

Final Report Number: NCAP-TRC-17-003

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

**Toyota Motor Manufacturing
2017 Toyota Corolla 4DR Sedan
NHTSA Number: M20175104**

**PREPARED BY:
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Report Date: December 15, 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**

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Prepared By: ILO Project Operations Group

Approved By: John Shultz

Approval Date: December 15, 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 Toyota Corolla 4DR Sedan, 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 November 14, 2016. The impact velocity was 56.65 km/h, and the ambient temperature at the barrier face at the time of impact was 21.7° C. The target vehicle post-test maximum crush was 738 millimeters at crush centerline. The test vehicle's performance is as follows: <table border="1"> <thead> <tr> <th></th> <th colspan="3">Driver ATD</th> <th colspan="3">Passenger ATD</th> </tr> <tr> <th>Measurement Description</th> <th>Units</th> <th>Threshold</th> <th>Result</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>NA</td> <td>700</td> <td>210</td> <td>NA</td> <td>700</td> <td>201</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-24.6</td> <td>mm</td> <td>52</td> <td>-20.4</td> </tr> <tr> <td>3ms Chest Clip</td> <td>Gs</td> <td>60</td> <td>45.5</td> <td>Gs</td> <td>60</td> <td>46.5</td> </tr> <tr> <td>Nij</td> <td>NA</td> <td>1</td> <td>0.26</td> <td>NA</td> <td>1</td> <td>0.54</td> </tr> <tr> <td>Neck Tension</td> <td>Newtons</td> <td>4170</td> <td>1379.3</td> <td>Newtons</td> <td>2620</td> <td>730.1</td> </tr> <tr> <td>Neck Compression</td> <td>Newtons</td> <td>4000</td> <td>-145.7</td> <td>Newtons</td> <td>2520</td> <td>-167.8</td> </tr> <tr> <td>Left Femur Force</td> <td>Newtons</td> <td>10000</td> <td>-1459.3</td> <td>Newtons</td> <td>6800</td> <td>-1086.7</td> </tr> <tr> <td>Right Femur Force</td> <td>Newtons</td> <td>10000</td> <td>-2358.2</td> <td>Newtons</td> <td>6800</td> <td>-194.5</td> </tr> </tbody> </table>								Driver ATD			Passenger ATD			Measurement Description	Units	Threshold	Result	Units	Threshold	Result	Head Injury Criteria (HIC ₁₅)	NA	700	210	NA	700	201	Maximum Chest Compression	mm	63	-24.6	mm	52	-20.4	3ms Chest Clip	Gs	60	45.5	Gs	60	46.5	Nij	NA	1	0.26	NA	1	0.54	Neck Tension	Newtons	4170	1379.3	Newtons	2620	730.1	Neck Compression	Newtons	4000	-145.7	Newtons	2520	-167.8	Left Femur Force	Newtons	10000	-1459.3	Newtons	6800	-1086.7	Right Femur Force	Newtons	10000	-2358.2	Newtons	6800	-194.5
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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 Toyota Corolla 4DR Sedan impacted the barrier wall at a velocity of 56.65 km/h. The test was performed at Transportation Research Center, Inc. on November 14, 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 738 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, side curtain airbag, headrest, and knee airbag. The passenger's visible contact points were as follows: front airbag, side curtain airbag and headrest.

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)	210	0.26	1379.3	-145.7	45.5	-24.6	-1459.3	-2358.2
Passenger (5 th Female)	201	0.54	730.1	-167.8	46.5	-20.4	-1086.7	-194.5

2: OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2017 Toyota Corolla 4DR Sedan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20175104
 Test Date: 11/14/16

TEST VEHICLE INFORMATION

NHTSA No.	M20175104
Model Year	2017
Make	Toyota
Model	Corolla
Body Style	Sedan
VIN	2T1BURHE9HC747230
Body Color	Barcelona Red
Odometer Reading (km/mi)	9 mi.
Engine Displacement (L)	1.8
Type/No. Cylinders	Inline/4
Engine Placement	Front/Transverse
Transmission Type	Automatic
Transmission Speeds	CVT
Overdrive	Yes
Final Drive	FWD
Roof Rack	No
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes
Automatic Door Locks (ADLs)	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: Pass. Seat Cushion Airbag	Yes

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

Yes

DATA FROM CERTIFICATION LABEL

Manufactured by	Toyota Motor Manufacturing	GVWR (lbs)	3820
Date of Manufacture	08/16	GAWR Front (lbs)	2070
		GAWR Rear (lbs)	1850

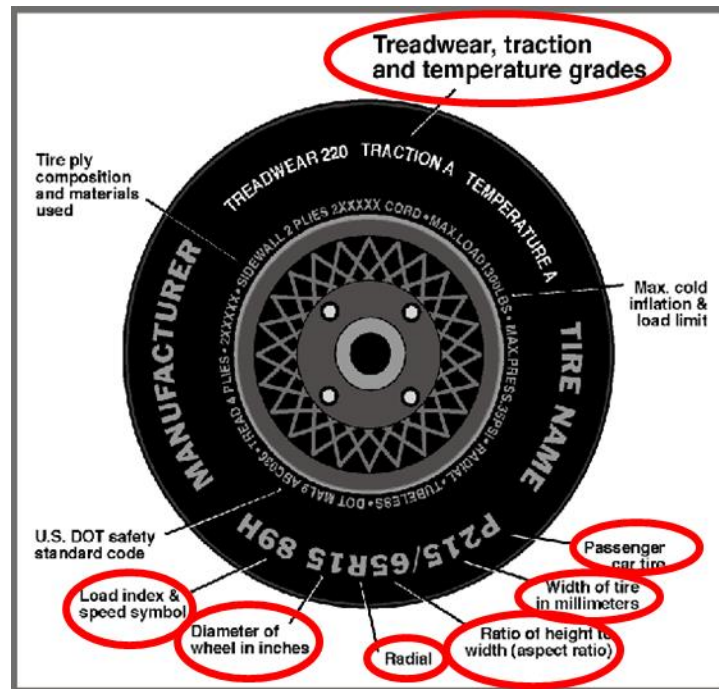
VEHICLE SEATING AND WEIGHT CAPACITY

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench	N/A	
Number of Occupants	2	3	N/A	5
Capacity Wt. (VCW) (kg)				381
Cargo Wt. (RCLW) (kg)				40.8

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

Test Vehicle: 2017 Toyota Corolla 4DR Sedan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20175104
 Test Date: 11/14/16



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold / Test Pressure (kPa)	220	220
Recommended Tire Size	P205/55R16	P205/55R16
Tire Size on Vehicle	P205/55R16	P205/55R16
Tire Manufacturer	Michelin	Michelin
Tire Model	Primacy MXV4	Primacy MXV4
Treadwear	620	620
Traction Grade	A	A
Temperature Grade	A	A
Tire Plies Sidewall	1	1
Tire Plies Body	4	4
Load Index/Speed Symbol	89H	89H
Tire Material	Polyester, Polyamide & Steel	Polyester, Polyamide & Steel
DOT Safety Code Right	B3WC 02NX 2716	B3WC 02NX 2716
DOT Safety Code Left	B3WC 02NX 2716	B3WC 02NX 2716

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

Test Vehicle: 2017 Toyota Corolla 4DR Sedan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20175104
 Test Date: 11/14/16

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	415.0	267.8		446.4	320.0	
Right	kg	387.4	245.2		414.0	307.4	
Ratio	%	61.0	39.0		57.8	42.2	
Totals	kg	802.4	513.0	1315.4	860.4	627.4	1487.8

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1315.4
Weight of 1 P572E ATD & 1 P572O ATD	kg	139.3
Rated Cargo/Luggage Weight (RCLW)	kg	40.8
Vehicle Target Weight (TVTW)	kg	1495.5

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front)
As Delivered	mm	690	693	715	712	1053
As Tested	mm	675	683	679	683	1139
Post Test	mm	713	679	712	709	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2700
Total Vehicle Length at Left Side	mm	4367
Total Vehicle Length at Centerline	mm	4650
Total Vehicle Length at Right Side	mm	4366
Weight of Ballast in Cargo Area	kg	0.0
Weight of Vehicle Components Removed	kg	62.0
Amount of Stoddard Solvent in Fuel Tank	liters	45.4

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT: Rear bumper beam and fascia, rear door windows, panels and speakers, tail lights, hubcaps, rear shelf panel and speakers, C-pillar trim, rear seat belts, exterior mirrors, rear brake drums and rear deck lid.

DATA SHEET NO. 1 (CONTINUED)**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2017 Toyota Corolla 4DR SedanNHTSA No.: M20175104Test Program: NCAP Frontal ImpactTest Date: 11/14/16**TARGET VEHICLE STRUCTURAL MEASUREMENT**

	Elements	Pre-Test (mm)
1	Total Length	4650
2	Total Width	1765
3	Bumper Top Height	541
4	Bumper Bottom Height	429
5	Longitudinal Member Top Height	541
6	Distance Between Longitudinal Members	915
7	Longitudinal Member Width	100
8	Engine Top Height	870
9	Engine Bottom Height	200
10	Engine and Gearbox Width	760
11	Front Bumper-Engine Distance	510
12	Front Shock Absorber Fixing Height	865
13	Bonnet Leading Edge Height	710
14	Front Shock Absorber Fixing Width	1140
15	Front Bumper – Front Axle Distance	470
16	Front Axle – A-Pillar Distance	445
17	A-Pillar – B-Pillar Distance	1070
18	B-Pillar – Rear Axle Distance	1185
19	B-Pillar – C-Pillar Distance	1040
20	Roof Sill Bottom Height	1308
21	Roof Sill Top Height	1382
22	Floor Sill Bottom Height	327
23	Floor Sill Top Height	375

DATA SHEET NO. 2

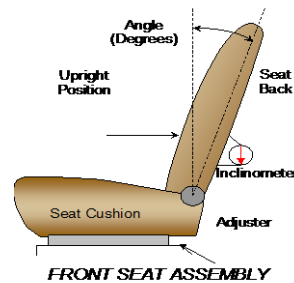
SEAT ADJUSTMENT, FUEL SYSTEM AND STEERING WHEEL DATA

Test Vehicle: 2017 Toyota Corolla 4DR Sedan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20175104
 Test Date: 11/14/16

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:	3.1
Passenger Seat back angle:	1.4

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	240	10
Passenger Seat	240	0

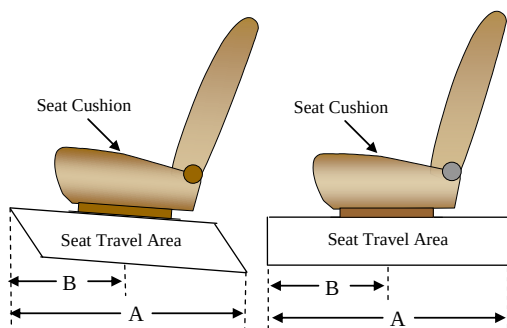
SEAT BELT UPPER ANCHORAGE

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	4, numbered from 0 to 3	3, Uppermost
Passenger Seat	4, numbered from 0 to 3	3, Uppermost



DATA SHEET NO. 2 (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM AND STEERING WHEEL DATA

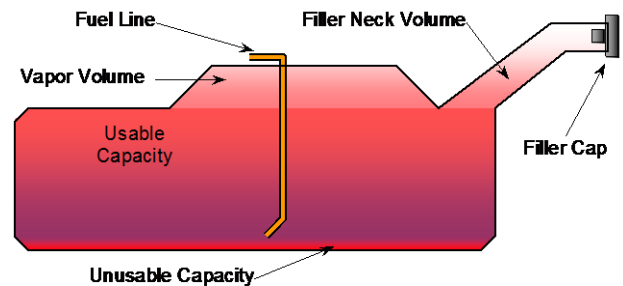
Test Vehicle: 2017 Toyota Corolla 4DR Sedan
Test Program: NCAP Frontal Impact

NHTSA No.: M20175104
Test Date: 11/14/16

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	48.8
Usable Capacity of "Optional Tank"	N/A
92%-94% of Usable Capacity	45.4
Actual Amount of Solvent Used	45.4
1/3 of Usable Capacity	16.3

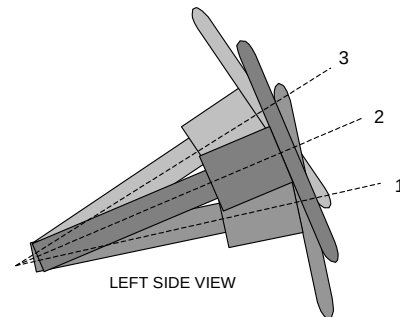
The vehicle is equipped with an electric fuel pump. The fuel pump is activated when the ignition is turned to "on".



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.



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONS

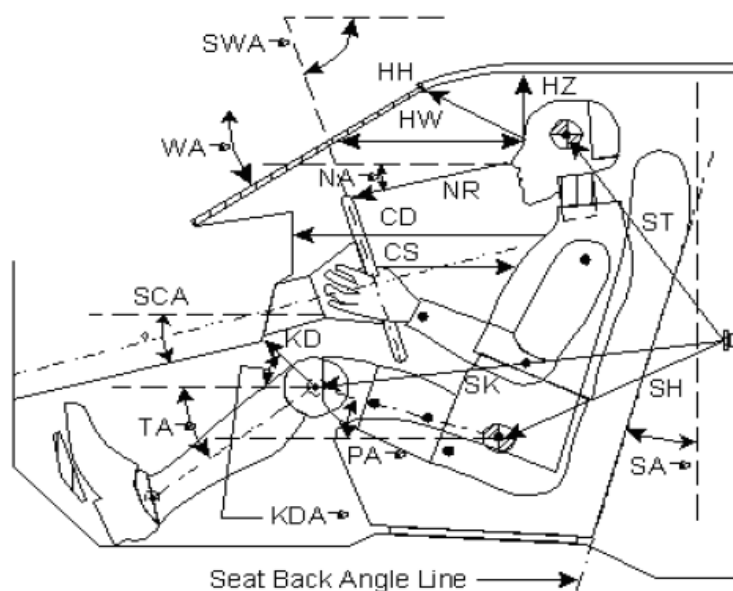
	Degrees	Fore/Aft Position (mm)
Lowermost Position No. 1	20.4	
Geometric Center Position No. 2	22.2	
Uppermost Position No. 3	23.9	
Telescoping Steering Wheel Travel		70
Test Position	22.2	35

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2017 Toyota Corolla 4DR Sedan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20175104
 Test Date: 11/14/16



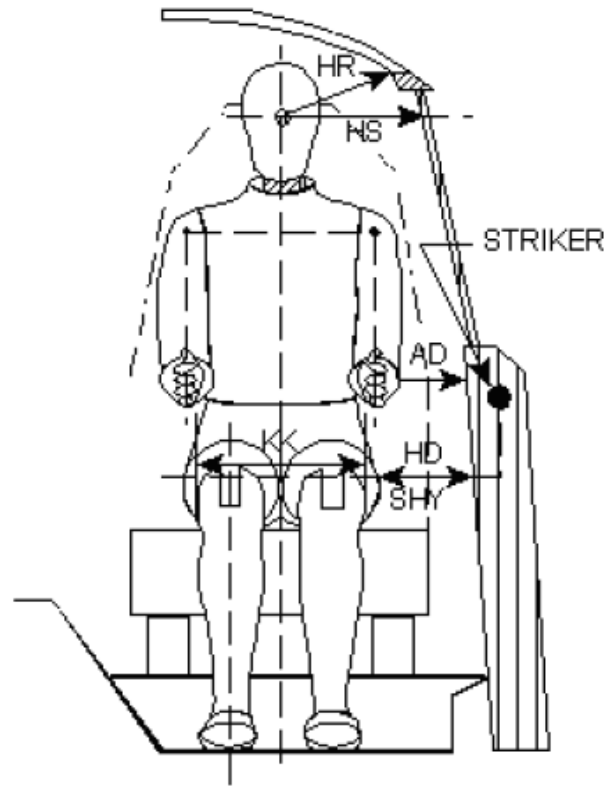
Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		24.9		
SWA°	Steering Wheel Angle		22.2		
SCA°	Steering Column Angle		67.8		
SA°	Seat Back Angle (on headrest post)		3.1		1.4
HZ	Head to Roof (Z)	201		220	
HH	Head to Header	351		276	
HW	Head to Windshield	696		723	
NR	Nose to Rim	370	9.6		
CD	Chest to Dash	496		388	
CS	Chest to Steering Hub	280			
RA	Rim to Abdomen	188			
KDL	Left Knee to Dash	137	24.4	104	38.5
KDR	Right Knee to Dash	129	24.3	114	38.5
PA°	Pelvic Angle		23.5		19.9
TA°	Tibia Angle		50.1		53.1
SK	Striker to Knee	585	9.6	710	15.1
ST	Striker to Head	407	-73.5	397	-59.1
SH	Striker to H-Point	340	50.1	412	32.5

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2017 Toyota Corolla 4DR Sedan
Test Program: NCAP Frontal Impact

NHTSA No.: M20175104
Test Date: 11/14/16



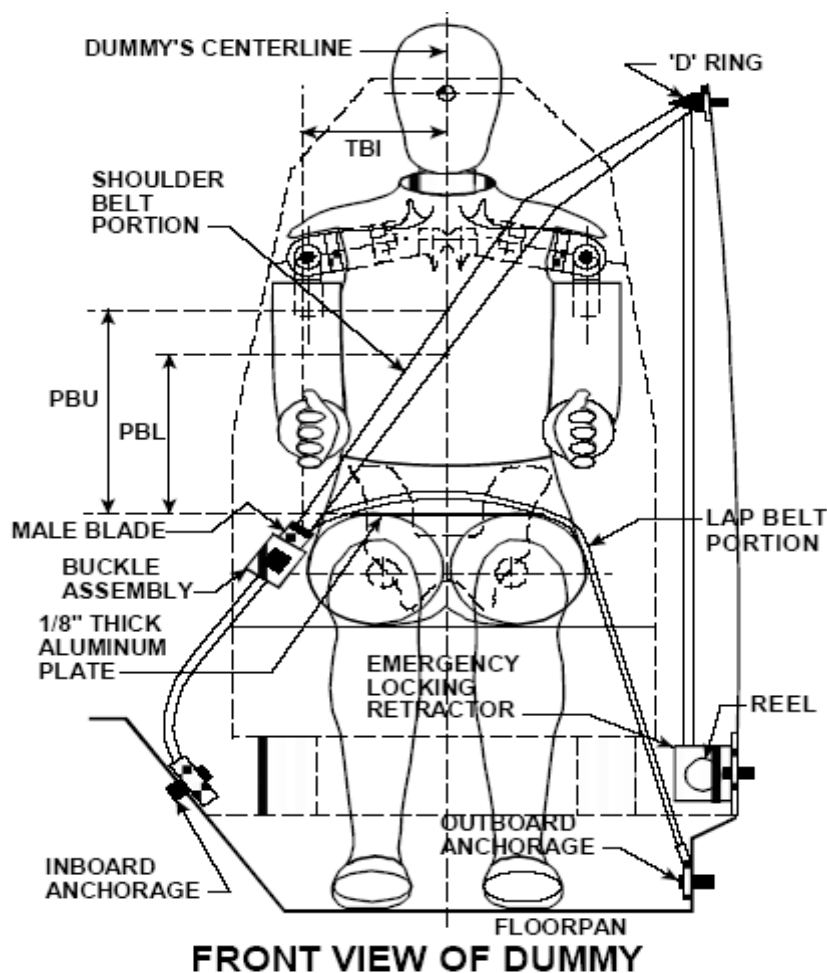
Code	Measurement Description	Driver	Passenger
AD	Arm to Door	151	102
HD	H-Point to Door	145	178
HR	Head to Side Header	215	240
HS	Head to Side Window	327	326
KK	Knee to Knee	360	170
SHY	Striker to H-Point (Y Direction)	240	300
AA	Ankle to Ankle	360	182

DATA SHEET NO. 5

SEAT BELT POSITIONING DATA

Test Vehicle: 2017 Toyota Corolla 4DR Sedan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20175104
 Test Date: 11/14/16



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU – Top surface of reference to belt upper edge	mm	298	310
PBL – Top surface of reference to belt lower edge	mm	214	205

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	870	964
Lap belt length as measured on ATD	mm	802	908
Remainder of belt on reel	mm	968	718
Total belt length for continuous webbing systems	mm	2640	2590

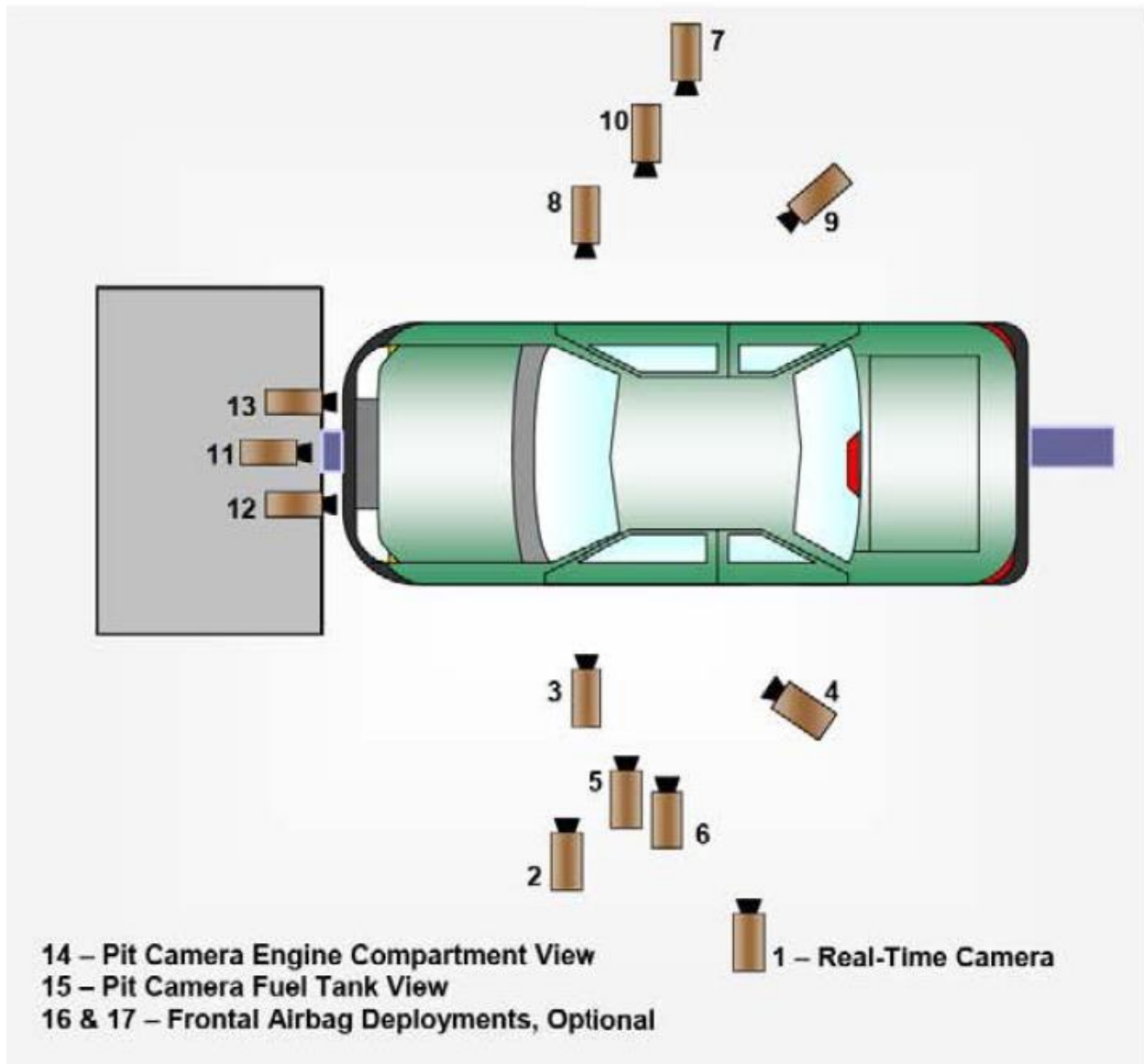
DATA SHEET NO. 6

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2017 Toyota Corolla 4DR Sedan
Test Program: NCAP Frontal Impact

NHTSA No.: M20175104
Test Date: 11/14/16

CAMERA POSITIONS FOR FRONTAL IMPACTS



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

Test Vehicle: 2017 Toyota Corolla 4DR Sedan
Test Program: NCAP Frontal Impact

NHTSA No.: M20175104
Test Date: 11/14/16

CAMERA LOCATIONS

No.	Camera View	Location (mm)			Lens (mm)	Frame Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	2376	5612	1410	Zoom	30
2	Driver Close-Up	1578	-4902	1200	50	1000
3	Left Front Half	1289	-4769	1200	28	1000
4	Left Angle	4017	2176	1950	35	1000
5	Steering Column - Top	1858	-5364	2380	50	1000
6	Steering Column – Bottom	1839	-5044	1220	50	1000
7	Right Overall	2135	5549	1210	20	1000
8	Passenger Close-Up	1657	4891	1090	50	1000
9	Right Front Half	4187	2201	1930	35	1000
10	Right Angle	1548	5235	990	28	1000
11	Windshield	0	0	2680	20	1000
12	Driver Windshield	0	-310	2680	25	1000
13	Passenger Windshield	0	470	2680	25	1000
14	Pit Front	1240	0	3077	25	1000
15	Pit Rear	3043	0	3228	12.5	1000
16	Onboard Driver Airbag (Optional)				12.5	1000
17	Onboard Passenger Airbag (Optional)				12.5	1000

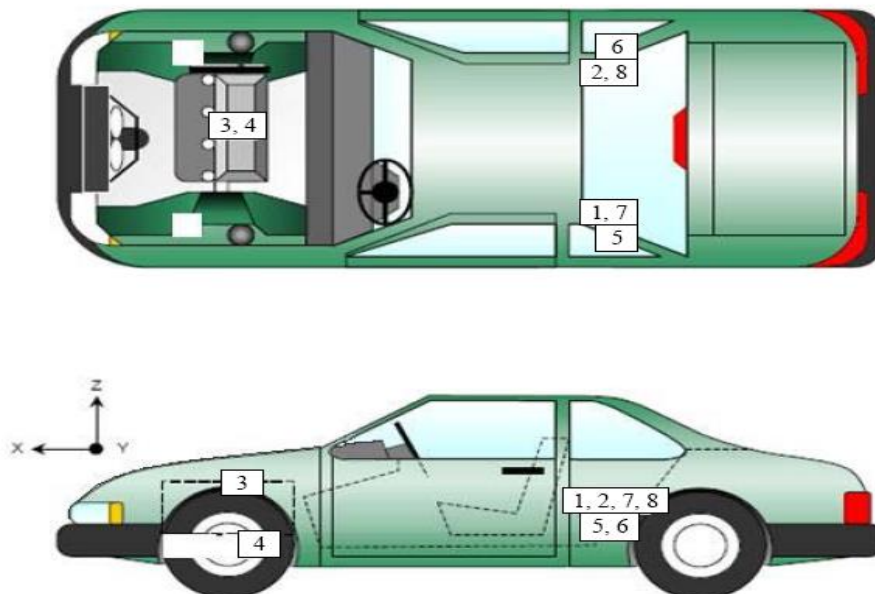
Reference Points: +X – forward of impact plane
+Y – right of monorail center
+Z – into ground

DATA SHEET NO. 7

VEHICLE ACCELEROMETER DATA

Test Vehicle: 2017 Toyota Corolla 4DR Sedan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20175104
 Test Date: 11/14/16



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Location (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	1782	-222	-424
2	Right Rear Accelerometer – X Direction	1782	215	-427
3	Engine Top X	3882	25	-820
4	Engine Bottom X	3810	175	-233
5	Left Rear Accelerometer – Z Direction	1782	-222	-424
6	Right Rear Accelerometer – Z Direction	1782	215	-427
7	Left Rear Accelerometer – X Direction Redundant	1782	-165	-424
8	Right Rear Accelerometer- X Direction Redundant	1782	157	-427

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

DATA SHEET NO. 8

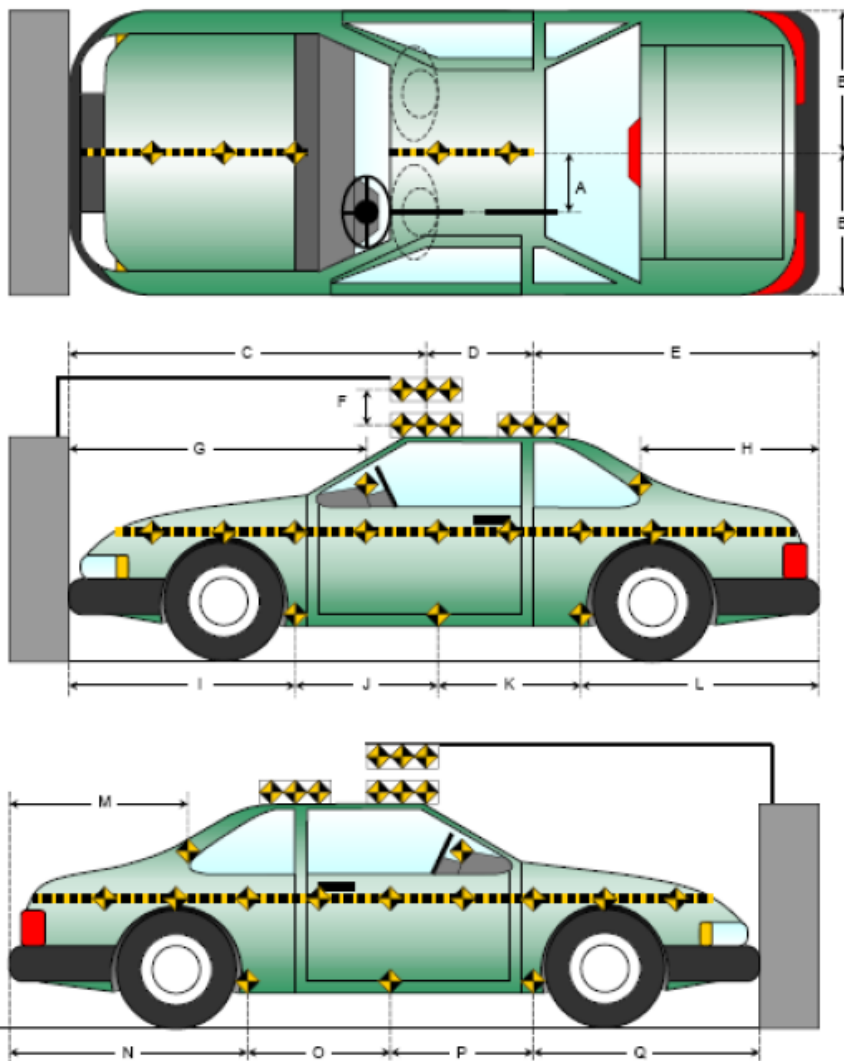
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2017 Toyota Corolla 4DR Sedan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20175104
 Test Date: 11/14/16

Item	Value
A	350
B	883
C	2300
D	625
E	1716
F	213
G	1719
H	1227
I	1441
J	884
K	923
L	1402
M	1226
N	1395
O	923
P	883
Q	1449

All units in millimeters



DATA SHEET NO. 9

LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2017 Toyota Corolla 4DR Sedan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20175104
 Test Date: 11/14/16

								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 Toyota Corolla 4DR Sedan
Test Program: NCAP Frontal Impact

NHTSA No.: M20175104
Test Date: 11/14/16

INSTRUMENTATION

Instrumentation	Number of Channels Collected
Driver Dummy Accelerometers	44
Passenger Dummy Accelerometers	44
Vehicle Structure Accelerometers	8
Total	96

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 Toyota Corolla 4DR SedanNHTSA No.: M20175104Test Program: NCAP Frontal ImpactTest Date: 11/14/16**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, SCAB	Frontal Airbag, Head Restraint, SCAB
Upper Torso Contact	Frontal Airbag	Frontal Airbag
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)	0	0
Seat Back Failure	None	None

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Windshield Damage	Lower right side at cowl
Window Damage	None
Other Notable Effects	None

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	1917
Center	mm	1848
Right Side	mm	1944
Average	mm	1903

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	Yes	Yes	Yes
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	Unknown	Yes	Unknown
Seat Cushion Airbag	No	N/A	Yes	Yes

DATA SHEET NO. 12

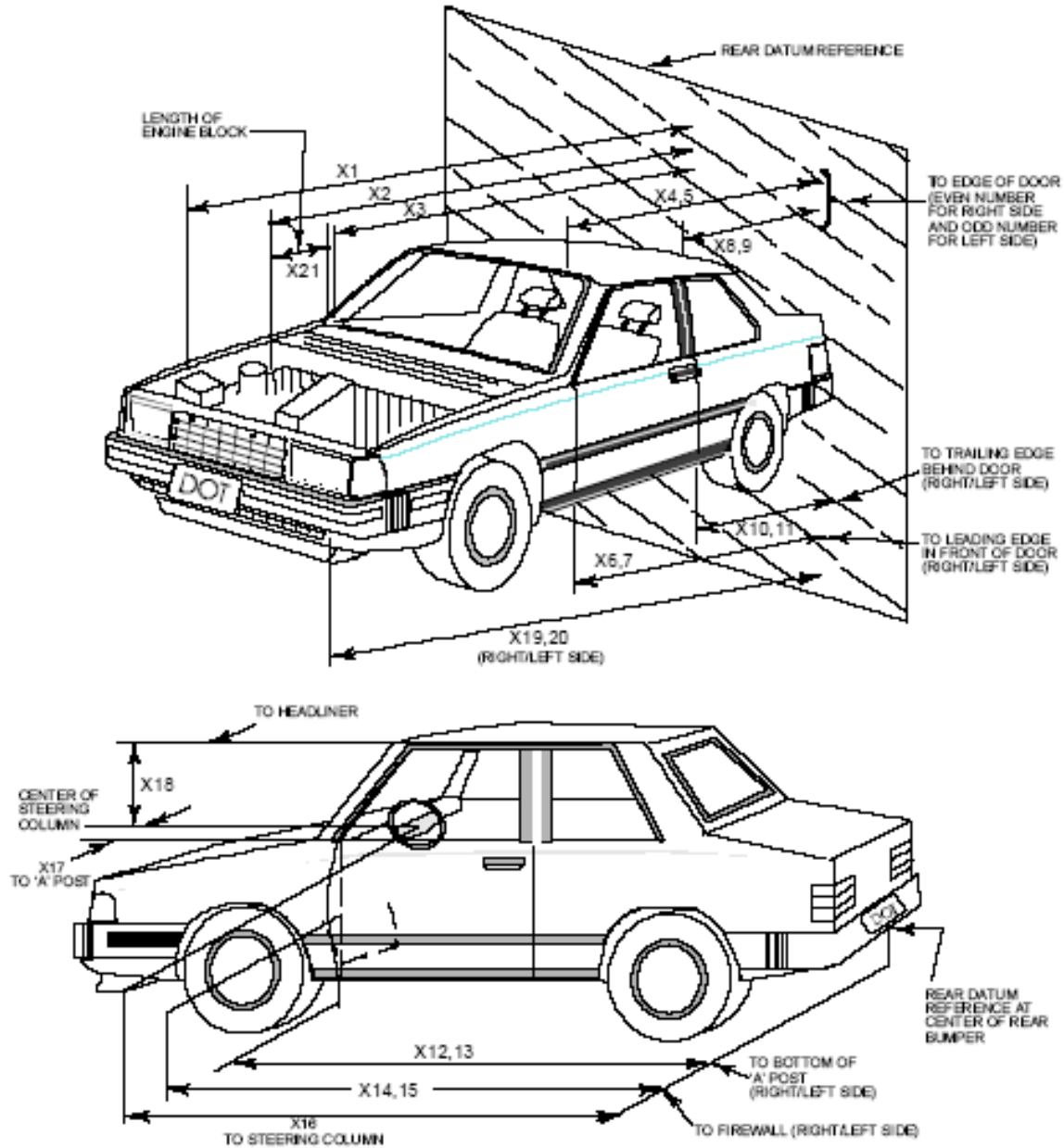
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2017 Toyota Corolla 4DR Sedan

