

Final Report Number: NCAP-TRC-19-001

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

**TOYOTA MOTOR CORPORATION
2019 Toyota C-HR 5-DR Hatchback
NHTSA Number: M20195100**

**PREPARED BY:
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Report Date: November 6, 2018

FINAL REPORT

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

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Prepared By: ILO Project Operations Group

Approved By: John Shultz

Approval Date: November 6, 2018

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date _____

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

Date _____

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16. Abstract A 56.0 km/h NCAP Frontal Impact Test was conducted on a 2019 Toyota C-HR 5-DR Hatchback, in accordance with the specifications the Office of Crashworthiness Standards Laboratory Procedure for NCAP Full Frontal Rigid Barrier Impact Testing. This test was conducted to obtain data related to FMVSS Nos. 208, 212, 219 (partial), and 301 performance. The test was conducted at the Transportation Research Center Inc. in East Liberty, Ohio on October 10, 2018. The impact velocity was 56.71 km/h, and the ambient temperature at the barrier face at the time of impact was 21.0° C. The target vehicle post-test maximum crush was 393 millimeters at crush zone 4 at right side. The test vehicle's performance is as follows: <table border="1"> <thead> <tr> <th></th> <th colspan="3">Driver ATD</th> <th colspan="3">Passenger ATD</th> </tr> <tr> <th>Measurement Description</th> <th>Units</th> <th>Threshold</th> <th>Result</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>NA</td> <td>700</td> <td>163</td> <td>NA</td> <td>700</td> <td>149</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-19.8</td> <td>mm</td> <td>52</td> <td>-19.7</td> </tr> <tr> <td>3ms Chest Clip</td> <td>Gs</td> <td>60</td> <td>42.2</td> <td>Gs</td> <td>60</td> <td>44.5</td> </tr> <tr> <td>Nij</td> <td>NA</td> <td>1</td> <td>0.27</td> <td>NA</td> <td>1</td> <td>0.41</td> </tr> <tr> <td>Neck Tension</td> <td>Newtons</td> <td>4170</td> <td>1389.9</td> <td>Newtons</td> <td>2620</td> <td>1058.1</td> </tr> <tr> <td>Neck Compression</td> <td>Newtons</td> <td>4000</td> <td>-106.1</td> <td>Newtons</td> <td>2520</td> <td>-262.0</td> </tr> <tr> <td>Left Femur Force</td> <td>Newtons</td> <td>10000</td> <td>-1704.9</td> <td>Newtons</td> <td>6800</td> <td>-687.5</td> </tr> <tr> <td>Right Femur Force</td> <td>Newtons</td> <td>10000</td> <td>-1530.5</td> <td>Newtons</td> <td>6800</td> <td>-1226.1</td> </tr> </tbody> </table>								Driver ATD			Passenger ATD			Measurement Description	Units	Threshold	Result	Units	Threshold	Result	Head Injury Criteria (HIC ₁₅)	NA	700	163	NA	700	149	Maximum Chest Compression	mm	63	-19.8	mm	52	-19.7	3ms Chest Clip	Gs	60	42.2	Gs	60	44.5	Nij	NA	1	0.27	NA	1	0.41	Neck Tension	Newtons	4170	1389.9	Newtons	2620	1058.1	Neck Compression	Newtons	4000	-106.1	Newtons	2520	-262.0	Left Femur Force	Newtons	10000	-1704.9	Newtons	6800	-687.5	Right Femur Force	Newtons	10000	-1530.5	Newtons	6800	-1226.1
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1: PURPOSE AND SUMMARY OF THE TEST

PURPOSE

This 56 km/h frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-12-D-00257. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

This 56 km/h frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Test Procedure or NCAP Full Frontal Rigid Barrier Impact Testing dated May 2018.

SUMMARY

A load cell barrier consisting of 288 load cells was impacted by a 2019 Toyota C-HR 5-DR Hatchback at a velocity of 56.71 km/h. The test was performed at Transportation Research Center, Inc. on October 10, 2018. 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 Laboratory Procedure for NCAP Full Frontal Rigid Barrier Impact Testing.

Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometers, upper neck transducers, femur load cells, and lower leg instrumentation.

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

The 96 channels of data were recorded on an on-board data acquisition system. Appendix B contains the vehicle, load cell barrier and dummy response data traces.

There was 100.0 percent windshield retention and no intrusion into the protected zone of the windshield during the event. There was no Stoddard solvent leakage (or electrolyte spillage) after the event or during any phase of the static rollover.

The maximum static crush of the vehicle was 393 mm and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

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

The occupant data is summarized below:

ATD Position	HIC ₁₅	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)	163	0.27	1389.9	-106.1	42.2	-19.8	-1704.9	-1530.5
Passenger (5 th Female)	149	0.41	1058.1	-262.0	44.5	-19.7	-687.5	-1226.1

2.2 REPORT AREA 2: DATA SHEETS

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

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195100
 Test Date: 10/10/2018

TEST VEHICLE INFORMATION

NHTSA No.	M20195100
Model Year	2019
Make	Toyota
Model	C-HR
Body Style	Passenger Car
VIN	JTNKHMBOX7K1018975
Body Color	Silver Knockout Metallic
Odometer Reading (km/mi)	5 mi
Engine Displacement (L)	2.0
Type/No. Cylinders	4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	CVT
Overdrive	Yes
Final Drive	FWD
Roof Rack	No
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes
Automatic Door Locks (ADLs)	Yes

TEST VEHICLE OPTIONS

Traction Control System (TCS)	Yes
Power Steering	Yes
Power Window Auto-Reverse	Yes
Driver Frontal Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	Yes
Front Pass. Frontal Airbag	Yes
Front Pass. Curtain Airbag	Yes
Front Pass. Head/Torso Airbag	No
Front Pass. Torso Airbag	No
Front Pass. Torso/Pelvis Airbag	Yes
Front Pass. Pelvis Airbag	No
Front Pass. Knee Airbag	No
Driver Pretensioner	Yes
Driver Load Limiter	Yes
Front Pass. Pretensioner	Yes
Front Pass. Load Limiter	Yes
Other: Passenger Seat Cushion Airbag	Yes

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

No

DATA FROM CERTIFICATION LABEL

Manufactured by	TOYOTA MOTOR CORPORATION	GVWR (lb)	4330
Date of Manufacture	07/18	GAWR Front (lb)	2315
		GAWR Rear (lb)	2380

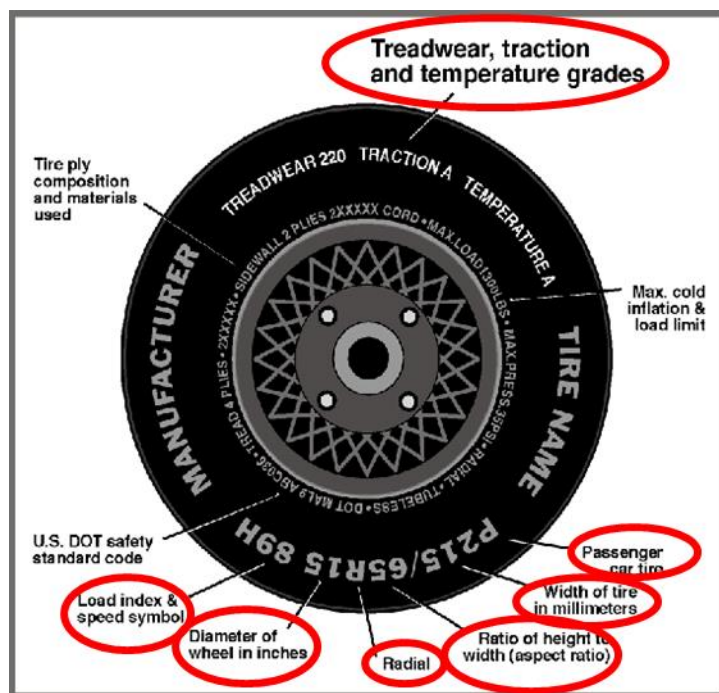
VEHICLE SEATING AND WEIGHT CAPACITY

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench	N/A	
Number of Occupants	2	3	N/A	5
Capacity Wt. (VCW) (kg)				371
Cargo Wt. (RCLW) (kg)				30.8

**DATA SHEET NO. 1 - GENERAL TEST AND VEHICLE PARAMETER DATA
(CONT'D)**

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback
Test Program: NCAP Frontal Impact

NHTSA No.: M20195100
Test Date: 10/10/2018



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold / Test Pressure (kPa)	230	230
Recommended Tire Size	215/60R17	215/60R17
Tire Size on Vehicle	215/60R17	215/60R17
Tire Manufacturer	Continental	Continental
Tire Model	ProContact	ProContact
Treadwear	500	500
Traction Grade	A	A
Temperature Grade	A	A
Tire Plies Sidewall	1	1
Tire Plies Body	4	4
Load Index/Speed Symbol	96H	96H
Tire Material	Polyester, Steel, Polyamide	Polyester, Steel, Polyamide
DOT Safety Code Right	6YKT WCOE 1818	6YKT WCOE 1818
DOT Safety Code Left	6YKT WCOE 1818	6YKT WCOE 1818

**DATA SHEET NO. 1 - GENERAL TEST AND VEHICLE PARAMETER DATA
(CONT'D)**

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195100
 Test Date: 10/10/2018

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	461.2	292.6		496.8	342.4	
Right	kg	432.8	296.6		457.2	349.6	
Ratio	%	60.3	39.7		58.0	42.0	
Totals	kg	894.0	589.2	1483.2	954.0	692.0	1646.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1483.2
Weight of 1 P572E ATD & 1 P572O ATD	kg	139.3
Rated Cargo/Luggage Weight (RCLW)	kg	30.8
Vehicle Target Weight (TVTW)	kg	1653.3

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front)
As Delivered	mm	745	756	784	790	1047
As Tested	mm	733	745	767	765	1108
Post Test	mm	786	805	762	775	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2635
Total Vehicle Length at Left Side	mm	4275
Total Vehicle Length at Centerline	mm	4400
Total Vehicle Length at Right Side	mm	4275
Weight of Ballast in Cargo Area	kg	0.0
Weight of Vehicle Components Removed	kg	46.8
Amount of Stoddard Solvent in Fuel Tank	liters	45.8

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT: Six gallons of Stoddard Solvent, tail lights, rear bumper beam & fascia, rear door trim panels, rear door glass and regulators, rear door speakers, rear door seals and rear mud flaps.
NOTE: Stoddard added back in for Rollover test.

**DATA SHEET NO. 1 - GENERAL TEST AND VEHICLE PARAMETER DATA
(CONT'D)**

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195100
 Test Date: 10/10/2018

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4400
2	Total Width	1800
3	Bumper Top Height	570
4	Bumper Bottom Height	435
5	Longitudinal Member Top Height	553
6	Distance Between Longitudinal Members	895
7	Longitudinal Member Width	70
8	Engine Top Height	880
9	Engine Bottom Height	217
10	Engine and Gearbox Width	800
11	Front Bumper-Engine Distance	490
12	Front Shock Absorber Fixing Height	870
13	Bonnet Leading Edge Height	830
14	Front Shock Absorber Fixing Width	1140
15	Front Bumper – Front Axle Distance	962
16	Front Axle – A-Pillar Distance	525
17	A-Pillar – B-Pillar Distance	1050
18	B-Pillar – Rear Axle Distance	1070
19	B-Pillar – C-Pillar Distance	885
20	Roof Sill Bottom Height	1370
21	Roof Sill Top Height	1445
22	Floor Sill Bottom Height	375
23	Floor Sill Top Height	410

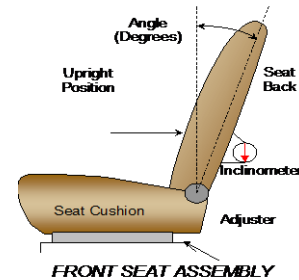
DATA SHEET NO. 2 - SEAT ADJUSTMENT, FUEL SYSTEM AND STEERING WHEEL DATA

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback
Test Program: NCAP Frontal Impact

NHTSA No.: M20195100
Test Date: 10/10/2018

NORMAL DESIGN RIDING POSITION

For adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent, if applicable



	Degree
Driver Seat back angle:	1.8
Passenger Seat back angle:	1.0

SEAT FORE/AFT POSITIONS

Describe the method of determining seat fore/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	27 notches; 260 mm	11
Passenger Seat	27 notches; 296 mm	0

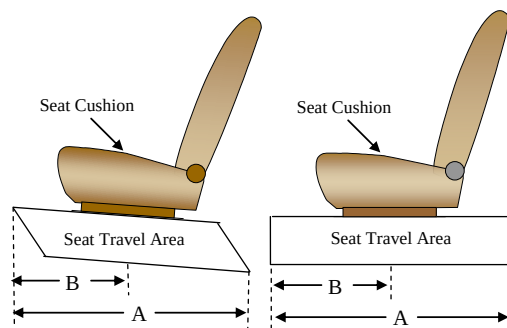
SEAT BELT UPPER ANCHORAGE

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	1 (Uppermost)
Passenger Seat	4	1 (Uppermost)



DATA SHEET NO. 2 - SEAT ADJUSTMENT, FUEL SYSTEM AND STEERING WHEEL DATA (CONT'D)

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback
Test Program: NCAP Frontal Impact

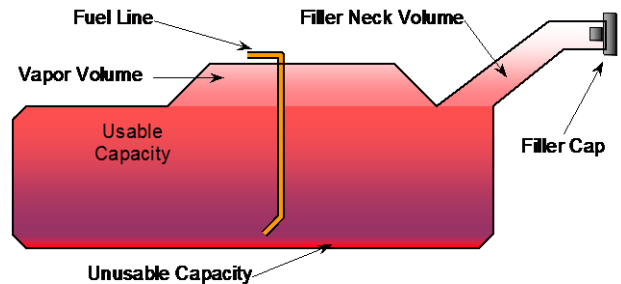
NHTSA No.: M20195100
Test Date: 10/10/2018

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	49.2
Usable Capacity of "Optional Tank"	N/A
92%-94% of Usable Capacity	45.8
Actual Amount of Solvent Used	45.8
1/3 of Usable Capacity	16.4

Describe the fuel system - what type of fuel pump, details about how it operates, etc.

The fuel pump is activated when the ignition is turned on

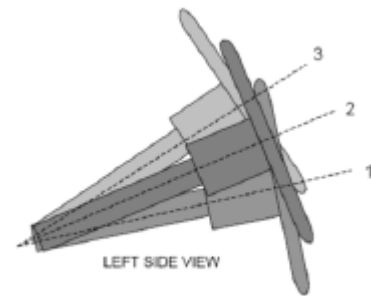


VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

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

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



STEERING COLUMN ASSEMBLY

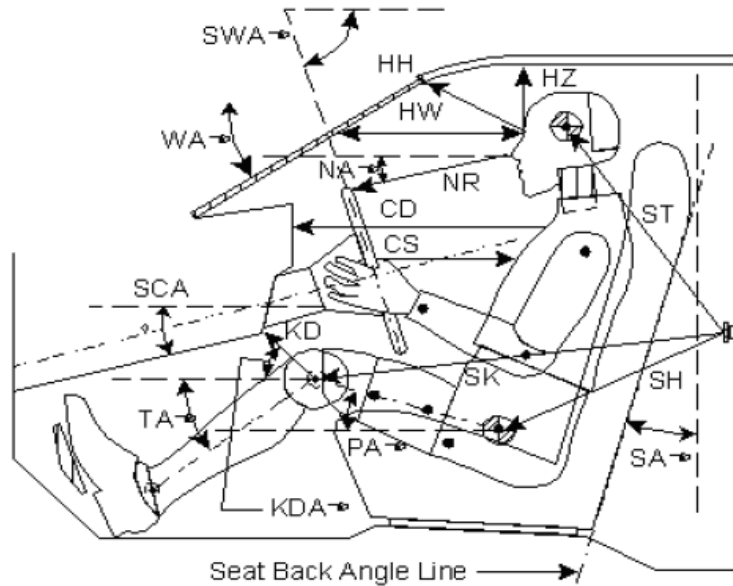
STEERING COLUMN POSITIONS

	Degrees	Fore/Aft Position (mm)
Lowermost Position No. 1	20.6	
Geometric Center Position No. 2	22.5	
Uppermost Position No. 3	24.5	
Telescoping Steering Wheel Travel		37
Test Position	22.5	18.5

DATA SHEET NO. 3 - DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195100
 Test Date: 10/10/2018



Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		27.6		
SWA°	Steering Wheel Angle		22.5		
SCA°	Steering Column Angle		67.5		
SA°	Seat Back Angle (on head rest post)		1.8		1.0
HZ	Head to Roof (Z)	247	90.0	248	90.0
HH	Head to Header	393	22.2	340	39.7
HW	Head to Windshield	681	0.0	686	0.0
NR	Nose to Rim	381	14.6		
CD	Chest to Dash	512		322	
CS	Chest to Steering Hub	280	0.0		
RA	Rim to Abdomen	192	0.0		
KDL	Left Knee to Dash	169	22.6	80	31.4
KDR	Right Knee to Dash	158	23.1	84	32.6
PA°	Pelvic Angle		24.4		20.7
TA°	Tibia Angle		53.5		57.5
SK	Striker to Knee	604	13.3	421	33.2
ST	Striker to Head	409	-74.9	386	-57.4
SH	Striker to H-Point	350	52.8	710	14.9

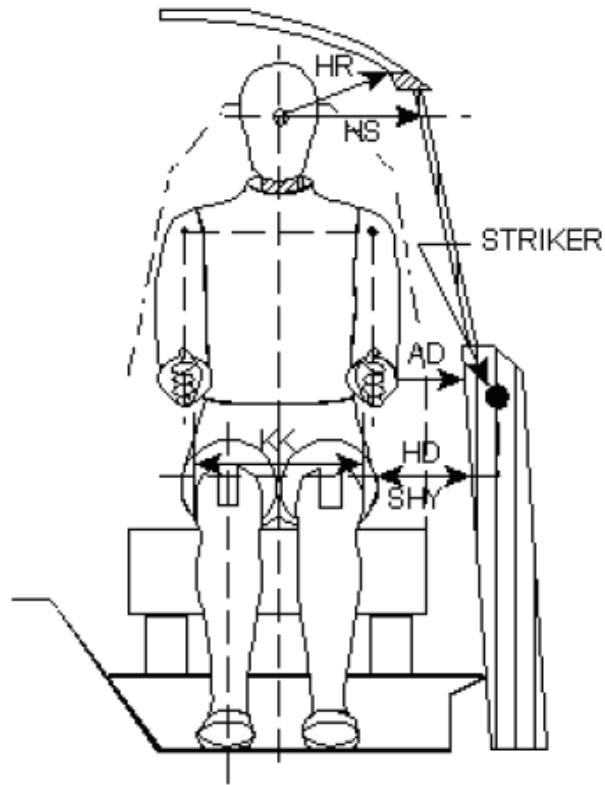
DATA SHEET NO. 4 - DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback

NHTSA No.: M20195100

Test Program: NCAP Frontal Impact

Test Date: 10/10/2018

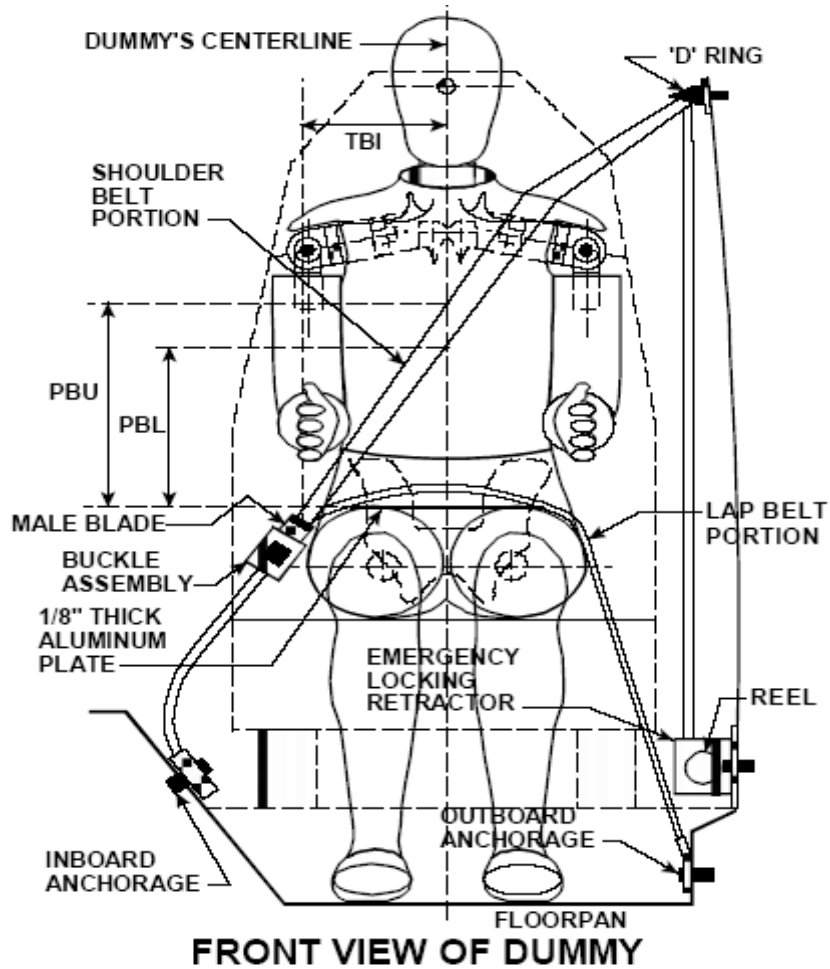


Code	Measurement Description	Driver	Passenger
AD	Arm to Door	144	116
HD	H-Point to Door	146	186
HR	Head to Side Header	201	229
HS	Head to Side Window	335	351
KK	Knee to Knee	281	164
SHY	Striker to H-Point (Y Direction)	254	281
AA	Ankle to Ankle	288	180

DATA SHEET NO. 5 - SEAT BELT POSITIONING DATA

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195100
 Test Date: 10/10/2018



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU – Top surface of reference to belt upper edge	mm	350	285
PBL – Top surface of reference to belt lower edge	mm	280	187

BELT LENGTH DATA

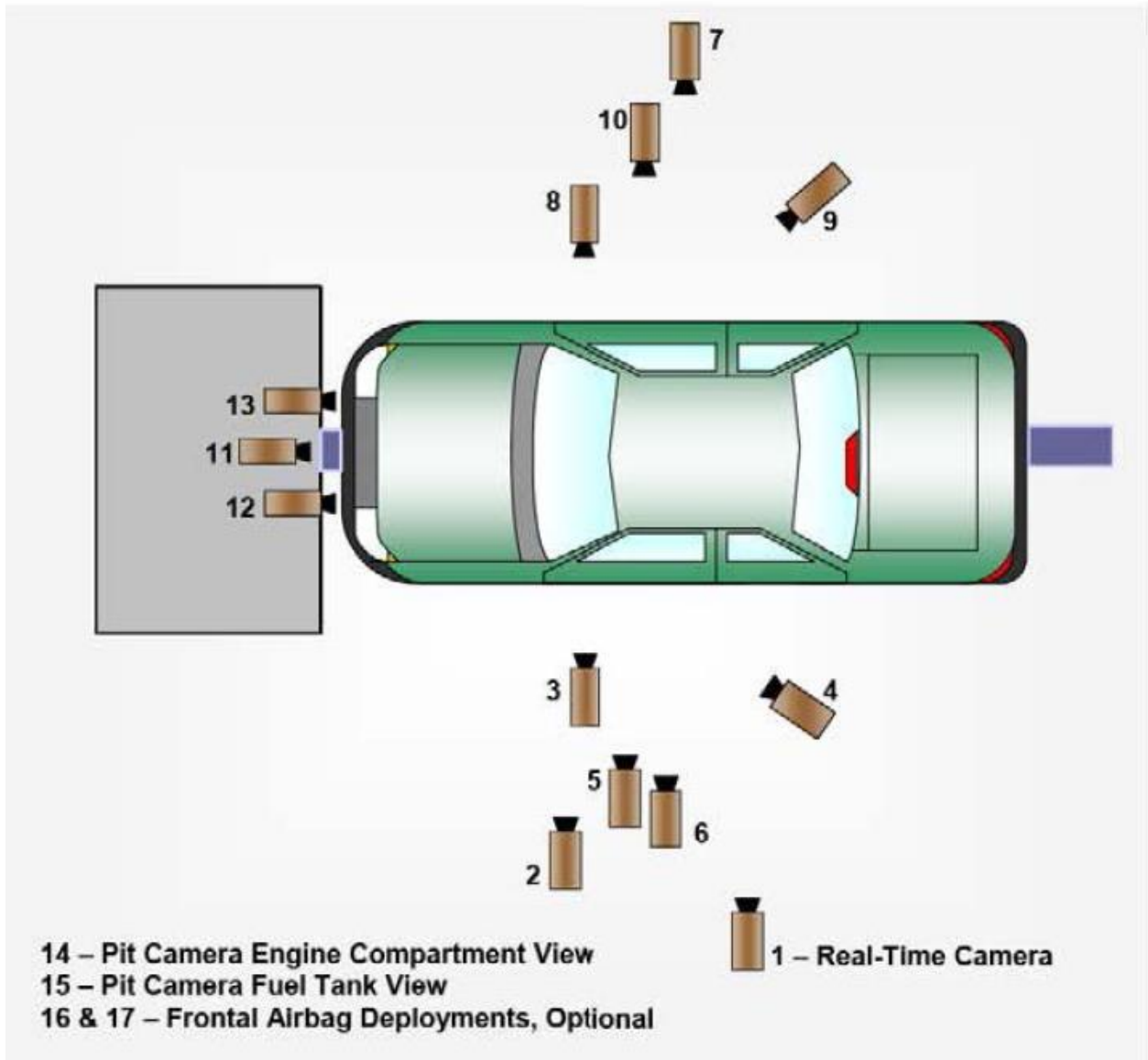
Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	857	936
Lap belt length as measured on ATD	mm	661	812
Remainder of belt on reel	mm	1022	837
Total belt length for continuous webbing systems	mm	2540	2585

DATA SHEET NO. 6 - HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback
Test Program: NCAP Frontal Impact

NHTSA No.: M20195100
Test Date: 10/10/2018

CAMERA POSITIONS FOR FRONTAL IMPACTS



**DATA SHEET NO. 6 - HIGH SPEED CAMERA LOCATIONS AND DATA
(CONT'D)**

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback
Test Program: NCAP Frontal Impact

NHTSA No.: M20195100
Test Date: 10/10/2018

CAMERA LOCATIONS

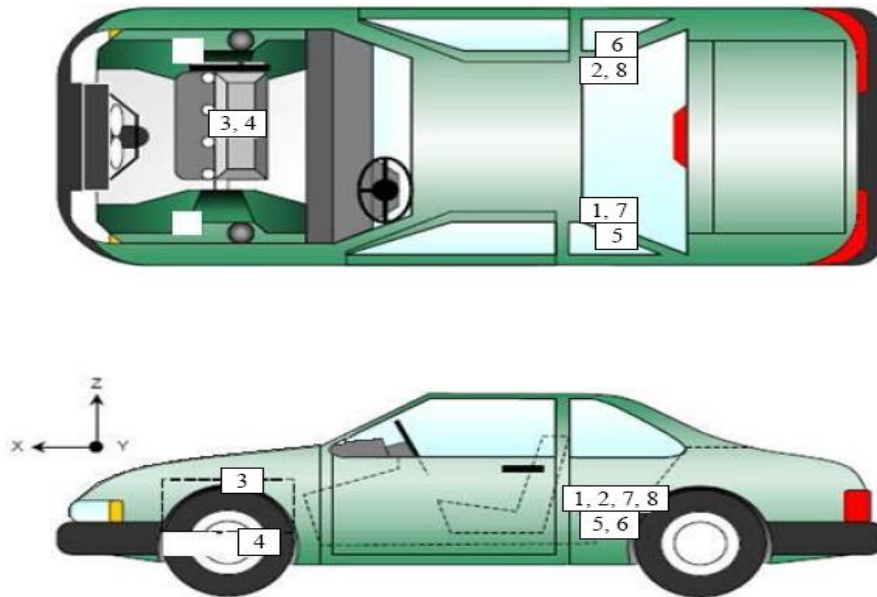
No.	Camera View	Location (mm)			Lens (mm)	Frame Speed (fps)
		X	Y	Z		
1	REAL-TIME LEFT OVERALL	0	-5614	-1400	Zoom	30
2	LEFT OVERALL	2057	-5593	-1331	20	1000
3	DRIVER CLOSE-UP	1562	-5952	-1337	50	1000
4	LEFT FRONT HALF	1133	-4707	-1160	25	1000
5	LEFT ANGLE	3904	-2823	-1919	25	1000
6	STEERING COLUMN	1973	-5399	-1527	50	1000
7	RIGHT OVERALL	1634	5932	-1077	20	1000
8	PASSENGER CLOSE-UP	1212	6155	-1319	50	1000
9	RIGHT FRONT HALF	840	5392	-1261	25	1000
10	RIGHT ANGLE	3973	175	-1916	25	1000
11	WINDSHIELD	0	0	-2587	12.5	1000
12	DRIVER WINDSHIELD	0	-546	-2587	25	1000
13	PASSENGER WINDSHIELD	0	607	-2587	25	1000
14	PIT FRONT	623	0	3083	25	1000
15	PIT REAR	2417	0	3083	12.5	1000
16	DRIVER ONBOARD				25	1000
17	PASSENGER ONBOARD				25	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: 2019 Toyota C-HR 5-DR Hatchback
Test Program: NCAP Frontal Impact

NHTSA No.: M20195100
Test Date: 10/10/2018



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	1247	-675	-375
2	Right Rear Accelerometer – X Direction	1248	675	-392
3	Engine Top X	3628	50	-868
4	Engine Bottom X	3700	185	-193
5	Left Rear Accelerometer – Z Direction	1247	-675	-375
6	Right Rear Accelerometer – Z Direction	1248	675	-392
7	Left Rear Accelerometer – X Direction Redundant	1210	-675	-375
8	Right Rear Accelerometer- X Direction Redundant	1210	675	-392

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

DATA SHEET NO. 8 - PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback

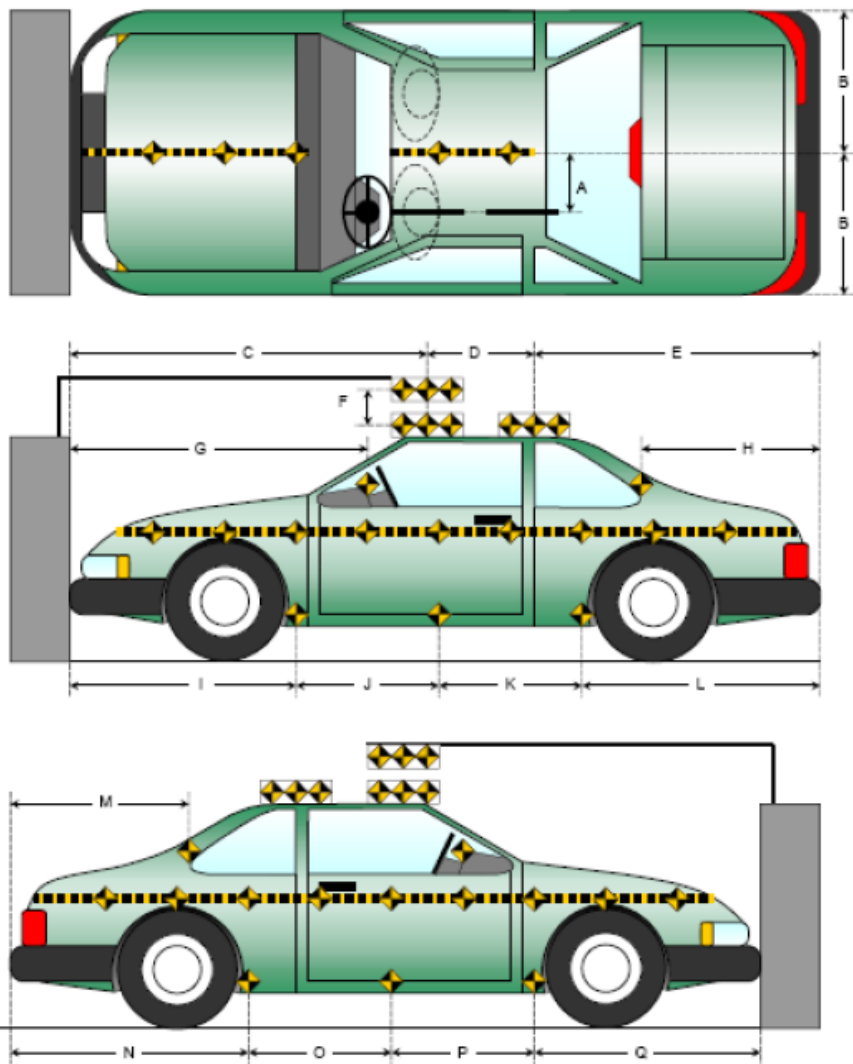
NHTSA No.: M20195100

Test Program: NCAP Frontal Impact

Test Date: 10/10/2018

Item	Value
A	370
B	900
C	2356
D	595
E	1701
F	257
G	1730
H	1229
I	1152
J	848
K	860
L	1508
M	1220
N	1509
O	860
P	845
Q	1152

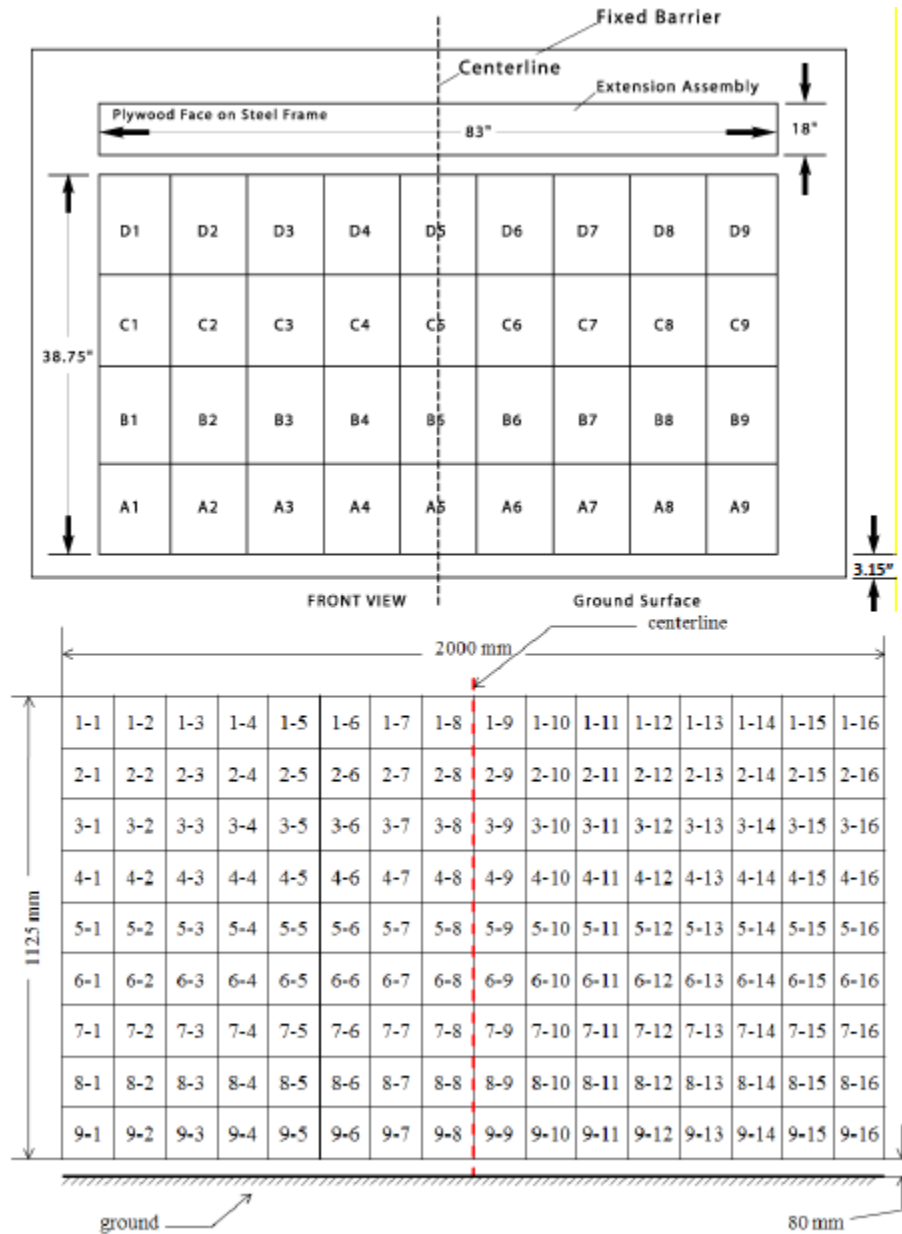
All units in millimeters



DATA SHEET NO. 9 - LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195100
 Test Date: 10/10/2018



DATA SHEET NO. 10 - TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback

NHTSA No.: M20195100

Test Program: NCAP Frontal Impact

Test Date: 10/10/2018

INSTRUMENTATION

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

CAMERA COVERAGE

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

DATA SHEET NO. 11 - POST-TEST OBSERVATIONS

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback
 Test Program: NCAP Frontal Impact

NHTSA No.: M20195100
 Test Date: 10/10/2018

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

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

DOOR OPENING, TRUNK OPENING, AND SEAT TRACK INFORMATION

Description	Driver	Passenger	Other
Locked/Unlocked Doors**	Unlocked	Unlocked	
Front Door Opening**	No	No	
Rear Door Opening**	No	No	
Trunk/Hatch/Tailgate Opening**			No
Seat Track Shift (mm) **	No	No	
Seat Back Movement from Initial Position**	No	No	

**NOTE: Indicate "No", "N/A", or "Yes", and if "Yes", describe

POST- OTHER VEHICLE POST-TEST OBSERVATIONS

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

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	964
Center	mm	799
Right Side	mm	866
Average	mm	876

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

**NOTE: Indicate "No", "N/A", or "Yes"

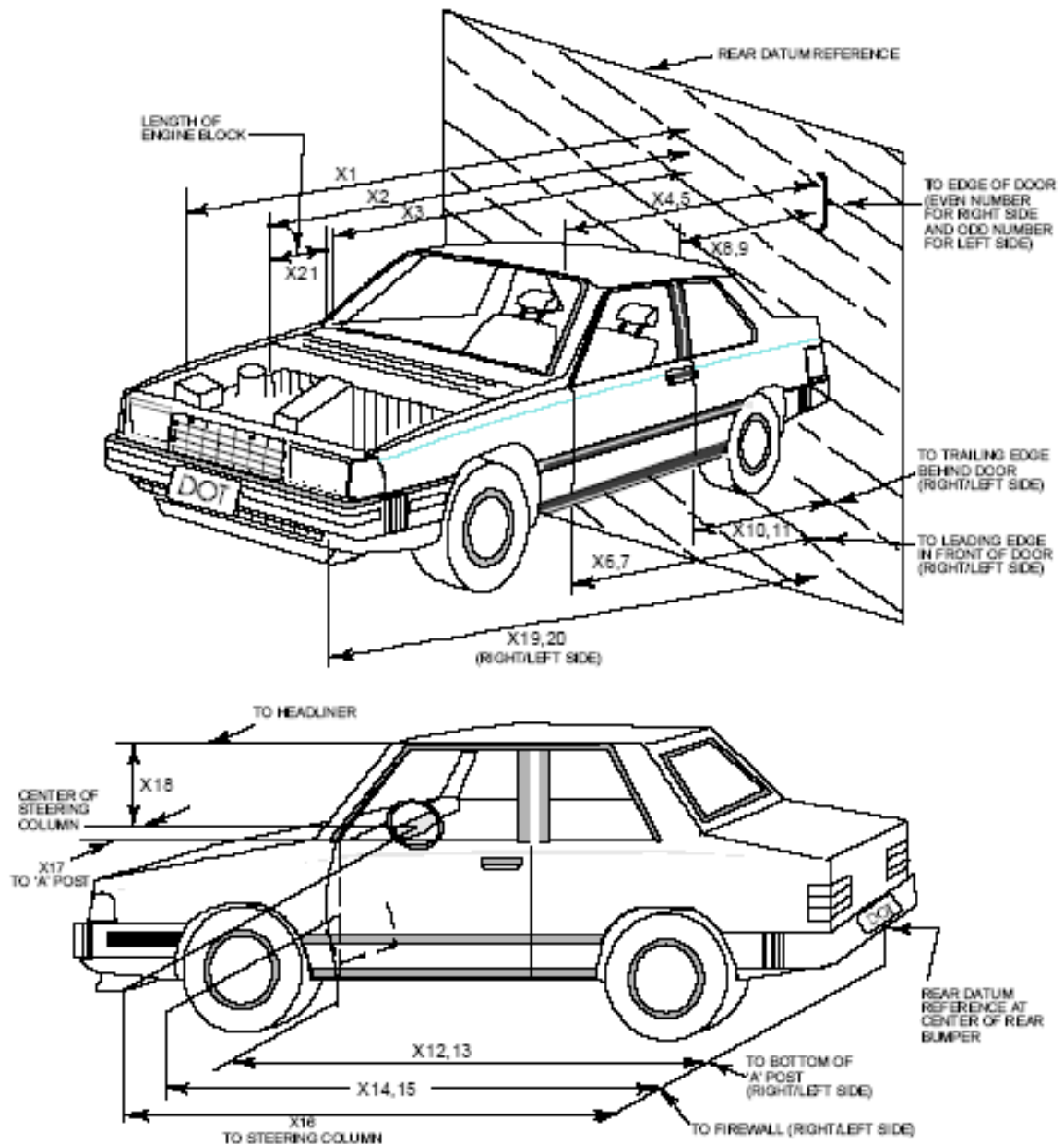
DATA SHEET NO. 12 - VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback

