Final Report Number: NCAP-TRC-21-002

New Car Assessment Program (NCAP)

Frontal Barrier Impact Test

FCA US LLC

2021 Dodge Durango

NHTSA Number: M20210300

PREPARED BY:
Transportation Research Center Inc.
10820 State Route 347
P. O. Box B-67
East Liberty, OH 43319

Report Date: March 25, 2021

FINAL REPORT

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

Notice

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Prepared By: ILO Project Operations Group

Approved By: John Shultz

Approval Date: March 25, 2021

FINAL REPORT ACCEPTANCE BY OCWS:

_____

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

Date _____

_____

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

Date _____

Technical Report Documentation Page

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Final Report of NEW CAR ASSESSMENT PROGRAM Frontal Impact Testing of a 2021 Dodge Durango NHTSA No. M20210300	March 25, 2021
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15. Supplemental Notes

16. Abstract

A 56.0 km/h NCAP Frontal Impact Test was conducted on a 2021 Dodge Durango, in accordance with the specifications of the Office of Crashworthiness Standards Laboratory Procedure for NCAP Full Frontal Rigid Barrier Impact Testing. The test was conducted at the Transportation Research Center Inc. in East Liberty, Ohio on February 2, 2021.

The impact velocity was 56.54 km/h, and the ambient temperature at the barrier face at the time of impact was 21.4° C. The target vehicle post-test maximum crush was 614 millimeters at vehicle center line. The test vehicle's performance is as follows:

	Driver ATD			Passenger ATD		
Measurement Description	Units	Threshold	Result	Units	Threshold	Result
Head Injury Criteria (HIC_{15})	NA	700	95	NA	700	116
Maximum Chest Compression	mm	63	-34.5	mm	52	-24.5
3ms Chest Clip	Gs	60	41.3	Gs	60	45.9
Nij	NA	1	0.33	NA	1	0.42
Neck Tension	Newtons	4170	1132.9	Newtons	2620	546.8
Neck Compression	Newtons	4000	-205.0	Newtons	2520	-372.6
Left Femur Force	Newtons	10000	-1688.5	Newtons	6800	-1234.2
Right Femur Force	Newtons	10000	-1031.4	Newtons	6800	-1475.5

17. Key Words	18. Distribution Statement
56.3 km/h (35 mph) Full Frontal Rigid Barrier Impact Test New Car Assessment Program (NCAP)	Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division 1200 New Jersey Ave, SE Washington, DC 20590

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. Number of Pages	22. Price
Unclassified	Unclassified	177	

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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. 693JJ919D000007. 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 2021 Dodge Durango at a velocity of 56.54 km/h. The test was performed at Transportation Research Center, Inc. on February 2, 2021. 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 106 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 614 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)	95	0.33	1132.9	-205.0	41.3	-34.5	-1688.5	-1031.4
Passenger (5^{th} Female)	116	0.42	546.8	-372.6	45.9	-24.5	-1234.2	-1475.5

TEST COMMENTS:

DRIVER HEAD Y ACCEL PRIMARY – DATA SPIKES THROUGHOUT

ENGINE BOTTOM X – FAILED AT 66.0 MS

Pit cameras did not trigger resulting in no video coverage

2.2 REPORT AREA 2: DATA SHEETS

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

Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021

TEST VEHICLE INFORMATION

NHTSA No.	M20210300
Model Year	2021
Make	Dodge
Model	Durango
Body Style	MPV
VIN	1C4RDJAG5MC520860
Body Color	Reactor Blue Pearl Coat
Odometer Reading (km/mi)	14 mi.
Engine Displacement (L)	3.6
Type/No. Cylinders	V/6
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	8
Overdrive	Yes
Final Drive	AWD
Roof Rack	Yes
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes, Driver
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:	No

Does owner's manual provide instructions to turn off automatic door locks? No

DATA FROM CERTIFICATION LABEL

Manufactured by	FCA US LLC
Date of Manufacture	10-20

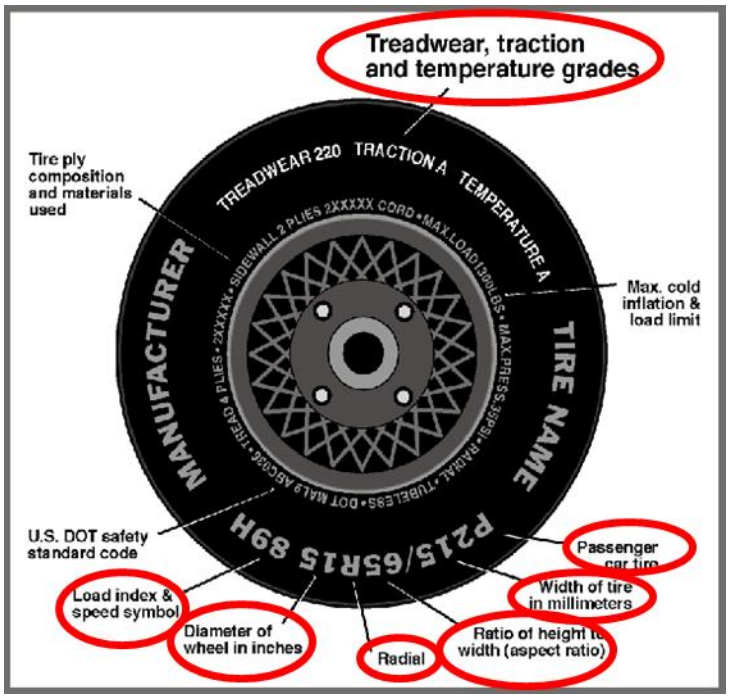
GVWR (kg)	2949 (6500 lbs)
GAWR Front (kg)	1452 (3200 lbs)
GAWR Rear (kg)	1770 (3900 lbs)

VEHICLE SEATING AND WEIGHT CAPACITY

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Buckets	Split Bench	Split Bench	
Number of Occupants	2	3	2	7
Capacity Wt. (VCW) (kg)				544.0
Cargo Wt. (RCLW) (kg)				68.0

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

Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold / Test Pressure (kPa)	250	250
Recommended Tire Size	265/60R18 110T	265/60R18 110T
Tire Size on Vehicle	265/60R18	265/60R18
Tire Manufacturer	Michelin	Michelin
Tire Model	Premier LTX	Premier LTX
Treadwear	620	620
Traction Grade	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index/Speed Symbol	110T	110T
Tire Material	Polyester, Polyamide, Steel	Polyester, Polyamide, Steel
DOT Safety Code Right	1AP5E 0TEX 3720	1AP5E 0TEX 3720
DOT Safety Code Left	1AP5E 0TEX 3720	1AP5E 0TEX 3720

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

Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	552.4	561.4		580.4	646.2	
Right	kg	573.6	546.2		570.2	637.0	
Ratio	%	50.4	49.6		47.3	52.7	
Totals	kg	1126.0	1107.6	2233.6	1150.6	1283.2	2433.8

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2233.6
Weight of 1 P572E ATD & 1 P572O ATD	kg	139.3
Rated Cargo/Luggage Weight (RCLW)	kg	68.0
Vehicle Target Weight (TVTW)	kg	2440.9

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front)
As Delivered	mm	877	872	890	895	1507
As Tested	mm	866	867	871	874	1603
Post Test	mm	810	894	830	906	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	3040
Total Vehicle Length at Left Side	mm	4935
Total Vehicle Length at Centerline	mm	5114
Total Vehicle Length at Right Side	mm	4935
Weight of Ballast in Cargo Area	kg	75.2
Weight of Vehicle Components Removed	kg	0.0
Amount of Stoddard Solvent in Fuel Tank	liters	87.0

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT: None

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

Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021

TARGET VEHICLE STRUCTURAL MEASUREMENT

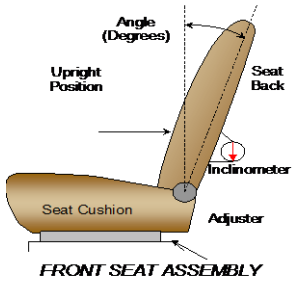
	Elements	Pre-Test (mm)
1	Total Length	5114
2	Total Width	1930
3	Bumper Top Height	575
4	Bumper Bottom Height	510
5	Longitudinal Member Top Height	585
6	Distance Between Longitudinal Members	790
7	Longitudinal Member Width	75
8	Engine Top Height	1120
9	Engine Bottom Height	290
10	Engine and Gearbox Width	620
11	Front Bumper-Engine Distance	690
12	Front Shock Absorber Fixing Height	1030
13	Bonnet Leading Edge Height	1010
14	Front Shock Absorber Fixing Width	960
15	Front Bumper – Front Axle Distance	914
16	Front Axle – A-Pillar Distance	750
17	A-Pillar – B-Pillar Distance	1020
18	B-Pillar – Rear Axle Distance	1280
19	B-Pillar – C-Pillar Distance	1070
20	Roof Sill Bottom Height	1605
21	Roof Sill Top Height	1675
22	Floor Sill Bottom Height	460
23	Floor Sill Top Height	525

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

Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021

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:	13.0
Passenger Seat back angle:	Fixed

SEAT FORE/AFT POSITIONS

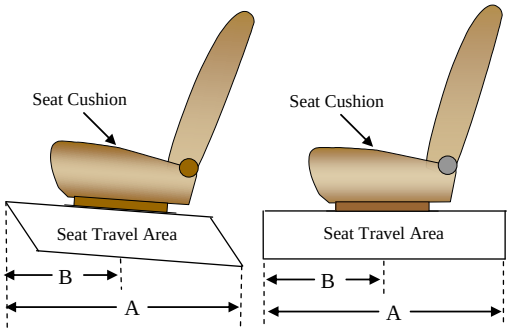
Describe the method of determining seat fore/aft positions.
Driver: Mid position, Positioned according to Form 1
Passenger: Full forward, Positioned according to Form 1

	Total Fore/Aft Travel	Placed in Position No.
Driver Seat	326 mm	163 mm
Passenger Seat	235 mm, 34 detents	0 mm, 1st detent

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	5	5 (uppermost)
Passenger Seat	5	5 (uppermost)



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

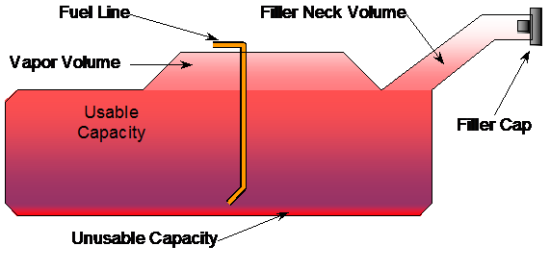
Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	93.5
Usable Capacity of "Optional Tank"	N/A
92%-94% of Usable Capacity	87.0
Actual Amount of Solvent Used	87.0
1/3 of Usable Capacity	31.2

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

The fuel pump starts pumping fuel when the key is "ON" position

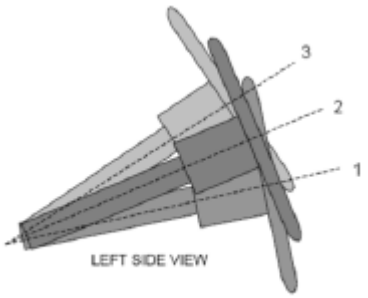


VEHICLE FUEL TANK ASSEMBLY

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.



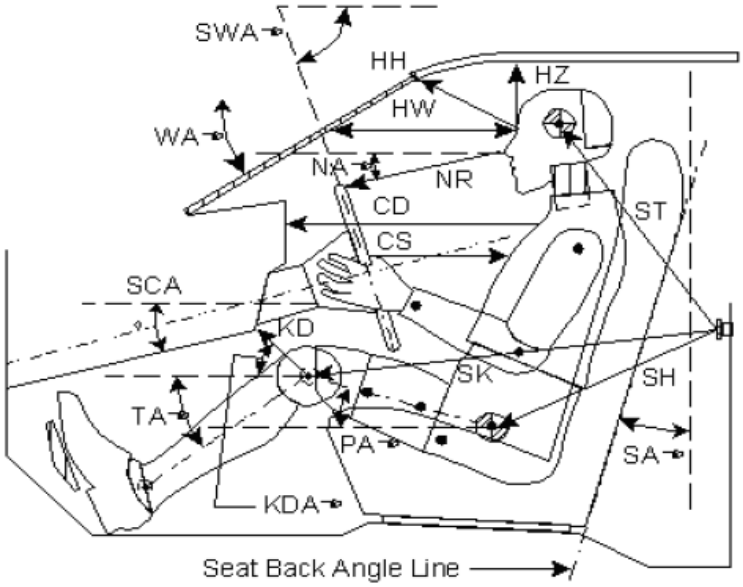
STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONS

	Degrees	Fore/Aft Position (mm)
Lowermost Position No. 1	20.2	0
Geometric Center Position No. 2	22.6	23
Uppermost Position No. 3	25.0	55
Telescoping Steering Wheel Travel		55
Test Position	22.6	23

DATA SHEET NO. 3 - DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

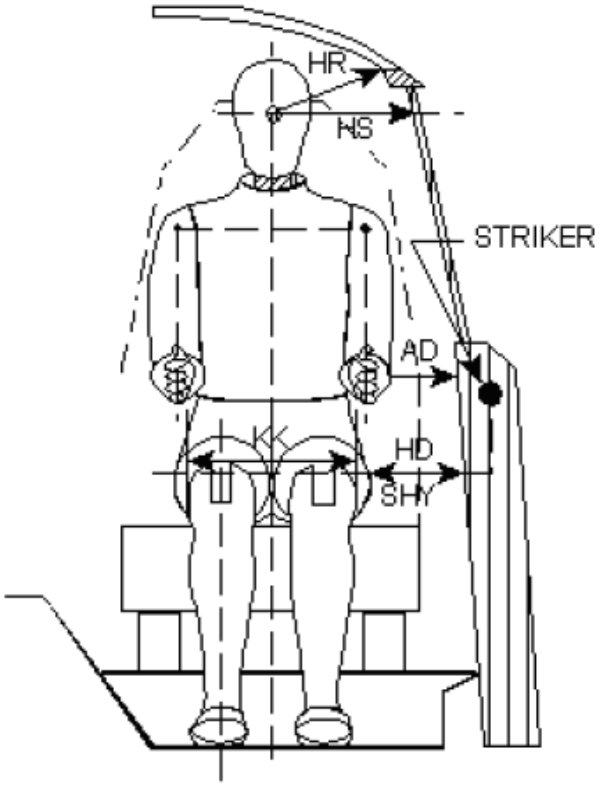
Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021



Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WAº	Windshield Angle		28.6		
SWAº	Steering Wheel Angle		67.4		
SCAº	Steering Column Angle		22.6		
SAº	Seat Back Angle (on head rest post)		13.0		11.4
HZ	Head to Roof (Z)	236		283	
HH	Head to Header	416		386	
HW	Head to Windshield	692		694	
NR	Nose to Rim	385	3.2		
CD	Chest to Dash	550		429	
CS	Chest to Steering Hub	307			
RA	Rim to Abdomen	189			
KDL	Left Knee to Dash	176	25.2	142	37.8
KDR	Right Knee to Dash	171	25.4	147	38.1
PAº	Pelvic Angle		23.8		21.2
TAº	Tibia Angle		49.8		66.7
SK	Striker to Knee	576	-2.2	622	2.2
ST	Striker to Head	569	-81.0	511	-72.8
SH	Striker to H-Point	216	29.0	310	11.5

DATA SHEET NO. 4 - DUMMY LATERAL CLEARANCE DIMENSIONS

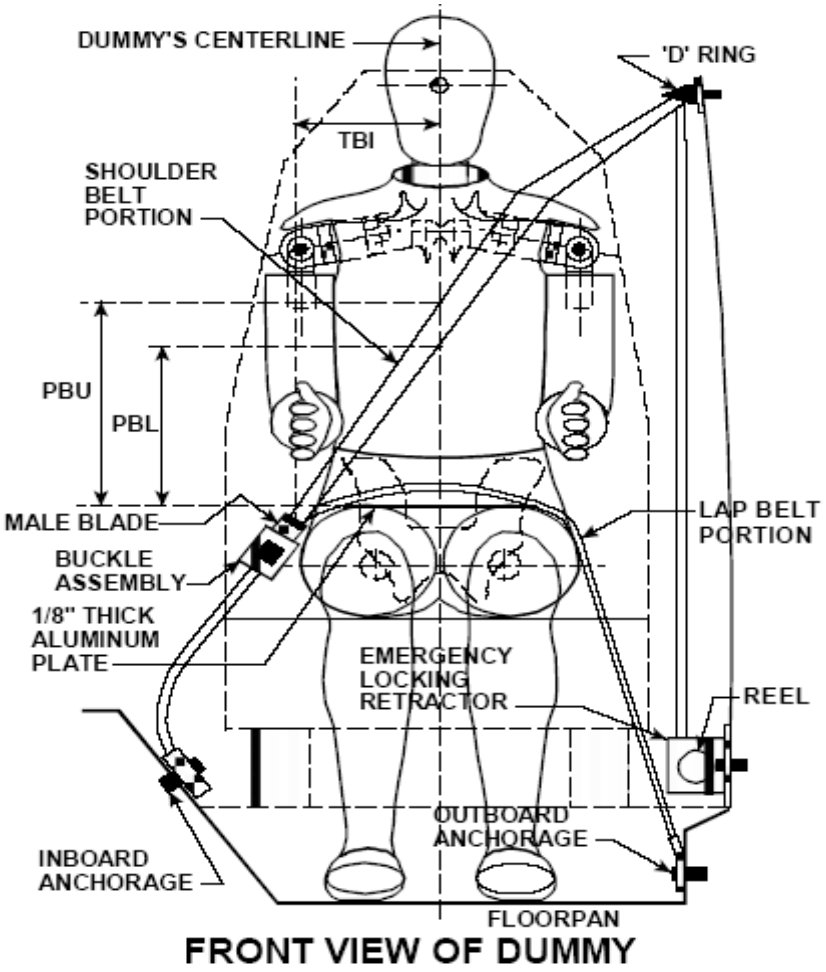
Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021



Code	Measurement Description	Driver	Passenger
AD	Arm to Door	127	114
HD	H-Point to Door	154	192
HR	Head to Side Header	245	288
HS	Head to Side Window	366	397
KK	Knee to Knee	320	165
SHY	Striker to H-Point (Y Direction)	237	276
AA	Ankle to Ankle	295	170

DATA SHEET NO. 5 - SEAT BELT POSITIONING DATA

Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU – Top surface of reference to belt upper edge	mm	370	274
PBL – Top surface of reference to belt lower edge	mm	285	188

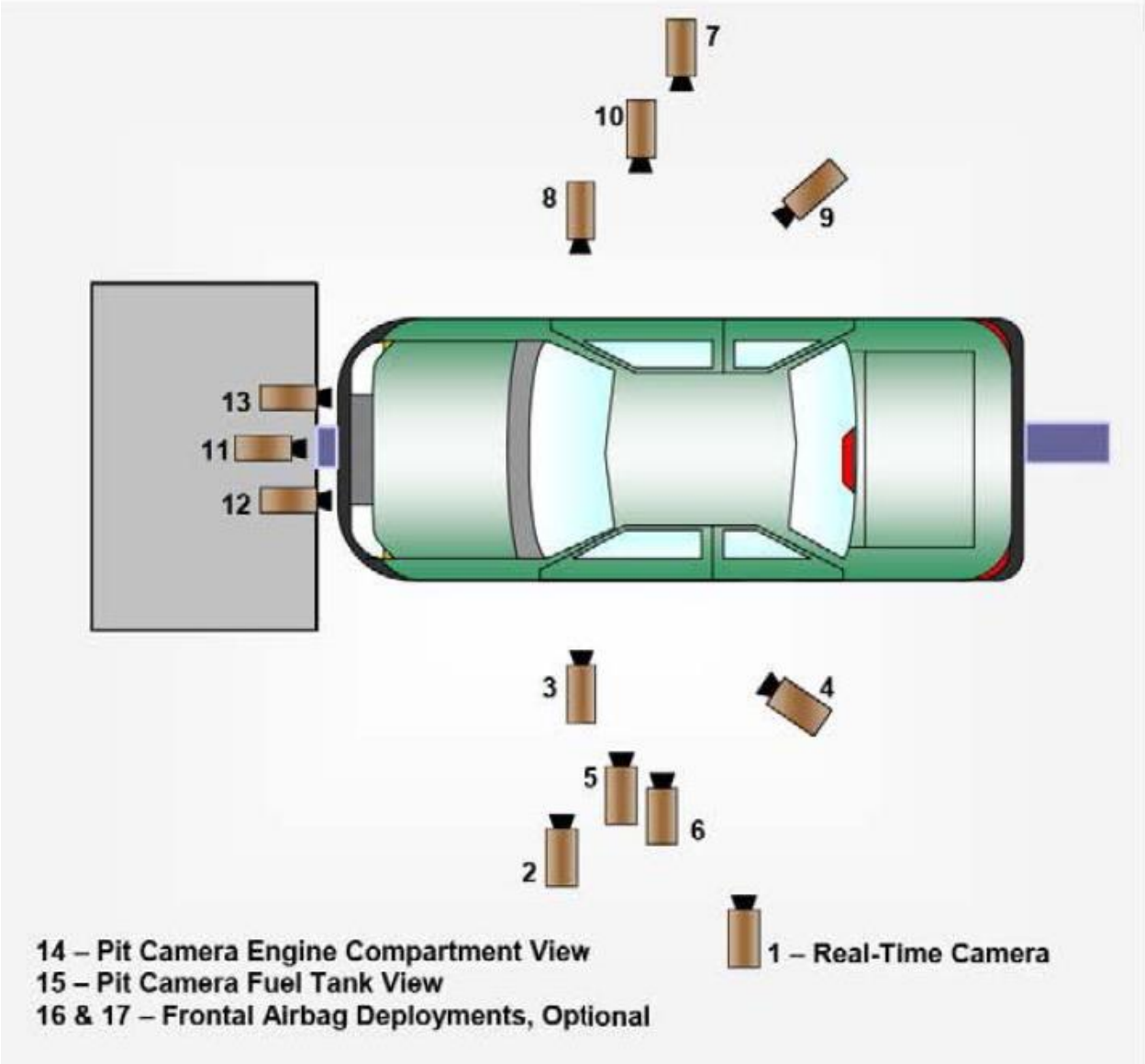
BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	884	867
Lap belt length as measured on ATD	mm	546	556
Remainder of belt on reel	mm	985	962
Total belt length for continuous webbing systems	mm	2415	2385

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

Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021

CAMERA POSITIONS FOR FRONTAL IMPACTS



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

Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021

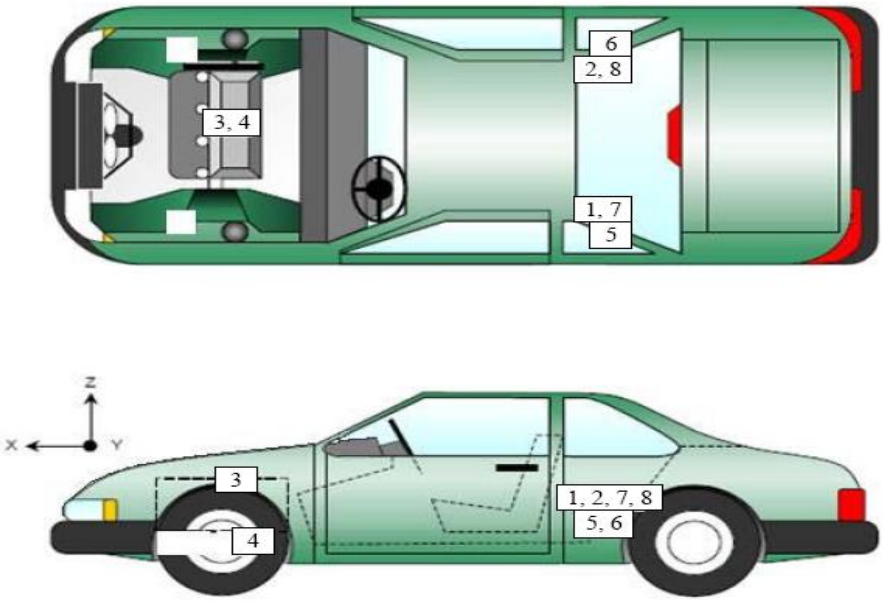
CAMERA LOCATIONS

No.	Camera View	Location (mm)			Lens (mm)	Frame Speed (fps)
		X	Y	Z		
1	REAL-TIME LEFT OVERALL	-1629	-5890	-1506	Zoom	30
2	LEFT OVERALL	-3853	-6017	-1698	20	1000
3	DRIVER CLOSE-UP	-2594	-5247	-1535	50	1000
4	LEFT FRONT HALF	-1245	-4505	-1495	28	1000
5	LEFT ANGLE	-1157	2426	-1695	20	1000
6	STEERING COLUMN	-2803	-5292	-1538	50	1000
7	RIGHT OVERALL	-1865	5931	-1532	20	1000
8	PASSENGER CLOSE-UP	-2400	3824	-1593	50	1000
9	RIGHT FRONT HALF	-1101	5525	-1508	28	1000
10	RIGHT ANGLE	-3352	-2242	-1693	20	1000
11	WINDSHIELD	1566	0	-5614	20	1000
12	DRIVER WINDSHIELD	0	-608	-2544	16	1000
13	PASSENGER WINDSHIELD	0	731	-2512	16	1000
14	PIT FRONT	1392	0	2954	20	1000
15	PIT REAR	3032	0	3034	20	1000
16	DRIVER ONBOARD				8.5	1000
17	PASSENGER ONBOARD				8.5	1000

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

DATA SHEET NO. 7 - VEHICLE ACCELEROMETER DATA

Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	2120	-440	-548
2	Right Rear Accelerometer – X Direction	2120	430	-550
3	Engine Top X	4069	150	-1081
4	Engine Bottom X	4069	-50	-281
5	Left Rear Accelerometer – Z Direction	2120	-440	-553
6	Right Rear Accelerometer – Z Direction	2120	430	-555
7	Left Rear Accelerometer – X Direction Redundant	2120	-415	-548
8	Right Rear Accelerometer- X Direction Redundant	2120	405	-550

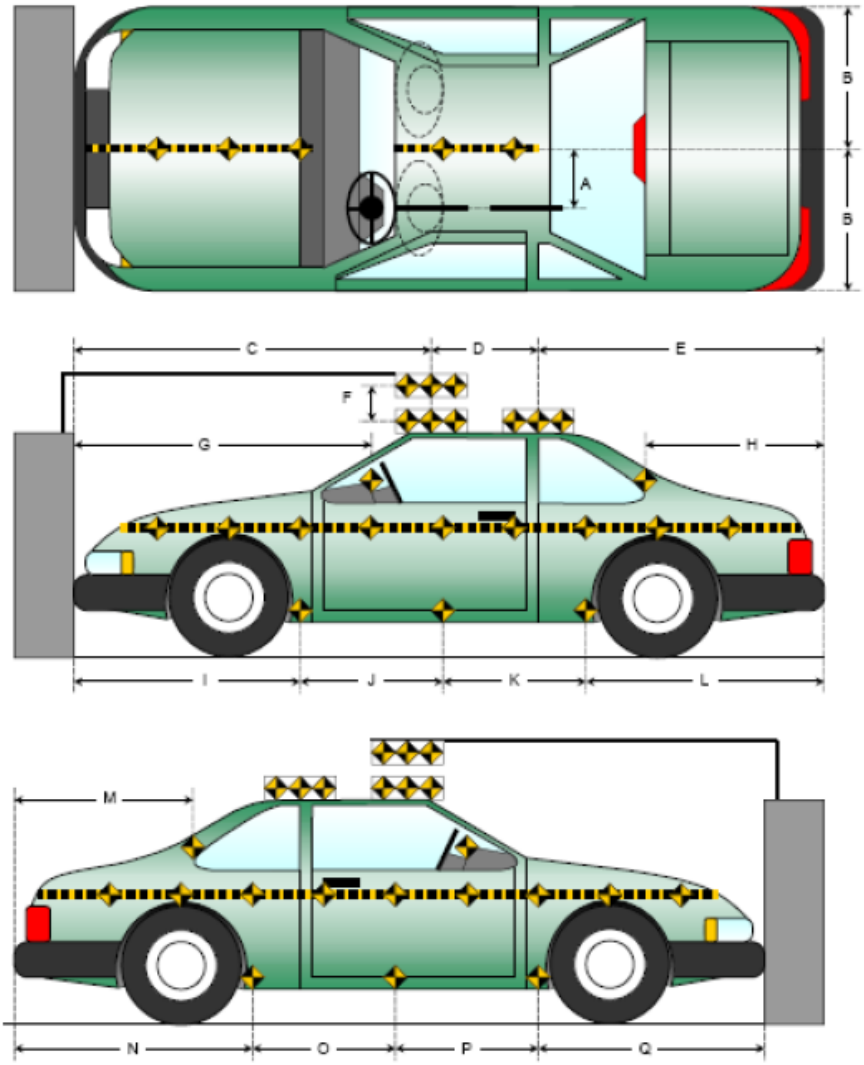
Reference Points: X – Rear Surface of Vehicle (+ forward)
Y – Vehicle Centerline (+ to right)
Z – Ground Plane (+ down)

DATA SHEET NO. 8 - PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021

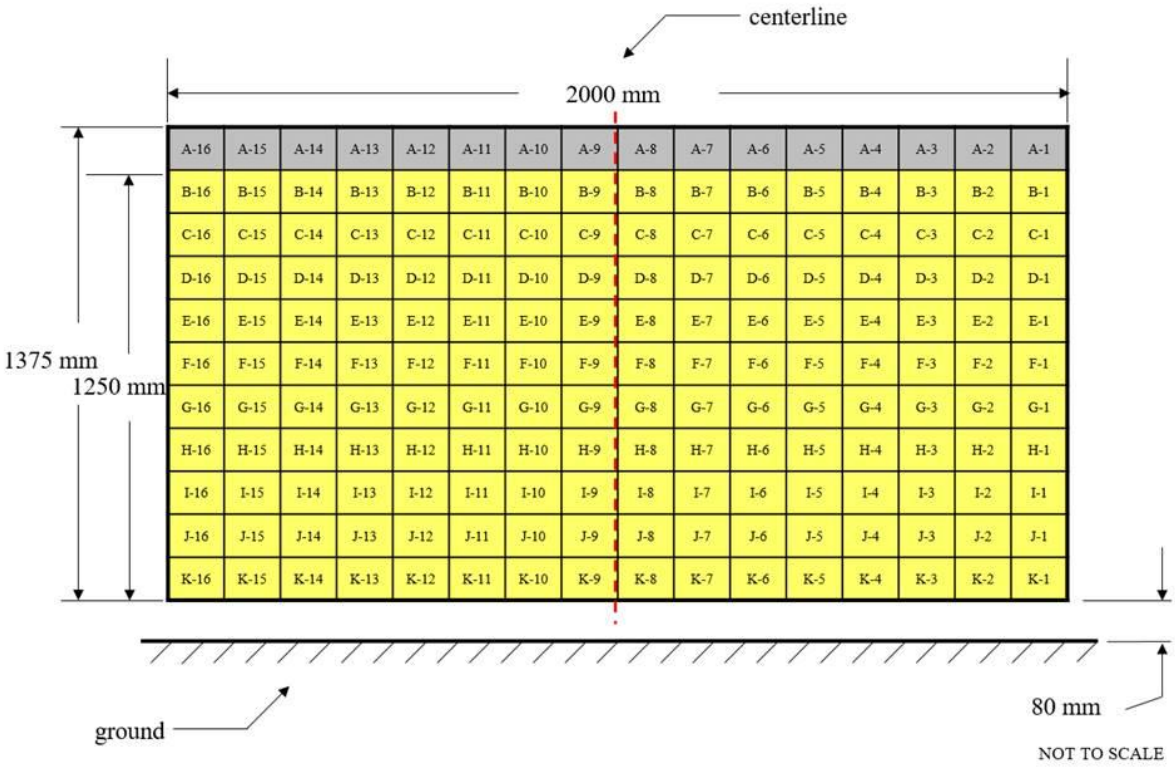
Item	Value
A	380
B	965
C	2386
D	600
E	2020
F	310
G	1864
H	1570
I	1484
J	950
K	970
L	1710
M	1570
N	1720
O	970
P	945
Q	1479

All units in millimeters



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

Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021



DATA SHEET NO. 10 - TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021

INSTRUMENTATION

Instrumentation	Number of Channels Collected
Driver Dummy Accelerometers	47
Passenger Dummy Accelerometers	47
Vehicle Structure Accelerometers	8
Total	102

CAMERA COVERAGE

Type of Camera	Number Used in this Test
High-Speed Vehicle Onboard	2
High-Speed Offboard	14
Real-Time Panning	2
Total	18

DATA SHEET NO. 11 - POST-TEST OBSERVATIONS

Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021

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 Head Restraint	Frontal Airbag and Head Restraint
Upper Torso Contact	Airbag	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) **	Yes, 9 mm	No	
Seat Back Movement from Initial Position**	No	No	

POST- OTHER VEHICLE POST-TEST OBSERVATIONS

Critical Areas of Performance	Observations
Windshield Damage	Small crack at right lower A pillar
Window Damage	None
Other Notable Effects	Left front tire flat

VEHICLE REBOUND FROM BARRIER

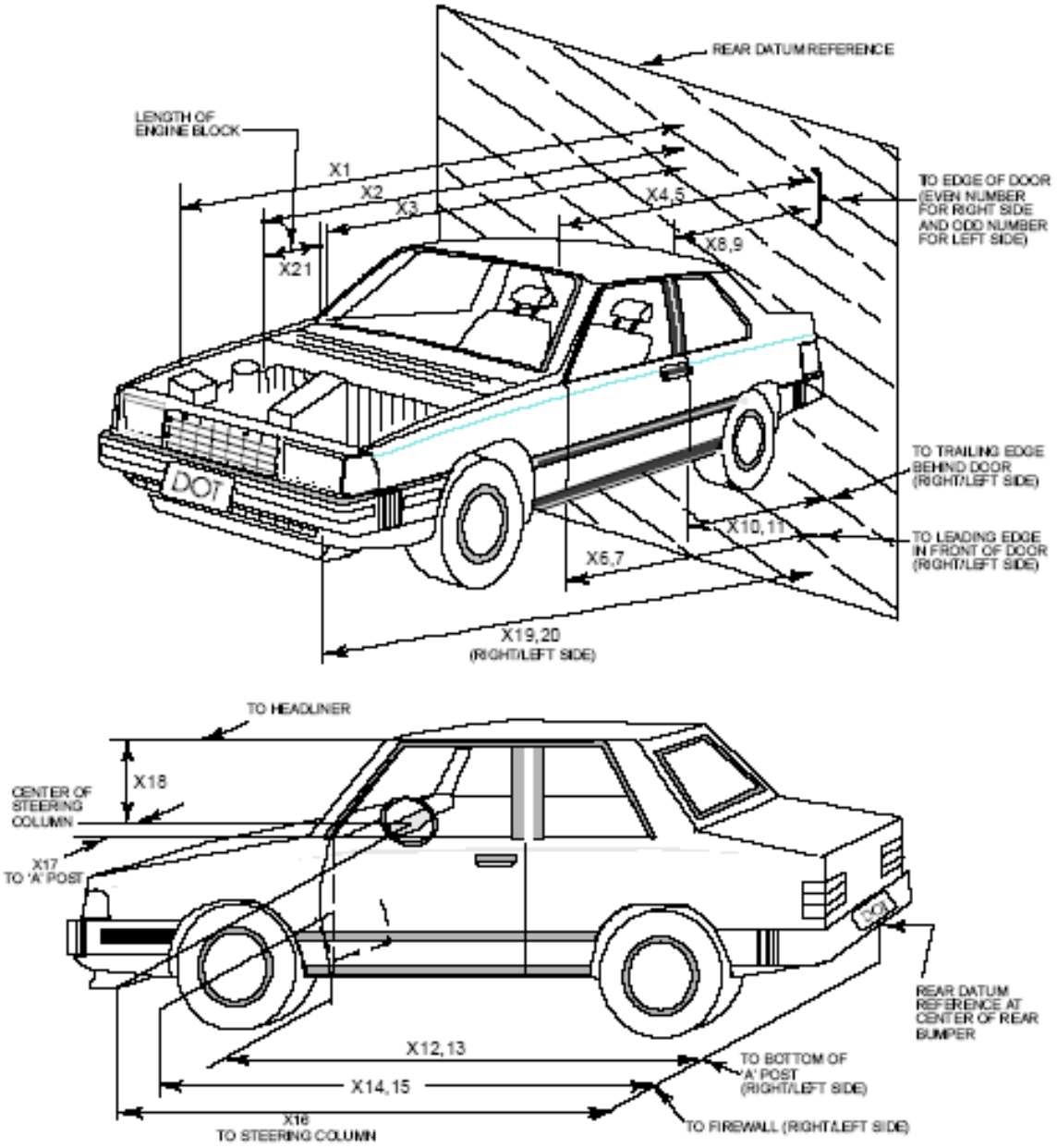
Measured Parameter	Units	Value
Left Side	mm	623
Center	mm	410
Right Side	mm	566
Average	mm	533

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	No	Yes	No
Knee Airbag	Yes	Yes	No	N/A
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes
Seat Belt Buckle Pretensioner	No	N/A	No	N/A
Other	No	N/A	No	N/A

DATA SHEET NO. 12 - VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021



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

Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	5114	4500	614
2	Rear Surface of Vehicle (RSOV) to Front of Engine	4414	4270	144
3	RSOV to Firewall	3984	3910	74
4	RSOV to Upper Leading Edge of Right Door	3550	3548	2
5	RSOV to Upper Leading Edge of Left Door	3540	3538	2
6	RSOV to Lower Leading Edge of Right Door	3520	3520	0
7	RSOV to Lower Leading Edge of Left Door	3514	3520	-6
8	RSOV to Upper Trailing Edge of Right Door	2485	2492	-7
9	RSOV to Upper Trailing Edge of Left Door	2482	2480	2
10	RSOV to Lower Trailing Edge of Right Door	2500	2500	0
11	RSOV to Lower Trailing Edge of Left Door	2495	2500	-5
12	RSOV to Bottom of "A" Post-of Right Side	3495	3490	5
13	RSOV to Bottom of "A" Post-of Left Side	3485	3480	5
14	RSOV to Firewall, Right Side	4130	4056	74
15	RSOV to Firewall, Left Side	4130	4056	74
16	RSOV to Steering Column	3055	3125	-70
17	Center of Steering Column to "A" Post	330	320	10
18	Center of Steering Column to Headliner	390	420	-30
19	RSOV to Right Side of Front Bumper	4935	4475	460
20	RSOV to Left Side of Front Bumper	4935	4465	470
21	Length of Engine Block	620	620	0
RD	RSOV to Right Side of Dash Panel	3340	3330	10
CD	RSOV to Center of Dash Panel	3270	3260	10
LD	RSOV to Left Side of Dash Panel	3330	3325	5

All Dimensions in mm

DATA SHEET NO. 13 - ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021

VEHICLE INFORMATION

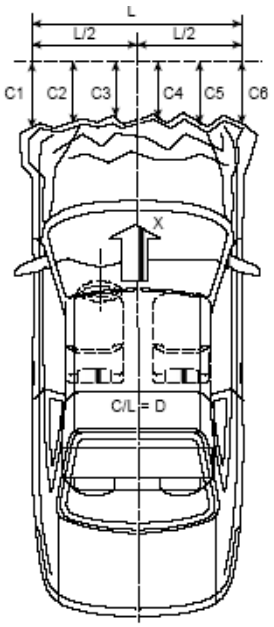
VIN: 1C4RDJAG5MC520860 Wheelbase: 3040
Vehicle Size Category: MPV Test Weight (kg): 2433.8

ACCELEROMETER DATA

Accelerometer Locations: As listed on Page 15 of this report.
Cal. Procedure/Interval: TRC procedure / 6 month interval
Integration Algorithm: Trapezoidal
Linearity: > 99%
Impact Velocity (km/h): 56.54
Velocity Change (km/h): 66.29
Time of Separation (ms): 137

CRUSH PROFILE

Collision Deformation Classification: 12FDEW2
Midpoint of Damage: Centerline
Damage Region Length (mm): 1524
Impact Mode: Frontal



No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4935	4465	470
C2	Crush zone 2 at left side	mm	5045	4510	535
C3	Crush zone 3 at left side	mm	5114	4515	599
C4	Crush zone 4 at right side	mm	5114	4510	604
C5	Crush zone 5 at right side	mm	5045	4520	525
C6	Crush zone 6 at right side	mm	4935	4475	460
L	C1 to C6	mm	1524	1200	324

DATA SHEET NO. 14 - VEHICLE INTRUSION MEASUREMENTS

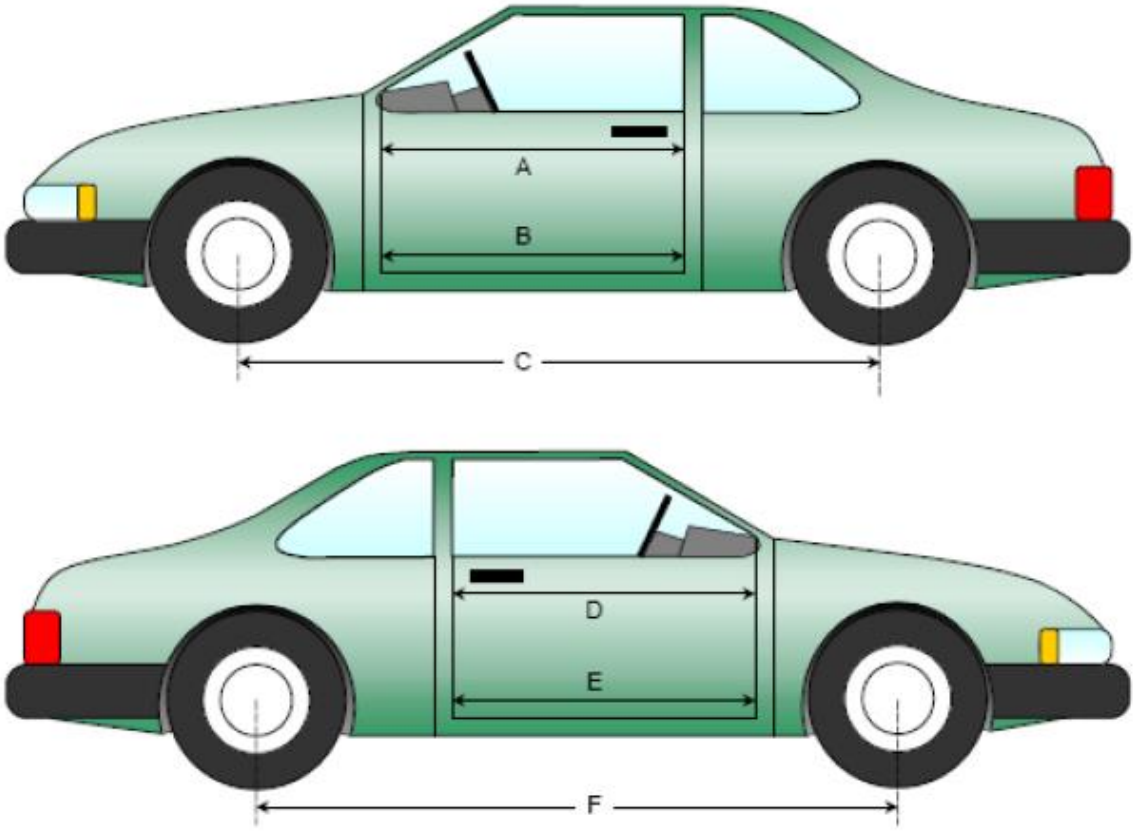
Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021

DOOR OPENING WIDTH

No.	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	970	970	0
B	Left Side Lower	mm	890	890	0
D	Right Side Upper	mm	970	970	0
E	Right Side Lower	mm	890	890	0

WHEELBASE MEASUREMENTS

No.	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3040	2903	137
F	Right Side Wheelbase	mm	3040	2905	135



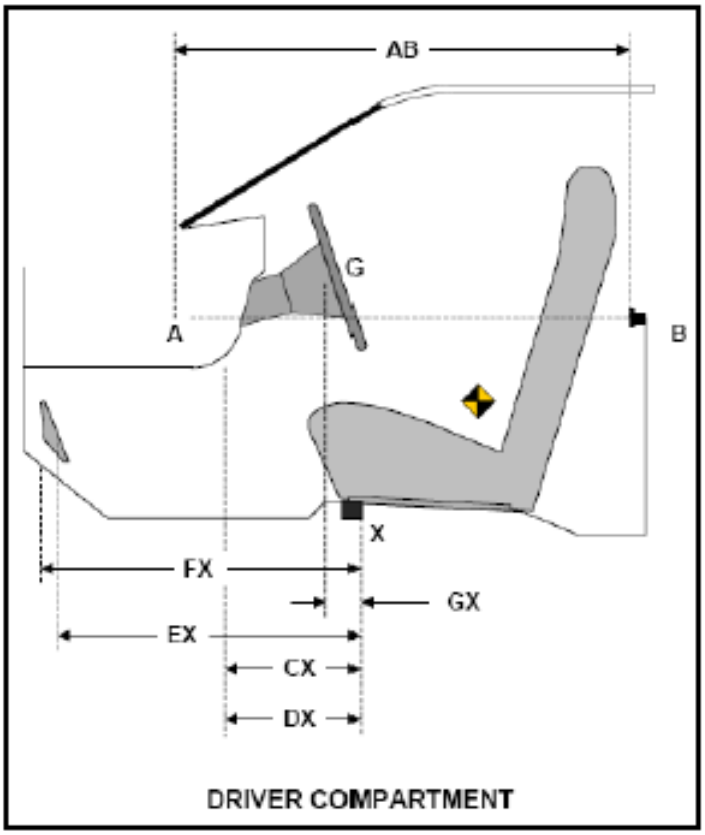
DATA SHEET NO. 14 - VEHICLE INTRUSION MEASUREMENTS (CONT'D)

Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	980	980	0
CX	Left Knee Bolster to X	mm	234	225	9
DX	Right Knee Bolster to X	mm	210	210	0
EX	Brake Pedal to X	mm	510	484	26
FX	Foot Rest to X	mm	560	545	15
GX	Center of Steering Column Wheel Hub to X	mm	5	80	-75

X = Front of Seat Track (Stationary)



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

Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021

Please provide windshield mounting details.