NHTSA No.: M20175104

Test Program: NCAP Frontal Impact

Test Date: 11/14/16



DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2017 Toyota Corolla 4DR Sedan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20175104
 Test Date: 11/14/16

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4650	3912	738
2	Rear Surface of Vehicle (RSOV) to Front of Engine	4135	3861	274
3	RSOV to Firewall	3707	3650	57
4	RSOV to Upper Leading Edge of Right Door	3232	3231	1
5	RSOV to Upper Leading Edge of Left Door	3231	3223	8
6	RSOV to Lower Leading Edge of Right Door	3165	3166	-1
7	RSOV to Lower Leading Edge of Left Door	3167	3158	9
8	RSOV to Upper Trailing Edge of Right Door	2168	2167	1
9	RSOV to Upper Trailing Edge of Left Door	2166	2159	7
10	RSOV to Lower Trailing Edge of Right Door	2160	2162	-2
11	RSOV to Lower Trailing Edge of Left Door	2168	2160	8
12	RSOV to Bottom of "A" Post-of Right Side	3225	3223	2
13	RSOV to Bottom of "A" Post-of Left Side	3224	3215	9
14	RSOV to Firewall, Right Side	3586	3730	-144
15	RSOV to Firewall, Left Side	3587	3715	-128
16	RSOV to Steering Column	2749	2780	-31
17	Center of Steering Column to "A" Post	283	300	-17
18	Center of Steering Column to Headliner	407	400	7
19	RSOV to Right Side of Front Bumper	4366	3964	402
20	RSOV to Left Side of Front Bumper	4367	3950	417
21	Length of Engine Block	550	550	0
RD	RSOV to Right Side of Dash Panel	3006	3010	-4
CD	RSOV to Center of Dash Panel	2943	2950	-7
LD	RSOV to Left Side of Dash Panel	3010	3000	10

All Dimensions in mm

DATA SHEET NO. 13

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2017 Toyota Corolla 4DR Sedan
Test Program: NCAP Frontal Impact

NHTSA No.: M20175104
Test Date: 11/14/16

VEHICLE INFORMATION

VIN: 2T1BURHE9HC747230
Vehicle Size Category: Passenger Car

Wheelbase: 2700
Test Weight (kg): 1487.8

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): 56.65

Velocity Change (km/h): 69.59

Time of Separation (ms): 120

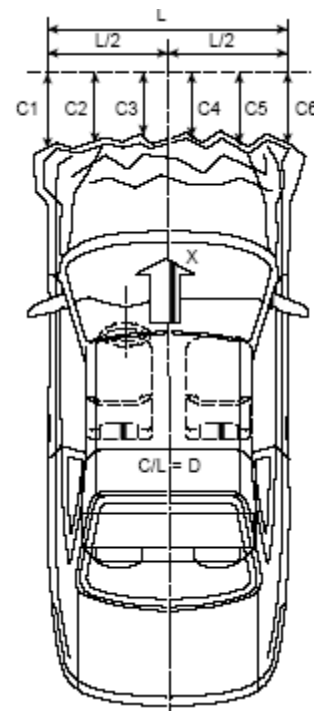
CRUSH PROFILE

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	4367	3950	417
C2	Crush zone 2 at left side	mm	4548	3960	588
C3	Crush zone 3 at left side	mm	4611	3925	686
C4	Crush zone 4 at right side	mm	4610	3935	675
C5	Crush zone 5 at right side	mm	4548	3956	592
C6	Crush zone 6 at right side	mm	4366	3964	402
L	C1 to C6	mm	1524	1080	444

DATA SHEET NO. 14

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2017 Toyota Corolla 4DR Sedan
Test Program: NCAP Frontal Impact

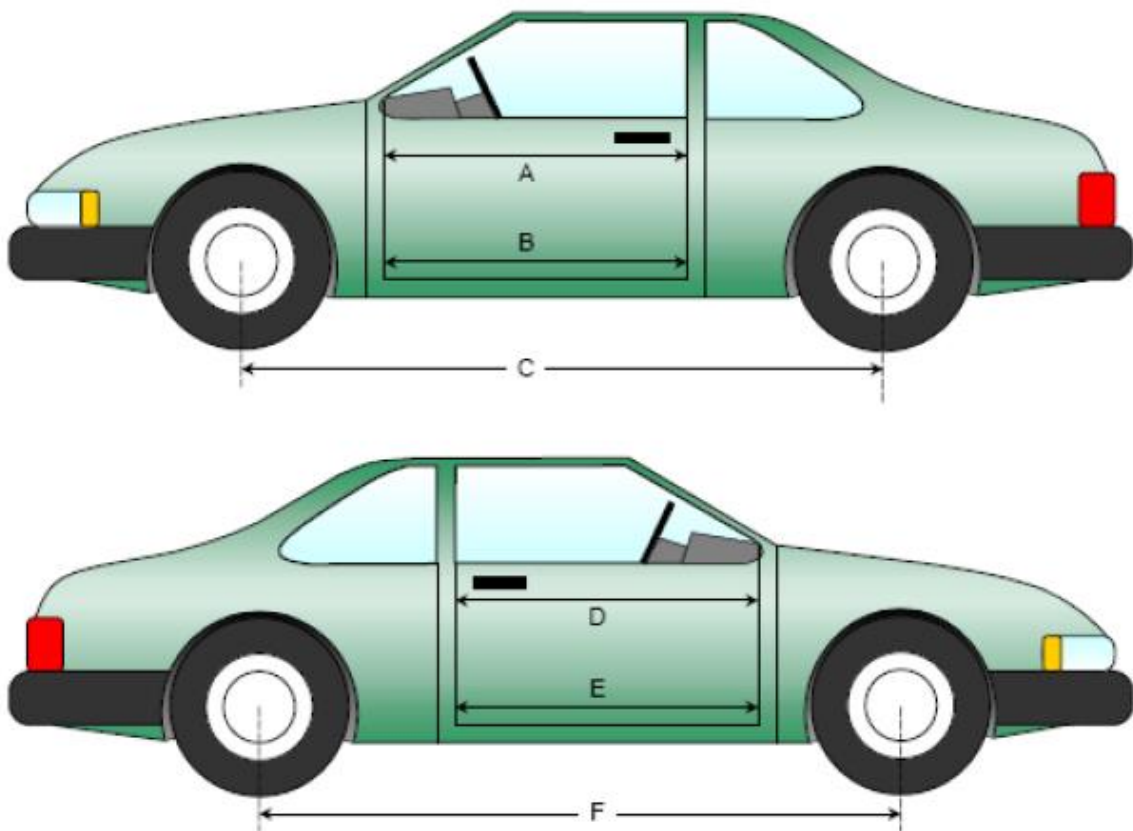
NHTSA No.: M20175104
Test Date: 11/14/16

DOOR OPENING WIDTH

No.	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1033	1032	1
B	Left Side Lower	mm	852	852	0
C	Right Side Upper	mm	1033	1033	0
D	Right Side Lower	mm	852	852	0

WHEELBASE MEASUREMENTS

No.	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2700	2635	65
F	Right Side Wheelbase	mm	2700	2662	38



DATA SHEET NO. 14 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

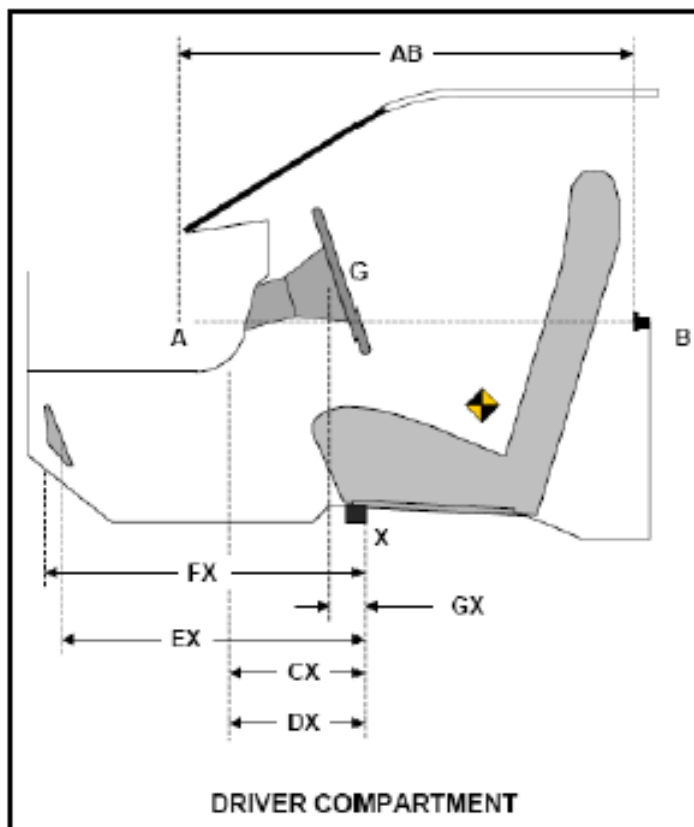
Test Vehicle: 2017 Toyota Corolla 4DR Sedan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20175104
 Test Date: 11/14/16

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	1020	1020	0
CX	Left Knee Bolster to X	mm	308	318	-10
DX	Right Knee Bolster to X	mm	305	340	-35
EX	Brake Pedal to X	mm	545	545	0
FX	Foot Rest to X	mm	530	515	15
GX	Center of Steering Column Wheel Hub to X	mm	55	115	-60

X = Front of Seat Track (Stationary)



DATA SHEET NO. 15

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

Test Vehicle: 2017 Toyota Corolla 4DR Sedan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20175104
 Test Date: 11/14/16

Please provide windshield mounting details.

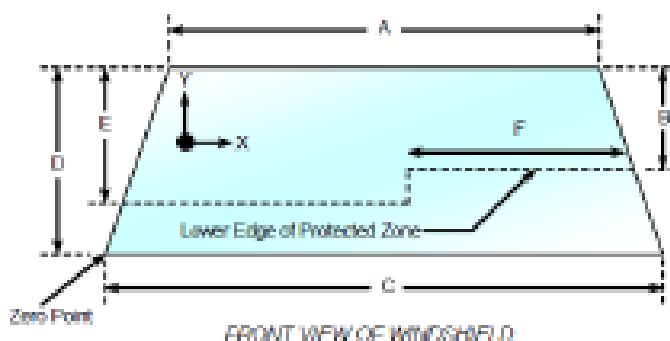
The standard requires that the post-test retention measurement be a minimum of 75% of the pre-test total periphery measurement for vehicle not equipped with occupant passive restraint and 50% for each side of the windshield for vehicle which are equipped with occupant passive restraints.

Temperature of windshield molding during test: 21.7° C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2094	2094	100.0
Right Side	2117	2117	100.0
Total	4211	4211	100.0

Item	Units	Value
A	mm	1100
B	mm	473
C	mm	1440
D	mm	840
E	mm	489
F	mm	415



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 Toyota Corolla 4DR Sedan

NHTSA No.: M20175104

Test Program: NCAP Frontal Impact

Test Date: 11/14/16

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21.1°C

Test Time: 17:03

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

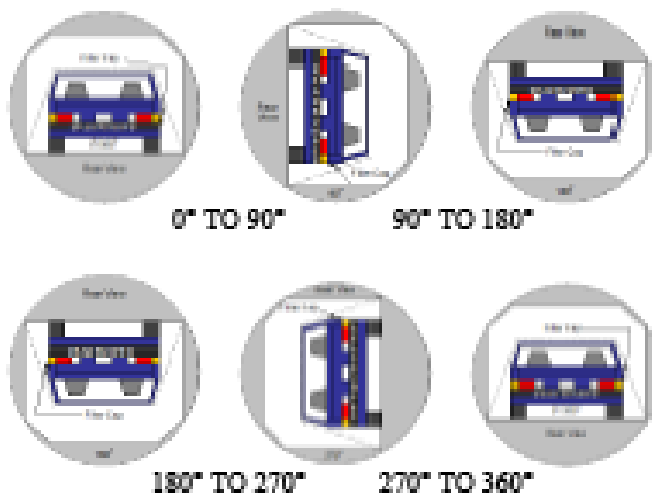
DATA SHEET NO. 16

FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2017 Toyota Corolla 4DR Sedan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20175104
 Test Date: 11/14/16

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

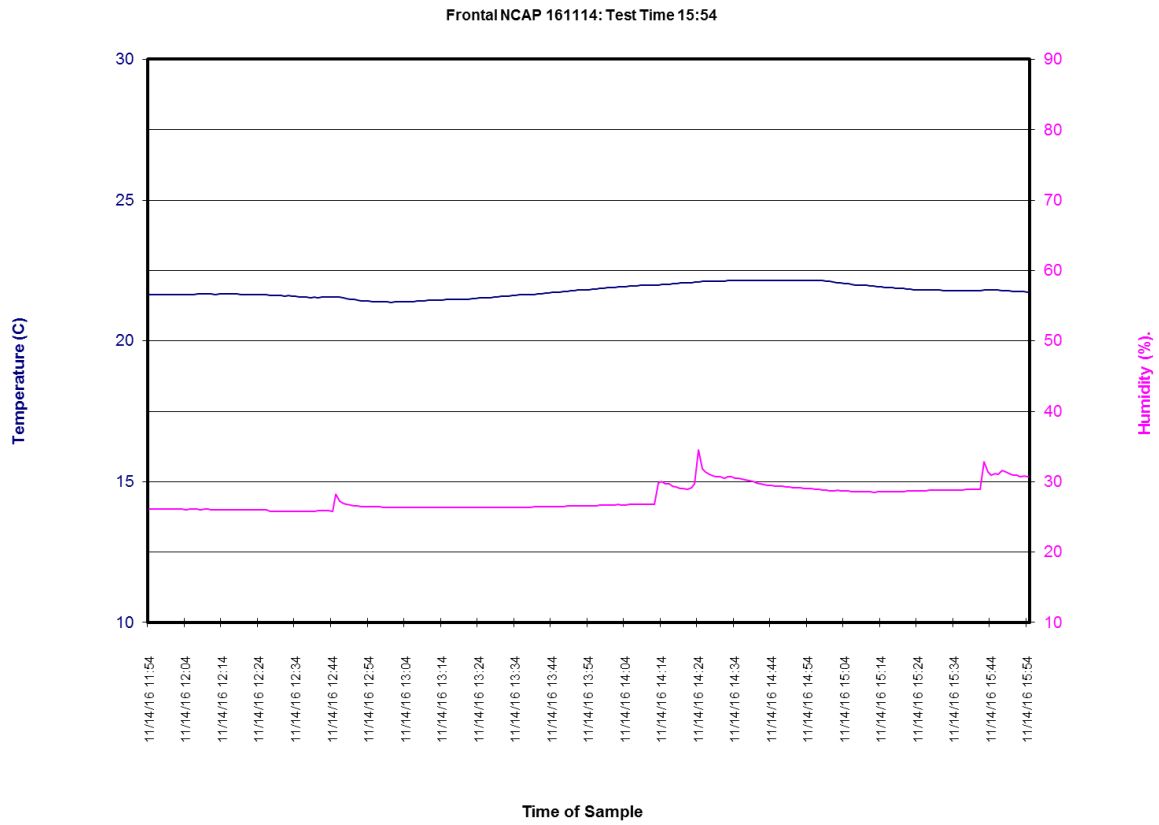
Test Phase	Spillage Location
0° to 90°	None
90° to 180°	None
180° to 270°	None
270° to 360°	None

DATA SHEET NO. 17

DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2017 Toyota Corolla 4DR Sedan
Test Program: NCAP Frontal Impact

NHTSA No.: M20175104
Test Date: 11/14/16



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

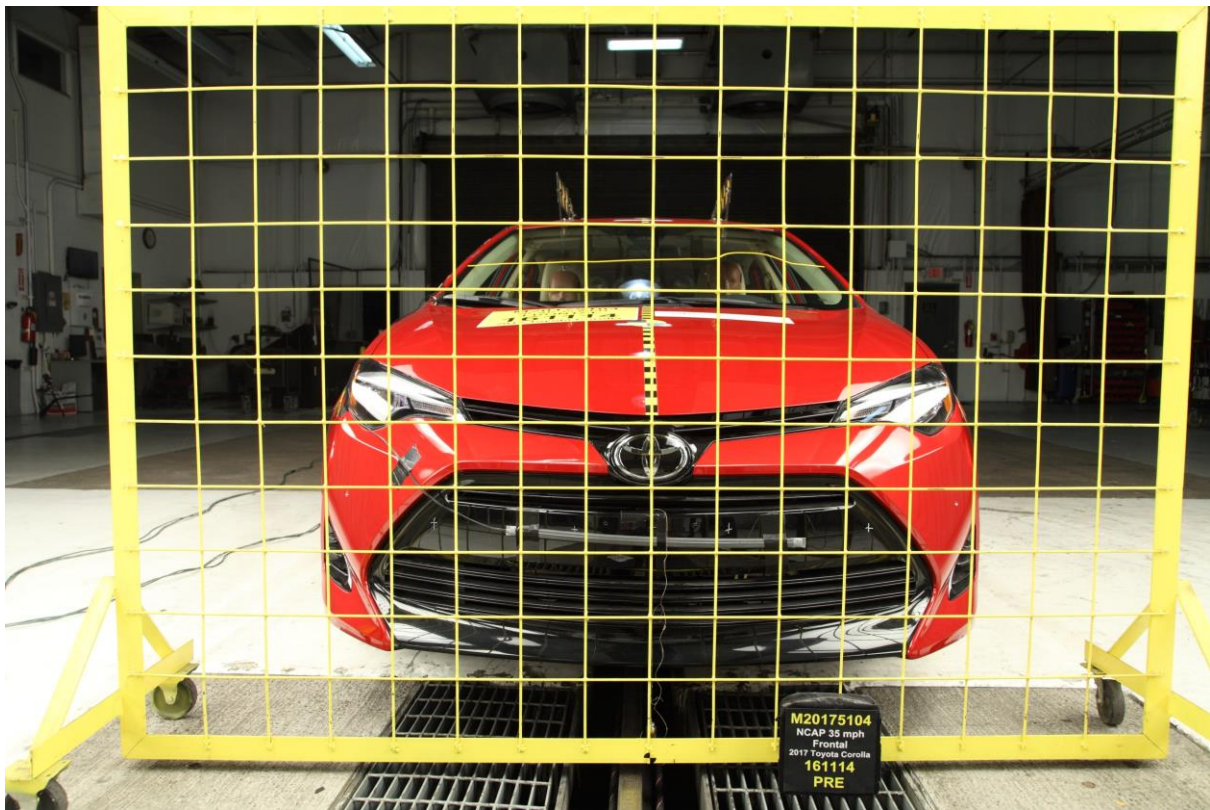
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1	Load Cell Location	A-5
2	Pre-Test Load Cell Wall	A-5
3	Post-Test Load Cell Wall	A-6
4	Manufacturer's Label	A-6
4a	Reduced Load Carrying Capacity Label	A-7
5	Tire Placard	A-7
6	2017 Toyota Corolla 4DR Sedan Frontal as Delivered	A-8
7	Right Rear 3-4 View, as Received	A-8
8	Pre-Test Front View of Test Vehicle	A-9
9	Post-Test Front View of Test Vehicle	A-9
10	Pre-Test Left View of Test Vehicle	A-10
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12	Pre-Test Right View of Test Vehicle	A-11
13	Post-Test Right View of Test Vehicle	A-11
14	Pre-Test Right Front 3-4 View	A-12
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25b	Post-Test Mid Underbody View	A-18
25c	Pre-Test Mid Rear Underbody View	A-19
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26	Pre-Test Rear Underbody View	A-20
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42	Pre-Test Driver's Side Knee Bolster	A-28
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44	Pre-Test Driver's Side Floorpan	A-29
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79	Monroney Label Photograph	A-47



001 Load Cell Location



002 Pre-Test Load Cell Wall



003 Post-Test Load Cell Wall



004 Manufacturer's Label



004a Reduced Load Carrying Capacity Label



005 Tire Placard



006 2017 Toyota Corolla 4DR Sedan 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



