

Final Report Number: NCAP-TRC-15-003

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

**Toyota Motor Manufacturing, Kentucky, Inc.
2015 Toyota Avalon 4-Door Passenger Car**

NHTSA Number: M20155100

**PREPARED BY:
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Report Date: March 16, 2015

FINAL REPORT

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

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Prepared By: Impact Laboratory Project Operations Group

Approved By: Jeffery W. Sankey

Approval Date: March 16, 2015

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 _____

1. Report No. NCAP-TRC-15-003	2. Government Accession No.	3. Recipient's Catalog No.																																																																									
4. Title and Subtitle Final Report of NEW CAR ASSESSMENT PROGRAM Frontal Impact Testing of a 2015 Toyota Avalon 4-Door Passenger Car NHTSA No. M20155100				5. Report Date March 16, 2015																																																																							
				6. Performing Organization Code TRC Inc.																																																																							
7. Author(s) Jeffery W. Sankey, Manager, Project Operations				8. Performing Organization Report No. 150115																																																																							
9. Performing Organization Name and Address Transportation Research Center Inc. 10820 State Route 347 East Liberty, OH 43319-0367				10. Work Unit No. (TRAIS)																																																																							
				11. Contract or Grant No. DTNH22-12-D-00257																																																																							
12. Sponsoring Agency Name and Address 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				13. Type of Report and Period Covered Draft Report January 15, 2015 – March 16, 2015																																																																							
				14. Sponsoring Agency Code NVS-111																																																																							
15. Supplemental Notes																																																																											
16. Abstract A 56.0 km/h NCAP Frontal Impact Test was conducted on a 2015 Toyota Avalon 4-Door Passenger Car 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 January 15, 2015. The impact velocity was 56.35 km/h, and the ambient temperature at the barrier face at the time of impact was 21° C. The target vehicle post-test maximum crush was 545 millimeters at vehicle centerline. The test vehicle's performance is as follows: <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Driver ATD</th> <th colspan="3">Passenger ATD</th> </tr> <tr> <th>Units</th> <th>Threshold</th> <th>Result</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>NA</td> <td>700</td> <td>177</td> <td>NA</td> <td>700</td> <td>269</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-22.6</td> <td>mm</td> <td>52</td> <td>-13.5</td> </tr> <tr> <td>3ms Chest Clip</td> <td>Gs</td> <td>60</td> <td>37.8</td> <td>Gs</td> <td>60</td> <td>41.4</td> </tr> <tr> <td>Nij</td> <td>NA</td> <td>1</td> <td>0.33</td> <td>NA</td> <td>1</td> <td>0.38</td> </tr> <tr> <td>Neck Tension</td> <td>Newtons</td> <td>4170</td> <td>1573.0</td> <td>Newtons</td> <td>2620</td> <td>834.3</td> </tr> <tr> <td>Neck Compression</td> <td>Newtons</td> <td>4000</td> <td>-73.3</td> <td>Newtons</td> <td>2520</td> <td>-480.9</td> </tr> <tr> <td>Left Femur Force</td> <td>Newtons</td> <td>10008</td> <td>-2188.6</td> <td>Newtons</td> <td>6805</td> <td>-2078.1</td> </tr> <tr> <td>Right Femur Force</td> <td>Newtons</td> <td>10008</td> <td>-2634.4</td> <td>Newtons</td> <td>6805</td> <td>2022.4</td> </tr> </tbody> </table>							Measurement Description	Driver ATD			Passenger ATD			Units	Threshold	Result	Units	Threshold	Result	Head Injury Criteria (HIC ₁₅)	NA	700	177	NA	700	269	Maximum Chest Compression	mm	63	-22.6	mm	52	-13.5	3ms Chest Clip	Gs	60	37.8	Gs	60	41.4	Nij	NA	1	0.33	NA	1	0.38	Neck Tension	Newtons	4170	1573.0	Newtons	2620	834.3	Neck Compression	Newtons	4000	-73.3	Newtons	2520	-480.9	Left Femur Force	Newtons	10008	-2188.6	Newtons	6805	-2078.1	Right Femur Force	Newtons	10008	-2634.4	Newtons	6805	2022.4
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19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified		21. Number of Pages 175		22. Price																																																																						

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1: PURPOSE AND SUMMARY OF 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 August 2013.

SUMMARY

A 2015 Toyota Avalon 4-Door Passenger Car impacted the barrier wall at a velocity of 56.35 km/h. The test was performed at Transportation Research Center, Inc. on January 15, 2015. 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 95 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 545 mm and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

The driver's visible contact points were as follows: front airbag, headrest, and knee airbag. The passenger's visible contact points were as follows: front airbag, headrest, and knee airbag.

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)	177	0.33	1573.0	-73.3	37.8	-22.6	-2188.6	-2634.4
Passenger (5 th Female)	269	0.38	834.3	-480.9	41.4	-13.5	-2078.1	-2022.4

2: OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

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

Test Vehicle: 2015 Toyota Avalon 4-Door Passenger Car
 Test Program: NCAP Frontal Impact

NHTSA No.: M20155100
 Test Date: 1/15/15

TEST VEHICLE INFORMATION

NHTSA No.	M20155100
Model Year	2015
Make	Toyota
Model	Avalon
Body Style	Passenger Car
VIN	4T1BK1EBXFU138810
Body Color	Silver
Odometer Reading (km/mi)	5 mi
Engine Displacement (L)	3.5
Type/No. Cylinders	Gas/6
Engine Placement	Front/Transverse
Transmission Type	Automatic
Transmission Speeds	6
Overdrive	Yes
Final Drive	FWD
Roof Rack	No
Sunroof/T-Top	Yes
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes
Automatic Door Locks (ADLs)	Yes

TEST VEHICLE OPTIONS

Traction Control System (TCS)	Yes
Power Steering	Yes
Power Window Auto-Reverse	Yes
Driver Frontal Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	Yes
Front Pass. Frontal Airbag	Yes
Front Pass. Curtain Airbag	Yes
Front Pass. Head/Torso Airbag	No
Front Pass. Torso Airbag	No
Front Pass. Torso/Pelvis Airbag	Yes
Front Pass. Pelvis Airbag	No
Front Pass. Knee Airbag	Yes
Driver Pretensioner	Yes
Driver Load Limiter	Yes
Front Pass. Pretensioner	Yes
Front Pass. Load Limiter	Yes
Other:	None

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

Yes

DATA FROM CERTIFICATION LABEL

Manufactured by	Toyota Motor Manufacturing, Kentucky, Inc.
Date of Manufacture	11/14

GVWR (kg)	2082.0 (4590 lbs)
GAWR Front (kg)	1190.7 (2625 lbs)
GAWR Rear (kg)	1134.0 (2500 lbs)

VEHICLE SEATING AND WEIGHT CAPACITY

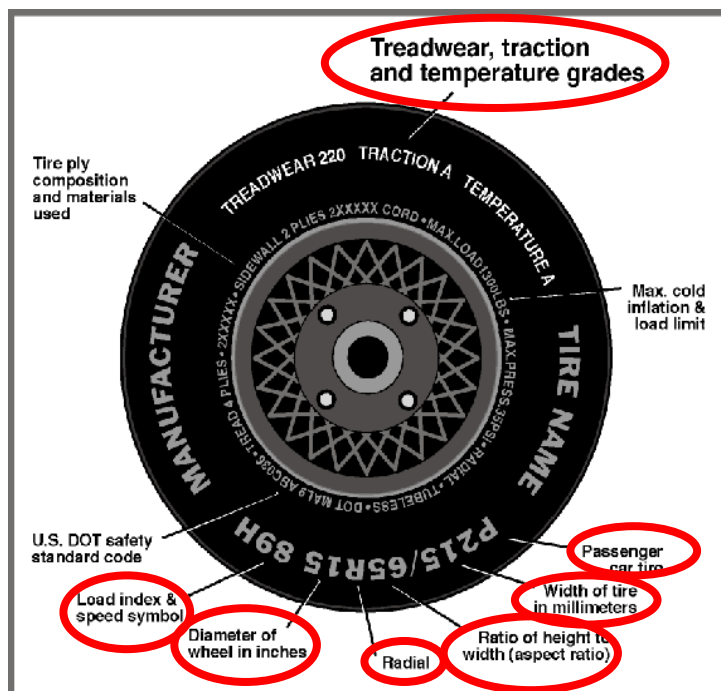
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	N/A	
Number of Occupants	2	3	N/A	5
Capacity Wt. (VCW) (kg)				412
Cargo Wt. (RCLW) (kg)				71.8

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2015 Toyota Avalon 4-Door Passenger Car
 Test Program: NCAP Frontal Impact

NHTSA No.: M20155100
 Test Date: 1/15/15



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold / Test Pressure (kPa)	230	230
Recommended Tire Size	P225/45R18	P225/45R18
Tire Size on Vehicle	P225/45R18	P225/45R18
Tire Manufacturer	Michelin	Michelin
Tire Model	Primacy	Primacy
Treadwear	500	500
Traction Grade	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index/Speed Symbol	91V	91V
Tire Material	Polyester, polyamide & steel	Polyester, polyamide & steel
DOT Safety Code Right	B9MT 009X 4214	B9MT 009X 4214
DOT Safety Code Left	B9MT 009X 4214	B9MT 009X 4214

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

Test Vehicle: 2015 Toyota Avalon 4-Door Passenger Car
 Test Program: NCAP Frontal Impact

NHTSA No.: M20155100
 Test Date: 1/15/15

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	501.4	319.0		546.8	381.4	
Right	kg	486.6	306.6		513.2	377.0	
Ratio	%	61.2	38.8		58.3	41.7	
Totals	kg	988.0	625.6	1613.6	1060.0	758.4	1818.4

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1613.6
Weight of 1 P572E ATD & 1 P572O ATD	kg	139.3
Rated Cargo/Luggage Weight (RCLW)	kg	71.8
Vehicle Target Weight (TVTW)	kg	1824.7

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	710	711	718	719	1093
As Tested	mm	693	704	693	691	1176
Post Test	mm	711	703	697	694	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2820
Total Vehicle Length at Left Side	mm	4733
Total Vehicle Length at Centerline	mm	4953
Total Vehicle Length at Right Side	mm	4733
Weight of Ballast in Cargo Area	kg	0
Weight of Vehicle Components Removed	kg	10.8
Amount of Stoddard Solvent in Fuel Tank	liters	58.4

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT: Interior door trim on left & right rear doors, trunk lid liner, trunk seal, trunk hinge covers.

DATA SHEET NO. 1 (CONTINUED)**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2015 Toyota Avalon 4-Door Passenger CarNHTSA No.: M20155100Test Program: NCAP Frontal ImpactTest Date: 1/15/15**TARGET VEHICLE STRUCTURAL MEASUREMENT**

	Elements	Pre-Test (mm)
1	Total Length	4953
2	Total Width	1835
3	Bumper Top Height	525
4	Bumper Bottom Height	408
5	Longitudinal Member Top Height	543
6	Distance Between Longitudinal Members	935
7	Longitudinal Member Width	75
8	Engine Top Height	895
9	Engine Bottom Height	168
10	Engine and Gearbox Width	805
11	Front Bumper-Engine Distance	470
12	Front Shock Absorber Fixing Height	900
13	Bonnet Leading Edge Height	745
14	Front Shock Absorber Fixing Width	1210
15	Front Bumper – Front Axle Distance	995
16	Front Axle – A-Pillar Distance	490
17	A-Pillar – B-Pillar Distance	1115
18	B-Pillar – Rear Axle Distance	1227
19	B-Pillar – C-Pillar Distance	1050
20	Roof Sill Bottom Height	1298
21	Roof Sill Top Height	1365
22	Floor Sill Bottom Height	343
23	Floor Sill Top Height	380

DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEM AND STEERING WHEEL DATA

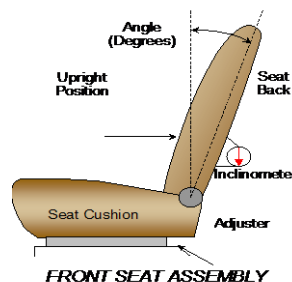
Test Vehicle: 2015 Toyota Avalon 4-Door Passenger Car
 Test Program: NCAP Frontal Impact

NHTSA No.: M20155100
 Test Date: 1/15/15

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:	3.5 rearward
Passenger Seat back angle:	1.5 rearward

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	282	141
Passenger Seat	240	0

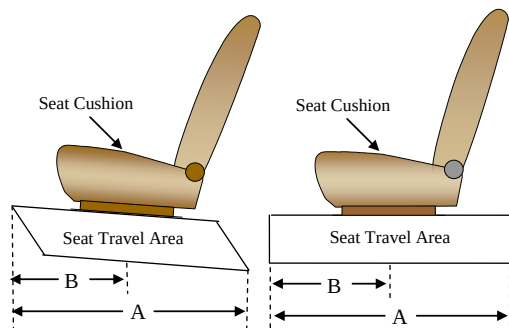
SEAT BELT UPPER ANCHORAGE

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



DATA SHEET NO. 2 (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM AND STEERING WHEEL DATA

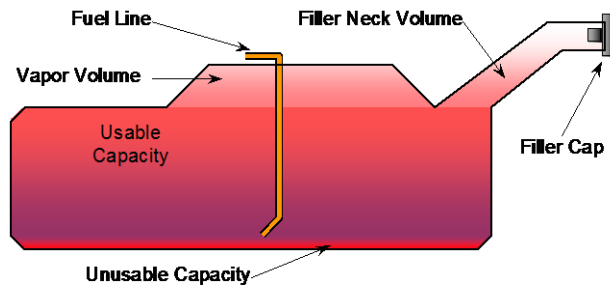
Test Vehicle: 2015 Toyota Avalon 4-Door Passenger Car
Test Program: NCAP Frontal Impact

NHTSA No.: M20155100
Test Date: 1/15/15

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	62.8
Usable Capacity of "Optional Tank"	N/A
92%-94% of Usable Capacity	58.4
Actual Amount of Solvent Used	58.4
1/3 of Usable Capacity	19.5

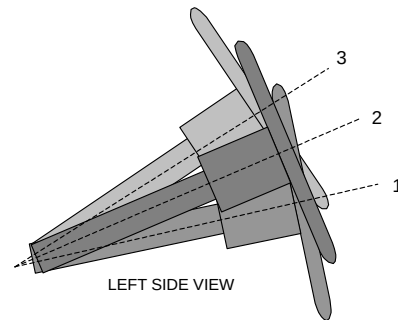
The vehicle is equipped with an electric fuel pump. If ignition key is at "ON" position and engine is not running, the fuel pump operates for 2 seconds. If the engine is running, then the fuel pump will run continuously.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. Steel square was placed across the rim of the steering wheel, an inclinometer was placed on the plate and the angle was measured. Telescope travel was measured full in and full out and set at the midpoint.



LEFT SIDE VIEW

STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONS

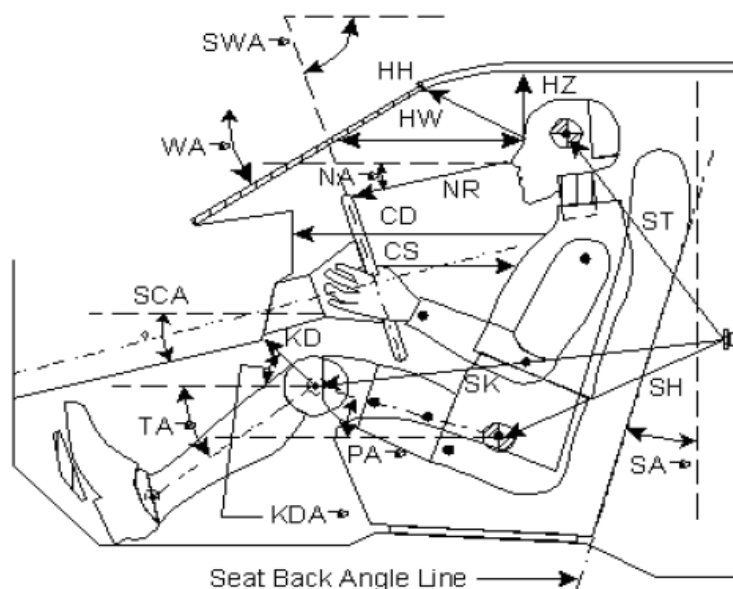
	Degrees	Fore/Aft Position (mm)
Lowermost Position No. 1	21.8	--
Geometric Center Position No. 2	24.0	--
Uppermost Position No. 3	26.2	--
Telescoping Steering Wheel Travel	--	38
Test Position	24.0	19

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Toyota Avalon 4-Door Passenger Car
 Test Program: NCAP Frontal Impact

NHTSA No.: M20155100
 Test Date: 1/15/15



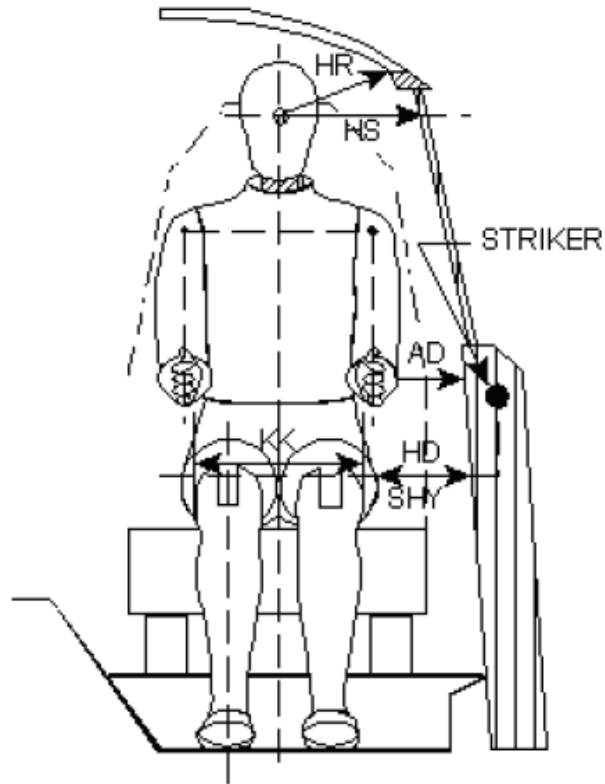
Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		27.2		
SWA°	Steering Wheel Angle		24.0		
SCA°	Steering Column Angle		66.0		
SA°	Seat Back Angle (on headrest post)		3.5 rearward		1.5 rearward
HZ	Head to Roof (Z)	182		205 to visor	
HH	Head to Header	376		329	
HW	Head to Windshield	731		723	
NR	Nose to Rim	420			
CD	Chest to Dash	544		412	
CS	Chest to Steering Hub	319			
RA	Rim to Abdomen	212			
KDL	Left Knee to Dash	173	32.0	122	40.0
KDR	Right Knee to Dash	161	32.0	126	43.0
PA°	Pelvic Angle		23.9		21.2
TA°	Tibia Angle		40.0		42.0
SK	Striker to Knee	616	10.5	697	12.7
ST	Striker to Head	433	79.5	418	60.3
SH	Striker to H-Point	313	46.5	414	29.6

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Toyota Avalon 4-Door Passenger Car
Test Program: NCAP Frontal Impact

NHTSA No.: M20155100
Test Date: 1/15/15



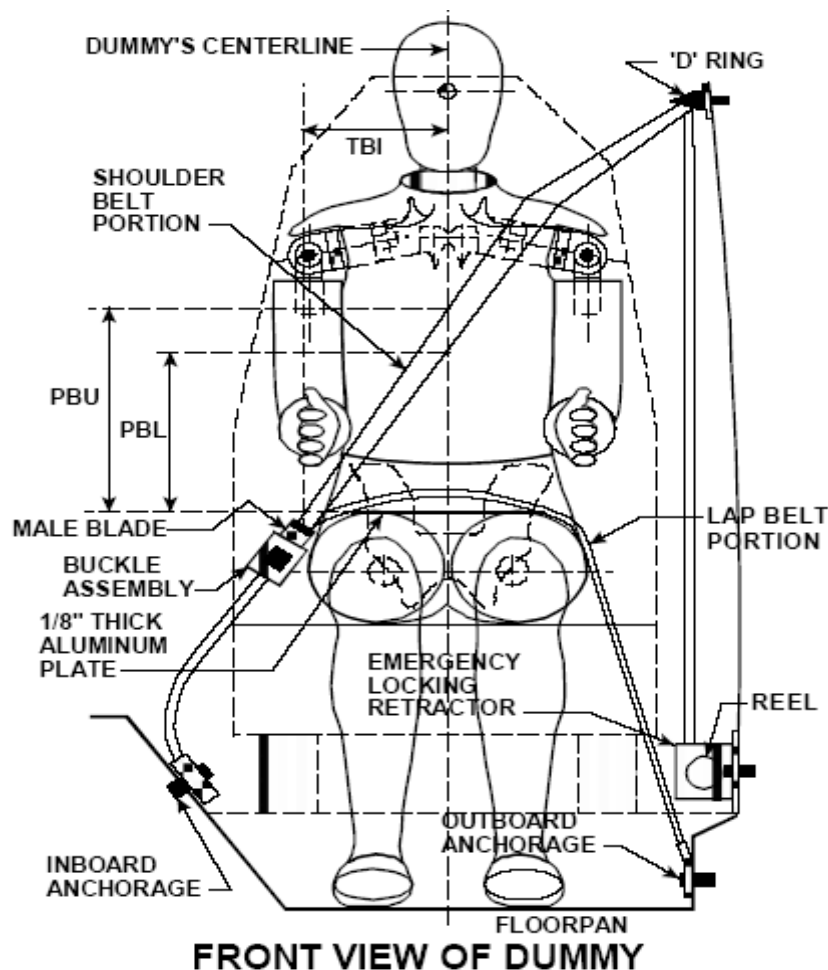
Code	Measurement Description	Driver	Passenger
AD	Arm to Door	147	93
HD	H-Point to Door	157	177
HR	Head to Side Header	272	243
HS	Head to Side Window	360	375
KK	Knee to Knee	343	165
SHY	Striker to H-Point (Y Direction)	256	190
AA	Ankle to Ankle	363	165

DATA SHEET NO. 5

SEAT BELT POSITIONING DATA

Test Vehicle: 2015 Toyota Avalon 4-Door Passenger Car
 Test Program: NCAP Frontal Impact

NHTSA No.: M20155100
 Test Date: 1/15/15



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU – Top surface of reference to belt upper edge	mm	402	338
PBL – Top surface of reference to belt lower edge	mm	318	245

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	875	970
Lap belt length as measured on ATD	mm	865	960
Remainder of belt on reel	mm	897	787
Total belt length for continuous webbing systems	mm	2637	2717

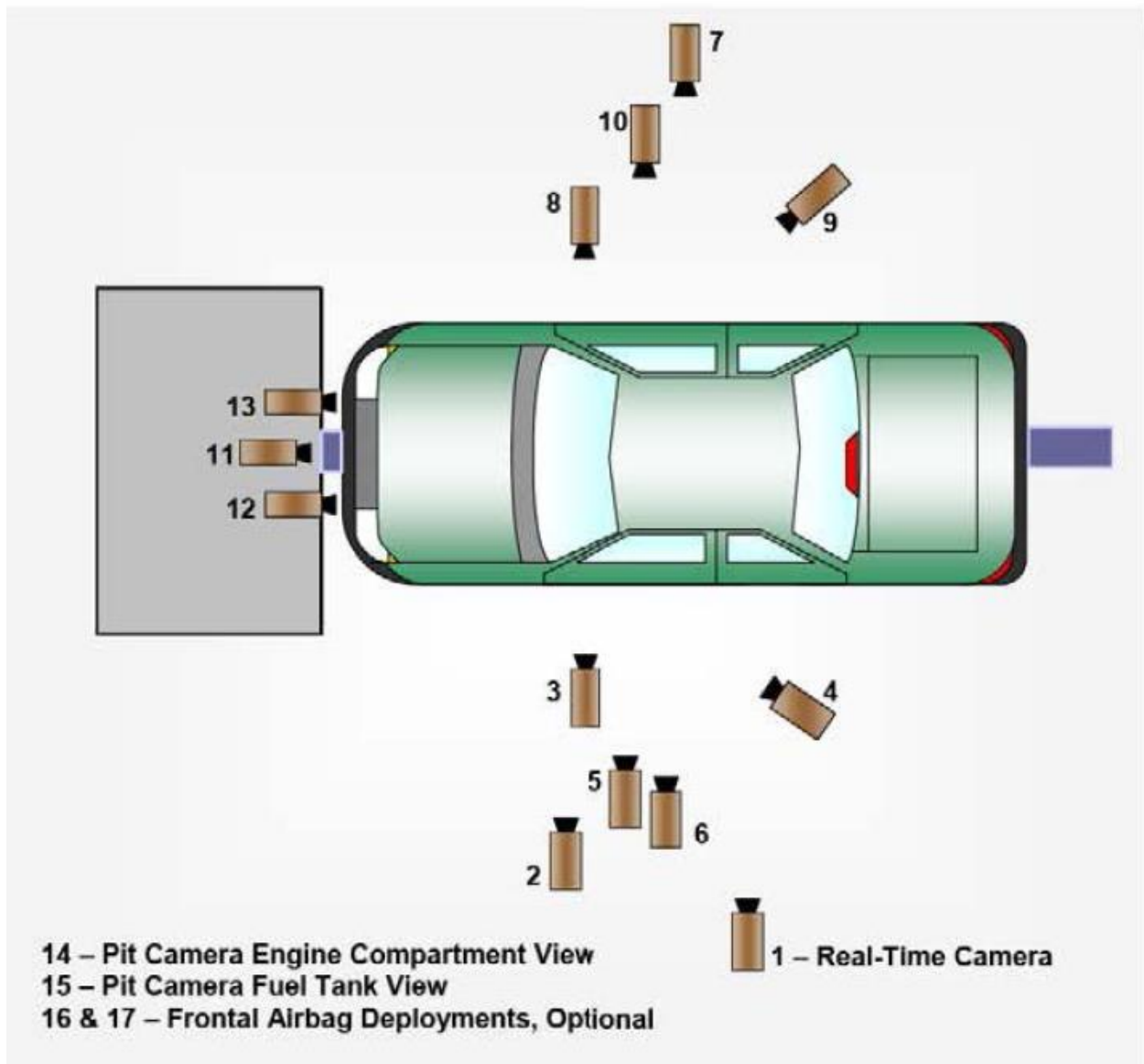
DATA SHEET NO. 6

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2015 Toyota Avalon 4-Door Passenger Car
Test Program: NCAP Frontal Impact

NHTSA No.: M20155100
Test Date: 1/15/15

CAMERA POSITIONS FOR FRONTAL IMPACTS



DATA SHEET NO. 6 (CONTINUED)**HIGH SPEED CAMERA LOCATIONS AND DATA**Test Vehicle: 2015 Toyota Avalon 4-Door Passenger CarNHTSA No.: M20155100Test Program: NCAP Frontal ImpactTest Date: 1/15/15**CAMERA LOCATIONS**

No.	Camera View	Location (mm)			Lens (mm)	Frame Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	866	5889	-1222	Zoom	30
2	Driver Close-Up	1627	-4836	-1199	20	1000
3	Left Front Half	1164	-5196	-1203	28	1000
4	Left Angle	3977	-3036	-1805	Zoom	1000
5	Steering Column - Top	1729	-5556	-2289	50	1000
6	Steering Column – Bottom	1709	-5081	-1499	Zoom	1000
7	Right Overall	1908	6019	-1226	20	1000
8	Passenger Close-Up	1503	5254	-1265	50	1000
9	Right Front Half	4479	3495	-1885	28	1000
10	Right Angle	1234	5624	-1227	60	1000
11	Windshield	105	-20	-2630	12.5	1000
12	Driver Windshield	120	-420	-2677	50	1000
13	Passenger Windshield	115	285	-2677	50	1000
14	Pit Front	733	45	3132	28	1000
15	Pit Rear	3481	50	3029	18	1000
16	Onboard Driver Airbag (Optional)				12.5	1000
17	Onboard Passenger Airbag (Optional)				12.5	1000

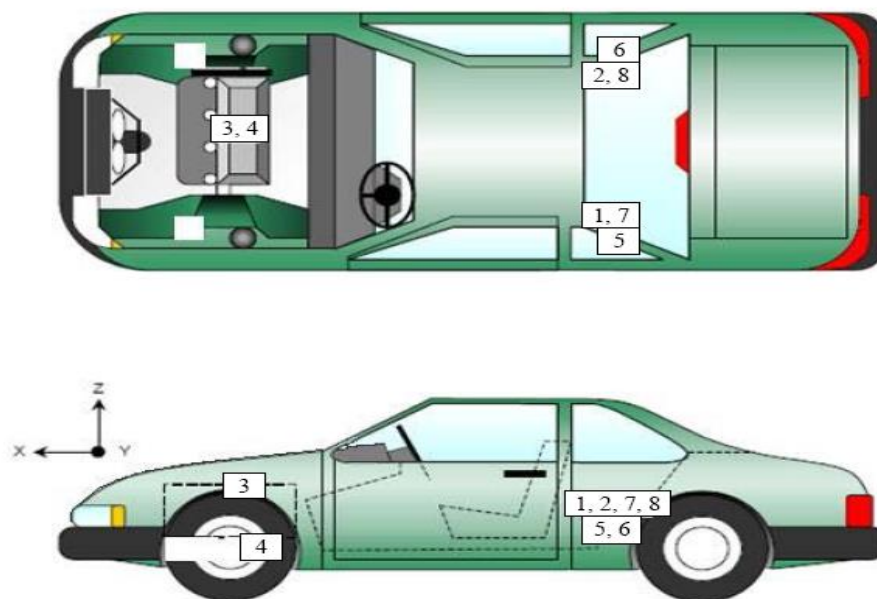
Reference Points: +X – forward of impact plane
+Y – right of monorail center
+Z – into ground

DATA SHEET NO. 7

VEHICLE ACCELEROMETER DATA

Test Vehicle: 2015 Toyota Avalon 4-Door Passenger Car
 Test Program: NCAP Frontal Impact

NHTSA No.: M20155100
 Test Date: 1/15/15



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Camera View	Location (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	1913	-380	428
2	Right Rear Accelerometer – X Direction	1913	380	424
3	Engine Top X	4322	120	797
4	Engine Bottom X	4050	277	183
5	Left Rear Accelerometer – Z Direction	1913	-380	428
6	Right Rear Accelerometer – Z Direction	1913	380	424
7	Left Rear Accelerometer – X Direction Redundant	1923	-220	428
8	Right Rear Accelerometer- X Direction Redundant	1923	220	424

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

DATA SHEET NO. 8

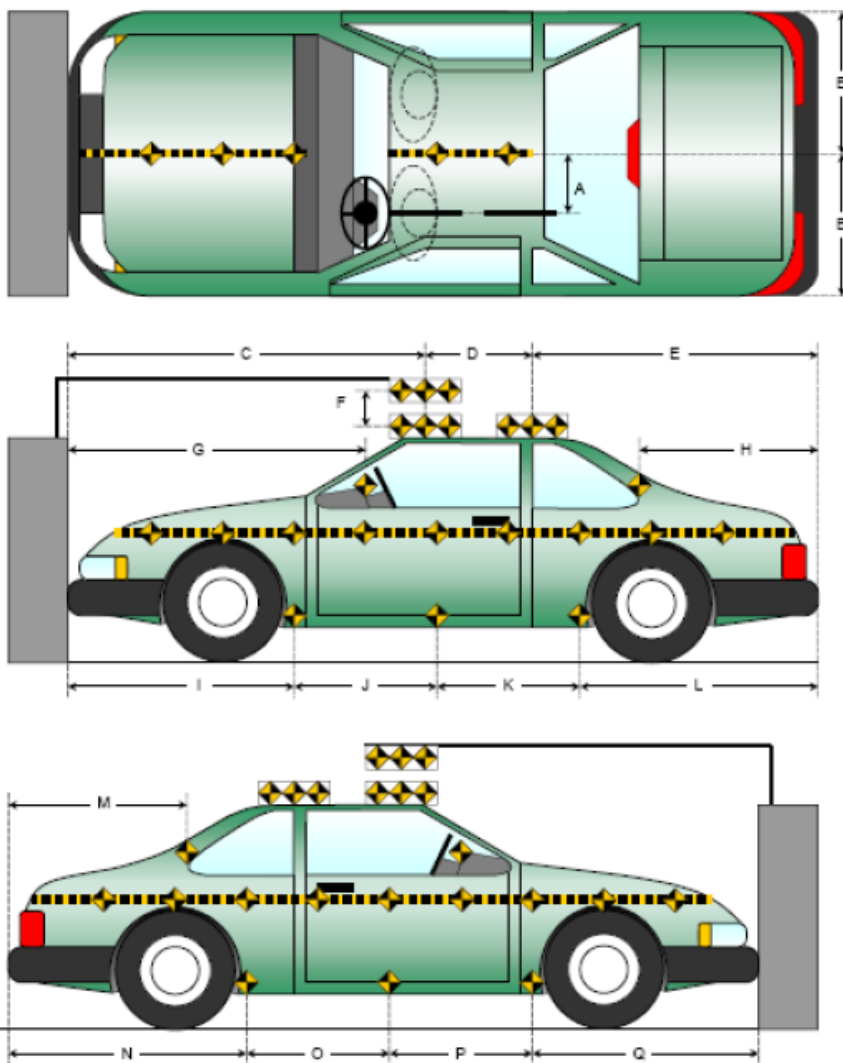
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2015 Toyota Avalon 4-Door Passenger Car
 Test Program: NCAP Frontal Impact

NHTSA No.: M20155100
 Test Date: 1/15/15

Item	Value
A	473
B	917
C	2409
D	610
E	2257
F	240
G	1780
H	1588
I	1420
J	967
K	977
L	1875
M	1585
N	1878
O	979
P	968
Q	1415

All units in millimeters

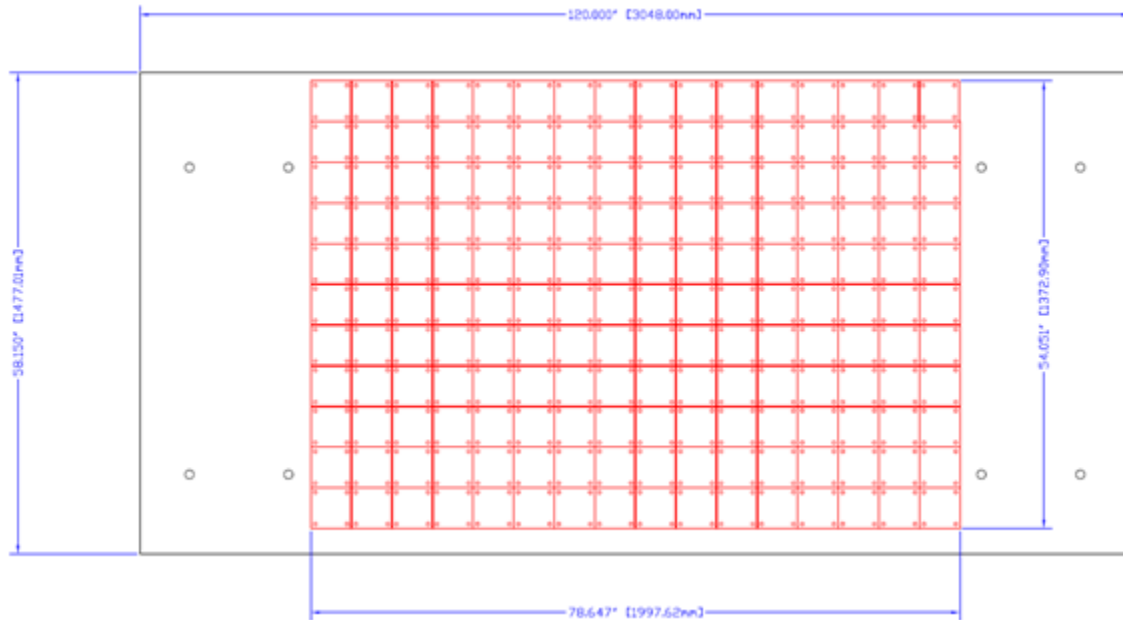


DATA SHEET NO. 9

LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2015 Toyota Avalon 4-Door Passenger Car
Test Program: NCAP Frontal Impact

NHTSA No.: M20155100
Test Date: 1/15/15



DATA SHEET NO. 10

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2015 Toyota Avalon 4-Door Passenger Car
Test Program: NCAP Frontal Impact

NHTSA No.: M20155100
Test Date: 1/15/15

INSTRUMENTATION

Instrumentation	Number of Channels Collected
Driver Dummy Accelerometers	21
Passenger Dummy Accelerometers	21
Vehicle Structure Accelerometers	8
Total	94

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: 2015 Toyota Avalon 4-Door Passenger Car NHTSA No.: M20155100
 Test Program: NCAP Frontal Impact Test Date: 1/15/15

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

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

DOOR OPENING AND SEAT TRACK INFORMATION

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

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Windshield Damage	Broken
Window Damage	None
Other Notable Effects	None

VEHICLE REBOUND FROM BARRIER

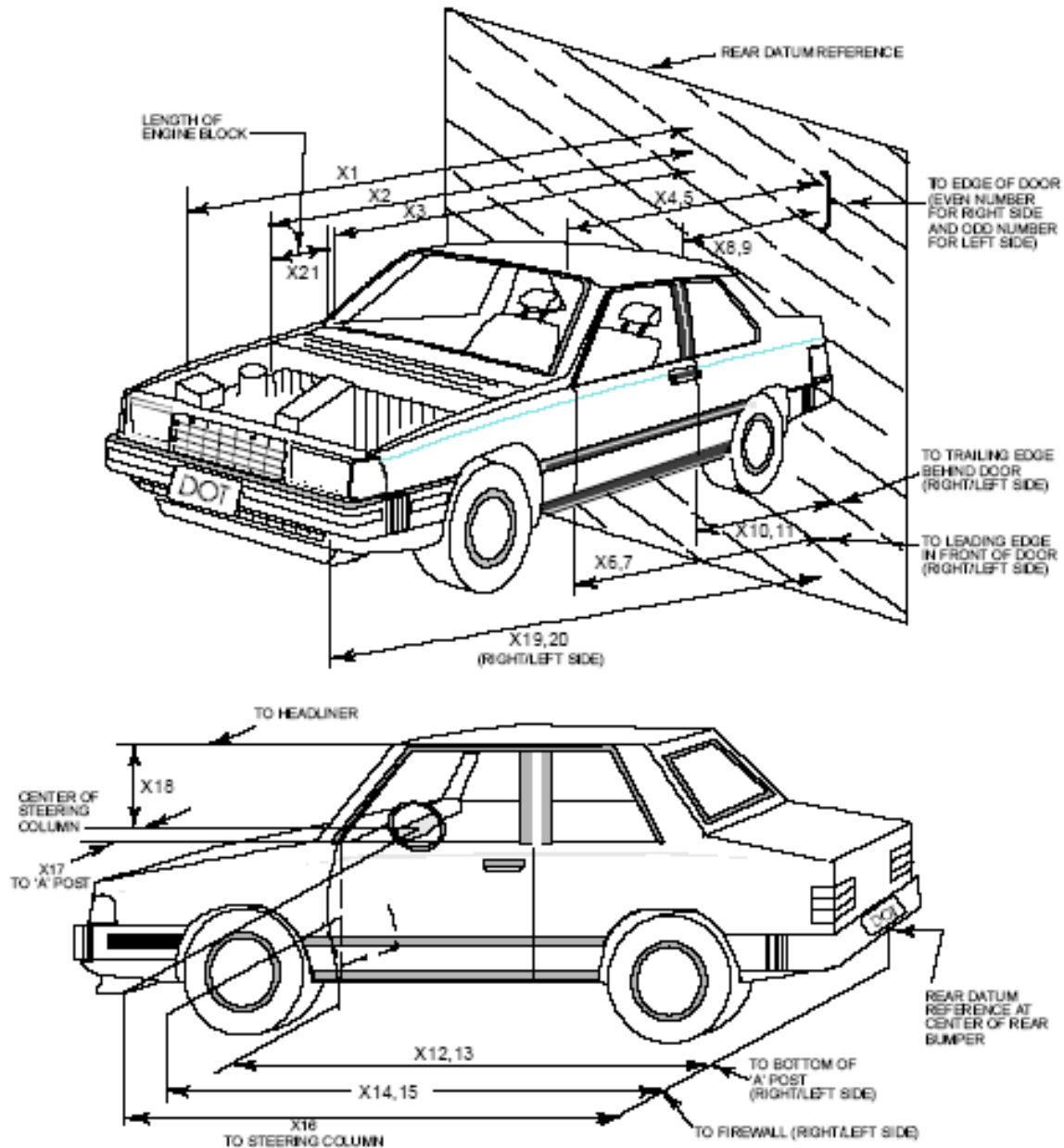
Measured Parameter	Units	Value
Left Side	mm	810
Center	mm	808
Right Side	mm	906
Average	mm	841.3