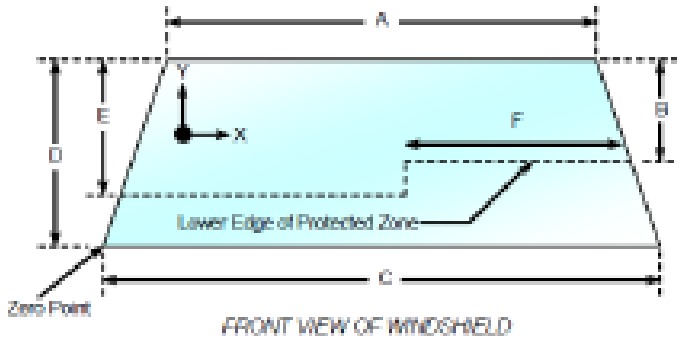
The standard requires that the post-test retention measurement be a minimum of 75% of the pre-test total periphery measurement for vehicle not equipped with occupant passive restraint and 50% for each side of the windshield for vehicle which are equipped with occupant passive restraints.

Temperature of windshield molding during test: 21.4°C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2255	2255	100.0
Right Side	2255	2255	100.0
Total	4510	4510	100.0

Item	Units	Value
A	mm	1330
B	mm	475
C	mm	1530
D	mm	825
E	mm	485
F	mm	520



FRONT VIEW OF WINDSHIELD

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: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021

FMVSS 301 FUEL SYSTEM INTEGRTY POST IMPACT DATA

Temperature at Time of Impact: 21.4°C Test Time: 17:36

Stoddard Solvent Spillage Measurements

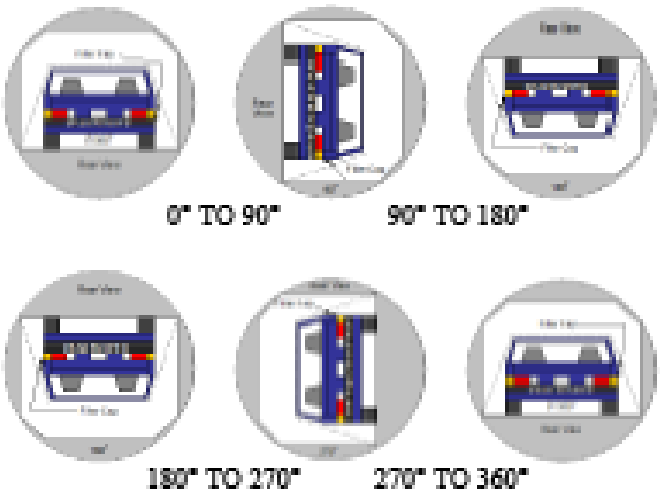
A	From impact until vehicle motion ceases: (maximum allowable – 1 oz.)	0 oz.
B	For the 5-minute period after motion ceases: (maximum allowable – 5 oz.)	0 oz.
C	For the following 25 minutes: (maximum allowable – 1 oz./minutes)	0 oz.
D	Spillage: None	

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

Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021

1. The specified fixture rollover rate for each 90º 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
0º to 90º	90	330	420
90º to 180º	90	330	840
180º to 270º	90	330	1260
270º to 360º	90	330	1480

FMVSS 301 SPILLAGE TABLE

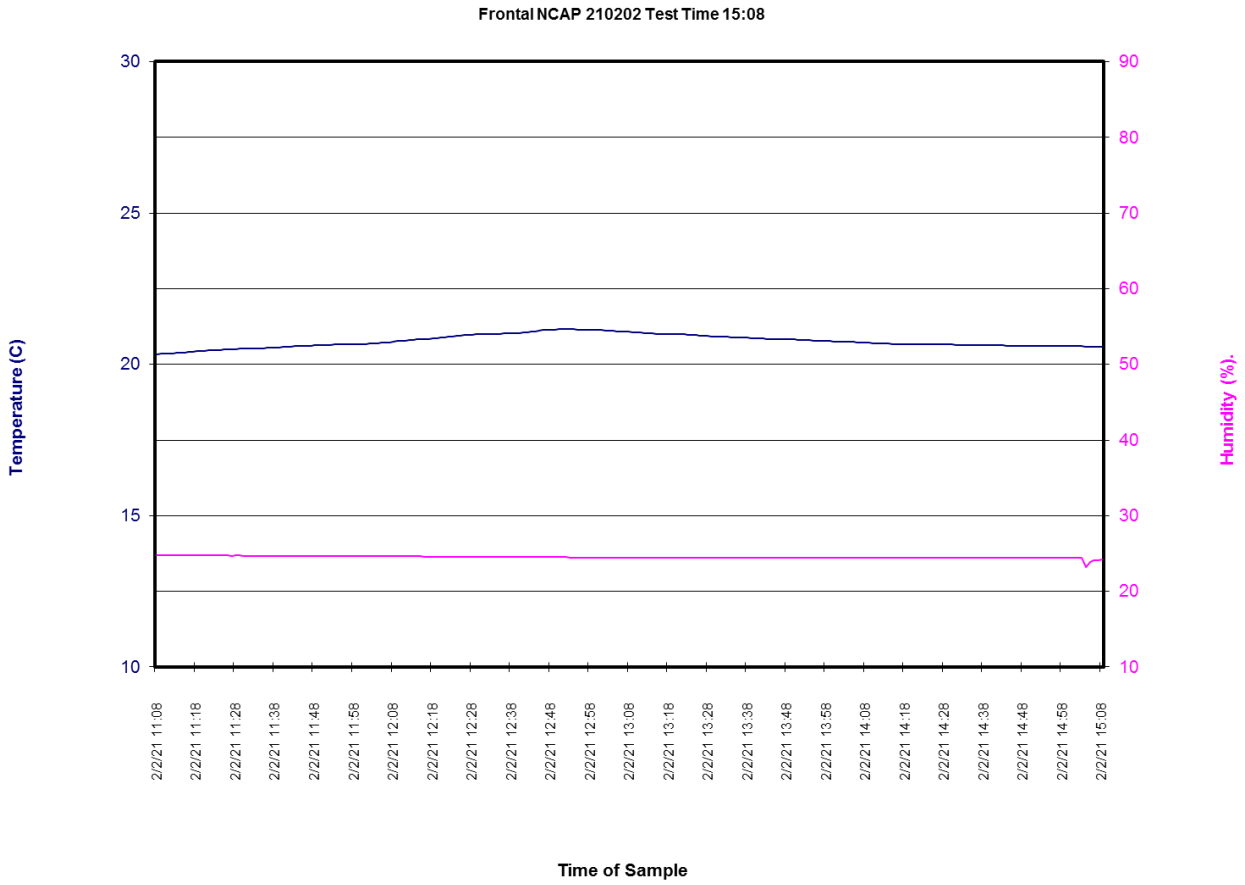
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0º to 90º	0	0	0	N/A
90º to 180º	0	0	0	N/A
180º to 270º	0	0	0	N/A
270º to 360º	0	0	0	N/A

SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 17 - DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2021 Dodge Durango NHTSA No.: M20210300
Test Program: NCAP Frontal Impact Test Date: 2/2/2021



APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS (CONTINUED)

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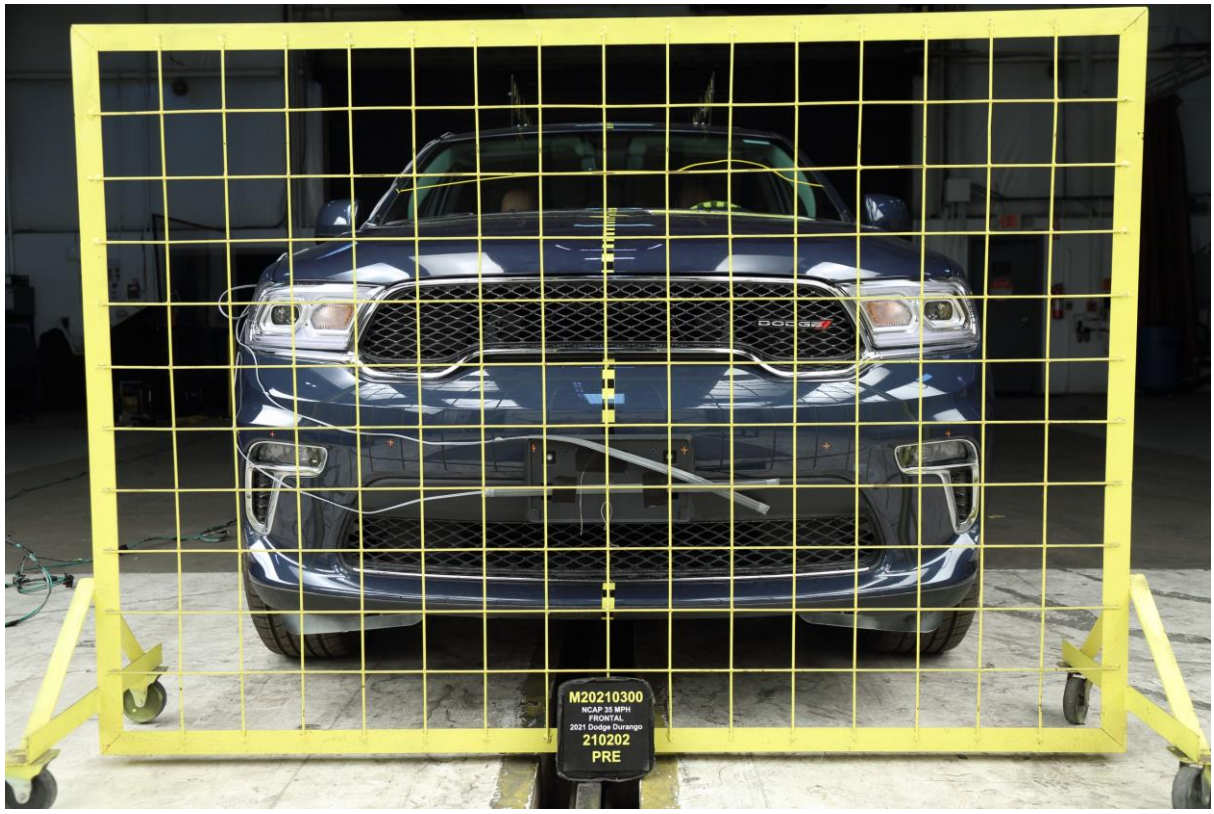
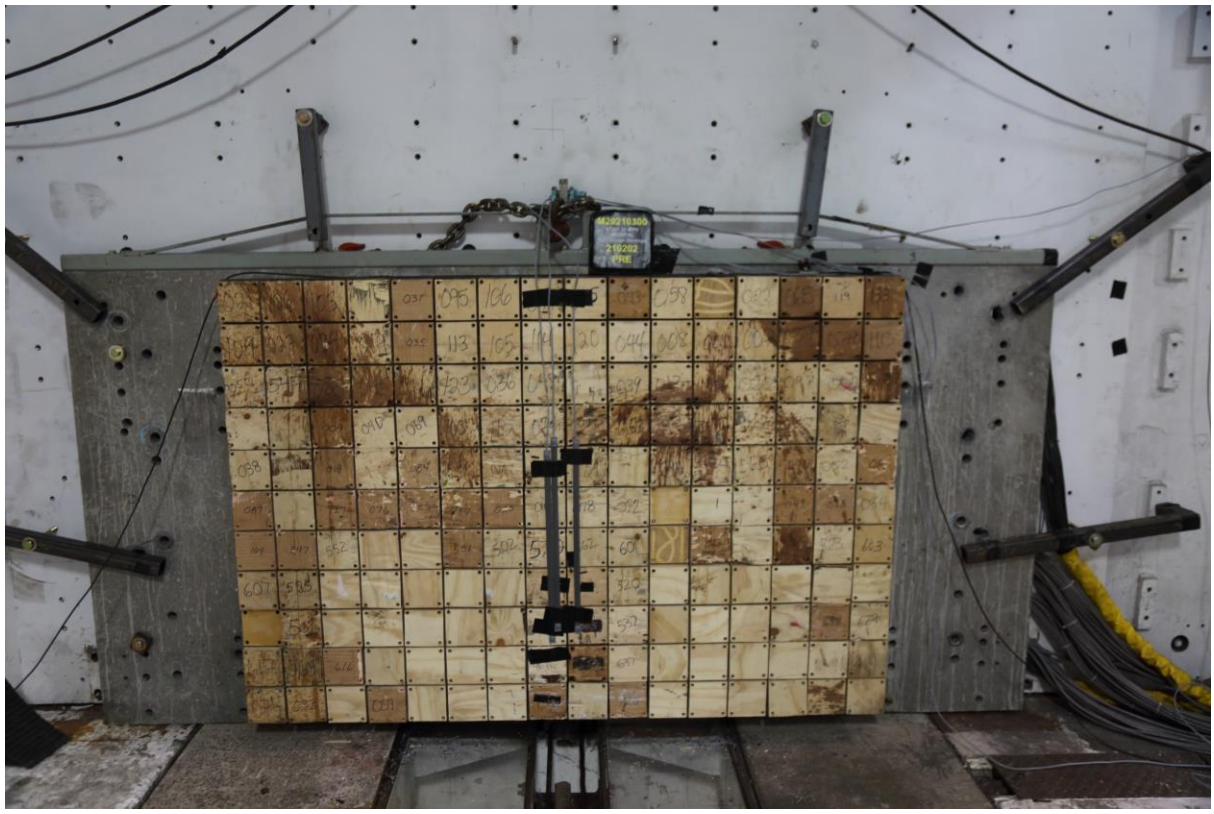
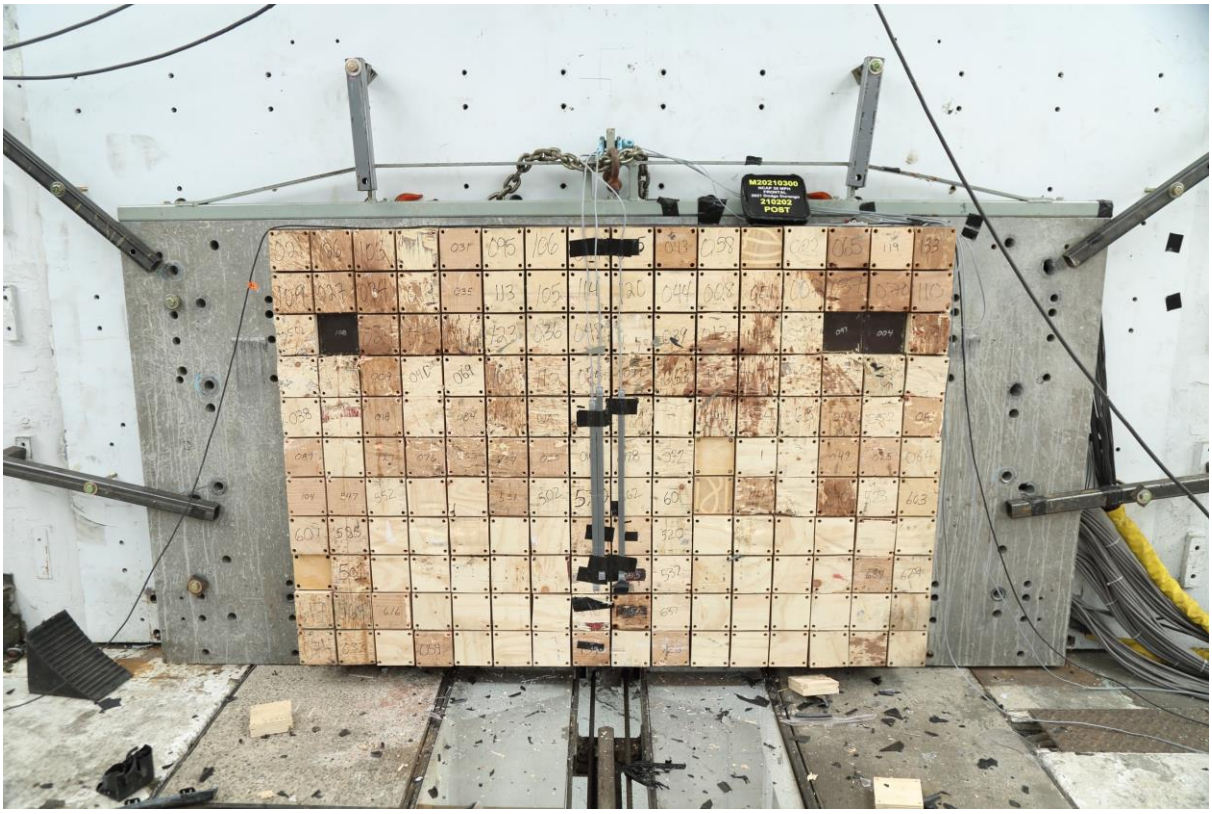


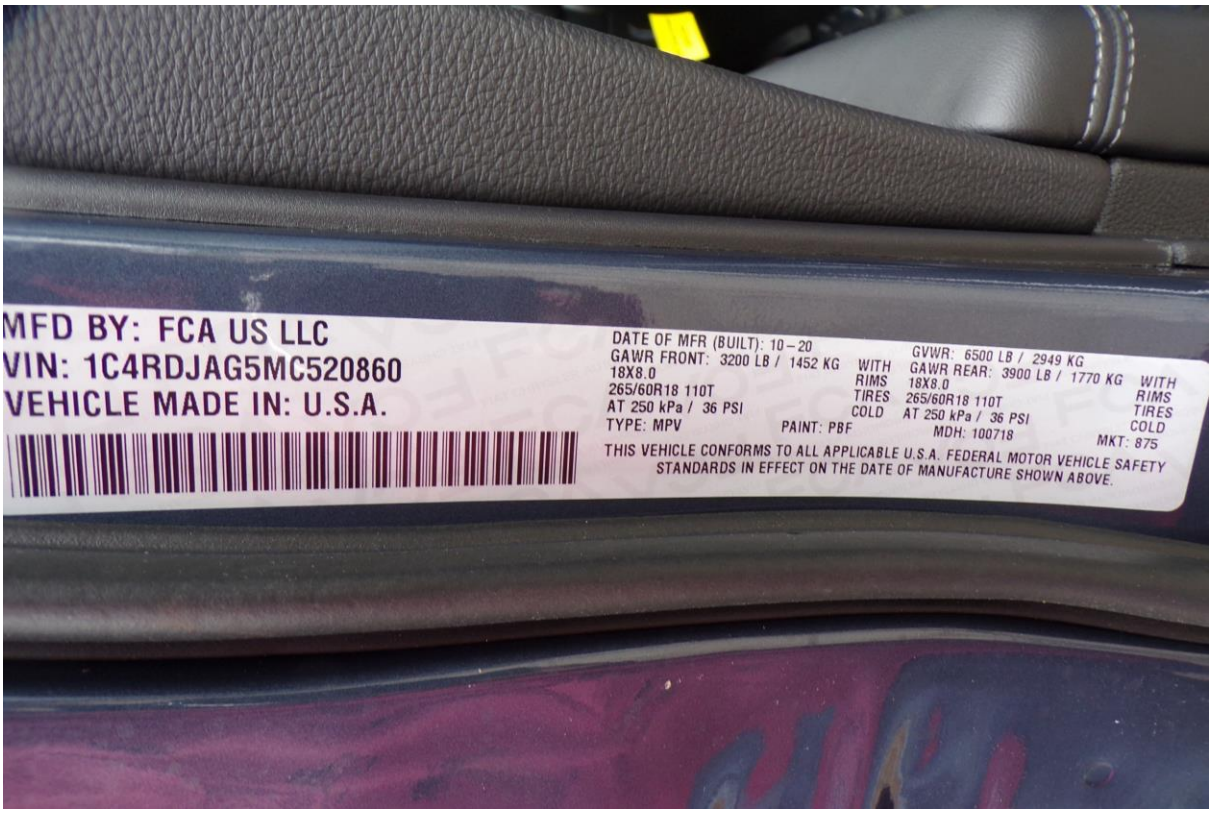
001 Load Cell Location



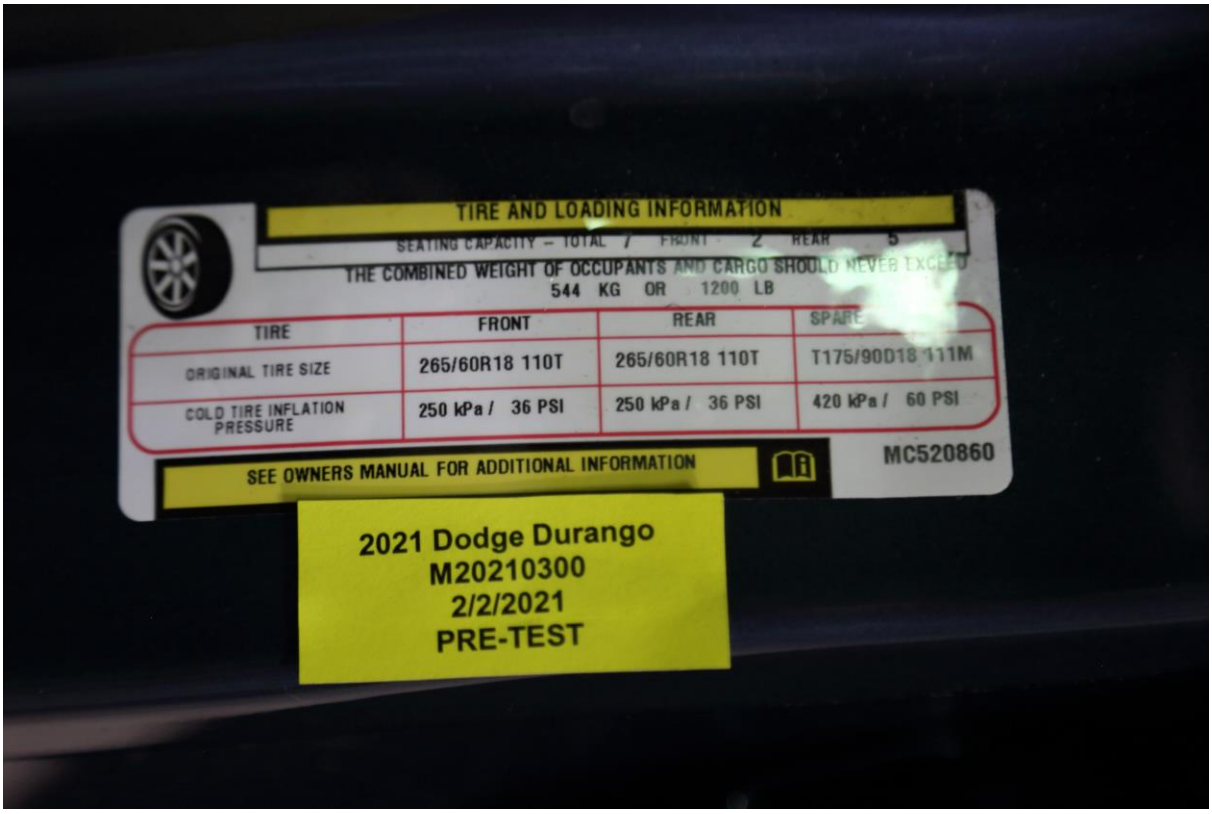
002 Pre-Test Load Cell Wall



003 Post-Test Load Cell Wall



004 Manufacturer's Label



005 Tire Placard

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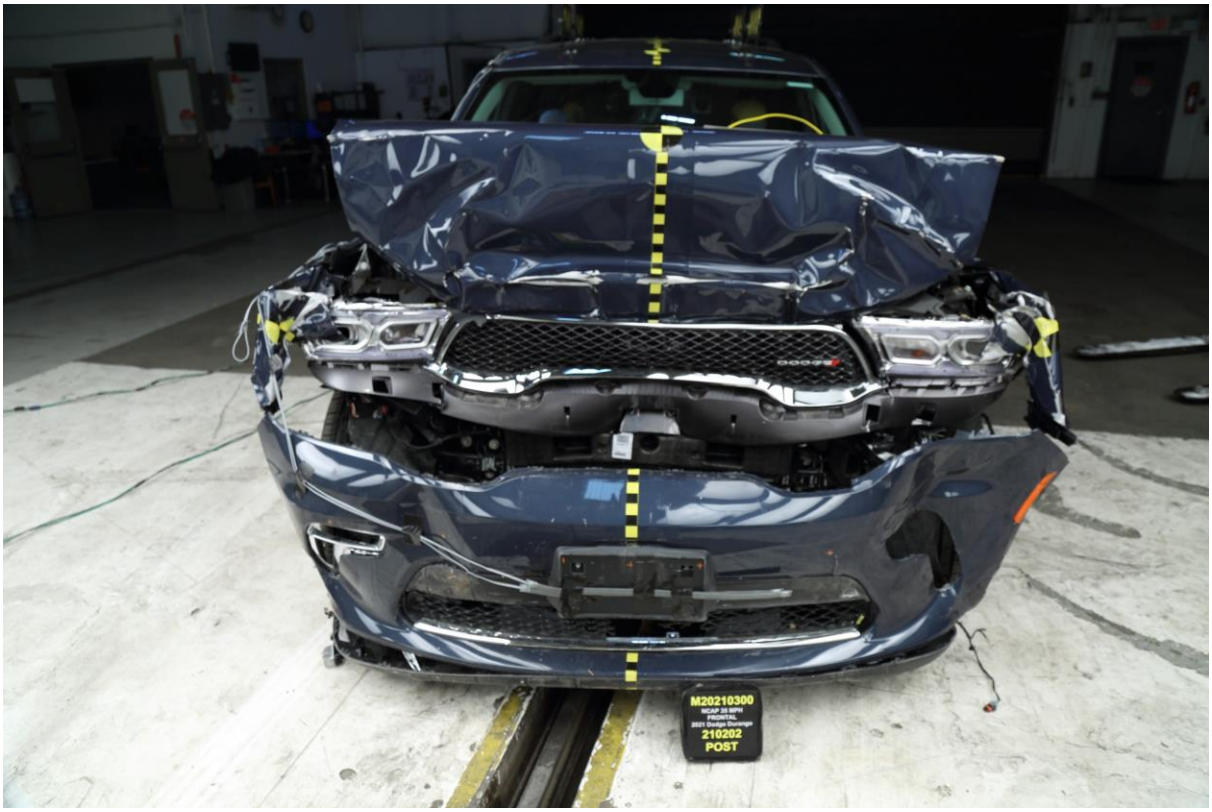
006 2021 Dodge Durango Frontal As Delivered