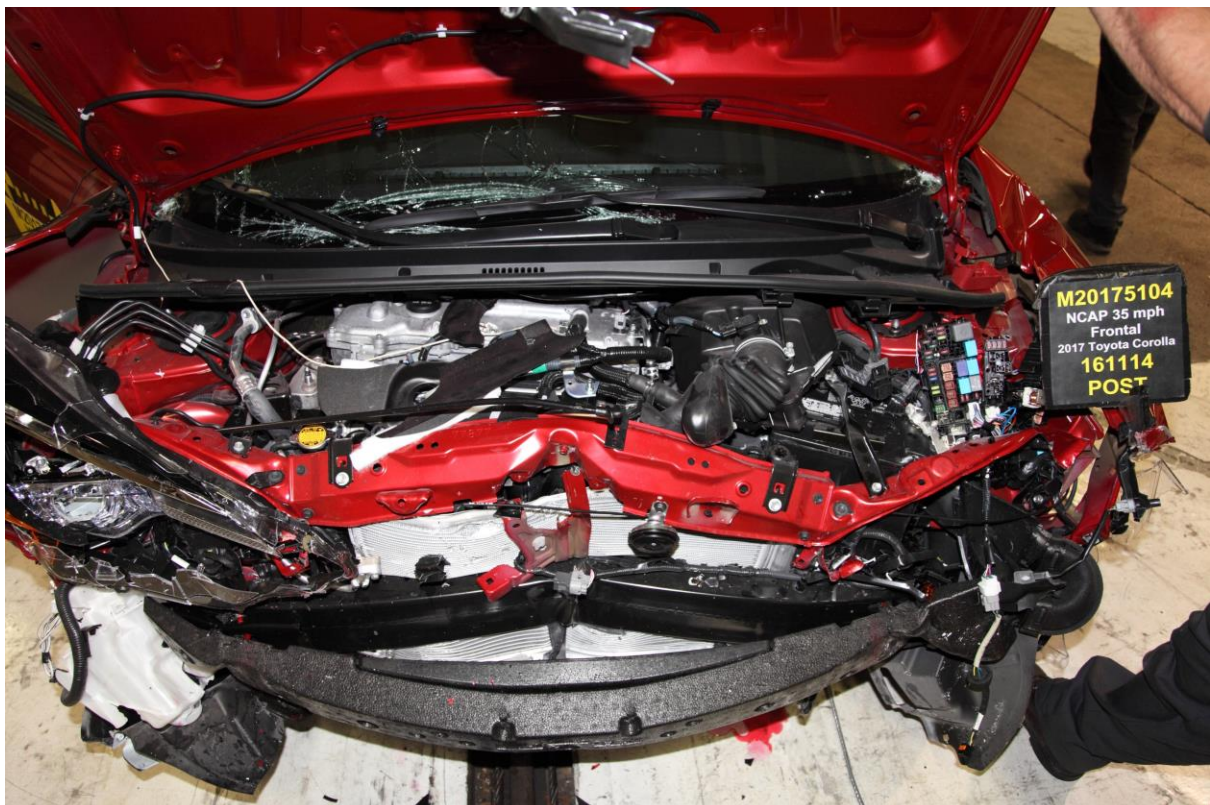
018 Pre-Test Windshield View



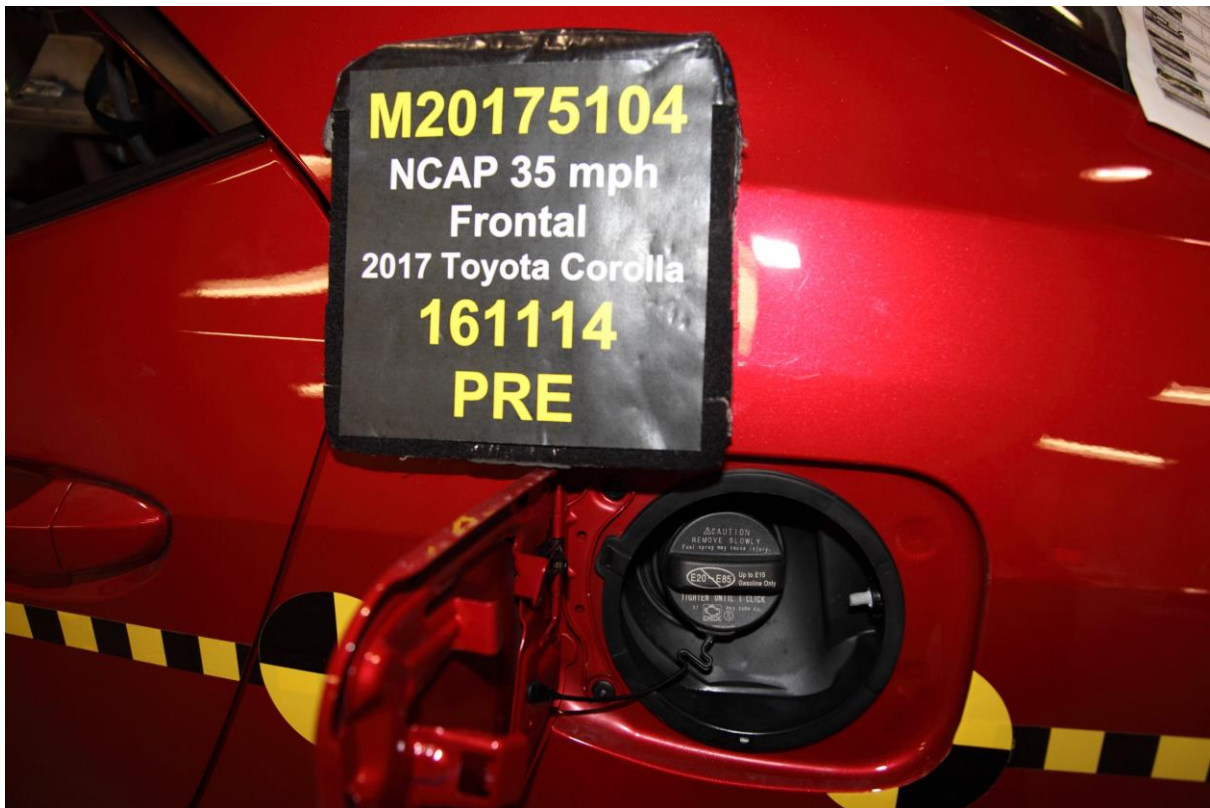
019 Post-Test Windshield View



020 Pre-Test Engine Compartment View



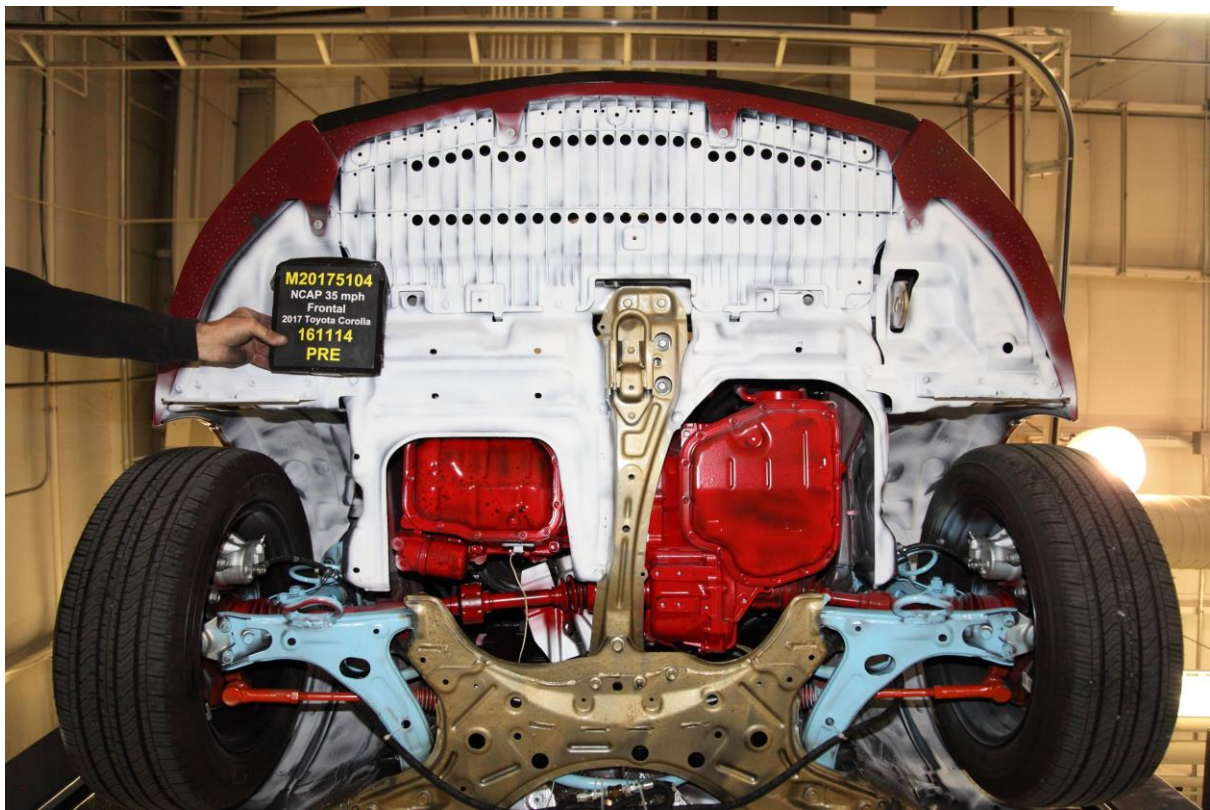
021 Post-Test Engine Compartment View



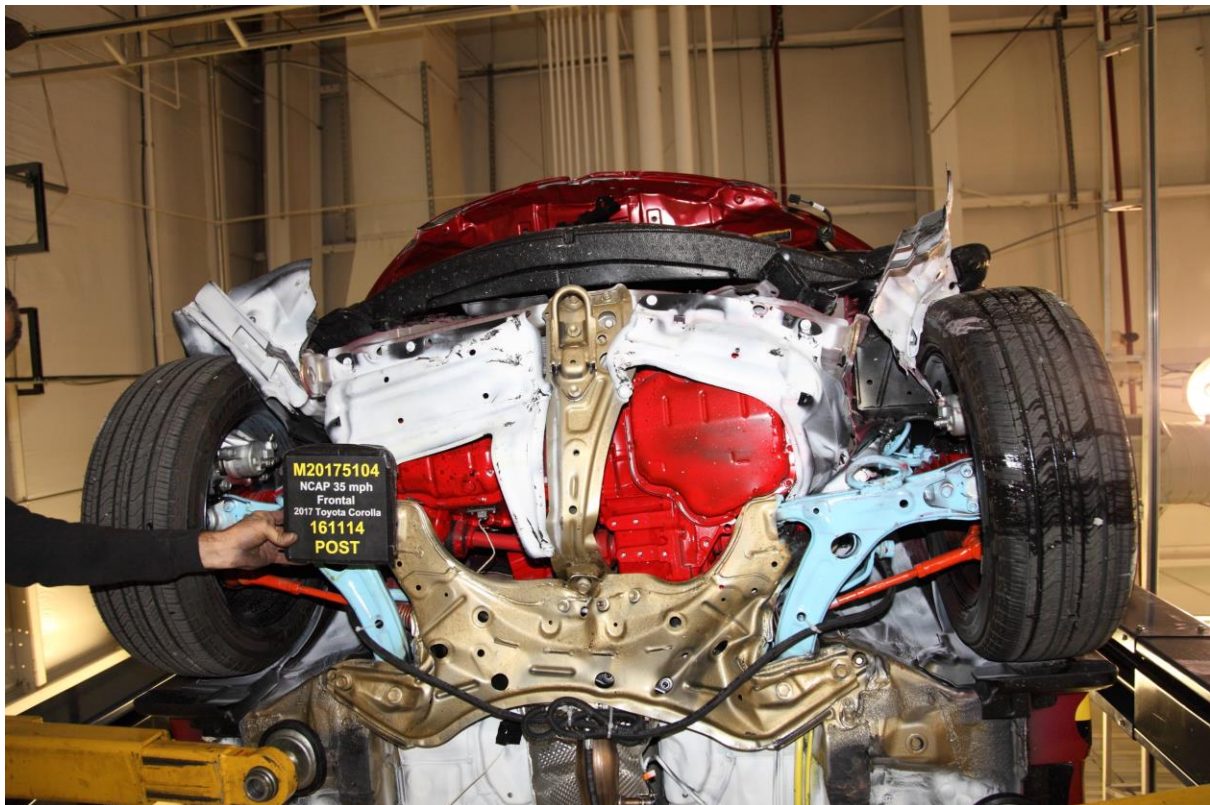
022 Pre-Test Fuel Filler Cap View



023 Post-Test Fuel Filler Cap View



024 Pre-Test Front Underbody View



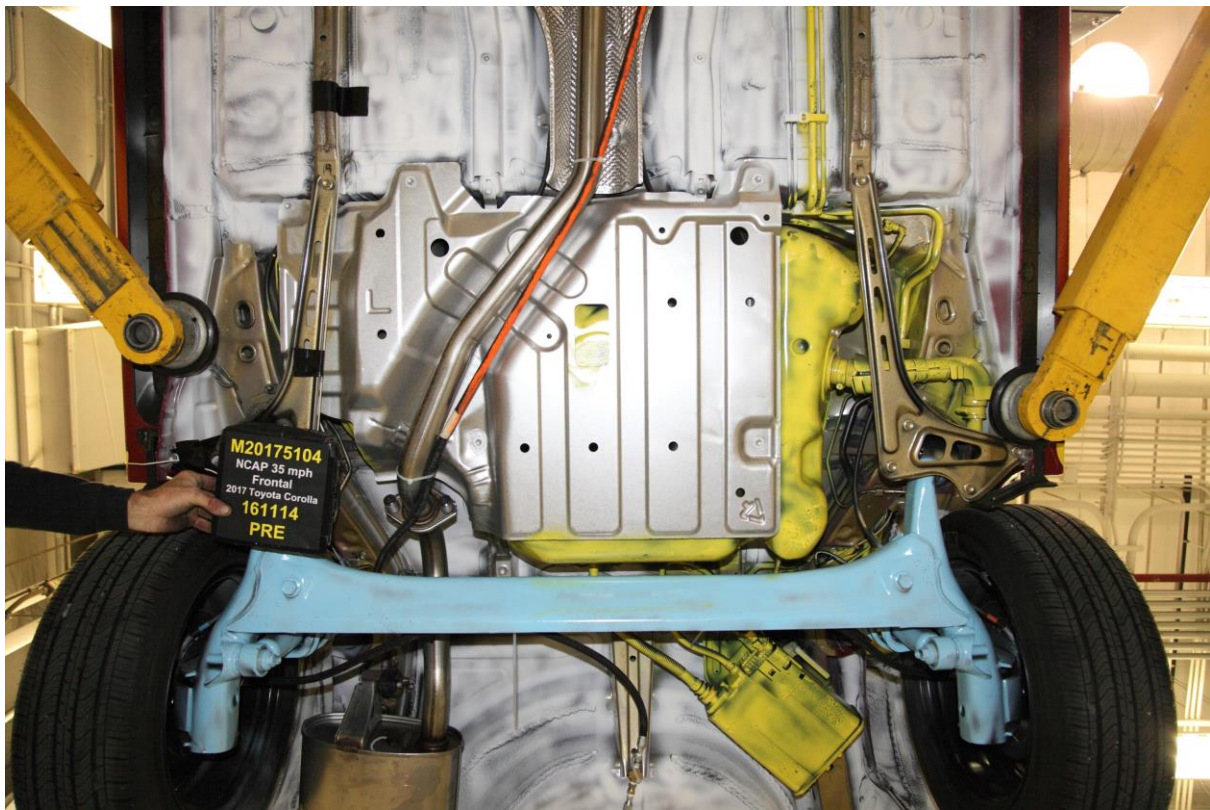
025 Post-Test Front Underbody View



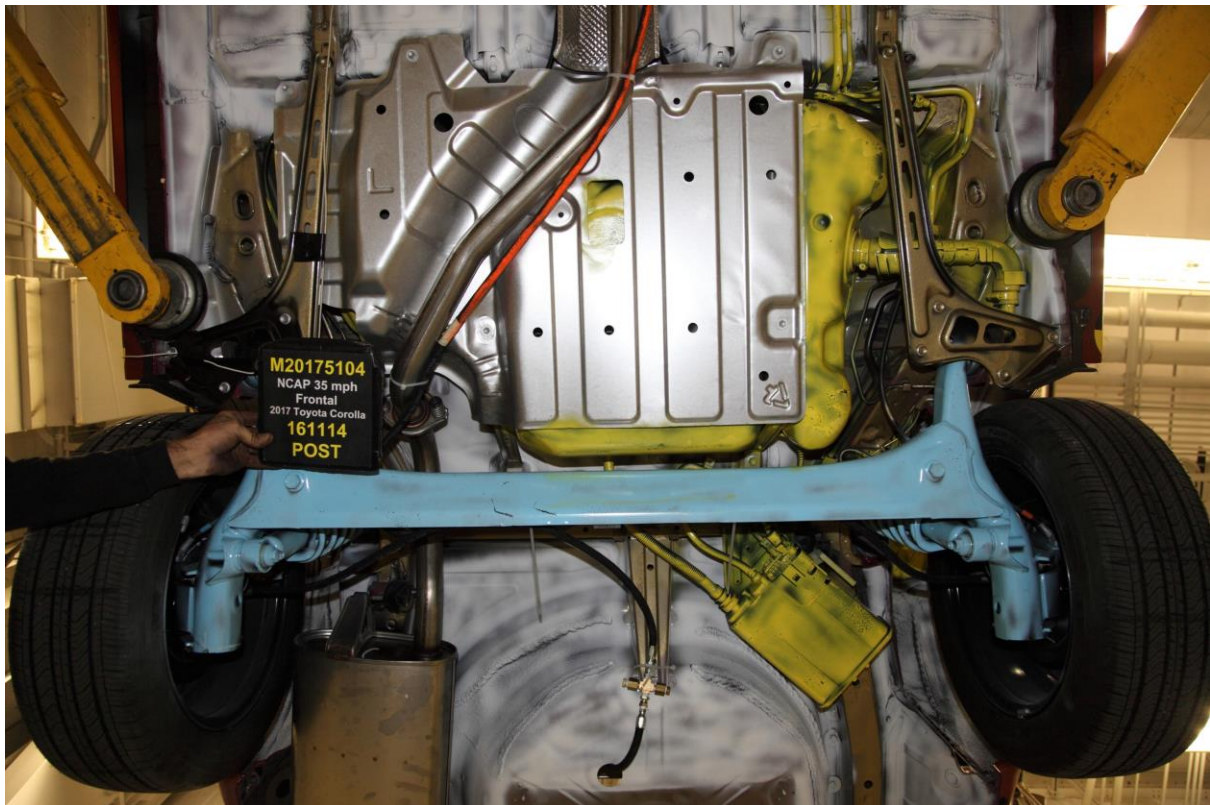
025a Pre-Test Mid Front Underbody View



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



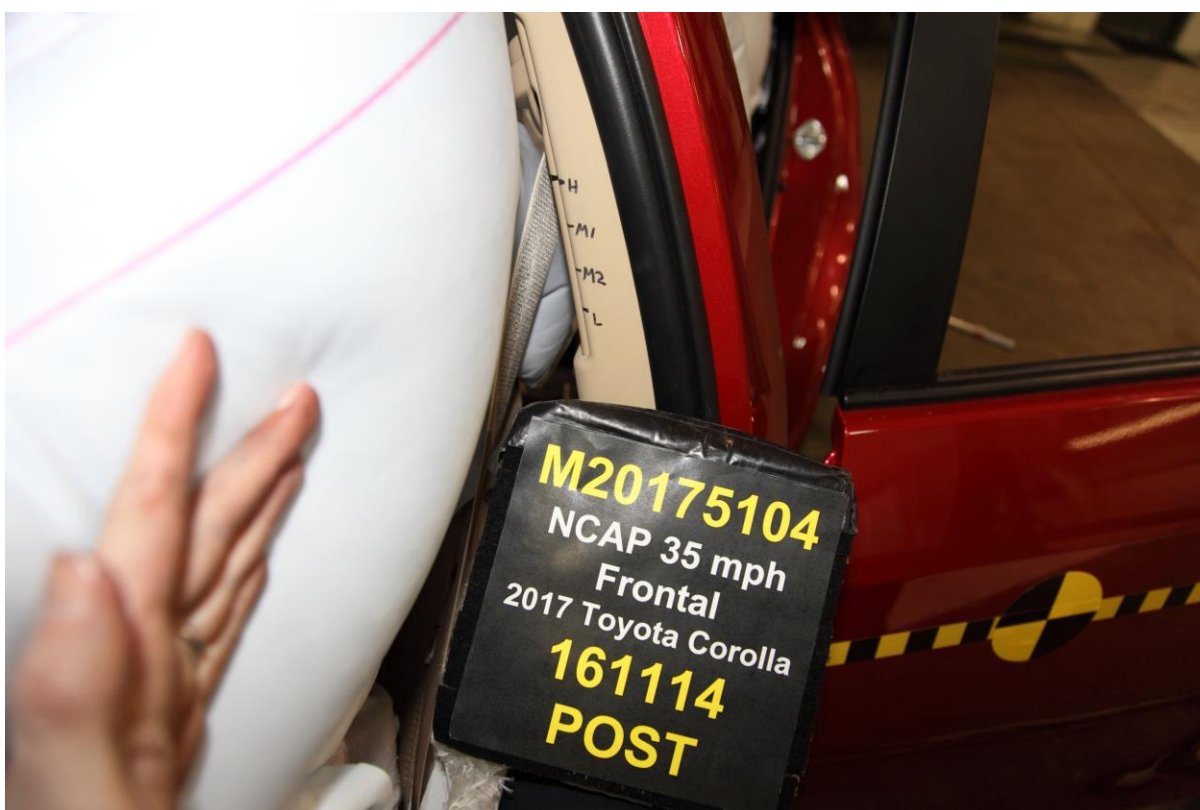
036 Pre-Test Driver's Seat Fore-Aft Markings



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



048a Post-Test Driver Dummy Contact with Side Curtain Airbag



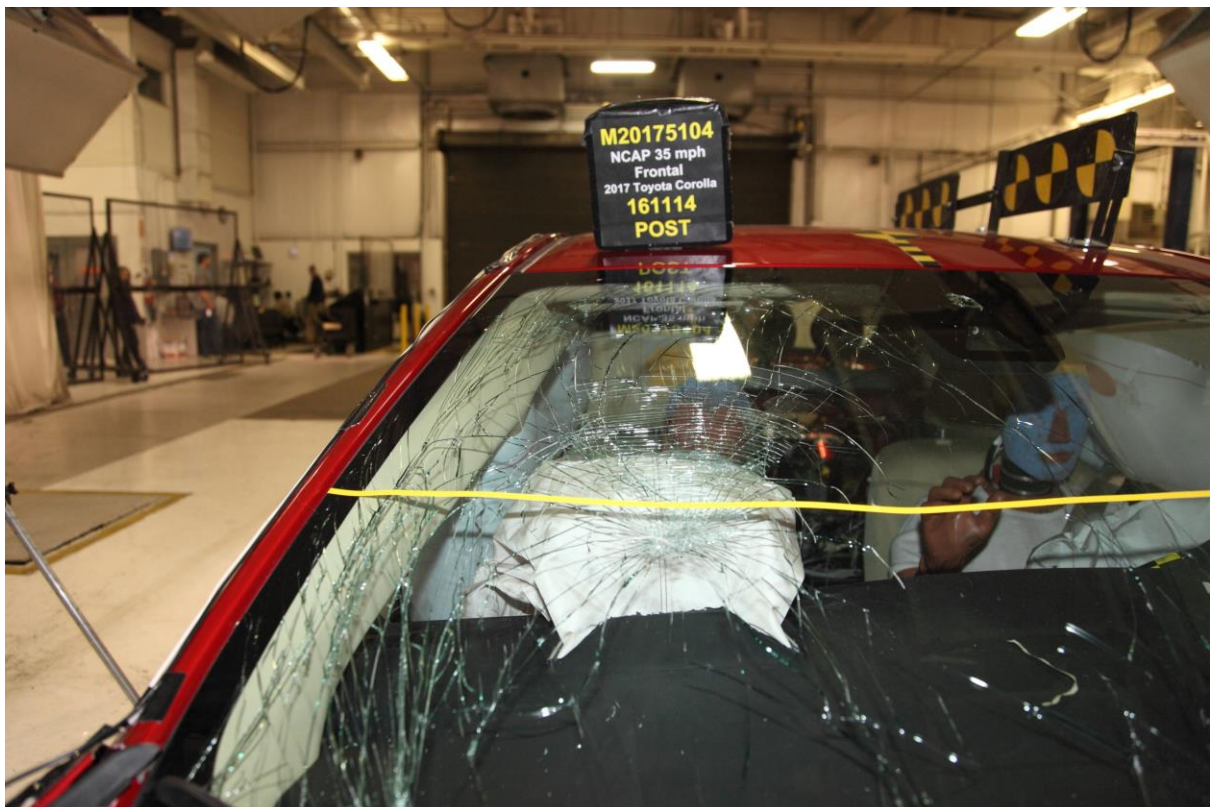
049 Pre-Test View of the Steering Wheel



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



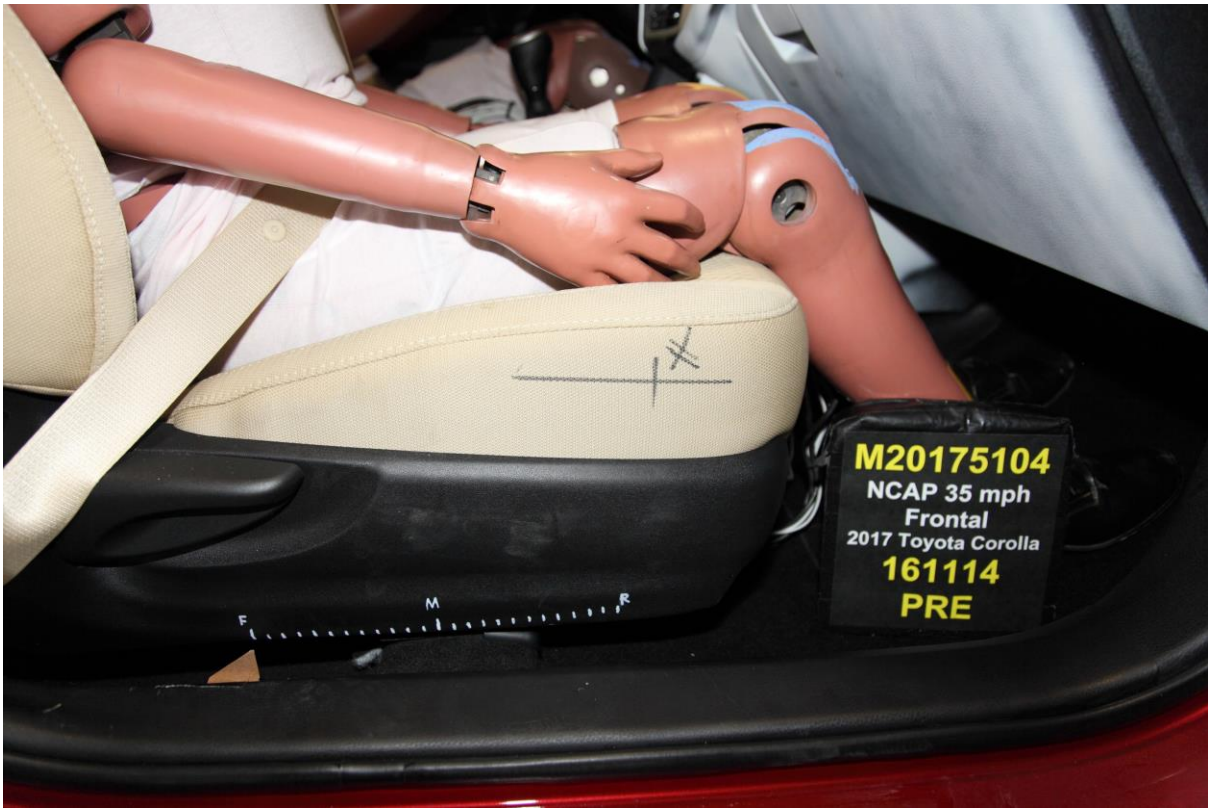
054 Post-Test Passenger Dummy Window View



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



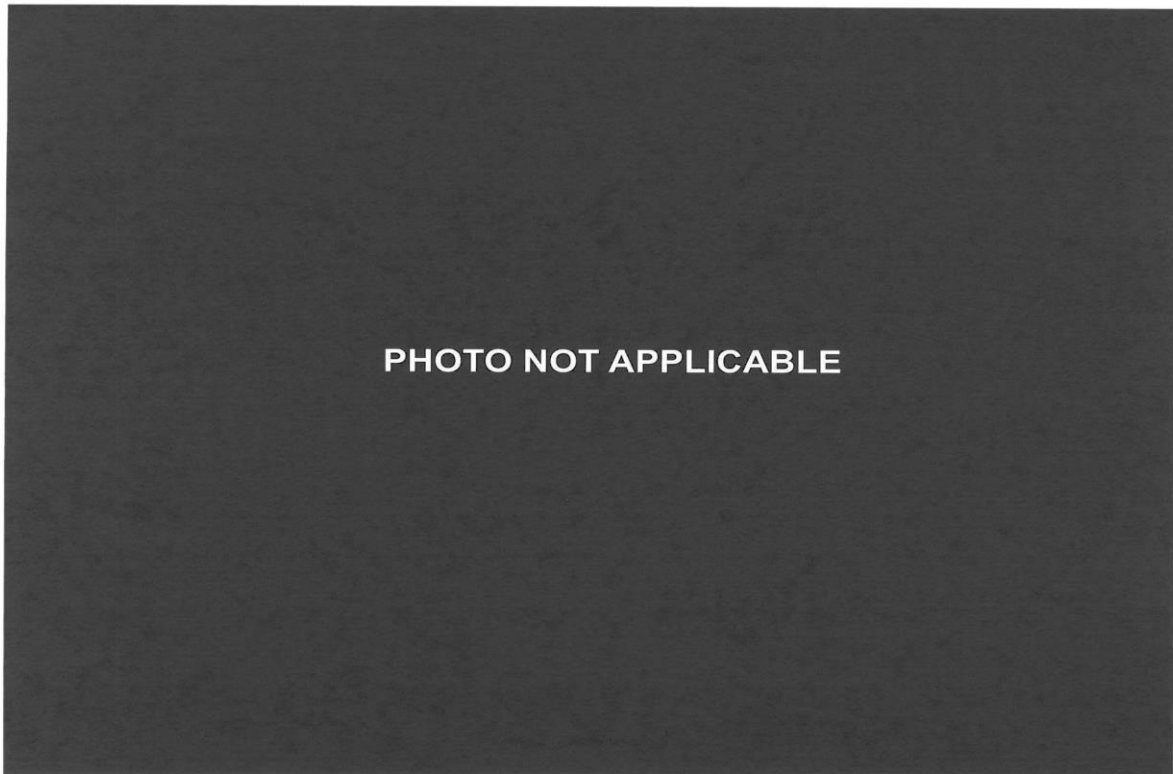
069 Post Test Passenger Dummy Contact with Headrest



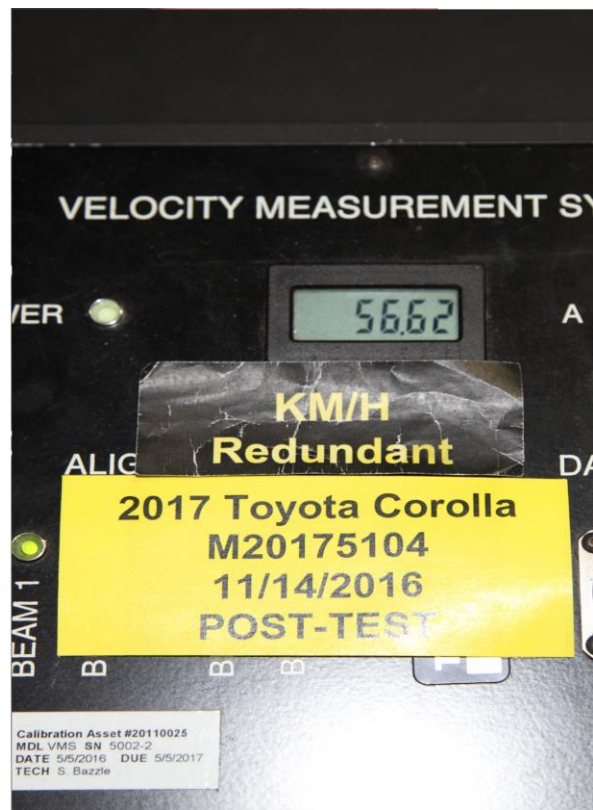
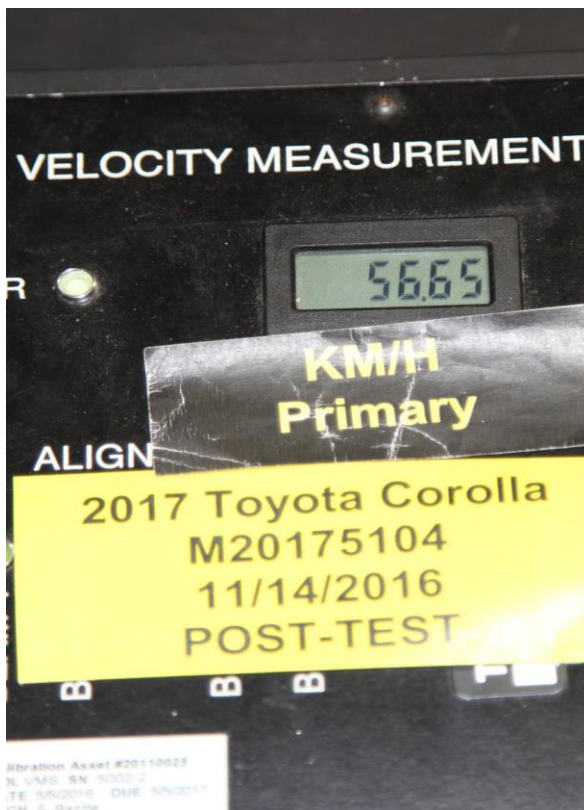
069a Post Test Passenger Dummy Contact with Side Curtain Airbag



070 Photograph of Ballast Installed in Vehicle View



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 Toyota Corolla 4DR Sedan Frontal Impact Event

TOYOTA
Let's Go Places

DESC: **COROLLA** LE
VIN: **2T1BURHE9HC747230**
YR/MDL: 2017/1852A
CLR: BARCELONA RED MET./IVORY (03R3/01)
FINAL ASSEMBLY POINT: CAMBRIDGE, ONTARIO, CANADA

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score Not Rated
Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.

Frontal Crash	Driver Passenger	Not Rated
Based on the risk of injury in a frontal impact.		

Side Crash Not Rated
Based on the risk of injury in a side impact.

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

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

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

STANDARD EQUIPMENT

MECHANICAL & PERFORMANCE

- 1.8L 4-cyl DOHC 16-Valve Dual VVT-i
- Continuously Variable Transmission
- 16-in Wide Vent Steel Wheels
- And P205/55R16 Tires

SAFETY & CONVENIENCE

- Toyota Safety Sense-P: Pre-Collision Sys w/Pedestrian Detection, Dynamic Radar Cruise Control, Lane Departure Alert w/Steering Assist, Automatic High Beams
- Star Safety System includes: VSC, TRAC, Anti-lock Brake System, EBD, Brake Assist & Smart Stop Technology
- 8 Airbags: Dr & Fr Pass Adv Airbag Syst, Dr & Fr Pass Seat-Mounted Side Airbags, Dr Knee Airbag, Pass Seat Cushion Airbag, Front & Rear Side Curtain Airbags
- LATCH (Lar Anchors&Tethers for Children) for Outboard Rear Seating Positions Only
- Whiplash-Injury Lessening Front Seats

EXTERIOR

- Bi-LED Headlights
- LED Daytime Running Lights in Headlight
- Color-Keyed Heated Power Outside Mirrors

INTERIOR

- Premium Fabric-Trimmed 6-Way Adj Dr Seat
- 4-Way Adj Fr Pass Seat w/Seatback Pocket
- Entune Audio w/1.1-in Touch-screen Incl
- Entune Multimedia Bundle (AUX/USB/3.5-in Monoheadphone TTY Multi-Info Display)
- Integrated Backup Camera w/Projected Pin
- Steering Wheel w/ Audio & Bluetooth
- Hands-Free Phone Voice Command Controls
- Auto Climate Control w/ Pollen Filter
- Push Button Controls
- Remote Keyless Entry System
- Power Door Locks and Windows
- **Full Tank of Gas**

MANUFACTURER'S SUGGESTED RETAIL PRICE \$18,935.00

OPTIONAL EQUIPMENT	PRICE
FE 50 State Emissions	
ZT All Weather Floor Liners/Cargo Tray	\$49.00
MF Mudguards	\$29.00

EPA DOT Fuel Economy and Environment

Gasoline Vehicle

Fuel Economy

32 MPG combined city/hwy
28 city 36 highway
3.1 gallons per 100 miles

You save \$1,250 in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$1,150

Fuel Economy & Greenhouse Gas Rating (mpg city) 1 7 10 (best)

Smog Rating (mpg city) 1 6 10 (best)

DELIVERY PROCESSING AND HANDLING FEE \$65.00

TOTAL \$20,175.00

The New Vehicle Limited Warranty provides 3-year/50,000-mile basic coverage, 5-year/100,000-mile powertrain coverage, plus 24-hour roadside assistance coverage. See Warranty and Maintenance Guide for details. An extended service contract may be available for the vehicle.

Manufacturer's suggested retail price includes manufacturer's recommended pre-delivery service. Destination, taxes and title fees, registered dealer, state and local taxes and dealer and distributor handling options are excluded in the MSRP of the manufacturer's suggested retail price.

ToyotaCare, which covers normal factory scheduled maintenance for two years or 25,000 miles, whichever occurs first, is included as part of the value price of the vehicle for qualifying buyers. See dealer for details. See dealer for details.

Delivered by Truck to: 31175 WEST HERR TOWN/WILLIAMSVILLE 8109 MAIN STREET WILLIAMSVILLE NY14221

fueleconomy.gov
Calculate personalized estimates and compare vehicles

Smartphone QR Code

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

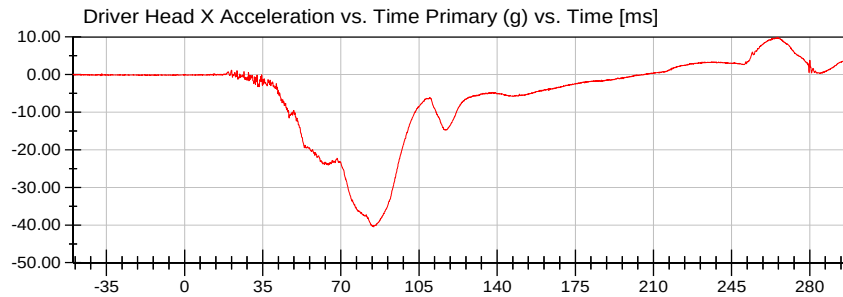
Test Lab: CTF

Test Number: 161114 (M20175104)

Test Date: 11/14/2016

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

Position #2 Hybrid III Small Adult Female (426)



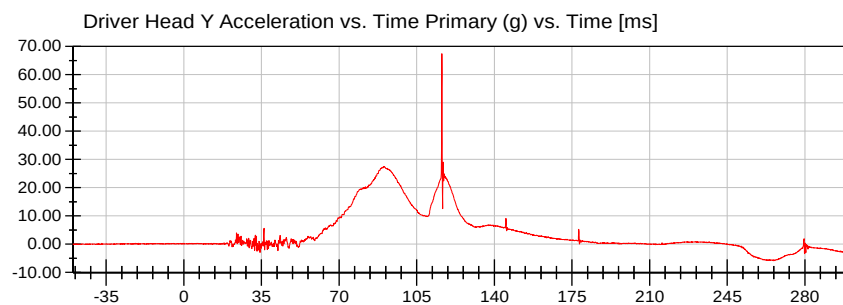
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CFC_1000



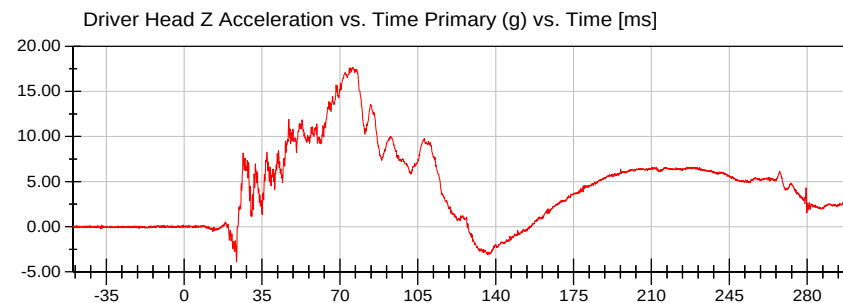
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-5.89 g at 266.00 ms

CFC_1000



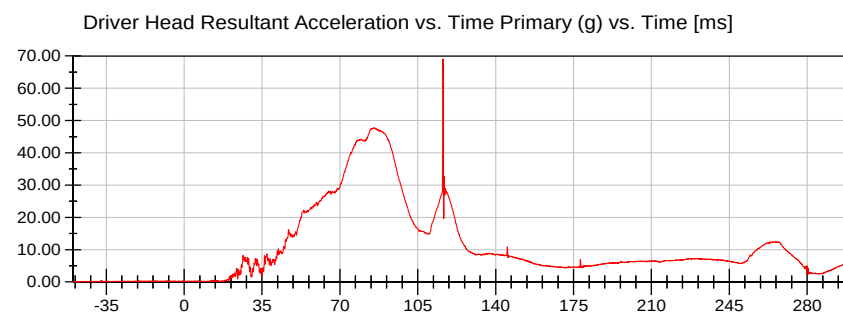
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17.65 g at 75.84 ms

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-3.89 g at 23.52 ms

CFC_1000



<Max>

69.12 g at 116.32 ms

<Min>

0.03 g at -48.48 ms

CFC_1000



NHTSA

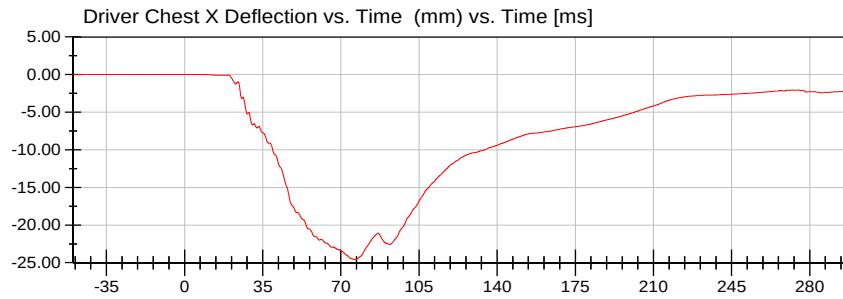
Test Lab: CTF

Test Number: 161114 (M20175104)

Test Date: 11/14/2016

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

Position #2 Hybrid III Small Adult Female (426)



<Max>

0.01 mm at -20.00 ms

<Min>

-24.57 mm at 76.16 ms

CFC_600



NHTSA

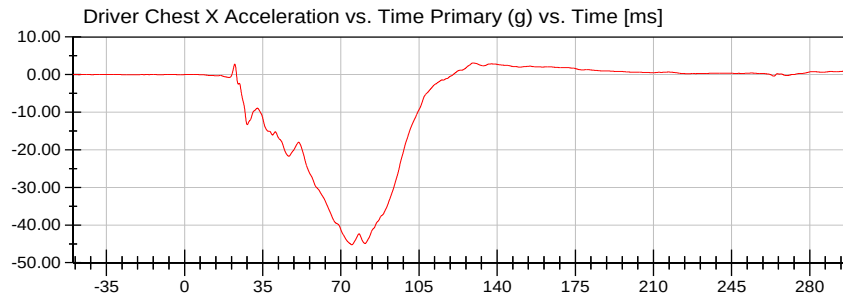
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Test Number: 161114 (M20175104)

Test Date: 11/14/2016

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

Position #2 Hybrid III Small Adult Female (426)



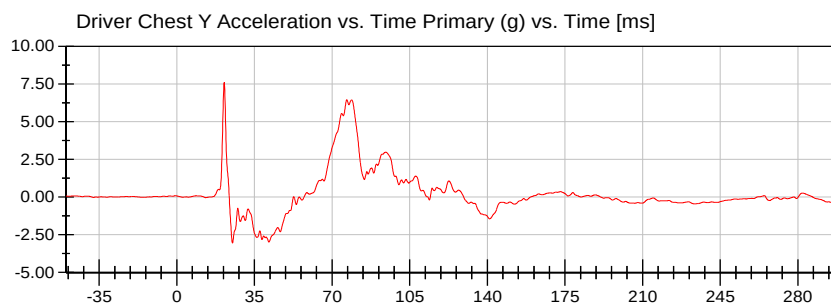
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-45.25 g at 74.88 ms

CFC_180



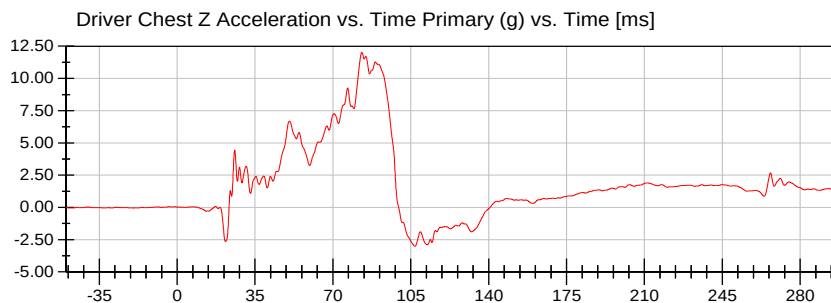
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CFC_180



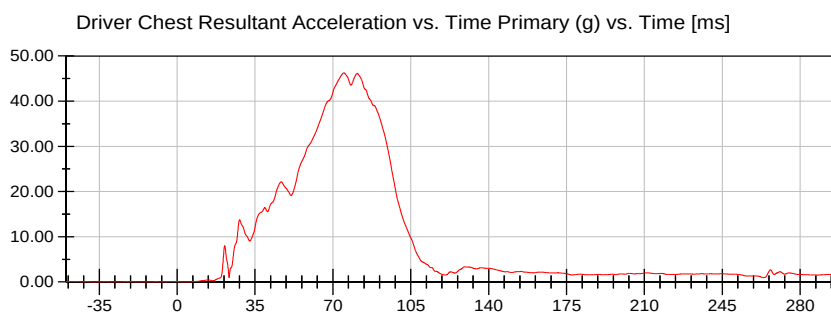
<Max>

12.02 g at 82.96 ms

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-3.02 g at 106.88 ms

CFC_180



<Max>

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<Min>

0.01 g at -15.52 ms

CFC_180



NHTSA

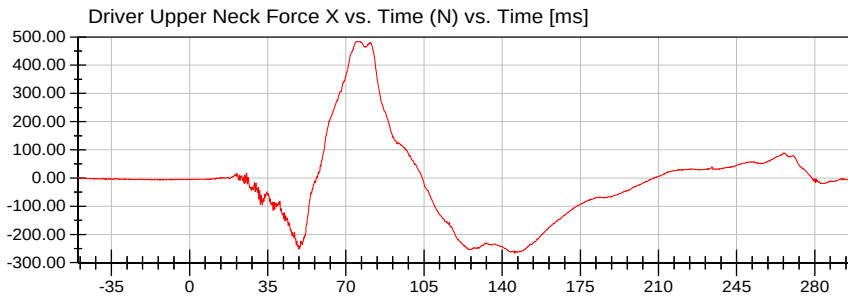
Test Lab: CTF

Test Number: 161114 (M20175104)

Test Date: 11/14/2016

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

Position #2 Hybrid III Small Adult Female (426)



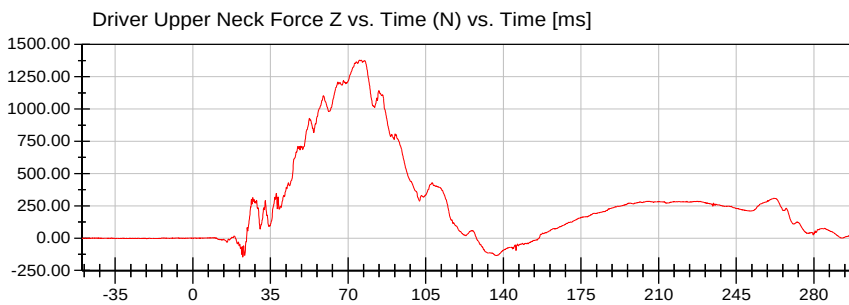
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484.24 N at 76.08 ms

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CFC_1000



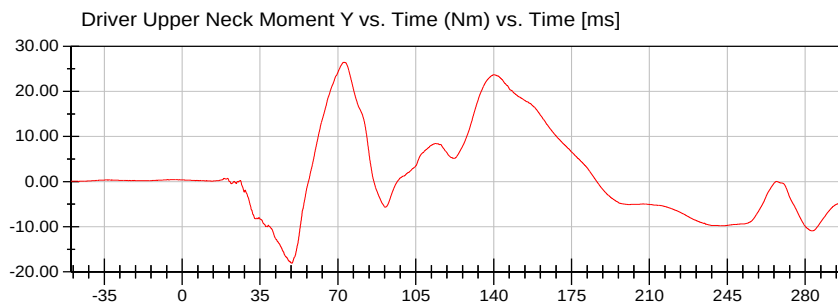
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1,379.28 N at 75.12 ms

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-145.73 N at 22.56 ms

CFC_1000



<Max>

26.43 Nm at 72.72 ms

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-18.08 Nm at 49.20 ms

CFC_600





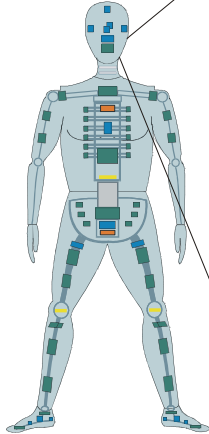
2017 Toyota Corolla NCAP 35 mph Frontal Impact Neck Injury Predictor (NIJ)

