

Final Report Number: NCAP-TRC-17-001

**New Car Assessment Program (NCAP)
Frontal Barrier Impact Test**

**General Motors LLC
2017 GMC Acadia
NHTSA Number: M20170100**

**PREPARED BY:
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Report Date: September 30, 2016

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**

Notice

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Prepared By: ILO Project Operations Group

Approved By: Melinda Lackey

Approval Date: September 30, 2016

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date _____

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

Date _____

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16. Abstract A 56.0 km/h NCAP Frontal Impact Test was conducted on a 2017 GMC Acadia, 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 August 30, 2016. The impact velocity was 56.91 km/h, and the ambient temperature at the barrier face at the time of impact was 21.1° C. The target vehicle post-test maximum crush was 454 millimeters at the crush zone at left side. The test vehicle's performance is as follows: <table border="1"> <thead> <tr> <th></th> <th colspan="3">Driver ATD</th> <th colspan="3">Passenger ATD</th> </tr> <tr> <th>Measurement Description</th> <th>Units</th> <th>Threshold</th> <th>Result</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>NA</td> <td>700</td> <td>138</td> <td>NA</td> <td>700</td> <td>403</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-20.0</td> <td>mm</td> <td>52</td> <td>-15.1</td> </tr> <tr> <td>3ms Chest Clip</td> <td>Gs</td> <td>60</td> <td>40.3</td> <td>Gs</td> <td>60</td> <td>38.9</td> </tr> <tr> <td>Nij</td> <td>NA</td> <td>1</td> <td>0.22</td> <td>NA</td> <td>1</td> <td>0.37</td> </tr> <tr> <td>Neck Tension</td> <td>Newtons</td> <td>4170</td> <td>721.2</td> <td>Newtons</td> <td>2620</td> <td>674.0</td> </tr> <tr> <td>Neck Compression</td> <td>Newtons</td> <td>4000</td> <td>-69.4</td> <td>Newtons</td> <td>2520</td> <td>-827.5</td> </tr> <tr> <td>Left Femur Force</td> <td>Newtons</td> <td>10000</td> <td>-497.9</td> <td>Newtons</td> <td>6800</td> <td>-44.9</td> </tr> <tr> <td>Right Femur Force</td> <td>Newtons</td> <td>10000</td> <td>-1,742.7</td> <td>Newtons</td> <td>6800</td> <td>-421.1</td> </tr> </tbody> </table>								Driver ATD			Passenger ATD			Measurement Description	Units	Threshold	Result	Units	Threshold	Result	Head Injury Criteria (HIC ₁₅)	NA	700	138	NA	700	403	Maximum Chest Compression	mm	63	-20.0	mm	52	-15.1	3ms Chest Clip	Gs	60	40.3	Gs	60	38.9	Nij	NA	1	0.22	NA	1	0.37	Neck Tension	Newtons	4170	721.2	Newtons	2620	674.0	Neck Compression	Newtons	4000	-69.4	Newtons	2520	-827.5	Left Femur Force	Newtons	10000	-497.9	Newtons	6800	-44.9	Right Femur Force	Newtons	10000	-1,742.7	Newtons	6800	-421.1
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1: PURPOSE AND SUMMARY OF THE TEST

PURPOSE

This 56 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 km/h frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Front NCAP Laboratory Test Procedure dated October 2015.

SUMMARY

A 2017 GMC Acadia impacted the barrier wall at a velocity of 56.91 km/h. The test was performed at Transportation Research Center, Inc. on August 30, 2016. 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 load cells, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were also on the driver's and the passenger's lap belts to measure dummy 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 100 channels of data were recorded on an on-board data acquisition system. The 288 barrier channels of data were recorded on an off-board high resolution barrier 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 454 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: front airbag, headrest, and knee airbag. The passenger's visible contact points were as follows: front airbag, headrest, and glove box.

The occupant data is summarized below:

ATD Position	HIC₁₅	Nij	Neck Tension (N)	Neck Compression (N)	3 ms Chest Clip (Gs)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50 th Male)	138	0.22	721.2	-69.4	40.3	-20.0	-497.9	-1,742.7
Passenger (5 th Female)	403	0.37	674.0	-827.5	38.9	-15.1	-44.9	-421.1

2: OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2017 GMC Acadia
 Test Program: NCAP Frontal Impact

NHTSA No.: M20170100
 Test Date: 8/30/16

TEST VEHICLE INFORMATION

NHTSA No.	M20170100
Model Year	2017
Make	GMC
Model	Acadia
Body Style	MPV
VIN	1GKKNXLS3HZ138983
Body Color	Iridium Metallic
Odometer Reading (km/mi)	4 mi.
Engine Displacement (L)	3.6
Type/No. Cylinders	V/6
Engine Placement	Front Transverse
Transmission Type	Automatic
Transmission Speeds	6
Overdrive	Yes
Final Drive	AWD
Roof Rack	Rails
Sunroof/T-Top	Sunroof x2
Running Boards	Yes
Tilt Steering Wheel	Yes
Power Seats	Yes
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	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	Yes
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	Yes
Front Pass. Pelvis Airbag	No
Front Pass. Knee Airbag	No
Driver Pretensioner	Yes
Driver Load Limiter	Yes
Front Pass. Pretensioner	Yes
Front Pass. Load Limiter	Yes
Other: Driver Inboard Seat Airbag	Yes

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

No

DATA FROM CERTIFICATION LABEL

Manufactured by	General Motors LLC	GVWR (kg)	2722 (6001 lbs)
Date of Manufacture	07/16	GAWR Front (kg)	1350 (2976lbs)
		GAWR Rear (kg)	1545 (3406 lbs)

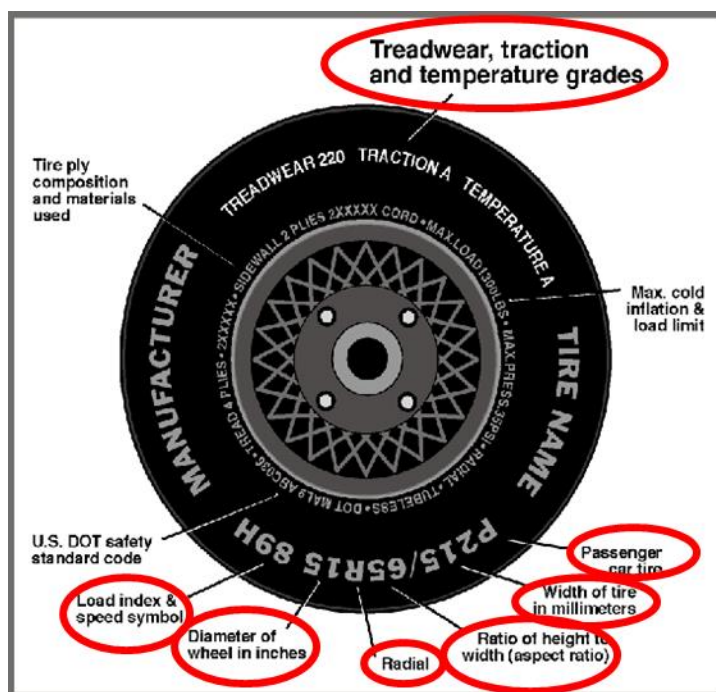
VEHICLE SEATING AND WEIGHT CAPACITY

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench	Split Bench	
Number of Occupants	2	3	2	7
Capacity Wt. (VCW) (kg)				682
Cargo Wt. (RCLW) (kg)				205.72

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

Test Vehicle: 2017 GMC Acadia
 Test Program: NCAP Frontal Impact

NHTSA No.: M20170100
 Test Date: 8/30/16



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold / Test Pressure (kPa)	250	250
Recommended Tire Size	235/55R20	235/55R20
Tire Size on Vehicle	235/55R20	235/55R20
Tire Manufacturer	Michelin	Michelin
Tire Model	Premier LTX	Premier LTX
Treadwear	620	620
Traction Grade	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index/Speed Symbol	102 H	102 H
Tire Material	Polyester, Steel & Polyamide	Polyester, Steel & Polyamide
DOT Safety Code Right	B9AJ OOTX 1516	B9AJ OOTX 1516
DOT Safety Code Left	B9AJ OOTX 1516	B9AJ OOTX 1516

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

Test Vehicle: 2017 GMC Acadia
 Test Program: NCAP Frontal Impact

NHTSA No.: M20170100
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TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	573.2	459.6		597.8	563.6	
Right	kg	565.2	434.2		580.6	557.4	
Ratio	%	56.0	44.0		51.2	48.8	
Totals	kg	1138.4	893.8	2032.2	1178.4	1121.0	2299.4

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2032.2
Weight of 1 P572E ATD & 1 P572O ATD	kg	139.3
Rated Cargo/Luggage Weight (RCLW) ¹	kg	136.0
Vehicle Target Weight (TVTW)	kg	2307.5

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front)
As Delivered	mm	835	834	880	885	1258
As Tested	mm	825	826	849	847	1394
Post Test	mm	N/A ²	844	870	818	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2860
Total Vehicle Length at Left Side	mm	4735
Total Vehicle Length at Centerline	mm	4915
Total Vehicle Length at Right Side	mm	4720
Weight of Ballast in Cargo Area	kg	134.7
Weight of Vehicle Components Removed	kg	0.0
Amount of Stoddard Solvent in Fuel Tank	liters	72.5

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT: None

¹ Rated cargo and luggage weight limited to 136.0 kg or 300.0 lbs.

² Target missing post-test

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

Test Vehicle: 2017 GMC Acadia
Test Program: NCAP Frontal Impact

NHTSA No.: M20170100
Test Date: 8/30/16

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4915
2	Total Width	1915
3	Bumper Top Height	627
4	Bumper Bottom Height	457
5	Longitudinal Member Top Height	597
6	Distance Between Longitudinal Members	950
7	Longitudinal Member Width	144
8	Engine Top Height	1043
9	Engine Bottom Height	214
10	Engine and Gearbox Width	800
11	Front Bumper-Engine Distance	465
12	Front Shock Absorber Fixing Height	1015
13	Bonnet Leading Edge Height	1000
14	Front Shock Absorber Fixing Width	1220
15	Front Bumper – Front Axle Distance	900
16	Front Axle – A-Pillar Distance	565
17	A-Pillar – B-Pillar Distance	1055
18	B-Pillar – Rear Axle Distance	1235
19	B-Pillar – C-Pillar Distance	955
20	Roof Sill Bottom Height	1533
21	Roof Sill Top Height	1600
22	Floor Sill Bottom Height	426
23	Floor Sill Top Height	465

DATA SHEET NO. 2

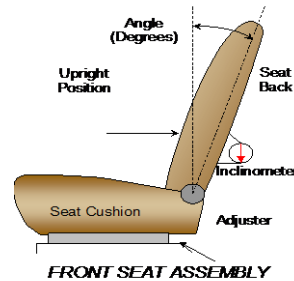
SEAT ADJUSTMENT, FUEL SYSTEM AND STEERING WHEEL DATA

Test Vehicle: 2017 GMC Acadia
 Test Program: NCAP Frontal Impact

NHTSA No.: M20170100
 Test Date: 8/30/16

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. Inclinometer measurement at the top of the backrest at the seat centerline, according to Form 1 attachment.



	Degree
Driver Seat back angle:	18.7
Passenger Seat back angle:	25.5

SEAT FORE/AFT POSITIONS

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

Driver: Mid position, Positioned according to Form 1

Passenger: Full forward, Positioned according to Form 1

	Total Fore/Aft Travel	Placed in Position No.
Driver Seat	312	156
Passenger Seat	245	0

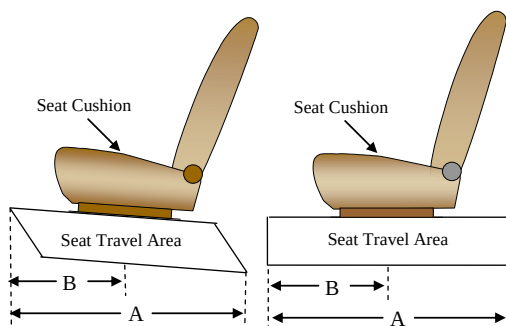
SEAT BELT UPPER ANCHORAGE

Describe the method of positioning seat belt upper anchorages.

Driver: Uppermost, Positioned according to Form 1

Passenger: Uppermost, Positioned according to Form 1.

	Total No. of Positions	Placed in Position No.
Driver Seat	1, Fixed	1, Fixed
Passenger Seat	1, Fixed	1, Fixed



DATA SHEET NO. 2 (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM AND STEERING WHEEL DATA

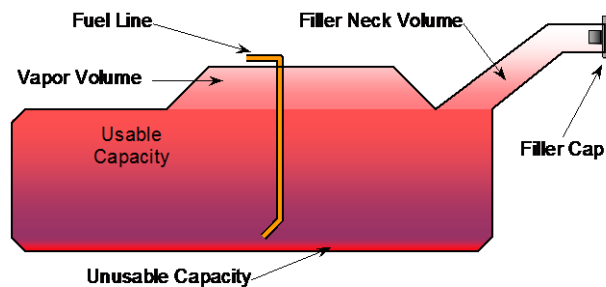
Test Vehicle: 2017 GMC Acadia
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NHTSA No.: M20170100
 Test Date: 8/30/16

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	78.0
Usable Capacity of "Optional Tank"	N/A
92%-94% of Usable Capacity	72.5
Actual Amount of Solvent Used	72.5
1/3 of Usable Capacity	26.0

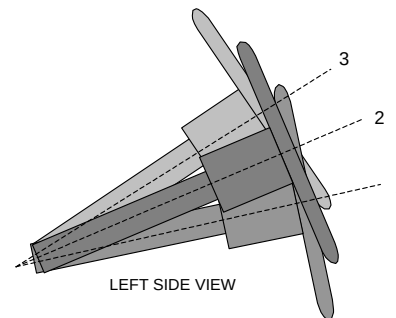
The vehicle is equipped with an electric fuel pump. The electric fuel pump will run for about 3 seconds when the key is turned on and then will not run unless the engine is cranking or running.



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. Steel square was placed across the rim of the steering wheel, an inclinometer was placed on the plate and the angle was measured. Telescope travel was measured full in and full out and set at the midpoint.



LEFT SIDE VIEW

STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONS

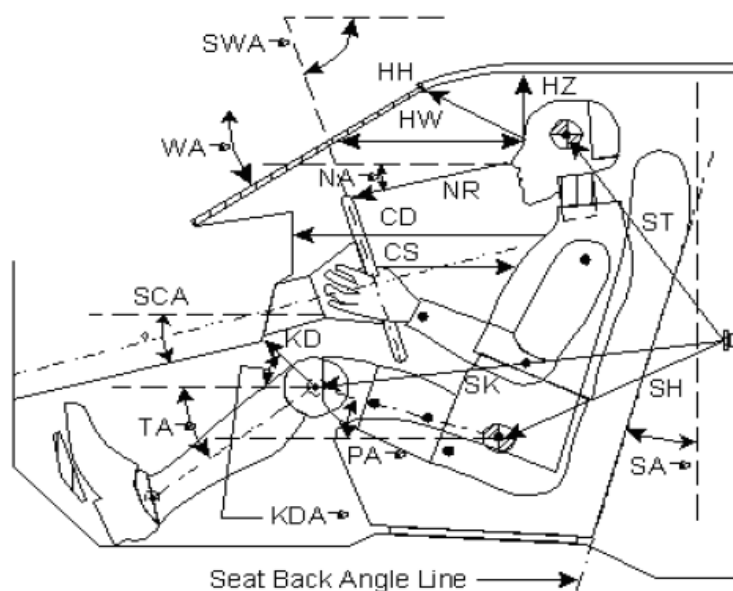
	Degrees	Fore/Aft Position (mm)
Lowermost Position No. 1	20.3	
Geometric Center Position No. 2	22.85	
Uppermost Position No. 3	25.2	
Telescoping Steering Wheel Travel		49
Test Position	22.3	24.5

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2017 GMC Acadia
 Test Program: NCAP Frontal Impact

NHTSA No.: M20170100
 Test Date: 8/30/16



Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		26.4		
SWA°	Steering Wheel Angle		67.7		
SCA°	Steering Column Angle		22.3		
SA°	Seat Back Angle (on headrest post)		18.7		25.5
HZ	Head to Roof (Z)	225		240 ¹	
HH	Head to Header	442		368	
HW	Head to Windshield	785		748	
NR	Nose to Rim	415	7.2		
CD	Chest to Dash	562		430	
CS	Chest to Steering Hub	346			
RA	Rim to Abdomen	228			
KDL	Left Knee to Dash	217	30.6	138	36.0
KDR	Right Knee to Dash	217	33.1	136	36.8
PA°	Pelvic Angle		24.9		20.1
TA°	Tibia Angle		41.9		59.4
SK	Striker to Knee	585	0.7	678	0.2
ST	Striker to Head	540	81.0	543	68.5
SH	Striker to H-Point	234	31.5	339	13.1

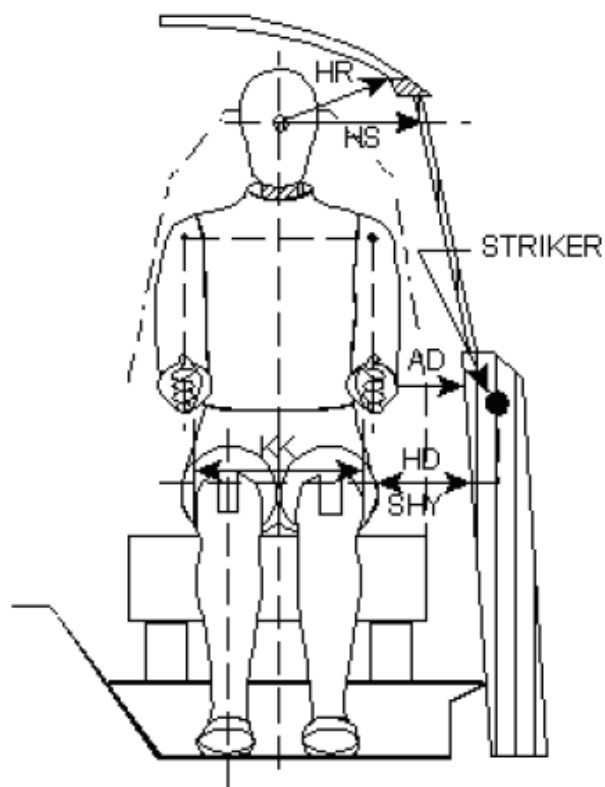
¹ Measurement taken to visor

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2017 GMC Acadia
Test Program: NCAP Frontal Impact

NHTSA No.: M20170100
Test Date: 8/30/16



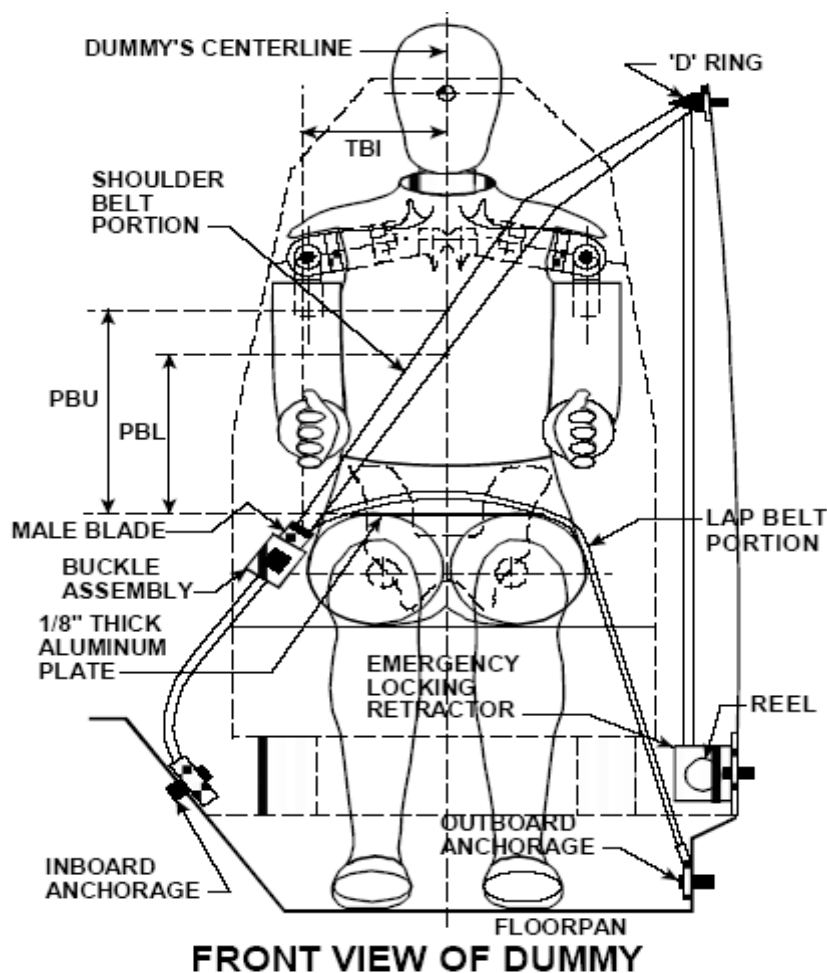
Code	Measurement Description	Driver	Passenger
AD	Arm to Door	60	103
HD	H-Point to Door	147	184
HR	Head to Side Header	275	283
HS	Head to Side Window	397	388
KK	Knee to Knee	315	163
SHY	Striker to H-Point (Y Direction)	232	252
AA	Ankle to Ankle	304	182

DATA SHEET NO. 5

SEAT BELT POSITIONING DATA

Test Vehicle: 2017 GMC Acadia
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NHTSA No.: M20170100
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SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU – Top surface of reference to belt upper edge	mm	330	353
PBL – Top surface of reference to belt lower edge	mm	249	271

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	865	934
Lap belt length as measured on ATD	mm	440	481
Remainder of belt on reel	mm	1020	910
Total belt length for continuous webbing systems	mm	2325	23.25

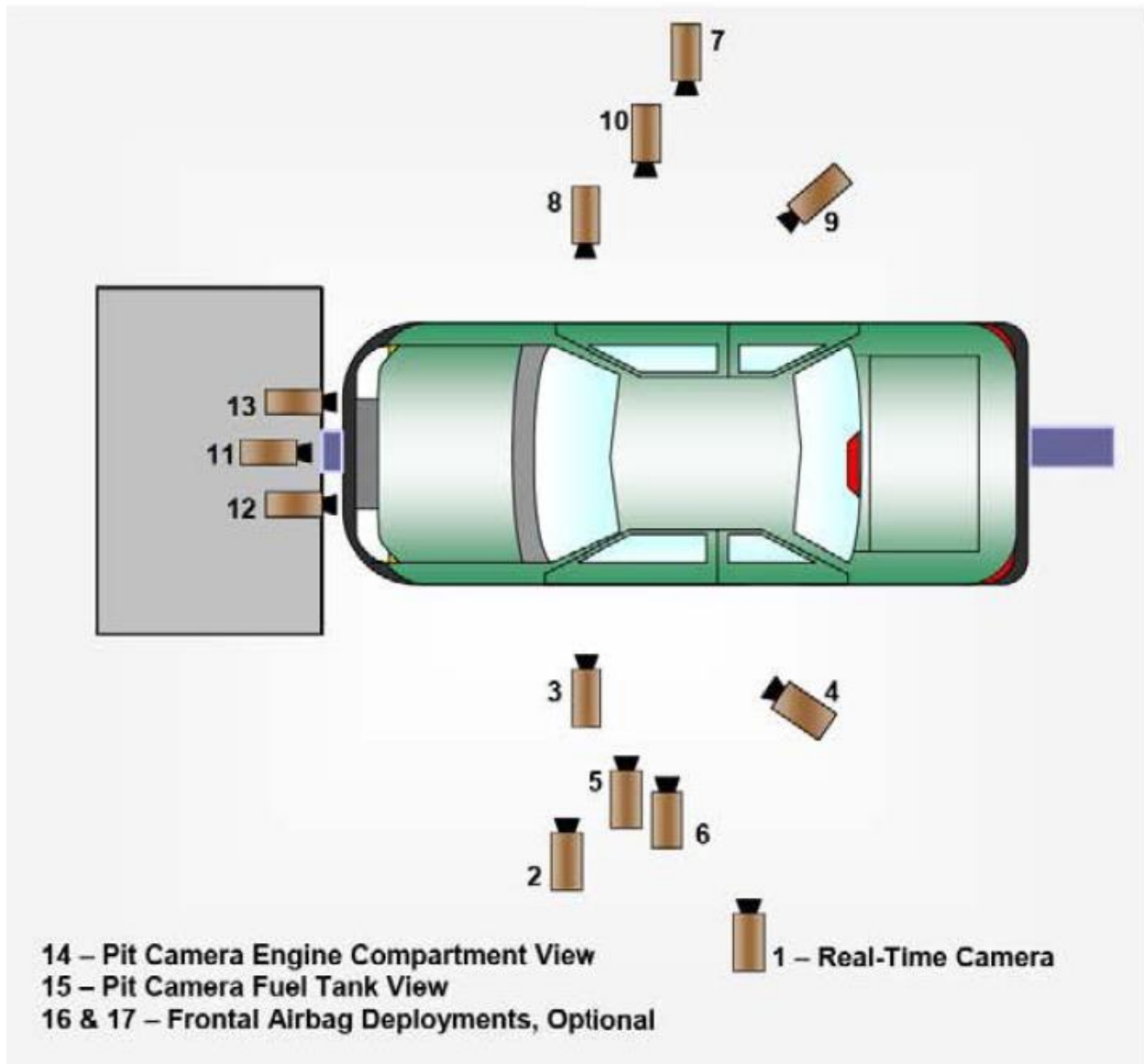
DATA SHEET NO. 6

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2017 GMC Acadia
Test Program: NCAP Frontal Impact

NHTSA No.: M20170100
Test Date: 8/30/16

CAMERA POSITIONS FOR FRONTAL IMPACTS



DATA SHEET NO. 6 (CONTINUED)

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2017 GMC Acadia
 Test Program: NCAP Frontal Impact

NHTSA No.: M20170100
 Test Date: 8/30/16

CAMERA LOCATIONS

No.	Camera View	Location (mm)			Lens (mm)	Frame Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	936	-5127	1460	Zoom	30
2	Driver Close-Up	1903	-4434	1350	50	1000
3	Left Front Half	914	-4439	1200	25	1000
4	Left Angle	4004	1968	2080	25	1000
5	Steering Column - Top	1987	4554	2440	50	1000
6	Steering Column – Bottom	1987	-4694	1370	50	1000
7	Right Overall	1934	6290	1000	20	1000
8	Passenger Close-Up	1422	6048	1290	50	1000
9	Right Front Half	4508	2659	2040	25	1000
10	Right Angle	1098	5971	1150	28	1000
11	Windshield	0	0	2680	18	1000
12	Driver Windshield	0	-310	2680	20	1000
13	Passenger Windshield	0	470	2680	20	1000
14	Pit Front	-1240	0	3077	20	1000
15	Pit Rear	-3043	0	3228	20	1000
16	Onboard Driver Airbag (Optional)				12.5	1000
17	Onboard Passenger Airbag (Optional)				12.5	1000

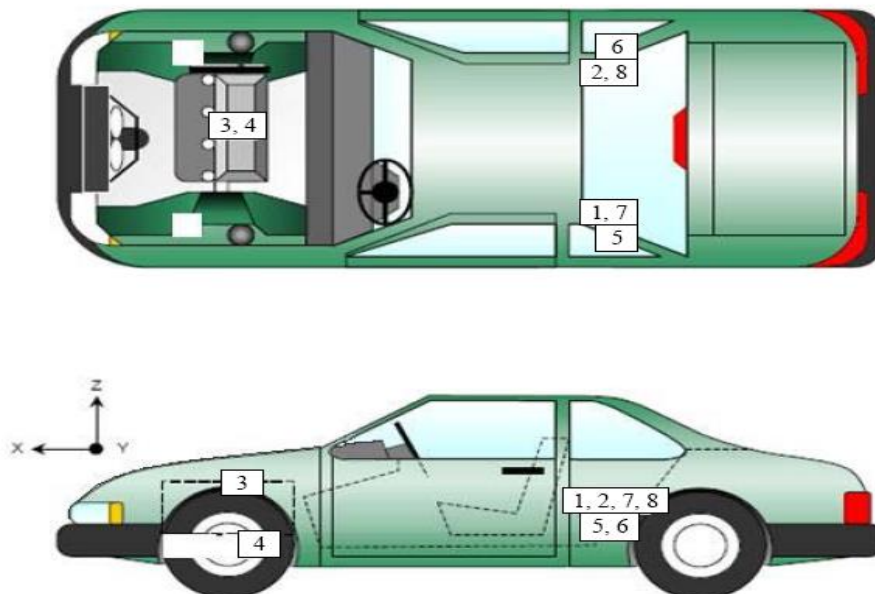
Reference Points: +X – forward of impact plane
 +Y – right of monorail center
 +Z – into ground

DATA SHEET NO. 7

VEHICLE ACCELEROMETER DATA

Test Vehicle: 2017 GMC Acadia
 Test Program: NCAP Frontal Impact

NHTSA No.: M20170100
 Test Date: 8/30/16



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Camera View	Location (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	1885	-645	-455
2	Right Rear Accelerometer – X Direction	1890	+645	-448
3	Engine Top X	4275	-65	-959
4	Engine Bottom X	4205	-18	-246
5	Left Rear Accelerometer – Z Direction	1885	-645	-455
6	Right Rear Accelerometer – Z Direction	1890	+645	-448
7	Left Rear Accelerometer – X Direction Redundant	1940	-645	-455
8	Right Rear Accelerometer- X Direction Redundant	1950	+645	-448

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

DATA SHEET NO. 8

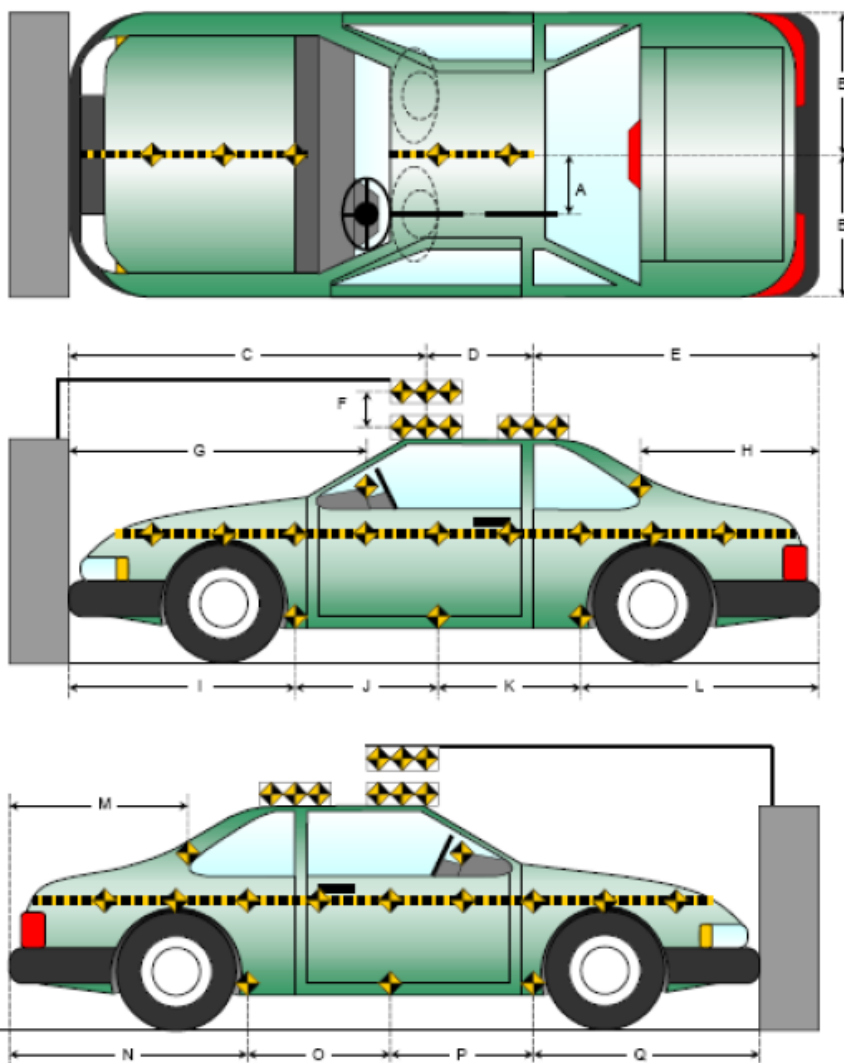
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2017 GMC Acadia
 Test Program: NCAP Frontal Impact

NHTSA No.: M20170100
 Test Date: 8/30/16

Item	Value
A	375
B	957.5
C	2758
D	610
E	1925
F	216
G	1640
H	1350
I	1380
J	905
K	940
L	1925
M	1350
N	2200
O	941
P	911
Q	1440

All units in millimeters



DATA SHEET NO. 9

LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2017 GMC Acadia
 Test Program: NCAP Frontal Impact

NHTSA No.: M20170100
 Test Date: 8/30/16

								Centerline							
A-16	A-15	A-14	A-13	A-12	A-11	A-10	A-09	A-08	A-07	A-06	A-05	A-04	A-03	A-02	A-01
B-16	B-15	B-14	B-13	B-12	B-11	B-10	B-09	B-08	B-07	B-06	B-05	B-04	B-03	B-02	B-01
C-16	C-15	C-14	C-13	C-12	C-11	C-10	C-09	C-08	C-07	C-06	C-05	C-04	C-03	C-02	C-01
D-16	D-15	D-14	D-13	D-12	D-11	D-10	D-09	D-08	D-07	D-06	D-05	D-04	D-03	D-02	D-01
E-16	E-15	E-14	E-13	E-12	E-11	E-10	E-09	E-08	E-07	E-06	E-05	E-04	E-03	E-02	E-01
F-16	F-15	F-14	F-13	F-12	F-11	F-10	F-09	F-08	F-07	F-06	F-05	F-04	F-03	F-02	F-01
G-16	G-15	G-14	G-13	G-12	G-11	G-10	G-09	G-08	G-07	G-06	G-05	G-04	G-03	G-02	G-01
H-16	H-15	H-14	H-13	H-12	H-11	H-10	H-09	H-08	H-07	H-06	H-05	H-04	H-03	H-02	H-01
I-16	I-15	I-14	I-13	I-12	I-11	I-10	I-09	I-08	I-07	I-06	I-05	I-04	I-03	I-02	I-01
J-16	J-15	J-14	J-13	J-12	J-11	J-10	J-09	J-08	J-07	J-06	J-05	J-04	J-03	J-02	J-01
K-16	K-15	K-14	K-13	K-12	K-11	K-10	K-09	K-08	K-07	K-06	K-05	K-04	K-03	K-02	K-01

DATA SHEET NO. 10

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2017 GMC Acadia
Test Program: NCAP Frontal Impact

NHTSA No.: M20170100
Test Date: 8/30/16

INSTRUMENTATION

Instrumentation	Number of Channels Collected
Driver Dummy Accelerometers	44
Passenger Dummy Accelerometers	44
Vehicle Structure Accelerometers	8
Total	100

CAMERA COVERAGE

Type of Camera	Number Used in this Test
High-Speed Vehicle Onboard	2
High-Speed Offboard	14
Real-Time Panning	1
Total	17

DATA SHEET NO. 11

POST-TEST OBSERVATIONS

Test Vehicle: 2017 GMC Acadia

NHTSA No.: M20170100

Test Program: NCAP Frontal Impact

Test Date: 8/30/16

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type / Serial No.	Hybrid III 50th/ 037	Hybrid III 5th/ 426
Head Contact	Frontal Airbag/Head Restraint	Frontal Airbag/Head Restraint
Upper Torso Contact	None	None
Lower Torso Contact	None	None
Left Knee Contact	Knee Airbag	Glove Box
Right Knee Contact	Knee Airbag	Glove Box

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Locked/Unlocked Doors	Unlocked	Unlocked
Front Door Opening	Remained closed & latched, operational	Remained closed & latched, operational
Rear Door Opening	Remained closed & latched, operational	Remained closed & latched, operational
Seat Track Shift (mm)	None	None
Seat Back Failure	None	None

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Windshield Damage	None
Window Damage	None
Other Notable Effects	Right front tire flat

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	1062
Center	mm	984
Right Side	mm	1011
Average	mm	1019

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

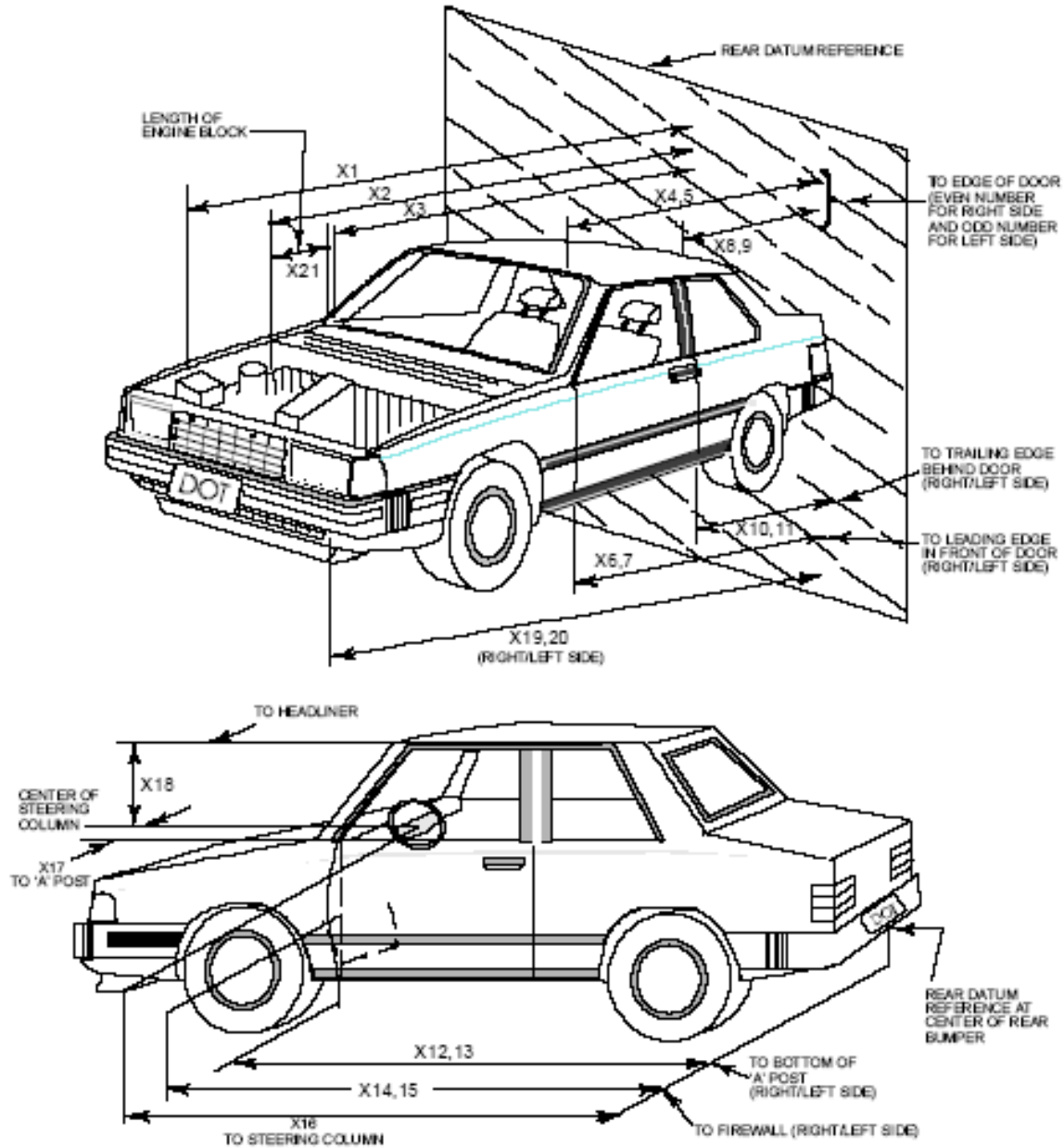
Restraint Type	Driver (Occupant 1)		Passenger (Occupant 2)	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	Yes	Yes	Yes
Side Curtain Airbag	Yes	Yes	Yes	Yes
Torso/Pelvis Airbag	Yes	No	Yes	No
Pelvis Airbag	No	N/A	No	N/A
Knee Airbag	Yes	Yes	No	N/A
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt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

DATA SHEET NO. 12

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2017 GMC Acadia
Test Program: NCAP Frontal Impact

