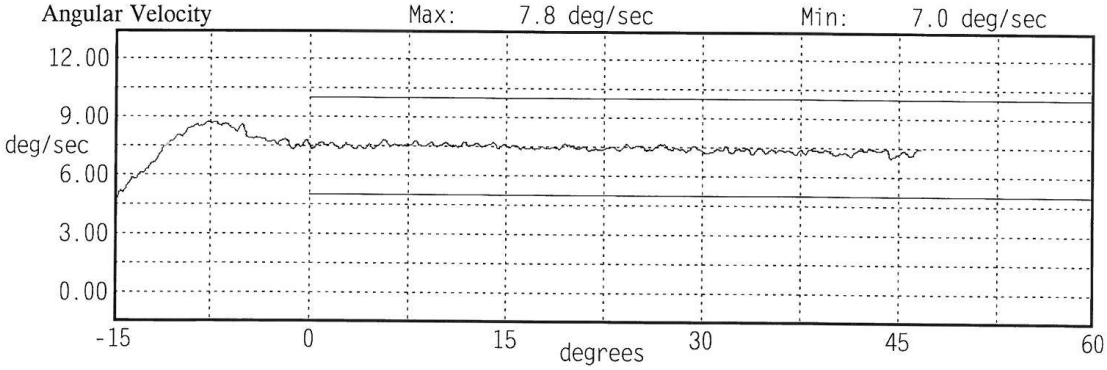
Moment About H-Point

Peak Moment: 210.3 Nm at 46.6 deg
Peak Angle: 46.6 deg at 210.3 Nm



Angular Velocity

Max: 7.8 deg/sec Min: 7.0 deg/sec



Transportation Research Center Inc

Hybrid III Hip Range of Motion

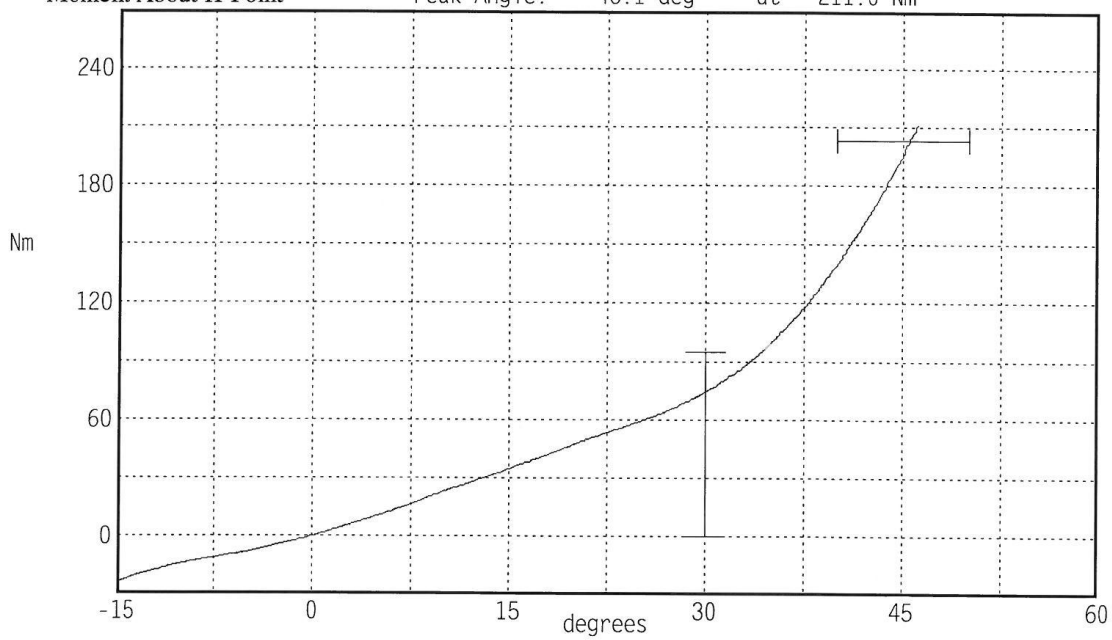
Serial Number: 037R
Test Number: 037C11
Comments:

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

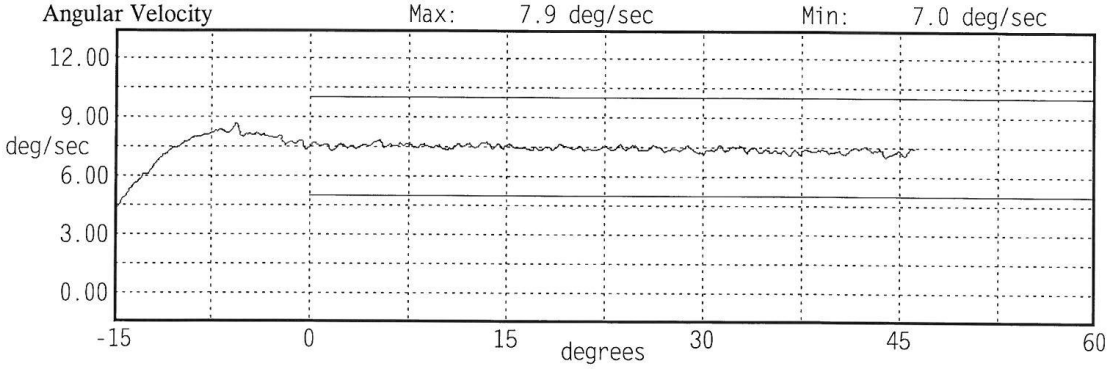
Moment About H-Point

Peak Moment: 211.0 Nm at 46.1 deg
Peak Angle: 46.1 deg at 211.0 Nm



Angular Velocity

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



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

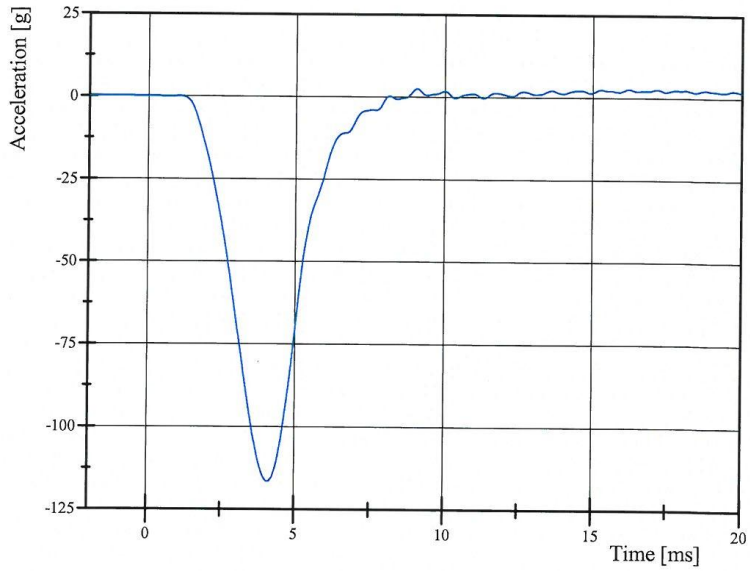
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.20.2012 08:41:27 1683

Transportation Research Center Inc.

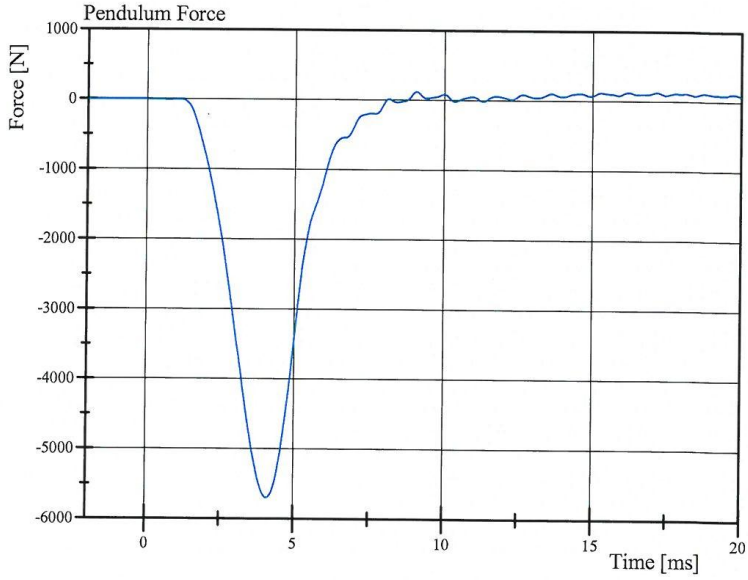
Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 11-1
Test Date: 10/20/2012

Pendulum Acceleration



Filter Class: CFC_600
Max: 2.6 gn at 16.2 ms
Min: -116.5 gn at 4.1 ms

Pendulum Force



Filter Class: CFC_600
Max: 124.9 N at 16.2 ms
Min: -5,702.0 N at 4.1 ms

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

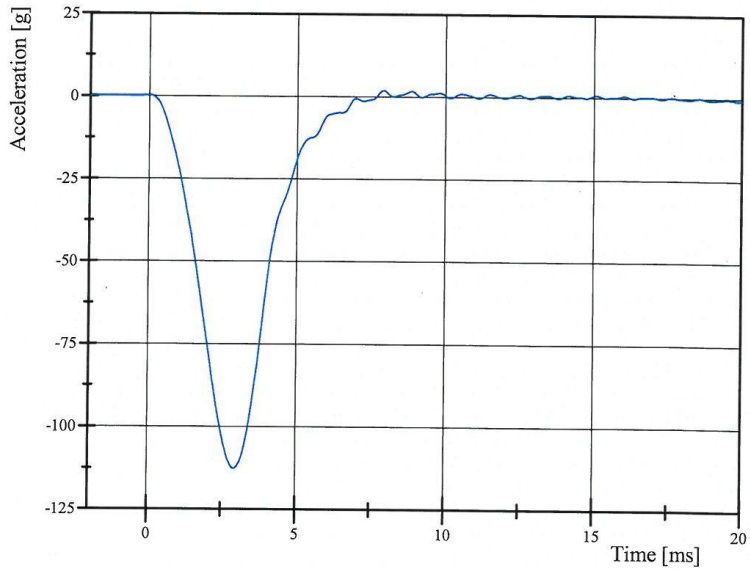
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.20.2012 08:44:59 1697

Transportation Research Center Inc.

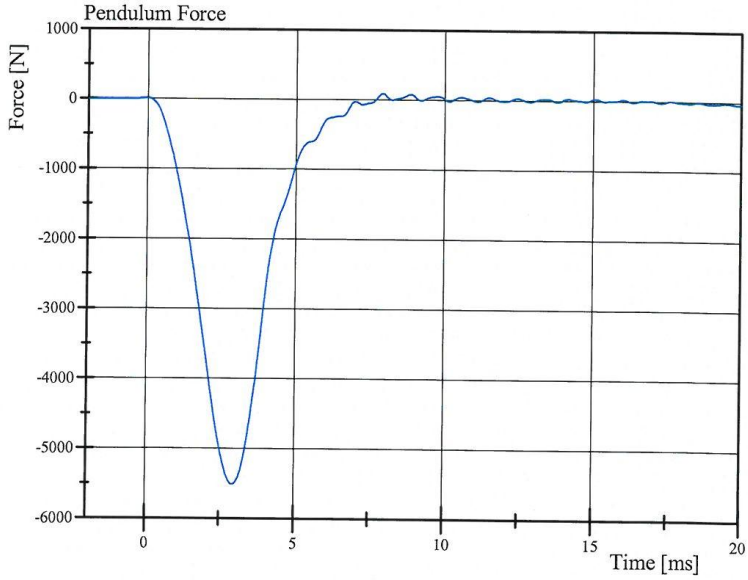
Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 11-1
Test Date: 10/20/2012

Pendulum Acceleration



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

Pendulum Force



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

Driver S/N 037

Post-Test Calibration Sheets

Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 037
Calibration No. 12

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	882	Yes
B	Shoulder Pivot Height	505.5 - 520.7	519	Yes
C	H-Point Height	83.8 - 88.9	85	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	150	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	198	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	427	Yes
W	Foot Breadth	91.4 - 106.7	97	Yes
Y	Chest Circumference	970.3 - 1000.8	984	Yes
Z	Waist Circumference	835.7 - 866.1	865	Yes
AA	Location For Chest Circumference	429.3 - 434.3	431	Yes
BB	Location For Waist Circumference	226.1 - 231.1	230	Yes

Comments:

Technician

Approved

Revised 3/13/3003

Transportation Research Center Inc.

Front Head Drop
HIII 50th Serial No. 037 Certification No. 12-1
Test Date: 10/25/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	258.2 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-13.1 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

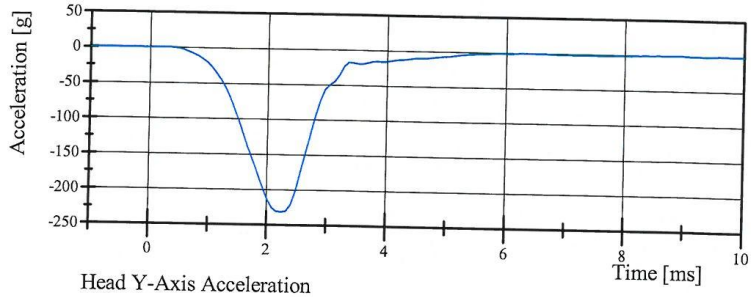
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.25.2012 15:13:03 610

Transportation Research Center Inc.

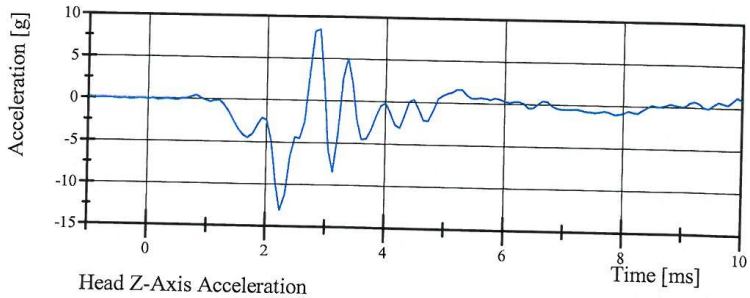
Front Head Drop
HIII 50th Serial No. 037 Certification No. 12-1
Test Date: 10/25/2012

Head X-Axis Acceleration



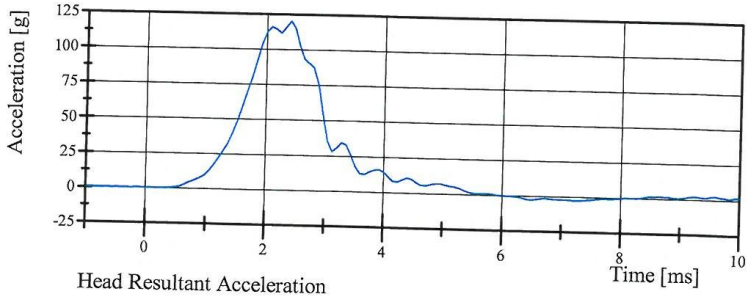
Filter Class: CFC_1000
Max: 0.2 gn at 9.7 ms
Min: -232.0 gn at 2.2 ms

Head Y-Axis Acceleration



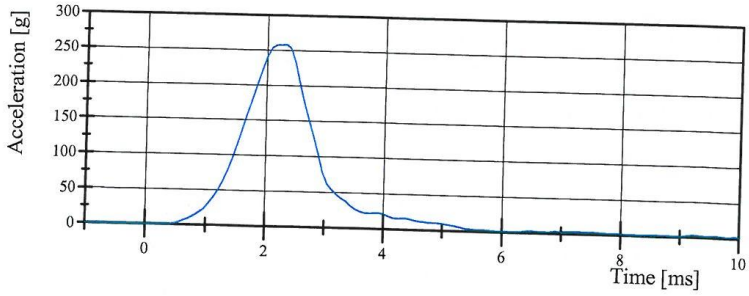
Filter Class: CFC_1000
Max: 8.4 gn at 2.9 ms
Min: -13.1 gn at 2.2 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 120.1 gn at 2.4 ms
Min: -2.8 gn at 6.5 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 258.2 gn at 2.3 ms
Min: 0.0 gn at -0.9 ms

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

10.25.2012 15:13:24 610

Transportation Research Center Inc.