NHTSA No.: M20195100

Test Program: NCAP Frontal Impact

Test Date: 10/10/2018



DATA SHEET NO. 12 - VEHICLE PROFILE MEASUREMENTS (CONT'D)

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback
Test Program: NCAP Frontal Impact

NHTSA No.: M20195100
Test Date: 10/10/2018

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4400	4017	383
2	Rear Surface of Vehicle (RSOV) to Front of Engine	3900	3743	157
3	RSOV to Firewall	3415	3512	-97
4	RSOV to Upper Leading Edge of Right Door	2932	2930	2
5	RSOV to Upper Leading Edge of Left Door	2935	2935	0
6	RSOV to Lower Leading Edge of Right Door	2908	2901	7
7	RSOV to Lower Leading Edge of Left Door	2915	2907	8
8	RSOV to Upper Trailing Edge of Right Door	1895	1887	8
9	RSOV to Upper Trailing Edge of Left Door	1890	1890	0
10	RSOV to Lower Trailing Edge of Right Door	1915	1910	5
11	RSOV to Lower Trailing Edge of Left Door	1919	1910	9
12	RSOV to Bottom of "A" Post-of Right Side	2940	2935	5
13	RSOV to Bottom of "A" Post-of Left Side	2949	2942	7
14	RSOV to Firewall, Right Side	3650	3494	156
15	RSOV to Firewall, Left Side	3648	3477	171
16	RSOV to Steering Column	2468	2530	-62
17	Center of Steering Column to "A" Post	345	326	19
18	Center of Steering Column to Headliner	450	450	0
19	RSOV to Right Side of Front Bumper	4275	4009	266
20	RSOV to Left Side of Front Bumper	4275	3965	310
21	Length of Engine Block	580	580	0
RD	RSOV to Right Side of Dash Panel	2635	2634	1
CD	RSOV to Center of Dash Panel	2585	2812	-227
LD	RSOV to Left Side of Dash Panel	2645	2865	-220

All Dimensions in mm

DATA SHEET NO. 13 - ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback
Test Program: NCAP Frontal Impact

NHTSA No.: M20195100
Test Date: 10/10/2018

VEHICLE INFORMATION

VIN: JTNKHMBX7K1018975
Vehicle Size Category: Passenger Car

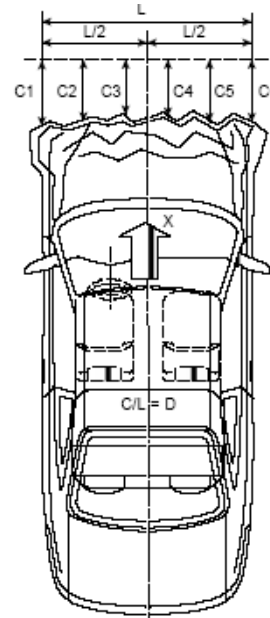
Wheelbase: 2635
Test Weight (kg): 1646.0

ACCELEROMETER DATA

Accelerometer Locations: As listed on Page 15 of this report.
Cal. Procedure/Interval: TRC procedure / 6 month interval
Integration Algorithm: Trapezoidal
Linearity: > 99%
Impact Velocity (km/h): 56.71
Velocity Change (km/h): 65.85
Time of Separation (ms): 155

CRUSH PROFILE

Collision Deformation Classification: 12FDEW2
Midpoint of Damage: Centerline
Damage Region Length (mm): 1219
Impact Mode: Frontal



No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4275	3965	310
C2	Crush zone 2 at left side	mm	4365	4009	356
C3	Crush zone 3 at left side	mm	4400	4010	390
C4	Crush zone 4 at right side	mm	4400	4007	393
C5	Crush zone 5 at right side	mm	4365	4025	340
C6	Crush zone 6 at right side	mm	4275	4009	266
L	C1 to C6	mm	1219	1219	0

DATA SHEET NO. 14 - VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback
Test Program: NCAP Frontal Impact

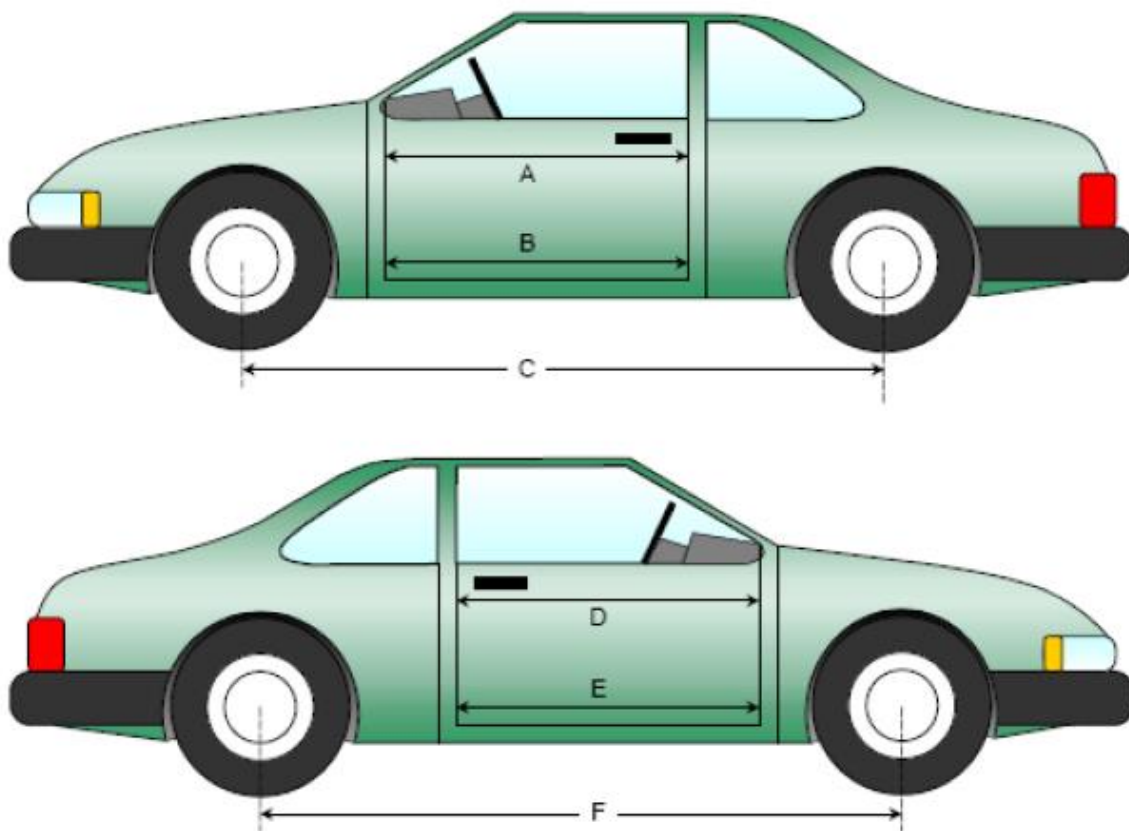
NHTSA No.: M20195100
Test Date: 10/10/2018

DOOR OPENING WIDTH

No.	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1010	1005	5
B	Left Side Lower	mm	820	818	2
C	Right Side Upper	mm	1009	1005	4
D	Right Side Lower	mm	820	823	-3

WHEELBASE MEASUREMENTS

No.	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2635	2560	75
F	Right Side Wheelbase	mm	2635	2590	45



DATA SHEET NO. 14 - VEHICLE INTRUSION MEASUREMENTS (CONT'D)

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback

NHTSA No.: M20195100

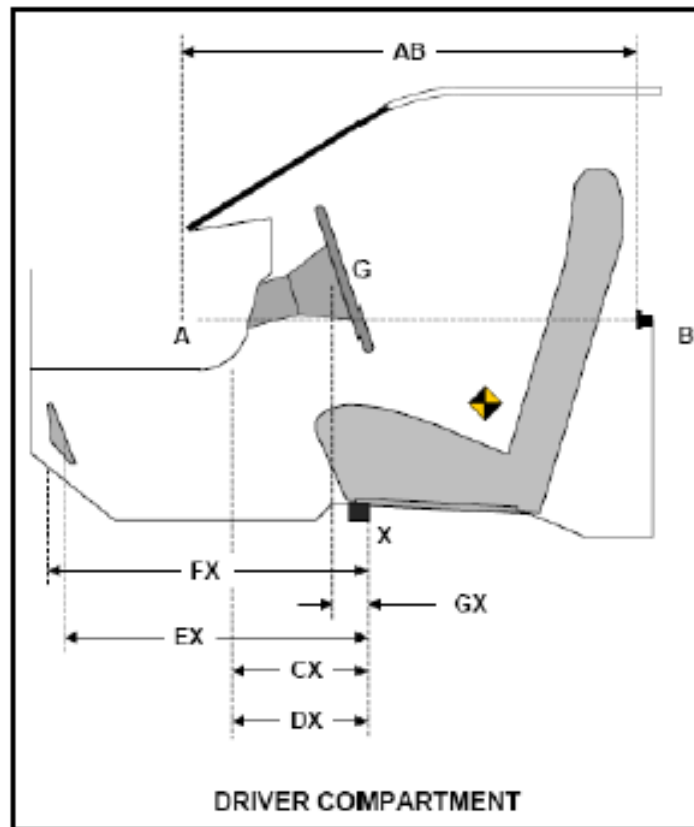
Test Program: NCAP Frontal Impact

Test Date: 10/10/2018

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	1012	1010	2
CX	Left Knee Bolster to X	mm	267	265	2
DX	Right Knee Bolster to X	mm	280	300	-20
EX	Brake Pedal to X	mm	500	520	-20
FX	Foot Rest to X	mm	540	530	10
GX	Center of Steering Column Wheel Hub to X	mm	20	80	-60

X = Front of Seat Track (Stationary)



DATA SHEET NO. 15 - SUMMARY OF INDICANT FMVSS 212 AND FMVSS 219 (PARTIAL) DATA

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback
Test Program: NCAP Frontal Impact

NHTSA No.: M20195100
Test Date: 10/10/2018

Please provide windshield mounting details.

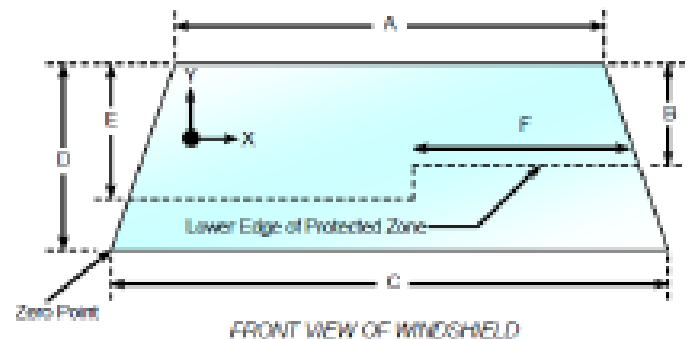
The standard requires that the post-test retention measurement be a minimum of 75% of the pre-test total periphery measurement for vehicle not equipped with occupant passive restraint and 50% for each side of the windshield for vehicle which are equipped with occupant passive restraints.

Temperature of windshield molding during test: 21.0° C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2050	2050	100.0
Right Side	2050	2050	100.0
Total	4100	4100	100.0

Item	Units	Value
A	mm	1140
B	mm	480
C	mm	1470
D	mm	745
E	mm	580
F	mm	620



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. 16 - FMVSS 301 BARRIER IMPACT AND STATIC ROLLOVER
RESULTS**

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback
Test Program: NCAP Frontal Impact

NHTSA No.: M20195100
Test Date: 10/10/2018

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21.2°C

Test Time: 14:32

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

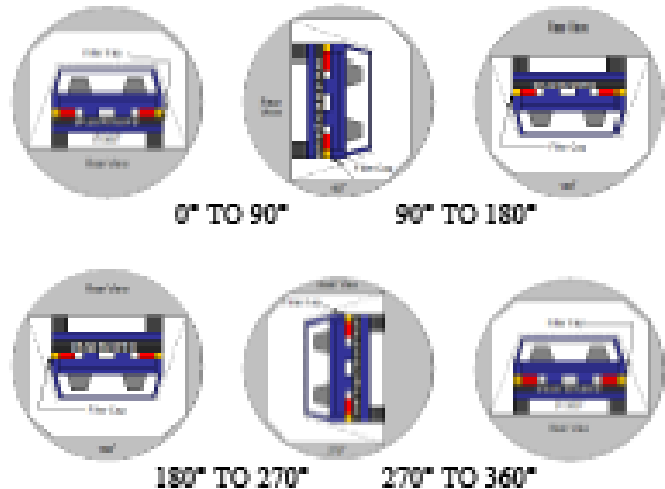
DATA SHEET NO. 16 - FMVSS 301 BARRIER IMPACT AND STATIC ROLLOVER RESULTS (CONT'D)

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback
Test Program: NCAP Frontal Impact

NHTSA No.: M20195100
Test Date: 10/10/2018

1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.
2. The position hold time at each position is 300 seconds (minimum).
3. Details of Stoddard Solvent spillage:

None



SOLVENT COLLECTION TIME TABLE IN SECONDS

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

FMVSS 301 SPILLAGE TABLE

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

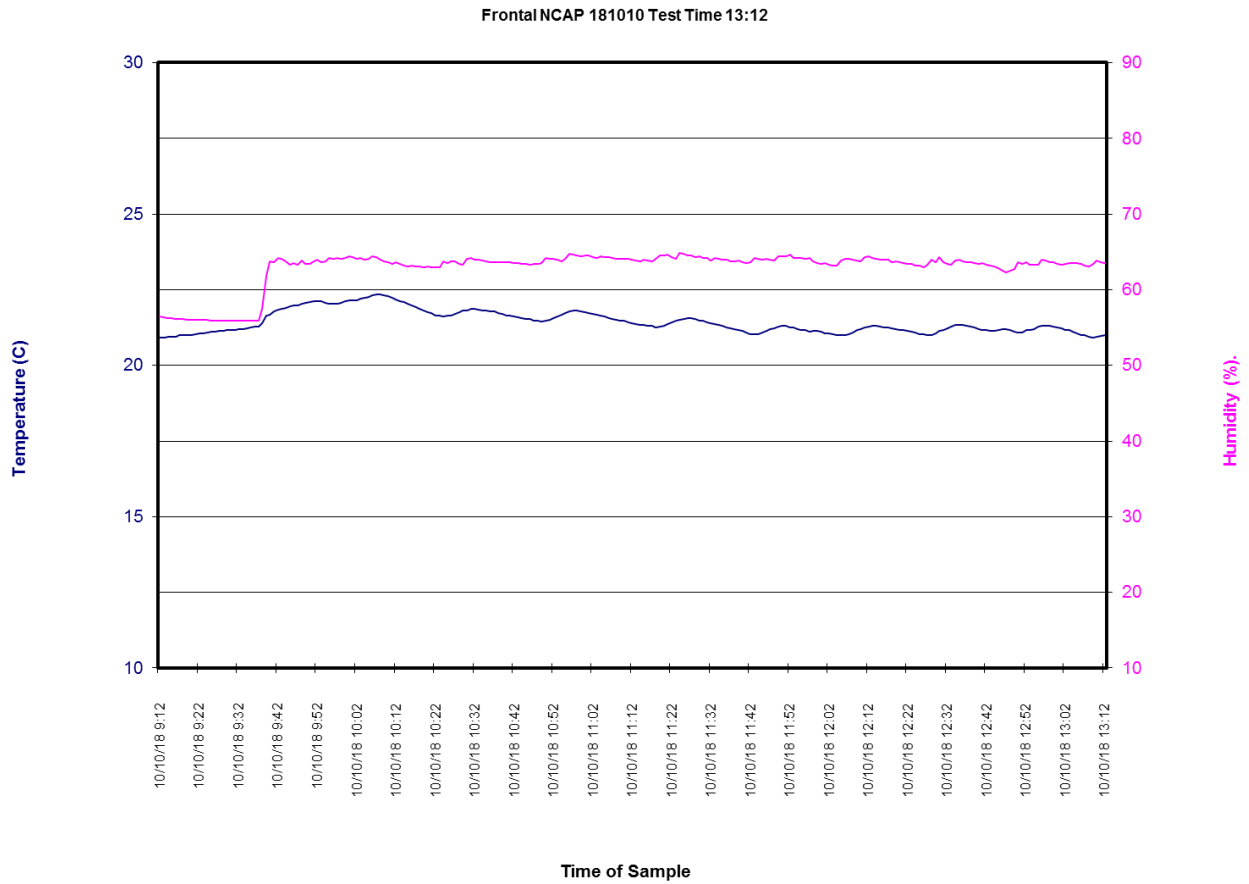
SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 17 - DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2019 Toyota C-HR 5-DR Hatchback
Test Program: NCAP Frontal Impact

NHTSA No.: M20195100
Test Date: 10/10/2018



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

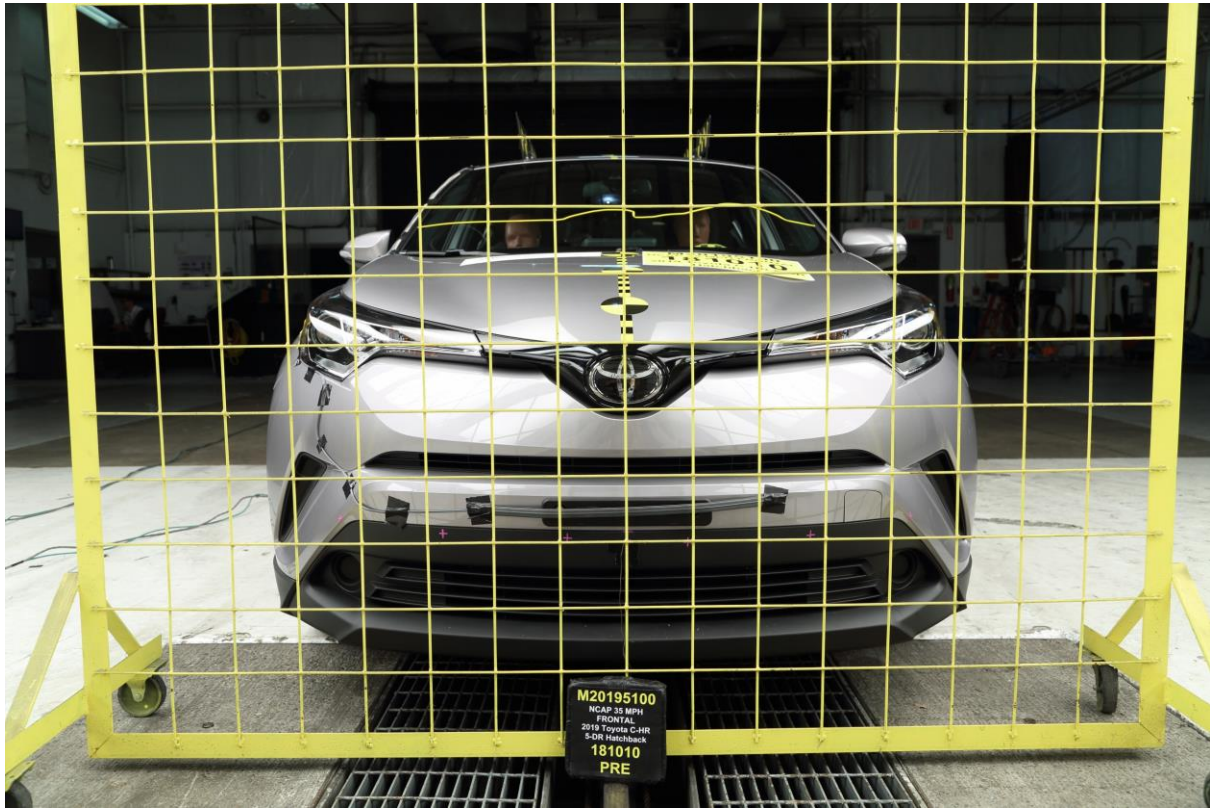
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3	Post-Test Load Cell Wall	A-6
4	Manufacturer's Label	A-6
5	Tire Placard	A-7
5a	Reduced Load Carrying Capacity Label	A-7
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11	Post-Test Left View of Test Vehicle	A-10
12	Pre-Test Right View of Test Vehicle	A-11
13	Post-Test Right View of Test Vehicle	A-11
14	Pre-Test Right Front 3-4 View	A-12
15	Post-Test Right Front 3-4 View	A-12
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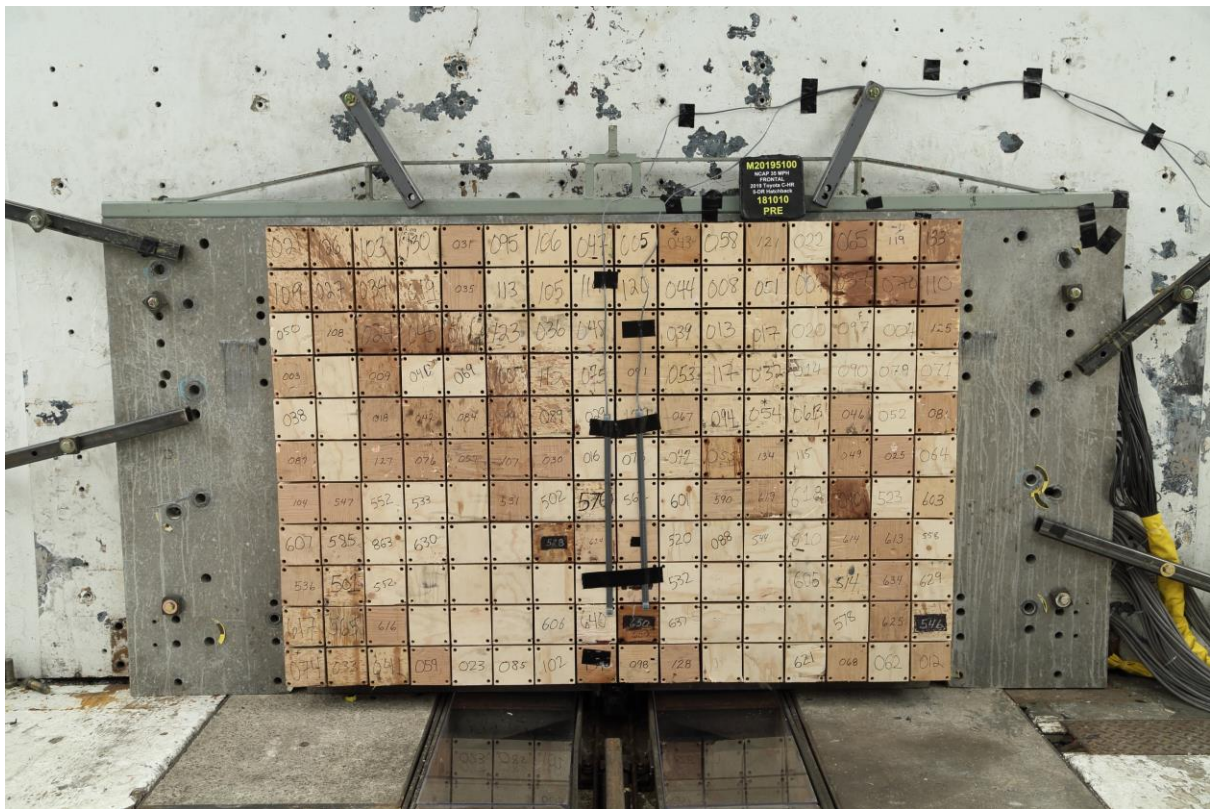
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001 Load Cell Location



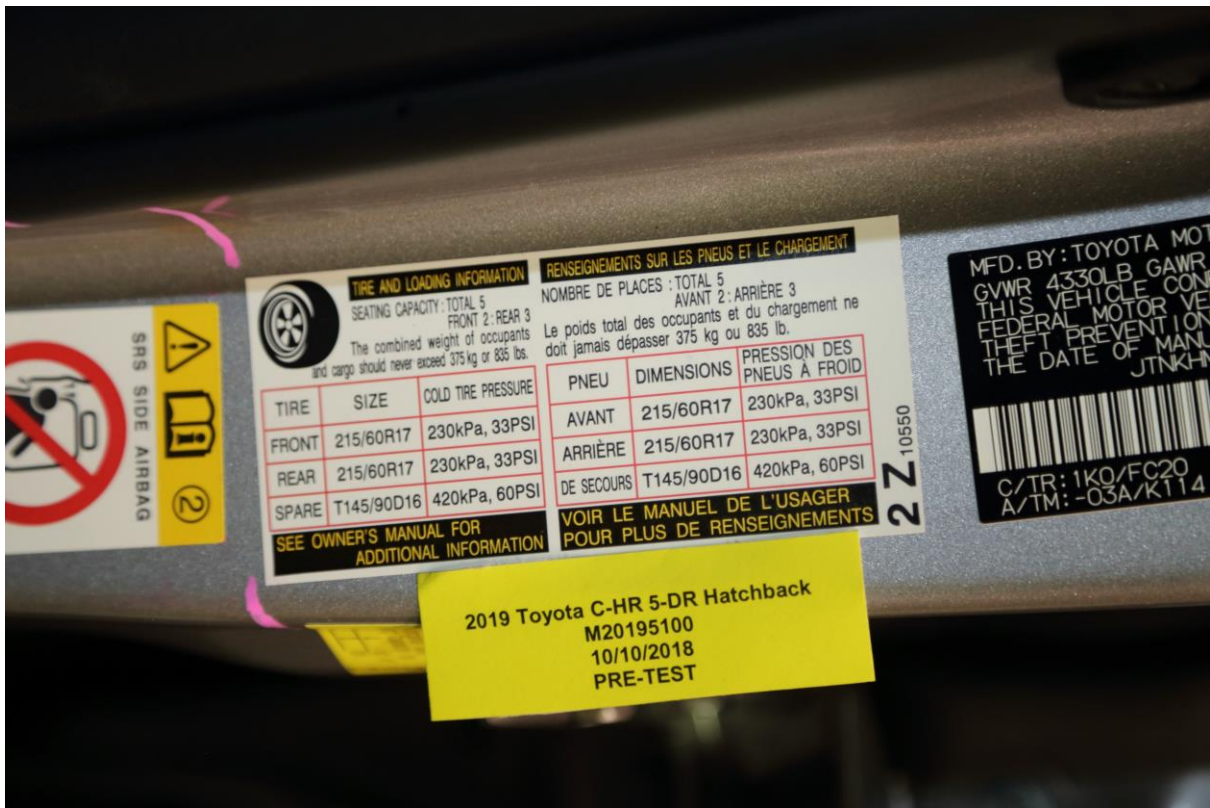
002 Pre-Test Load Cell Wall



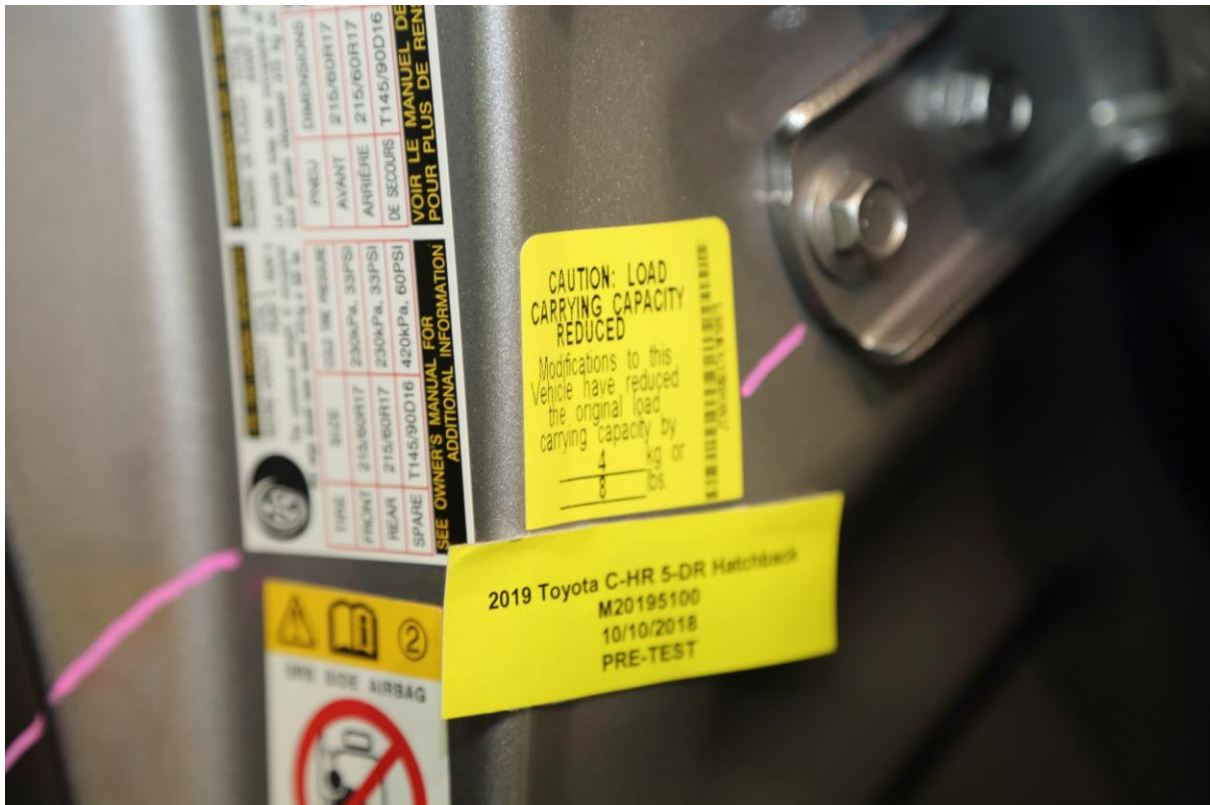
003 Post-Test Load Cell Wall



004 Manufacturer's Label



005 Tire Placard



005a Reduced Load Carrying Capacity Label



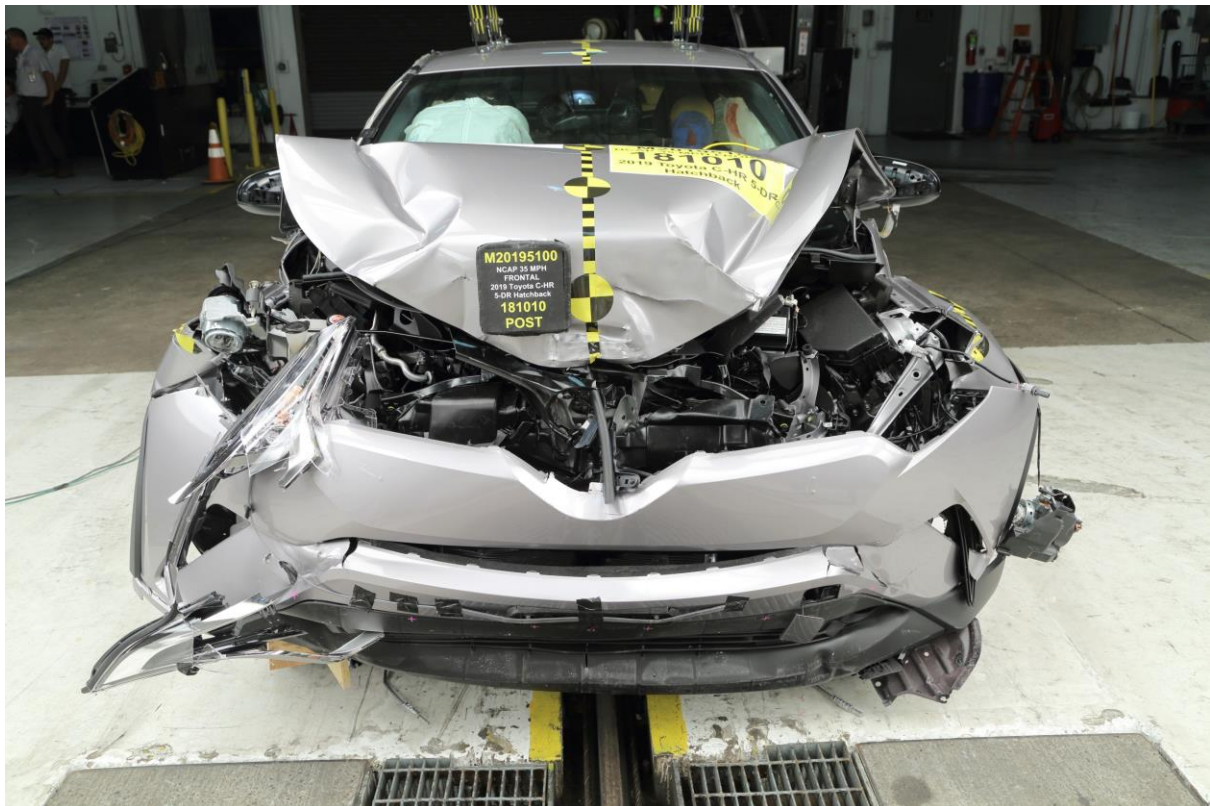
006 019 Toyota C-HR 5-DR Hatchback Frontal As Delivered