Date: 11/14/2016
Time: 15:54

Customer: NHTSA

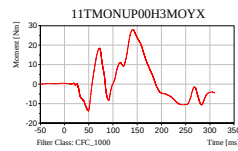
Test Number: M20175104

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

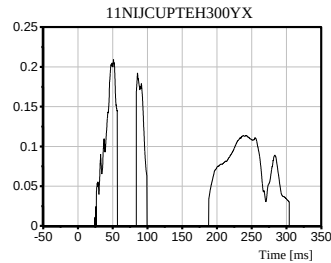


Dummy: HIII 50th Male
Seating Position:
Driver

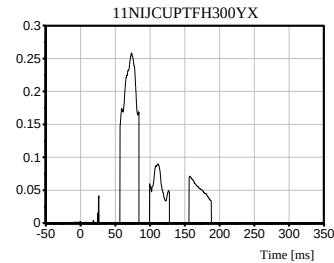
NIJ Source Code: (Fz/Fzc)+(Myc/Myc)



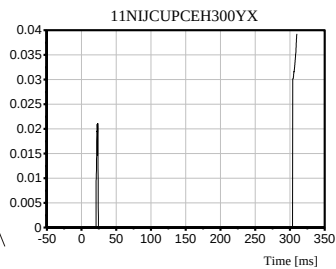
TRC Inc. Test Lab: CTF
Test Number: 161114



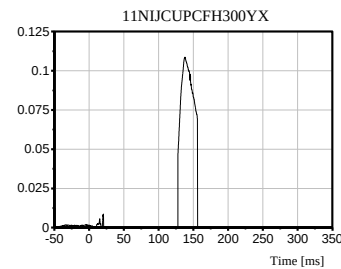
Max [NTE] 0.2090 at 51.20 ms



Max [NTF] 0.2583 at 73.60 ms



Max [NCE] 0.0393 at 310.00 ms



Max [NCF] 0.1086 at 137.92 ms

NHTSA

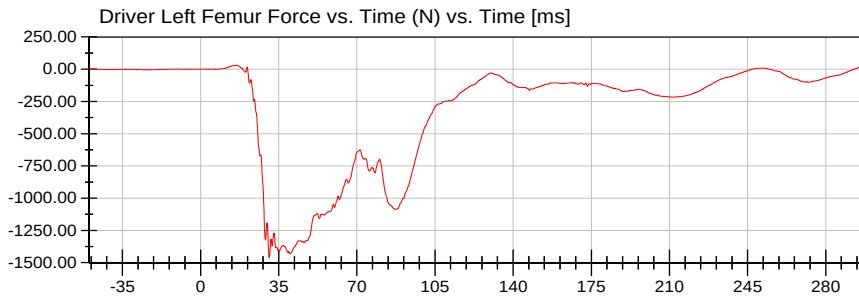
Test Lab: CTF

Test Number: 161114 (M20175104)

Test Date: 11/14/2016

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

Position #2 Hybrid III Small Adult Female (426)



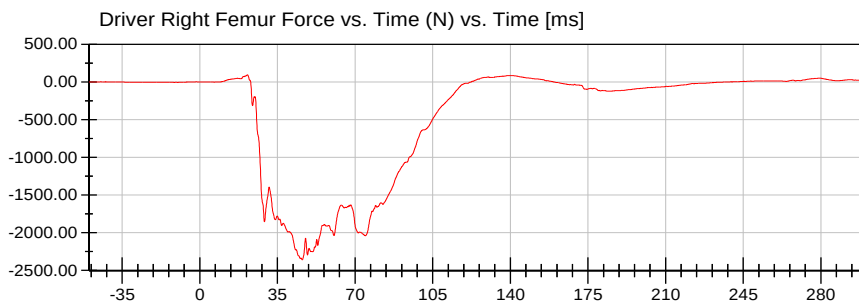
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34.44 N at 300.00 ms

<Min>

-1,459.27 N at 30.72 ms

CFC_600



<Max>

97.97 N at 21.44 ms

<Min>

-2,358.16 N at 46.16 ms

CFC_600



NHTSA

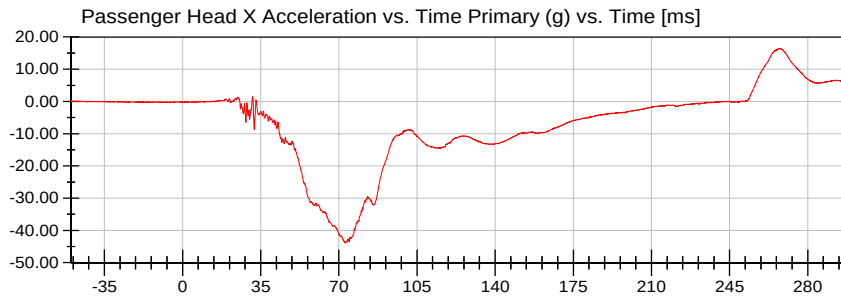
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Test Number: 161114 (M20175104)

Test Date: 11/14/2016

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

Position #2 Hybrid III Small Adult Female (426)



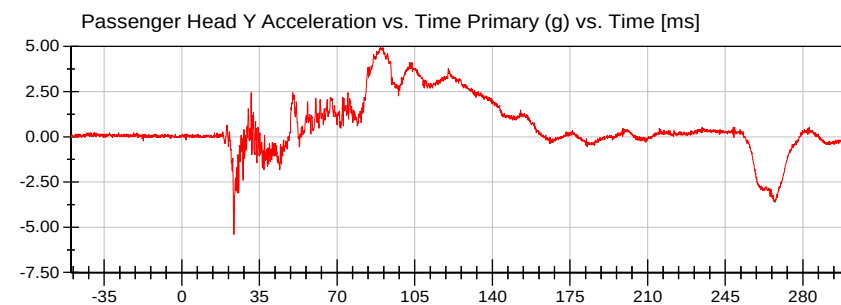
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-43.90 g at 72.88 ms

CFC_1000



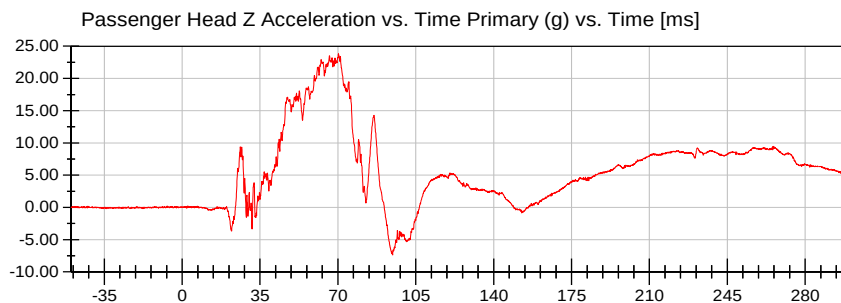
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4.94 g at 89.44 ms

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-5.40 g at 23.44 ms

CFC_1000



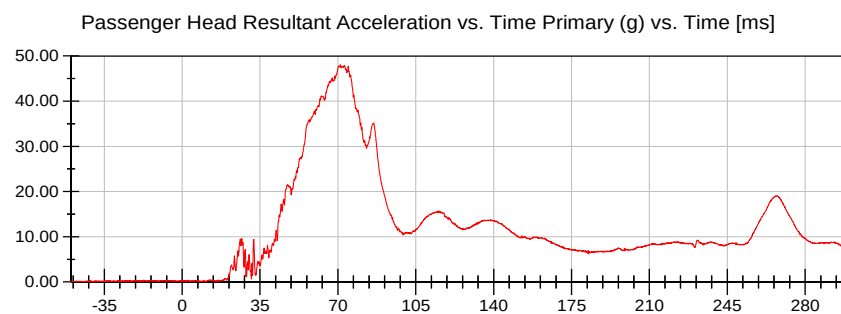
<Max>

23.84 g at 70.24 ms

<Min>

-7.37 g at 94.56 ms

CFC_1000



<Max>

48.07 g at 71.12 ms

<Min>

0.03 g at -48.48 ms

CFC_1000



NHTSA

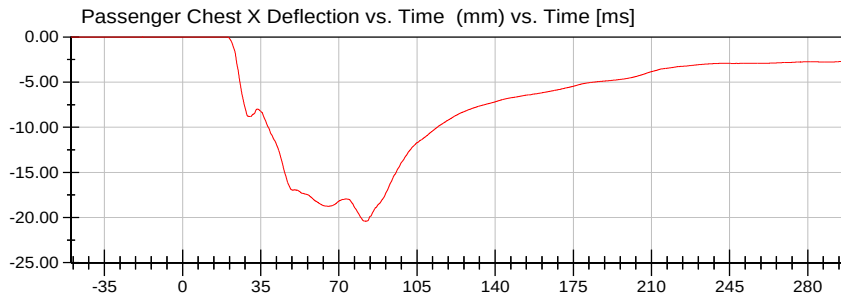
Test Lab: CTF

Test Number: 161114 (M20175104)

Test Date: 11/14/2016

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

Position #2 Hybrid III Small Adult Female (426)



<Max>

0.00 mm at -17.92 ms

<Min>

-20.41 mm at 82.00 ms

CFC_600



NHTSA

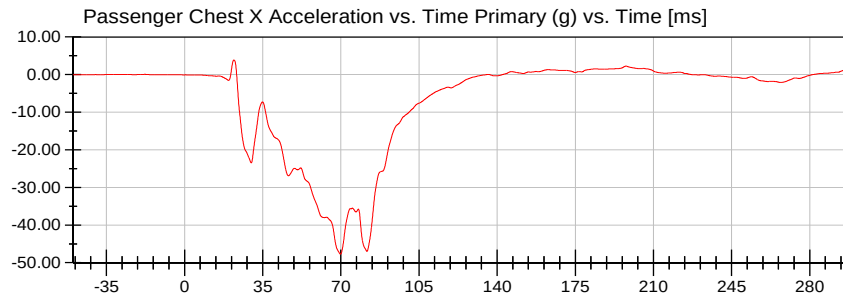
Test Lab: CTF

Test Number: 161114 (M20175104)

Test Date: 11/14/2016

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

Position #2 Hybrid III Small Adult Female (426)

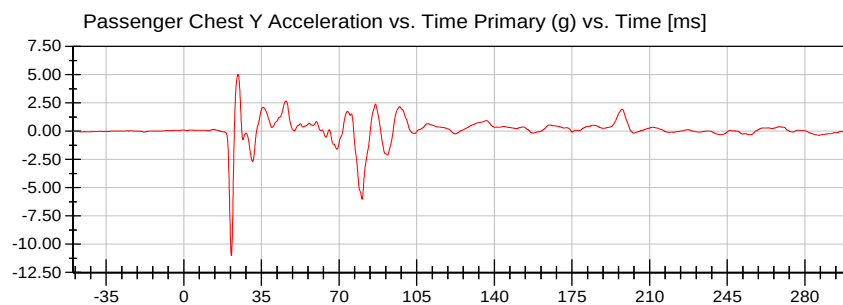


<Max>

3.86 g at 22.08 ms

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-47.75 g at 69.84 ms

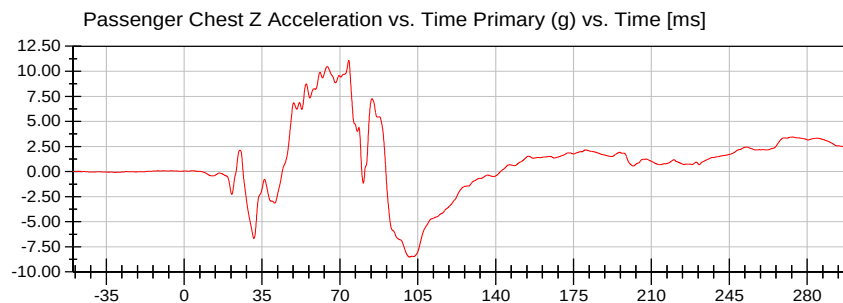


<Max>

5.04 g at 24.48 ms

<Min>

-11.00 g at 21.44 ms

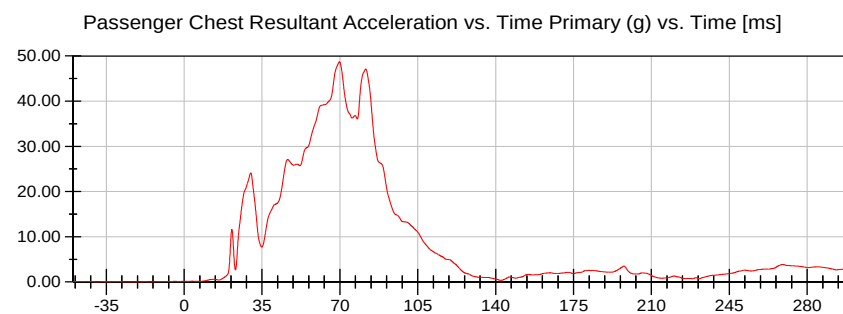


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11.08 g at 74.00 ms

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-8.51 g at 101.28 ms



<Max>

48.71 g at 69.84 ms

<Min>

0.01 g at -20.48 ms



NHTSA

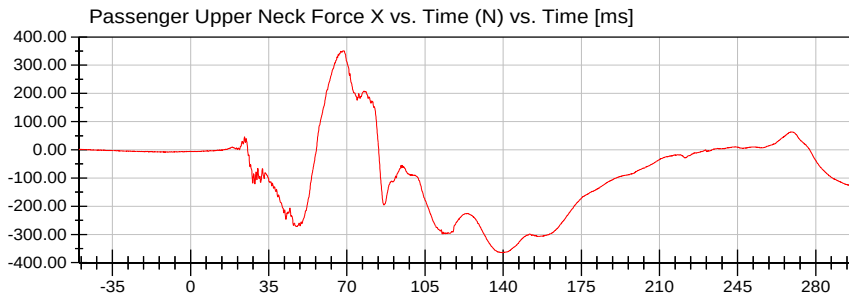
Test Lab: CTF

Test Number: 161114 (M20175104)

Test Date: 11/14/2016

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

Position #2 Hybrid III Small Adult Female (426)



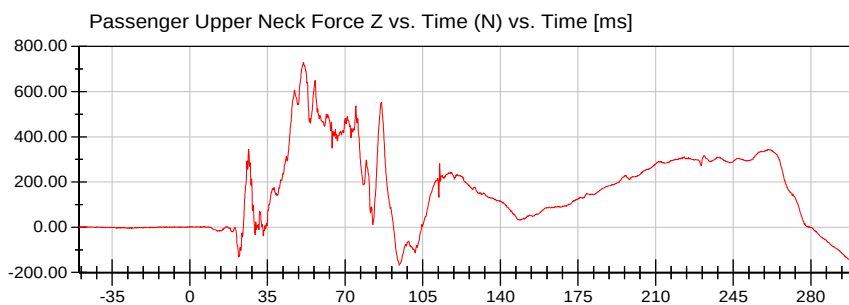
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351.28 N at 68.24 ms

<Min>

-364.98 N at 139.68 ms

CFC_1000



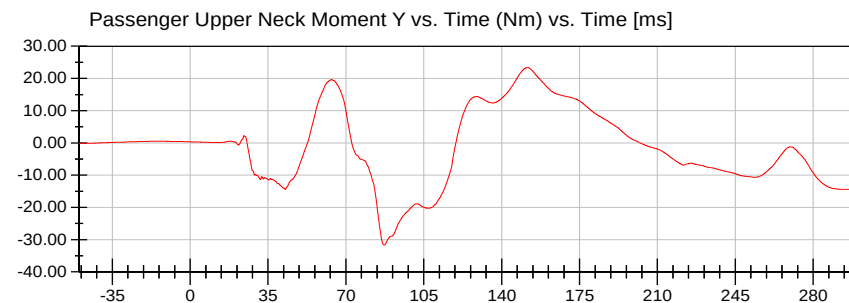
<Max>

730.08 N at 51.20 ms

<Min>

-167.84 N at 94.40 ms

CFC_1000



<Max>

23.35 Nm at 151.60 ms

<Min>

-31.71 Nm at 87.28 ms

CFC_600





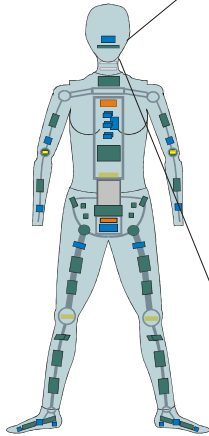
2017 Toyota Corolla NCAP 35 mph Frontal Impact Neck Injury Predictor (NIJ)

Date: 11/14/2016
Time: 15:54

Customer: NHTSA

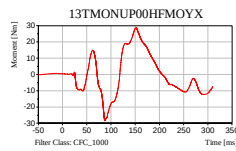
Test Number: M20175104

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

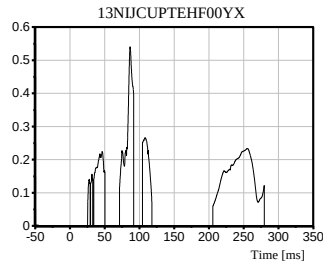


Dummy: HIII 5th Female
Seating Position:
Right Front Passenger

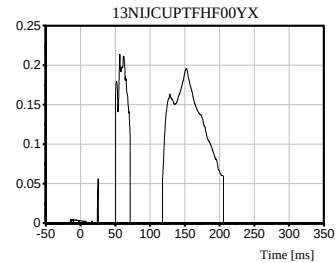
NIJ Source Code: (Fz/Fzc)*(Myc/Myc)



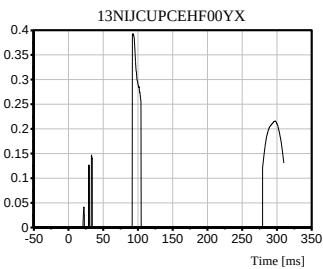
TRC Inc. Test Lab: CTF
Test Number: 161114



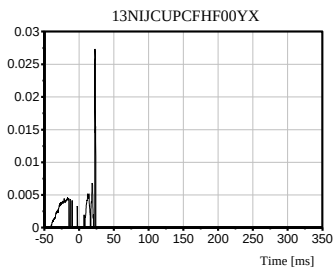
Max [NTE] 0.5399 at 86.48 ms



Max [NTF] 0.2135 at 56.48 ms



Max [NCE] 0.3934 at 92.80 ms



Max [NCF] 0.0273 at 22.96 ms

NHTSA

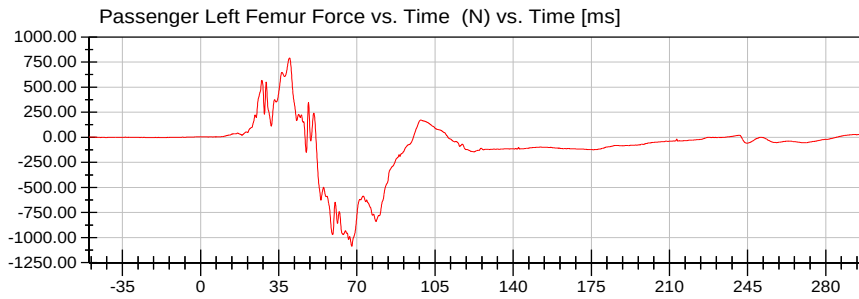
Test Lab: CTF

Test Number: 161114 (M20175104)

Test Date: 11/14/2016

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

Position #2 Hybrid III Small Adult Female (426)



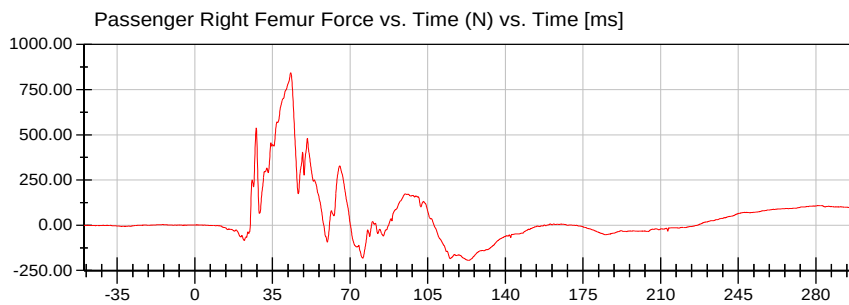
<Max>

790.45 N at 39.84 ms

<Min>

-1,086.67 N at 67.68 ms

CFC_600



<Max>

843.10 N at 43.20 ms

<Min>

-194.51 N at 123.36 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. 40

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	514	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	198	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. 40-1

Test Date: 10/11/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	265.0 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	5.7 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

10.11.2016 08:14:30 614

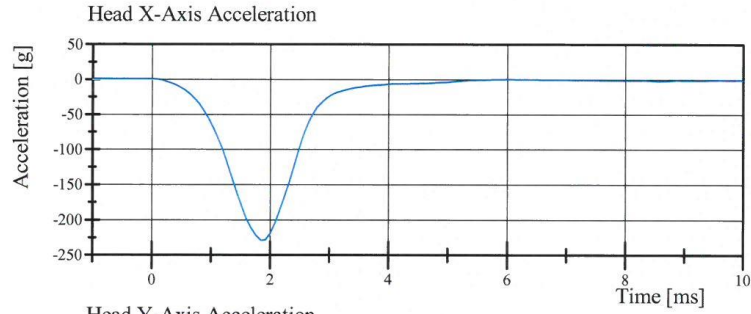


Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 037 Certification No. 40-1

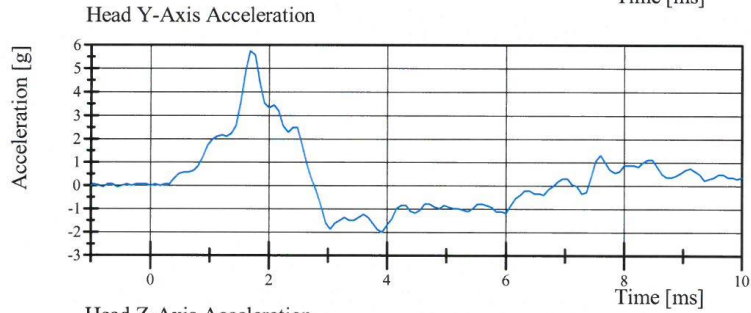
Test Date: 10/11/2016



Filter Class: CFC_1000

Max: 0.1 g at -1.0 ms

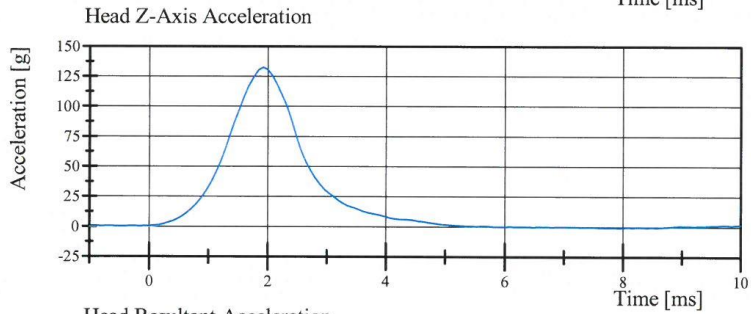
Min: -229.8 g at 1.8 ms



Filter Class: CFC_1000

Max: 5.7 g at 1.7 ms

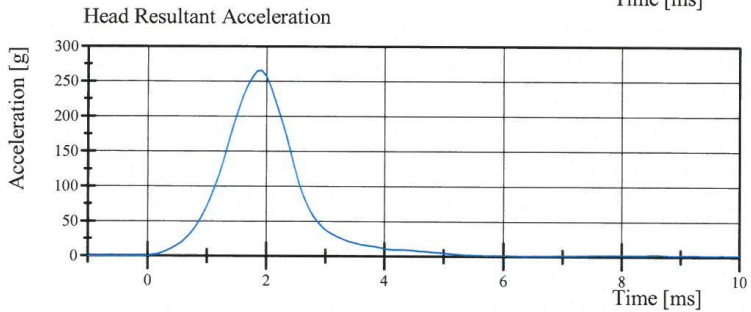
Min: -2.0 g at 3.9 ms



Filter Class: CFC_1000

Max: 132.5 g at 1.9 ms

Min: -0.8 g at 7.9 ms



Filter Class: CFC_1000

Max: 265.0 g at 1.9 ms

Min: 0.0 g at -0.4 ms

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

10.11.2016 08:14:39 614



Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 40-3

Test Date: 10/11/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.941 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	38.9 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-23.47 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-19.84 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-15.74 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-15.74 g	Yes
Total Head D-Plane Rotation			
Peak	(-64) - (-78) °	-67.7 °	Yes
Time of Peak	57 - 64 ms	60.4 ms	Yes
Total Head D-Plane Rotation			
Decay to 0°	113 - 128 ms	121.0 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	88 - 108 N·m	101.6 N·m	Yes
Time of Peak	47 - 58 ms	51.6 ms	Yes
Total Neck Occipital Condyles Moment			
Decay to 0 N·m	97 - 107 ms	101.6 ms	Yes

Test meets specifications.

Comments:

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

10.11.2016 12:43:24 3039

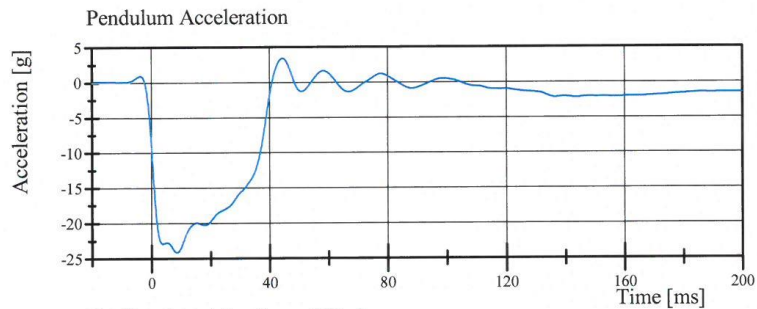


Transportation Research Center Inc.

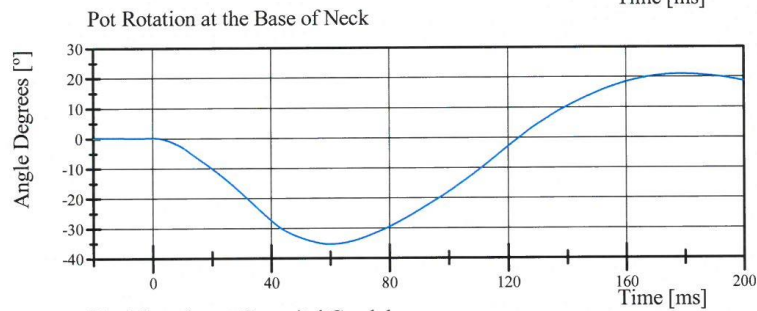
Neck Flexion

HIII 50th Serial No. 037 Certification No. 40-3

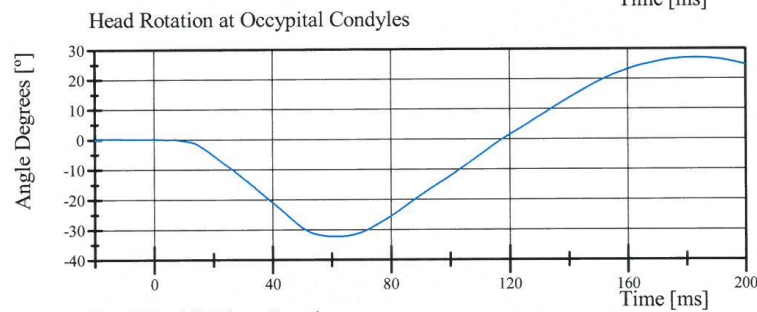
Test Date: 10/11/2016



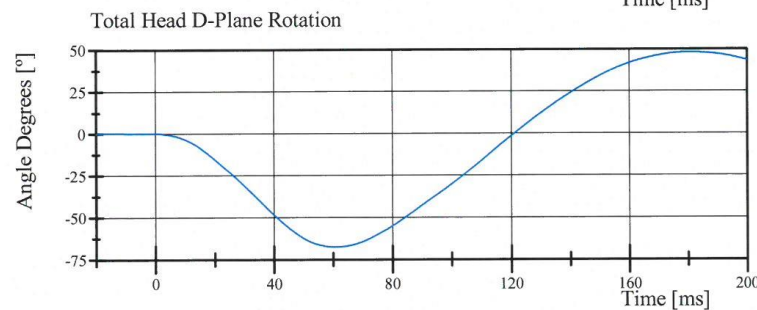
Filter Class: CFC_60
Max: 3.4 g at 44.4 ms
Min: -24.2 g at 8.6 ms



Filter Class: CFC_60
Max: 21.0 ° at 178.7 ms
Min: -35.4 ° at 59.8 ms



Filter Class: CFC_60
Max: 27.0 ° at 183.0 ms
Min: -32.4 ° at 61.4 ms



Filter Class: CFC_60
Max: 48.0 ° at 180.6 ms
Min: -67.7 ° at 60.4 ms

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

10.11.2016 12:43:50 3039

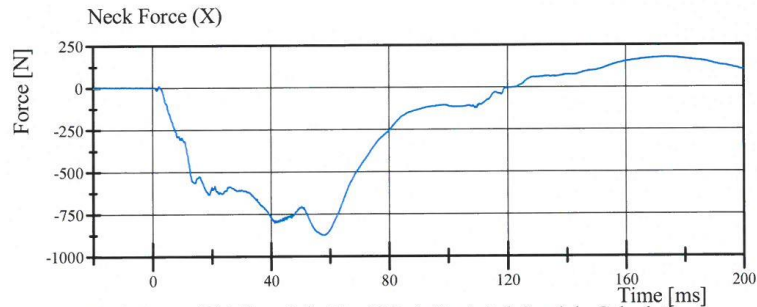


Transportation Research Center Inc.

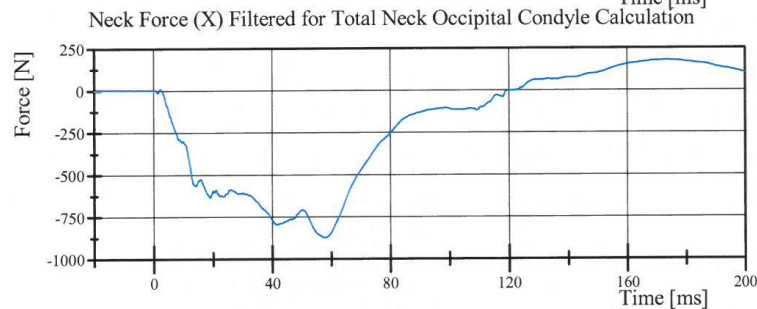
Neck Flexion

HIII 50th Serial No. 037 Certification No. 40-3

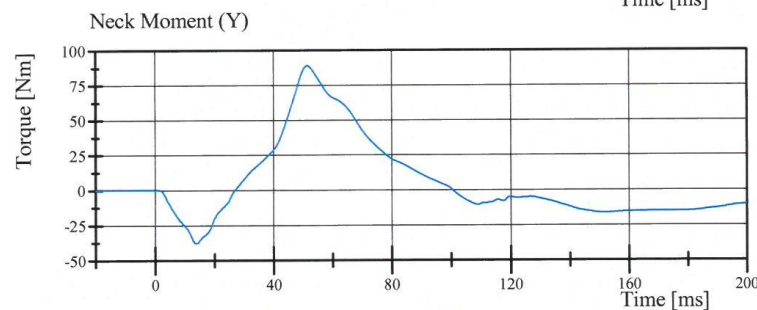
Test Date: 10/11/2016



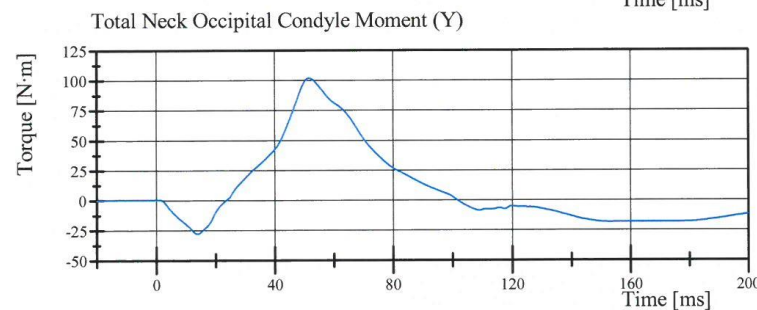
Filter Class: CFC_1000
Max: 177.5 N at 173.5 ms
Min: -874.7 N at 57.9 ms



Filter Class: CFC_600
Max: 177.2 N at 173.6 ms
Min: -874.2 N at 57.8 ms



Filter Class: CFC_600
Max: 88.8 Nm at 51.4 ms
Min: -38.2 Nm at 13.9 ms



Filter Class: Without_Constant
Max: 101.6 N·m at 51.6 ms
Min: -28.2 N·m at 13.8 ms

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

10.11.2016 12:43:51 3039



Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 40-1

Test Date: 10/11/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-6.005 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	42.1 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	18.35 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	16.97 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	13.25 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	13.25 g	Yes
Total Head D-Plane Rotation			
Peak	81 - 106 °	93.0 °	Yes
Time of Peak	72 - 82 ms	78.2 ms	Yes
Total Head D-Plane Rotation			
Decay to 0°	147 - 174 ms	159.8 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	(-53) - (-80) N·m	-67.6 N·m	Yes
Time of Peak	65 - 79 ms	72.0 ms	Yes
Total Neck Occipital Condyles Moment			
Decay to 0 N·m	120 - 148 ms	145.6 ms	Yes

Test meets specifications.

Comments:

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

10.11.2016 13:13:24 3126

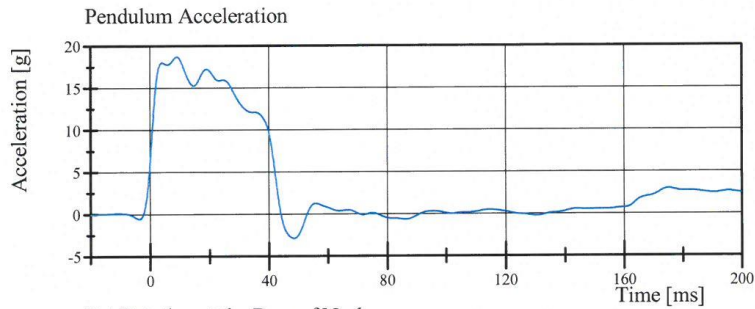


Transportation Research Center Inc.