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

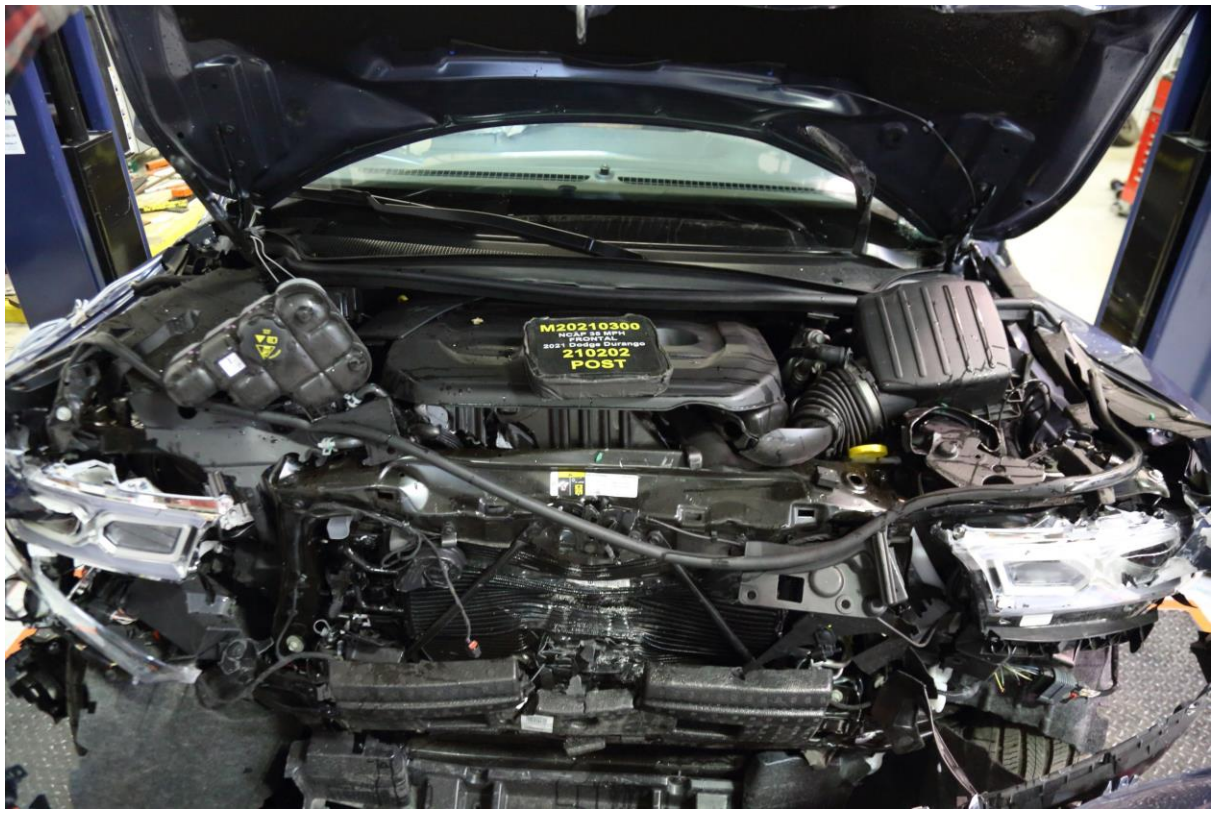
016 Pre-Test Left Rear 3-4 View

017 Post-Test Left Rear 3-4 View

018 Pre-Test Windshield View

019 Post-Test Windshield View

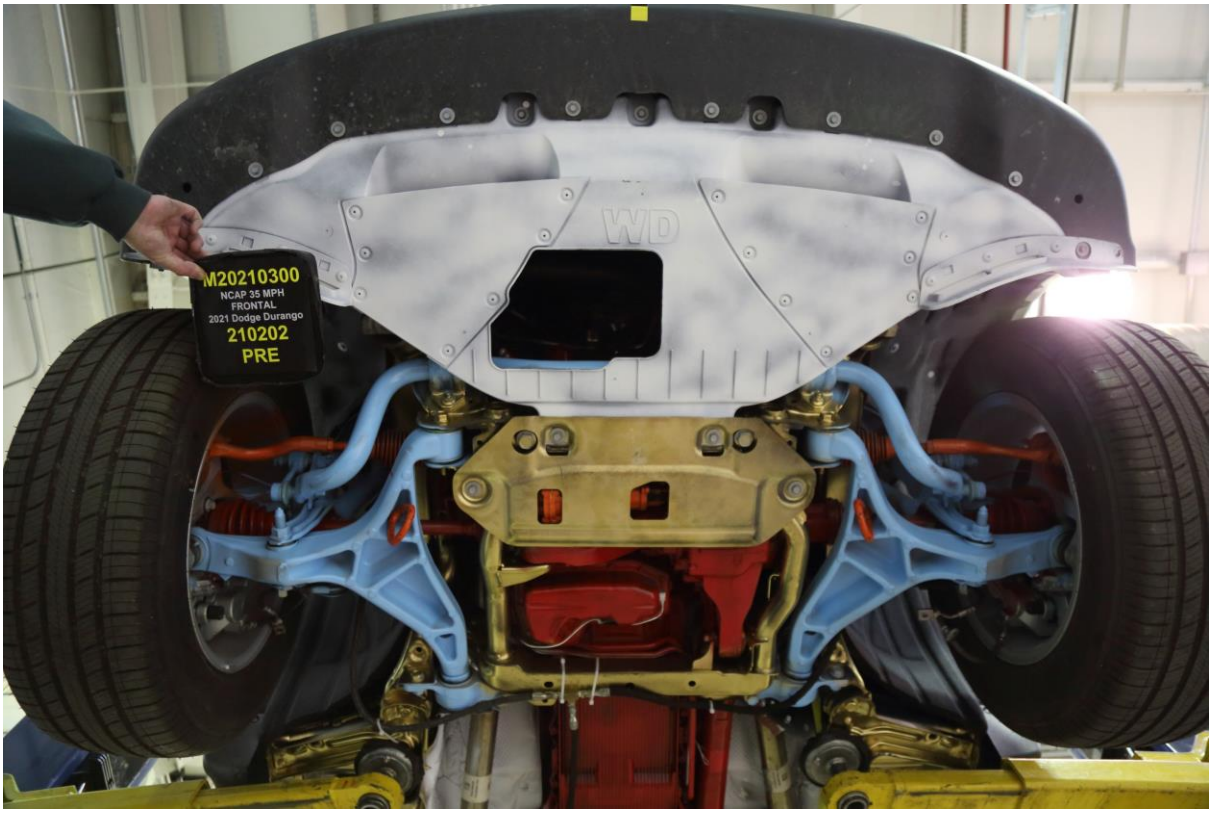
020 Pre-Test Engine Compartment View



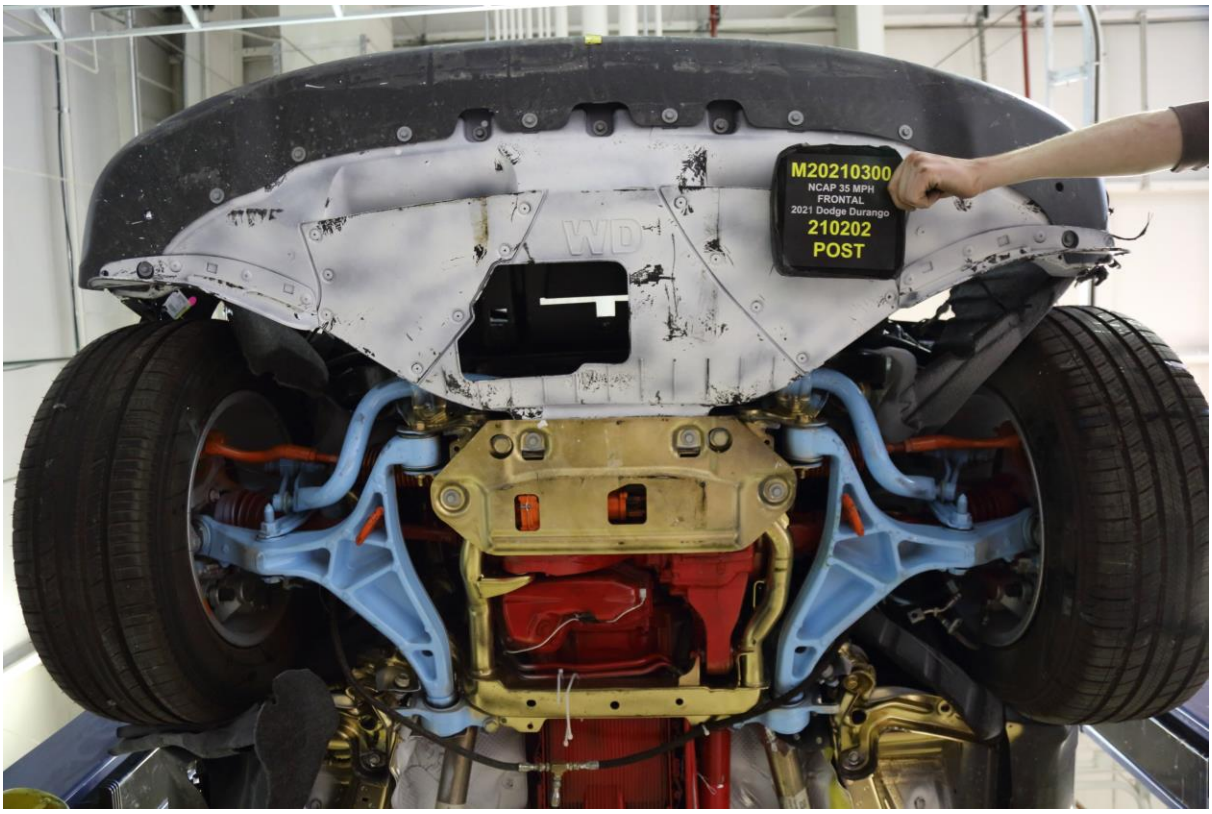
021 Post-Test Engine Compartment View

022 Pre-Test Fuel Filler Cap View

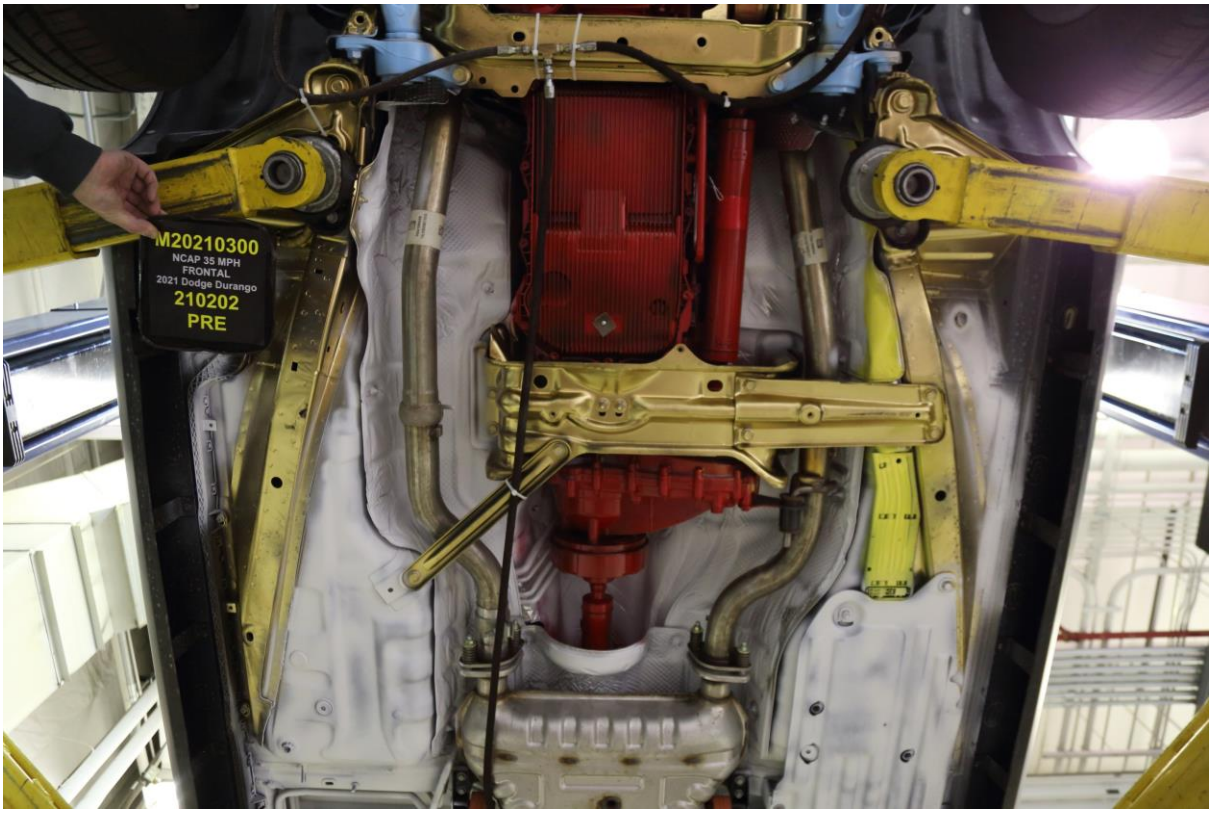
023 Post-Test Fuel Filler Cap View



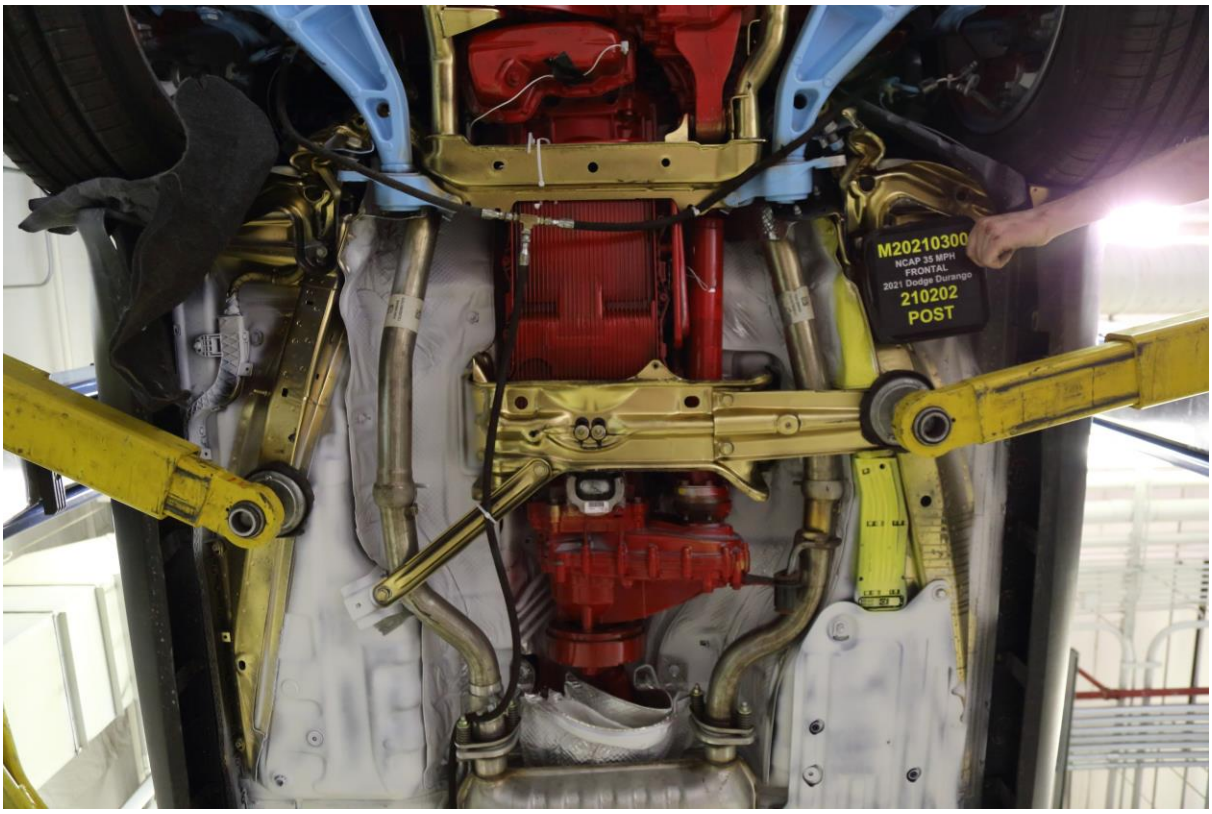
024 Pre-Test Front Underbody View



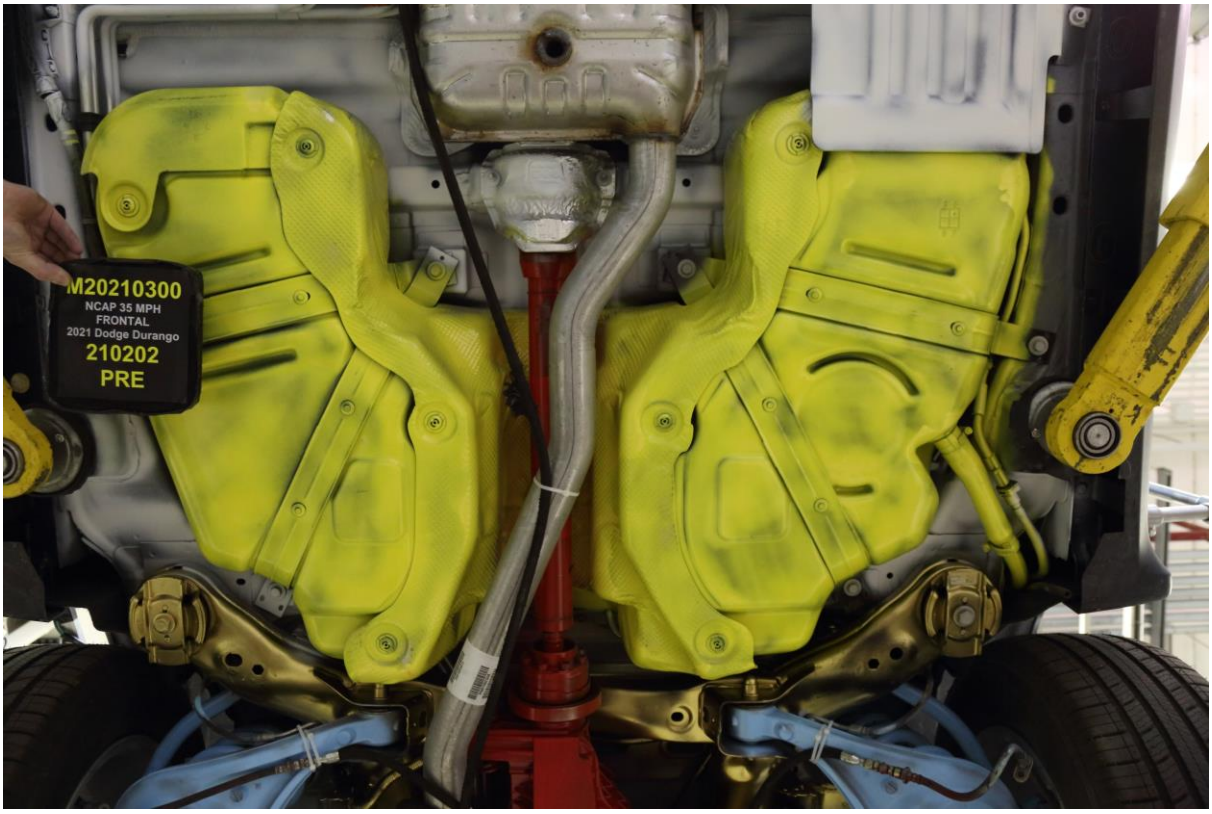
025 Post-Test Front Underbody View



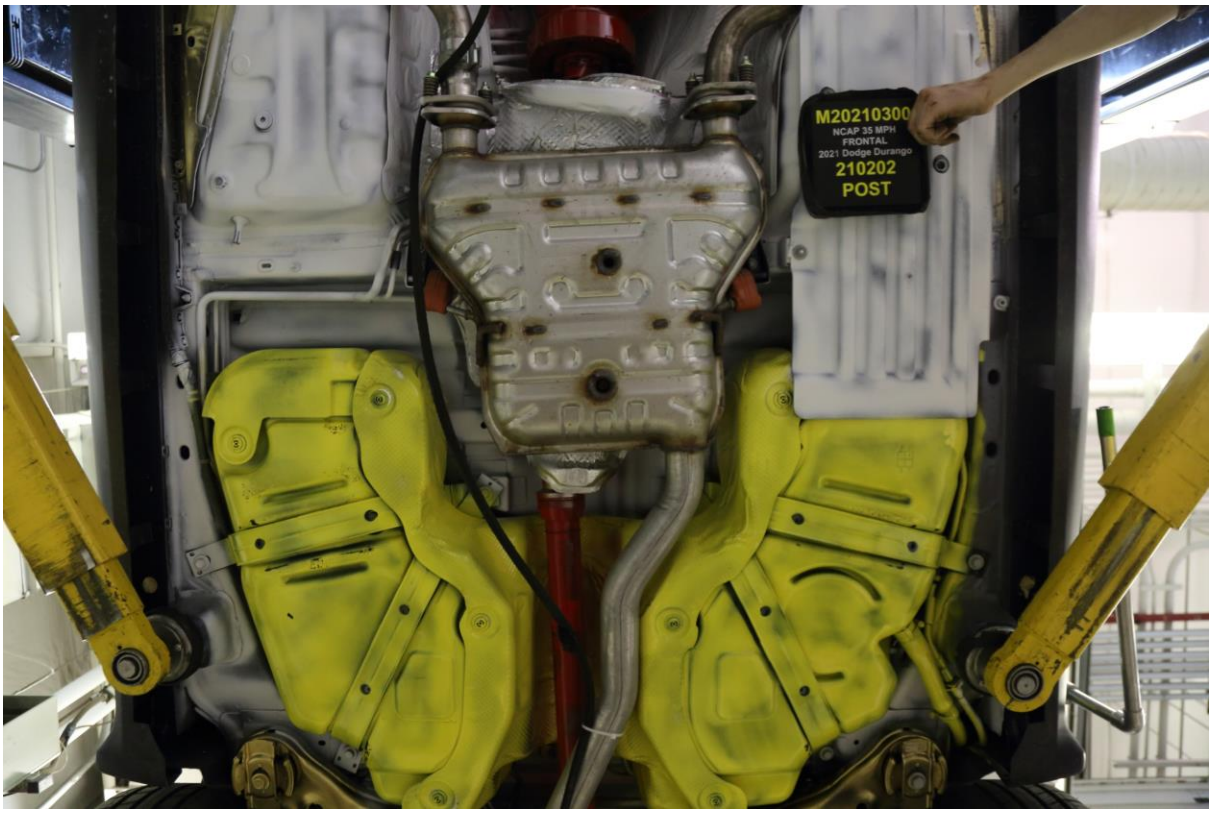
025a Pre-Test Mid Front Underbody View



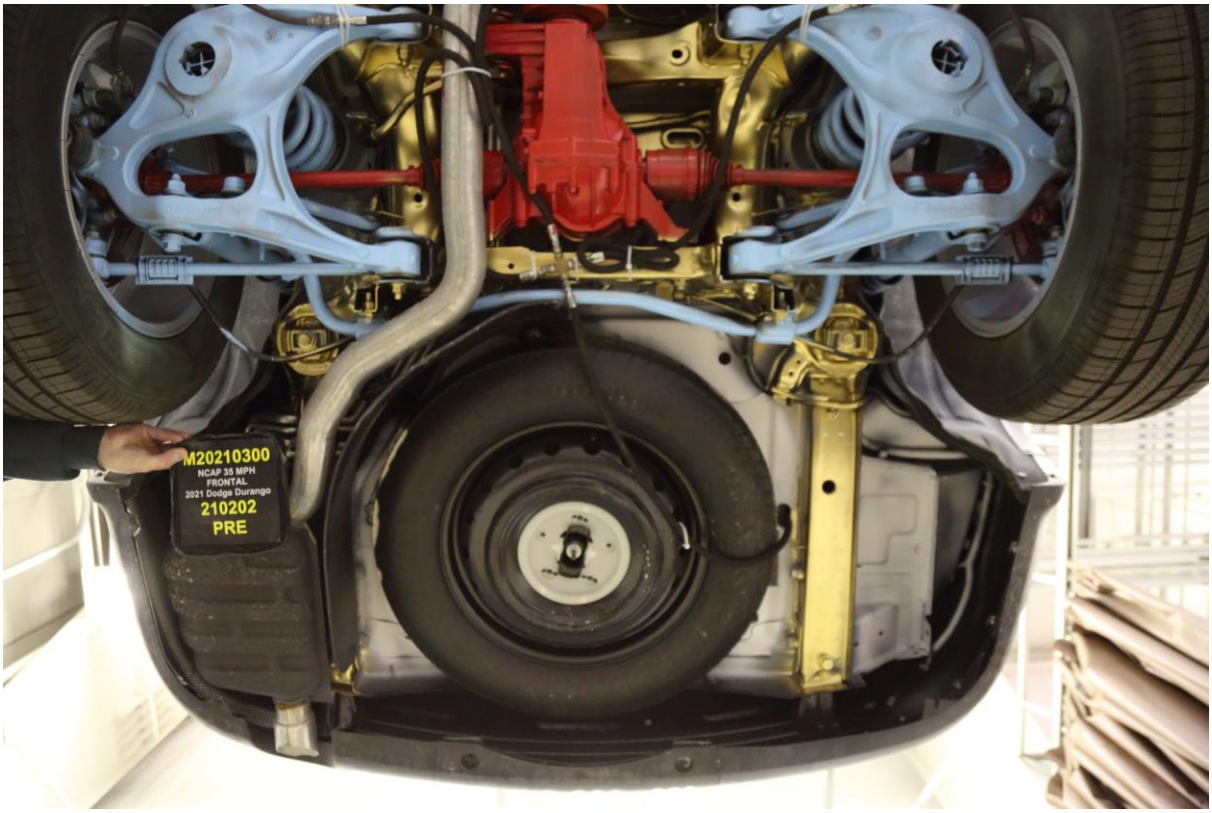
025b Post-Test Mid Front Underbody View



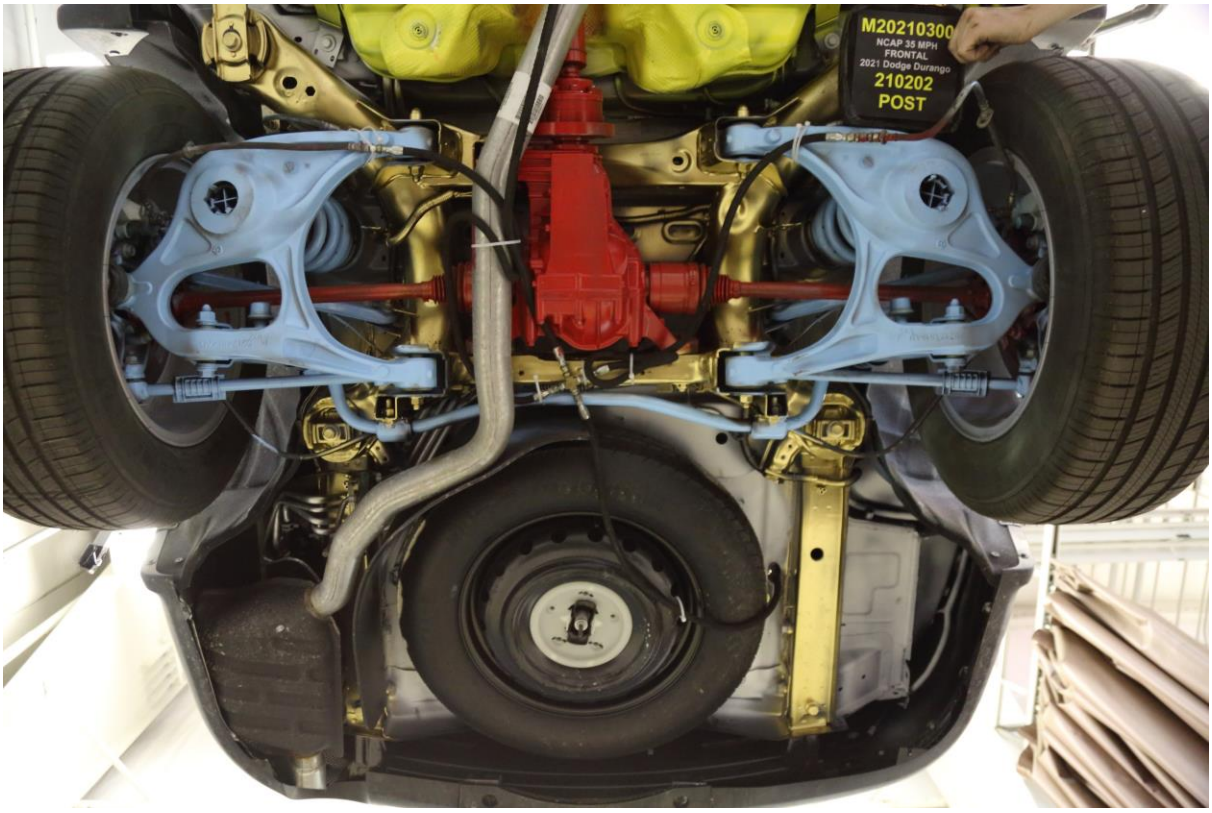
025c Pre-Test Mid Rear Underbody View



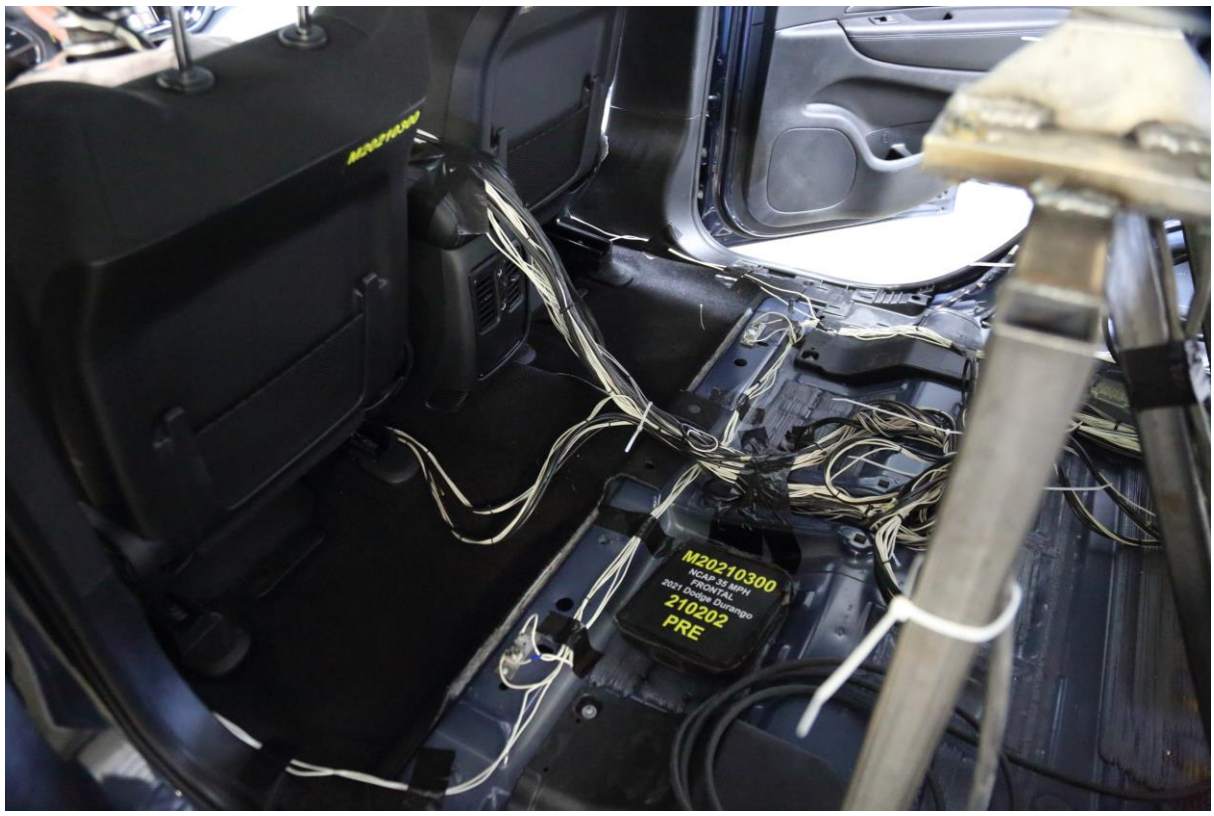
025d Post-Test Mid Rear Underbody View



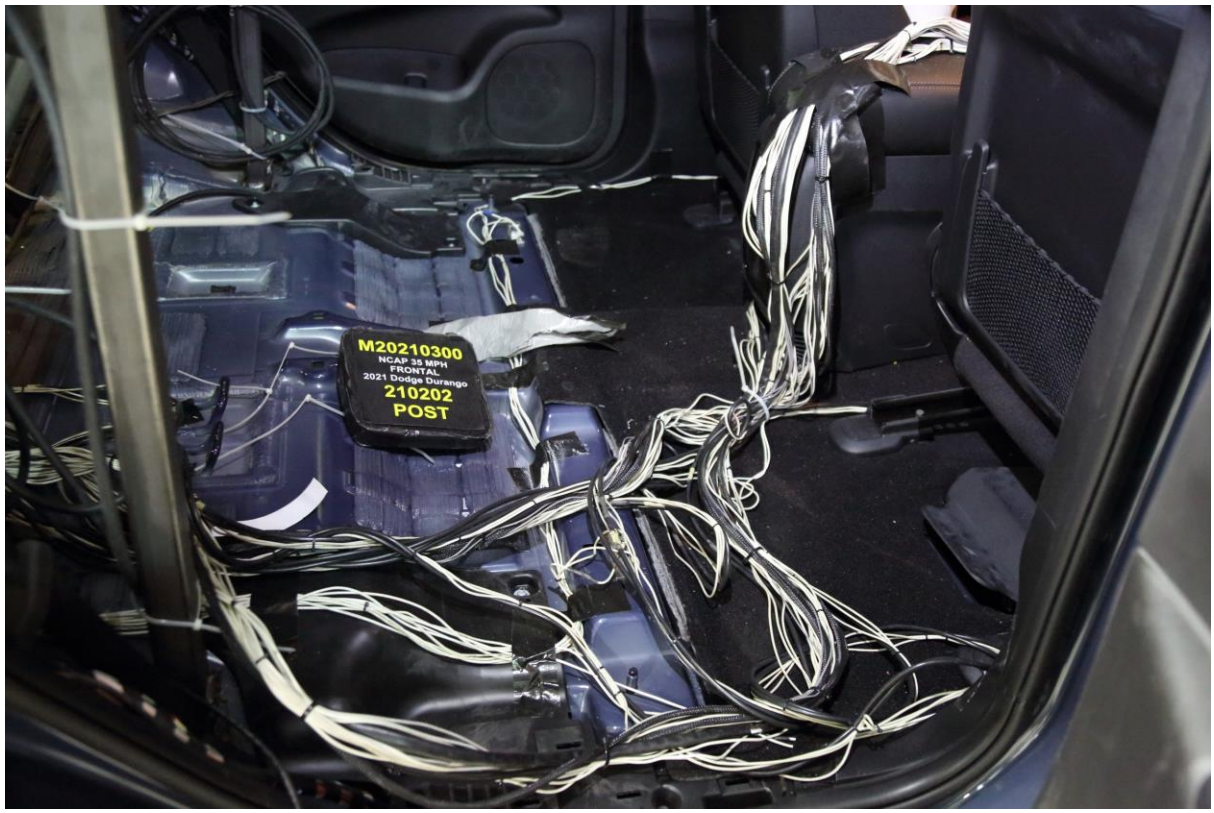
026 Pre-Test Rear Underbody View



027 Post-Test Rear Underbody View

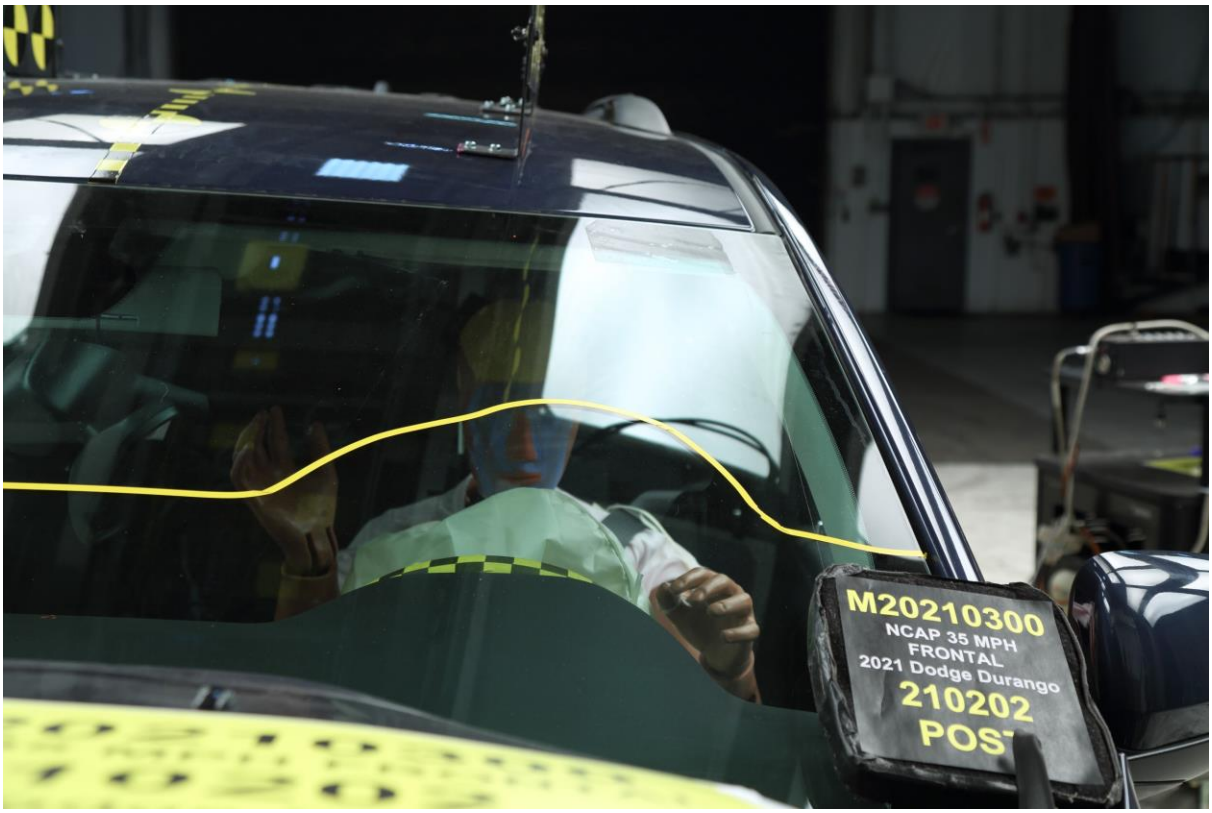


028 Pre-Test Dummy Cable Routing



029 Post-Test Dummy Cable Routing

030 Pre-Test Driver Dummy Front View



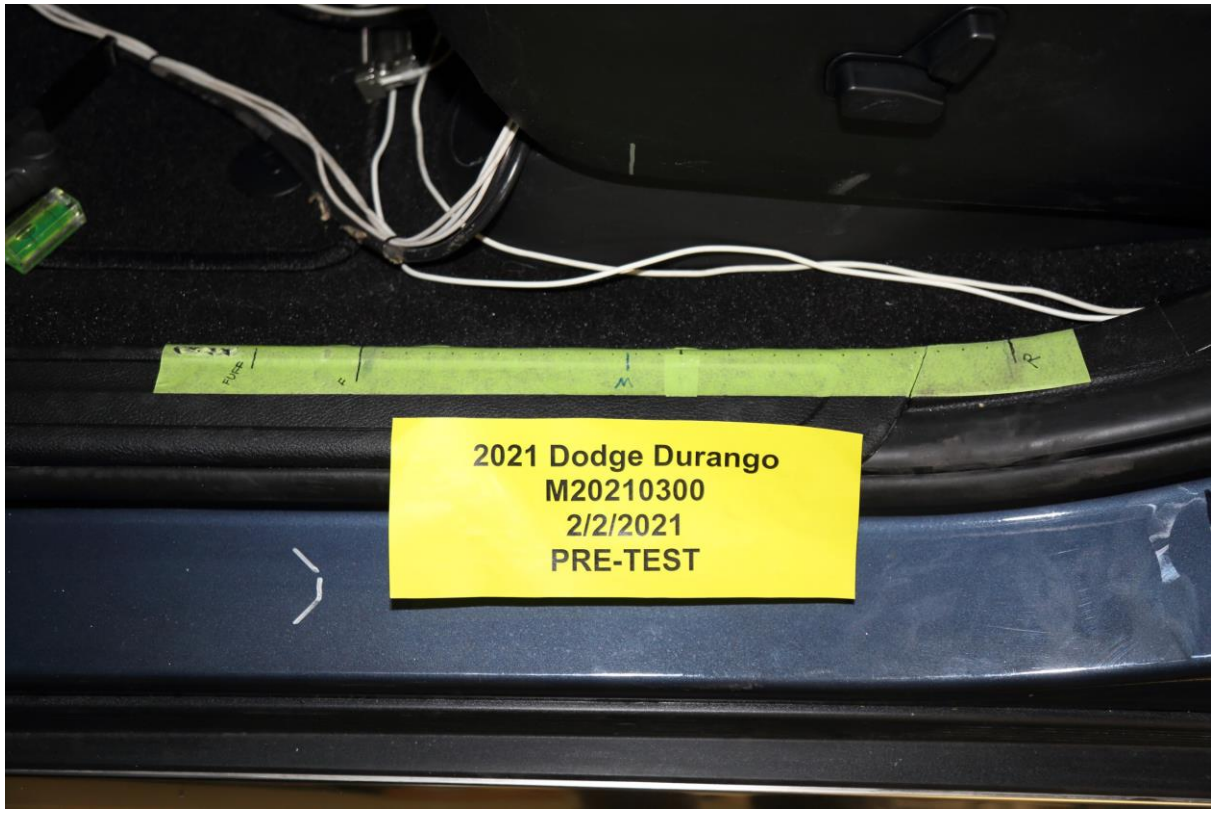
031 Post-Test Driver Dummy Front View

032 Pre-Test Driver Dummy Window View

033 Post-Test Driver Dummy Window View

034 Pre-Test Driver Dummy and Vehicle Interior View

035 Post-Test Driver Dummy and Vehicle Interior View



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

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

038 Pre-Test View of Belt Anchorage for Driver Dummy

039 Post-Test View of Belt Anchorage for Driver Dummy

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

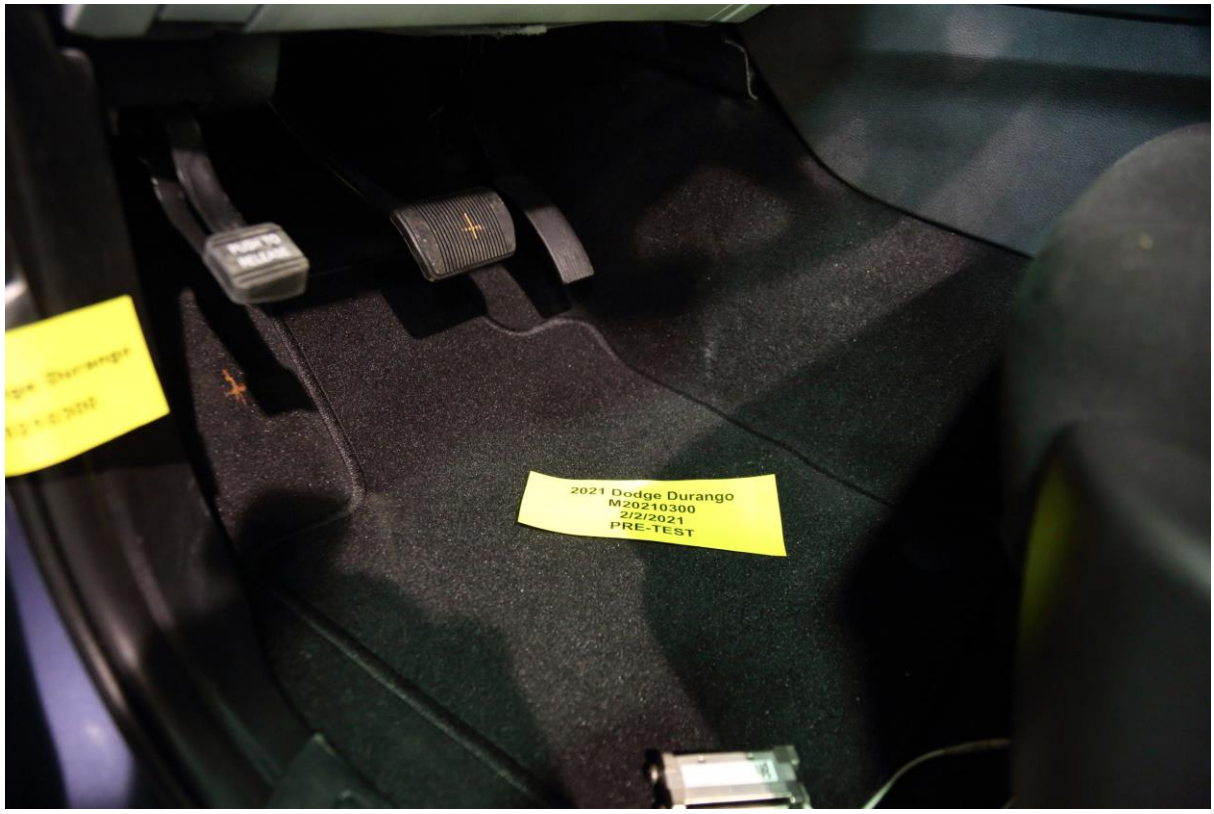
041 Post-Test View of Belt Buckle and Latch Plate for Driver Dummy