007 Left Rear 3-4 View, as Received



008 Pre-Test Front View of Test Vehicle



009 Post-Test Front View of Test Vehicle



010 Pre-Test Left View of Test Vehicle



011 Post-Test Left View of Test Vehicle



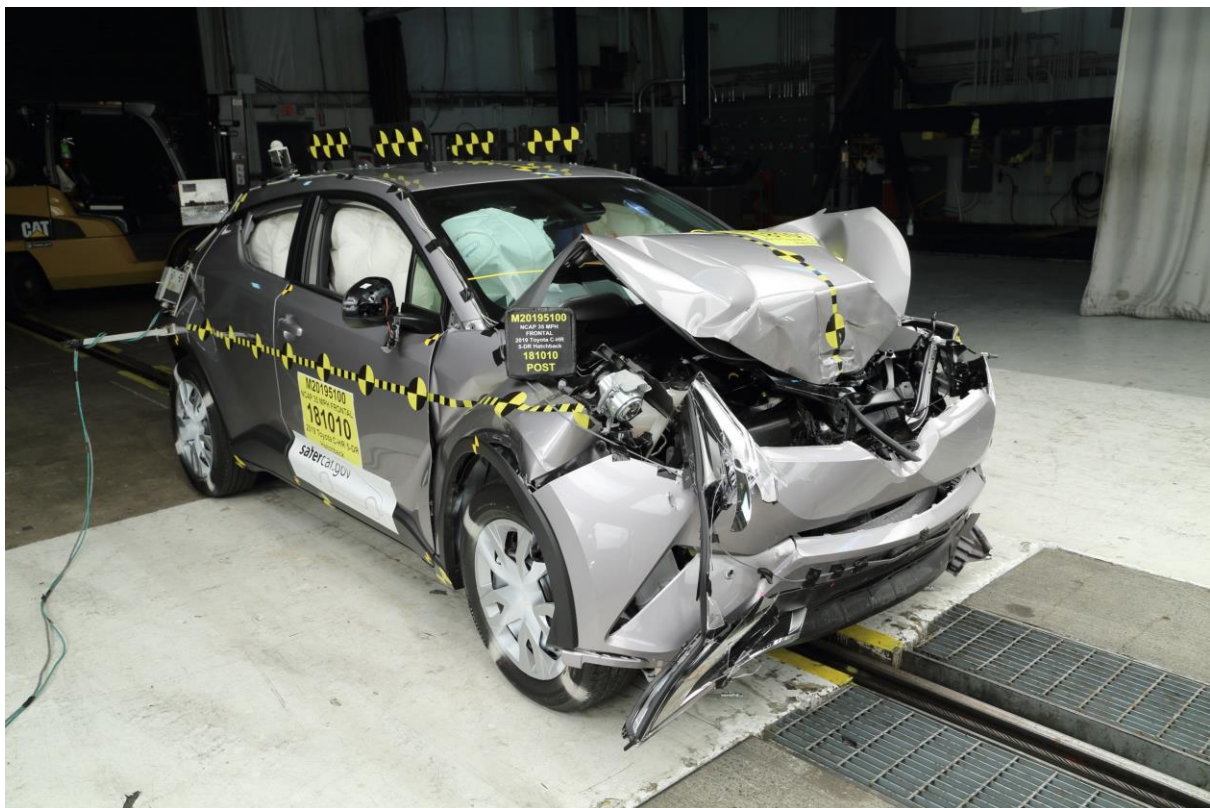
012 Pre-Test Right View of Test Vehicle



013 Post-Test Right View of Test Vehicle



014 Pre-Test Right Front 3-4 View



015 Post-Test Right Front 3-4 View



016 Pre-Test Left Rear 3-4 View



017 Post-Test Left Rear 3-4 View



018 Pre-Test Windshield View



019 Post-Test Windshield View



020 Pre-Test Engine Compartment View



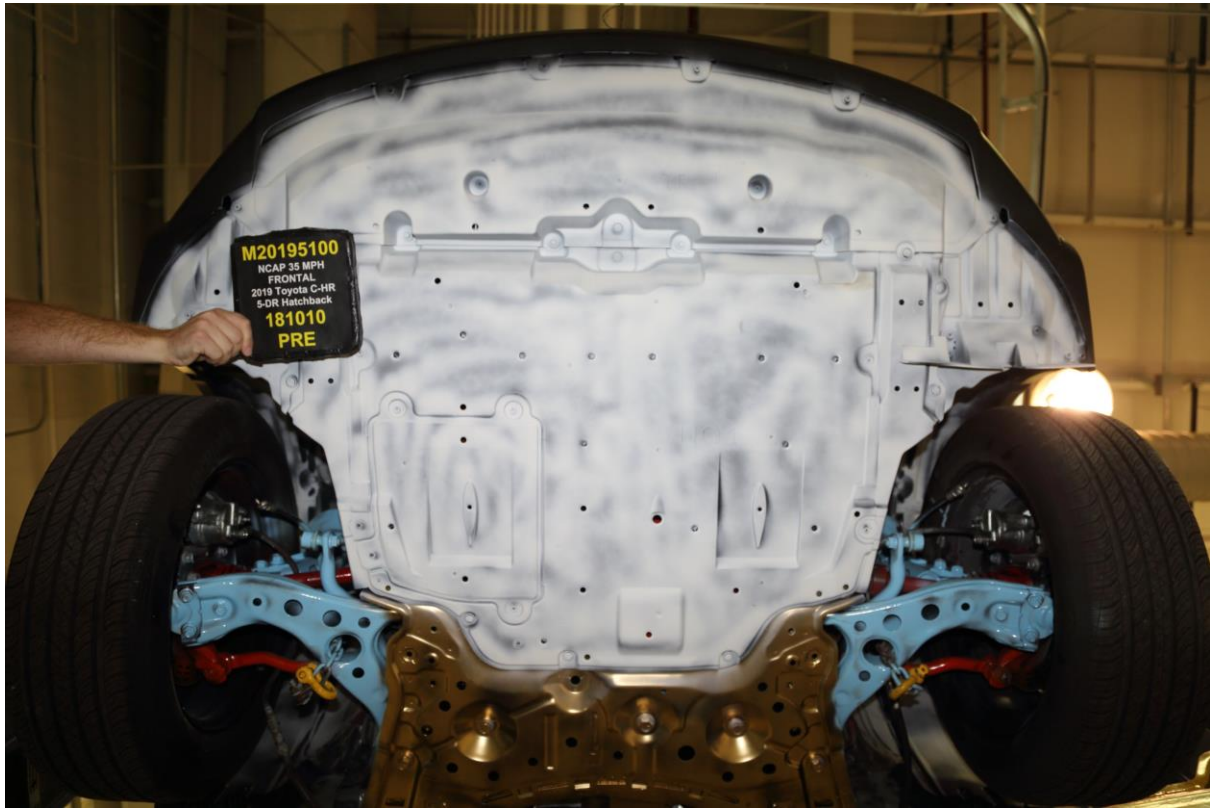
021 Post-Test Engine Compartment View



022 Pre-Test Fuel Filler Cap View



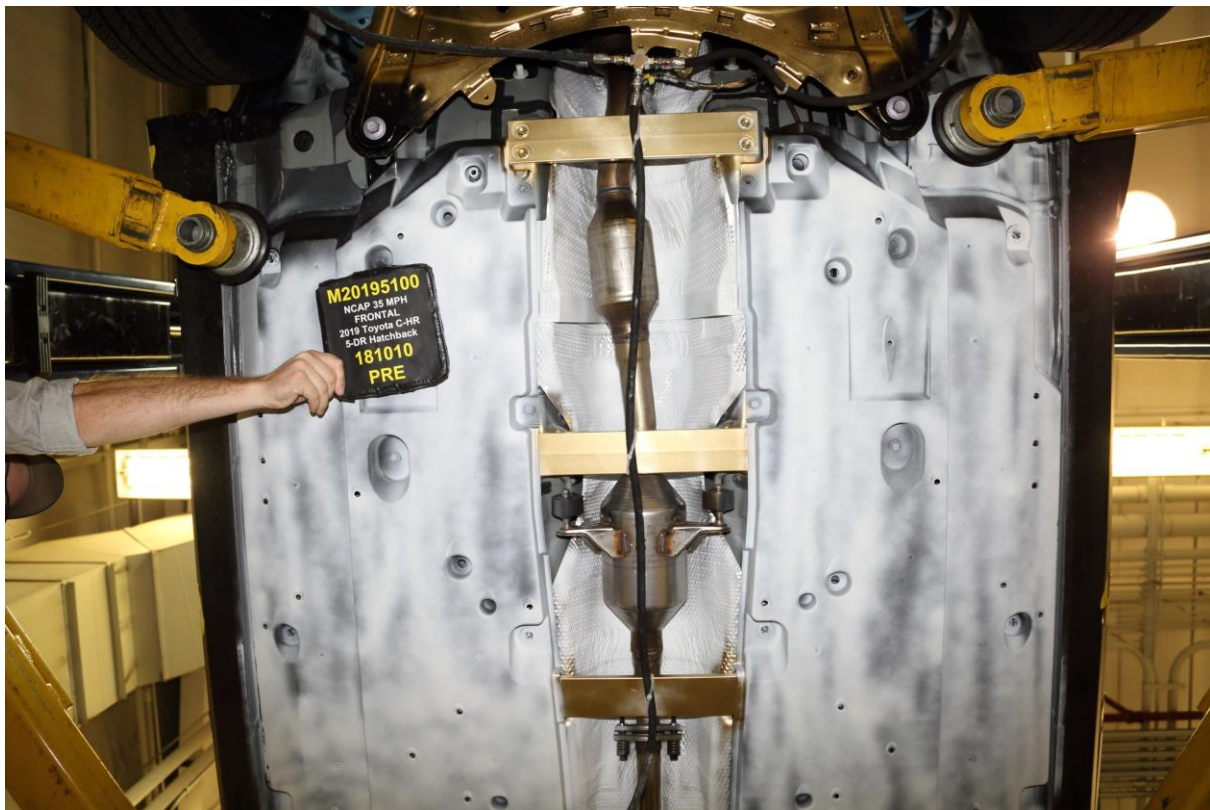
023 Post-Test Fuel Filler Cap View



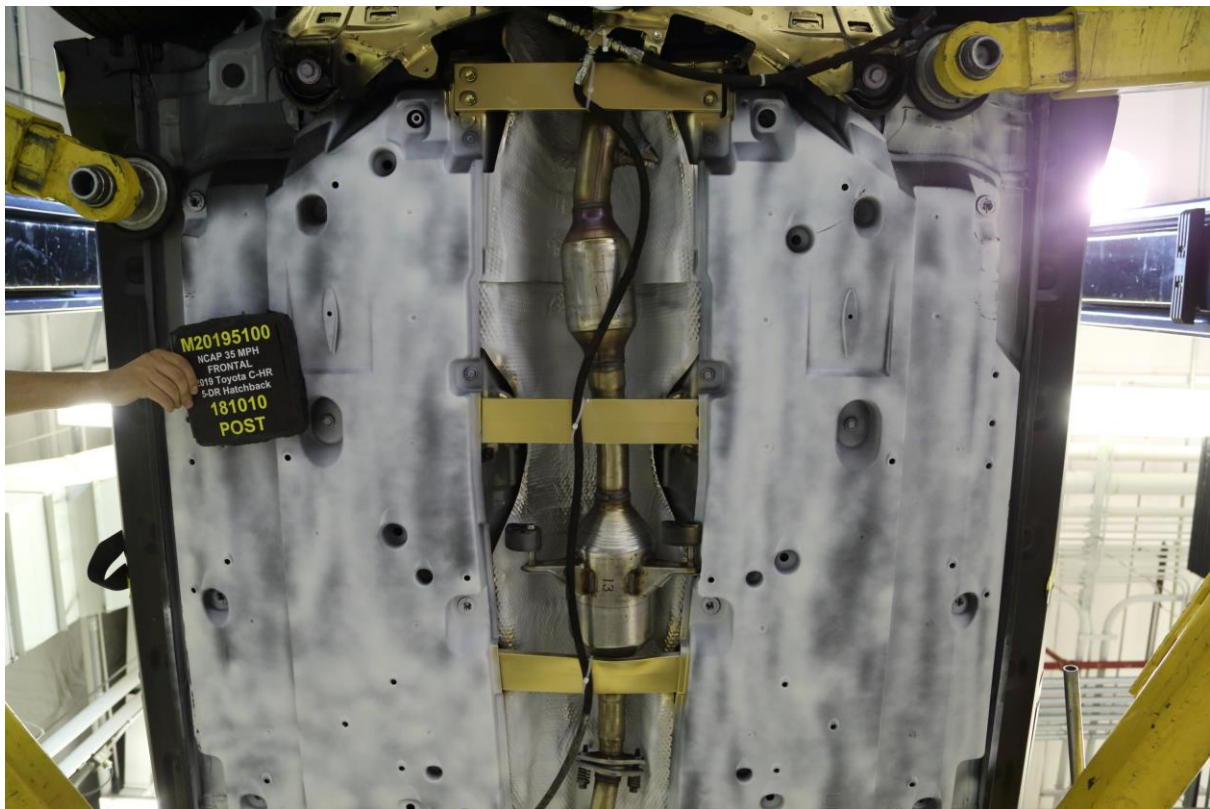
024 Pre-Test Front Underbody View



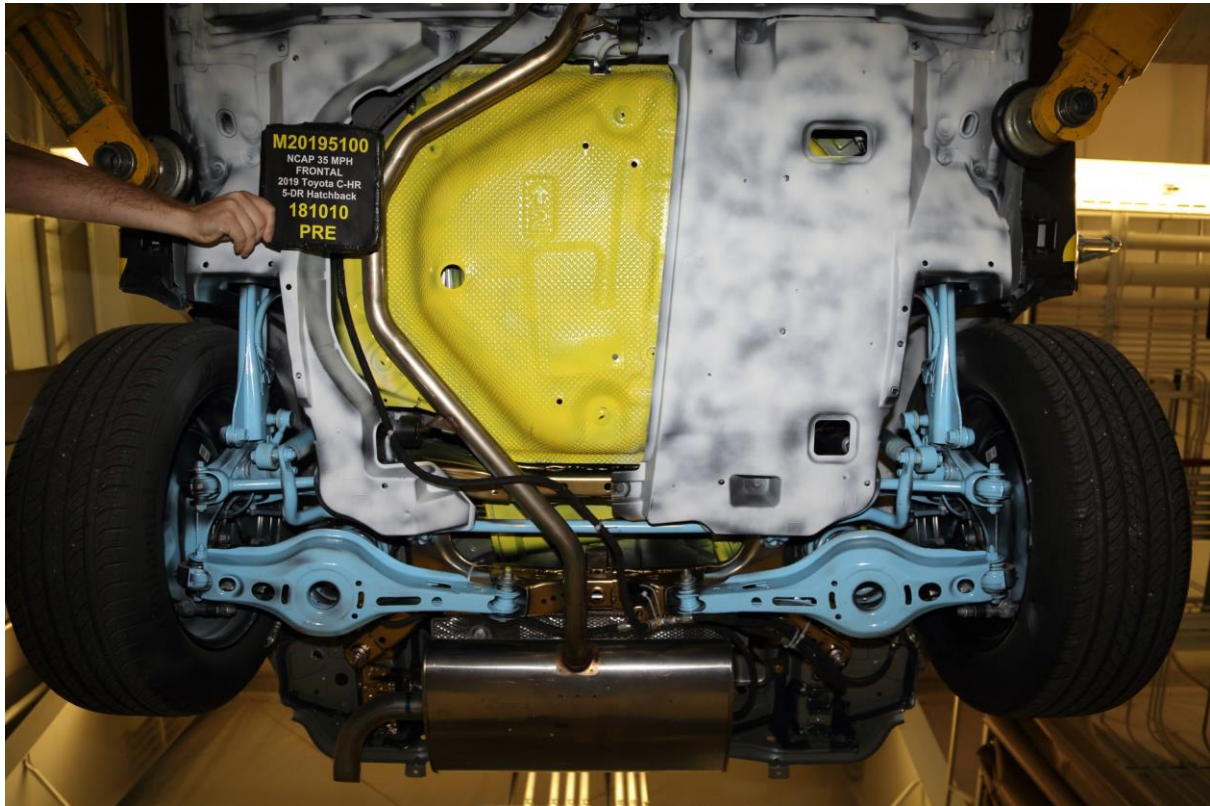
025 Post-Test Front Underbody View



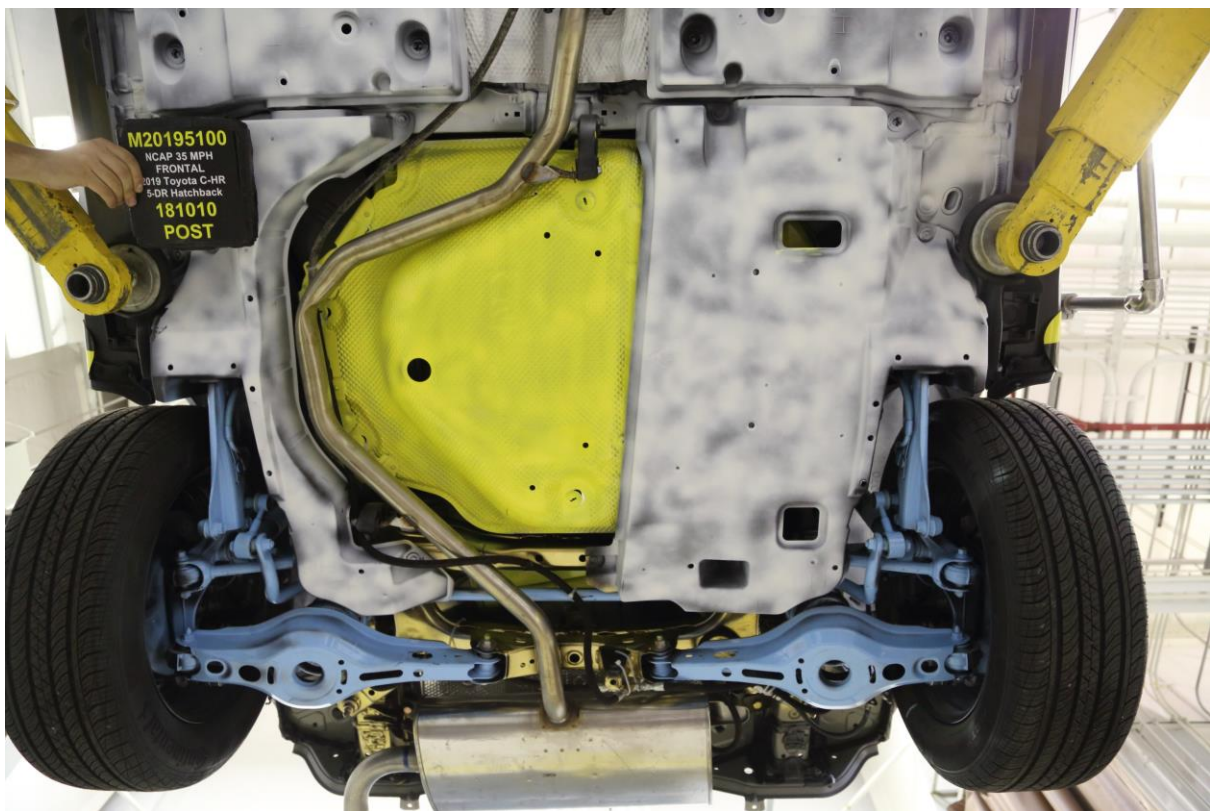
025a Pre-Test Mid Underbody View



025b Post-Test Mid Underbody View



026 Pre-Test Rear Underbody View



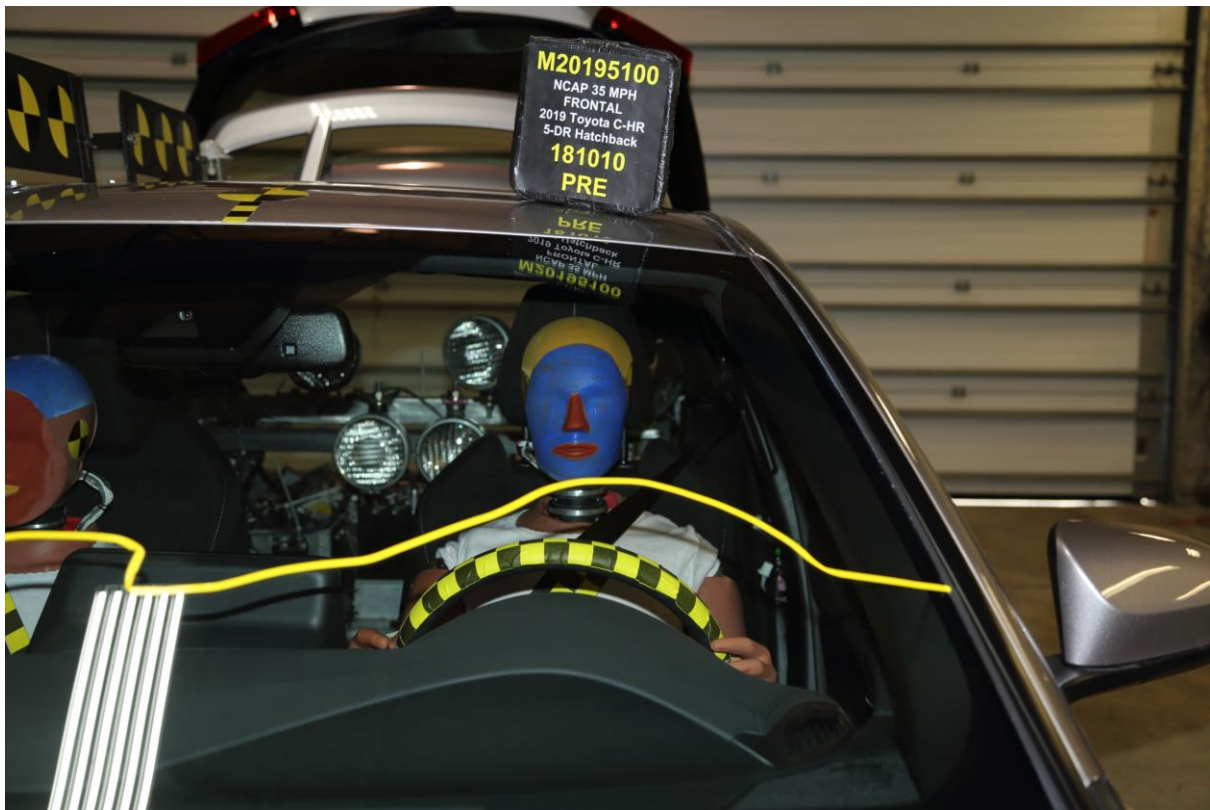
027 Post-Test Rear Underbody View



028 Pre-Test Dummy Cable Routing



029 Post-Test Dummy Cable Routing



030 Pre-Test Driver Dummy Front View



031 Post-Test Driver Dummy Front View



032 Pre-Test Driver Dummy Window View



033 Post-Test Driver Dummy Window View



034 Pre-Test Driver Dummy and Vehicle Interior View



035 Post-Test Driver Dummy and Vehicle Interior View



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



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



038 Pre-Test View of Belt Anchorage for Driver Dummy



039 Post-Test View of Belt Anchorage for Driver Dummy



040 Pre-Test View of Belt Buckle and Latch Plate for Driver Dummy



041 Post-Test View of Belt Buckle and Latch Plate for Driver Dummy



042 Pre-Test Driver Dummy Feet



043 Post-Test Driver Dummy Feet



044 Pre-Test Driver's Side Knee Bolster



045 Post-Test Driver's Side Knee Bolster



046 Pre-Test Driver's Side Floorpan



047 Post-Test Driver's Side Floorpan



048 Post-Test Driver Dummy Face



049 Post-Test Driver Dummy Contact with Airbag

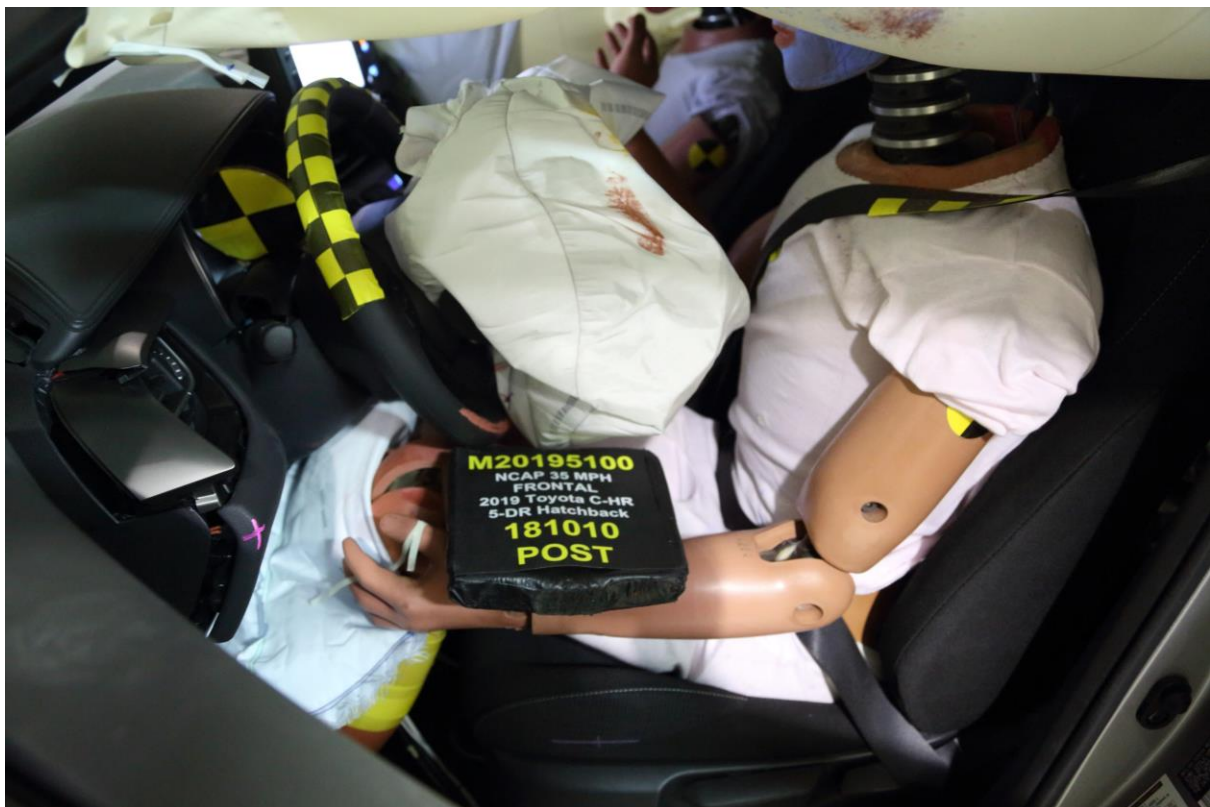


050 Post-Test Driver Dummy Contact with Headrest

Intentionally Left Blank



051 Pre-Test View of the Steering Wheel



052 Post-Test View of the Steering Wheel



053 Pre-Test Passenger Dummy Front View



054 Post-Test Passenger Dummy Front View



055 Pre-Test Passenger Dummy Window View



056 Post-Test Passenger Dummy Window View



057 Pre-Test Passenger Dummy and Vehicle Interior View



058 Post-Test Passenger Dummy and Vehicle Interior View



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



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



061 Pre-Test View of Belt Anchorage for Passenger Dummy



062 Post-Test View of Belt Anchorage for Passenger Dummy



063 Pre-Test View of Belt Buckle and Latch Plate for Passenger Dummy



064 Post-Test View of Belt Buckle and Latch Plate for Passenger Dummy



065 Pre-Test Passenger Dummy Feet



066 Post-Test Passenger Dummy Feet



067 Pre-Test Passenger's Side Knee Bolster



068 Post-Test Passenger's Side Knee Bolster



069 Pre-Test Passenger's Side Floorpan



070 Post-Test Passenger's Side Floorpan



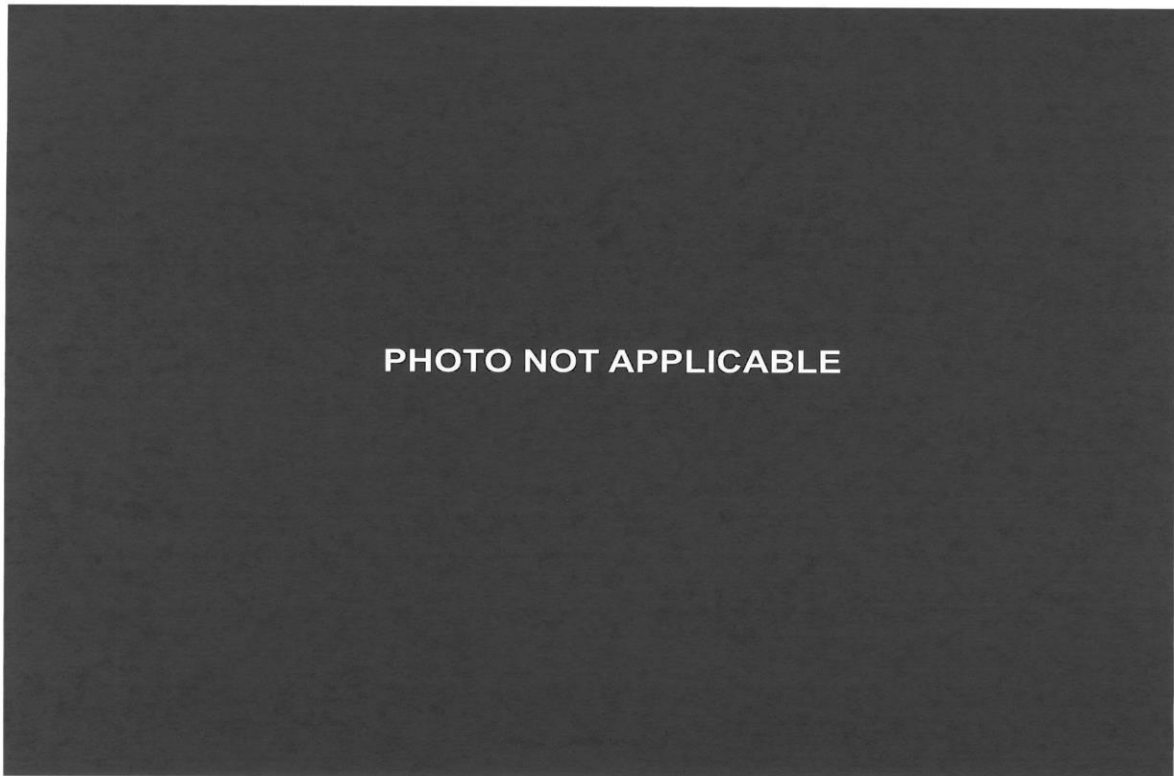
071 Post-Test Passenger Dummy Face



072 Post-Test Passenger Dummy Contact with Airbag



073 Post-Test Passenger Dummy Contact with Headrest



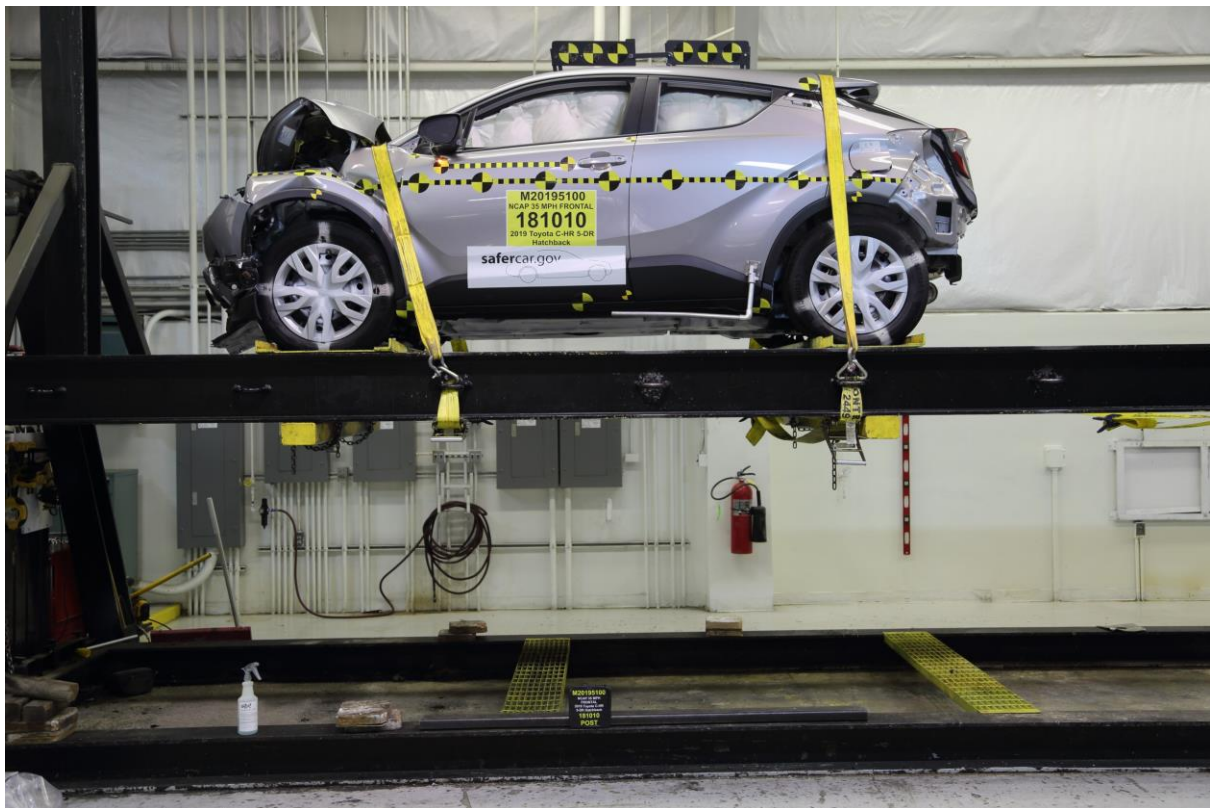
074 Photograph of Ballast Installed in Vehicle

PHOTO NOT APPLICABLE

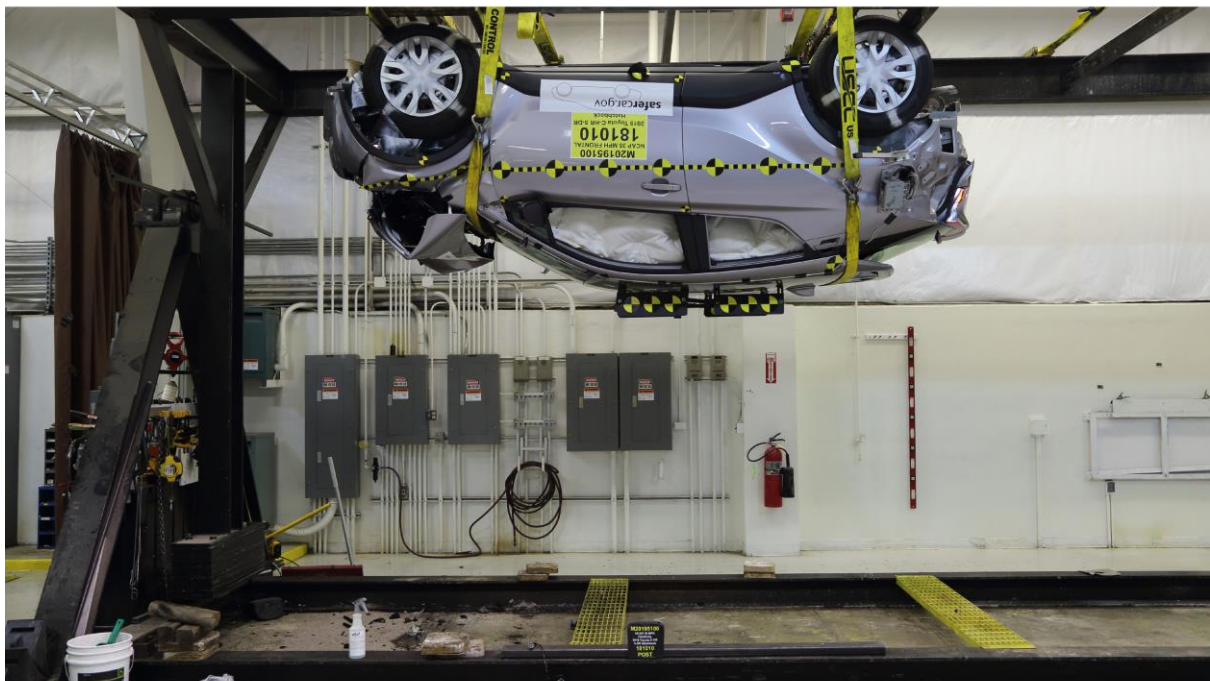
075 Post-Test Stoddard Spillage Location View



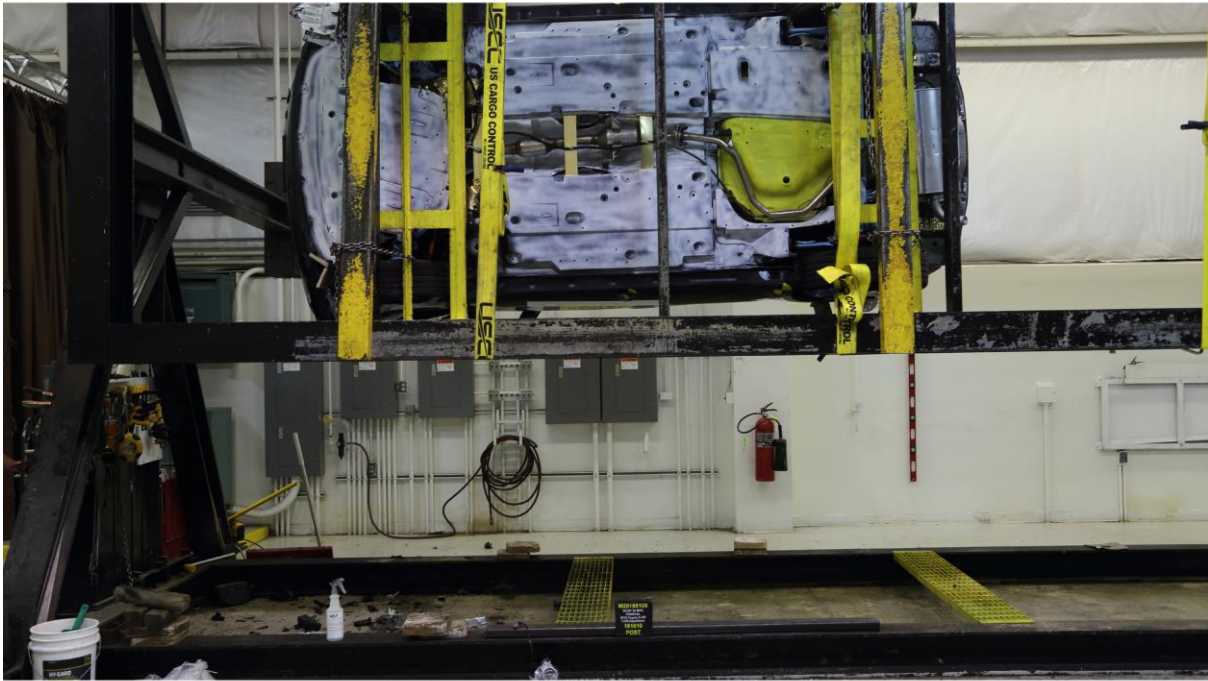
076 Post-Test Speed Trap Read out



077 Vehicle at 0° on Static Rollover Device



078 Vehicle at 90° on Static Rollover Device



079 Vehicle at 180° on Static Rollover Device



080 Vehicle at 270° on Static Rollover Device

081 Vehicle at 360° on Static Rollover Device



082 2019 Toyota C-HR 5-DR Hatchback Frontal Impact Event

TOYOTA
Let's Go Places

DESC: **C-HR** LE
VIN: **JTNKHMBX7K1018975**
YR/MDL: 2018/2402A
CLR: SILVER KNOCKOUT MET/FC20 (01K0/20)
FINAL ASSEMBLY POINT: ISAWA, IWATE, JAPAN

STANDARD EQUIPMENT

MECHANICAL AND PERFORMANCE

- 2.0L 4-Cyl DOHC 16-Valve 144HP
- CVT w/ Intelligence and Shift Mode
- Front Wh Drive Electric Power Assisted Steering
- Electronic Fuel Injection Syst
- Ventilated Fr Disc/Solid Rr Disc Brakes
- Indp MacPherson Strd Front Suspension w/Stabilizer Bar and Dampers
- 17" Steel Wheels with 215/60R17 Tires

SAFETY AND CONVENIENCE

- Toyota Safety Sense 2.0 Pre-Collision System with Pedestrian Detection
- Lane Departure Alert with Steering Assist
- Automatic High Beams
- Full-Speed Range Dynamic Radar Cruise Control
- Electric Parking Brake and Brake Hold
- Ten Standard Airbags
- Auto-Dimming Rearview Mirror
- LATCH Lower Anchor & Tether for Children
- Tire Pressure Monitoring System

EXTERIOR

- Proj-Beam Halogen Hdamps w/Auto On/Off
- LED Daytime Running Lights w/ On/Off
- Rear Window Wiper & Defogger
- Heated Power Outside Mirrors w/Turn Sig Ind
- Variable Intermitt Fr Windshield Wipers

INTERIOR

- Entune 3.5 Audio w/App Suite, 8" Touch Screen, w/ 6 Speakers, Hands Free Bluetooth Phone/Music, USB Media/Charge Port
- Integrated Back Up Camera
- Apple CarPlay Compatible Siri Eyes Free
- Dual-Zone Auto Climate Control System
- Steering Wheel w/8 Controls, Power Fan
- Per Locks, Per Windows w/One-Touch Auto Up/Down in All Positions
- Dual Sun Visors
- Sport Fabric Trim Front Bucket Seats
- Urethane Trim/Tires Str Wht w/Black, MID, BT, Voice Command, DRCC, LDA, Trip Crt

MANUFACTURER'S SUGGESTED RETAIL PRICE \$20,945.00

OPTIONAL EQUIPMENT

FE 30 State Emissions 169.00
ET All Weather Floor Liners

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.

Crash	Driver Passenger	Not Rated
Frontal	Not Rated	Not Rated
Side	Not Rated	Not Rated
Rollover	Not Rated	Not Rated

Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.

Based on the risk of injury in a side impact.

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

Fuel Economy and Environment

Fuel Economy

29 MPG
combined city/hwy

City 27 MPG
Hwy 31 MPG

3.4 gallons per 100 miles

You save \$500 in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$1,300

Fuel Economy & Greenhouse Gas Rating (EPA est.)

6 (Best)

Smog Rating (EPA est.)

3 (Best)

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and costs \$1,300 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$2.55 per gallon. MPG is miles per gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fuel economy.gov

Calculate personalized estimates and compare vehicles

DELIVERY PROCESSING AND HANDLING FEE 1,045.00

TOTAL \$22,139.00

The New Vehicle Limited Warranty provides 3-year/50,000-mile basic coverage, 5-year/100,000-mile powertrain coverage, and 8-year/unlimited-mile corrosion/perforation coverage. See Warranty and Maintenance Guide for details. An extended service contract may be available for this vehicle.

Manufacturer's suggested retail price includes manufacturer's recommended pre-delivery service. Destination, license and title taxes, registration, license, sales and local taxes and dealer and distributor installed options and accessories are all listed up in the manufacturer's suggested retail price.

ToyotaCare, which covers normal factory scheduled maintenance for two years or 25,000 miles, whichever comes first, is included as part of the sales price of the vehicle for qualifying buyers. See participating dealer for eligibility and coverage details.

Delivered by Truck to: 31069
NORTH TOWN TOYOTA
1130 MILLERSPORT HIGHWAY
AMHERST NY 14226

083 Monroney Label Photograph

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

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

The following additional dummy and vehicle response data can be found in the R & D section of the NHTSA website at: www.nhtsa.dot.gov.