NHTSA No.: M20170100
Test Date: 8/30/16



DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2017 GMC Acadia
 Test Program: NCAP Frontal Impact

NHTSA No.: M20170100
 Test Date: 8/30/16

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4915	4474	441
2	Rear Surface of Vehicle (RSOV) to Front of Engine	4455	4134	321
3	RSOV to Firewall	3910	3894	16
4	RSOV to Upper Leading Edge of Right Door	3425	3423	2
5	RSOV to Upper Leading Edge of Left Door	3434	3422	12
6	RSOV to Lower Leading Edge of Right Door	3355	3357	-2
7	RSOV to Lower Leading Edge of Left Door	3365	3362	3
8	RSOV to Upper Trailing Edge of Right Door	2364	2360	4
9	RSOV to Upper Trailing Edge of Left Door	2370	2358	12
10	RSOV to Lower Trailing Edge of Right Door	2375	2378	-3
11	RSOV to Lower Trailing Edge of Left Door	2382	2385	-3
12	RSOV to Bottom of "A" Post-of Right Side	3390	3400	-10
13	RSOV to Bottom of "A" Post-of Left Side	3395	3390	5
14	RSOV to Firewall, Right Side	3865	3869	-4
15	RSOV to Firewall, Left Side	3880	3868	12
16	RSOV to Steering Column	2990	3012	-22
17	Center of Steering Column to "A" Post	330	334	-4
18	Center of Steering Column to Headliner	445	495	-50
19	RSOV to Right Side of Front Bumper	4720	4387	333
20	RSOV to Left Side of Front Bumper	4735	4409	326
21	Length of Engine Block	480	480	0
RD	RSOV to Right Side of Dash Panel	3270	3265	5
CD	RSOV to Center of Dash Panel	3170	3158	12
LD	RSOV to Left Side of Dash Panel	3270	3257	13

All Dimensions in mm

DATA SHEET NO. 13

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2017 GMC Acadia
Test Program: NCAP Frontal Impact

NHTSA No.: M20170100
Test Date: 8/30/16

VEHICLE INFORMATION

VIN: 1GKKNXLS3HZ138983
Vehicle Size Category: MPV

Wheelbase: 2860
Test Weight (kg): 2299.4

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): 56.91

Velocity Change (km/h): 66.86

Time of Separation (ms): 116

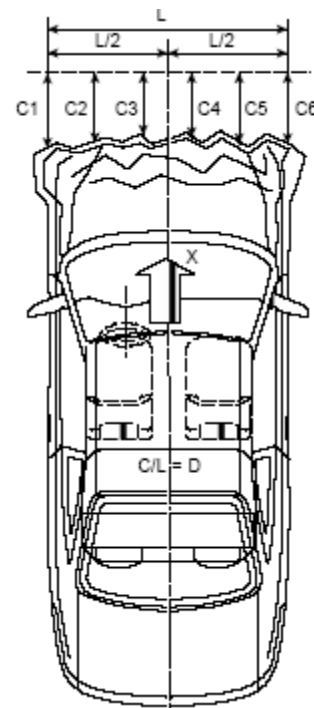
CRUSH PROFILE

Collision Deformation Classification: 12FDEW2

Midpoint of Damage: Centerline

Damage Region Length (mm): 1524

Impact Mode: Frontal



No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4735	4387	348
C2	Crush zone 2 at left side	mm	4860	4448	412
C3	Crush zone 3 at left side	mm	4915	4461	454
C4	Crush zone 4 at right side	mm	4915	4484	431
C5	Crush zone 5 at right side	mm	4855	4449	406
C6	Crush zone 6 at right side	mm	4720	4409	311
L	C1 to C6	mm	1524	1505	19

DATA SHEET NO. 14

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2017 GMC Acadia
Test Program: NCAP Frontal Impact

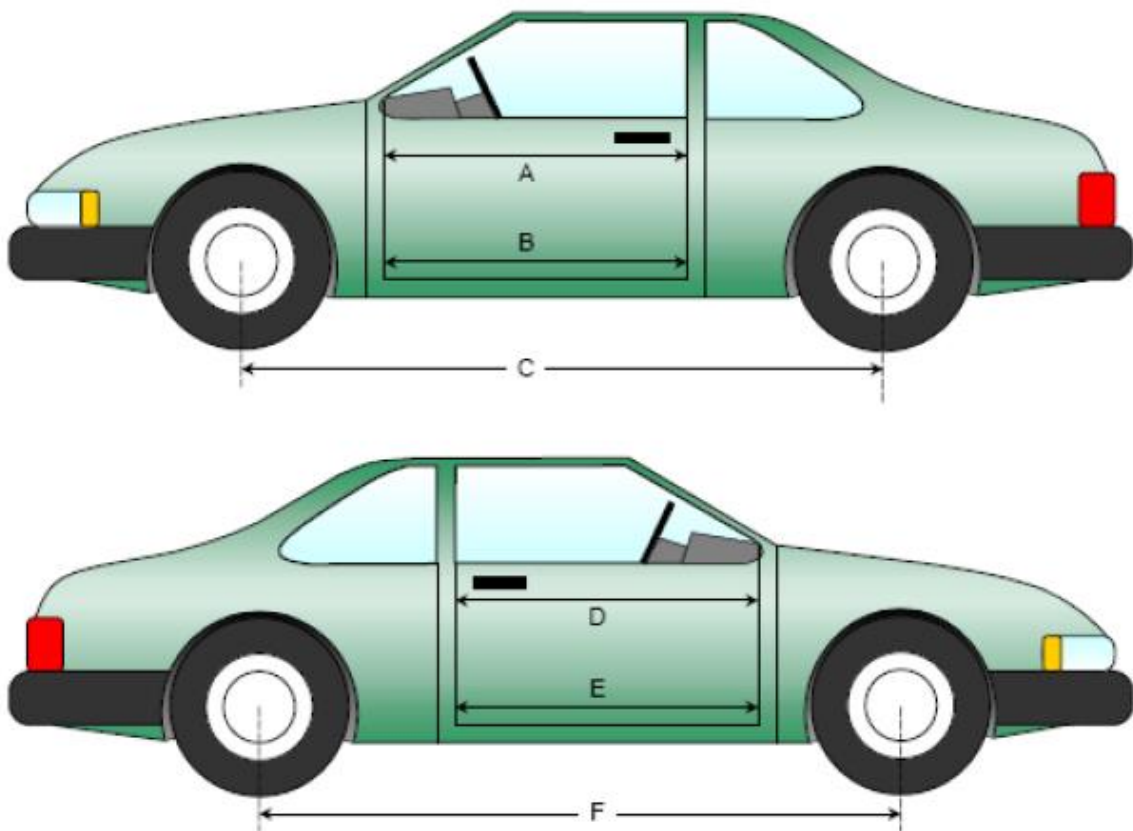
NHTSA No.: M20170100
Test Date: 8/30/16

DOOR OPENING WIDTH

No.	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	990	990	0
B	Left Side Lower	mm	850	850	0
C	Right Side Upper	mm	990	990	0
D	Right Side Lower	mm	900	900	0

WHEELBASE MEASUREMENTS

No.	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2860	2760	100
F	Right Side Wheelbase	mm	2860	2745	115



DATA SHEET NO. 14 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

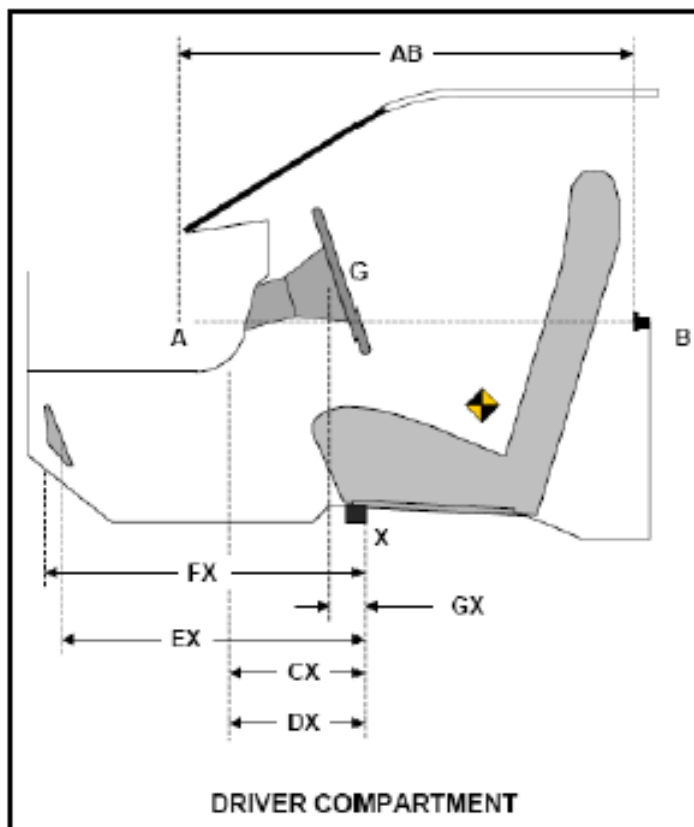
Test Vehicle: 2017 GMC Acadia
 Test Program: NCAP Frontal Impact

NHTSA No.: M20170100
 Test Date: 8/30/16

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	990	990	0
CX	Left Knee Bolster to X	mm	340	315	25
DX	Right Knee Bolster to X	mm	360	349	11
EX	Brake Pedal to X	mm	573	530	43
FX	Foot Rest to X	mm	600	572	28
GX	Center of Steering Column Wheel Hub to X	mm	110	150	-40

X = Front of Seat Track (Stationary)



DATA SHEET NO. 15

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

Test Vehicle: 2017 GMC Acadia
 Test Program: NCAP Frontal Impact

NHTSA No.: M20170100
 Test Date: 8/30/16

Please provide windshield mounting details.

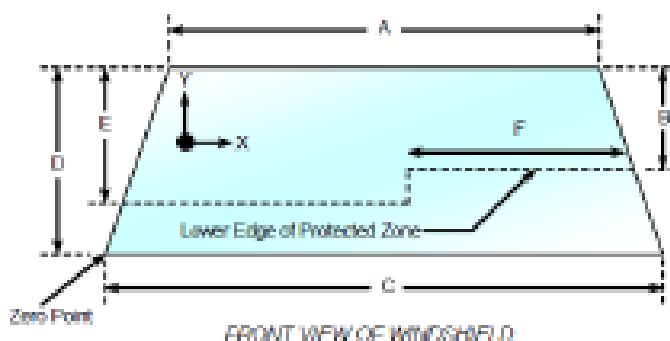
The standard requires that the post-test retention measurement be a minimum of 75% of the pre-test total periphery measurement for vehicle not equipped with occupant passive restraint and 50% for each side of the windshield for vehicle which are equipped with occupant passive restraints.

Temperature of windshield molding during test: 21.1° C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2200	2200	100
Right Side	2200	2200	100
Total	4400	4400	100

Item	Units	Value
A	mm	1290
B	mm	450
C	mm	1550
D	mm	800
E	mm	527
F	mm	535



AREAS OF PROTECTED ZONE FAILURES

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

X	Y
NA	NA
NA	NA
NA	NA
NA	NA

B. The inner surface of the windshield was penetrated by the hood support beneath the protected zone.

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: 2017 GMC Acadia
Test Program: NCAP Frontal Impact

NHTSA No.: M20170100
Test Date: 8/30/16

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21.1°C

Test Time: 15:04

Stoddard Solvent Spillage Measurements

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

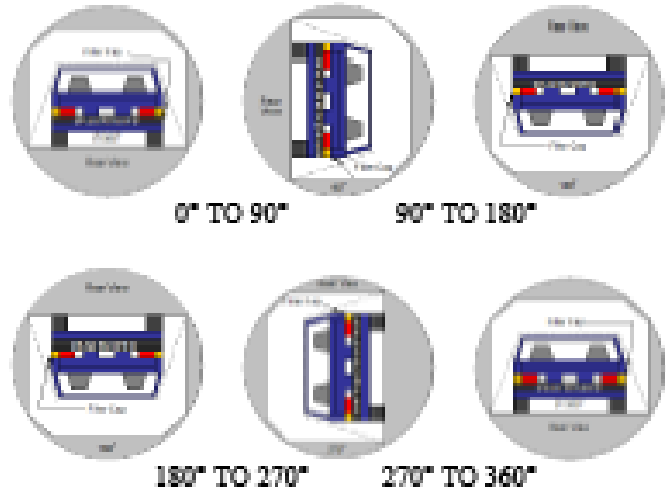
DATA SHEET NO. 16

FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2017 GMC Acadia
 Test Program: NCAP Frontal Impact

NHTSA No.: M20170100
 Test Date: 8/30/16

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



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	90	330	420
90° to 180°	90	330	840
180° to 270°	90	330	1260
270° to 360°	90	330	1480

FMVSS 301 SPILLAGE TABLE

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

SOLVENT SPILLAGE LOCATION TABLE

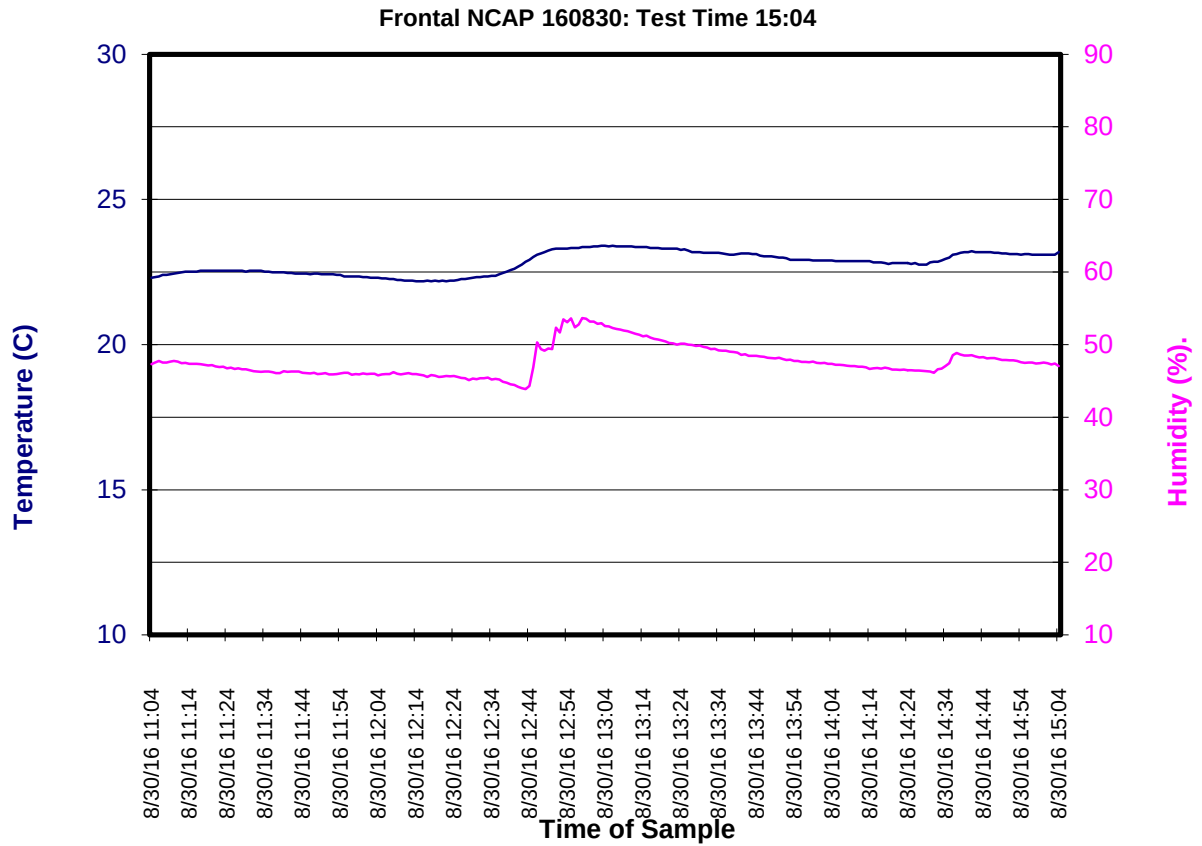
Test Phase	Spillage Location
0° to 90°	None
90° to 180°	None
180° to 270°	None
270° to 360°	None

DATA SHEET NO. 17

DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2017 GMC Acadia
Test Program: NCAP Frontal Impact

NHTSA No.: M20170100
Test Date: 8/30/16



APPENDIX A
PHOTOGRAPHS

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4	Manufacturer's Label	A-6
5	Tire Placard	A-7
6	2017 GMC Acadia Frontal as Delivered	A-7
7	Right Rear 3-4 View, as Received	A-8
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9	Post-Test Front View of Test Vehicle	A-9
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28	Pre-Test Dummy Cable Routing	A-21
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30	Pre-Test Driver Dummy Front View	A-22
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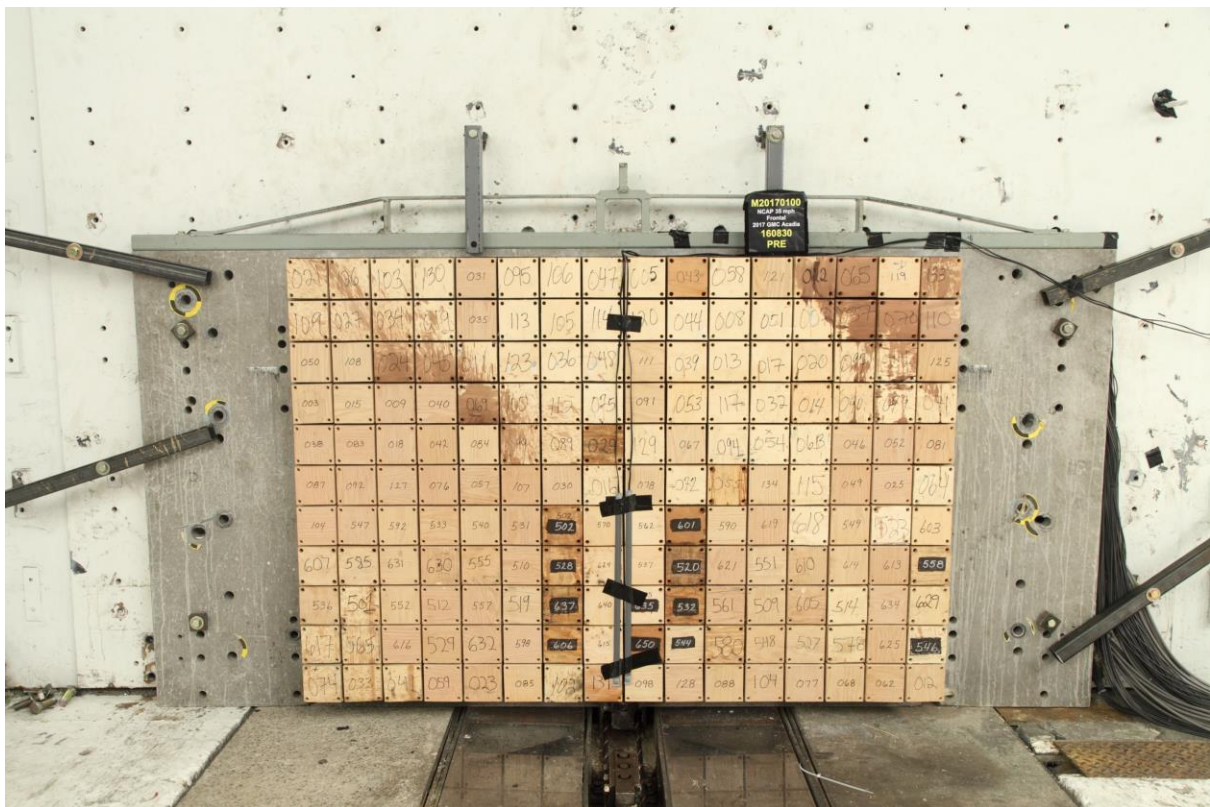
No.	Description	Page
32	Pre-Test Driver Dummy Window View	A-23
33	Post-Test Driver Dummy Window View	A-23
34	Pre-Test Driver Dummy and Vehicle Interior View	A-24
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40	Pre-Test Driver Dummy Feet	A-26
41	Post-Test Driver Dummy Feet	A-27
42	Pre-Test Driver's Side Knee Bolster	A-28
43	Post-Test Driver's Side Knee Bolster	A-28
44	Pre-Test Driver's Side Floorpan	A-29
45	Post-Test Driver's Side Floorpan	A-29
46	Post-Test Driver Dummy Face	A-30
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69a	Post-Test Passenger Dummy Contact With Side Airbag	A-42
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72	Post-Test Speed Trap Read-out	A-45
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77	Vehicle at 360° on Static Rollover Device	A-48
78	2017 GMC Acadia Frontal Impact Event	A-48
79	Monroney Label Photograph	A-49