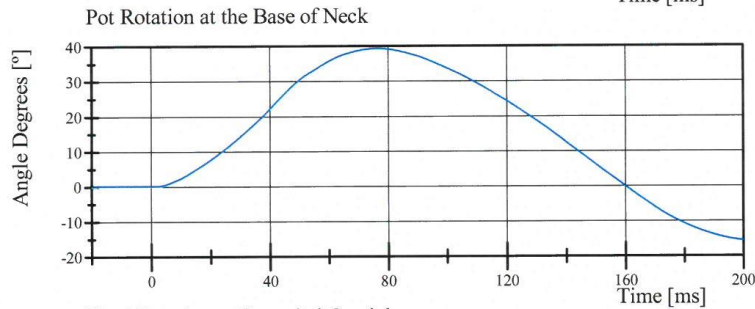
Neck Extension

HIII 50th Serial No. 037 Certification No. 40-1

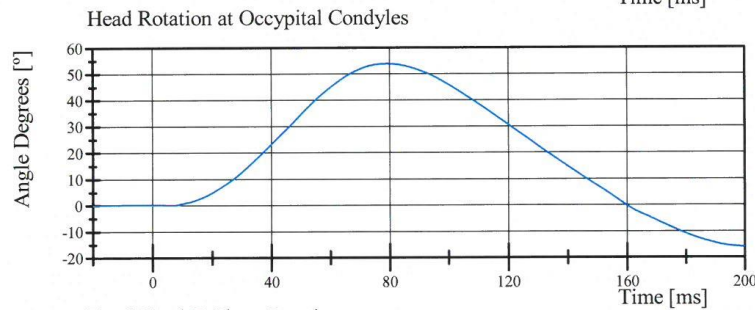
Test Date: 10/11/2016



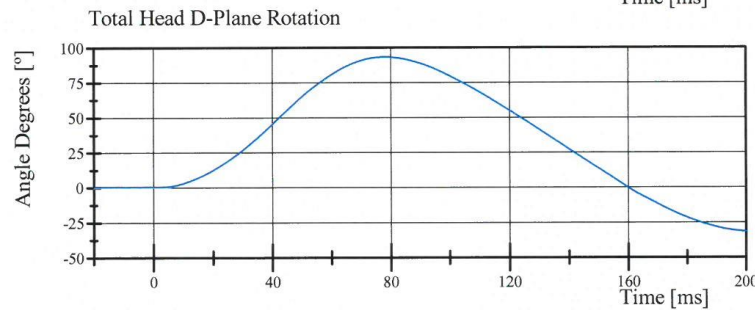
Filter Class: CFC_60
Max: 18.6 g at 9.0 ms
Min: -2.9 g at 48.4 ms



Filter Class: CFC_60
Max: 39.3 ° at 76.3 ms
Min: -15.6 ° at 200.0 ms



Filter Class: CFC_60
Max: 53.8 ° at 79.2 ms
Min: -16.0 ° at 200.0 ms



Filter Class: CFC_60
Max: 93.0 ° at 78.2 ms
Min: -31.6 ° at 200.0 ms

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

10.11.2016 13:13:35 3126

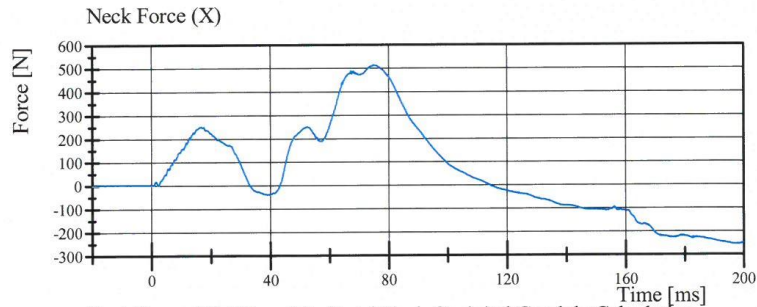


Transportation Research Center Inc.

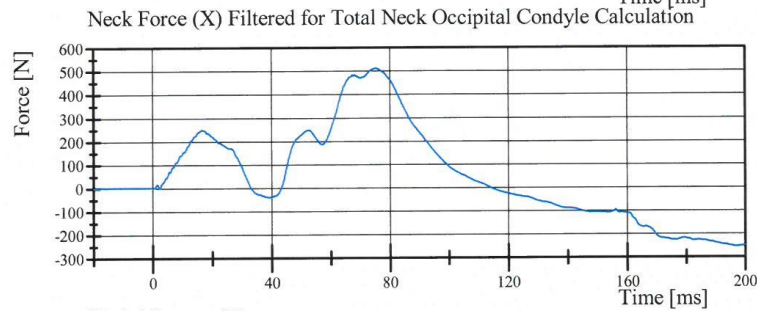
Neck Extension

HIII 50th Serial No. 037 Certification No. 40-1

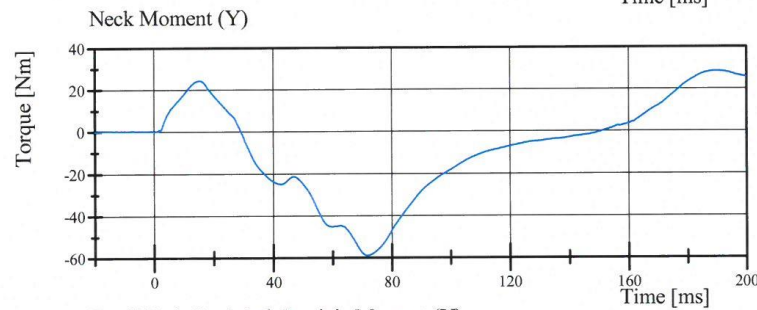
Test Date: 10/11/2016



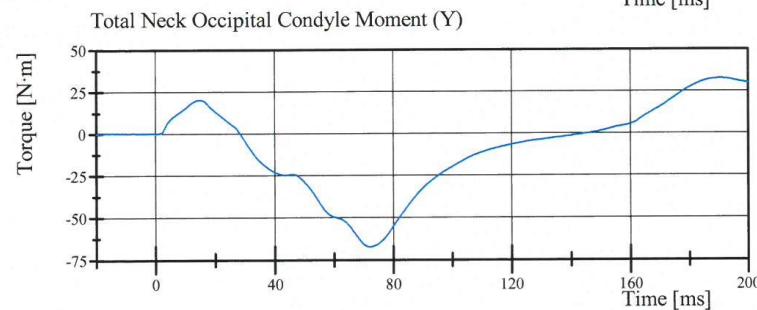
Filter Class: CFC_1000
Max: 511.7 N at 75.0 ms
Min: -253.6 N at 196.8 ms



Filter Class: CFC_600
Max: 511.3 N at 75.1 ms
Min: -253.2 N at 196.9 ms



Filter Class: CFC_600
Max: 28.3 Nm at 189.8 ms
Min: -59.1 Nm at 71.8 ms



Filter Class: Without_Constant
Max: 32.6 N·m at 190.7 ms
Min: -67.6 N·m at 72.0 ms

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

10.11.2016 13:13:35 3126



Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 037 Certification No. 40-1

Test Date: 10/11/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.644 m/s	Yes
Probe Force Peak	(-5,160) - (-5,893) N	-5,460.8 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-71.07 mm	Yes
Internal Hysteresis	65 - 85 %	72.8 %	Yes

Test meets specifications.

Comments:

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

10.11.2016 09:43:08 437

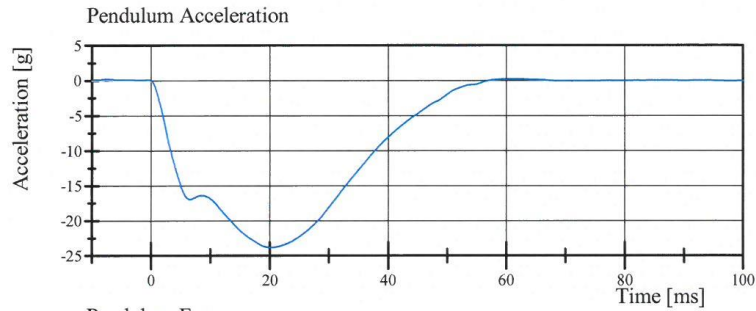


Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 037 Certification No. 40-1

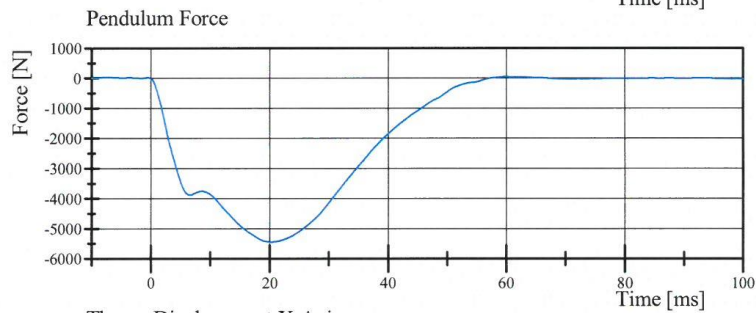
Test Date: 10/11/2016



Filter Class: CFC_180

Max: 0.2 g at 59.8 ms

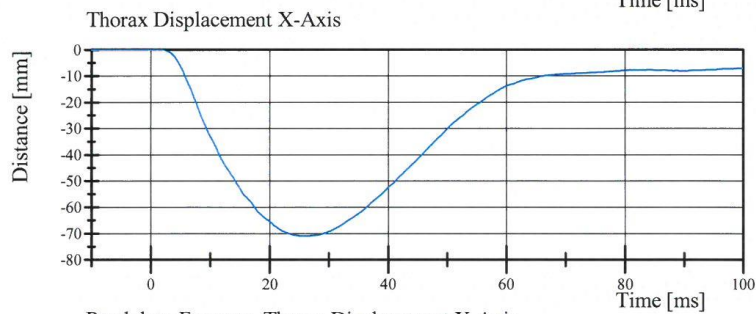
Min: -23.8 g at 20.2 ms



Filter Class: CFC_180

Max: 41.2 N at 59.8 ms

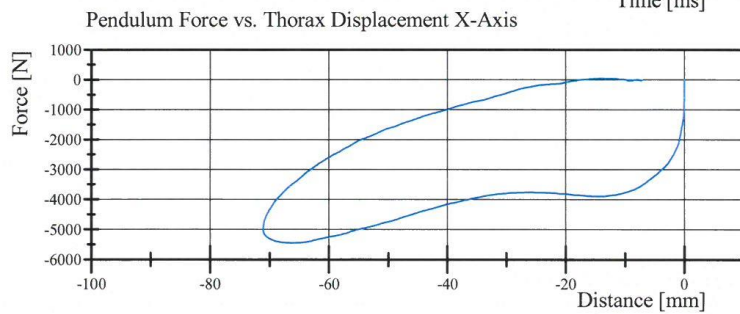
Min: -5,460.8 N at 20.2 ms



Filter Class: CFC_600

Max: 0.0 mm at -9.8 ms

Min: -71.1 mm at 25.8 ms



Filter Class: CFC_180

Max: 41.2 N at -14.1 mm

Min: -5,460.8 N at -66.0 mm

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

10.11.2016 09:43:22 437



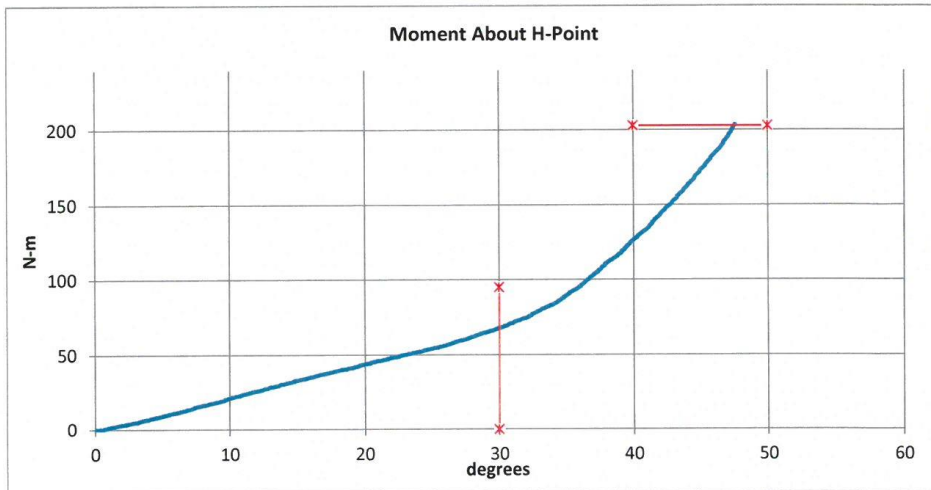
Transportation Research Center Inc.

Hybrid III 50th Male Hip Range of Motion

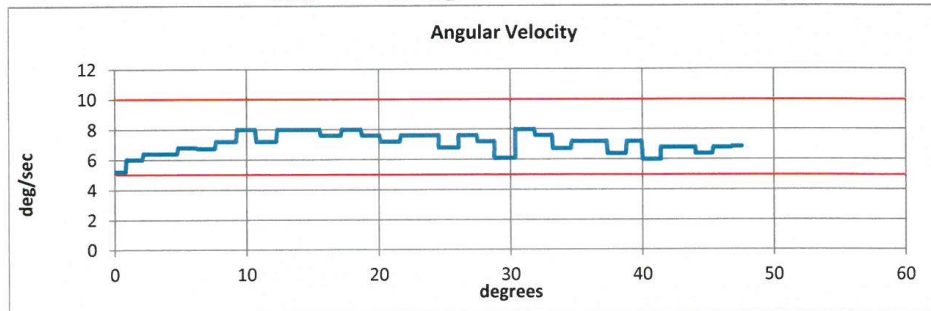


Serial Number: 037 Date: 10-Oct-2016
Side Tested: Left Hip Time: 15:39
Test Number: 1 Comments:

TEST PARAMETER	SPECIFICATION		TEST RESULTS		
Temperature	18.9	- 25.6	21.7	°C	Pass
Humidity	10	- 70	38	%	Pass
Moment at 30°	0	≤ 94.9	67.86	N-m	Pass
Angle at 203 Nm	40	- 50	47.56	deg	Pass
Average Velocity	5	- 10	7.04	deg/sec	Pass



Max: 7.99 deg/sec Min: 5.19 deg/sec



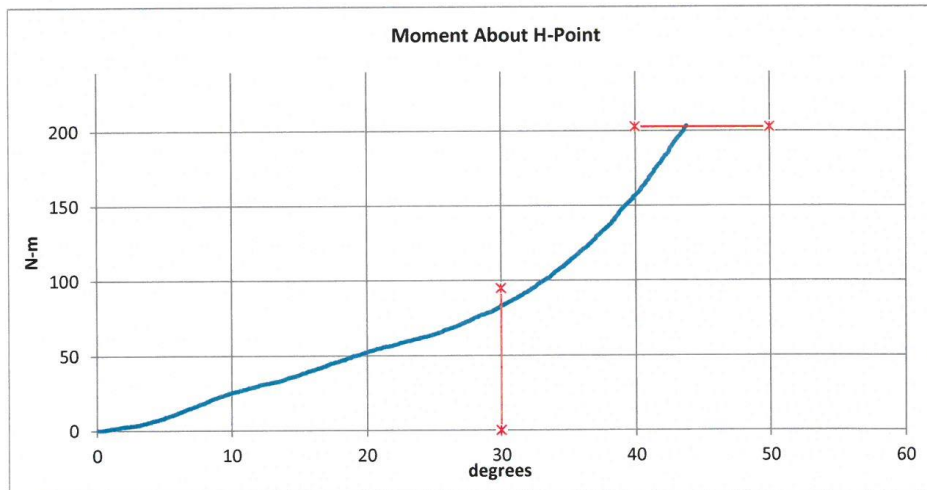
Transportation Research Center Inc.

Hybrid III 50th Male Hip Range of Motion

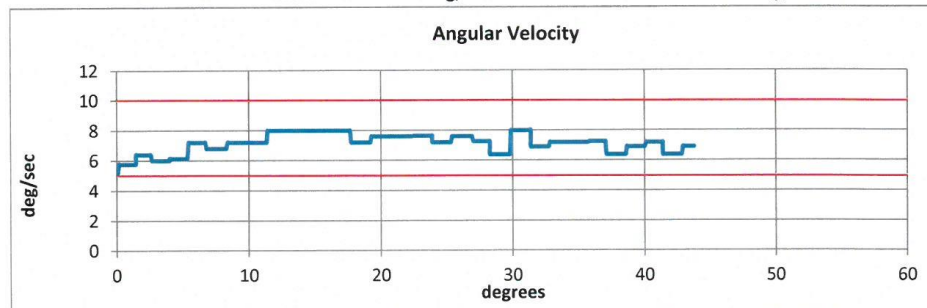


Serial Number: 037 Date: 11-Oct-2016
Side Tested: Right Hip Time: 6:49
Test Number: 1 Comments:

TEST PARAMETER	SPECIFICATION		TEST RESULTS		
Temperature	18.9	- 25.6	21.7	°C	Pass
Humidity	10	- 70	35	%	Pass
Moment at 30°	0	≤ 94.9	83.27	N-m	Pass
Angle at 203 Nm	40	- 50	43.8	deg	Pass
Average Velocity	5	- 10	7.1	deg/sec	Pass



Max: 7.99 deg/sec Min: 5.19 deg/sec



Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 40-1
Test Date: 10/11/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.117 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,718.16 N	Yes

Test meets specifications.

Comments:

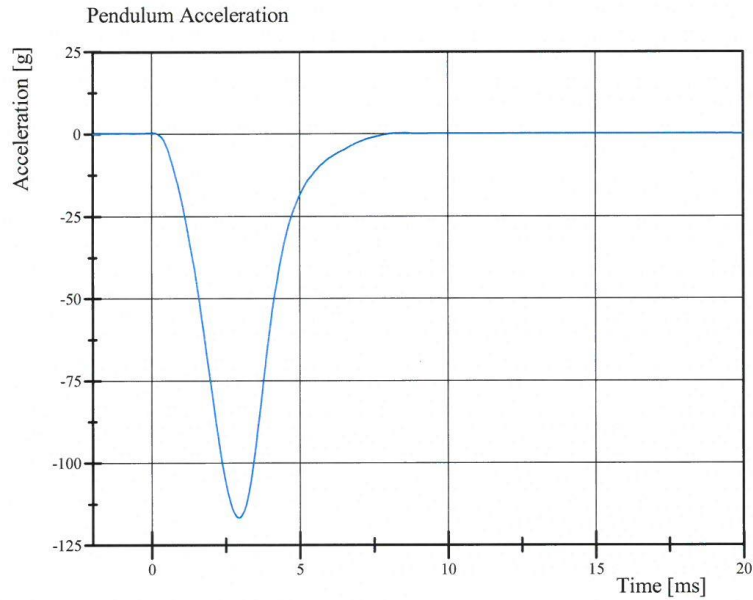
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.11.2016 07:26:54 1746

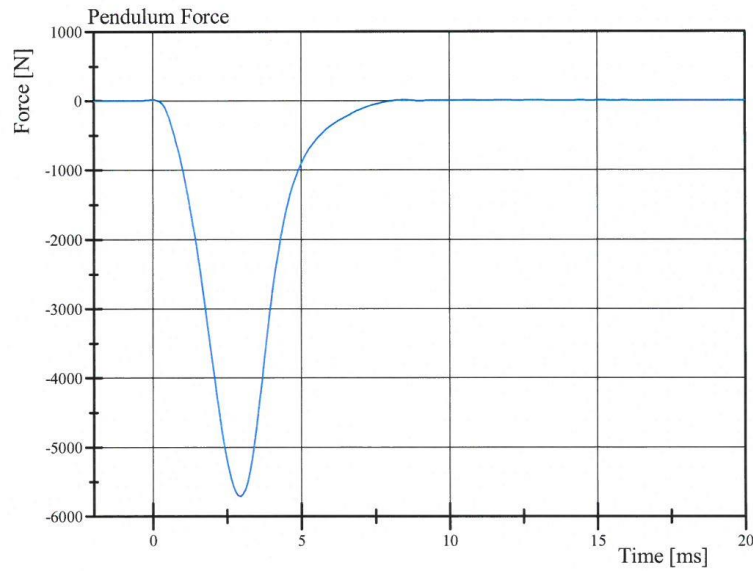


Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 40-1
Test Date: 10/11/2016



Filter Class: CFC_600
Max: 0.2 g at 8.5 ms
Min: -116.9 g at 3.0 ms



Filter Class: CFC_600
Max: 10.2 N at 8.5 ms
Min: -5,718.2 N at 3.0 ms

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

10.11.2016 07:27:07 1746



Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 40-1
Test Date: 10/11/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.118 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,573.60 N	Yes

Test meets specifications.

Comments:

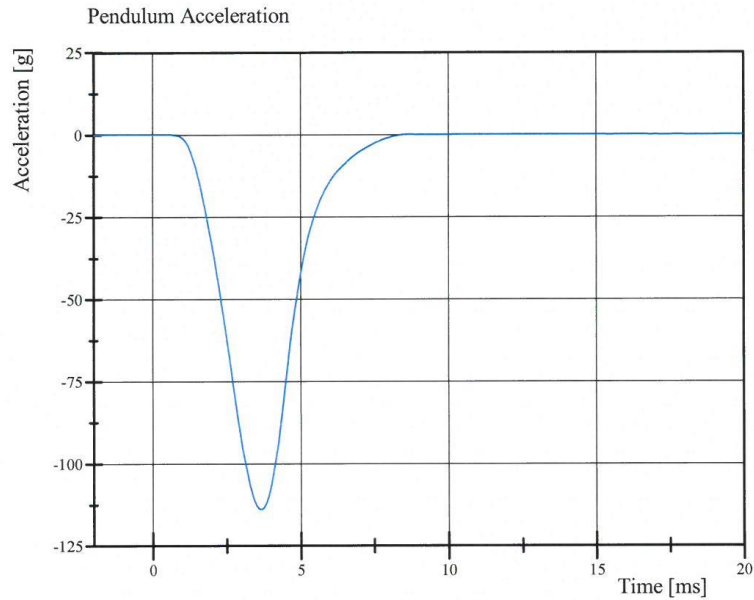
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

10.11.2016 07:30:02 1735

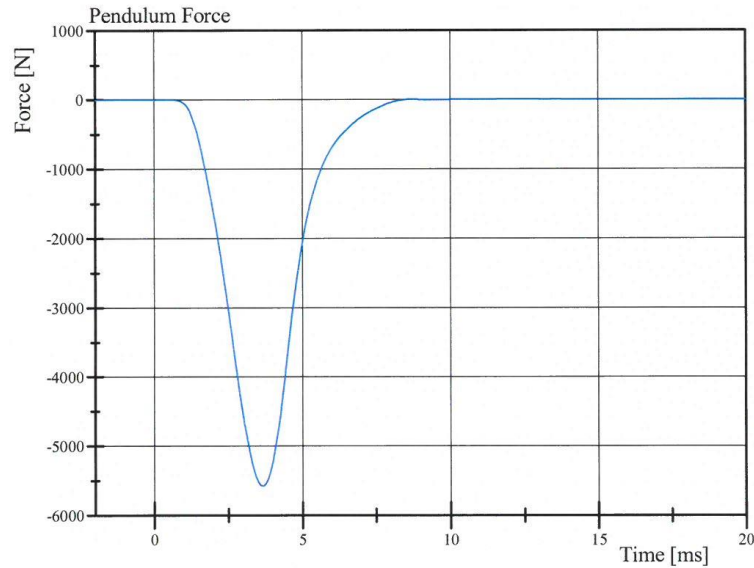


Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 40-1
Test Date: 10/11/2016



Filter Class: CFC_600
Max: 0.1 g at 12.7 ms
Min: -113.9 g at 3.7 ms



Filter Class: CFC_600
Max: 4.8 N at 12.7 ms
Min: -5,573.6 N at 3.7 ms

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

10.11.2016 07:30:12 1735



Post-Test Calibration Sheets

Driver S/N 037

Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 037
Calibration No. 41

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	514	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	198	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. 41-1

Test Date: 11/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	28 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	249.1 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-8.7 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

11.15.2016 13:25:57 614

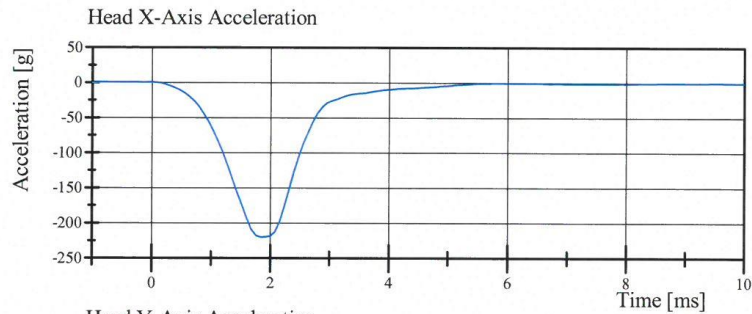


Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 037 Certification No. 41-1

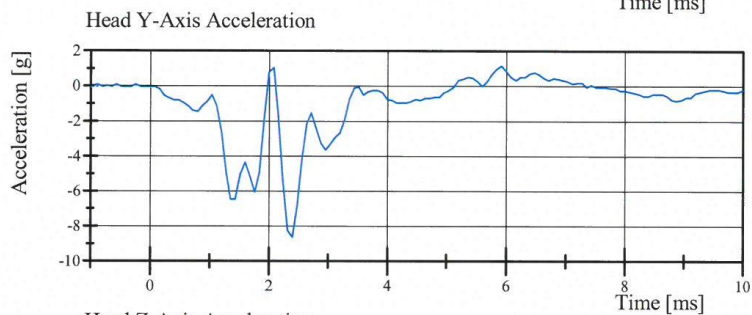
Test Date: 11/15/2016



Filter Class: CFC_1000

Max: 0.1 g at -0.2 ms

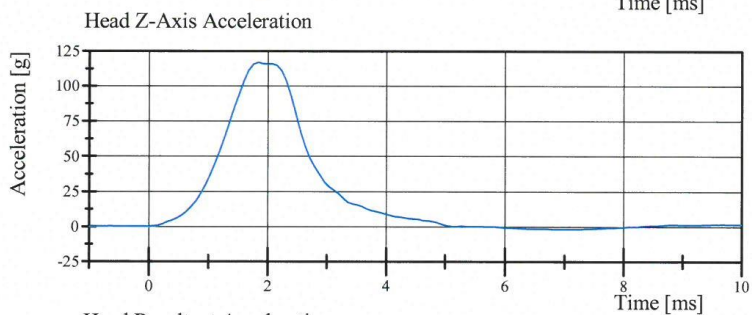
Min: -220.0 g at 1.8 ms



Filter Class: CFC_1000

Max: 1.1 g at 5.9 ms

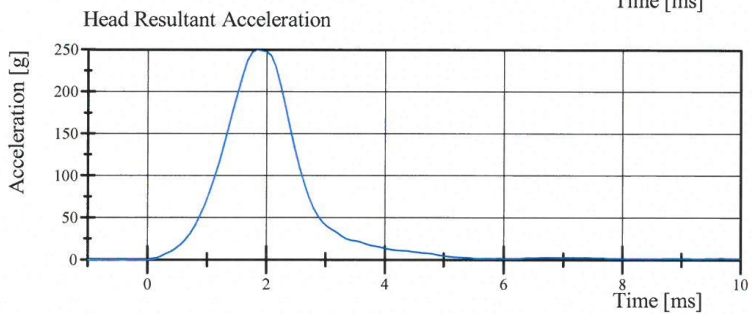
Min: -8.7 g at 2.4 ms



Filter Class: CFC_1000

Max: 116.7 g at 1.8 ms

Min: -1.8 g at 7.0 ms



Filter Class: CFC_1000

Max: 249.1 g at 1.8 ms

Min: 0.1 g at -0.6 ms

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

11.15.2016 13:26:06 614



Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 41-2

Test Date: 11/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	28 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.941 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	37.6 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-24.70 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-19.83 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-14.38 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-14.38 g	Yes
Total Head D-Plane Rotation			
Peak	(-64) - (-78) °	-76.3 °	Yes
Time of Peak	57 - 64 ms	59.5 ms	Yes
Total Head D-Plane Rotation			
Decay to 0°	113 - 128 ms	119.0 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	88 - 108 N·m	102.5 N·m	Yes
Time of Peak	47 - 58 ms	50.7 ms	Yes
Total Neck Occipital Condyles Moment			
Decay to 0 N·m	97 - 107 ms	99.9 ms	Yes

Test meets specifications.

Comments:

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

11.15.2016 14:23:30 3039

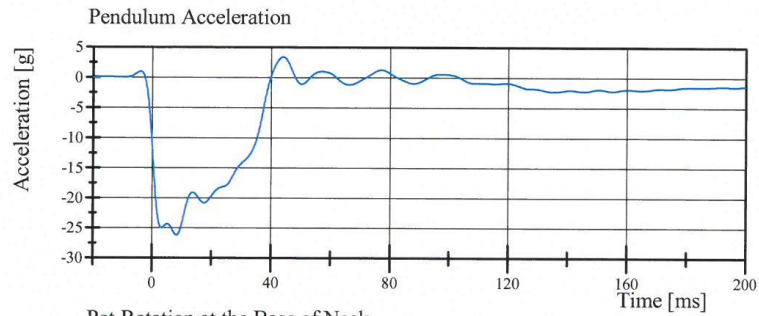


Transportation Research Center Inc.

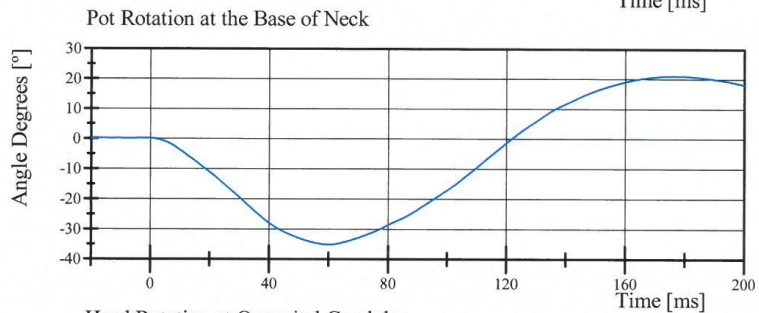
Neck Flexion

HIII 50th Serial No. 037 Certification No. 41-2

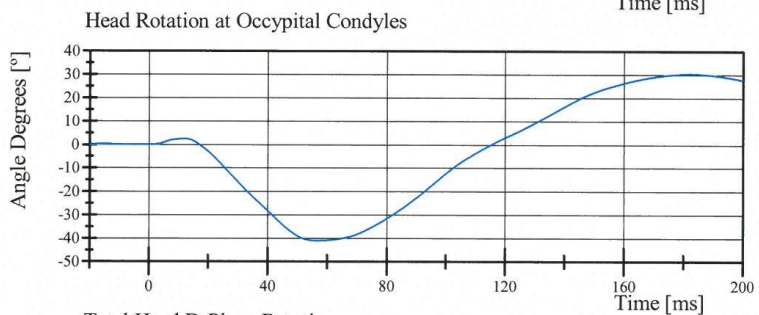
Test Date: 11/15/2016



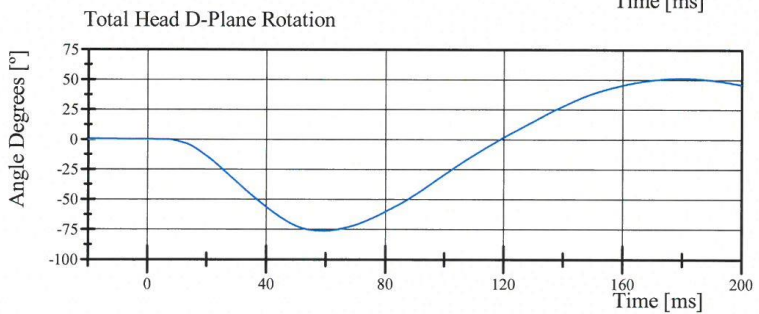
Filter Class: CFC_60
Max: 3.3 g at 44.1 ms
Min: -26.3 g at 8.4 ms



Filter Class: CFC_60
Max: 21.0 ° at 176.3 ms
Min: -35.3 ° at 60.4 ms



Filter Class: CFC_60
Max: 30.5 ° at 182.2 ms
Min: -41.2 ° at 56.5 ms



Filter Class: CFC_60
Max: 51.4 ° at 180.2 ms
Min: -76.3 ° at 59.5 ms

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

11.15.2016 14:23:55 3039

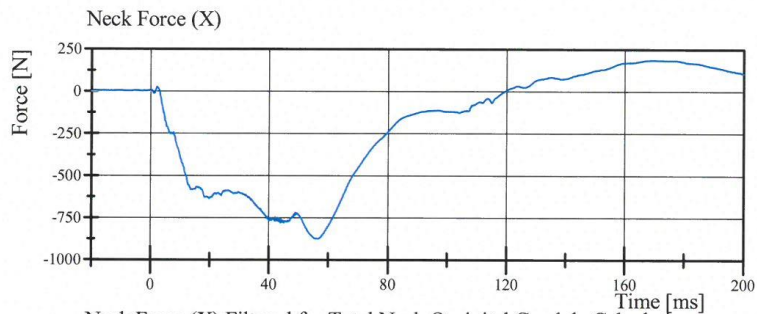


Transportation Research Center Inc.

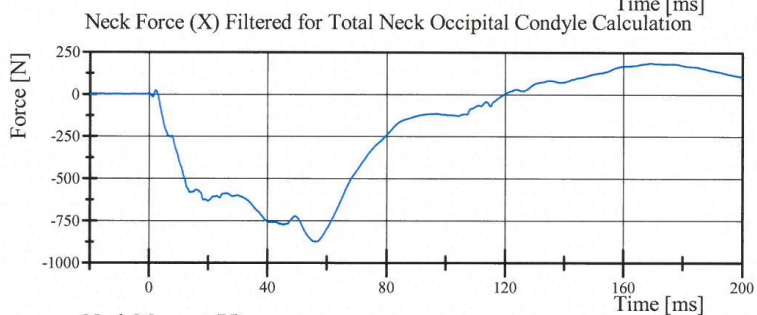
Neck Flexion

HIII 50th Serial No. 037 Certification No. 41-2

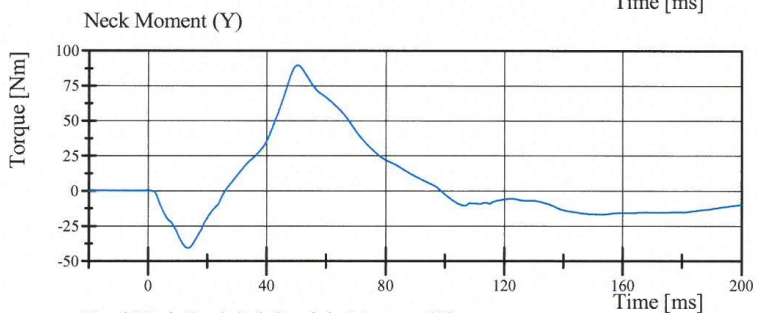
Test Date: 11/15/2016



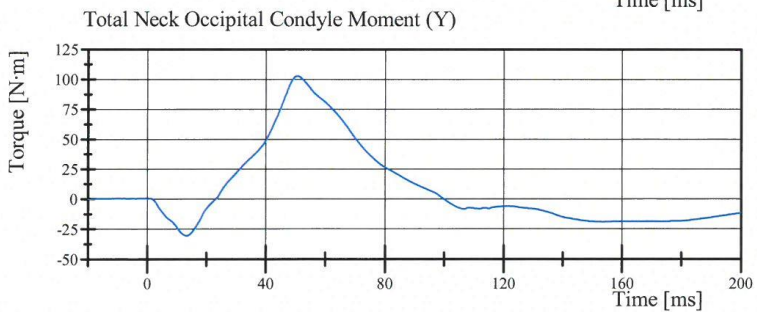
Filter Class: CFC_1000
Max: 187.3 N at 170.0 ms
Min: -876.3 N at 56.6 ms



Filter Class: CFC_600
Max: 186.6 N at 169.9 ms
Min: -875.8 N at 56.6 ms



Filter Class: CFC_600
Max: 89.4 Nm at 50.5 ms
Min: -41.1 Nm at 13.7 ms



Filter Class: Without_Constai
Max: 102.5 N·m at 50.7 ms
Min: -30.9 N·m at 13.2 ms

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

11.15.2016 14:23:56 3039



Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 41-2

Test Date: 11/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	29 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-5.984 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	41.0 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	19.11 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	16.00 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	13.01 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	13.01 g	Yes
Total Head D-Plane Rotation			
Peak	81 - 106 °	98.6 °	Yes
Time of Peak	72 - 82 ms	77.4 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	159.2 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	(-53) - (-80) N·m	-72.0 N·m	Yes
Time of Peak	65 - 79 ms	71.9 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	120 - 148 ms	145.6 ms	Yes

Test meets specifications.