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Driver (Occupant 1)		Passenger (Occupant 2)	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	Yes	Yes	Yes
Side Curtain Airbag	Yes	Yes	Yes	Yes
Torso/Pelvis Airbag	Yes	No	Yes	No
Pelvis Airbag	No	N/A	No	N/A
Knee Airbag	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes
Other	None	N/A	None	N/A

DATA SHEET NO. 12
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2015 Toyota Avalon 4-Door Passenger Car NHTSA No.: M20155100
Test Program: NCAP Frontal Impact Test Date: 1/15/15



DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2015 Toyota Avalon 4-Door Passenger Car
 Test Program: NCAP Frontal Impact

NHTSA No.: M20155100
 Test Date: 1/15/15

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4953	4408	545
2	Rear Surface of Vehicle (RSOV) to Front of Engine	4448	4193	255
3	RSOV to Firewall	3898	3734	164
4	RSOV to Upper Leading Edge of Right Door	3493	3492	1
5	RSOV to Upper Leading Edge of Left Door	3488	3488	0
6	RSOV to Lower Leading Edge of Right Door	3445	3443	2
7	RSOV to Lower Leading Edge of Left Door	3443	3440	3
8	RSOV to Upper Trailing Edge of Right Door	2396	2396	0
9	RSOV to Upper Trailing Edge of Left Door	2393	2393	0
10	RSOV to Lower Trailing Edge of Right Door	2373	2369	4
11	RSOV to Lower Trailing Edge of Left Door	2368	2368	0
12	RSOV to Bottom of "A" Post-of Right Side	3493	3493	0
13	RSOV to Bottom of "A" Post-of Left Side	3488	3488	0
14	RSOV to Firewall, Right Side	3910	3788	122
15	RSOV to Firewall, Left Side	3920	3793	127
16	RSOV to Steering Column	3113	3068	45
17	Center of Steering Column to "A" Post	310	320	-10
18	Center of Steering Column to Headliner	405	460	-55
19	RSOV to Right Side of Front Bumper	4728	4348	380
20	RSOV to Left Side of Front Bumper	4738	4358	380
21	Length of Engine Block	500	500	0
RD	RSOV to Right Side of Dash Panel	3283	3284	-1
CD	RSOV to Center of Dash Panel	3276	3258	18
LD	RSOV to Left Side of Dash Panel	3306	3306	0

All Dimensions in mm

DATA SHEET NO. 13

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2015 Toyota Avalon 4-Door Passenger Car
Test Program: NCAP Frontal Impact

NHTSA No.: M20155100
Test Date: 1/15/15

VEHICLE INFORMATION

VIN: 4T1BK1EBXFU138810
Vehicle Size Category: Midsize Car

Wheelbase: 2820
Test Weight (kg): 1818.4

ACCELEROMETER DATA

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

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

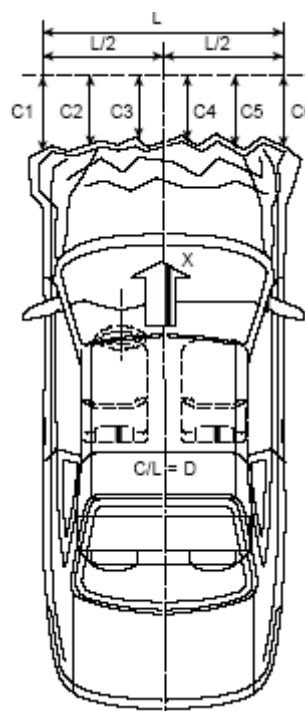
Integration Algorithm: Trapezoidal

Linearity: > 99%

Impact Velocity (km/h): 56.35

Velocity Change (km/h): 63.86

Time of Separation (ms): 95



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	4738	4358	380
C2	Crush zone 2 at left side	mm	4890	4433	457
C3	Crush zone 3 at left side	mm	4952	4428	524
C4	Crush zone 4 at right side	mm	4952	4426	526
C5	Crush zone 5 at right side	mm	4895	4408	487
C6	Crush zone 6 at right side	mm	4728	4348	380
L	C1 to C6	mm	1524	1430	94

DATA SHEET NO. 14**VEHICLE INTRUSION MEASUREMENTS**

Test Vehicle: 2015 Toyota Avalon 4-Door Passenger Car
Test Program: NCAP Frontal Impact

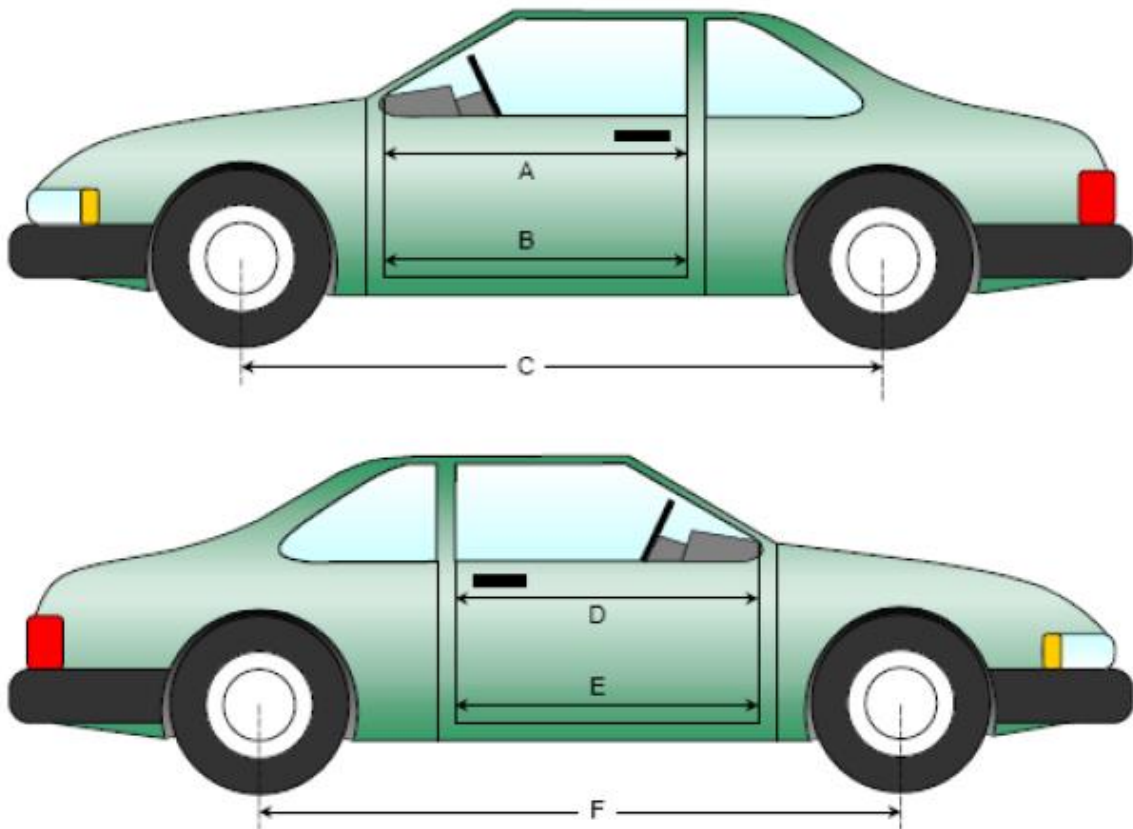
NHTSA No.: M20155100
Test Date: 1/15/15

DOOR OPENING WIDTH

No.	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1060	1060	0
B	Left Side Lower	mm	875	875	0
C	Right Side Upper	mm	1060	1060	0
D	Right Side Lower	mm	875	875	0

WHEELBASE MEASUREMENTS

No.	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2820	2720	100
F	Right Side Wheelbase	mm	2820	2765	55



DATA SHEET NO. 14 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

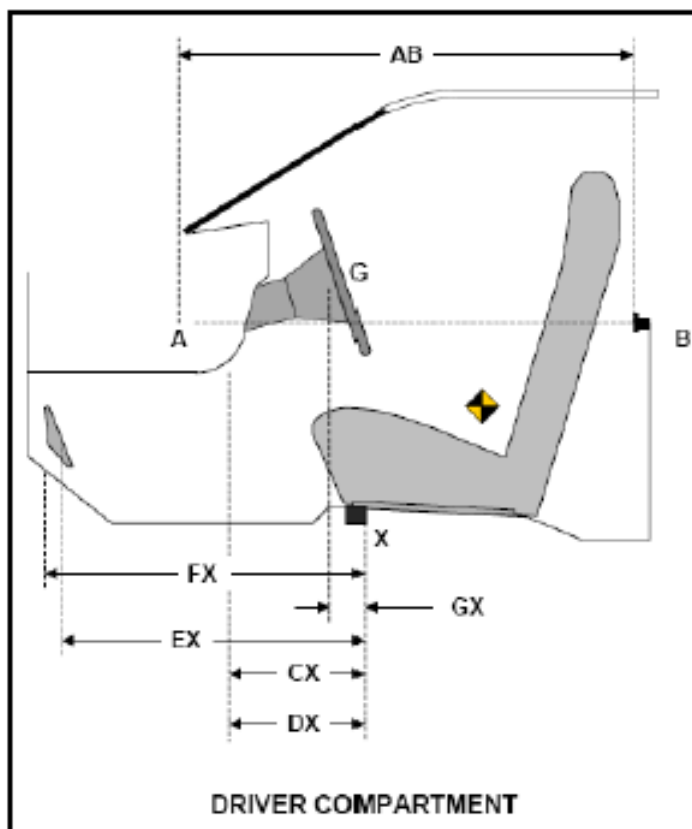
Test Vehicle: 2015 Toyota Avalon 4-Door Passenger Car
 Test Program: NCAP Frontal Impact

NHTSA No.: M20155100
 Test Date: 1/15/15

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	1052	1052	0
CX	Left Knee Bolster to X	mm	270	270	0
DX	Right Knee Bolster to X	mm	300	280	20
EX	Brake Pedal to X	mm	585	635	-50
FX	Foot Rest to X	mm	603	598	5
GX	Center of Steering Column Wheel Hub to X	mm	70	145	-75

X = Front of Seat Track (Stationary)



DATA SHEET NO. 15

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

Test Vehicle: 2015 Toyota Avalon 4-Door Passenger Car
 Test Program: NCAP Frontal Impact

NHTSA No.: M20155100
 Test Date: 1/15/15

Please provide windshield mounting details.

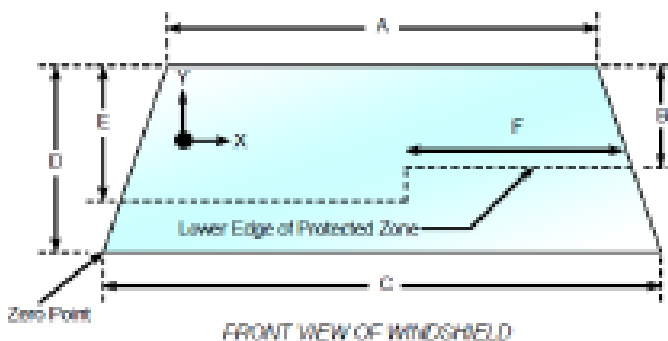
The standard requires that the post-test retention measurement be a minimum of 75% of the pre-test total periphery measurement for vehicle not equipped with occupant passive restraint and 50% for each side of the windshield for vehicle which are equipped with occupant passive restraints.

Temperature of windshield molding during test:

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2057.5	2057.5	100
Right Side	2112.5	2112.5	100
Total	4170	4170	100

Item	Units	Value
A	mm	1200
B	mm	472
C	mm	1485
D	mm	870
E	mm	525
F	mm	568



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: 2015 Toyota Avalon 4-Door Passenger Car NHTSA No.: M20155100
Test Program: NCAP Frontal Impact Test Date: 1/15/15

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21.6°C

Test Time: 14:49

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

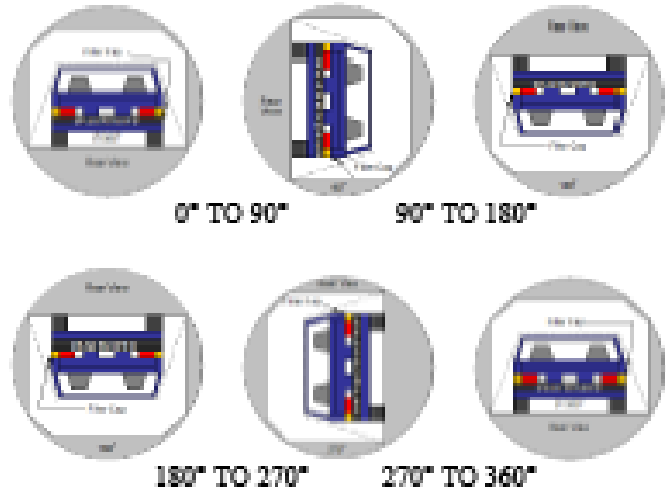
DATA SHEET NO. 16

FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2015 Toyota Avalon 4-Door Passenger Car
 Test Program: NCAP Frontal Impact

NHTSA No.: M20155100
 Test Date: 1/15/15

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



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	90°	330	420
90° to 180°	90°	330	840
180° to 270°	90°	330	1260
270° to 360°	90°	330	1680

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

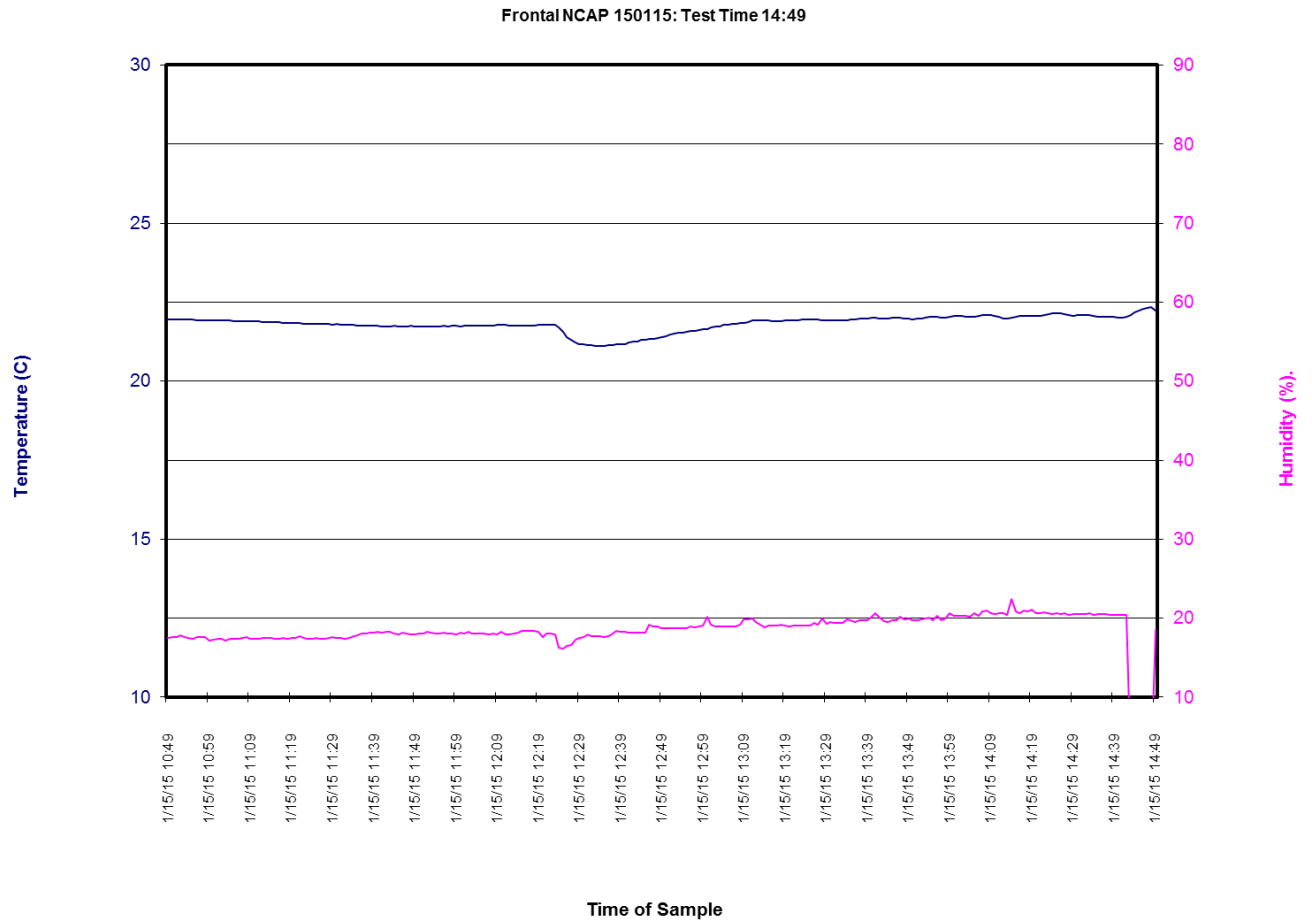
Test Phase	Spillage Location
0° to 90°	None
90° to 180°	None
180° to 270°	None
270° to 360°	None

DATA SHEET NO. 17

DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2015 Toyota Avalon 4-Door Passenger Car
Test Program: NCAP Frontal Impact

NHTSA No.: M20155100
Test Date: 1/15/15



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

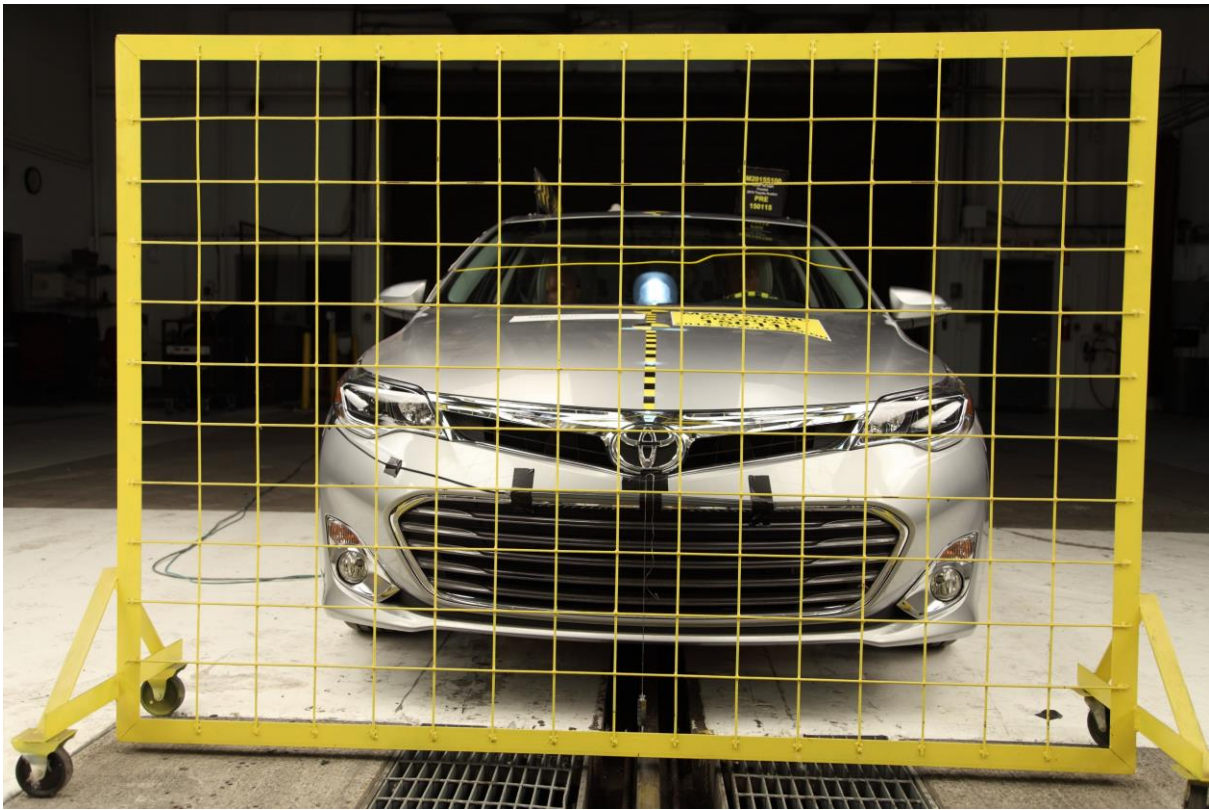
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2	Load Cell Wall	A-4
3	Manufacturer's Label	A-5
4	Tire Placard	A-5
4a	Reduced Load Carrying Capacity Label	A-6
5	2015 Toyota Avalon 4-Door Passenger Car Frontal as Delivered	A-6
6	Left Rear 3-4 View, as Received	A-7
7	Pre-Test Front View of Test Vehicle	A-7
8	Post-Test Front View of Test Vehicle	A-8
9	Pre-Test Left View of Test Vehicle	A-8
10	Post-Test Left View of Test Vehicle	A-9
11	Pre-Test Right View of Test Vehicle	A-9
12	Post-Test Right View of Test Vehicle	A-10
13	Pre-Test Right Front 3-4 View	A-10
14	Post-Test Right Front 3-4 View	A-11
15	Pre-Test Left Rear 3-4 View	A-11
16	Post-Test Left Rear 3-4 View	A-12
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27	Pre-Test Dummy Cable Routing	A-19
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29	Pre-Test Driver Dummy Front View	A-20
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38	Post-Test View of Belt Anchorage for Driver Dummy	A-26
39	Pre-Test Driver Dummy Feet	A-26
40	Post-Test Driver Dummy Feet	A-27
41	Pre-Test Driver's Side Knee Bolster	A-27
42	Post-Test Driver's Side Knee Bolster	A-28
43	Pre-Test Driver's Side Floorpan	A-28
44	Post-Test Driver's Side Floorpan	A-29
45	Post-Test Driver Dummy Face	A-29
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47	Post-Test Driver Dummy Contact with Headrest	A-30
48	Pre-Test View of the Steering Wheel	A-31
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50	Pre-Test Passenger Dummy Front View	A-32
51	Post-Test Passenger Dummy Front View	A-32
52	Pre-Test Passenger Dummy Window View	A-33
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54	Pre-Test Passenger Dummy and Vehicle Interior View	A-34
55	Post-Test Passenger Dummy and Vehicle Interior View	A-34
56	Pre-Test Passenger Seat Fore-Aft Markings	A-35
57	Post-Test Passenger Seat Fore-Aft Markings	A-35
58	Pre-Test View of Belt Anchorage for Passenger Dummy	A-36
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60	Pre-Test Passenger Dummy Feet	A-37
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74	Vehicle at 360° on Static Rollover Device	A-44
75	2015 Toyota Avalon 4-Door Passenger Car Frontal Impact Event	A-45
76	Monroney Label Photograph	A-45