Neck Flexion
HIII 50th Serial No. 037 Certification No. 12-1
Test Date: 10/26/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.955 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	41.8 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-22.66 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-20.70 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-15.13 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-15.13 g	Yes
Total Head D-Plane Rotation			
Peak	(-64) - (-78) °	-69.2 °	Yes
Time of Peak	57 - 64 ms	59.4 ms	Yes
Total Head D-Plane Rotation Decay to 0°	113 - 128 ms	117.7 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	88 - 108 N·m	103.2 N·m	Yes
Time of Peak	47 - 58 ms	53.6 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	97 - 107 ms	99.1 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

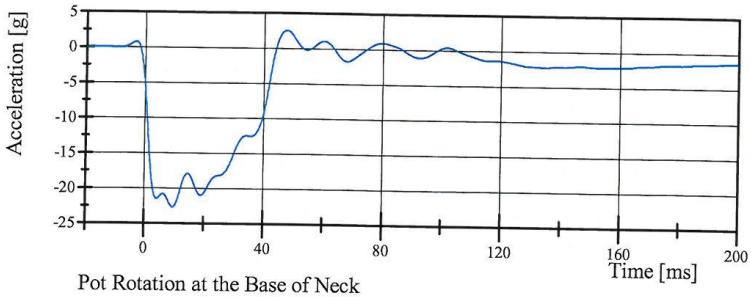
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.26.2012 13:47:26 2941

Transportation Research Center Inc.

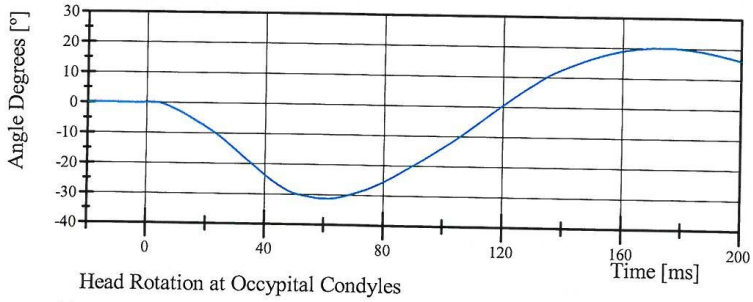
Neck Flexion
HIII 50th Serial No. 037 Certification No. 12-1
Test Date: 10/26/2012

Pendulum Acceleration



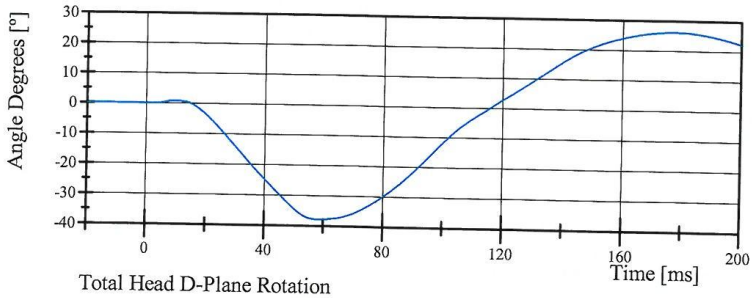
Filter Class: CFC_60
Max: 2.5 gn at 47.6 ms
Min: -22.7 gn at 9.7 ms

Pot Rotation at the Base of Neck



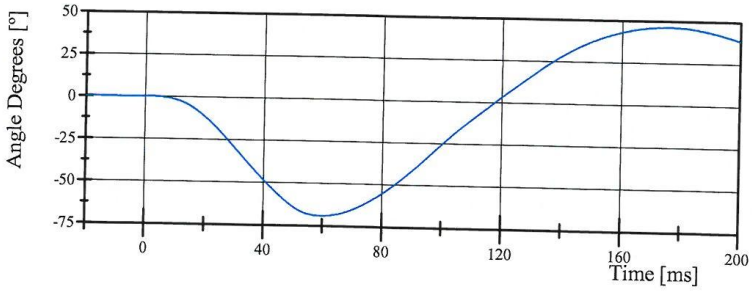
Filter Class: CFC_60
Max: 20.2 ° at 173.0 ms
Min: -31.4 ° at 60.4 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 26.2 ° at 177.3 ms
Min: -37.9 ° at 58.6 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 46.3 ° at 175.5 ms
Min: -69.2 ° at 59.4 ms

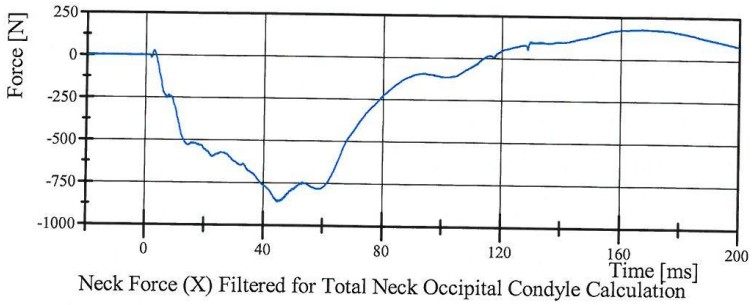
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.26.2012 13:47:42 2941

Transportation Research Center Inc.

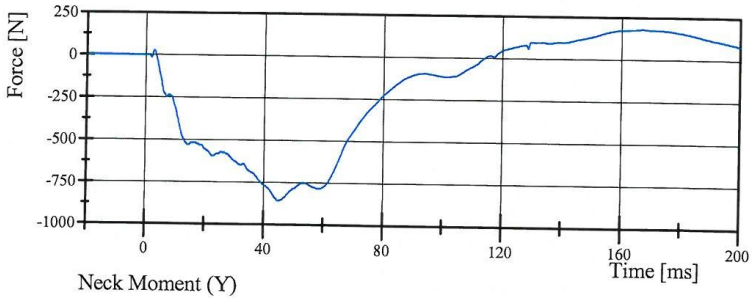
Neck Flexion
HIII 50th Serial No. 037 Certification No. 12-1
Test Date: 10/26/2012

Neck Force (X)



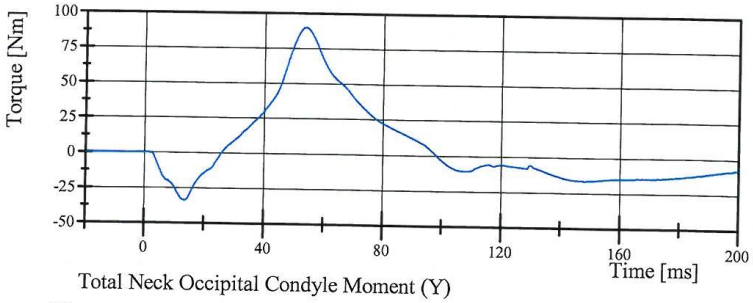
Filter Class: CFC_1000
Max: 179.3 N at 166.5 ms
Min: -861.2 N at 45.0 ms

Neck Force (X) Filtered for Total Neck Occipital Condyle Calculation



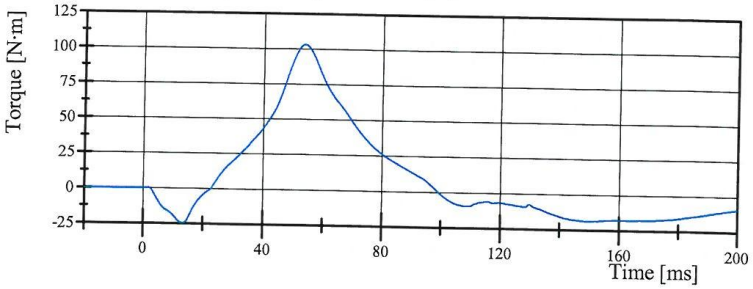
Filter Class: CFC_600
Max: 179.1 N at 166.6 ms
Min: -858.4 N at 45.0 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 89.9 Nm at 53.6 ms
Min: -33.9 Nm at 13.5 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: Without_(Constai
Max: 103.2 N·m at 53.6 ms
Min: -24.9 N·m at 13.2 ms

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

10.26.2012 13:47:43 2941

Transportation Research Center Inc.

Neck Extension
HIII 50th Serial No. 037 Certification No. 12-1
Test Date: 10/26/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-5.969 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	38.3 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	19.64 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	17.00 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	14.99 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	14.99 g	Yes
Total Head D-Plane Rotation			
Peak	81 - 106 °	94.8 °	Yes
Time of Peak	72 - 82 ms	74.2 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	153.0 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	(-53) - (-80) N·m	-72.2 N·m	Yes
Time of Peak	65 - 79 ms	69.2 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	120 - 148 ms	139.9 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

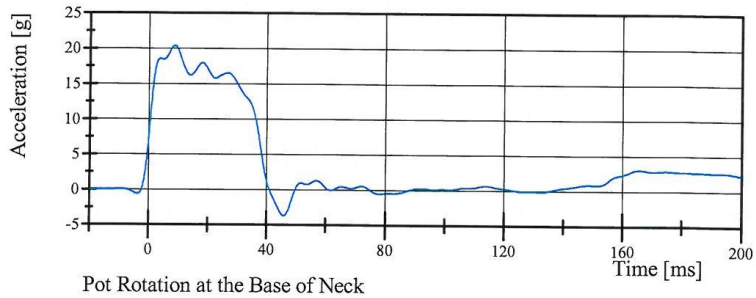
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.26.2012 14:20:34 3028

Transportation Research Center Inc.

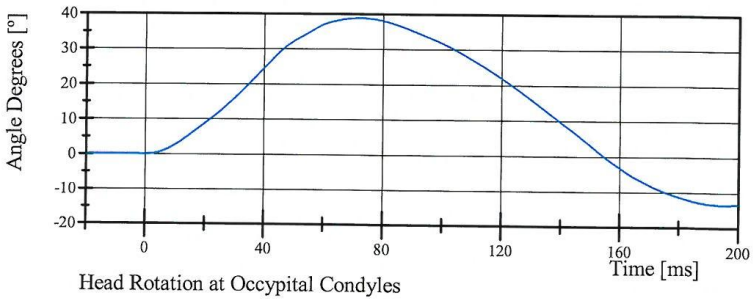
Neck Extension
HIII 50th Serial No. 037 Certification No. 12-1
Test Date: 10/26/2012

Pendulum Acceleration



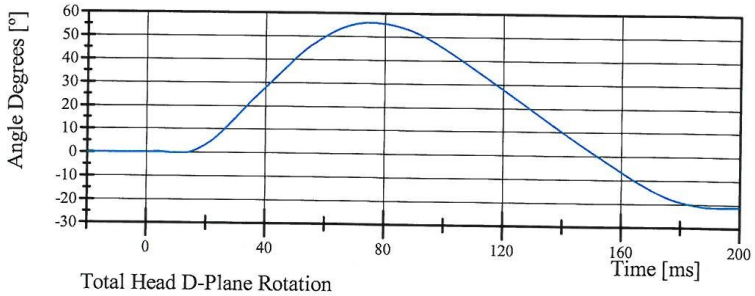
Filter Class: CFC_60
Max: 20.4 gn at 8.6 ms
Min: -3.7 gn at 45.8 ms

Pot Rotation at the Base of Neck



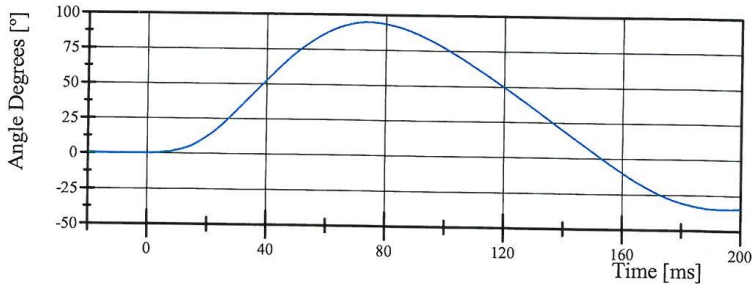
Filter Class: CFC_60
Max: 38.8 ° at 72.2 ms
Min: -13.5 ° at 195.4 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 56.0 ° at 75.2 ms
Min: -21.4 ° at 193.8 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 94.8 ° at 74.2 ms
Min: -34.9 ° at 194.6 ms

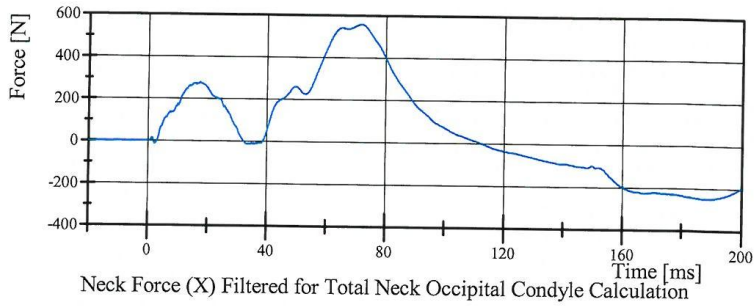
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.26.2012 14:20:48 3028

Transportation Research Center Inc.

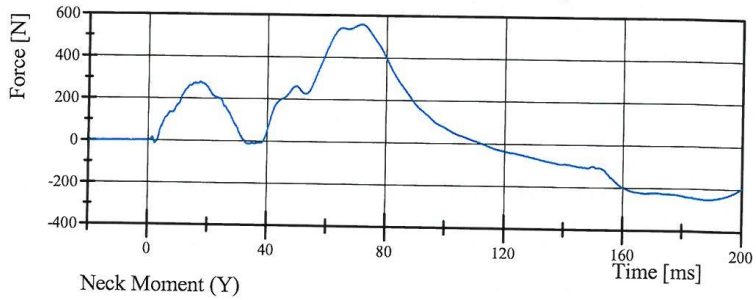
Neck Extension
HIII 50th Serial No. 037 Certification No. 12-1
Test Date: 10/26/2012

Neck Force (X)



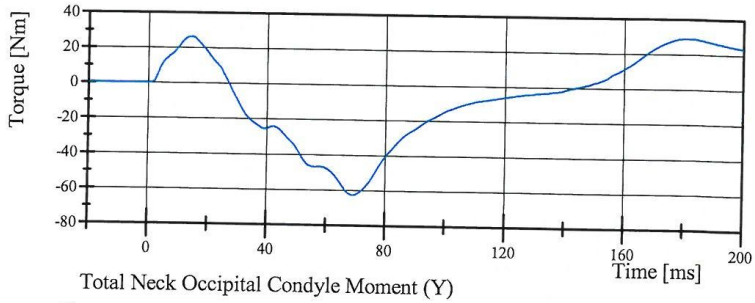
Filter Class: CFC_1000
Max: 558.0 N at 71.7 ms
Min: -250.2 N at 188.2 ms

Neck Force (X) Filtered for Total Neck Occipital Condyle Calculation



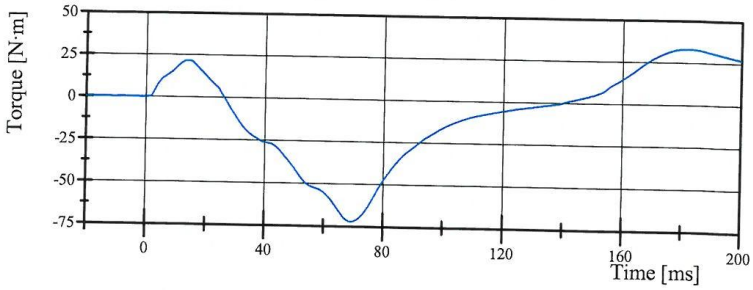
Filter Class: CFC_600
Max: 557.6 N at 71.8 ms
Min: -249.6 N at 188.2 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 29.0 Nm at 181.2 ms
Min: -62.6 Nm at 69.0 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: Without_(Constai
Max: 33.2 N·m at 182.3 ms
Min: -72.2 N·m at 69.2 ms

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

10.26.2012 14:20:49 3028

Transportation Research Center Inc.