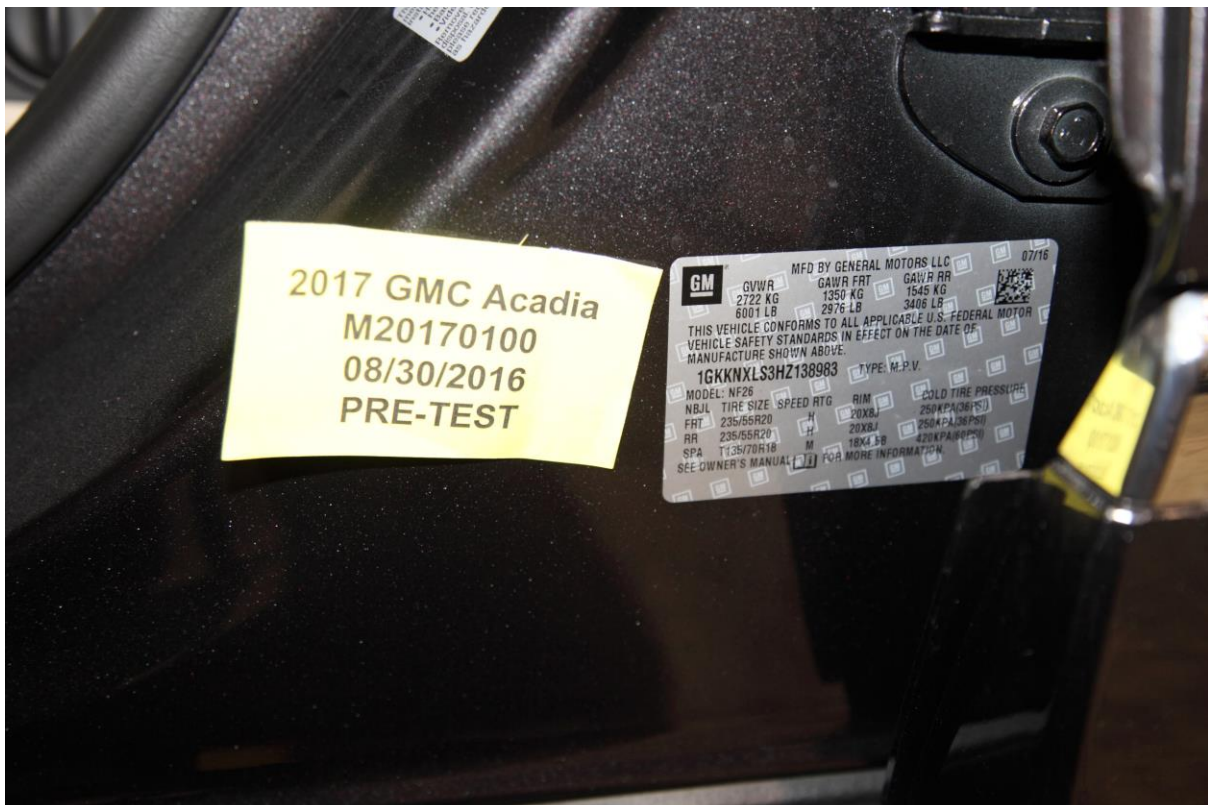
001 Load Cell Location



002 Pre-Test Load Cell Wall



003 Post-Test Load Cell Wall



004 Manufacturer's Label



005 Tire Placard



006 2017 GMC Acadia Frontal As Delivered



007 Right Rear 3-4 View, as Received



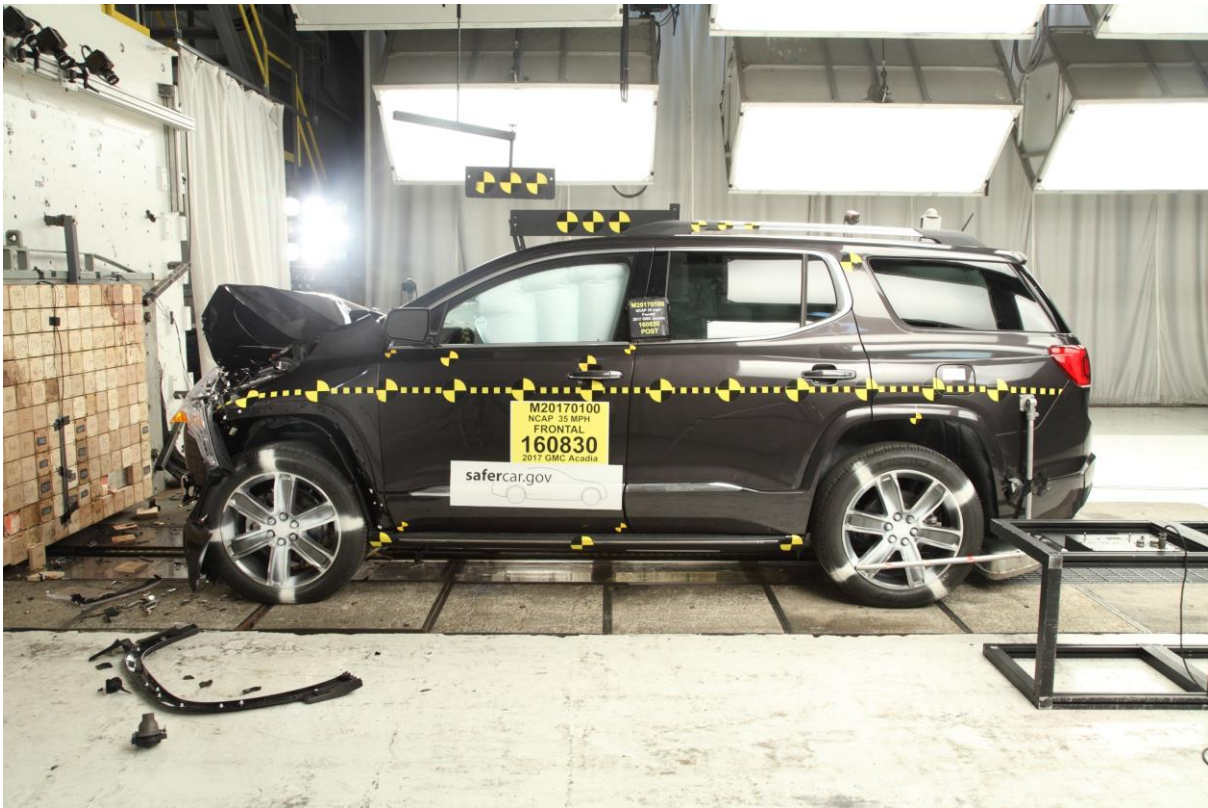
008 Pre-Test Front View of Test Vehicle



009 Post-Test Front View of Test Vehicle



010 Pre-Test Left View of Test Vehicle



011 Post-Test Left View of Test Vehicle



012 Pre-Test Right View of Test Vehicle



013 Post-Test Right View of Test Vehicle



014 Pre-Test Right Front 3-4 View



015 Post-Test Right Front 3-4 View



016 Pre-Test Left Rear 3-4 View



017 Post-Test Left Rear 3-4 View



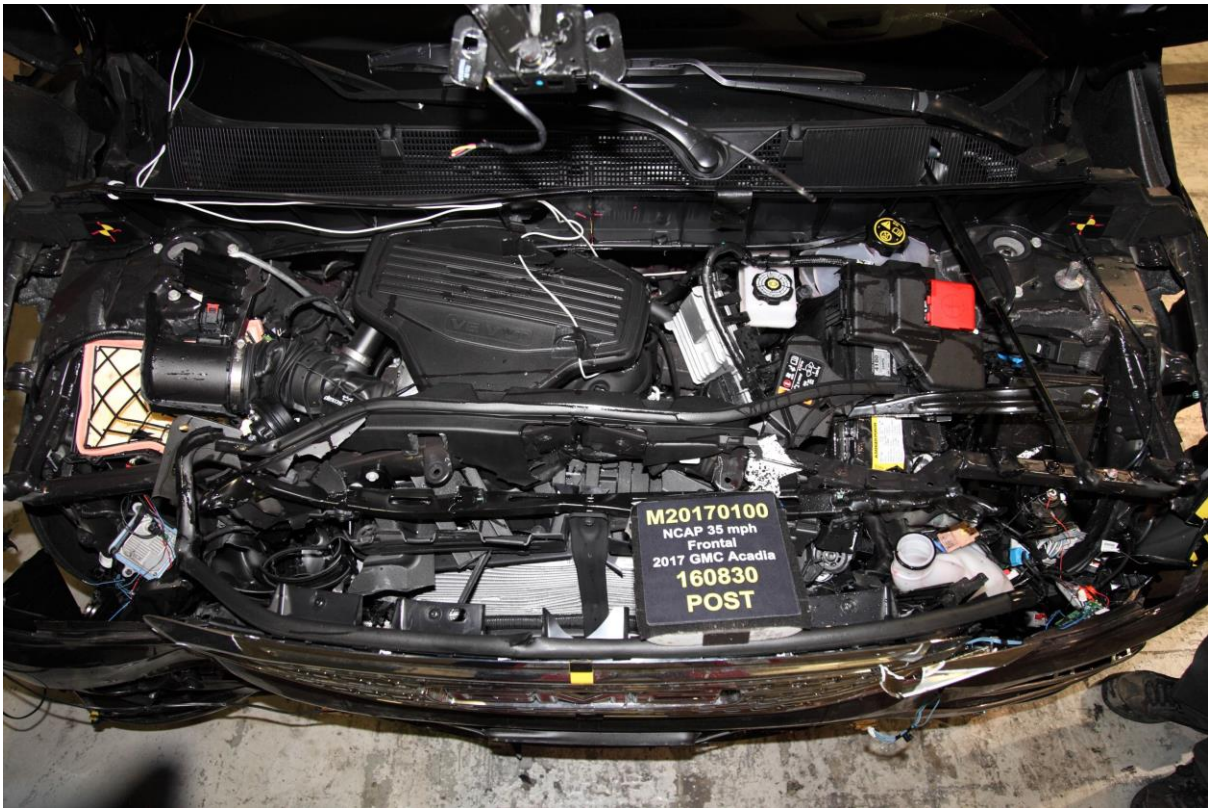
018 Pre-Test Windshield View



019 Post-Test Windshield View



020 Pre-Test Engine Compartment View



021 Post-Test Engine Compartment View

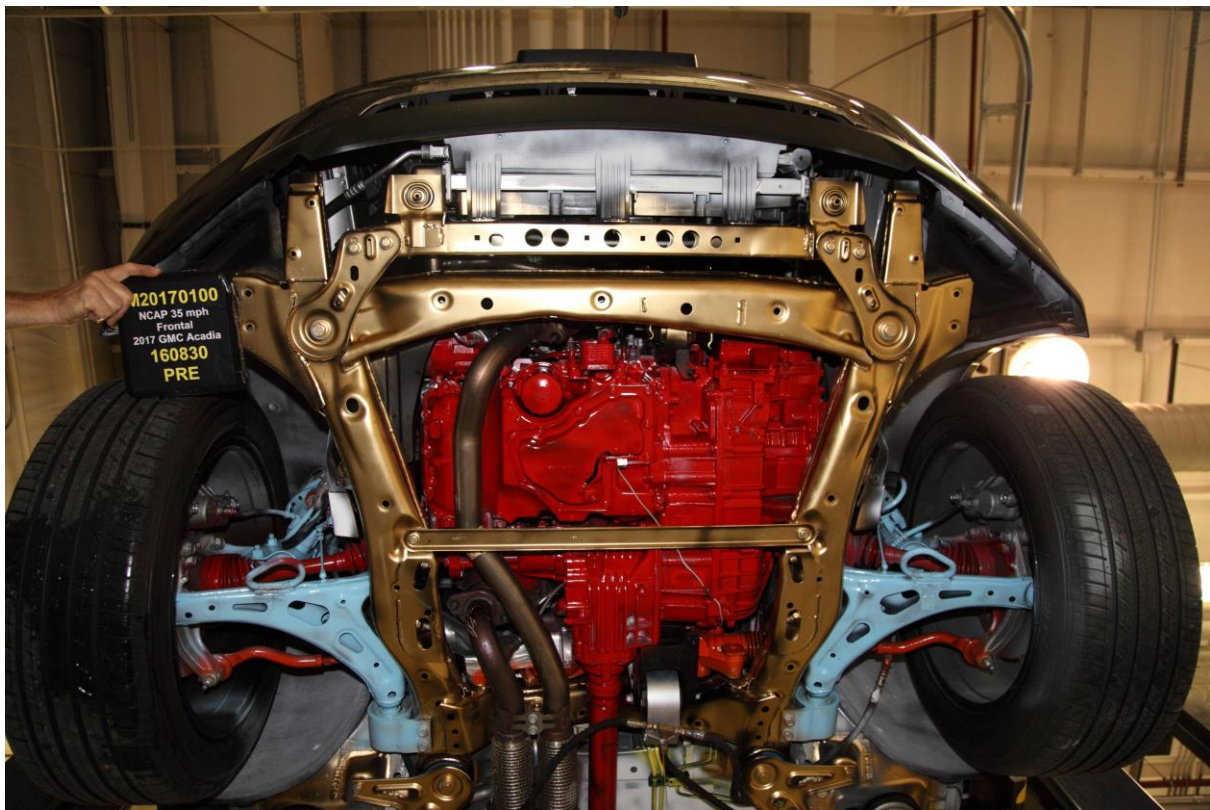


022 Pre-Test Fuel Filler Cap View

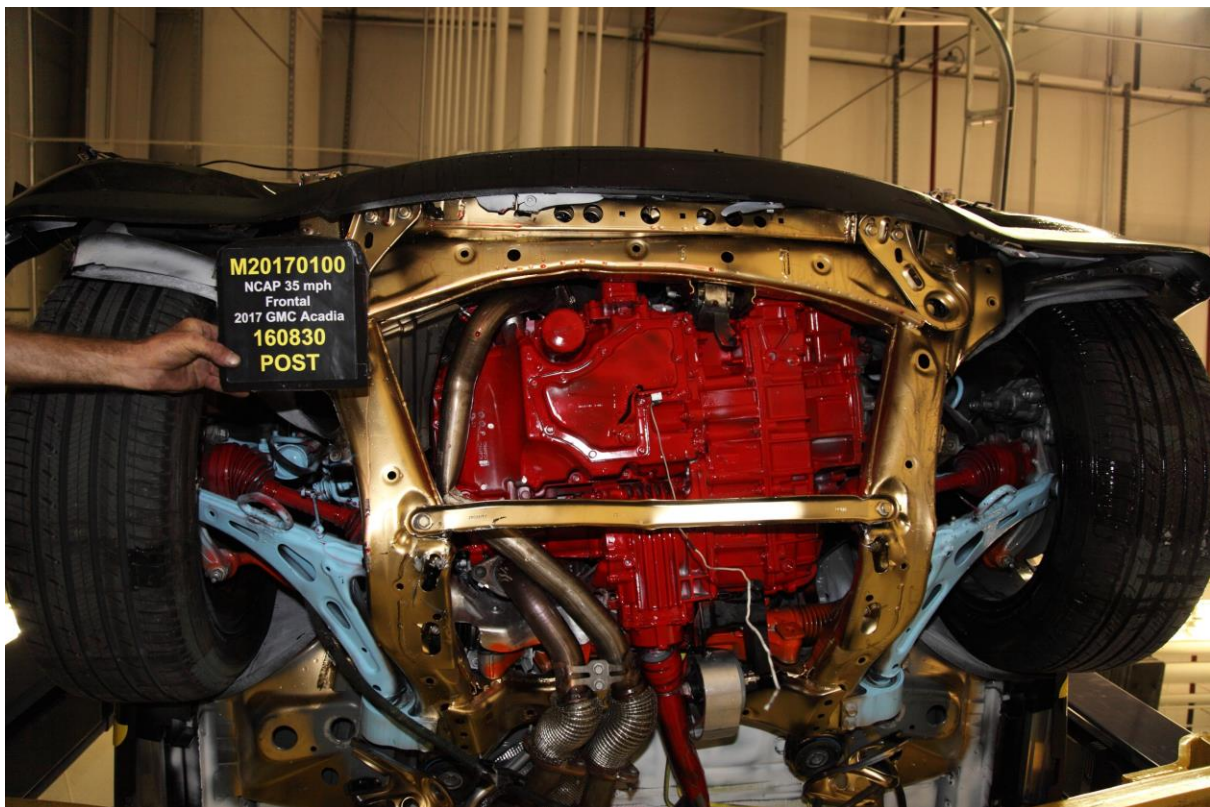


023 Post-Test Fuel Filler Cap View

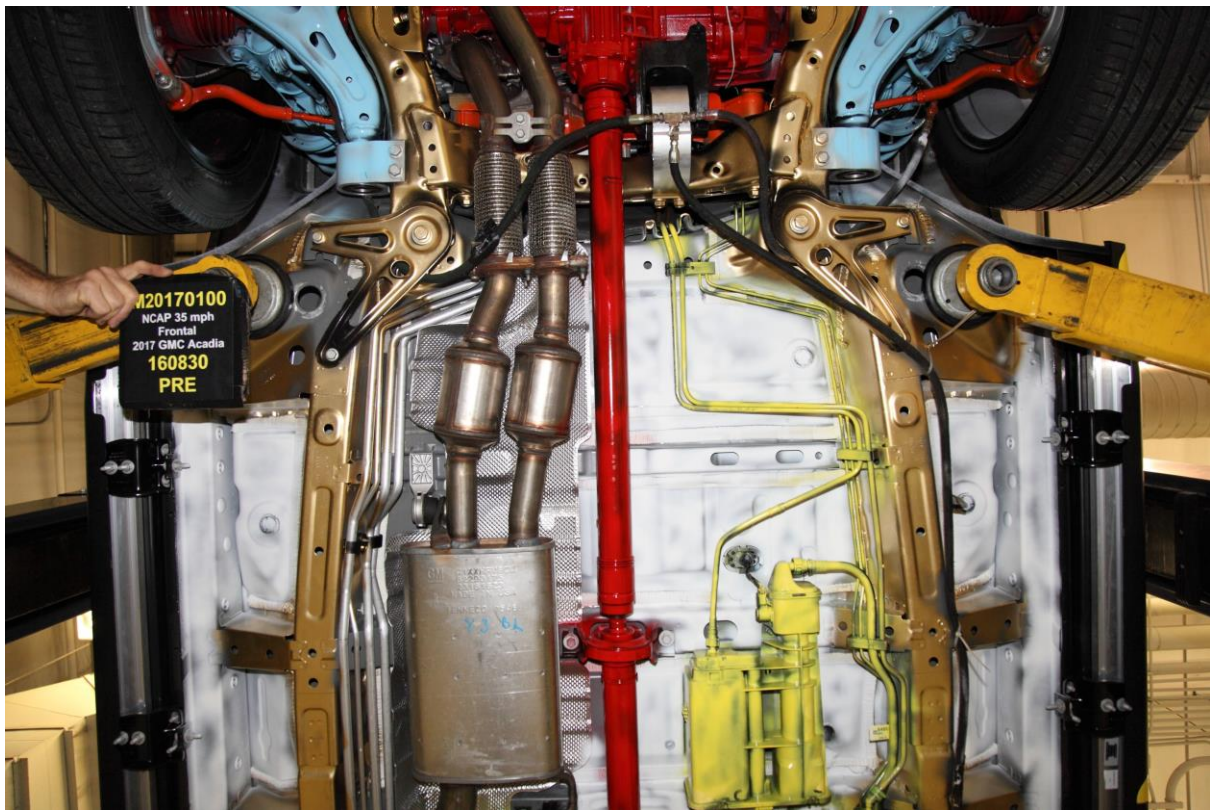
Intentionally Left Blank



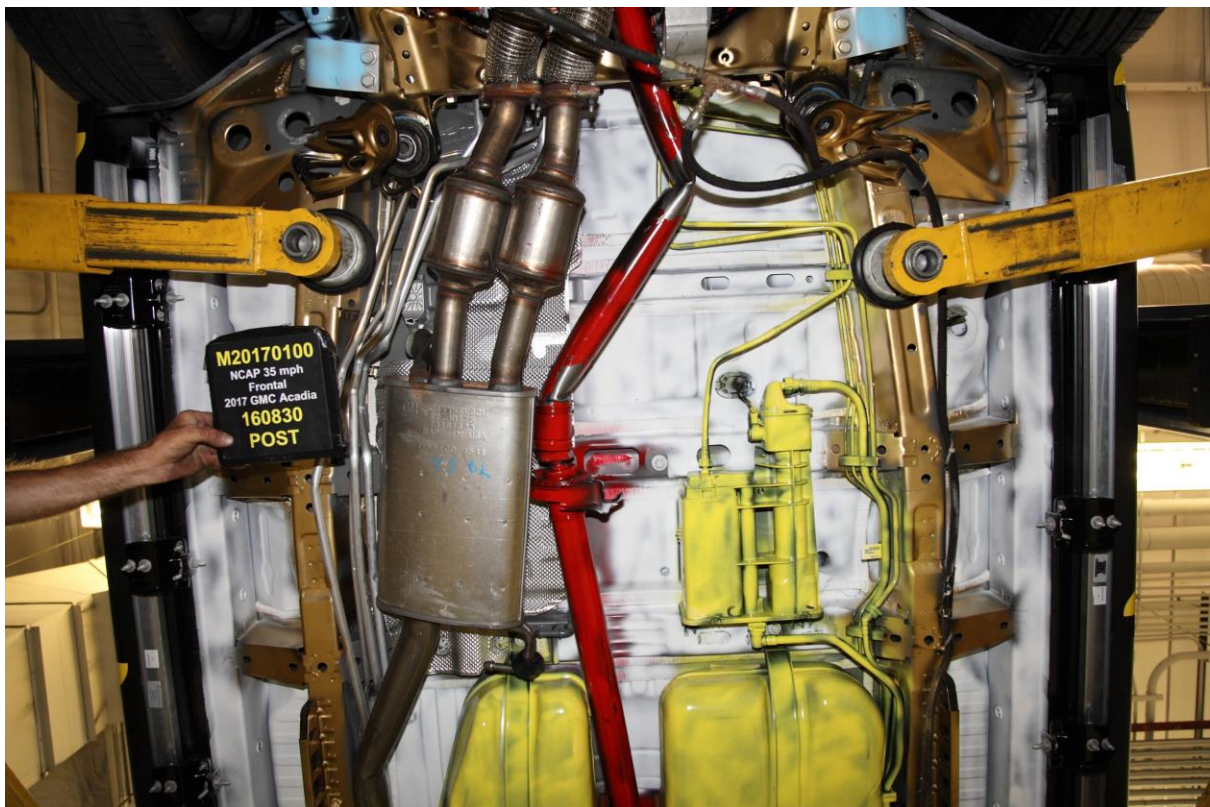
024 Pre-Test Front Underbody View



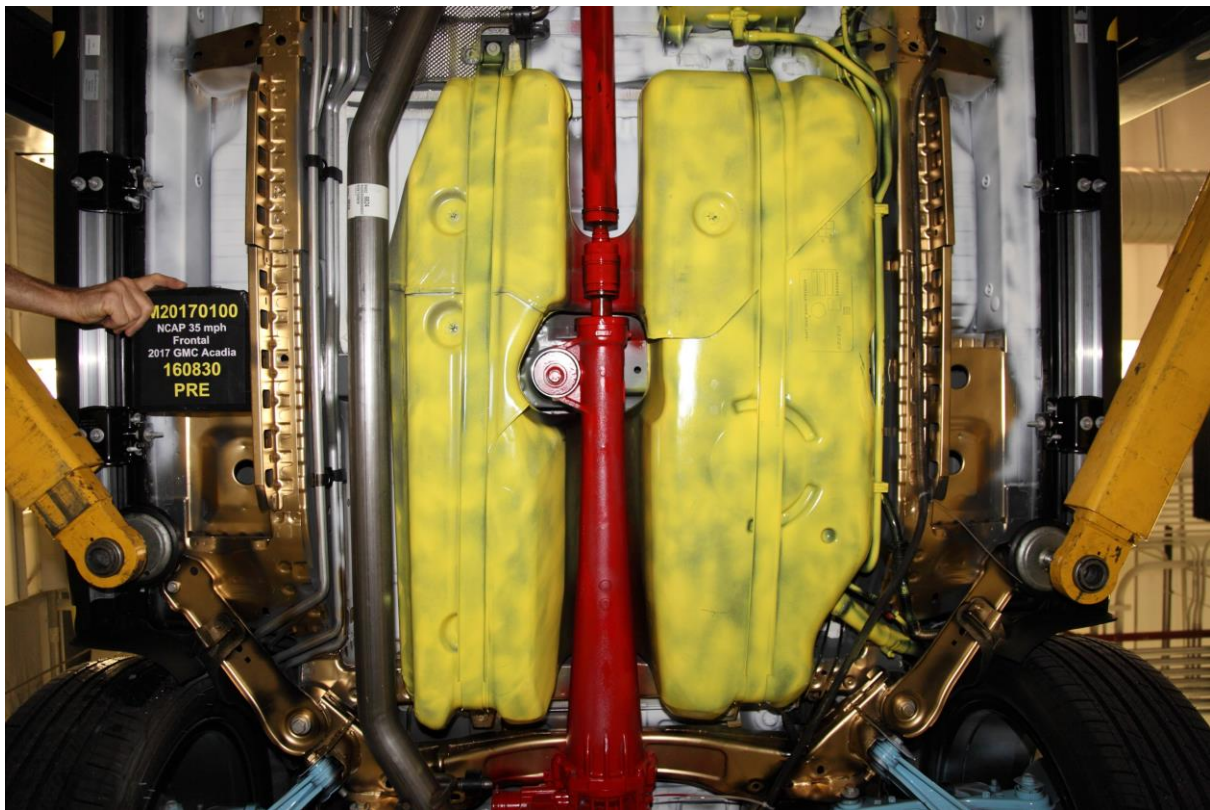
025 Post-Test Front Underbody View



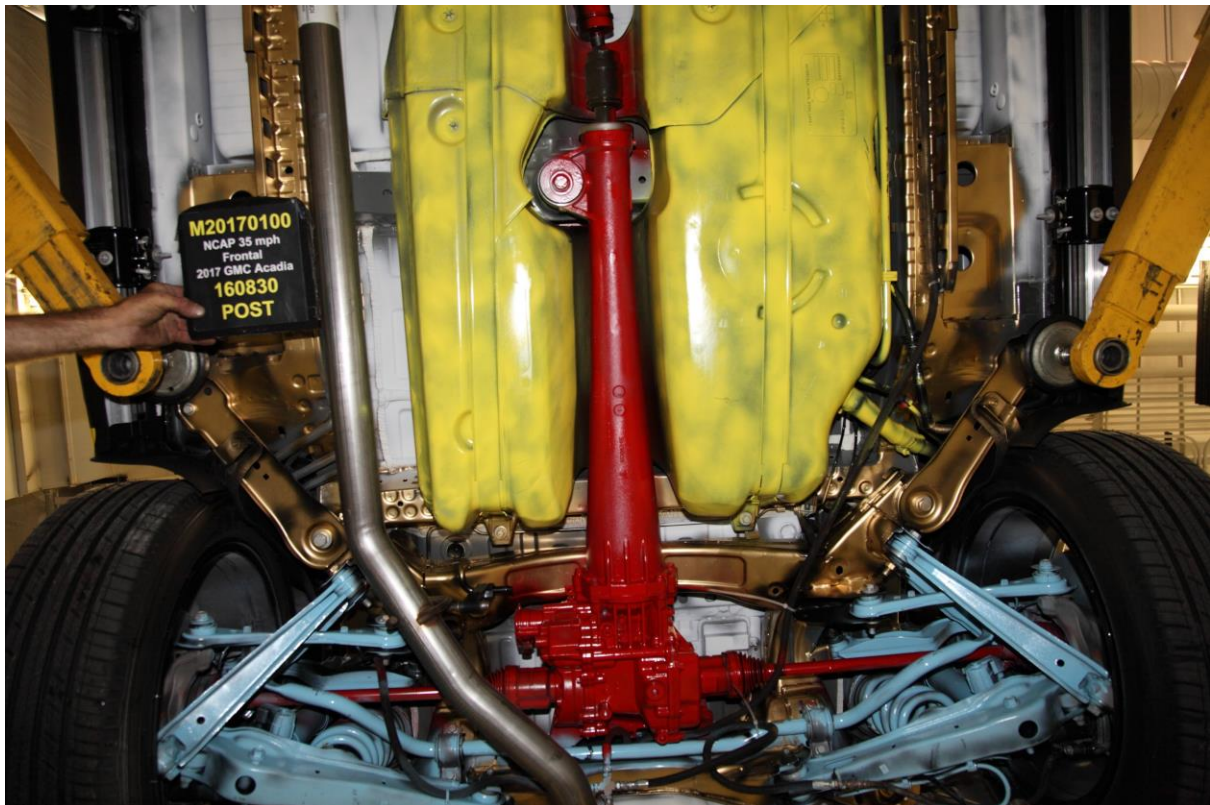
025a Pre-Test Mid Front Underbody View



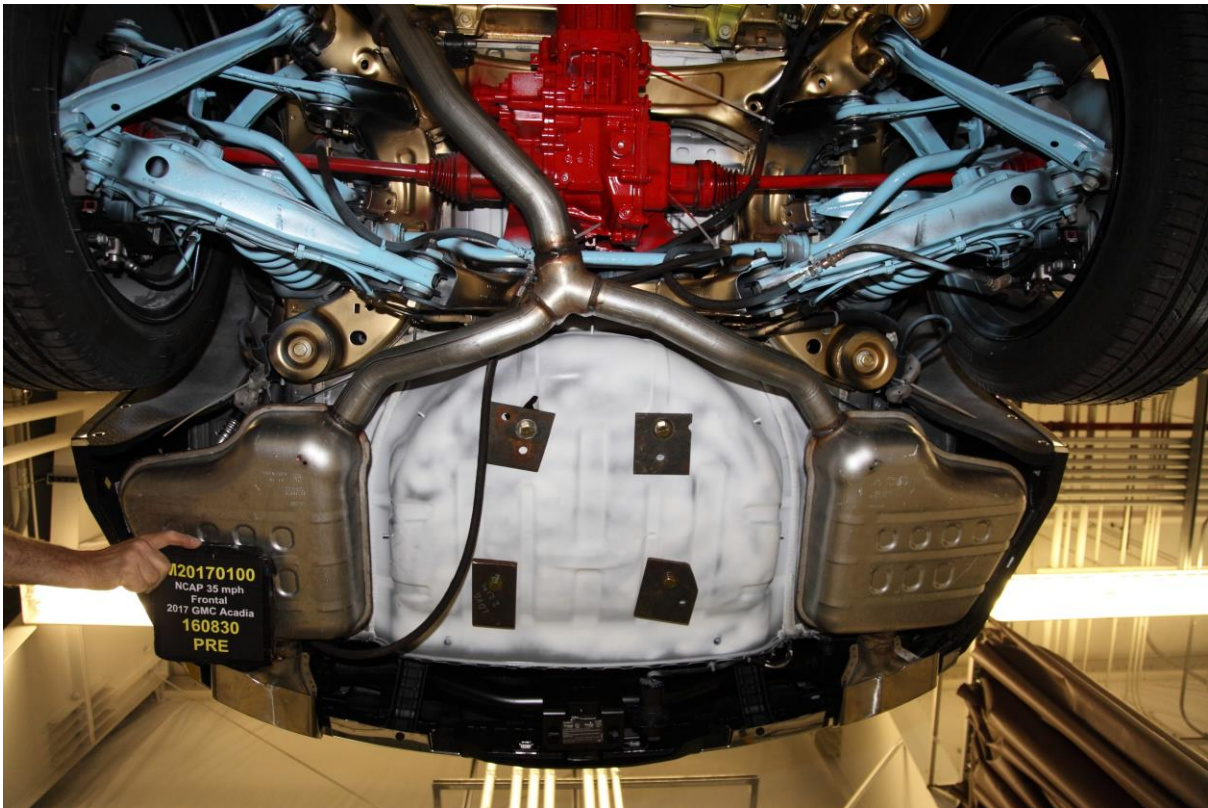
025b Post-Test Mid Front Underbody View



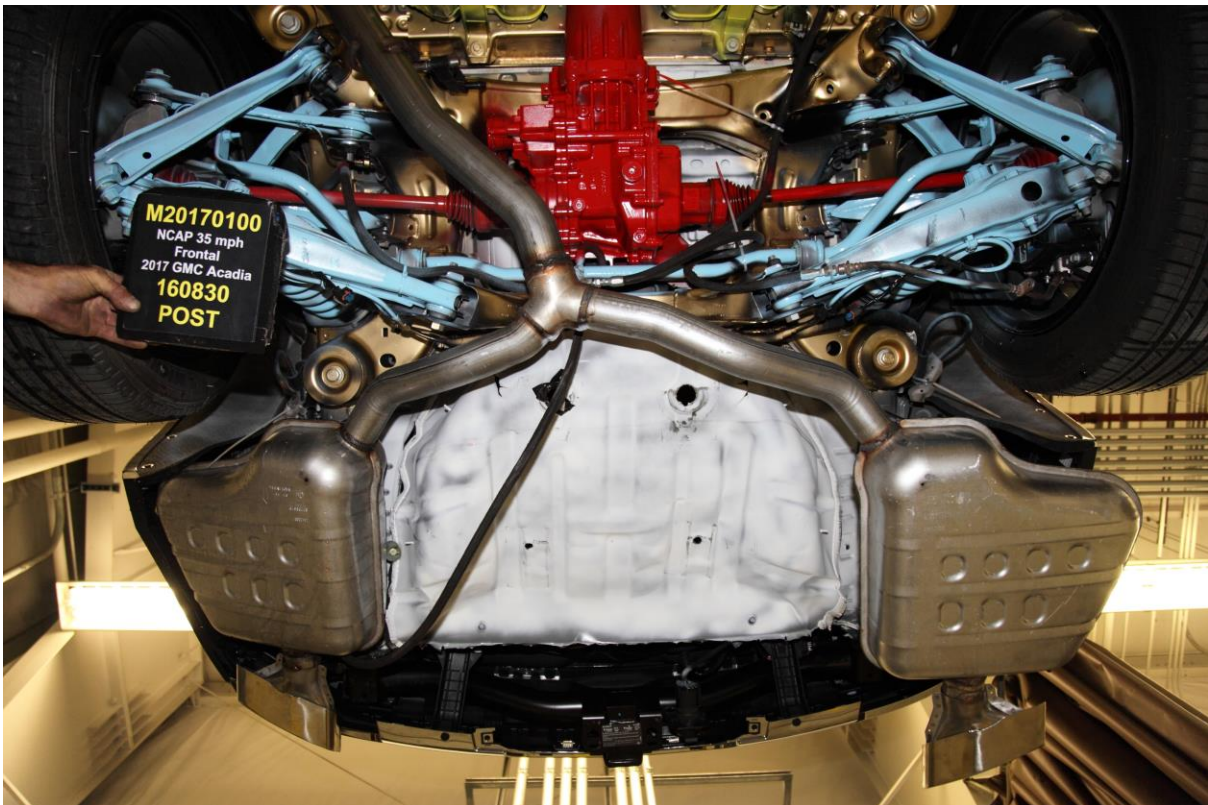
025c Pre-Test Mid Rear Underbody View



025d Post-Test Mid Rear Underbody View



026 Pre-Test Rear Underbody View



027 Post-Test Rear Underbody View



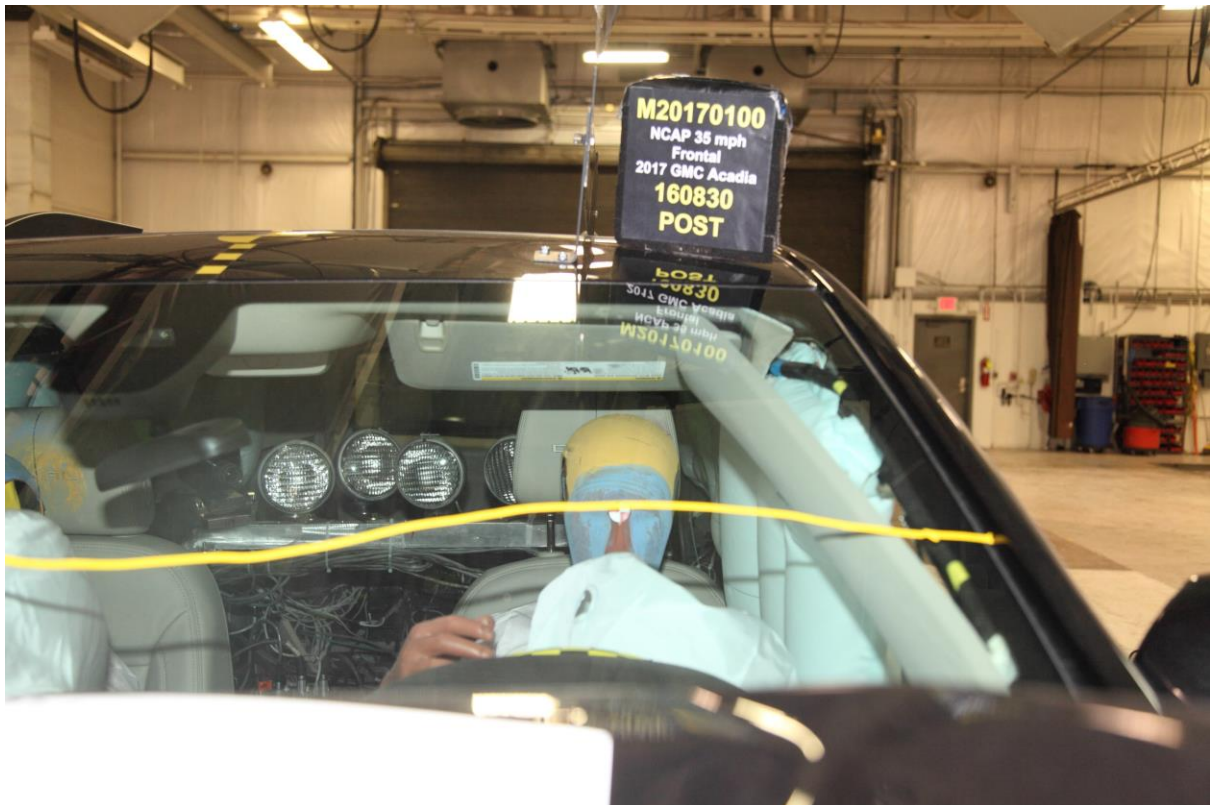
028 Pre-Test Dummy Cable Routing



029 Post-Test Dummy Cable Routing



030 Pre-Test Driver Dummy Front View



031 Post-Test Driver Dummy Front View



032 Pre-Test Driver Dummy Window View



033 Post-Test Driver Dummy Window View



034 Pre-Test Driver Dummy and Vehicle Interior View



035 Post-Test Driver Dummy and Vehicle Interior View



036 Pre-Test Driver's Seat Fore-Aft Markings



037 Post-Test Driver's Seat Fore-Aft Markings



038 Pre-Test View of Belt Anchorage for Driver Dummy



039 Post-Test View of Belt Anchorage for Driver Dummy



040 Pre-Test Driver Dummy Feet



041 Post-Test Driver Dummy Feet



042 Pre-Test Driver's Side Knee Bolster



043 Post-Test Driver's Side Knee Bolster



044 Pre-Test Driver's Side Floorpan



045 Post-Test Driver's Side Floorpan



046 Post-Test Driver Dummy Face



047 Post-Test Driver Dummy Contact With Airbag



048 Post-Test Driver Dummy Contact With Headrest

Intentionally Left Blank



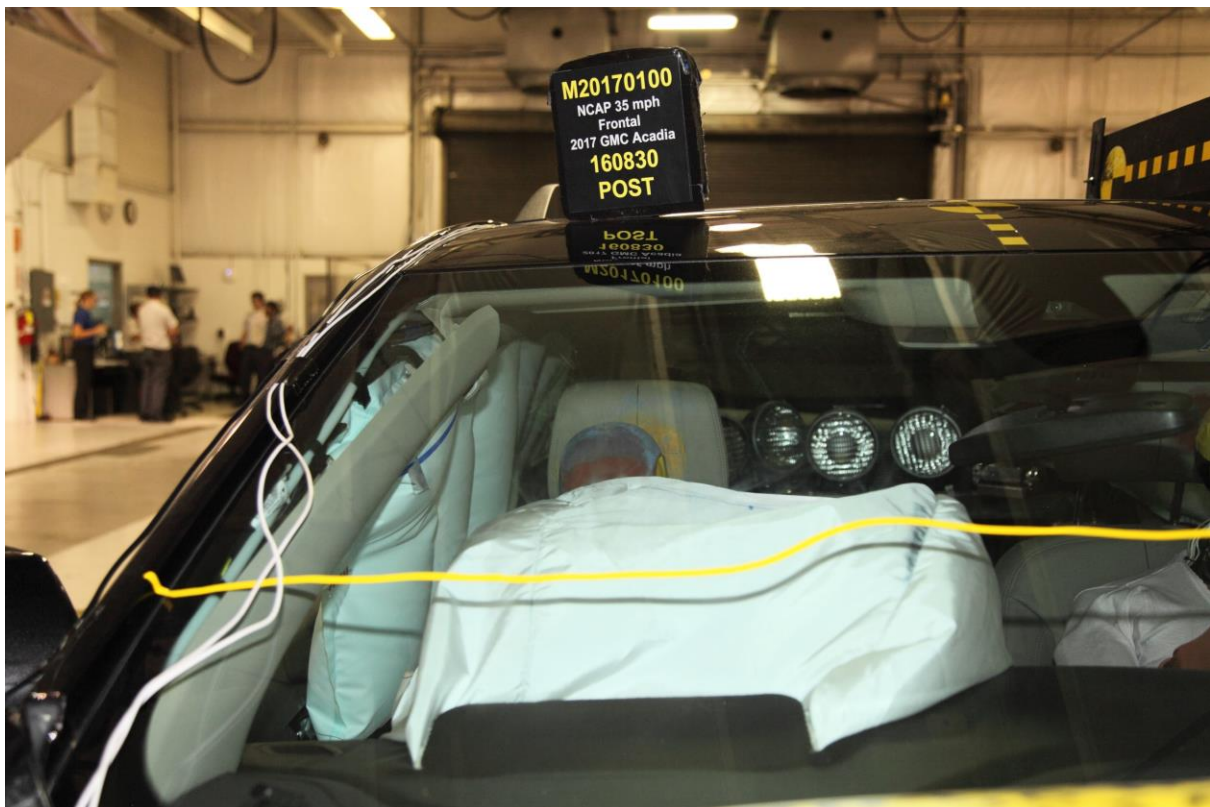
049 Pre-Test View of the Steering Wheel



050 Post-Test View of the Steering Wheel



051 Pre-Test Passenger Dummy Front View



052 Post-Test Passenger Dummy Front View



053 Pre-Test Passenger Dummy Window View



054 Post-Test Passenger Dummy Window View



055 Pre-Test Passenger Dummy and Vehicle Interior View



056 Post-Test Passenger Dummy and Vehicle Interior View



057 Pre-Test Passenger's Seat Fore-Aft Markings



058 Post-Test Passenger's Seat Fore-Aft Markings



059 Pre-Test View of Belt Anchorage for Passenger Dummy



060 Post-Test View of Belt Anchorage for Passenger Dummy



061 Pre-Test Passenger Dummy Feet



062 Post-Test Passenger Dummy Feet



063 Pre-Test Passenger's Side Knee Bolster



064 Post-Test Passenger's Side Knee Bolster



065 Pre-Test Passenger's Side Floorpan



066 Post-Test Passenger's Side Floorpan



067 Post-Test Passenger Dummy Face



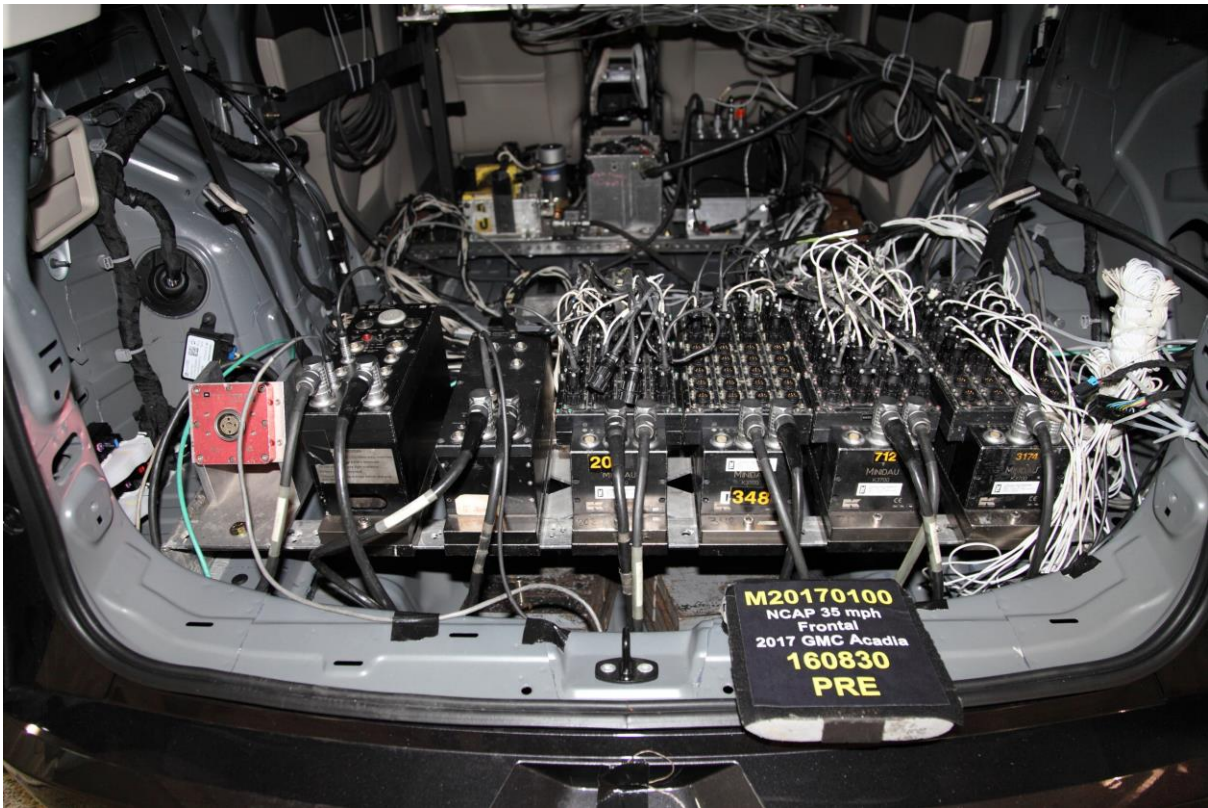
068 Post-Test Passenger Dummy Contact With Airbag



069 Post Test Passenger Dummy Contact With Headrest



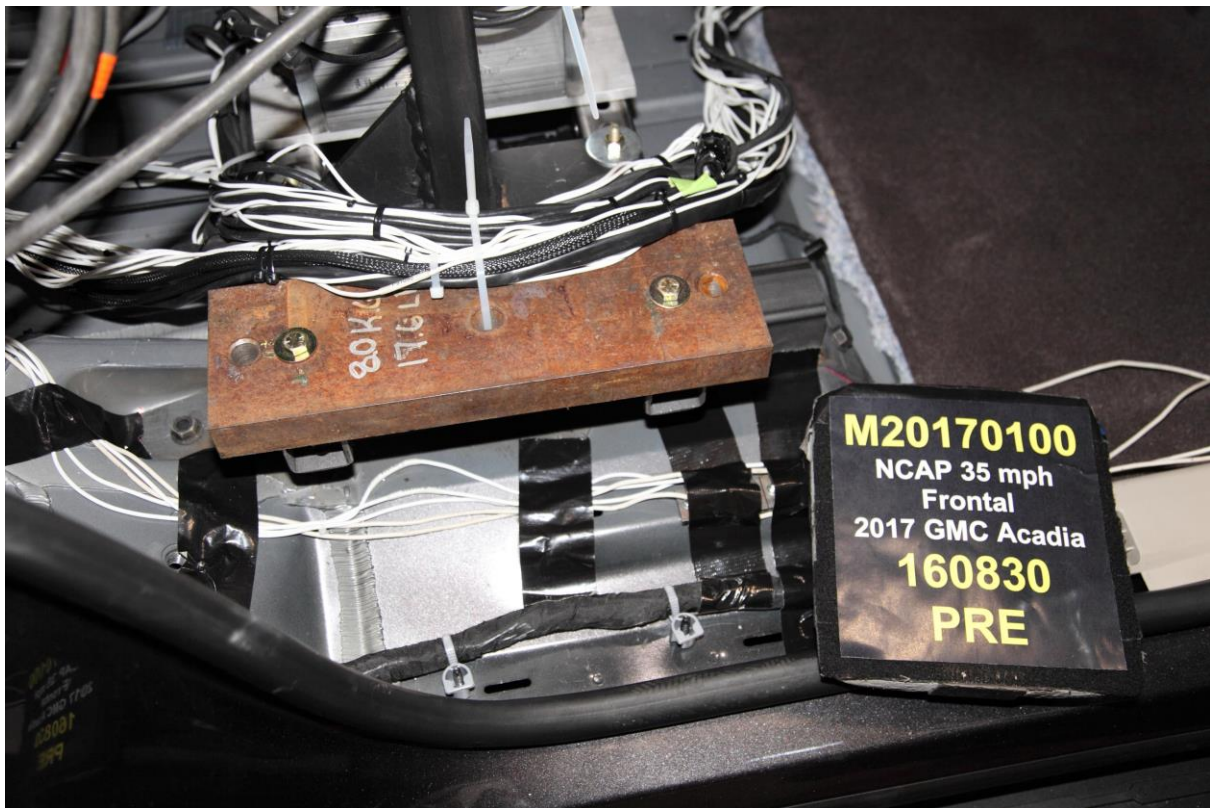
069a Post Test Passenger Dummy Contact With Side Curtain Airbag



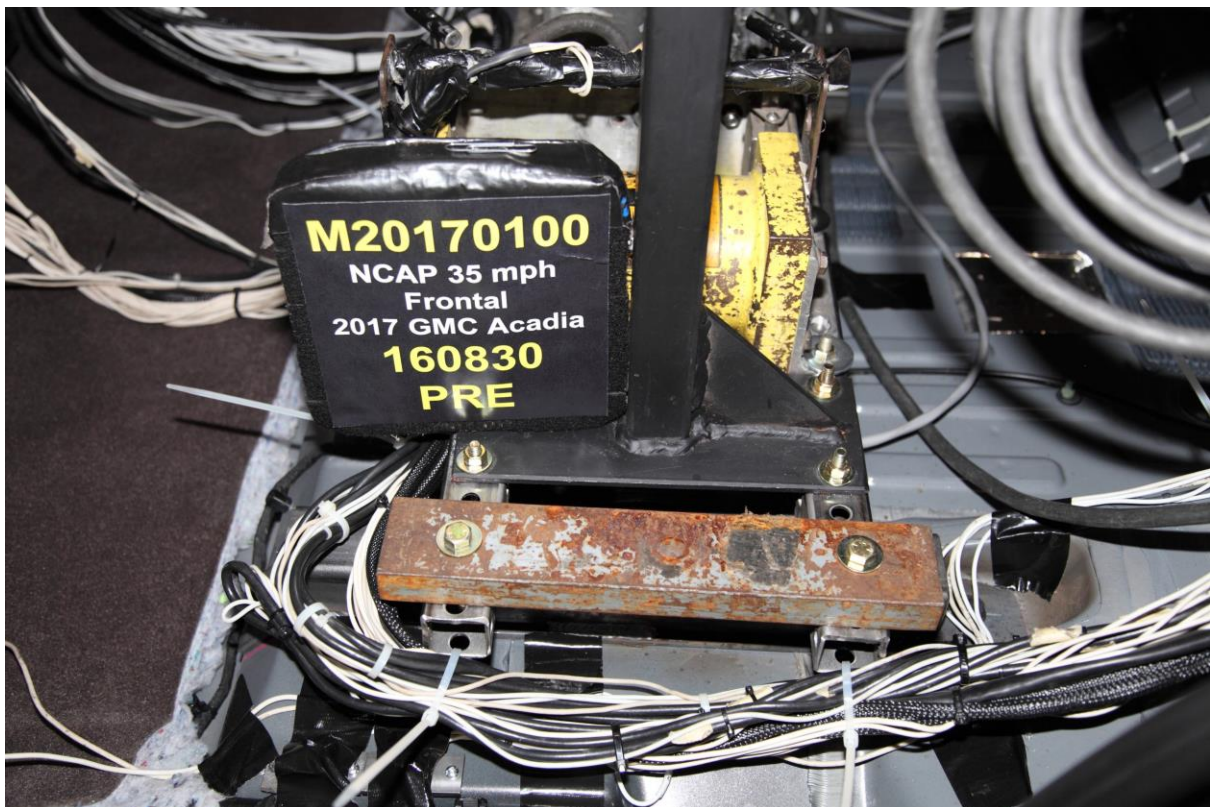
070 Photograph of Ballast Installed in Vehicle View 1



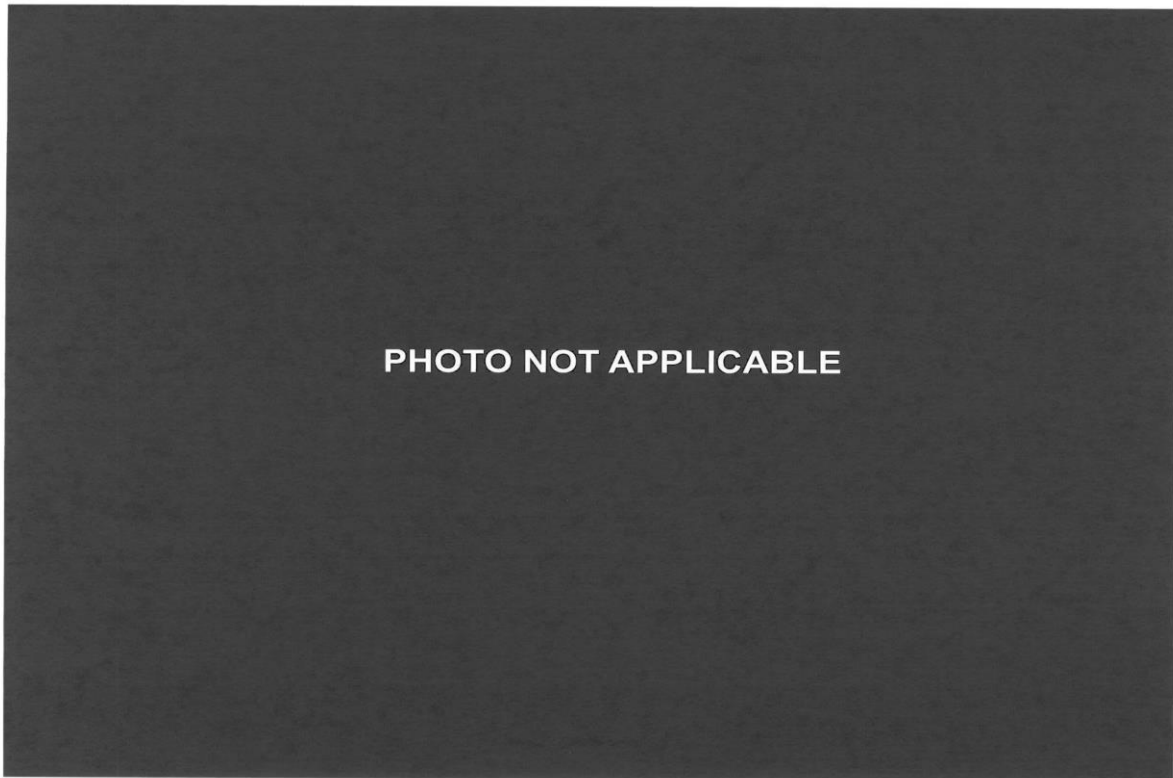
070a Photograph of Ballast Installed in Vehicle View 2



070b Photograph of Ballast Installed in Vehicle View 3



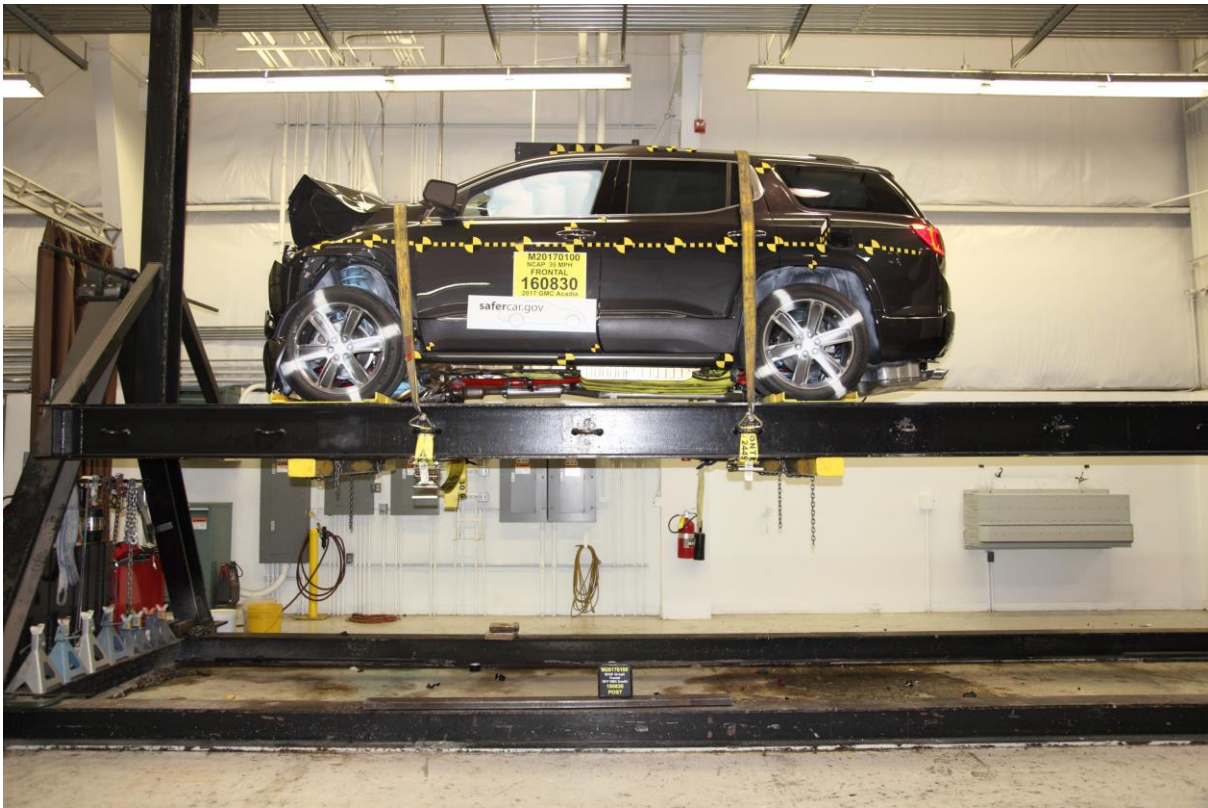
070c Photograph of Ballast Installed in Vehicle View 4