042 Pre-Test Driver Dummy Feet

043 Post-Test Driver Dummy Feet

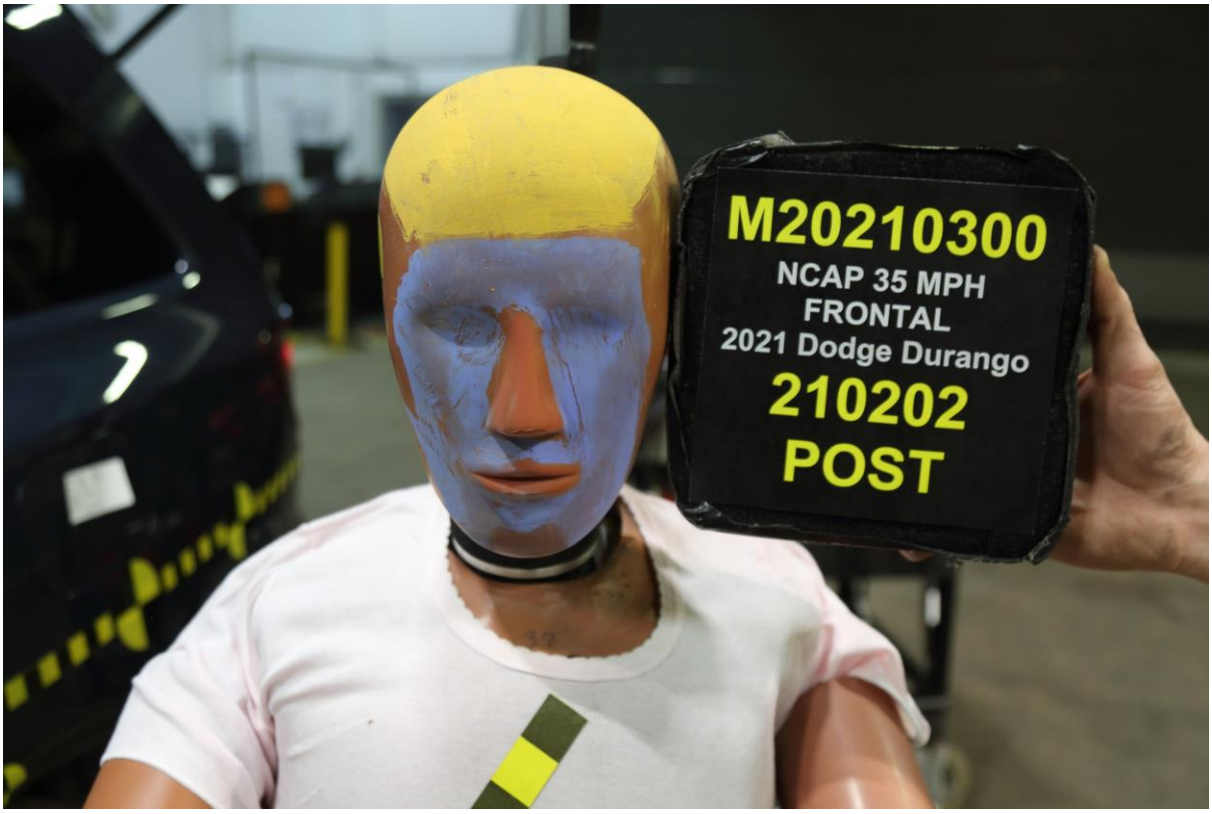
044 Pre-Test Driver's Side Knee Bolster

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

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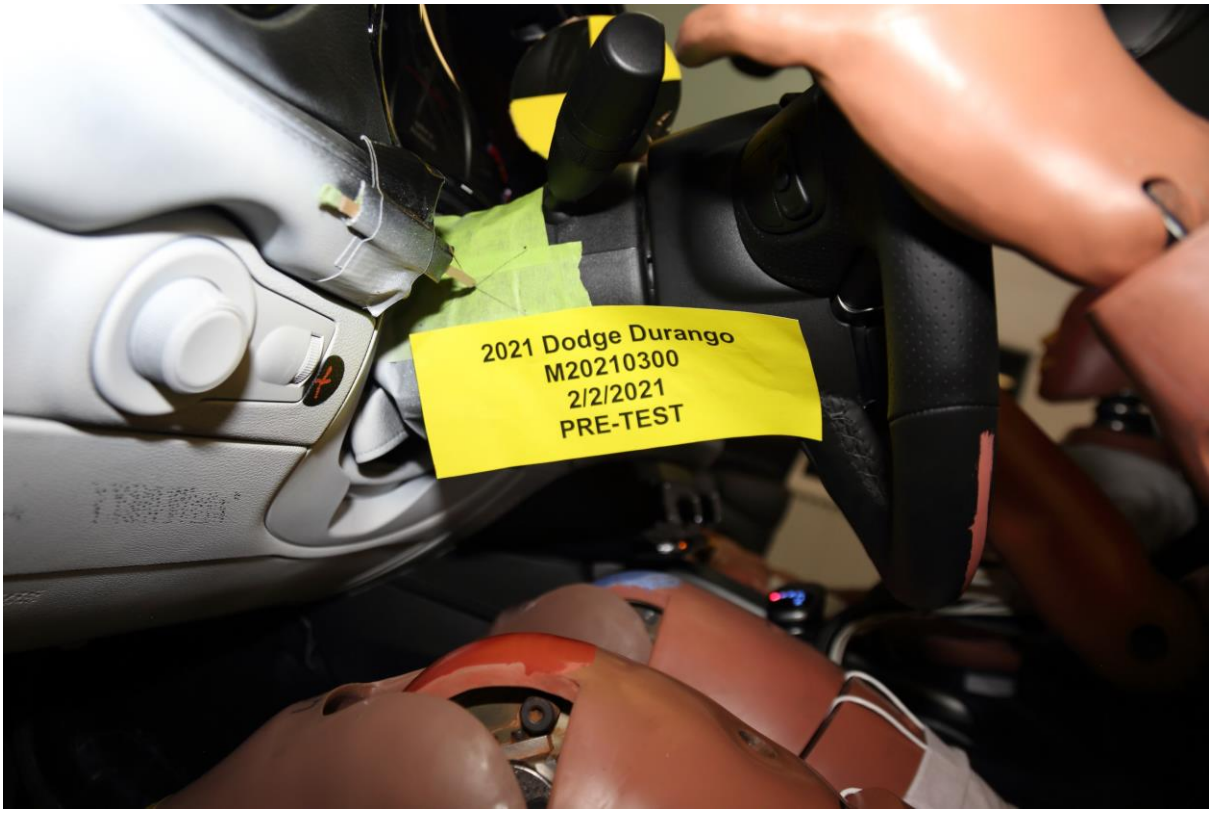
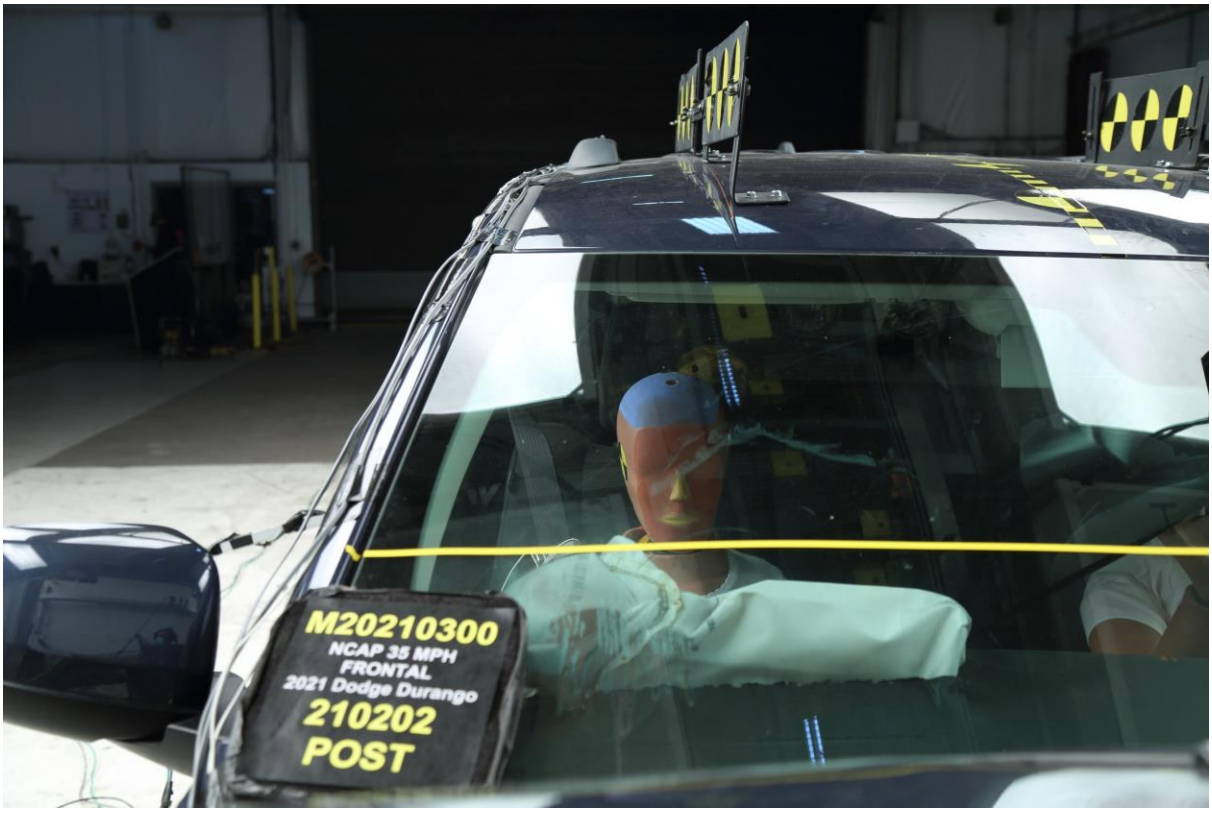


051 Pre-Test View of the Steering Wheel

052 Post-Test View of the Steering Wheel

53 Pre-Test Passenger Dummy Front View



054 Post-Test Passenger Dummy Front View

055 Pre-Test Passenger Dummy Window View

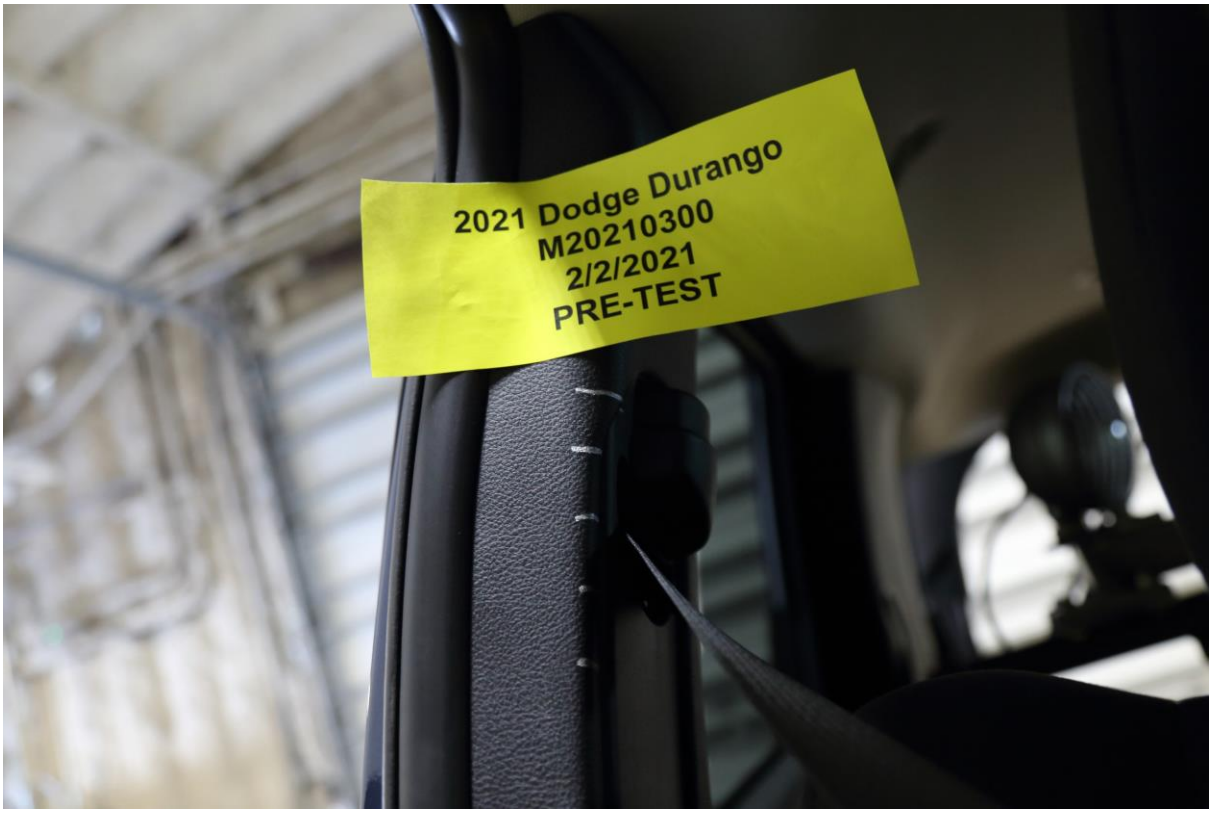
056 Post-Test Passenger Dummy Window View

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

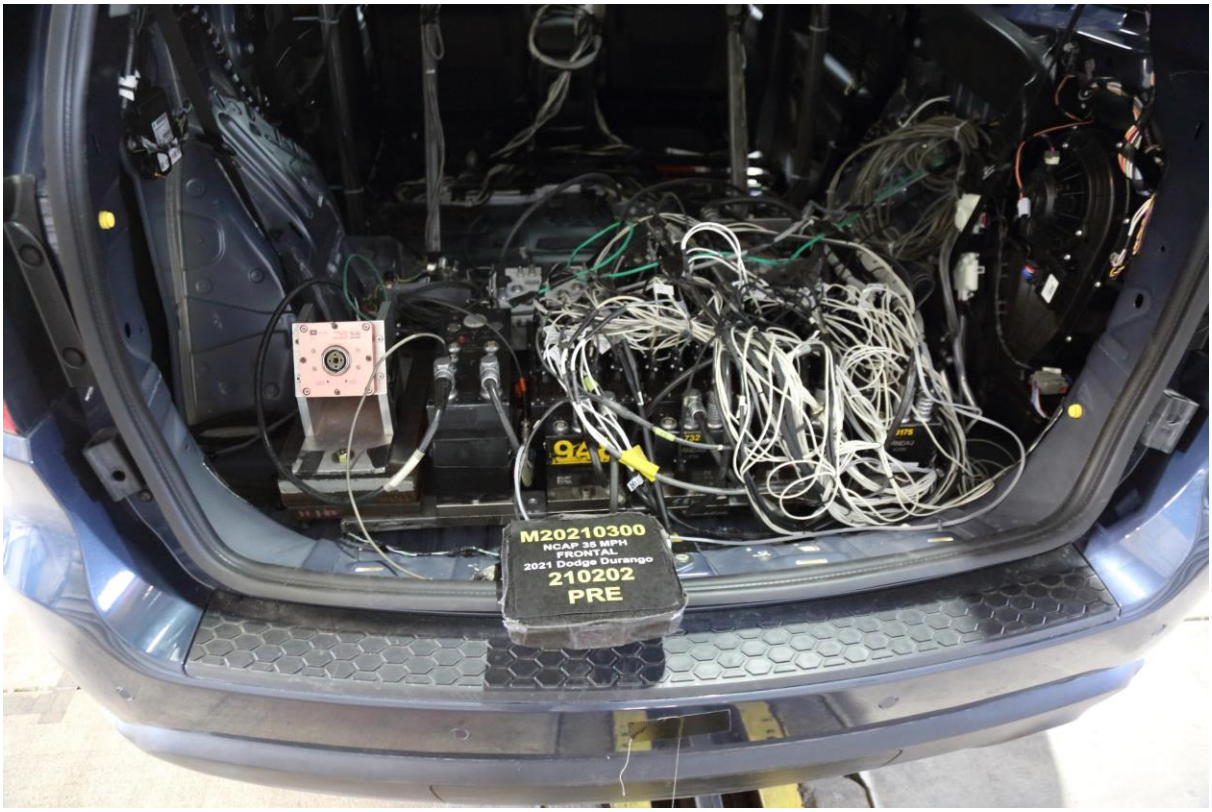
069 Pre-Test Passenger's Side Floorpan

070 Post-Test Passenger's Side Floorpan

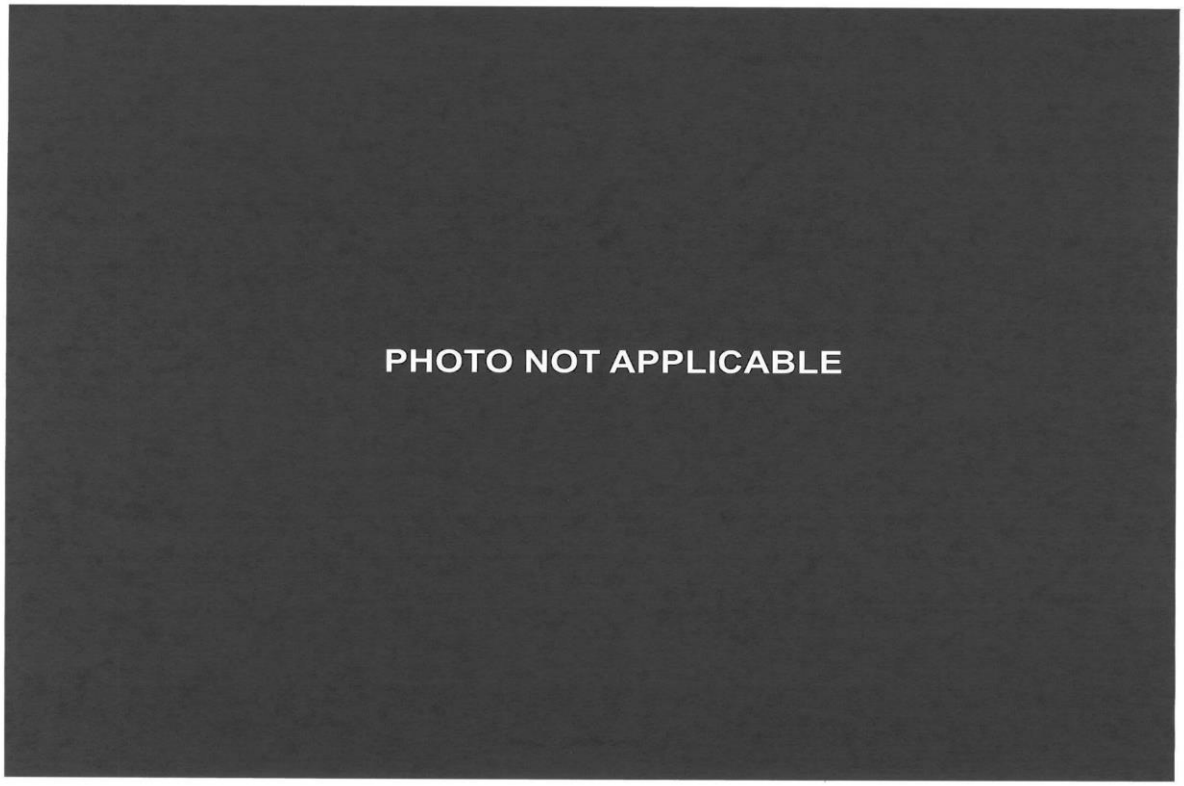
071 Post-Test Passenger Dummy Face

072 Post-Test Passenger Dummy Contact with Airbag

073 Post-Test Passenger Dummy Contact with Headrest



074 Photograph of Ballast Installed in Vehicle

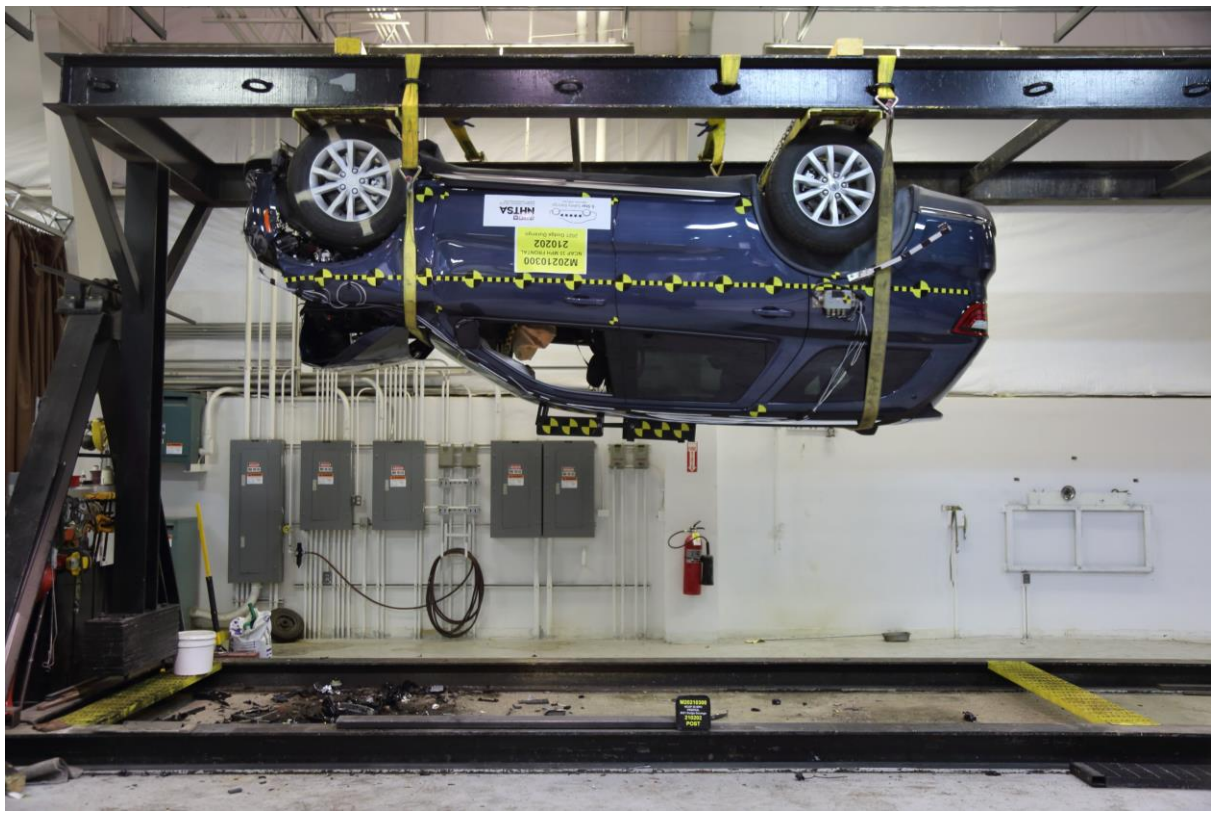


075 Post-Test Stoddard Spillage Location View

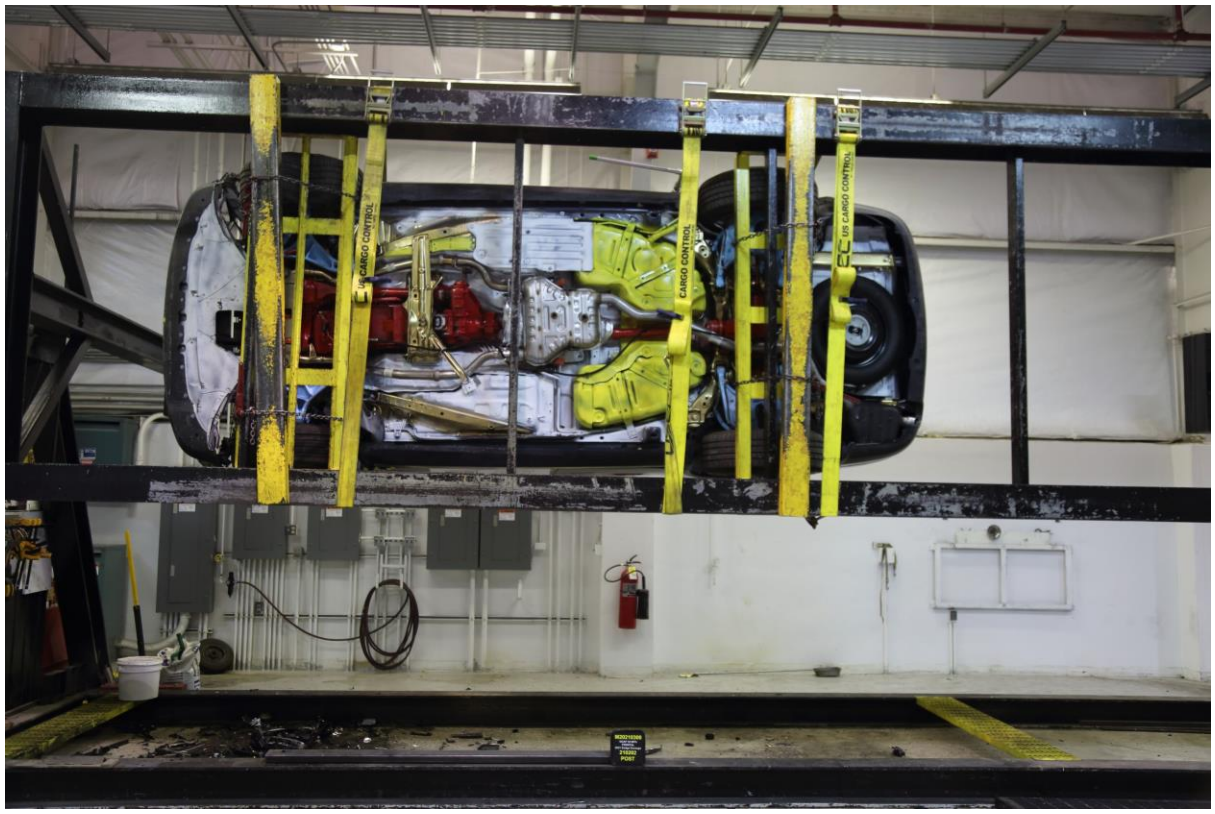
076 Post-Test Speed Trap Read out

077 Vehicle at 0º on Static Rollover Device

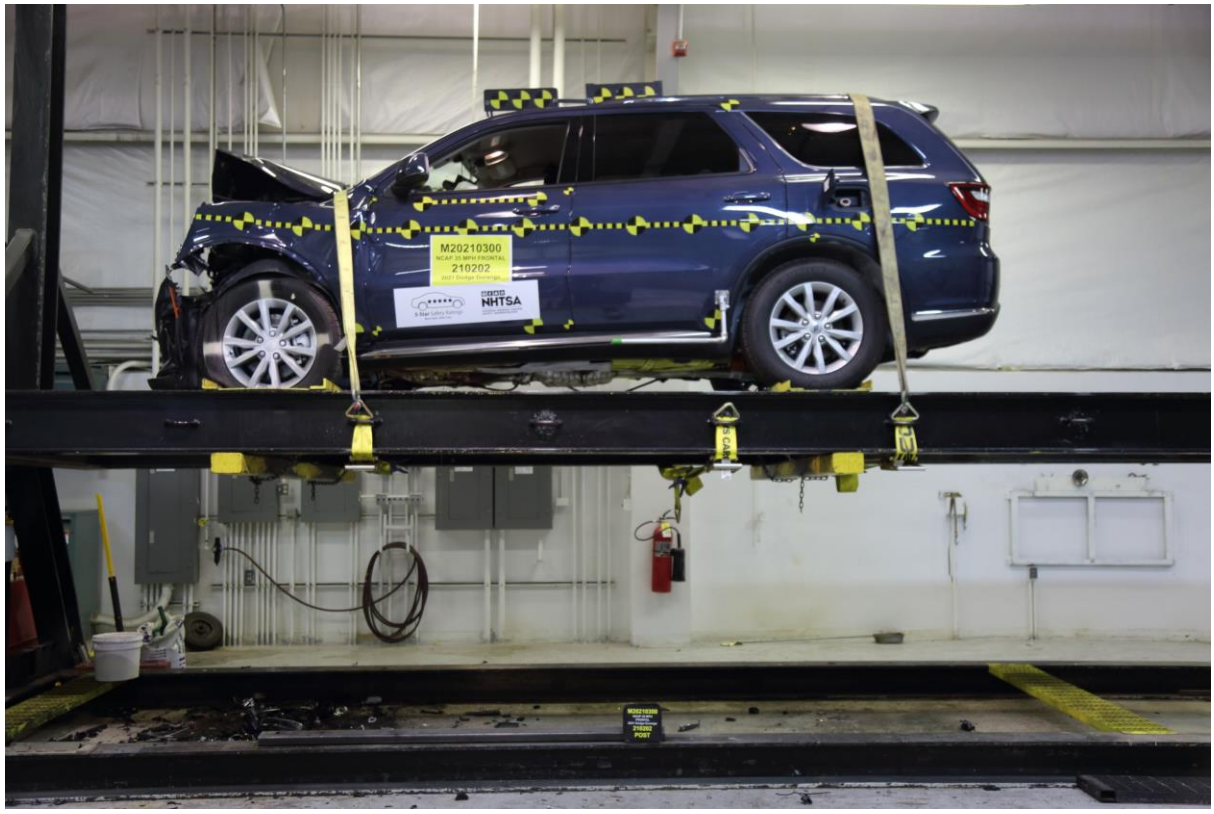
078 Vehicle at 90º on Static Rollover Device



079 Vehicle at 180º on Static Rollover Device

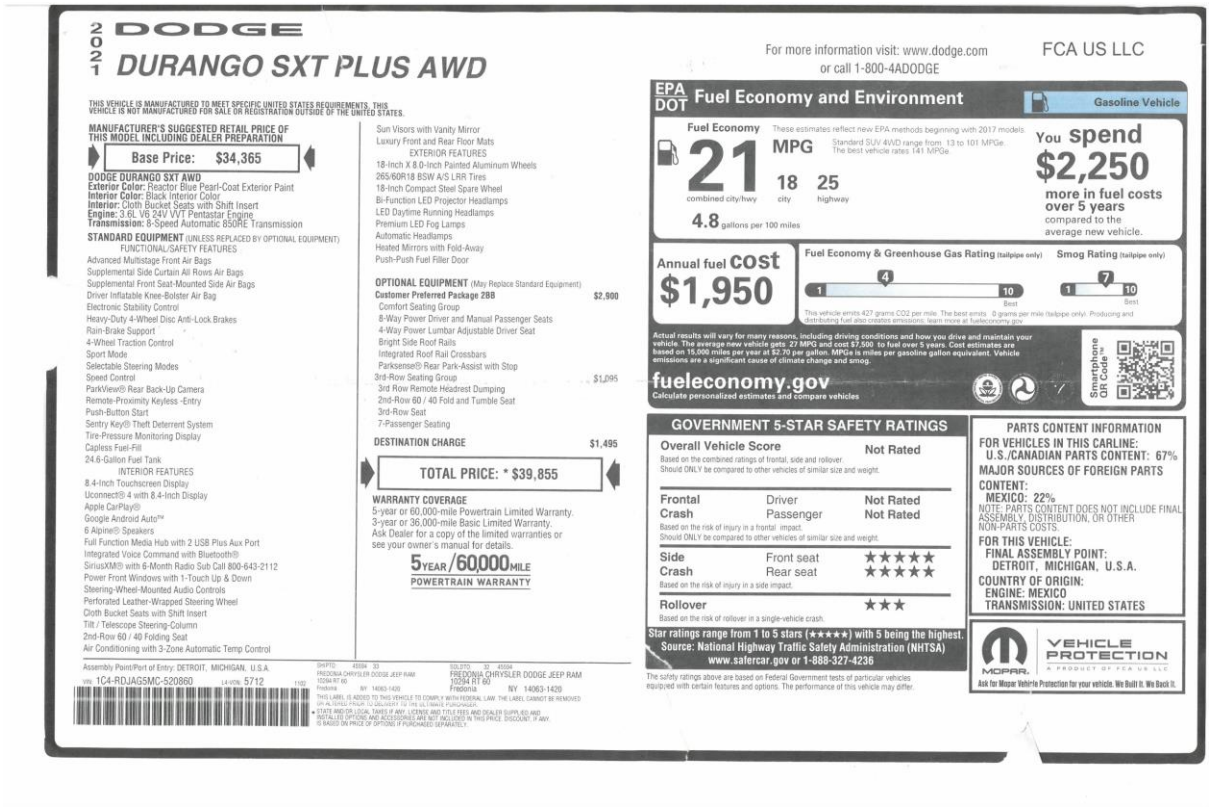


080 Vehicle at 270º on Static Rollover Device



081 Vehicle at 360º on Static Rollover Device

082 2021 Dodge Durango Frontal Impact Event



2021 DODGE
DURANGO SXT PLUS AWD

For more information visit: www.dodge.com
or call 1-800-4ADODGE

FCA US LLC

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

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

Base Price: $34,365

DODGE DURANGO SXT AWD
Exterior Color: Reactor Blue Pearl-Coat Exterior Paint
Interior Color: Black Interior Color
Interior: Cloth Bucket Seats with Shift Insert
Engine: 3.6L V6 24V VVT Pentastar Engine
Transmission: 8-Speed Automatic 850RE Transmission

STANDARD EQUIPMENT (UNLESS REPLACED BY OPTIONAL EQUIPMENT)
FUNCTIONAL/SAFETY FEATURES
Advanced Multistage Front Air Bags
Supplemental Side Curtain All Rows Air Bags
Supplemental Front Seat-Mounted Side Air Bags
Driver Inflatable Knee-Bolster Air Bag
Electronic Stability Control
Heavy-Duty 4-Wheel Disc Anti-Lock Brakes
Rain-Brake Support
4-Wheel Traction Control
Sport Mode
Selectable Steering Modes
Speed Control
ParkView® Rear Back-Up Camera
Remote-Proximity Keyless -Entry
Push-Button Start
Sentry Key® Theft Deterrent System
Tire-Pressure Monitoring Display
Capless Fuel-Fill
24.6-Gallon Fuel Tank
INTERIOR FEATURES
8.4-Inch Touchscreen Display
Uconnect® 4 with 8.4-Inch Display
Apple CarPlay®
Google Android Auto™
6 Alpine® Speakers
Full Function Media Hub with 2 USB Plus Aux Port
Integrated Voice Command with Bluetooth®
SiriusXM® with 6-Month Radio Sub Call 800-643-2112
Power Front Windows with 1-Touch Up & Down
Steering-Wheel-Mounted Audio Controls
Perforated Leather-Wrapped Steering Wheel
Cloth Bucket Seats with Shift Insert
Tilt / Telescope Steering-Column
2nd-Row 60 / 40 Folding Seat
Air Conditioning with 3-Zone Automatic Temp Control
Sun Visors with Vanity Mirror
Luxury Front and Rear Floor Mats
EXTERIOR FEATURES
18-Inch X 8.0-Inch Painted Aluminum Wheels
265/60R18 BSW A/S LRR Tires
18-Inch Compact Steel Spare Wheel
Bi-Function LED Projector Headlamps
LED Daytime Running Headlamps
Premium LED Fog Lamps
Automatic Headlamps
Heated Mirrors with Fold-Away
Push-Push Fuel Filler Door

OPTIONAL EQUIPMENT (May Replace Standard Equipment)
Customer Preferred Package 28B $2,900
Comfort Seating Group
8-Way Power Driver and Manual Passenger Seats
4-Way Power Lumbar Adjustable Driver Seat
Bright Side Roof Rails
Integrated Roof Rail Crossbars
Parksense® Rear Park-Assist with Stop
3rd-Row Seating Group $1,095
3rd Row Remote Headrest Dumping
2nd-Row 60 / 40 Fold and Tumble Seat
3rd-Row Seat
7-Passenger Seating

DESTINATION CHARGE $1,495

TOTAL PRICE: * $39,855

WARRANTY COVERAGE
5-year or 60,000-mile Powertrain Limited Warranty.
3-year or 36,000-mile Basic Limited Warranty.
Ask Dealer for a copy of the limited warranties or see your owner's manual for details.
5YEAR/60,000MILE
POWERTRAIN WARRANTY

Assembly Point/Port of Entry: DETROIT, MICHIGAN, U.S.A.
VIN: 1C4-RDJAG5MC-520860 LA-VON: 5712

SHIPTO: 45684 30
FREDONIA CHRYSLER DODGE JEEP RAM
10294 RT 60
Fredonia NY 14063-1426

SOLDTO: 31 45684
FREDONIA CHRYSLER DODGE JEEP RAM
10294 RT 60
Fredonia NY 14063-1426

THIS LABEL IS AFFIXED TO THIS VEHICLE TO COMPLY WITH FEDERAL LAW. THE LABEL CANNOT BE REMOVED OR ALTERED PRIOR TO DELIVERY TO THE ULTIMATE PURCHASER.

* STATE AND OR LOCAL TAXES IF ANY, LICENSE AND TITLE FEES AND DEALER SUPPLIED AND INSTALLED OPTIONS AND ACCESSORIES ARE NOT INCLUDED IN THIS PRICE. DISCOUNT, IF ANY, IS BASED ON PRICE OF OPTIONS IF PURCHASED SEPARATELY.

EPA DOT Fuel Economy and Environment — Gasoline Vehicle

Fuel Economy
21 MPG
combined city/hwy
18 city
25 highway
4.8 gallons per 100 miles

These estimates reflect new EPA methods beginning with 2017 models.
Standard SUV 4WD range from 13 to 101 MPGe.
The best vehicle rates 141 MPGe.

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

Annual fuel cost $1,950

Fuel Economy & Greenhouse Gas Rating (tailpipe only): 4 (1 — 10 Best)
Smog Rating (tailpipe only): 7 (1 — 10 Best)
This vehicle emits 427 grams CO2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions; learn more at fueleconomy.gov

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and cost $7,500 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $2.70 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

Smartphone Tag Code

GOVERNMENT 5-STAR SAFETY RATINGS

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

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

Side Crash — Front seat: ★★★★★; Rear seat: ★★★★★
Based on the risk of injury in a side impact.

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

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

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

PARTS CONTENT INFORMATION
FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 67%
MAJOR SOURCES OF FOREIGN PARTS CONTENT:
MEXICO: 22%
NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.
FOR THIS VEHICLE:
FINAL ASSEMBLY POINT:
DETROIT, MICHIGAN, U.S.A.
COUNTRY OF ORIGIN:
ENGINE: MEXICO
TRANSMISSION: UNITED STATES

MOPAR VEHICLE PROTECTION
A PRODUCT OF FCA US LLC
Ask for Mopar Vehicle Protection for your vehicle. We Build It. We Back It.