Front Thorax
HIII 50th Serial No. 037 Certification No. 12-1
Test Date: 10/26/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.677 m/s	Yes
Probe Force Peak	(-5,160) - (-5,893) N	-5,611.5 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-68.04 mm	Yes
Internal Hysteresis	65 - 85 %	74.3 %	Yes

Test meets specifications.

Comments:

Technician

Approved

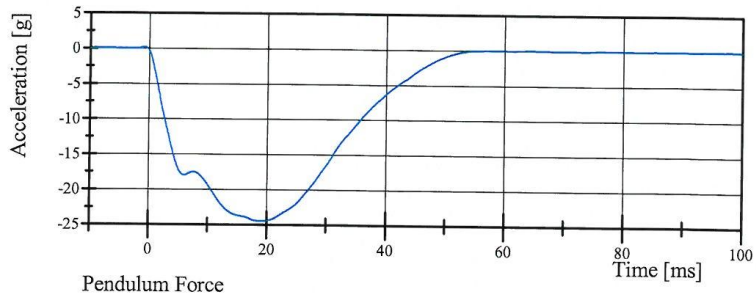
Specification Source: CFR49 Part 572 Subpart P
with Polarity in accordance with J211

10.26.2012 15:51:06 424

Transportation Research Center Inc.

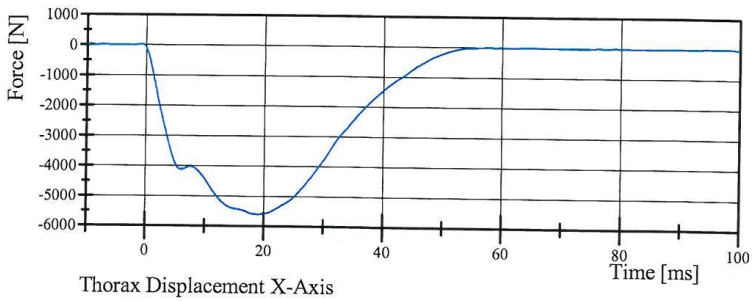
Front Thorax
HIII 50th Serial No. 037 Certification No. 12-1
Test Date: 10/26/2012

Pendulum Acceleration



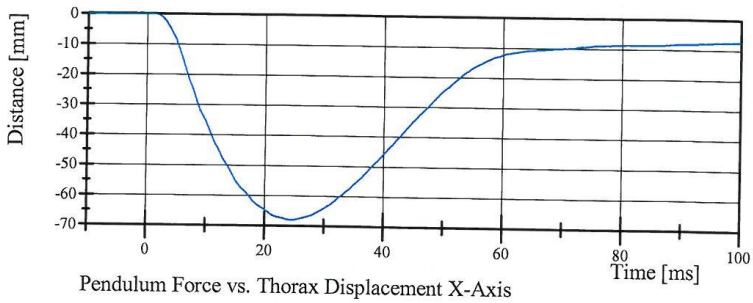
Filter Class: CFC_180
Max: 0.1 gn at -0.8 ms
Min: -24.5 gn at 18.9 ms

Pendulum Force



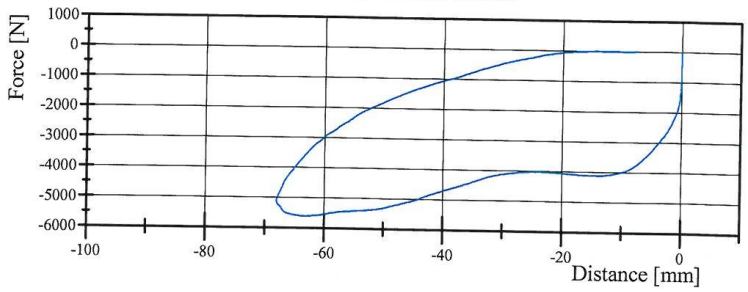
Filter Class: CFC_180
Max: 20.0 N at -0.8 ms
Min: -5,611.5 N at 18.9 ms

Thorax Displacement X-Axis



Filter Class: CFC_600
Max: 0.0 mm at -8.2 ms
Min: -68.0 mm at 24.5 ms

Pendulum Force vs. Thorax Displacement X-Axis



Filter Class: CFC_180
Max: 20.0 N at -0.0 mm
Min: -5,611.5 N at -63.3 mm

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

10.26.2012 15:51:30 424

Transportation Research Center Inc

Hybrid III Hip Range of Motion

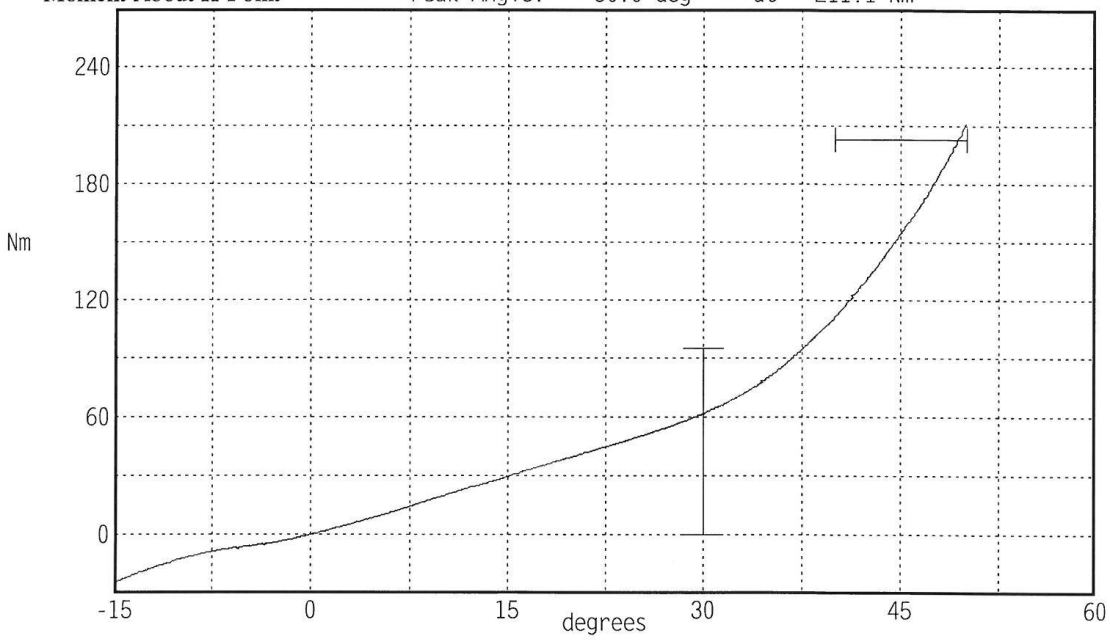
Serial Number: 037L
Test Number: 037C12
Comments:

Date: 10/26/2012
Time: 11:43

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	18.9 - 25.6	21.9	°C	Pass
Humidity	10 - 70	43	%	Pass
Moment at 30 deg	<= 94.9	61.6	Nm	Pass
Angle at 203 Nm	40.0 - 50.0	49.3	deg	Pass
Average Velocity	5.0 - 10.0	7.4	deg/sec	Pass

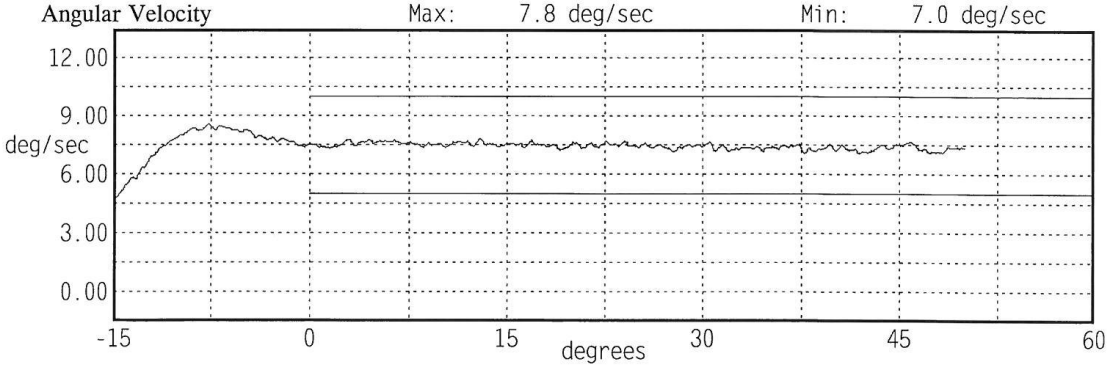
Moment About H-Point

Peak Moment: 211.1 Nm at 50.0 deg
Peak Angle: 50.0 deg at 211.1 Nm



Angular Velocity

Max: 7.8 deg/sec Min: 7.0 deg/sec



Transportation Research Center Inc

Hybrid III Hip Range of Motion

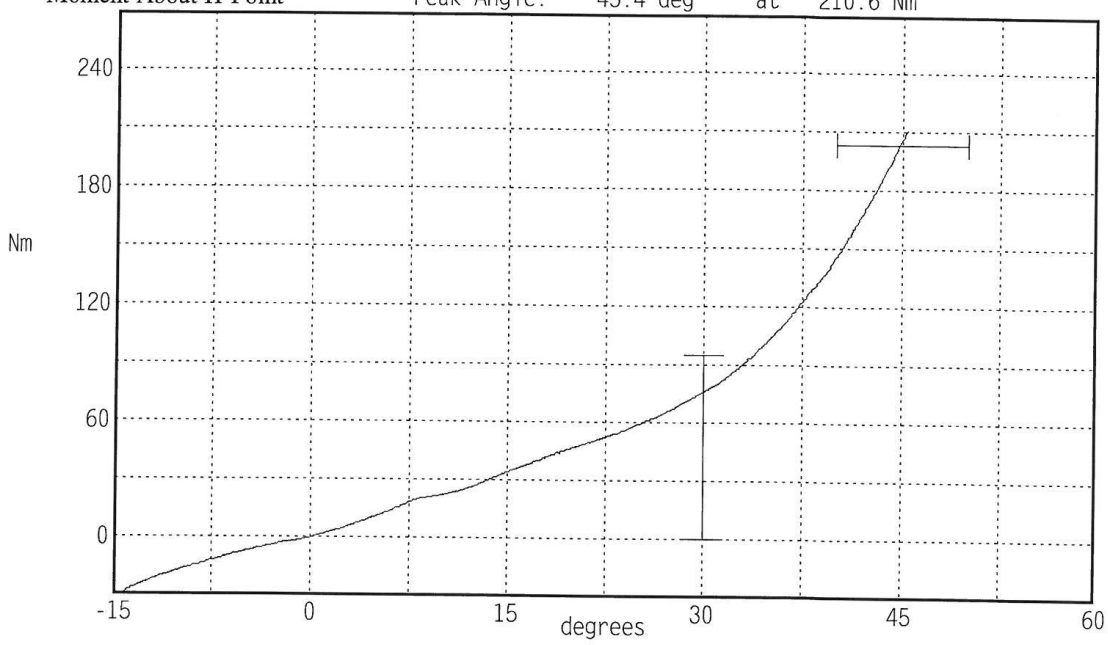
Serial Number: 037R
Test Number: 037C12
Comments:

Date: 10/26/2012
Time: 12:28

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	18.9 - 25.6	21.0	°C	Pass
Humidity	10 - 70	44	%	Pass
Moment at 30 deg	<= 94.9	76.2	Nm	Pass
Angle at 203 Nm	40.0 - 50.0	44.8	deg	Pass
Average Velocity	5.0 - 10.0	7.4	deg/sec	Pass

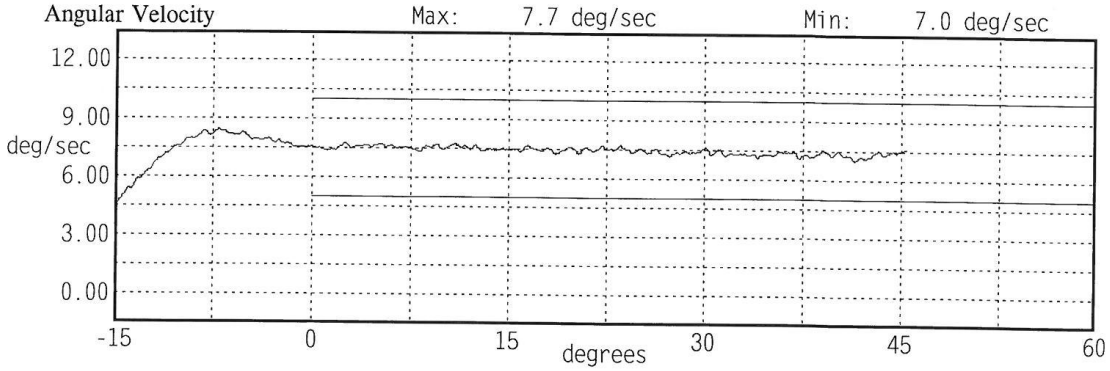
Moment About H-Point

Peak Moment: 210.6 Nm at 45.4 deg
Peak Angle: 45.4 deg at 210.6 Nm



Angular Velocity

Max: 7.7 deg/sec
Min: 7.0 deg/sec



Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 12-1
Test Date: 10/25/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.104 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,528.78 N	Yes

Test meets specifications.

Comments:

Technician

Approved

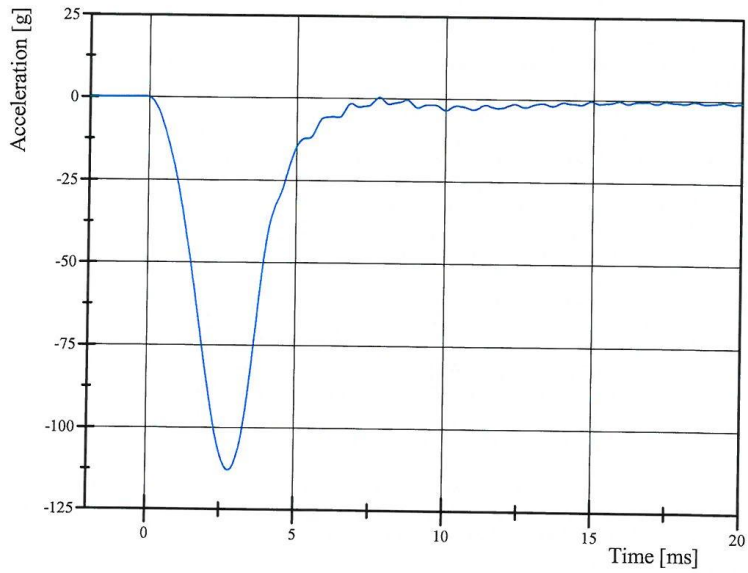
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.25.2012 14:37:59 1699

Transportation Research Center Inc.

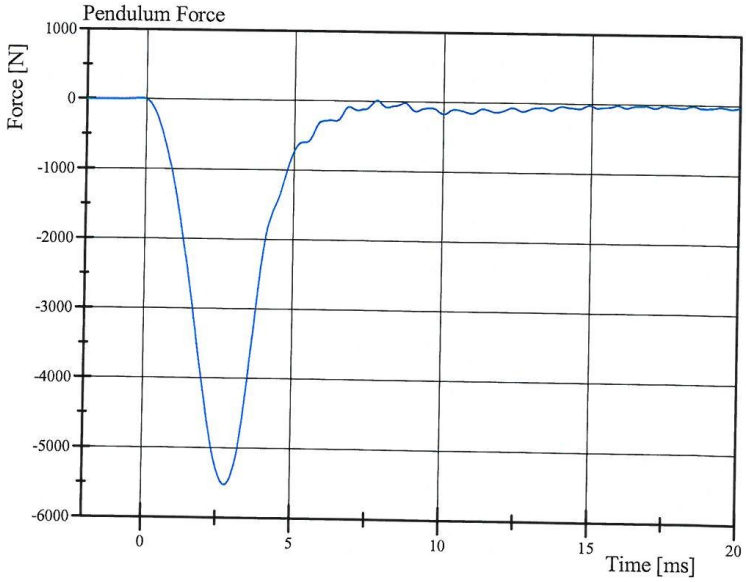
Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 12-1
Test Date: 10/25/2012

Pendulum Acceleration



Filter Class: CFC_600
Max: 0.4 gn at 7.8 ms
Min: -113.0 gn at 2.8 ms

Pendulum Force



Filter Class: CFC_600
Max: 18.3 N at 7.8 ms
Min: -5,528.8 N at 2.8 ms

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

10.25.2012 14:38:17 1699

Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 12-1
Test Date: 10/25/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.103 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,570.34 N	Yes

Test meets specifications.