071 Post-Test Stoddard Solvent Spillage Location View



072 Post-Test Speed Trap Readout



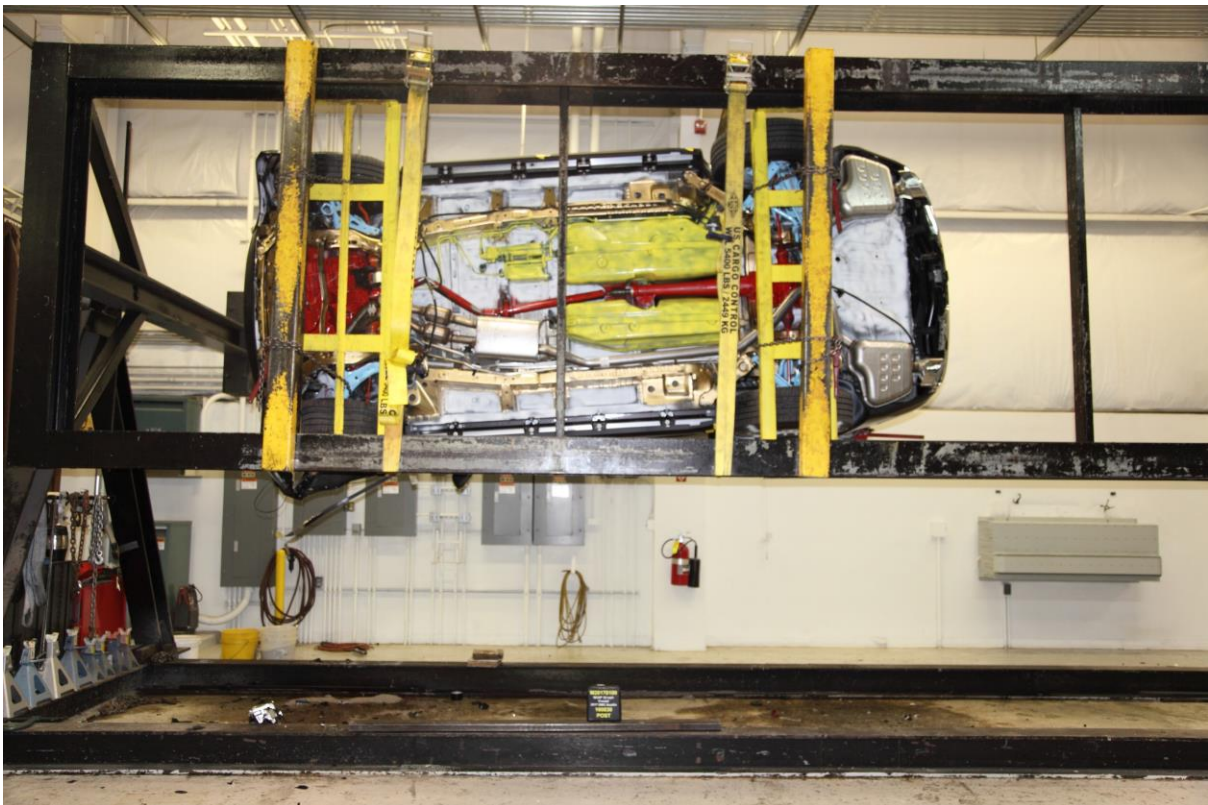
073 Vehicle at 0° on Static Rollover Device



074 Vehicle at 90° on Static Rollover Device



075 Vehicle at 180° on Static Rollover Device



076 Vehicle at 270° on Static Rollover Device



077 Vehicle at 360° on Static Rollover Device



078 2017 GMC Acadia Frontal Impact Event

2017 ACADIA AWD DENALI

EXTERIOR: IRIIDIUM METALLIC
INTERIOR: COCOA/ SHALE

ENGINE, 3.6L V6, SIDI, DOHC,
TRANSMISSION, 6-SPD AUTOMATIC

Visit us at www.gmc.com

STANDARD EQUIPMENT

ITEMS LISTED BELOW ARE INCLUDED AT NO EXTRA CHARGE IN THE STANDARD VEHICLE PRICE SHOWN

- 15-YR/50,000 MILE POWERTRAIN LIMITED WARRANTY SEE DEALER FOR DETAILS
- TWO MAINTENANCE VISITS OIL & FILTER
- 4 WHEEL TIRE ROTATION SEE WWW.GMC.COM ON DEALER FOR DETAILS

MECHANICAL

- ALL-WHEEL DRIVE
- ENGINE, 3.6L V6, SIDI, DOHC, VVT
- TRAILERING PACKAGE

SAFETY & SECURITY

- KEYLESS OPEN AND START
- REMOTE VEHICLE START
- AIR BAGS, FRONTAL AND SIDE IMPACT FOR DRIVER & FRONT PASSENGER, DRIVER INBOARD SEAT-MOUNTED SIDE-IMPACT, AND

HEAD CURTAIN SIDE-IMPACT FOR ALL ROWS IN OUTBOARD SEATING POSITIONS

- ANTILOCK BRAKE SYSTEM, 4 WHEEL DISC
- TEEN DRIVER
- DRIVER ALERT PACKAGE II
- HEADLAMPS, INTELLIBEAM, AUTOMATIC HIGH-BEAM
- FRONT & REAR PARKING ASSIST
- FOLLOWING DISTANCE INDICATOR
- FORWARD COLLISION ALERT
- REAR CROSS TRAFFIC ALERT
- LANE KEEP ASSIST
- LOW SPEED FORWARD AUTOMATIC BRAKING
- LANE CHANGE ALERT WITH SIDE BLIND ZONE ALERT
- PEDESTRIAN DETECTION, FRONT

EXTERIOR

- MIRRORS, OUTSIDE HEATED POWER DRIVER SIDE AUTO DIMMING
- DAYTIME RUNNING LAMPS, LED

TIRE, COMPACT SPARE

- WHEELS, 20" POLISHED ALUMINUM
- HEADLAMPS, HIGH INTENSITY DISCHARGE
- LIFTGATE, POWER, HANDS FREE
- ROOF RAILS, BRIGHT

INTERIOR

- AIR CONDITIONING, TRI ZONE AUTO CLIMATE CONTROL
- MEMORY PACKAGE
- SEATING, 6-PASSENGER
- POWER SEAT ADJUSTER, DRIVER, 8-WAY
- POWER SEAT ADJUSTER, FRONT PASSENGER, 8-WAY
- POWER LUMBAR, DRIVER SEAT
- POWER LUMBAR, FRONT PASSENGER
- DRIVER & FRONT PASSENGER HEATED SEATS
- SEATS, HEATED REAR OUTBOARD POSITIONS
- POWER OUTLET, 120 VOLT
- SEATS, VENTILATED DRIVER & FR

PASSENGER

- LEATHER WRAP STEERING WHEEL
- STEERING COLUMN, POWER TILT & TELESCOPIC
- UNIVERSAL HOME REMOTE
- DISPLAY, DRIVER INSTRUMENT INFO, 8" COLOR CONFIGURABLE
- BOSE PREMIUM 8 SPEAKER AUDIO
- HEATED STEERING WHEEL
- LEATHER-APPOINTED SEATING

CONNECTIVITY FEATURES

- XM RADIO + SERVICE SUBSCRIPTION SOLD SEPARATELY BY SIRIUSXM AFTER 3 MTHS
- ONSTAR® INCLUDES 5 YR BASIC PLAN PLUS 6 MTH SERVICE W/ AUTOMATIC CRASH RESPONSE, NAVIGATION & MORE (SUBJECT TO TERMS SEE ONSTAR.COM)
- 4G LTE W/ FURN HOTSPOT WITH LIMITED DATA TRIAL AND MORE (SUBJECT TO TERMS SEE ONSTAR.COM)

AUDIO SYSTEM, 8" DIAGONAL COLOR TOUCH W/ NAVIGATION & INTELLILINK

- APPLE CARPLAY CAPABILITY AND ANDROID AUTO CAPABILITY PROVIDED BY APPLE AND GOOGLE AVAILABLE WITH COMPATIBLE SMARTPHONES

OPTIONS & PRICING

MANUFACTURER'S SUGGESTED RETAIL PRICE

STANDARD VEHICLE PRICE	\$46,920.00
OPTIONS INSTALLED BY THE MANUFACTURER (MAY REPLACE STANDARD EQUIPMENT SHOWN)	
DUAL SKYSCAPE SUNROOF TECHNOLOGY PACKAGE	1,400.00
ADAPTIVE CRUISE CONTROL WITH FULL SPEED FRONT AUTOMATIC BRAKING	1,345.00
AUTOMATIC COLLISION PREPARATION	1,200.00
CHASSIS CONTINUOUSLY VARIABLE	1,200.00

REAL TIME DAMPING MOLDED ADJUST STEPS (DEALER INSTALLED)	695.00
IRIDIUM METALLIC	395.00
CARGO PACKAGE	310.00
CARGO SHADE, RETRACTABLE (DEALER INSTALLED)	
CARGO NET (DEALER INSTALLED)	
WHEEL LOCKS (DEALER INSTALLED)	70.00
SEATING, 7-PASSENGER	400.00

TOTAL OPTIONS	\$5,415.00
TOTAL VEHICLE & OPTIONS	\$52,335.00
DESTINATION CHARGE	925.00
TOTAL VEHICLE PRICE*	\$53,260.00

Fuel Economy and Environment

These estimates reflect new EPA methods beginning with 2017 models

Fuel Economy

20 MPG
combined city/highway

18 City 25 Highway

5.0 gallons per 100 miles

Special purpose range from 12 to 92 MPG. The best vehicle rates 119 MPG.

You spend \$2,250 more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$1,850

Fuel Economy & Greenhouse Gas Rating (tailpipe only)

4

1 10 Best

This vehicle emits 437 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions, from more at fuelconomy.gov.

Smog Rating (tailpipe only)

5

1 10 Best

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 26 MPG and costs \$7,000 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$2.45 per gallon. MPG is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fuelconomy.gov
Calculate personalized estimates and compare vehicles

GOVERNMENT 5-STAR SAFETY RATINGS

This vehicle has not been rated by the government for overall vehicle score, frontal crash, side crash or rollover risk.

Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4236

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS COUNTRY: U.S./CANADIAN PARTS CONTENT: 65%

NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.

FOR THIS VEHICLE:
FINAL ASSEMBLY POINT: SPRING HILL, TN U.S.A.
COUNTRY OF ORIGIN: ENGINE: UNITED STATES
TRANSMISSION: UNITED STATES

ORDER NO. TN1958 - SALES CODE E
DEALER NO. 0817
FINAL ASSEMBLY: SPRING HILL, TN, U.S.A.
VIN 1GKKXLLS3HZ138963
DEALER TO WHOM DELIVERED:
WIN KELLY CHEVROLET BUICK GMC
12421 AUTO DR
CLARKSVILLE, MD 21029-1266

HL
1GA0167228

079 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-5
2	Driver Head Y Acceleration vs. Time Primary	B-5
3	Driver Head Z Acceleration vs. Time Primary	B-5
4	Driver Head Resultant Acceleration vs. Time Primary	B-5
5	Driver Chest X Deflection vs. Time	B-6
6	Driver Chest X Acceleration vs. Time Primary	B-7
7	Driver Chest Y Acceleration vs. Time Primary	B-7
8	Driver Chest Z Acceleration vs. Time Primary	B-7
9	Driver Chest Resultant Acceleration vs. Time Primary	B-7
10	Driver Upper Neck Force X vs. Time	B-8
11	Driver Upper Neck Force Z vs. Time	B-8
12	Driver Upper Neck Moment Y vs. Time	B-8
13	Driver Nij vs. Time	B-9
14	Driver Left Femur Force vs. Time	B-10
15	Driver Right Femur Force vs. Time	B-10
16	Passenger Head X Acceleration vs. Time Primary	B-11
17	Passenger Head Y Acceleration vs. Time Primary	B-11
18	Passenger Head Z Acceleration vs. Time Primary	B-11
19	Passenger Head Resultant Acceleration vs. Time Primary	B-11
20	Passenger Chest X Deflection vs. Time	B-12
21	Passenger Chest X Acceleration vs. Time Primary	B-13
22	Passenger Chest Y Acceleration vs. Time Primary	B-13
23	Passenger Chest Z Acceleration vs. Time Primary	B-13
24	Passenger Chest Resultant Acceleration vs. Time Primary	B-13
25	Passenger Upper Neck Force X vs. Time	B-14
26	Passenger Upper Neck Force Z vs. Time	B-14
27	Passenger Upper Neck Moment Y vs. Time	B-14
28	Passenger Nij vs. Time	B-15
29	Passenger Left Femur Force vs. Time	B-16
30	Passenger Right Femur Force vs. Time	B-16

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 Acceleration
Driver Pelvis Y Acceleration
Driver Pelvis Z Acceleration
Driver Left Femur Force Redundant
Driver Right Femur Force Redundant
Driver Left Upper Tibia Moment X
Driver Left Upper Tibia Moment Y
Driver Left Upper Tibia Force Z
Driver Left Lower Tibia Moment X
Driver Left Lower Tibia Moment Y
Driver Left Lower Tibia Force Z
Driver Right Upper Tibia Moment X
Driver Right Upper Tibia Moment Y
Driver Right Upper Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver Right Lower Tibia Force Z
Driver Left Foot Fore Z
Driver Left Foot Aft X
Driver Left Foot Aft Z
Driver Right Foot Fore Z
Driver Right Foot Aft X
Driver Right Foot Aft Z
Driver Shoulder Belt Force
Driver Lap Belt Force
Passenger Head 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 Femur Force Redundant
Passenger Right Femur Force Redundant
Passenger Left Upper Tibia Moment X
Passenger Left Upper Tibia Moment Y
Passenger Left Upper Tibia Force Z
Passenger Left Lower Tibia Moment X
Passenger Left Lower Tibia Moment Y
Passenger Left Lower Tibia Force Z
Passenger Right Upper Tibia Moment X
Passenger Right Upper Tibia Moment Y
Passenger Right Upper Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger Left Foot Fore Z
Passenger Left Foot Aft X
Passenger Left Foot Aft Z
Passenger Right 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
Load Cell Barrier Forces and Moments

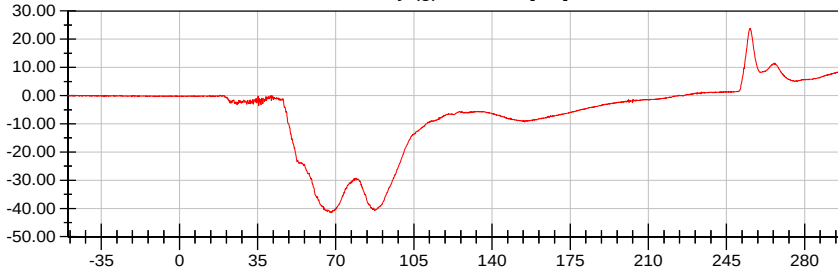
NHTSA

Test Lab: Transportation Research Center, Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)
Test Number: 160830 (M20170100)

Test Date: 08/30/2016

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

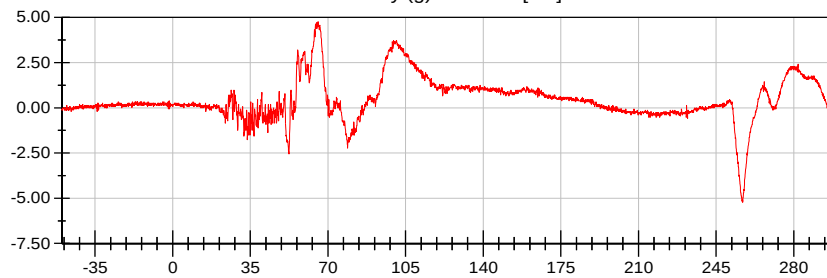
23.79 g at 255.60 ms

<Min>

-41.48 g at 67.44 ms

CFC_1000

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



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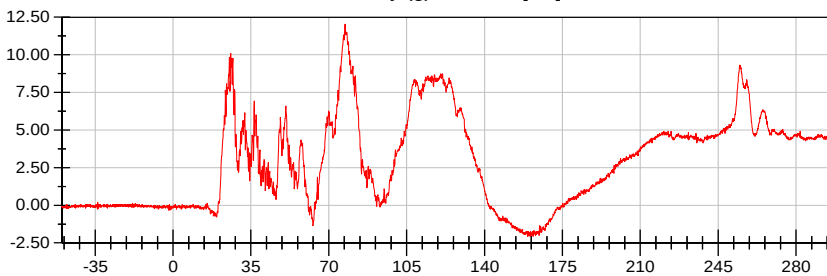
4.77 g at 65.52 ms

<Min>

-5.23 g at 256.96 ms

CFC_1000

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



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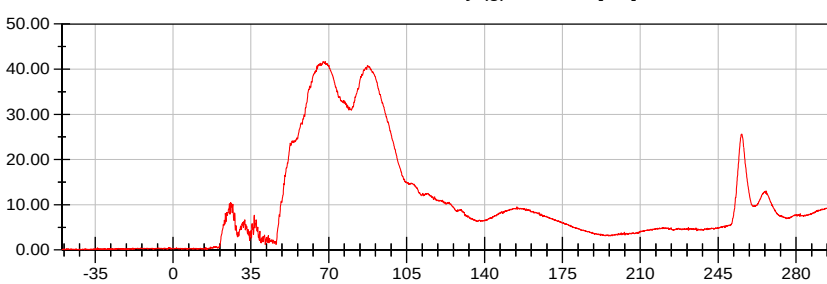
12.03 g at 77.28 ms

<Min>

-2.07 g at 159.36 ms

CFC_1000

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



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41.72 g at 67.44 ms

<Min>

0.02 g at -48.24 ms

CFC_1000



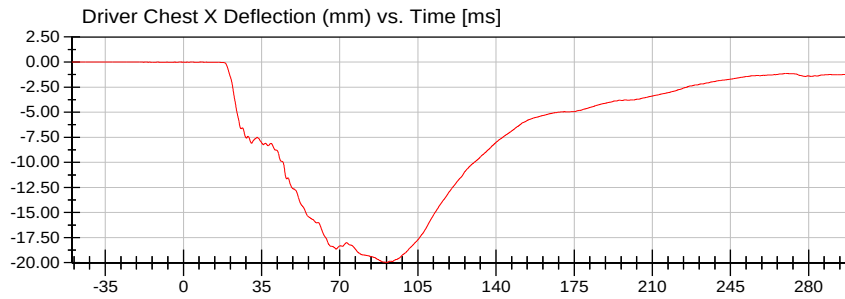
NHTSA

Test Date: 08/30/2016

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

Test Lab: Transportation Research Center, Position #2 Hybrid III Small Adult Female (426)

Test Number: 160830 (M20170100)



<Max>

0.01 mm at -33.68 ms

<Min>

-19.97 mm at 90.88 ms

CFC_600

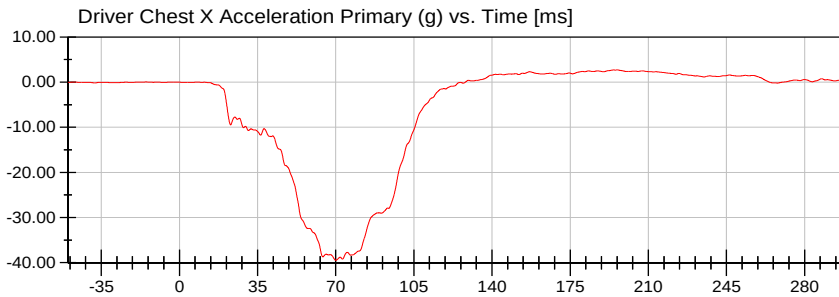


NHTSA

Test Lab: Transportation Research Center, Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)
Test Number: 160830 (M20170100)

Test Date: 08/30/2016

Position #2 Hybrid III Small Adult Female (426)



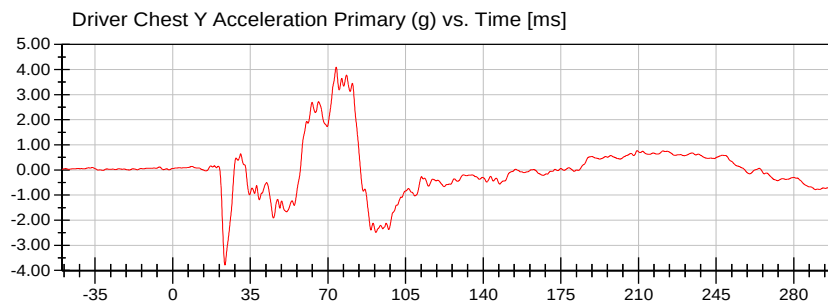
<Max>

2.70 g at 196.08 ms

<Min>

-39.45 g at 70.00 ms

CFC_180



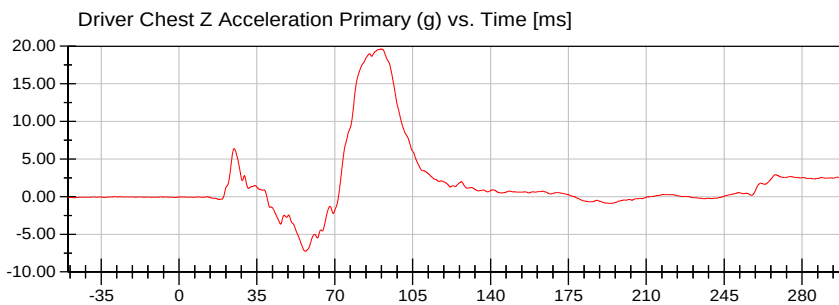
<Max>

4.09 g at 73.68 ms

<Min>

-3.78 g at 23.52 ms

CFC_180



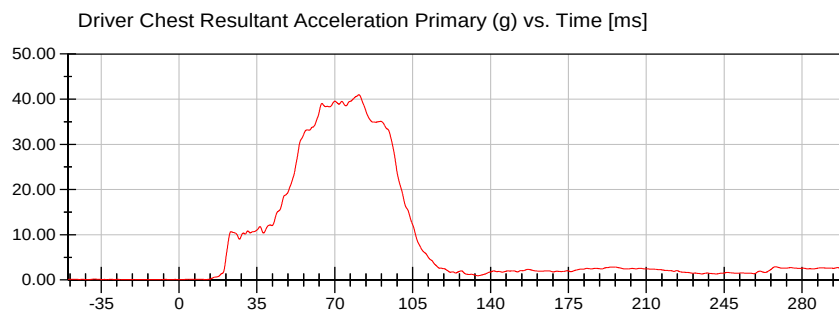
<Max>

19.63 g at 90.88 ms

<Min>

-7.25 g at 56.64 ms

CFC_180



<Max>

40.97 g at 80.80 ms

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0.06 g at -18.88 ms

CFC_180



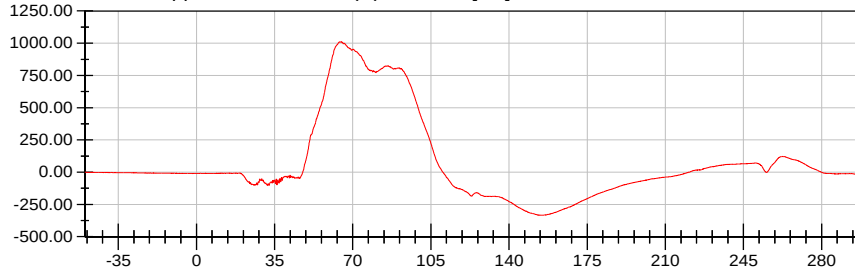
NHTSA

Test Lab: Transportation Research Center, Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)
Test Number: 160830 (M20170100)

Test Date: 08/30/2016

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

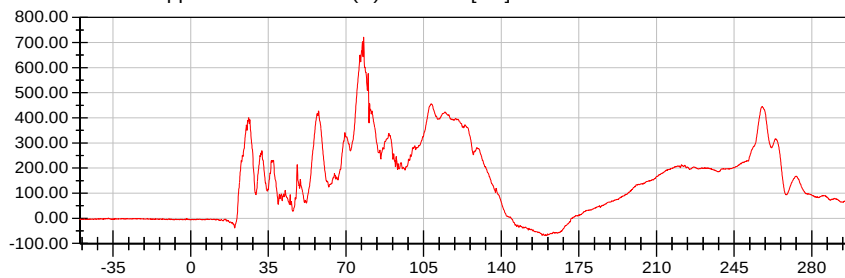
1,012.91 N at 64.88 ms

<Min>

-333.67 N at 154.40 ms

CFC_1000

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



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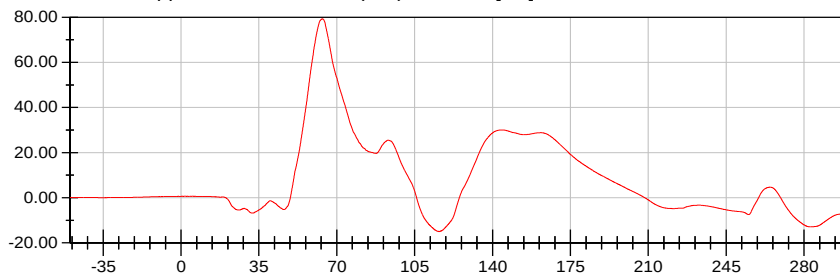
721.22 N at 78.00 ms

<Min>

-69.37 N at 160.56 ms

CFC_1000

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



<Max>

79.29 Nm at 63.52 ms

<Min>

-14.95 Nm at 116.00 ms

CFC_600





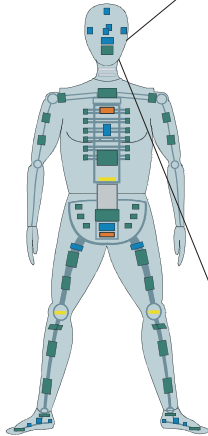
2017 GMC Acadia NCAP 35 mph Frontal Impact Neck Injury Predictor (NIJ)

Date: 08/30/2016
Time: 15:04

Customer: NHTSA

Test Number: M20170100

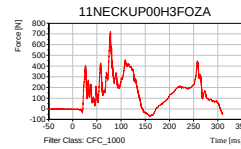
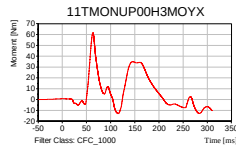
Test Orientation = Frontal
Fzc(Tension) = 6806
Fzc(Compression) = 6160
Myc(Extension) = 135
Myc(Flexion) = 310



Dummy: HIII 50th Male
Seating Position:

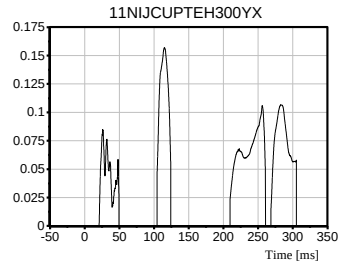
Driver

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

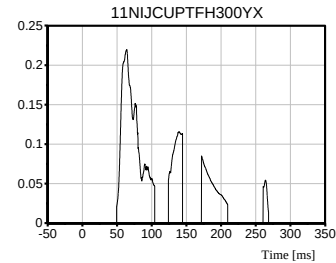


TRC Inc. Test Lab: CTF

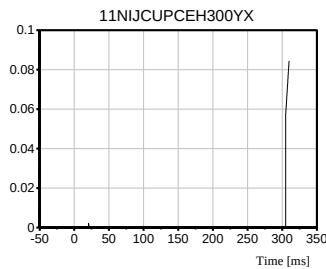
Test Number: 160830



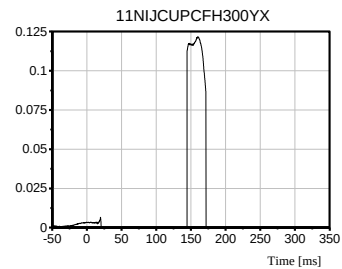
Max [NTE] 0.1569 at 115.12 ms



Max [NTF] 0.2197 at 64.08 ms



Max [NCE] 0.0845 at 310.00 ms



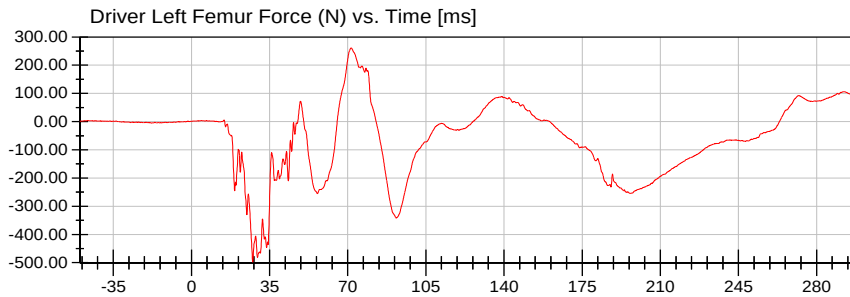
Max [NCF] 0.1217 at 159.84 ms

NHTSA

Test Lab: Transportation Research Center, Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)
Test Number: 160830 (M20170100)

Test Date: 08/30/2016

Position #2 Hybrid III Small Adult Female (426)



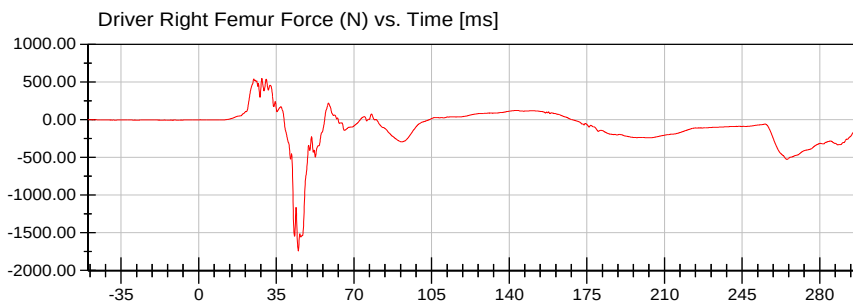
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261.22 N at 71.52 ms

<Min>

-497.87 N at 27.44 ms

CFC_600



<Max>

550.06 N at 28.48 ms

<Min>

-1,742.73 N at 44.96 ms

CFC_600

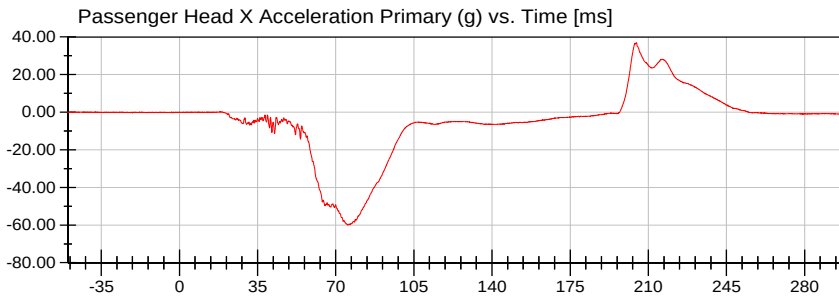


NHTSA

Test Lab: Transportation Research Center, Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)
Test Number: 160830 (M20170100)

Test Date: 08/30/2016

Position #2 Hybrid III Small Adult Female (426)



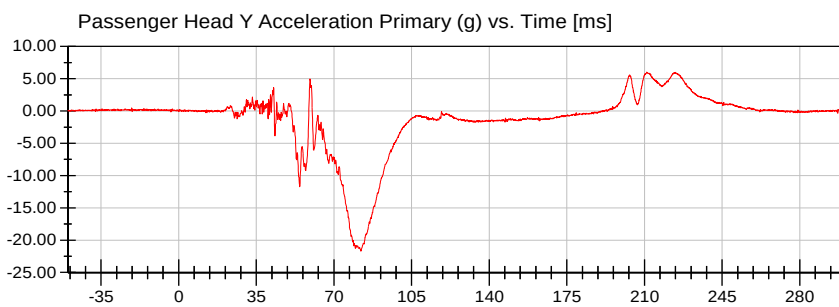
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36.94 g at 204.64 ms

<Min>

-60.09 g at 75.44 ms

CFC_1000



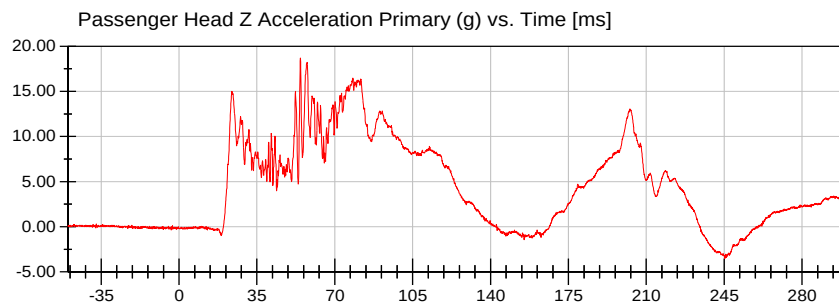
<Max>

6.05 g at 211.04 ms

<Min>

-21.70 g at 82.16 ms

CFC_1000



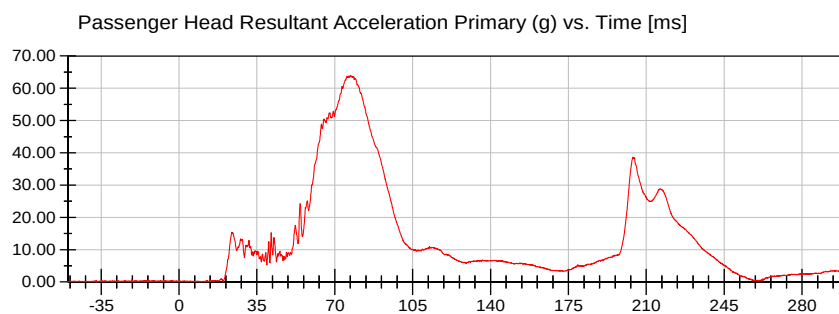
<Max>

18.70 g at 54.56 ms

<Min>

-3.53 g at 245.28 ms

CFC_1000



<Max>

63.95 g at 77.20 ms

<Min>

0.03 g at -48.72 ms

CFC_1000



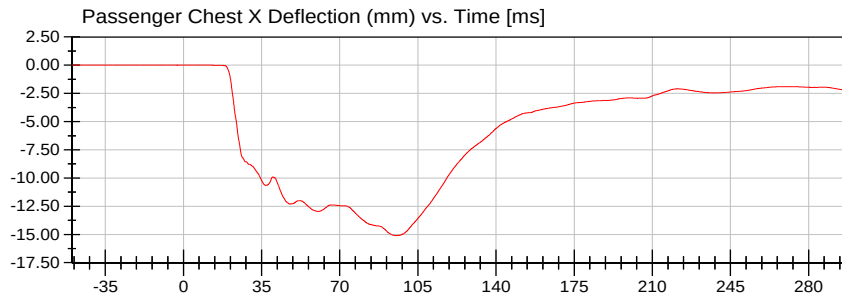
NHTSA

Test Date: 08/30/2016

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

Test Lab: Transportation Research Center, Position #2 Hybrid III Small Adult Female (426)

Test Number: 160830 (M20170100)



<Max>

0.00 mm at -21.52 ms

<Min>

-15.09 mm at 95.20 ms

CFC_600



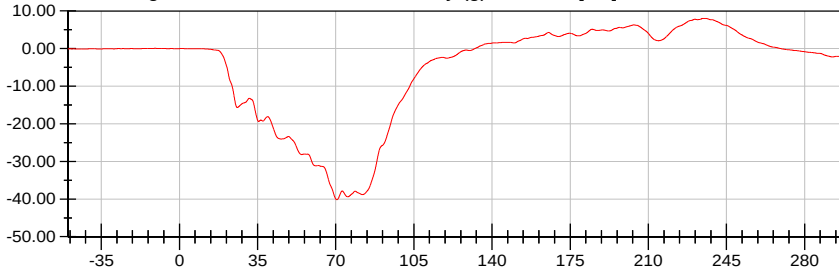
NHTSA

Test Lab: Transportation Research Center, Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)
Test Number: 160830 (M20170100)

Test Date: 08/30/2016

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

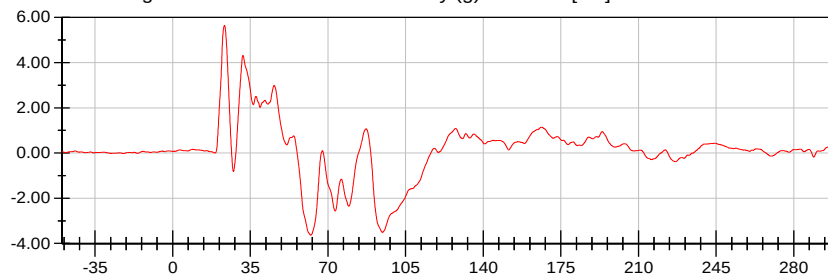
8.03 g at 234.56 ms

<Min>

-40.18 g at 70.48 ms

CFC_180

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



<Max>

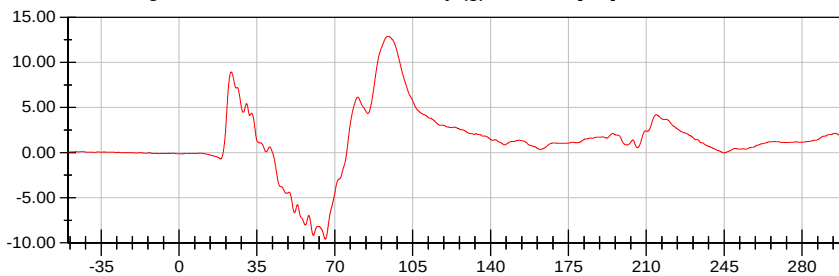
5.65 g at 23.36 ms

<Min>

-3.63 g at 62.32 ms

CFC_180

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



<Max>

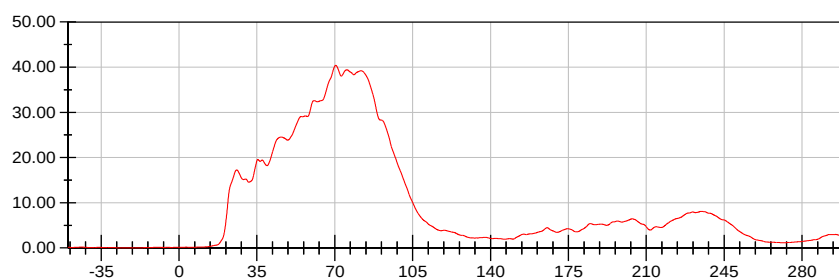
12.88 g at 94.16 ms

<Min>

-9.58 g at 65.76 ms

CFC_180

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



<Max>

40.39 g at 70.48 ms

<Min>

0.01 g at -21.36 ms

CFC_180

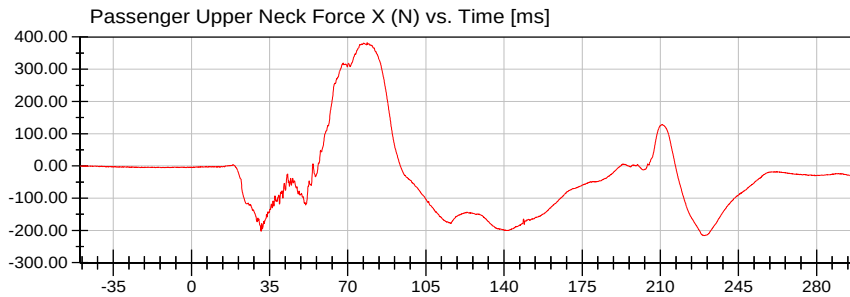


NHTSA

Test Lab: Transportation Research Center, Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)
Test Number: 160830 (M20170100)

Test Date: 08/30/2016

Position #2 Hybrid III Small Adult Female (426)



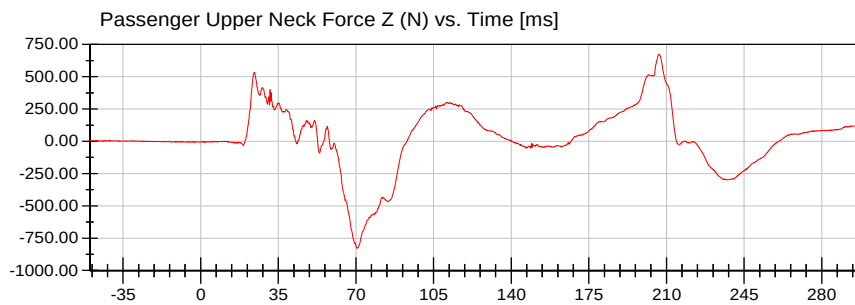
<Max>

382.04 N at 78.72 ms

<Min>

-215.85 N at 229.52 ms

CFC_1000



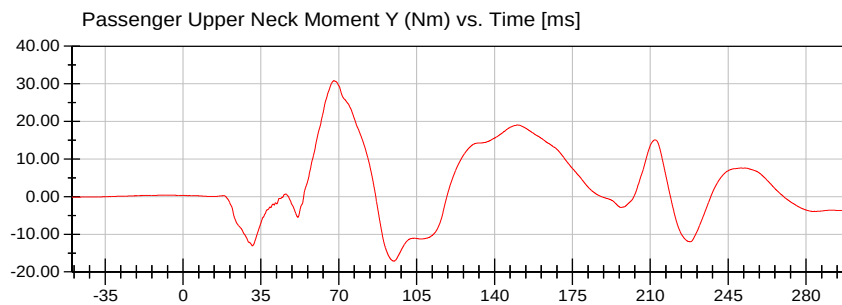
<Max>

674.04 N at 206.64 ms

<Min>

-827.53 N at 70.48 ms

CFC_1000



<Max>

30.87 Nm at 67.84 ms

<Min>

-17.13 Nm at 94.72 ms

CFC_600





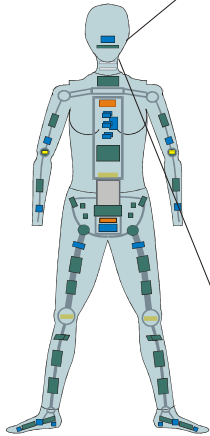
2017 GMC Acadia NCAP 35 mph Frontal Impact Neck Injury Predictor (NIJ)

Date: 08/30/2016
Time: 15:04

Customer: NHTSA

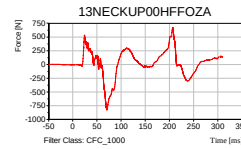
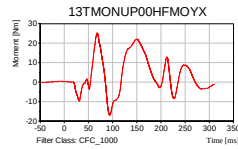
Test Number: M20170100

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

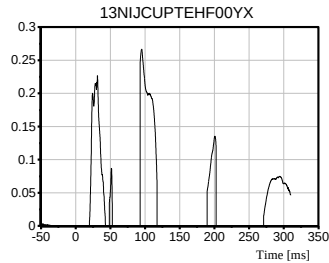


Dummy: HIII 5th Female
Seating Position:
Right Front Passenger

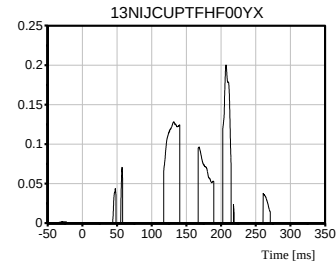
NIJ Source Code: (Fz/Fzc)+(Myc/Myc)



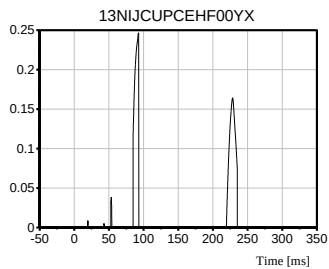
TRC Inc. Test Lab: CTF
Test Number: 160830



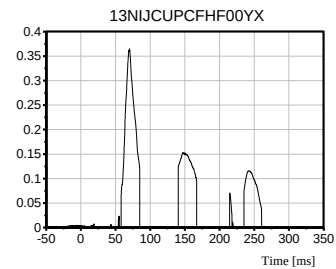
Max [NTE] 0.2668 at 95.20 ms



Max [NTF] 0.2003 at 207.12 ms



Max [NCE] 0.2467 at 92.96 ms



Max [NCF] 0.3646 at 70.24 ms

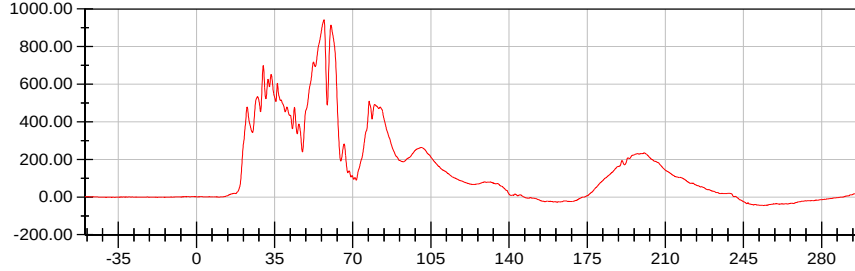
NHTSA

Test Lab: Transportation Research Center, Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)
Test Number: 160830 (M20170100)

Test Date: 08/30/2016

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

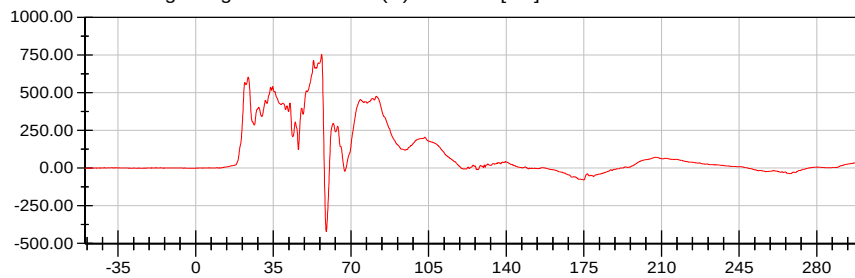
942.83 N at 57.12 ms

<Min>

-44.88 N at 253.92 ms

CFC_600

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



<Max>

754.91 N at 56.80 ms

<Min>

-421.13 N at 58.88 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. 38

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	880	Yes
B	Shoulder Pivot Height	505.5 - 520.7	515	Yes
C	H-Point Height	83.8 - 88.9	87	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	295	Yes
H	Skull Cap To Backline	40.6 - 45.7	45	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	340	Yes
J	Elbow Rest Height	190.5 - 210.8	200	Yes
K	Buttock Knee Length	579.1 - 604.5	599	Yes
L	Popliteal Height	429.3 - 454.7	440	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	429	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	865	Yes
AA	Location For Chest Circumference	429.3 - 434.3	430	Yes
BB	Location For Waist Circumference	226.1 - 231.1	230	Yes

Comments:



Revised 8/10/12

Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 037 Certification No. 38-1

Test Date: 8/22/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	251.7 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	5.5 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

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

08.22.2016 11:50:09 610

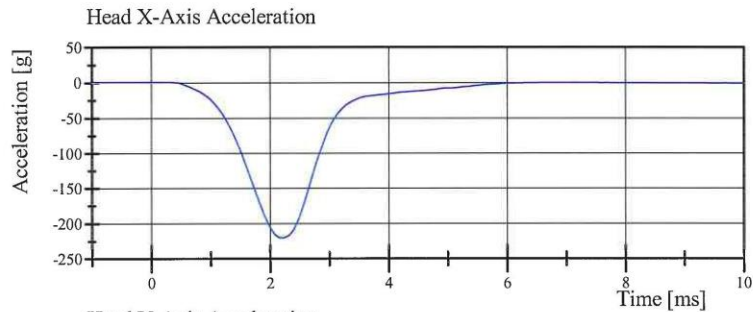


Transportation Research Center Inc.