083 Monroney Label Photograph

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

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

Driver Head Acceleration X Redundant
Driver Head Acceleration Y Redundant
Driver Head Acceleration Z Redundant
Driver Upper Neck Force Y
Driver Upper Neck Moment X
Driver Upper Neck Moment Z
Driver Chest X Acceleration Redundant
Driver Chest Y Acceleration Redundant
Driver Chest Z Acceleration Redundant
Driver Pelvis X
Driver Pelvis Y
Driver Pelvis Z
Driver Left 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 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 Date: 02/02/2021

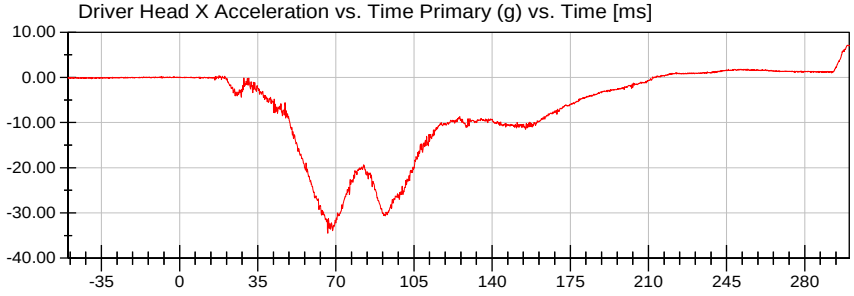
Test Lab: CTF

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

Test Number: 210202 (M20210300)

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

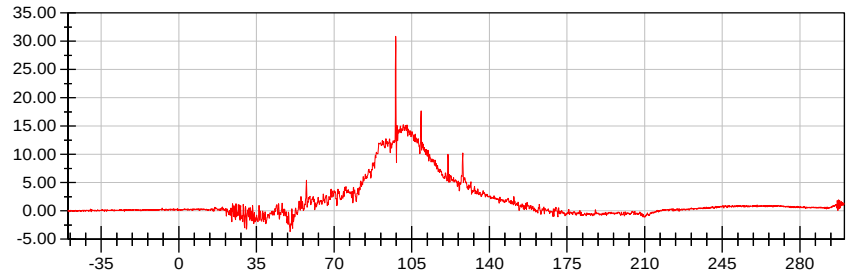
7.08 g at 299.20 ms

<Min>

-34.48 g at 66.32 ms

CFC_1000

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



<Max>

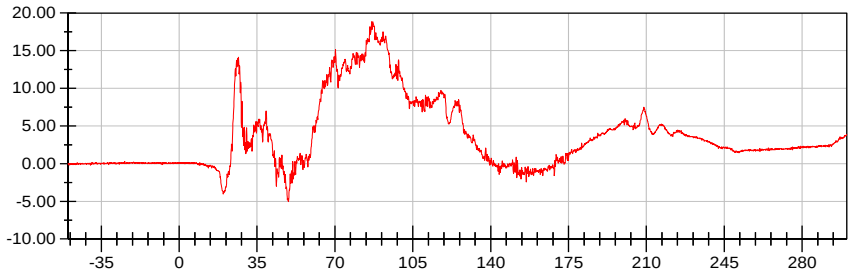
30.86 g at 97.76 ms

<Min>

-3.66 g at 50.16 ms

CFC_1000

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



<Max>

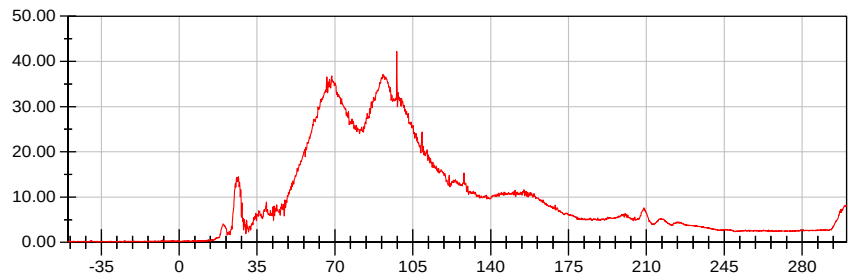
18.84 g at 86.48 ms

<Min>

-5.04 g at 49.12 ms

CFC_1000

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



<Max>

42.22 g at 97.76 ms

<Min>

0.06 g at -42.48 ms

CFC_1000

NHTSA

Test Date: 02/02/2021

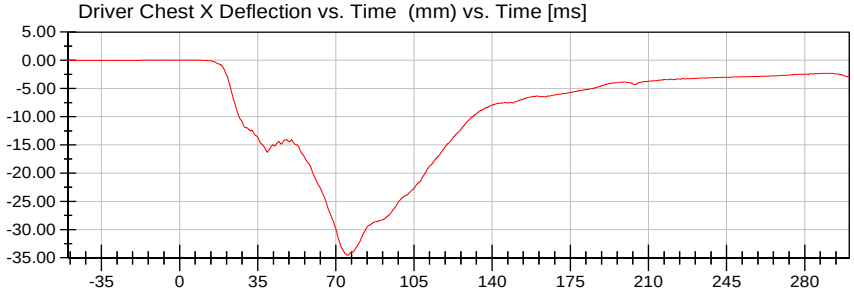
Test Lab: CTF

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

Test Number: 210202 (M20210300)

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

0.01 mm at -8.00 ms

<Min>

-34.53 mm at 75.28 ms

CFC_600

NHTSA

Test Date: 02/02/2021

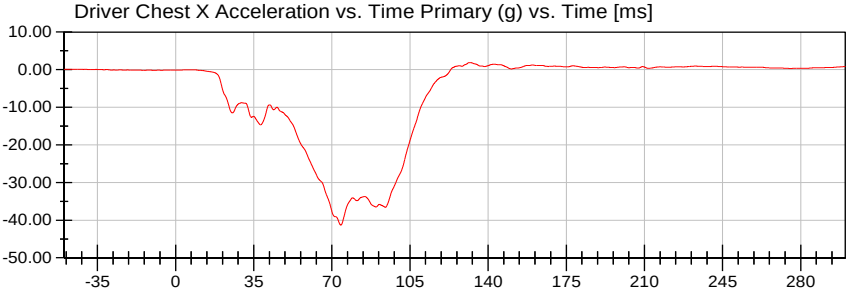
Test Lab: CTF

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

Test Number: 210202 (M20210300)

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

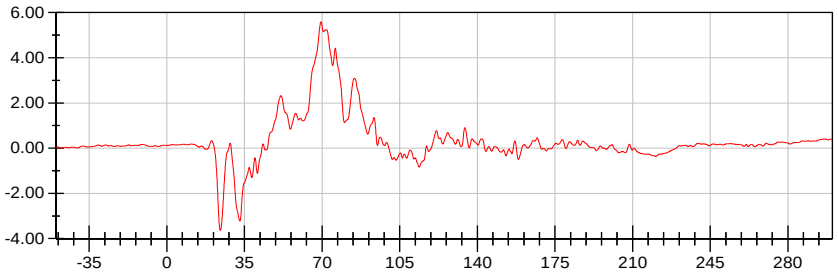
1.86 g at 131.44 ms

<Min>

-41.31 g at 74.00 ms

CFC_180

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



<Max>

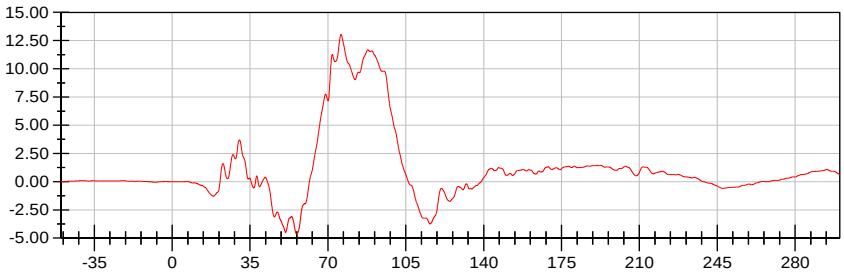
5.59 g at 69.52 ms

<Min>

-3.63 g at 24.08 ms

CFC_180

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



<Max>

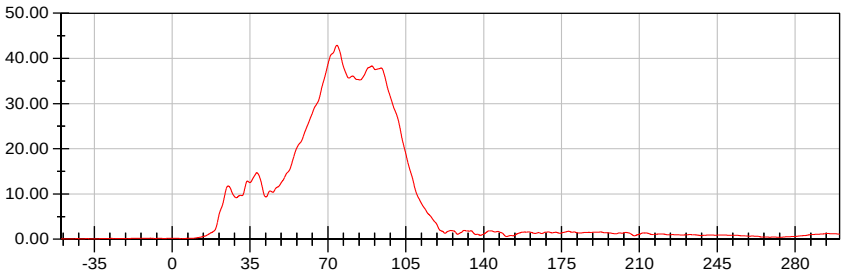
13.05 g at 75.92 ms

<Min>

-4.63 g at 55.92 ms

CFC_180

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



<Max>

42.89 g at 74.08 ms

<Min>

0.08 g at -48.48 ms

CFC_180

NHTSA

Test Date: 02/02/2021

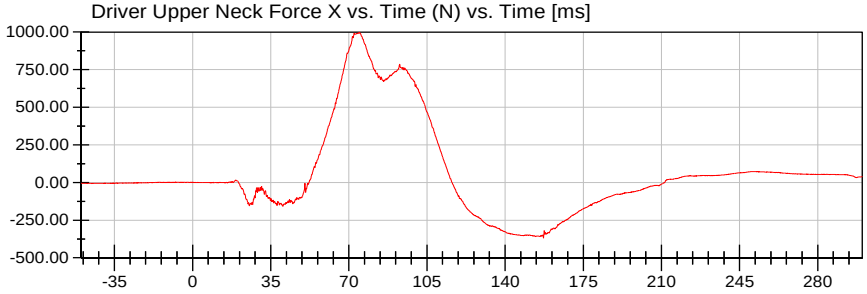
Test Lab: CTF

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

Test Number: 210202 (M20210300)

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

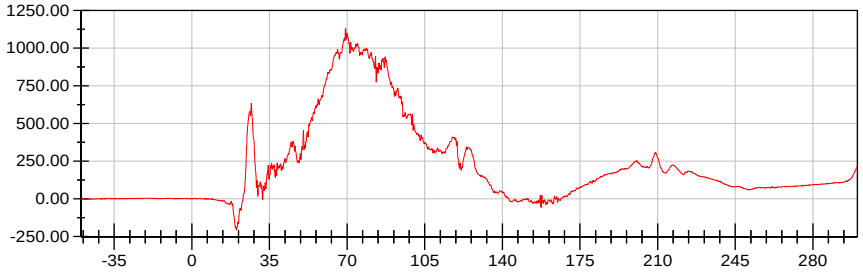
996.42 N at 74.48 ms

<Min>

-368.35 N at 157.20 ms

CFC_1000

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



<Max>

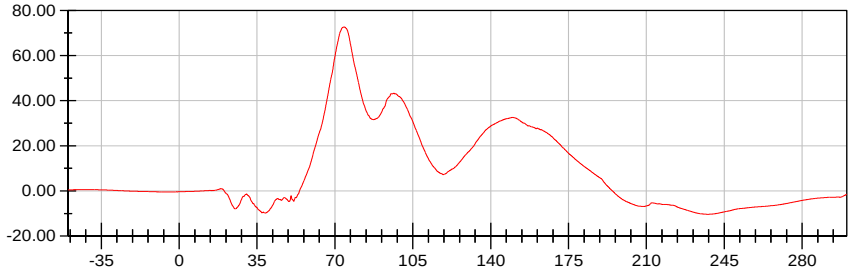
1,132.85 N at 69.28 ms

<Min>

-205.00 N at 20.00 ms

CFC_1000

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



<Max>

72.64 Nm at 74.24 ms

<Min>

-10.33 Nm at 237.20 ms

CFC_600

2021 Dodge Durango NCAP 35 mph Frontal Impact

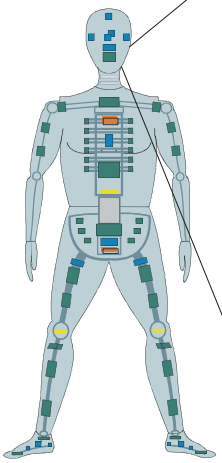
Neck Injury Predictor (NIJ)

Date: 02/02/2021
Time: 15:08

Customer: NHTSA
Test Number: M20210300

TRC Inc. Test Lab: CTF
Test Number: 210202

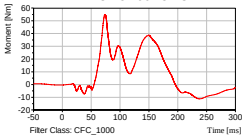
Test Orientation = Frontal
Fzc(Tension) = 6806
Fzc(Compression) = 6160
Myc(Extension) = 135
Myc(Flexion) = 310



Dummy:HIII 50th Male
Seating Position:
Driver

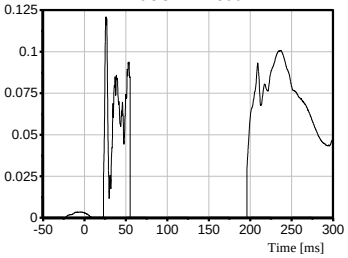
NIJ Source Code: (Fz/Fzc)+(My/Myc)

11TMONUP00H3MOYX



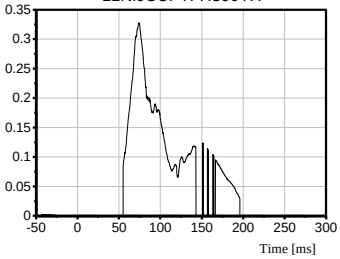
11NECKUP00H3FOZA

11NIJCUPTEH300YX



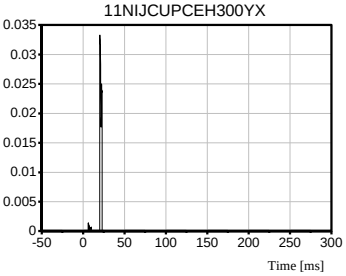
Max [NTE] 0.1209 at 25.92 ms

11NIJCUPTFH300YX



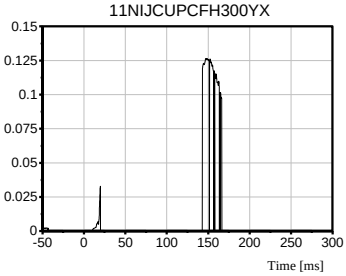
Max [NTF] 0.3274 at 74.64 ms

11NIJCUPCEH300YX



Max [NCE] 0.0333 at 20.32 ms

11NIJCUPCFH300YX



Max [NCF] 0.1265 at 148.72 ms

NHTSA

Test Date: 02/02/2021

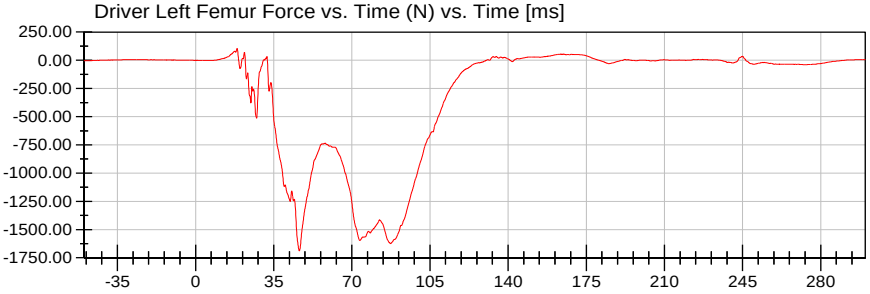
Test Lab: CTF

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

Test Number: 210202 (M20210300)

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

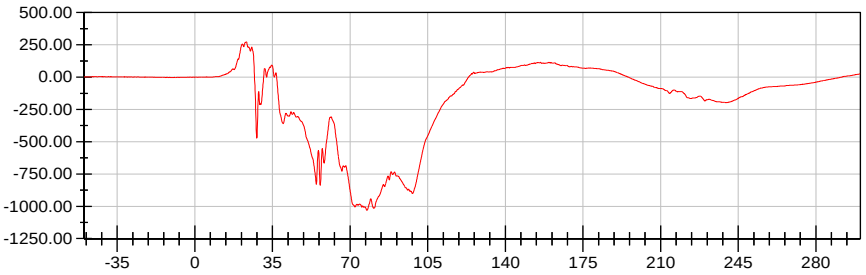
105.11 N at 18.64 ms

<Min>

-1,688.52 N at 46.48 ms

CFC_600

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



<Max>

273.92 N at 23.28 ms

<Min>

-1,031.35 N at 77.60 ms

CFC_600

NHTSA

Test Date: 02/02/2021

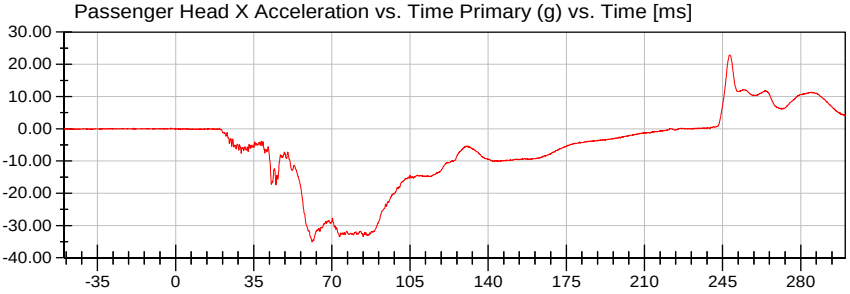
Test Lab: CTF

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

Test Number: 210202 (M20210300)

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

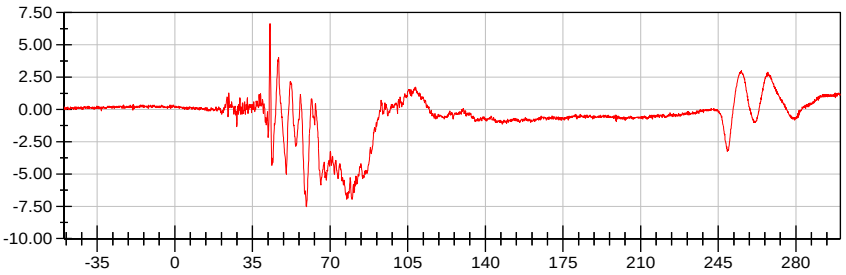
22.89 g at 248.00 ms

<Min>

-35.02 g at 61.04 ms

CFC_1000

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



<Max>

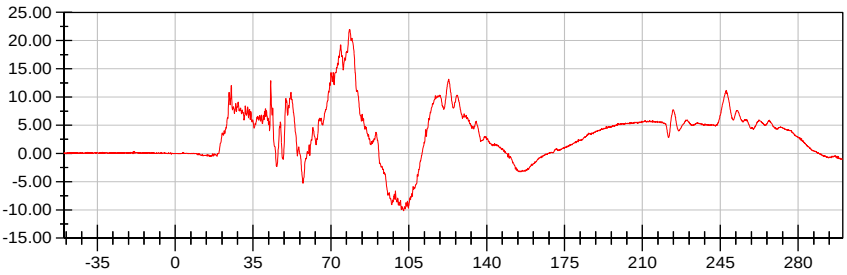
6.64 g at 42.88 ms

<Min>

-7.52 g at 59.28 ms

CFC_1000

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



<Max>

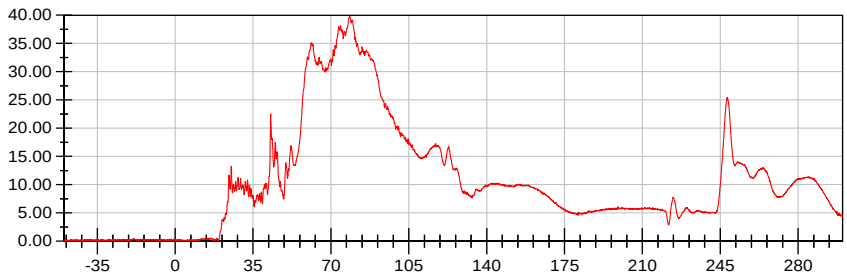
21.98 g at 78.32 ms

<Min>

-10.13 g at 102.64 ms

CFC_1000

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



<Max>

39.79 g at 78.40 ms

<Min>

0.02 g at 19.60 ms

CFC_1000

NHTSA

Test Date: 02/02/2021

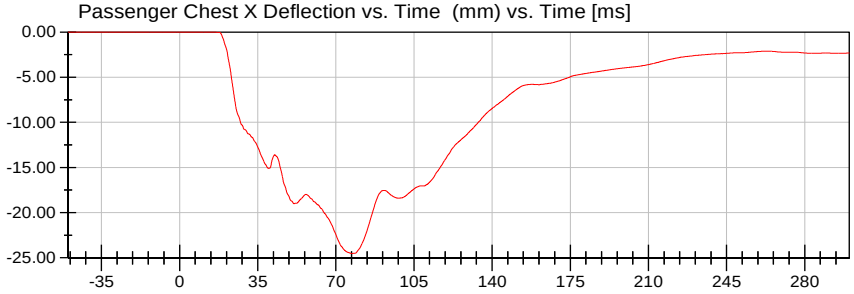
Test Lab: CTF

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

Test Number: 210202 (M20210300)

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

0.00 mm at -36.32 ms

<Min>

-24.53 mm at 77.28 ms

CFC_600

NHTSA

Test Date: 02/02/2021

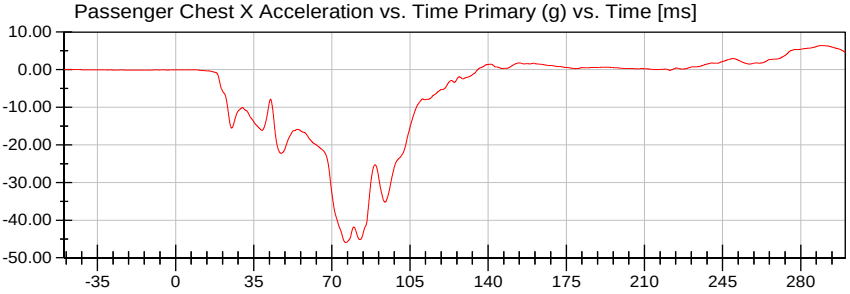
Test Lab: CTF

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

Test Number: 210202 (M20210300)

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

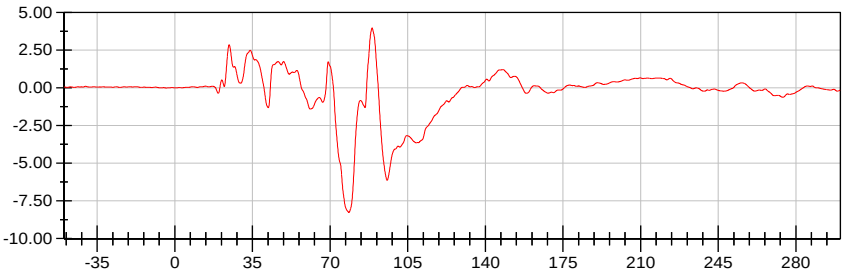
6.39 g at 289.52 ms

<Min>

-45.96 g at 76.32 ms

CFC_180

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



<Max>

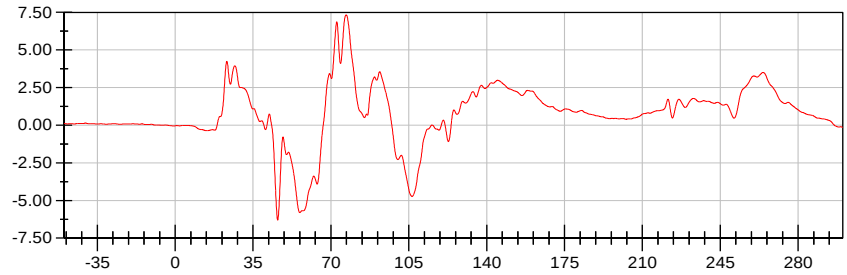
3.98 g at 88.96 ms

<Min>

-8.26 g at 78.48 ms

CFC_180

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



<Max>

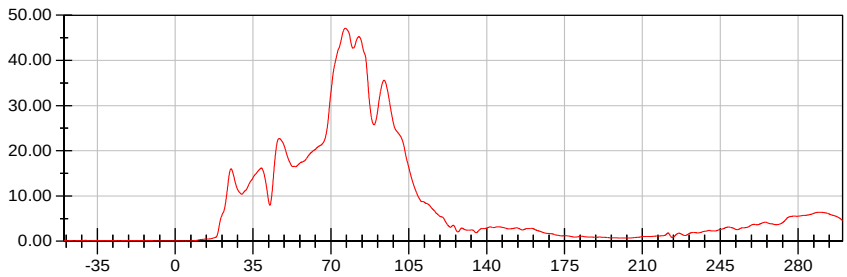
7.33 g at 76.88 ms

<Min>

-6.30 g at 46.08 ms

CFC_180

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



<Max>

47.12 g at 76.48 ms

<Min>

0.05 g at 3.04 ms

CFC_180

NHTSA

Test Date: 02/02/2021

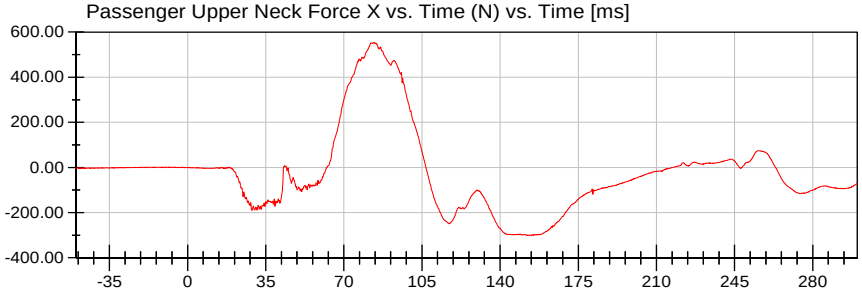
Test Lab: CTF

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

Test Number: 210202 (M20210300)

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

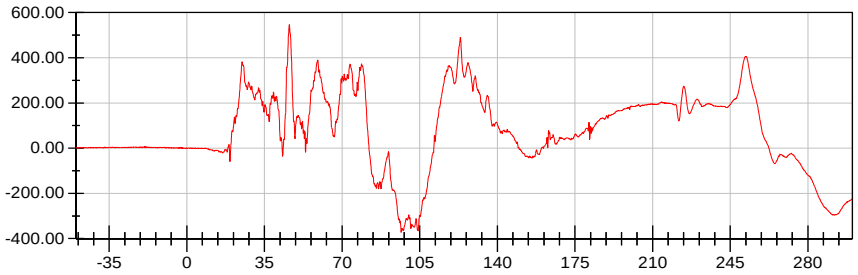
553.32 N at 83.44 ms

<Min>

-301.42 N at 152.72 ms

CFC_1000

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



<Max>

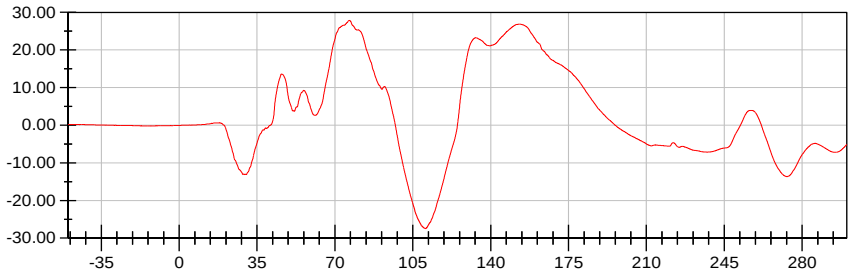
546.81 N at 46.16 ms

<Min>

-372.63 N at 96.64 ms

CFC_1000

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



<Max>

27.85 Nm at 76.48 ms

<Min>

-27.46 Nm at 110.64 ms

CFC_600

2021 Dodge Durango NCAP 35 mph Frontal Impact

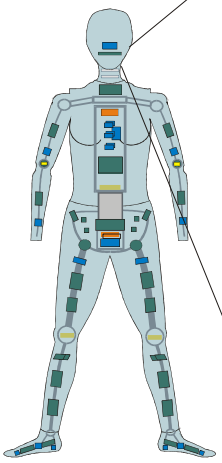
Neck Injury Predictor (NIJ)

Date: 02/02/2021
Time: 15:08

Customer: NHTSA
Test Number: M20210300

TRC Inc. Test Lab: CTF
Test Number: 210202

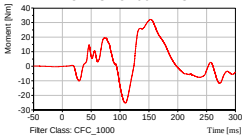
Test Orientation = Frontal
Fzc(Tension) = 4287
Fzc(Compression) = 3880
Myc(Extension) = 67
Myc(Flexion) = 155



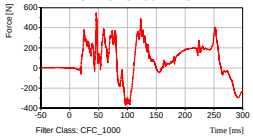
Dummy:HIII 5th Female
Seating Position:
Right Front Passenger

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

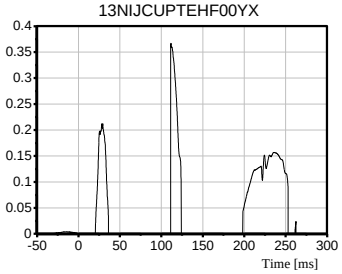
13TMONUP00HFMOYX



13NECKUP00HFFOZA

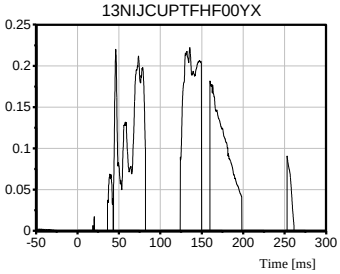


13NIJCUPTEHF00YX



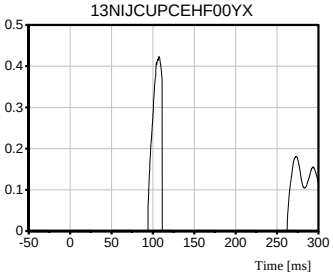
Max [NTE] 0.3671 at 111.60 ms

13NIJCUPTFHF00YX



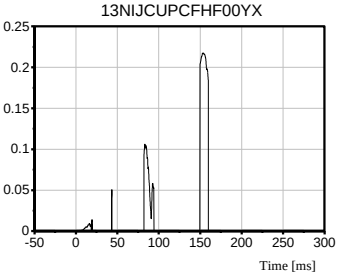
Max [NTF] 0.2222 at 135.52 ms

13NIJCUPCEHF00YX



Max [NCE] 0.4238 at 107.36 ms

13NIJCUPCFHF00YX



Max [NCF] 0.2176 at 154.00 ms

NHTSA

Test Date: 02/02/2021

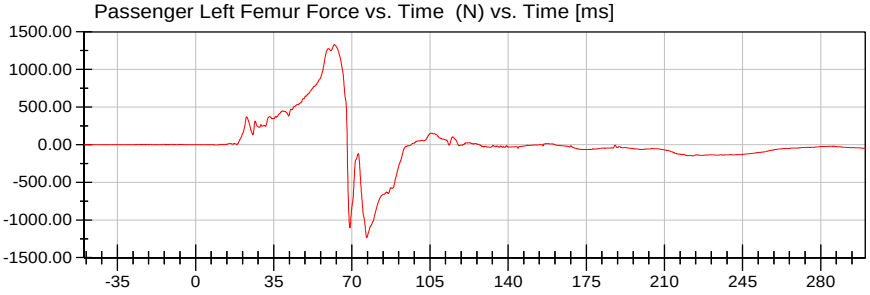
Test Lab: CTF

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

Test Number: 210202 (M20210300)

Position #2 Hybrid III Small Adult Female (426)

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



<Max>

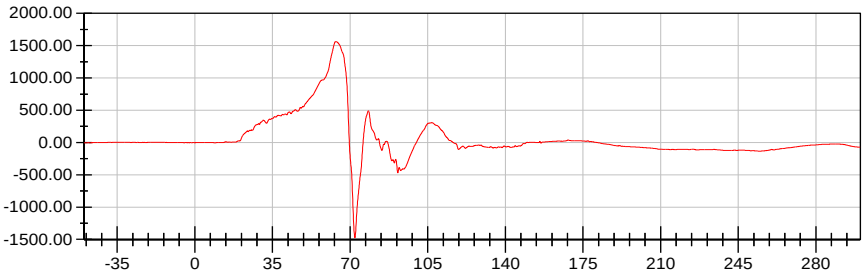
1,329.99 N at 62.16 ms

<Min>

-1,234.23 N at 76.64 ms

CFC_600

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



<Max>

1,562.04 N at 63.52 ms

<Min>

-1,475.45 N at 72.16 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. 70

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	510	Yes
C	H-Point Height	83.8 - 88.9	85	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	144	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	222	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	865	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. 70-1
Test Date: 1/6/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	256.0 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-8.3 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	< 10 %	3.88 %	Yes

Test meets specifications.

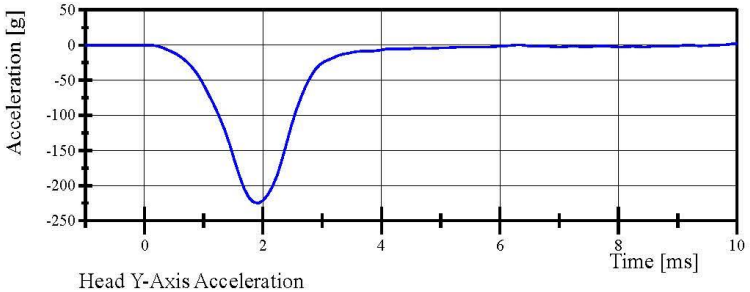
Condition: Used

Comments:
Head Skin S/N: N/A

Transportation Research Center Inc.

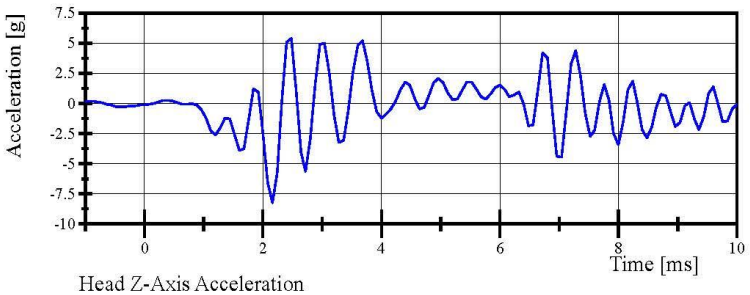
Front Head Drop
HIII 50th Serial No. 037 Certification No. 70-1
Test Date: 1/6/2021

Head X-Axis Acceleration



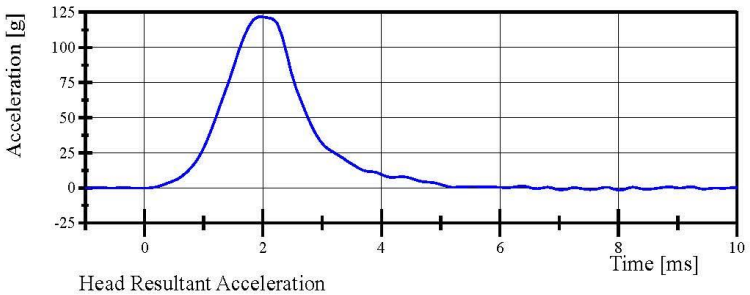
Filter Class: CFC_1000
Max: 1.8 g at 10.0 ms
Min: -225.2 g at 1.9 ms

Head Y-Axis Acceleration



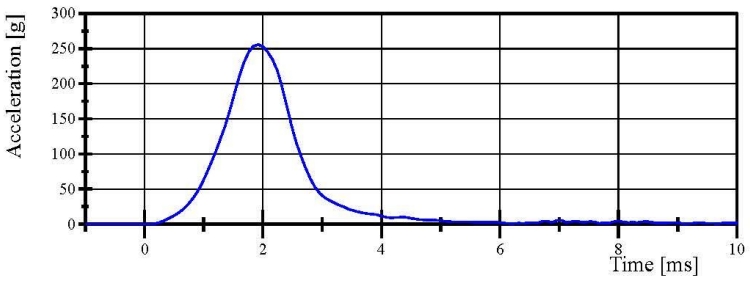
Filter Class: CFC_1000
Max: 5.4 g at 2.5 ms
Min: -8.3 g at 2.2 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 121.8 g at 1.9 ms
Min: -1.6 g at 8.0 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 256.0 g at 1.9 ms
Min: 0.1 g at -0.7 ms

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

01.06.2021 09:37:10 578

Transportation Research Center Inc.

Neck Flexion
HIII 50th Serial No. 037 Certification No. 70-2
Test Date: 1/6/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.914 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	38.5 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-23.82 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-20.58 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-15.47 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-15.47 g	Yes
Total Head D-Plane Rotation			
Peak	(-64) - (-78) °	-67.6 °	Yes
Time of Peak	57 - 64 ms	59.1 ms	Yes
Total Head D-Plane Rotation Decay to 0°	113 - 128 ms	119.7 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	88.1 - 108.4 N·m	104.63 N·m	Yes
Time of Peak	47 - 58 ms	51.7 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	97 - 107 ms	97.7 ms	Yes

Test meets specifications.

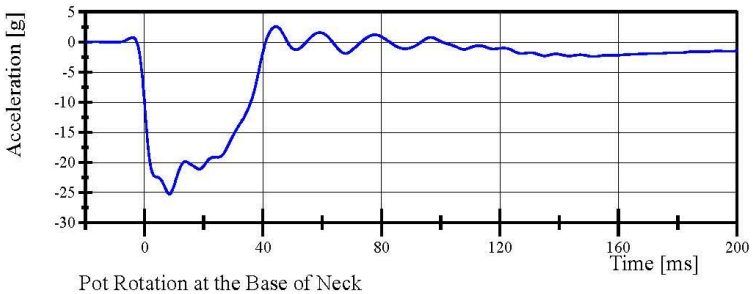
Condition: Used

Comments:
Neck S/N: 4728

Transportation Research Center Inc.

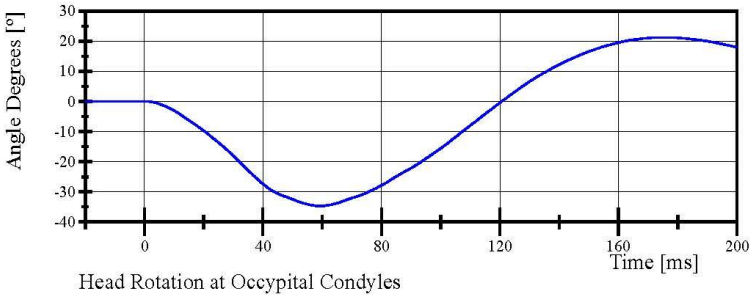
Neck Flexion
HIII 50th Serial No. 037 Certification No. 70-2
Test Date: 1/6/2021

Pendulum Acceleration



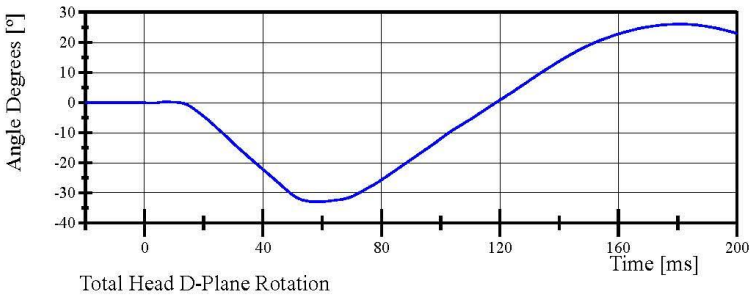
Filter Class: CFC_60
Max: 2.6 g at 44.4 ms
Min: -25.2 g at 8.4 ms

Pot Rotation at the Base of Neck



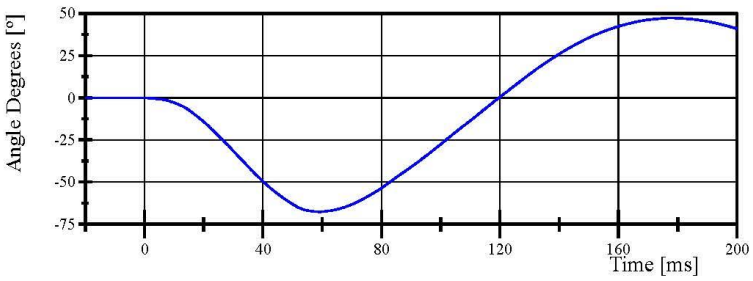
Filter Class: CFC_60
Max: 21.3 ° at 175.5 ms
Min: -34.7 ° at 59.3 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 26.0 ° at 181.0 ms
Min: -32.9 ° at 58.5 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 47.2 ° at 177.6 ms
Min: -67.6 ° at 59.1 ms

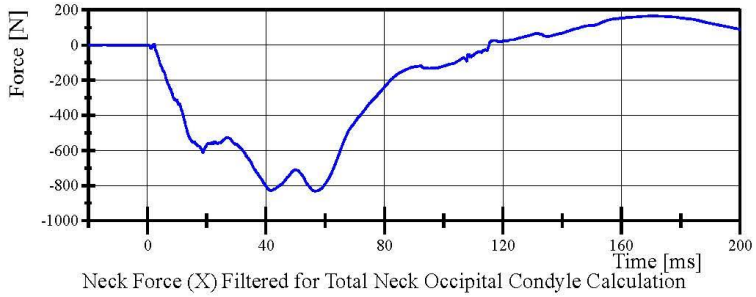
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

01.06.2021 13:59:25 1842

Transportation Research Center Inc.

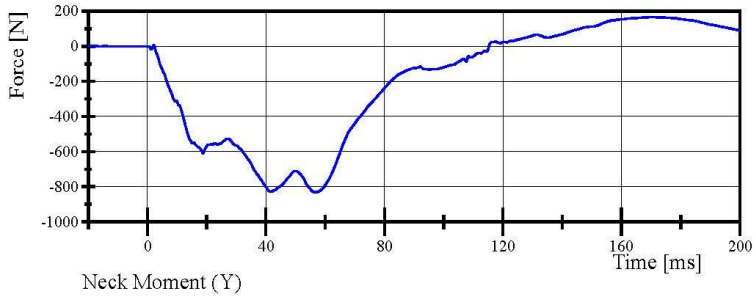
Neck Flexion
HIII 50th Serial No. 037 Certification No. 70-2
Test Date: 1/6/2021

Neck Force (X)



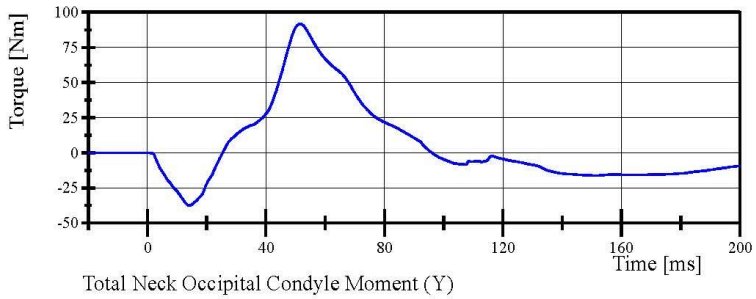
Filter Class: CFC_1000
Max: 166.7 N at 170.7 ms
Min: -832.0 N at 56.7 ms

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



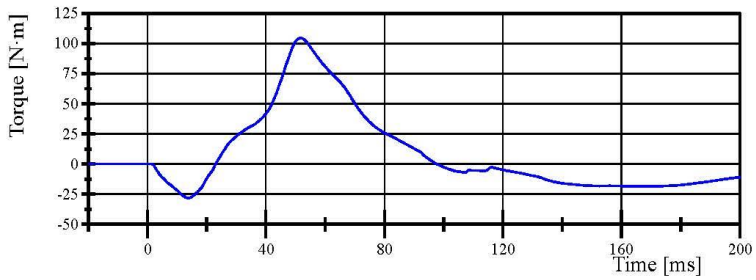
Filter Class: CFC_600
Max: 166.7 N at 171.1 ms
Min: -831.7 N at 56.7 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 91.8 Nm at 51.6 ms
Min: -37.5 Nm at 14.2 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: Without_(Constar
Max: 104.6 N·m at 51.7 ms
Min: -28.3 N·m at 13.8 ms

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

01.06.2021 13:59:25 1842

Transportation Research Center Inc.

Neck Extension
HIII 50th Serial No. 037 Certification No. 70-1
Test Date: 1/6/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-5.967 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	42.1 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	17.82 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	16.45 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	13.01 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	13.19 g	Yes
Total Head D-Plane Rotation			
Peak	81 - 106 °	93.4 °	Yes
Time of Peak	72 - 82 ms	78.8 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	160.5 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	(-52.9) - (-80) N·m	-64.62 N·m	Yes
Time of Peak	65 - 79 ms	72.5 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	120 - 148 ms	145.1 ms	Yes

Test meets specifications.