001 Load Cell Location



002 Load Cell Wall



003 Manufacturer's Label



004 Tire Placard



004a Reduced Load Carrying Capacity Label



005 2015 Toyota Avalon 4-Door Passenger Car Frontal As Delivered



006 Left Rear 3-4 View, as Received



007 Pre-Test Front View of Test Vehicle



008 Post-Test Front View of Test Vehicle



009 Pre-Test Left View of Test Vehicle



010 Post-Test Left View of Test Vehicle



011 Pre-Test Right View of Test Vehicle



012 Post-Test Right View of Test Vehicle



013 Pre-Test Right Front 3-4 View



014 Post-Test Right Front 3-4 View



015 Pre-Test Left Rear 3-4 View



016 Post-Test Left Rear 3-4 View



017 Pre-Test Windshield View



018 Post-Test Windshield View



019 Pre-Test Engine Compartment View



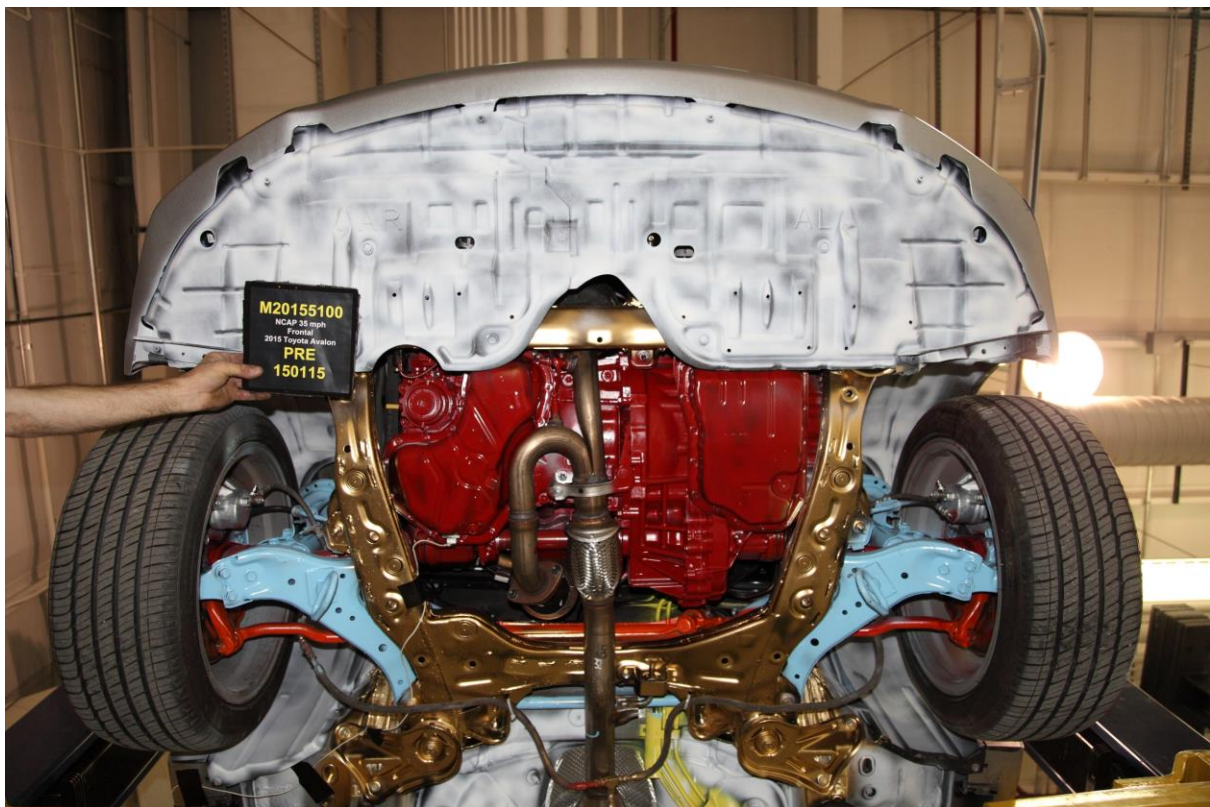
020 Post-Test Engine Compartment View



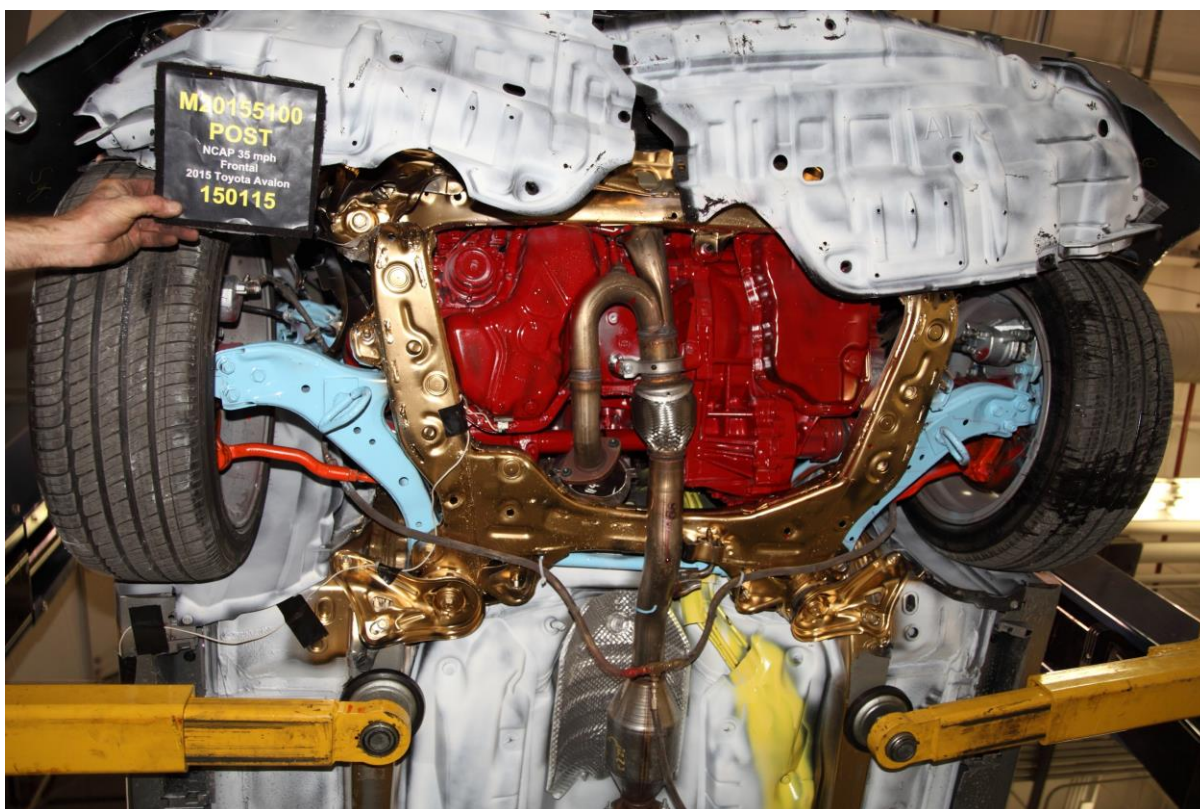
021 Pre-Test Fuel Filler Cap View



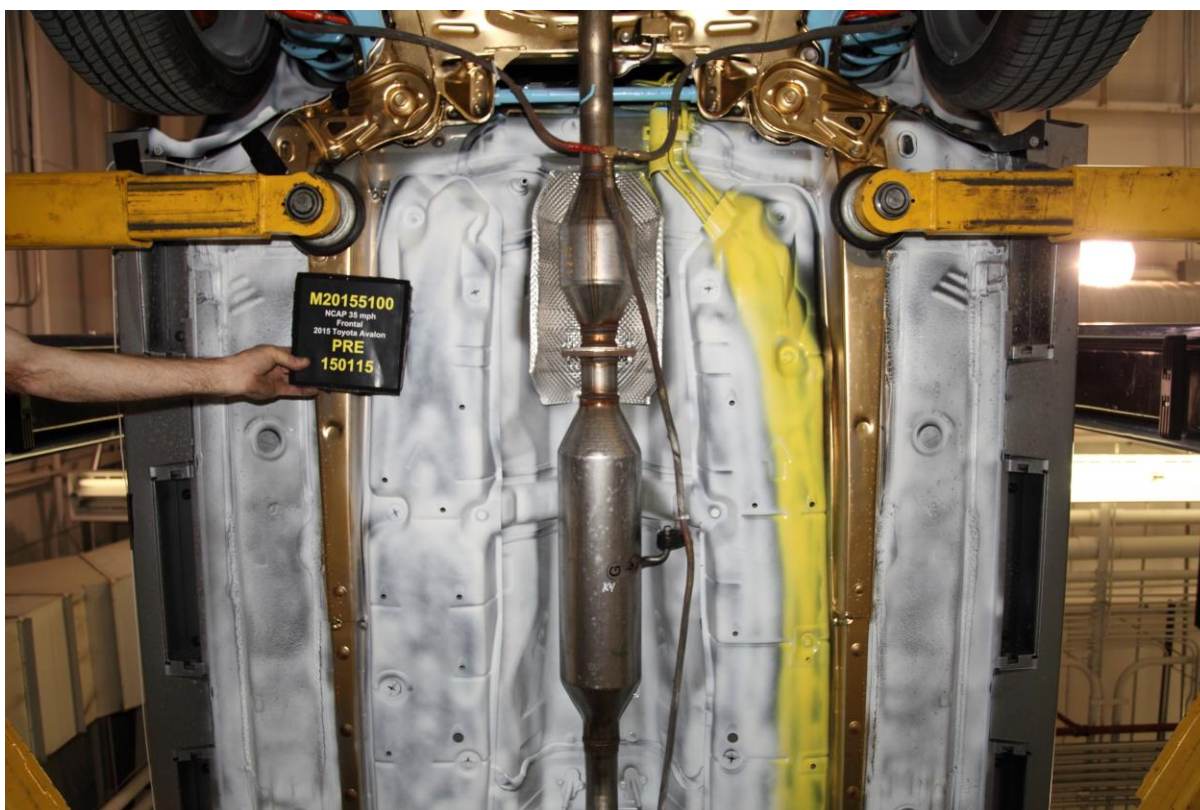
022 Post-Test Fuel Filler Cap View



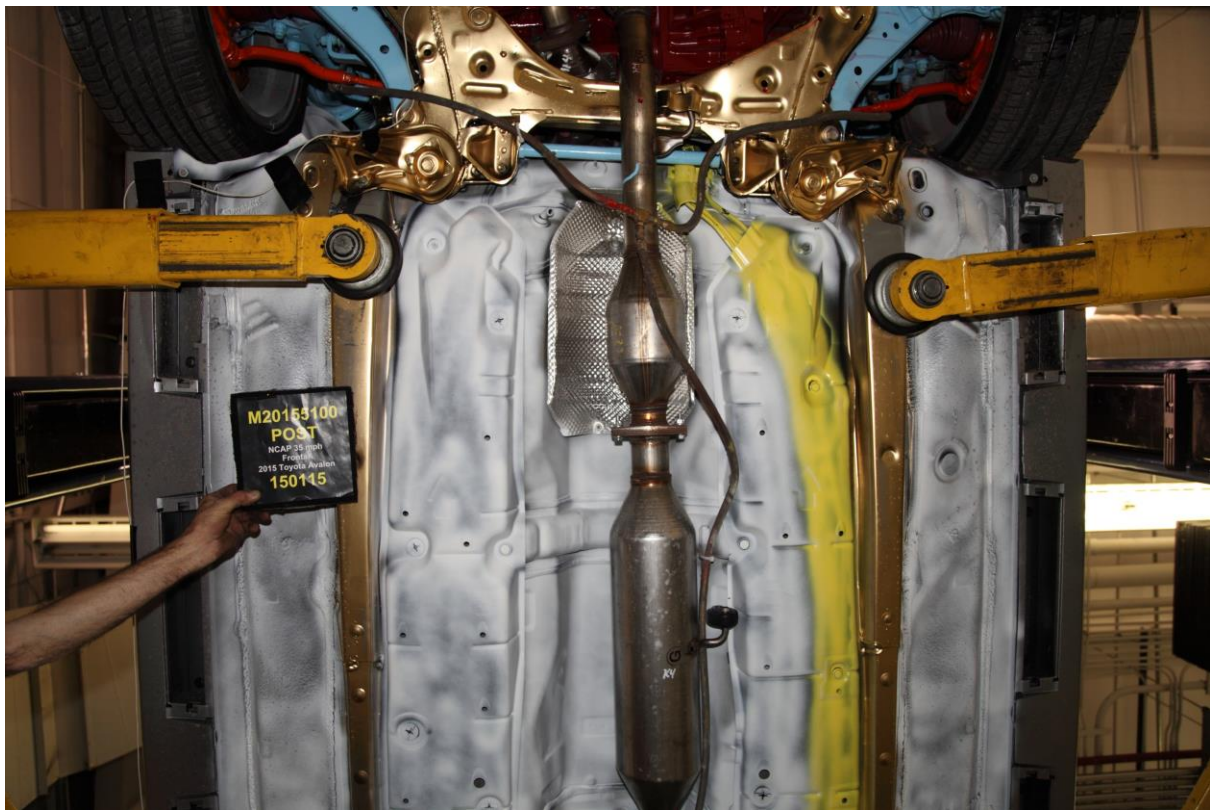
023 Pre-Test Front Underbody View



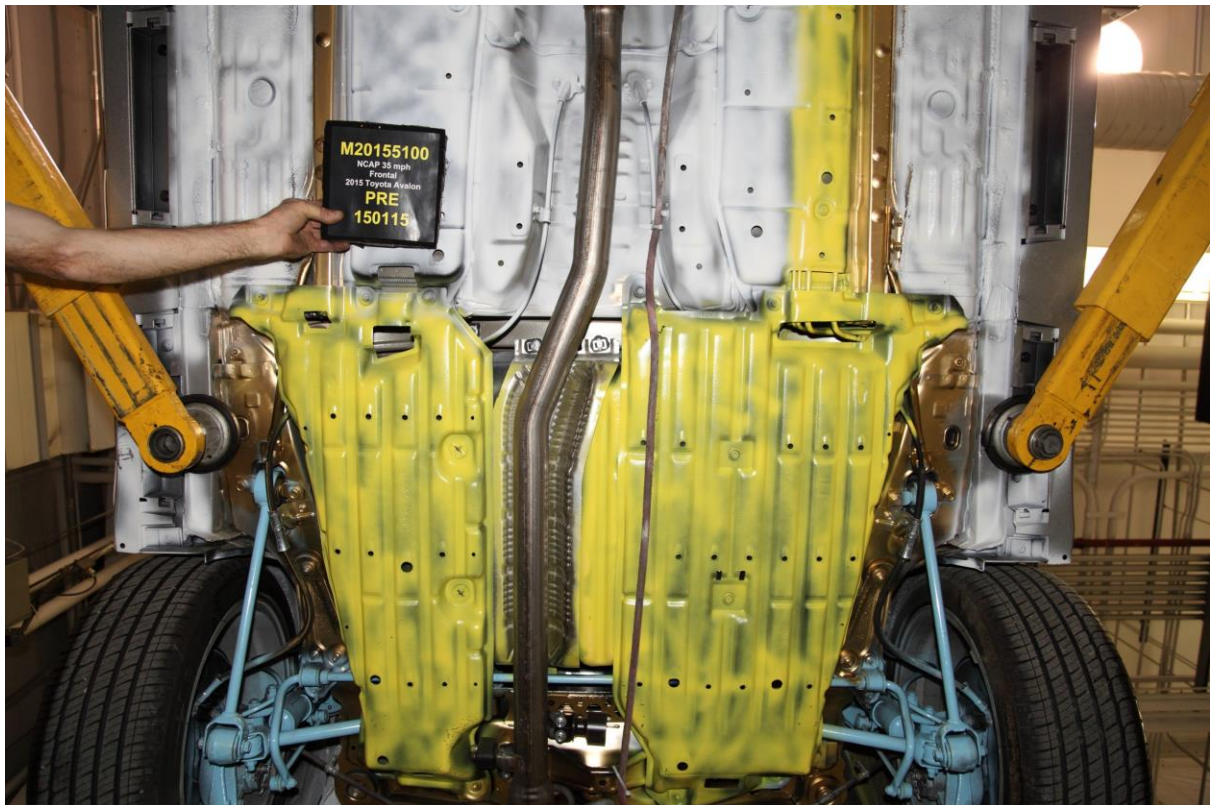
024 Post-Test Front Underbody View



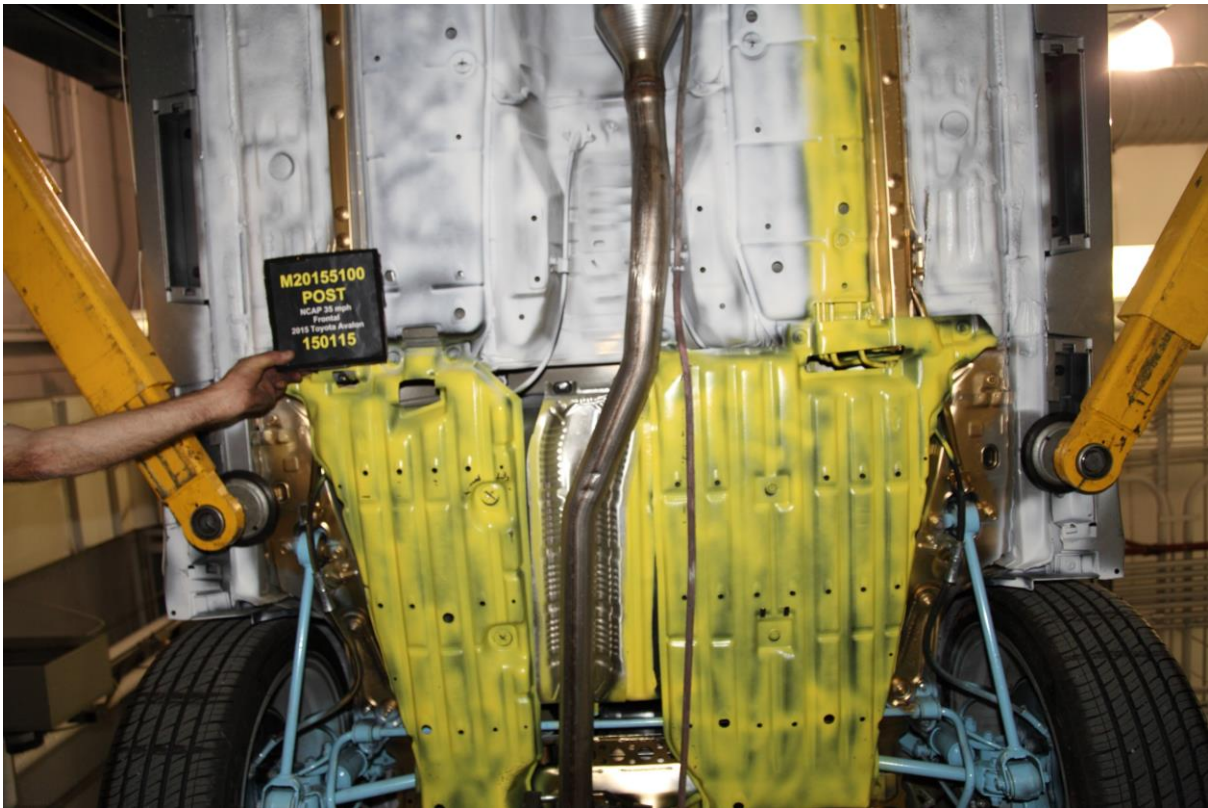
024a Pre-Test Mid Underbody View



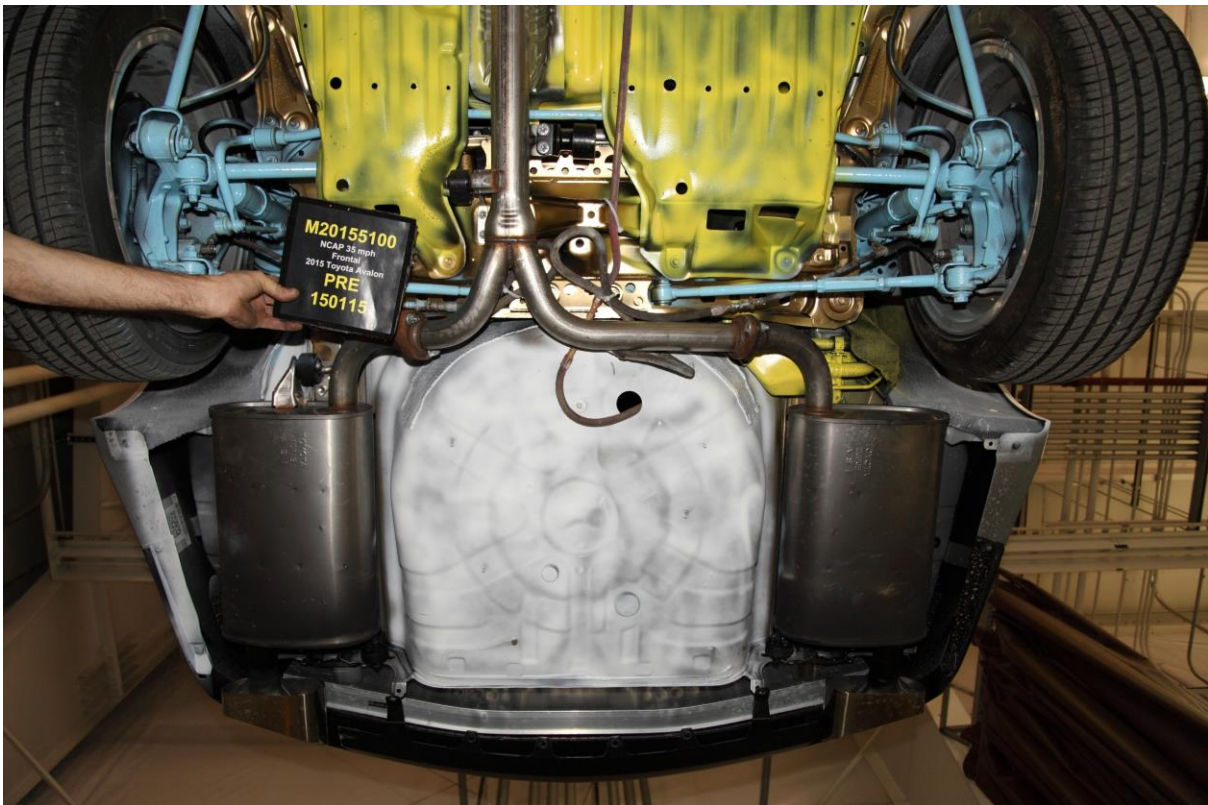
024b Post-Test Mid Underbody View



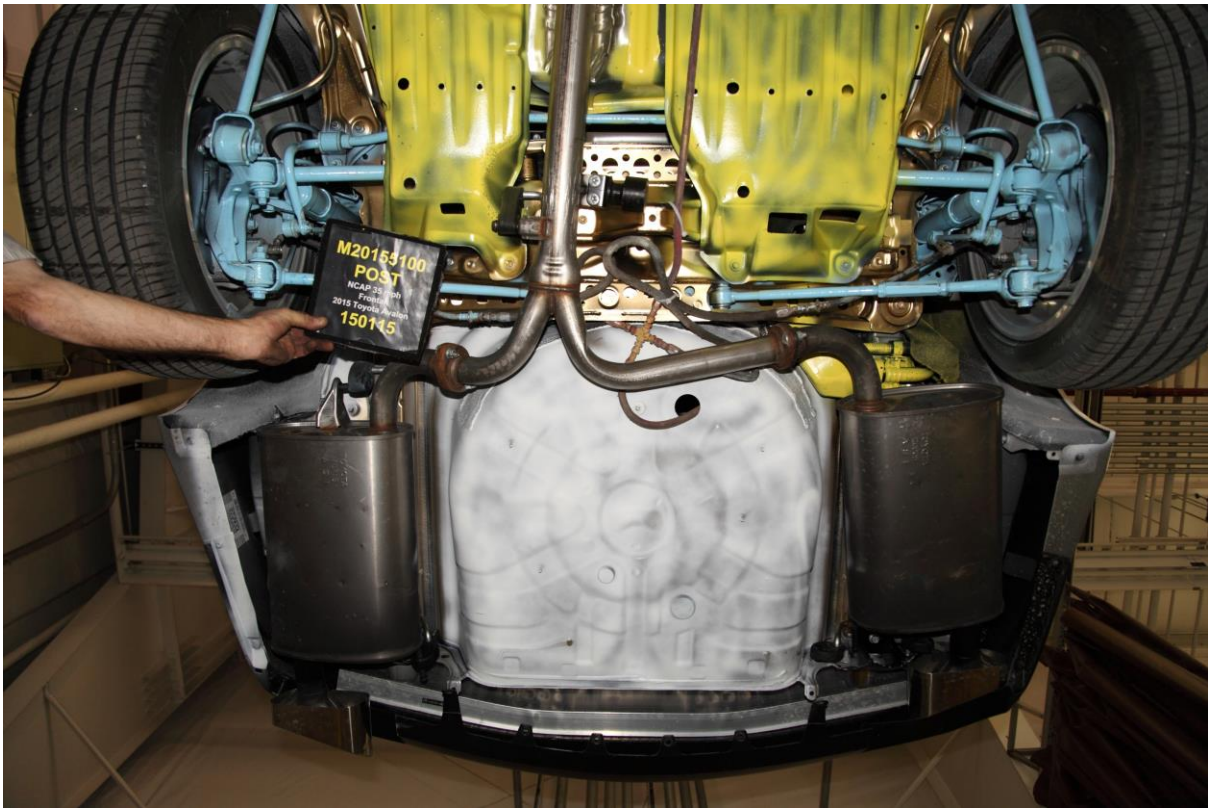
024c Pre-Test Mid Rear Underbody View



024d Post-Test Mid Rear Underbody View



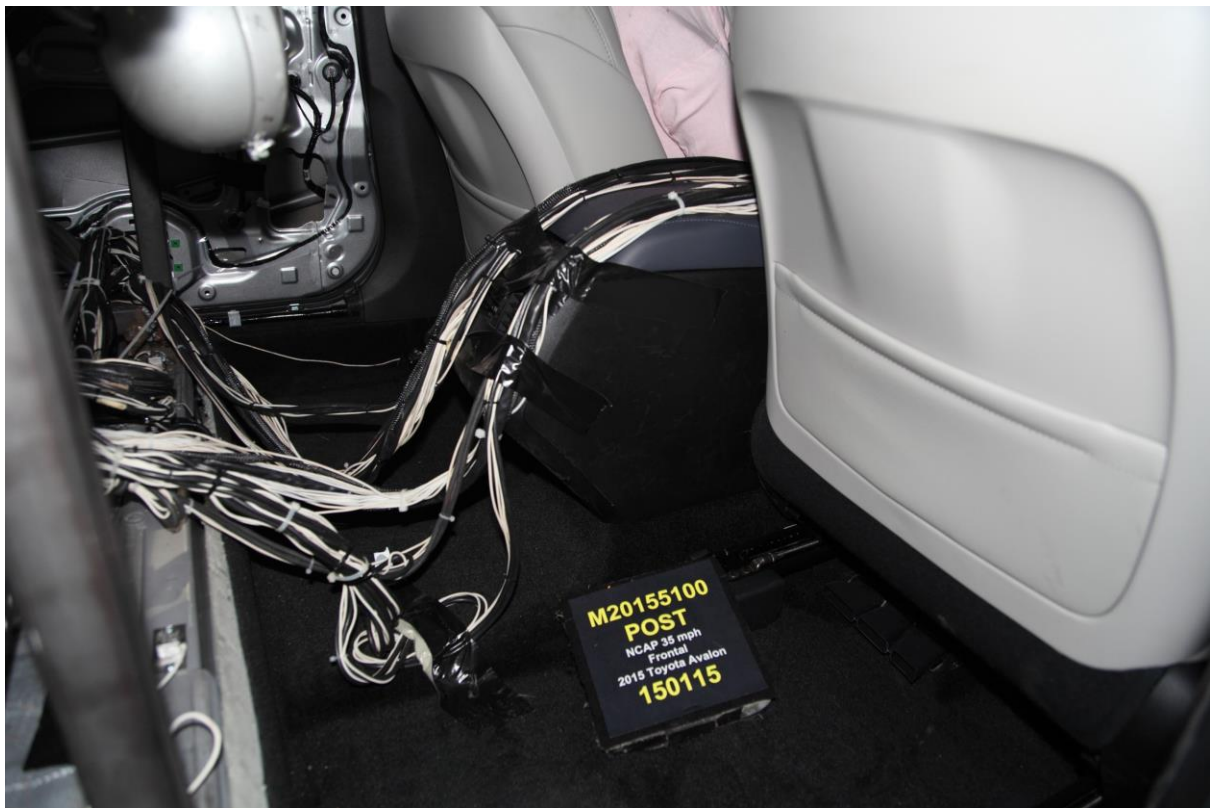
025 Pre-Test Rear Underbody View



026 Post-Test Rear Underbody View



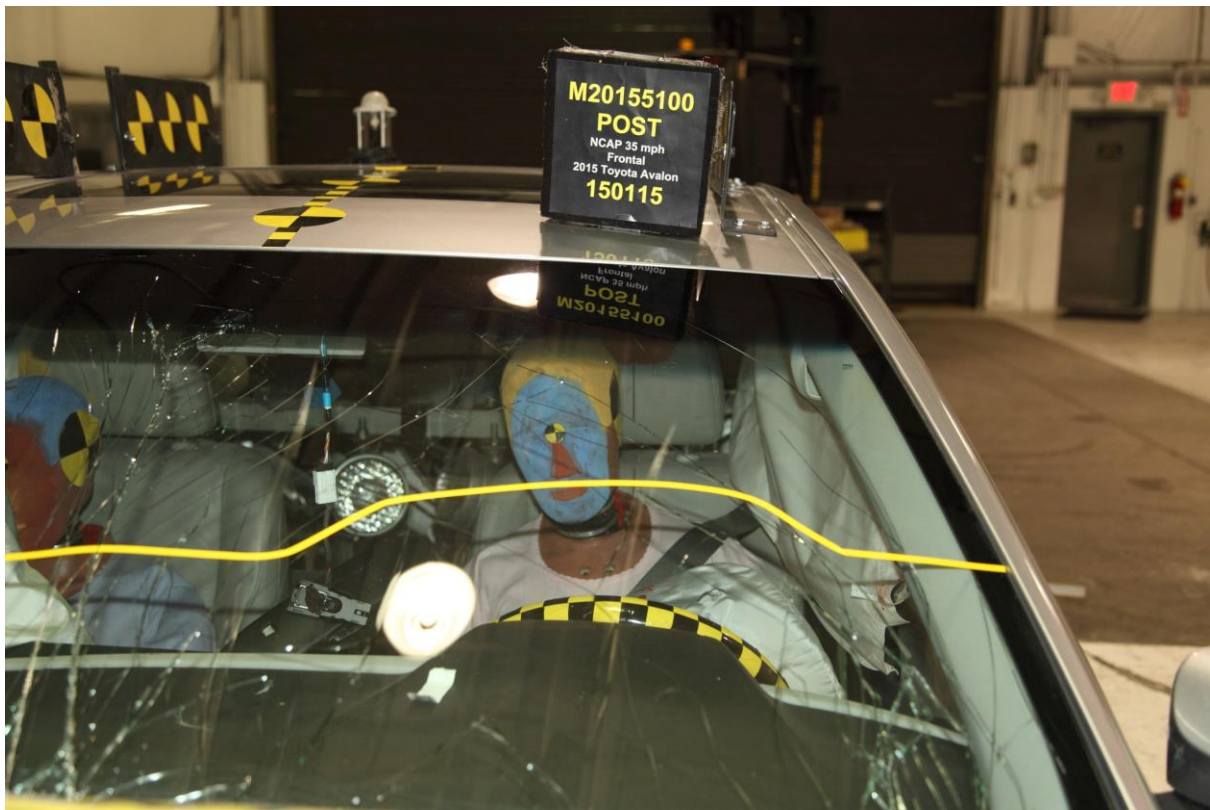
027 Pre-Test Dummy Cable Routing



028 Post-Test Dummy Cable Routing



029 Pre-Test Driver Dummy Front View



030 Post-Test Driver Dummy Front View



031 Pre-Test Driver Dummy Window View



032 Post-Test Driver Dummy Window View



033 Pre-Test Driver Dummy and Vehicle Interior View



034 Post-Test Driver Dummy and Vehicle Interior View



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



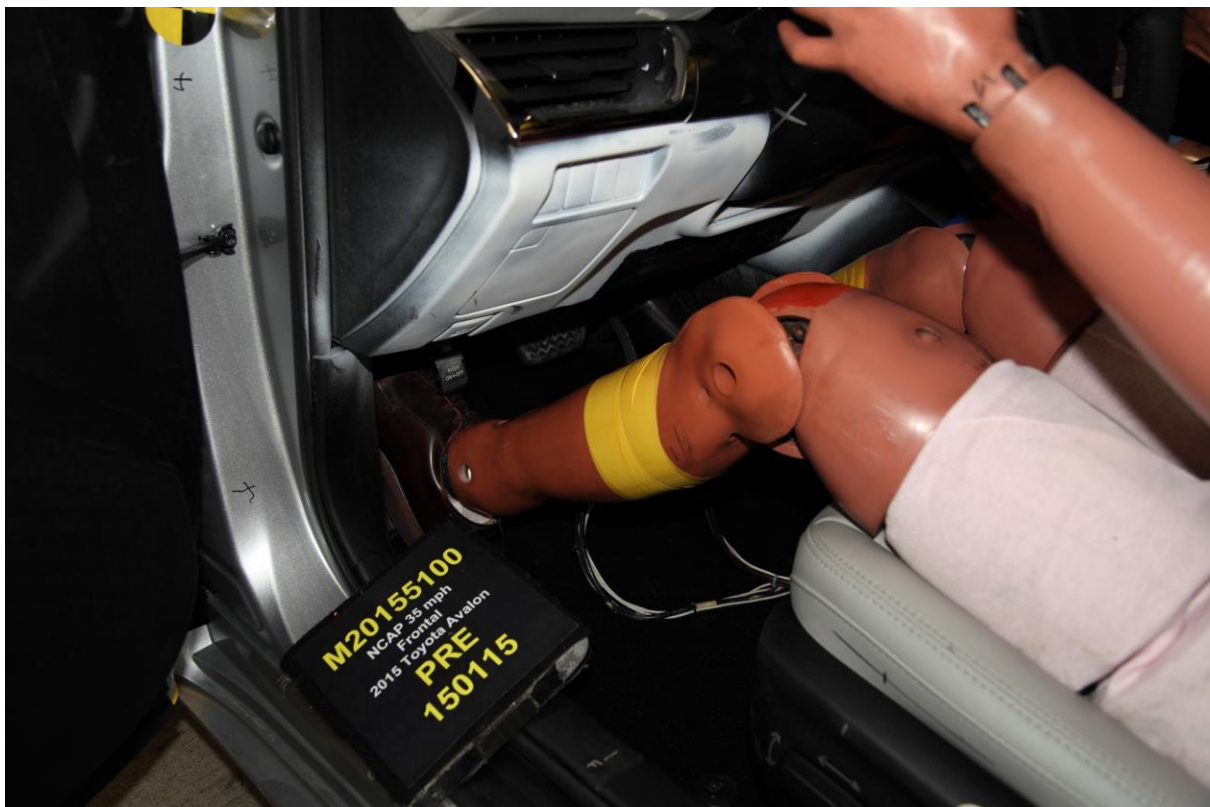
036 Post-Test Driver's Seat Fore-Aft Markings



037 Pre-Test View of Belt Anchorage for Driver Dummy



038 Post-Test View of Belt Anchorage for Driver Dummy



039 Pre-Test Driver Dummy Feet



040 Post-Test Driver Dummy Feet



041 Pre-Test Driver's Side Knee Bolster



042 Post-Test Driver's Side Knee Bolster



043 Pre-Test Driver's Side Floorpan



044 Post-Test Driver's Side Floorpan



045 Post-Test Driver Dummy Face



046 Post-Test Driver Dummy Contact With Airbag



047 Post-Test Driver Dummy Contact With Headrest



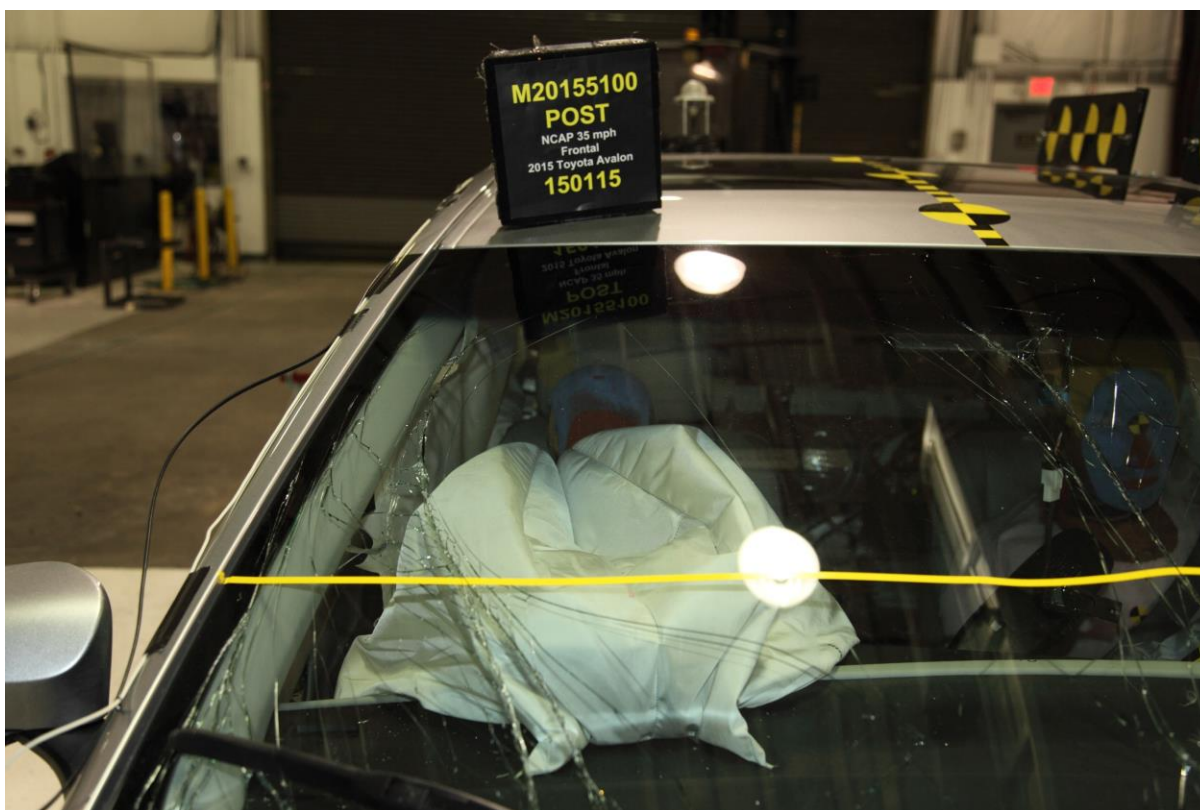
048 Pre-Test View of the Steering Wheel



049 Post-Test View of the Steering Wheel



050 Pre-Test Passenger Dummy Front View



051 Post-Test Passenger Dummy Front View



052 Pre-Test Passenger Dummy Window View



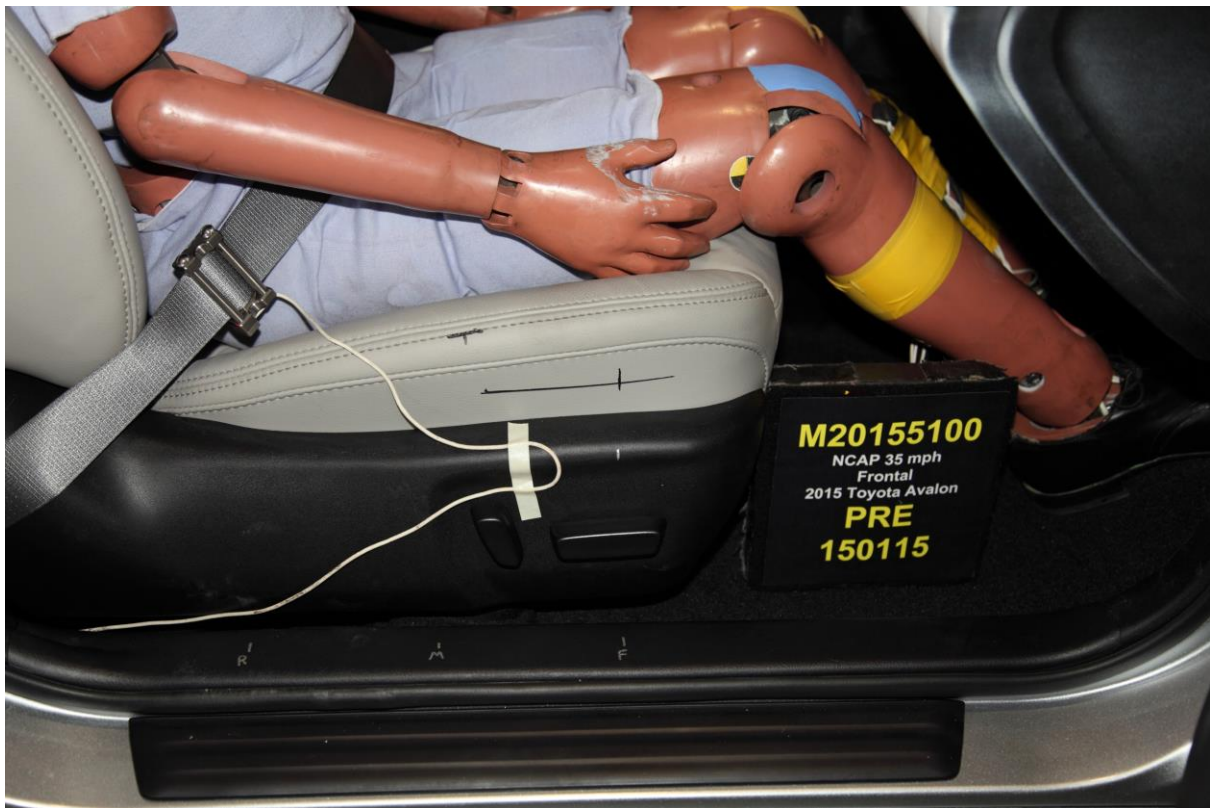
053 Post-Test Passenger Dummy Window View



054 Pre-Test Passenger Dummy and Vehicle Interior View



055 Post-Test Passenger Dummy and Vehicle Interior View



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



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



058 Pre-Test View of Belt Anchorage for Passenger Dummy



059 Post-Test View of Belt Anchorage for Passenger Dummy



060 Pre-Test Passenger Dummy Feet



061 Post-Test Passenger Dummy Feet



062 Pre-Test Passenger's Side Knee Bolster



063 Post-Test Passenger's Side Knee Bolster



064 Pre-Test Passenger's Side Floorpan



065 Post-Test Passenger's Side Floorpan



066 Post Test Passenger Dummy Contact With Headrest



066a Post-Test Passenger Dummy Contact With Airbag

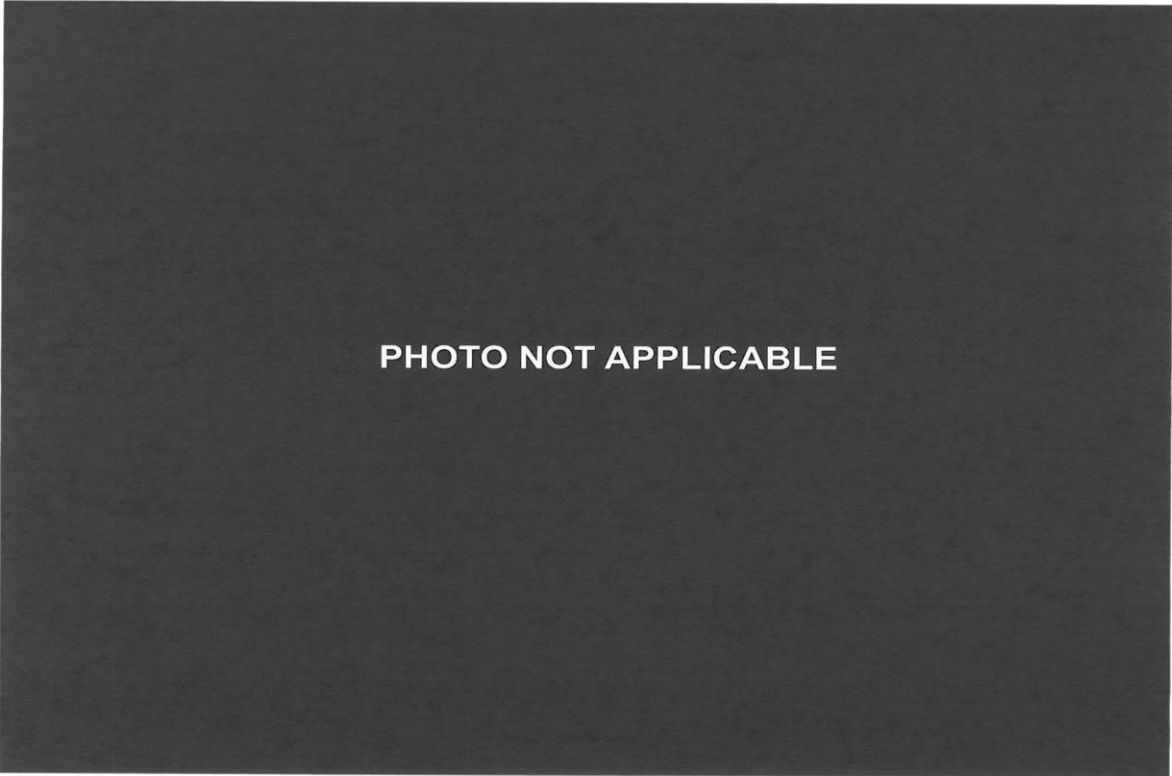


PHOTO NOT APPLICABLE

067 Photograph of Ballast Installed in Vehicle

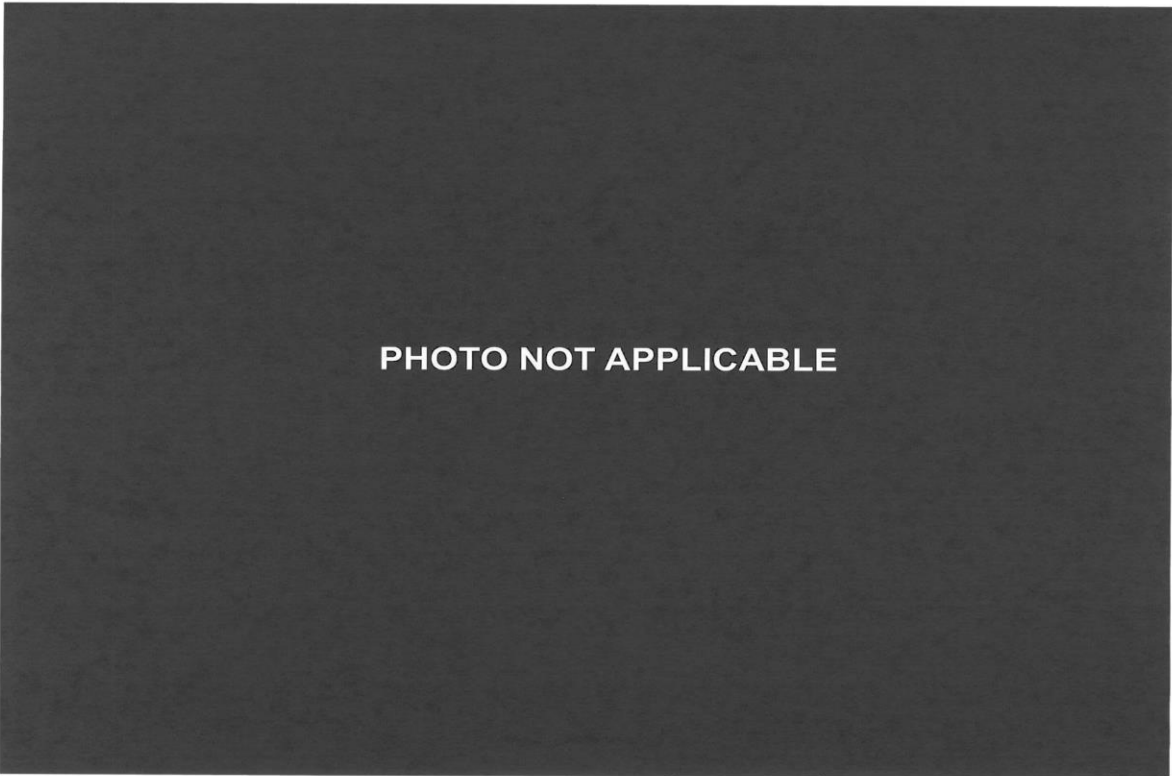
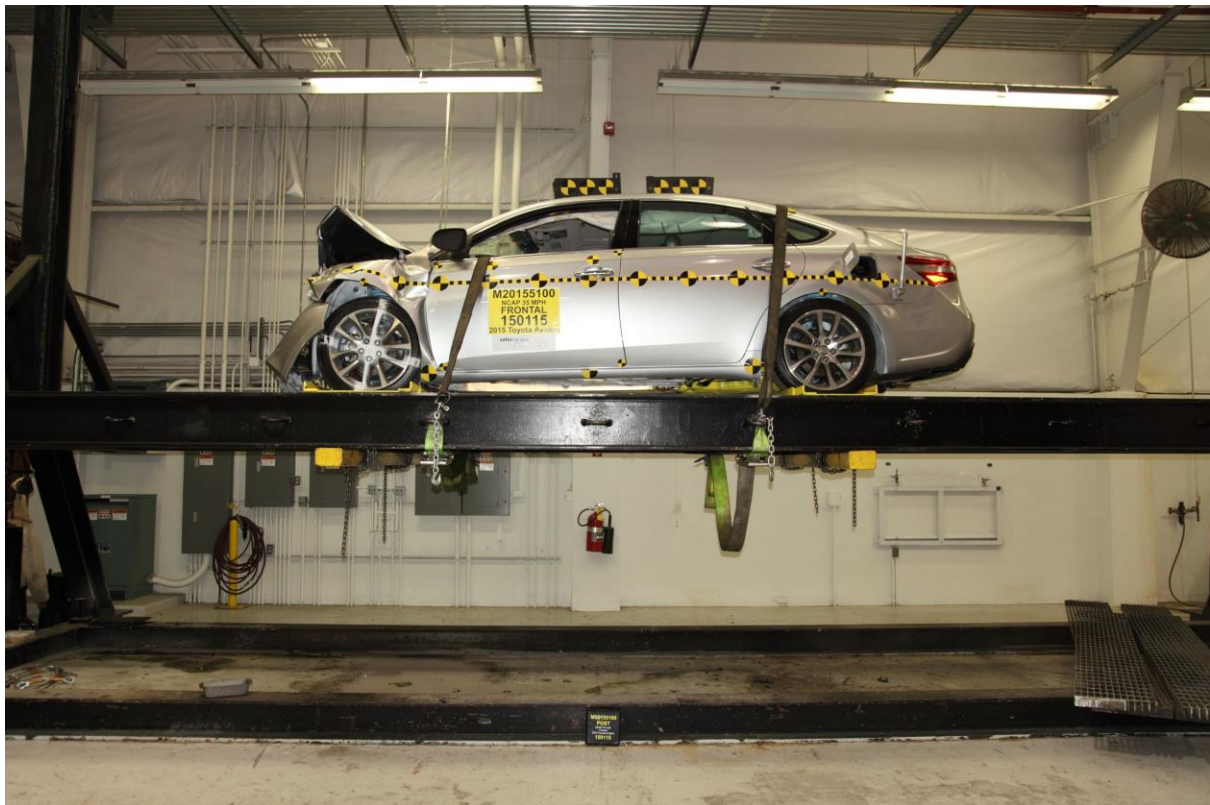


PHOTO NOT APPLICABLE

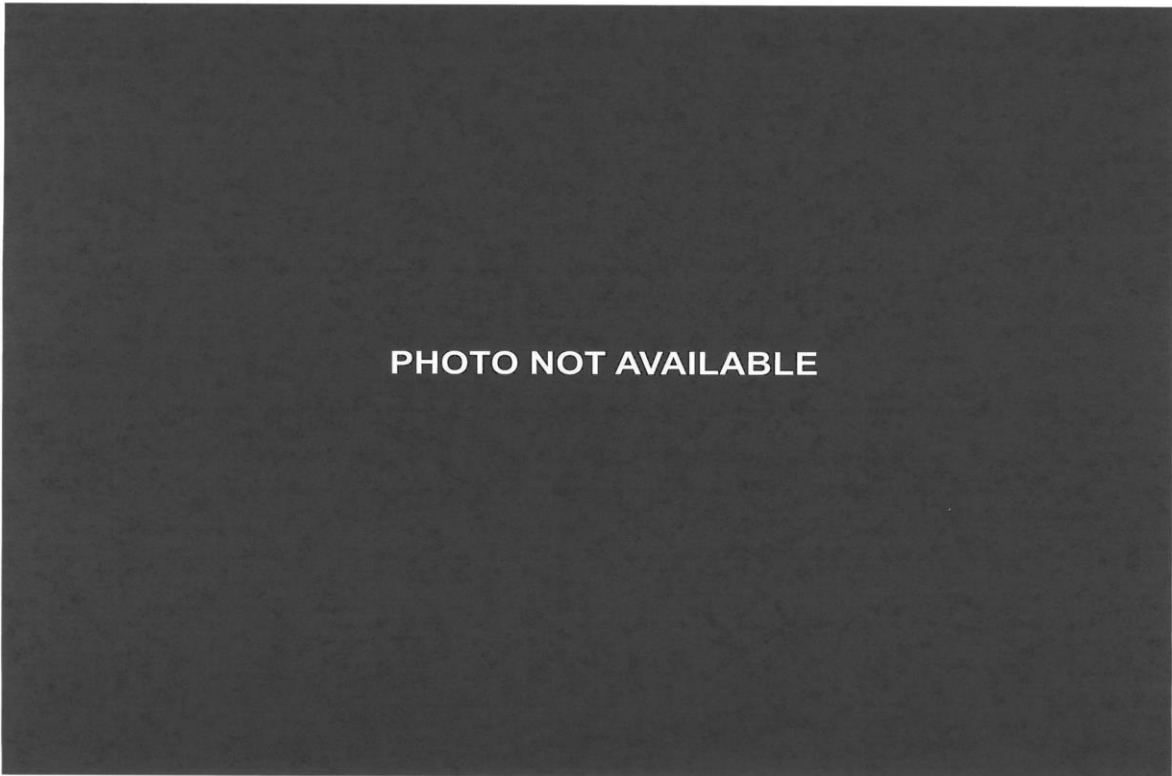
068 Post-Test Stoddard Spillage Location View



069 Post-Test Speed Trap Readout



070 Vehicle at 0° on Static Rollover Device



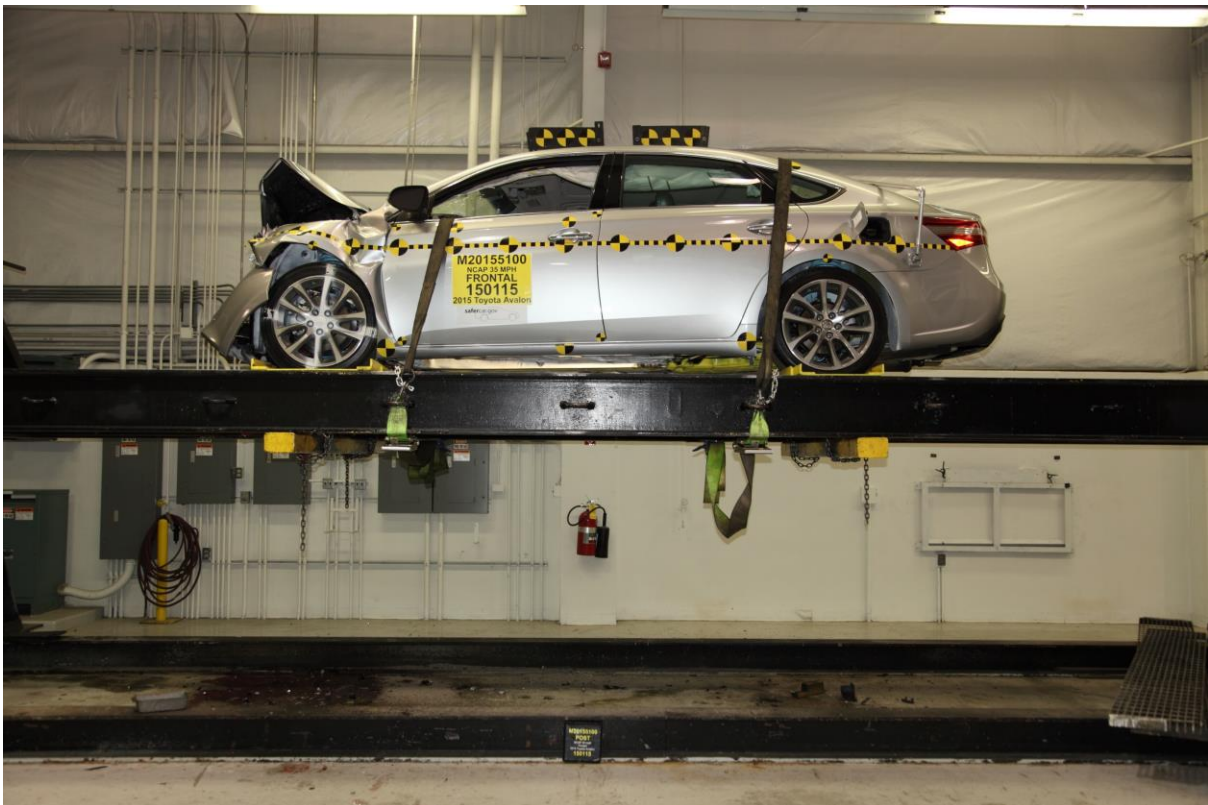
071 Vehicle at 90° on Static Rollover Device



072 Vehicle at 180° on Static Rollover Device



073 Vehicle at 270° on Static Rollover Device



074 Vehicle at 360° on Static Rollover Device



075 2015 Toyota Avalon 4-Door Passenger Car Frontal Impact Event

TOYOTA
Let's Go Places

DESC: **AVALON** 4-DR XLE TOURING
VIN: **4T1BK1EBXFU138810**
YR/MDL: 2015/3548A
CLR: SILVER METALLIC/GRAY LEATH (61J9/17)
PORT/PLANT: Georgetown, KY/TMMK RAILHEAD:

STANDARD EQUIPMENT

MECHANICAL & PERFORMANCE

- 3.5L 288HP D4TC V6 w/ Dual VVT-i
- 6-Spd ECT-A/T w/ Sel S-Shift Mode
- 18" Unique Alloy W/ Hls w/ 225/50R18 Tires
- Per-Assisted F/R Solid Rear Disc Brakes

SAFETY & CONVENIENCE

- Star Safety System Includes: VSC, TRAC, ABS, EBD, Brake Assist, and Smart Stop Technology (SST)
- 10 Airbags
- LATCH/LAR Anchor & Tethers for Children
- Outboard Rear Seating Positions
- Anti-Theft System w/ Engine Immobilizer
- Blind Spot Monitor/R Cross-Traffic Alert

EXTERIOR

- Quad-Beam Headlights w/ Auto On/Off, DEL & Wide-Angle Fog Lights
- Heated Outside Mirrors w/ Turn Signals
- Dual Chrome-Tipped Exhaust
- Power Tiltside Sunroof

INTERIOR

- Dual Zone Auto Climate Control w/ Air Filter and Rear-Seat Vents
- Entune Premium Audio w/ 6 Speakers, Auxiliary, Bluetooth, Entune App Suite, XM Radio, XM Radio w/ 3-Month Trial, & Backup Camera Display
- Leather-Trimmed Multi-Stage Htd Front Seats, 8-Way Power Driver Seat w/ Power Lumbar Support & 4-Way Power Pass Seat
- Driver Seat & Outside Mirrors Memory Sys
- Smart Key System w/ Push Button Start
- Auto-Dimming Rearview Mirror w/ Compass and Tachometer
- (3) 12V Aux Power Outlets

MANUFACTURER'S SUGGESTED RETAIL PRICE **\$36,080.00**

OPTIONAL EQUIPMENT

FE	50 State Emissions	200.00
20	1/2 Weather Mats/Cargo Tray	

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. Should ONLY be compared to other vehicles of similar size and weight.			
Side Crash	Front seat	Rear seat	★★★★★
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

EPA DOT Fuel Economy and Environment

Fuel Economy

24 MPG
combined city/hwy
4.2 gallons per 100 miles

Midsize Cars range from 13 to 30 MPG.
The best vehicle rates 119 MPG.