Front Head Drop

IIII 50th Serial No. 037 Certification No. 38-1

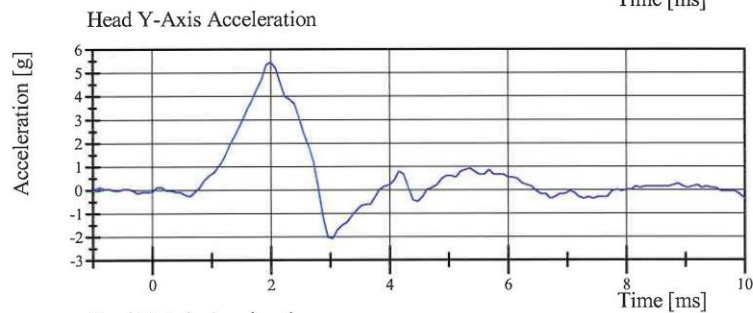
Test Date: 8/22/2016



Filter Class: CFC_1000

Max: 0.1 g at -1.0 ms

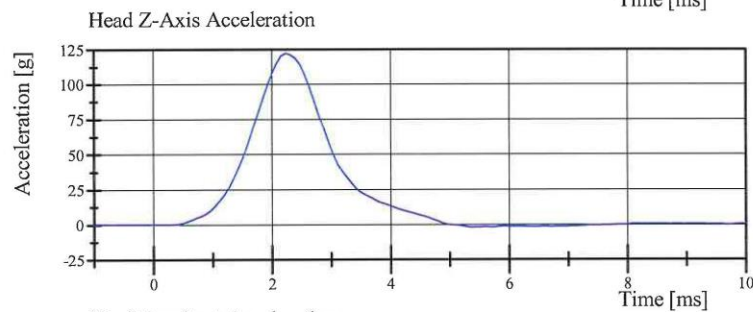
Min: -220.3 g at 2.2 ms



Filter Class: CFC_1000

Max: 5.5 g at 2.0 ms

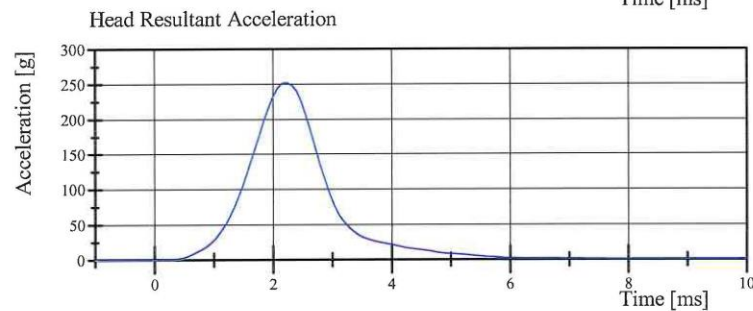
Min: -2.1 g at 3.0 ms



Filter Class: CFC_1000

Max: 121.9 g at 2.2 ms

Min: -2.0 g at 5.4 ms



Filter Class: CFC_1000

Max: 251.7 g at 2.2 ms

Min: 0.0 g at -0.6 ms

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

08.22.2016 11:50:16 610



Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 38-1

Test Date: 8/23/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.948 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	40.6 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-23.29 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-20.58 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-13.91 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-13.91 g	Yes
Total Head D-Plane Rotation			
Peak	(-64) - (-78) °	-64.2 °	Yes
Time of Peak	57 - 64 ms	60.2 ms	Yes
Total Head D-Plane Rotation			
Decay to 0°	113 - 128 ms	119.8 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	88 - 108 N·m	97.4 N·m	Yes
Time of Peak	47 - 58 ms	53.0 ms	Yes
Total Neck Occipital Condyles Moment			
Decay to 0 N·m	97 - 107 ms	101.8 ms	Yes

Test meets specifications.

Comments:

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

08.23.2016 07:19:15 3039

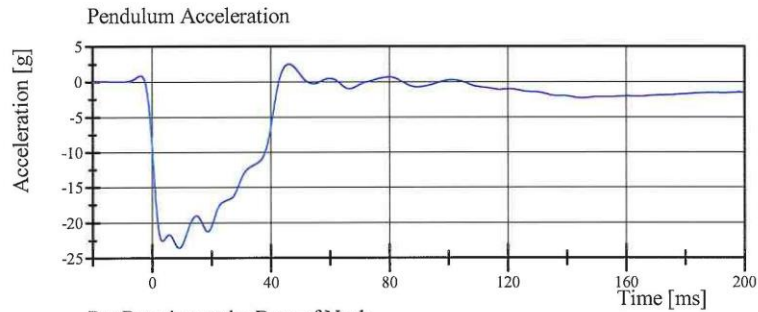


Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 38-1

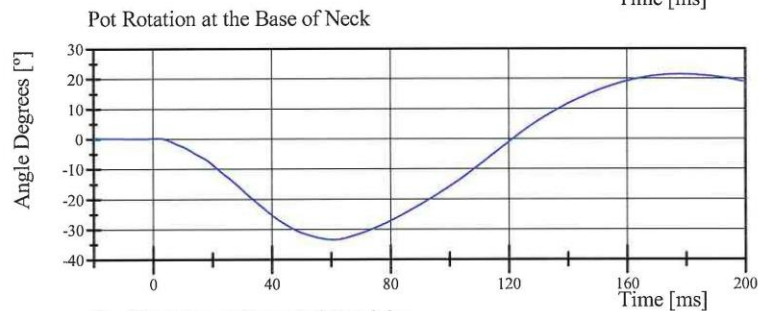
Test Date: 8/23/2016



Filter Class: CFC_60

Max: 2.4 g at 46.2 ms

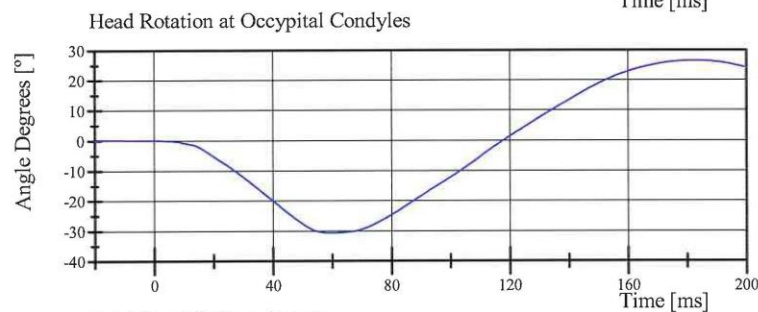
Min: -23.6 g at 9.1 ms



Filter Class: CFC_60

Max: 21.5 ° at 178.0 ms

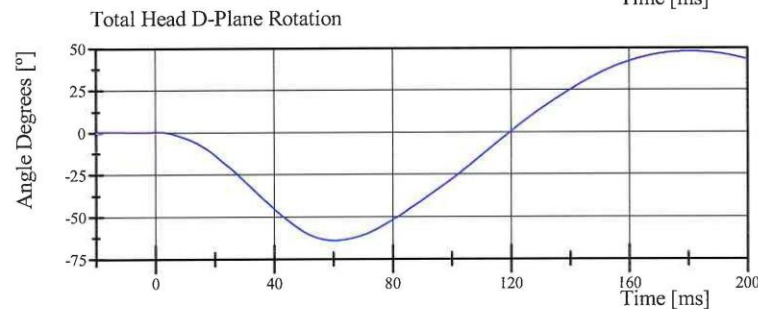
Min: -33.5 ° at 60.6 ms



Filter Class: CFC_60

Max: 26.5 ° at 182.6 ms

Min: -30.7 ° at 59.5 ms



Filter Class: CFC_60

Max: 48.0 ° at 180.6 ms

Min: -64.2 ° at 60.2 ms

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

08.23.2016 07:19:25 3039

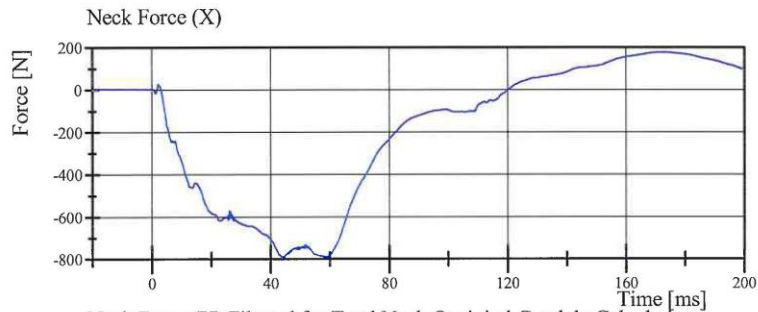


Transportation Research Center Inc.

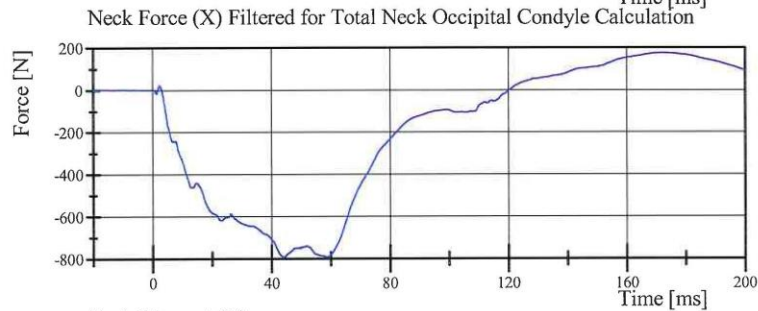
Neck Flexion

HIII 50th Serial No. 037 Certification No. 38-1

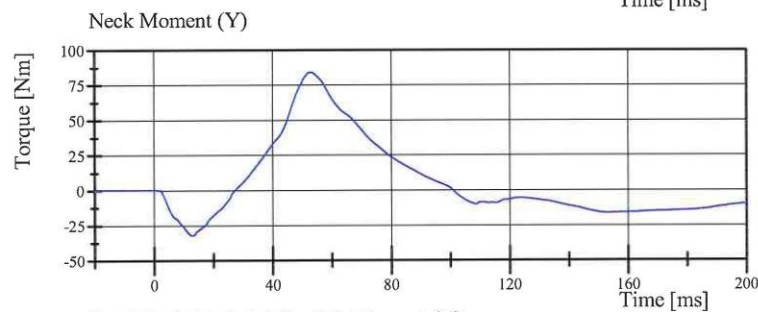
Test Date: 8/23/2016



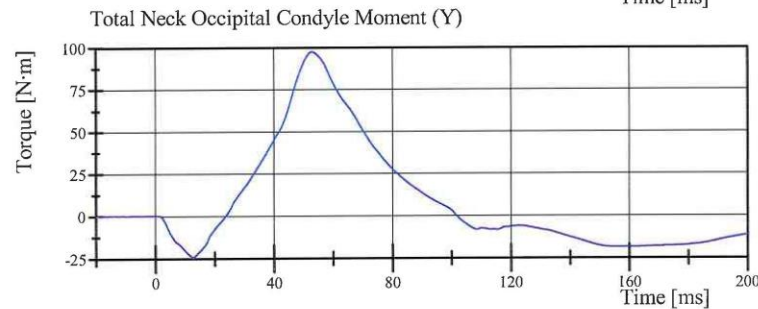
Filter Class: CFC_1000
Max: 177.2 N at 173.0 ms
Min: -795.6 N at 43.8 ms



Filter Class: CFC_600
Max: 176.6 N at 173.1 ms
Min: -792.9 N at 43.9 ms



Filter Class: CFC_600
Max: 84.2 Nm at 53.0 ms
Min: -32.4 Nm at 12.8 ms



Filter Class: Without_(Consta
Max: 97.4 N·m at 53.0 ms
Min: -24.2 N·m at 12.8 ms

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

08.23.2016 07:19:27 3039



Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 38-1

Test Date: 8/23/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-5.990 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	42.6 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	18.07 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	16.58 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	11.92 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	11.92 g	Yes
Total Head D-Plane Rotation			
Peak	81 - 106 °	92.6 °	Yes
Time of Peak	72 - 82 ms	79.0 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	160.5 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	(-53) - (-80) N·m	-66.3 N·m	Yes
Time of Peak	65 - 79 ms	72.8 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	120 - 148 ms	144.7 ms	Yes

Test meets specifications.

Comments:

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

08.23.2016 07:51:51 3132

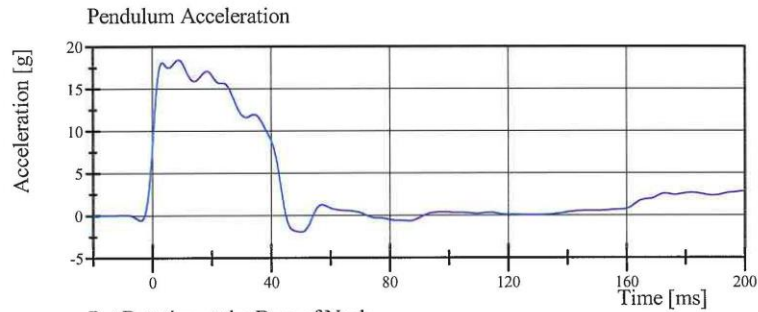


Transportation Research Center Inc.

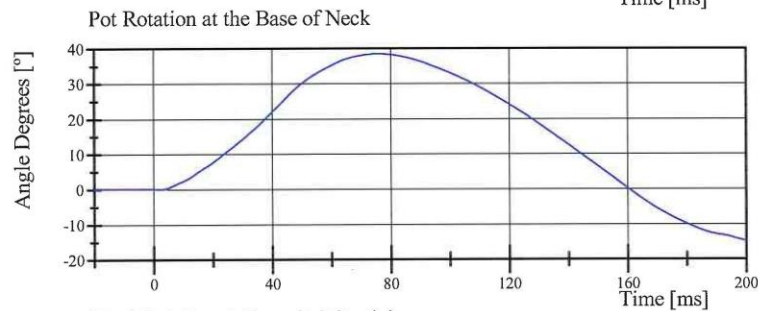
Neck Extension

HIII 50th Serial No. 037 Certification No. 38-1

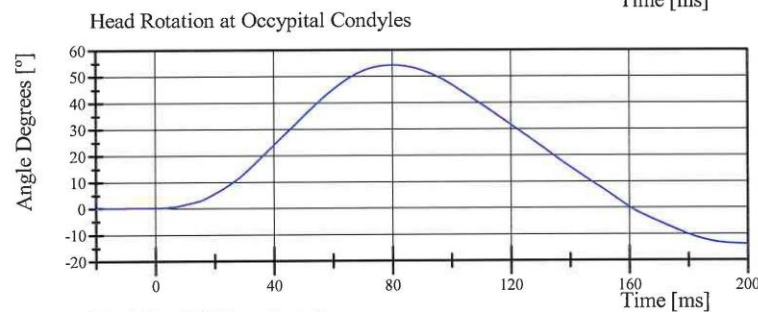
Test Date: 8/23/2016



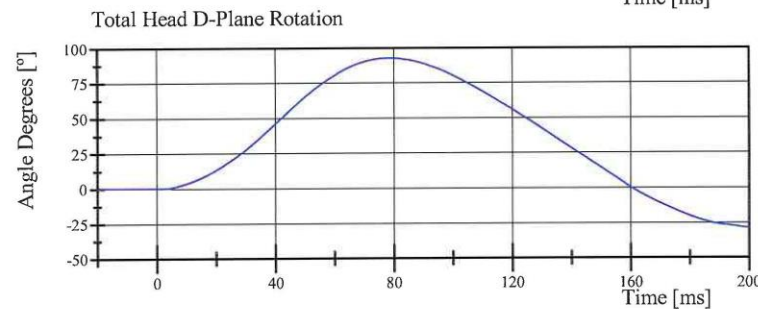
Filter Class: CFC_60
Max: 18.4 g at 8.9 ms
Min: -2.0 g at 50.1 ms



Filter Class: CFC_60
Max: 38.4 ° at 75.8 ms
Min: -14.6 ° at 200.0 ms



Filter Class: CFC_60
Max: 54.3 ° at 80.3 ms
Min: -14.0 ° at 200.0 ms



Filter Class: CFC_60
Max: 92.6 ° at 79.0 ms
Min: -28.6 ° at 200.0 ms

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

08.23.2016 07:52:27 3132

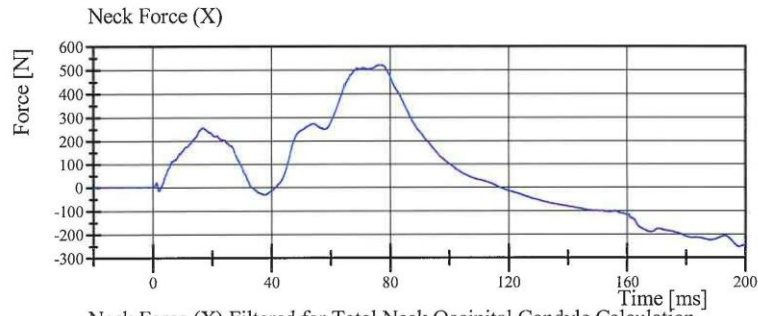


Transportation Research Center Inc.

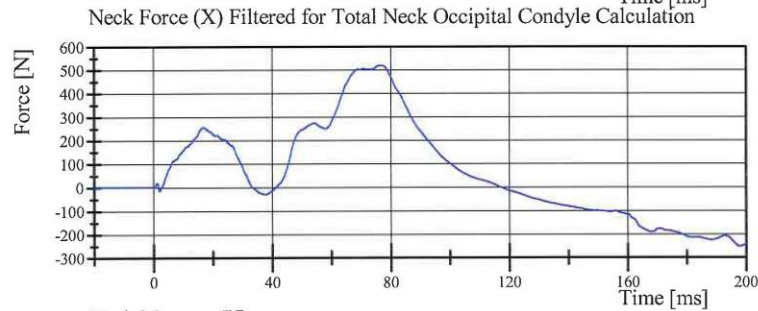
Neck Extension

HIII 50th Serial No. 037 Certification No. 38-1

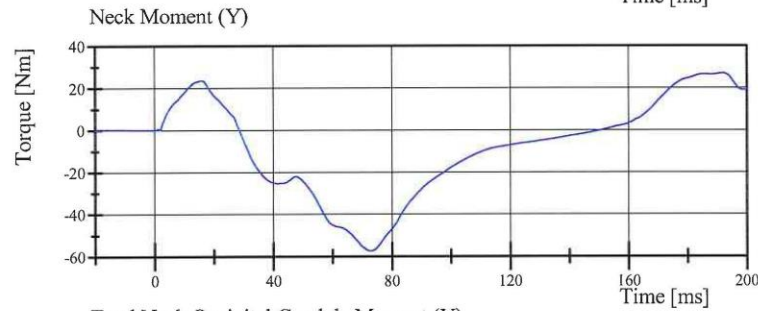
Test Date: 8/23/2016



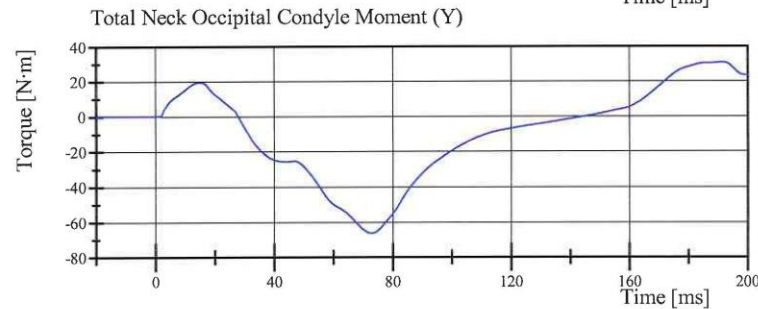
Filter Class: CFC_1000
Max: 520.1 N at 76.3 ms
Min: -253.0 N at 197.9 ms



Filter Class: CFC_600
Max: 519.8 N at 76.4 ms
Min: -252.5 N at 197.9 ms



Filter Class: CFC_600
Max: 27.1 Nm at 191.9 ms
Min: -57.4 Nm at 72.8 ms



Filter Class: Without_(Consta
Max: 30.8 N-m at 191.5 ms
Min: -66.3 N-m at 72.8 ms

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

08.23.2016 07:52:29 3132



Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 037 Certification No. 38-1

Test Date: 8/23/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.618 m/s	Yes
Probe Force Peak	(-5,160) - (-5,893) N	-5,455.4 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-70.38 mm	Yes
Internal Hysteresis	65 - 85 %	72.0 %	Yes

Test meets specifications.

Comments:

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

08.23.2016 09:50:23 439

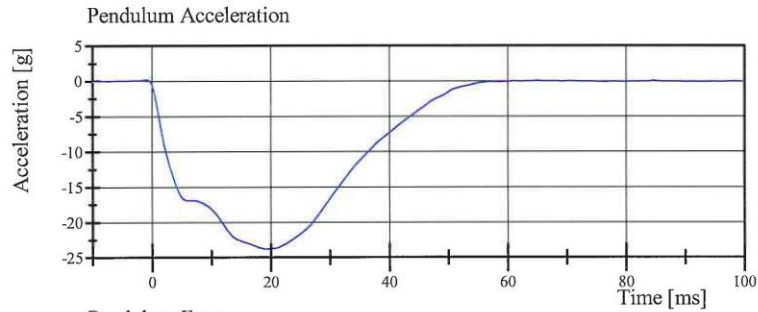


Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 037 Certification No. 38-1

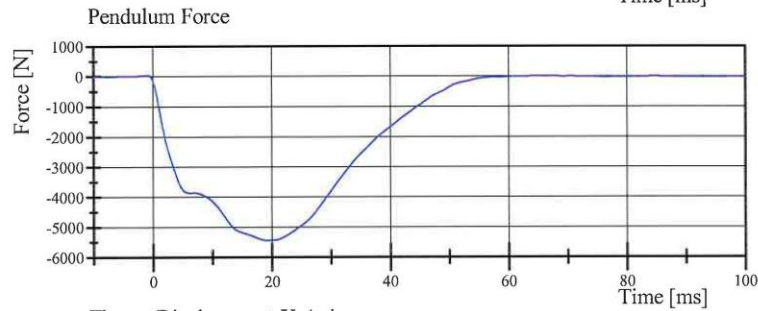
Test Date: 8/23/2016



Filter Class: CFC_180

Max: 0.1 g at -0.9 ms

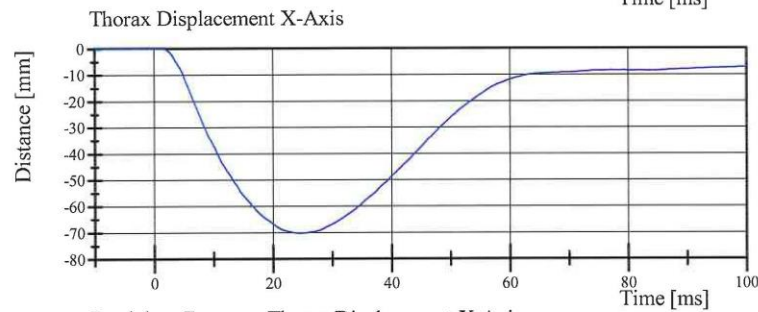
Min: -23.8 g at 19.2 ms



Filter Class: CFC_180

Max: 27.7 N at -0.9 ms

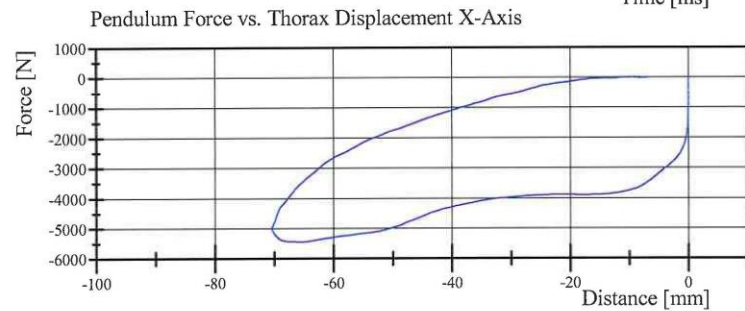
Min: -5,455.4 N at 19.2 ms



Filter Class: CFC_600

Max: 0.0 mm at -6.8 ms

Min: -70.4 mm at 24.6 ms



Filter Class: CFC_180

Max: 27.7 N at -0.0 mm

Min: -5,455.4 N at -65.4 mm

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

08.23.2016 09:50:31 439



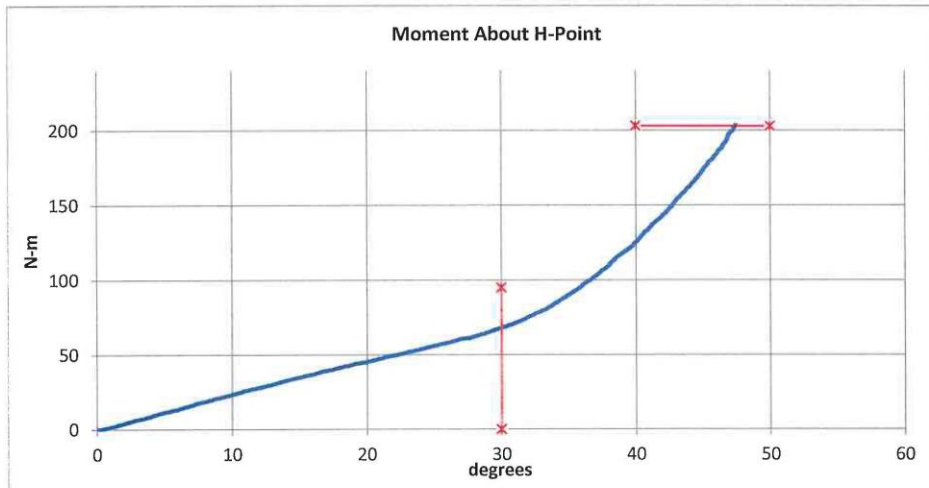
Transportation Research Center Inc.

Hybrid III 50th Male Hip Range of Motion

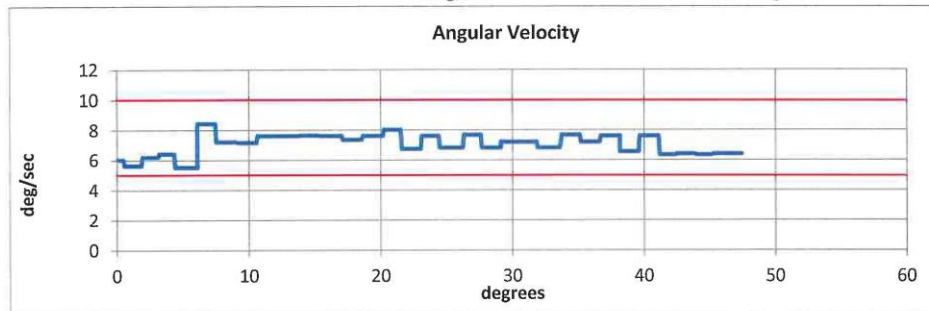


Serial Number: 037 Date: 22-Aug-2016
Side Tested: Left Hip Time: 12:57
Test Number: 1 Comments: VRTC

TEST PARAMETER	SPECIFICATION			TEST RESULTS		
Temperature	18.9	-	25.6	21.5	°C	Pass
Humidity	10	-	70	52	%	Pass
Moment at 30°	0	≤	94.9	67.94	N-m	Pass
Angle at 203 Nm	40	-	50	47.45	deg	Pass
Average Velocity	5	-	10	7.02	deg/sec	Pass



Max: 8.4 deg/sec Min: 5.5 deg/sec



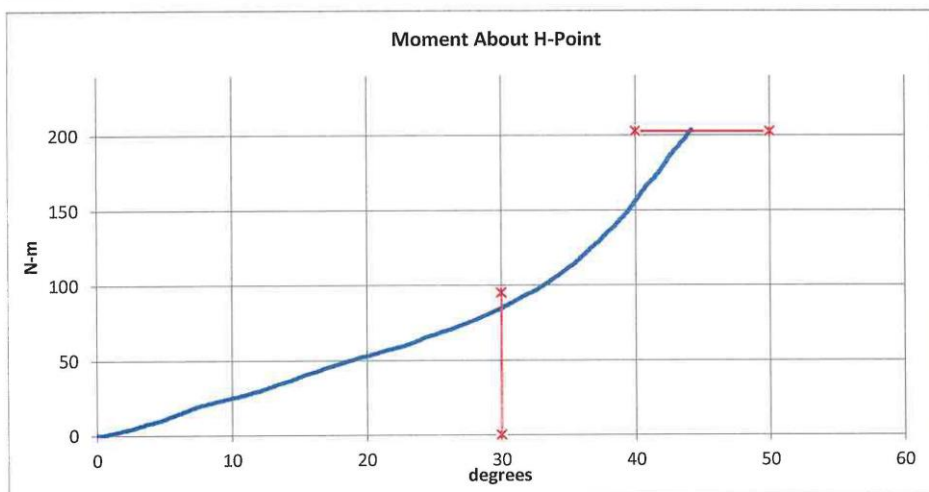
Transportation Research Center Inc.

Hybrid III 50th Male Hip Range of Motion

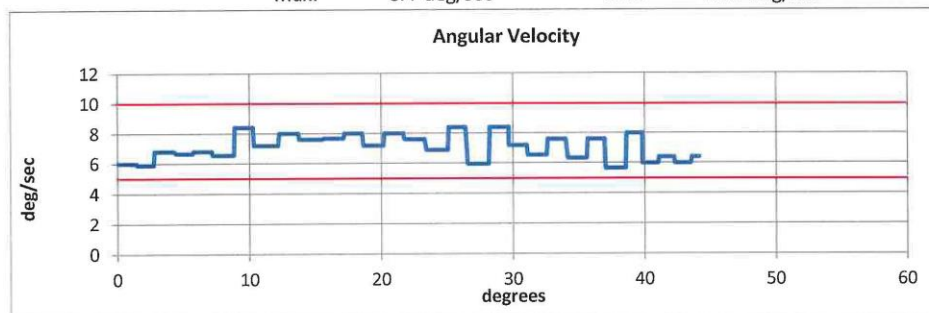


Serial Number: 037 Date: 22-Aug-2016
Side Tested: Right Hip Time: 14:02
Test Number: 1 Comments: VRTC

TEST PARAMETER	SPECIFICATION		TEST RESULTS		
Temperature	18.9	- 25.6	20.8 °C	Pass	
Humidity	10	- 70	52 %	Pass	
Moment at 30°	0	≤ 94.9	84.56 N-m	Pass	
Angle at 203 Nm	40	- 50	44.17 deg	Pass	
Average Velocity	5	- 10	7.06 deg/sec	Pass	



Max: 8.4 deg/sec Min: 5.66 deg/sec



Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 38-1
Test Date: 8/22/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.092 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,492.70 N	Yes

Test meets specifications.

Comments:

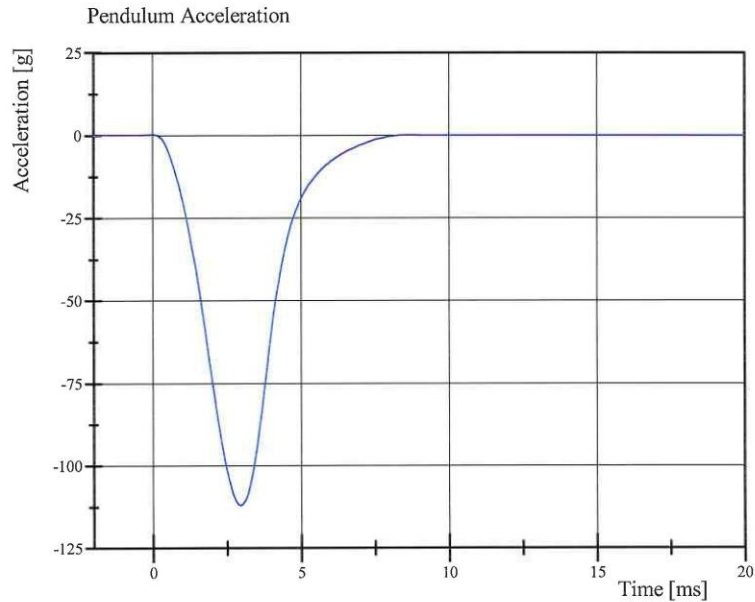
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

08.22.2016 13:18:33 1853

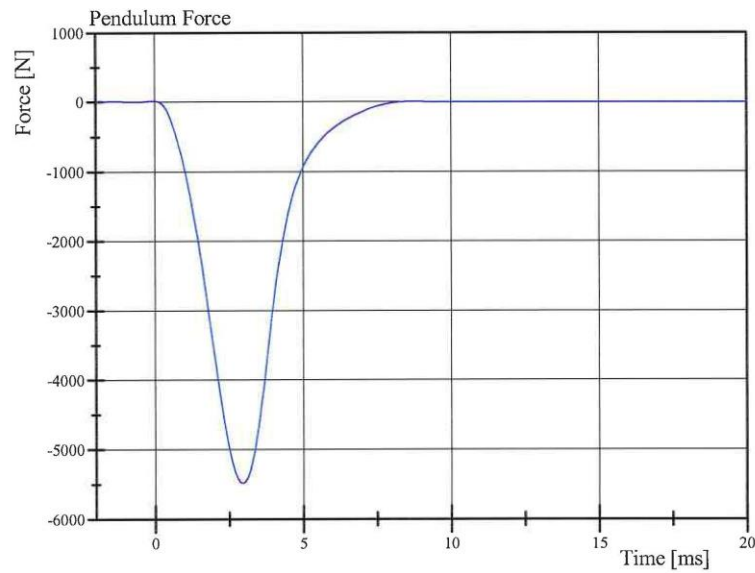


Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 38-1
Test Date: 8/22/2016



Filter Class: CFC_600
Max: 0.2 g at 0.0 ms
Min: -112.3 g at 3.0 ms



Filter Class: CFC_600
Max: 8.0 N at 0.0 ms
Min: -5,492.7 N at 3.0 ms

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

08.22.2016 13:18:39 1853



Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 38-1
Test Date: 8/22/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.096 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,571.05 N	Yes

Test meets specifications.