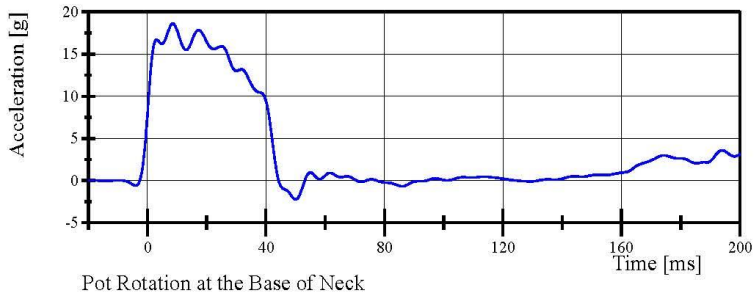
Condition: Used

Comments:
Neck S/N: 4728

Transportation Research Center Inc.

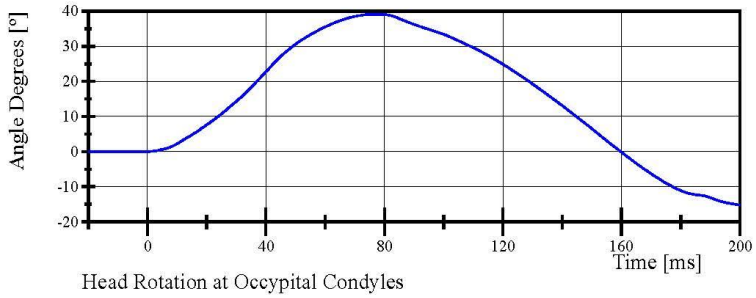
Neck Extension
HIII 50th Serial No. 037 Certification No. 70-1
Test Date: 1/6/2021

Pendulum Acceleration



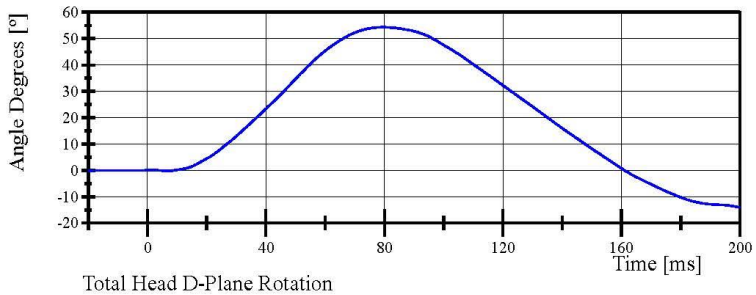
Filter Class: CFC_60
Max: 18.6 g at 8.6 ms
Min: -2.2 g at 50.1 ms

Pot Rotation at the Base of Neck



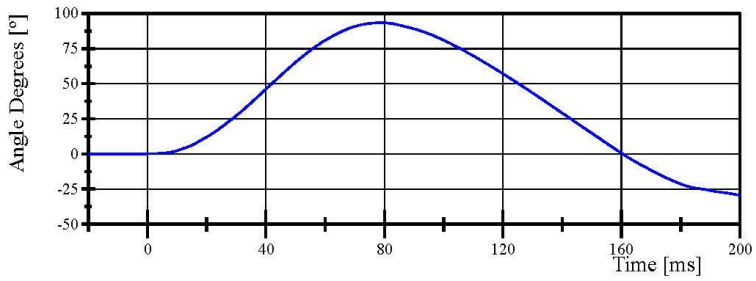
Filter Class: CFC_60
Max: 39.1 ° at 77.0 ms
Min: -15.2 ° at 200.0 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 54.4 ° at 79.6 ms
Min: -14.0 ° at 200.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 93.4 ° at 78.8 ms
Min: -29.3 ° at 200.0 ms

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

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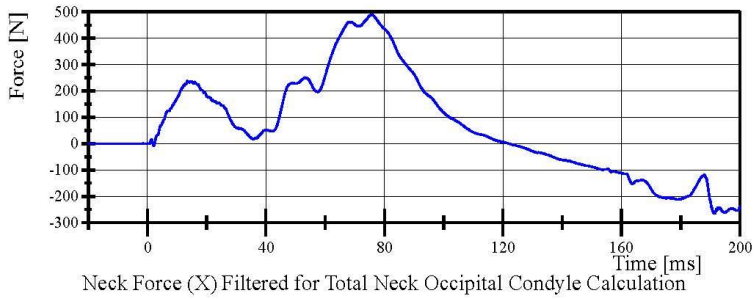
Transportation Research Center Inc.

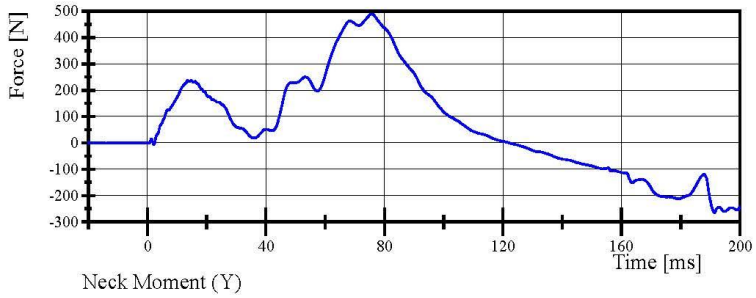
Neck Extension
HIII 50th Serial No. 037 Certification No. 70-1
Test Date: 1/6/2021

Neck Force (X)



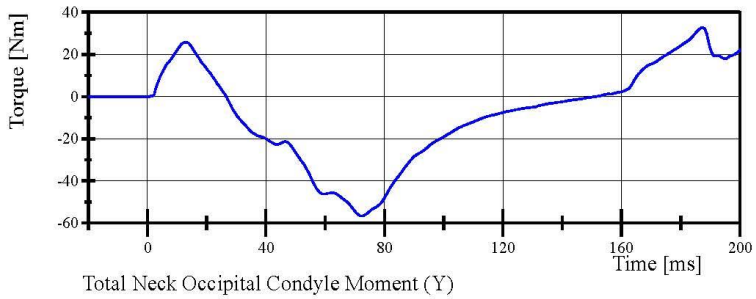
Filter Class: CFC_1000
Max: 489.0 N at 75.8 ms
Min: -264.6 N at 191.4 ms

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



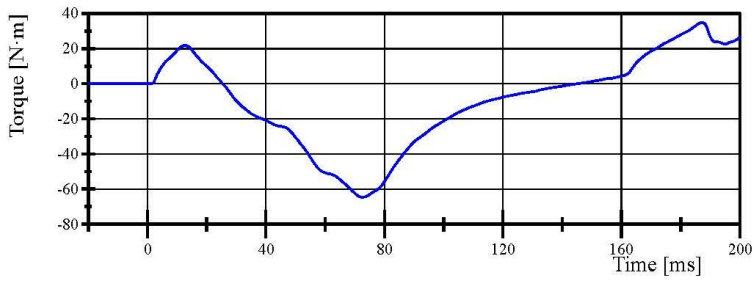
Filter Class: CFC_600
Max: 488.9 N at 75.7 ms
Min: -265.0 N at 191.5 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 32.7 Nm at 187.4 ms
Min: -56.6 Nm at 72.3 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: Without_(Constar
Max: 34.9 N·m at 187.4 ms
Min: -64.6 N·m at 72.5 ms

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

01.06.2021 14:39:05 1989

Transportation Research Center Inc.

Front Thorax
HIII 50th Serial No. 037 Certification No. 70-1
Test Date: 1/6/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.733 m/s	Yes
Probe Force Peak	(-5,160) - (-5,894) N	-5,727.3 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-68.34 mm	Yes
Internal Hysteresis	69 - 85 %	71.8 %	Yes

Test meets specifications.

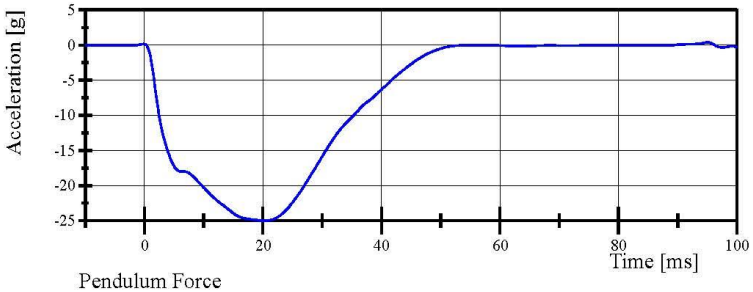
Condition: Used

Comments:
Jacket S/N: 2565
Rib Set S/N: 02033121A

Transportation Research Center Inc.

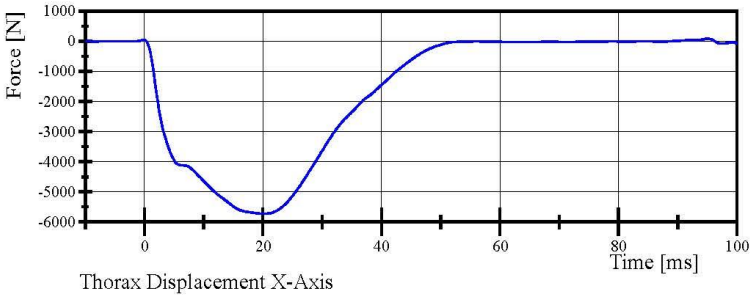
Front Thorax
HIII 50th Serial No. 037 Certification No. 70-1
Test Date: 1/6/2021

Pendulum Acceleration



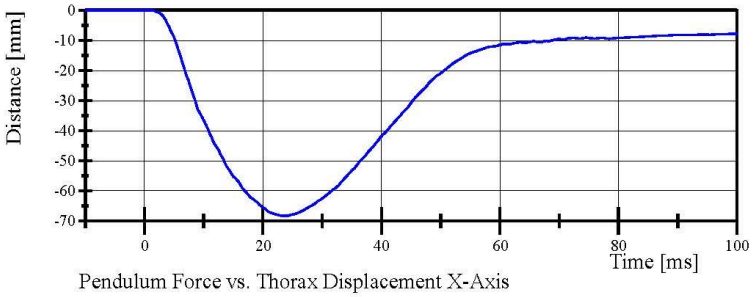
Filter Class: CFC_180
Max: 0.4 g at 95.0 ms
Min: -25.0 g at 20.2 ms

Pendulum Force



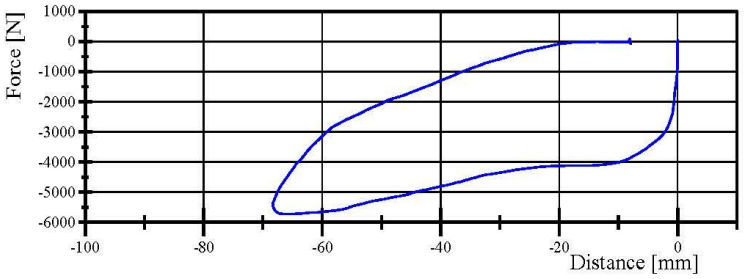
Filter Class: CFC_180
Max: 84.1 N at 95.0 ms
Min: -5,727.3 N at 20.2 ms

Thorax Displacement X-Axis



Filter Class: CFC_600
Max: 0.0 mm at -9.8 ms
Min: -68.3 mm at 23.8 ms

Pendulum Force vs. Thorax Displacement X-Axis



Filter Class: CFC_180
Max: 84.1 N at -8.1 mm
Min: -5,727.3 N at -65.6 mm

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

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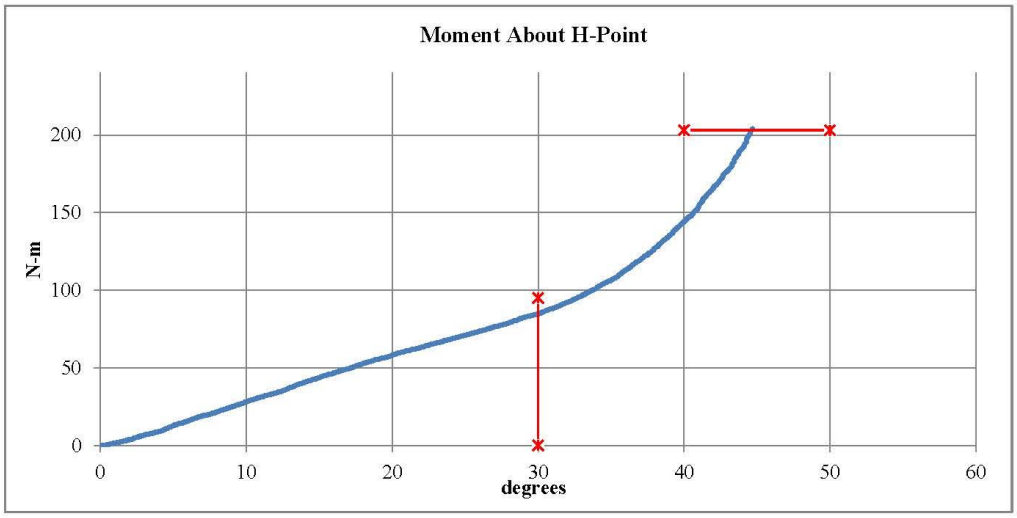
Transportation Research Center Inc.

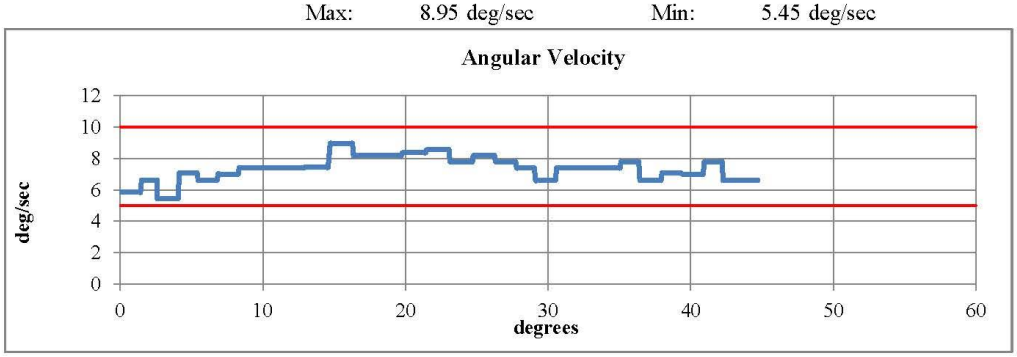
Hybrid III 50th Male Hip Range of Motion

Serial Number:	037	Date:	06-Jan-2021
Side Tested:	Left Hip	Time:	8:44
Test Number:	1		

TEST PARAMETER	SPECIFICATION			TEST RESULTS		
Temperature	18.9	-	25.6	21.6	°C	Pass
Humidity	10	-	70	36	%	Pass
Moment at 30°	0	≤	94.9	85.14	N-m	Pass
Angle at 203 Nm	40	-	50	44.69	deg	Pass
Average Velocity	5	-	10	7.32	deg/sec	Pass



Max: 8.95 deg/sec Min: 5.45 deg/sec



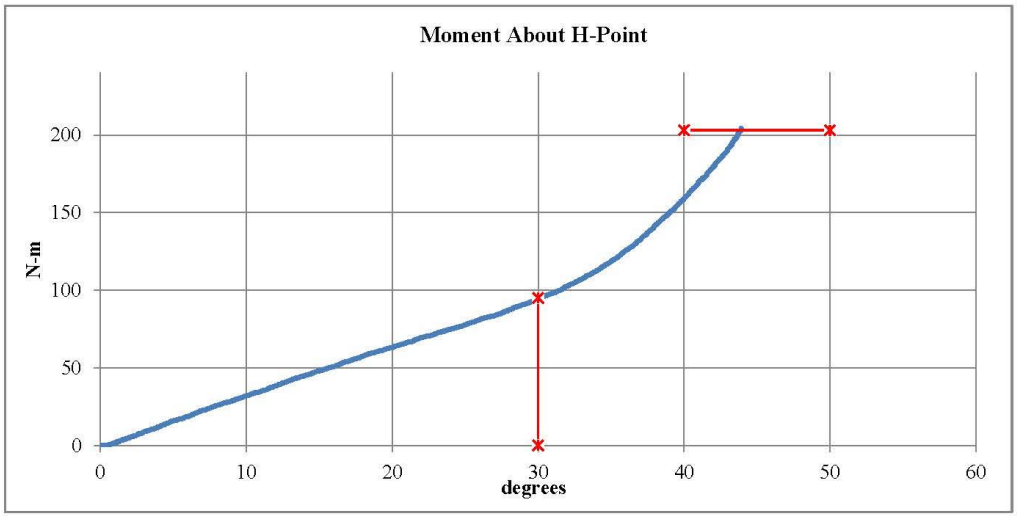
Comments:
Pelvis Skin S/N: EK3565

Transportation Research Center Inc.

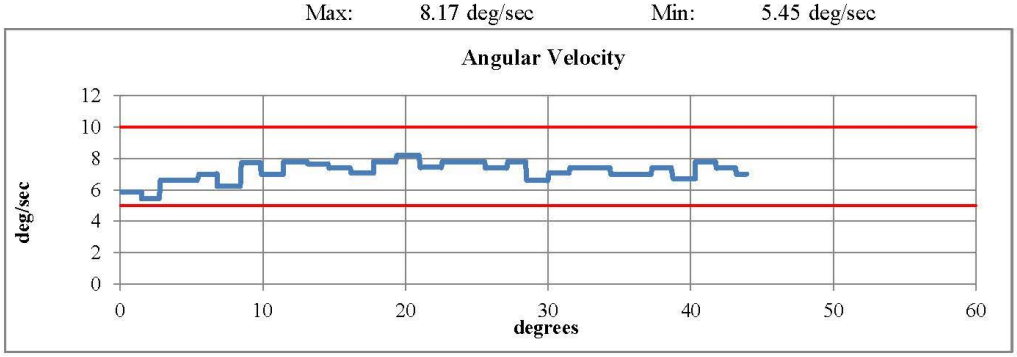
Hybrid III 50th Male Hip Range of Motion

Serial Number:	037	Date:	06-Jan-2021
Side Tested:	Right Hip	Time:	9:53
Test Number:	1		

TEST PARAMETER	SPECIFICATION			TEST RESULTS		
Temperature	18.9	-	25.6	21.3	°C	Pass
Humidity	10	-	70	41	%	Pass
Moment at 30°	0	≤	94.9	94.51	N-m	Pass
Angle at 203 Nm	40	-	50	43.91	deg	Pass
Average Velocity	5	-	10	7.17	deg/sec	Pass



Max: 8.17 deg/sec Min: 5.45 deg/sec



Comments:
Pelvis Skin S/N: EK3565

Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 70-1
Test Date: 1/6/2021

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.095 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,517.42 N	Yes

Test meets specifications.

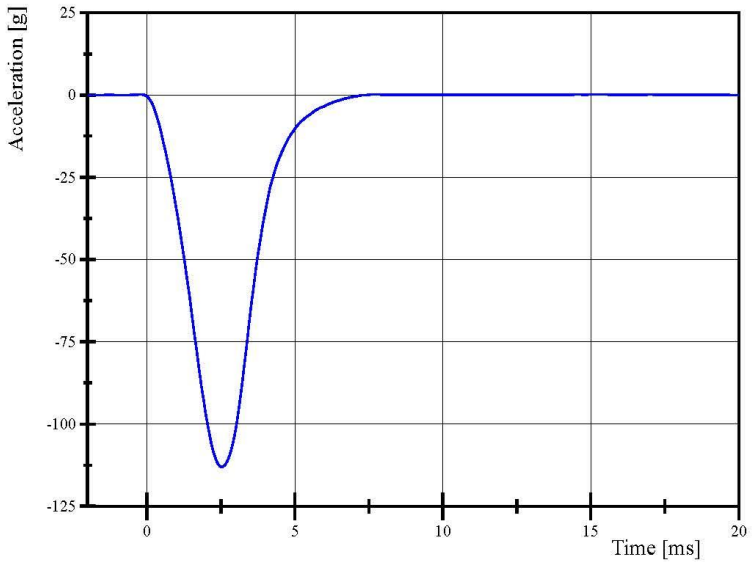
Condition: Used

Comments:
Knee Skin S/N: 2672

Transportation Research Center Inc.

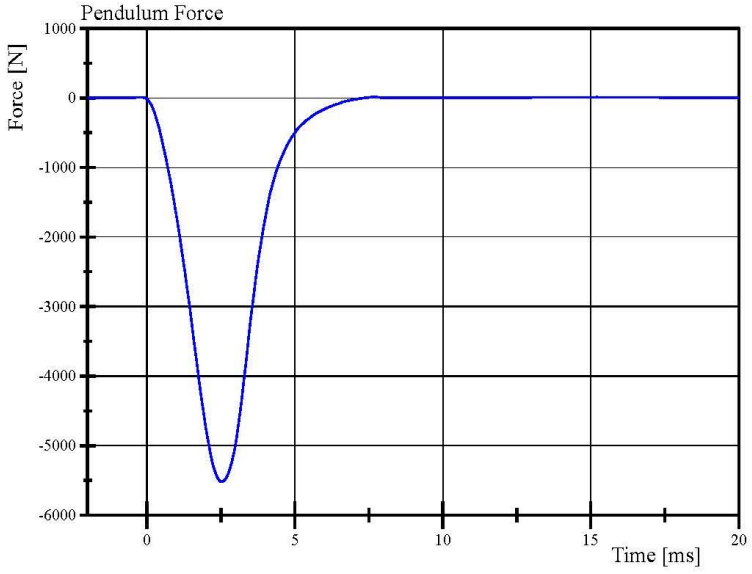
Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 70-1
Test Date: 1/6/2021

Pendulum Acceleration



Filter Class: CFC_600
Max: 0.2 g at 7.7 ms
Min: -113.0 g at 2.6 ms

Pendulum Force



Filter Class: CFC_600
Max: 10.1 N at 7.7 ms
Min: -5,517.4 N at 2.6 ms

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. 70-1
Test Date: 1/6/2021

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.097 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,099.19 N	Yes

Test meets specifications.

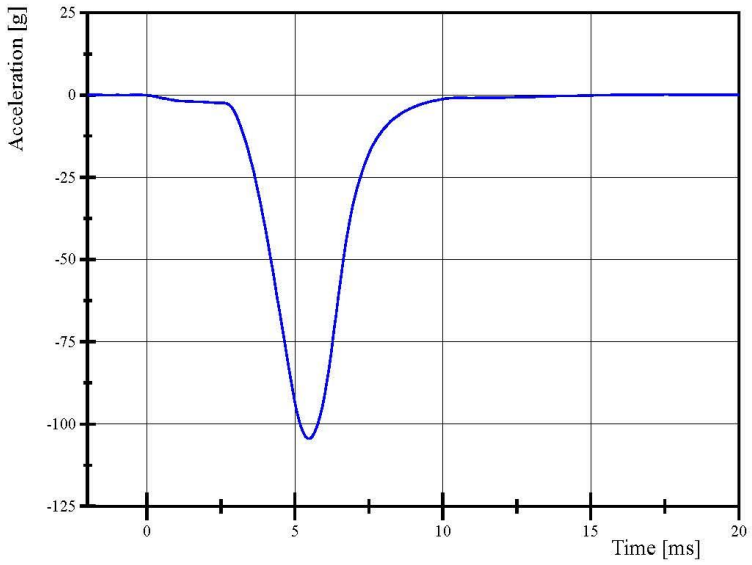
Condition: Used

Comments:
Knee Skin S/N: 1248

Transportation Research Center Inc.

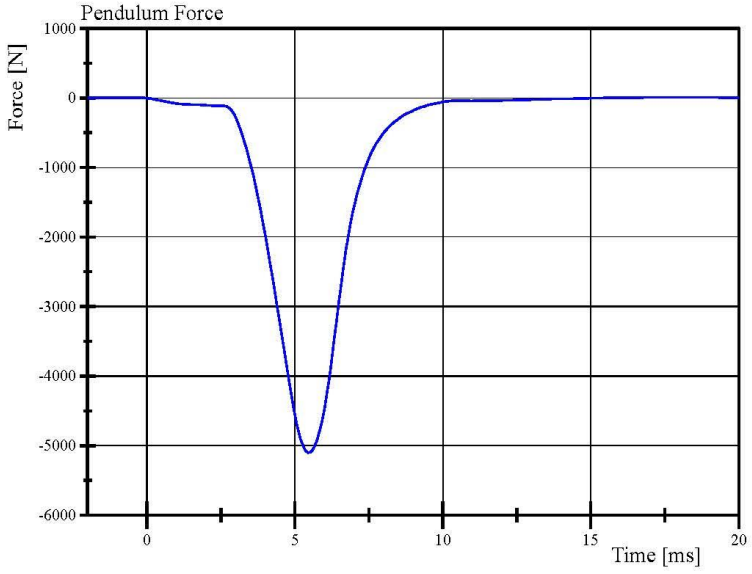
Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 70-1
Test Date: 1/6/2021

Pendulum Acceleration



Filter Class: CFC_600
Max: 0.1 g at 17.5 ms
Min: -104.4 g at 5.4 ms

Pendulum Force



Filter Class: CFC_600
Max: 6.6 N at 17.5 ms
Min: -5,099.2 N at 5.4 ms

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

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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. 71

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	510	Yes
C	H-Point Height	83.8 - 88.9	85	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	144	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	222	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	865	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. 71-1
Test Date: 2/3/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	255.1 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-9.9 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	< 10 %	4.91 %	Yes

Test meets specifications.

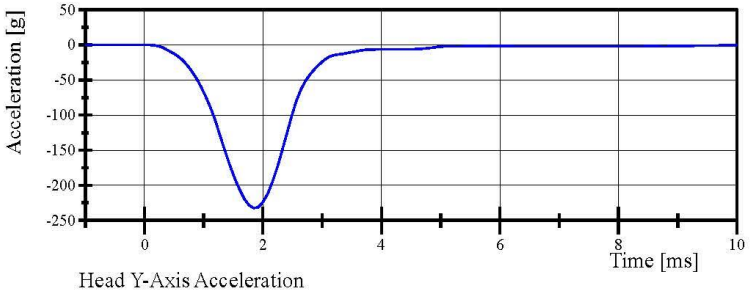
Condition: Used

Comments:
Head Skin S/N: N/A

Transportation Research Center Inc.

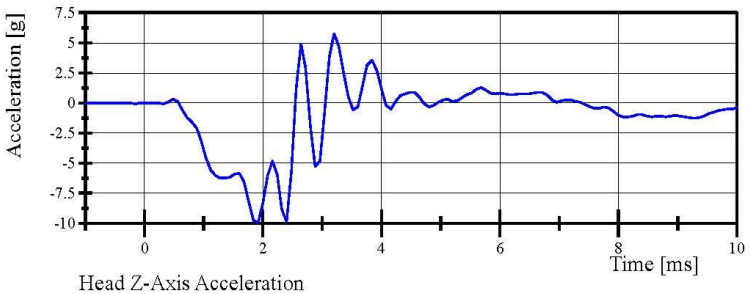
Front Head Drop
HIII 50th Serial No. 037 Certification No. 71-1
Test Date: 2/3/2021

Head X-Axis Acceleration



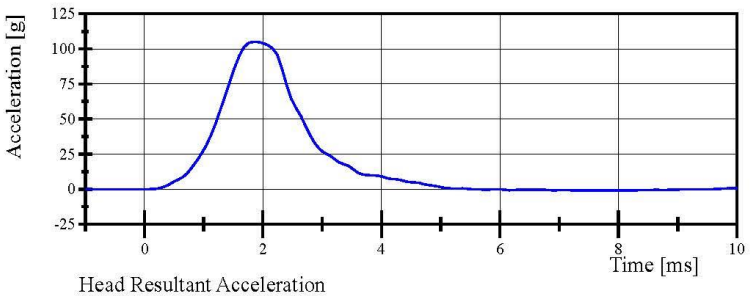
Filter Class: CFC_1000
Max: 0.1 g at -1.0 ms
Min: -232.3 g at 1.8 ms

Head Y-Axis Acceleration



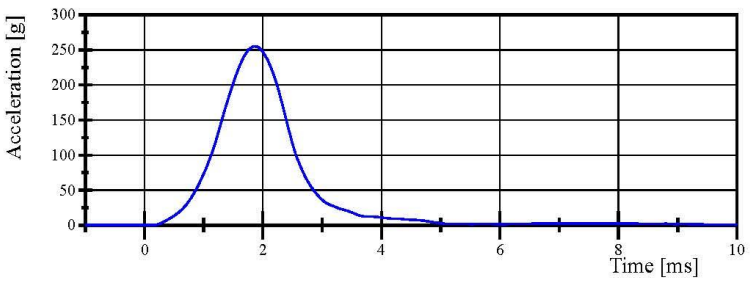
Filter Class: CFC_1000
Max: 5.8 g at 3.2 ms
Min: -9.9 g at 1.9 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 105.0 g at 1.8 ms
Min: -0.9 g at 7.3 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 255.1 g at 1.8 ms
Min: 0.0 g at -1.0 ms

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

02.03.2021 11:37:11 578

Transportation Research Center Inc.

Neck Flexion
HIII 50th Serial No. 037 Certification No. 71-1
Test Date: 2/3/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.915 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	36.7 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-25.72 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-21.57 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-15.12 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-15.12 g	Yes
Total Head D-Plane Rotation			
Peak	(-64) - (-78) °	-66.5 °	Yes
Time of Peak	57 - 64 ms	57.8 ms	Yes
Total Head D-Plane Rotation Decay to 0°	113 - 128 ms	117.1 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	88.1 - 108.4 N·m	103.08 N·m	Yes
Time of Peak	47 - 58 ms	50.4 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	97 - 107 ms	97.2 ms	Yes

Test meets specifications.

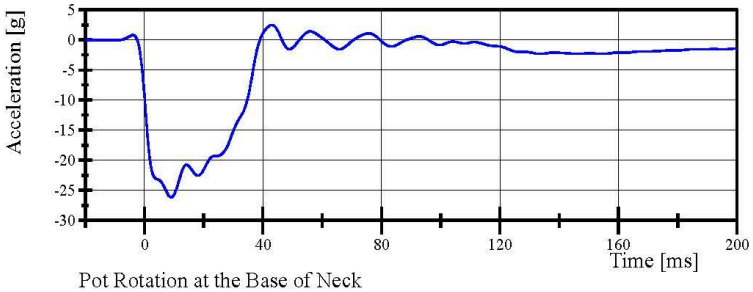
Condition: Used

Comments:
Neck S/N: 4728

Transportation Research Center Inc.

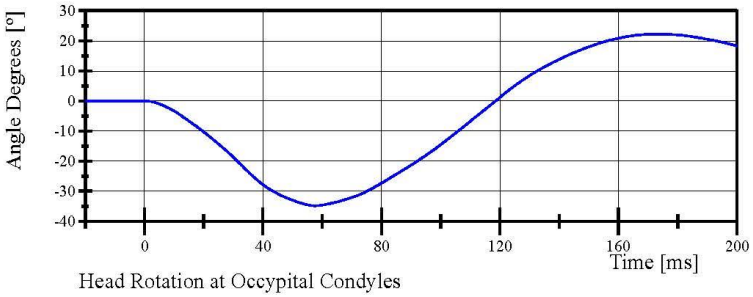
Neck Flexion
HIII 50th Serial No. 037 Certification No. 71-1
Test Date: 2/3/2021

Pendulum Acceleration



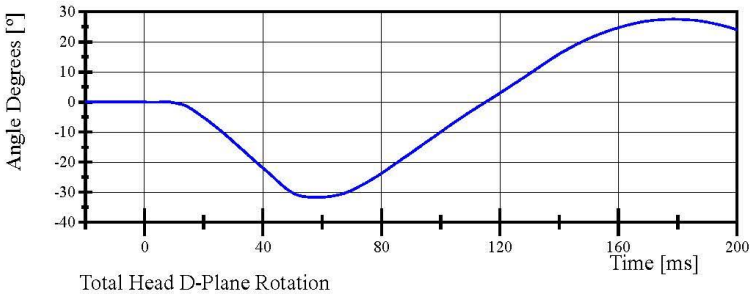
Filter Class: CFC_60
Max: 2.5 g at 43.0 ms
Min: -26.2 g at 9.0 ms

Pot Rotation at the Base of Neck



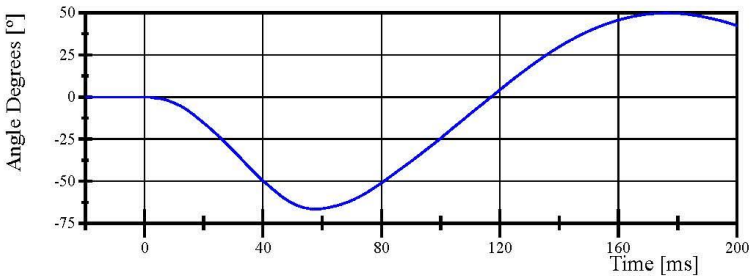
Filter Class: CFC_60
Max: 22.3 ° at 173.3 ms
Min: -34.8 ° at 57.6 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 27.6 ° at 178.5 ms
Min: -31.7 ° at 58.5 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 49.7 ° at 176.3 ms
Min: -66.5 ° at 57.8 ms

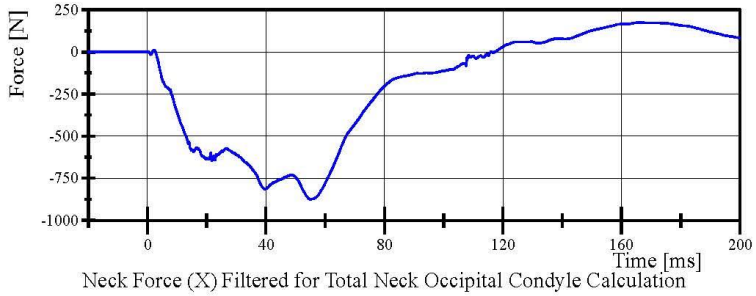
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

02.03.2021 13:39:00 1842

Transportation Research Center Inc.

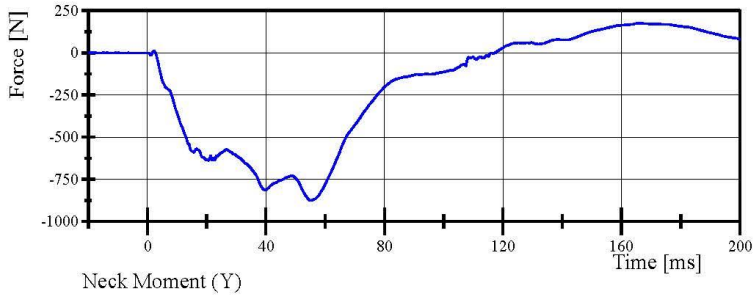
Neck Flexion
HIII 50th Serial No. 037 Certification No. 71-1
Test Date: 2/3/2021

Neck Force (X)



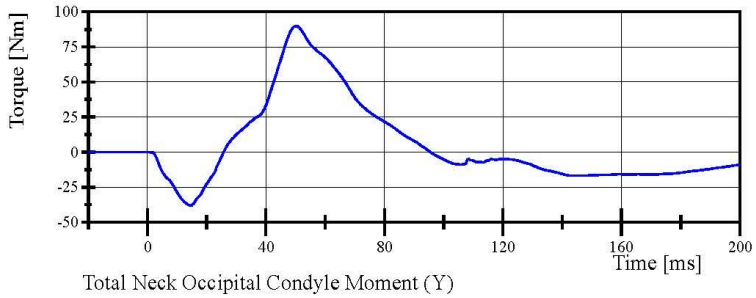
Filter Class: CFC_1000
Max: 175.4 N at 165.7 ms
Min: -875.9 N at 55.1 ms

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



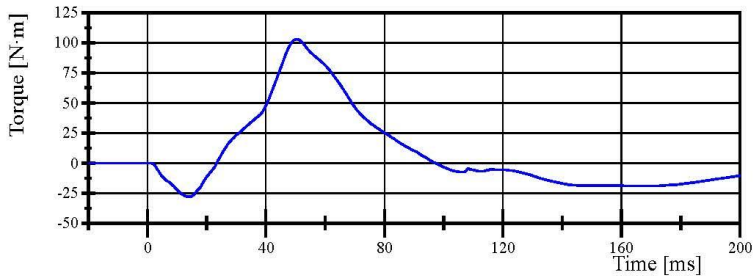
Filter Class: CFC_600
Max: 175.3 N at 165.8 ms
Min: -875.7 N at 55.1 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 89.8 Nm at 50.2 ms
Min: -38.1 Nm at 14.6 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: Without_(Constar
Max: 103.1 N·m at 50.4 ms
Min: -28.1 N·m at 14.0 ms

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

02.03.2021 13:39:00 1842

Transportation Research Center Inc.

Neck Extension
HIII 50th Serial No. 037 Certification No. 71-3
Test Date: 2/3/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-5.965 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	44.2 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	17.94 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	16.19 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	12.93 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	12.93 g	Yes
Total Head D-Plane Rotation			
Peak	81 - 106 °	91.6 °	Yes
Time of Peak	72 - 82 ms	78.8 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	160.1 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	(-52.9) - (-80) N·m	-63.94 N·m	Yes
Time of Peak	65 - 79 ms	73.5 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	120 - 148 ms	143.8 ms	Yes

Test meets specifications.

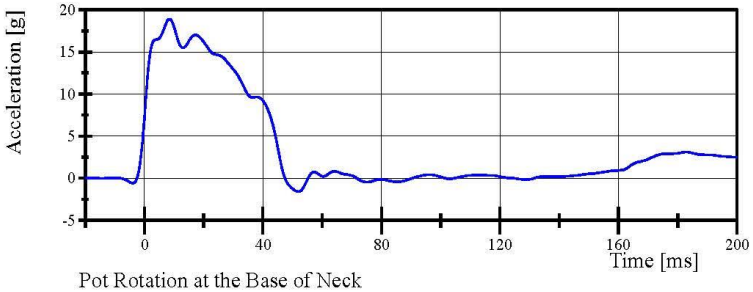
Condition: Used

Comments:
Neck S/N: 4728

Transportation Research Center Inc.

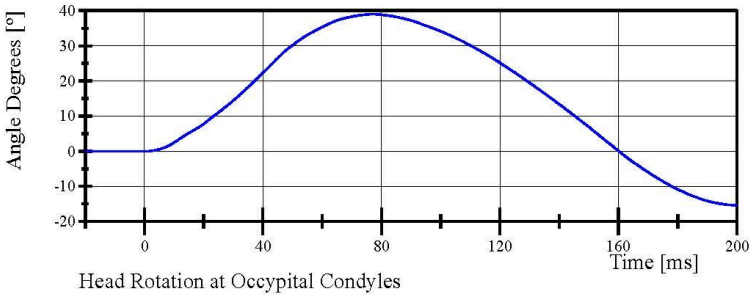
Neck Extension
HIII 50th Serial No. 037 Certification No. 71-3
Test Date: 2/3/2021

Pendulum Acceleration



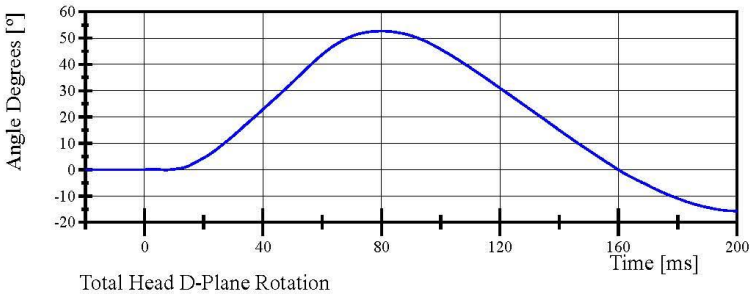
Filter Class: CFC_60
Max: 18.9 g at 8.5 ms
Min: -1.6 g at 52.0 ms

Pot Rotation at the Base of Neck



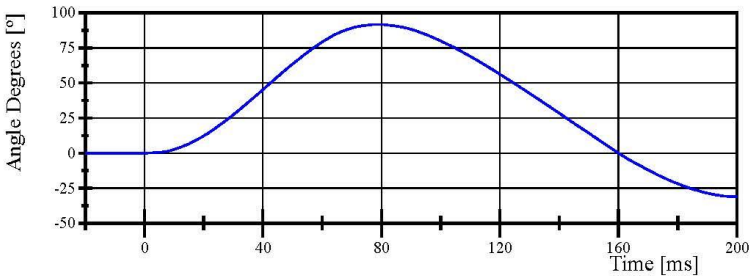
Filter Class: CFC_60
Max: 39.0 ° at 77.1 ms
Min: -15.5 ° at 200.0 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 52.7 ° at 80.1 ms
Min: -15.8 ° at 200.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 91.6 ° at 78.8 ms
Min: -31.3 ° at 200.0 ms

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

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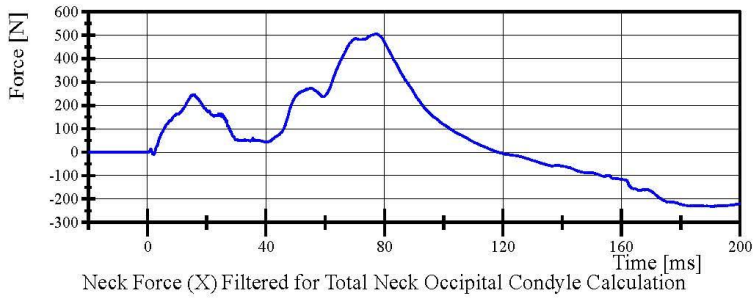
Report Number: 037_H3F71

Transportation Research Center Inc.