Comments:

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

11.15.2016 15:26:04 3128

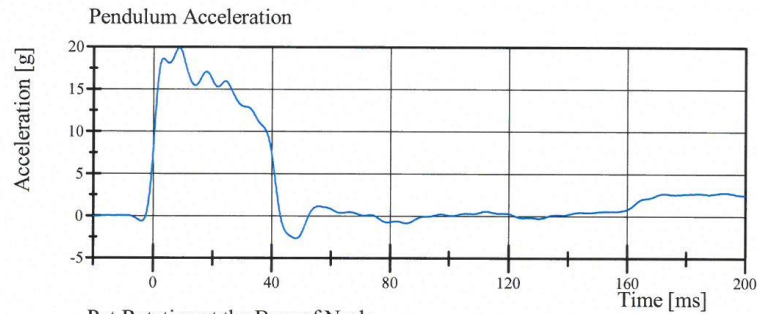


Transportation Research Center Inc.

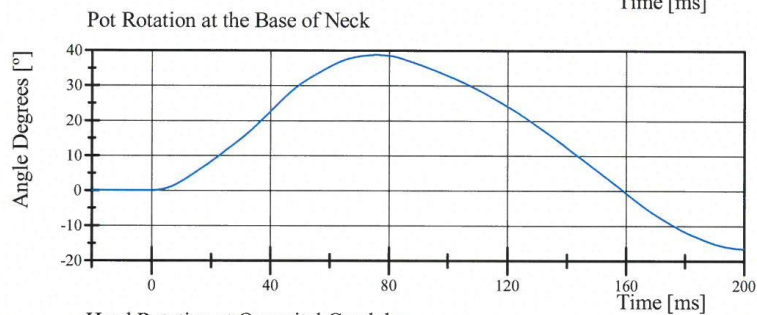
Neck Extension

HIII 50th Serial No. 037 Certification No. 41-2

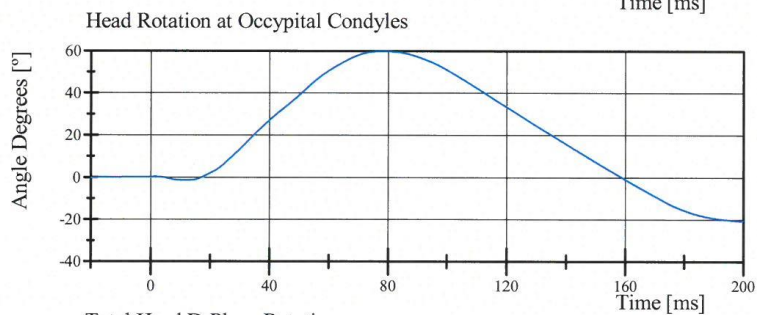
Test Date: 11/15/2016



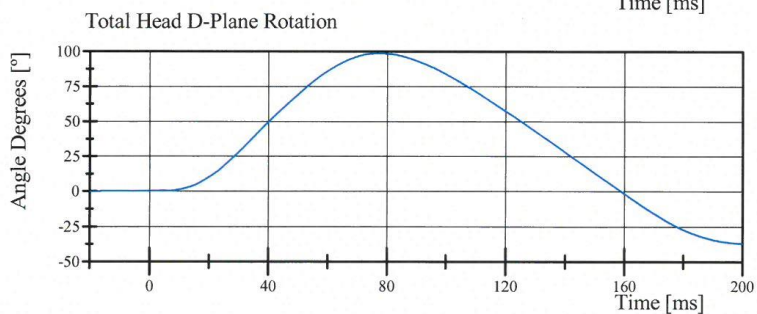
Filter Class: CFC_60
Max: 19.9 g at 8.7 ms
Min: -2.7 g at 48.2 ms



Filter Class: CFC_60
Max: 38.8 ° at 75.8 ms
Min: -16.5 ° at 200.0 ms



Filter Class: CFC_60
Max: 59.9 ° at 78.4 ms
Min: -20.5 ° at 200.0 ms



Filter Class: CFC_60
Max: 98.6 ° at 77.4 ms
Min: -37.0 ° at 200.0 ms

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

11.15.2016 15:26:15 3128

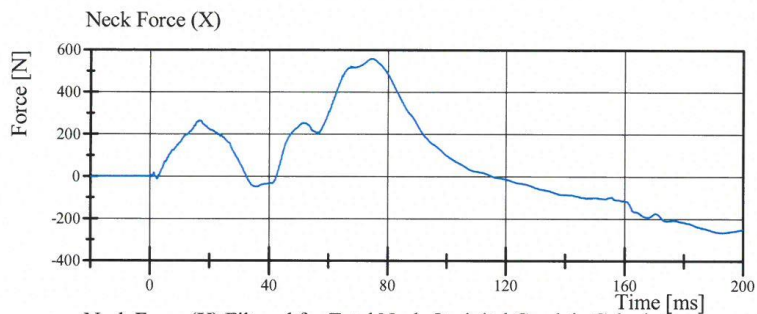


Transportation Research Center Inc.

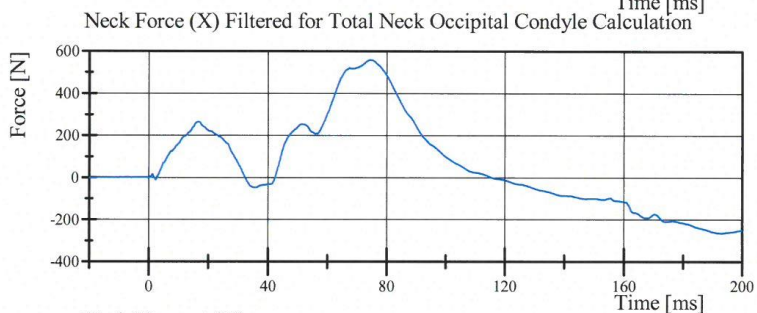
Neck Extension

HIII 50th Serial No. 037 Certification No. 41-2

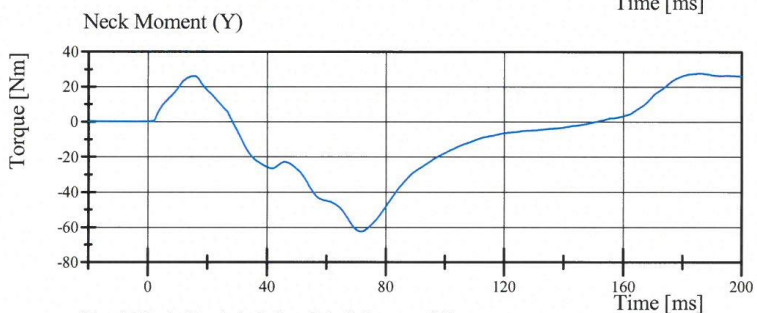
Test Date: 11/15/2016



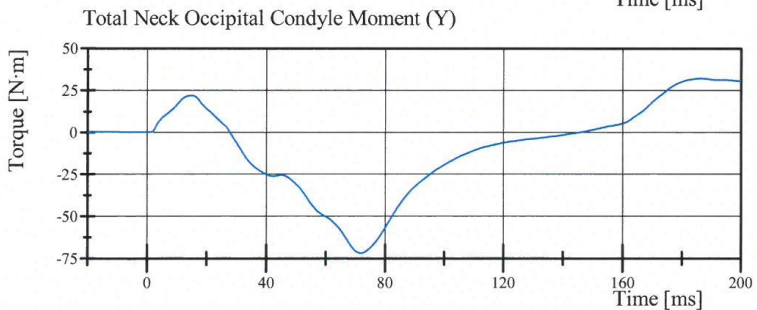
Filter Class: CFC_1000
Max: 558.9 N at 74.4 ms
Min: -263.7 N at 193.0 ms



Filter Class: CFC_600
Max: 558.6 N at 74.5 ms
Min: -263.4 N at 193.0 ms



Filter Class: CFC_600
Max: 27.9 Nm at 186.1 ms
Min: -62.5 Nm at 71.7 ms



Filter Class: Without_Constai
Max: 32.2 N·m at 186.1 ms
Min: -72.0 N·m at 71.9 ms

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

11.15.2016 15:26:16 3128



Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 037 Certification No. 41-3

Test Date: 11/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.680 m/s	Yes
Probe Force Peak	(-5,160) - (-5,893) N	-5,550.3 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-71.96 mm	Yes
Internal Hysteresis	65 - 85 %	72.7 %	Yes

Test meets specifications.

Comments:

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

11.15.2016 16:14:54 381

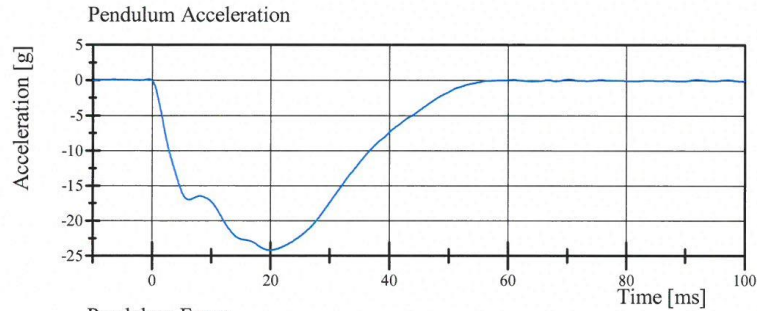


Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 037 Certification No. 41-3

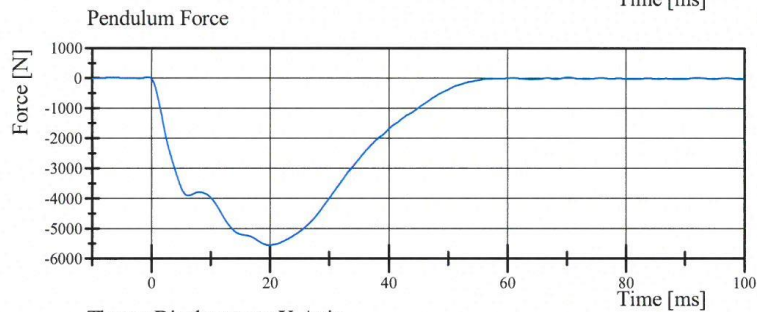
Test Date: 11/15/2016



Filter Class: CFC_180

Max: 0.2 g at 70.3 ms

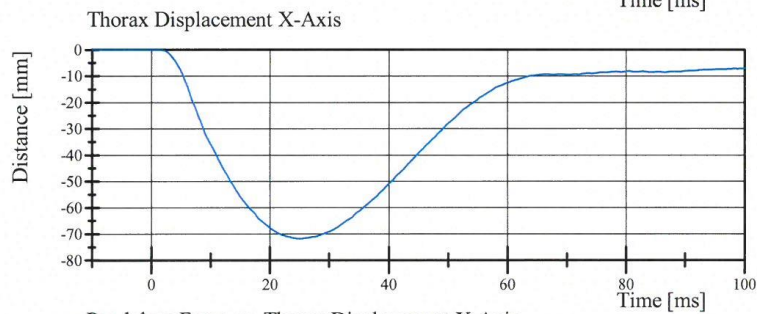
Min: -24.2 g at 19.9 ms



Filter Class: CFC_180

Max: 37.8 N at 70.3 ms

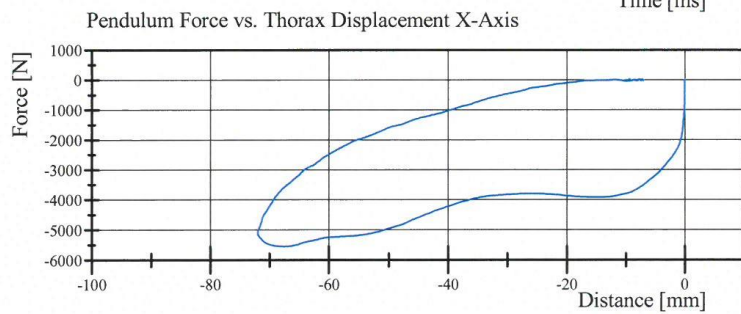
Min: -5,550.3 N at 19.9 ms



Filter Class: CFC_600

Max: 0.0 mm at -9.8 ms

Min: -72.0 mm at 25.1 ms



Filter Class: CFC_180

Max: 37.8 N at -9.4 mm

Min: -5,550.3 N at -67.6 mm

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

11.15.2016 16:15:09 381



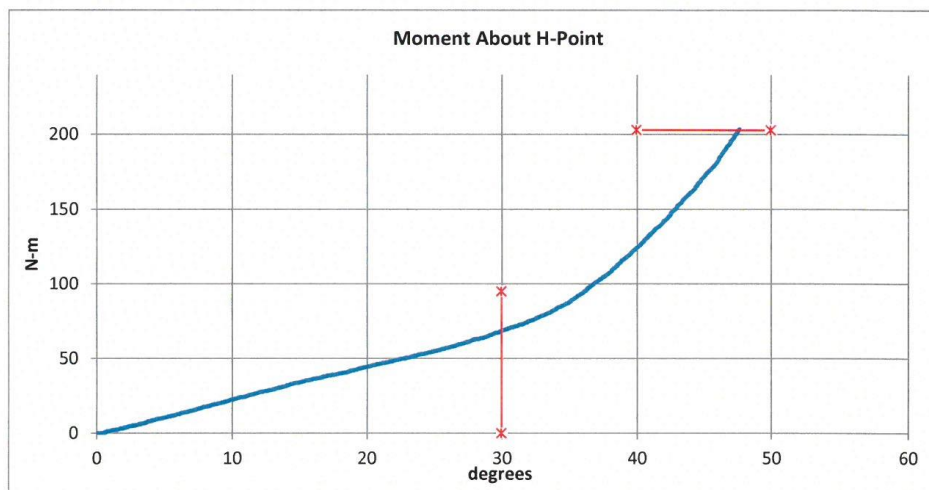
Transportation Research Center Inc.

Hybrid III 50th Male Hip Range of Motion

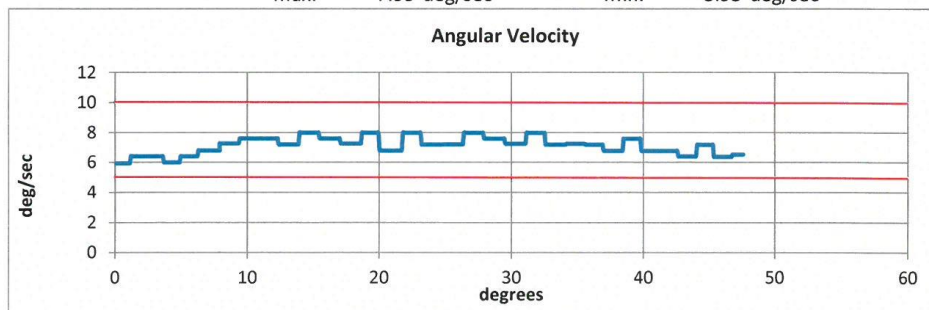


Serial Number: 037 Date: 15-Nov-2016
Side Tested: Left Hip Time: 11:27
Test Number: 1 Comments:

TEST PARAMETER	SPECIFICATION			TEST RESULTS	
Temperature	18.9	-	25.6	21.8 °C	Pass
Humidity	10	-	70	25 %	Pass
Moment at 30°	0	≤	94.9	68.75 N-m	Pass
Angle at 203 Nm	40	-	50	47.64 deg	Pass
Average Velocity	5	-	10	7.11 deg/sec	Pass



Max: 7.99 deg/sec Min: 5.93 deg/sec



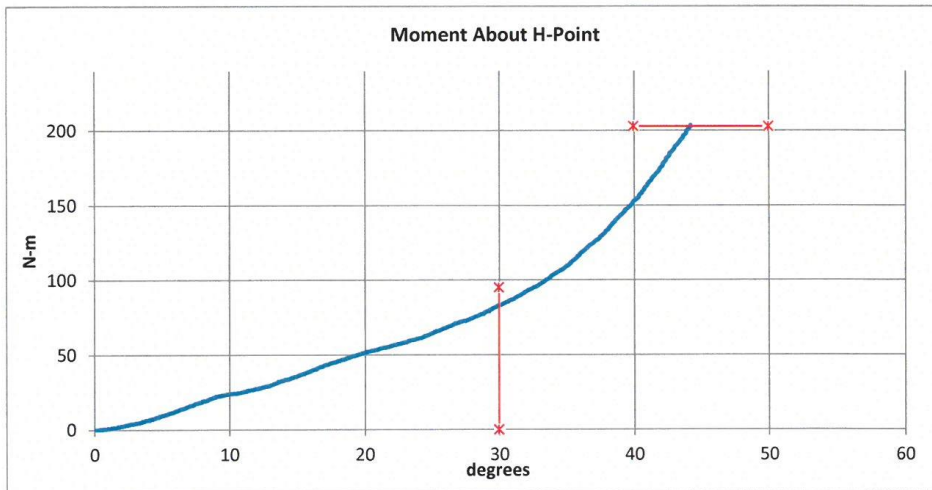
Transportation Research Center Inc.

Hybrid III 50th Male Hip Range of Motion

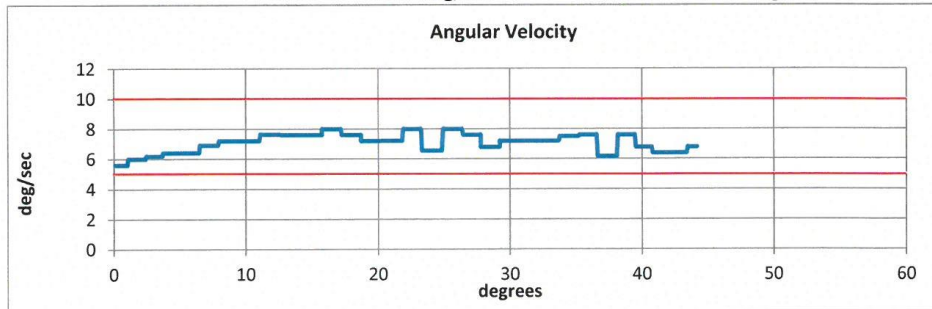


Serial Number: 037 Date: 15-Nov-2016
Side Tested: Right Hip Time: 12:29
Test Number: 1 Comments:

TEST PARAMETER	SPECIFICATION			TEST RESULTS		
Temperature	18.9	-	25.6	21.8	°C	Pass
Humidity	10	-	70	26	%	Pass
Moment at 30°	0	≤	94.9	83.27	N-m	Pass
Angle at 203 Nm	40	-	50	44.2	deg	Pass
Average Velocity	5	-	10	7.05	deg/sec	Pass



Max: 7.99 deg/sec Min: 5.59 deg/sec



Transportation Research Center Inc.

Left Knee Femur Response Test

HIII 50th Serial No. 037 Certification No. 41-2

Test Date: 11/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	23 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.098 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,472.02 N	Yes

Test meets specifications.

Comments:

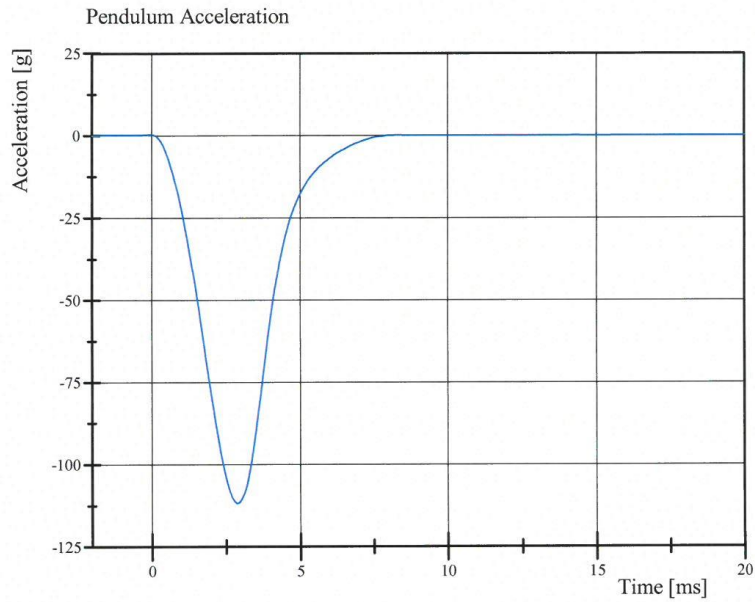
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

11.15.2016 09:49:58 1780

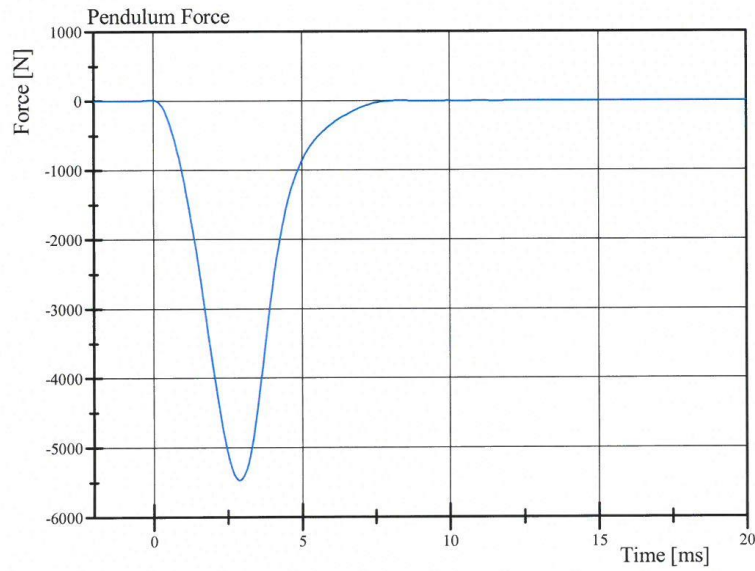


Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 41-2
Test Date: 11/15/2016



Filter Class: CFC_600
Max: 0.2 g at -0.1 ms
Min: -111.8 g at 2.9 ms



Filter Class: CFC_600
Max: 7.4 N at -0.1 ms
Min: -5,472.0 N at 2.9 ms

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

11.15.2016 09:50:35 1780



Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 41-1
Test Date: 11/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	22 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.084 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,468.86 N	Yes

Test meets specifications.

Comments:

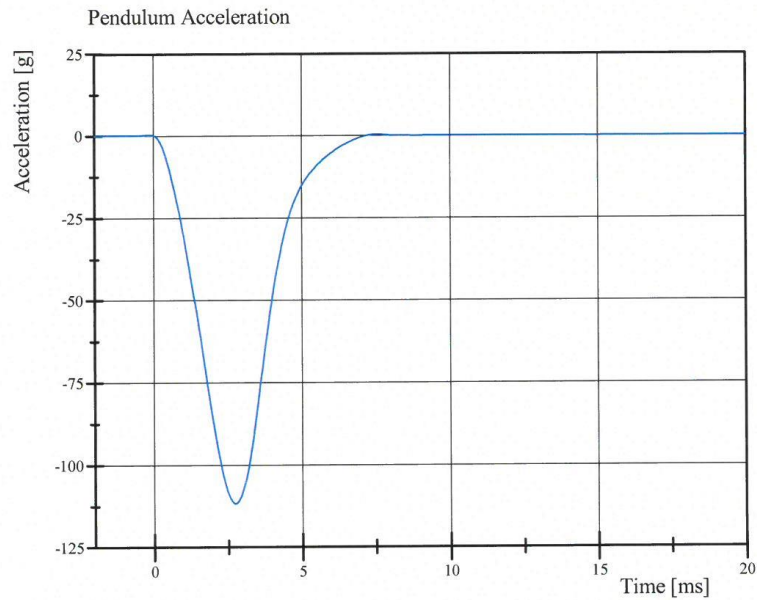
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

11.15.2016 09:31:22 1789

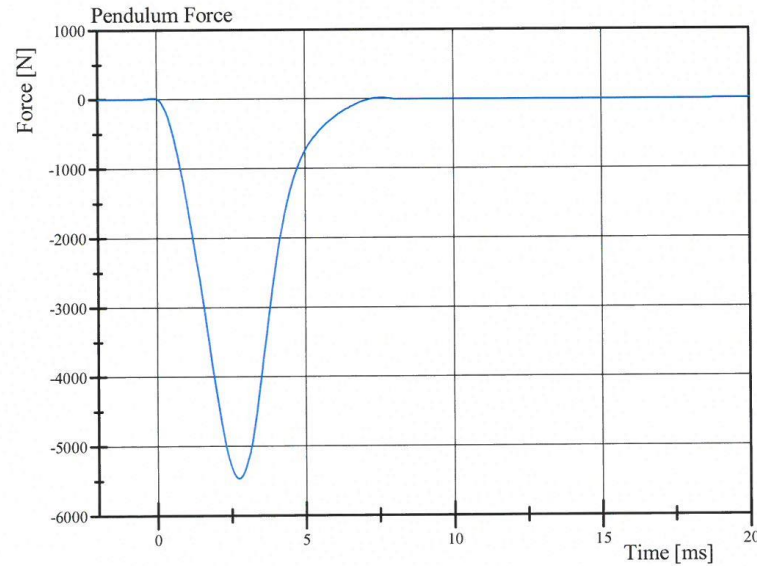


Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 41-1
Test Date: 11/15/2016



Filter Class: CFC_600
Max: 0.3 g at 7.6 ms
Min: -111.8 g at 2.7 ms



Filter Class: CFC_600
Max: 14.9 N at 7.6 ms
Min: -5,468.9 N at 2.7 ms

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

11.15.2016 09:32:20 1789



Pre-Test Calibration Sheets

Front Passenger S/N 426

Transportation Research Center Inc.
5720 HIII 5th Dummy
External Dimensions
Serial No. 426 Calibration No. 38

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. 38-1

Test Date: 10/10/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Peak Head Resultant Acceleration	250 - 300 g	282.2 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-1.2 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

10.10.2016 15:09:40 609

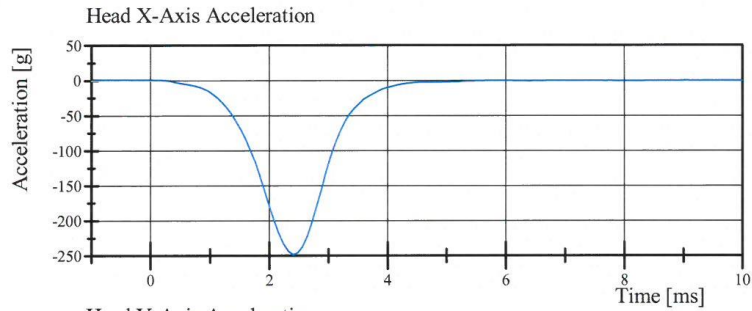


Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 426 Certification No. 38-1

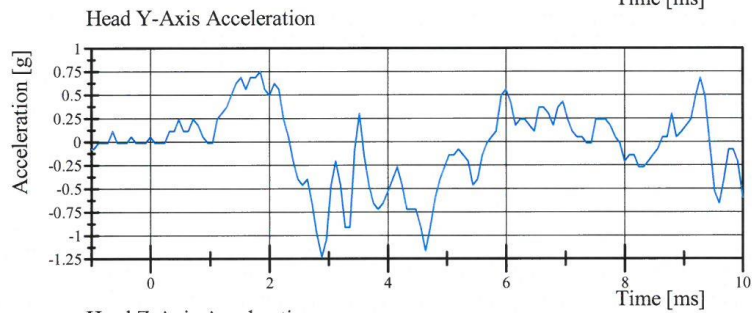
Test Date: 10/10/2016



Filter Class: CFC_1000

Max: 0.1 g at -0.2 ms

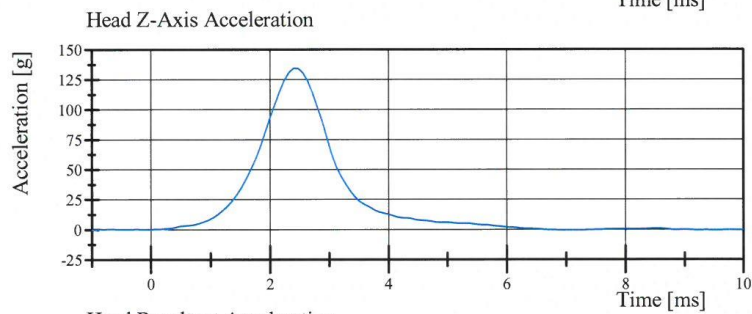
Min: -248.3 g at 2.4 ms



Filter Class: CFC_1000

Max: 0.8 g at 1.8 ms

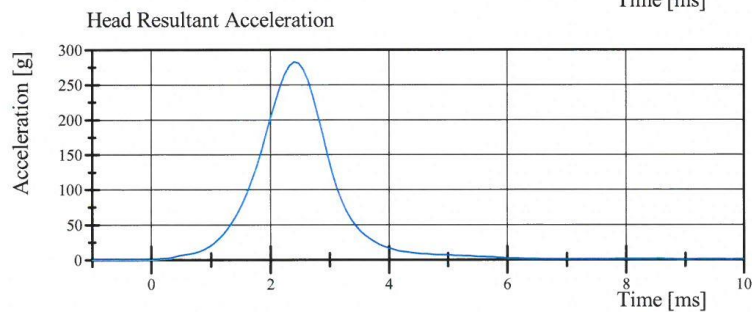
Min: -1.2 g at 2.9 ms



Filter Class: CFC_1000

Max: 134.1 g at 2.4 ms

Min: -0.5 g at 6.9 ms



Filter Class: CFC_1000

Max: 282.2 g at 2.4 ms

Min: 0.0 g at -0.8 ms

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

10.10.2016 15:09:53 609



Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 38-1

Test Date: 10/11/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	7.089 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	-4.67 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	(-5.8) - (-7.0) m/s	-6.48 m/s	Yes
Total Head D-Plane Rotation	(-77) - (-91) °	-79.5 °	Yes
Total Neck Occipital Condyles Moment Between -77° and -91° Rotation	69 - 83 N·m	72.9 N·m	Yes
Total Neck Occipital Condyles Moment Decay to 10 N·m	80 - 100 ms	87.2 ms	Yes

Test meets specifications.

Comments:

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

10.11.2016 13:34:28 1848

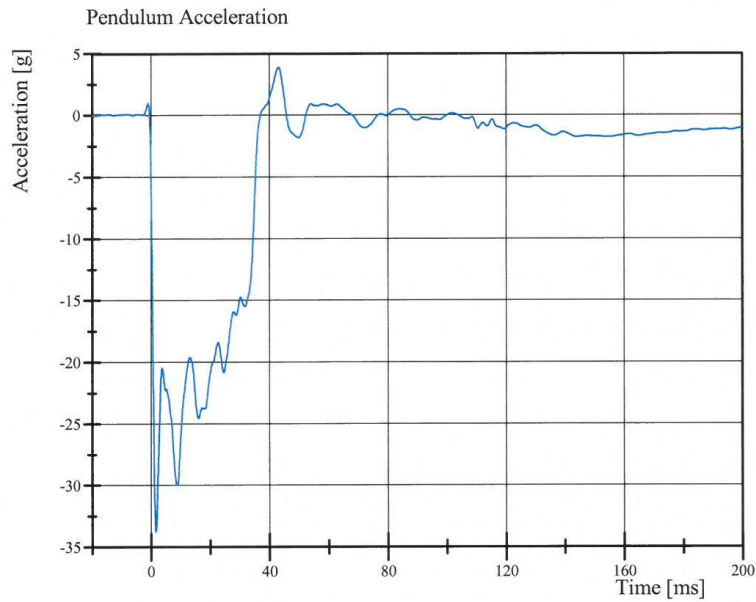


Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 38-1

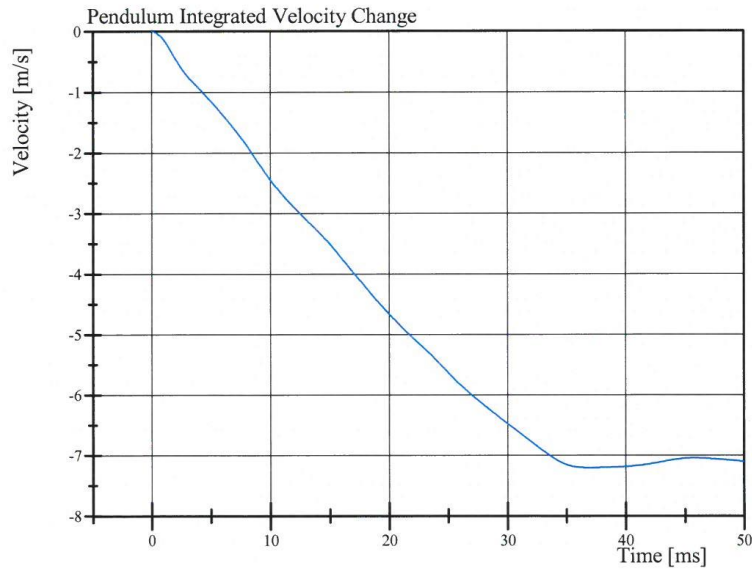
Test Date: 10/11/2016



Filter Class: CFC_180

Max: 3.8 g at 43.1 ms

Min: -33.8 g at 1.8 ms



Filter Class: CFC_180

Max: 0.0 m/s at 0.0 ms

Min: -7.2 m/s at 37.0 ms

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

10.11.2016 13:34:46 1848



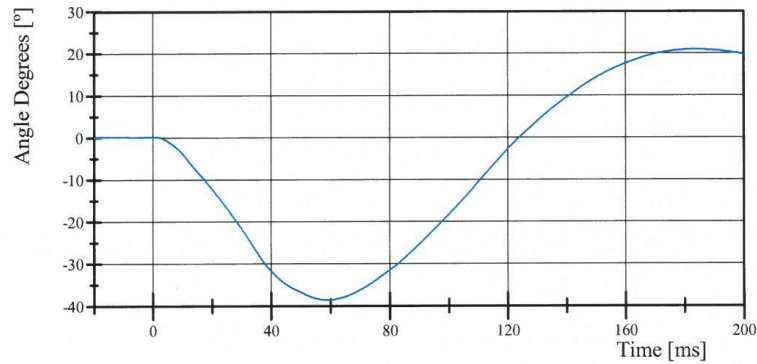
Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 38-1

Test Date: 10/11/2016

Pot Rotation at the Base of Neck

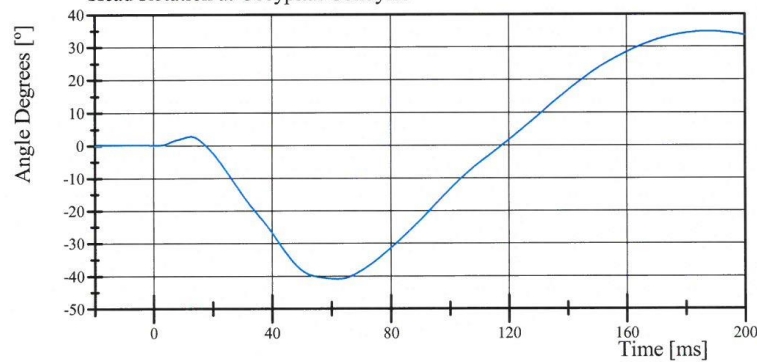


Filter Class: CFC_60

Max: 20.9 ° at 183.3 ms

Min: -38.6 ° at 59.1 ms

Head Rotation at Occypital Condyles

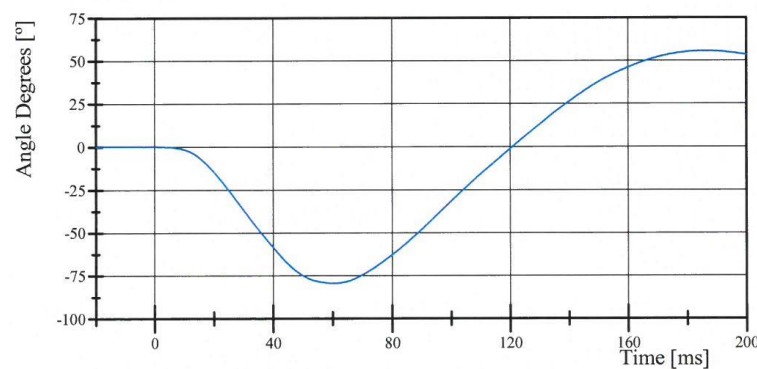


Filter Class: CFC_60

Max: 34.8 ° at 187.3 ms

Min: -41.0 ° at 62.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60

Max: 55.6 ° at 186.0 ms

Min: -79.5 ° at 60.3 ms

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

10.11.2016 13:34:47 1848

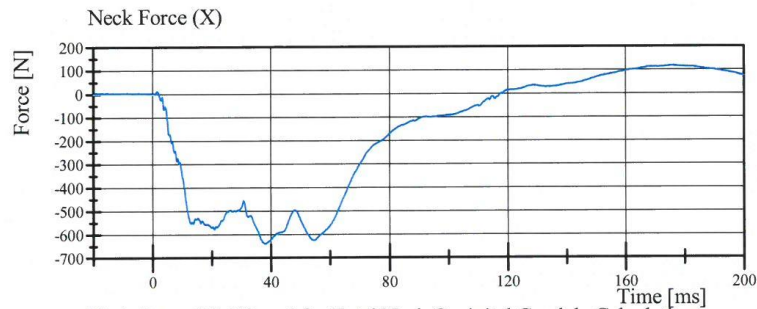


Transportation Research Center Inc.