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

Driver Head Angular Velocity X
Driver Head Angular Velocity Y
Driver Head Angular Velocity Z
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 Pelvis Resultant
Passenger Left Femur Redundant
Passenger Right Femur Redundant
Passenger Left Upper Tibia Moment X
Passenger Left Upper Tibia Moment Y
Passenger Left Upper Tibia Force Z
Passenger Left Lower Tibia Moment X
Passenger Left Lower Tibia Moment Y
Passenger Left Lower Tibia Force Z
Passenger Right Upper Tibia Moment X
Passenger Right Upper Tibia Moment Y
Passenger Right Upper Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger Left Foot Fore Z
Passenger Left Foot Aft X
Passenger Left Foot Aft Z
Passenger Right Foot Fore Z
Passenger Right Foot Aft X
Passenger Right Foot Aft Z
Passenger Shoulder Belt Force
Passenger Lap Belt Force

Passenger Head Angular Velocity X
Passenger Head Angular Velocity Y
Passenger Head Angular Velocity Z
Left Rear Seat Crossmember X
Left Rear Seat Crossmember Z
Right Rear Seat Crossmember X
Right Rear Seat Crossmember Z
Left Rear Seat Crossmember X Redundant
Right Rear Seat Crossmember X Redundant
Vehicle Engine Top X
Vehicle Engine Bottom X
Load Cell Barrier Forces and Moments

NHTSA

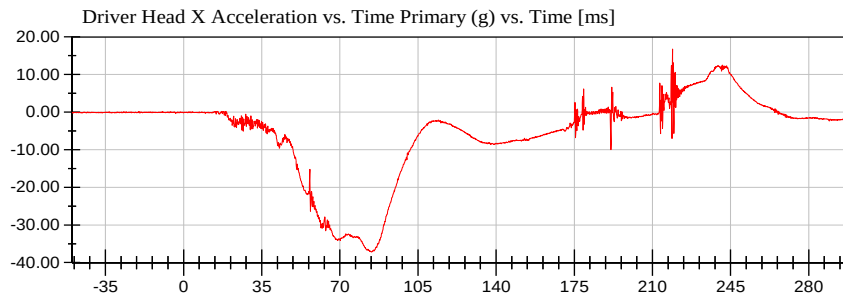
Test Lab: CTF

Test Number: 181010 (M20195100)

Test Date: 10/10/2018

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

Position #2 Hybrid III Small Adult Female (426)

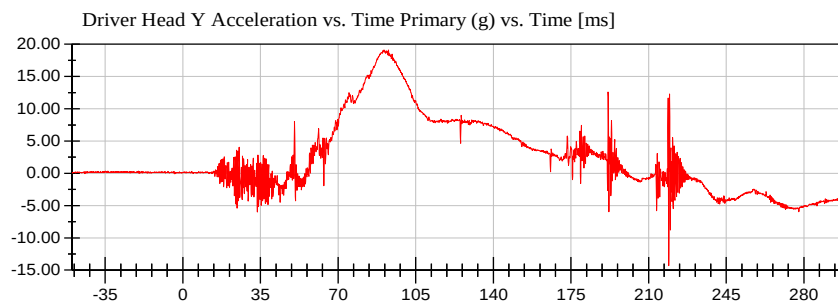


<Max>

16.80 g at 218.96 ms

<Min>

-37.18 g at 84.00 ms

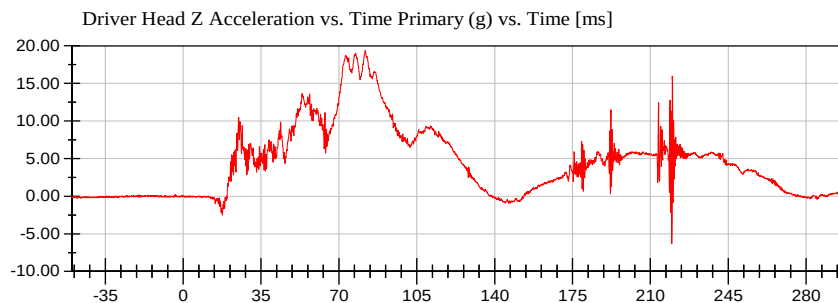


<Max>

19.12 g at 90.64 ms

<Min>

-14.32 g at 219.12 ms

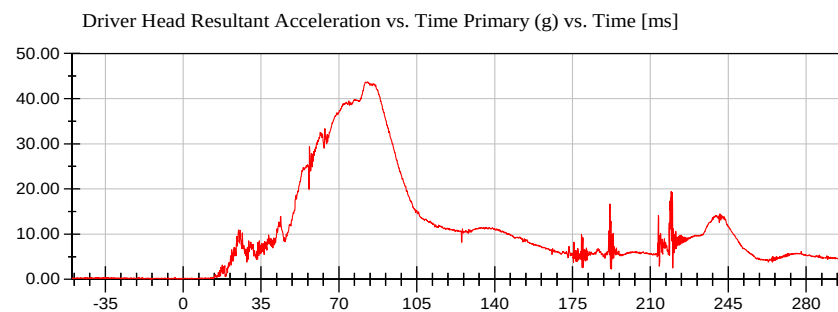


<Max>

19.36 g at 81.84 ms

<Min>

-6.30 g at 219.60 ms



<Max>

43.70 g at 82.88 ms

<Min>

0.05 g at -14.80 ms



NHTSA

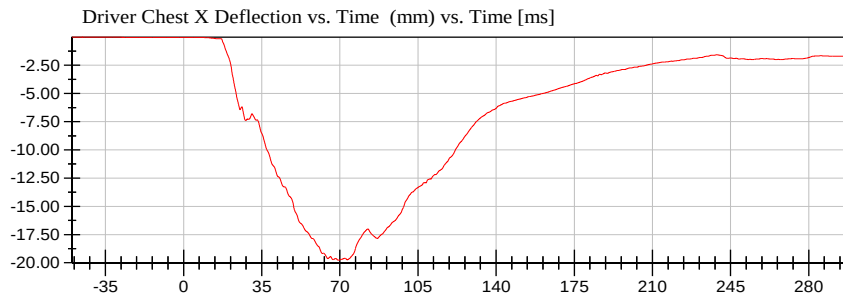
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Test Number: 181010 (M20195100)

Test Date: 10/10/2018

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

Position #2 Hybrid III Small Adult Female (426)



<Max>

0.00 mm at -45.36 ms

<Min>

-19.76 mm at 69.60 ms

CFC_600



NHTSA

Test Lab: CTF

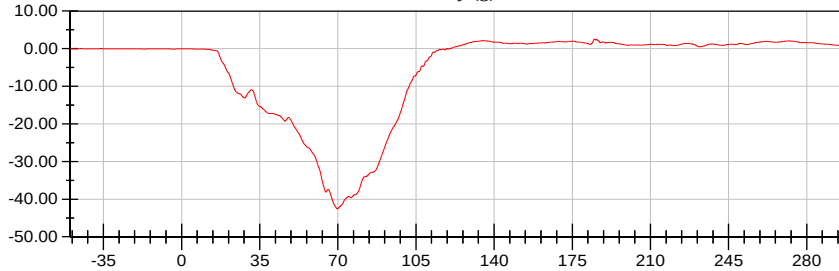
Test Number: 181010 (M20195100)

Test Date: 10/10/2018

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

Position #2 Hybrid III Small Adult Female (426)

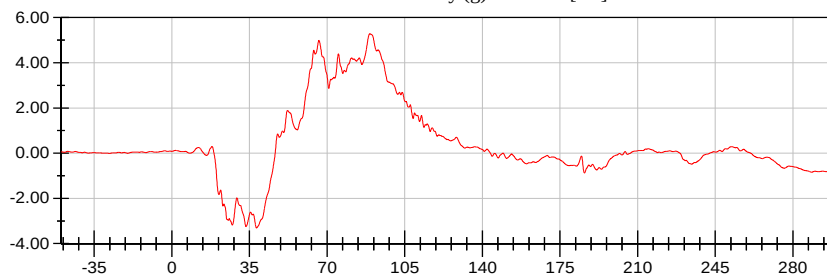
Driver Chest X Acceleration vs. Time Primary (g) vs. Time [ms]



<Max>

<Min>

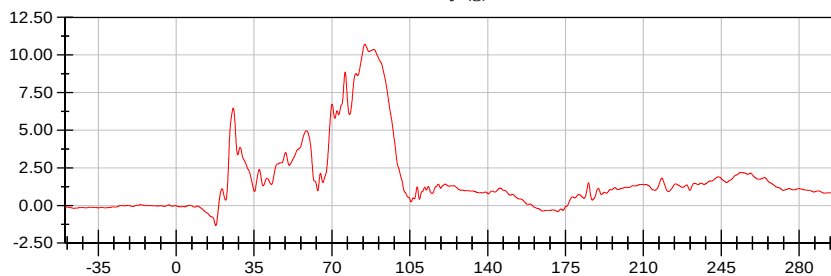
Driver Chest Y Acceleration vs. Time Primary (g) vs. Time [ms]



<Max>

<Min>

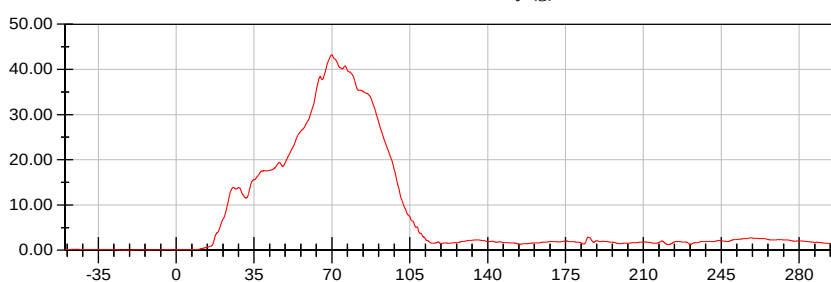
Driver Chest Z Acceleration vs. Time Primary (g) vs. Time [ms]



<Max>

<Min>

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



<Max>

<Min>



NHTSA

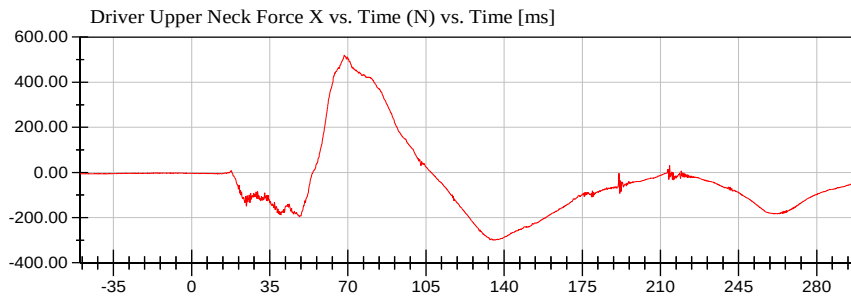
Test Lab: CTF

Test Number: 181010 (M20195100)

Test Date: 10/10/2018

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

Position #2 Hybrid III Small Adult Female (426)



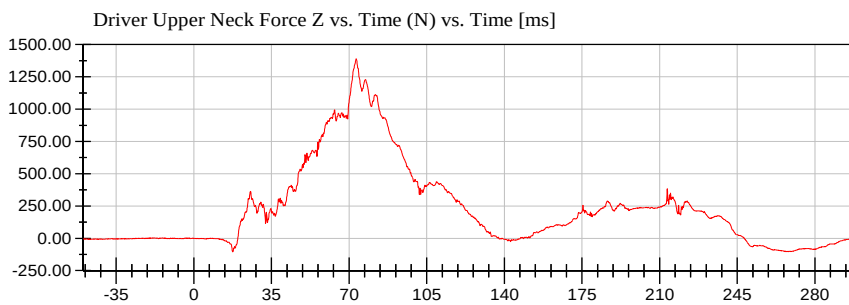
<Max>

519.44 N at 68.40 ms

<Min>

-299.10 N at 135.76 ms

CFC_1000



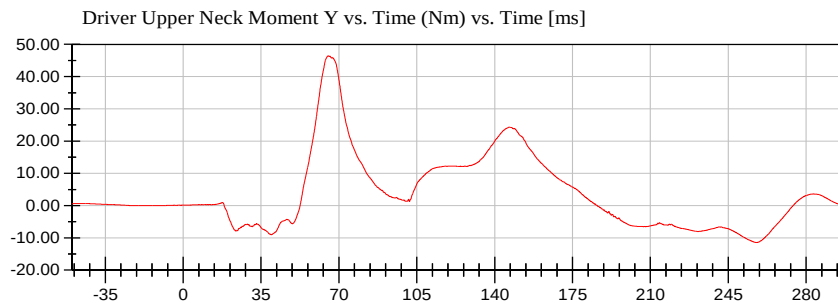
<Max>

1,389.85 N at 73.20 ms

<Min>

-106.08 N at 17.52 ms

CFC_1000



<Max>

46.39 Nm at 65.20 ms

<Min>

-11.45 Nm at 257.52 ms

CFC_600





2019 Toyota C-HR 5-DR Hatchback NCAP 35 mph Frontal Impact Neck Injury Predictor (NIJ)

Date: 10/10/2018
Time: 13:12

Customer: NHTSA

Test Number: M20195100

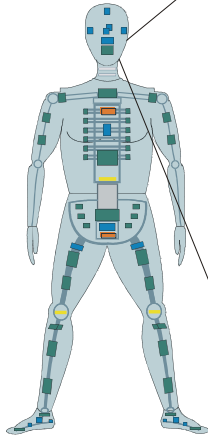
Test Orientation = Frontal

Fzc(Tension) = 6806

Fzc(Compression) = 6160

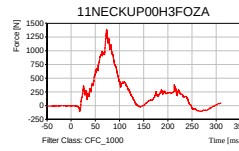
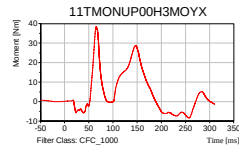
Myc(Extension) = 135

Myc(Flexion) = 310

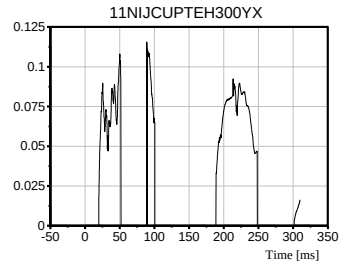


Dummy: HIII 50th Male
Seating Position:
Driver

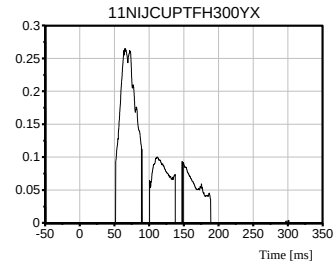
NIJ Source Code: (Fz/Fzc)+(Myl/Myc)



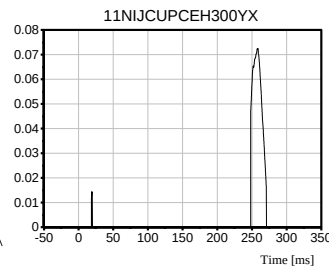
TRC Inc. Test Lab: CTF
Test Number: 181010



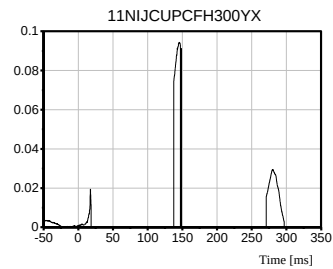
Max [NTE] 0.1154 at 88.96 ms



Max [NTF] 0.2654 at 65.20 ms



Max [NCE] 0.0725 at 258.56 ms



Max [NCF] 0.0944 at 145.76 ms

NHTSA

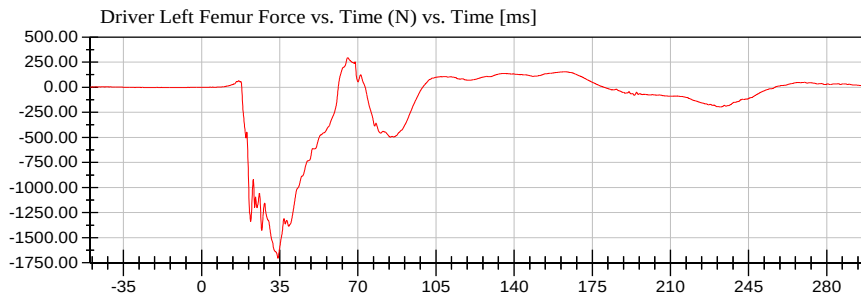
Test Lab: CTF

Test Number: 181010 (M20195100)

Test Date: 10/10/2018

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

Position #2 Hybrid III Small Adult Female (426)



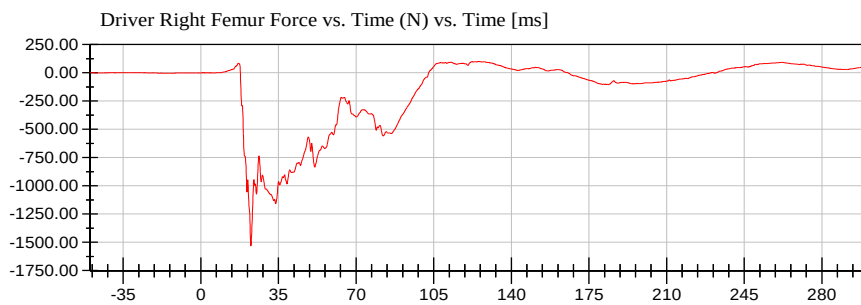
<Max>

293.95 N at 65.52 ms

<Min>

-1,704.93 N at 34.24 ms

CFC_600



<Max>

100.53 N at 125.36 ms

<Min>

-1,530.50 N at 22.56 ms

CFC_600

TRC

NHTSA

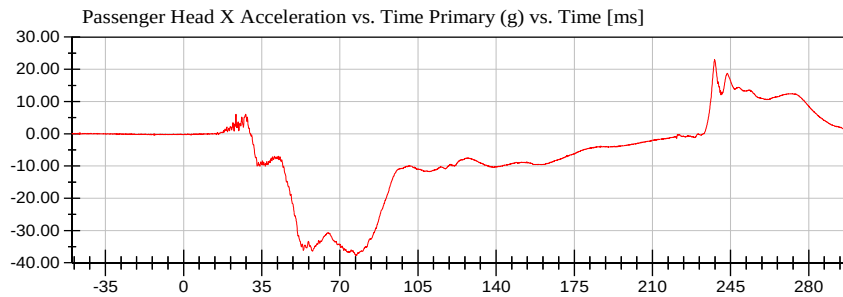
Test Lab: CTF

Test Number: 181010 (M20195100)

Test Date: 10/10/2018

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

Position #2 Hybrid III Small Adult Female (426)



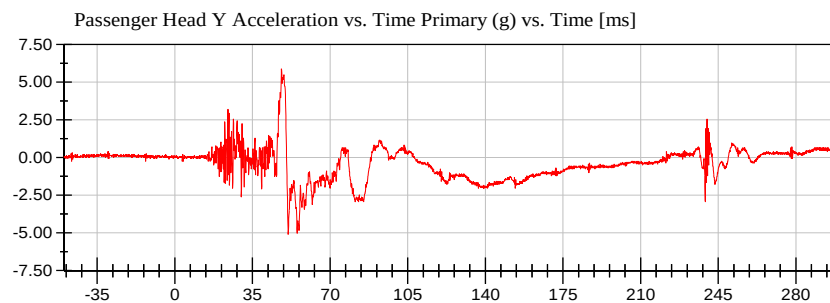
<Max>

22.99 g at 237.84 ms

<Min>

-37.70 g at 77.04 ms

CFC_1000



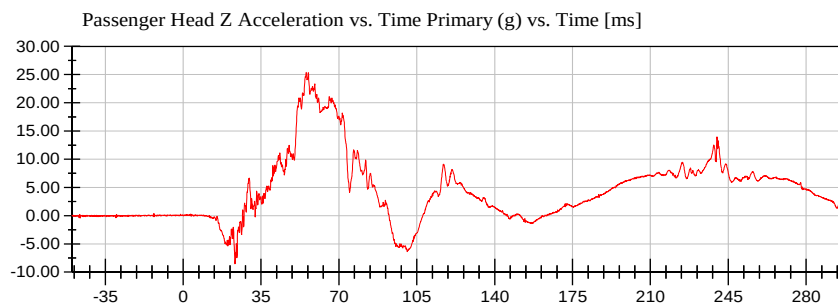
<Max>

5.89 g at 48.08 ms

<Min>

-5.09 g at 51.12 ms

CFC_1000



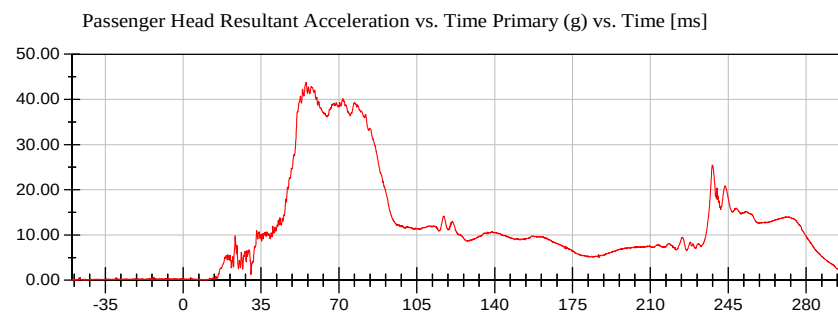
<Max>

25.39 g at 55.28 ms

<Min>

-8.55 g at 23.28 ms

CFC_1000



<Max>

43.78 g at 55.28 ms

<Min>

0.02 g at -49.52 ms

CFC_1000



NHTSA

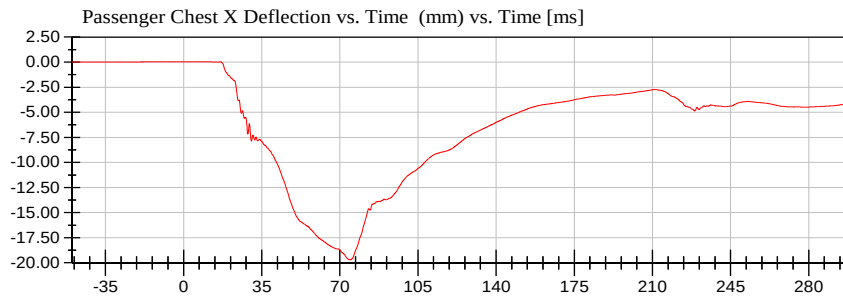
Test Lab: CTF

Test Number: 181010 (M20195100)

Test Date: 10/10/2018

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

Position #2 Hybrid III Small Adult Female (426)



<Max>

0.04 mm at 4.24 ms

<Min>

-19.70 mm at 74.72 ms

CFC_600



NHTSA

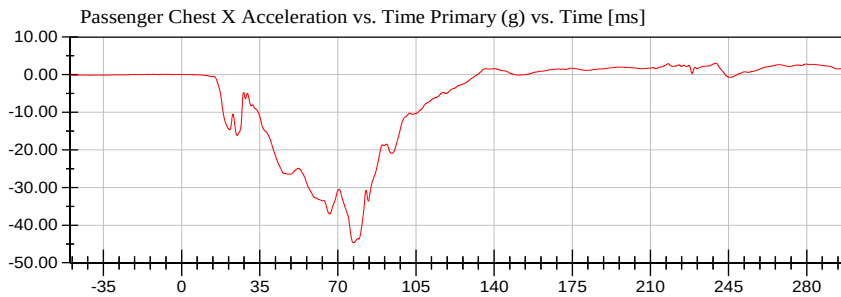
Test Lab: CTF

Test Number: 181010 (M20195100)

Test Date: 10/10/2018

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

Position #2 Hybrid III Small Adult Female (426)

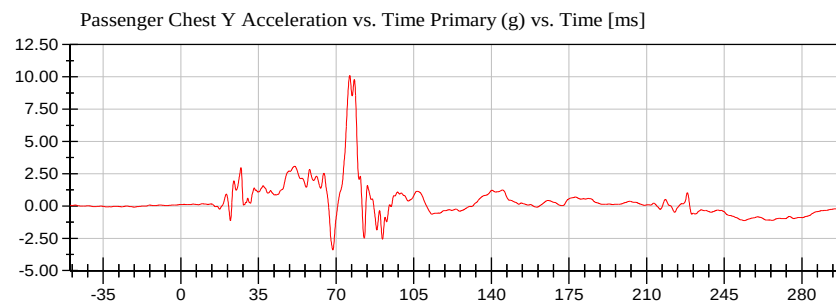


<Max>

3.01 g at 239.36 ms

<Min>

-44.69 g at 77.04 ms

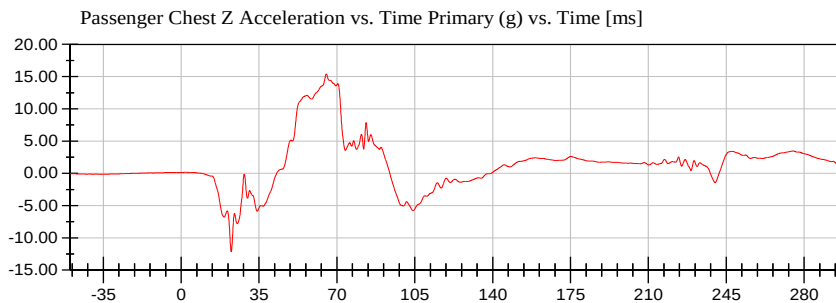


<Max>

10.11 g at 76.16 ms

<Min>

-3.40 g at 68.56 ms

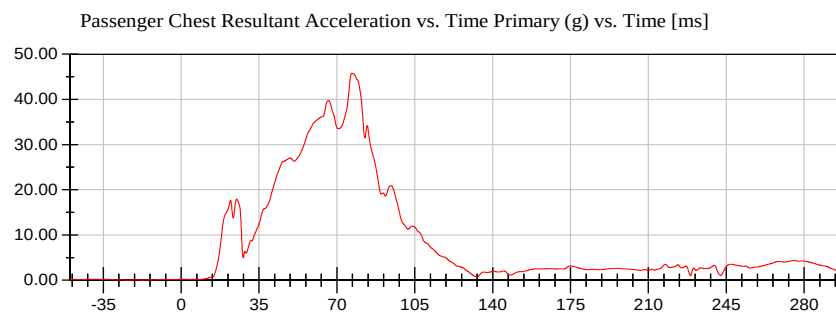


<Max>

15.42 g at 65.28 ms

<Min>

-12.14 g at 22.48 ms



<Max>

45.76 g at 76.80 ms

<Min>

0.03 g at -23.68 ms



NHTSA

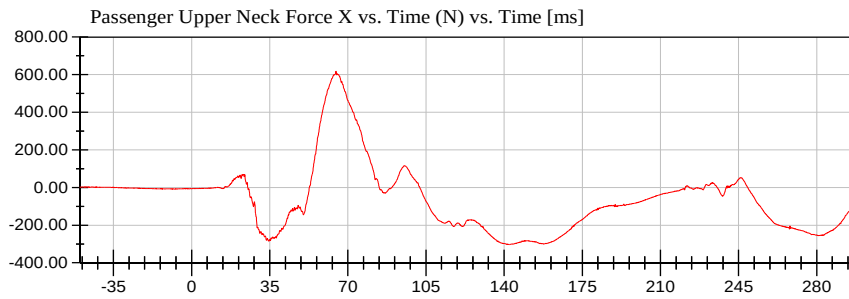
Test Lab: CTF

Test Number: 181010 (M20195100)

Test Date: 10/10/2018

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

Position #2 Hybrid III Small Adult Female (426)



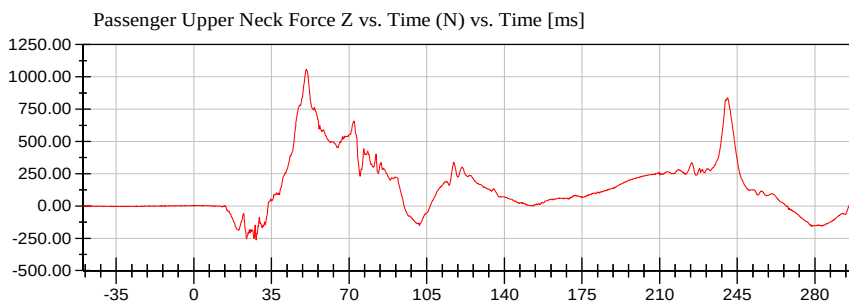
<Max>

618.71 N at 64.72 ms

<Min>

-303.27 N at 142.32 ms

CFC_1000



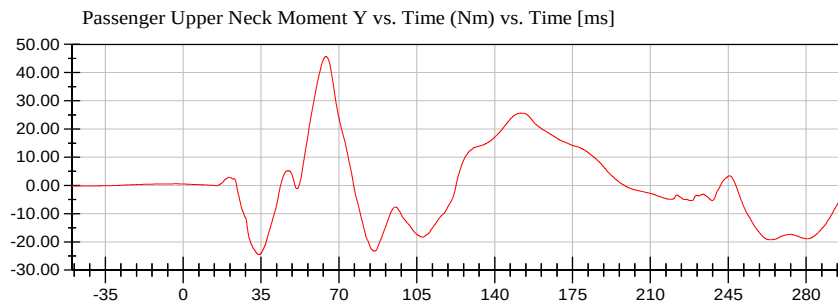
<Max>

1,058.11 N at 50.80 ms

<Min>

-261.98 N at 28.08 ms

CFC_1000



<Max>

45.71 Nm at 64.08 ms

<Min>

-24.48 Nm at 33.76 ms

CFC_600





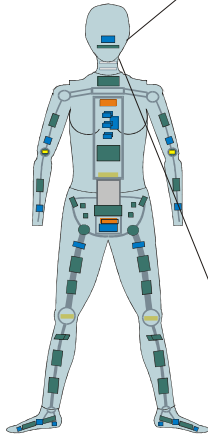
2019 Toyota C-HR 5-DR Hatchback NCAP 35 mph Frontal Impact Neck Injury Predictor (NIJ)

Date: 10/10/2018
Time: 13:12

Customer: NHTSA

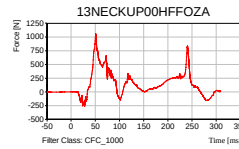
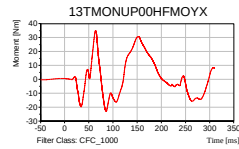
Test Number: M20195100

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

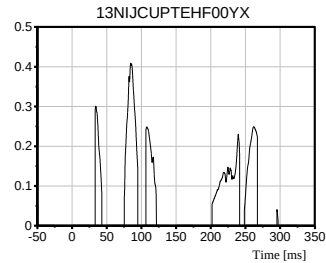


Dummy: HIII 5th Female
Seating Position:
Right Front Passenger

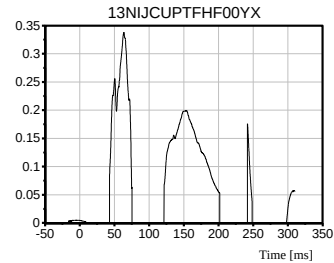
NIJ Source Code: (Fz/Fzc)+(Myl/Myc)



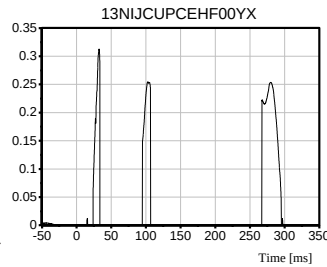
TRC Inc. Test Lab: CTF
Test Number: 181010



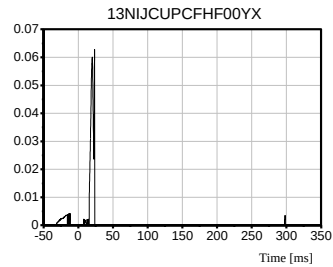
Max [NTE] 0.4093 at 84.48 ms



Max [NTF] 0.3376 at 63.68 ms



Max [NCE] 0.3130 at 32.24 ms



Max [NCF] 0.0628 at 23.68 ms

NHTSA

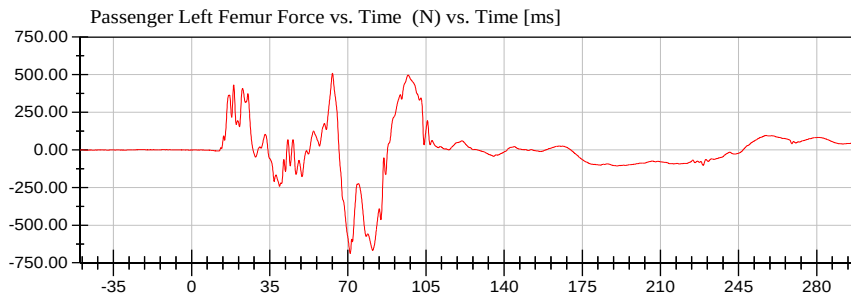
Test Lab: CTF

Test Number: 181010 (M20195100)

Test Date: 10/10/2018

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

Position #2 Hybrid III Small Adult Female (426)



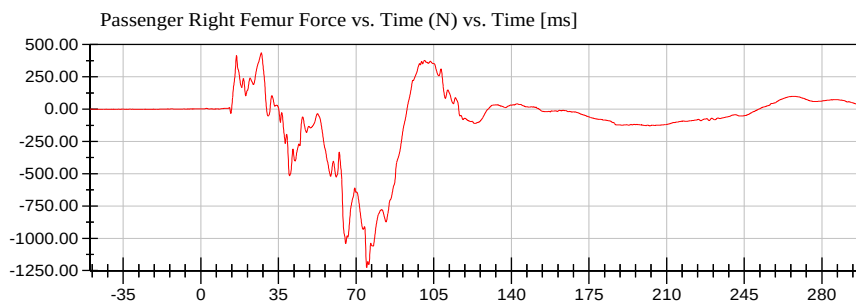
<Max>

508.60 N at 63.12 ms

<Min>

-687.53 N at 71.04 ms

CFC_600



<Max>

435.93 N at 27.28 ms

<Min>

-1,226.05 N at 74.80 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. 50

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	880	Yes
B	Shoulder Pivot Height	505.5 - 520.7	513	Yes
C	H-Point Height	83.8 - 88.9	86	Yes
D	H-Point From Seatback	134.6 - 139.7	137	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	91	Yes
F	Thigh Clearance	139.7 - 154.9	147	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	295	Yes
H	Skull Cap To Backline	40.6 - 45.7	44	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	337	Yes
J	Elbow Rest Height	190.5 - 210.8	200	Yes
K	Buttock Knee Length	579.1 - 604.5	601	Yes
L	Popliteal Height	429.3 - 454.7	440	Yes
M	Knee Pivot Height	485.1 - 500.4	494	Yes
N	Buttock Popliteal Length	452.1 - 477.5	470	Yes
O	Chest Depth	213.4 - 228.6	226	Yes
P	Foot Length	251.5 - 266.7	264	Yes
V	Shoulder Breadth	421.6 - 436.9	425	Yes
W	Foot Breadth	91.4 - 106.7	96	Yes
Y	Chest Circumference	970.3 - 1000.8	991	Yes
Z	Waist Circumference	835.7 - 866.1	864	Yes
AA	Location For Chest Circumference	429.3 - 434.3	432	Yes
BB	Location For Waist Circumference	226.1 - 231.1	229	Yes

Transportation Research Center Inc.

Front Head Drop

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

Test Date: 9/18/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	252.8 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	3.9 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Condition: Used

Comments:

Head Skin S/N: N/A

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

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09.18.2018 10:30:54 577

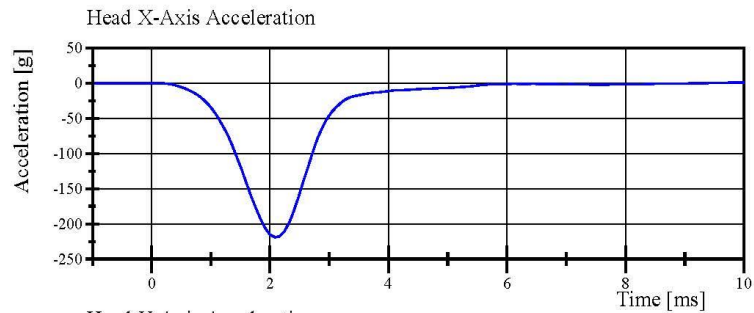


Transportation Research Center Inc.

Front Head Drop

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

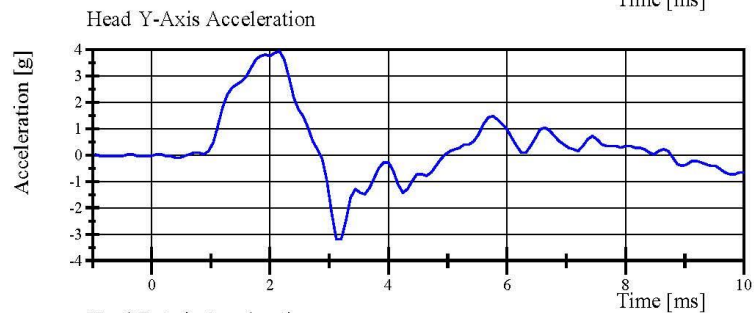
Test Date: 9/18/2018



Filter Class: CFC_1000

Max: 0.9 g at 9.8 ms

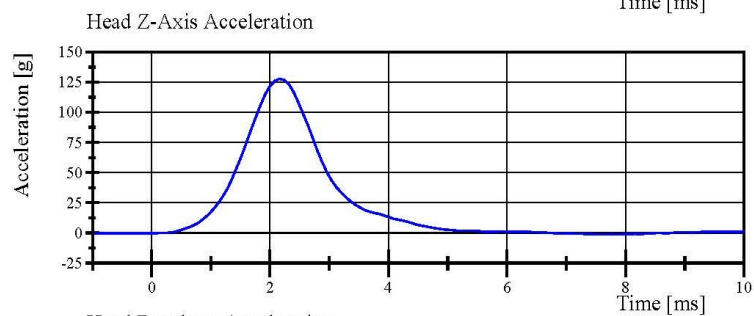
Min: -219.1 g at 2.1 ms



Filter Class: CFC_1000

Max: 3.9 g at 2.2 ms

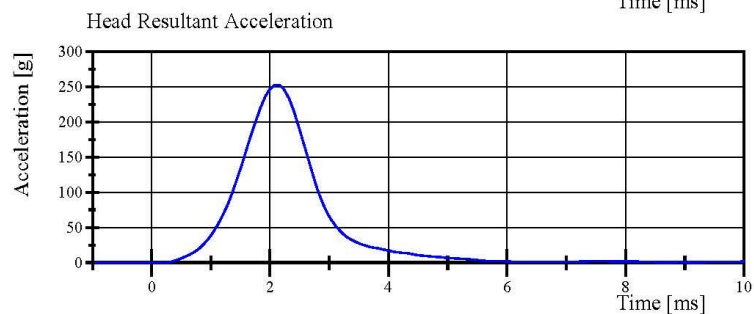
Min: -3.2 g at 3.1 ms



Filter Class: CFC_1000

Max: 127.9 g at 2.2 ms

Min: -1.2 g at 7.6 ms



Filter Class: CFC_1000

Max: 252.8 g at 2.1 ms

Min: 0.0 g at -0.9 ms

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

09.18.2018 10:31:41 577



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Transportation Research Center Inc.

Neck Flexion

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

Test Date: 9/18/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.932 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	39.1 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-24.48 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-20.10 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-15.85 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-15.85 g	Yes
Total Head D-Plane Rotation			
Peak	(-64) - (-78) °	-64.5 °	Yes
Time of Peak	57 - 64 ms	59.3 ms	Yes
Total Head D-Plane Rotation Decay to 0°	113 - 128 ms	118.0 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	88 - 108 N·m	99.3 N·m	Yes
Time of Peak	47 - 58 ms	51.9 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	97 - 107 ms	101.1 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: 4728

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

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09.18.2018 11:12:15 1831

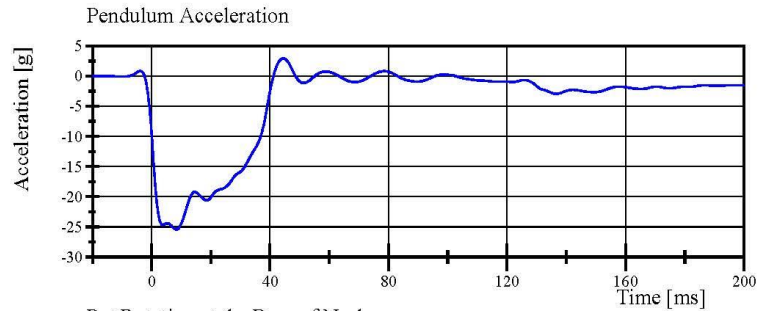


Transportation Research Center Inc.