21 city **31** highway

You save \$000
in fuel costs
over 5 years
compared to the
average new vehicle.

Annual fuel Cost \$2,200

Fuel Economy & Greenhouse Gas Rating (midsize cars) **6**

Smog Rating (midsize cars) **5**

Actual results may vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 24 MPG and costs \$11,000 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.30 per gallon. MPG is miles per gallon city equivalent. Vehicle emissions are a significant cause of climate change and smog.

fuel economy.gov
Calculate personalized estimates and compare vehicles

Scanning QR Code

DELIVERY PROCESSING AND HANDLING FEE **\$25.00**

TOTAL **\$37,105.00**

Dealer Name / Address: 48012
JACK SAFARI TOYOTA
20445 W. CAPITOL DRIVE
BROOKFIELD WISCONSIN 53005

Ship to:

Warranty: 3-year/50,000-mile basic warranty, 5-year/100,000-mile powertrain warranty, unlimited miles, unlimited kilometers coverage. See Warranty for complete details.
*Excludes taxes, title and license fees and dealer-installed options.
†Excludes destination charge.
‡Excludes as part of the sales price of the vehicle for fleet buying buyers.
§Excludes as part of the sales price of the vehicle for fleet buying buyers.
||Excludes as part of the sales price of the vehicle for fleet buying buyers.

076 Monroney Label Photograph

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

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

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

Passenger Left Upper Tibia Moment Y
Passenger Left Upper Tibia Force Z
Passenger Left Lower Tibia Moment X
Passenger Left Lower Tibia Moment Y
Passenger Left Lower Tibia Force Z
Passenger Right Upper Tibia Moment X
Passenger Right Upper Tibia Moment Y
Passenger Right Upper Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger Left Foot Fore Z
Passenger Left Foot Aft X
Passenger Left Foot Aft Z
Passenger Right Foot Fore Z
Passenger Right Foot Aft X
Passenger Right Foot Aft Z
Passenger Shoulder Belt Force
Passenger Lap Belt Force
Left Rear Seat Crossmember X
Left Rear Seat Crossmember Z
Right Rear Seat Crossmember X
Right Rear Seat Crossmember Z
Left Rear Seat Crossmember X Redundant
Right Rear Seat Crossmember X Redundant
Vehicle Engine Top X
Vehicle Engine Bottom X
BARRIER 2-1
BARRIER 2-2
BARRIER 2-3
BARRIER 2-4
BARRIER 2-5
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BARRIER 2-15
BARRIER 2-16
BARRIER 3-1
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BARRIER 7-6 FX

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BARRIER 7-16 Mz
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BARRIER 10-15 FX
BARRIER 10-15 My
BARRIER 10-15 Mz
BARRIER 10-16 FX
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BARRIER 10-16 Mz
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BARRIER 11-16

NHTSA

Test Lab: CTF

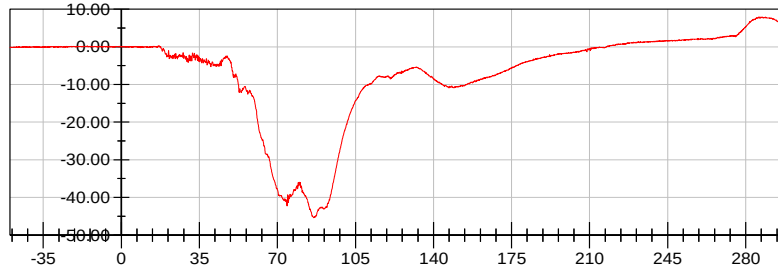
Test Number: 150115 (M20155100)

Test Date: 01/15/2015

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

Position #2 Hybrid III Small Adult Female (426)

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



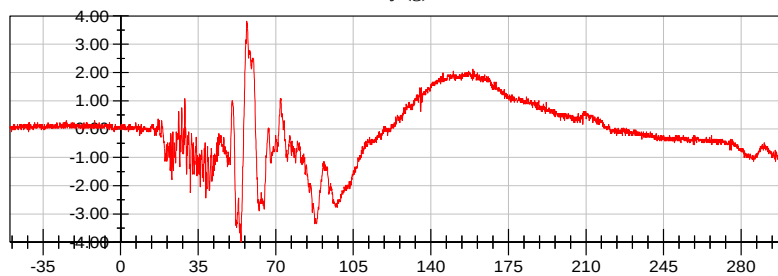
<Max>

7.95 g at 285.92 ms

<Min>

-45.37 g at 86.24 ms

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



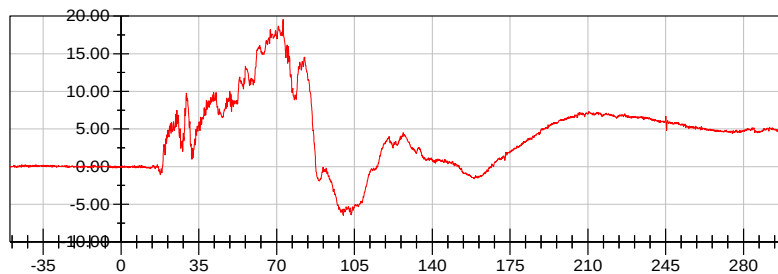
<Max>

3.81 g at 56.88 ms

<Min>

-4.00 g at 54.32 ms

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



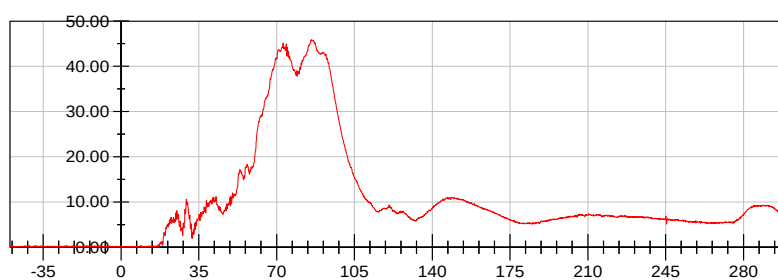
<Max>

19.54 g at 72.88 ms

<Min>

-6.47 g at 100.00 ms

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



<Max>

45.85 g at 85.60 ms

<Min>

0.04 g at -3.52 ms



NHTSA

Test Lab: CTF

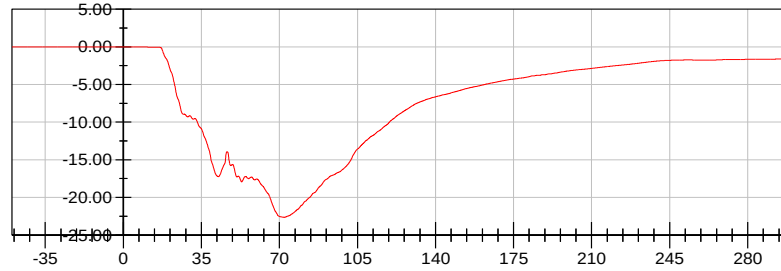
Test Number: 150115 (M20155100)

Test Date: 01/15/2015

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

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

0.01 mm at 2.96 ms

<Min>

-22.64 mm at 72.16 ms

CFC_600



NHTSA

Test Lab: CTF

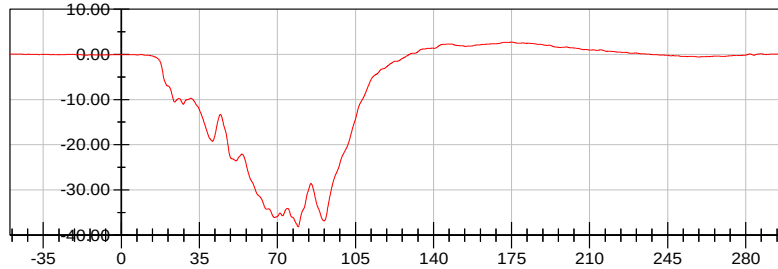
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Test Date: 01/15/2015

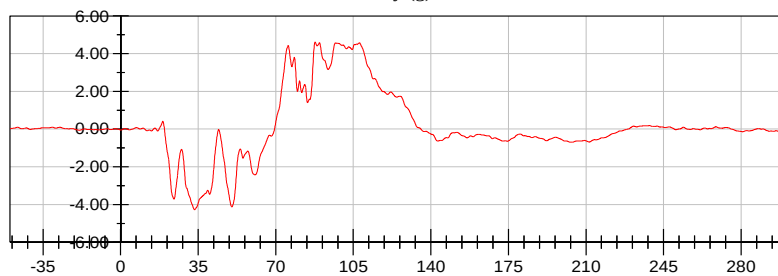
Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (426)

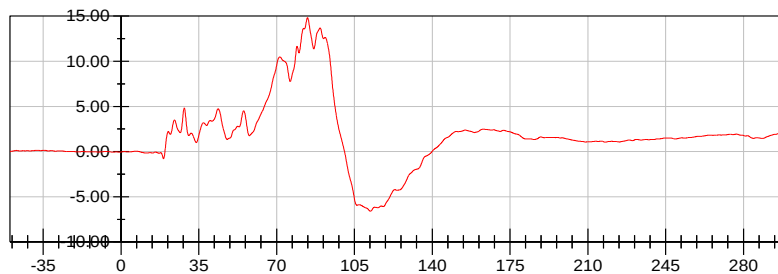
Driver Chest X Acceleration vs. Time Primary (g) vs. Time [ms]



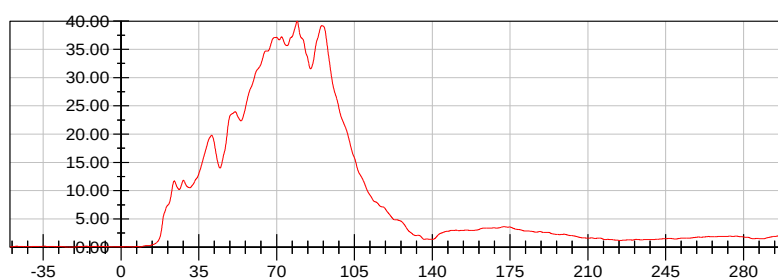
Driver Chest Y Acceleration vs. Time Primary (g) vs. Time [ms]



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



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



NHTSA

Test Lab: CTF

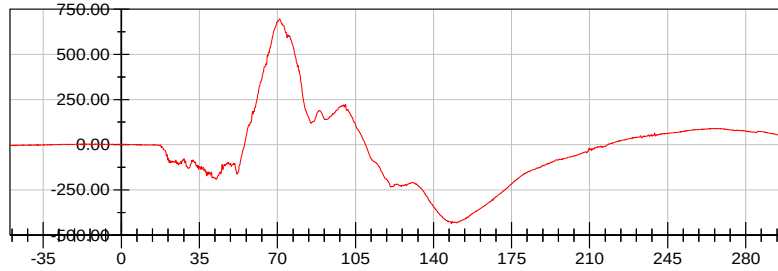
Test Number: 150115 (M20155100)

Test Date: 01/15/2015

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

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

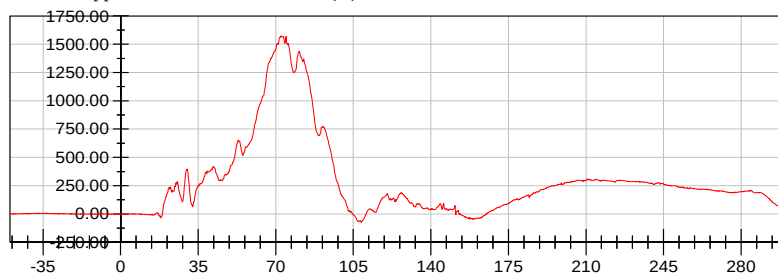
697.47 N at 70.96 ms

<Min>

-436.11 N at 148.00 ms

CFC_1000

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



<Max>

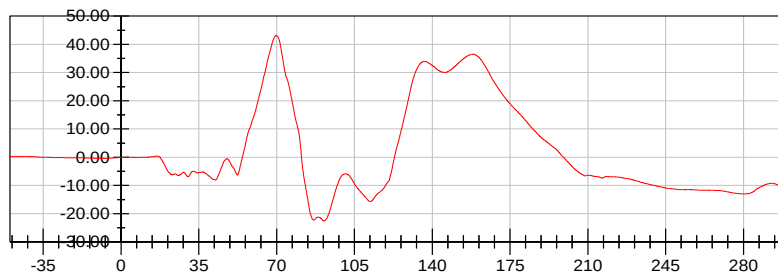
1,572.99 N at 72.40 ms

<Min>

-73.33 N at 108.64 ms

CFC_1000

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



<Max>

43.20 Nm at 69.76 ms

<Min>

-22.51 Nm at 91.36 ms

CFC_600





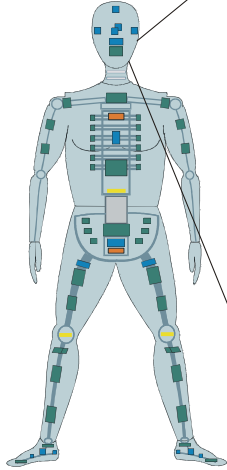
2015 Toyota Avalon NCAP 35 mph Frontal Impact Neck Injury Predictor (NIJ)

Date: 01/15/2015
Time: 14:49

Customer: NHTSA

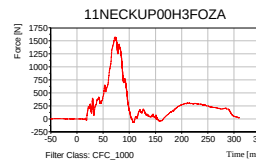
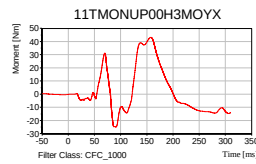
Test Number: M20155100

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

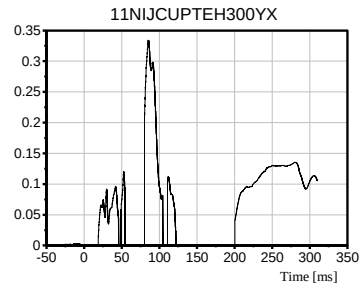


Dummy: HIII 50th Male
Seating Position:
Driver

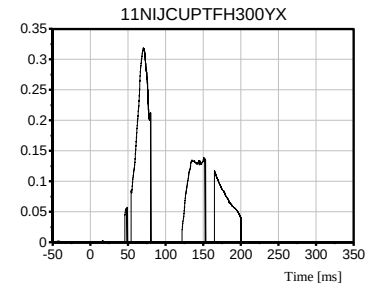
NIJ Source Code: (Fz/Fzc)+(Myc/Myc)



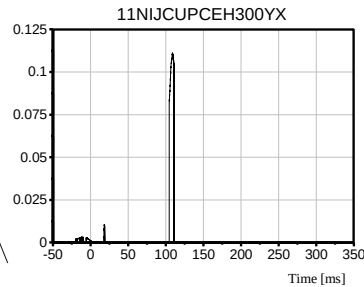
TRC Inc. Test Lab: CTF
Test Number: 150115



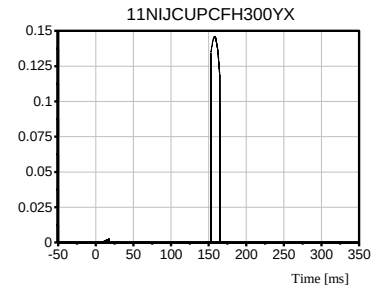
Max [NTE] 0.3340 at 85.28 ms



Max [NTF] 0.3188 at 70.56 ms



Max [NCE] 0.1111 at 108.88 ms



Max [NCF] 0.1461 at 158.64 ms

NHTSA

Test Lab: CTF

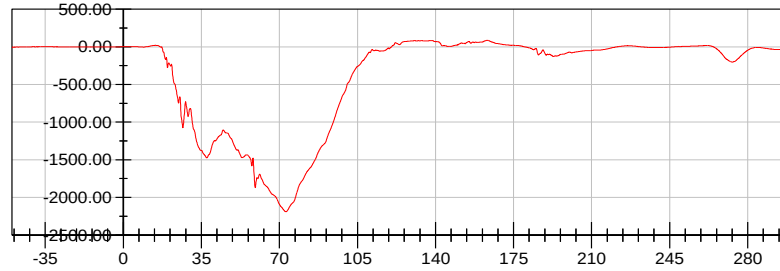
Test Number: 150115 (M20155100)

Test Date: 01/15/2015

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

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

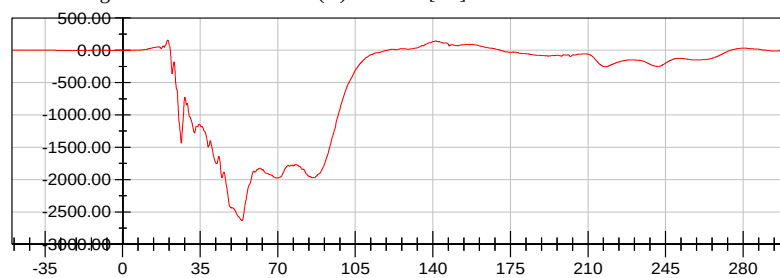
87.82 N at 163.20 ms

<Min>

-2,188.59 N at 72.96 ms

CFC_600

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



<Max>

156.50 N at 20.40 ms

<Min>

-2,634.44 N at 53.84 ms

CFC_600



NHTSA

Test Lab: CTF

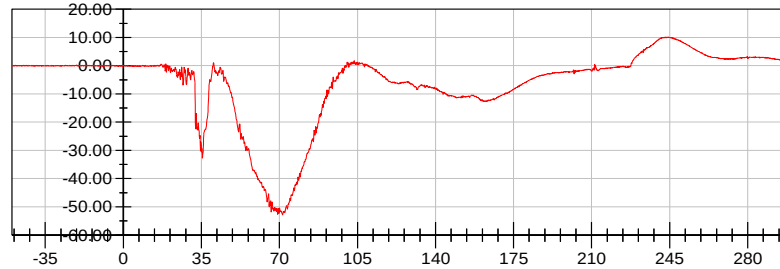
Test Number: 150115 (M20155100)

Test Date: 01/15/2015

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

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

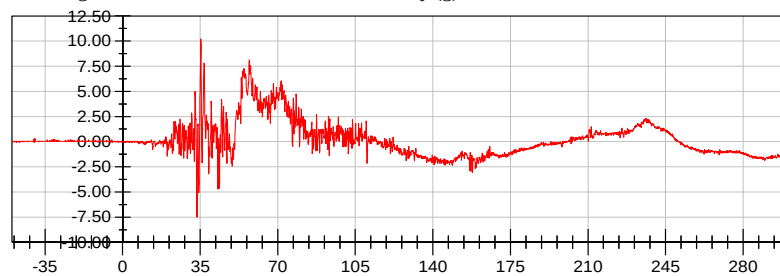
10.17 g at 242.96 ms

<Min>

-52.84 g at 71.44 ms

CFC_1000

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



<Max>

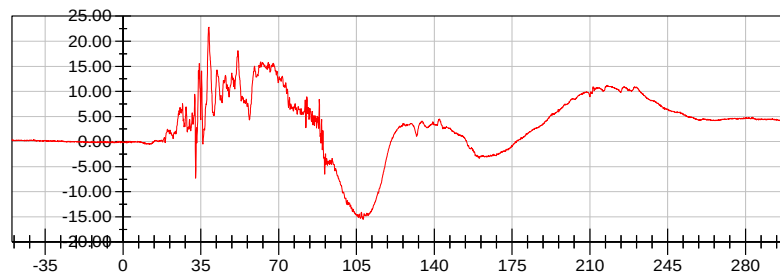
10.22 g at 35.28 ms

<Min>

-7.51 g at 33.60 ms

CFC_1000

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



<Max>

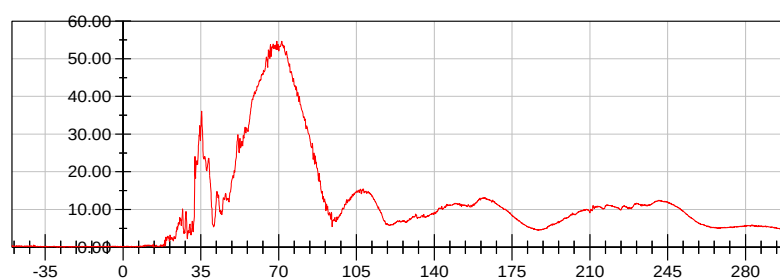
22.80 g at 38.64 ms

<Min>

-15.49 g at 108.08 ms

CFC_1000

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



<Max>

54.67 g at 71.44 ms

<Min>

0.05 g at -36.24 ms

CFC_1000



NHTSA

Test Lab: CTF

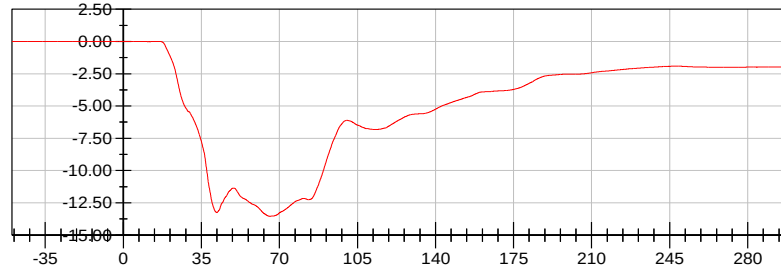
Test Number: 150115 (M20155100)

Test Date: 01/15/2015

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

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

0.00 mm at -43.60 ms

<Min>

-13.54 mm at 65.68 ms

CFC_600



NHTSA

Test Lab: CTF

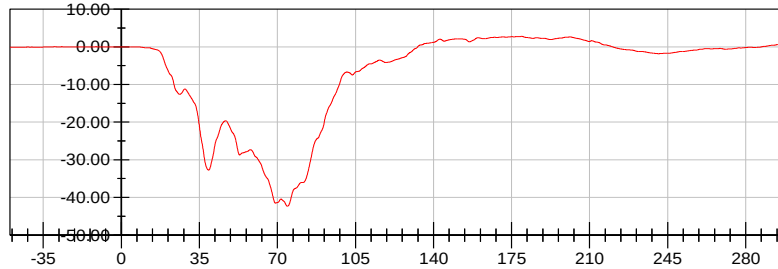
Test Number: 150115 (M20155100)

Test Date: 01/15/2015

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

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

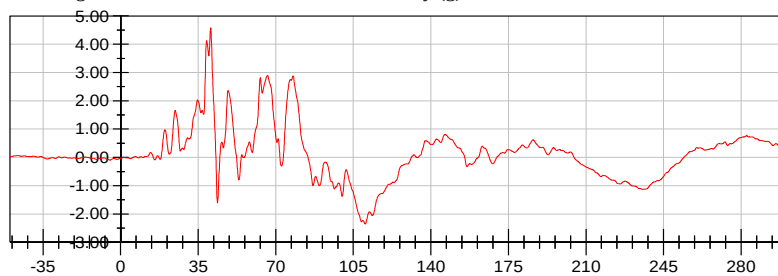
2.78 g at 179.60 ms

<Min>

-42.33 g at 74.48 ms

CFC_180

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



<Max>

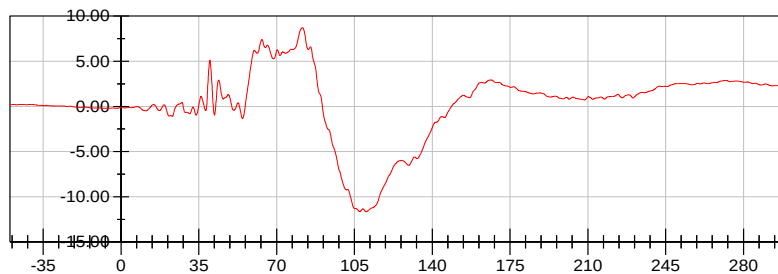
4.58 g at 40.64 ms

<Min>

-2.36 g at 110.40 ms

CFC_180

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



<Max>

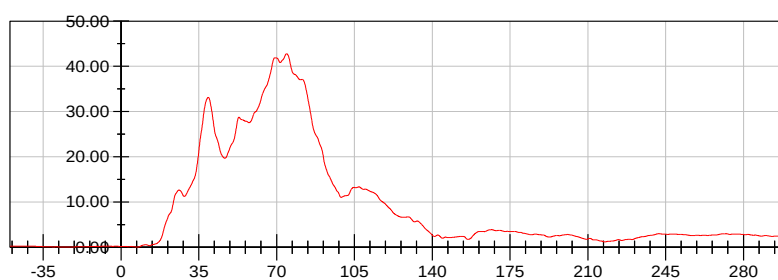
8.72 g at 81.60 ms

<Min>

-11.65 g at 110.24 ms

CFC_180

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



<Max>

42.77 g at 74.48 ms

<Min>

0.01 g at -24.48 ms

CFC_180



NHTSA

Test Lab: CTF

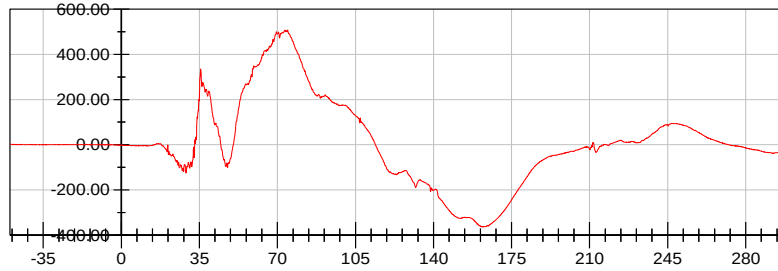
Test Number: 150115 (M20155100)

Test Date: 01/15/2015

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

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

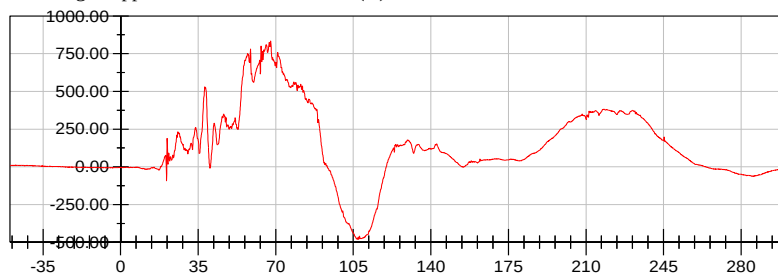
507.99 N at 74.56 ms

<Min>

-363.91 N at 161.44 ms

CFC_1000

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



<Max>

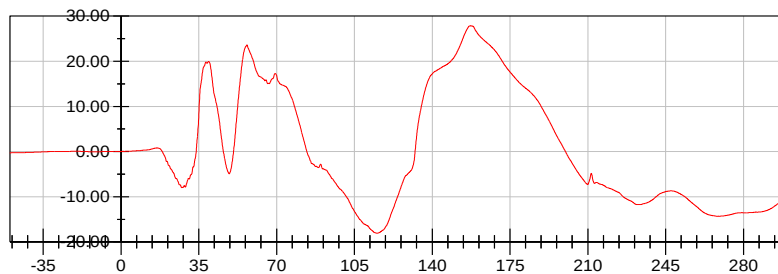
834.32 N at 67.68 ms

<Min>

-480.92 N at 106.88 ms

CFC_1000

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



<Max>

27.85 Nm at 157.28 ms

<Min>

-18.08 Nm at 115.20 ms

CFC_600





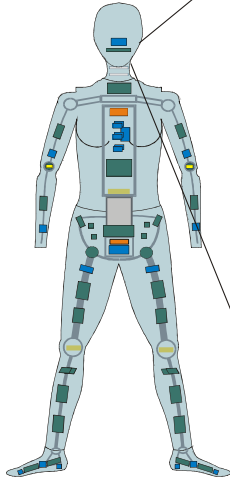
2015 Toyota Avalon NCAP 35 mph Frontal Impact Neck Injury Predictor (NIJ)

Date: 01/15/2015
Time: 14:49

Customer: NHTSA

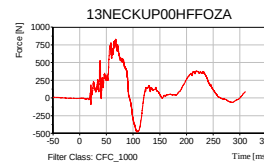
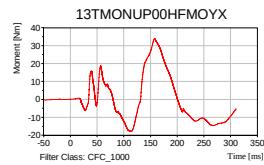
Test Number: M20155100

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

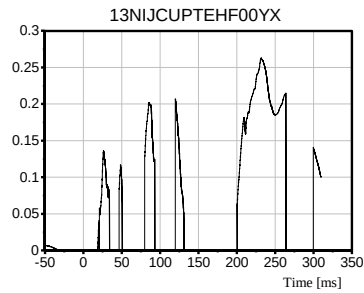


Dummy: HIII 5th Female
Seating Position:
Right Front Passenger

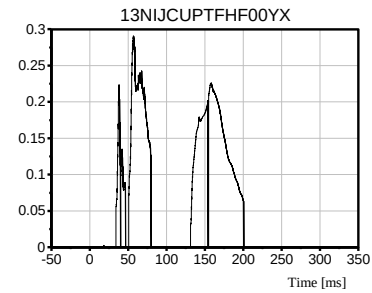
NIJ Source Code: (Fz/Fzc)+(Myc/Myc)



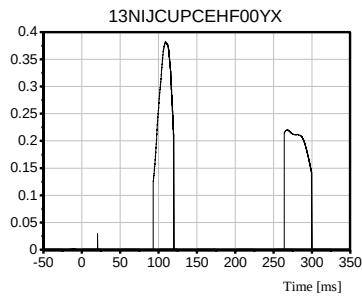
TRC Inc. Test Lab: CTF
Test Number: 150115



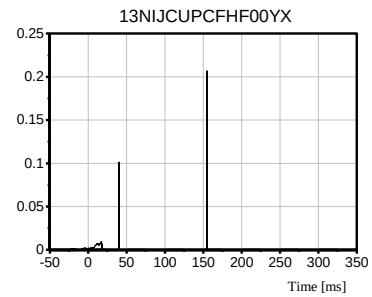
Max [NTE] 0.2632 at 231.92 ms



Max [NTF] 0.2908 at 56.80 ms



Max [NCE] 0.3825 at 109.20 ms



Max [NCF] 0.2069 at 154.88 ms

NHTSA

Test Lab: CTF

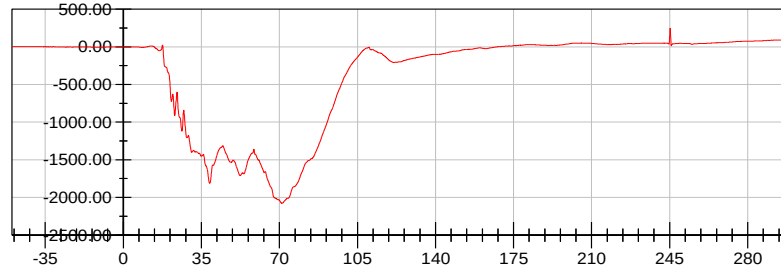
Test Number: 150115 (M20155100)

Test Date: 01/15/2015

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

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

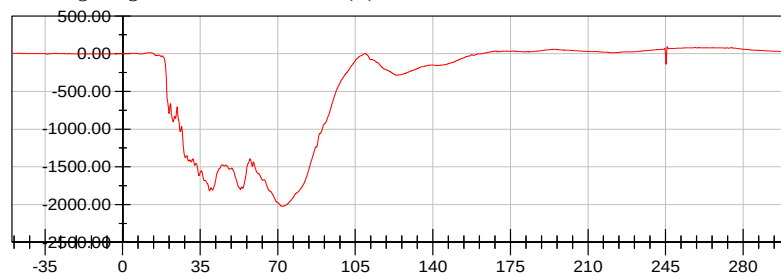
246.95 N at 245.20 ms

<Min>

-2,078.10 N at 70.96 ms

CFC_600

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



<Max>

91.91 N at 245.68 ms

<Min>

-2,022.41 N at 72.08 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. 27

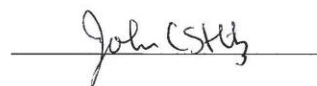
Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	885	Yes
B	Shoulder Pivot Height	505.5 - 520.7	520	Yes
C	H-Point Height	83.8 - 88.9	85	Yes
D	H-Point From Seatback	134.6 - 139.7	138	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	92	Yes
F	Thigh Clearance	139.7 - 154.9	149	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	294	Yes
H	Skull Cap To Backline	40.6 - 45.7	45	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	340	Yes
J	Elbow Rest Height	190.5 - 210.8	200	Yes
K	Buttock Knee Length	579.1 - 604.5	600	Yes
L	Popliteal Height	429.3 - 454.7	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	223	Yes
P	Foot Length	251.5 - 266.7	264	Yes
V	Shoulder Breadth	421.6 - 436.9	428	Yes
W	Foot Breadth	91.4 - 106.7	97	Yes
Y	Chest Circumference	970.3 - 1000.8	987	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:

Technician



Approved




Revised 8/10/12

Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 037 Certification No. 27-2

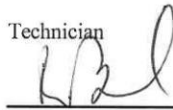
Test Date: 1/10/2015

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	237.4 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-7.9 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician



Approved



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

01.10.2015 10:02:09 611

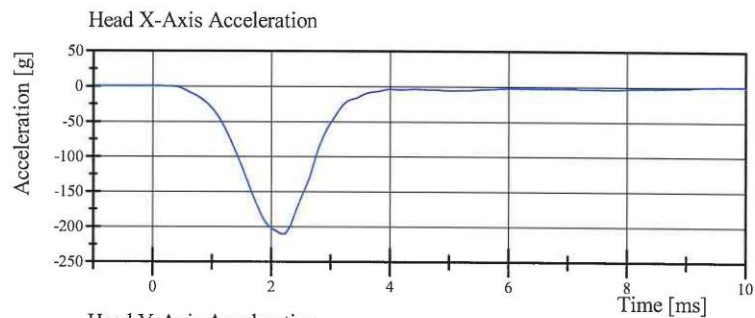


Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 037 Certification No. 27-2

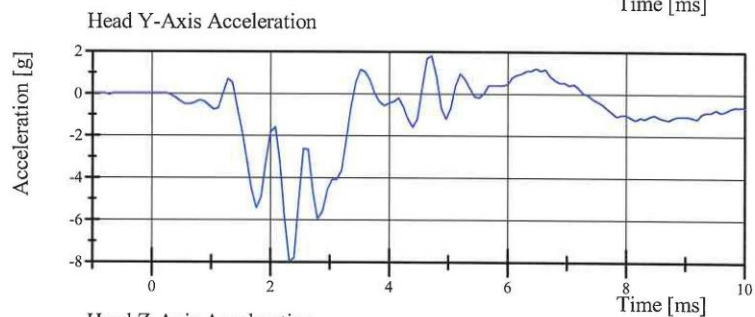
Test Date: 1/10/2015



Filter Class: CFC_1000

Max: 0.1 g at -0.5 ms

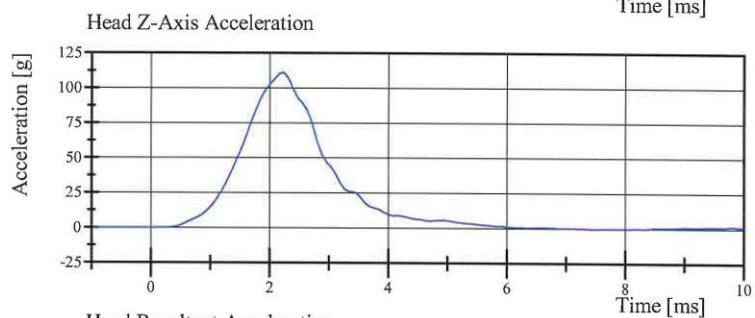
Min: -210.0 g at 2.2 ms



Filter Class: CFC_1000

Max: 1.8 g at 4.7 ms

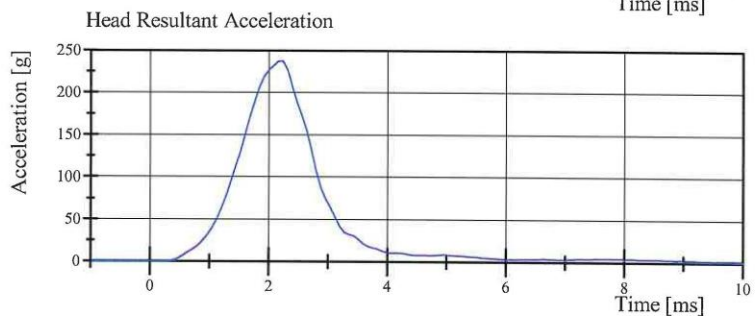
Min: -7.9 g at 2.3 ms



Filter Class: CFC_1000

Max: 110.9 g at 2.2 ms

Min: -0.4 g at 7.5 ms



Filter Class: CFC_1000

Max: 237.4 g at 2.2 ms

Min: 0.0 g at -0.6 ms

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

01.10.2015 10:02:23 611



Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 27-1

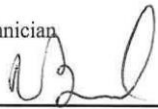
Test Date: 1/10/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.920 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	39.5 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-22.93 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-19.64 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-14.69 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-14.69 g	Yes
Total Head D-Plane Rotation			
Peak	(-64) - (-78) °	-66.3 °	Yes
Time of Peak	57 - 64 ms	60.4 ms	Yes
Total Head D-Plane Rotation			
Decay to 0°	113 - 128 ms	120.0 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	88 - 108 N·m	101.0 N·m	Yes
Time of Peak	47 - 58 ms	52.2 ms	Yes
Total Neck Occipital Condyles Moment			
Decay to 0 N·m	97 - 107 ms	100.0 ms	Yes

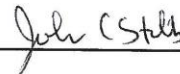
Test meets specifications.