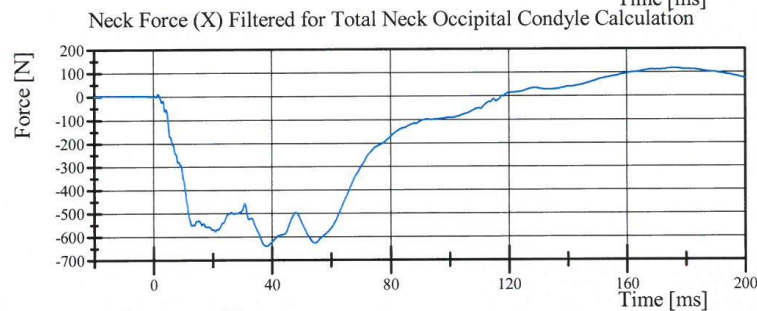
Neck Flexion

HIII 5th Serial No. 426 Certification No. 38-1

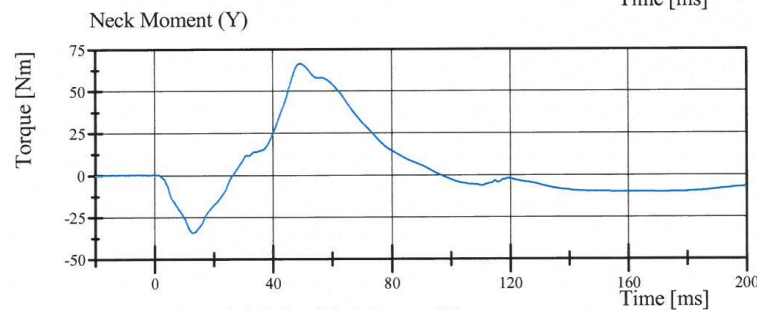
Test Date: 10/11/2016



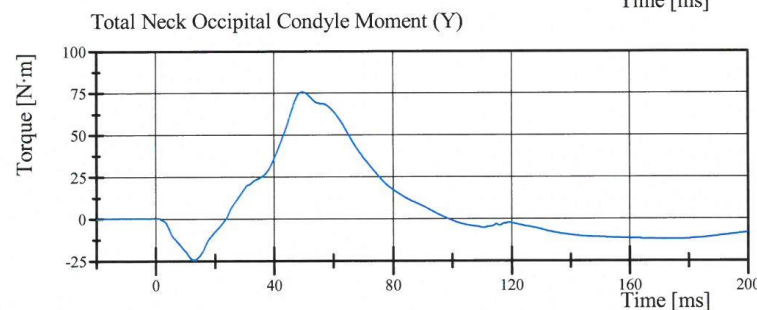
Filter Class: CFC_1000
Max: 117.9 N at 176.2 ms
Min: -642.5 N at 38.1 ms



Filter Class: CFC_600
Max: 117.4 N at 176.1 ms
Min: -641.8 N at 38.1 ms



Filter Class: CFC_600
Max: 66.3 Nm at 49.3 ms
Min: -34.5 Nm at 12.9 ms



Filter Class: Without_(Consta
Max: 75.6 N·m at 49.7 ms
Min: -24.6 N·m at 12.9 ms

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

10.11.2016 13:34:48 1848



Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 38-3

Test Date: 10/11/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Velocity	(-5.95) - (-6.19) m/s	-6.140 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	1.5 - 1.9 m/s	1.86 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	3.1 - 3.9 m/s	3.75 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	4.6 - 5.6 m/s	5.40 m/s	Yes
Total Head D-Plane Rotation	99 - 114 °	109.2 °	Yes
Total Neck Occipital Condyles Moment Between 99° and 114° Rotation	(-53) - (-65) N·m	-59.4 N·m	Yes
Total Neck Occipital Condyles Moment Decay to -10 N·m	94 - 114 ms	100.6 ms	Yes

Test meets specifications.

Comments:

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

10.11.2016 15:30:48 3116

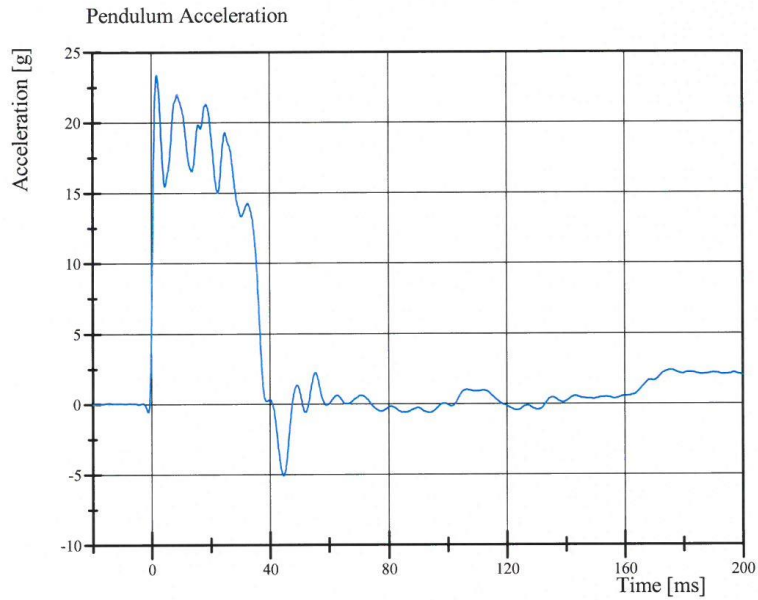


Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 38-3

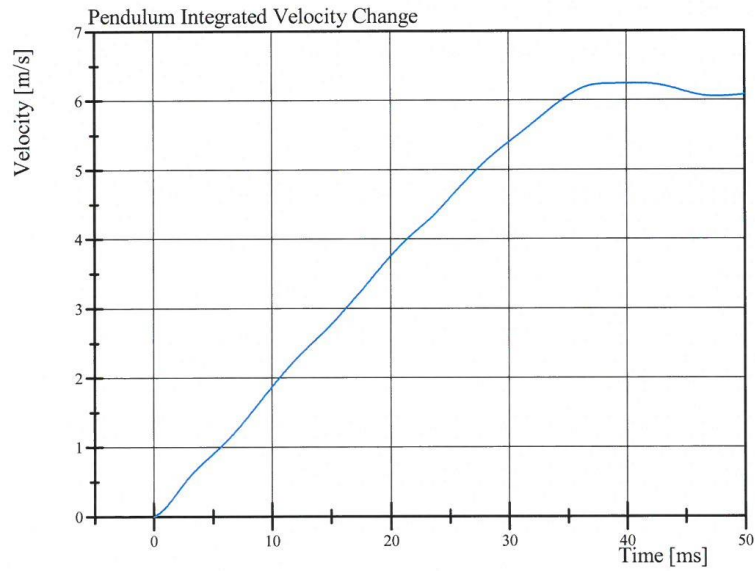
Test Date: 10/11/2016



Filter Class: CFC_180

Max: 23.3 g at 1.8 ms

Min: -5.1 g at 44.6 ms



Filter Class: CFC_180

Max: 6.2 m/s at 40.9 ms

Min: 0.0 m/s at 0.0 ms

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

10.11.2016 15:30:58 3116



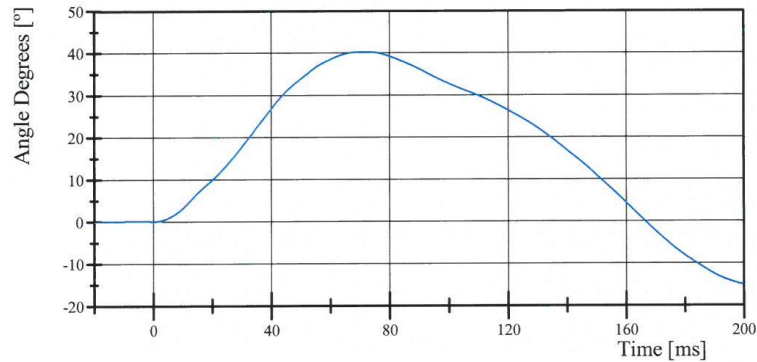
Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 38-3

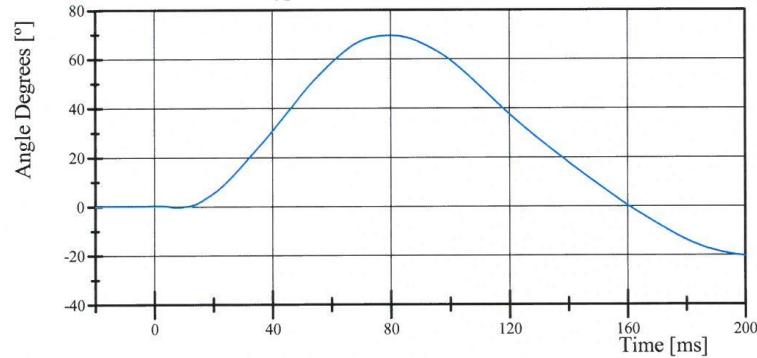
Test Date: 10/11/2016

Pot Rotation at the Base of Neck



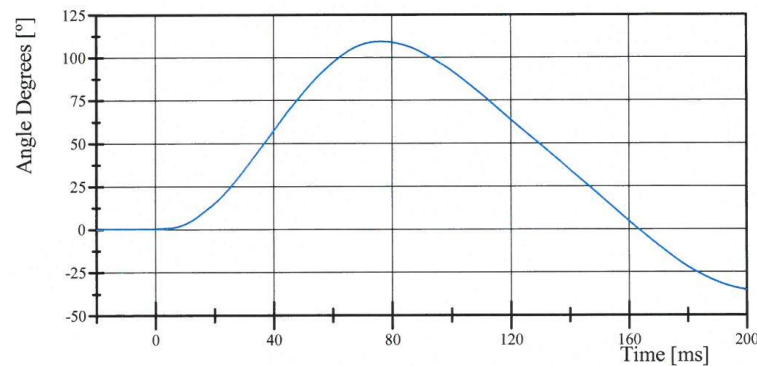
Filter Class: CFC_60
Max: 40.2 ° at 71.4 ms
Min: -15.1 ° at 200.0 ms

Head Rotation at Occipital Condyles



Filter Class: CFC_60
Max: 69.5 ° at 79.9 ms
Min: -20.3 ° at 200.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 109.2 ° at 76.2 ms
Min: -35.4 ° at 200.0 ms

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

10.11.2016 15:30:59 3116

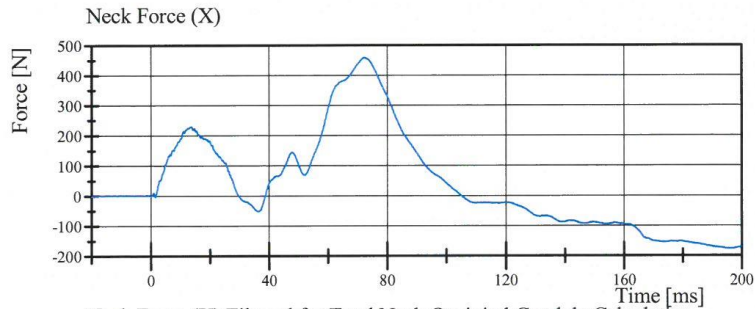


Transportation Research Center Inc.

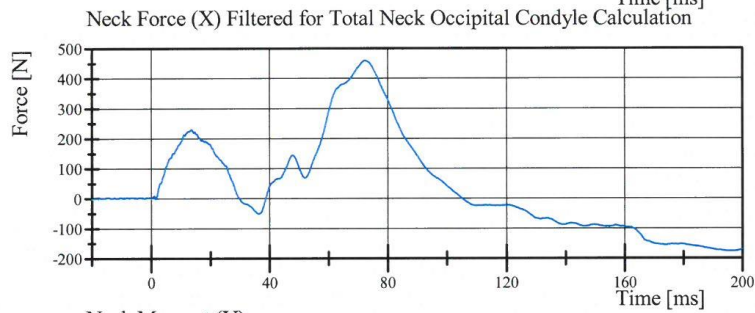
Neck Extension

HIII 5th Serial No. 426 Certification No. 38-3

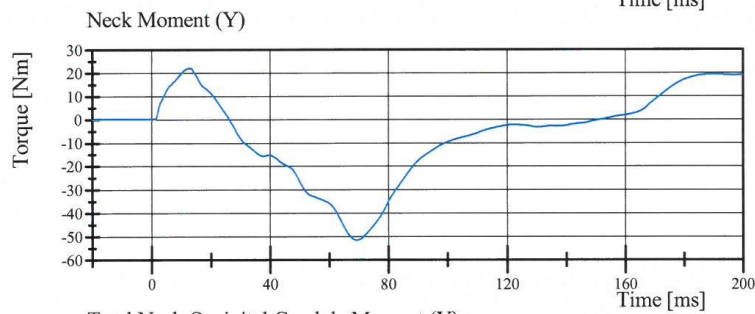
Test Date: 10/11/2016



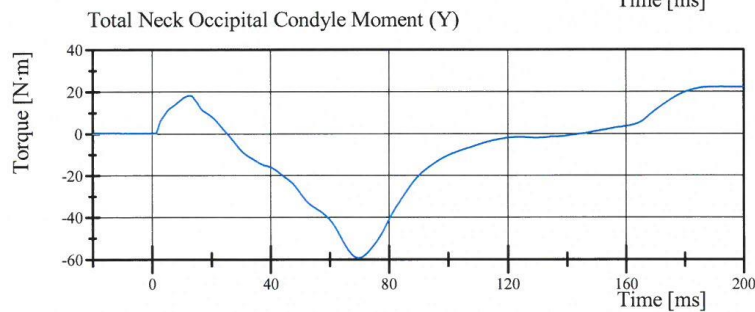
Filter Class: CFC_1000
Max: 458.7 N at 72.6 ms
Min: -175.9 N at 195.0 ms



Filter Class: CFC_600
Max: 458.3 N at 72.2 ms
Min: -175.8 N at 196.6 ms



Filter Class: CFC_600
Max: 21.9 Nm at 12.5 ms
Min: -51.7 Nm at 69.4 ms



Filter Class: Without_(Consta
Max: 22.3 N·m at 192.1 ms
Min: -59.4 N·m at 69.8 ms

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

10.11.2016 15:31:00 3116



Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. 426 Certification No. 38-1

Test Date: 10/11/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.616 m/s	Yes
Probe Force Peak Between 50.0 mm and 58.0 mm Chest Deflection	(-3,900) - (-4,400) N	-4,273.7 N	Yes
Probe Force Peak Between 18.0 mm and 50.0 mm Chest Deflection	$\geq$ (-4,600) N	-4,301.2 N	Yes
Maximum Chest Compression	(-50) - (-58) mm	-51.4 mm	Yes
Internal Hysteresis	69 - 85 %	75.2 %	Yes

Test meets specifications.

Comments:

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

10.11.2016 13:35:46 420

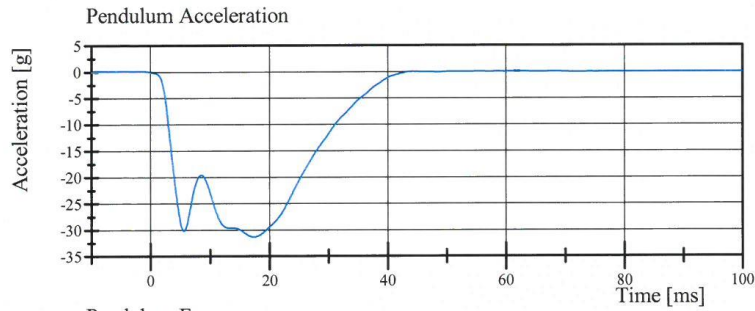


Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. 426 Certification No. 38-1

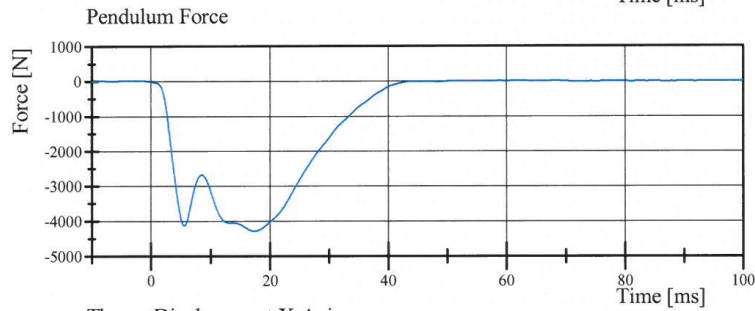
Test Date: 10/11/2016



Filter Class: CFC_180

Max: 0.1 g at 61.8 ms

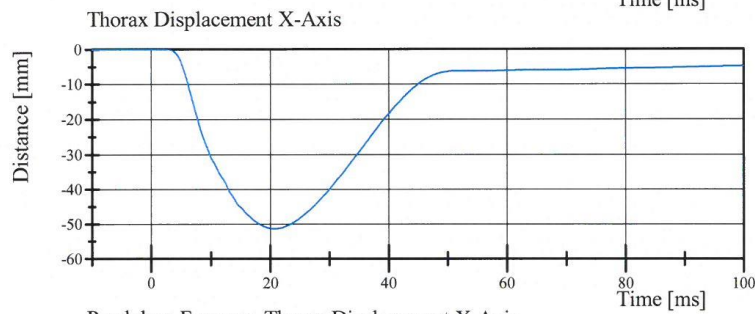
Min: -31.4 g at 17.3 ms



Filter Class: CFC_180

Max: 14.2 N at 61.8 ms

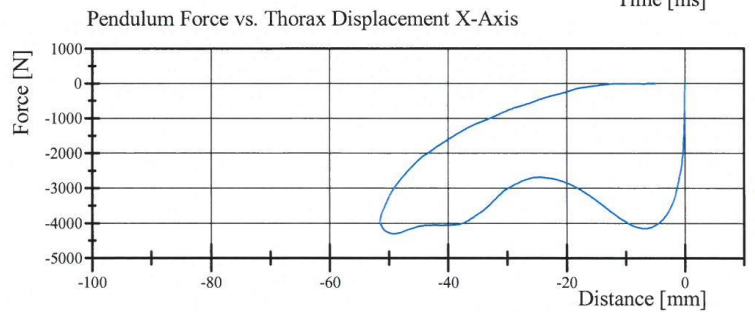
Min: -4,301.2 N at 17.3 ms



Filter Class: CFC_600

Max: 0.0 mm at -5.2 ms

Min: -51.4 mm at 20.6 ms



Filter Class: CFC_180

Max: 14.2 N at -6.1 mm

Min: -4,301.2 N at -49.1 mm

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

10.11.2016 13:35:58 420



Transportation Research Center Inc.

Hybrid III Small Female Torso Flexion

NHTSA



Serial Number: 426

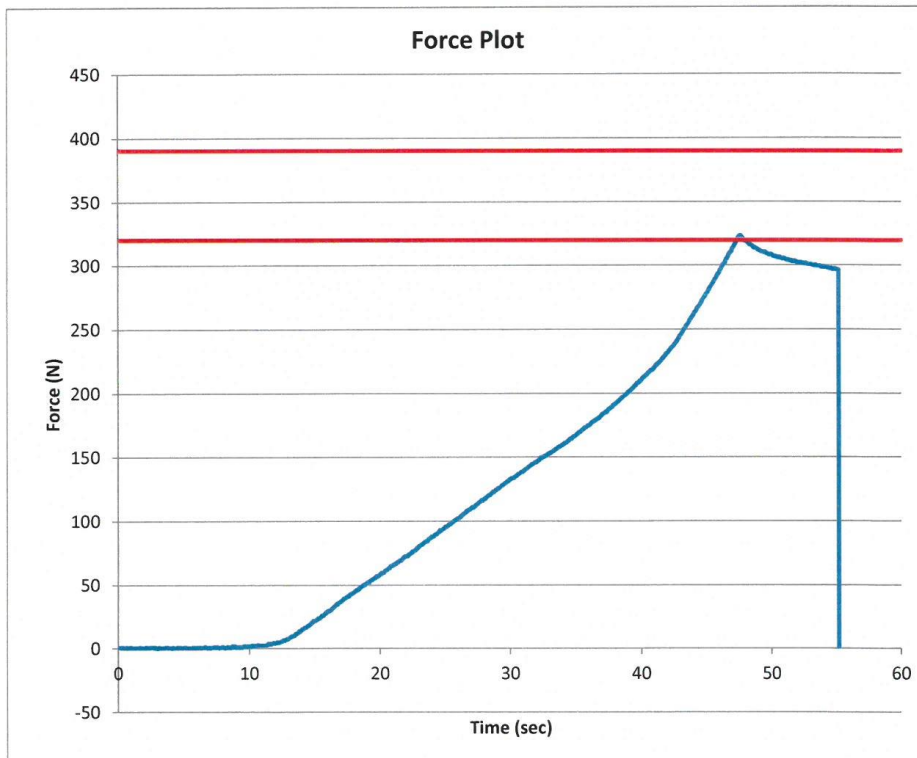
Date: 10/12/2016

Test Number: 01

Time: 7:39

Comments:

TEST PARAMETER	SPECIFICATION		TEST RESULTS		
Temperature	18.9	- 25.6	21.6	°C	Pass
Humidity	10	- 70	41	%	Pass
Average Angular Velocity	0.5	- 1.5	0.82	deg/sec	Pass
Initial Angle	0	- 20	15.76	deg	Pass
Peak Force at 45.12°	320	- 390	323.15	N	Pass
Final Angle	-8	- 8	4.94	deg	Pass



Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 38-4
Test Date: 10/11/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.114 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,788.0 N	Yes

Test meets specifications.

Comments:

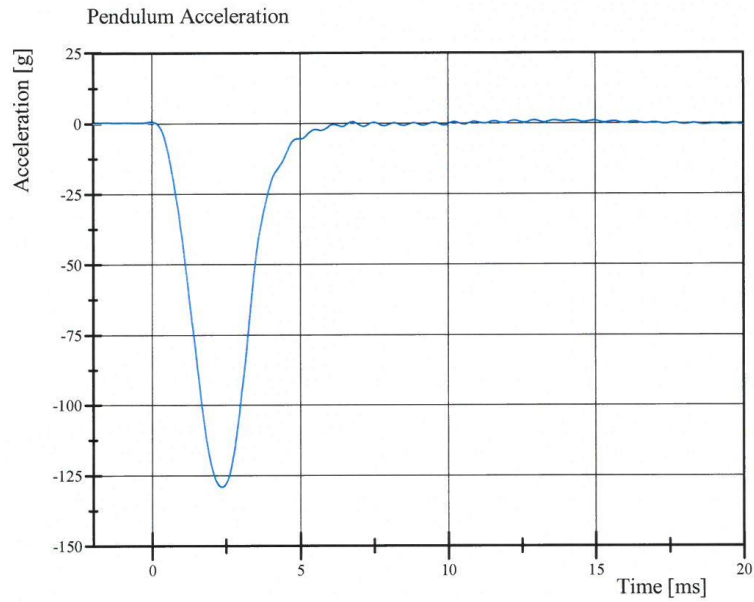
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.11.2016 11:45:16 1766

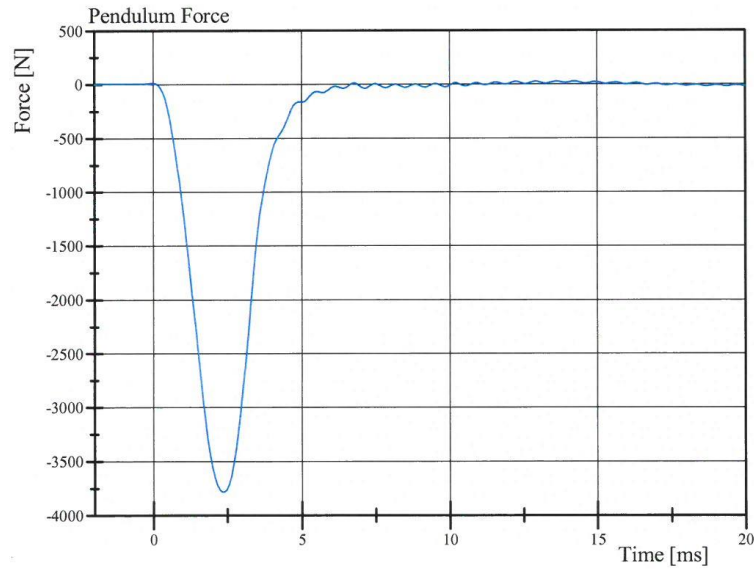


Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 38-4
Test Date: 10/11/2016



Filter Class: CFC_600
Max: 0.9 g at 13.6 ms
Min: -129.2 g at 2.4 ms



Filter Class: CFC_600
Max: 26.8 N at 13.6 ms
Min: -3,788.0 N at 2.4 ms

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

10.11.2016 11:45:26 1766



Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 38-1
Test Date: 10/11/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.114 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,785.1 N	Yes

Test meets specifications.

Comments:

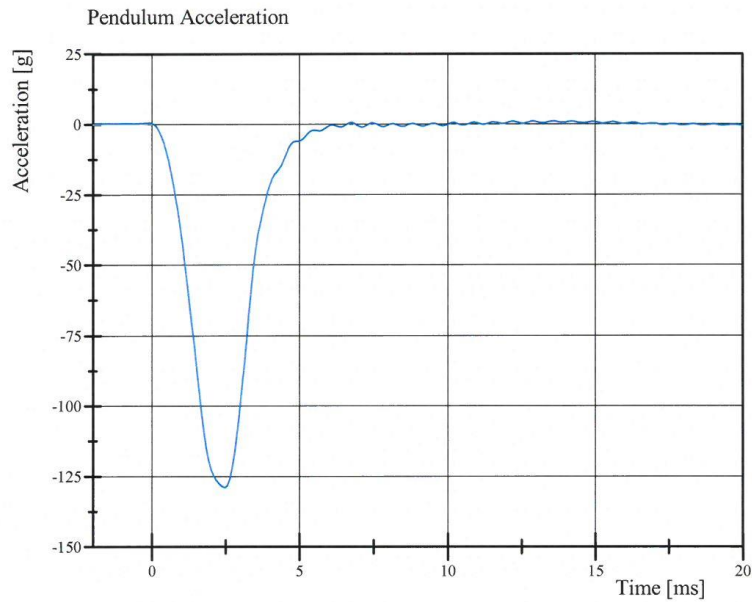
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

10.11.2016 10:20:01 1768

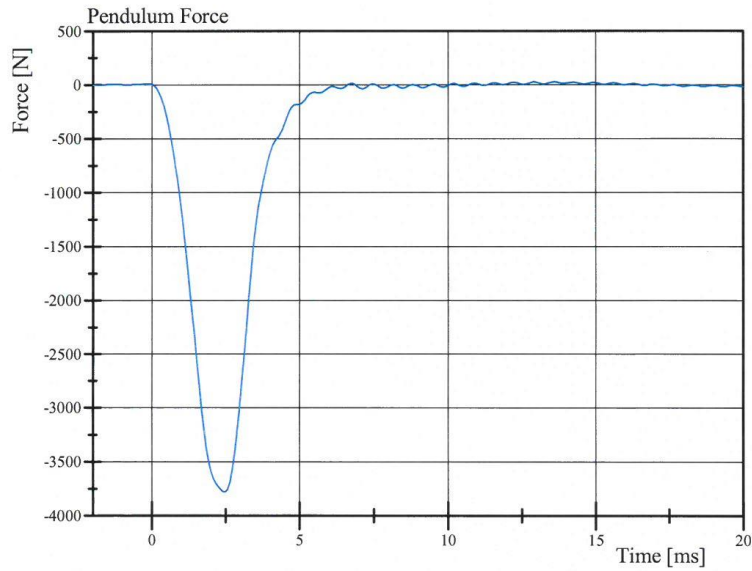


Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 38-1
Test Date: 10/11/2016



Filter Class: CFC_600
Max: 0.9 g at 13.6 ms
Min: -129.1 g at 2.5 ms



Filter Class: CFC_600
Max: 27.2 N at 13.6 ms
Min: -3,785.1 N at 2.5 ms

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

10.11.2016 10:20:12 1768



Post-Test Calibration Sheets

Front Passenger S/N 426

Transportation Research Center Inc.
5720 HHH 5th Dummy
External Dimensions
Serial No. 426 Calibration No. 39

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	774.7 - 800.1	780	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	130	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. 39-1

Test Date: 11/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	27 %	Yes
Peak Head Resultant Acceleration	250 - 300 g	284.9 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	4.0 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

11.15.2016 13:57:55 608

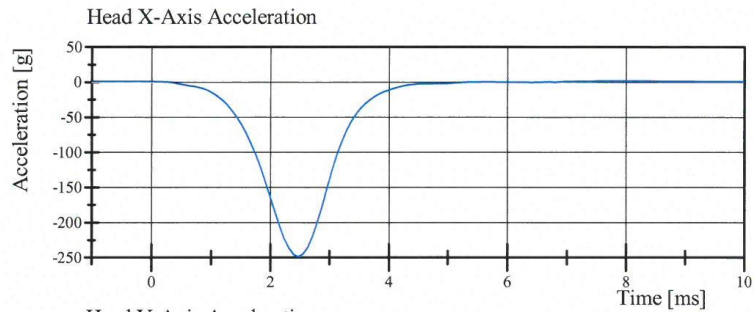


Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 426 Certification No. 39-1

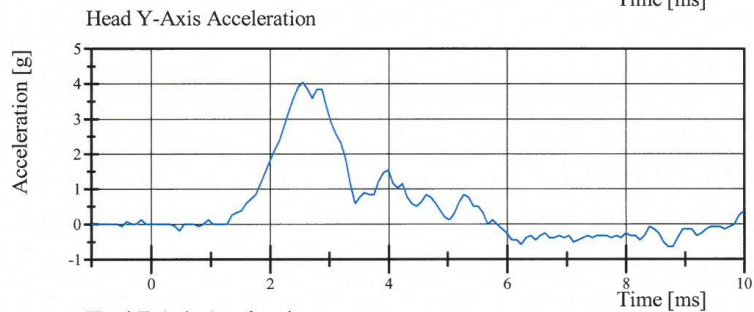
Test Date: 11/15/2016



Filter Class: CFC_1000

Max: 1.5 g at 7.8 ms

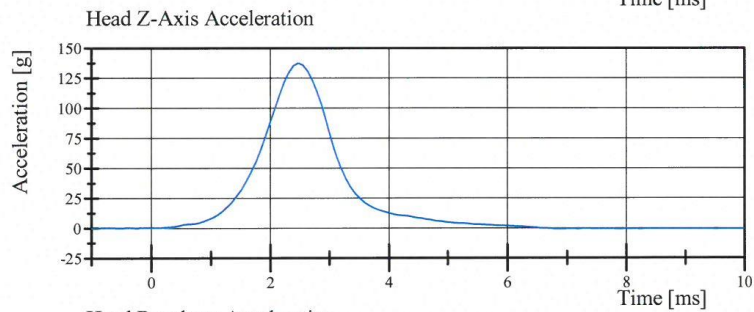
Min: -249.5 g at 2.5 ms



Filter Class: CFC_1000

Max: 4.0 g at 2.6 ms

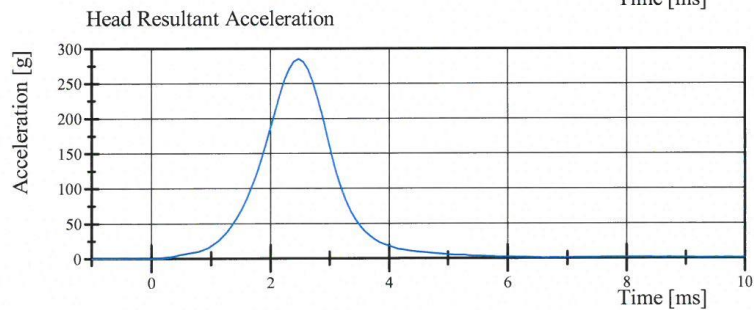
Min: -0.6 g at 8.7 ms



Filter Class: CFC_1000

Max: 137.5 g at 2.5 ms

Min: -0.7 g at 6.9 ms



Filter Class: CFC_1000

Max: 284.9 g at 2.5 ms

Min: 0.0 g at -1.0 ms

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

11.15.2016 13:58:04 608



Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 39-2

Test Date: 11/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	7.092 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	(-2.1) - (-2.5) m/s	-2.39 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	(-4.0) - (-5.0) m/s	-4.68 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	(-5.8) - (-7.0) m/s	-6.73 m/s	Yes
Total Head D-Plane Rotation	(-77) - (-91) °	-82.6 °	Yes
Total Neck Occipital Condyles Moment Between -77° and -91° Rotation	69 - 83 N·m	75.7 N·m	Yes
Total Neck Occipital Condyles Moment Decay to 10 N·m	80 - 100 ms	87.0 ms	Yes

Test meets specifications.