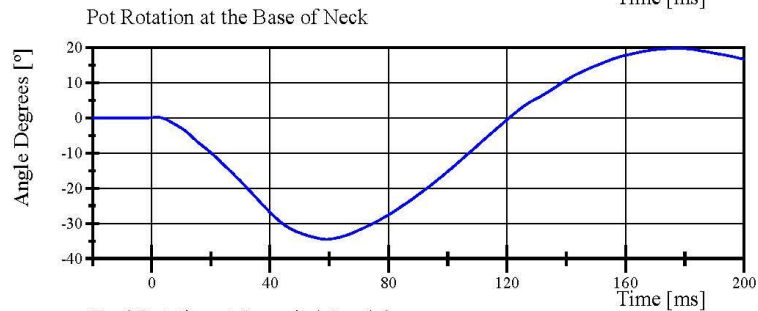
Neck Flexion

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

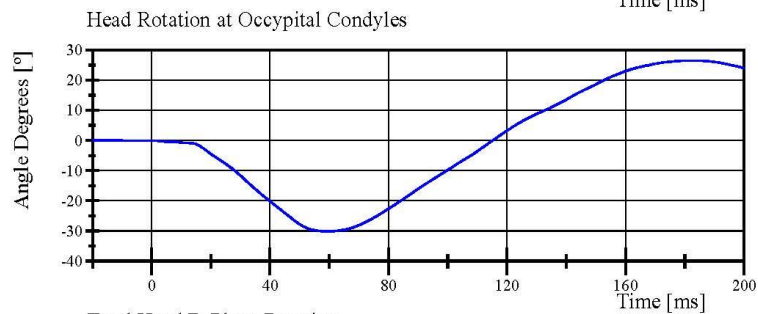
Test Date: 9/18/2018



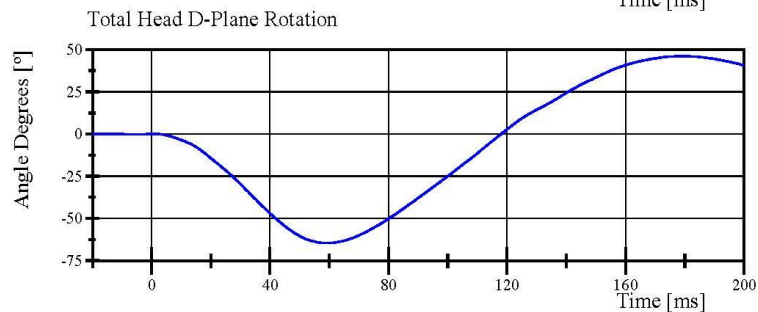
Filter Class: CFC_60
Max: 3.0 g at 44.5 ms
Min: -25.4 g at 8.4 ms



Filter Class: CFC_60
Max: 19.8 ° at 177.4 ms
Min: -34.4 ° at 59.1 ms



Filter Class: CFC_60
Max: 26.5 ° at 182.3 ms
Min: -30.1 ° at 59.5 ms



Filter Class: CFC_60
Max: 46.2 ° at 179.4 ms
Min: -64.5 ° at 59.3 ms

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

09.18.2018 11:17:52 1831



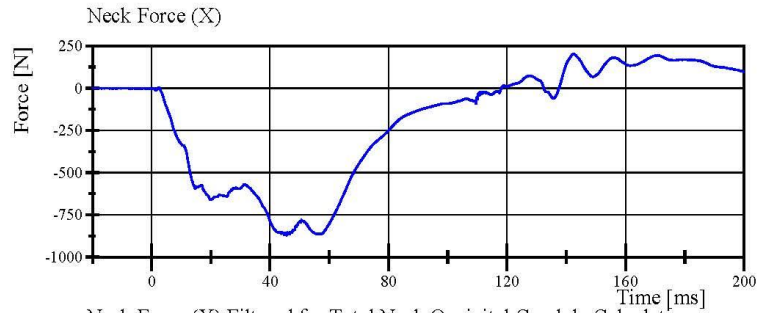
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Transportation Research Center Inc.

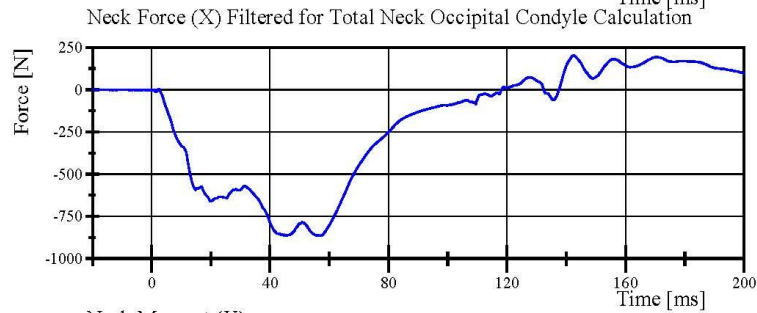
Neck Flexion

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

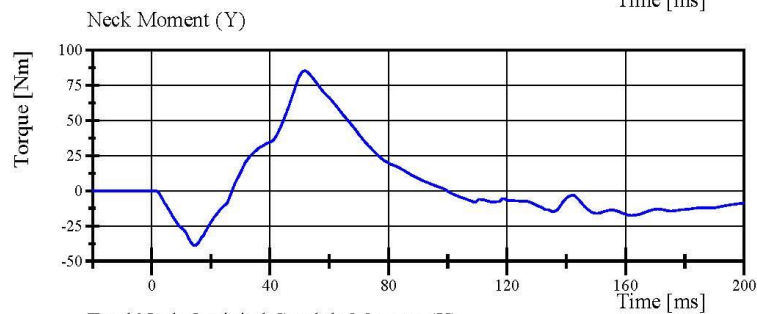
Test Date: 9/18/2018



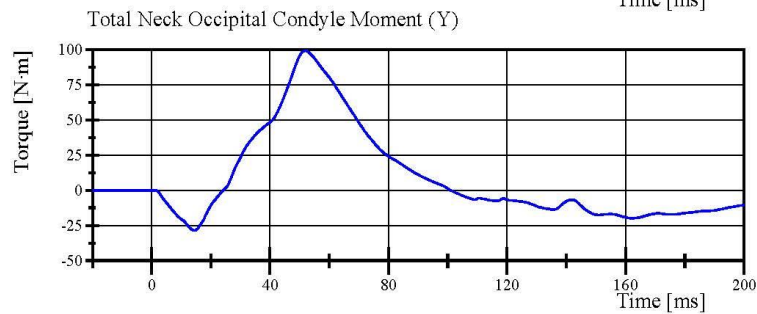
Filter Class: CFC_1000
Max: 203.4 N at 142.3 ms
Min: -871.5 N at 45.6 ms



Filter Class: CFC_600
Max: 202.8 N at 142.4 ms
Min: -865.2 N at 45.6 ms



Filter Class: CFC_600
Max: 85.2 Nm at 51.8 ms
Min: -38.9 Nm at 14.7 ms



Filter Class: Without_(Constai
Max: 99.3 N·m at 51.9 ms
Min: -28.5 N·m at 14.5 ms

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

09.18.2018 11:17:53 1831



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Transportation Research Center Inc.

Neck Extension

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

Test Date: 9/18/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-5.999 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	38.3 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	20.19 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	18.10 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	15.53 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	15.53 g	Yes
Total Head D-Plane Rotation			
Peak	81 - 106 °	93.6 °	Yes
Time of Peak	72 - 82 ms	76.8 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	158.4 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	(-53) - (-80) N·m	-72.3 N·m	Yes
Time of Peak	65 - 79 ms	71.5 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	120 - 148 ms	146.5 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: 4728

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

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09.18.2018 14:13:55 1972

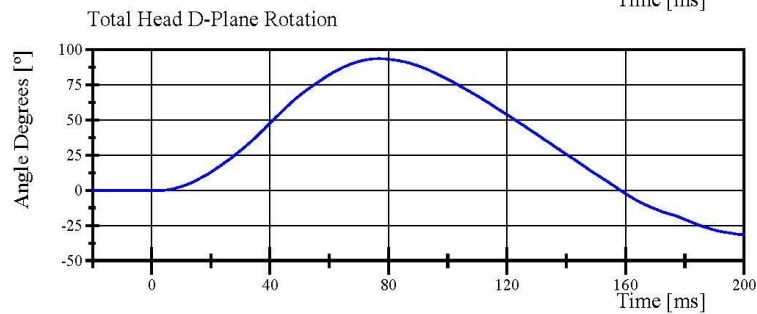
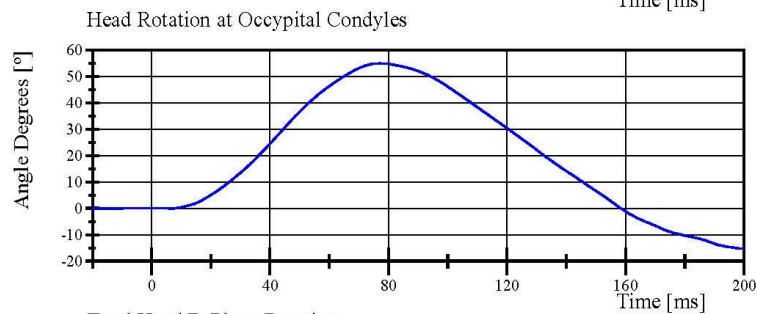
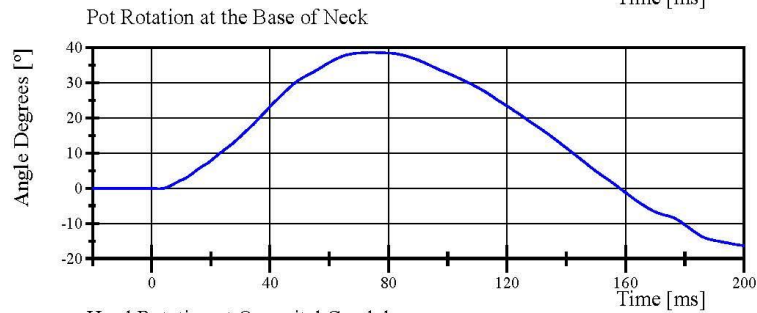
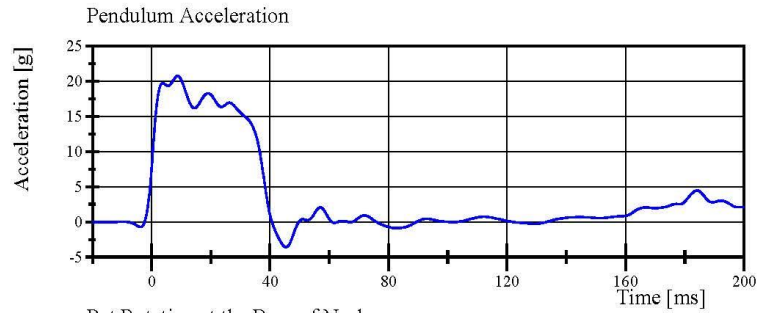


Transportation Research Center Inc.

Neck Extension

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

Test Date: 9/18/2018



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

09.18.2018 14:14:13 1972



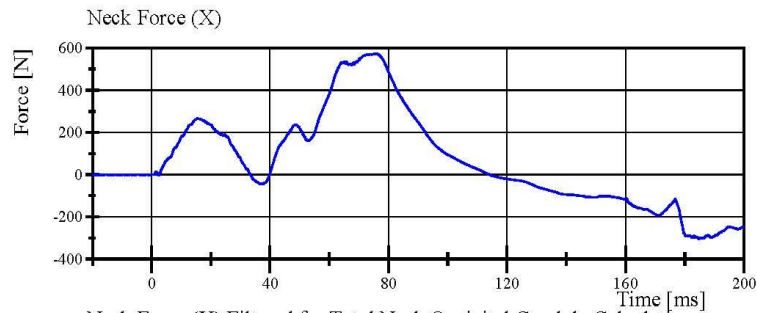
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Transportation Research Center Inc.

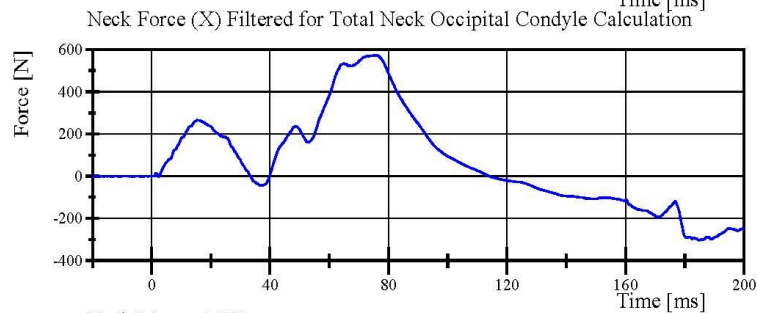
Neck Extension

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

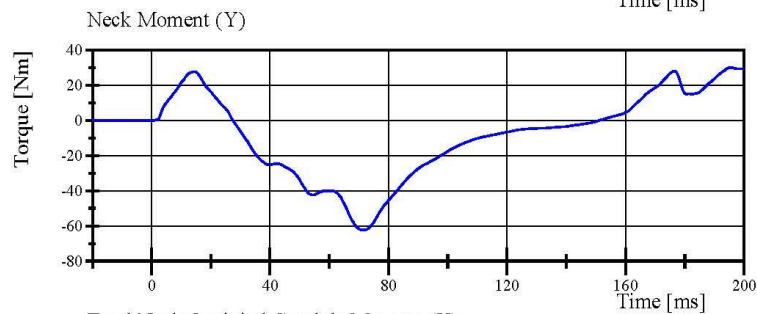
Test Date: 9/18/2018



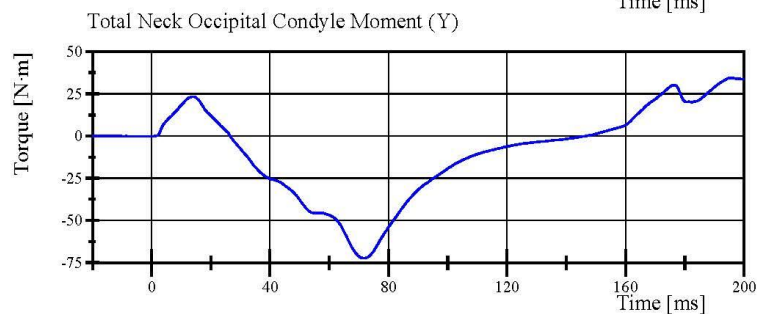
Filter Class: CFC_1000
Max: 573.8 N at 75.9 ms
Min: -304.3 N at 184.9 ms



Filter Class: CFC_600
Max: 573.4 N at 75.9 ms
Min: -303.0 N at 184.9 ms



Filter Class: CFC_600
Max: 30.0 Nm at 195.3 ms
Min: -62.4 Nm at 71.3 ms



Filter Class: Without_(Constai
Max: 34.4 N·m at 195.5 ms
Min: -72.3 N·m at 71.5 ms

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

09.18.2018 14:14:14 1972



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Transportation Research Center Inc.

Front Thorax

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

Test Date: 9/21/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.607 m/s	Yes
Probe Force Peak	(-5,160) - (-5,894) N	-5,355.8 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-71.00 mm	Yes
Internal Hysteresis	69 - 85 %	72.9 %	Yes

Test meets specifications.

Condition: Used

Comments:

Jacket S/N: 2565

Rib #1 Assembly S/N: 178051-35 HI6550

Rib #2 Assembly S/N: 36 16526

Rib #3 Assembly S/N: 37 16543

Rib #4 Assembly S/N: 38 16538

Rib #5 Assembly S/N: 39 HI6530

Rib #6 Assembly S/N: 40 16548

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

09.21.2018 14:42:20 374



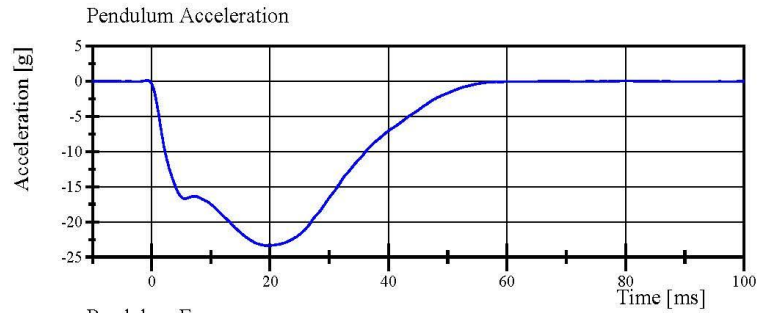
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Transportation Research Center Inc.

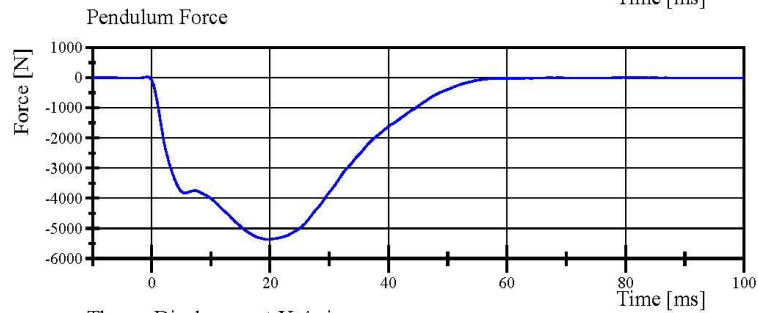
Front Thorax

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

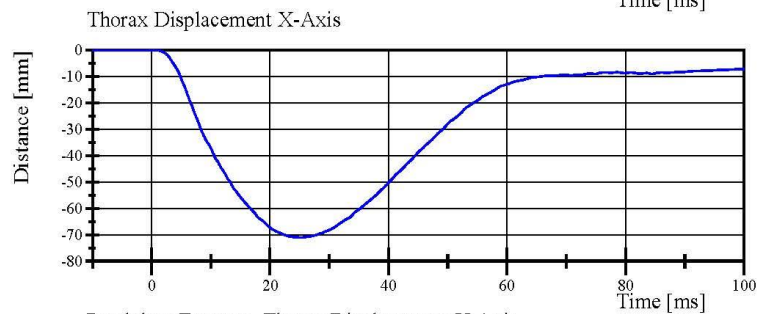
Test Date: 9/21/2018



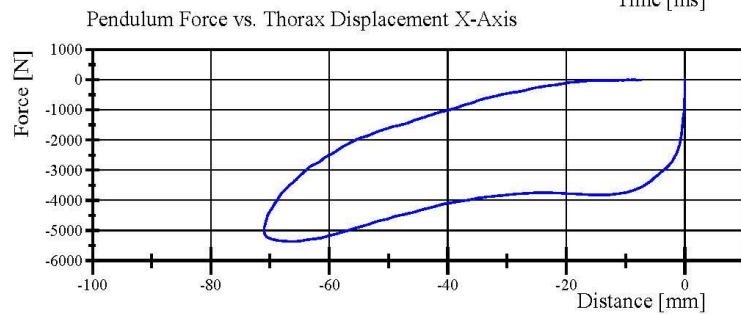
Filter Class: CFC_180
Max: 0.1 g at -0.7 ms
Min: -23.4 g at 19.5 ms



Filter Class: CFC_180
Max: 25.5 N at -0.7 ms
Min: -5,355.8 N at 19.5 ms



Filter Class: CFC_600
Max: 0.0 mm at -9.2 ms
Min: -71.0 mm at 25.2 ms



Filter Class: CFC_180
Max: 25.5 N at -0.0 mm
Min: -5,355.8 N at -66.3 mm

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

09.21.2018 14:44:13 374



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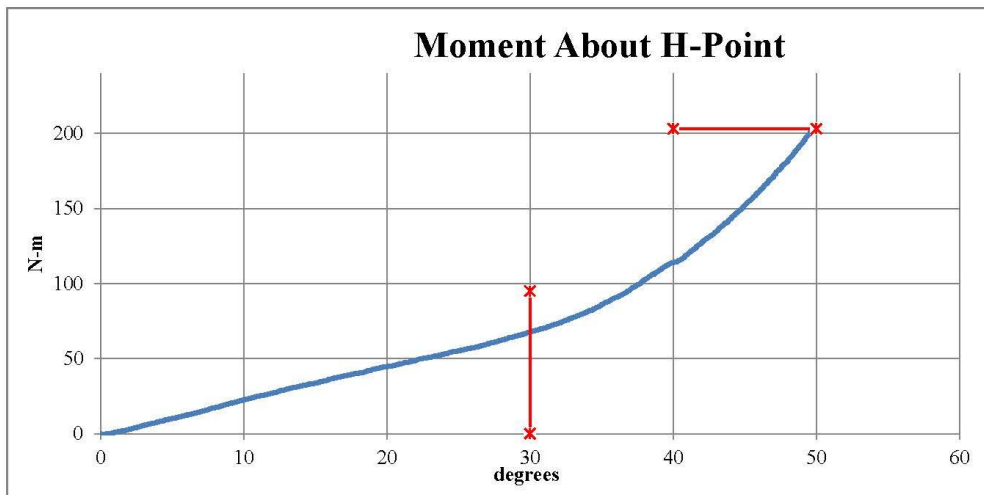
Transportation Research Center Inc.

Hybrid III 50th Male Hip Range of Motion

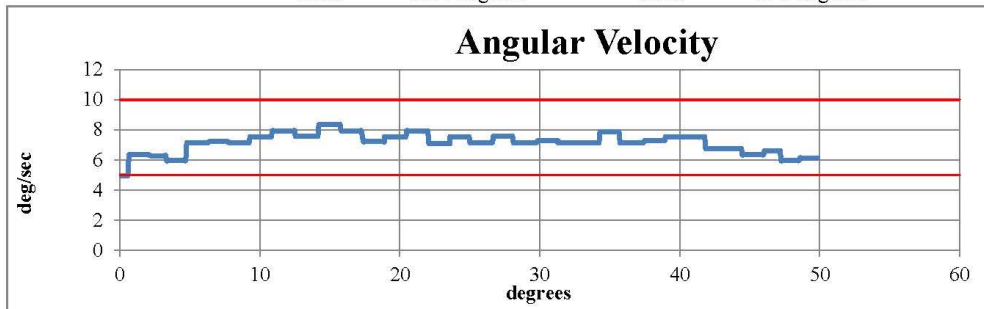


Serial Number: 037 Date: 18-Sep-2018
Side Tested: Left Hip Time: 14:44
Test Number: 1

TEST PARAMETER	SPECIFICATION			TEST RESULTS		
Temperature	18.9	-	25.6	20.8 °C	Pass	
Humidity	10	-	70	50 %	Pass	
Moment at 30°	0	≤	94.9	67.78 N-m	Pass	
Angle at 203 Nm	40	-	50	49.88 deg	Pass	
Average Velocity	5	-	10	7.13 deg/sec	Pass	



Max: 8.34 deg/sec Min: 4.96 deg/sec



Comments:
Pelvis Skin S/N: N/A
Lumbar Spine S/N: 0551
Lumbar Cable S/N: N/A

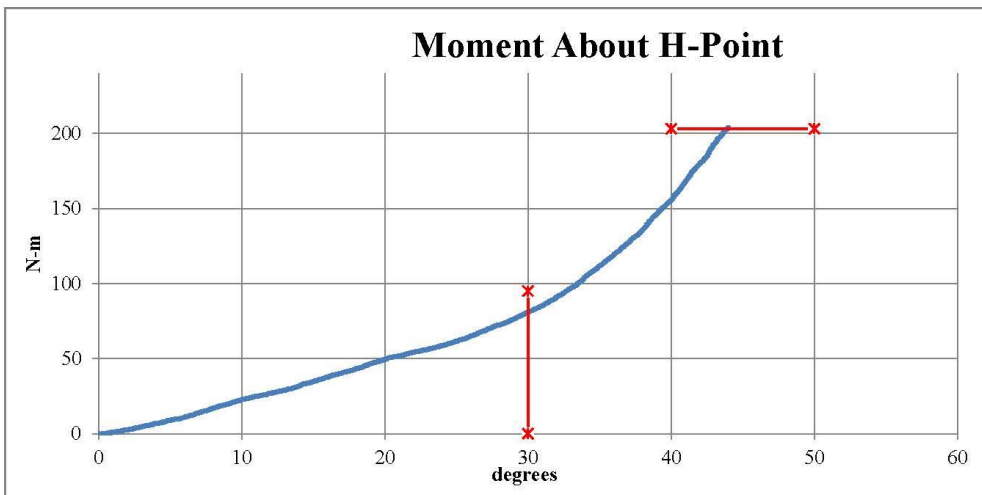
Transportation Research Center Inc.

Hybrid III 50th Male Hip Range of Motion

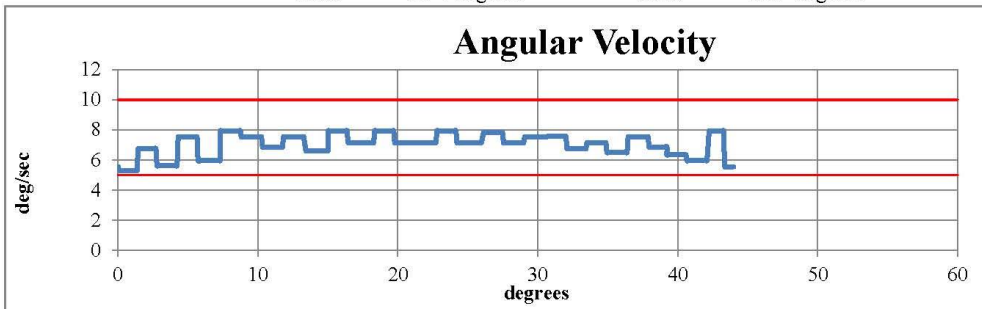


Serial Number: 037 Date: 18-Sep-2018
Side Tested: Right Hip Time: 16:12
Test Number: 1

TEST PARAMETER	SPECIFICATION		TEST RESULTS		
Temperature	18.9	- 25.6	21.2 °C	Pass	
Humidity	10	- 70	50 %	Pass	
Moment at 30°	0	≤ 94.9	81.09 N-m	Pass	
Angle at 203 Nm	40	- 50	44 deg	Pass	
Average Velocity	5	- 10	7.05 deg/sec	Pass	



Max: 7.94 deg/sec Min: 5.29 deg/sec



Comments:
Pelvis Skin S/N: N/A
Lumbar Spine S/N: 0551
Lumbar Cable S/N: N/A

Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 50-1
Test Date: 9/18/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.072 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,649.10 N	Yes

Test meets specifications.

Condition: Used

Comments:

Knee Skin S/N: 2672

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

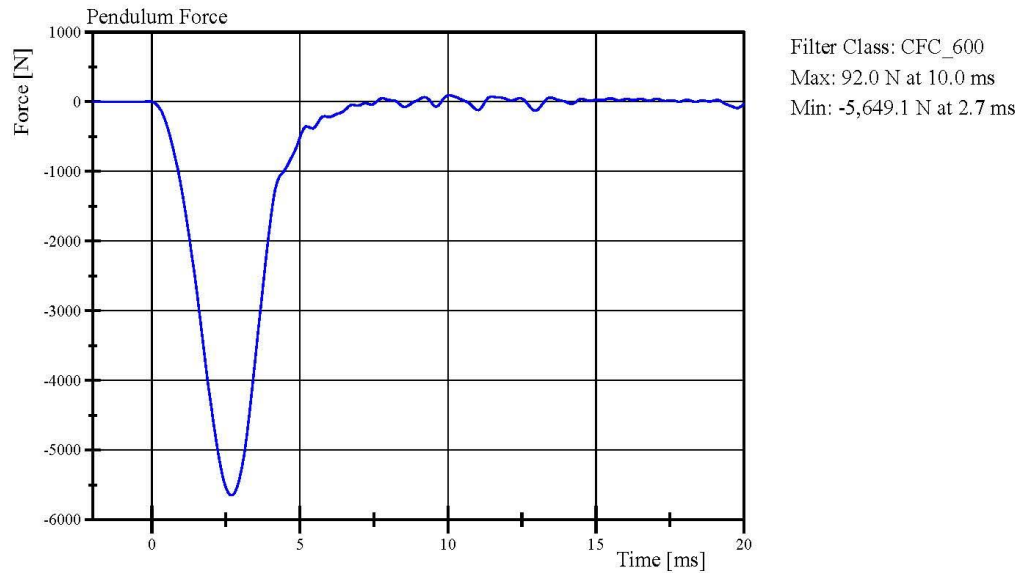
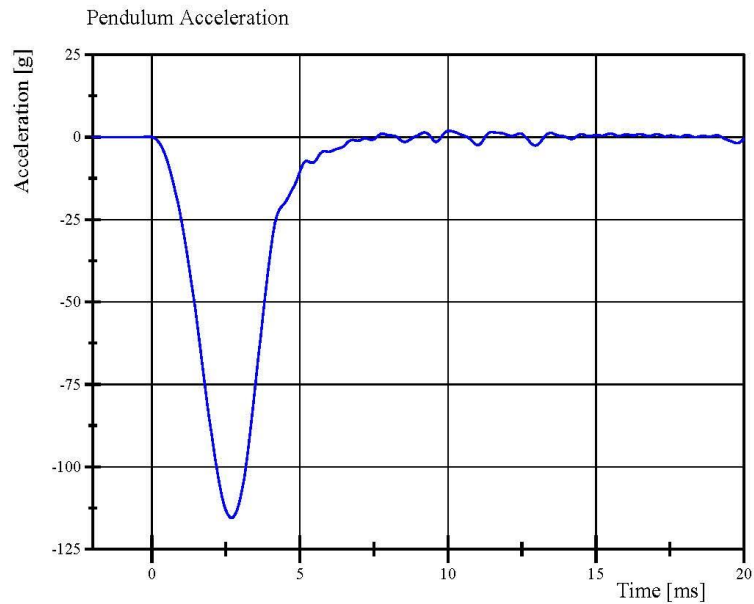
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09.18.2018 11:46:12 1879



Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 50-1
Test Date: 9/18/2018



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

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Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 50-2
Test Date: 9/18/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.076 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,499.47 N	Yes

Test meets specifications.

Condition: Used

Comments:

Knee Skin S/N: 3131

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

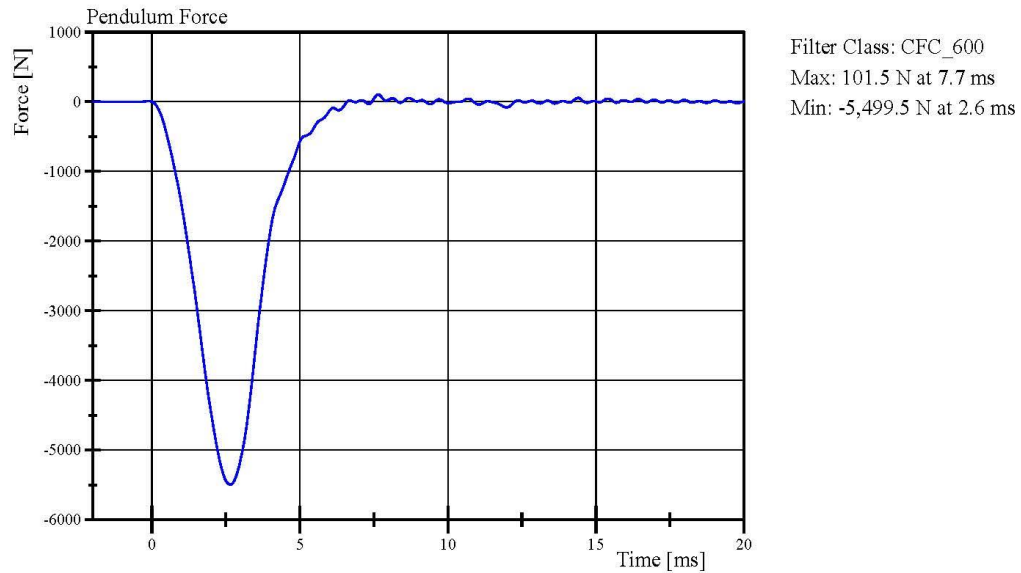
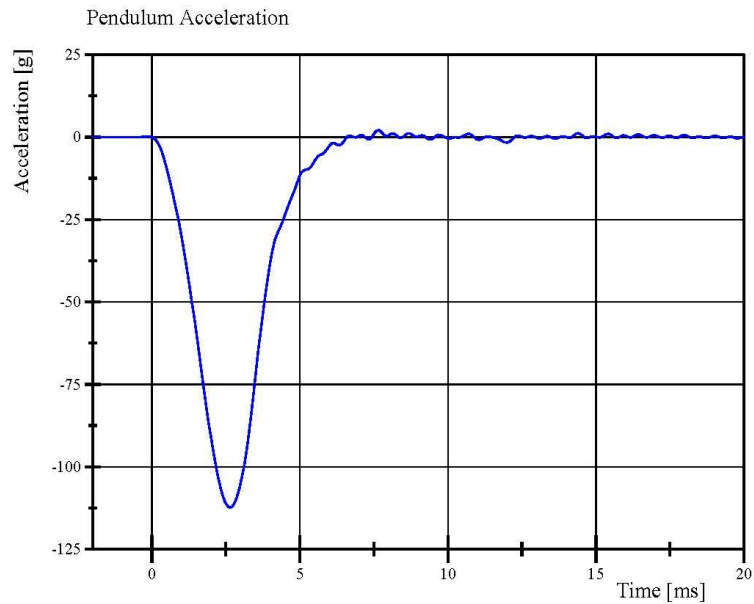
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09.18.2018 12:58:45 1880



Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 50-2
Test Date: 9/18/2018



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

09.18.2018 12:59:17 1880



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Post-Test Calibration Sheets

Driver S/N 037

Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 037
Calibration No. 51

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	880	Yes
B	Shoulder Pivot Height	505.5 - 520.7	512	Yes
C	H-Point Height	83.8 - 88.9	86	Yes
D	H-Point From Seatback	134.6 - 139.7	137	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	91	Yes
F	Thigh Clearance	139.7 - 154.9	146	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	337	Yes
J	Elbow Rest Height	190.5 - 210.8	199	Yes
K	Buttock Knee Length	579.1 - 604.5	601	Yes
L	Popliteal Height	429.3 - 454.7	440	Yes
M	Knee Pivot Height	485.1 - 500.4	494	Yes
N	Buttock Popliteal Length	452.1 - 477.5	470	Yes
O	Chest Depth	213.4 - 228.6	225	Yes
P	Foot Length	251.5 - 266.7	264	Yes
V	Shoulder Breadth	421.6 - 436.9	425	Yes
W	Foot Breadth	91.4 - 106.7	96	Yes
Y	Chest Circumference	970.3 - 1000.8	990	Yes
Z	Waist Circumference	835.7 - 866.1	865	Yes
AA	Location For Chest Circumference	429.3 - 434.3	432	Yes
BB	Location For Waist Circumference	226.1 - 231.1	229	Yes

Revised 8/10/12



Transportation Research Center Inc.

Front Head Drop

IIII 50th Serial No. 037 Certification No. 51-1

Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	258.9 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-2.2 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Condition: Used

Comments:

Head Skin S/N: N/A

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

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10.11.2018 10:41:19 579

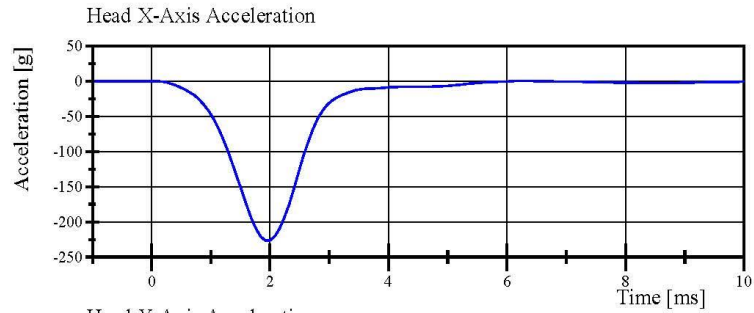


Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 037 Certification No. 51-1

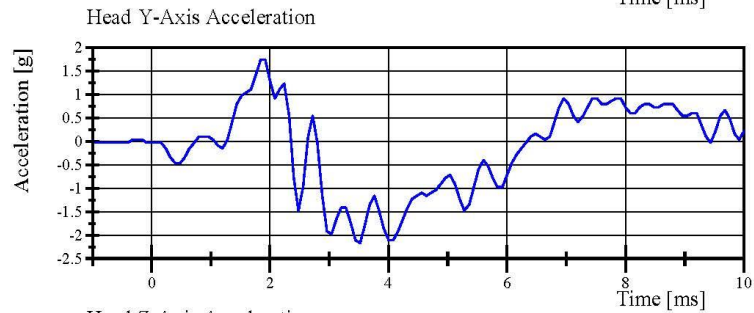
Test Date: 10/11/2018



Filter Class: CFC_1000

Max: 0.6 g at 6.2 ms

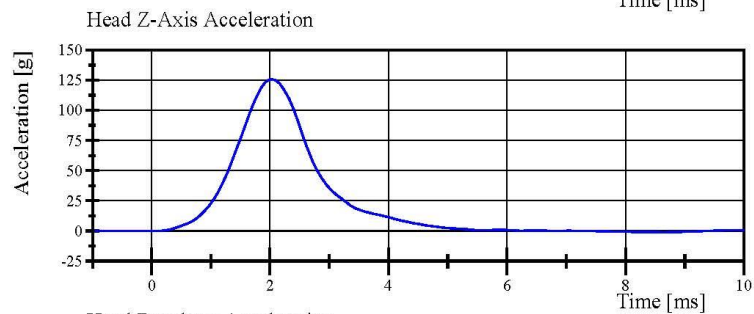
Min: -226.4 g at 1.9 ms



Filter Class: CFC_1000

Max: 1.7 g at 1.8 ms

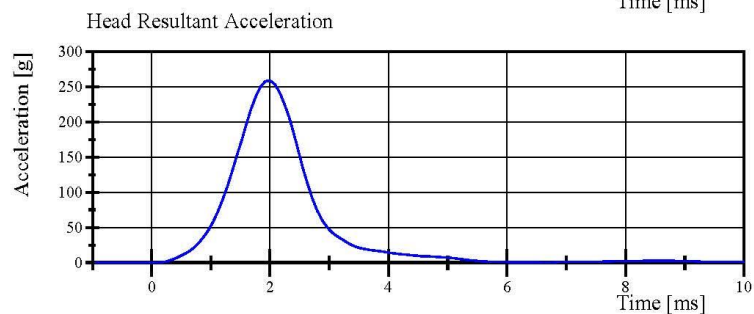
Min: -2.2 g at 3.5 ms



Filter Class: CFC_1000

Max: 125.8 g at 2.0 ms

Min: -1.1 g at 8.6 ms



Filter Class: CFC_1000

Max: 258.9 g at 2.0 ms

Min: 0.0 g at -1.0 ms

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

10.11.2018 10:42:07 579



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Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 51-1

Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	48 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.936 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	34.7 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-27.26 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-21.40 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-17.99 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-17.99 g	Yes
Total Head D-Plane Rotation			
Peak	(-64) - (-78) °	-73.6 °	Yes
Time of Peak	57 - 64 ms	58.5 ms	Yes
Total Head D-Plane Rotation Decay to 0°	113 - 128 ms	115.8 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	88 - 108 N·m	95.9 N·m	Yes
Time of Peak	47 - 58 ms	48.3 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	97 - 107 ms	99.6 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: 4728

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

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10.11.2018 13:30:50 1830

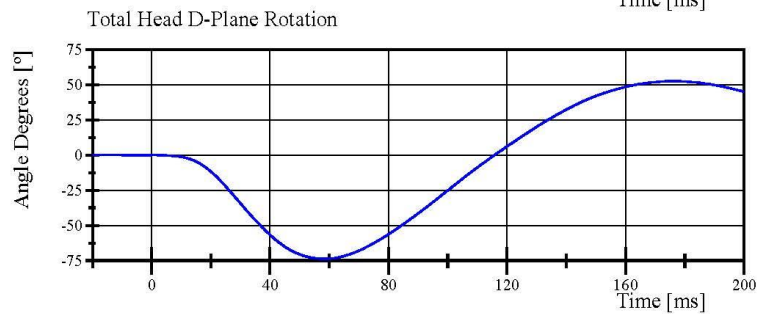
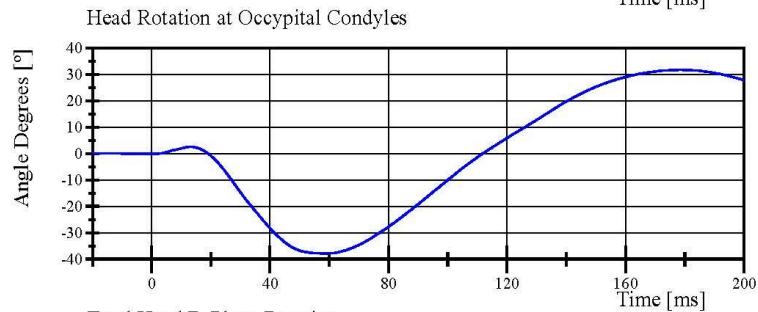
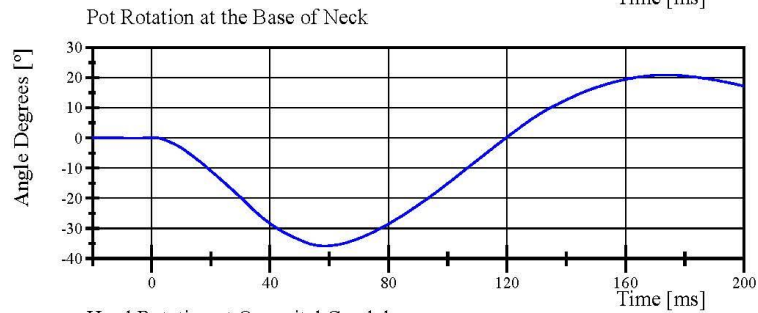
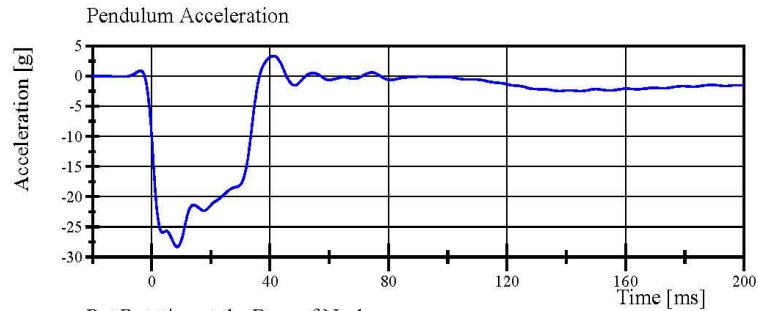


Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 51-1

Test Date: 10/11/2018



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

10.11.2018 13:31:16 1830



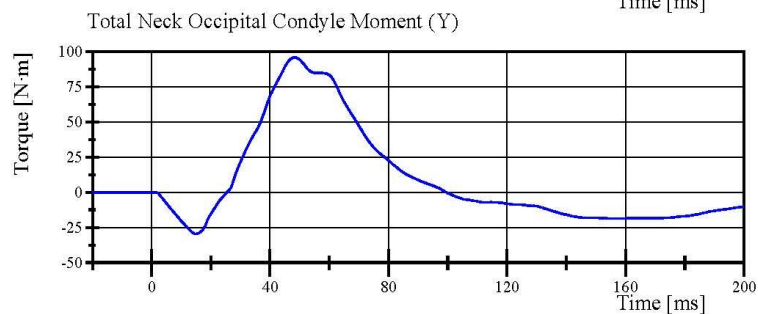
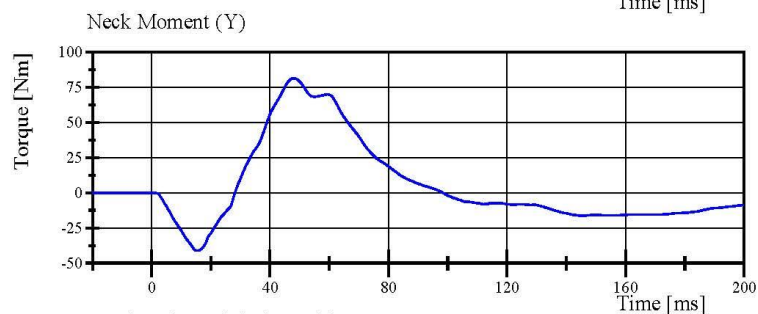
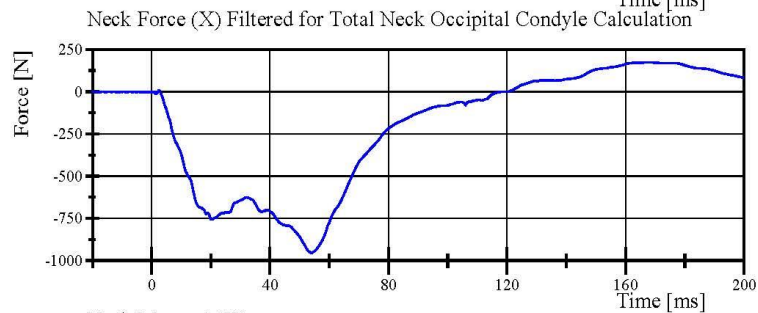
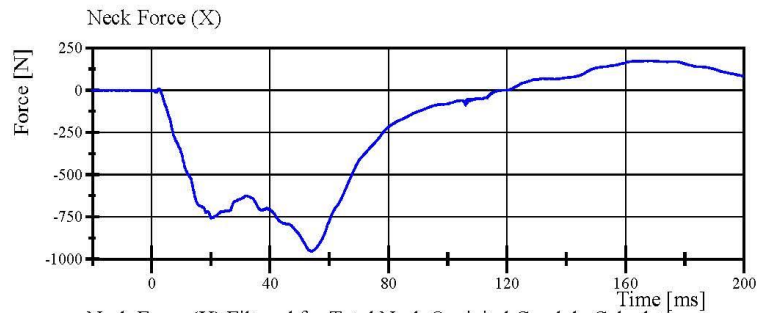
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Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 51-1

Test Date: 10/11/2018



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

10.11.2018 13:31:17 1830



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Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 51-4

Test Date: 10/12/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	48 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-6.009 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	38.3 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	19.79 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	16.37 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	14.03 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	14.71 g	Yes
Total Head D-Plane Rotation			
Peak	81 - 106 °	100.9 °	Yes
Time of Peak	72 - 82 ms	77.9 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	160.6 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	(-53) - (-80) N·m	-71.2 N·m	Yes
Time of Peak	65 - 79 ms	72.2 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	120 - 148 ms	147.7 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: 4728

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

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10.12.2018 06:37:46 1971

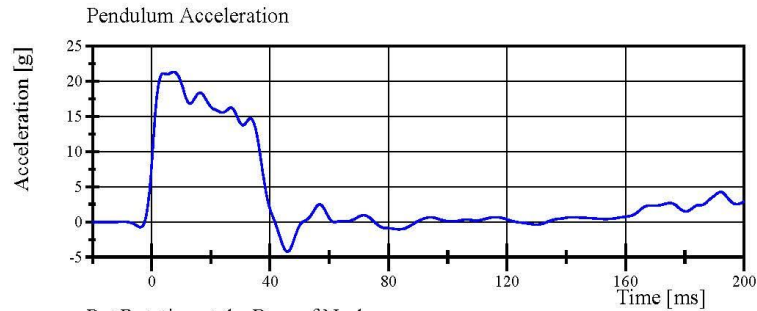


Transportation Research Center Inc.