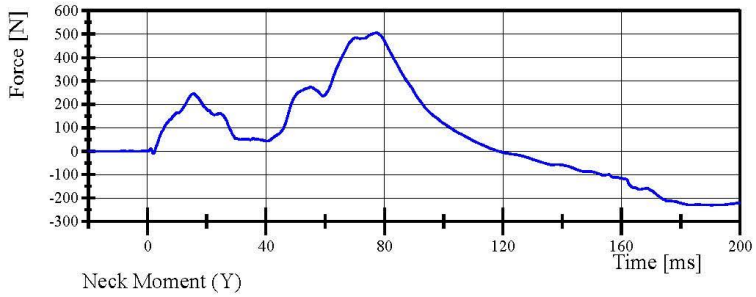
Neck Extension
HIII 50th Serial No. 037 Certification No. 71-3
Test Date: 2/3/2021

Neck Force (X)



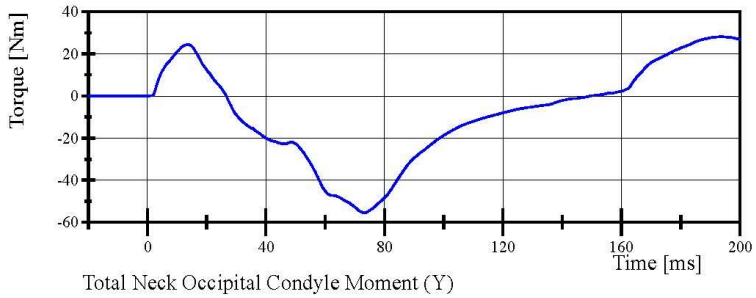
Filter Class: CFC_1000
Max: 506.3 N at 77.1 ms
Min: -231.2 N at 191.3 ms

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



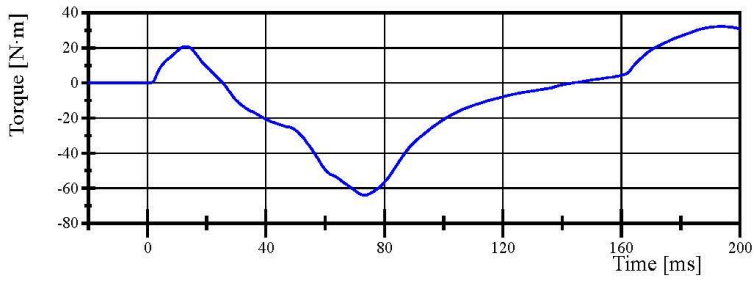
Filter Class: CFC_600
Max: 505.8 N at 77.2 ms
Min: -230.8 N at 190.3 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 28.1 Nm at 193.6 ms
Min: -55.4 Nm at 73.4 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: Without_(Constar
Max: 32.2 N·m at 193.6 ms
Min: -63.9 N·m at 73.5 ms

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

02.03.2021 15:36:42 1992

Transportation Research Center Inc.

Front Thorax
HIII 50th Serial No. 037 Certification No. 71-1
Test Date: 2/3/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.703 m/s	Yes
Probe Force Peak	(-5,160) - (-5,894) N	-5,472.5 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-71.75 mm	Yes
Internal Hysteresis	69 - 85 %	71.1 %	Yes

Test meets specifications.

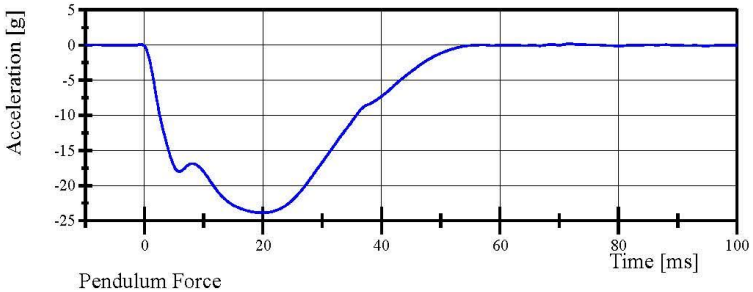
Condition: Used

Comments:
Jacket S/N: 2565
Rib Set S/N: 02033121A

Transportation Research Center Inc.

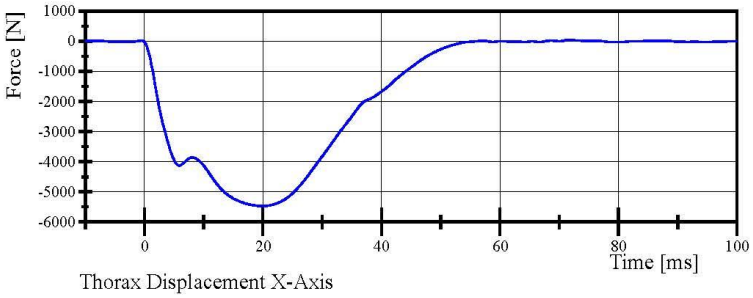
Front Thorax
HIII 50th Serial No. 037 Certification No. 71-1
Test Date: 2/3/2021

Pendulum Acceleration



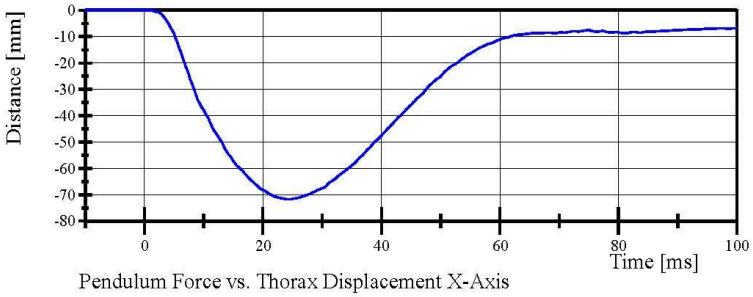
Filter Class: CFC_180
Max: 0.2 g at 71.8 ms
Min: -23.9 g at 19.9 ms

Pendulum Force



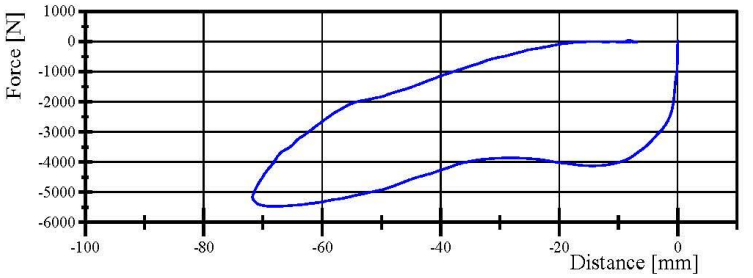
Filter Class: CFC_180
Max: 44.8 N at 71.8 ms
Min: -5,472.5 N at 19.9 ms

Thorax Displacement X-Axis



Filter Class: CFC_600
Max: 0.0 mm at -8.6 ms
Min: -71.8 mm at 24.4 ms

Pendulum Force vs. Thorax Displacement X-Axis



Filter Class: CFC_180
Max: 44.8 N at -8.2 mm
Min: -5,472.5 N at -68.1 mm

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

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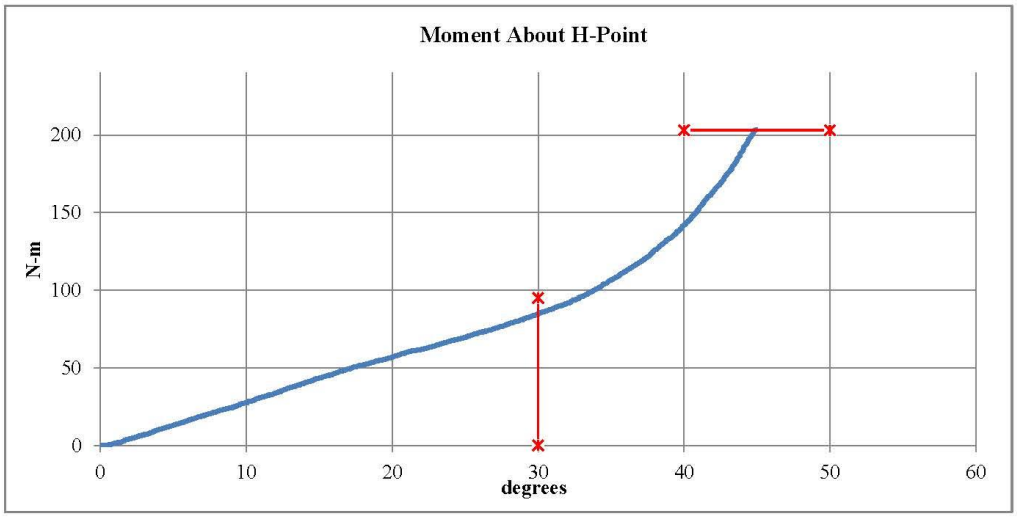
Transportation Research Center Inc.

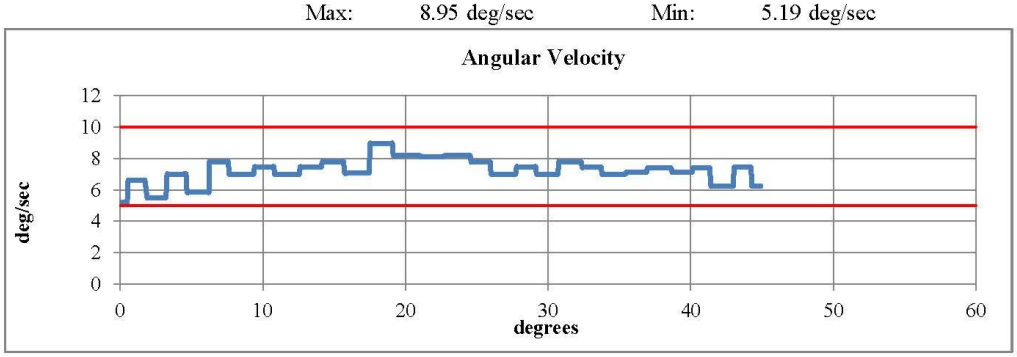
Hybrid III 50th Male Hip Range of Motion

Serial Number:	037	Date:	03-Feb-2021
Side Tested:	Left Hip	Time:	11:47
Test Number:	1		

TEST PARAMETER	SPECIFICATION			TEST RESULTS		
Temperature	18.9	-	25.6	21.4	°C	Pass
Humidity	10	-	70	38	%	Pass
Moment at 30°	0	≤	94.9	85.14	N-m	Pass
Angle at 203 Nm	40	-	50	44.92	deg	Pass
Average Velocity	5	-	10	7.25	deg/sec	Pass



Max: 8.95 deg/sec Min: 5.19 deg/sec



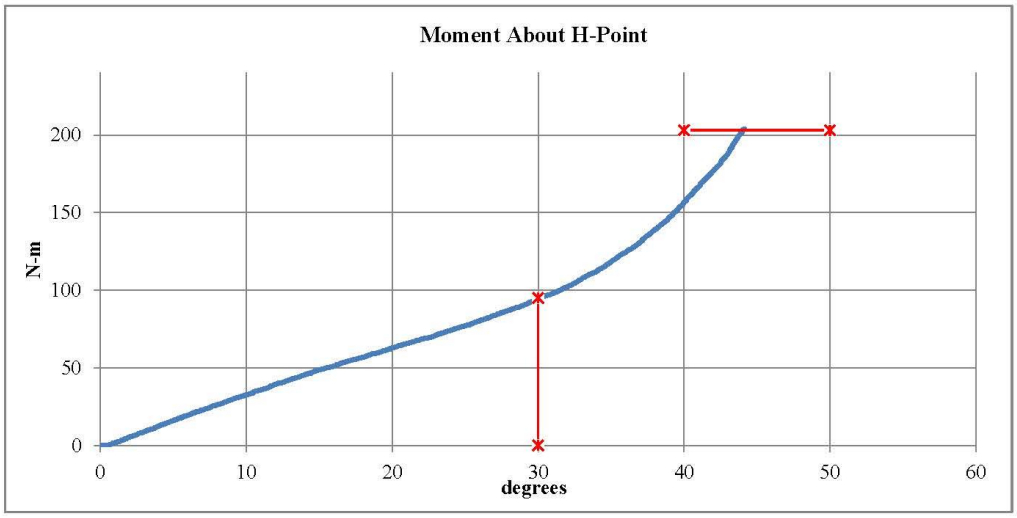
Comments:
Pelvis Skin S/N: EK3565

Transportation Research Center Inc.

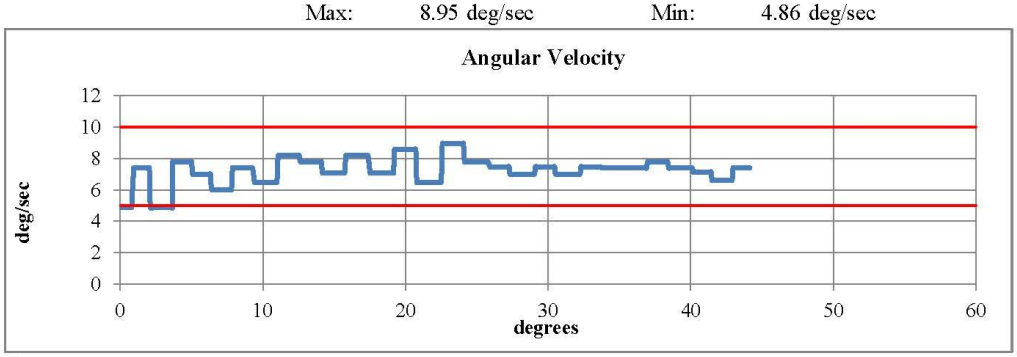
Hybrid III 50th Male Hip Range of Motion

Serial Number:	037	Date:	03-Feb-2021
Side Tested:	Right Hip	Time:	13:02
Test Number:	1		

TEST PARAMETER	SPECIFICATION			TEST RESULTS		
Temperature	18.9	-	25.6	21.7	°C	Pass
Humidity	10	-	70	25	%	Pass
Moment at 30°	0	≤	94.9	94.79	N-m	Pass
Angle at 203 Nm	40	-	50	44.14	deg	Pass
Average Velocity	5	-	10	7.24	deg/sec	Pass



Max: 8.95 deg/sec Min: 4.86 deg/sec



Comments:
Pelvis Skin S/N: EK3565

Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 71-1
Test Date: 2/3/2021

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.103 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,588.41 N	Yes

Test meets specifications.

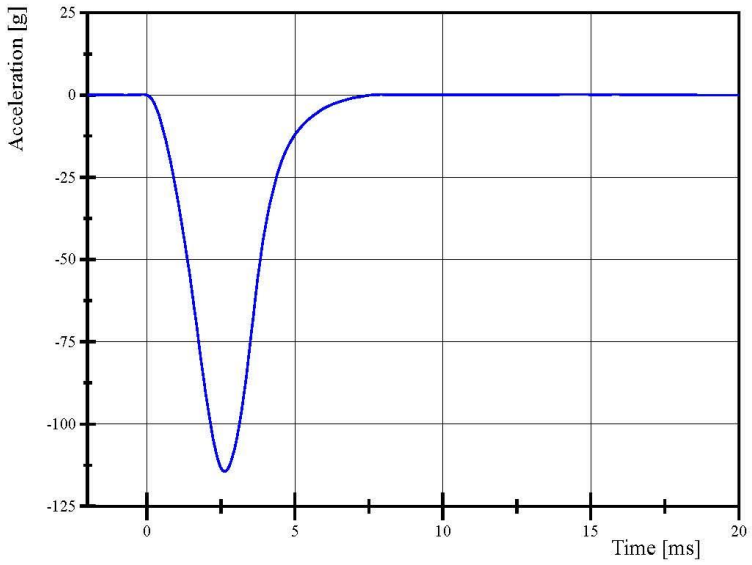
Condition: Used

Comments:
Knee Skin S/N: 2672

Transportation Research Center Inc.

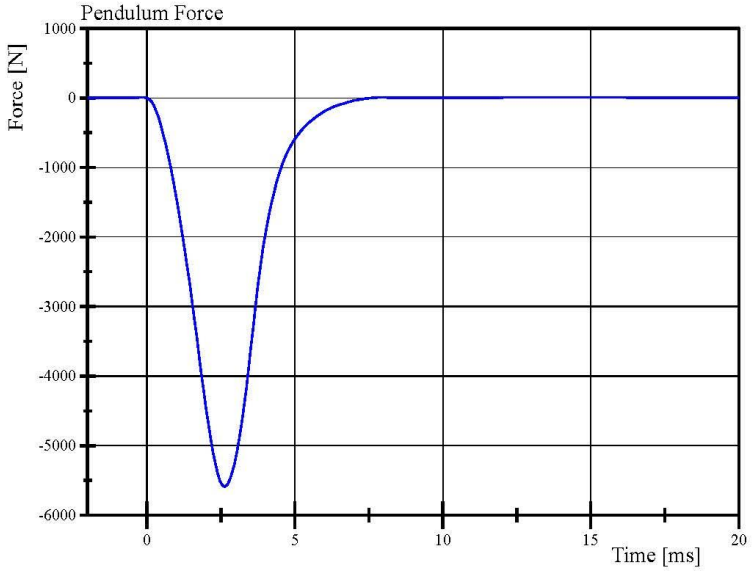
Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 71-1
Test Date: 2/3/2021

Pendulum Acceleration



Filter Class: CFC_600
Max: 0.2 g at -0.2 ms
Min: -114.4 g at 2.6 ms

Pendulum Force



Filter Class: CFC_600
Max: 7.9 N at -0.2 ms
Min: -5,588.4 N at 2.6 ms

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. 71-1
Test Date: 2/3/2021

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.097 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,434.88 N	Yes

Test meets specifications.

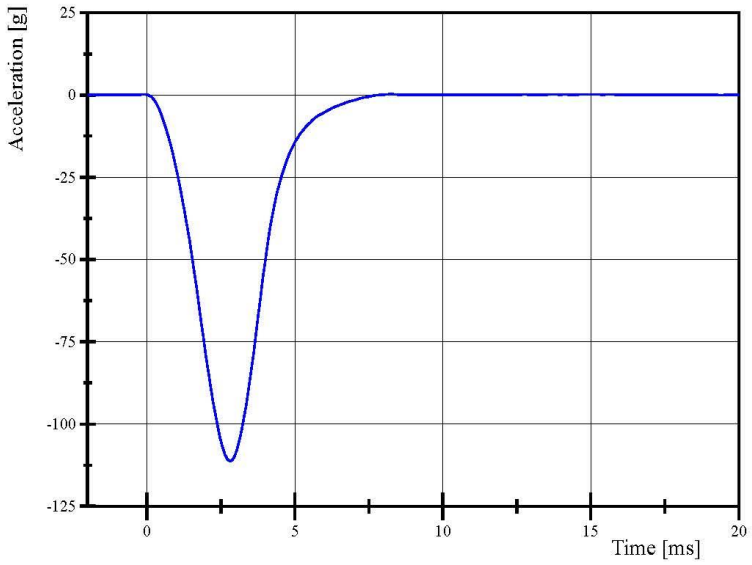
Condition: Used

Comments:
Knee Skin S/N: 1248

Transportation Research Center Inc.

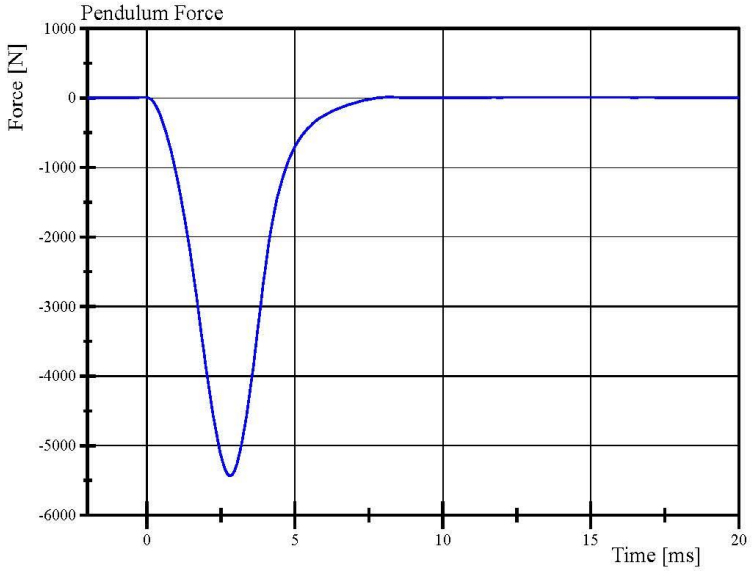
Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 71-1
Test Date: 2/3/2021

Pendulum Acceleration



Filter Class: CFC_600
Max: 0.2 g at 8.2 ms
Min: -111.3 g at 2.8 ms

Pendulum Force



Filter Class: CFC_600
Max: 12.0 N at 8.2 ms
Min: -5,434.9 N at 2.8 ms

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

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Pre-Test Calibration Sheets

Front Passenger S/N 426

Transportation Research Center Inc.
572O HIII 5th Dummy
External Dimensions
Serial No. 426 Calibration No. 54

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	444	Yes
C	Hip Pivot Height	81.3 - 86.3	85	Yes
D	Hip Pivot from Backline	144.8 - 149.8	147	Yes
E	Shoulder Pivot from Backline	68.6 - 83.8	79	Yes
F	Thigh Clearance	119.4 - 134.6	129	Yes
G	Back of Elbow to Wrist Pivot	243.9 - 259.1	249	Yes
H	Head Back to Backline	43.2 - 48.2	45	Yes
I	Shoulder to Elbow Length	276.8 - 297.2	286	Yes
J	Elbow Rest Height	182.8 - 203.2	197	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	225	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

Transportation Research Center Inc.

Front Head Drop
HIII 5th Serial No. 426 Certification No. 54-1
Test Date: 1/6/2021

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Peak Head Resultant Acceleration	250 - 300 g	278.7 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	4.9 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	< 10 %	0.63 %	Yes

Test meets specifications.

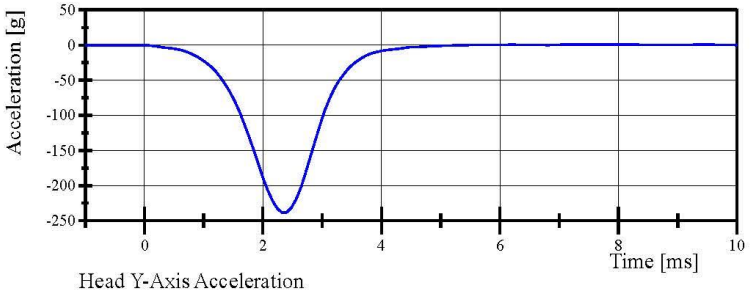
Condition: Used

Comments:
Head Skin S/N: 1348

Transportation Research Center Inc.

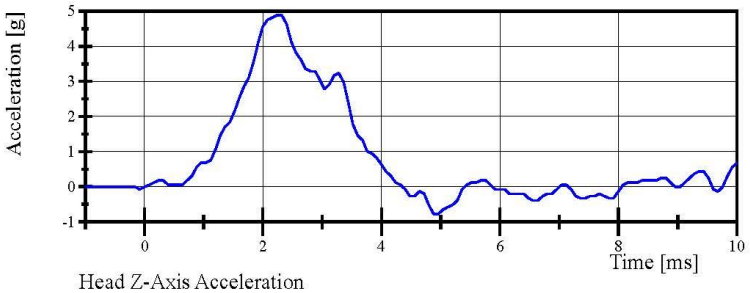
Front Head Drop
HIII 5th Serial No. 426 Certification No. 54-1
Test Date: 1/6/2021

Head X-Axis Acceleration



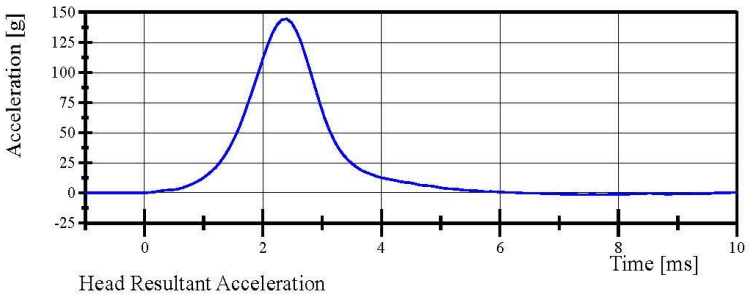
Filter Class: CFC_1000
Max: 1.0 g at 7.8 ms
Min: -238.5 g at 2.3 ms

Head Y-Axis Acceleration



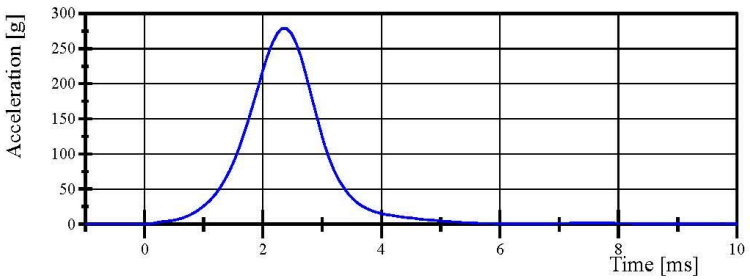
Filter Class: CFC_1000
Max: 4.9 g at 2.2 ms
Min: -0.8 g at 4.9 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 144.5 g at 2.4 ms
Min: -1.4 g at 7.8 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 278.7 g at 2.4 ms
Min: 0.0 g at -1.0 ms

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

01.06.2021 08:55:41 576

Transportation Research Center Inc.

Neck Flexion
HIII 5th Serial No. 426 Certification No. 54-3
Test Date: 1/6/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	7.056 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	(-2.1) - (-2.5) m/s	-2.30 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	(-4.0) - (-5.0) m/s	-4.60 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	(-5.8) - (-7.0) m/s	-6.66 m/s	Yes
Total Head D-Plane Rotation	(-77) - (-91) °	-78.8 °	Yes
Total Neck Occipital Condyles Moment Between -77° and -91° Rotation	69 - 83 N·m	73.3 N·m	Yes
Total Neck Occipital Condyles Moment Decay to 10 N·m	80 - 100 ms	87.7 ms	Yes

Test meets specifications.

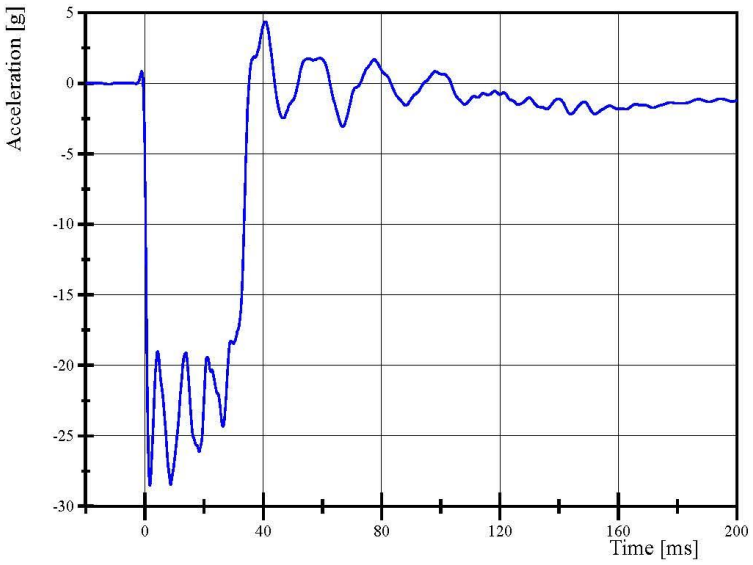
Condition: Used

Comments:
Neck S/N: DM2392

Transportation Research Center Inc.

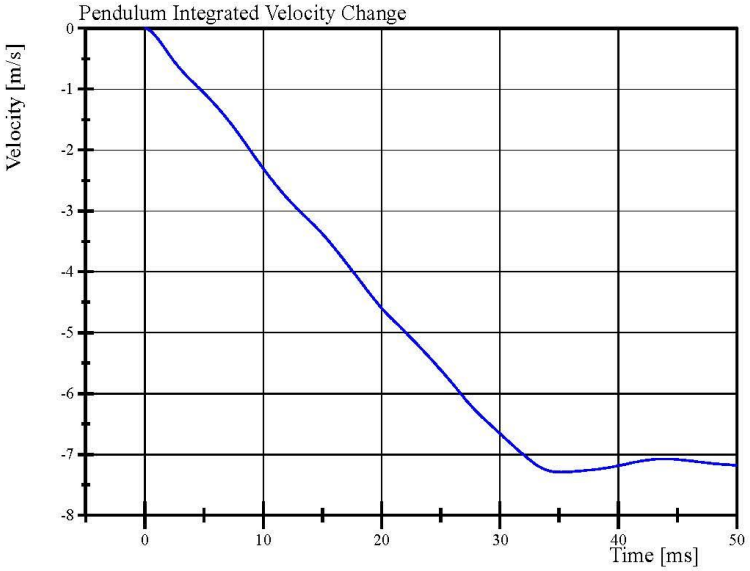
Neck Flexion
HIII 5th Serial No. 426 Certification No. 54-3
Test Date: 1/6/2021

Pendulum Acceleration



Filter Class: CFC_180
Max: 4.4 g at 40.8 ms
Min: -28.5 g at 1.7 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 0.0 m/s at 0.0 ms
Min: -7.3 m/s at 35.2 ms

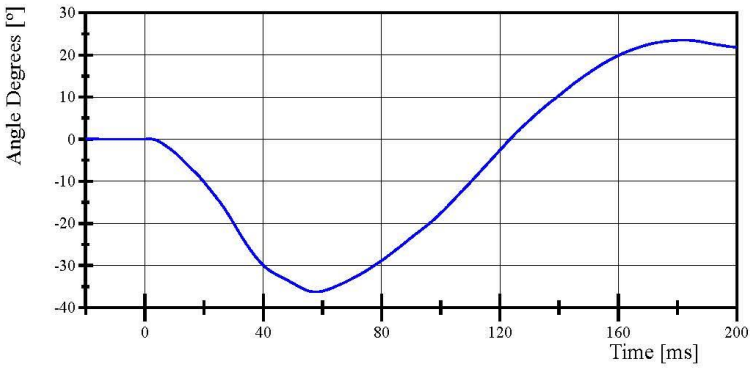
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

01.06.2021 11:05:06 1822

Transportation Research Center Inc.

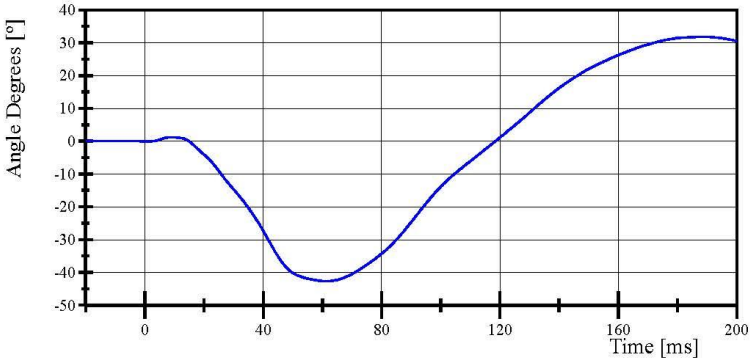
Neck Flexion
HIII 5th Serial No. 426 Certification No. 54-3
Test Date: 1/6/2021

Pot Rotation at the Base of Neck



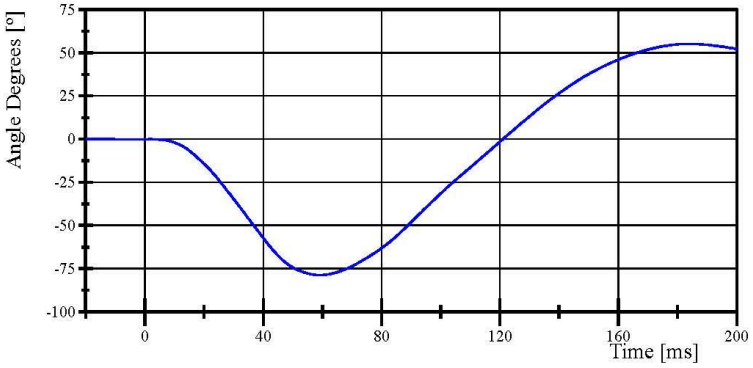
Filter Class: CFC_60
Max: 23.5 ° at 182.1 ms
Min: -36.3 ° at 57.8 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 31.8 ° at 189.0 ms
Min: -42.7 ° at 61.4 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 55.2 ° at 183.5 ms
Min: -78.8 ° at 59.1 ms

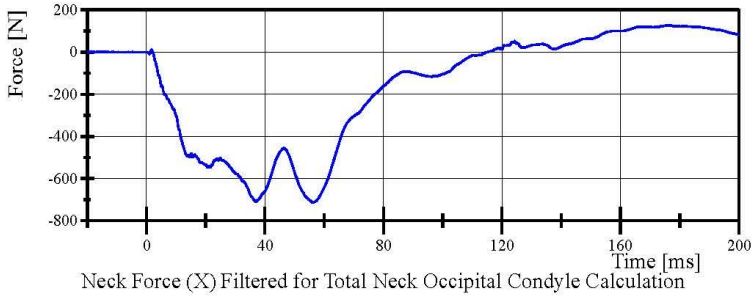
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

01.06.2021 11:05:07 1822

Transportation Research Center Inc.

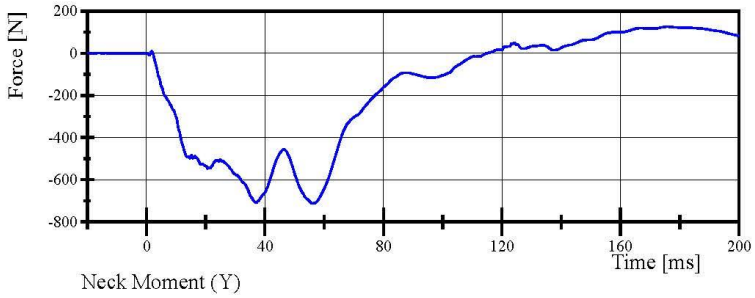
Neck Flexion
HIII 5th Serial No. 426 Certification No. 54-3
Test Date: 1/6/2021

Neck Force (X)



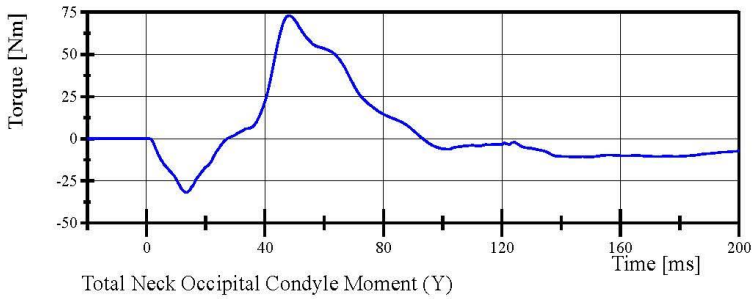
Filter Class: CFC_1000
Max: 126.5 N at 175.6 ms
Min: -712.8 N at 56.2 ms

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



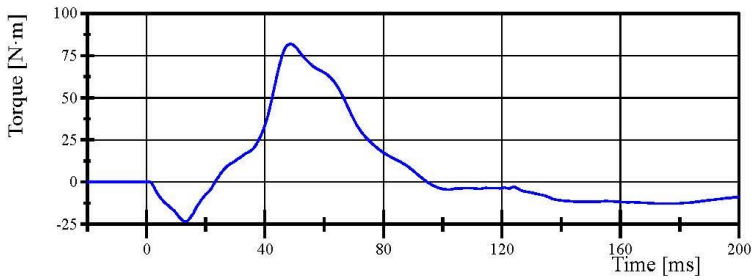
Filter Class: CFC_600
Max: 126.1 N at 176.2 ms
Min: -712.6 N at 56.2 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 73.0 Nm at 48.2 ms
Min: -31.9 Nm at 13.5 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: Without_(Constar
Max: 81.9 N·m at 48.6 ms
Min: -23.3 N·m at 13.3 ms

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

01.06.2021 11:05:07 1822

Transportation Research Center Inc.

Neck Extension
HIII 5th Serial No. 426 Certification No. 54-1
Test Date: 1/6/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Velocity	(-5.95) - (-6.19) m/s	-6.077 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	1.5 - 1.9 m/s	1.86 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	3.1 - 3.9 m/s	3.72 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	4.6 - 5.6 m/s	5.49 m/s	Yes
Total Head D-Plane Rotation	99 - 114 °	106.6 °	Yes
Total Neck Occipital Condyles Moment Between 99° and 114° Rotation	(-53) - (-65) N·m	-59.6 N·m	Yes
Total Neck Occipital Condyles Moment Decay to -10 N·m	94 - 114 ms	103.0 ms	Yes

Test meets specifications.

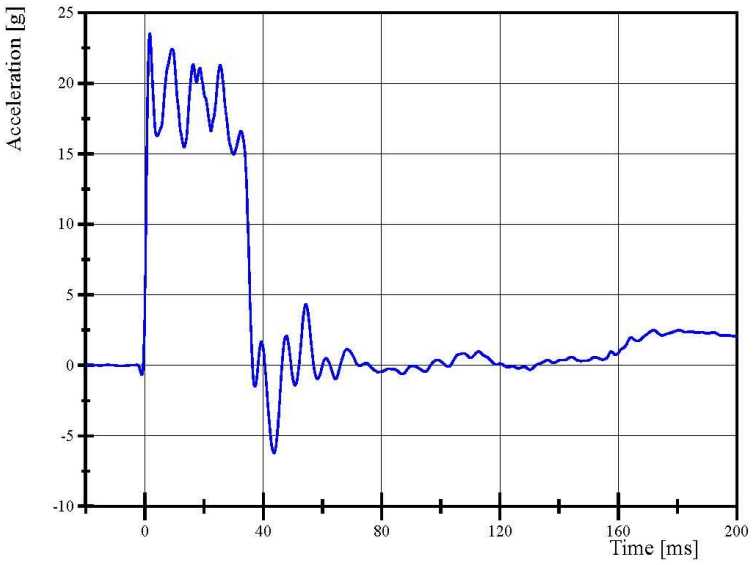
Condition: Used

Comments:
Neck S/N: DM2392

Transportation Research Center Inc.