Comments:

Technician

Approved

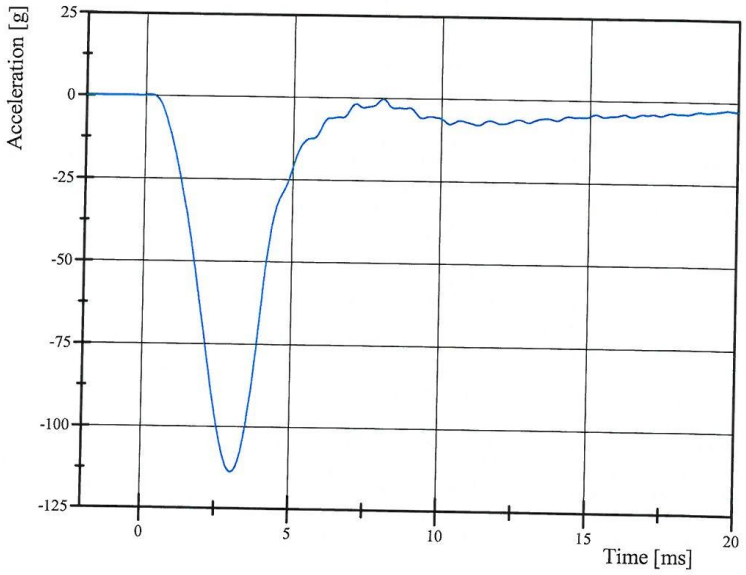
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.25.2012 14:44:56 1695

Transportation Research Center Inc.

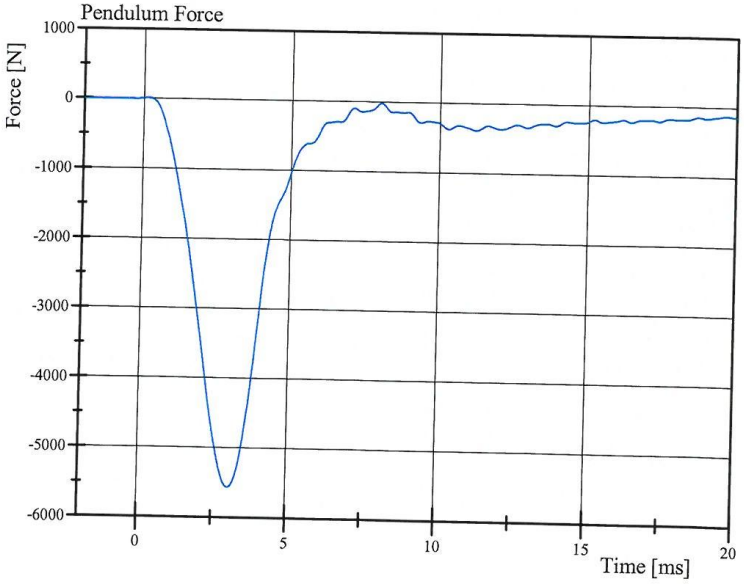
Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 12-1
Test Date: 10/25/2012

Pendulum Acceleration



Filter Class: CFC_600
Max: 0.2 gn at 0.2 ms
Min: -113.8 gn at 3.0 ms

Pendulum Force



Filter Class: CFC_600
Max: 7.4 N at 0.2 ms
Min: -5,570.3 N at 3.0 ms

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

10.25.2012 14:45:28 1695

Pre-Test Calibration Sheets
Front Passenger S/N 426

Transportation Research Center Inc.
572O HIII 5th Dummy
External Dimensions
Serial No. 426 Calibration No. 13

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	774.7 - 800.1	784	Yes
B	Shoulder Pivot Height	431.8 - 457.2	445	Yes
C	Hip Pivot Height	81.3 - 86.3	85	Yes
D	Hip Pivot from Backline	144.8 - 149.8	147	Yes
E	Shoulder Pivot from Backline	68.6 - 83.8	80	Yes
F	Thigh Clearance	119.4 - 134.6	127	Yes
G	Back of Elbow to Wrist Pivot	243.9 - 259.1	250	Yes
H	Head Back to Backline	43.2 - 48.2	46	Yes
I	Shoulder to Elbow Length	276.8 - 297.2	283	Yes
J	Elbow Rest Height	182.8 - 203.2	193	Yes
K	Buttock Knee Length	520.7 - 546.1	535	Yes
L	Popliteal Height	355.6 - 376.0	370	Yes
M	Knee Pivot Height	393.7 - 419.1	413	Yes
N	Buttock Popliteal Length	414.0 - 439.4	436	Yes
O	Chest Depth without Jacket	175.3 - 190.5	185	Yes
P	Foot Length	218.5 - 233.7	222	Yes
R	Buttock to Knee Pivot Length	457.2 - 482.6	475	Yes
S	Head Breadth	137.1 - 147.3	140	Yes
T	Head Depth	177.8 - 188.0	182	Yes
U	Hip Breadth	299.7 - 314.9	306	Yes
V	Shoulder Breadth	350.5 - 365.7	361	Yes
W	Foot Breadth	78.8 - 94.0	83	Yes
X	Head Circumference	528.3 - 548.7	539	Yes
Y	Chest Circumference with Jacket	850.9 - 881.3	864	Yes
Z	Waist Circumference	759.5 - 789.9	769	Yes
AA	Reference Location for Chest Circumference	332.7 - 358.1	345	Yes
BB	Reference Location for Waist Circumference	160.0 - 170.2	165	Yes

Technician

Approved

Revised 3/19/3003

Transportation Research Center Inc.

Front Head Drop
HIII 5th Serial No. 426 Certification No. 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

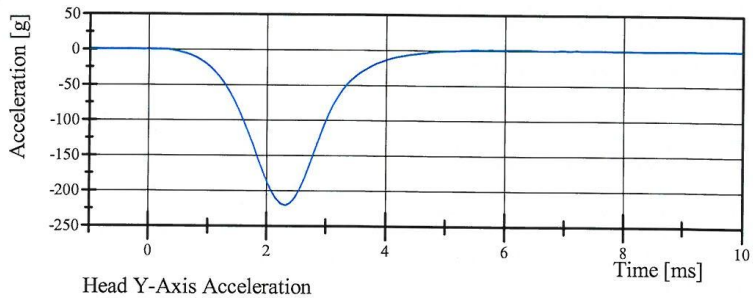
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.20.2012 08:23:12 610

Transportation Research Center Inc.

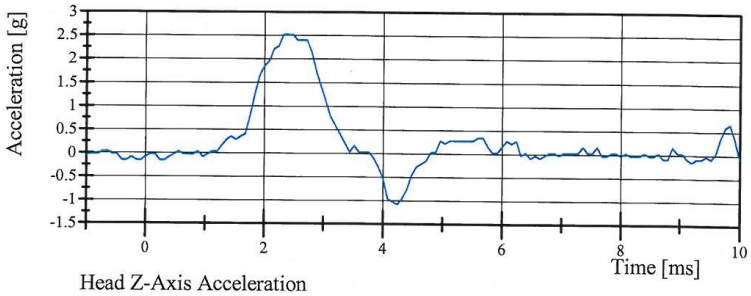
Front Head Drop
HIII 5th Serial No. 426 Certification No. 13-1
Test Date: 10/20/2012

Head X-Axis Acceleration



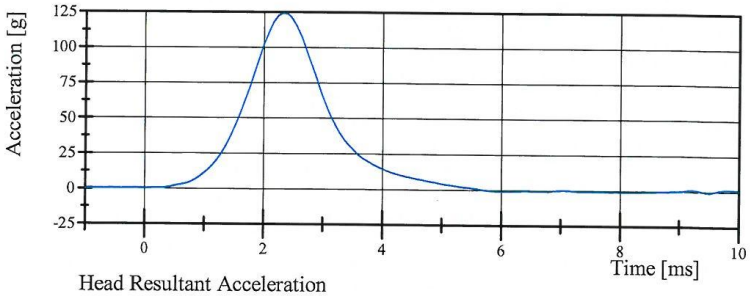
Filter Class: CFC_1000
Max: 1.1 gn at 6.2 ms
Min: -220.9 gn at 2.3 ms

Head Y-Axis Acceleration



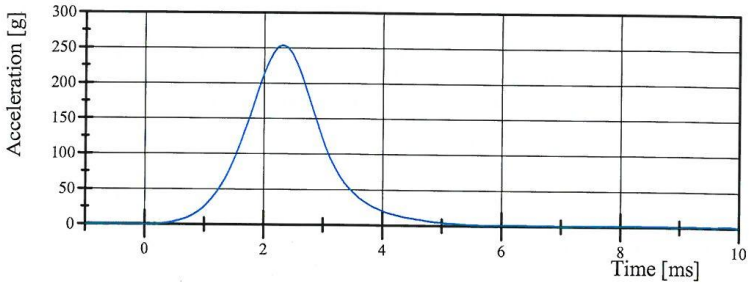
Filter Class: CFC_1000
Max: 2.5 gn at 2.3 ms
Min: -1.1 gn at 4.2 ms

Head Z-Axis Acceleration



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

Head Resultant Acceleration



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

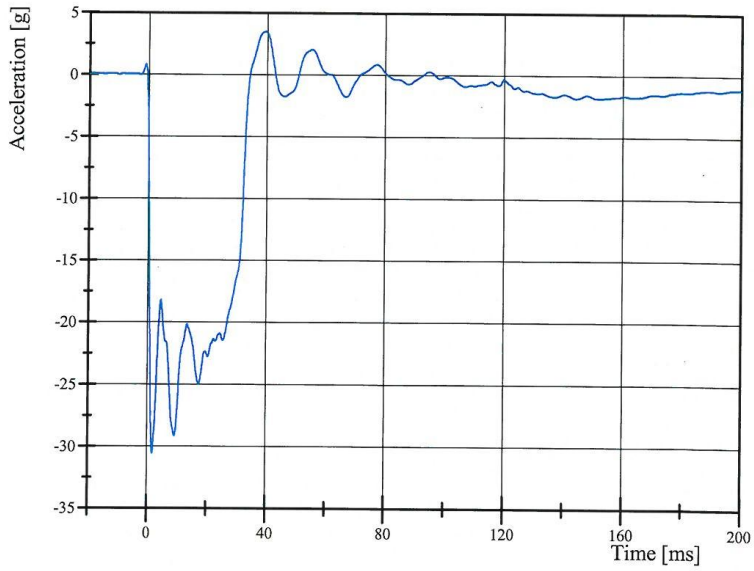
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.22.2012 11:10:05 1724

Transportation Research Center Inc.

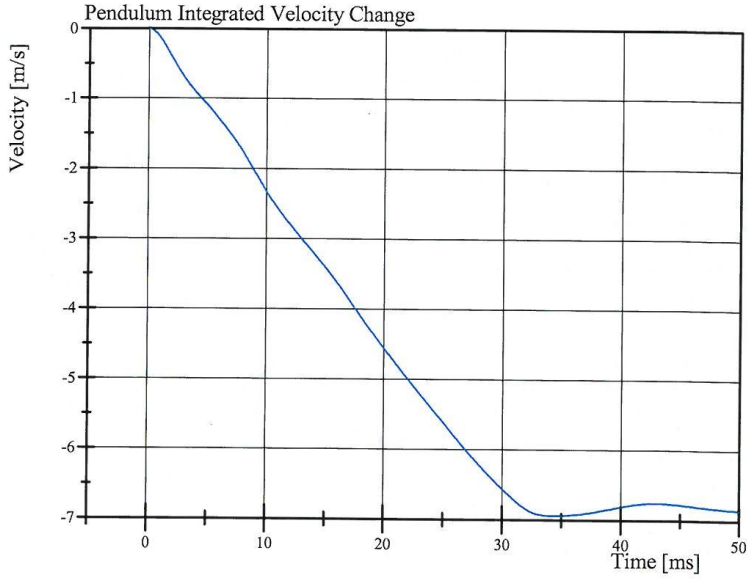
Neck Flexion
HIII 5th Serial No. 426 Certification No. 13-3
Test Date: 10/22/2012

Pendulum Acceleration



Filter Class: CFC_180
Max: 3.5 gn at 39.5 ms
Min: -30.6 gn at 1.9 ms

Pendulum Integrated Velocity Change



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

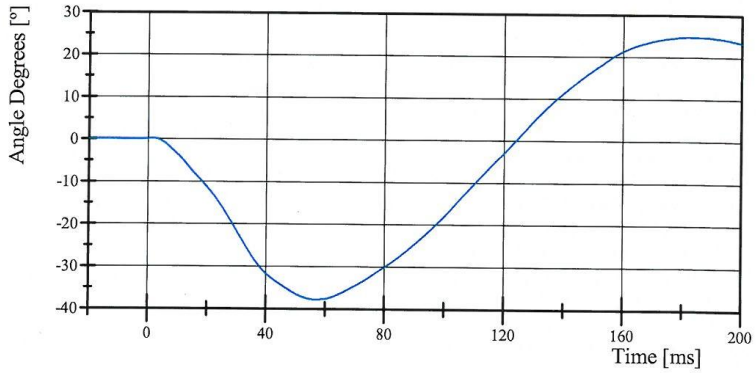
Transportation Research Center Inc.

Neck Flexion

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

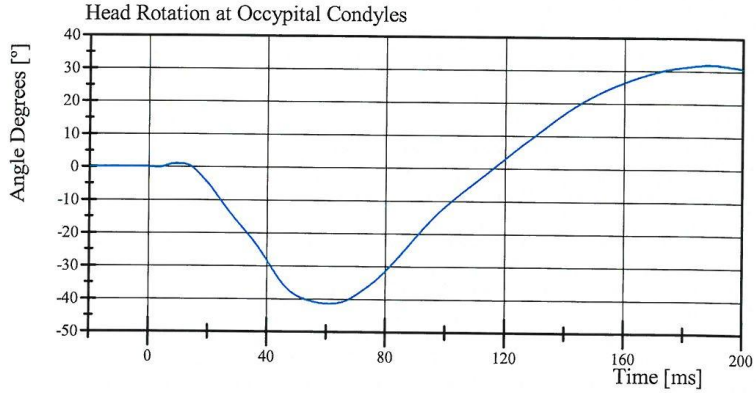
Test Date: 10/22/2012

Pot Rotation at the Base of Neck



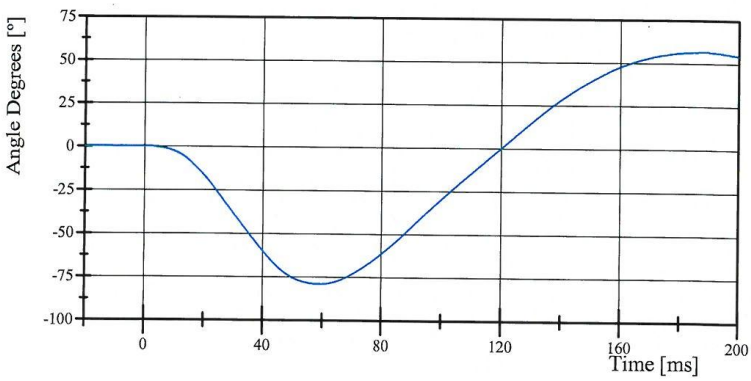
Filter Class: CFC_60
Max: 24.7 ° at 181.8 ms
Min: -37.8 ° at 57.0 ms

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

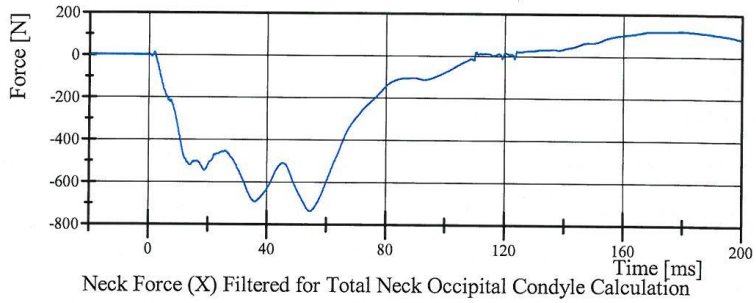
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.22.2012 11:10:13 1724

Transportation Research Center Inc.