Comments:

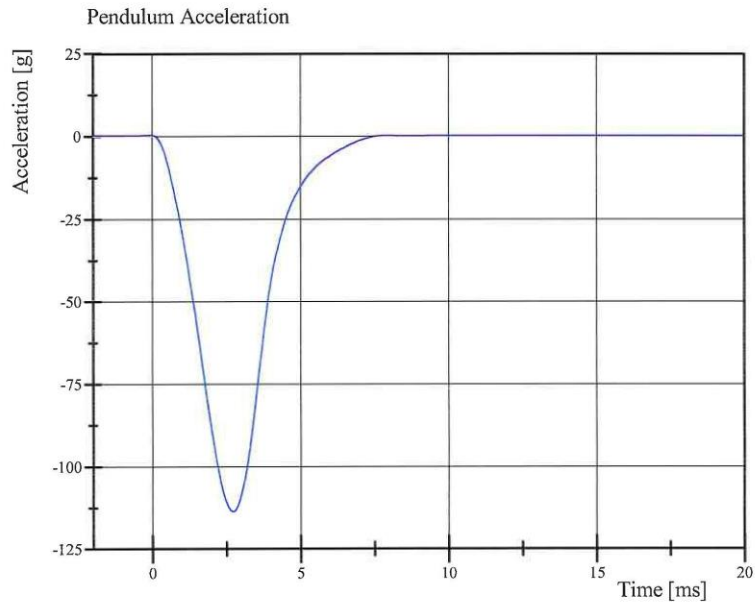
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

08.22.2016 13:21:35 1852

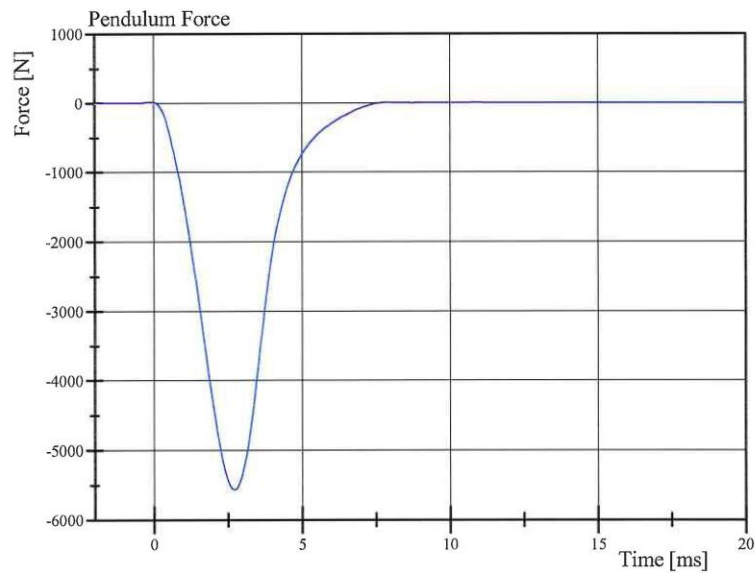


Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 38-1
Test Date: 8/22/2016



Filter Class: CFC_600
Max: 0.2 g at -0.1 ms
Min: -113.9 g at 2.7 ms



Filter Class: CFC_600
Max: 10.2 N at -0.1 ms
Min: -5,571.1 N at 2.7 ms

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

08.22.2016 13:21:44 1852



Post-Test Calibration Sheets

Driver S/N 037

Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 037
Calibration No. 39

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	881	Yes
B	Shoulder Pivot Height	505.5 - 520.7	515	Yes
C	H-Point Height	83.8 - 88.9	87	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	151	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	295	Yes
H	Skull Cap To Backline	40.6 - 45.7	45	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	340	Yes
J	Elbow Rest Height	190.5 - 210.8	199	Yes
K	Buttock Knee Length	579.1 - 604.5	599	Yes
L	Popliteal Height	429.3 - 454.7	440	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	429	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	865	Yes
AA	Location For Chest Circumference	429.3 - 434.3	430	Yes
BB	Location For Waist Circumference	226.1 - 231.1	230	Yes

Comments:



Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 037 Certification No. 39-1

Test Date: 8/31/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	259.5 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	8.1 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

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

08.31.2016 08:32:58 614

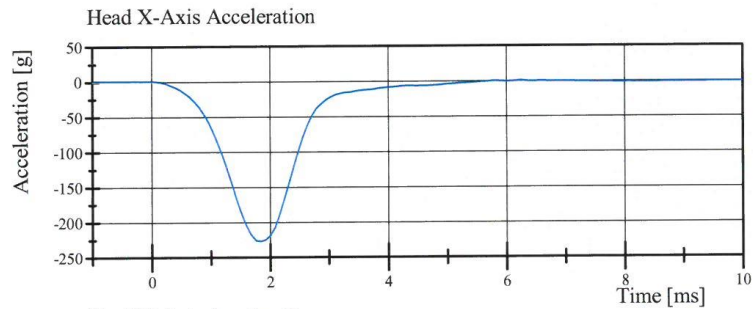


Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 037 Certification No. 39-1

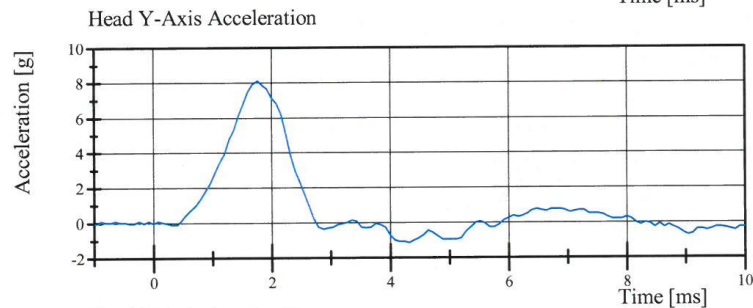
Test Date: 8/31/2016



Filter Class: CFC_1000

Max: 0.4 g at 6.2 ms

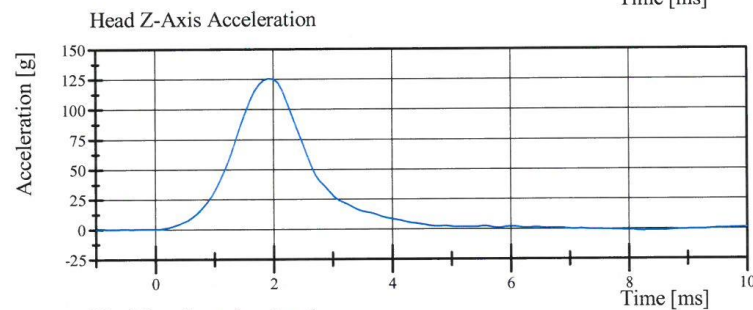
Min: -227.7 g at 1.8 ms



Filter Class: CFC_1000

Max: 8.1 g at 1.8 ms

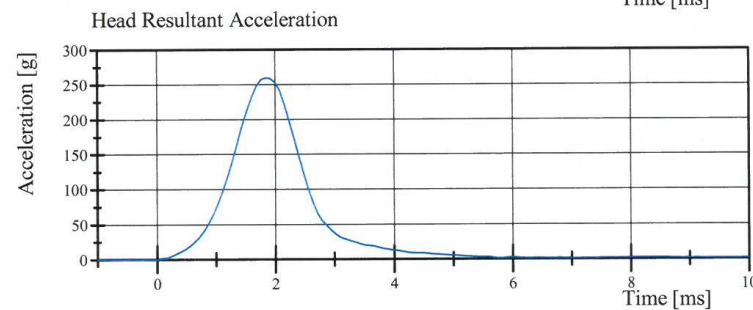
Min: -1.2 g at 4.3 ms



Filter Class: CFC_1000

Max: 125.4 g at 1.9 ms

Min: -1.3 g at 8.2 ms



Filter Class: CFC_1000

Max: 259.5 g at 1.8 ms

Min: 0.0 g at -0.7 ms

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

08.31.2016 08:33:04 614



Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 39-1

Test Date: 8/31/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.955 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	39.1 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-23.42 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-20.18 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-15.00 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-15.00 g	Yes
Total Head D-Plane Rotation			
Peak	(-64) - (-78) °	-65.9 °	Yes
Time of Peak	57 - 64 ms	59.7 ms	Yes
Total Head D-Plane Rotation			
Decay to 0°	113 - 128 ms	120.2 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	88 - 108 N·m	100.1 N·m	Yes
Time of Peak	47 - 58 ms	51.8 ms	Yes
Total Neck Occipital Condyles Moment			
Decay to 0 N·m	97 - 107 ms	100.6 ms	Yes

Test meets specifications.

Comments:

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

08.31.2016 08:48:15 3037

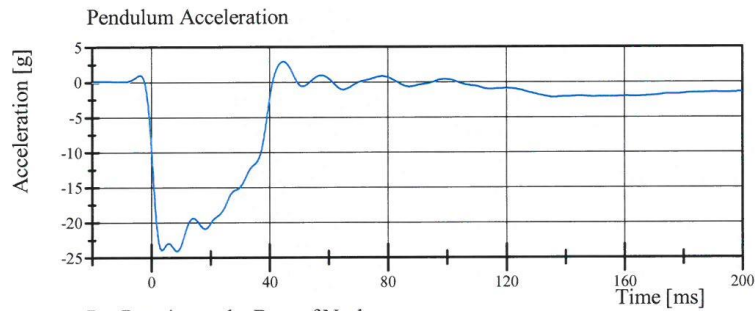


Transportation Research Center Inc.

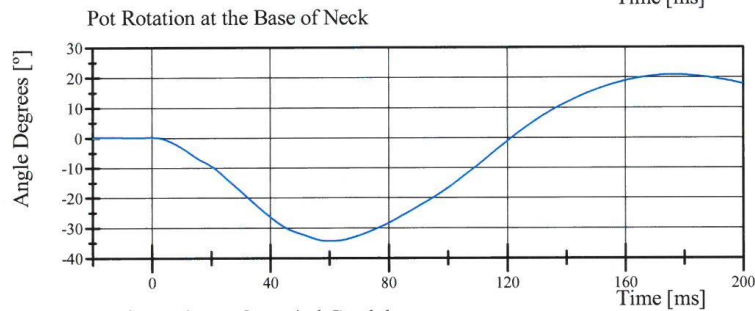
Neck Flexion

HIII 50th Serial No. 037 Certification No. 39-1

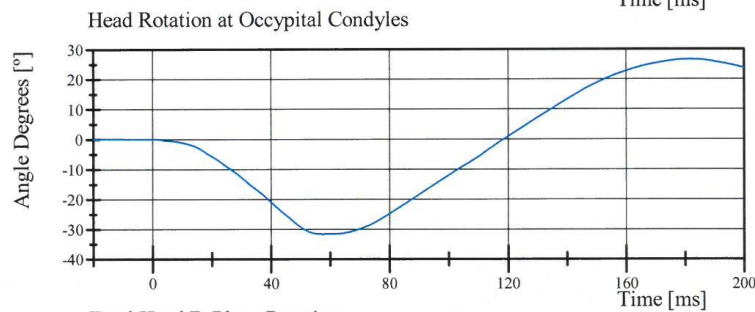
Test Date: 8/31/2016



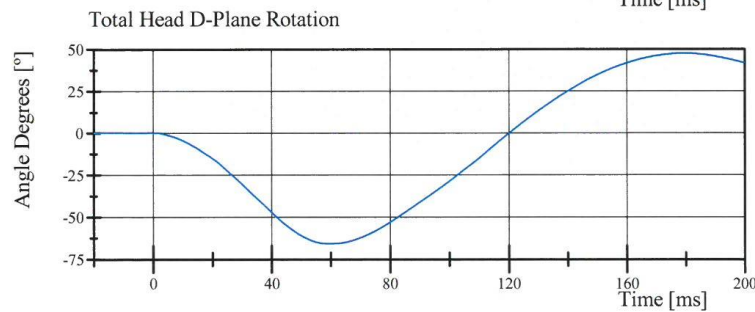
Filter Class: CFC_60
Max: 2.8 g at 44.6 ms
Min: -24.1 g at 8.6 ms



Filter Class: CFC_60
Max: 21.0 ° at 176.0 ms
Min: -34.4 ° at 60.2 ms



Filter Class: CFC_60
Max: 26.6 ° at 181.8 ms
Min: -31.6 ° at 57.6 ms



Filter Class: CFC_60
Max: 47.5 ° at 179.5 ms
Min: -65.9 ° at 59.7 ms

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

08.31.2016 08:48:21 3037

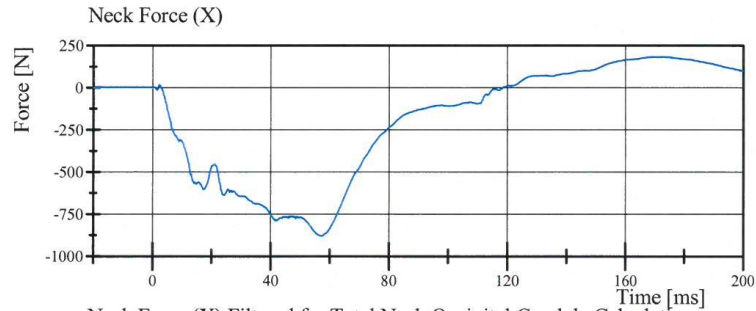


Transportation Research Center Inc.

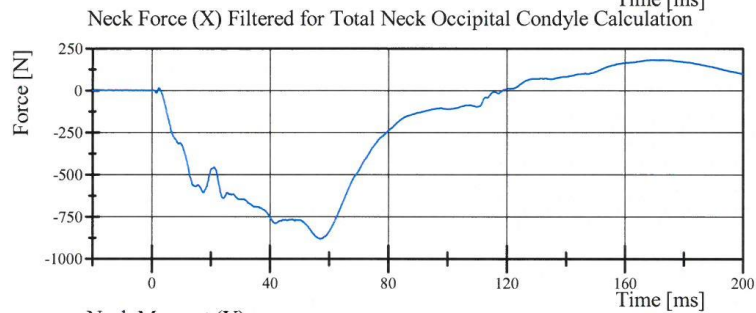
Neck Flexion

HIII 50th Serial No. 037 Certification No. 39-1

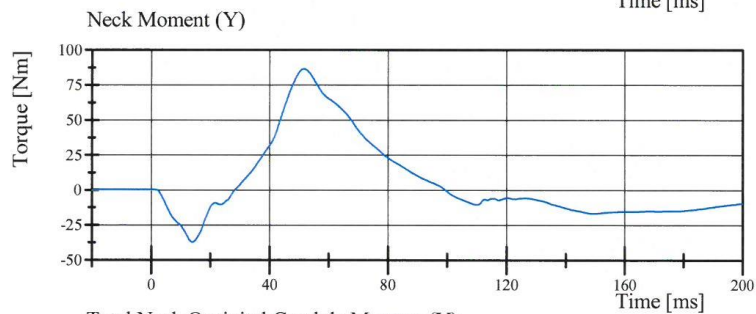
Test Date: 8/31/2016



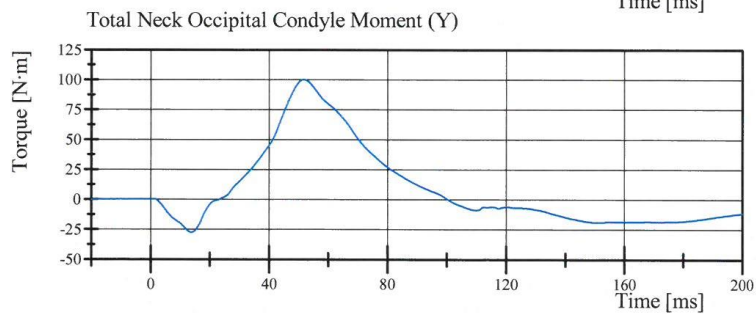
Filter Class: CFC_1000
Max: 183.5 N at 172.7 ms
Min: -881.2 N at 57.0 ms



Filter Class: CFC_600
Max: 183.0 N at 172.7 ms
Min: -881.1 N at 57.0 ms



Filter Class: CFC_600
Max: 86.2 Nm at 51.6 ms
Min: -37.6 Nm at 13.9 ms



Filter Class: Without_(Consta
Max: 100.1 N·m at 51.8 ms
Min: -27.7 N·m at 13.8 ms

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

08.31.2016 08:48:22 3037



Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 39-1

Test Date: 8/31/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-6.000 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	42.3 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	18.70 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	16.64 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	13.28 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	13.28 g	Yes
Total Head D-Plane Rotation			
Peak	81 - 106 °	91.2 °	Yes
Time of Peak	72 - 82 ms	77.8 ms	Yes
Total Head D-Plane Rotation			
Decay to 0°	147 - 174 ms	158.7 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	(-53) - (-80) N·m	-68.3 N·m	Yes
Time of Peak	65 - 79 ms	72.2 ms	Yes
Total Neck Occipital Condyles Moment			
Decay to 0 N·m	120 - 148 ms	144.7 ms	Yes

Test meets specifications.

Comments:

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

08.31.2016 09:22:57 3126

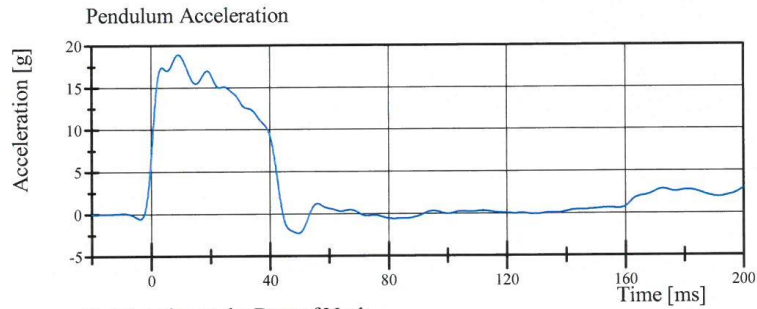


Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 39-1

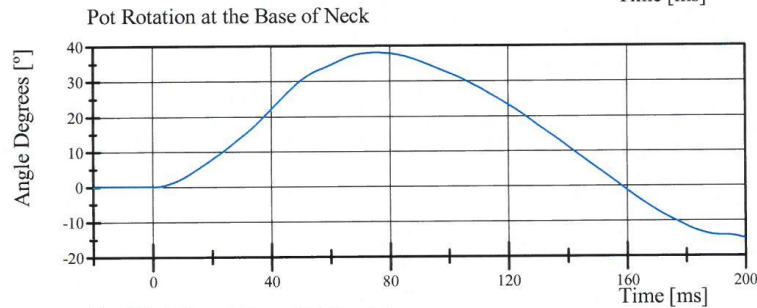
Test Date: 8/31/2016



Filter Class: CFC_60

Max: 18.9 g at 9.2 ms

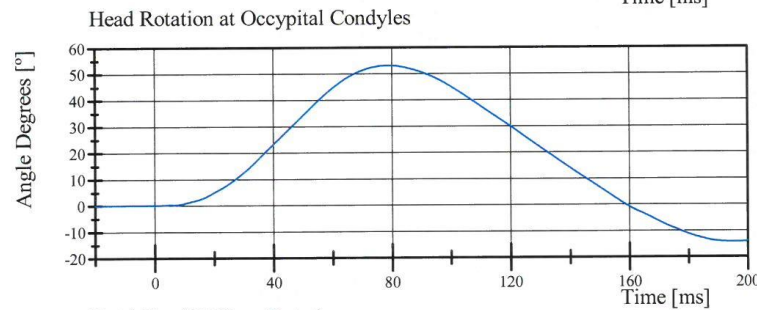
Min: -2.3 g at 49.6 ms



Filter Class: CFC_60

Max: 38.0 ° at 75.5 ms

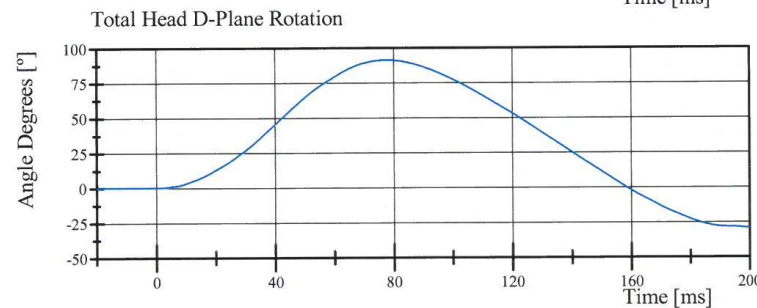
Min: -15.0 ° at 200.0 ms



Filter Class: CFC_60

Max: 53.2 ° at 79.0 ms

Min: -14.1 ° at 196.0 ms



Filter Class: CFC_60

Max: 91.2 ° at 77.8 ms

Min: -28.9 ° at 200.0 ms

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

08.31.2016 09:23:09 3126

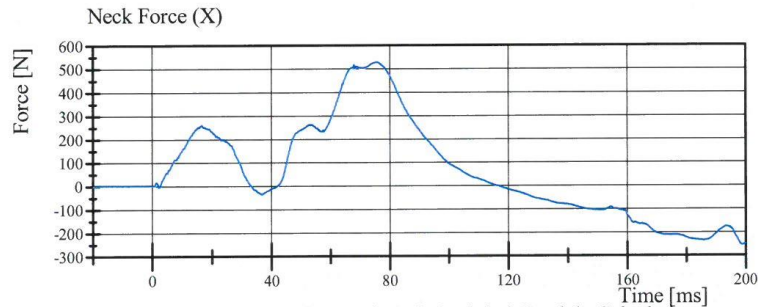


Transportation Research Center Inc.

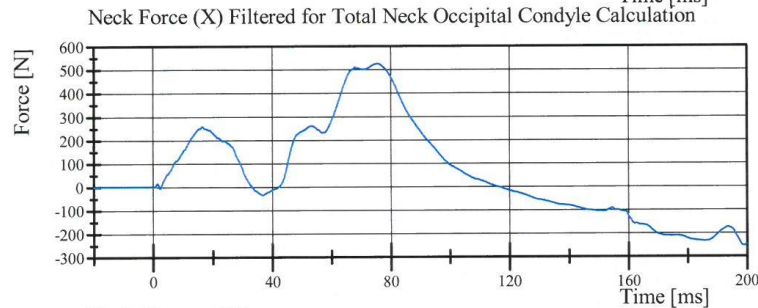
Neck Extension

HIII 50th Serial No. 037 Certification No. 39-1

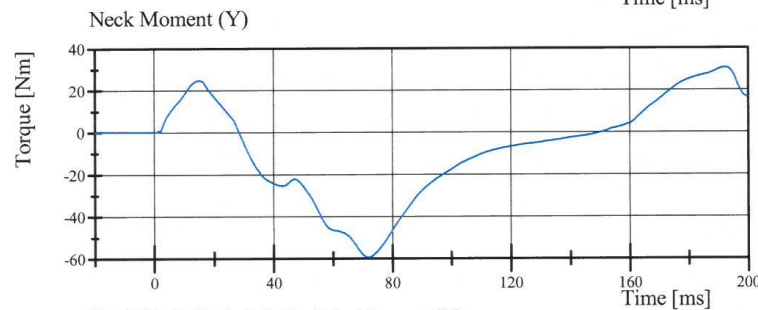
Test Date: 8/31/2016



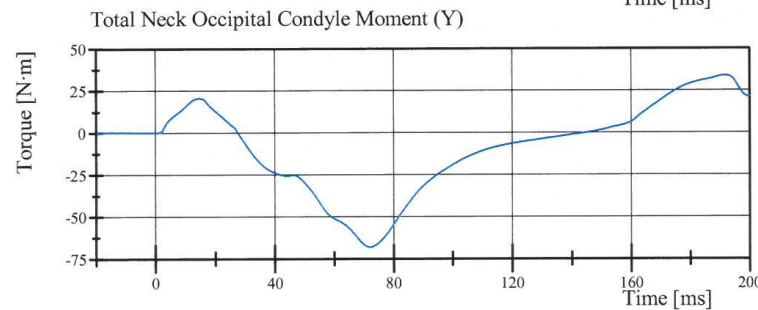
Filter Class: CFC_1000
Max: 526.1 N at 75.4 ms
Min: -254.1 N at 198.9 ms



Filter Class: CFC_600
Max: 525.7 N at 75.8 ms
Min: -253.4 N at 198.9 ms



Filter Class: CFC_600
Max: 30.7 Nm at 192.3 ms
Min: -59.3 Nm at 72.1 ms



Filter Class: Without_Constai
Max: 34.0 N·m at 191.7 ms
Min: -68.3 N·m at 72.2 ms

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

08.31.2016 09:23:10 3126



Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 037 Certification No. 39-1

Test Date: 8/31/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.669 m/s	Yes
Probe Force Peak	(-5,160) - (-5,893) N	-5,503.7 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-71.88 mm	Yes
Internal Hysteresis	65 - 85 %	72.4 %	Yes

Test meets specifications.

Comments:

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

08.31.2016 10:03:42 421

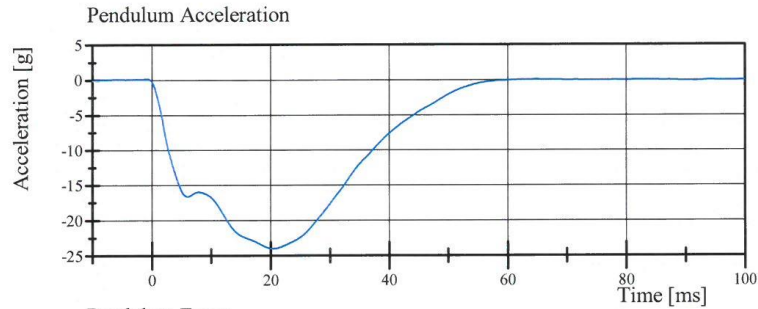


Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 037 Certification No. 39-1

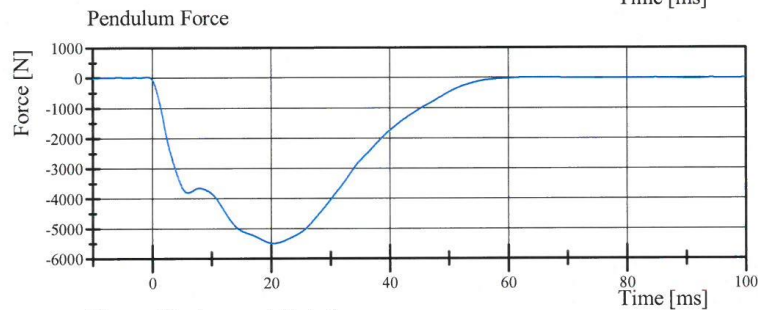
Test Date: 8/31/2016



Filter Class: CFC_180

Max: 0.1 g at -0.7 ms

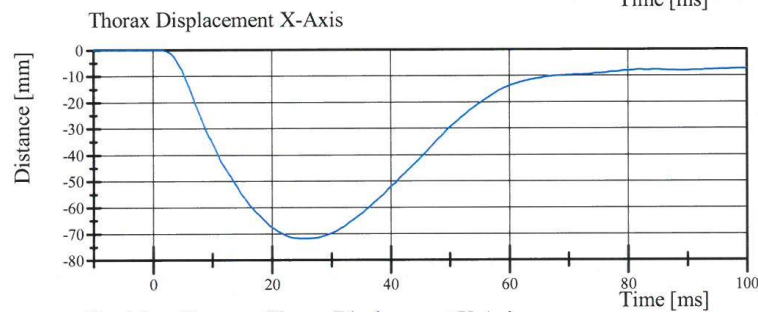
Min: -24.0 g at 20.4 ms



Filter Class: CFC_180

Max: 14.9 N at -0.7 ms

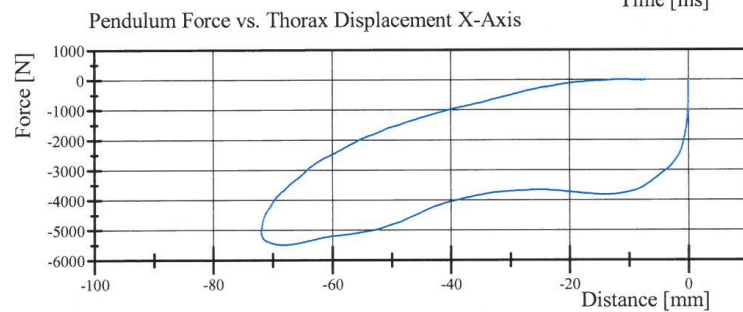
Min: -5,503.7 N at 20.4 ms



Filter Class: CFC_600

Max: 0.0 mm at -5.6 ms

Min: -71.9 mm at 25.5 ms



Filter Class: CFC_180

Max: 14.9 N at -0.0 mm

Min: -5,503.7 N at -68.0 mm

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

08.31.2016 10:03:51 421



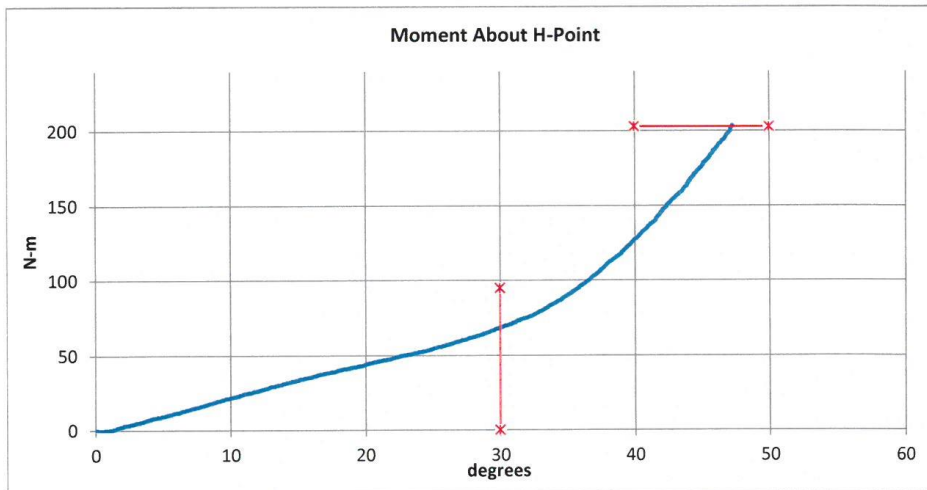
Transportation Research Center Inc.

Hybrid III 50th Male Hip Range of Motion

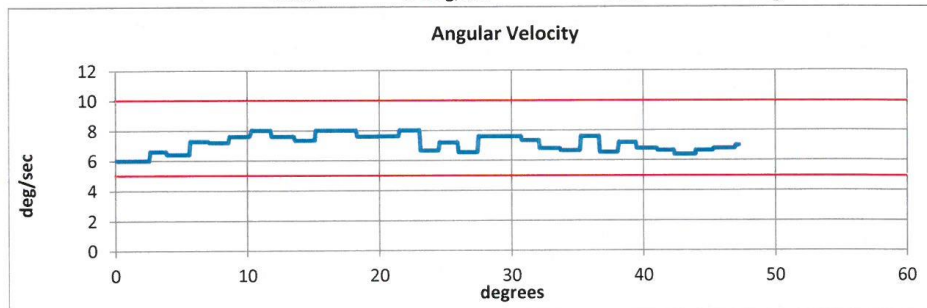


Serial Number: 037 Date: 31-Aug-2016
Side Tested: Left Hip Time: 7:44
Test Number: 1 Comments:

TEST PARAMETER	SPECIFICATION		TEST RESULTS		
Temperature	18.9	- 25.6	21.6	°C	Pass
Humidity	10	- 70	52	%	Pass
Moment at 30°	0	≤ 94.9	68.54	N-m	Pass
Angle at 203 Nm	40	- 50	47.29	deg	Pass
Average Velocity	5	- 10	7.1	deg/sec	Pass



Max: 8 deg/sec Min: 6 deg/sec



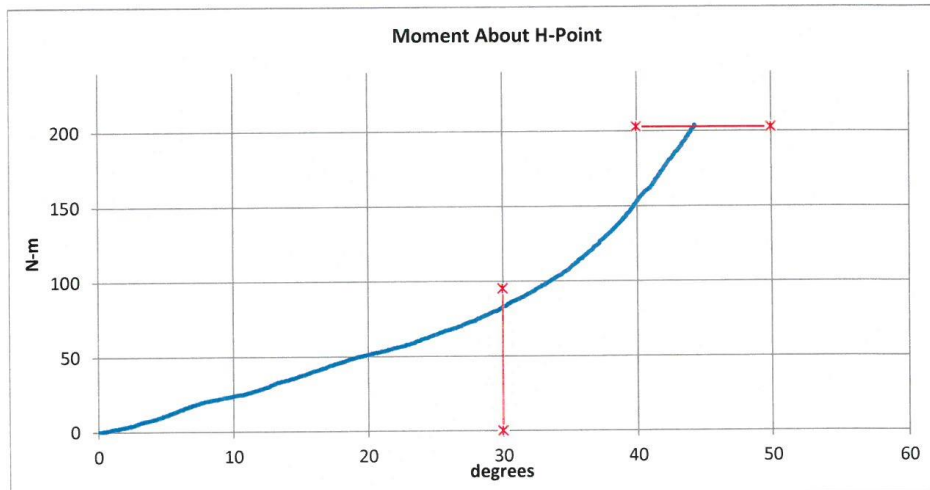
Transportation Research Center Inc.

Hybrid III 50th Male Hip Range of Motion

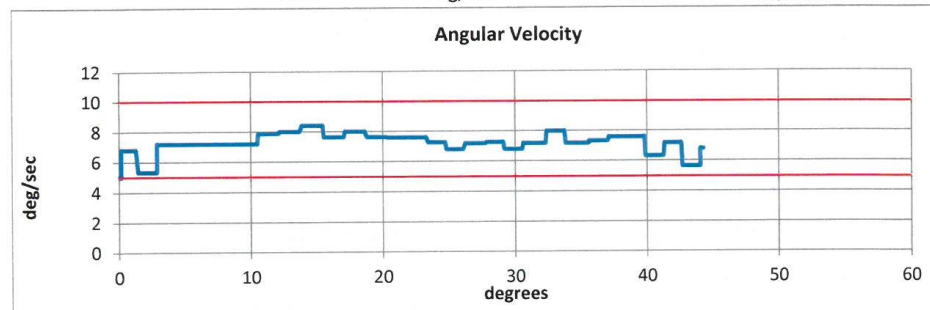


Serial Number: 037 Date: 31-Aug-2016
Side Tested: Right Hip Time: 8:44
Test Number: 1 Comments:

TEST PARAMETER	SPECIFICATION			TEST RESULTS		
Temperature	18.9	-	25.6	21.1	°C	Pass
Humidity	10	-	70	52	%	Pass
Moment at 30°	0	≤	94.9	82.78	N-m	Pass
Angle at 203 Nm	40	-	50	44.33	deg	Pass
Average Velocity	5	-	10	7.23	deg/sec	Pass



Max: 8.4 deg/sec Min: 5 deg/sec



Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 39-1
Test Date: 8/31/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.6 °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	-5,674.73 N	Yes

Test meets specifications.

Comments:

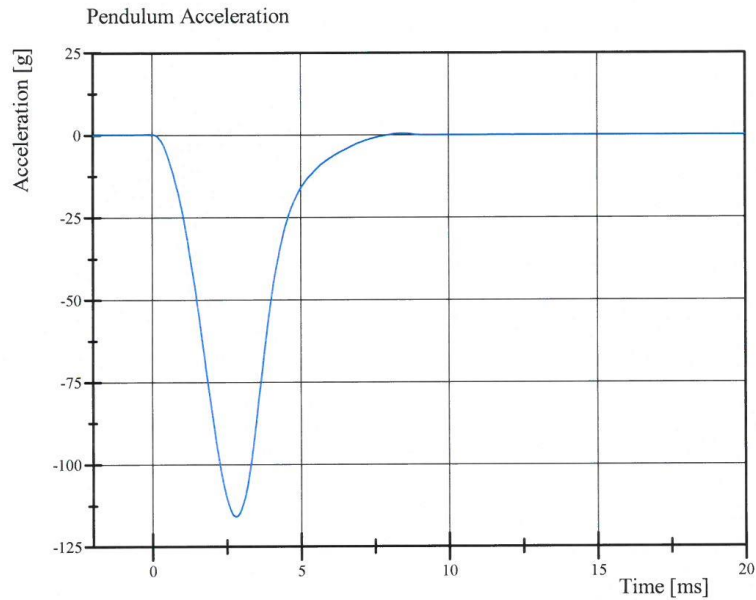
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

08.31.2016 08:17:04 1855

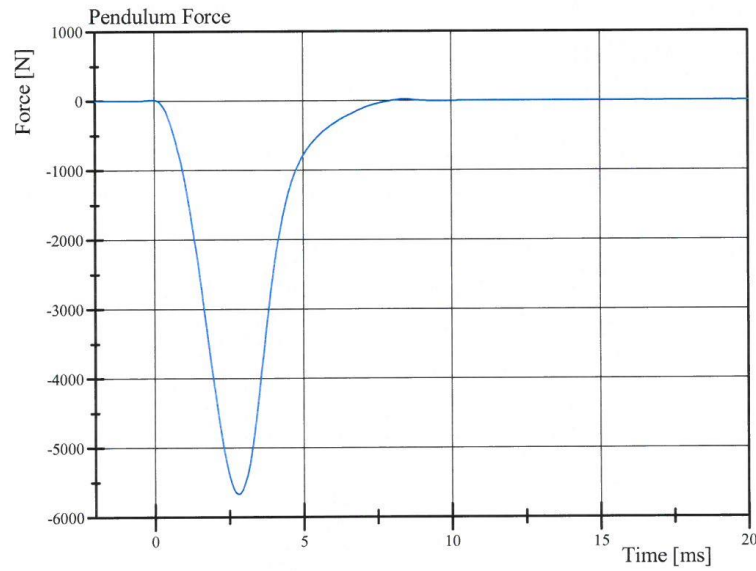


Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 39-1
Test Date: 8/31/2016



Filter Class: CFC_600
Max: 0.4 g at 8.4 ms
Min: -116.0 g at 2.8 ms



Filter Class: CFC_600
Max: 19.7 N at 8.4 ms
Min: -5,674.7 N at 2.8 ms

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

08.31.2016 08:17:17 1855



Transportation Research Center Inc.

Right Knee Femur Response Test

HIII 50th Serial No. 037 Certification No. 39-1

Test Date: 8/31/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °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	-5,698.55 N	Yes

Test meets specifications.