Comments:

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

11.15.2016 16:48:02 1845

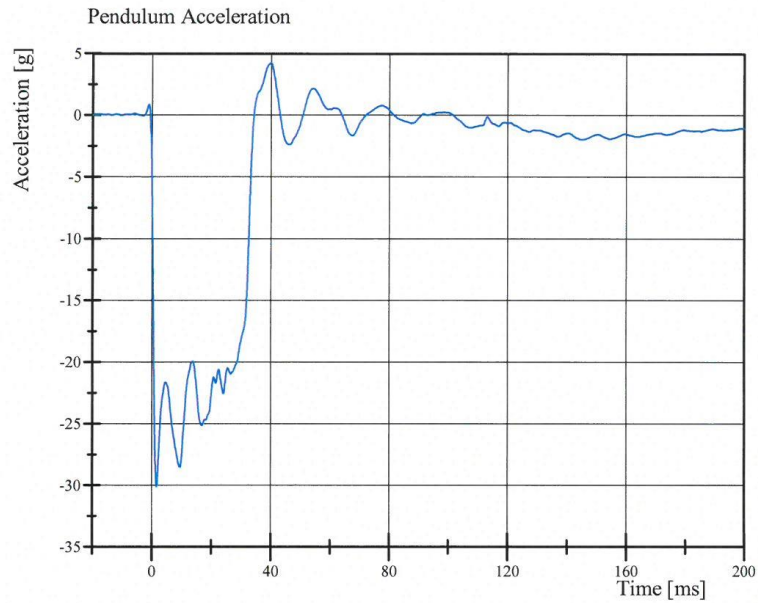


Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 39-2

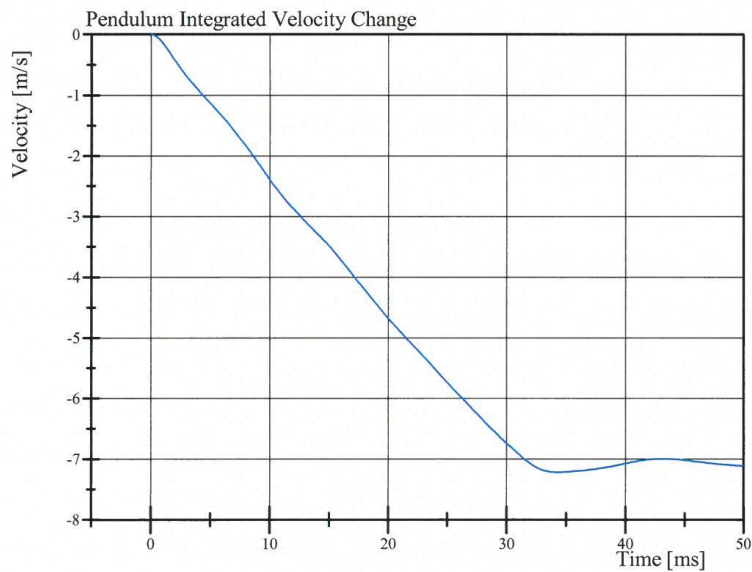
Test Date: 11/15/2016



Filter Class: CFC_180

Max: 4.2 g at 40.1 ms

Min: -30.2 g at 1.8 ms



Filter Class: CFC_180

Max: 0.0 m/s at 0.0 ms

Min: -7.2 m/s at 34.3 ms

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

11.15.2016 16:48:12 1845

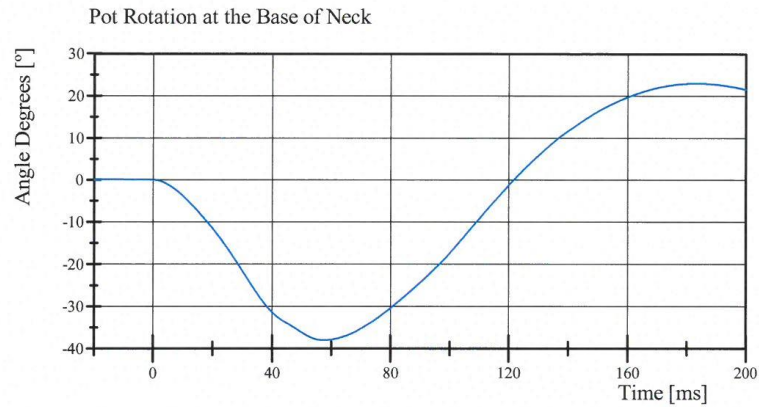


Transportation Research Center Inc.

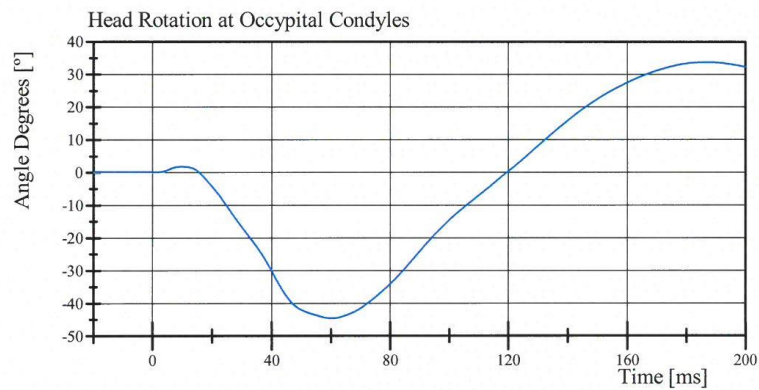
Neck Flexion

HIII 5th Serial No. 426 Certification No. 39-2

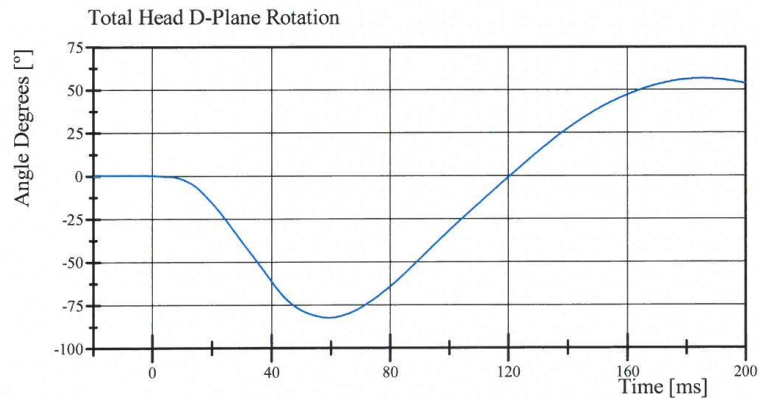
Test Date: 11/15/2016



Filter Class: CFC_60
Max: 23.0 ° at 183.6 ms
Min: -38.1 ° at 57.6 ms



Filter Class: CFC_60
Max: 33.7 ° at 187.0 ms
Min: -44.7 ° at 60.4 ms



Filter Class: CFC_60
Max: 56.7 ° at 185.5 ms
Min: -82.6 ° at 59.5 ms

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

11.15.2016 16:48:13 1845

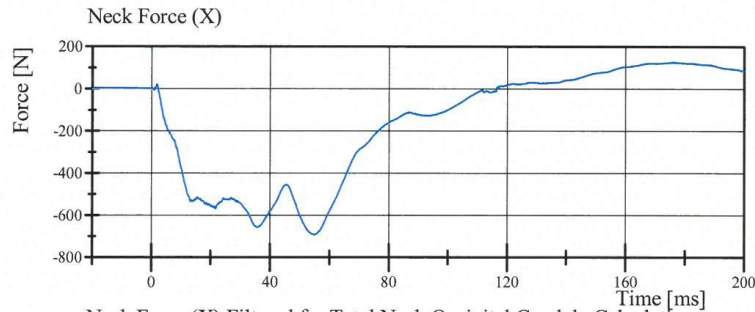


Transportation Research Center Inc.

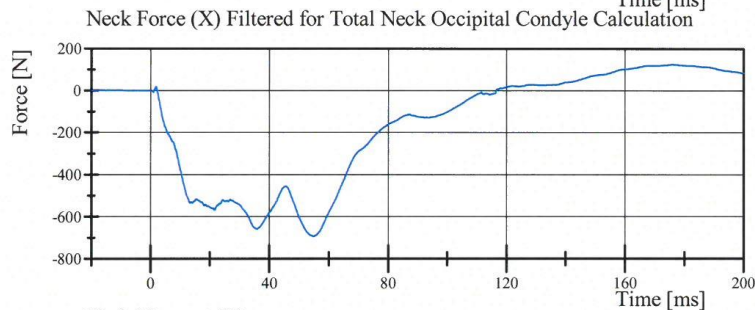
Neck Flexion

HIII 5th Serial No. 426 Certification No. 39-2

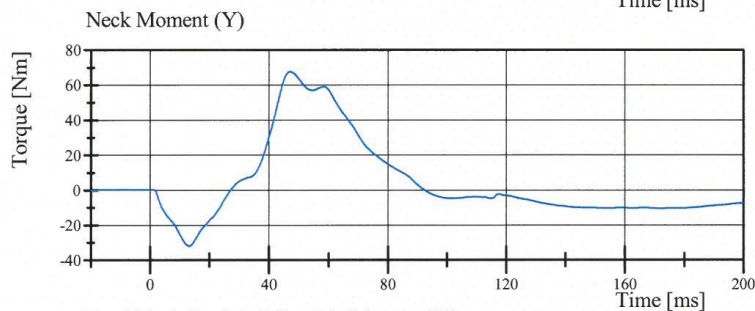
Test Date: 11/15/2016



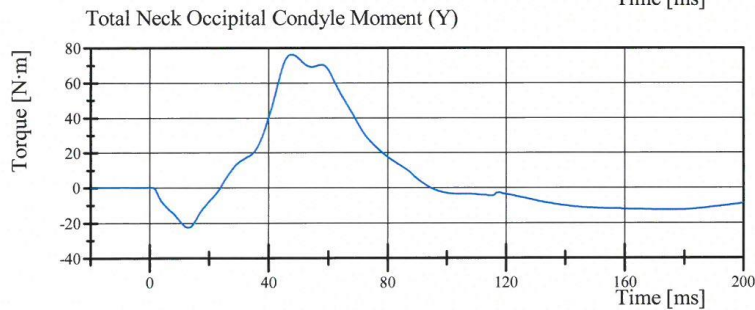
Filter Class: CFC_1000
Max: 126.6 N at 176.4 ms
Min: -693.4 N at 54.9 ms



Filter Class: CFC_600
Max: 126.1 N at 176.2 ms
Min: -692.9 N at 54.9 ms



Filter Class: CFC_600
Max: 67.4 Nm at 47.2 ms
Min: -32.3 Nm at 13.4 ms



Filter Class: Without (Consta
Max: 76.2 N·m at 47.9 ms
Min: -22.8 N·m at 13.3 ms

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

11.15.2016 16:48:14 1845



Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 39-1

Test Date: 11/16/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Pendulum Velocity	(-5.95) - (-6.19) m/s	-6.096 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	1.5 - 1.9 m/s	1.81 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	3.1 - 3.9 m/s	3.63 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	4.6 - 5.6 m/s	5.25 m/s	Yes
Total Head D-Plane Rotation	99 - 114 °	102.2 °	Yes
Total Neck Occipital Condyles Moment Between 99° and 114° Rotation	(-53) - (-65) N·m	-59.3 N·m	Yes
Total Neck Occipital Condyles Moment Decay to -10 N·m	94 - 114 ms	101.3 ms	Yes

Test meets specifications.

Comments:

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

11.16.2016 07:01:09 3115

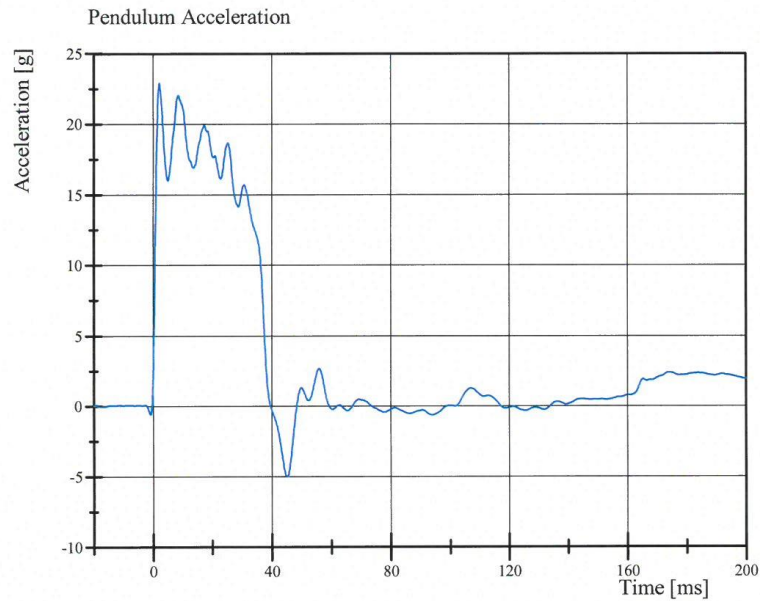


Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 39-1

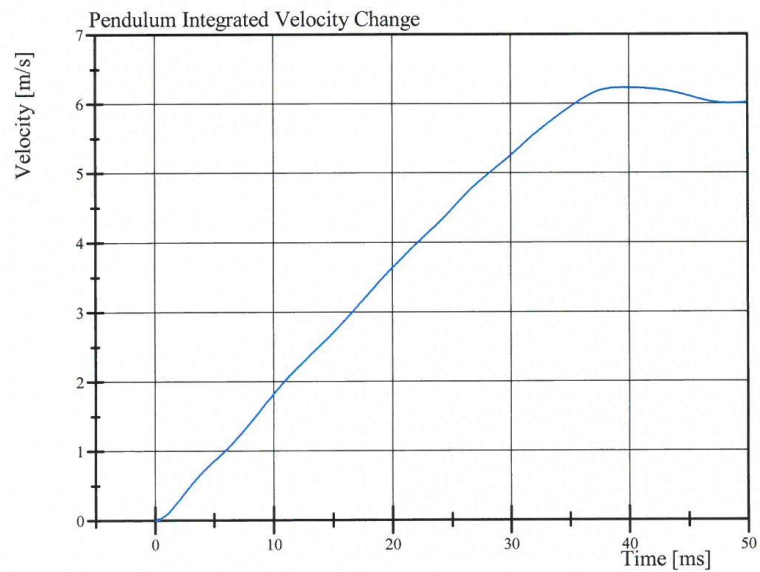
Test Date: 11/16/2016



Filter Class: CFC_180

Max: 22.8 g at 2.2 ms

Min: -5.0 g at 45.3 ms



Filter Class: CFC_180

Max: 6.2 m/s at 39.6 ms

Min: 0.0 m/s at 0.0 ms

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

11.16.2016 07:01:26 3115

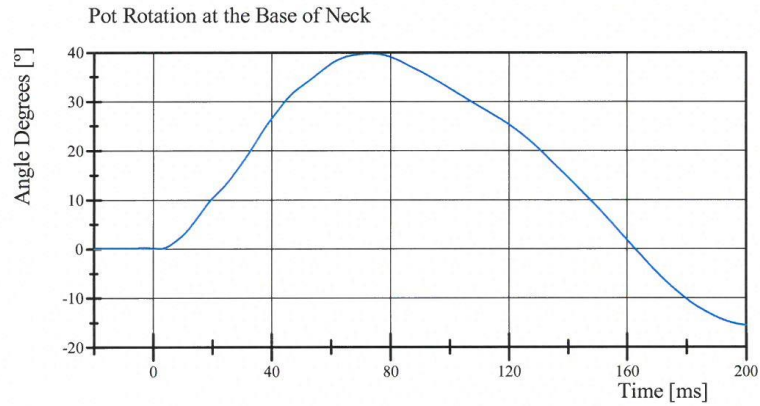


Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 39-1

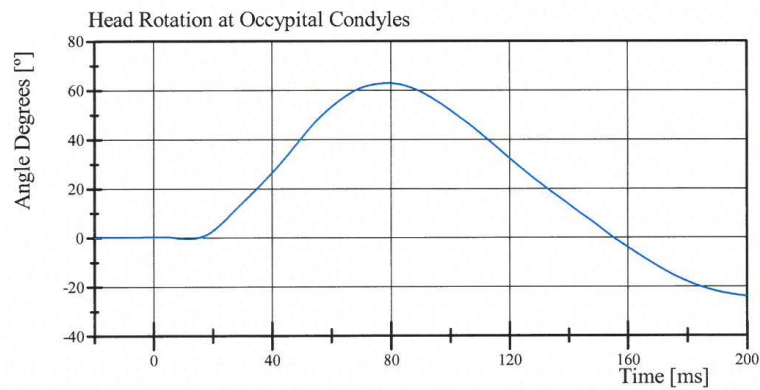
Test Date: 11/16/2016



Filter Class: CFC_60

Max: 39.6 ° at 73.3 ms

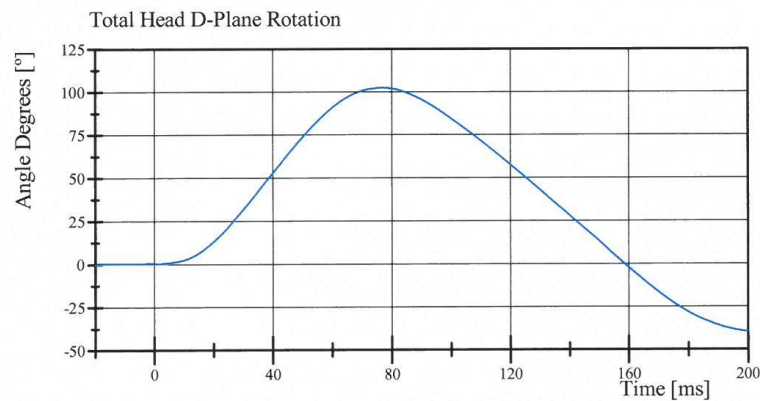
Min: -15.5 ° at 200.0 ms



Filter Class: CFC_60

Max: 62.8 ° at 79.1 ms

Min: -24.0 ° at 200.0 ms



Filter Class: CFC_60

Max: 102.2 ° at 76.9 ms

Min: -39.5 ° at 200.0 ms

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

11.16.2016 07:01:27 3115

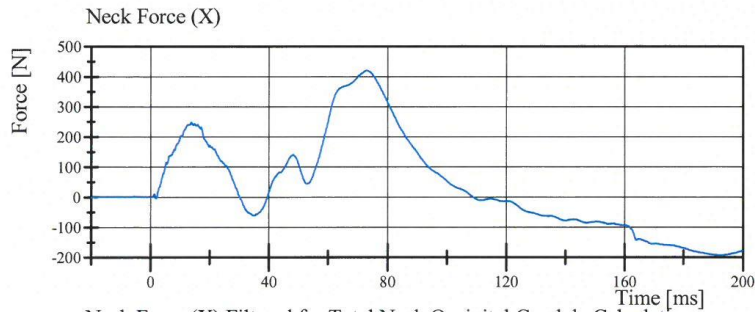


Transportation Research Center Inc.

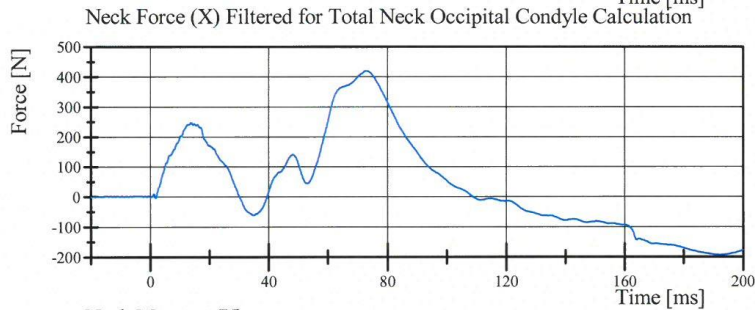
Neck Extension

HIII 5th Serial No. 426 Certification No. 39-1

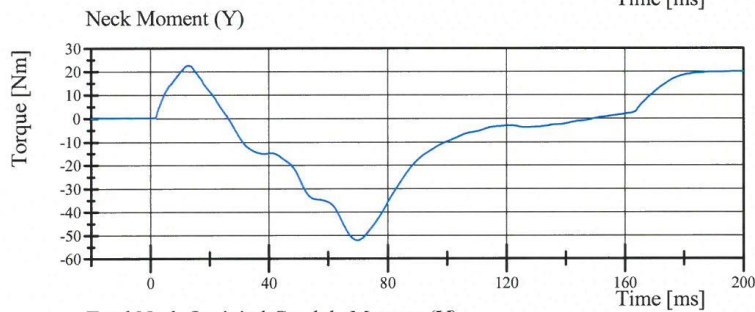
Test Date: 11/16/2016



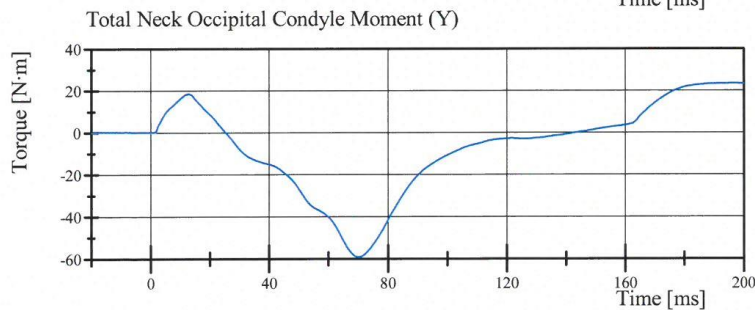
Filter Class: CFC_1000
Max: 419.3 N at 72.8 ms
Min: -193.3 N at 192.0 ms



Filter Class: CFC_600
Max: 419.2 N at 72.9 ms
Min: -193.1 N at 192.3 ms



Filter Class: CFC_600
Max: 22.5 Nm at 12.7 ms
Min: -52.2 Nm at 69.8 ms



Filter Class: Without_Constai
Max: 23.5 N·m at 195.7 ms
Min: -59.3 N·m at 70.2 ms

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

11.16.2016 07:01:28 3115



Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. 426 Certification No. 39-3

Test Date: 11/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.687 m/s	Yes
Probe Force Peak Between 50.0 mm and 58.0 mm Chest Deflection	(-3,900) - (-4,400) N	-4,320.9 N	Yes
Probe Force Peak Between 18.0 mm and 50.0 mm Chest Deflection	>= (-4,600) N	-4,541.7 N	Yes
Maximum Chest Compression	(-50) - (-58) mm	-50.2 mm	Yes
Internal Hysteresis	69 - 85 %	74.2 %	Yes

Test meets specifications.

Comments:

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

11.15.2016 12:39:14 404

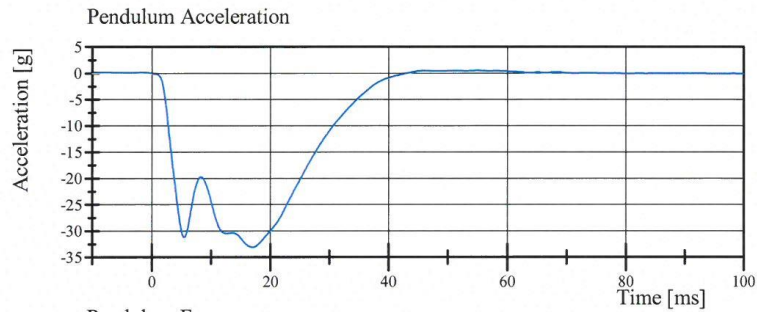


Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. 426 Certification No. 39-3

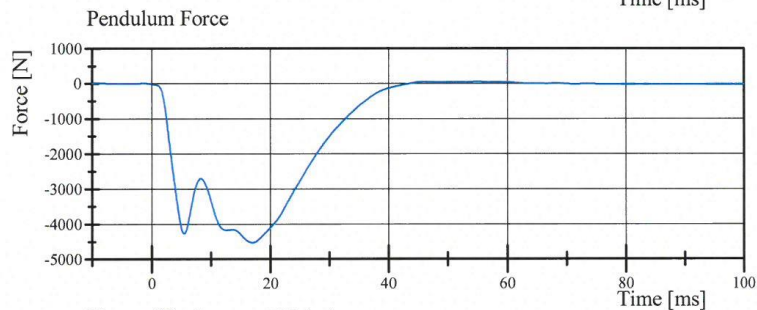
Test Date: 11/15/2016



Filter Class: CFC_180

Max: 0.4 g at 55.1 ms

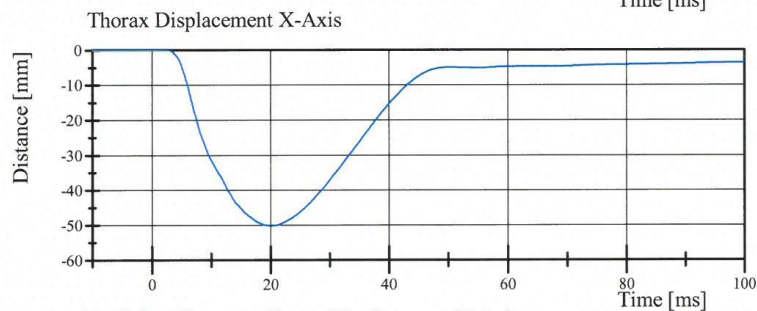
Min: -33.2 g at 17.0 ms



Filter Class: CFC_180

Max: 59.8 N at 55.1 ms

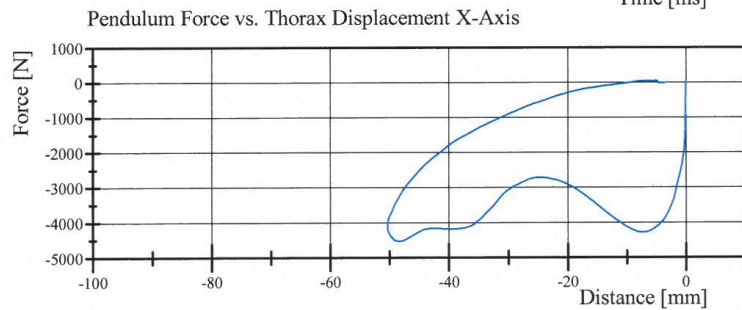
Min: -4,541.7 N at 17.0 ms



Filter Class: CFC_600

Max: 0.0 mm at -4.2 ms

Min: -50.2 mm at 20.2 ms



Filter Class: CFC_180

Max: 59.8 N at -5.2 mm

Min: -4,541.7 N at -48.4 mm

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

11.15.2016 12:41:58 404



Transportation Research Center Inc.

Hybrid III Small Female Torso Flexion

NHTSA

Serial Number: 426

Date: 11/15/2016

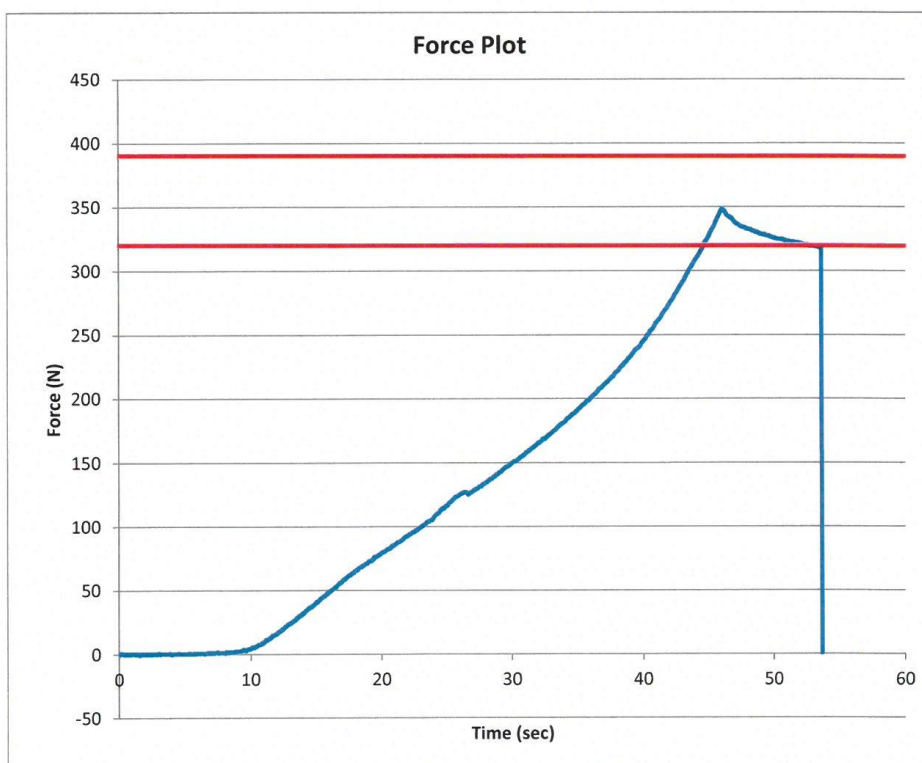
Test Number: 1

Time: 17:25

Comments:



TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.7 °C Pass
Humidity	10 - 70	30 % Pass
Average Angular Velocity	0.5 - 1.5	0.86 deg/sec Pass
Initial Angle	0 - 20	13.91 deg Pass
Peak Force at 45.12°	320 - 390	348.34 N Pass
Final Angle	-8 - 8	4.64 deg Pass



Transportation Research Center Inc.

Left Knee Femur Response Test

HIII 5th Serial No. 426 Certification No. 39-1

Test Date: 11/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	22 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.101 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,967.2 N	Yes

Test meets specifications.

Comments:

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

11.15.2016 08:33:34 1732

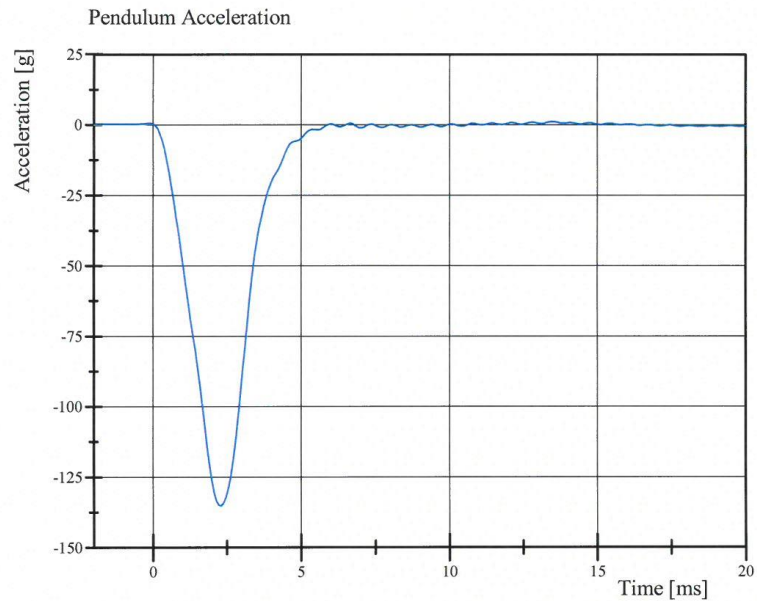


Transportation Research Center Inc.

Left Knee Femur Response Test

HIII 5th Serial No. 426 Certification No. 39-1

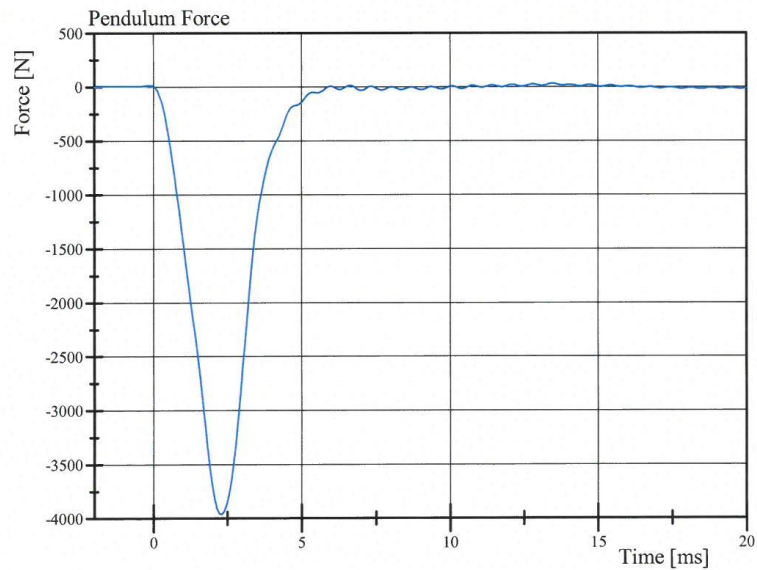
Test Date: 11/15/2016



Filter Class: CFC_600

Max: 1.1 g at 13.4 ms

Min: -135.3 g at 2.3 ms



Filter Class: CFC_600

Max: 32.1 N at 13.4 ms

Min: -3,967.2 N at 2.3 ms

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

11.15.2016 08:34:52 1732



Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 39-1
Test Date: 11/15/2016

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	22 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.112 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,749.3 N	Yes

Test meets specifications.

Comments:

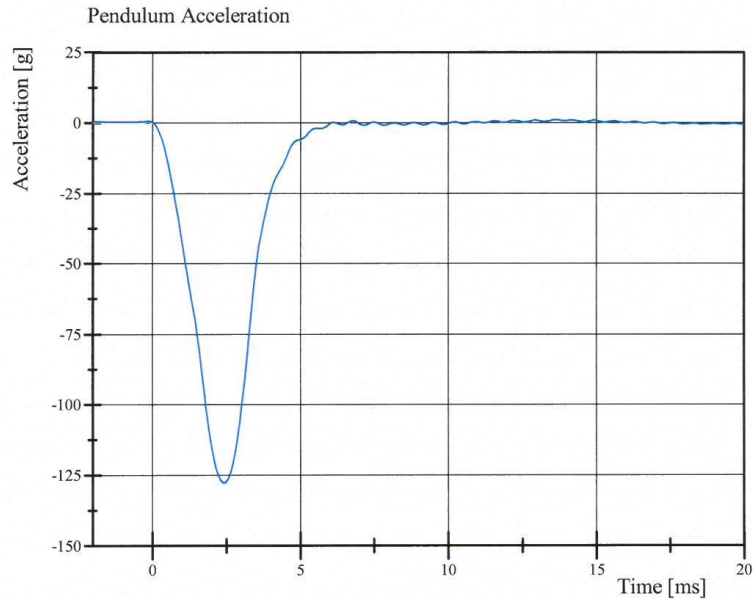
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

11.15.2016 08:46:07 1727

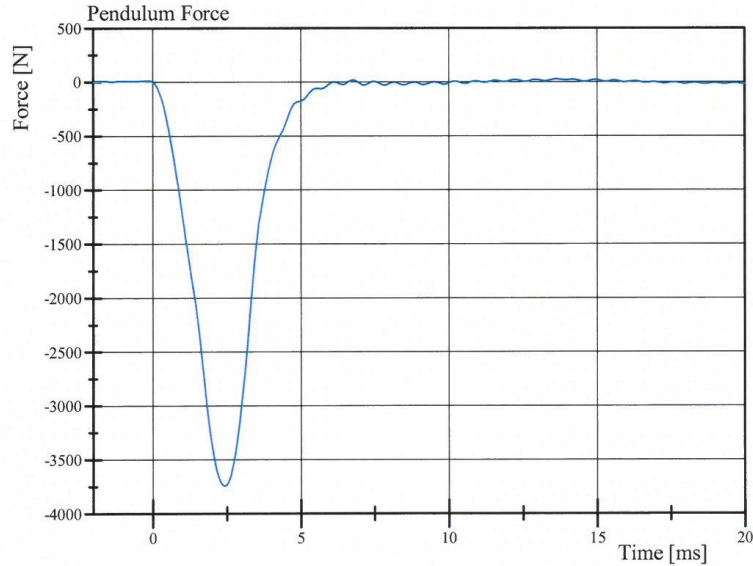


Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 39-1
Test Date: 11/15/2016



Filter Class: CFC_600
Max: 0.9 g at 13.6 ms
Min: -127.9 g at 2.4 ms



Filter Class: CFC_600
Max: 26.0 N at 13.6 ms
Min: -3,749.3 N at 2.4 ms

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

11.15.2016 08:47:13 1727