Comments:

Technician



Approved



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

01.10.2015 10:52:01 2951

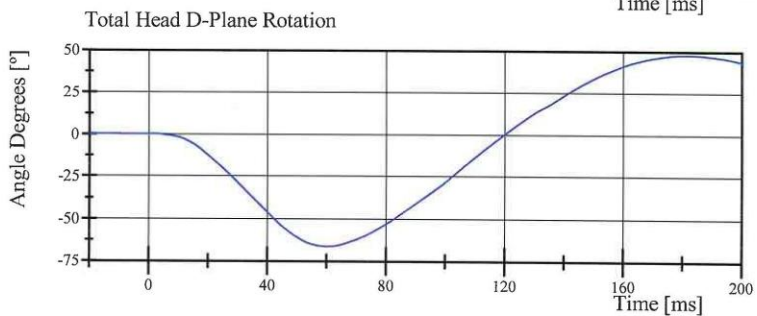
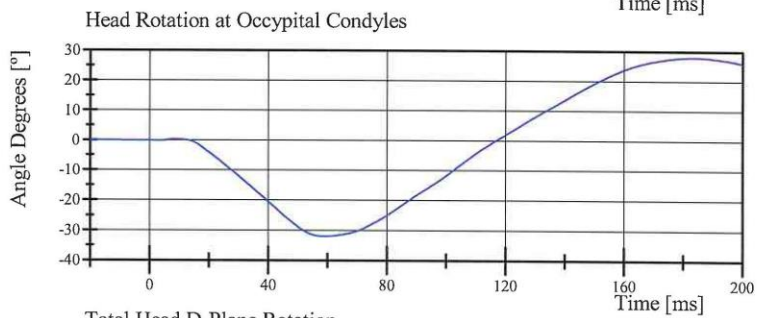
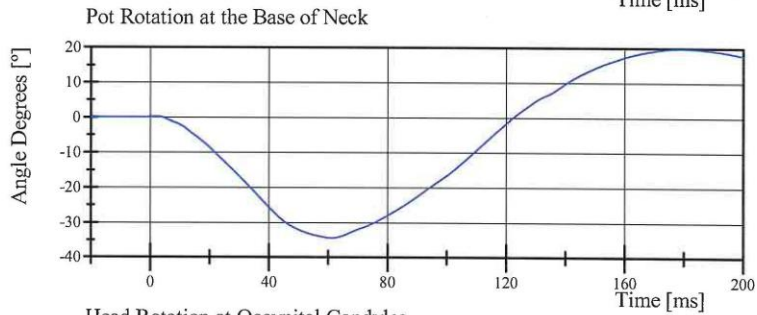
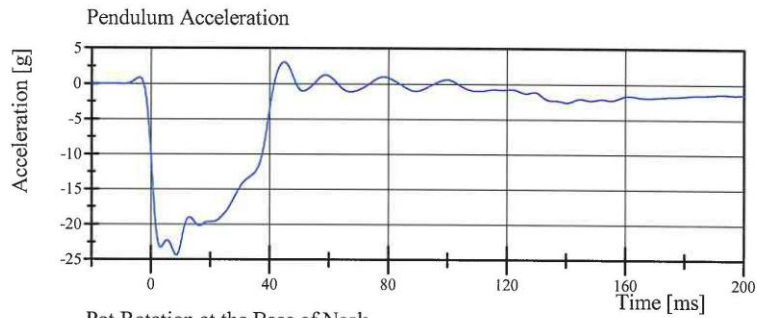


Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 27-1

Test Date: 1/10/2015



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

01.10.2015 10:52:15 2951

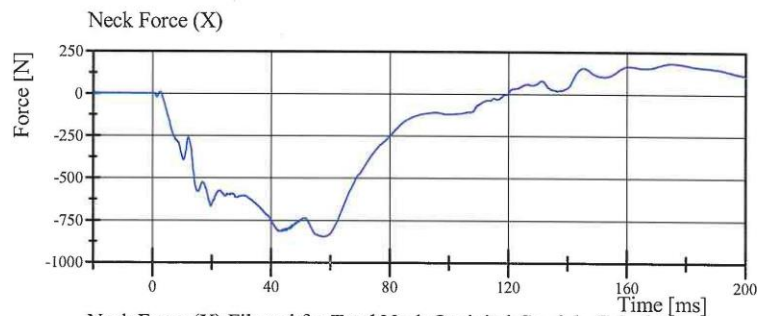


Transportation Research Center Inc.

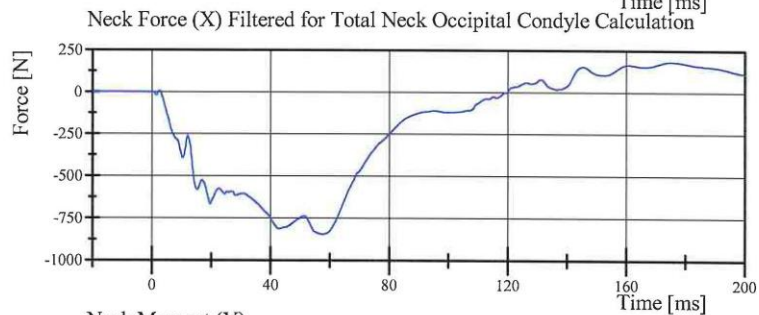
Neck Flexion

HIII 50th Serial No. 037 Certification No. 27-1

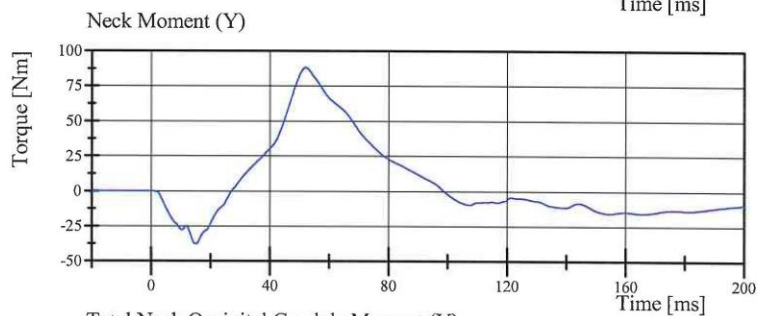
Test Date: 1/10/2015



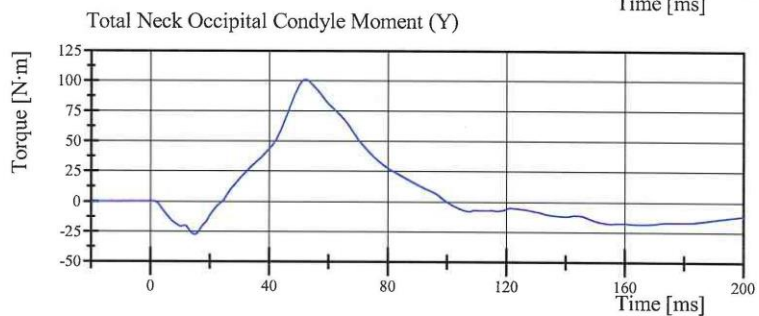
Filter Class: CFC_1000
Max: 182.5 N at 175.0 ms
Min: -847.5 N at 57.5 ms



Filter Class: CFC_600
Max: 181.9 N at 175.0 ms
Min: -846.9 N at 57.6 ms



Filter Class: CFC_600
Max: 87.9 Nm at 52.0 ms
Min: -37.7 Nm at 15.1 ms



Filter Class: Without_(Consta
Max: 101.0 N·m at 52.2 ms
Min: -27.5 N·m at 14.9 ms

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

01.10.2015 10:52:16 2951



Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 27-1

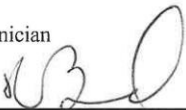
Test Date: 1/10/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-5.974 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	40.0 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	19.12 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	16.65 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	14.09 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	14.09 g	Yes
Total Head D-Plane Rotation			
Peak	81 - 106 °	92.7 °	Yes
Time of Peak	72 - 82 ms	76.9 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	155.5 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	(-53) - (-80) N·m	-70.6 N·m	Yes
Time of Peak	65 - 79 ms	71.1 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	120 - 148 ms	144.6 ms	Yes

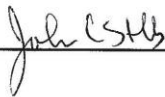
Test meets specifications.

Comments:

Technician



Approved



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

01.10.2015 11:21:51 3028

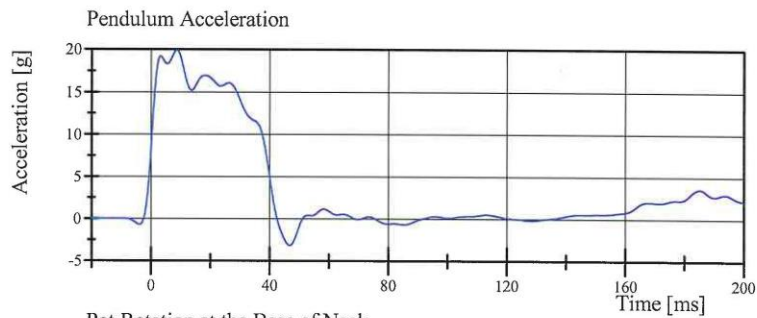


Transportation Research Center Inc.

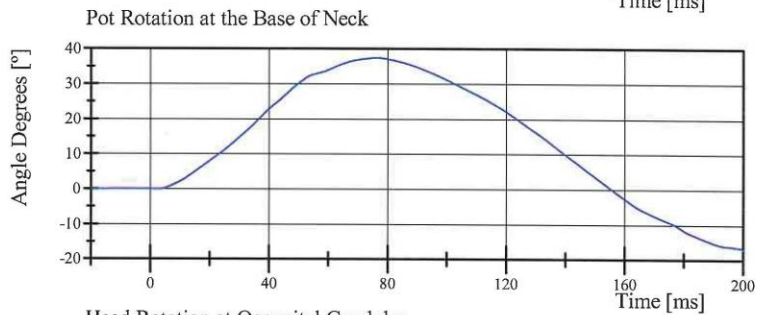
Neck Extension

HIII 50th Serial No. 037 Certification No. 27-1

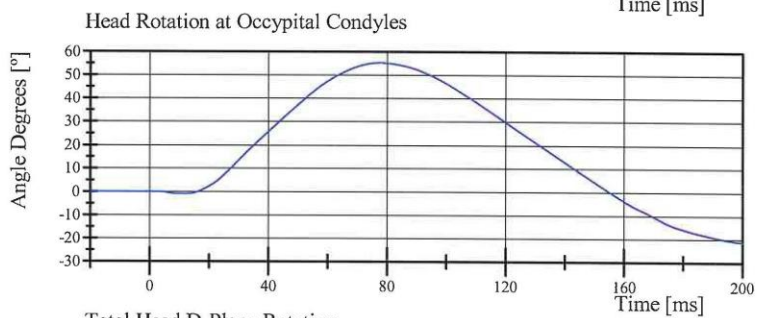
Test Date: 1/10/2015



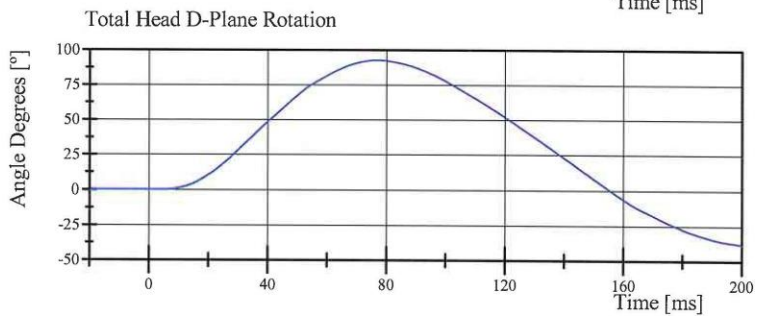
Filter Class: CFC_60
Max: 19.9 g at 8.7 ms
Min: -3.2 g at 46.9 ms



Filter Class: CFC_60
Max: 37.4 ° at 76.2 ms
Min: -16.9 ° at 200.0 ms



Filter Class: CFC_60
Max: 55.3 ° at 77.5 ms
Min: -21.4 ° at 200.0 ms



Filter Class: CFC_60
Max: 92.7 ° at 76.9 ms
Min: -38.2 ° at 200.0 ms

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

01.10.2015 11:22:03 3028

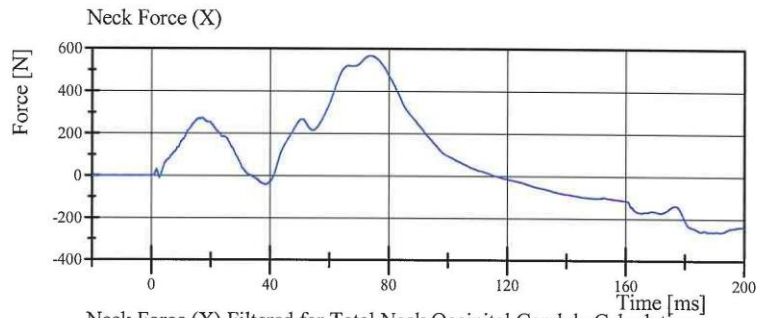


Transportation Research Center Inc.

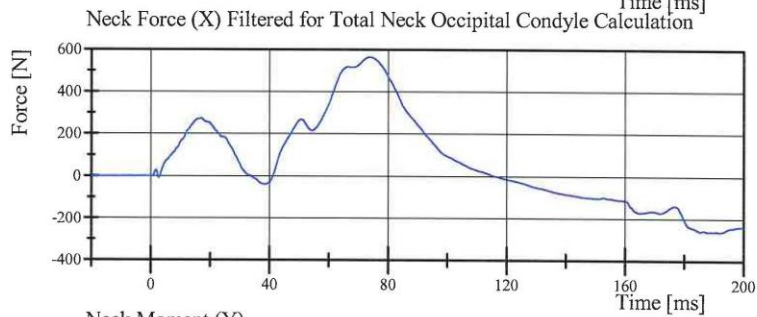
Neck Extension

HIII 50th Serial No. 037 Certification No. 27-1

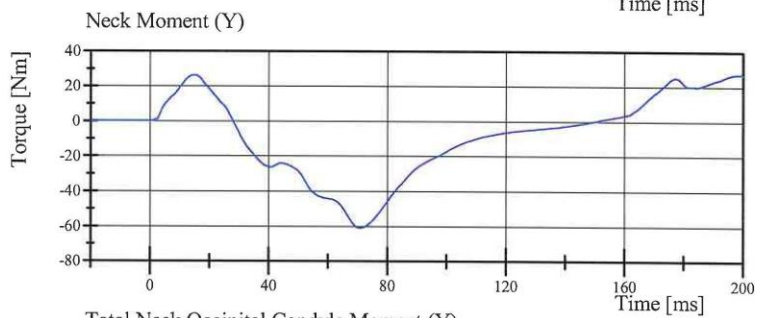
Test Date: 1/10/2015



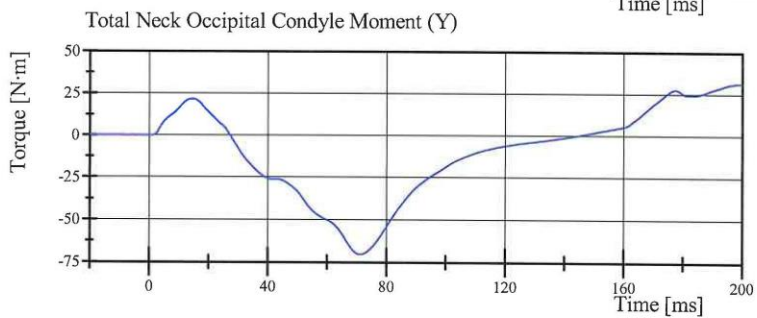
Filter Class: CFC_1000
Max: 566.7 N at 74.0 ms
Min: -264.3 N at 191.4 ms



Filter Class: CFC_600
Max: 566.5 N at 73.8 ms
Min: -263.7 N at 192.2 ms



Filter Class: CFC_600
Max: 27.0 Nm at 200.0 ms
Min: -61.0 Nm at 70.8 ms



Filter Class: Without_(Consta
Max: 31.2 N·m at 200.0 ms
Min: -70.6 N·m at 71.1 ms

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

01.10.2015 11:22:04 3028



Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 037 Certification No. 27-1

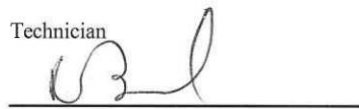
Test Date: 1/9/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.617 m/s	Yes
Probe Force Peak	(-5,160) - (-5,893) N	-5,459.5 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-67.84 mm	Yes
Internal Hysteresis	65 - 85 %	73.1 %	Yes

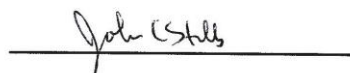
Test meets specifications.

Comments:

Technician



Approved



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

01.09.2015 09:11:59 416

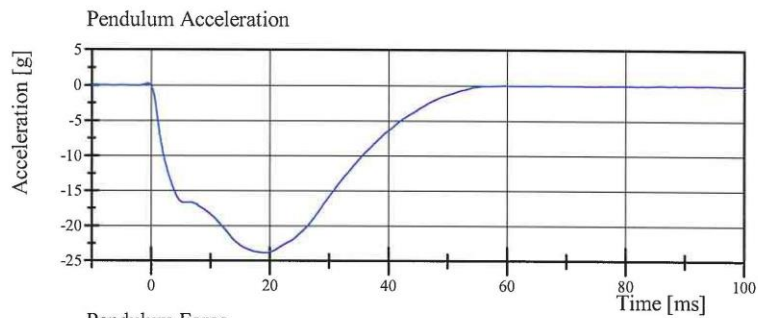


Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 037 Certification No. 27-1

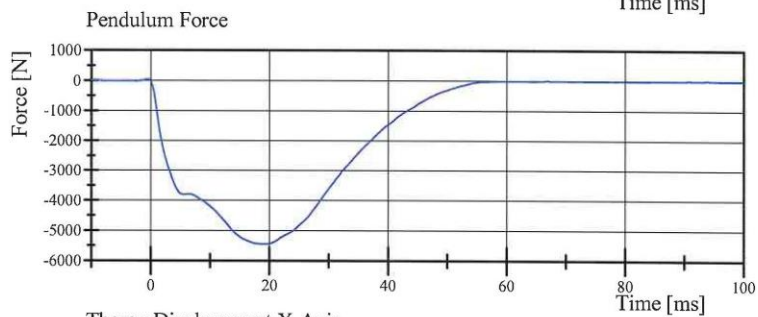
Test Date: 1/9/2015



Filter Class: CFC_180

Max: 0.2 g at -0.6 ms

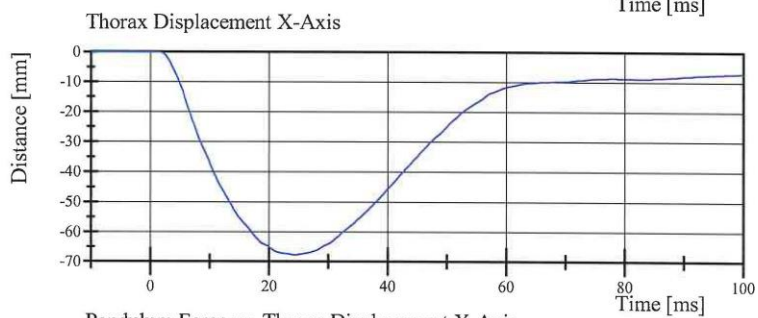
Min: -23.8 g at 19.2 ms



Filter Class: CFC_180

Max: 49.2 N at -0.6 ms

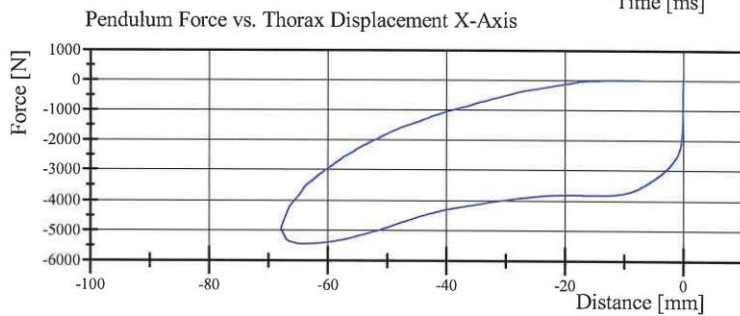
Min: -5,459.5 N at 19.2 ms



Filter Class: CFC_600

Max: 0.0 mm at -9.3 ms

Min: -67.8 mm at 24.4 ms



Filter Class: CFC_180

Max: 49.2 N at -0.0 mm

Min: -5,459.5 N at -64.3 mm

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

01.09.2015 09:12:58 416



Transportation Research Center Inc.

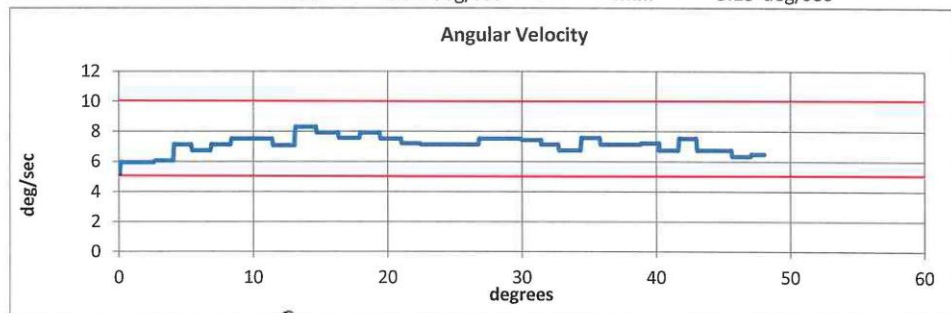
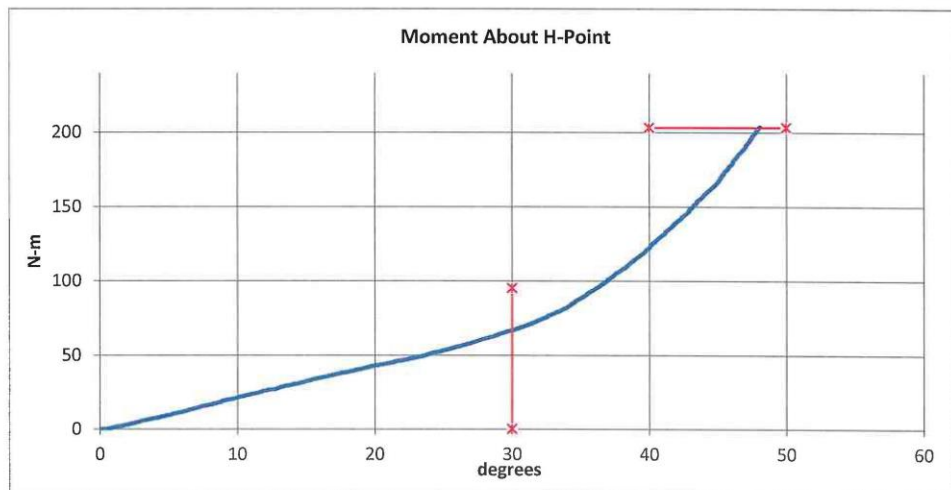
Hybrid III 50th Male Hip Range of Motion



Serial Number: 37
Test Number: 1
Comments: Left

Date: 09-Jan-2015
Time: 15:08

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.4 °C Pass
Humidity	10 - 70	35 % Pass
Moment at 30°	0 ≤ 94.9	66.66 N-m Pass
Angle at 203 Nm	40 - 50	48.07 deg Pass
Average Velocity	5 - 10	7.11 deg/sec Pass



Technician

[Signature]

Approved

[Signature]

Transportation Research Center Inc.

Hybrid III 50th Male Hip Range of Motion



Serial Number: 37

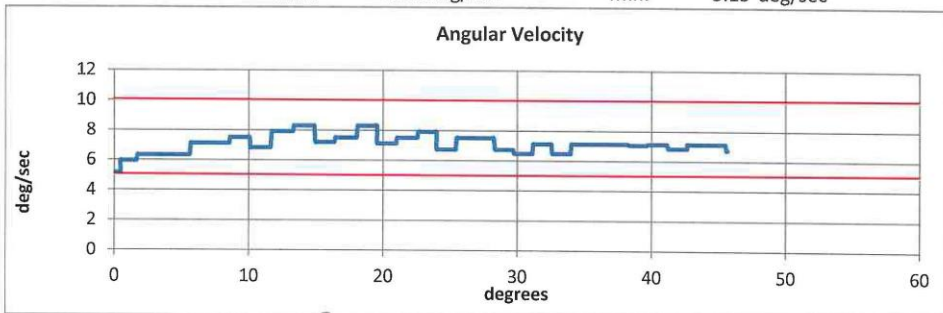
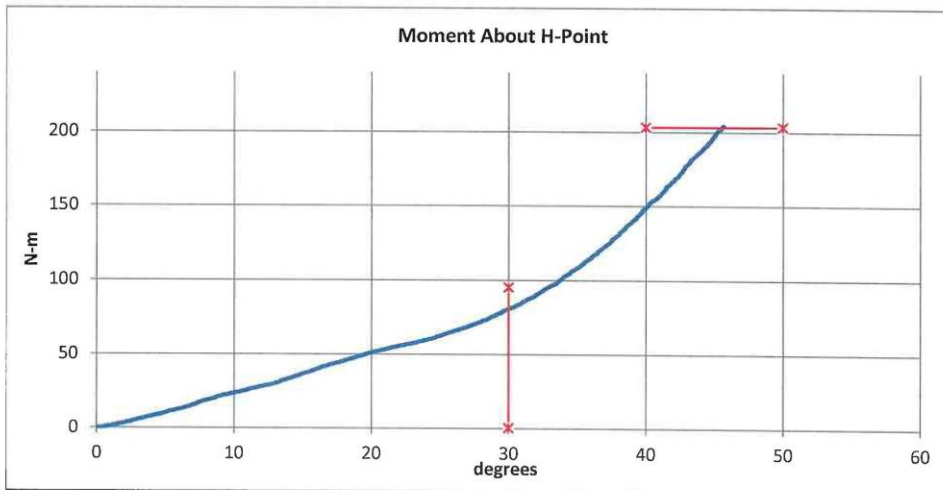
Date: 09-Jan-2015

Test Number: 1

Time: 15:42

Comments: Right

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.4 °C Pass
Humidity	10 - 70	39 % Pass
Moment at 30°	0 ≤ 94.9	80.66 N-m Pass
Angle at 203 Nm	40 - 50	45.69 deg Pass
Average Velocity	5 - 10	7.09 deg/sec Pass



Technician

[Signature]

Approved

[Signature]

Transportation Research Center Inc.

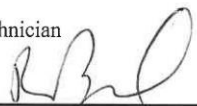
Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 27-2
Test Date: 1/9/2015

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.101 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,765.65 N	Yes

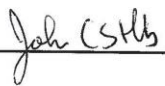
Test meets specifications.

Comments:

Technician



Approved



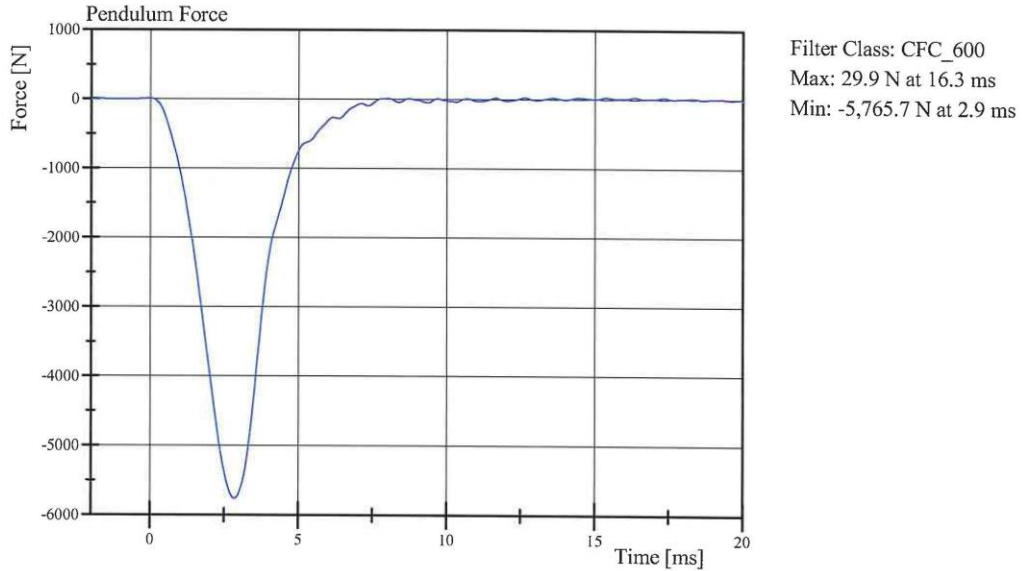
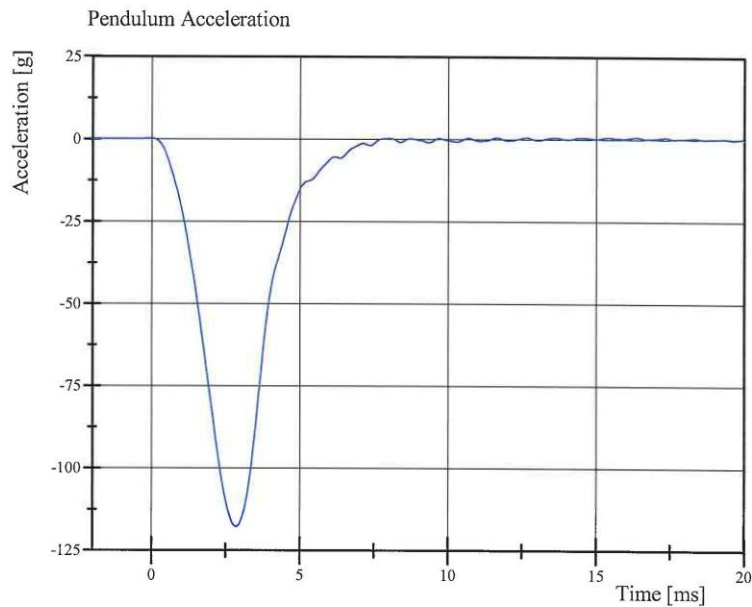
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

01.09.2015 13:55:18 1632



Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 27-2
Test Date: 1/9/2015



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

01.09.2015 13:55:28 1632



Transportation Research Center Inc.

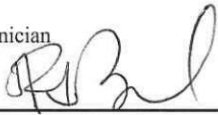
Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 27-1
Test Date: 1/9/2015

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.104 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,624.22 N	Yes

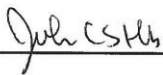
Test meets specifications.

Comments:

Technician



Approved



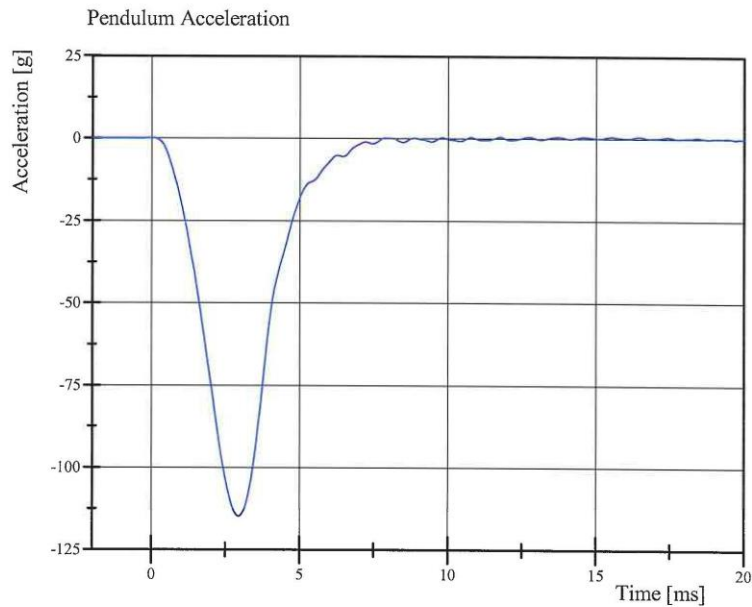
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

01.09.2015 14:02:29 1628

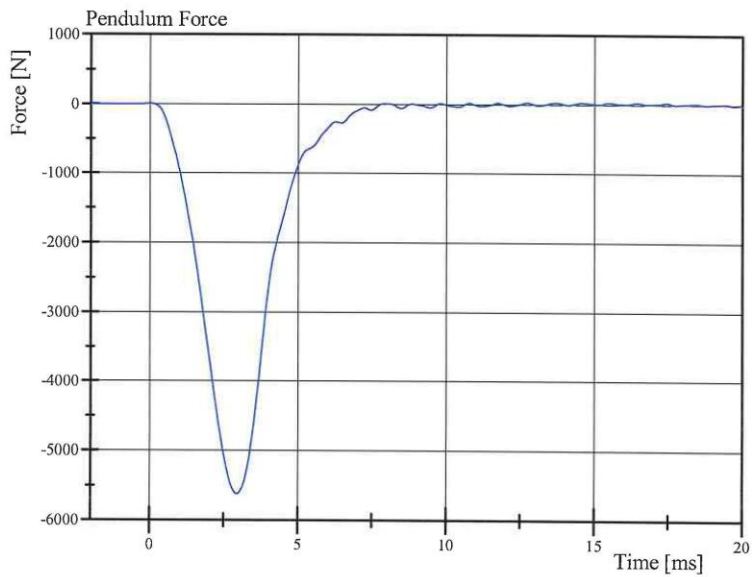


Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 27-1
Test Date: 1/9/2015



Filter Class: CFC_600
Max: 0.6 g at 16.5 ms
Min: -114.9 g at 3.0 ms



Filter Class: CFC_600
Max: 30.2 N at 16.5 ms
Min: -5,624.2 N at 3.0 ms

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

01.09.2015 14:02:36 1628



Driver S/N 037

Post-Test Calibration Sheets

Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 037
Calibration No. 28

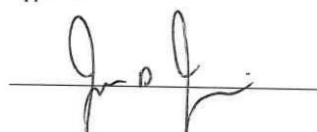
Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	886	Yes
B	Shoulder Pivot Height	505.5 - 520.7	520	Yes
C	H-Point Height	83.8 - 88.9	85	Yes
D	H-Point From Seatback	134.6 - 139.7	138	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	92	Yes
F	Thigh Clearance	139.7 - 154.9	151	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	295	Yes
H	Skull Cap To Backline	40.6 - 45.7	45	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	340	Yes
J	Elbow Rest Height	190.5 - 210.8	201	Yes
K	Buttock Knee Length	579.1 - 604.5	600	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	224	Yes
P	Foot Length	251.5 - 266.7	264	Yes
V	Shoulder Breadth	421.6 - 436.9	428	Yes
W	Foot Breadth	91.4 - 106.7	97	Yes
Y	Chest Circumference	970.3 - 1000.8	988	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:

Technician



Approved



Revised 8/10/12



Transportation Research Center Inc.

Front Head Drop

IIII 50th Serial No. 037 Certification No. 28-1

Test Date: 1/16/2015

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	245.1 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-7.3 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

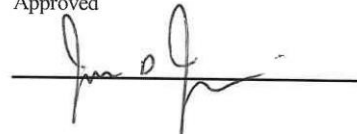
Test meets specifications.

Comments:

Technician



Approved



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

01.16.2015 13:53:54 607

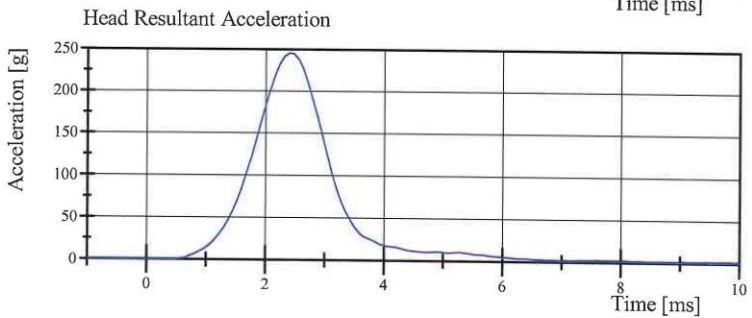
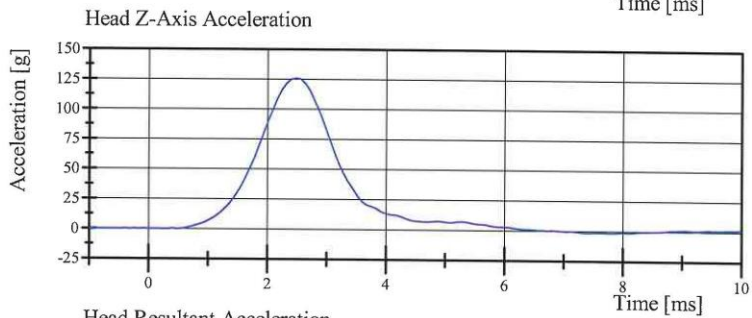
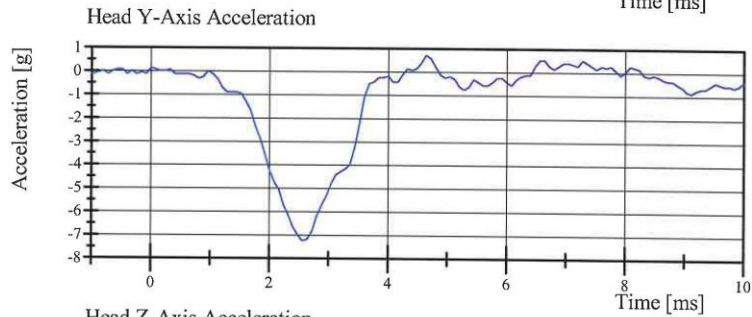
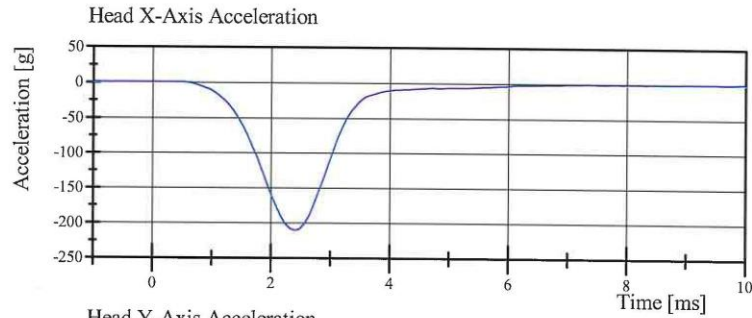


Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 037 Certification No. 28-1

Test Date: 1/16/2015



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

01.16.2015 13:54:07 607



Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 28-3

Test Date: 1/19/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.913 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	37.3 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-23.45 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-21.88 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-17.02 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-17.02 g	Yes
Total Head D-Plane Rotation			
Peak	(-64) - (-78) °	-74.4 °	Yes
Time of Peak	57 - 64 ms	59.6 ms	Yes
Total Head D-Plane Rotation Decay to 0°	113 - 128 ms	120.2 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	88 - 108 N·m	100.8 N·m	Yes
Time of Peak	47 - 58 ms	50.2 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	97 - 107 ms	99.8 ms	Yes

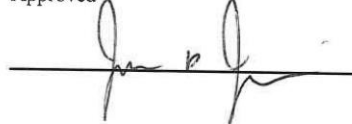
Test meets specifications.