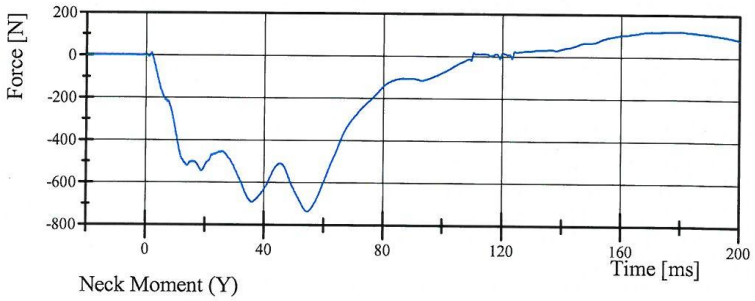
Neck Flexion
HIII 5th Serial No. 426 Certification No. 13-3
Test Date: 10/22/2012

Neck Force (X)



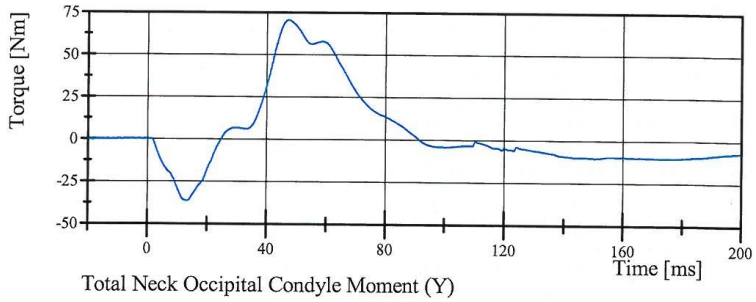
Filter Class: CFC_1000
Max: 120.7 N at 179.7 ms
Min: -736.7 N at 54.3 ms

Neck Force (X) Filtered for Total Neck Occipital Condyle Calculation



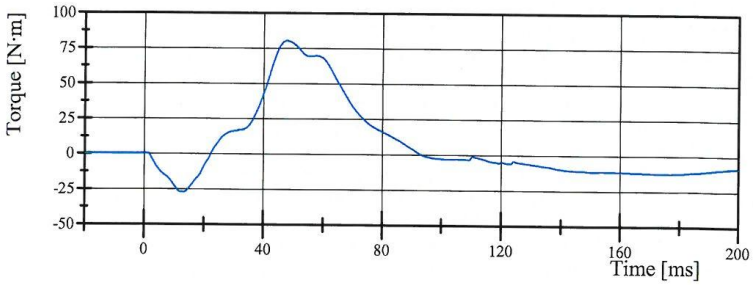
Filter Class: CFC_600
Max: 120.2 N at 179.9 ms
Min: -736.5 N at 54.6 ms

Neck Moment (Y)



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

Total Neck Occipital Condyle Moment (Y)



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

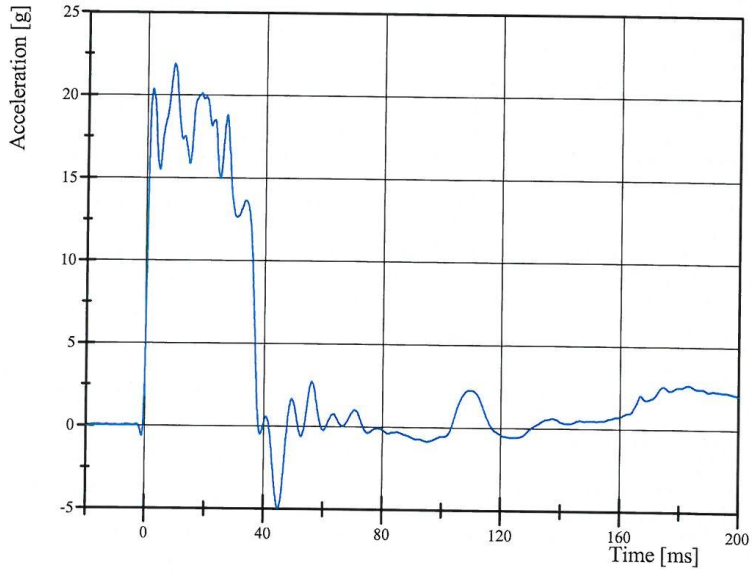
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.22.2012 12:34:11 1839

Transportation Research Center Inc.

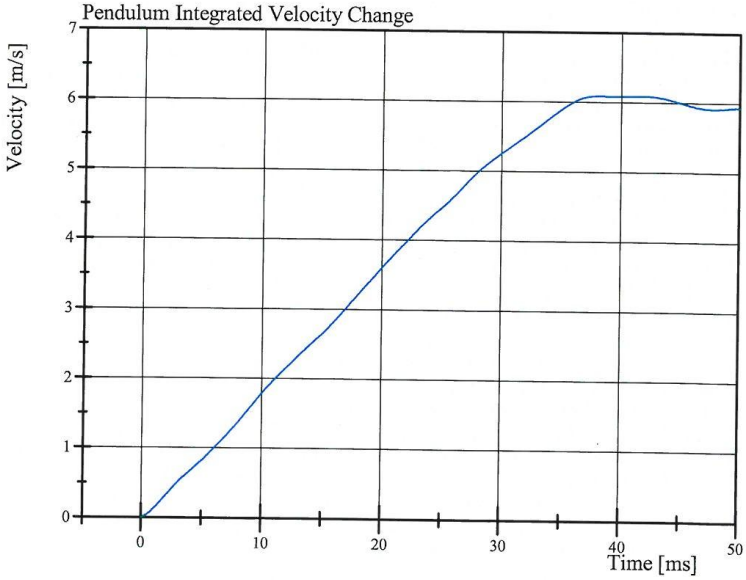
Neck Extension
HIII 5th Serial No. 426 Certification No. 13-1
Test Date: 10/22/2012

Pendulum Acceleration



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

Pendulum Integrated Velocity Change



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

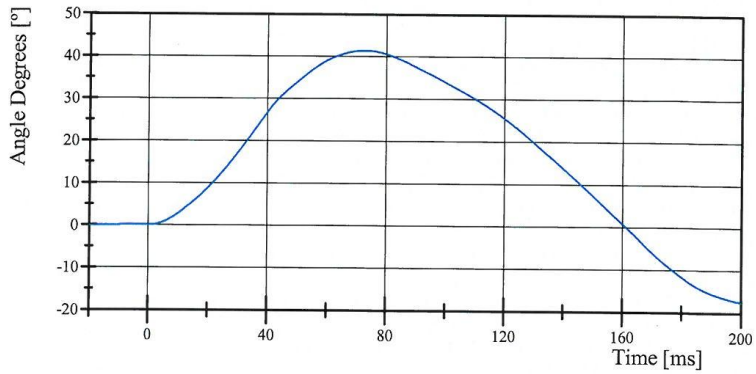
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.22.2012 12:34:21 1839

Transportation Research Center Inc.

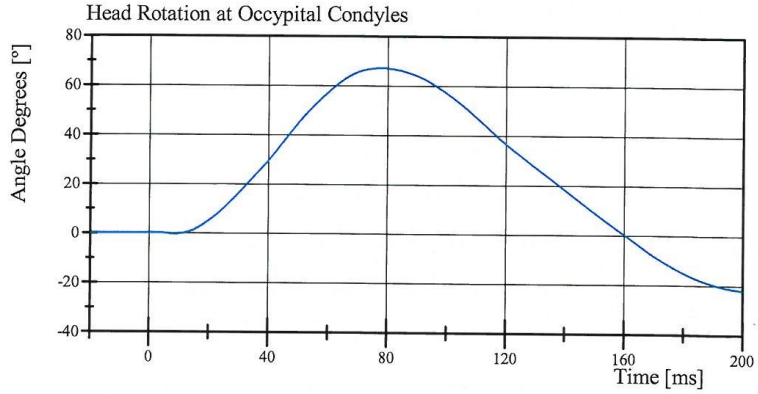
Neck Extension
HIII 5th Serial No. 426 Certification No. 13-1
Test Date: 10/22/2012

Pot Rotation at the Base of Neck



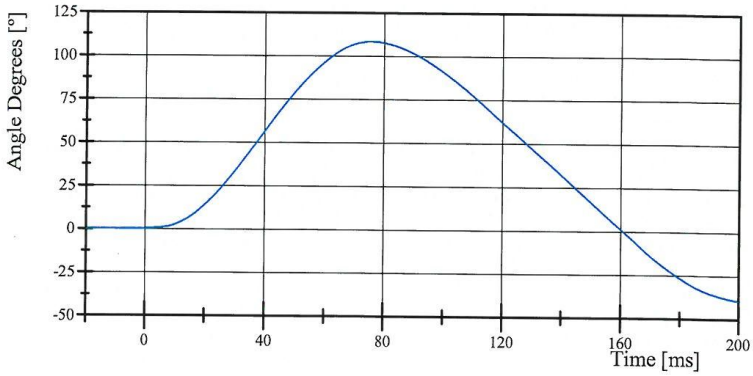
Filter Class: CFC_60
Max: 41.4 ° at 72.8 ms
Min: -17.5 ° at 200.0 ms

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

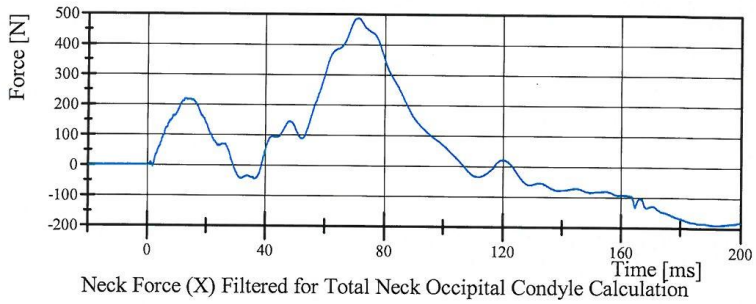
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.22.2012 12:34:22 1839

Transportation Research Center Inc.

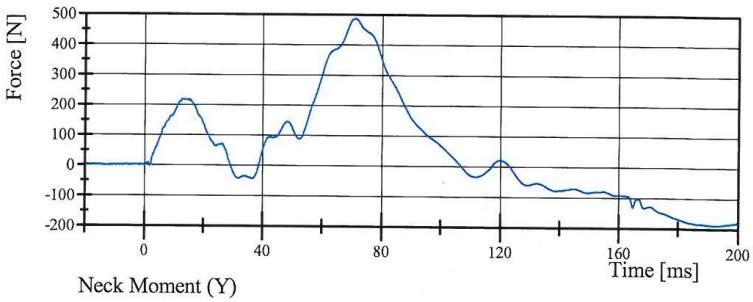
Neck Extension
HIII 5th Serial No. 426 Certification No. 13-1
Test Date: 10/22/2012

Neck Force (X)



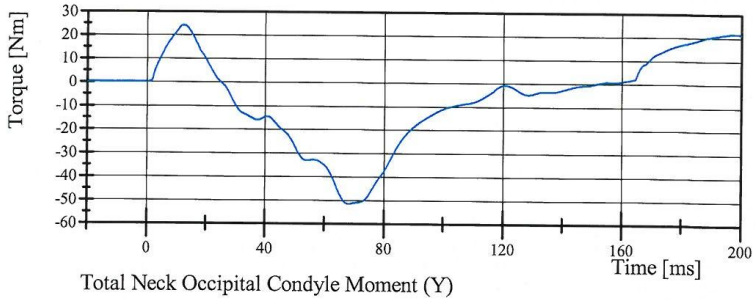
Filter Class: CFC_1000
Max: 487.0 N at 71.0 ms
Min: -190.1 N at 191.4 ms

Neck Force (X) Filtered for Total Neck Occipital Condyle Calculation



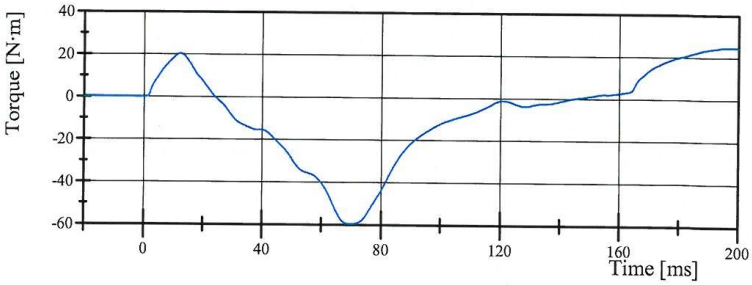
Filter Class: CFC_600
Max: 486.7 N at 71.0 ms
Min: -189.6 N at 191.5 ms

Neck Moment (Y)



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

Total Neck Occipital Condyle Moment (Y)



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

10.22.2012 12:34:23 1839

Transportation Research Center Inc.

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	>= (-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

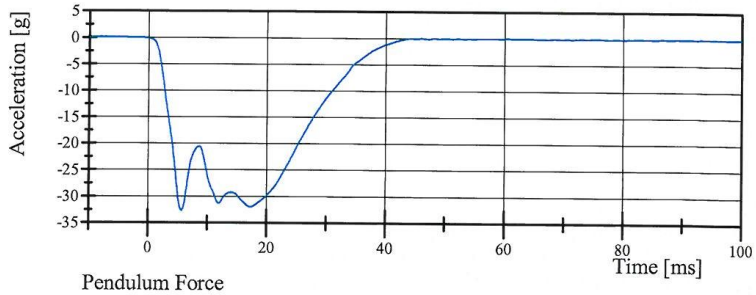
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.22.2012 10:19:49 356

Transportation Research Center Inc.