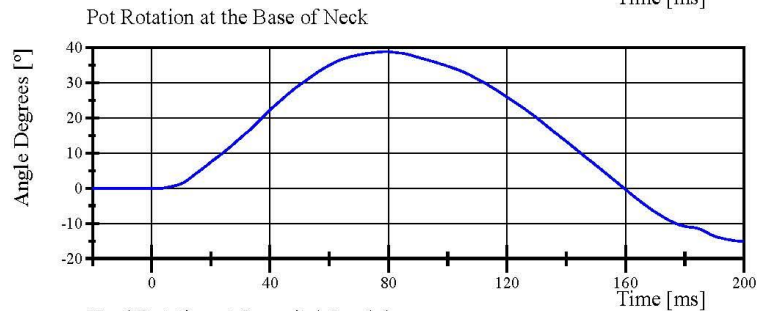
Neck Extension

HIII 50th Serial No. 037 Certification No. 51-4

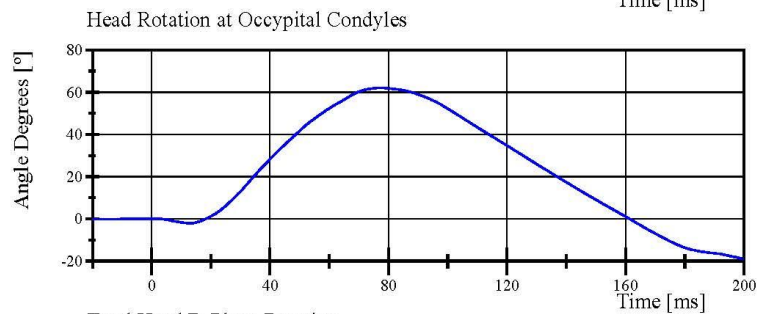
Test Date: 10/12/2018



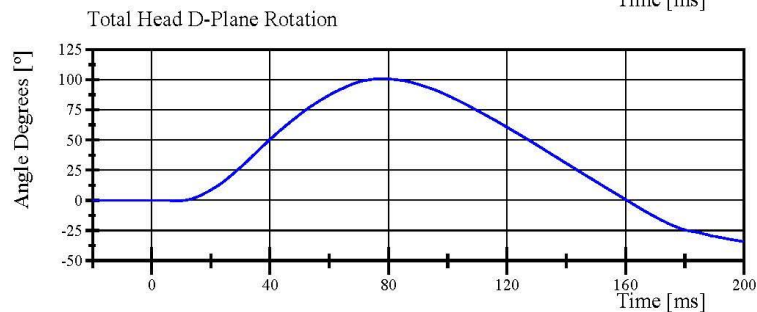
Filter Class: CFC_60
Max: 21.3 g at 7.4 ms
Min: -4.2 g at 45.9 ms



Filter Class: CFC_60
Max: 38.8 ° at 78.9 ms
Min: -15.1 ° at 200.0 ms



Filter Class: CFC_60
Max: 62.1 ° at 77.3 ms
Min: -19.0 ° at 200.0 ms



Filter Class: CFC_60
Max: 100.9 ° at 77.9 ms
Min: -34.1 ° at 200.0 ms

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

10.12.2018 06:38:57 1971

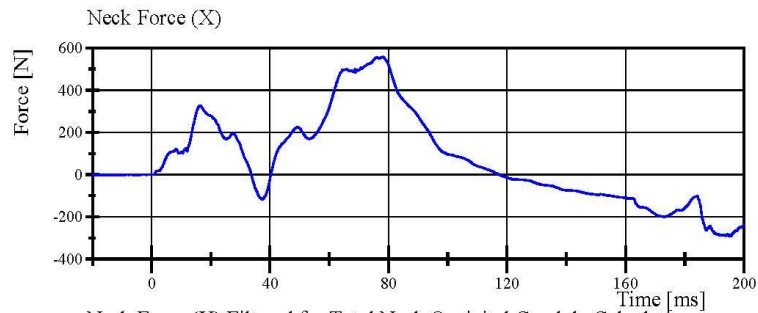


Transportation Research Center Inc.

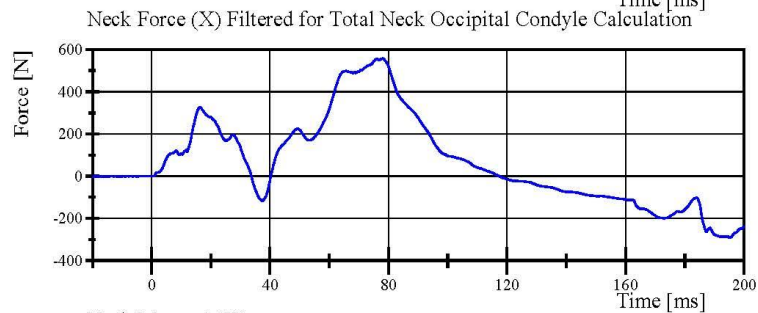
Neck Extension

HIII 50th Serial No. 037 Certification No. 51-4

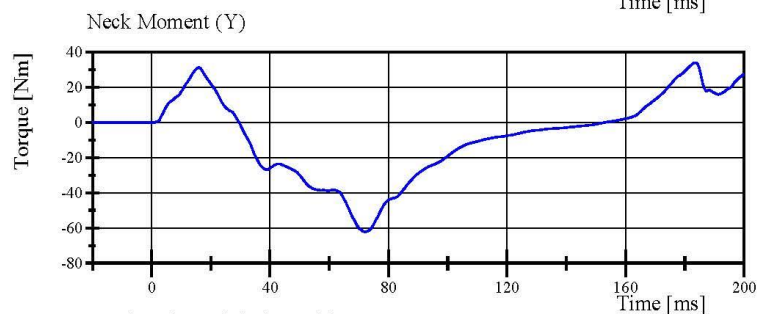
Test Date: 10/12/2018



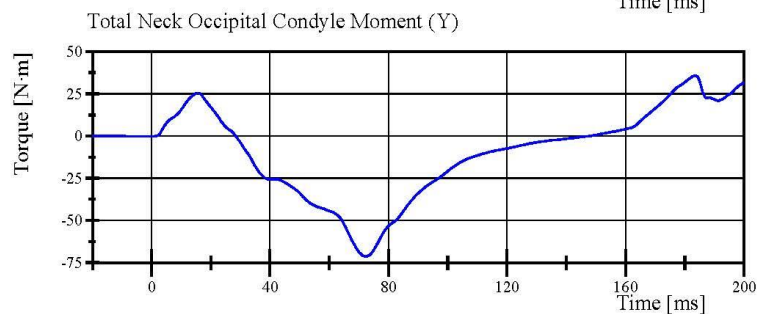
Filter Class: CFC_1000
Max: 557.5 N at 78.2 ms
Min: -292.0 N at 195.3 ms



Filter Class: CFC_600
Max: 557.5 N at 78.2 ms
Min: -289.7 N at 195.3 ms



Filter Class: CFC_600
Max: 33.9 Nm at 183.6 ms
Min: -62.1 Nm at 72.1 ms



Filter Class: Without_(Consta
Max: 33.7 N·m at 183.5 ms
Min: -71.2 N·m at 72.2 ms

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

10.12.2018 06:38:58 1971



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Transportation Research Center Inc.

Front Thorax

HIH 50th Serial No. 037 Certification No. 51-1

Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.623 m/s	Yes
Probe Force Peak	(-5,160) - (-5,894) N	-5,373.5 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-67.34 mm	Yes
Internal Hysteresis	69 - 85 %	72.9 %	Yes

Test meets specifications.

Condition: Used

Comments:

Jacket S/N: 2565

Rib #1 Assembly S/N: 178051-35 HI6550

Rib #2 Assembly S/N: 36 16526

Rib #3 Assembly S/N: 37 16543

Rib #4 Assembly S/N: 38 16538

Rib #5 Assembly S/N: 39 HI6530

Rib #6 Assembly S/N: 40 16548

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

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10.11.2018 10:01:55 400

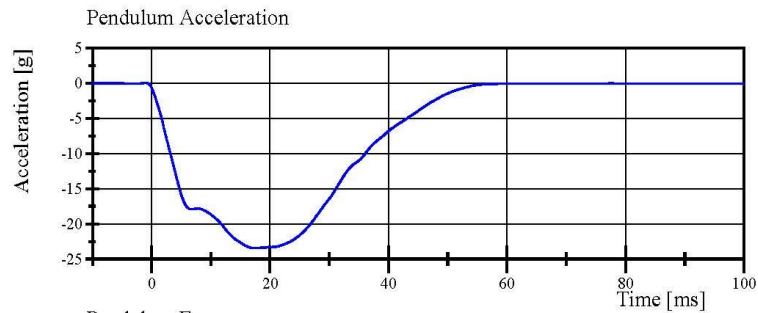


Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 037 Certification No. 51-1

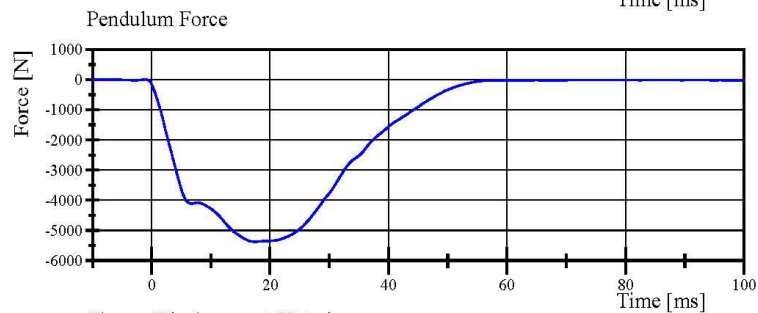
Test Date: 10/11/2018



Filter Class: CFC_180

Max: 0.0 g at -1.0 ms

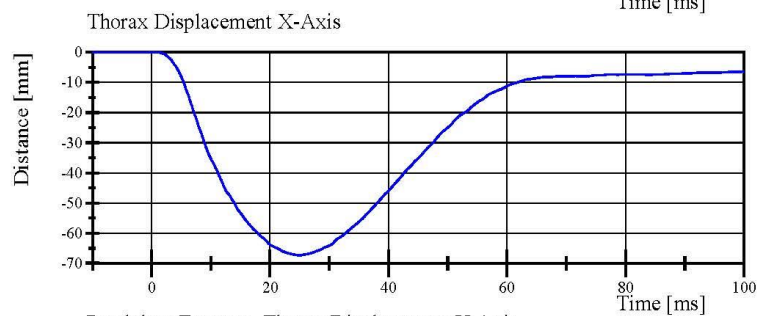
Min: -23.4 g at 17.5 ms



Filter Class: CFC_180

Max: 11.0 N at -1.0 ms

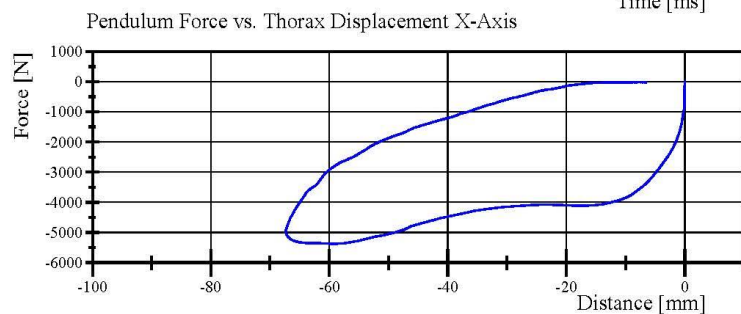
Min: -5,373.5 N at 17.5 ms



Filter Class: CFC_600

Max: 0.0 mm at -9.8 ms

Min: -67.3 mm at 25.0 ms



Filter Class: CFC_180

Max: 11.0 N at -0.0 mm

Min: -5,373.5 N at -59.2 mm

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

10.11.2018 10:03:40 400



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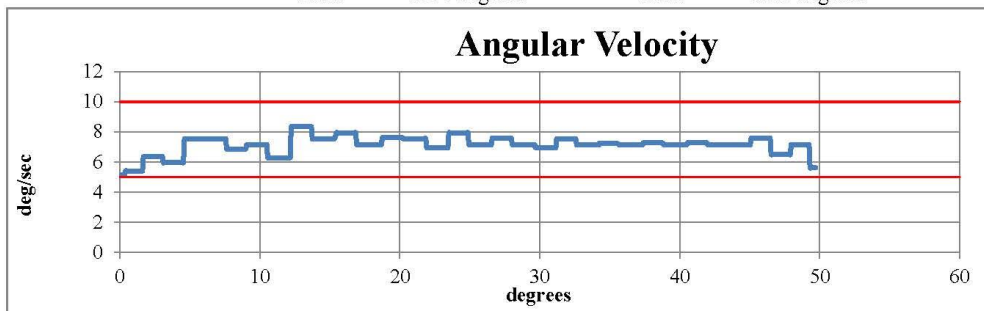
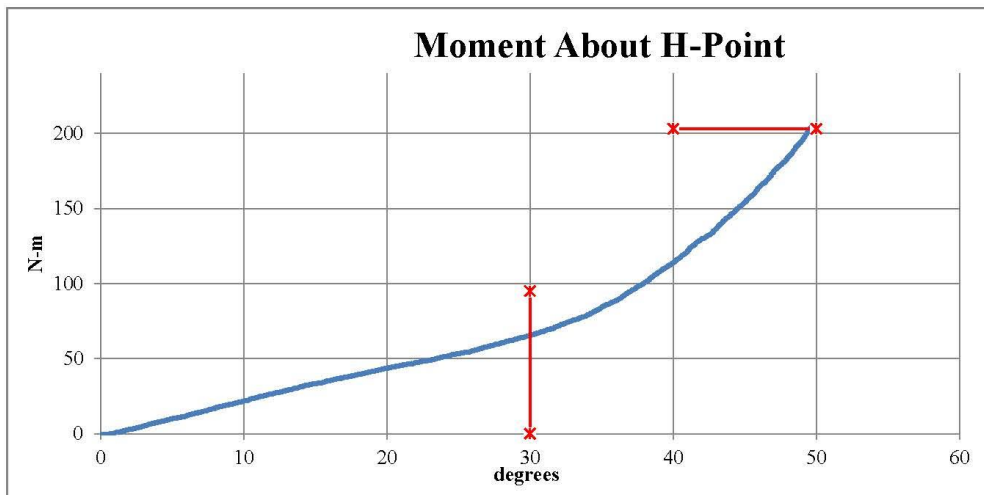
Transportation Research Center Inc.

Hybrid III 50th Male Hip Range of Motion



Serial Number: 037 Date: 11-Oct-2018
Side Tested: Left Hip Time: 10:56
Test Number: 1 Comments:

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.7 °C Pass
Humidity	10 - 70	50 % Pass
Moment at 30°	0 ≤ 94.9	65.7 N-m Pass
Angle at 203 Nm	40 - 50	49.72 deg Pass
Average Velocity	5 - 10	7.13 deg/sec Pass



Comments:
Pelvis Skin S/N: N/A
Lumbar Spine S/N: 0551
Lumbar Cable S/N: N/A

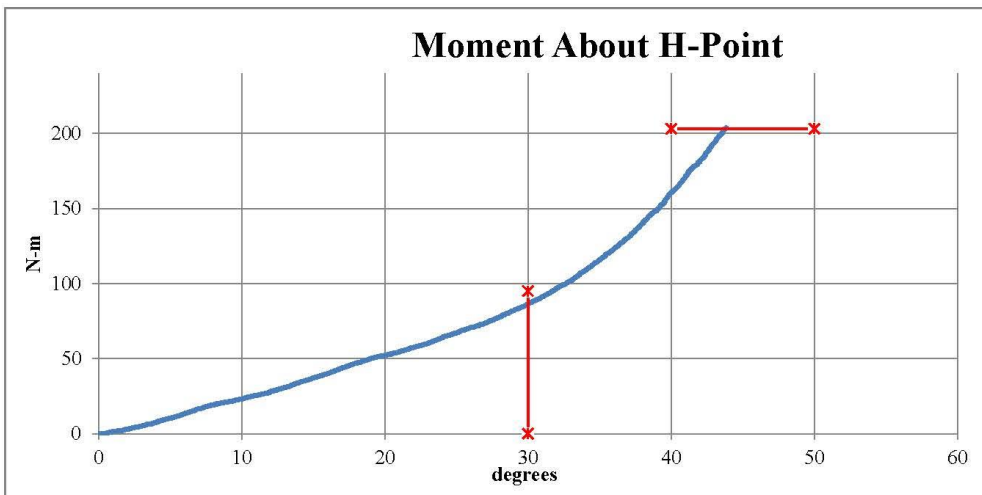
Transportation Research Center Inc.

Hybrid III 50th Male Hip Range of Motion

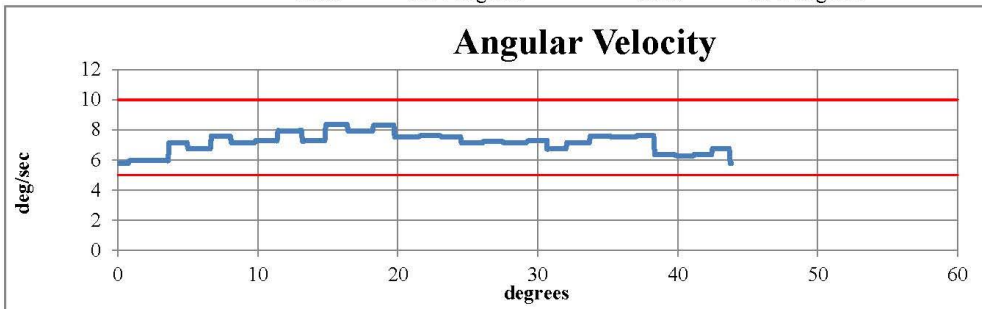


Serial Number: 037 Date: 11-Oct-2018
Side Tested: Right Hip Time: 11:57
Test Number: 1 Comments:

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.2 °C Pass
Humidity	10 - 70	49 % Pass
Moment at 30°	0 ≤ 94.9	86.72 N-m Pass
Angle at 203 Nm	40 - 50	43.84 deg Pass
Average Velocity	5 - 10	7.16 deg/sec Pass



Max: 8.34 deg/sec Min: 5.78 deg/sec



Comments:
Pelvis Skin S/N: N/A
Lumbar Spine S/N: 0551
Lumbar Cable S/N: N/A

Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 51-1
Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.090 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,449.00 N	Yes

Test meets specifications.

Condition: Used

Comments:

Knee Skin S/N: 2672

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

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10.11.2018 09:34:08 1773

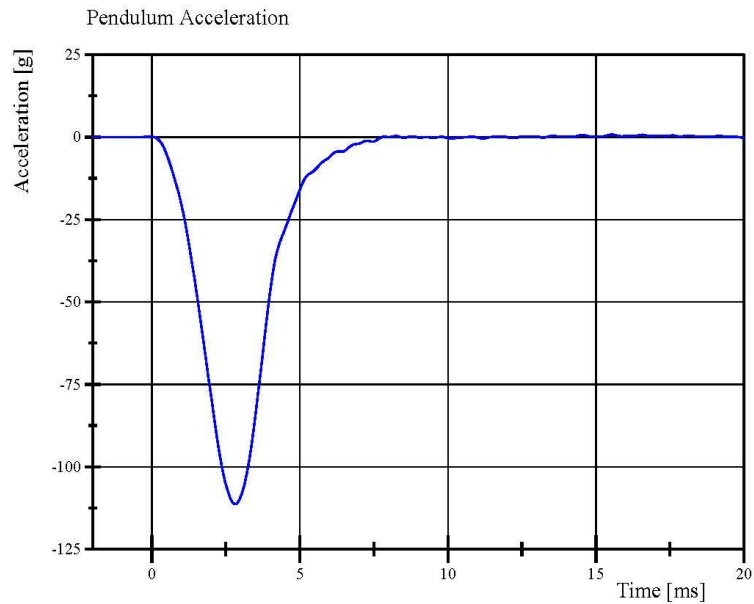


Transportation Research Center Inc.

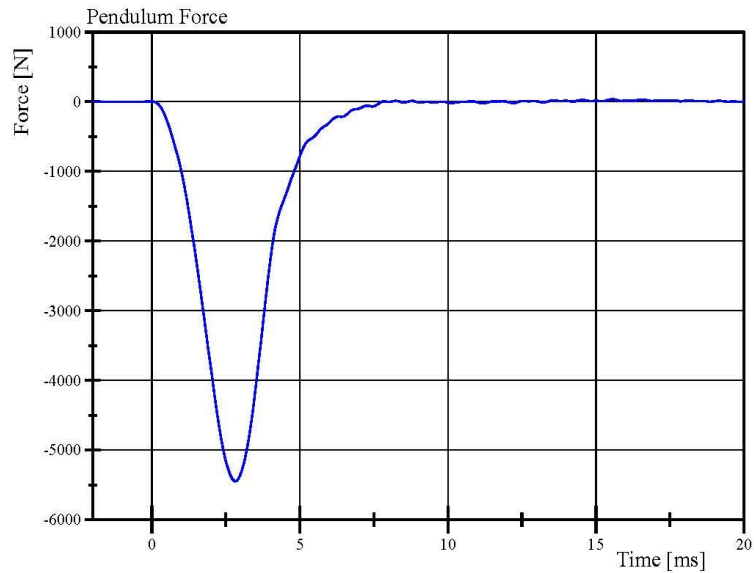
Left Knee Femur Response Test

HIH 50th Serial No. 037 Certification No. 51-1

Test Date: 10/11/2018



Filter Class: CFC_600
Max: 0.8 g at 15.5 ms
Min: -111.4 g at 2.8 ms



Filter Class: CFC_600
Max: 38.0 N at 15.5 ms
Min: -5,449.0 N at 2.8 ms

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

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10.11.2018 09:34:50 1773



Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 51-1
Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.089 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,452.01 N	Yes

Test meets specifications.

Condition: Used

Comments:

Knee Skin S/N: 3131

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

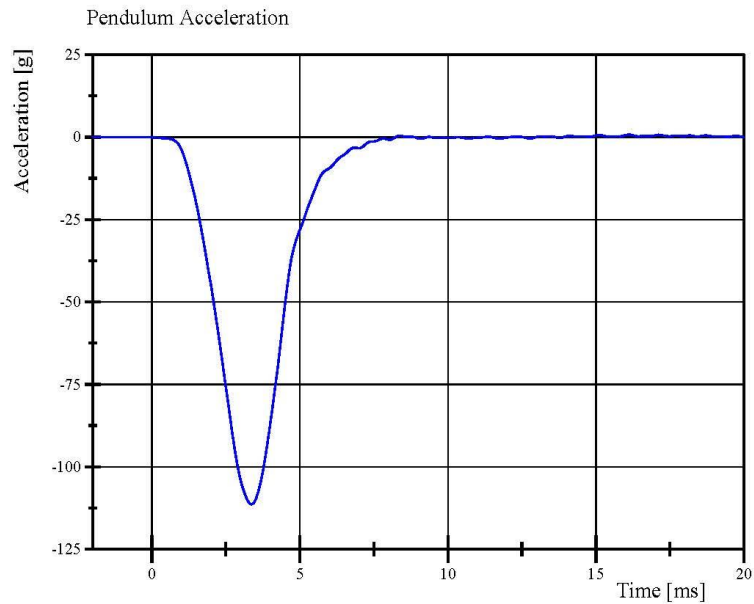
Page 23 of 27

10.11.2018 09:38:22 1766

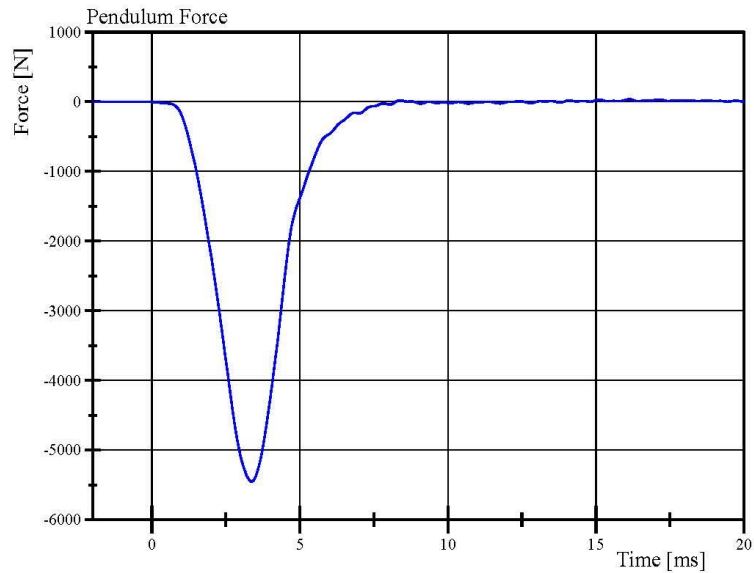


Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 51-1
Test Date: 10/11/2018



Filter Class: CFC_600
Max: 0.7 g at 16.1 ms
Min: -111.4 g at 3.4 ms



Filter Class: CFC_600
Max: 36.3 N at 16.1 ms
Min: -5,452.0 N at 3.4 ms

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

10.11.2018 09:38:58 1766



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Pre-Test Calibration Sheets

Front Passenger S/N 426

Transportation Research Center Inc.
5720 HIII 5th Dummy
External Dimensions
Serial No. 426 Calibration No. 44

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	774.7 - 800.1	781	Yes
B	Shoulder Pivot Height	431.8 - 457.2	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	285	Yes
J	Elbow Rest Height	182.8 - 203.2	196	Yes
K	Buttock Knee Length	520.7 - 546.1	535	Yes
L	Popliteal Height	355.6 - 376.0	359	Yes
M	Knee Pivot Height	393.7 - 419.1	409	Yes
N	Buttock Popliteal Length	414.0 - 439.4	429	Yes
O	Chest Depth without Jacket	175.3 - 190.5	182	Yes
P	Foot Length	218.5 - 233.7	224	Yes
R	Buttock to Knee Pivot Length	457.2 - 482.6	473	Yes
S	Head Breadth	137.1 - 147.3	141	Yes
T	Head Depth	177.8 - 188.0	180	Yes
U	Hip Breadth	299.7 - 314.9	306	Yes
V	Shoulder Breadth	350.5 - 365.7	357	Yes
W	Foot Breadth	78.8 - 94.0	85	Yes
X	Head Circumference	528.3 - 548.7	539	Yes
Y	Chest Circumference with Jacket	850.9 - 881.3	870	Yes
Z	Waist Circumference	759.5 - 789.9	775	Yes
AA	Reference Location for Chest Circumference	332.7 - 358.1	345	Yes
BB	Reference Location for Waist Circumference	160.0 - 170.2	165	Yes

Revised 8/10/12



Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 426 Certification No. 44-1

Test Date: 10/3/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Peak Head Resultant Acceleration	250 - 300 g	278.6 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-5.9 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Condition: Used

Comments:

Head Skin S/N: 1348

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

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10.03.2018 07:32:37 574

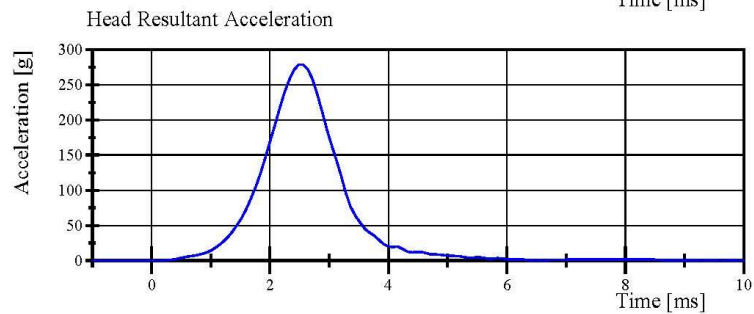
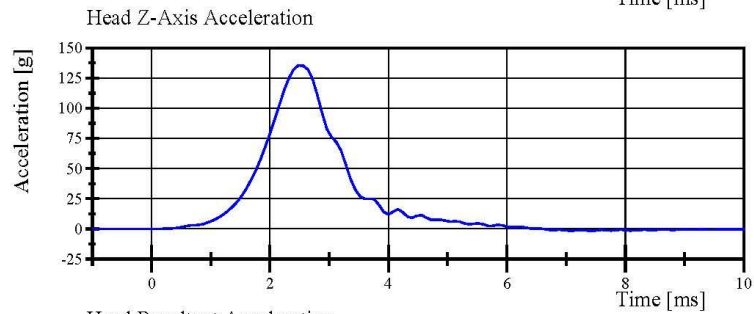
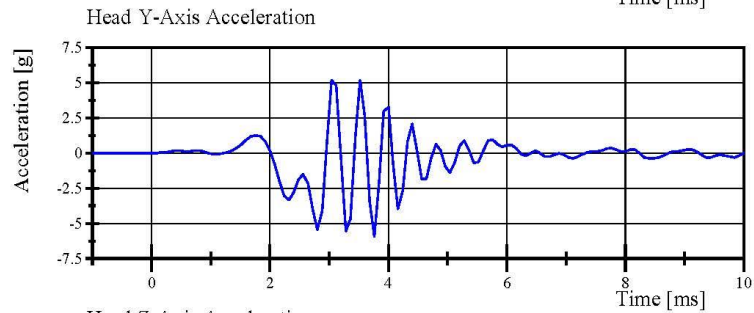
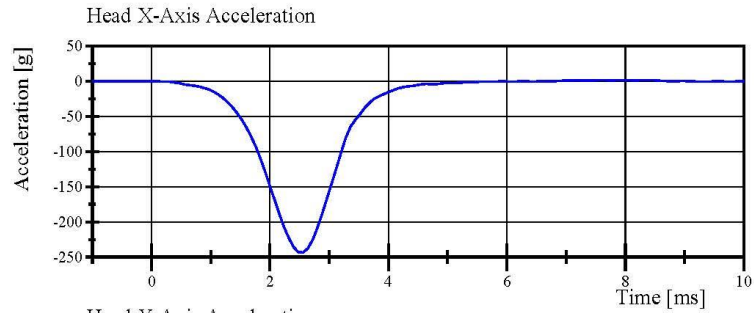


Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 426 Certification No. 44-1

Test Date: 10/3/2018



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

10.03.2018 08:23:52 574



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Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 44-1

Test Date: 10/3/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	7.062 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	(-2.1) - (-2.5) m/s	-2.22 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	(-4.0) - (-5.0) m/s	-4.33 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	(-5.8) - (-7.0) m/s	-6.20 m/s	Yes
Total Head D-Plane Rotation	(-77) - (-91) °	-80.6 °	Yes
Total Neck Occipital Condyles Moment Between -77° and -91° Rotation	69 - 83 N·m	74.4 N·m	Yes
Total Neck Occipital Condyles Moment Decay to 10 N·m	80 - 100 ms	90.1 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: DM2392

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

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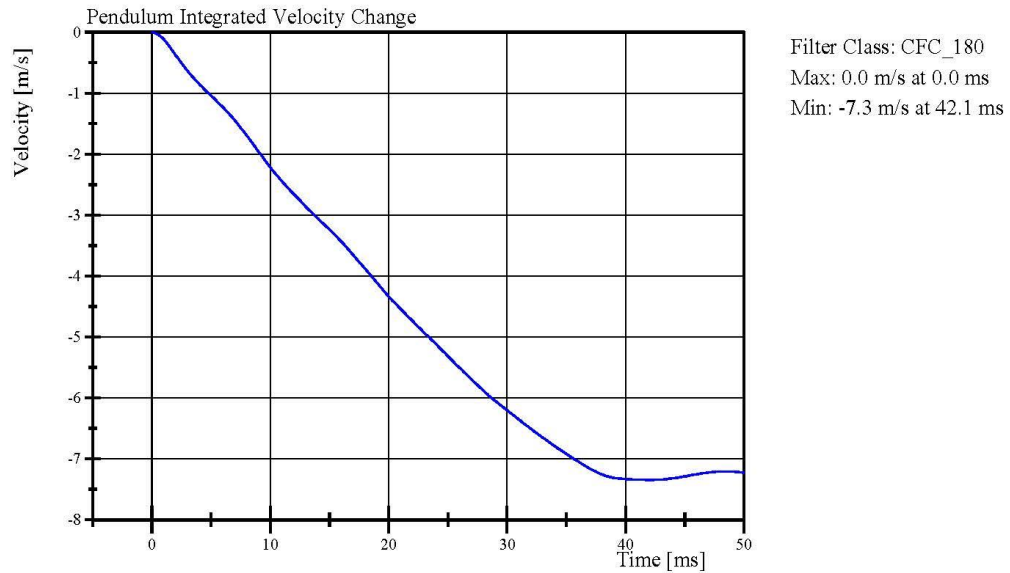
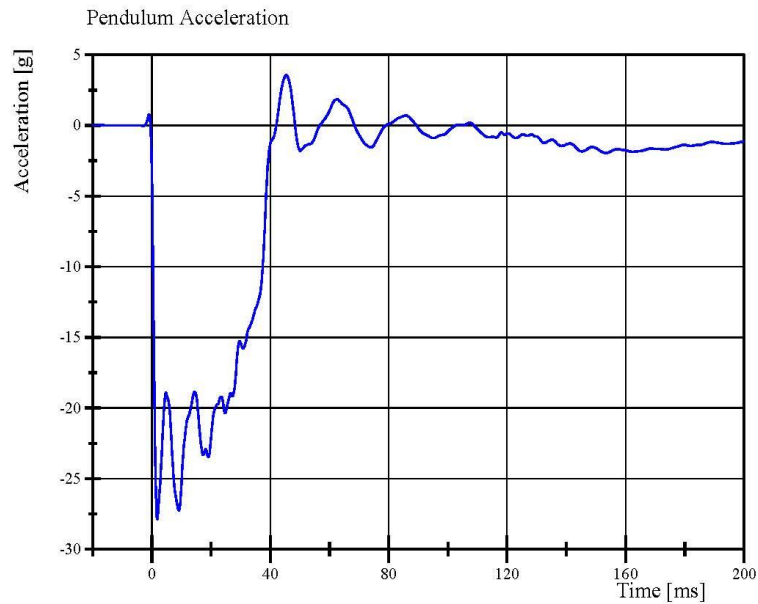


Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 44-1

Test Date: 10/3/2018



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

10.03.2018 08:40:42 1814



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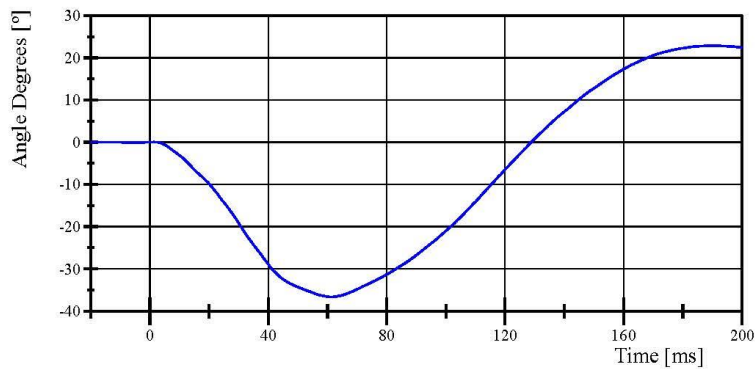
Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 44-1

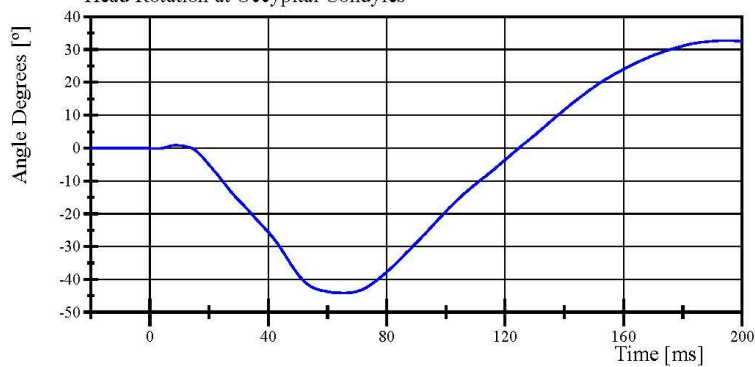
Test Date: 10/3/2018

Pot Rotation at the Base of Neck



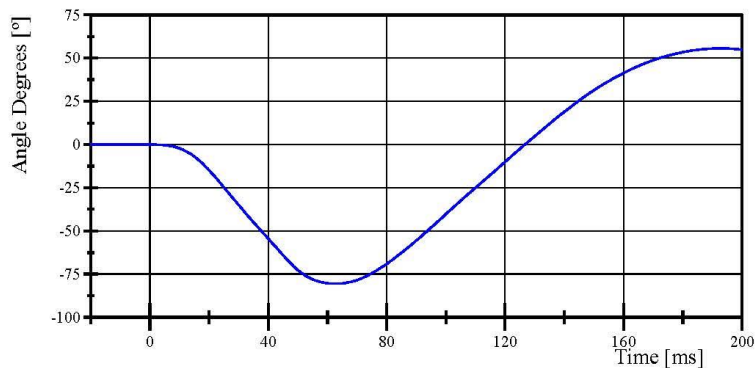
Filter Class: CFC_60
Max: 22.9 ° at 190.1 ms
Min: -36.6 ° at 61.3 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 32.7 ° at 194.6 ms
Min: -44.1 ° at 65.4 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 55.5 ° at 192.9 ms
Min: -80.6 ° at 62.6 ms

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

10.03.2018 08:40:43 1814



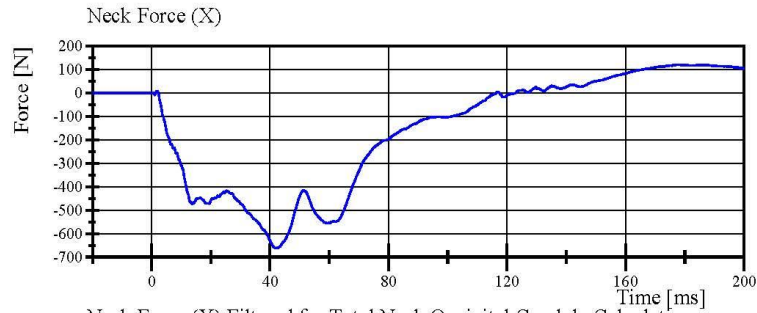
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Transportation Research Center Inc.