Comments:

Technician



Approved



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

01.19.2015 08:49:20 2946

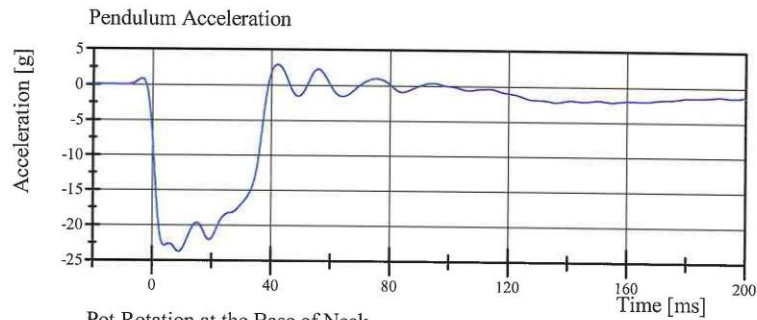


Transportation Research Center Inc.

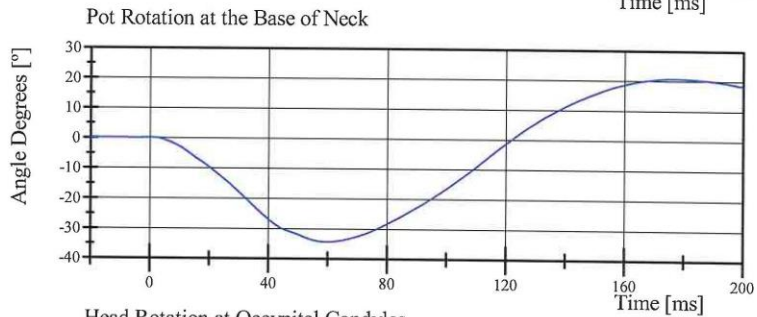
Neck Flexion

HIII 50th Serial No. 037 Certification No. 28-3

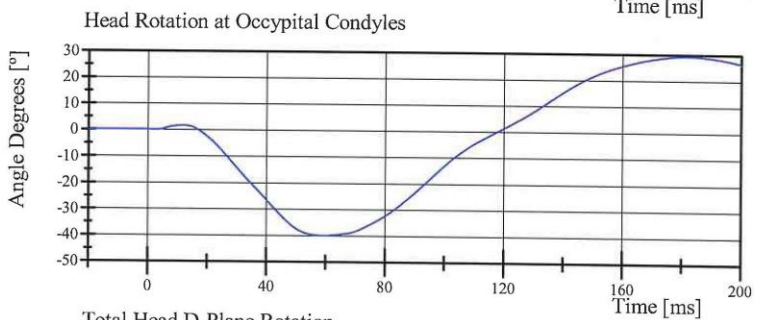
Test Date: 1/19/2015



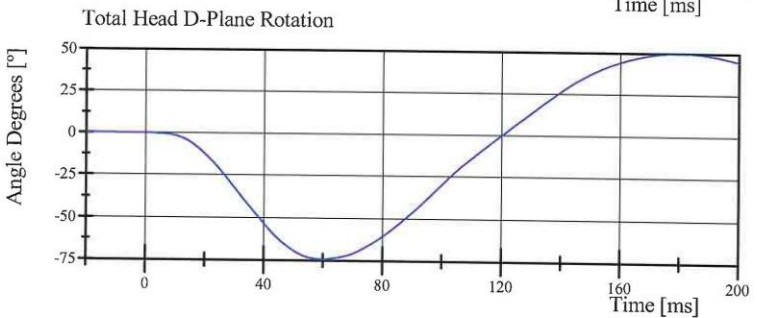
Filter Class: CFC_60
Max: 2.8 g at 42.1 ms
Min: -23.8 g at 8.9 ms



Filter Class: CFC_60
Max: 20.7 ° at 176.3 ms
Min: -34.4 ° at 59.7 ms



Filter Class: CFC_60
Max: 29.2 ° at 181.6 ms
Min: -40.0 ° at 59.4 ms



Filter Class: CFC_60
Max: 49.8 ° at 180.1 ms
Min: -74.4 ° at 59.6 ms

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

01.19.2015 08:49:28 2946

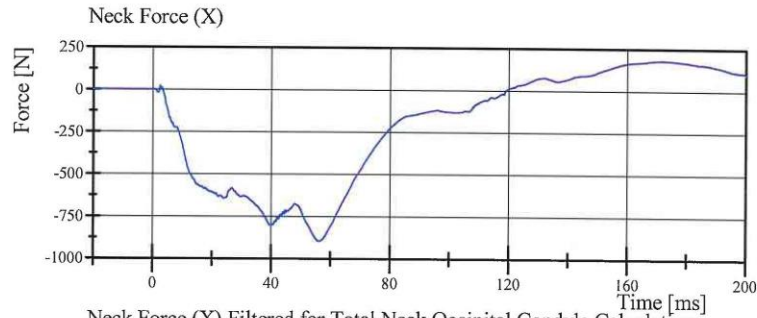


Transportation Research Center Inc.

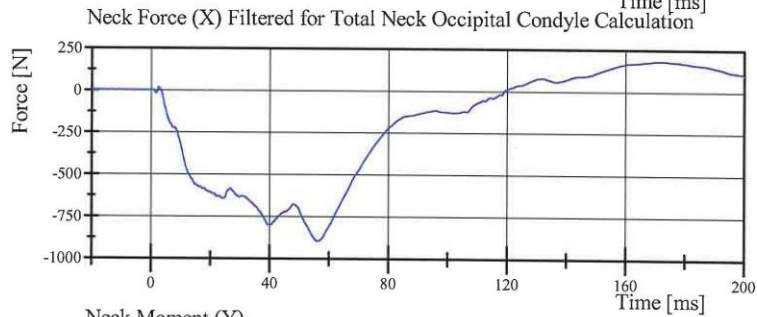
Neck Flexion

HIII 50th Serial No. 037 Certification No. 28-3

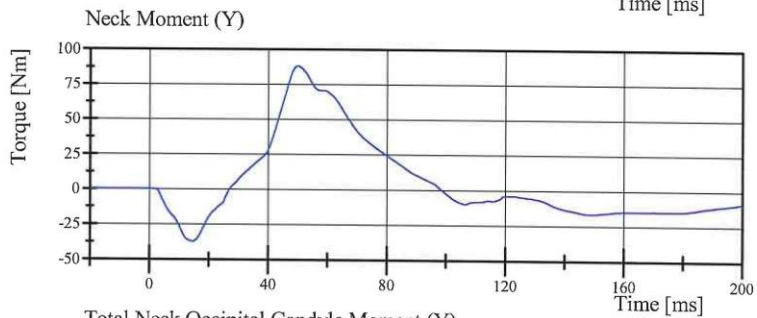
Test Date: 1/19/2015



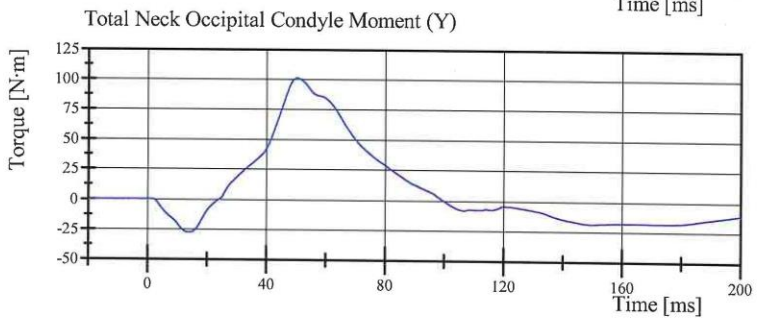
Filter Class: CFC_1000
Max: 180.7 N at 171.4 ms
Min: -897.4 N at 56.2 ms



Filter Class: CFC_600
Max: 180.5 N at 171.6 ms
Min: -897.0 N at 56.2 ms



Filter Class: CFC_600
Max: 88.2 Nm at 49.9 ms
Min: -37.5 Nm at 14.6 ms



Filter Class: Without_(Consta
Max: 100.8 N·m at 50.2 ms
Min: -27.7 N·m at 14.1 ms

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

01.19.2015 08:49:29 2946



Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 28-2

Test Date: 1/19/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-5.963 m/s	Yes
Pendulum Acceleration Decay			
Crossing 5g	38 - 46 ms	41.5 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	18.27 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	16.50 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	13.82 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	13.82 g	Yes
Total Head D-Plane Rotation			
Peak	81 - 106 °	97.3 °	Yes
Time of Peak	72 - 82 ms	77.0 ms	Yes
Total Head D-Plane Rotation			
Decay to 0°	147 - 174 ms	159.3 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	(-53) - (-80) N·m	-71.1 N·m	Yes
Time of Peak	65 - 79 ms	71.2 ms	Yes
Total Neck Occipital Condyles Moment			
Decay to 0 N·m	120 - 148 ms	143.3 ms	Yes

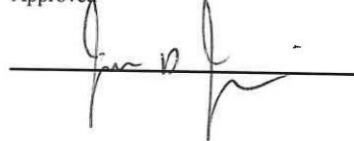
Test meets specifications.

Comments:

Technician



Approved



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

01.19.2015 10:09:31 3029

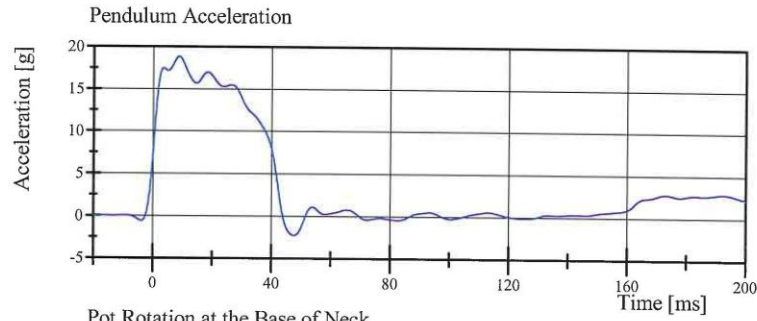


Transportation Research Center Inc.

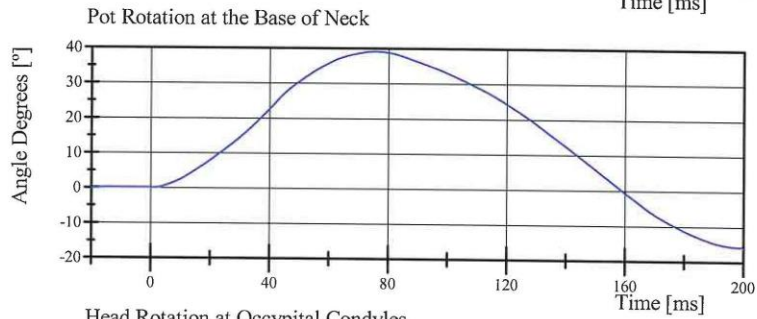
Neck Extension

HIII 50th Serial No. 037 Certification No. 28-2

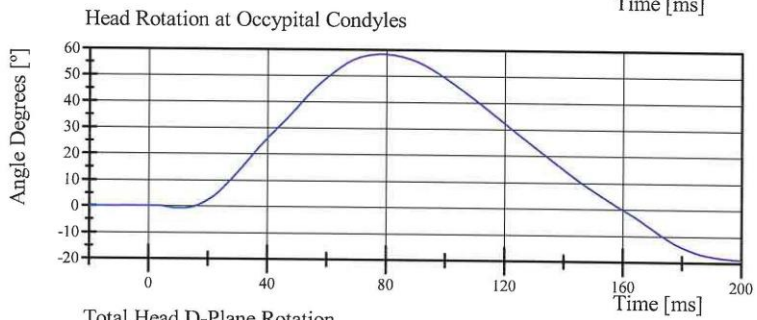
Test Date: 1/19/2015



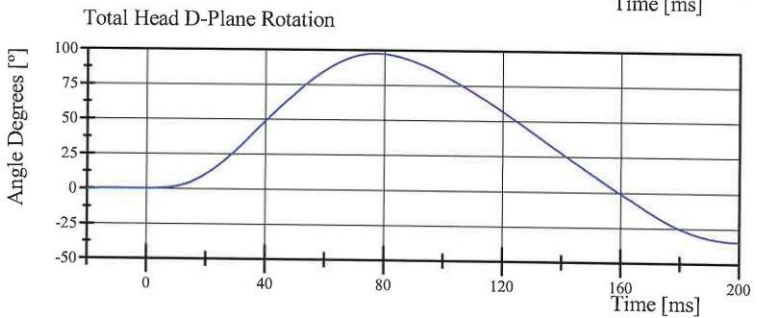
Filter Class: CFC_60
Max: 18.8 g at 8.7 ms
Min: -2.3 g at 47.6 ms



Filter Class: CFC_60
Max: 39.1 ° at 75.6 ms
Min: -15.9 ° at 199.4 ms



Filter Class: CFC_60
Max: 58.3 ° at 78.2 ms
Min: -18.9 ° at 200.0 ms



Filter Class: CFC_60
Max: 97.3 ° at 77.0 ms
Min: -34.8 ° at 199.8 ms

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

01.19.2015 10:09:38 3029

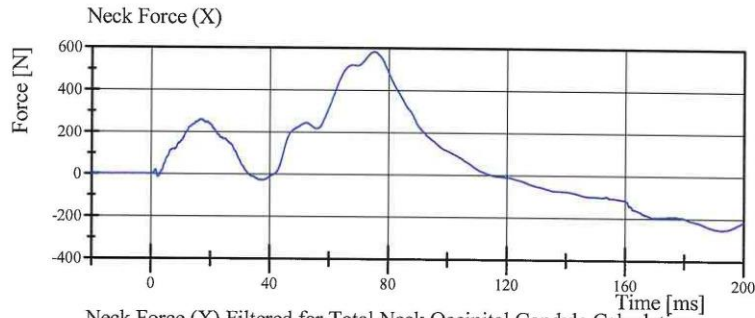


Transportation Research Center Inc.

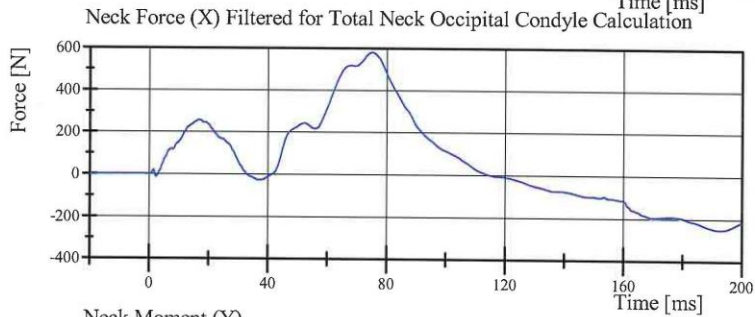
Neck Extension

HIII 50th Serial No. 037 Certification No. 28-2

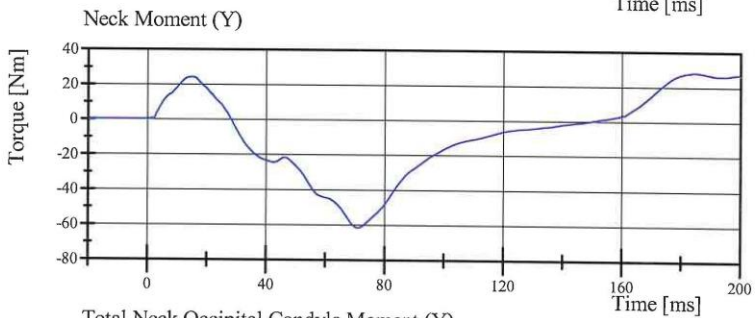
Test Date: 1/19/2015



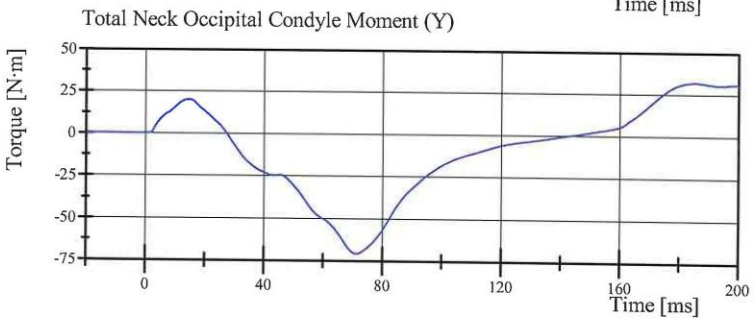
Filter Class: CFC_1000
Max: 582.0 N at 75.1 ms
Min: -254.4 N at 192.8 ms



Filter Class: CFC_600
Max: 581.5 N at 75.0 ms
Min: -253.7 N at 192.8 ms



Filter Class: CFC_600
Max: 28.0 Nm at 184.8 ms
Min: -61.7 Nm at 71.0 ms



Filter Class: Without_(Consta
Max: 31.9 N·m at 185.3 ms
Min: -71.1 N·m at 71.2 ms

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

01.19.2015 10:09:39 3029



Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 037 Certification No. 28-1

Test Date: 1/16/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.622 m/s	Yes
Probe Force Peak	(-5,160) - (-5,893) N	-5,541.0 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-69.78 mm	Yes
Internal Hysteresis	65 - 85 %	72.3 %	Yes

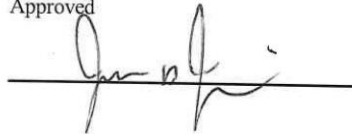
Test meets specifications.

Comments:

Technician



Approved



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

01.16.2015 13:01:34 362

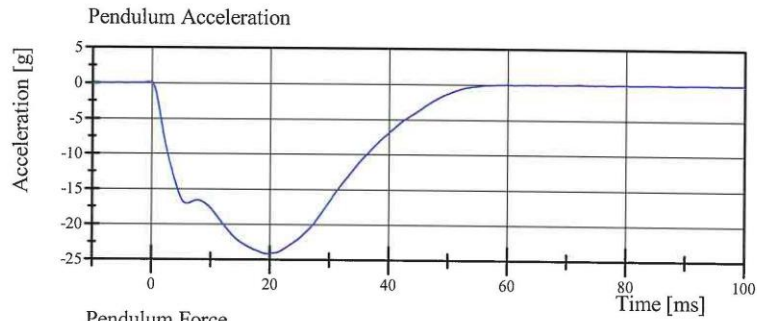


Transportation Research Center Inc.

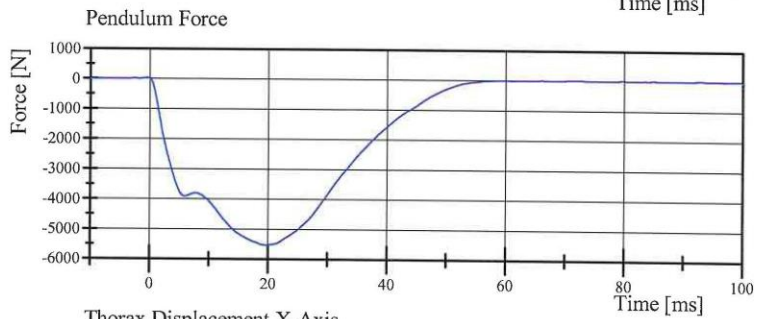
Front Thorax

HIII 50th Serial No. 037 Certification No. 28-1

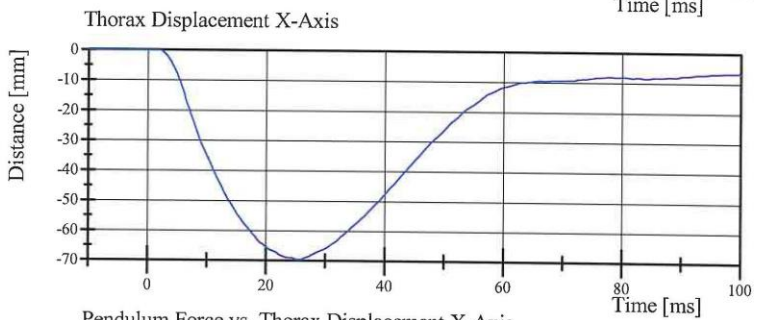
Test Date: 1/16/2015



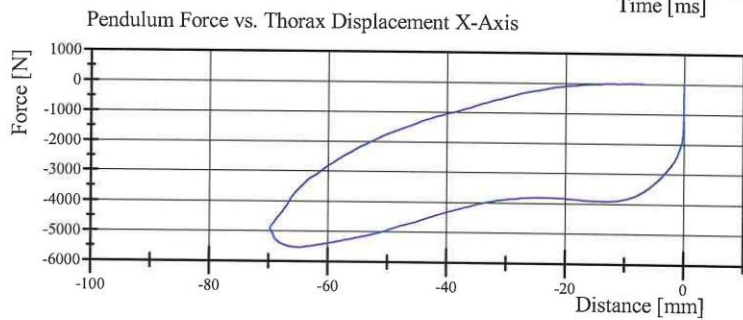
Filter Class: CFC_180
Max: 0.1 g at -0.4 ms
Min: -24.2 g at 19.6 ms



Filter Class: CFC_180
Max: 24.1 N at -0.4 ms
Min: -5,541.0 N at 19.6 ms



Filter Class: CFC_600
Max: 0.0 mm at -8.2 ms
Min: -69.8 mm at 25.5 ms



Filter Class: CFC_180
Max: 24.1 N at -0.0 mm
Min: -5,541.0 N at -64.9 mm

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

01.16.2015 13:01:46 362



Transportation Research Center Inc.

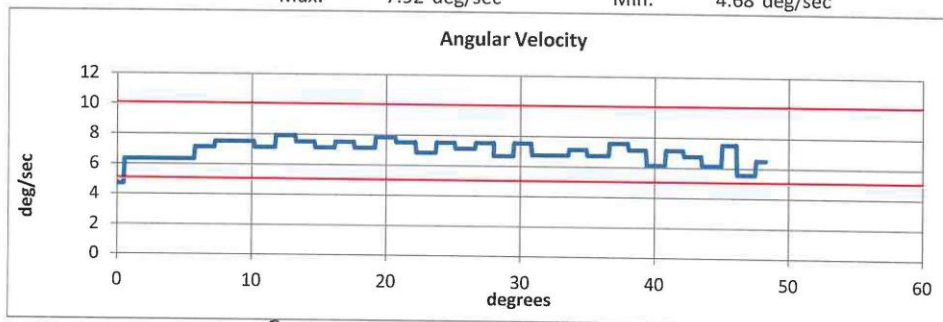
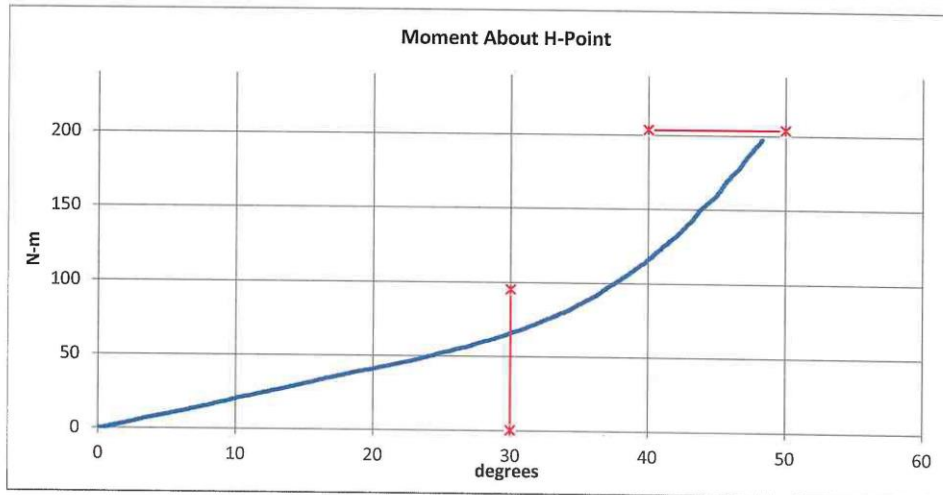
Hybrid III 50th Male Hip Range of Motion



Serial Number: 37
Test Number: 1
Comments: Left

Date: 16-Jan-2015
Time: 15:52

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.6 °C Pass
Humidity	10 - 70	36 % Pass
Moment at 30°	0 ≤ 94.9	65.82 N-m Pass
Angle at 203 Nm	40 - 50	48.78 deg Pass
Average Velocity	5 - 10	6.97 deg/sec Pass



Technician

Approved

Transportation Research Center Inc.

Hybrid III 50th Male Hip Range of Motion



Serial Number: 37

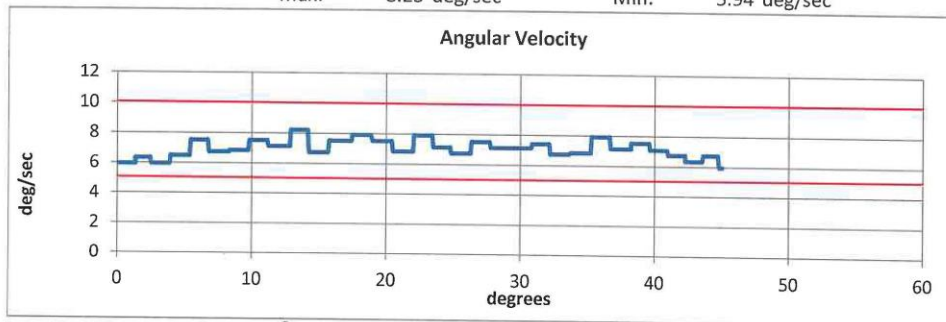
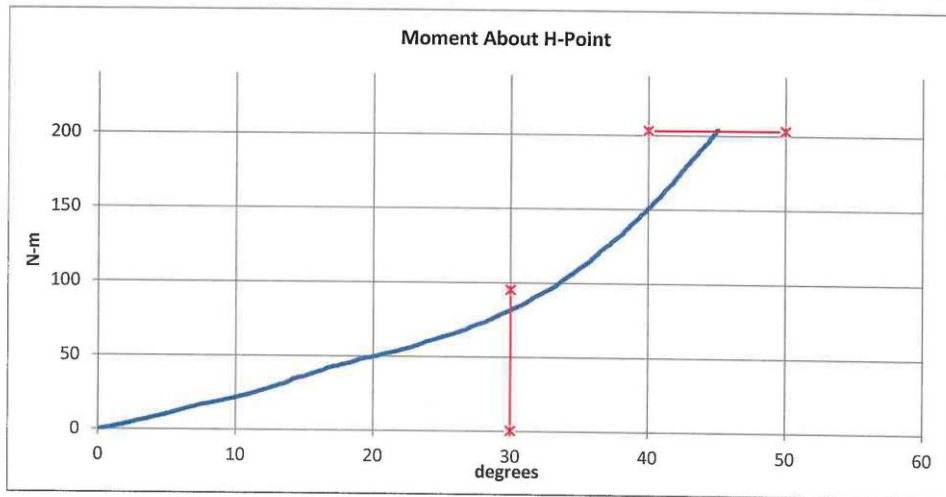
Date: 16-Jan-2015

Test Number: 1

Time: 16:22

Comments: Right

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.6 °C Pass
Humidity	10 - 70	36 % Pass
Moment at 30°	0 ≤ 94.9	81.5 N-m Pass
Angle at 203 Nm	40 - 50	45.06 deg Pass
Average Velocity	5 - 10	7.06 deg/sec Pass



Technician

Approved

Transportation Research Center Inc.

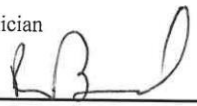
Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 28-2
Test Date: 1/16/2015

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.130 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,690.10 N	Yes

Test meets specifications.

Comments:

Technician



Approved



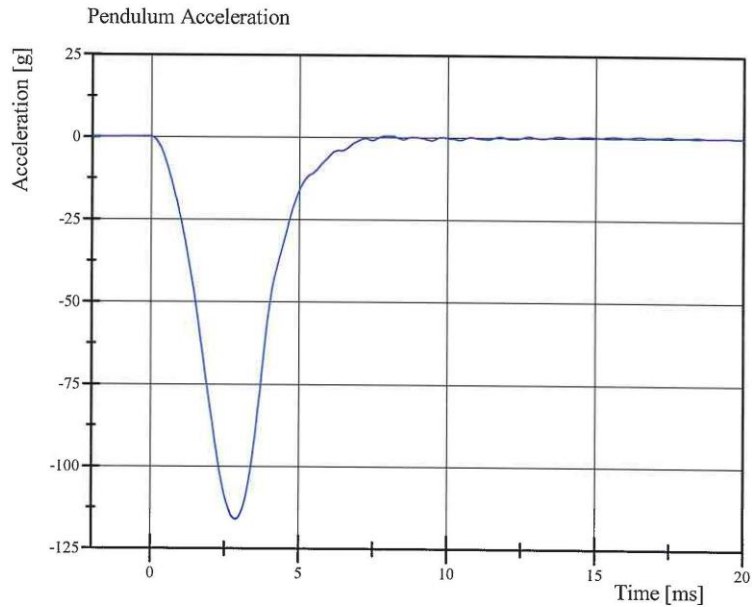
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

01.16.2015 14:03:25 1617

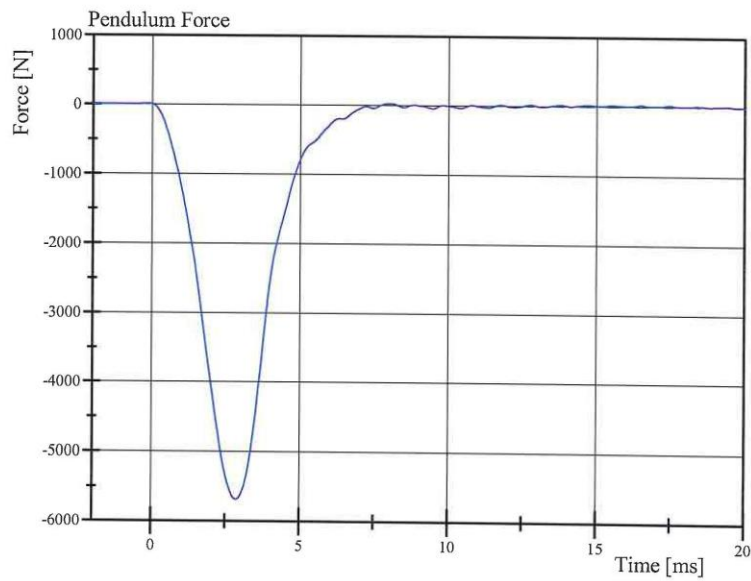


Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 28-2
Test Date: 1/16/2015



Filter Class: CFC_600
Max: 0.5 g at 8.1 ms
Min: -116.3 g at 2.9 ms



Filter Class: CFC_600
Max: 23.7 N at 8.1 ms
Min: -5,690.1 N at 2.9 ms

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

01.16.2015 14:03:34 1617



Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 28-1
Test Date: 1/16/2015

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.130 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,573.97 N	Yes

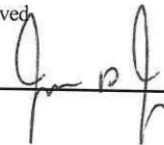
Test meets specifications.

Comments:

Technician



Approved



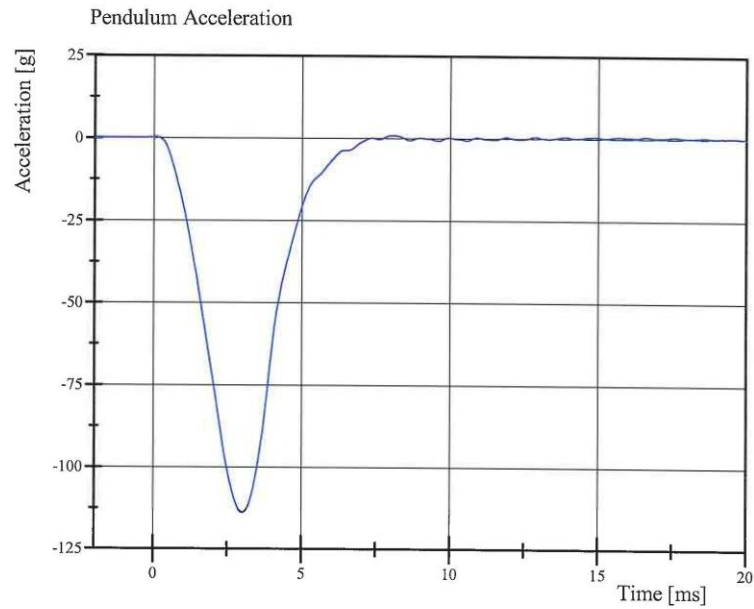
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

01.16.2015 13:49:34 1614

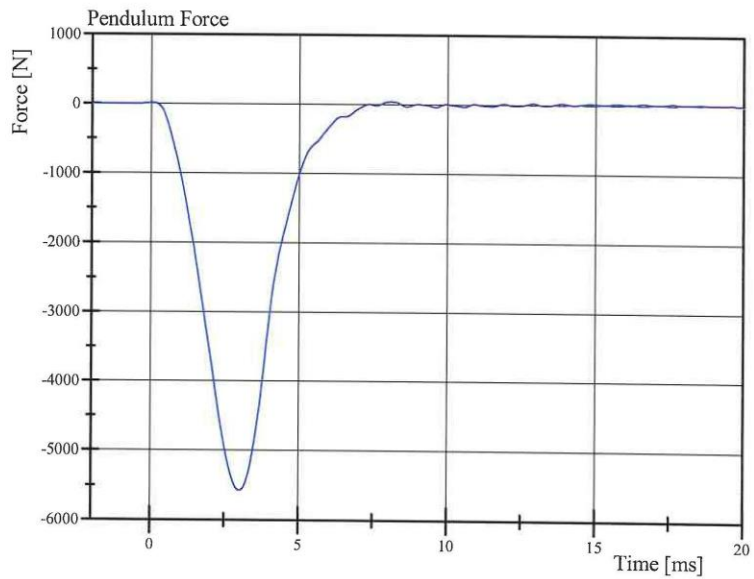


Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 28-1
Test Date: 1/16/2015



Filter Class: CFC_600
Max: 0.8 g at 8.0 ms
Min: -113.9 g at 3.0 ms



Filter Class: CFC_600
Max: 37.0 N at 8.0 ms
Min: -5,574.0 N at 3.0 ms

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

01.16.2015 13:49:48 1614



Pre-Test Calibration Sheets

Front Passenger S/N 426

Transportation Research Center Inc.
5720 HIII 5th Dummy
External Dimensions
Serial No. 426 Calibration No. 29

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	774.7 - 800.1	779	Yes
B	Shoulder Pivot Height	431.8 - 457.2	443	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	283	Yes
J	Elbow Rest Height	182.8 - 203.2	193	Yes
K	Buttock Knee Length	520.7 - 546.1	534	Yes
L	Popliteal Height	355.6 - 376.0	368	Yes
M	Knee Pivot Height	393.7 - 419.1	410	Yes
N	Buttock Popliteal Length	414.0 - 439.4	435	Yes
O	Chest Depth without Jacket	175.3 - 190.5	183	Yes
P	Foot Length	218.5 - 233.7	222	Yes
R	Buttock to Knee Pivot Length	457.2 - 482.6	473	Yes
S	Head Breadth	137.1 - 147.3	140	Yes
T	Head Depth	177.8 - 188.0	182	Yes
U	Hip Breadth	299.7 - 314.9	306	Yes
V	Shoulder Breadth	350.5 - 365.7	358	Yes
W	Foot Breadth	78.8 - 94.0	83	Yes
X	Head Circumference	528.3 - 548.7	539	Yes
Y	Chest Circumference with Jacket	850.9 - 881.3	865	Yes
Z	Waist Circumference	759.5 - 789.9	774	Yes
AA	Reference Location for Chest Circumference	332.7 - 358.1	345	Yes
BB	Reference Location for Waist Circumference	160.0 - 170.2	165	Yes

Technician

Melissa Schinker

Approved

John C. Still

Revised 8/10/12



Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 426 Certification No. 29-1

Test Date: 1/10/2015

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Peak Head Resultant Acceleration	250 - 300 g	273.6 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:

Technician

Melissa Schinker

Approved

John C. Stull

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

01.10.2015 09:13:38 608

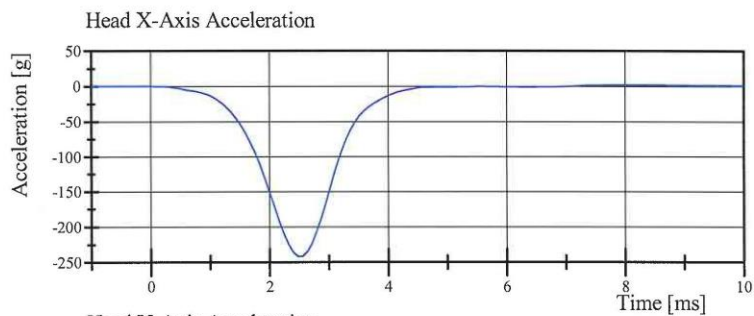


Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 426 Certification No. 29-1

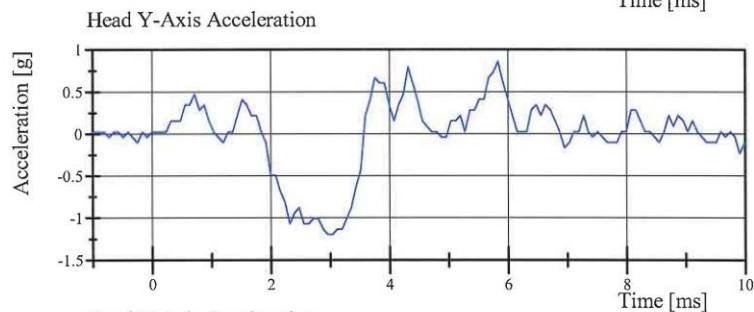
Test Date: 1/10/2015



Filter Class: CFC_1000

Max: 1.9 g at 8.4 ms

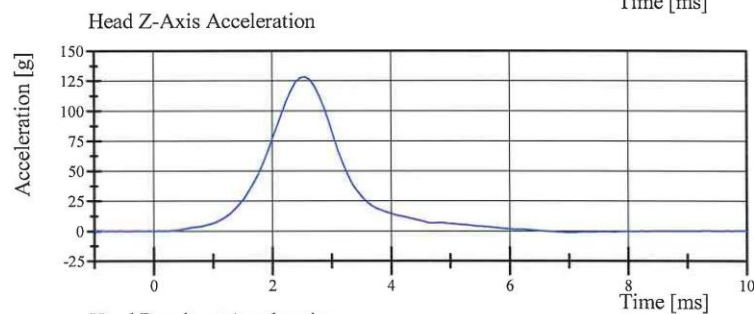
Min: -241.9 g at 2.5 ms



Filter Class: CFC_1000

Max: 0.9 g at 5.8 ms

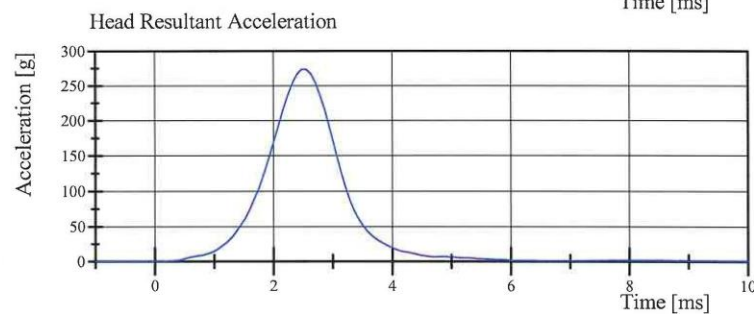
Min: -1.2 g at 3.0 ms



Filter Class: CFC_1000

Max: 128.3 g at 2.6 ms

Min: -1.1 g at 7.0 ms



Filter Class: CFC_1000

Max: 273.6 g at 2.6 ms

Min: 0.0 g at -0.6 ms

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

01.10.2015 09:14:07 608



Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 29-1

Test Date: 1/10/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	7.097 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	-4.80 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	(-5.8) - (-7.0) m/s	-6.78 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	73.4 N·m	Yes
Total Neck Occipital Condyles Moment Decay to 10 N·m	80 - 100 ms	85.8 ms	Yes

Test meets specifications.