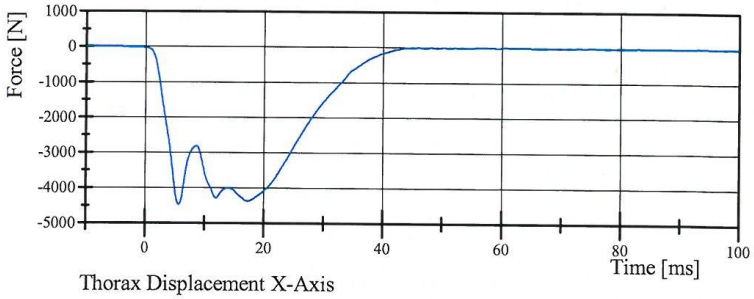
Front Thorax
HIII 5th Serial No. 426 Certification No. 13-3
Test Date: 10/22/2012

Pendulum Acceleration



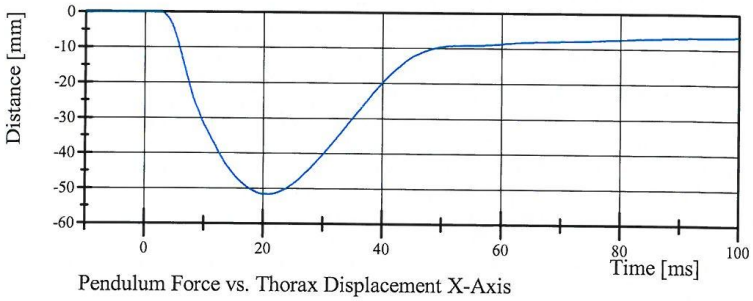
Filter Class: CFC_180
Max: 0.1 gn at 60.6 ms
Min: -32.7 gn at 5.7 ms

Pendulum Force



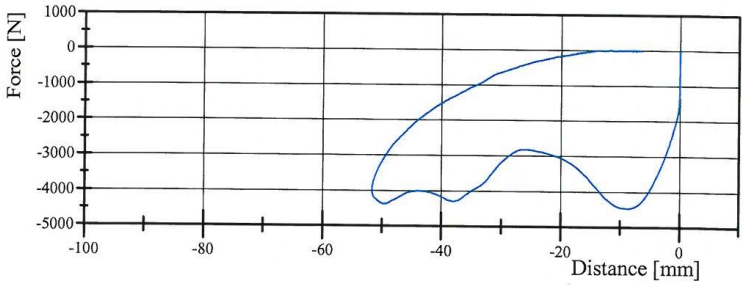
Filter Class: CFC_180
Max: 10.0 N at 60.6 ms
Min: -4,474.4 N at 5.7 ms

Thorax Displacement X-Axis



Filter Class: CFC_600
Max: 0.0 mm at -0.6 ms
Min: -51.6 mm at 20.8 ms

Pendulum Force vs. Thorax Displacement X-Axis



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

10.22.2012 10:20:10 356

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

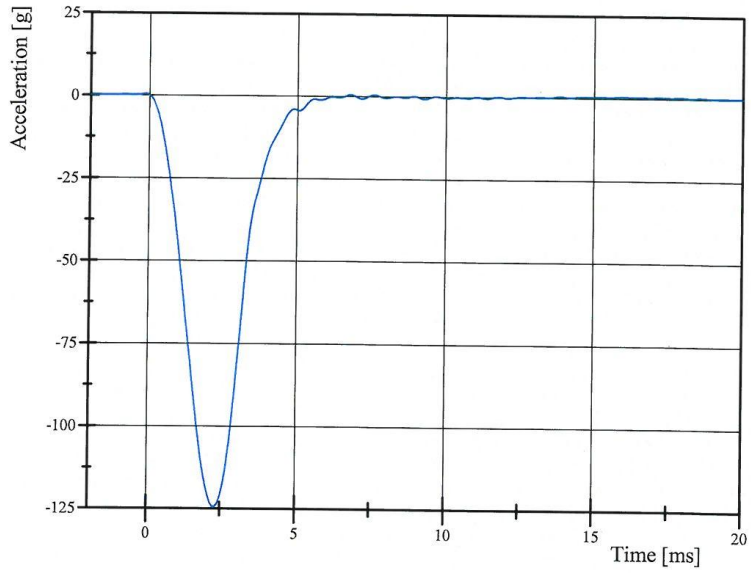
10.20.2012 07:57:23 1804

TRC

Transportation Research Center Inc.

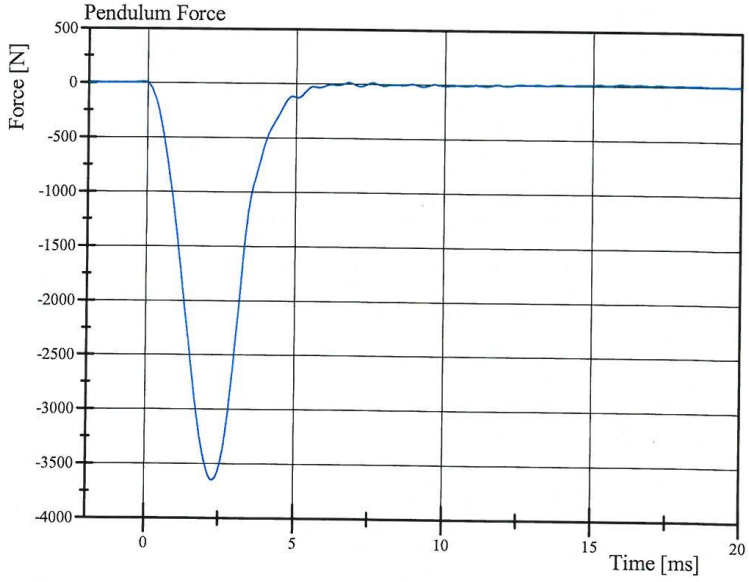
Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 13-1
Test Date: 10/20/2012

Pendulum Acceleration



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

Pendulum Force



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

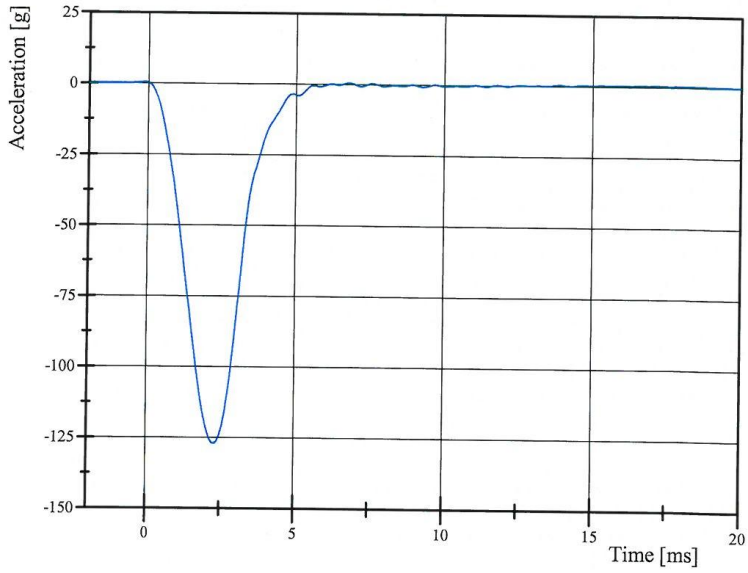
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.20.2012 08:02:25 1803

Transportation Research Center Inc.

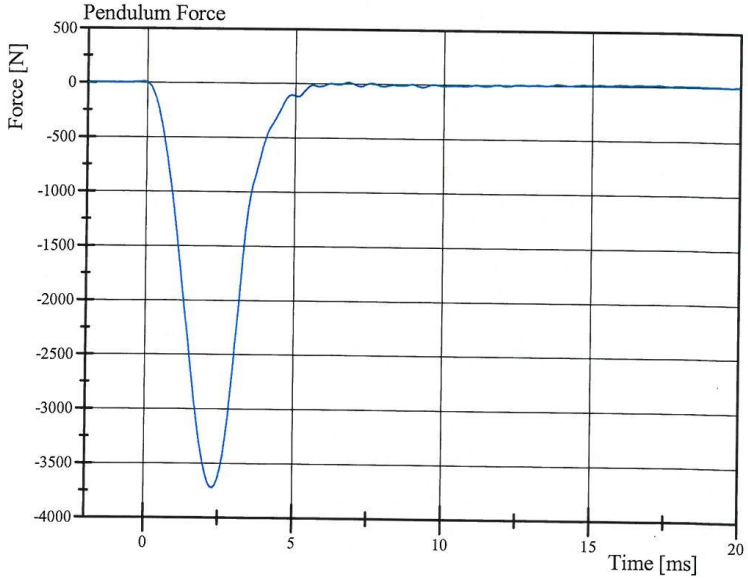
Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 13-1
Test Date: 10/20/2012

Pendulum Acceleration



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

Pendulum Force



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

Passenger **S/N 426**

Post-Test Calibration Sheets

Transportation Research Center Inc.
572O HIII 5th Dummy
External Dimensions
Serial No. 426 Calibration No. 14

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	774.7 - 800.1	779	Yes
B	Shoulder Pivot Height	431.8 - 457.2	442	Yes
C	Hip Pivot Height	81.3 - 86.3	85	Yes
D	Hip Pivot from Backline	144.8 - 149.8	147	Yes
E	Shoulder Pivot from Backline	68.6 - 83.8	80	Yes
F	Thigh Clearance	119.4 - 134.6	129	Yes
G	Back of Elbow to Wrist Pivot	243.9 - 259.1	250	Yes
H	Head Back to Backline	43.2 - 48.2	46	Yes
I	Shoulder to Elbow Length	276.8 - 297.2	283	Yes
J	Elbow Rest Height	182.8 - 203.2	193	Yes
K	Buttock Knee Length	520.7 - 546.1	535	Yes
L	Popliteal Height	355.6 - 376.0	370	Yes
M	Knee Pivot Height	393.7 - 419.1	413	Yes
N	Buttock Popliteal Length	414.0 - 439.4	436	Yes
O	Chest Depth without Jacket	175.3 - 190.5	186	Yes
P	Foot Length	218.5 - 233.7	222	Yes
R	Buttock to Knee Pivot Length	457.2 - 482.6	475	Yes
S	Head Breadth	137.1 - 147.3	140	Yes
T	Head Depth	177.8 - 188.0	182	Yes
U	Hip Breadth	299.7 - 314.9	306	Yes
V	Shoulder Breadth	350.5 - 365.7	358	Yes
W	Foot Breadth	78.8 - 94.0	83	Yes
X	Head Circumference	528.3 - 548.7	539	Yes
Y	Chest Circumference with Jacket	850.9 - 881.3	862	Yes
Z	Waist Circumference	759.5 - 789.9	769	Yes
AA	Reference Location for Chest Circumference	332.7 - 358.1	345	Yes
BB	Reference Location for Waist Circumference	160.0 - 170.2	165	Yes

Technician

Approved

Revised 3/19/3003

Transportation Research Center Inc.

Front Head Drop
HIII 5th Serial No. 426 Certification No. 14-1
Test Date: 10/29/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	29 %	Yes
Peak Head Resultant Acceleration	250 - 300 g	252.4 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-12.6 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

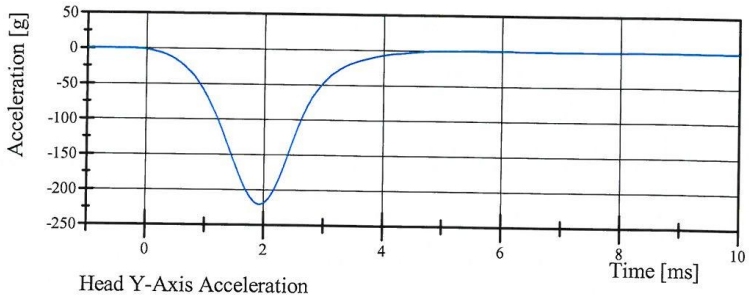
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.29.2012 10:54:54 615

Transportation Research Center Inc.

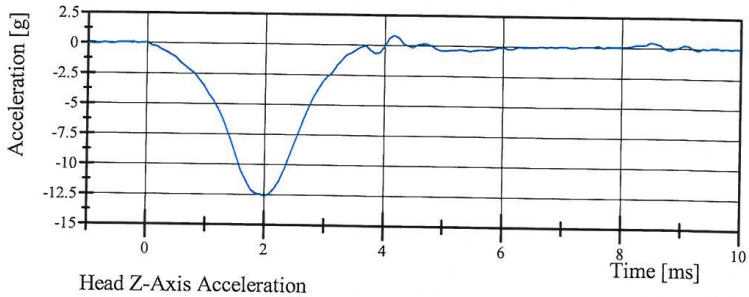
Front Head Drop
HIII 5th Serial No. 426 Certification No. 14-1
Test Date: 10/29/2012

Head X-Axis Acceleration



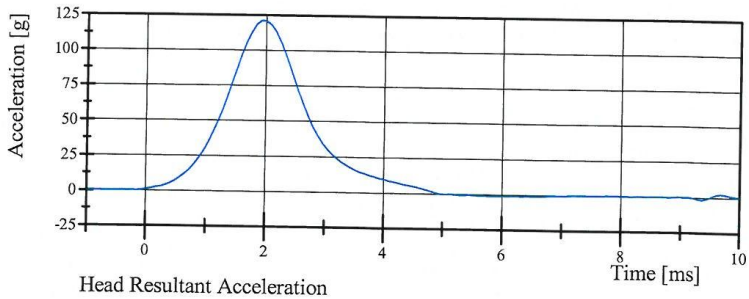
Filter Class: CFC_1000
Max: 0.5 gn at 5.8 ms
Min: -221.1 gn at 1.9 ms

Head Y-Axis Acceleration



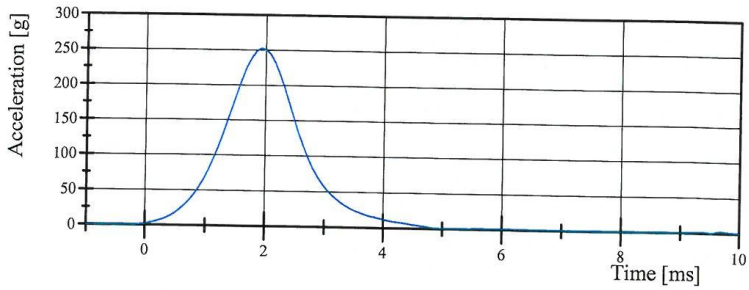
Filter Class: CFC_1000
Max: 0.8 gn at 4.2 ms
Min: -12.6 gn at 2.0 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 121.0 gn at 1.9 ms
Min: -1.7 gn at 9.4 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 252.4 gn at 1.9 ms
Min: 0.0 gn at -0.3 ms

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

10.29.2012 10:55:12 615

Transportation Research Center Inc.

Neck Flexion
HIII 5th Serial No. 426 Certification No. 14-3
Test Date: 10/29/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.919 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	(-2.1) - (-2.5) m/s	-2.26 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	(-4.0) - (-5.0) m/s	-4.42 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	(-5.8) - (-7.0) m/s	-6.48 m/s	Yes
Total Head D-Plane Rotation	(-77) - (-91) °	-77.5 °	Yes
Total Neck Occipital Condyles Moment Between -77° and -91° Rotation	69 - 83 N·m	66.0 N·m	No
Total Neck Occipital Condyles Moment Decay to 10 N·m	80 - 100 ms	86.4 ms	Yes

Test does not meet specifications.

Comments:

Technician

Approved

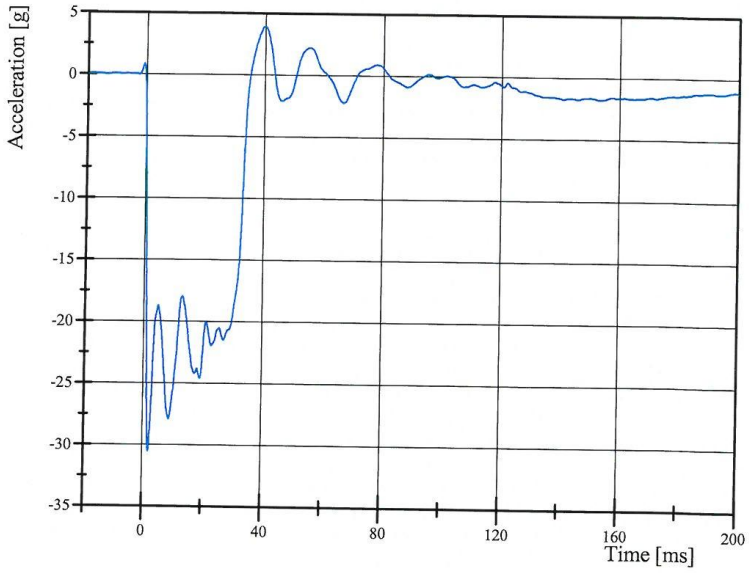
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.29.2012 15:09:36 1721

Transportation Research Center Inc.