Comments:

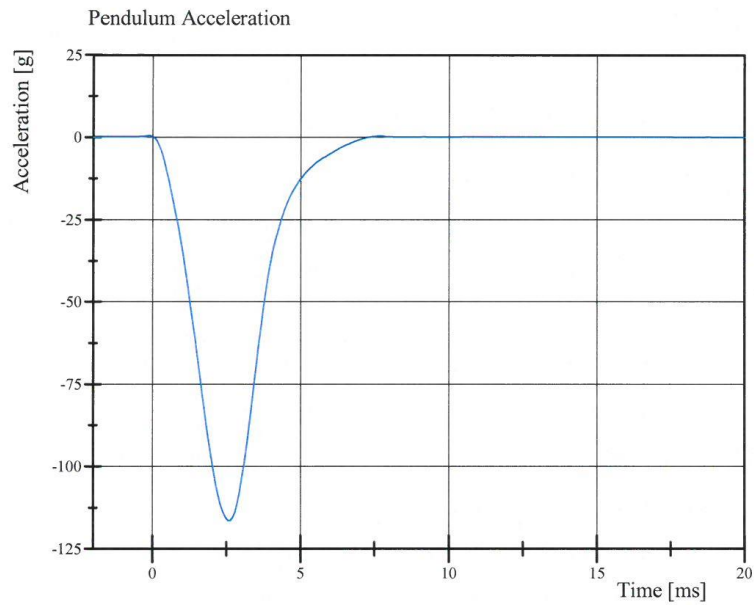
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

08.31.2016 08:19:48 1856

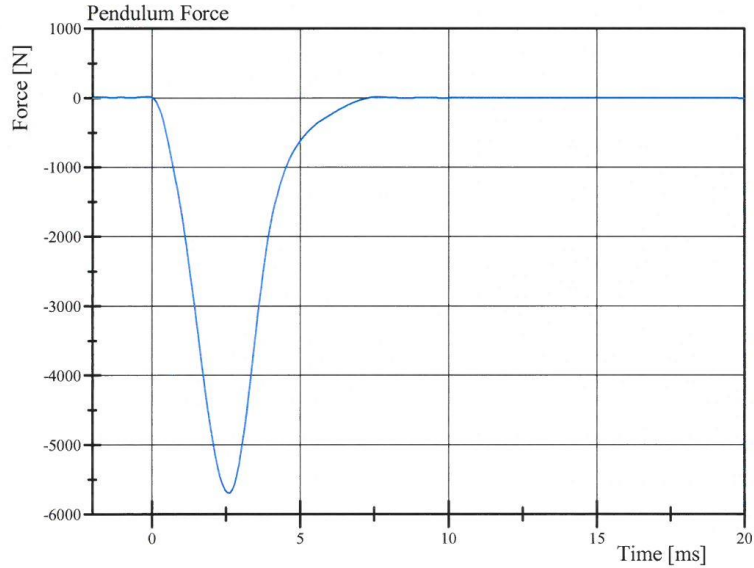


Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 39-1
Test Date: 8/31/2016



Filter Class: CFC_600
Max: 0.2 g at 7.7 ms
Min: -116.5 g at 2.6 ms



Filter Class: CFC_600
Max: 12.1 N at 7.7 ms
Min: -5,698.6 N at 2.6 ms

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

08.31.2016 08:20:31 1856



Pre-Test Calibration Sheets

Front Passenger S/N 426

Transportation Research Center Inc.
5720 HIII 5th Dummy
External Dimensions
Serial No. 426 Calibration No. 36

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	774.7 - 800.1	782	Yes
B	Shoulder Pivot Height	431.8 - 457.2	444	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	78	Yes
F	Thigh Clearance	119.4 - 134.6	128	Yes
G	Back of Elbow to Wrist Pivot	243.9 - 259.1	250	Yes
H	Head Back to Backline	43.2 - 48.2	45	Yes
I	Shoulder to Elbow Length	276.8 - 297.2	286	Yes
J	Elbow Rest Height	182.8 - 203.2	195	Yes
K	Buttock Knee Length	520.7 - 546.1	535	Yes
L	Popliteal Height	355.6 - 376.0	367	Yes
M	Knee Pivot Height	393.7 - 419.1	409	Yes
N	Buttock Popliteal Length	414.0 - 439.4	431	Yes
O	Chest Depth without Jacket	175.3 - 190.5	183	Yes
P	Foot Length	218.5 - 233.7	224	Yes
R	Buttock to Knee Pivot Length	457.2 - 482.6	473	Yes
S	Head Breadth	137.1 - 147.3	141	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	357	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	870	Yes
Z	Waist Circumference	759.5 - 789.9	775	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

Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 426 Certification No. 36-1

Test Date: 8/22/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Peak Head Resultant Acceleration	250 - 300 g	283.1 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	7.0 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

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

08.22.2016 15:38:07 609

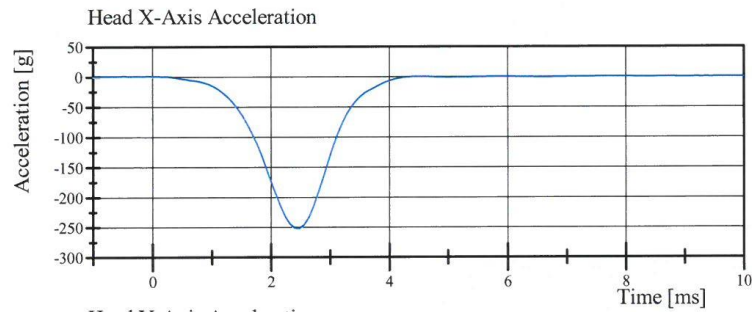


Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 426 Certification No. 36-1

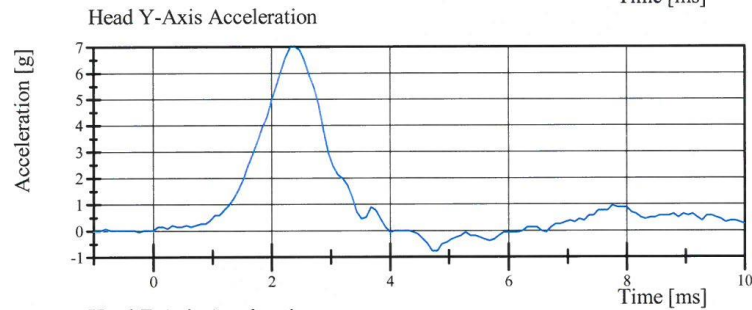
Test Date: 8/22/2016



Filter Class: CFC_1000

Max: 0.3 g at 7.8 ms

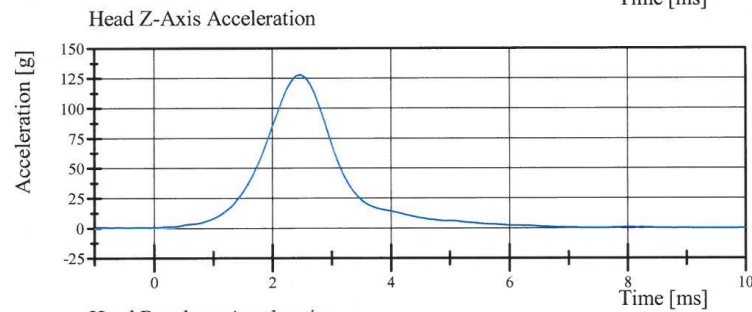
Min: -252.6 g at 2.5 ms



Filter Class: CFC_1000

Max: 7.0 g at 2.3 ms

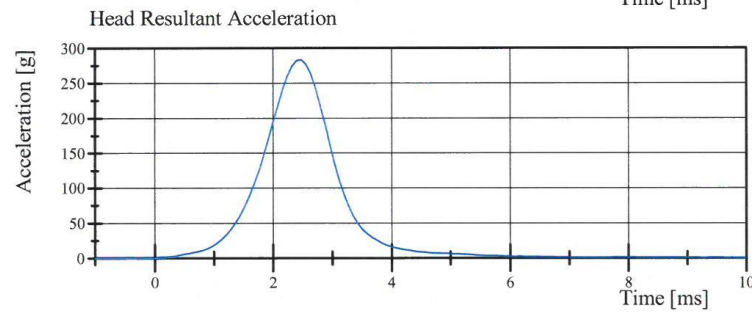
Min: -0.8 g at 4.7 ms



Filter Class: CFC_1000

Max: 127.7 g at 2.5 ms

Min: -0.2 g at 9.4 ms



Filter Class: CFC_1000

Max: 283.1 g at 2.5 ms

Min: 0.0 g at -0.9 ms

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

08.22.2016 15:38:18 609



Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 36-6

Test Date: 8/25/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	7.099 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	(-2.1) - (-2.5) m/s	-2.45 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	(-4.0) - (-5.0) m/s	-4.82 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	(-5.8) - (-7.0) m/s	-6.84 m/s	Yes
Total Head D-Plane Rotation	(-77) - (-91) °	-80.4 °	Yes
Total Neck Occipital Condyles Moment Between -77° and -91° Rotation	69 - 83 N·m	71.3 N·m	Yes
Total Neck Occipital Condyles Moment Decay to 10 N·m	80 - 100 ms	86.4 ms	Yes

Test meets specifications.

Comments:

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

08.25.2016 15:22:42 1839

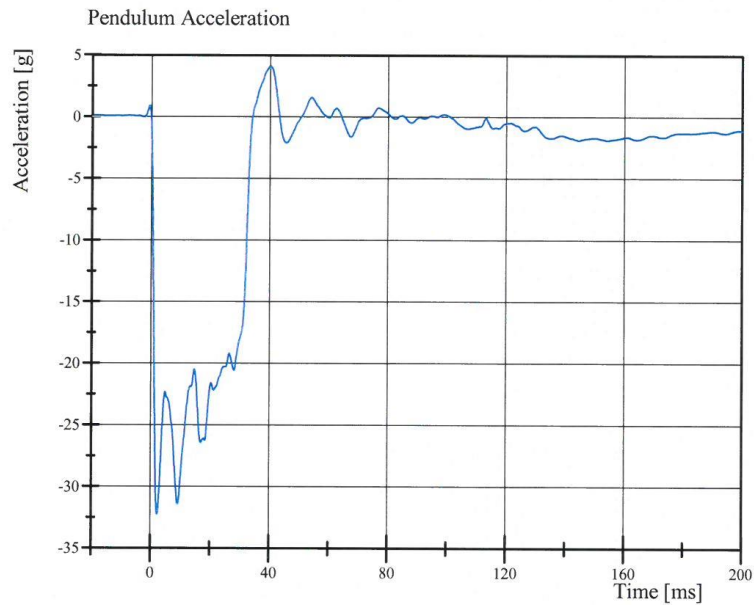


Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 36-6

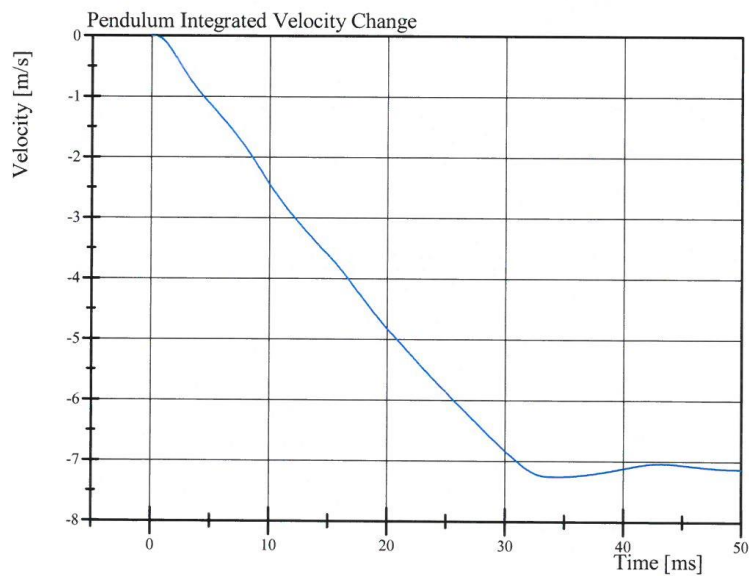
Test Date: 8/25/2016



Filter Class: CFC_180

Max: 4.0 g at 39.8 ms

Min: -32.3 g at 2.3 ms



Filter Class: CFC_180

Max: 0.0 m/s at 0.0 ms

Min: -7.3 m/s at 34.2 ms

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

08.25.2016 15:22:54 1839



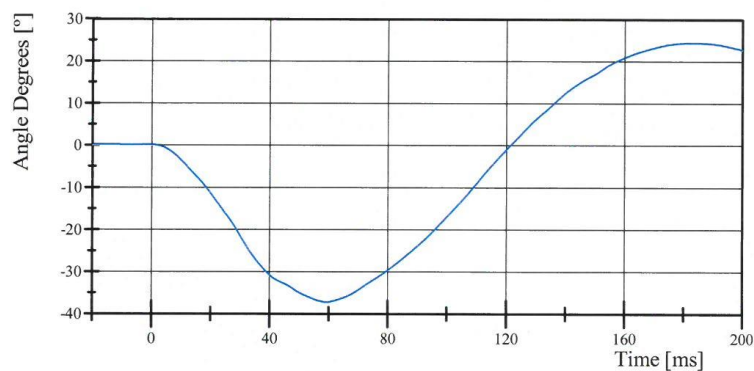
Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 36-6

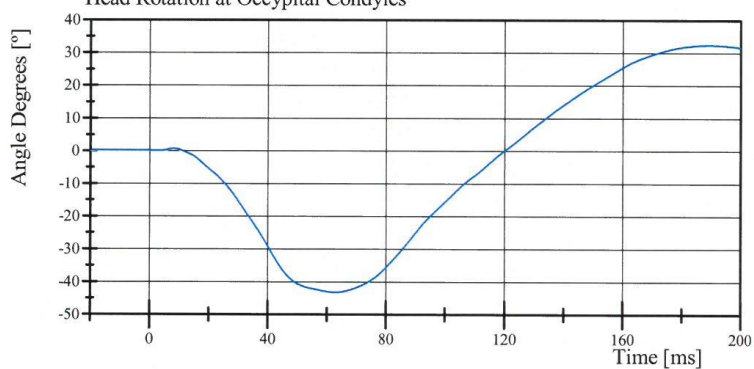
Test Date: 8/25/2016

Pot Rotation at the Base of Neck



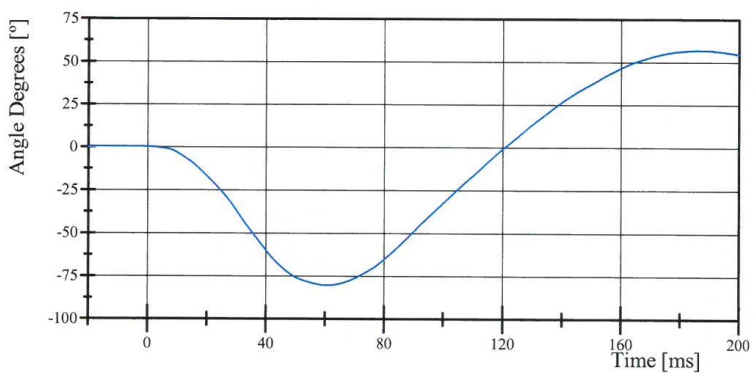
Filter Class: CFC_60
Max: 24.4 ° at 183.0 ms
Min: -37.3 ° at 59.3 ms

Head Rotation at Occipital Condyles



Filter Class: CFC_60
Max: 32.5 ° at 189.2 ms
Min: -43.4 ° at 62.8 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 56.8 ° at 187.3 ms
Min: -80.4 ° at 60.4 ms

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

08.25.2016 15:22:55 1839

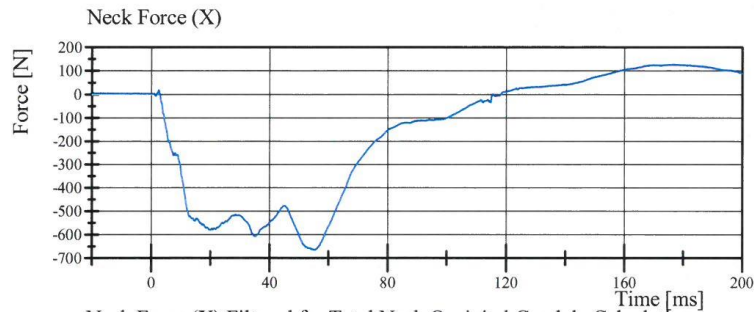


Transportation Research Center Inc.

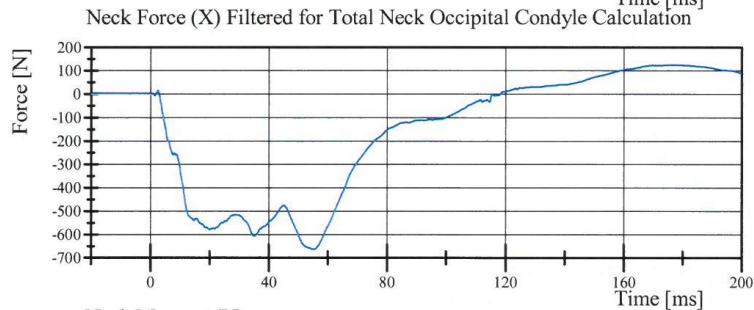
Neck Flexion

HIII 5th Serial No. 426 Certification No. 36-6

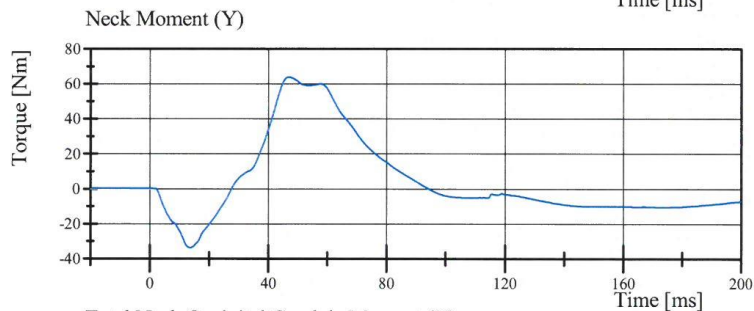
Test Date: 8/25/2016



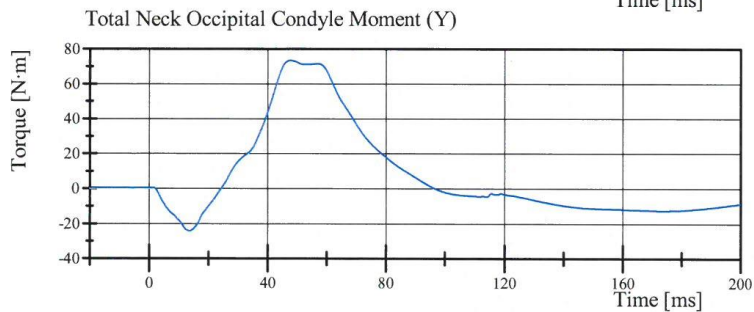
Filter Class: CFC_1000
Max: 125.6 N at 176.3 ms
Min: -666.1 N at 55.4 ms



Filter Class: CFC_600
Max: 125.4 N at 177.0 ms
Min: -665.9 N at 55.4 ms



Filter Class: CFC_600
Max: 63.7 Nm at 46.9 ms
Min: -33.9 Nm at 13.6 ms



Filter Class: Without_(Constai
Max: 73.0 N·m at 47.8 ms
Min: -24.5 N·m at 13.5 ms

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

08.25.2016 15:22:56 1839



Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 36-2

Test Date: 8/26/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Pendulum Velocity	(-5.95) - (-6.19) m/s	-6.140 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	1.5 - 1.9 m/s	1.71 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	3.1 - 3.9 m/s	3.35 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	4.6 - 5.6 m/s	4.81 m/s	Yes
Total Head D-Plane Rotation	99 - 114 °	102.3 °	Yes
Total Neck Occipital Condyles Moment Between 99° and 114° Rotation	(-53) - (-65) N·m	-53.5 N·m	Yes
Total Neck Occipital Condyles Moment Decay to -10 N·m	94 - 114 ms	106.6 ms	Yes

Test meets specifications.

Comments:

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

08.26.2016 11:01:05 3116

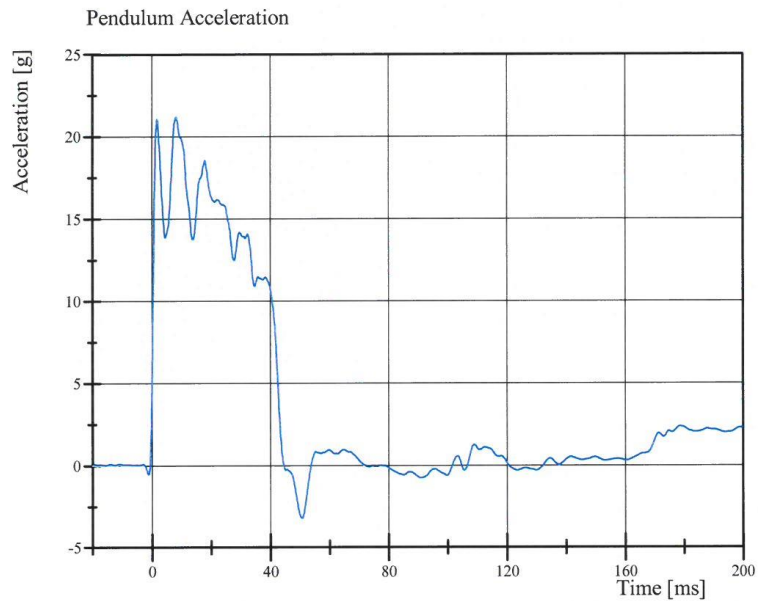


Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 36-2

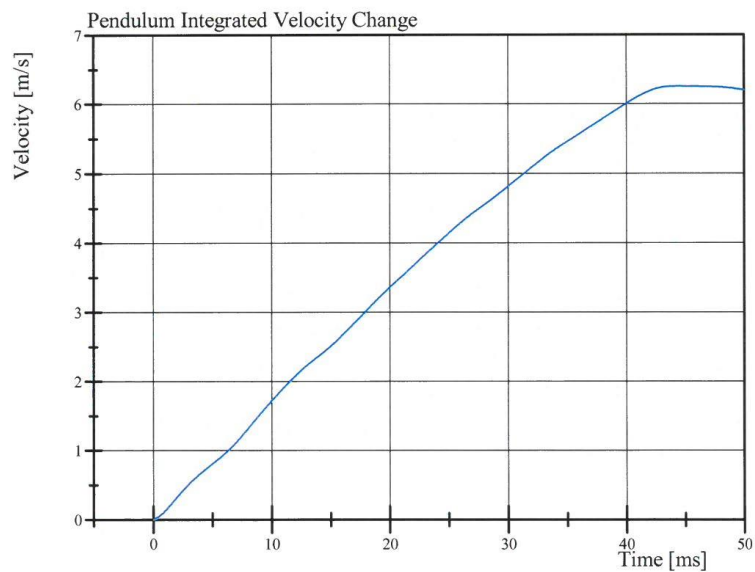
Test Date: 8/26/2016



Filter Class: CFC_180

Max: 21.1 g at 8.2 ms

Min: -3.2 g at 50.7 ms



Filter Class: CFC_180

Max: 6.3 m/s at 44.5 ms

Min: 0.0 m/s at 0.0 ms

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

08.26.2016 11:01:57 3116



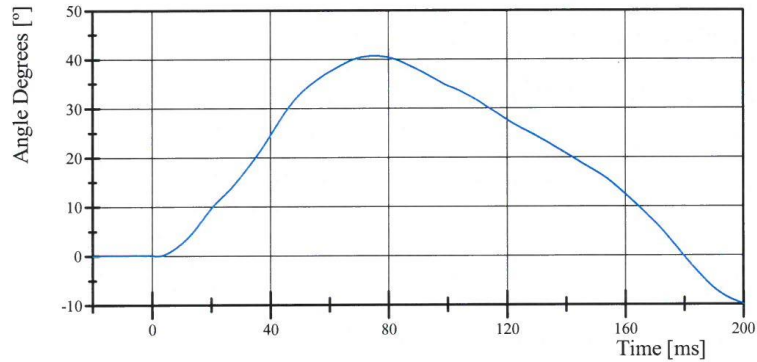
Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 36-2

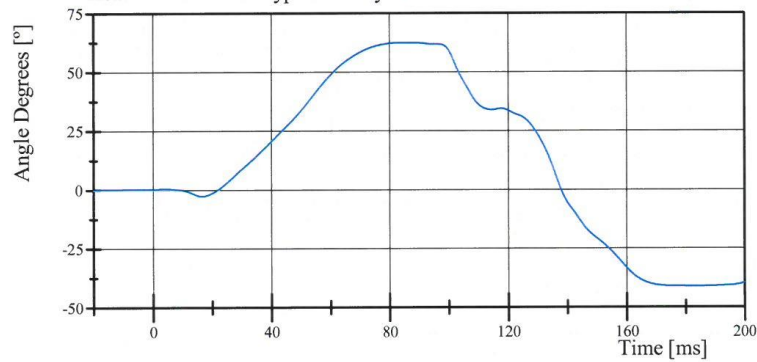
Test Date: 8/26/2016

Pot Rotation at the Base of Neck



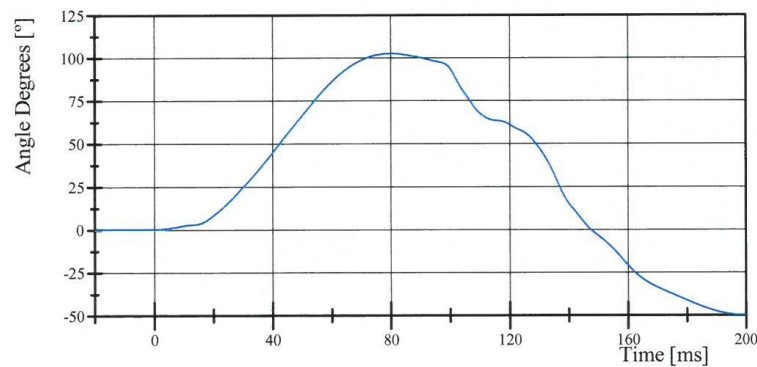
Filter Class: CFC_60
Max: 40.6 ° at 75.3 ms
Min: -9.9 ° at 200.0 ms

Head Rotation at Occipital Condyles



Filter Class: CFC_60
Max: 62.4 ° at 83.9 ms
Min: -41.1 ° at 183.4 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 102.3 ° at 80.2 ms
Min: -49.8 ° at 197.8 ms

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

08.26.2016 11:01:58 3116

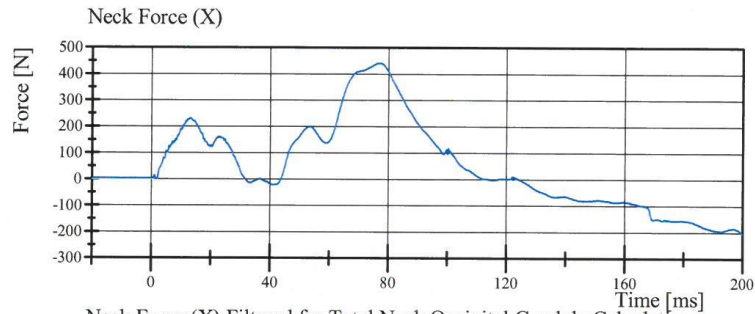


Transportation Research Center Inc.

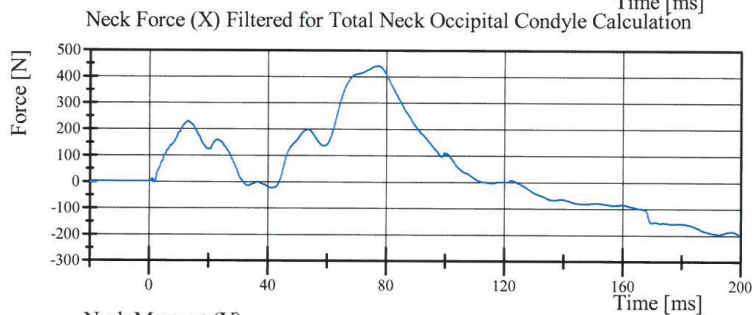
Neck Extension

HIII 5th Serial No. 426 Certification No. 36-2

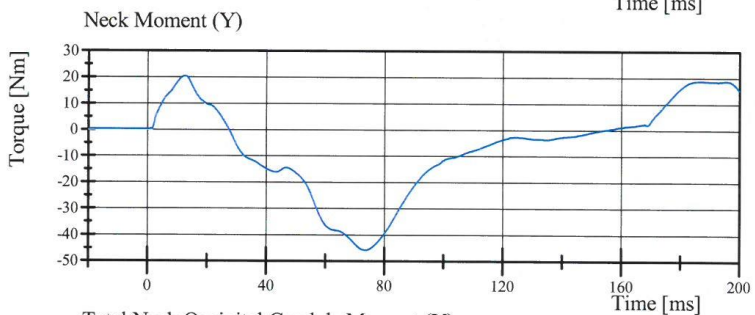
Test Date: 8/26/2016



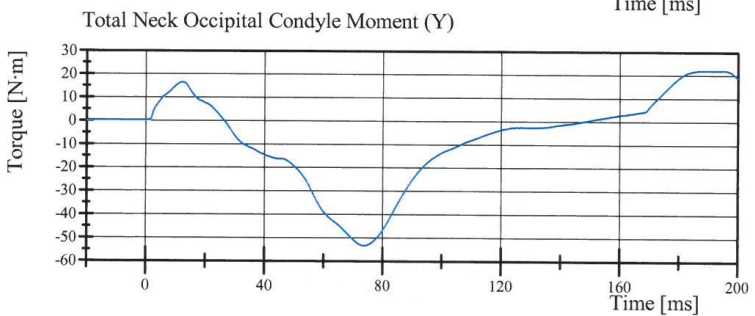
Filter Class: CFC_1000
Max: 440.0 N at 77.1 ms
Min: -204.5 N at 200.0 ms



Filter Class: CFC_600
Max: 439.8 N at 77.2 ms
Min: -204.6 N at 200.0 ms



Filter Class: CFC_600
Max: 20.2 Nm at 12.6 ms
Min: -45.9 Nm at 73.8 ms



Filter Class: Without_(Consta
Max: 22.1 N·m at 194.9 ms
Min: -53.5 N·m at 74.0 ms

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

08.26.2016 11:01:59 3116



Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. 426 Certification No. 36-2

Test Date: 8/26/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.618 m/s	Yes
Probe Force Peak Between 50.0 mm and 58.0 mm Chest Deflection	(-3,900) - (-4,400) N	-4,328.7 N	Yes
Probe Force Peak Between 18.0 mm and 50.0 mm Chest Deflection	>= (-4,600) N	-4,401.7 N	Yes
Maximum Chest Compression	(-50) - (-58) mm	-51.0 mm	Yes
Internal Hysteresis	69 - 85 %	75.0 %	Yes

Test meets specifications.

Comments:

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

08.26.2016 15:19:00 431

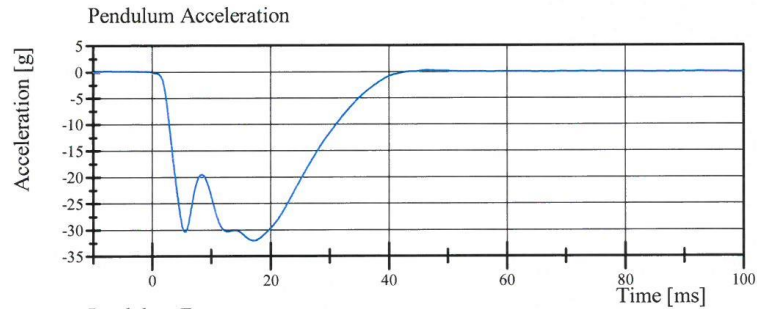


Transportation Research Center Inc.

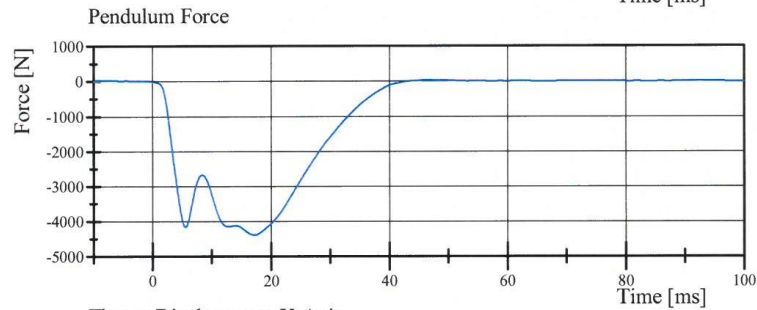
Front Thorax

HIII 5th Serial No. 426 Certification No. 36-2

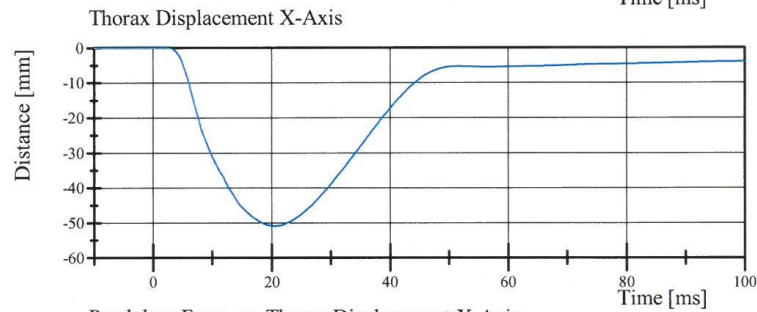
Test Date: 8/26/2016



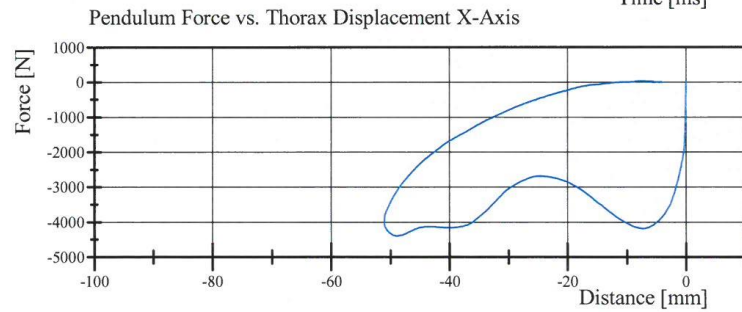
Filter Class: CFC_180
Max: 0.2 g at 46.5 ms
Min: -32.1 g at 17.1 ms



Filter Class: CFC_180
Max: 28.5 N at 46.5 ms
Min: -4,401.7 N at 17.1 ms



Filter Class: CFC_600
Max: 0.0 mm at -6.2 ms
Min: -51.0 mm at 20.5 ms



Filter Class: CFC_180
Max: 28.5 N at -7.4 mm
Min: -4,401.7 N at -48.9 mm

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

08.26.2016 15:19:06 431



Transportation Research Center Inc.

Hybrid III Small Female Torso Flexion

NHTSA

Serial Number: 426

Date: 8/25/2016

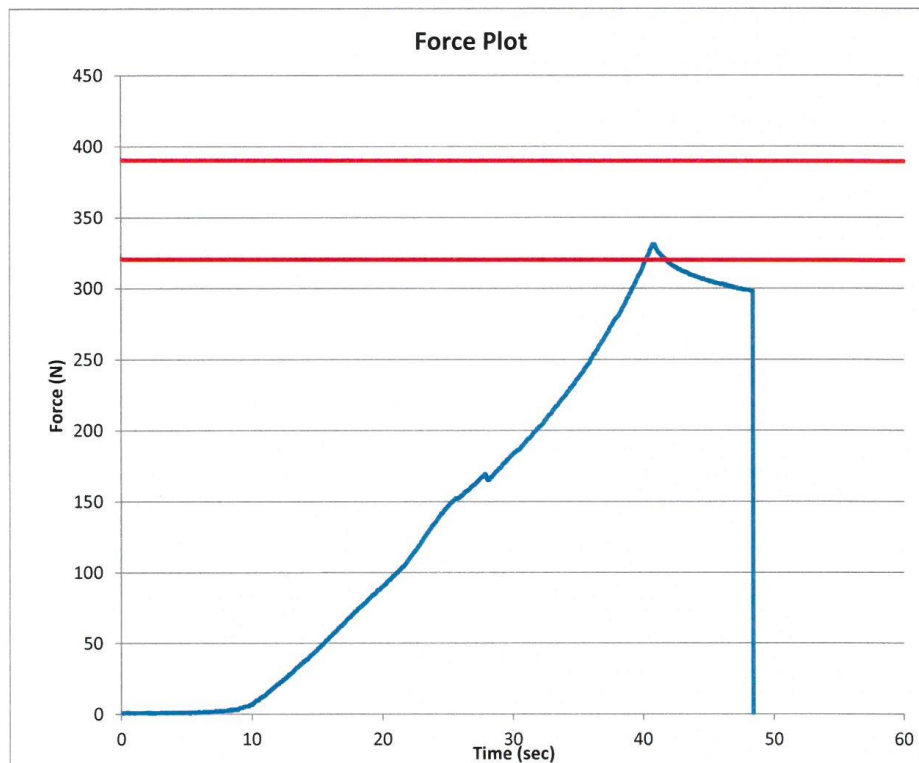
Test Number: 01

Time: 8:37

Comments:



TEST PARAMETER	SPECIFICATION		TEST RESULTS		
Temperature	18.9	- 25.6	21.1	°C	Pass
Humidity	10	- 70	52	%	Pass
Average Angular Velocity	0.5	- 1.5	0.98	deg/sec	Pass
Initial Angle	0	- 20	13.97	deg	Pass
Peak Force at 45.31°	320	- 390	330.88	N	Pass
Final Angle	-8	- 8	5.77	deg	Pass



Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 36-2
Test Date: 8/24/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.116 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,957.6 N	Yes

Test meets specifications.

Comments:

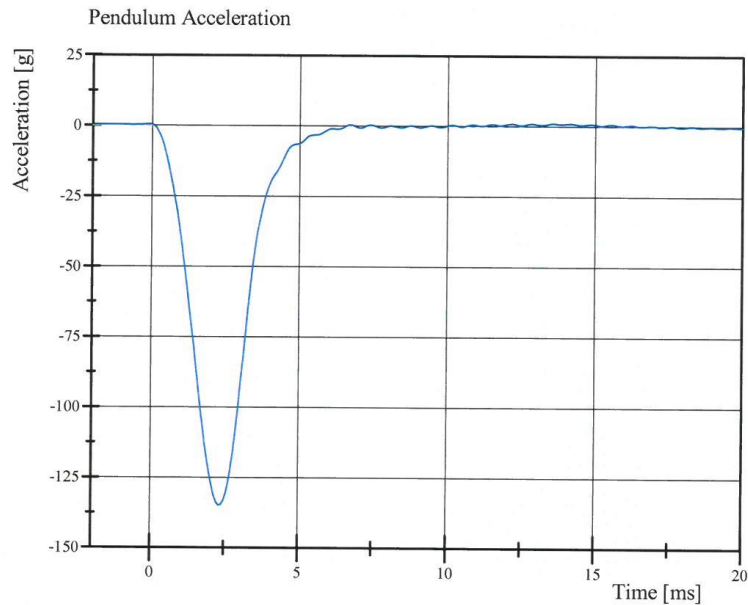
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

08.24.2016 10:31:19 1770

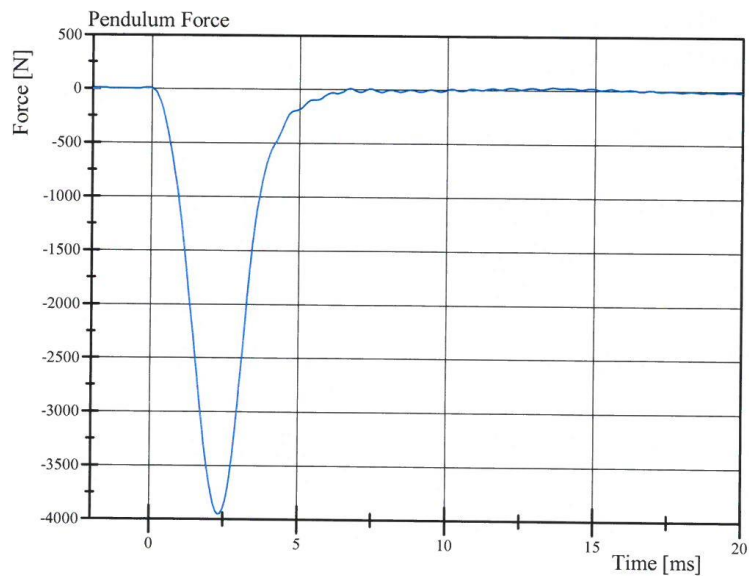


Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 36-2
Test Date: 8/24/2016



Filter Class: CFC_600
Max: 0.8 g at 13.6 ms
Min: -135.0 g at 2.3 ms



Filter Class: CFC_600
Max: 24.8 N at 13.6 ms
Min: -3,957.6 N at 2.3 ms

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

08.24.2016 10:31:32 1770



Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 36-1
Test Date: 8/24/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.093 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,858.6 N	Yes

Test meets specifications.