Comments:

Technician

Melissa Schinckel

Approved

John Smith

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

01.10.2015 09:55:34 1700

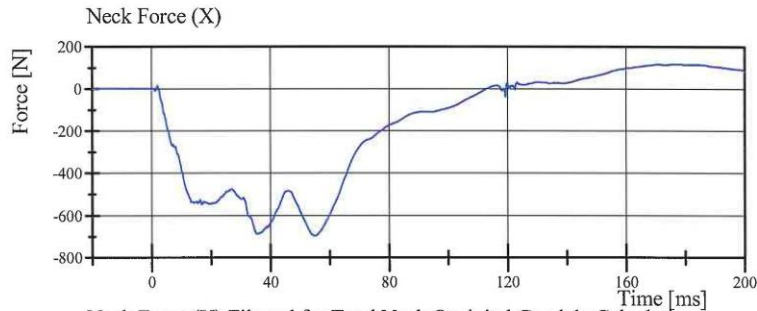


Transportation Research Center Inc.

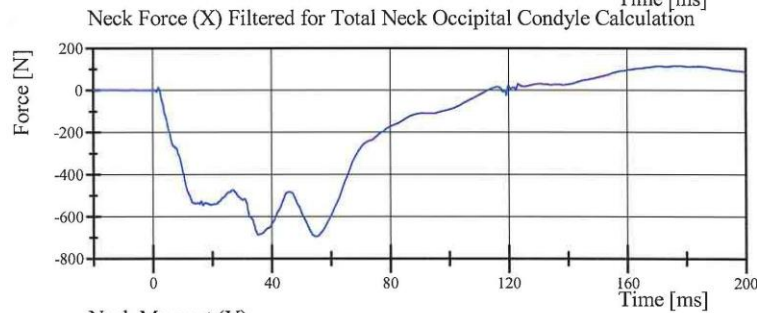
Neck Flexion

HIII 5th Serial No. 426 Certification No. 29-1

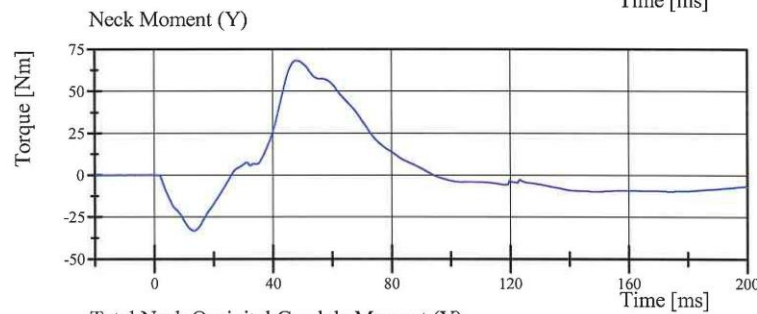
Test Date: 1/10/2015



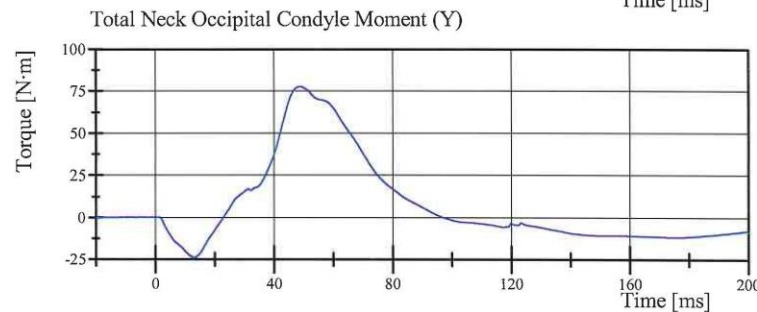
Filter Class: CFC_1000
Max: 115.7 N at 177.5 ms
Min: -696.1 N at 54.8 ms



Filter Class: CFC_600
Max: 115.0 N at 176.3 ms
Min: -695.7 N at 54.9 ms



Filter Class: CFC_600
Max: 68.0 Nm at 48.1 ms
Min: -33.4 Nm at 13.3 ms



Filter Class: Without_(Consta
Max: 77.4 N·m at 48.9 ms
Min: -24.0 N·m at 13.1 ms

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

01.10.2015 09:55:56 1700



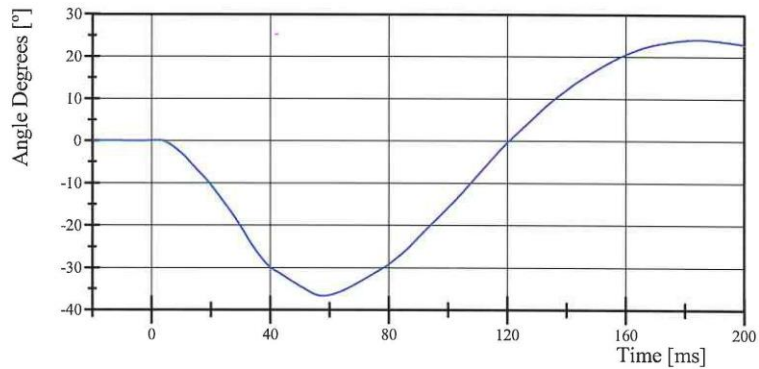
Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 29-1

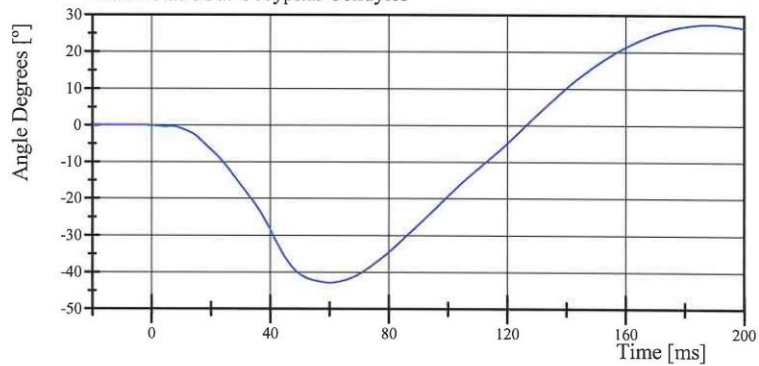
Test Date: 1/10/2015

Pot Rotation at the Base of Neck



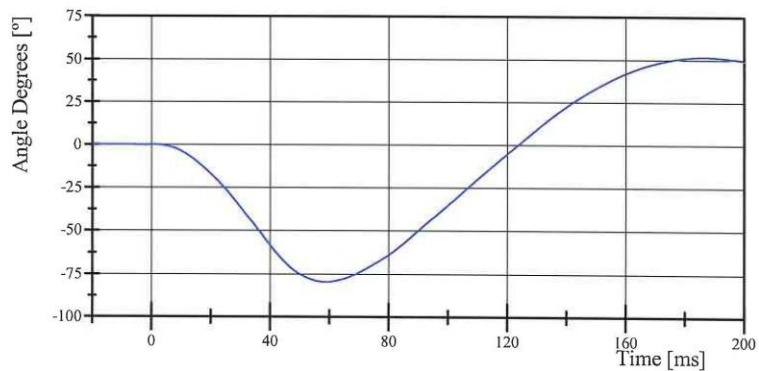
Filter Class: CFC_60
Max: 24.0 ° at 184.7 ms
Min: -36.7 ° at 57.8 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 27.4 ° at 188.3 ms
Min: -42.9 ° at 60.2 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 51.4 ° at 186.4 ms
Min: -79.5 ° at 58.9 ms

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

01.10.2015 09:55:54 1700

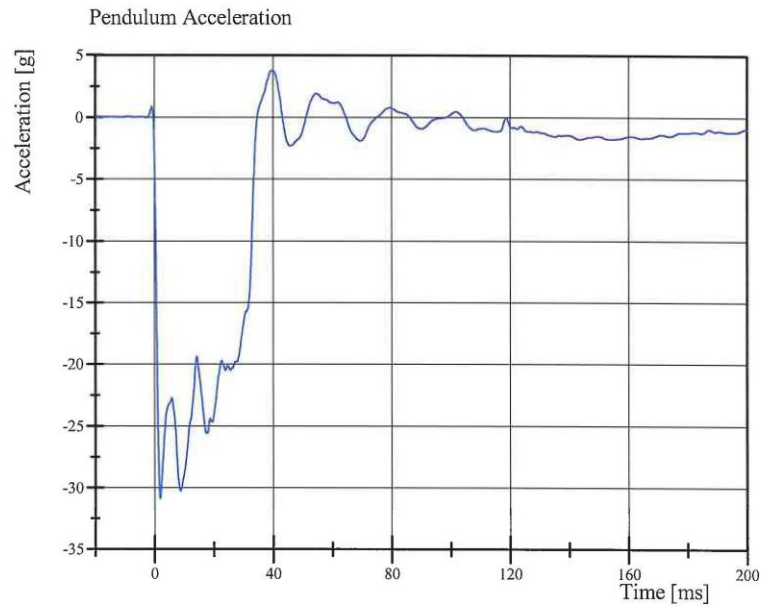


Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 29-1

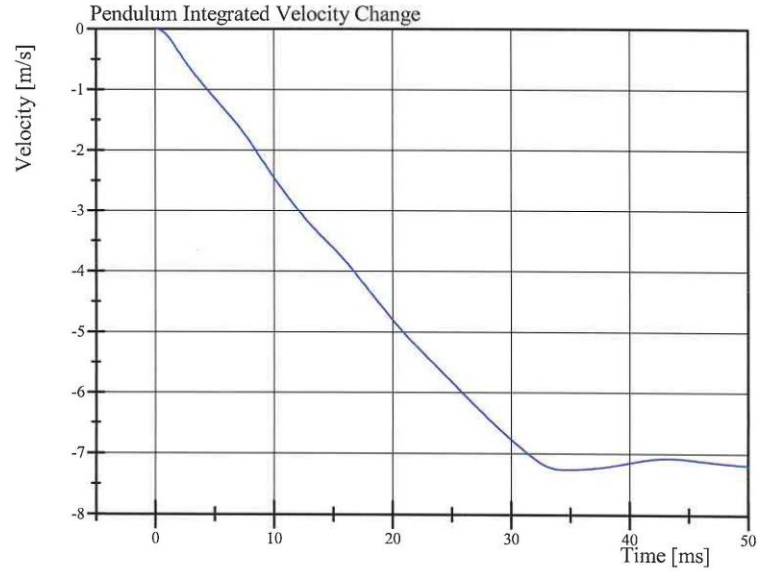
Test Date: 1/10/2015



Filter Class: CFC_180

Max: 3.7 g at 39.5 ms

Min: -30.9 g at 2.0 ms



Filter Class: CFC_180

Max: 0.0 m/s at 0.0 ms

Min: -7.3 m/s at 34.7 ms

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

01.10.2015 09:55:53 1700



Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 29-1

Test Date: 1/10/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Pendulum Velocity	(-5.95) - (-6.19) m/s	-6.116 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	3.62 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	4.6 - 5.6 m/s	5.23 m/s	Yes
Total Head D-Plane Rotation	99 - 114 °	103.0 °	Yes
Total Neck Occipital Condyles Moment Between 99° and 114° Rotation	(-53) - (-65) N·m	-57.0 N·m	Yes
Total Neck Occipital Condyles Moment Decay to -10 N·m	94 - 114 ms	102.9 ms	Yes

Test meets specifications.

Comments:

Technician

Melissa Schunke

Approved

John C. Still

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

01.10.2015 10:35:16 1830

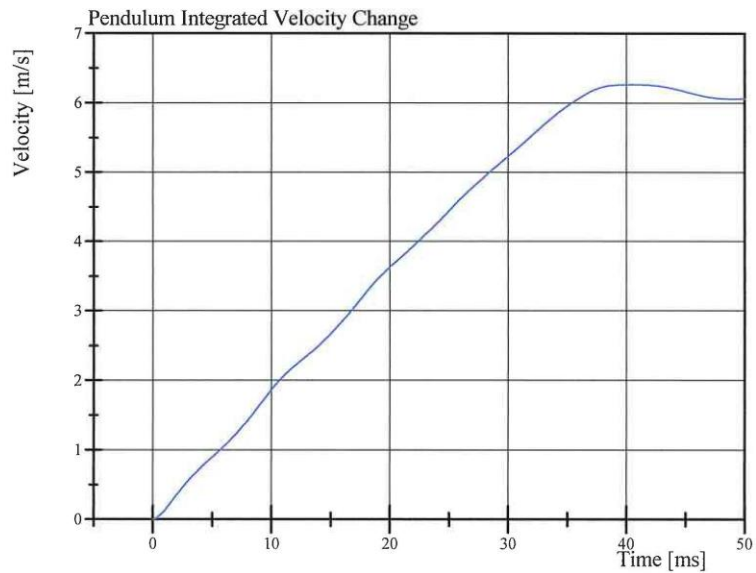
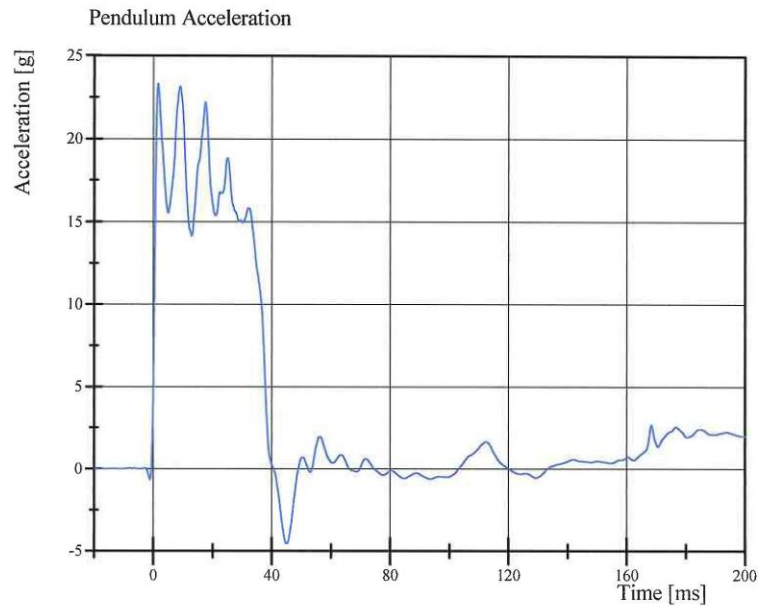


Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 29-1

Test Date: 1/10/2015



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

01.10.2015 10:35:23 1830



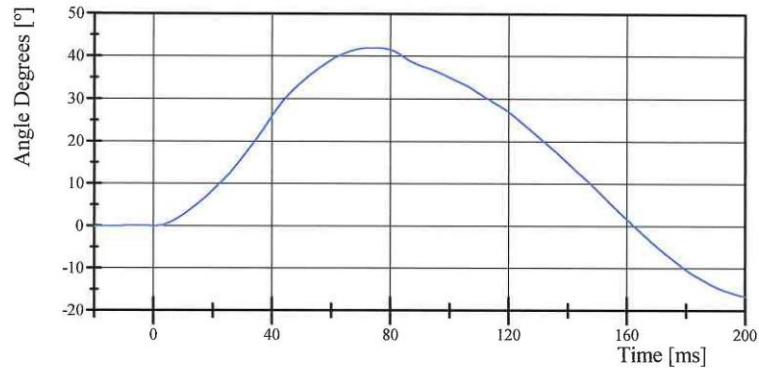
Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 29-1

Test Date: 1/10/2015

Pot Rotation at the Base of Neck

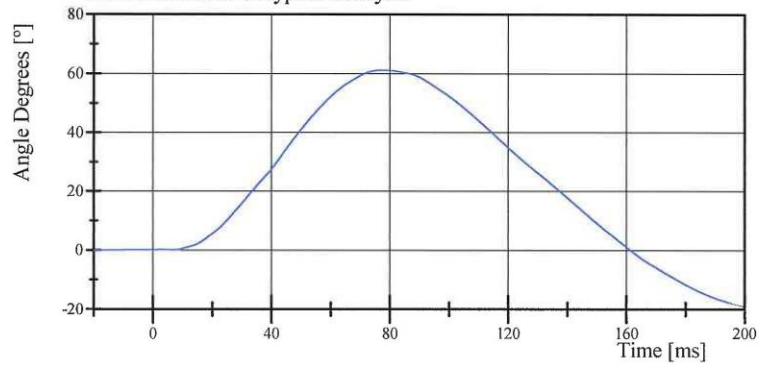


Filter Class: CFC_60

Max: 41.9 ° at 73.8 ms

Min: -16.7 ° at 200.0 ms

Head Rotation at Occypital Condyles

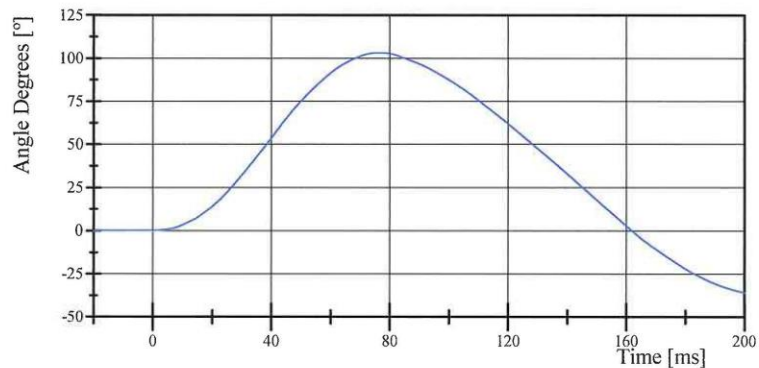


Filter Class: CFC_60

Max: 61.2 ° at 77.5 ms

Min: -19.1 ° at 200.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60

Max: 103.0 ° at 76.6 ms

Min: -35.8 ° at 200.0 ms

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

01.10.2015 10:35:24 1830

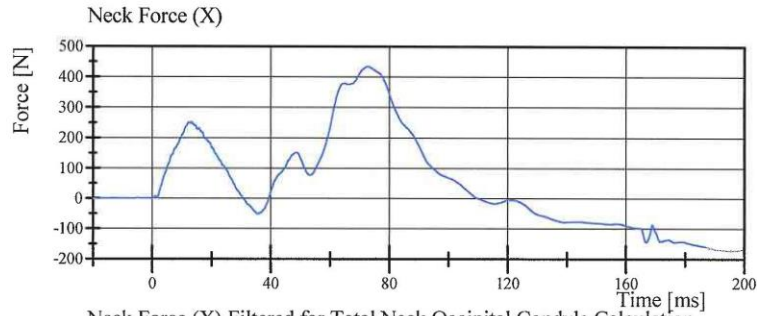


Transportation Research Center Inc.

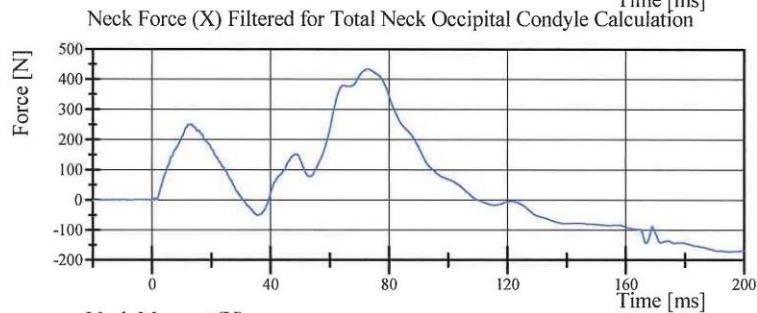
Neck Extension

HIII 5th Serial No. 426 Certification No. 29-1

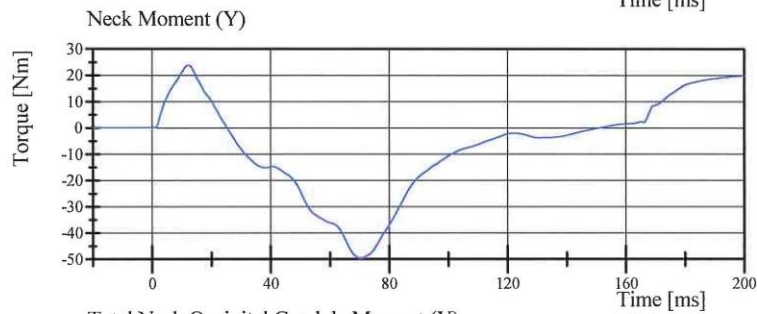
Test Date: 1/10/2015



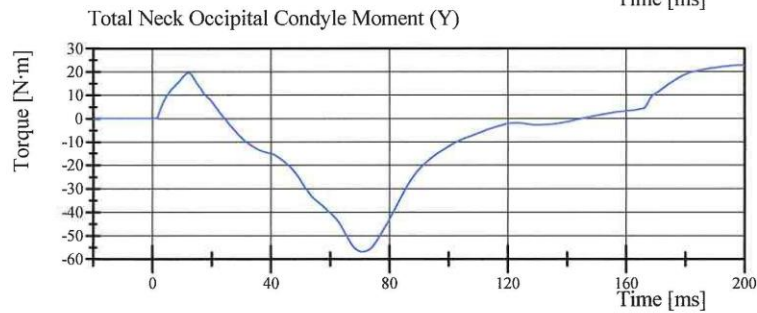
Filter Class: CFC_1000
Max: 434.3 N at 73.0 ms
Min: -172.8 N at 195.2 ms



Filter Class: CFC_600
Max: 433.7 N at 73.0 ms
Min: -172.2 N at 195.2 ms



Filter Class: CFC_600
Max: 23.8 Nm at 12.3 ms
Min: -49.5 Nm at 70.5 ms



Filter Class: Without (Consta
Max: 22.8 N·m at 200.0 ms
Min: -57.0 N·m at 70.8 ms

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

01.10.2015 10:35:25 1830



Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. 426 Certification No. 29-1

Test Date: 1/9/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.590 m/s	Yes
Probe Force Peak Between 50.0 mm and 58.0 mm Chest Deflection	(-3,900) - (-4,400) N	-4,167.0 N	Yes
Probe Force Peak Between 18.0 mm and 50.0 mm Chest Deflection	$\geq$ (-4,600) N	-4,327.9 N	Yes
Maximum Chest Compression	(-50) - (-58) mm	-50.2 mm	Yes
Internal Hysteresis	69 - 85 %	75.2 %	Yes

Test meets specifications.

Comments:

Technician

Melissa Schunker

Approved

John CSH

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

01.09.2015 14:44:50 328

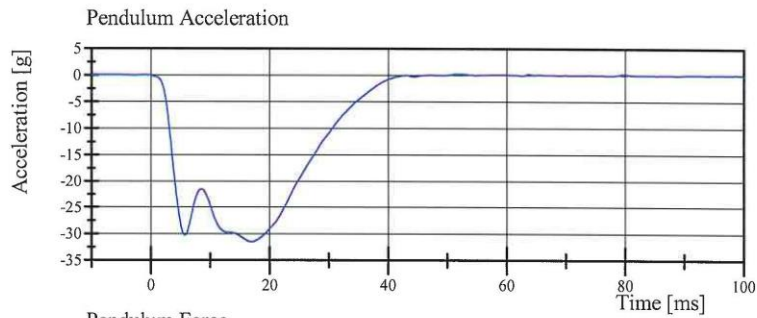


Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. 426 Certification No. 29-1

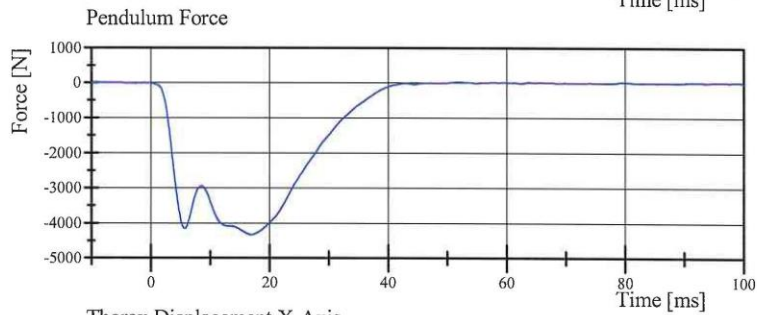
Test Date: 1/9/2015



Filter Class: CFC_180

Max: 0.2 g at 51.8 ms

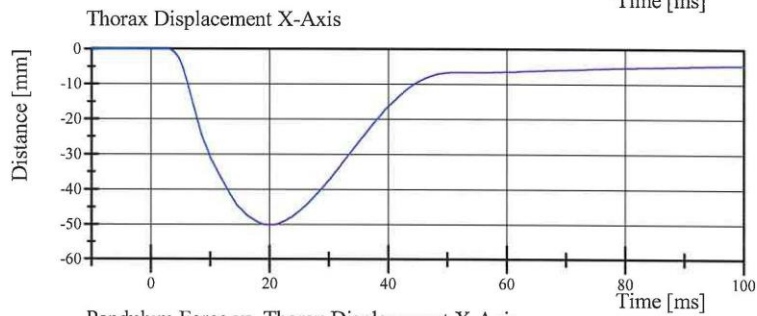
Min: -31.6 g at 17.0 ms



Filter Class: CFC_180

Max: 26.5 N at 51.8 ms

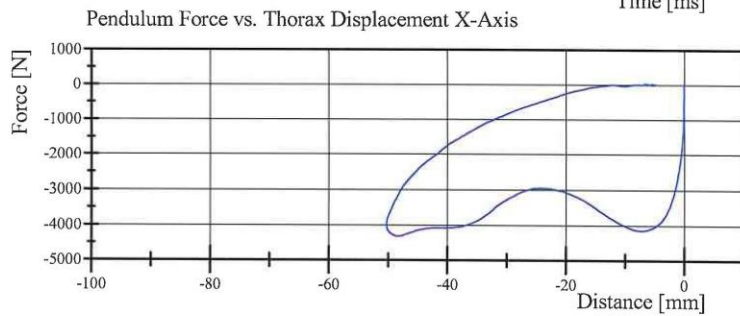
Min: -4,327.9 N at 17.0 ms



Filter Class: CFC_600

Max: 0.0 mm at -5.4 ms

Min: -50.2 mm at 19.9 ms



Filter Class: CFC_180

Max: 26.5 N at -6.6 mm

Min: -4,327.9 N at -48.3 mm

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

01.09.2015 14:45:04 328



Transportation Research Center Inc.

Hybrid III Small Female Torso Flexion

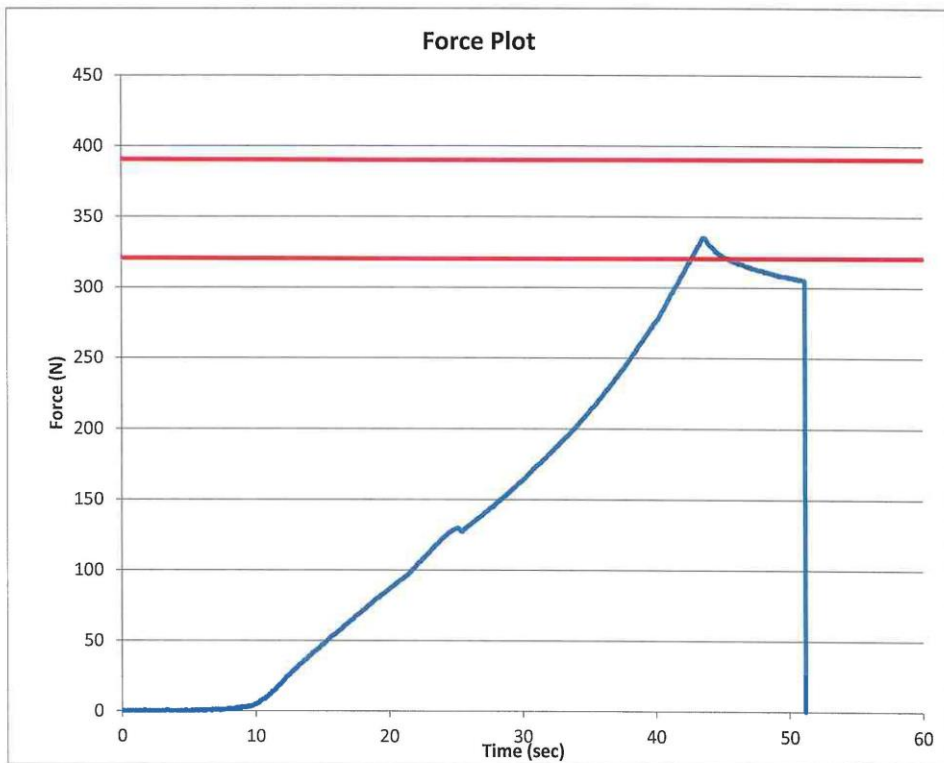


Serial Number: 426 Date: 1/9/2015

Test Number: 1 Time: 16:19

Comments:

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.4 °C Pass
Humidity	10 - 70	34 % Pass
Average Angular Velocity	0.5 - 1.5	0.91 deg/sec Pass
Initial Angle	0 - 20	14.3 deg Pass
Peak Force at 45.17°	320 - 390	335.07 N Pass
Final Angle	-8 - 8	5.16 deg Pass



Technician
Melissa Schunk

Approved
John C. Stiles

Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 29-2
Test Date: 1/10/2015

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.124 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-4,006.5 N	Yes

Test meets specifications.

Comments:

Technician

Melissa Schinker

Approved

John C. H.

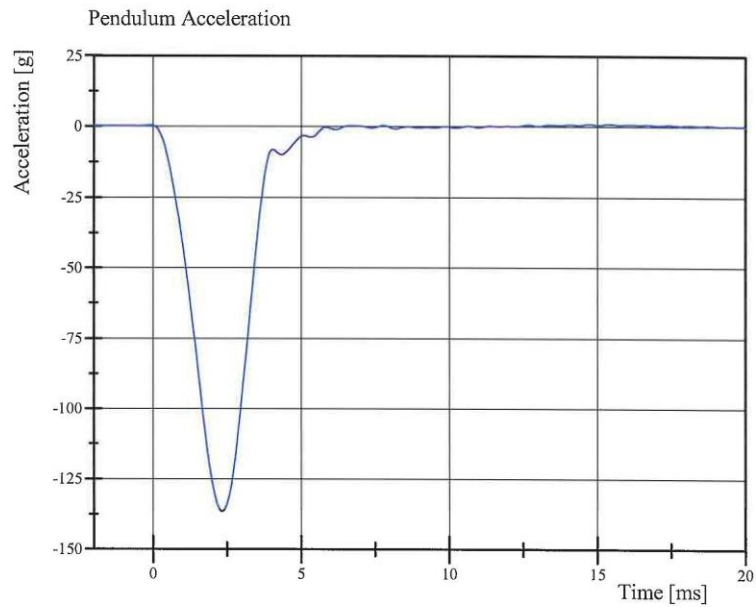
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

01.10.2015 11:08:56 1808

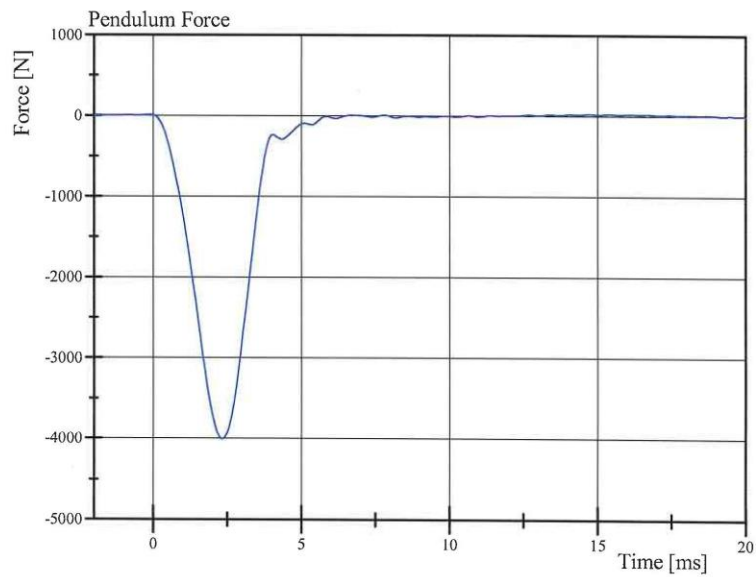


Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 29-2
Test Date: 1/10/2015



Filter Class: CFC_600
Max: 0.8 g at 14.7 ms
Min: -136.6 g at 2.3 ms



Filter Class: CFC_600
Max: 22.7 N at 14.7 ms
Min: -4,006.5 N at 2.3 ms

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

01.10.2015 11:09:22 1808



Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 29-1
Test Date: 1/10/2015

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.090 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,709.1 N	Yes

Test meets specifications.