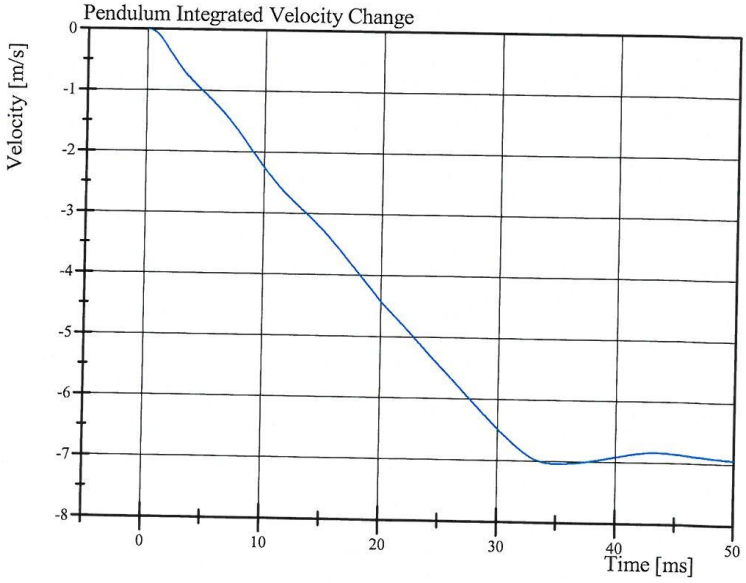
Neck Flexion
HIII 5th Serial No. 426 Certification No. 14-3
Test Date: 10/29/2012

Pendulum Acceleration



Filter Class: CFC_180
Max: 3.9 gn at 40.0 ms
Min: -30.5 gn at 2.0 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 0.0 m/s at 0.0 ms
Min: -7.0 m/s at 35.2 ms

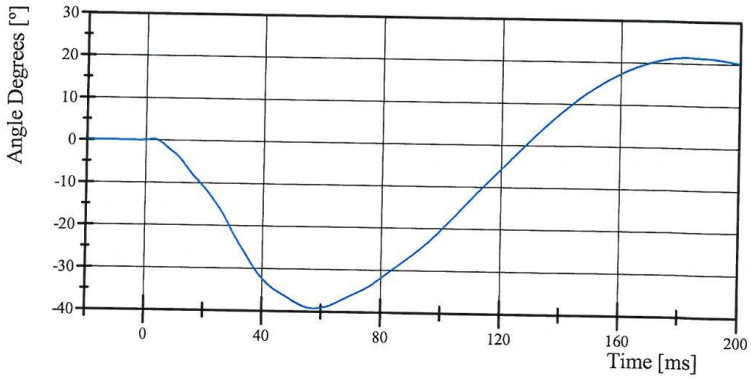
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.29.2012 15:10:41 1721

Transportation Research Center Inc.

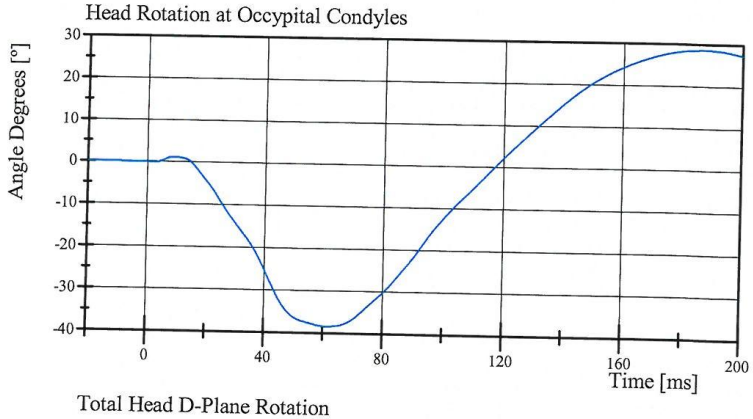
Neck Flexion
HIII 5th Serial No. 426 Certification No. 14-3
Test Date: 10/29/2012

Pot Rotation at the Base of Neck



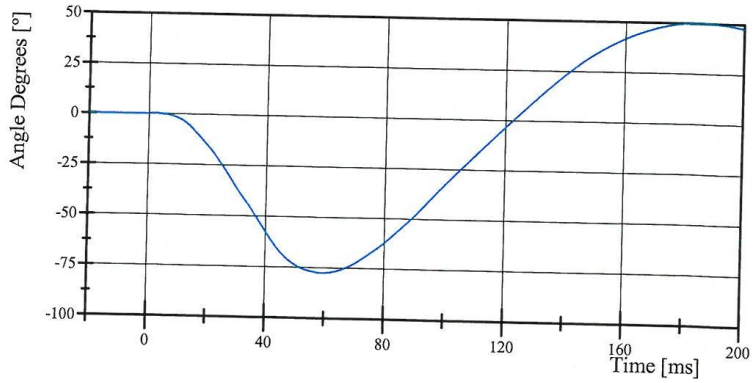
Filter Class: CFC_60
Max: 21.5 ° at 182.0 ms
Min: -39.2 ° at 57.4 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 28.6 ° at 187.4 ms
Min: -38.4 ° at 61.2 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 50.0 ° at 185.3 ms
Min: -77.5 ° at 59.4 ms

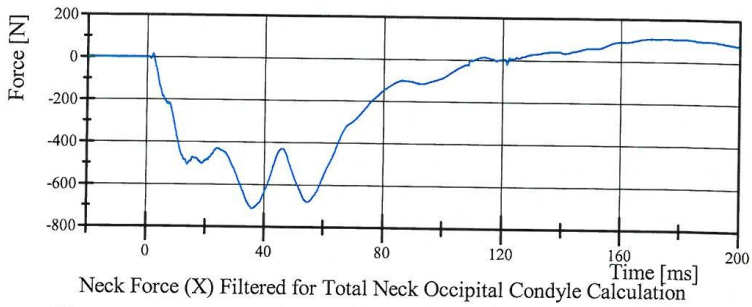
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.29.2012 15:10:42 1721

Transportation Research Center Inc.

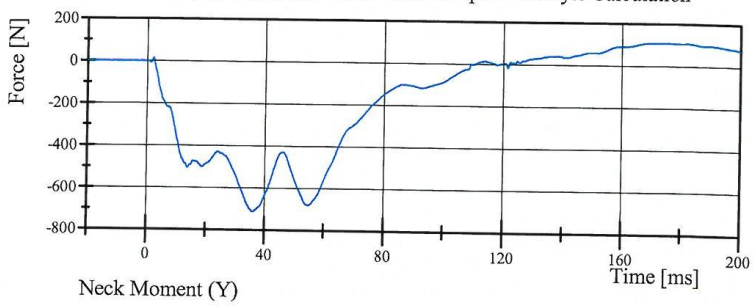
Neck Flexion
HIII 5th Serial No. 426 Certification No. 14-3
Test Date: 10/29/2012

Neck Force (X)



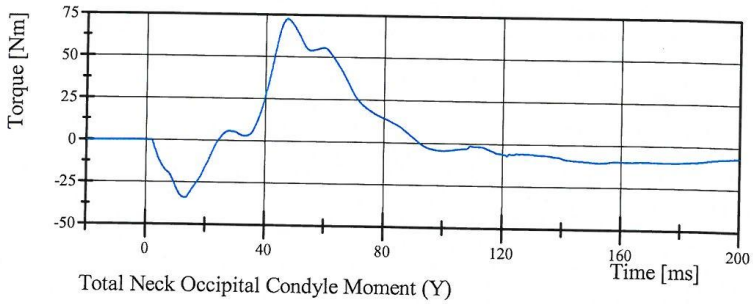
Filter Class: CFC_1000
Max: 109.5 N at 174.4 ms
Min: -713.5 N at 35.8 ms

Neck Force (X) Filtered for Total Neck Occipital Condyle Calculation



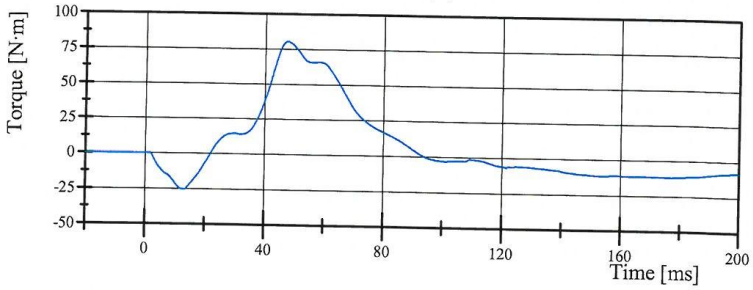
Filter Class: CFC_600
Max: 109.2 N at 174.4 ms
Min: -713.4 N at 35.8 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 72.4 Nm at 47.2 ms
Min: -34.3 Nm at 13.4 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: Without_(Constai
Max: 80.4 N·m at 47.5 ms
Min: -25.5 N·m at 12.8 ms

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

10.29.2012 15:10:43 1721

Transportation Research Center Inc.

Neck Extension
HIII 5th Serial No. 426 Certification No. 14-1
Test Date: 10/29/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Pendulum Velocity	(-5.95) - (-6.19) m/s	-6.051 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	1.5 - 1.9 m/s	1.81 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	3.1 - 3.9 m/s	3.56 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	4.6 - 5.6 m/s	5.09 m/s	Yes
Total Head D-Plane Rotation	99 - 114 °	105.7 °	Yes
Total Neck Occipital Condyles Moment Between 99° and 114° Rotation	(-53) - (-65) N·m	-54.8 N·m	Yes
Total Neck Occipital Condyles Moment Decay to -10 N·m	94 - 114 ms	105.3 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

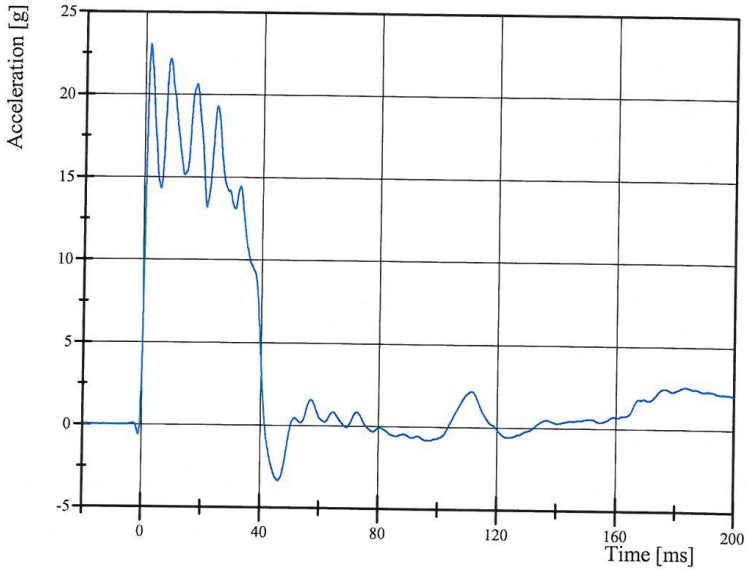
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.29.2012 15:39:23 1840

Transportation Research Center Inc.

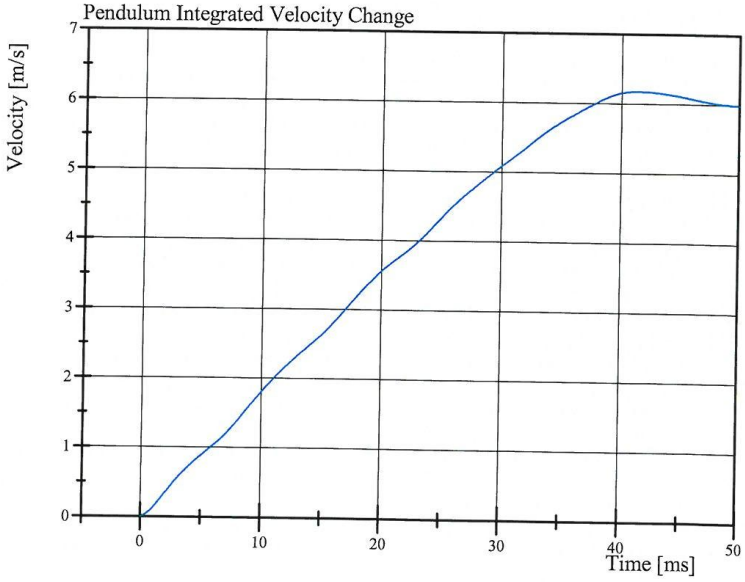
Neck Extension
HIII 5th Serial No. 426 Certification No. 14-1
Test Date: 10/29/2012

Pendulum Acceleration



Filter Class: CFC_180
Max: 23.0 gn at 1.8 ms
Min: -3.4 gn at 46.0 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 6.2 m/s at 41.4 ms
Min: 0.0 m/s at 0.0 ms

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

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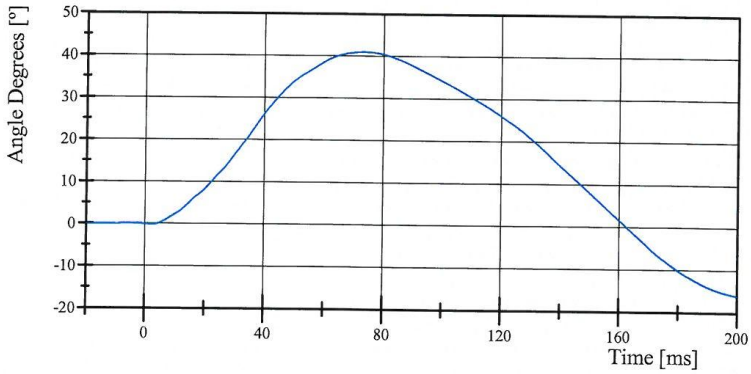
Transportation Research Center Inc.

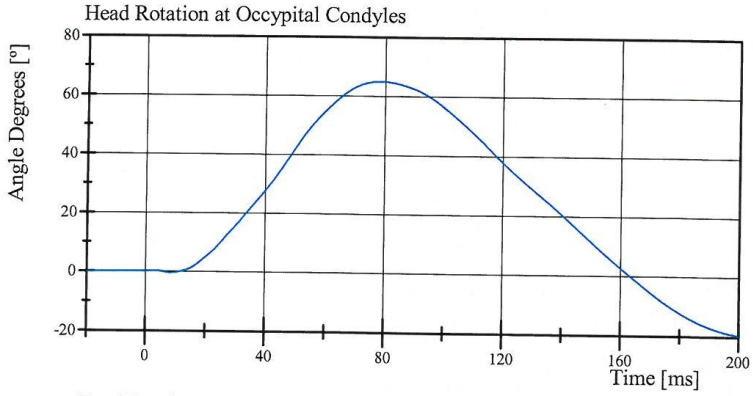
Neck Extension
HIII 5th Serial No. 426 Certification No. 14-1
Test Date: 10/29/2012

Pot Rotation at the Base of Neck



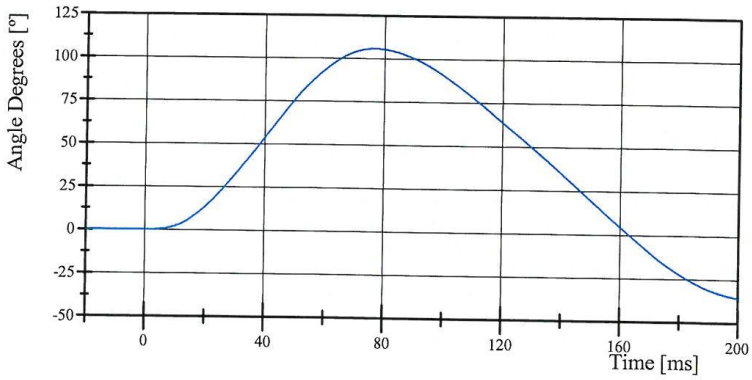
Filter Class: CFC_60
Max: 40.9 ° at 73.3 ms
Min: -16.0 ° at 200.0 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 65.0 ° at 77.9 ms
Min: -19.6 ° at 200.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 105.7 ° at 76.8 ms
Min: -35.6 ° at 200.0 ms

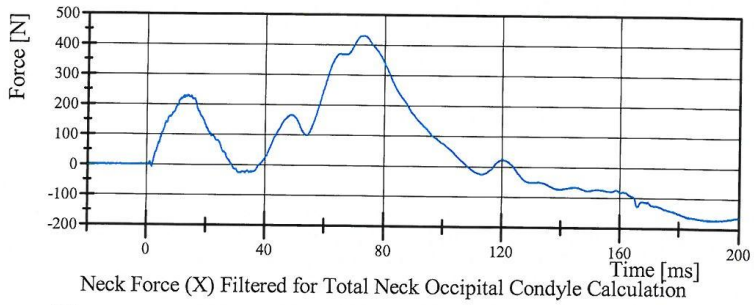
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.29.2012 15:39:30 1840

Transportation Research Center Inc.