Comments:

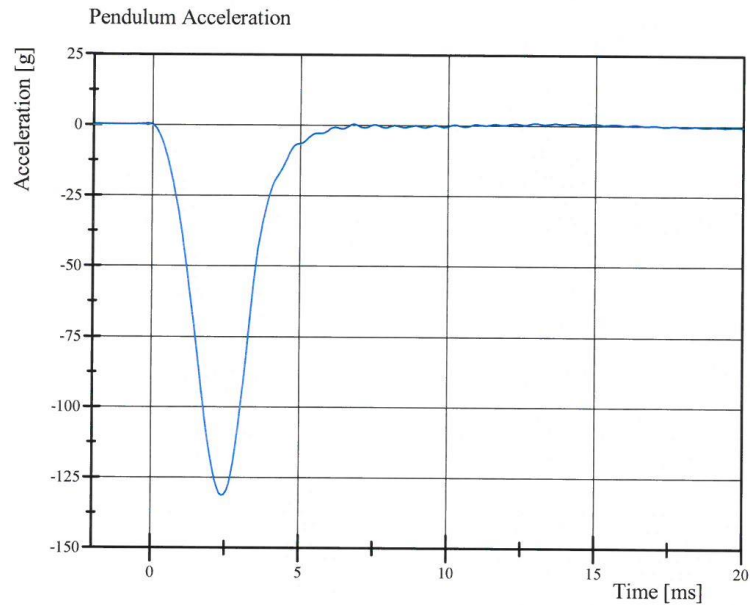
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

08.24.2016 10:44:50 1780

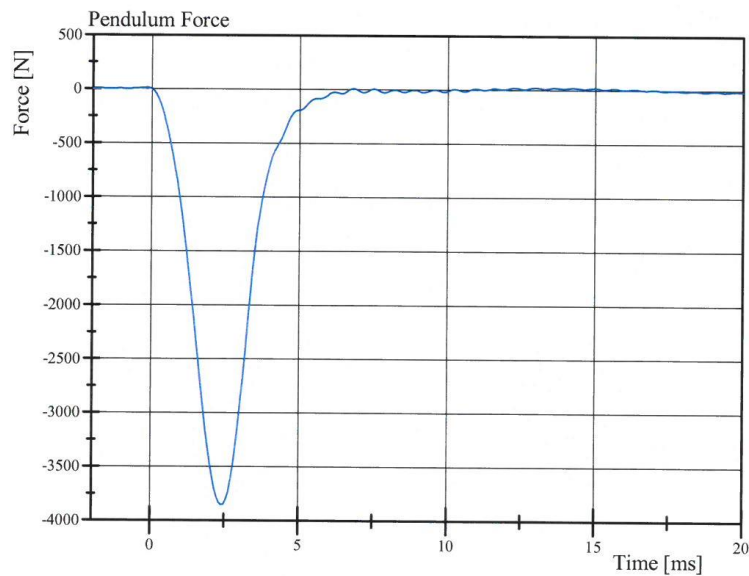


Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 36-1
Test Date: 8/24/2016



Filter Class: CFC_600
Max: 0.8 g at 13.0 ms
Min: -131.6 g at 2.4 ms



Filter Class: CFC_600
Max: 22.7 N at 13.0 ms
Min: -3,858.6 N at 2.4 ms

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

08.24.2016 10:45:01 1780



Post-Test Calibration Sheets

Front Passenger S/N 426

Transportation Research Center Inc.
5720 HIII 5th Dummy
External Dimensions
Serial No. 426 Calibration No. 37

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	774.7 - 800.1	781	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	78	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	45	Yes
I	Shoulder to Elbow Length	276.8 - 297.2	286	Yes
J	Elbow Rest Height	182.8 - 203.2	196	Yes
K	Buttock Knee Length	520.7 - 546.1	535	Yes
L	Popliteal Height	355.6 - 376.0	367	Yes
M	Knee Pivot Height	393.7 - 419.1	409	Yes
N	Buttock Popliteal Length	414.0 - 439.4	431	Yes
O	Chest Depth without Jacket	175.3 - 190.5	182	Yes
P	Foot Length	218.5 - 233.7	224	Yes
R	Buttock to Knee Pivot Length	457.2 - 482.6	473	Yes
S	Head Breadth	137.1 - 147.3	141	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	357	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	870	Yes
Z	Waist Circumference	759.5 - 789.9	775	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

Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 426 Certification No. 37-1

Test Date: 8/31/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Peak Head Resultant Acceleration	250 - 300 g	275.0 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	6.4 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

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

08.31.2016 16:10:09 609

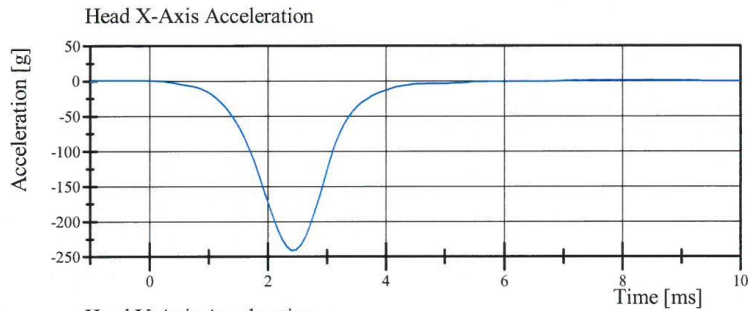


Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 426 Certification No. 37-1

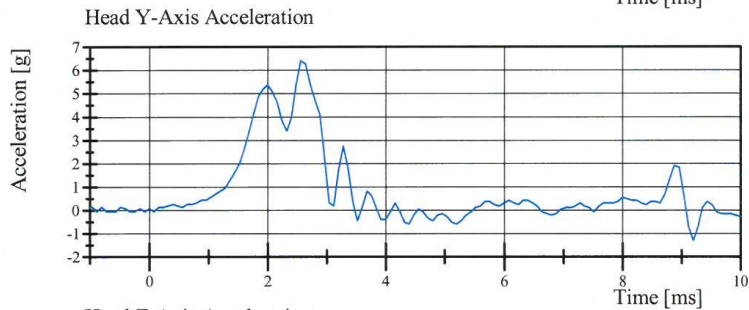
Test Date: 8/31/2016



Filter Class: CFC_1000

Max: 1.2 g at 8.4 ms

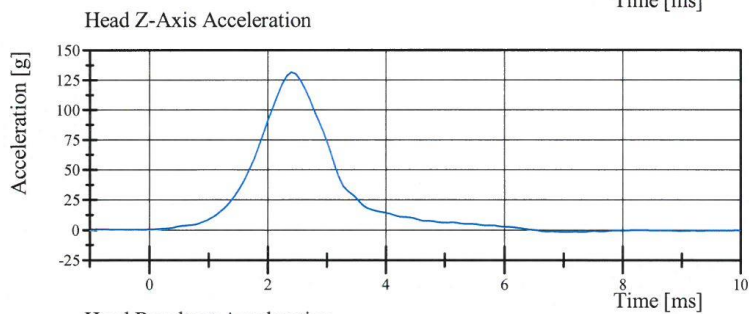
Min: -241.5 g at 2.4 ms



Filter Class: CFC_1000

Max: 6.4 g at 2.6 ms

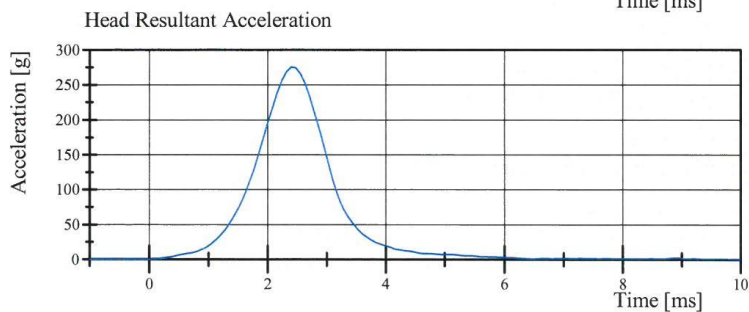
Min: -1.3 g at 9.2 ms



Filter Class: CFC_1000

Max: 131.5 g at 2.4 ms

Min: -1.7 g at 7.0 ms



Filter Class: CFC_1000

Max: 275.0 g at 2.4 ms

Min: 0.1 g at -0.2 ms

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

08.31.2016 16:10:18 609



Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 37-1

Test Date: 8/31/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	7.098 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	(-2.1) - (-2.5) m/s	-2.44 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	(-4.0) - (-5.0) m/s	-4.85 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	(-5.8) - (-7.0) m/s	-6.85 m/s	Yes
Total Head D-Plane Rotation	(-77) - (-91) °	-77.8 °	Yes
Total Neck Occipital Condyles Moment Between -77° and -91° Rotation	69 - 83 N·m	71.5 N·m	Yes
Total Neck Occipital Condyles Moment Decay to 10 N·m	80 - 100 ms	86.7 ms	Yes

Test meets specifications.

Comments:

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

08.31.2016 16:29:21 1837

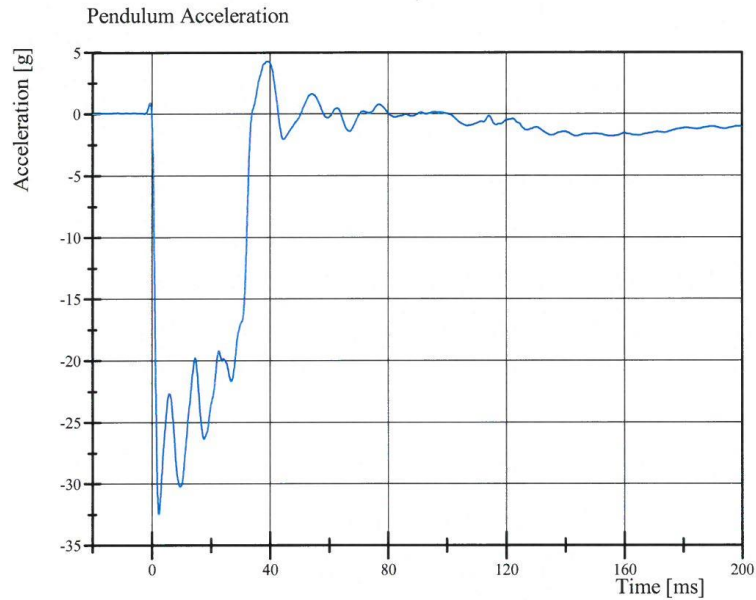


Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 37-1

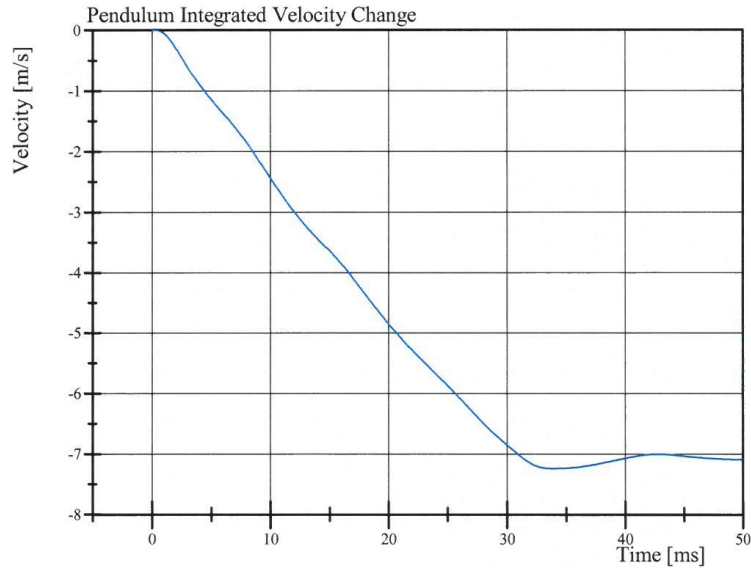
Test Date: 8/31/2016



Filter Class: CFC_180

Max: 4.2 g at 39.2 ms

Min: -32.5 g at 2.3 ms



Filter Class: CFC_180

Max: 0.0 m/s at 0.0 ms

Min: -7.2 m/s at 33.9 ms

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

08.31.2016 16:29:31 1837



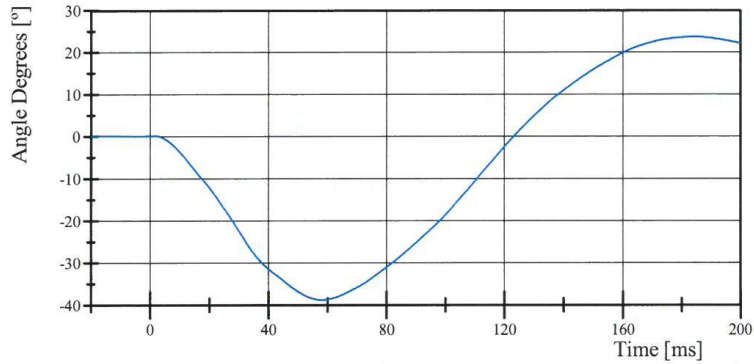
Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 37-1

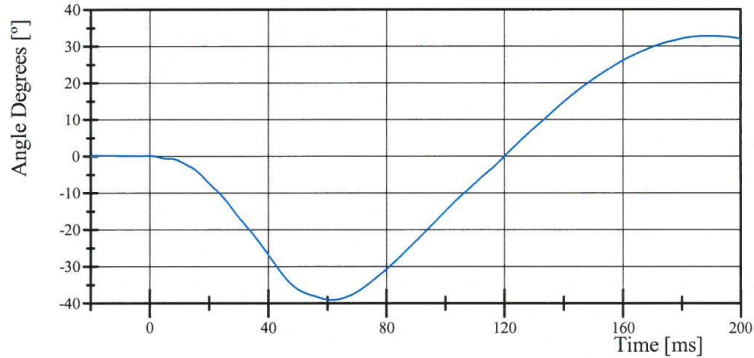
Test Date: 8/31/2016

Pot Rotation at the Base of Neck



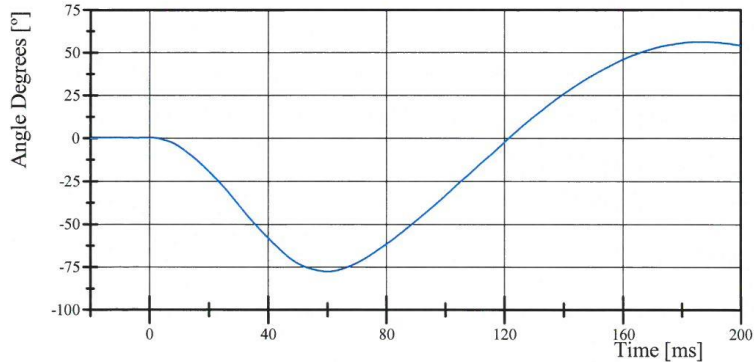
Filter Class: CFC_60
Max: 23.7 ° at 184.5 ms
Min: -38.9 ° at 58.0 ms

Head Rotation at Occipital Condyles



Filter Class: CFC_60
Max: 32.7 ° at 189.1 ms
Min: -39.2 ° at 61.7 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 56.3 ° at 186.4 ms
Min: -77.8 ° at 60.0 ms

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

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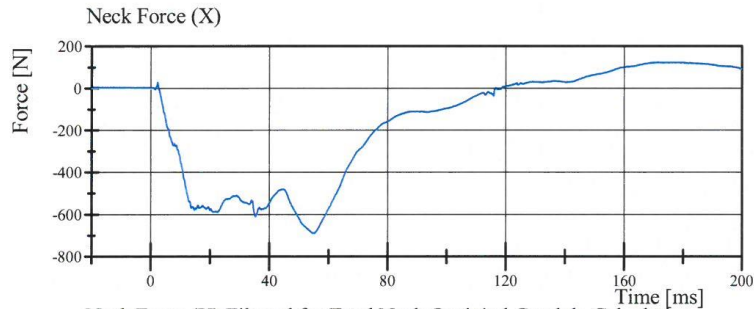


Transportation Research Center Inc.

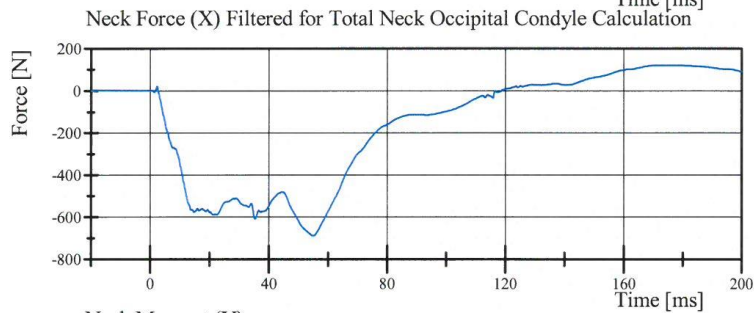
Neck Flexion

HIII 5th Serial No. 426 Certification No. 37-1

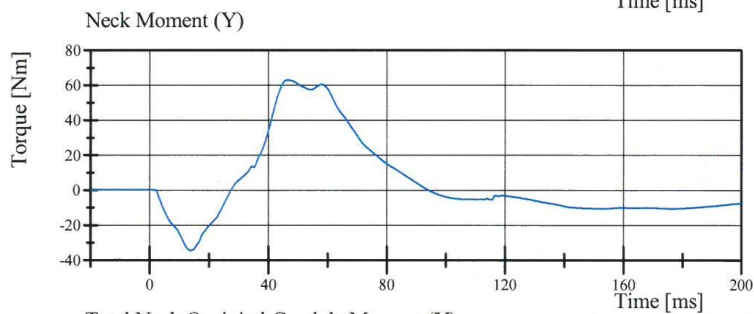
Test Date: 8/31/2016



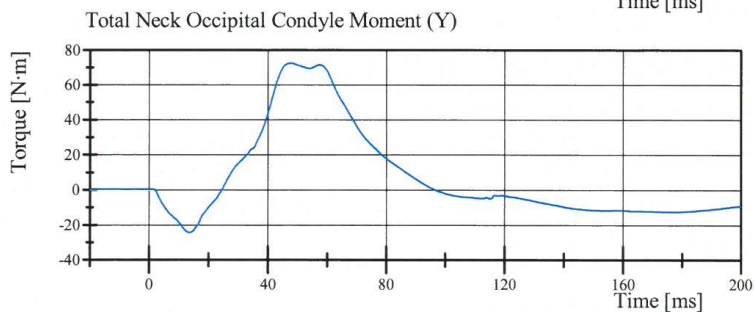
Filter Class: CFC_1000
Max: 121.8 N at 179.0 ms
Min: -690.5 N at 54.8 ms



Filter Class: CFC_600
Max: 121.2 N at 171.2 ms
Min: -690.1 N at 55.3 ms



Filter Class: CFC_600
Max: 62.8 Nm at 46.6 ms
Min: -34.8 Nm at 13.8 ms



Filter Class: Without_(Consta
Max: 72.4 N·m at 47.8 ms
Min: -24.7 N·m at 13.8 ms

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

08.31.2016 16:29:33 1837



Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 37-1

Test Date: 8/31/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	54 %	Yes
Pendulum Velocity	(-5.95) - (-6.19) m/s	-6.140 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	1.5 - 1.9 m/s	1.74 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	3.1 - 3.9 m/s	3.40 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	4.6 - 5.6 m/s	4.92 m/s	Yes
Total Head D-Plane Rotation	99 - 114 °	101.8 °	Yes
Total Neck Occipital Condyles Moment Between 99° and 114° Rotation	(-53) - (-65) N·m	-55.3 N·m	Yes
Total Neck Occipital Condyles Moment Decay to -10 N·m	94 - 114 ms	105.8 ms	Yes

Test meets specifications.

Comments:

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

08.31.2016 17:00:59 3112

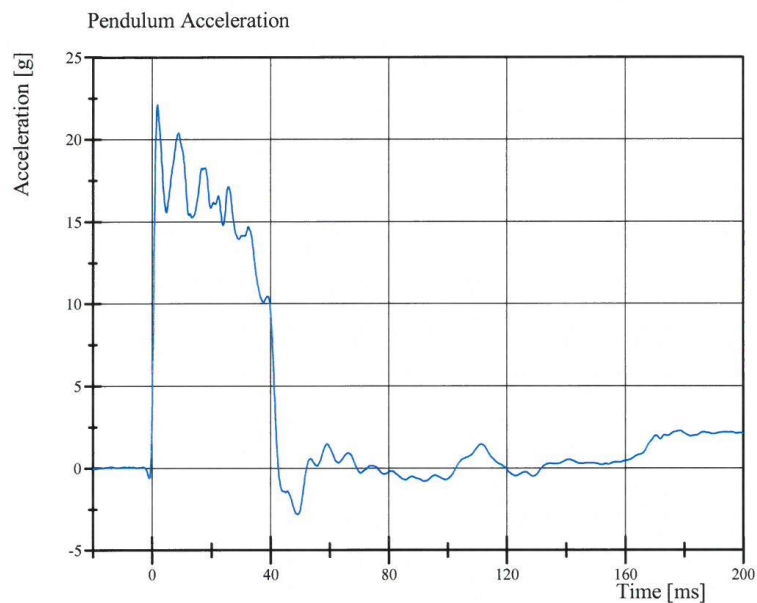


Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 37-1

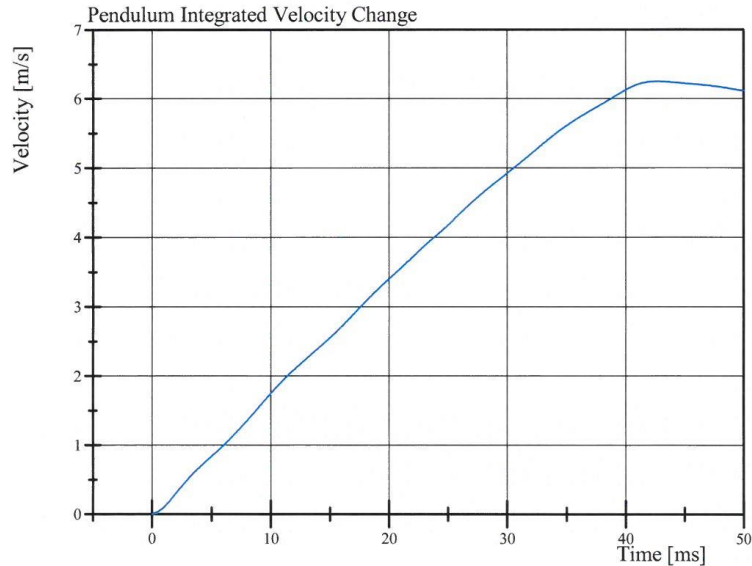
Test Date: 8/31/2016



Filter Class: CFC_180

Max: 22.1 g at 1.8 ms

Min: -2.8 g at 49.1 ms



Filter Class: CFC_180

Max: 6.2 m/s at 42.6 ms

Min: 0.0 m/s at 0.0 ms

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

08.31.2016 17:01:12 3112



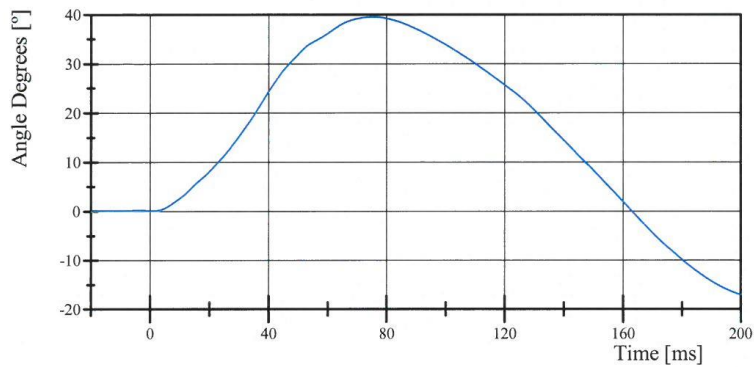
Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 37-1

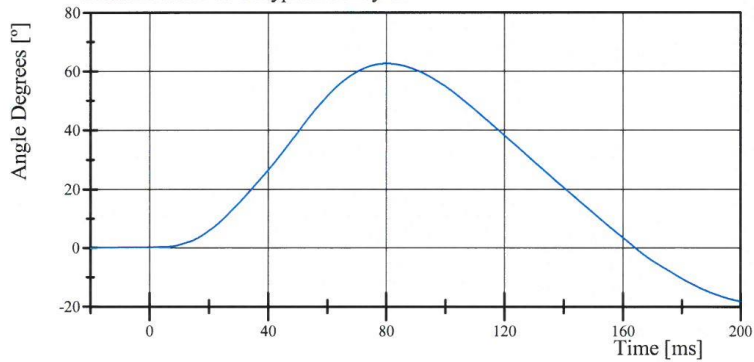
Test Date: 8/31/2016

Pot Rotation at the Base of Neck



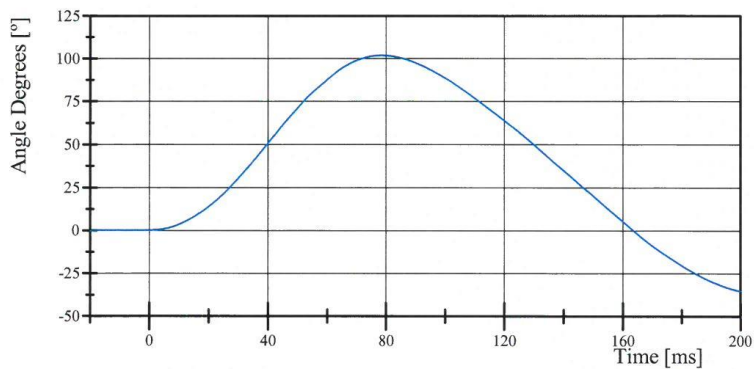
Filter Class: CFC_60
Max: 39.4 ° at 75.7 ms
Min: -17.1 ° at 200.0 ms

Head Rotation at Occipital Condyles



Filter Class: CFC_60
Max: 62.6 ° at 80.2 ms
Min: -18.2 ° at 200.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 101.8 ° at 78.3 ms
Min: -35.2 ° at 200.0 ms

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

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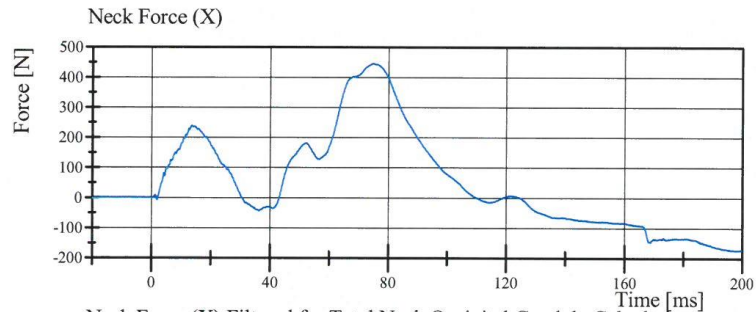


Transportation Research Center Inc.

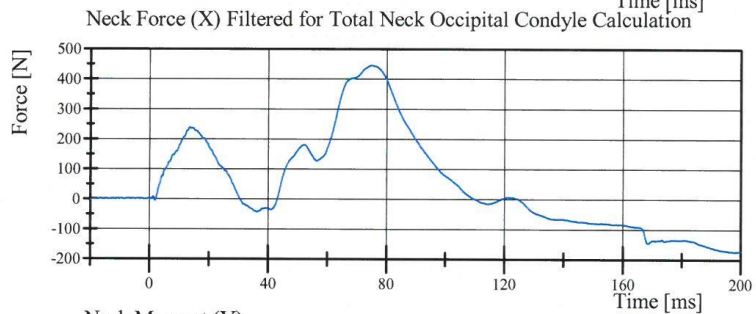
Neck Extension

HIII 5th Serial No. 426 Certification No. 37-1

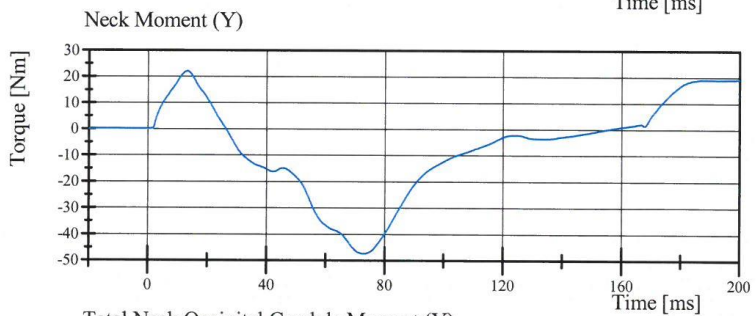
Test Date: 8/31/2016



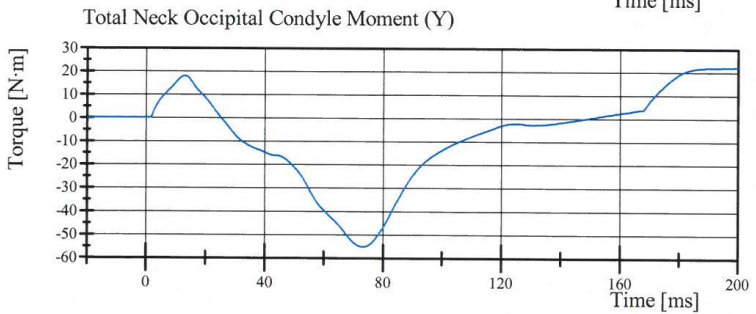
Filter Class: CFC_1000
Max: 445.4 N at 74.9 ms
Min: -173.5 N at 197.7 ms



Filter Class: CFC_600
Max: 444.9 N at 75.0 ms
Min: -173.1 N at 197.7 ms



Filter Class: CFC_600
Max: 21.9 Nm at 13.4 ms
Min: -47.5 Nm at 73.3 ms



Filter Class: Without_(Consta
Max: 22.3 N·m at 200.0 ms
Min: -55.3 N·m at 73.4 ms

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

08.31.2016 17:01:14 3112



Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. 426 Certification No. 37-1

Test Date: 8/31/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.615 m/s	Yes
Probe Force Peak Between 50.0 mm and 58.0 mm Chest Deflection	(-3,900) - (-4,400) N	-4,324.2 N	Yes
Probe Force Peak Between 18.0 mm and 50.0 mm Chest Deflection	$\geq$ (-4,600) N	-4,399.2 N	Yes
Maximum Chest Compression	(-50) - (-58) mm	-50.9 mm	Yes
Internal Hysteresis	69 - 85 %	74.5 %	Yes

Test meets specifications.

Comments:

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

08.31.2016 17:34:25 401

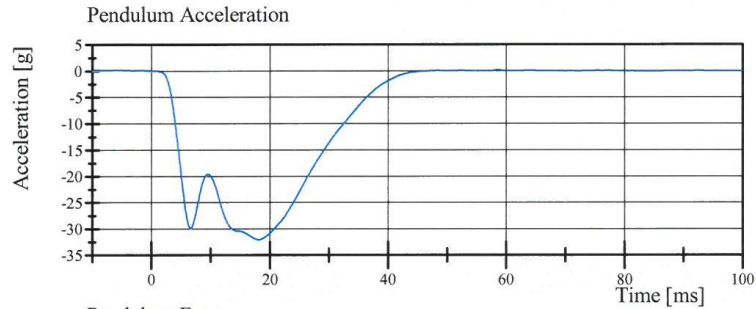


Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. 426 Certification No. 37-1

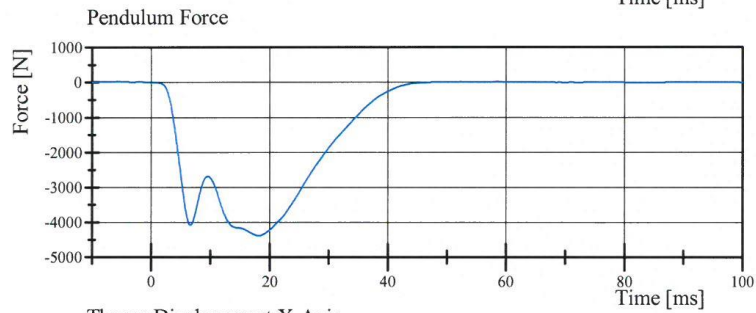
Test Date: 8/31/2016



Filter Class: CFC_180

Max: 0.1 g at 58.6 ms

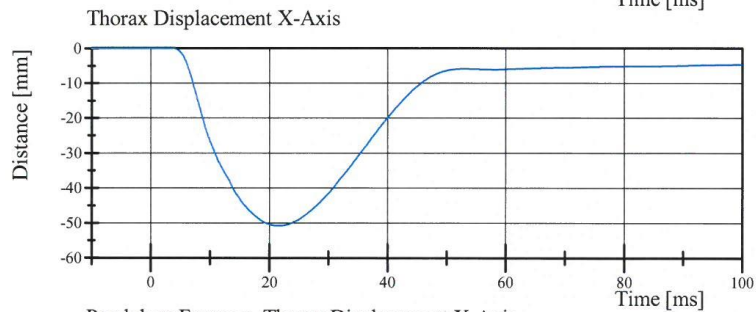
Min: -32.1 g at 18.2 ms



Filter Class: CFC_180

Max: 15.5 N at 58.6 ms

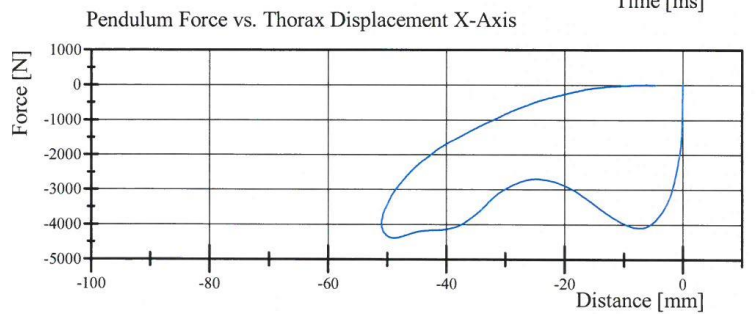
Min: -4,399.2 N at 18.2 ms



Filter Class: CFC_600

Max: 0.0 mm at -3.7 ms

Min: -50.9 mm at 21.4 ms



Filter Class: CFC_180

Max: 15.5 N at -6.2 mm

Min: -4,399.2 N at -48.8 mm

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

08.31.2016 17:34:31 401



Transportation Research Center Inc.

Hybrid III Small Female Torso Flexion



NHTSA

Serial Number: 426

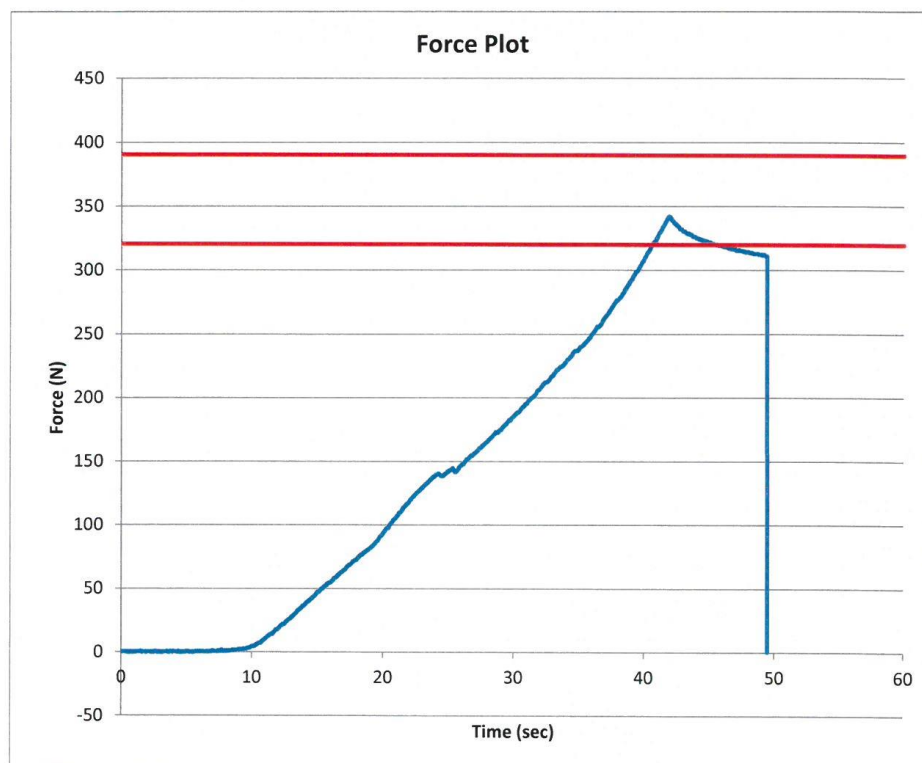
Date: 9/1/2016

Test Number: 1

Time: 7:02

Comments:

TEST PARAMETER	SPECIFICATION		TEST RESULTS	
Temperature	18.9	- 25.6	21.2 °C	Pass
Humidity	10	- 70	53 %	Pass
Average Angular Velocity	0.5	- 1.5	0.91 deg/sec	Pass
Initial Angle	0	- 20	15.72 deg	Pass
Peak Force at 45.21°	320	- 390	342.12 N	Pass
Final Angle	-8	- 8	5.26 deg	Pass



Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 37-1
Test Date: 8/31/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.123 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,546.5 N	Yes

Test meets specifications.

Comments:

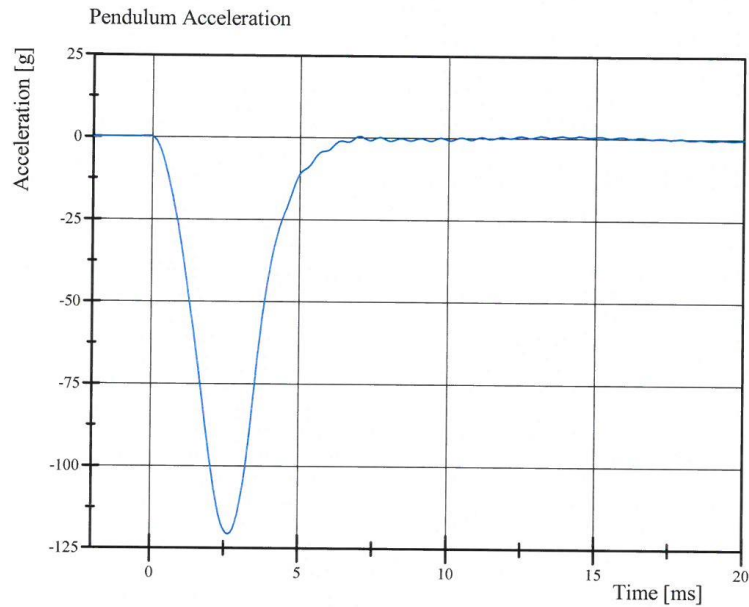
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

08.31.2016 15:59:00 1739

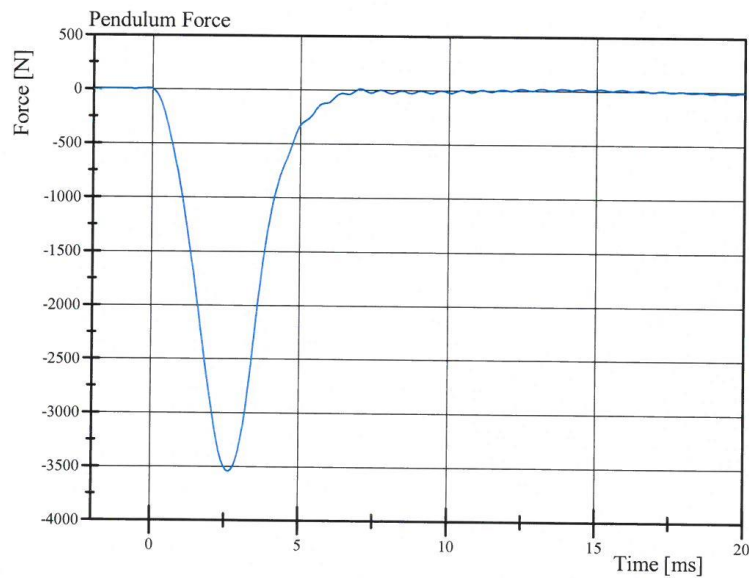


Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 37-1
Test Date: 8/31/2016



Filter Class: CFC_600
Max: 0.7 g at 14.5 ms
Min: -121.0 g at 2.6 ms



Filter Class: CFC_600
Max: 21.8 N at 14.5 ms
Min: -3,546.5 N at 2.6 ms

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

08.31.2016 15:59:10 1739



Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 37-1
Test Date: 8/31/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.122 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,574.1 N	Yes

Test meets specifications.

Comments:

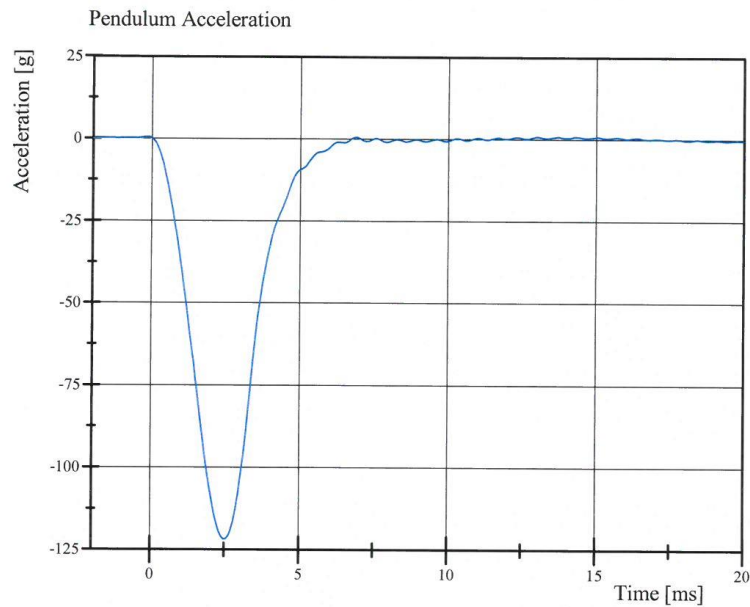
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

08.31.2016 16:01:30 1743

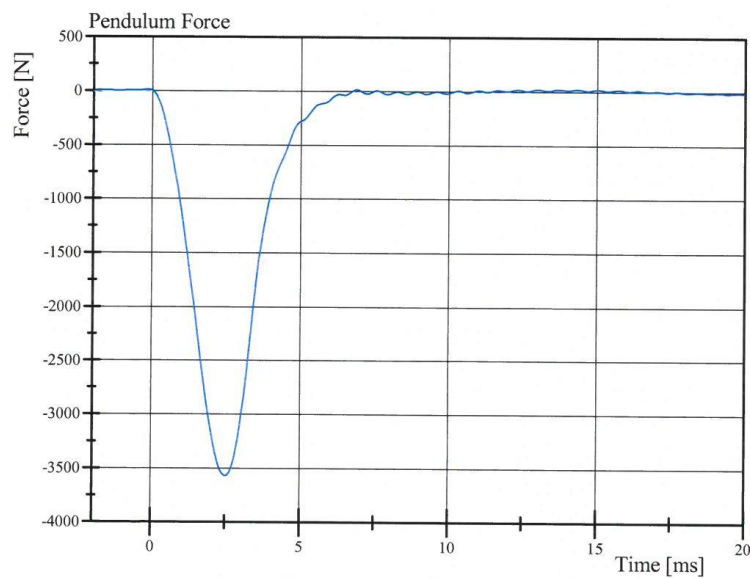


Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 37-1
Test Date: 8/31/2016



Filter Class: CFC_600
Max: 0.7 g at 14.3 ms
Min: -121.9 g at 2.5 ms



Filter Class: CFC_600
Max: 21.7 N at 14.3 ms
Min: -3,574.1 N at 2.5 ms

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

08.31.2016 16:01:42 1743