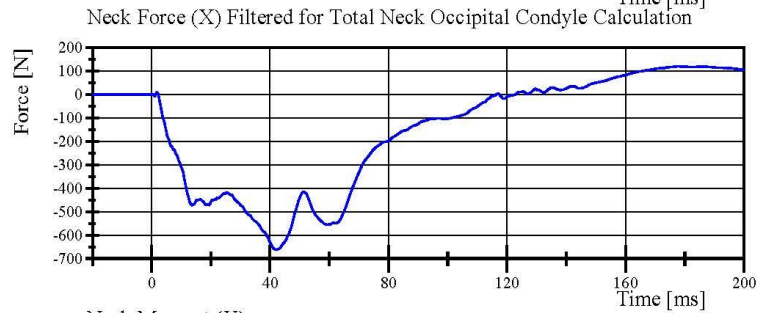
Neck Flexion

HIII 5th Serial No. 426 Certification No. 44-1

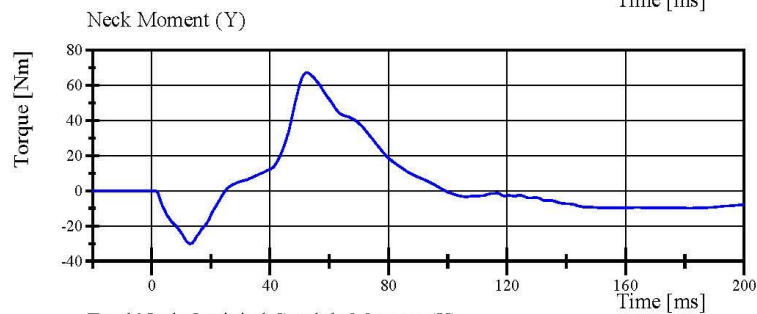
Test Date: 10/3/2018



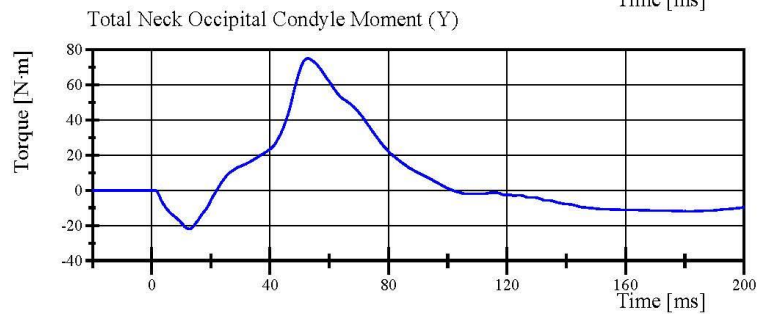
Filter Class: CFC_1000
Max: 119.9 N at 177.9 ms
Min: -662.4 N at 42.0 ms



Filter Class: CFC_600
Max: 119.6 N at 177.9 ms
Min: -662.1 N at 42.0 ms



Filter Class: CFC_600
Max: 67.3 Nm at 52.4 ms
Min: -30.1 Nm at 13.0 ms



Filter Class: Without_(Consta
Max: 74.9 N·m at 52.7 ms
Min: -21.9 N·m at 12.8 ms

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

10.03.2018 08:40:44 1814



Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 44-1

Test Date: 10/3/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Pendulum Velocity	(-5.95) - (-6.19) m/s	-6.091 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	1.5 - 1.9 m/s	1.88 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	3.1 - 3.9 m/s	3.73 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	4.6 - 5.6 m/s	5.37 m/s	Yes
Total Head D-Plane Rotation	99 - 114 °	107.3 °	Yes
Total Neck Occipital Condyles Moment Between 99° and 114° Rotation	(-53) - (-65) N·m	-55.2 N·m	Yes
Total Neck Occipital Condyles Moment Decay to -10 N·m	94 - 114 ms	106.7 ms	Yes

Test meets specifications.

Condition: Used

Comments:

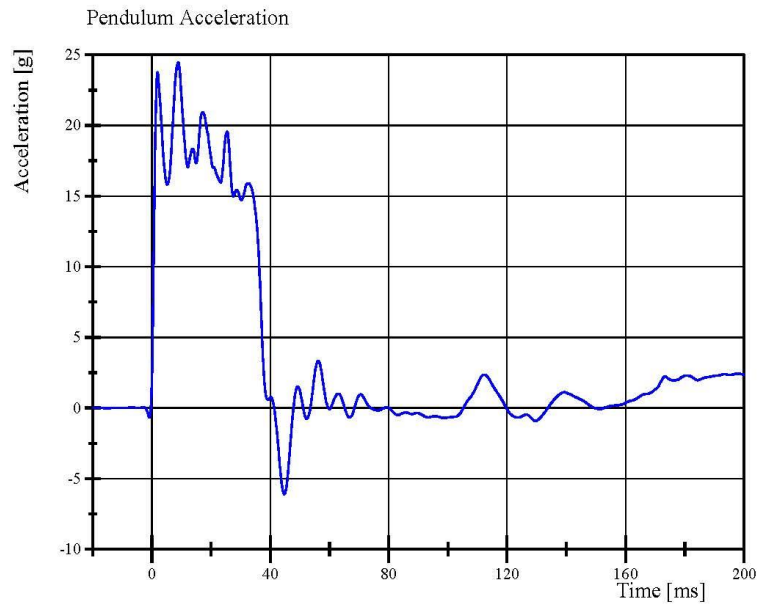
Neck S/N: DM2392

Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 44-1

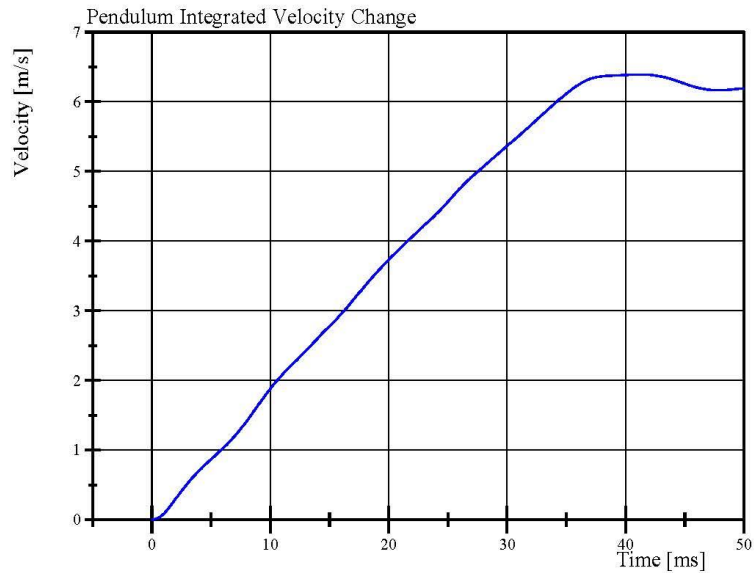
Test Date: 10/3/2018



Filter Class: CFC_180

Max: 24.5 g at 9.0 ms

Min: -6.1 g at 44.8 ms



Filter Class: CFC_180

Max: 6.4 m/s at 41.4 ms

Min: 0.0 m/s at 0.0 ms

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

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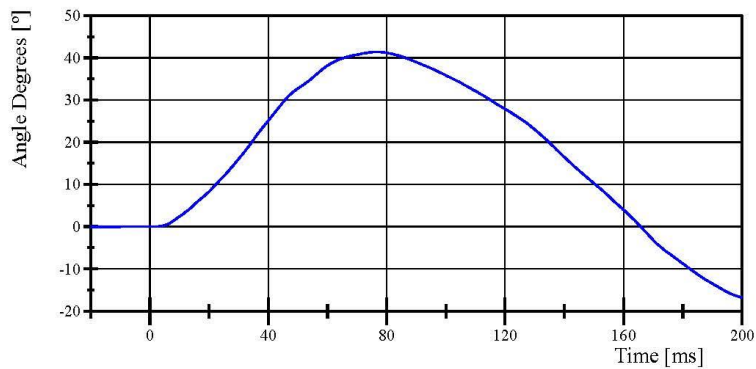
Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 44-1

Test Date: 10/3/2018

Pot Rotation at the Base of Neck

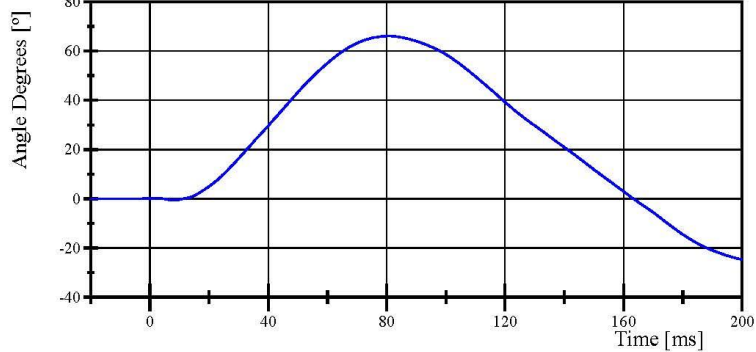


Filter Class: CFC_60

Max: 41.4 ° at 76.6 ms

Min: -16.8 ° at 200.0 ms

Head Rotation at Occypital Condyles

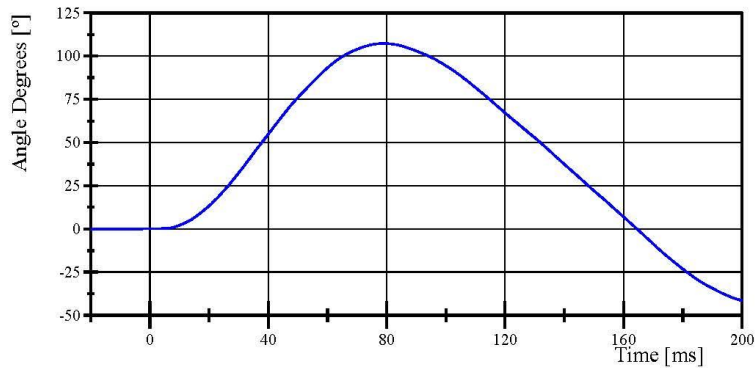


Filter Class: CFC_60

Max: 66.1 ° at 80.7 ms

Min: -24.7 ° at 200.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60

Max: 107.3 ° at 79.0 ms

Min: -41.4 ° at 200.0 ms

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

10.03.2018 09:18:48 1957



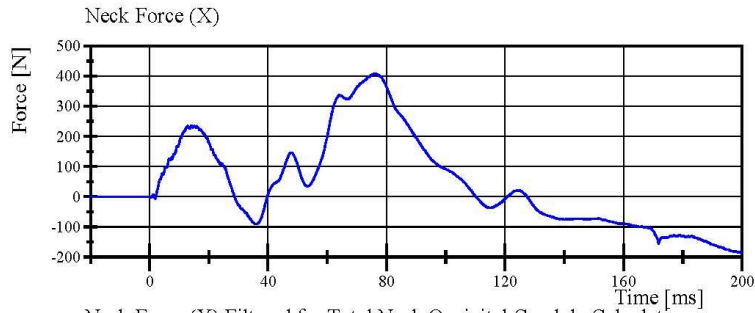
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Transportation Research Center Inc.

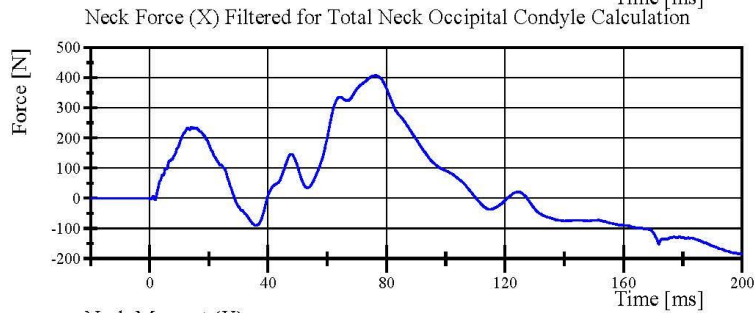
Neck Extension

HIII 5th Serial No. 426 Certification No. 44-1

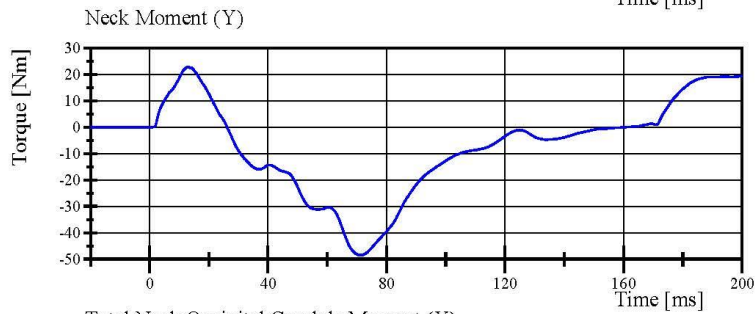
Test Date: 10/3/2018



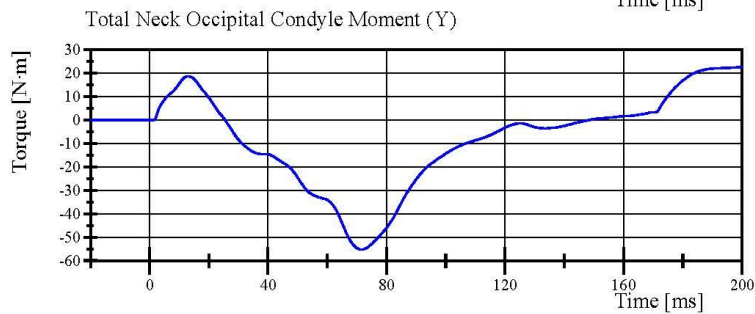
Filter Class: CFC_1000
Max: 408.3 N at 76.3 ms
Min: -183.7 N at 198.8 ms



Filter Class: CFC_600
Max: 408.0 N at 76.4 ms
Min: -183.6 N at 200.0 ms



Filter Class: CFC_600
Max: 22.8 Nm at 12.9 ms
Min: -48.5 Nm at 71.3 ms



Filter Class: Without_(Consta
Max: 22.7 N·m at 200.0 ms
Min: -55.2 N·m at 71.5 ms

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

10.03.2018 09:18:49 1957



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Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. 426 Certification No. 44-1

Test Date: 10/3/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.719 m/s	Yes
Probe Force Peak Between 50.0 mm and 58.0 mm Chest Deflection	(-3,900) - (-4,400) N	-4,303.8 N	Yes
Probe Force Peak Between 18.0 mm and 50.0 mm Chest Deflection	>= (-4,600) N	-4,376.4 N	Yes
Maximum Chest Compression	(-50) - (-58) mm	-50.8 mm	Yes
Internal Hysteresis	69 - 85 %	74.8 %	Yes

Test meets specifications.

Condition: Used

Comments:

Jacket S/N: DG9935

Rib Set S/N: DJ1164

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

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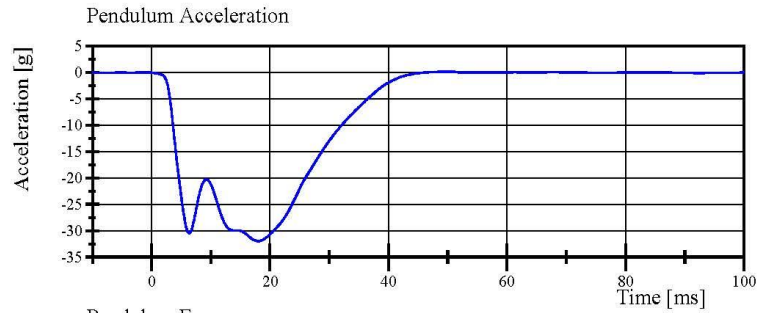


Transportation Research Center Inc.

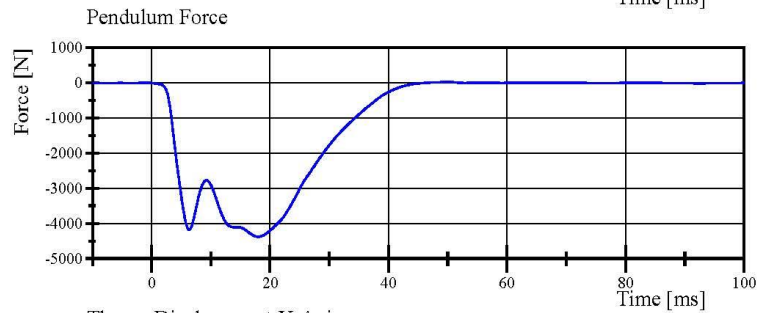
Front Thorax

HIII 5th Serial No. 426 Certification No. 44-1

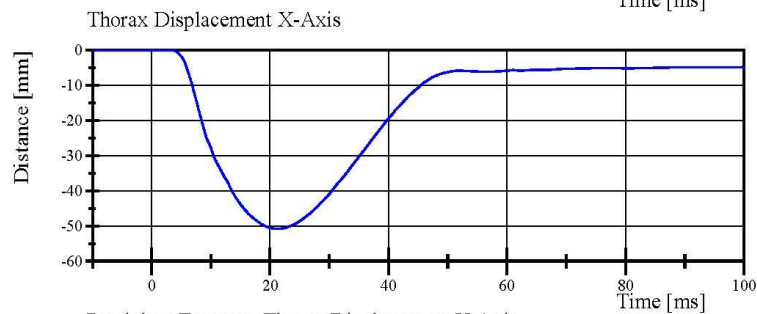
Test Date: 10/3/2018



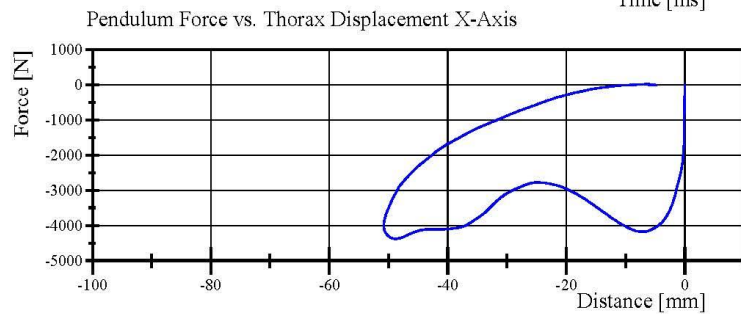
Filter Class: CFC_180
Max: 0.1 g at 50.0 ms
Min: -31.9 g at 18.0 ms



Filter Class: CFC_180
Max: 18.9 N at 50.0 ms
Min: -4,376.4 N at 18.0 ms



Filter Class: CFC_600
Max: 0.0 mm at 0.1 ms
Min: -50.8 mm at 21.2 ms



Filter Class: CFC_180
Max: 18.9 N at -6.2 mm
Min: -4,376.4 N at -48.8 mm

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

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Transportation Research Center Inc.

Hybrid III Small Female Torso Flexion

NHTSA

Serial Number: 426

Date: 10/3/2018

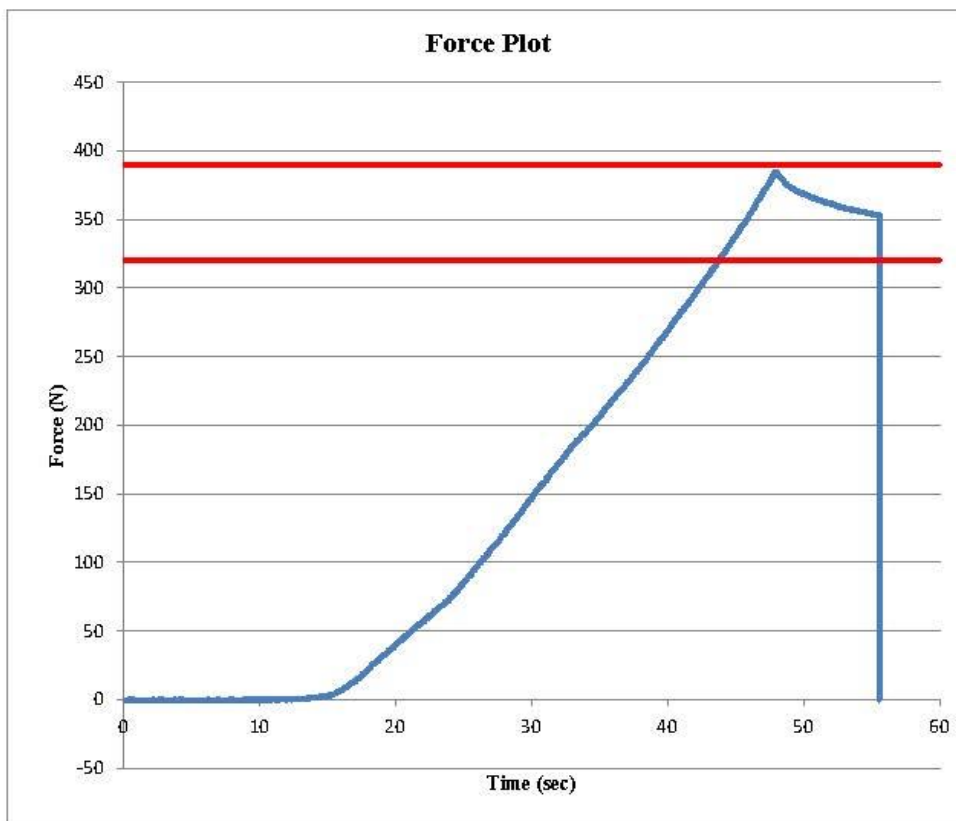
Test Number: 1

Time: 13:04

Comments:



TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	20.9 °C Pass
Humidity	10 - 70	49 % Pass
Average Angular Velocity	0.5 - 1.5	0.8 deg/sec Pass
Initial Angle	0 - 20	19.36 deg Pass
Peak Force at 45.21°	320 - 390	384.36 N Pass
Final Angle	-8 - 8	3.98 deg Pass



Comments:
 Abdomen S/N: 1047
 Pelvis S/N: 885
 Lumbar S/N: N/A

Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 44-1
Test Date: 10/3/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.116 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,798.1 N	Yes

Test meets specifications.

Condition: Used

Comments:

Knee Skin S/N: 1366

Knee Insert S/N: N/A

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

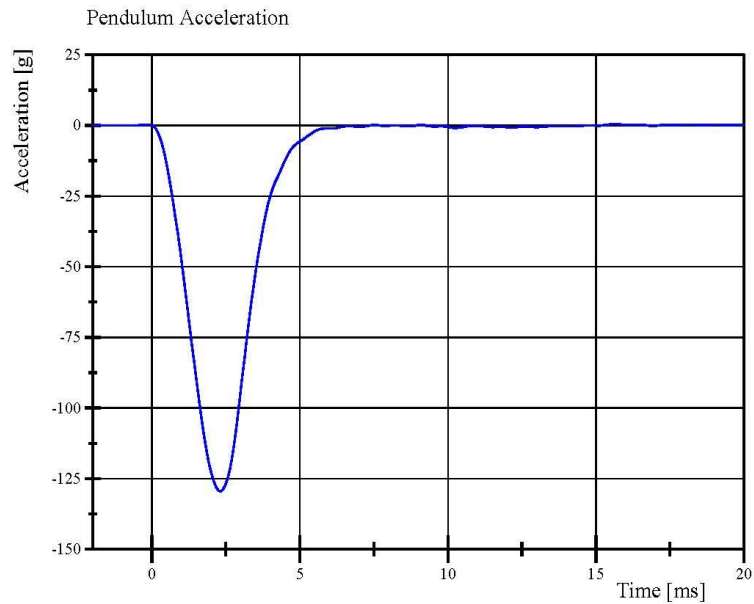
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10.03.2018 06:54:40 1771

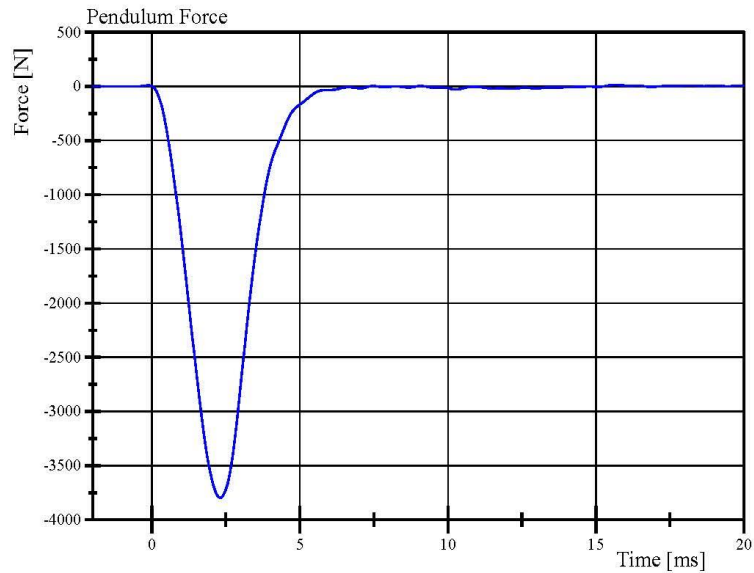


Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 44-1
Test Date: 10/3/2018



Filter Class: CFC_600
Max: 0.5 g at 15.7 ms
Min: -129.5 g at 2.3 ms



Filter Class: CFC_600
Max: 13.9 N at 15.7 ms
Min: -3,798.1 N at 2.3 ms

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

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Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 44-1
Test Date: 10/3/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.115 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,605.6 N	Yes

Test meets specifications.

Condition: Used

Comments:

Knee Skin S/N: 1402

Knee Insert S/N: N/A

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

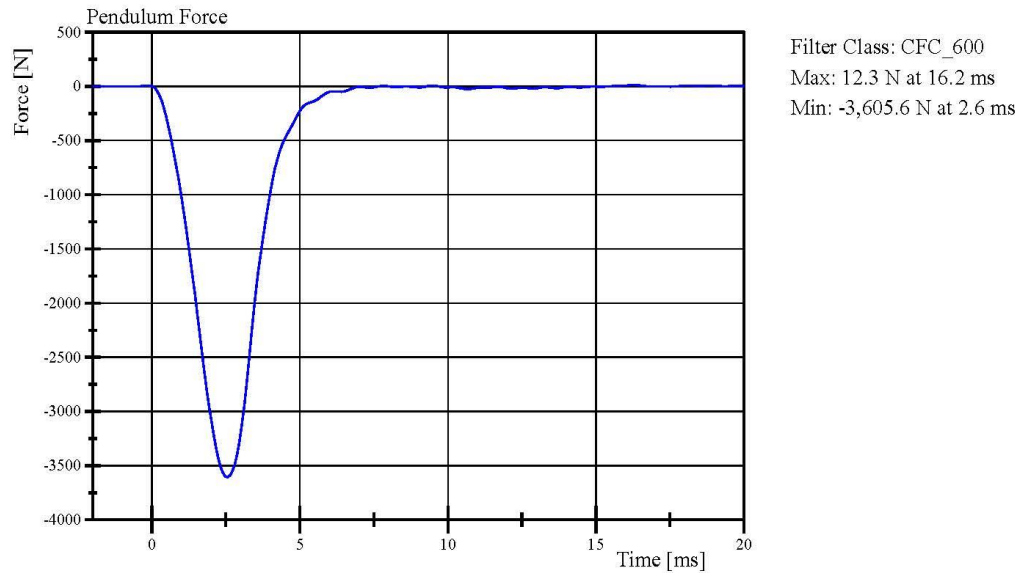
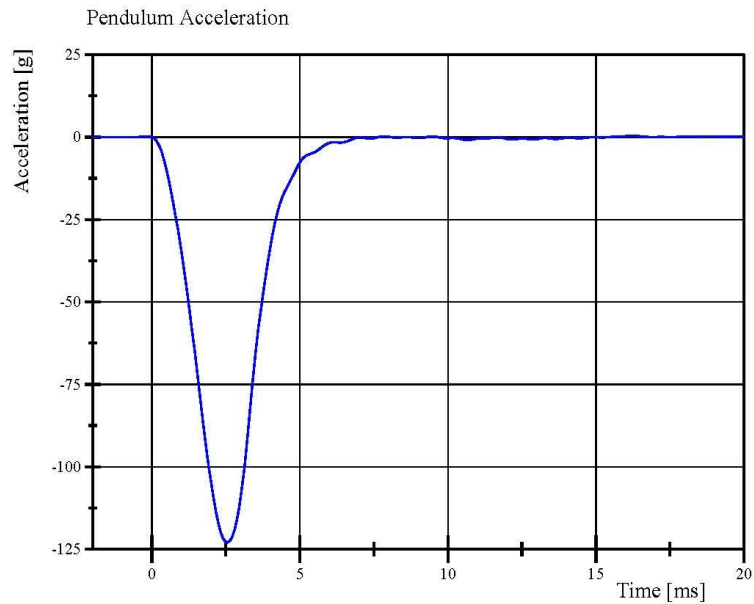
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Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 44-1
Test Date: 10/3/2018



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

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Post-Test Calibration Sheets

Front Passenger S/N 426

Transportation Research Center Inc.
5720 HIII 5th Dummy
External Dimensions
Serial No. 426 Calibration No. 45

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	774.7 - 800.1	781	Yes
B	Shoulder Pivot Height	431.8 - 457.2	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	79	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	285	Yes
J	Elbow Rest Height	182.8 - 203.2	196	Yes
K	Buttock Knee Length	520.7 - 546.1	534	Yes
L	Popliteal Height	355.6 - 376.0	359	Yes
M	Knee Pivot Height	393.7 - 419.1	409	Yes
N	Buttock Popliteal Length	414.0 - 439.4	429	Yes
O	Chest Depth without Jacket	175.3 - 190.5	182	Yes
P	Foot Length	218.5 - 233.7	224	Yes
R	Buttock to Knee Pivot Length	457.2 - 482.6	473	Yes
S	Head Breadth	137.1 - 147.3	141	Yes
T	Head Depth	177.8 - 188.0	180	Yes
U	Hip Breadth	299.7 - 314.9	306	Yes
V	Shoulder Breadth	350.5 - 365.7	356	Yes
W	Foot Breadth	78.8 - 94.0	85	Yes
X	Head Circumference	528.3 - 548.7	539	Yes
Y	Chest Circumference with Jacket	850.9 - 881.3	870	Yes
Z	Waist Circumference	759.5 - 789.9	775	Yes
AA	Reference Location for Chest Circumference	332.7 - 358.1	345	Yes
BB	Reference Location for Waist Circumference	160.0 - 170.2	164	Yes

Revised 8/10/12



Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 426 Certification No. 45-1

Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Peak Head Resultant Acceleration	250 - 300 g	284.2 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	4.6 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Condition: Used

Comments:

Head Skin S/N: 1348

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

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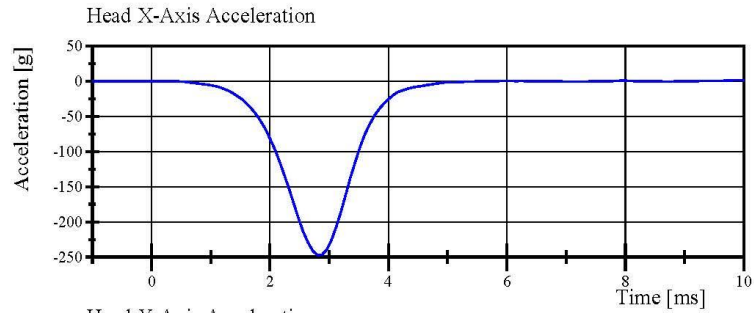


Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 426 Certification No. 45-1

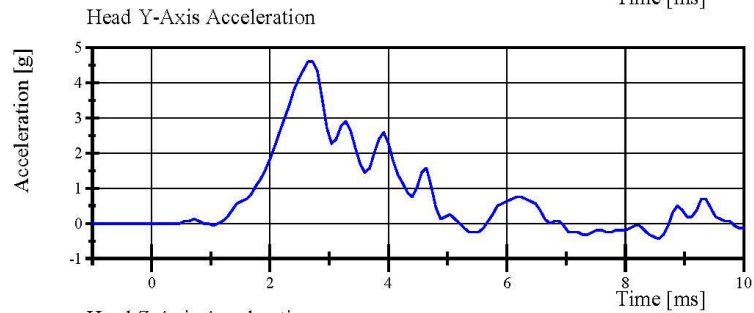
Test Date: 10/11/2018



Filter Class: CFC_1000

Max: 1.4 g at 10.0 ms

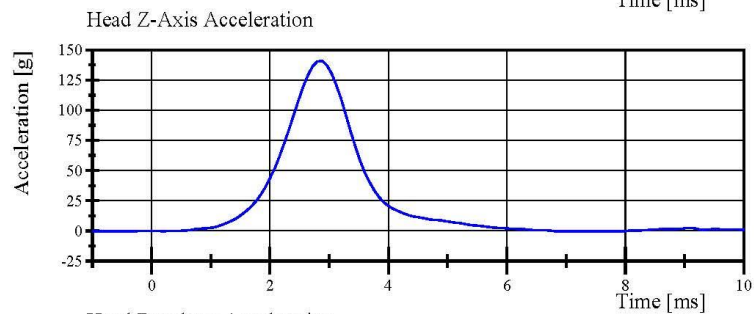
Min: -247.0 g at 2.8 ms



Filter Class: CFC_1000

Max: 4.6 g at 2.6 ms

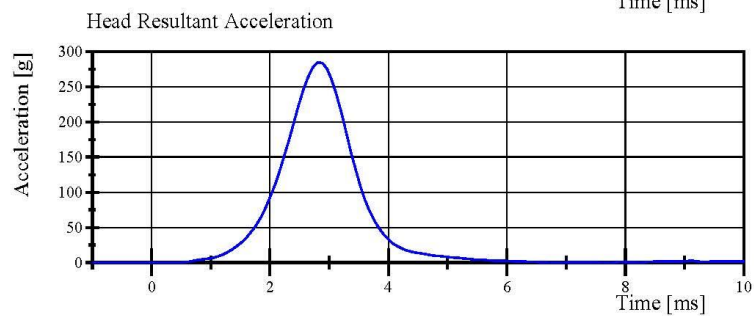
Min: -0.4 g at 8.6 ms



Filter Class: CFC_1000

Max: 140.8 g at 2.9 ms

Min: -0.4 g at 7.2 ms



Filter Class: CFC_1000

Max: 284.2 g at 2.8 ms

Min: 0.0 g at -1.0 ms

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

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Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 45-1

Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	7.062 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	(-2.1) - (-2.5) m/s	-2.35 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	(-4.0) - (-5.0) m/s	-4.50 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	(-5.8) - (-7.0) m/s	-6.43 m/s	Yes
Total Head D-Plane Rotation	(-77) - (-91) °	-79.2 °	Yes
Total Neck Occipital Condyles Moment Between -77° and -91° Rotation	69 - 83 N·m	77.9 N·m	Yes
Total Neck Occipital Condyles Moment Decay to 10 N·m	80 - 100 ms	87.6 ms	Yes

Test meets specifications.