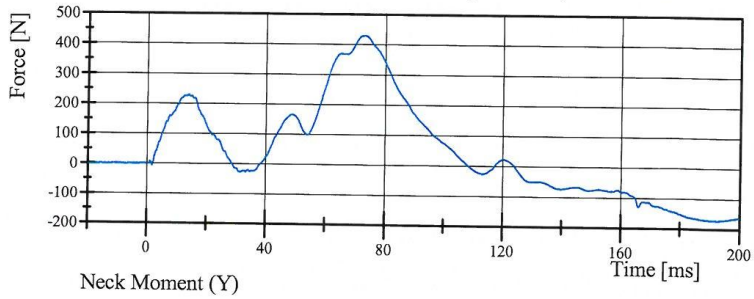
Neck Extension
HIII 5th Serial No. 426 Certification No. 14-1
Test Date: 10/29/2012

Neck Force (X)



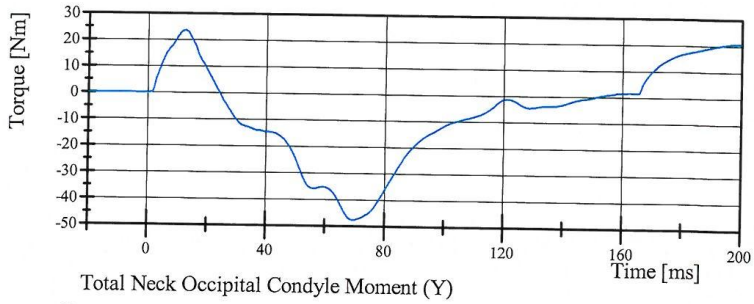
Filter Class: CFC_1000
Max: 430.6 N at 72.9 ms
Min: -172.0 N at 189.7 ms

Neck Force (X) Filtered for Total Neck Occipital Condyle Calculation



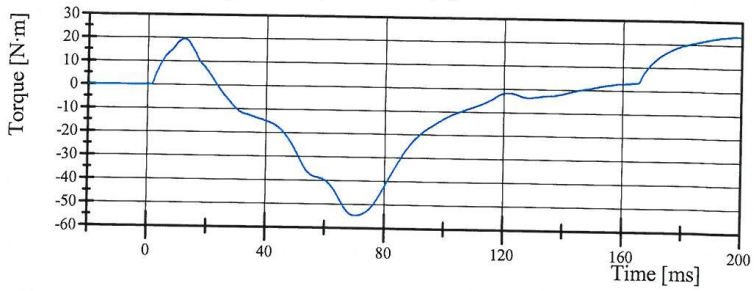
Filter Class: CFC_600
Max: 430.1 N at 73.0 ms
Min: -171.5 N at 191.5 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 23.5 Nm at 12.4 ms
Min: -47.7 Nm at 69.4 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: Without_(Constai
Max: 23.7 N·m at 198.5 ms
Min: -54.8 N·m at 70.2 ms

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

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Transportation Research Center Inc.

Front Thorax
HIII 5th Serial No. 426 Certification No. 14-2
Test Date: 10/29/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.763 m/s	Yes
Probe Force Peak Between 50.0 mm and 58.0 mm Chest Deflection	(-3,900) - (-4,400) N	Not Attained	No
Probe Force Peak Between 18.0 mm and 50.0 mm Chest Deflection	>= (-4,600) N	-4,347.5 N	Yes
Maximum Chest Compression	(-50) - (-58) mm	-49.0 mm	No
Internal Hysteresis	69 - 85 %	76.6 %	Yes

Test does not meet specifications.

Comments:

Technician

Approved

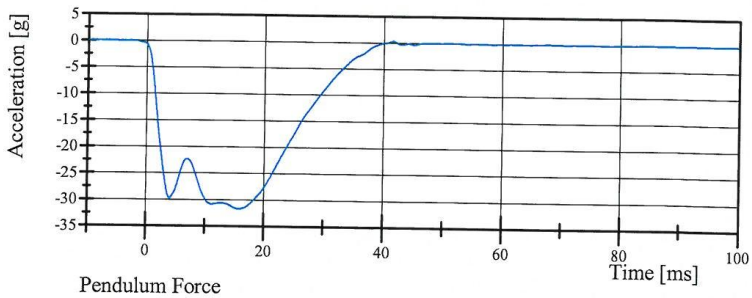
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.29.2012 12:58:29 438

Transportation Research Center Inc.

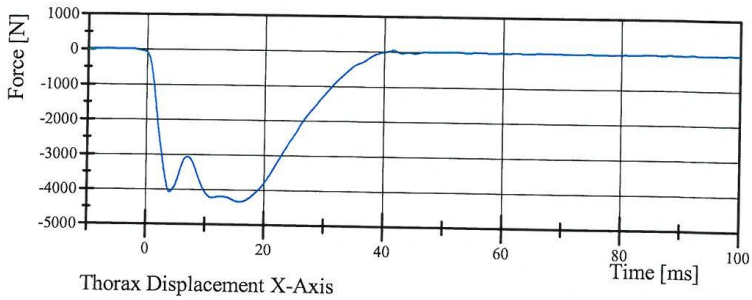
Front Thorax
HIII 5th Serial No. 426 Certification No. 14-2
Test Date: 10/29/2012

Pendulum Acceleration



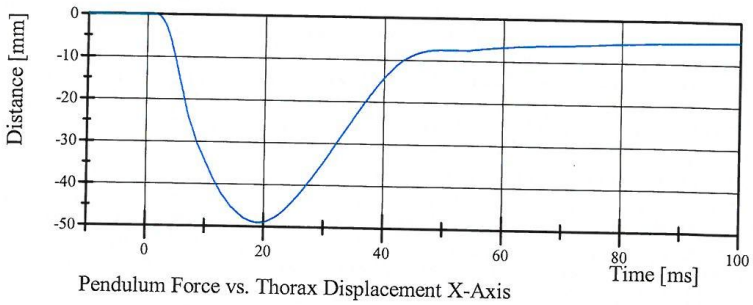
Filter Class: CFC_180
Max: 0.3 gn at 41.5 ms
Min: -31.7 gn at 15.8 ms

Pendulum Force



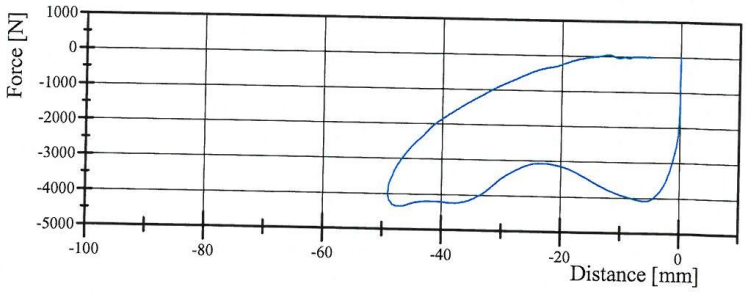
Filter Class: CFC_180
Max: 44.8 N at 41.5 ms
Min: -4,347.5 N at 15.8 ms

Thorax Displacement X-Axis



Filter Class: CFC_600
Max: 0.0 mm at -7.2 ms
Min: -49.0 mm at 19.0 ms

Pendulum Force vs. Thorax Displacement X-Axis



Filter Class: CFC_180
Max: 44.8 N at -12.2 mm
Min: -4,347.5 N at -47.1 mm

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

10.29.2012 12:59:46 438

TRANSPORTATION RESEARCH CENTER INC.

TORSO FLEXION TEST

HYBRID III SMALL FEMALE

CAL DATE: 25-Oct-12

TRC, INC. **TEST NO: TOFL-01** **572 O SN426 TORSO FLEX CAL 14**

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TIME		1100
TEMPERATURE	20.6 – 22.2° C	21.8 ° C
RELATIVE HUMIDITY	10 – 70 %	47 %
INITIAL ANGLE OF UNSUPPORRTED DUMMY START ANGLE	<= 20° REFERENCED TO VERTICAL	15.0 °
DIFFERENCE BETWEEN RETURN ANGLE & INTIAL ANGLE	+/- 8 ° OF INTIAL ANGLE	4.2 °
MAXIMUM FORCE AT 45 DEG. DURING 10 SECOND PERIOD	320 – 390 N	411.3 N F
RATE	0.5° - 1.5 °/sec	0.97°/sec

* TEST DOES NOT MEET SPECIFICATIONS

Comments:

TECHNICIAN

Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 14-3
Test Date: 10/29/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.090 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,663.1 N	Yes

Test meets specifications.

Comments:

Technician

Approved

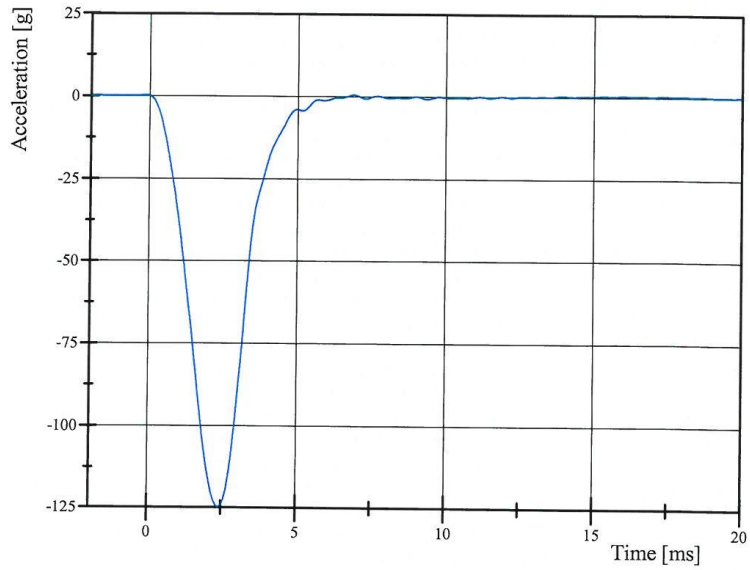
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.29.2012 11:02:58 1755

Transportation Research Center Inc.

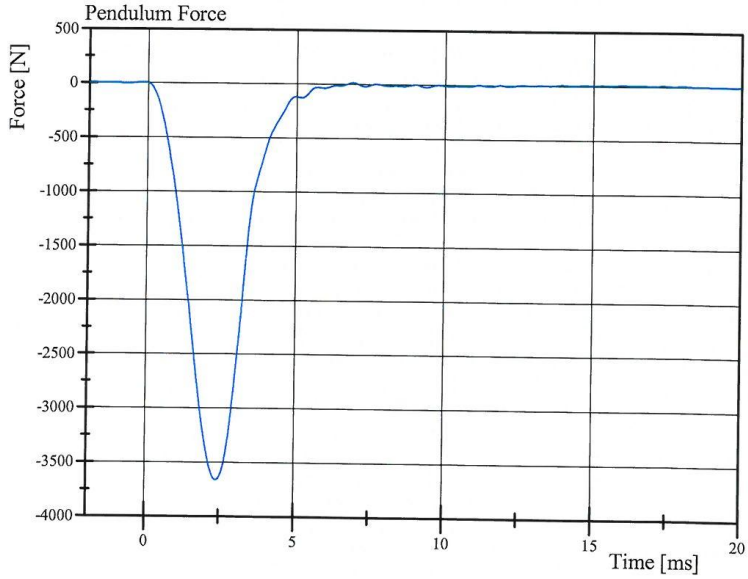
Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 14-3
Test Date: 10/29/2012

Pendulum Acceleration



Filter Class: CFC_600
Max: 0.5 gn at 6.9 ms
Min: -124.9 gn at 2.4 ms

Pendulum Force



Filter Class: CFC_600
Max: 14.6 N at 6.9 ms
Min: -3,663.1 N at 2.4 ms

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

10.29.2012 11:03:21 1755

Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 14-2
Test Date: 10/29/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	29 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.090 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,738.3 N	Yes

Test meets specifications.

Comments:

Technician

Approved

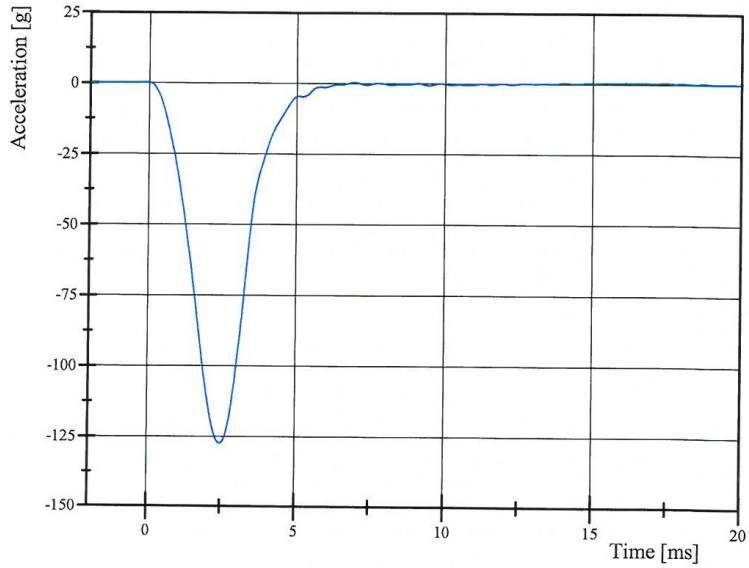
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.29.2012 10:07:31 1752

Transportation Research Center Inc.

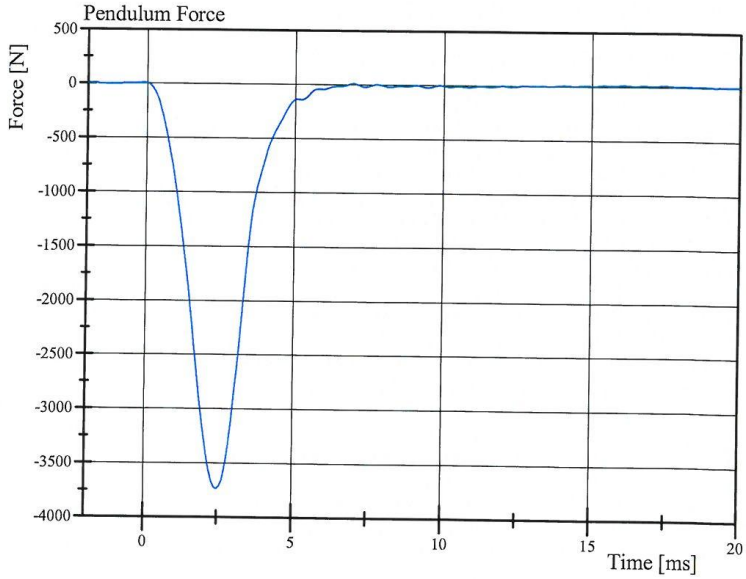
Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 14-2
Test Date: 10/29/2012

Pendulum Acceleration



Filter Class: CFC_600
Max: 0.5 gn at 16.1 ms
Min: -127.5 gn at 2.5 ms

Pendulum Force



Filter Class: CFC_600
Max: 13.4 N at 16.1 ms
Min: -3,738.3 N at 2.5 ms

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

10.29.2012 10:08:39 1752