Comments:

Technician

Melissa Schinker

Approved

John C. Stelly

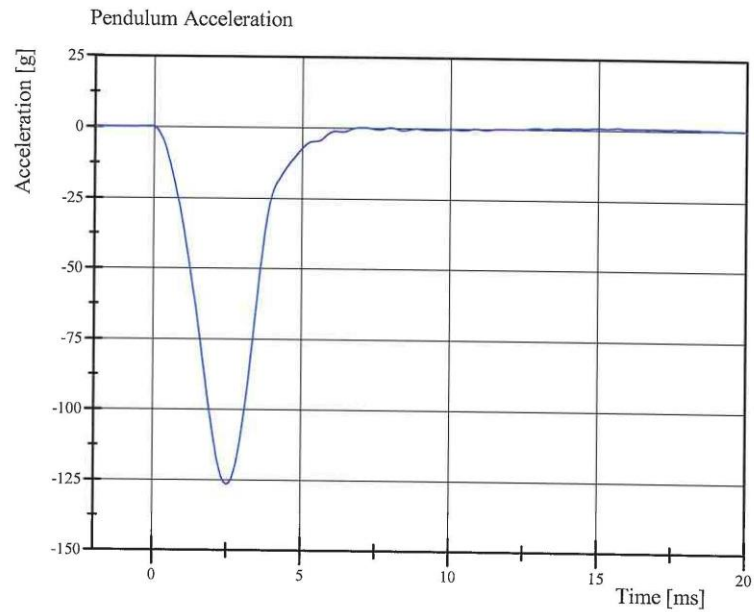
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

01.10.2015 10:44:58 1819

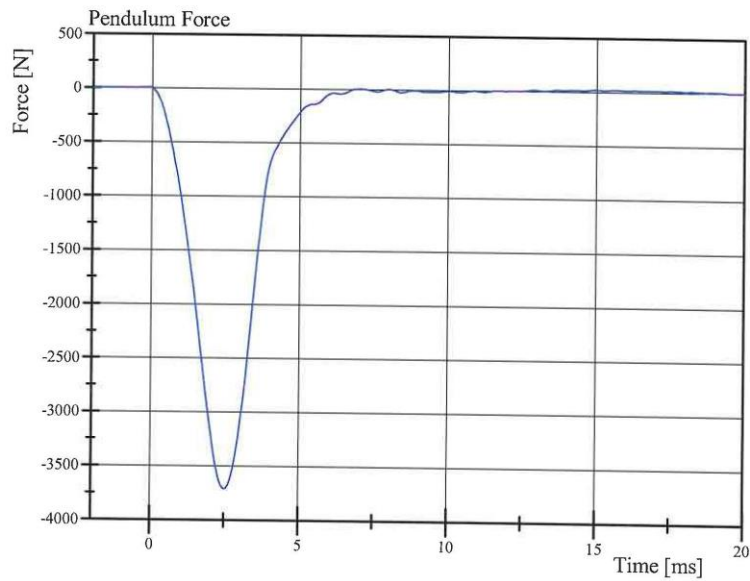


Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 29-1
Test Date: 1/10/2015



Filter Class: CFC_600
Max: 0.7 g at 15.6 ms
Min: -126.5 g at 2.5 ms



Filter Class: CFC_600
Max: 20.4 N at 15.6 ms
Min: -3,709.1 N at 2.5 ms

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

01.10.2015 10:45:10 1819



Post-Test Calibration Sheets

Passenger S/N 426

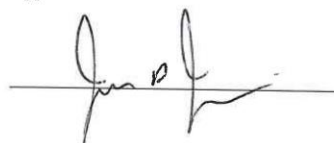
Transportation Research Center Inc.
5720 HIII 5th Dummy
External Dimensions
Serial No. 426 Calibration No. 30

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	131	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	283	Yes
J	Elbow Rest Height	182.8 - 203.2	192	Yes
K	Buttock Knee Length	520.7 - 546.1	534	Yes
L	Popliteal Height	355.6 - 376.0	368	Yes
M	Knee Pivot Height	393.7 - 419.1	410	Yes
N	Buttock Popliteal Length	414.0 - 439.4	435	Yes
O	Chest Depth without Jacket	175.3 - 190.5	185	Yes
P	Foot Length	218.5 - 233.7	222	Yes
R	Buttock to Knee Pivot Length	457.2 - 482.6	473	Yes
S	Head Breadth	137.1 - 147.3	140	Yes
T	Head Depth	177.8 - 188.0	182	Yes
U	Hip Breadth	299.7 - 314.9	306	Yes
V	Shoulder Breadth	350.5 - 365.7	358	Yes
W	Foot Breadth	78.8 - 94.0	83	Yes
X	Head Circumference	528.3 - 548.7	539	Yes
Y	Chest Circumference with Jacket	850.9 - 881.3	866	Yes
Z	Waist Circumference	759.5 - 789.9	774	Yes
AA	Reference Location for Chest Circumference	332.7 - 358.1	345	Yes
BB	Reference Location for Waist Circumference	160.0 - 170.2	165	Yes

Technician



Approved



Revised 8/10/12



Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 426 Certification No. 30-1

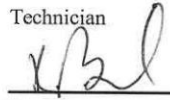
Test Date: 1/16/2015

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Peak Head Resultant Acceleration	250 - 300 g	275.2 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	5.9 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician



Approved



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

01.16.2015 12:37:51 606

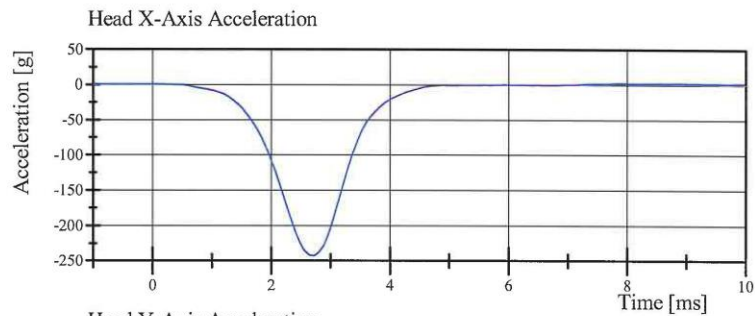


Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 426 Certification No. 30-1

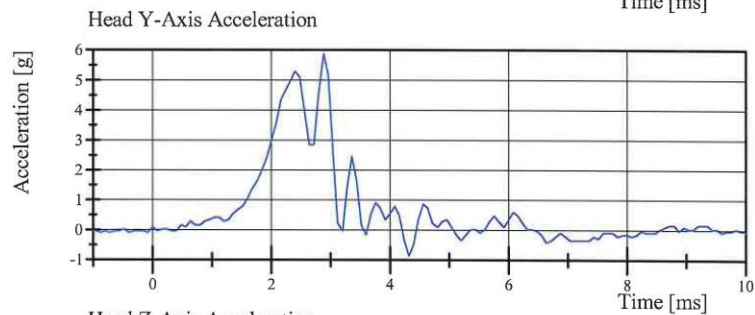
Test Date: 1/16/2015



Filter Class: CFC_1000

Max: 1.8 g at 8.9 ms

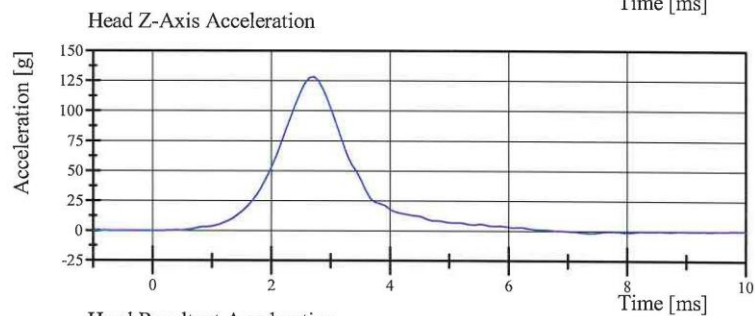
Min: -243.4 g at 2.7 ms



Filter Class: CFC_1000

Max: 5.9 g at 2.9 ms

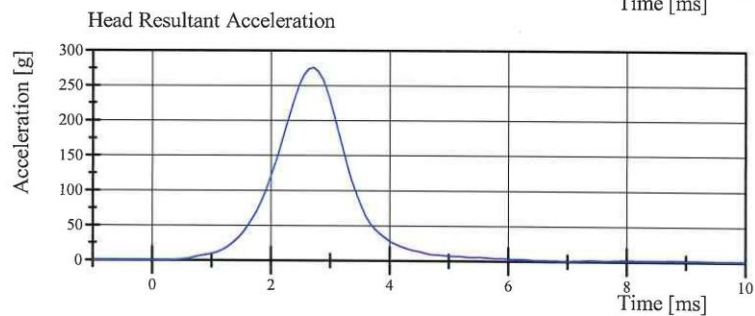
Min: -0.9 g at 4.3 ms



Filter Class: CFC_1000

Max: 128.5 g at 2.7 ms

Min: -1.9 g at 7.4 ms



Filter Class: CFC_1000

Max: 275.2 g at 2.7 ms

Min: 0.0 g at -0.5 ms

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

01.16.2015 12:37:58 606



Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 30-3

Test Date: 1/16/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	7.098 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	(-2.1) - (-2.5) m/s	-2.46 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	(-4.0) - (-5.0) m/s	-4.76 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) °	-77.9 °	Yes
Total Neck Occipital Condyles Moment Between -77° and -91° Rotation	69 - 83 N·m	73.6 N·m	Yes
Total Neck Occipital Condyles Moment Decay to 10 N·m	80 - 100 ms	86.0 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



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

01.16.2015 14:01:57 1698

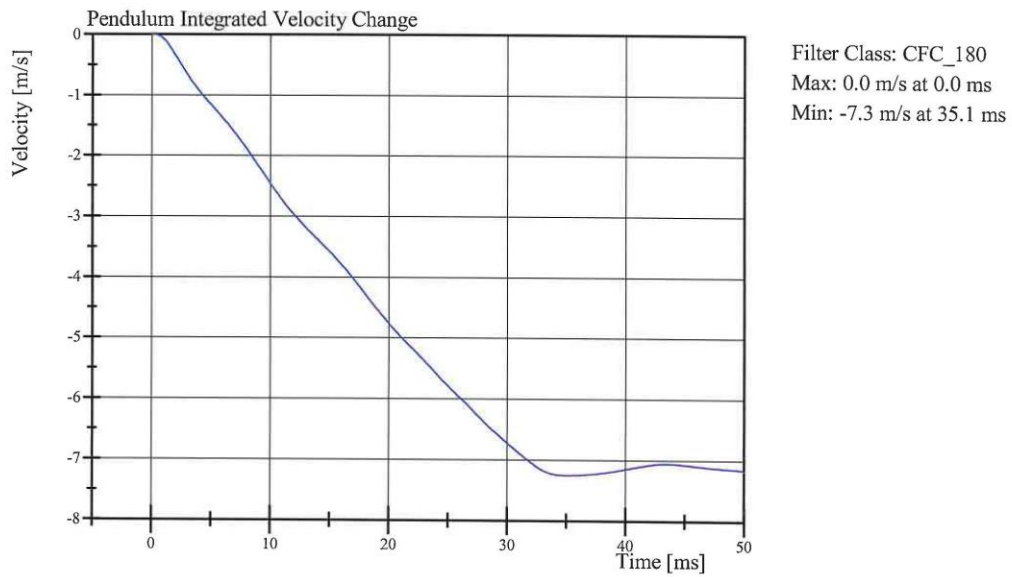
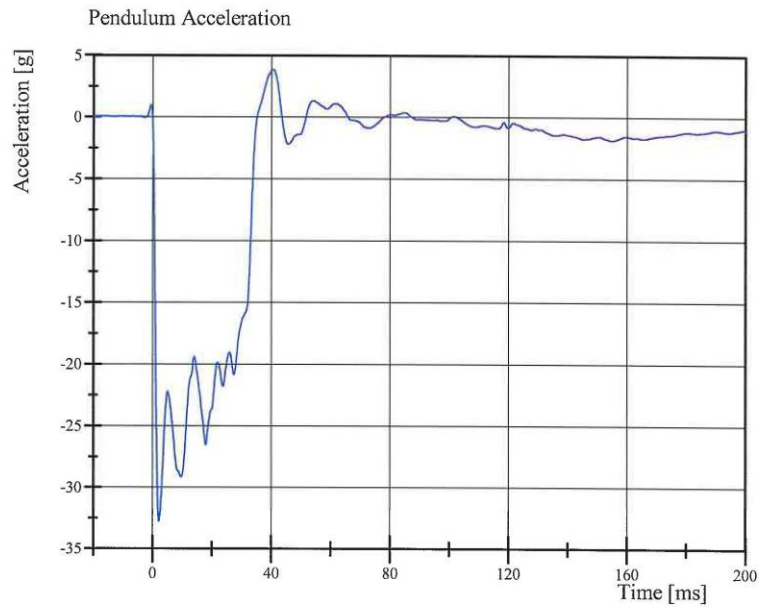


Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 30-3

Test Date: 1/16/2015



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

01.16.2015 14:02:04 1698



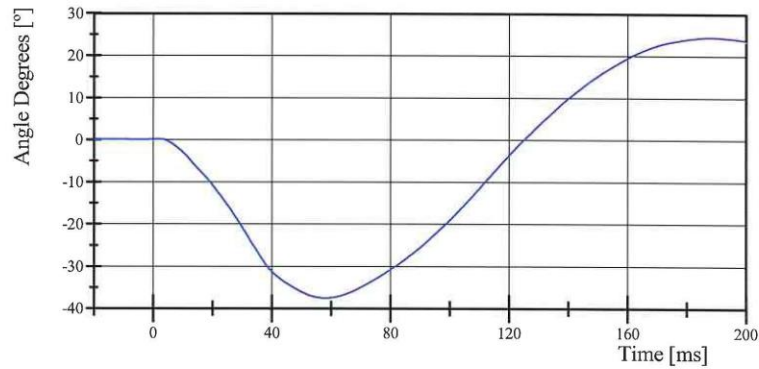
Transportation Research Center Inc.

Neck Flexion

HIH 5th Serial No. 426 Certification No. 30-3

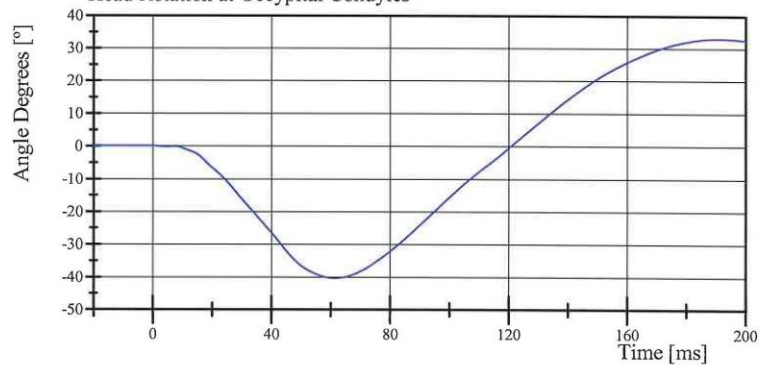
Test Date: 1/16/2015

Pot Rotation at the Base of Neck



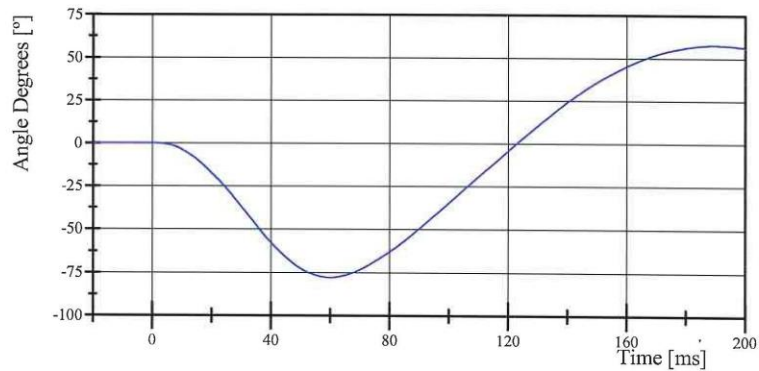
Filter Class: CFC_60
Max: 24.3 ° at 188.0 ms
Min: -37.5 ° at 58.0 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 33.0 ° at 190.8 ms
Min: -40.5 ° at 61.1 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 57.3 ° at 189.2 ms
Min: -77.9 ° at 60.0 ms

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

01.16.2015 14:02:05 1698

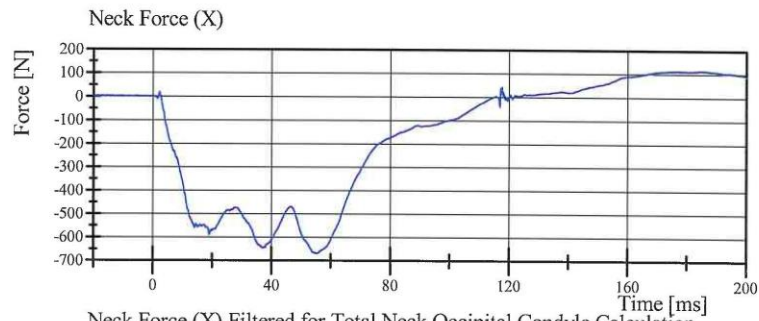


Transportation Research Center Inc.

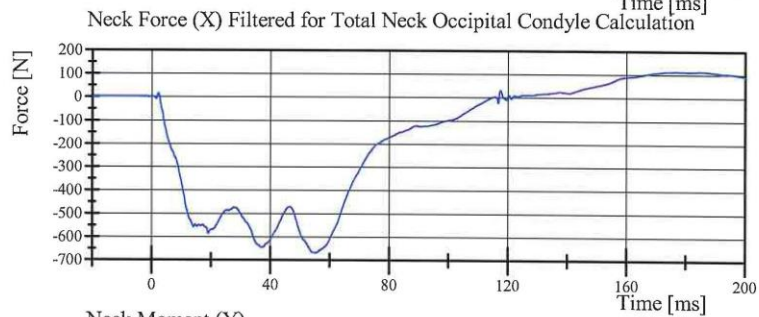
Neck Flexion

HIII 5th Serial No. 426 Certification No. 30-3

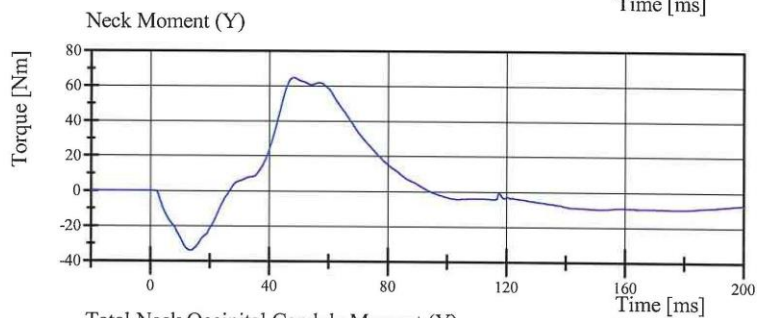
Test Date: 1/16/2015



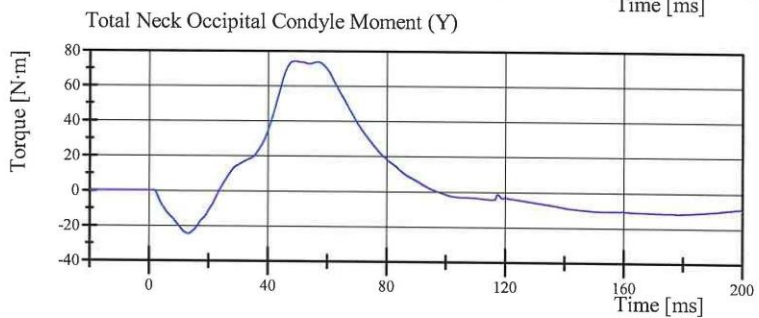
Filter Class: CFC_1000
Max: 113.0 N at 184.3 ms
Min: -670.5 N at 55.2 ms



Filter Class: CFC_600
Max: 112.5 N at 184.2 ms
Min: -669.5 N at 55.2 ms



Filter Class: CFC_600
Max: 64.8 Nm at 48.1 ms
Min: -34.2 Nm at 13.5 ms



Filter Class: Without_(Consta
Max: 74.0 N·m at 48.8 ms
Min: -24.6 N·m at 13.2 ms

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

01.16.2015 14:02:06 1698



Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 30-1

Test Date: 1/16/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Velocity	(-5.95) - (-6.19) m/s	-6.107 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	1.5 - 1.9 m/s	1.89 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	3.1 - 3.9 m/s	3.86 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	4.6 - 5.6 m/s	5.57 m/s	Yes
Total Head D-Plane Rotation	99 - 114 °	106.1 °	Yes
Total Neck Occipital Condyles Moment Between 99° and 114° Rotation	(-53) - (-65) N·m	-59.7 N·m	Yes
Total Neck Occipital Condyles Moment Decay to -10 N·m	94 - 114 ms	102.1 ms	Yes

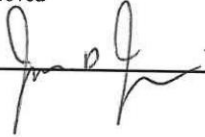
Test meets specifications.

Comments:

Technician



Approved



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

01.16.2015 14:38:14 1816

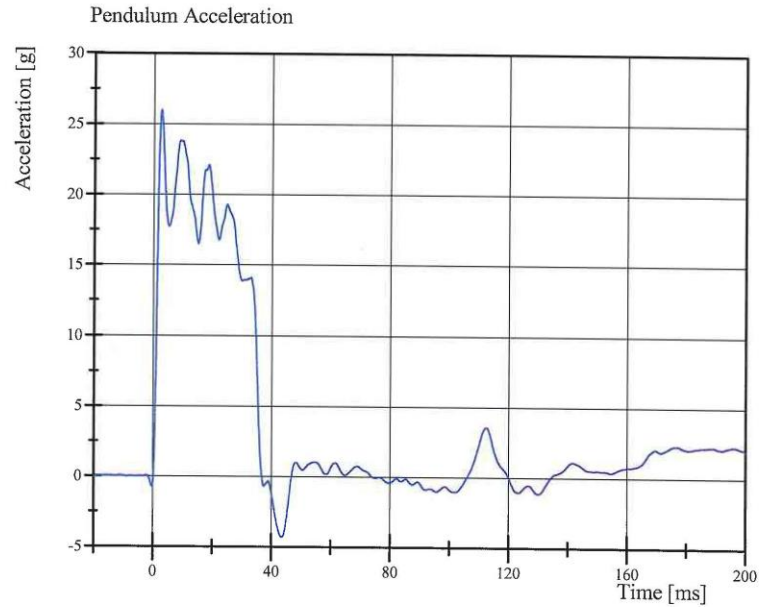


Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 30-1

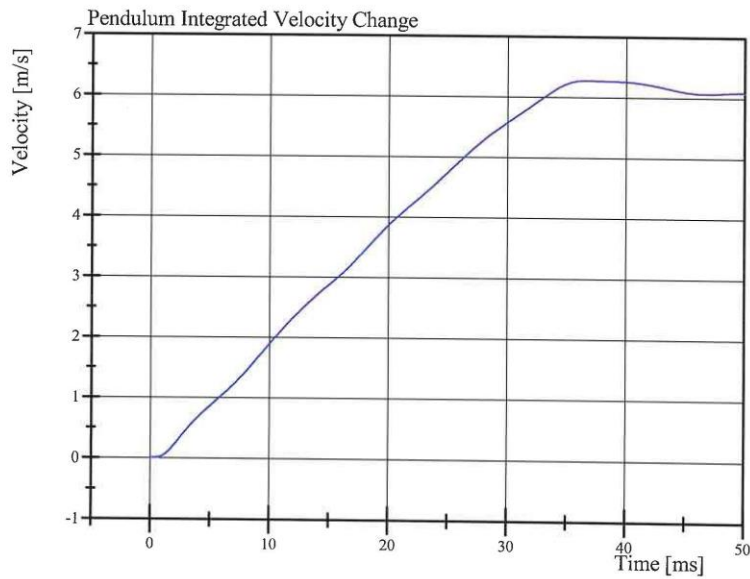
Test Date: 1/16/2015



Filter Class: CFC_180

Max: 25.9 g at 2.5 ms

Min: -4.3 g at 43.4 ms



Filter Class: CFC_180

Max: 6.3 m/s at 36.7 ms

Min: -0.0 m/s at 0.1 ms

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

01.16.2015 14:38:21 1816



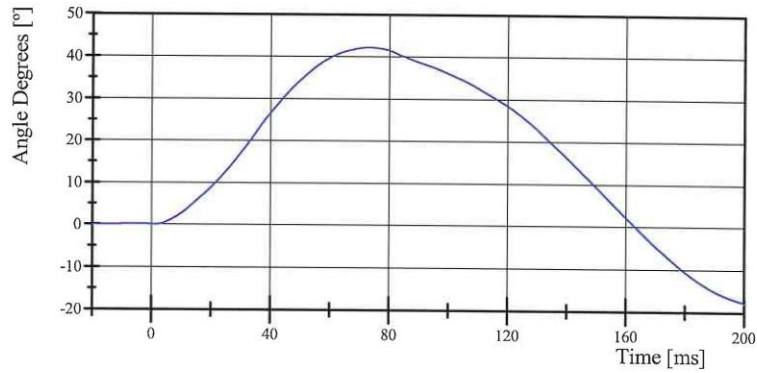
Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 30-1

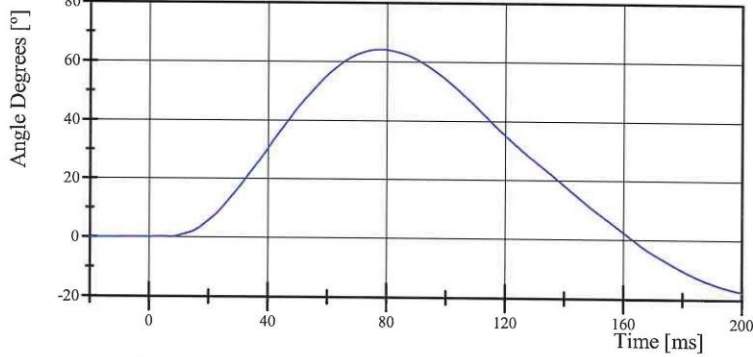
Test Date: 1/16/2015

Pot Rotation at the Base of Neck



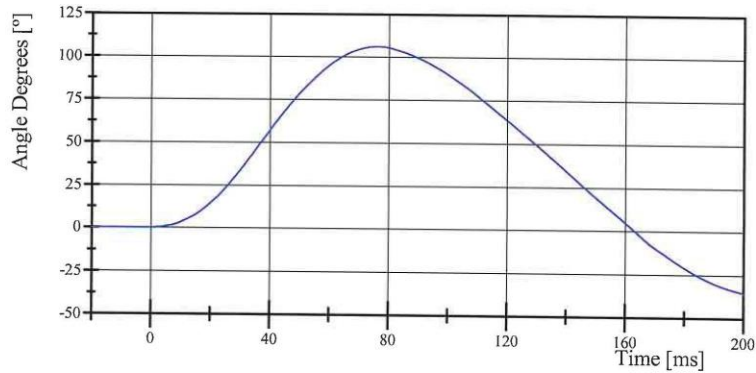
Filter Class: CFC_60
Max: 42.1 ° at 73.2 ms
Min: -17.8 ° at 200.0 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 64.2 ° at 77.7 ms
Min: -17.6 ° at 200.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 106.1 ° at 76.2 ms
Min: -35.5 ° at 200.0 ms

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

01.16.2015 14:38:21 1816

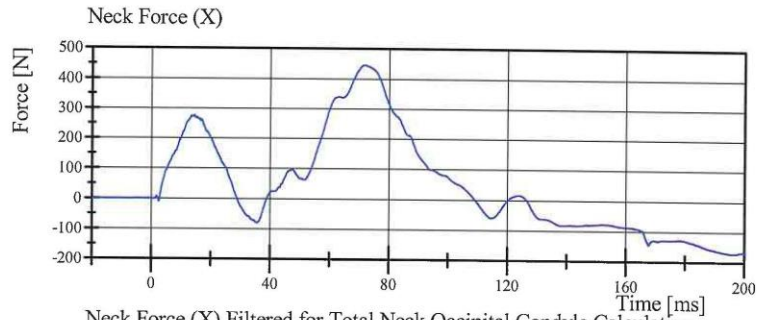


Transportation Research Center Inc.

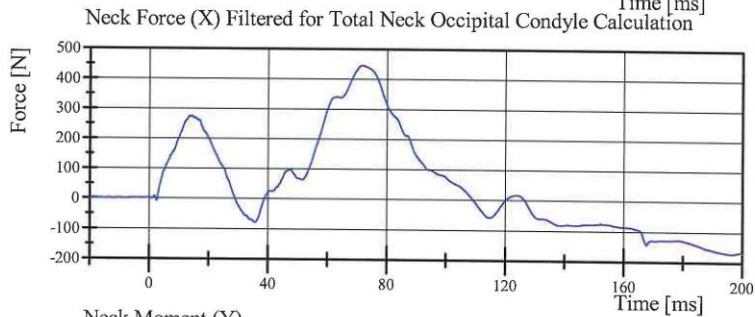
Neck Extension

HIII 5th Serial No. 426 Certification No. 30-1

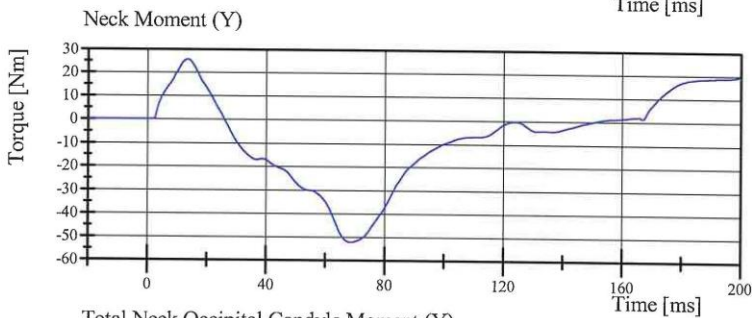
Test Date: 1/16/2015



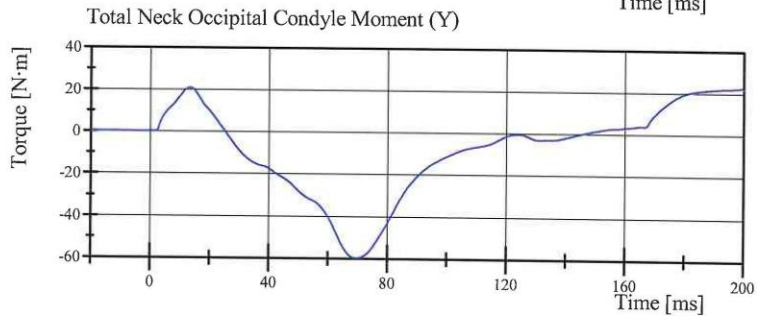
Filter Class: CFC_1000
Max: 446.4 N at 71.7 ms
Min: -173.0 N at 196.9 ms



Filter Class: CFC_600
Max: 445.5 N at 71.7 ms
Min: -172.6 N at 196.5 ms



Filter Class: CFC_600
Max: 25.6 Nm at 13.3 ms
Min: -52.3 Nm at 68.7 ms



Filter Class: Without_(Consta
Max: 22.4 N·m at 200.0 ms
Min: -59.7 N·m at 69.6 ms

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

01.16.2015 14:38:22 1816



Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. 426 Certification No. 30-2

Test Date: 1/16/2015

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.610 m/s	Yes
Probe Force Peak Between 50.0 mm and 58.0 mm Chest Deflection	(-3,900) - (-4,400) N	-4,297.1 N	Yes
Probe Force Peak Between 18.0 mm and 50.0 mm Chest Deflection	$\geq$ (-4,600) N	-4,422.8 N	Yes
Maximum Chest Compression	(-50) - (-58) mm	-50.7 mm	Yes
Internal Hysteresis	69 - 85 %	75.1 %	Yes

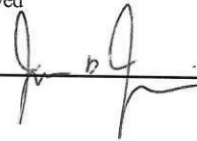
Test meets specifications.

Comments:

Technician



Approved



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

01.16.2015 11:35:34 417

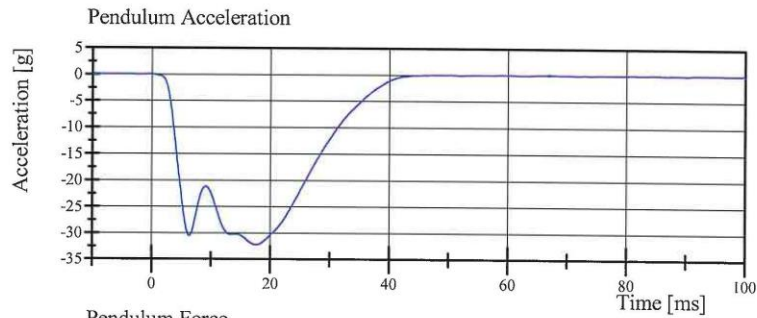


Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. 426 Certification No. 30-2

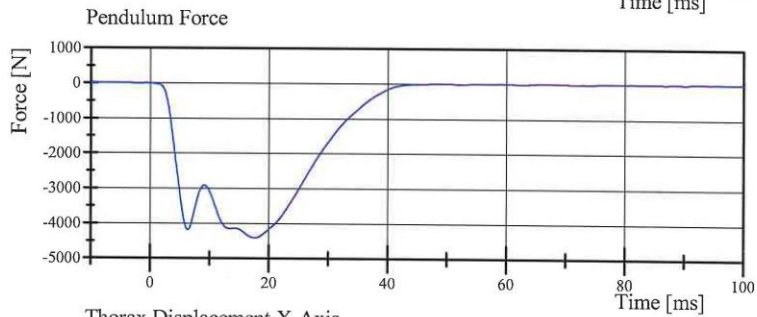
Test Date: 1/16/2015



Filter Class: CFC_180

Max: 0.1 g at 67.0 ms

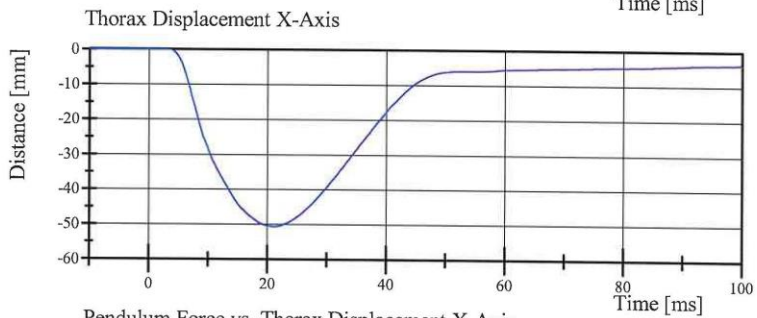
Min: -32.3 g at 17.6 ms



Filter Class: CFC_180

Max: 13.0 N at 67.0 ms

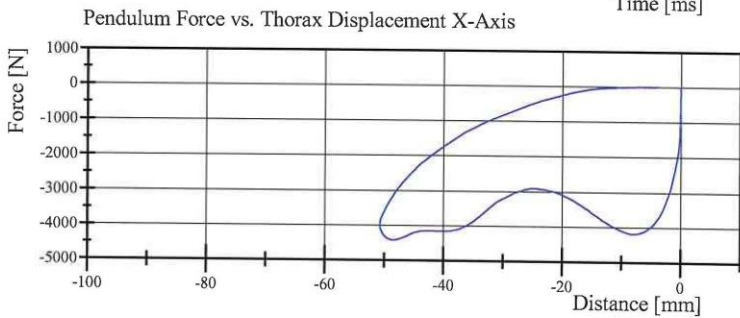
Min: -4,422.8 N at 17.6 ms



Filter Class: CFC_600

Max: 0.0 mm at -5.0 ms

Min: -50.7 mm at 21.1 ms



Filter Class: CFC_180

Max: 13.0 N at -5.3 mm

Min: -4,422.8 N at -48.4 mm

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

01.16.2015 11:35:42 417



Transportation Research Center Inc.

Hybrid III Small Female Torso Flexion



Serial Number: 426

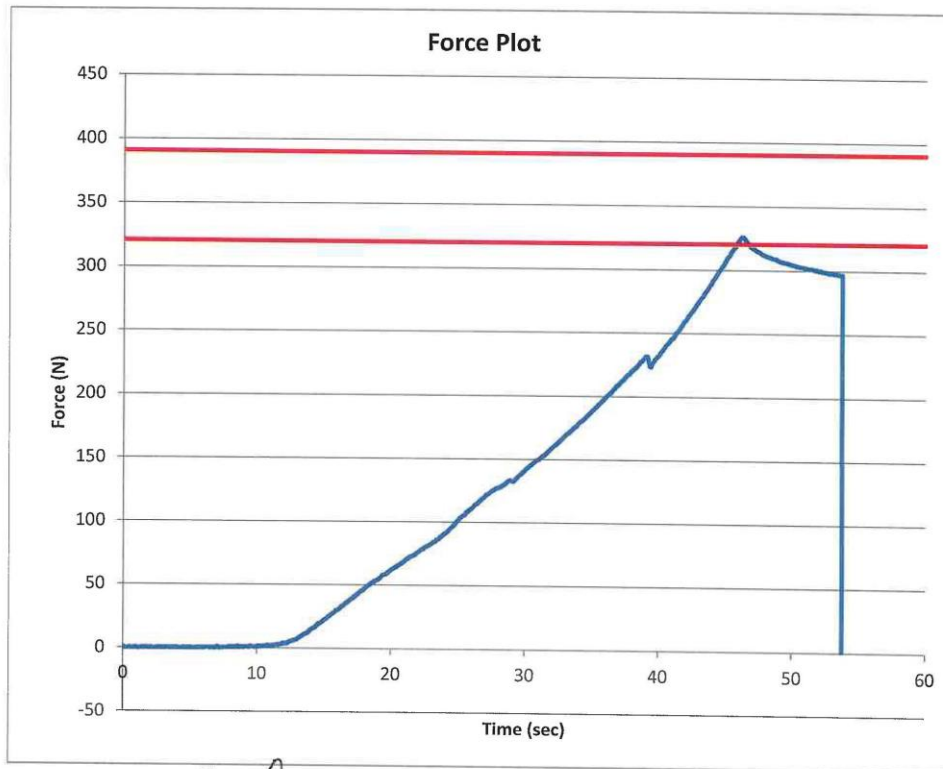
Date: 1/16/2015

Test Number: 1

Time: 11:01

Comments:

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.6 °C Pass
Humidity	10 - 70	36 % Pass
Average Angular Velocity	0.5 - 1.5	0.87 deg/sec Pass
Initial Angle	0 - 20	15.33 deg Pass
Peak Force at 45.27°	320 - 390	326.06 N Pass
Final Angle	-8 - 8	6.09 deg Pass



Technician

[Signature]

Approved

[Signature]

Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 30-2
Test Date: 1/16/2015

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.129 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,685.3 N	Yes

Test meets specifications.

Comments:

Technician


Approved

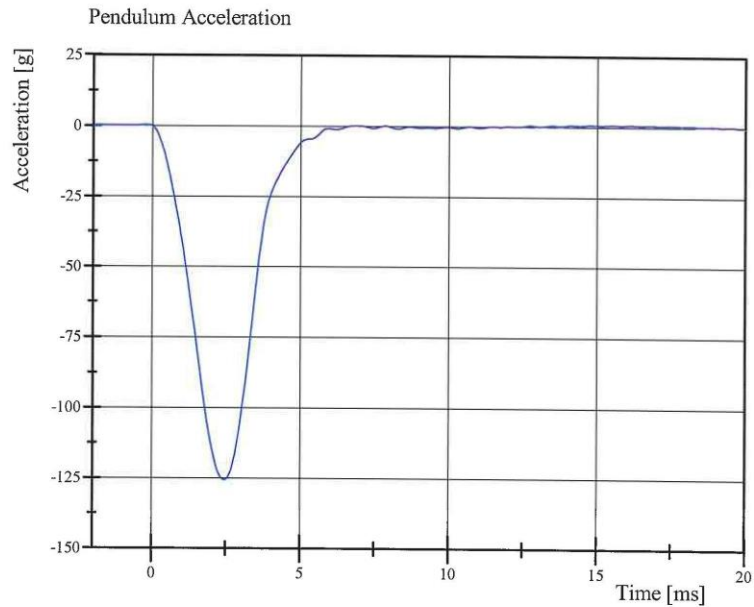

Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

01.16.2015 15:23:33 1780

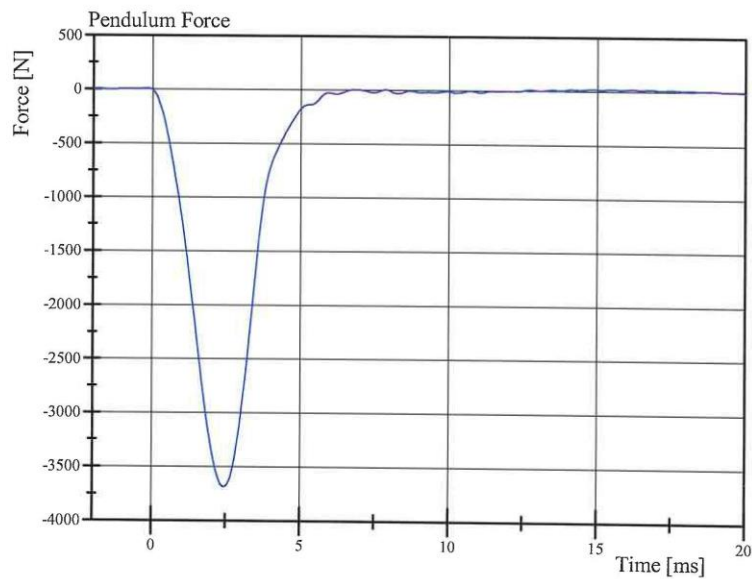


Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 30-2
Test Date: 1/16/2015



Filter Class: CFC_600
Max: 0.6 g at 14.8 ms
Min: -125.7 g at 2.5 ms



Filter Class: CFC_600
Max: 17.8 N at 14.8 ms
Min: -3,685.3 N at 2.5 ms

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

01.16.2015 15:23:48 1780



Transportation Research Center Inc.

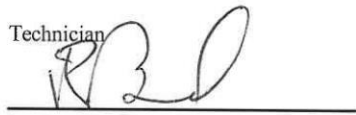
Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 30-1
Test Date: 1/16/2015

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.119 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,514.8 N	Yes

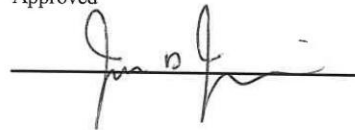
Test meets specifications.

Comments:

Technician



Approved



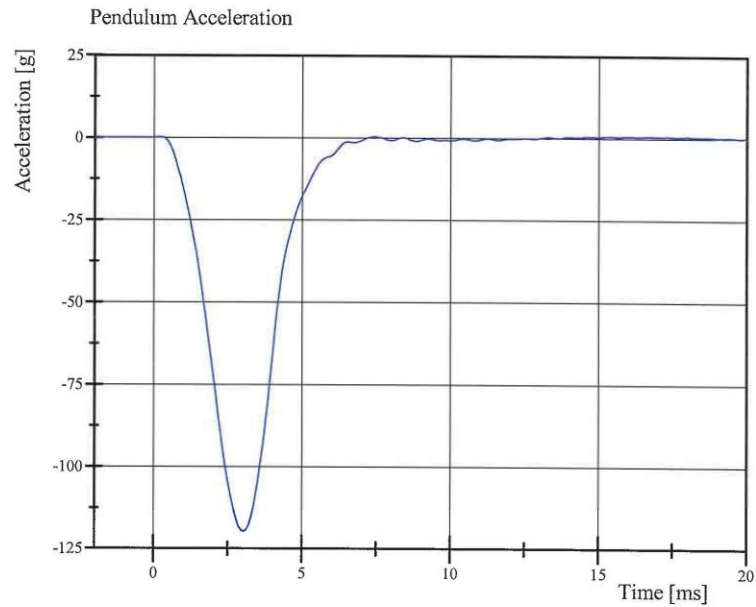
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

01.16.2015 14:55:05 1776

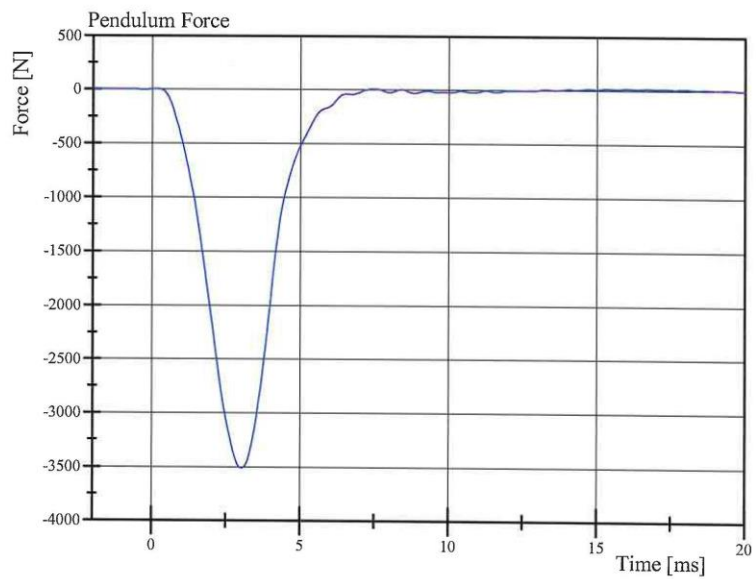


Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 30-1
Test Date: 1/16/2015



Filter Class: CFC_600
Max: 0.6 g at 16.0 ms
Min: -119.9 g at 3.0 ms



Filter Class: CFC_600
Max: 16.6 N at 16.0 ms
Min: -3,514.8 N at 3.0 ms

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

01.16.2015 14:55:12 1776