Condition: Used

Comments:

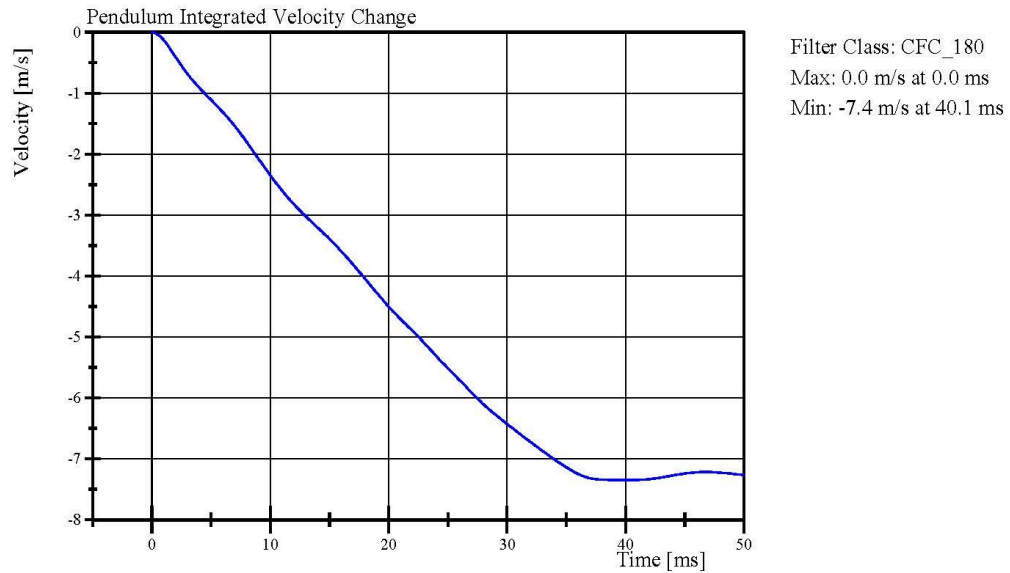
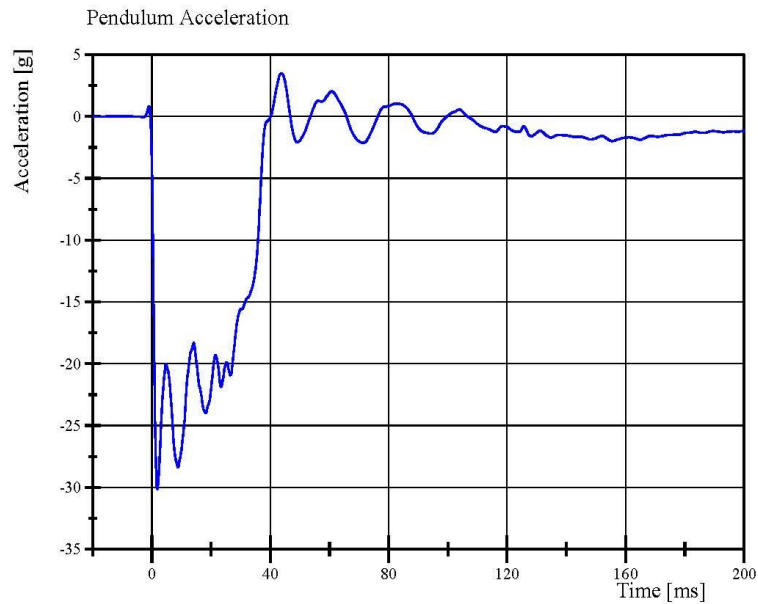
Neck S/N: DM2392

Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 45-1

Test Date: 10/11/2018



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

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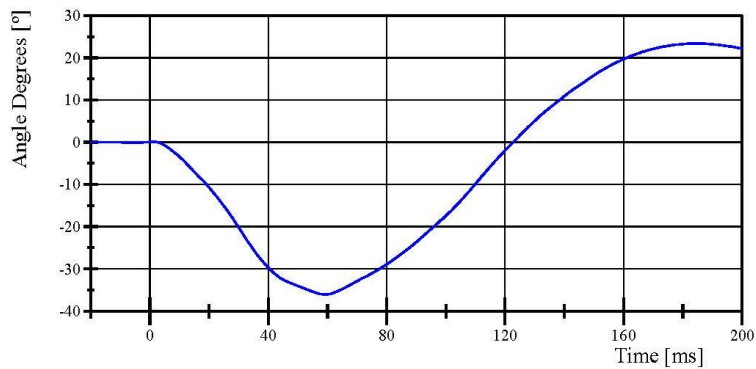
Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 426 Certification No. 45-1

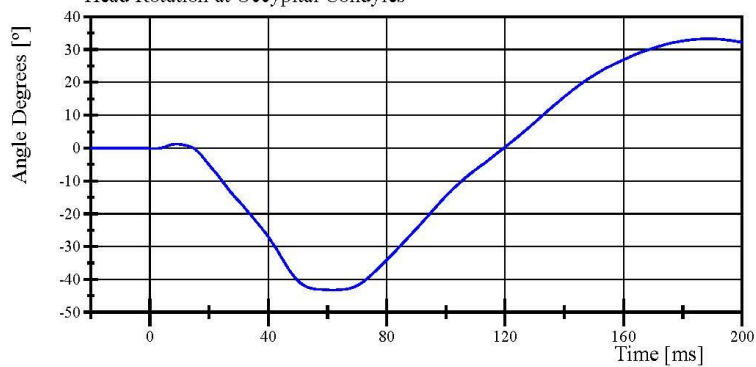
Test Date: 10/11/2018

Pot Rotation at the Base of Neck



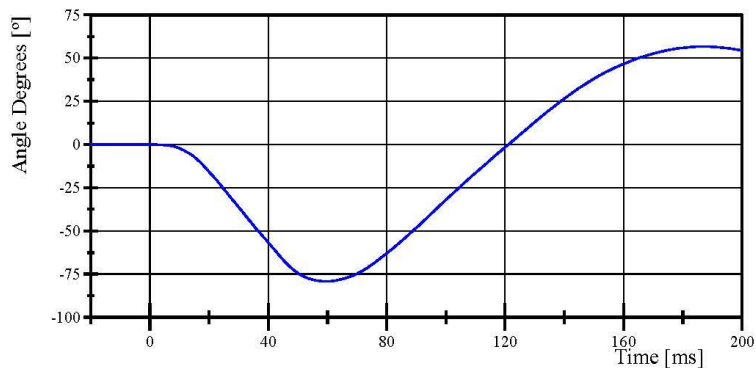
Filter Class: CFC_60
Max: 23.4 ° at 184.8 ms
Min: -36.0 ° at 59.2 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 33.3 ° at 188.8 ms
Min: -43.2 ° at 61.7 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 56.6 ° at 186.8 ms
Min: -79.2 ° at 59.8 ms

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

10.11.2018 11:27:28 1814

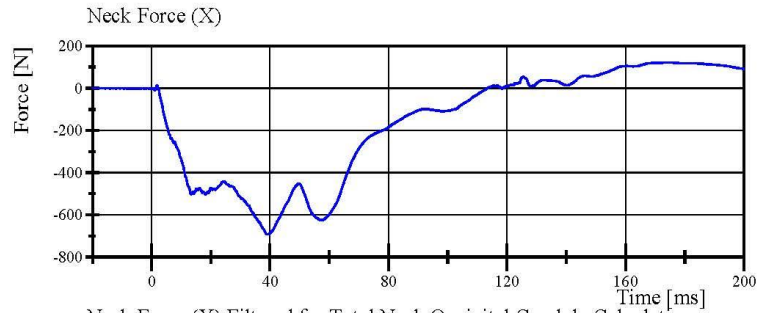


Transportation Research Center Inc.

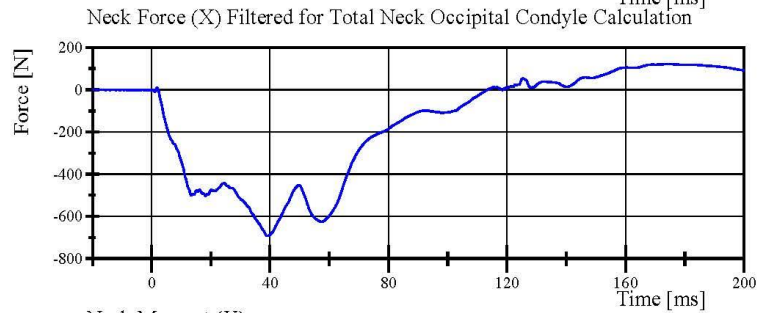
Neck Flexion

HIII 5th Serial No. 426 Certification No. 45-1

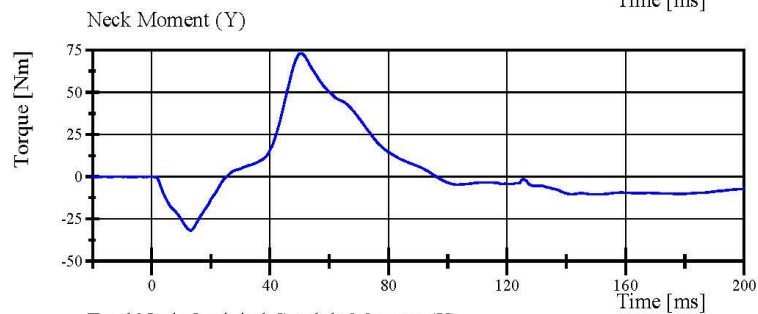
Test Date: 10/11/2018



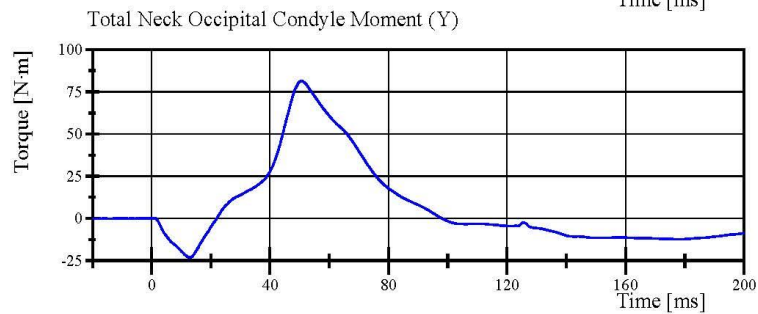
Filter Class: CFC_1000
Max: 122.8 N at 174.9 ms
Min: -692.7 N at 39.2 ms



Filter Class: CFC_600
Max: 122.4 N at 174.9 ms
Min: -692.5 N at 39.2 ms



Filter Class: CFC_600
Max: 73.1 Nm at 50.3 ms
Min: -31.9 Nm at 13.3 ms



Filter Class: Without_(Consta
Max: 81.3 N·m at 50.7 ms
Min: -23.0 N·m at 13.1 ms

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

10.11.2018 11:27:29 1814



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Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 45-2

Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Pendulum Velocity	(-5.95) - (-6.19) m/s	-6.105 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	1.5 - 1.9 m/s	1.85 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	5.29 m/s	Yes
Total Head D-Plane Rotation	99 - 114 °	110.4 °	Yes
Total Neck Occipital Condyles Moment Between 99° and 114° Rotation	(-53) - (-65) N·m	-56.3 N·m	Yes
Total Neck Occipital Condyles Moment Decay to -10 N·m	94 - 114 ms	105.9 ms	Yes

Test meets specifications.

Condition: Used

Comments:

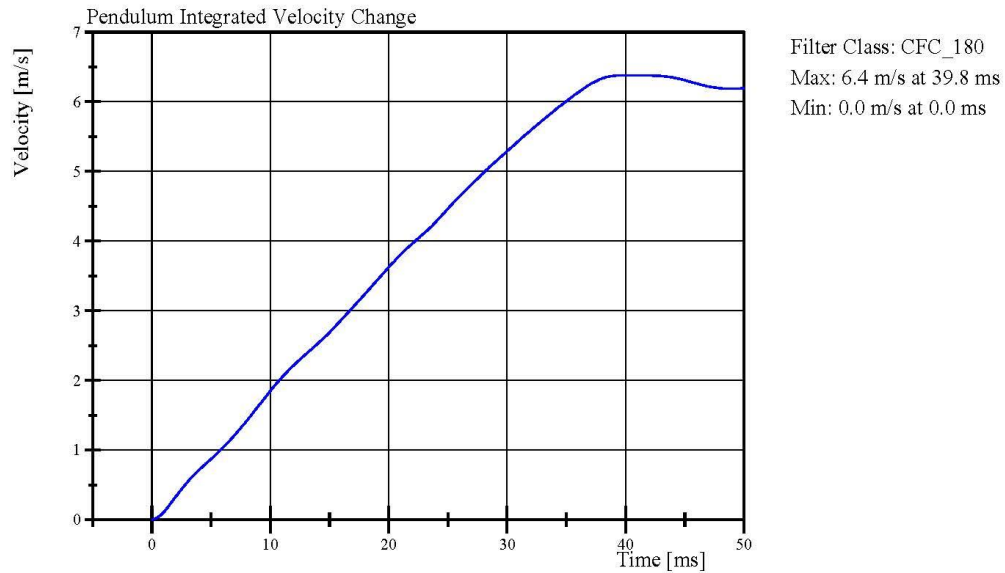
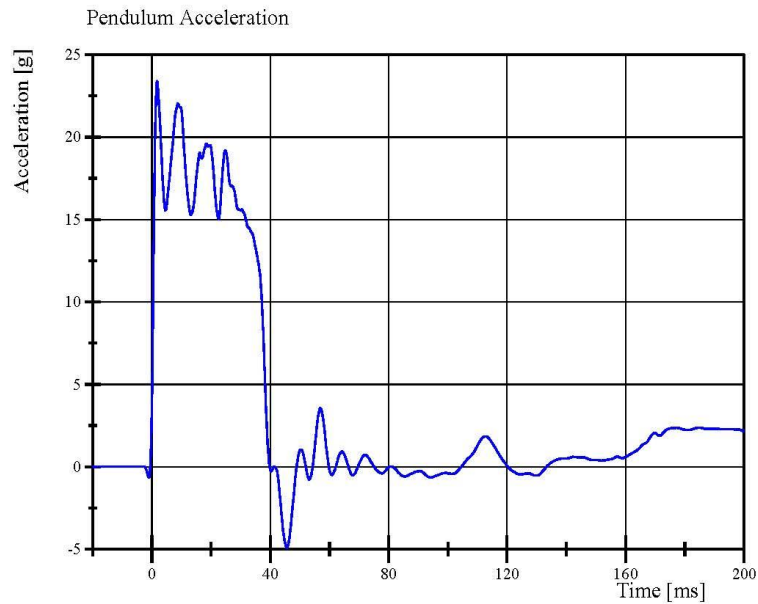
Neck S/N: DM2392

Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 45-2

Test Date: 10/11/2018



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

10.11.2018 13:09:48 1959



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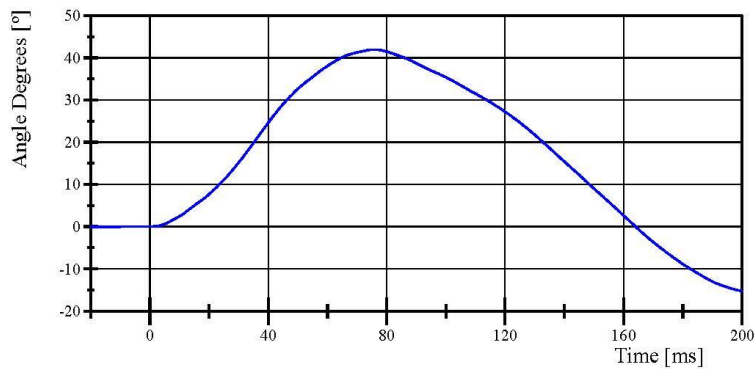
Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 426 Certification No. 45-2

Test Date: 10/11/2018

Pot Rotation at the Base of Neck

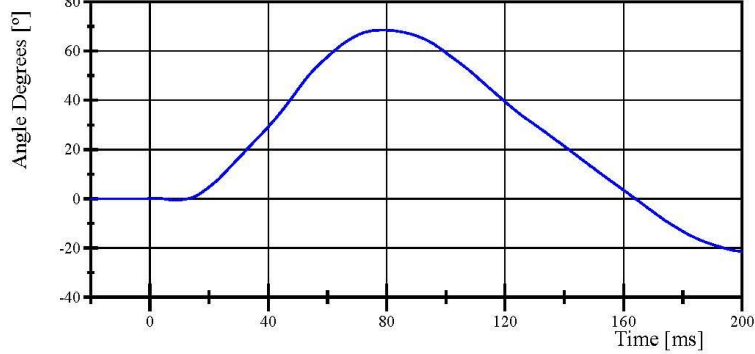


Filter Class: CFC_60

Max: 41.9 ° at 75.8 ms

Min: -15.2 ° at 200.0 ms

Head Rotation at Occypital Condyles

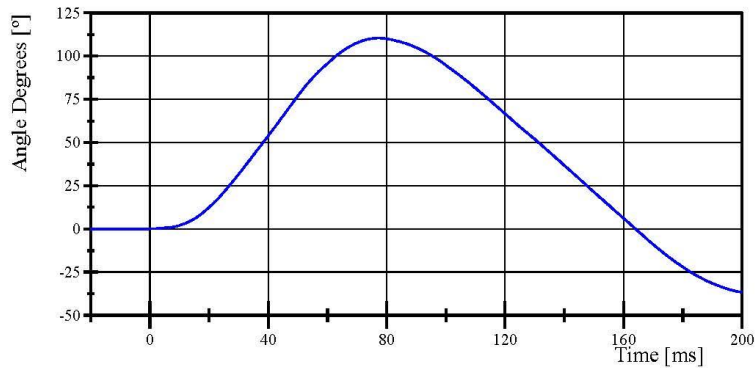


Filter Class: CFC_60

Max: 68.6 ° at 79.0 ms

Min: -21.5 ° at 200.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60

Max: 110.4 ° at 77.3 ms

Min: -36.8 ° at 200.0 ms

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

10.11.2018 13:09:49 1959



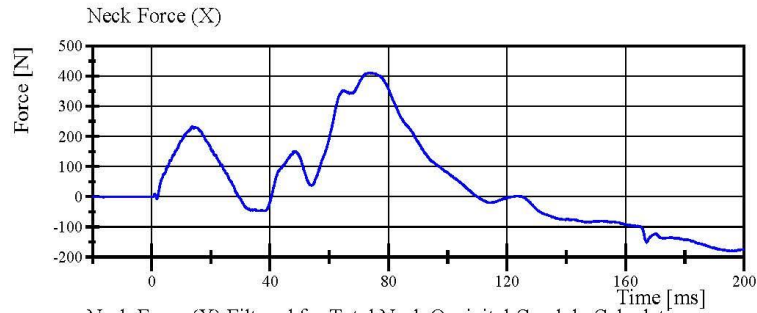
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Transportation Research Center Inc.

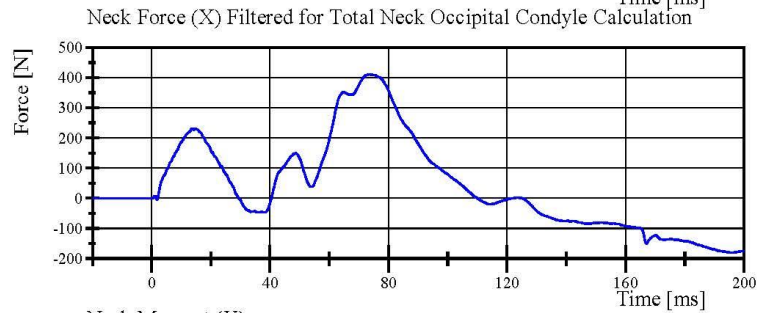
Neck Extension

HIII 5th Serial No. 426 Certification No. 45-2

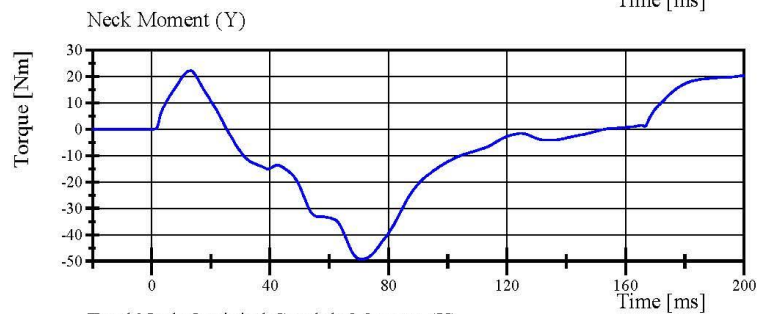
Test Date: 10/11/2018



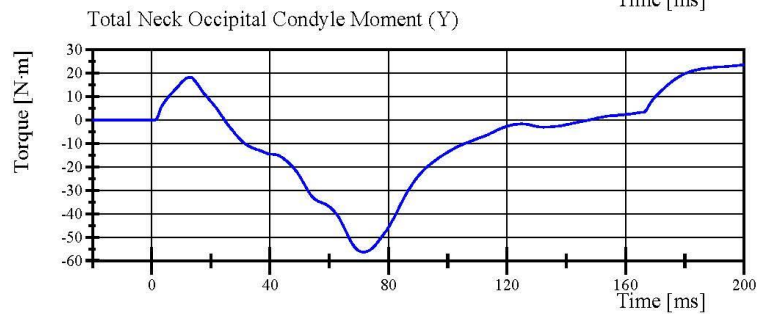
Filter Class: CFC_1000
Max: 411.8 N at 73.5 ms
Min: -179.9 N at 195.6 ms



Filter Class: CFC_600
Max: 411.4 N at 73.5 ms
Min: -179.6 N at 195.6 ms



Filter Class: CFC_600
Max: 22.2 Nm at 13.3 ms
Min: -49.3 Nm at 70.9 ms



Filter Class: Without_(Consta
Max: 23.4 N·m at 200.0 ms
Min: -56.3 N·m at 71.6 ms

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

10.11.2018 13:09:50 1959



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Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. 426 Certification No. 45-1

Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.726 m/s	Yes
Probe Force Peak Between 50.0 mm and 58.0 mm Chest Deflection	(-3,900) - (-4,400) N	-4,377.6 N	Yes
Probe Force Peak Between 18.0 mm and 50.0 mm Chest Deflection	>= (-4,600) N	-4,378.6 N	Yes
Maximum Chest Compression	(-50) - (-58) mm	-51.7 mm	Yes
Internal Hysteresis	69 - 85 %	74.7 %	Yes

Test meets specifications.

Condition: Used

Comments:

Jacket S/N: DG9935

Rib Set S/N: DJ1164

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

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10.11.2018 10:19:07 381

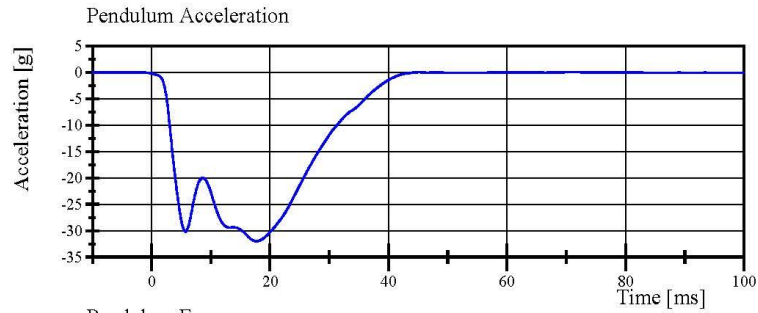


Transportation Research Center Inc.

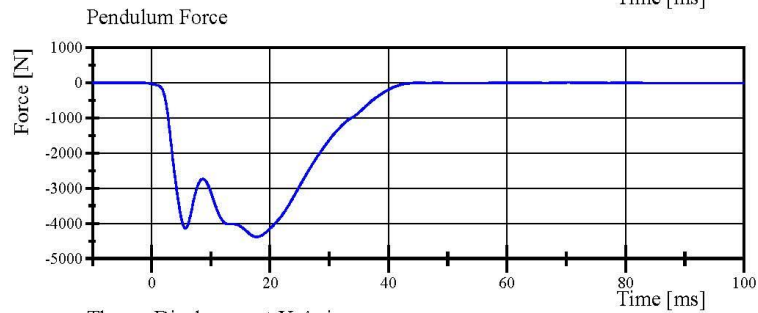
Front Thorax

HIII 5th Serial No. 426 Certification No. 45-1

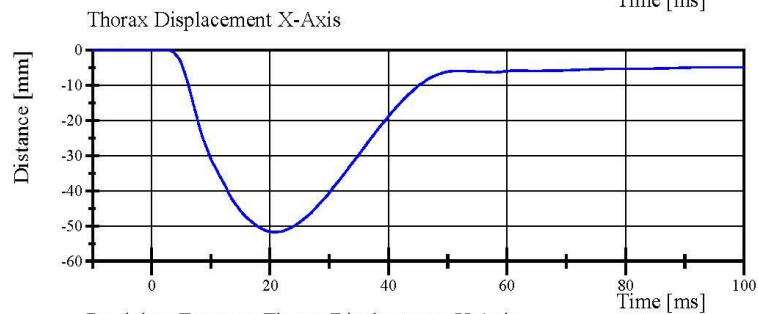
Test Date: 10/11/2018



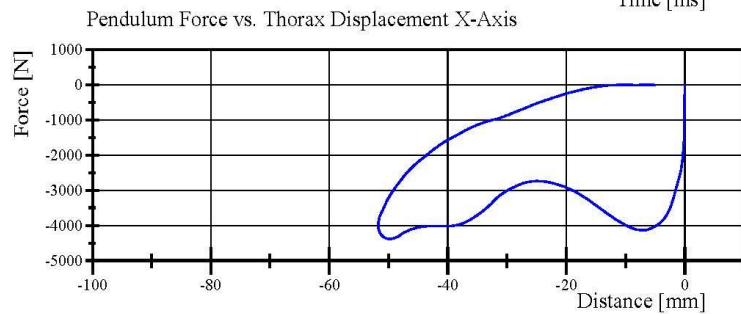
Filter Class: CFC_180
Max: 0.0 g at 70.4 ms
Min: -32.0 g at 17.7 ms



Filter Class: CFC_180
Max: 6.2 N at 70.4 ms
Min: -4,378.6 N at 17.7 ms



Filter Class: CFC_600
Max: 0.0 mm at -5.1 ms
Min: -51.7 mm at 20.9 ms



Filter Class: CFC_180
Max: 6.2 N at -5.7 mm
Min: -4,378.6 N at -49.8 mm

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

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Transportation Research Center Inc.

Hybrid III Small Female Torso Flexion

NHTSA

Serial Number: 426

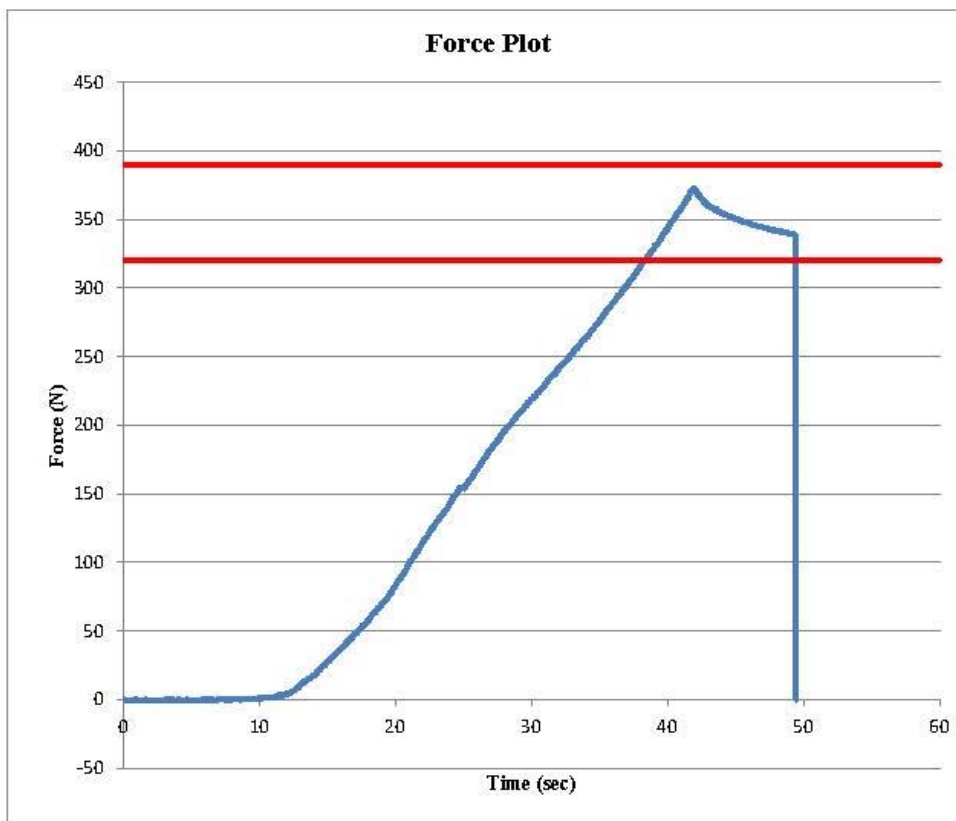
Date: 10/11/2018

Test Number: 1

Time: 13:49



TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.6 °C Pass
Humidity	10 - 70	48 % Pass
Average Angular Velocity	0.5 - 1.5	0.91 deg/sec Pass
Initial Angle	0 - 20	17.79 deg Pass
Peak Force at 45.31°	320 - 390	372.57 N Pass
Final Angle	-8 - 8	5.55 deg Pass



Comments:
 Abdomen S/N: 1047
 Pelvis S/N: 885
 Lumbar S/N: N/A

Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 45-1
Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.130 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,824.7 N	Yes

Test meets specifications.

Condition: Used

Comments:

Knee Skin S/N: 1366

Knee Insert S/N: N/A

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

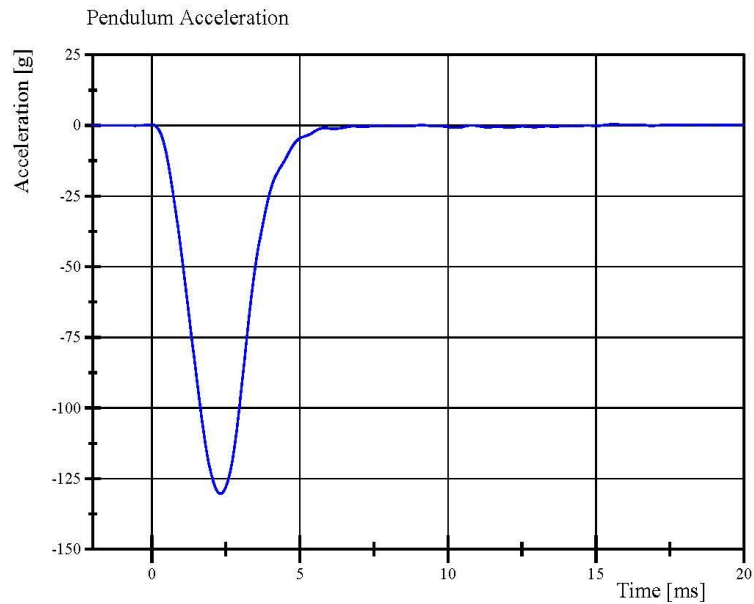
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10.11.2018 09:51:26 1747

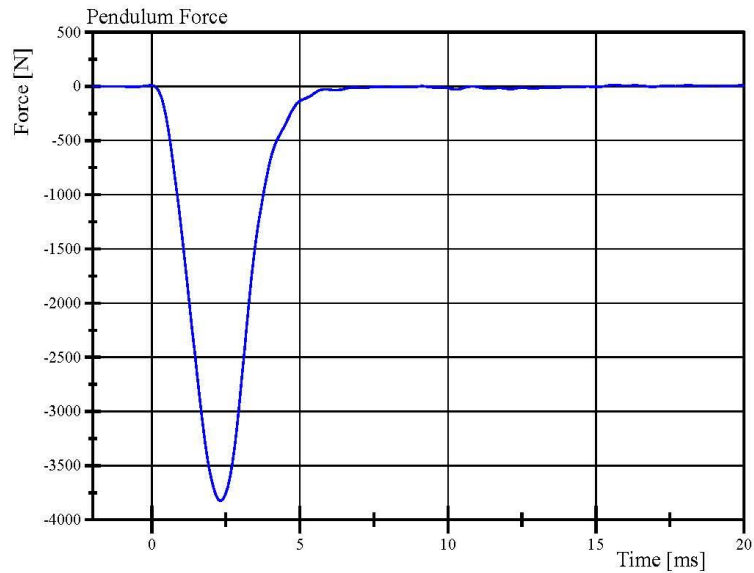


Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 45-1
Test Date: 10/11/2018



Filter Class: CFC_600
Max: 0.4 g at 15.6 ms
Min: -130.4 g at 2.3 ms



Filter Class: CFC_600
Max: 12.2 N at 15.6 ms
Min: -3,824.7 N at 2.3 ms

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

10.11.2018 09:52:30 1747



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Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 45-1
Test Date: 10/11/2018

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.107 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,675.6 N	Yes

Test meets specifications.

Condition: Used

Comments:

Knee Skin S/N: 1402

Knee Insert S/N: N/A

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

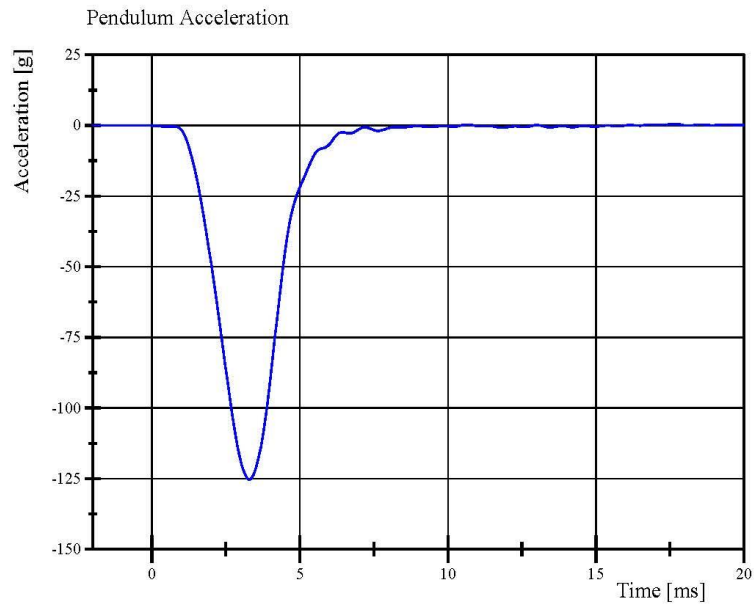
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10.11.2018 09:58:15 1751

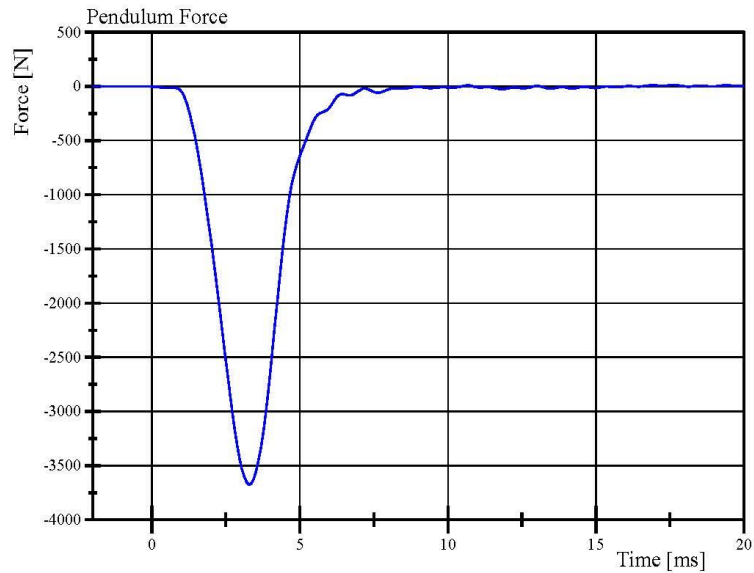


Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 45-1
Test Date: 10/11/2018



Filter Class: CFC_600
Max: 0.4 g at 17.6 ms
Min: -125.4 g at 3.3 ms



Filter Class: CFC_600
Max: 13.0 N at 17.6 ms
Min: -3,675.6 N at 3.3 ms

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

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APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

TABLE 1 – Driver Dummy Instrumentation

Instrumentation			Axis/Location	Hybrid III 50th S/N 037		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers	Primary		X	P94536	Endevco	19-Sep-2018
			Y	P94650	Endevco	19-Sep-2018
			Z	P94622	Endevco	19-Sep-2018
	Redundant		X	P94431	Endevco	19-Sep-2018
			Y	P94487	Endevco	19-Sep-2018
			Z	P94645	Endevco	19-Sep-2018
Head Angular Rate Sensors			X	ARS13049	DTS	8-Dec-2018
			Y	ARS13039	DTS	8-Dec-2018
			Z	ARS13573	DTS	8-Dec-2018
Upper Neck Load Cell			FX, FY, FZ, MX, MY, MZ	2021	Humanetics	2-Apr-2018
Chest Accelerometers	Primary		X	P87834	Endevco	19-Sep-2018
			Y	P61255	Endevco	20-Sep-2018
			Z	P45008	Endevco	20-Sep-2018
	Redundant		X	P91177	Endevco	19-Sep-2018
			Y	P94570	Endevco	20-Sep-2018
			Z	P91172	Endevco	20-Sep-2018
Chest Potentiometer			X	CST037	Servo	29-Mar-2018
Pelvis Accelerometers			X	P91185	Endevco	19-Sep-2018
			Y	P91876	Endevco	19-Sep-2018
			Z	P91180	Endevco	19-Sep-2018
Femur Load Cells	Left	Primary	Z	DI4215-FZ1	Denton	30-Mar-2018
		Redundant	Z	DI4215-FZ2	Denton	30-Mar-2018
	Right	Primary	Z	DI4216-FZ1	Denton	30-Mar-2018
		Redundant	Z	DI4216-FZ2	Denton	30-Mar-2018
Tibia Load Cells	Left	Upper	MX, MY, FZ	3643-94	Denton	30-Mar-2018
		Lower	MX, MY, FZ	3644-370	Denton	2-Apr-2018
	Right	Upper	MX, MY, FZ	3643-413	Denton	2-Apr-2018
		Lower	MX, MY, FZ	3644-401	Denton	2-Apr-2018
Foot Accelerometers	Left	Rear	X	P90848	Endevco	19-Sep-2018
			Z	P91498	Endevco	19-Sep-2018
		Front	Z	P90841	Endevco	19-Sep-2018
	Right	Rear	X	P93467	Endevco	19-Sep-2018
			Z	P97619	Endevco	19-Sep-2018
		Front	Z	P94523	Endevco	19-Sep-2018
Seat Belt Load Cells		Lap	N/A			
		Shoulder	N/A			

TABLE 2 – Front Passenger Dummy Instrumentation

Instrumentation			Axis/Location	Hybrid III 5th S/N 426		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers	Primary		X	P90285	Endevco	1-Oct-2018
			Y	P90302	Endevco	1-Oct-2018
			Z	P94534	Endevco	1-Oct-2018
	Redundant		X	P89014	Endevco	1-Oct-2018
			Y	P90855	Endevco	1-Oct-2018
			Z	P94525	Endevco	1-Oct-2018
Head Angular Rate Sensors			X	ARS14247	DTS	1-Dec-2018
			Y	ARS14299	DTS	1-Dec-2018
			Z	ARS14303	DTS	1-Dec-2018
Upper Neck Load Cell			FX, FY, FZ, MX, MY, MZ	2207	Denton	1-Oct-2018
Chest Accelerometers	Primary		X	P93543	Endevco	1-Oct-2018
			Y	P93533	Endevco	1-Oct-2018
			Z	P93402	Endevco	1-Oct-2018
	Redundant		X	P91664	Endevco	1-Oct-2018
			Y	P93546	Endevco	1-Oct-2018
			Z	P93547	Endevco	1-Oct-2018
Chest Potentiometer			X	CST426	Servo	1-Oct-2018
Pelvis Accelerometers			X	P93514	Endevco	1-Oct-2018
			Y	P87467	Endevco	1-Oct-2018
			Z	P93766	Endevco	1-Oct-2018
Femur Load Cells	Left	Primary	Z	DI4214-FZ1	Denton	1-Oct-2018
		Redundant	Z	DI4214-FZ2	Denton	1-Oct-2018
	Right	Primary	Z	DI4217-FZ1	Denton	1-Oct-2018
		Redundant	Z	DI4217-FZ2	Denton	1-Oct-2018
Tibia Load Cells	Left	Upper	MX, MY, FZ	3643-92	Denton	1-Oct-2018
		Lower	MX, MY, FZ	3644-92	Denton	1-Oct-2018
	Right	Upper	MX, MY, FZ	3643-484	Denton	1-Oct-2018
		Lower	MX, MY, FZ	3644-369	Denton	1-Oct-2018
Foot Accelerometers	Left	Rear	X	P90866	Endevco	1-Oct-2018
			Z	P91909	Endevco	1-Oct-2018
		Front	Z	P97890	Endevco	1-Oct-2018
	Right	Rear	X	P97640	Endevco	1-Oct-2018
			Z	P91471	Endevco	1-Oct-2018
		Front	Z	P91907	Endevco	1-Oct-2018
Seat Belt Load Cells		Lap	N/A			
		Shoulder	N/A			

TABLE 3 – Vehicle Instrumentation

Instrumentation			Axis	Serial Number	Manufacturer	Calibration Date
Crossmember/Rear Seat Accelerometers	Left	Primary	X	P58611	Endevco	14-Nov-2017
			Z	P97719	Endevco	23-Apr-2018
	Right	Redundant	X	P73570	Endevco	30-Apr-2018
		Primary	X	P88038	Endevco	30-Apr-2018
			Z	P61295	Endevco	14-Nov-2017
		Redundant	X	P88043	Endevco	23-Apr-2018
Engine Accelerometers	Top		X	P76454	Endevco	14-Nov-2017
	Bottom		X	P94740	Endevco	23-Apr-2018