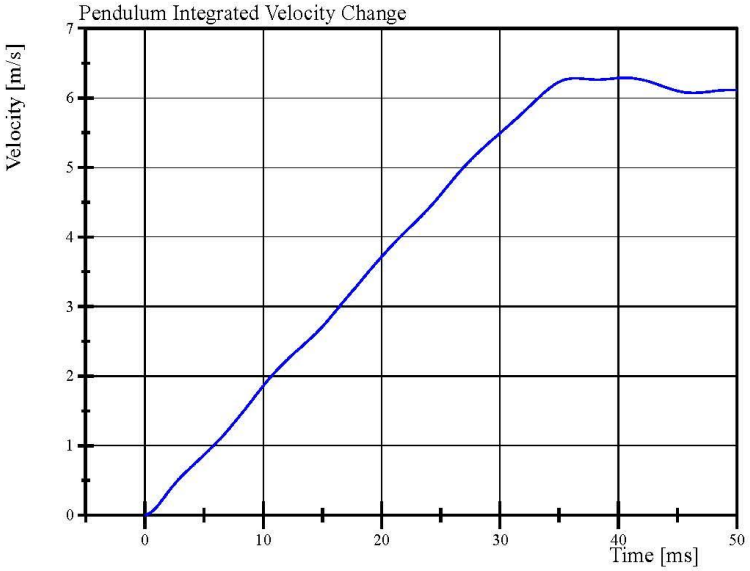
Neck Extension
HIII 5th Serial No. 426 Certification No. 54-1
Test Date: 1/6/2021

Pendulum Acceleration



Filter Class: CFC_180
Max: 23.5 g at 1.7 ms
Min: -6.2 g at 43.7 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 6.3 m/s at 40.6 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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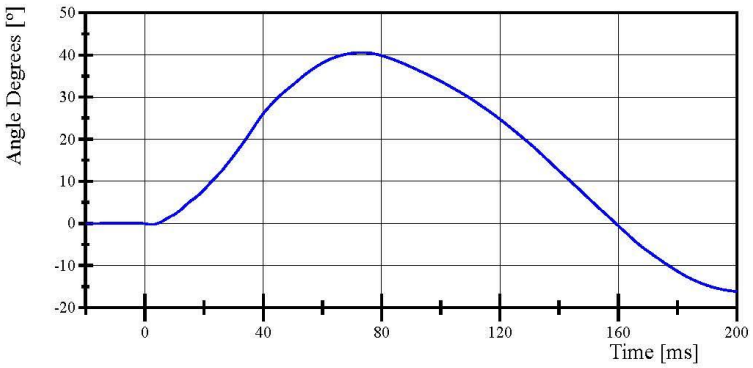
Transportation Research Center Inc.

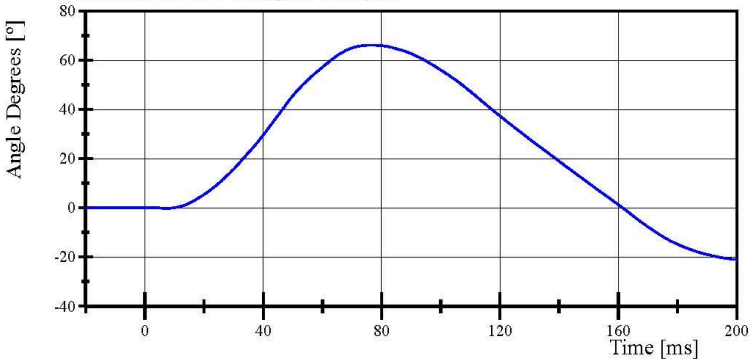
Neck Extension
HIII 5th Serial No. 426 Certification No. 54-1
Test Date: 1/6/2021

Pot Rotation at the Base of Neck



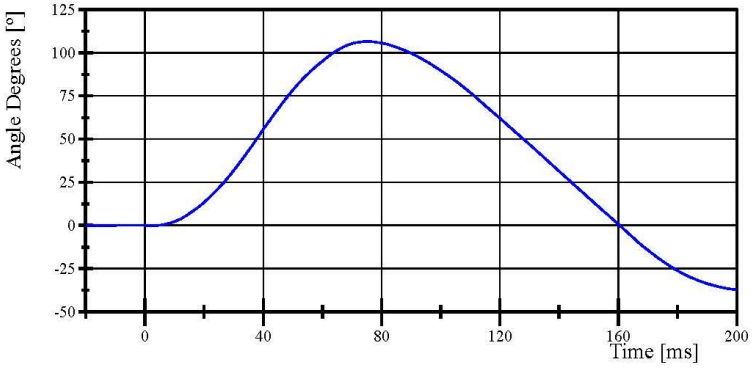
Filter Class: CFC_60
Max: 40.6 ° at 73.2 ms
Min: -16.2 ° at 200.0 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 66.1 ° at 76.5 ms
Min: -21.1 ° at 200.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 106.6 ° at 75.2 ms
Min: -37.3 ° at 200.0 ms

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

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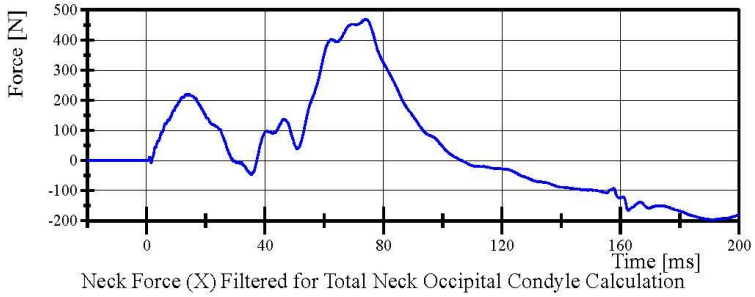
Transportation Research Center Inc.

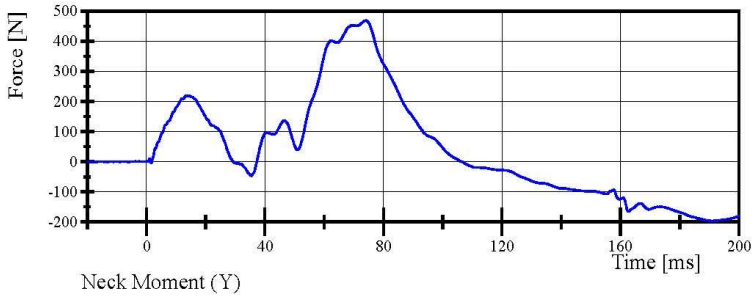
Neck Extension
HIII 5th Serial No. 426 Certification No. 54-1
Test Date: 1/6/2021

Neck Force (X)



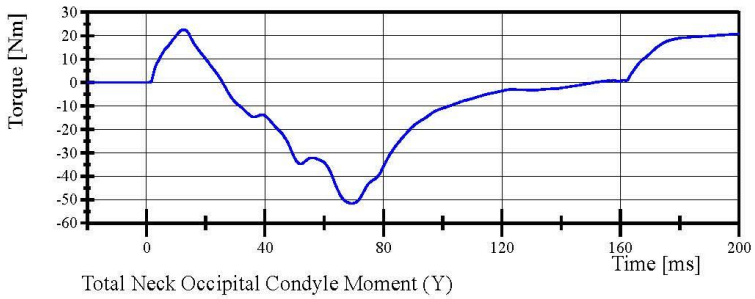
Filter Class: CFC_1000
Max: 469.3 N at 74.1 ms
Min: -197.0 N at 190.7 ms

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



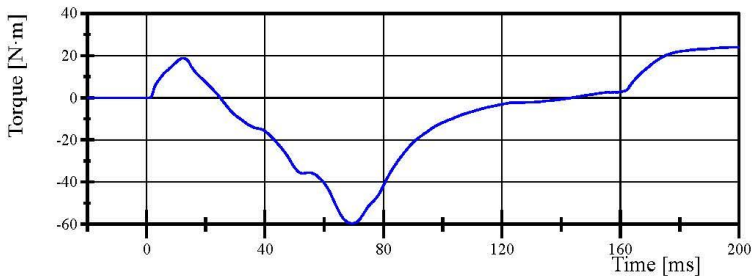
Filter Class: CFC_600
Max: 468.9 N at 74.1 ms
Min: -196.8 N at 190.7 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 22.5 Nm at 12.1 ms
Min: -51.6 Nm at 69.5 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: Without_(Constar
Max: 24.0 N·m at 198.6 ms
Min: -59.6 N·m at 69.4 ms

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

01.06.2021 11:46:53 1968

Transportation Research Center Inc.

Front Thorax
HIII 5th Serial No. 426 Certification No. 54-1
Test Date: 1/6/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.750 m/s	Yes
Probe Force Peak Between 50.0 mm and 58.0 mm Chest Deflection	(-3,900) - (-4,400) N	-4,240.9 N	Yes
Probe Force Peak Between 18.0 mm and 50.0 mm Chest Deflection	>= (-4,600) N	-4,523.7 N	Yes
Maximum Chest Compression	(-50) - (-58) mm	-50.0 mm	Yes
Internal Hysteresis	69 - 85 %	75.3 %	Yes

Test meets specifications.

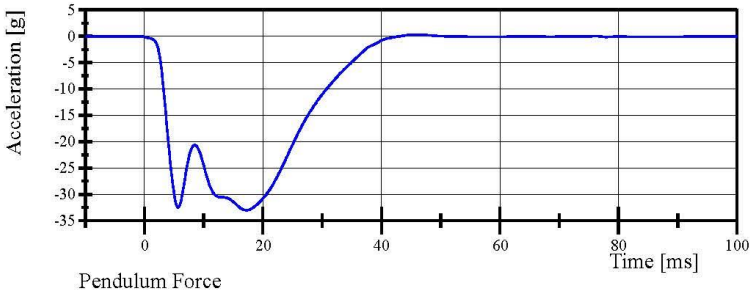
Condition: Used

Comments:
Jacket S/N: DG9935
Rib Set S/N: DJ1164

Transportation Research Center Inc.

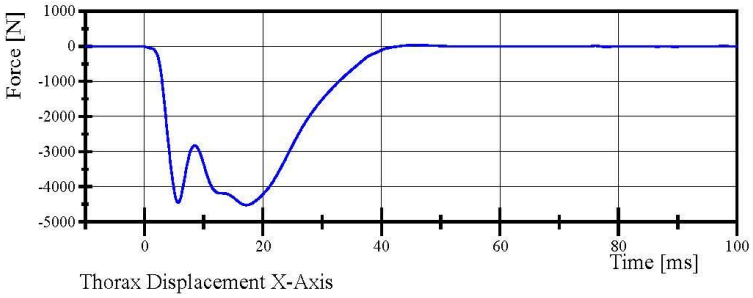
Front Thorax
HIII 5th Serial No. 426 Certification No. 54-1
Test Date: 1/6/2021

Pendulum Acceleration



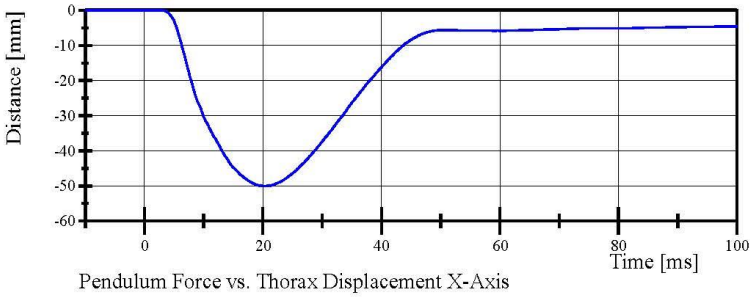
Filter Class: CFC_180
Max: 0.2 g at 45.5 ms
Min: -33.0 g at 17.2 ms

Pendulum Force



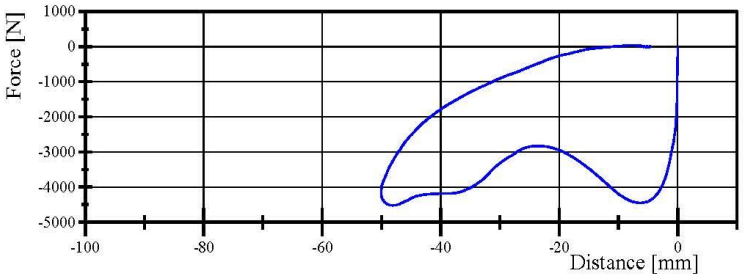
Filter Class: CFC_180
Max: 33.2 N at 45.5 ms
Min: -4,523.7 N at 17.2 ms

Thorax Displacement X-Axis



Filter Class: CFC_600
Max: 0.0 mm at -9.1 ms
Min: -50.0 mm at 20.3 ms

Pendulum Force vs. Thorax Displacement X-Axis



Filter Class: CFC_180
Max: 33.2 N at -7.8 mm
Min: -4,523.7 N at -48.1 mm

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

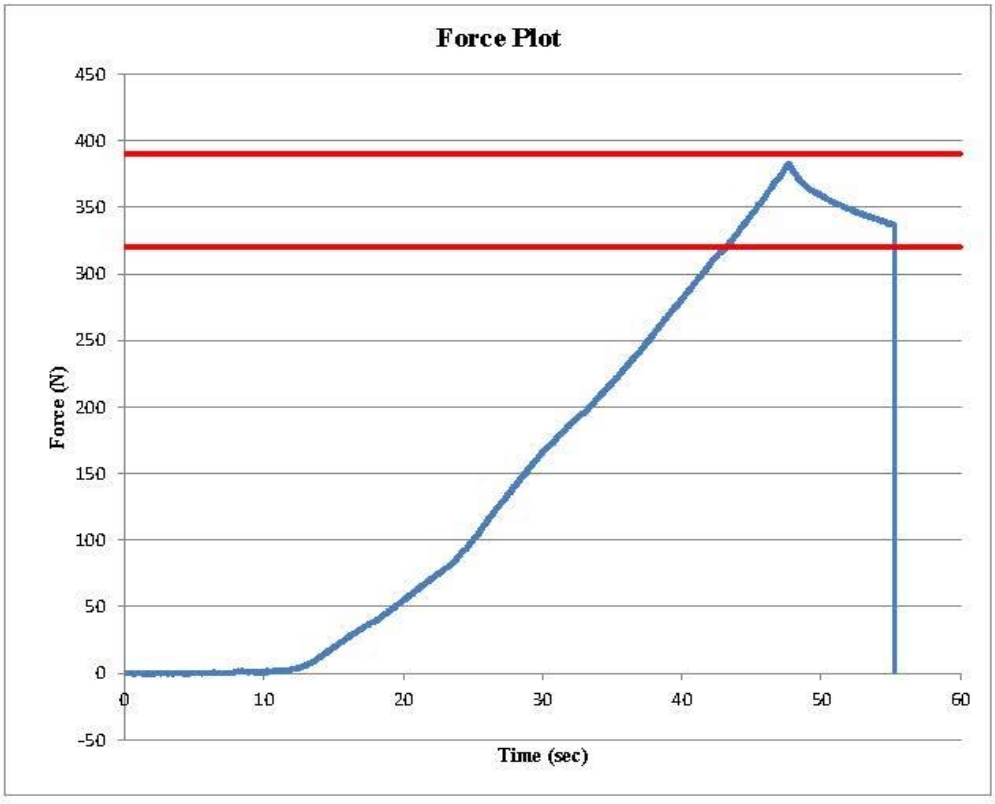
01.06.2021 13:16:08 420

Transportation Research Center Inc.

Hybrid III Small Female Torso Flexion

Customer:	NHTSA		
Serial Number:	426	Date:	01/06/2021
Test Number:	1	Time:	14:38

TEST PARAMETER	SPECIFICATION			TEST RESULTS		
Temperature	18.9	-	25.6	21.8	°C	Pass
Humidity	10	-	70	40	%	Pass
Average Angular Velocity	0.5	-	1.5	0.83	deg/sec	Pass
Initial Angle	0	-	20	15.8	deg	Pass
Peak Force at 45.13°	320	-	390	382.14	N	Pass
Final Angle	-8	-	8	7.77	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. 54-1
Test Date: 1/6/2021

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.108 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-4,009.5 N	Yes

Test meets specifications.

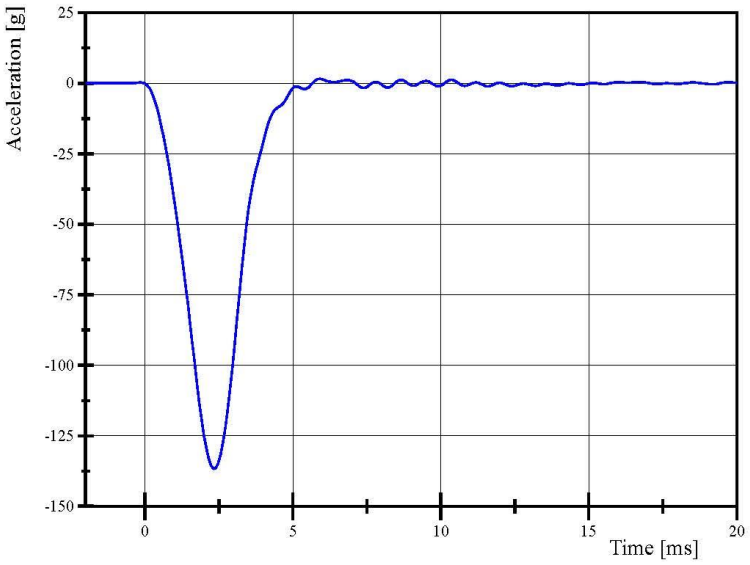
Condition: Used

Comments:

Transportation Research Center Inc.

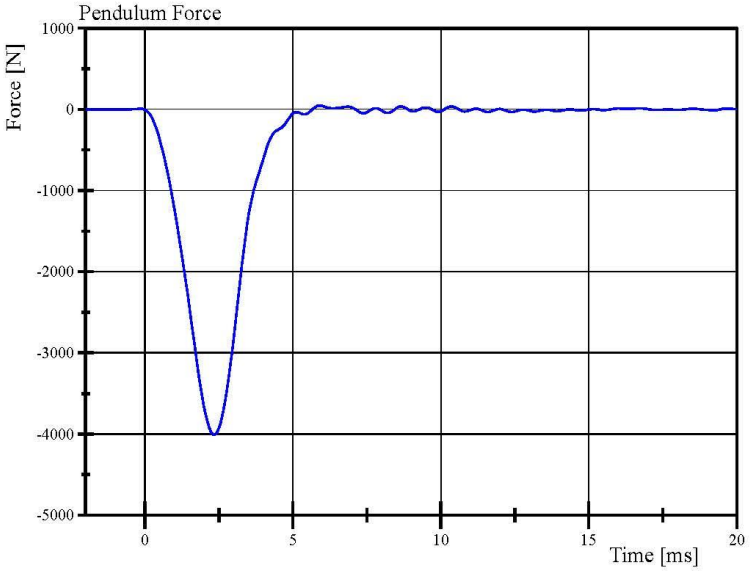
Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 54-1
Test Date: 1/6/2021

Pendulum Acceleration



Filter Class: CFC_600
Max: 1.6 g at 5.9 ms
Min: -136.7 g at 2.3 ms

Pendulum Force



Filter Class: CFC_600
Max: 46.8 N at 5.9 ms
Min: -4,009.5 N at 2.3 ms

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

01.06.2021 10:00:45 1696

Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 54-1
Test Date: 1/6/2021

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.107 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,853.4 N	Yes

Test meets specifications.

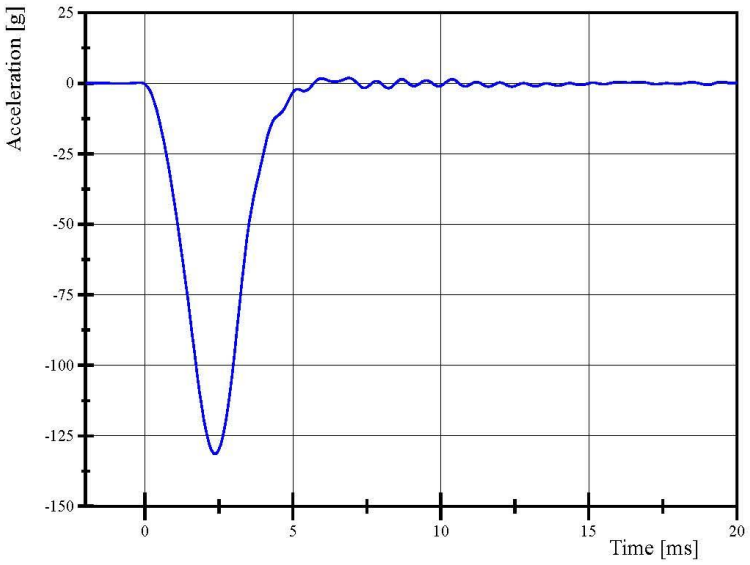
Condition: Used

Comments:
Knee Skin S/N: 1402

Transportation Research Center Inc.

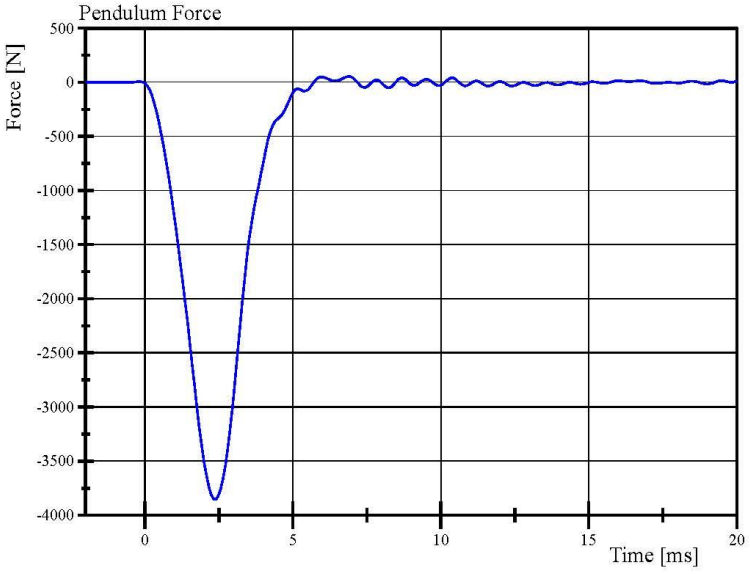
Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 54-1
Test Date: 1/6/2021

Pendulum Acceleration



Filter Class: CFC_600
Max: 1.8 g at 6.9 ms
Min: -131.4 g at 2.4 ms

Pendulum Force



Filter Class: CFC_600
Max: 54.2 N at 6.9 ms
Min: -3,853.4 N at 2.4 ms

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

01.06.2021 10:03:56 1696

Post-Test Calibration Sheets

Front Passenger S/N 426

Transportation Research Center Inc.
572O HIII 5th Dummy
External Dimensions
Serial No. 426 Calibration No. 55

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	444	Yes
C	Hip Pivot Height	81.3 - 86.3	85	Yes
D	Hip Pivot from Backline	144.8 - 149.8	147	Yes
E	Shoulder Pivot from Backline	68.6 - 83.8	79	Yes
F	Thigh Clearance	119.4 - 134.6	129	Yes
G	Back of Elbow to Wrist Pivot	243.9 - 259.1	249	Yes
H	Head Back to Backline	43.2 - 48.2	45	Yes
I	Shoulder to Elbow Length	276.8 - 297.2	286	Yes
J	Elbow Rest Height	182.8 - 203.2	197	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	225	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

Transportation Research Center Inc.

Front Head Drop
HIII 5th Serial No. 426 Certification No. 55-1
Test Date: 2/3/2021

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Peak Head Resultant Acceleration	250 - 300 g	281.2 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-3.3 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	< 10 %	0.57 %	Yes

Test meets specifications.

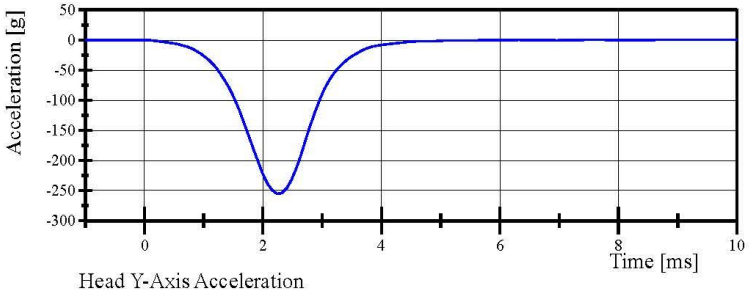
Condition: Used

Comments:
Head Skin S/N: 1348

Transportation Research Center Inc.

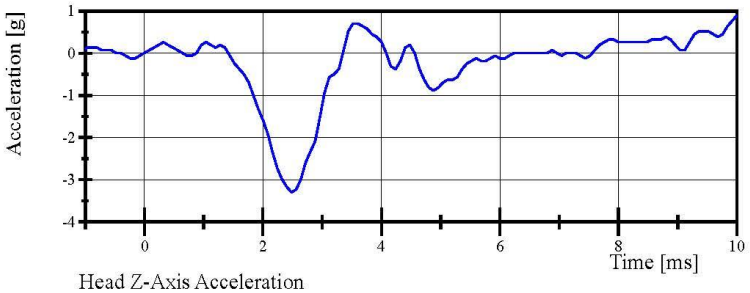
Front Head Drop
HIII 5th Serial No. 426 Certification No. 55-1
Test Date: 2/3/2021

Head X-Axis Acceleration



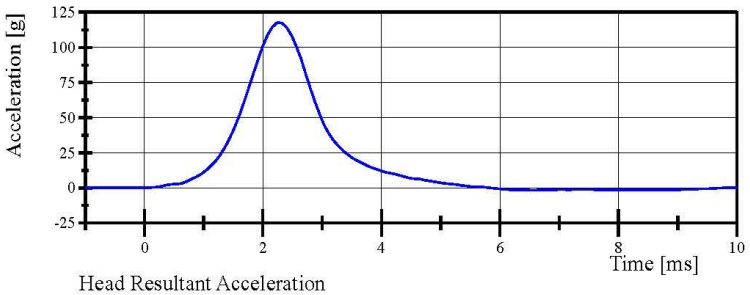
Filter Class: CFC_1000
Max: 0.7 g at 9.3 ms
Min: -255.4 g at 2.2 ms

Head Y-Axis Acceleration



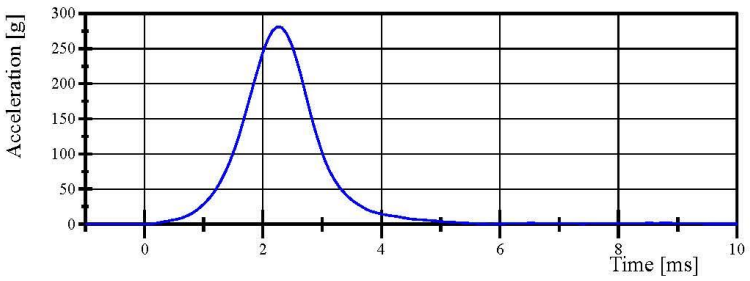
Filter Class: CFC_1000
Max: 0.9 g at 10.0 ms
Min: -3.3 g at 2.5 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 117.6 g at 2.2 ms
Min: -1.6 g at 6.6 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 281.2 g at 2.2 ms
Min: 0.1 g at -0.3 ms

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

02.03.2021 09:09:52 576

Transportation Research Center Inc.

Neck Flexion
HIII 5th Serial No. 426 Certification No. 55-2
Test Date: 2/3/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	27 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	7.048 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	(-2.1) - (-2.5) m/s	-2.36 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	(-4.0) - (-5.0) m/s	-4.72 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	(-5.8) - (-7.0) m/s	-6.83 m/s	Yes
Total Head D-Plane Rotation	(-77) - (-91) °	-80.7 °	Yes
Total Neck Occipital Condyles Moment Between -77° and -91° Rotation	69 - 83 N·m	76.1 N·m	Yes
Total Neck Occipital Condyles Moment Decay to 10 N·m	80 - 100 ms	86.2 ms	Yes

Test meets specifications.

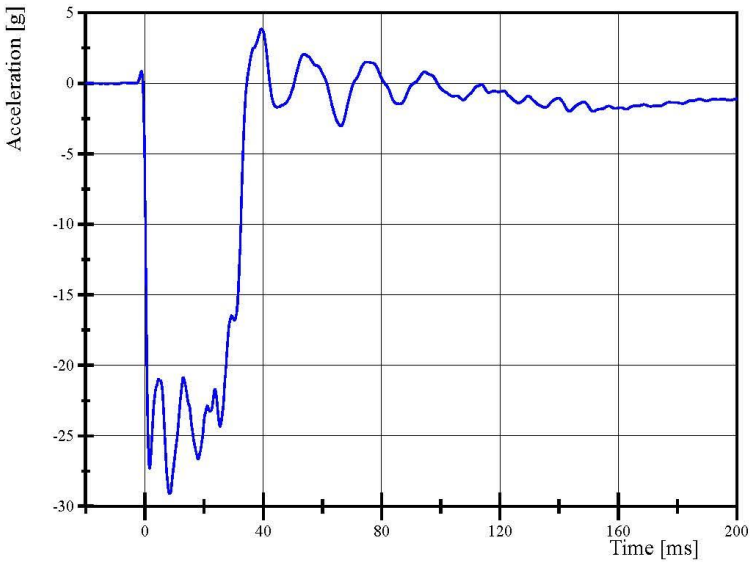
Condition: Used

Comments:
Neck S/N: DM2392

Transportation Research Center Inc.

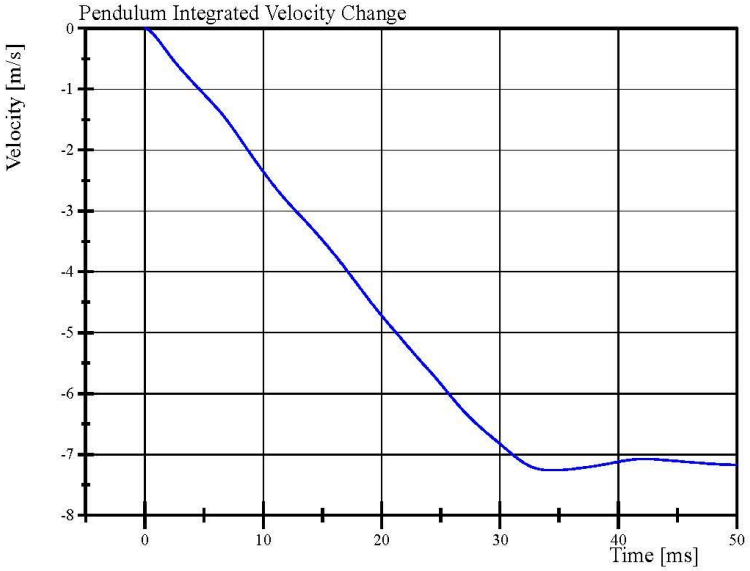
Neck Flexion
HIII 5th Serial No. 426 Certification No. 55-2
Test Date: 2/3/2021

Pendulum Acceleration



Filter Class: CFC_180
Max: 3.9 g at 39.4 ms
Min: -29.1 g at 8.4 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 0.0 m/s at 0.0 ms
Min: -7.3 m/s at 34.4 ms

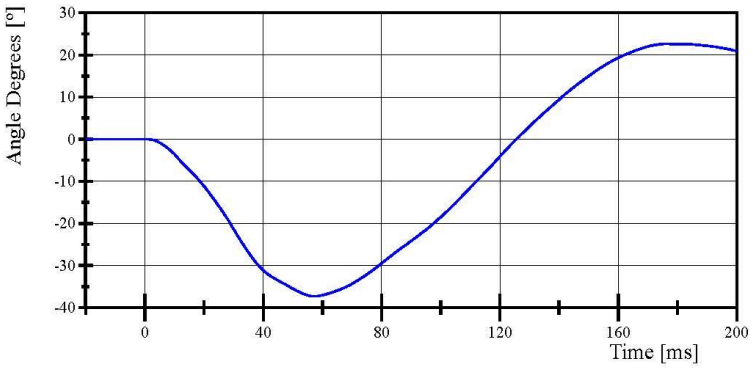
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

02.03.2021 10:50:15 1824

Transportation Research Center Inc.

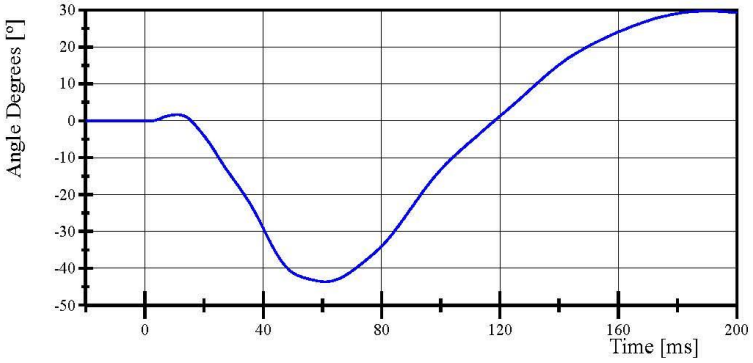
Neck Flexion
HIII 5th Serial No. 426 Certification No. 55-2
Test Date: 2/3/2021

Pot Rotation at the Base of Neck



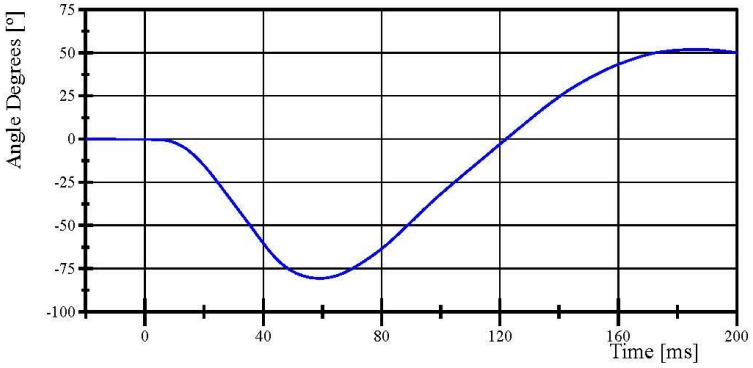
Filter Class: CFC_60
Max: 22.6 ° at 176.2 ms
Min: -37.3 ° at 57.3 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 29.7 ° at 190.2 ms
Min: -43.6 ° at 60.9 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 52.0 ° at 185.9 ms
Min: -80.7 ° at 59.1 ms

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

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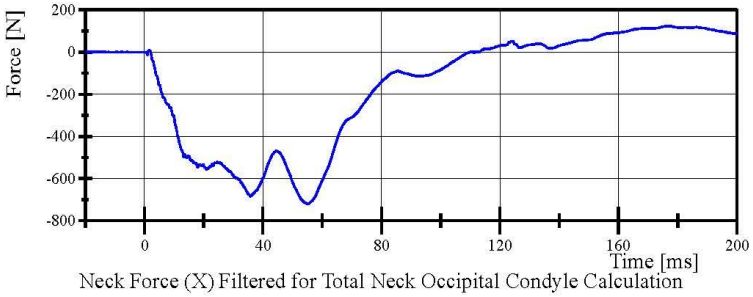
Transportation Research Center Inc.

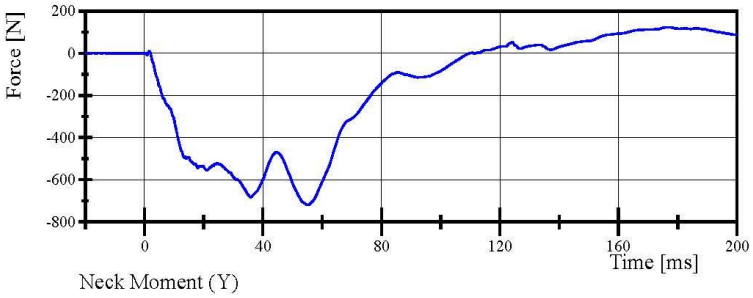
Neck Flexion
HIII 5th Serial No. 426 Certification No. 55-2
Test Date: 2/3/2021

Neck Force (X)



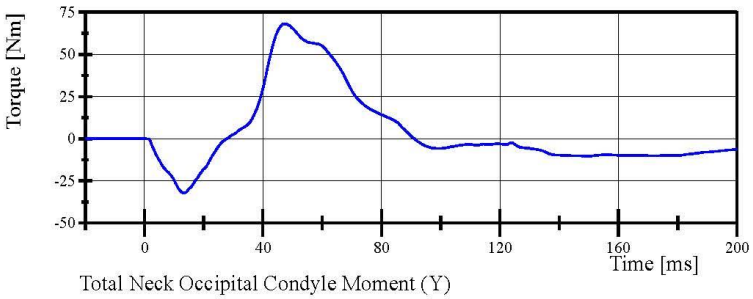
Filter Class: CFC_1000
Max: 124.0 N at 177.0 ms
Min: -719.6 N at 55.3 ms

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



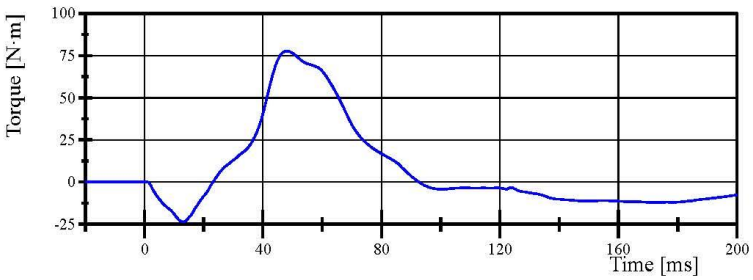
Filter Class: CFC_600
Max: 123.8 N at 177.1 ms
Min: -719.7 N at 55.3 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 68.2 Nm at 47.2 ms
Min: -32.4 Nm at 13.3 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: Without_(Constar
Max: 77.7 N·m at 48.1 ms
Min: -23.6 N·m at 13.2 ms

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

02.03.2021 10:50:16 1824

Transportation Research Center Inc.

Neck Extension
HIII 5th Serial No. 426 Certification No. 55-1
Test Date: 2/3/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	38 %	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	1.65 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	3.1 - 3.9 m/s	3.33 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	4.6 - 5.6 m/s	5.00 m/s	Yes
Total Head D-Plane Rotation	99 - 114 °	108.1 °	Yes
Total Neck Occipital Condyles Moment Between 99° and 114° Rotation	(-53) - (-65) N·m	-58.6 N·m	Yes
Total Neck Occipital Condyles Moment Decay to -10 N·m	94 - 114 ms	105.5 ms	Yes

Test meets specifications.

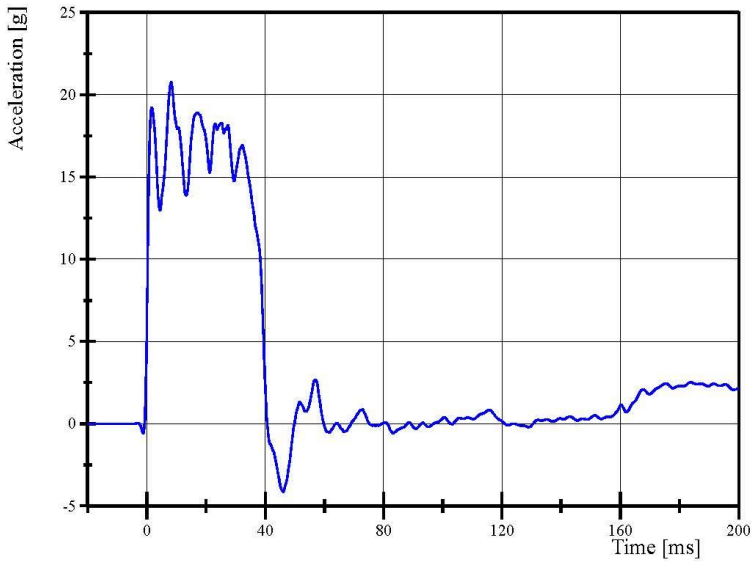
Condition: Used

Comments:
Neck S/N: DM2392

Transportation Research Center Inc.

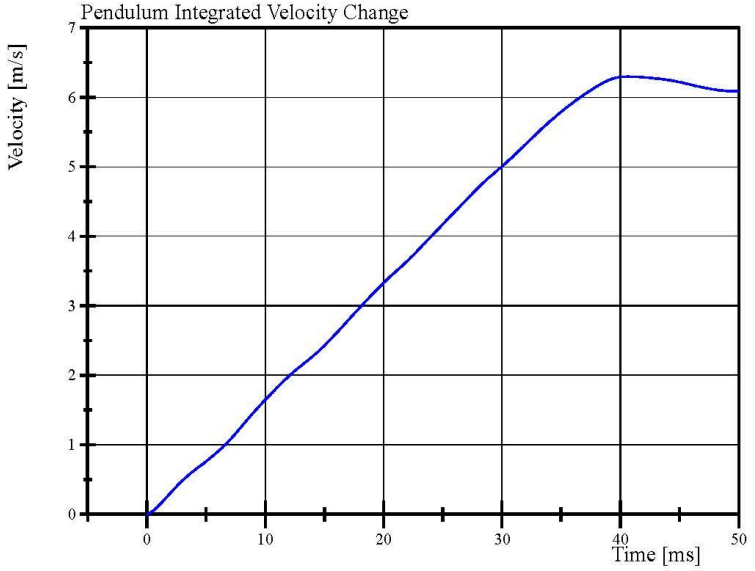
Neck Extension
HIII 5th Serial No. 426 Certification No. 55-1
Test Date: 2/3/2021

Pendulum Acceleration



Filter Class: CFC_180
Max: 20.8 g at 8.2 ms
Min: -4.1 g at 46.1 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 6.3 m/s at 40.7 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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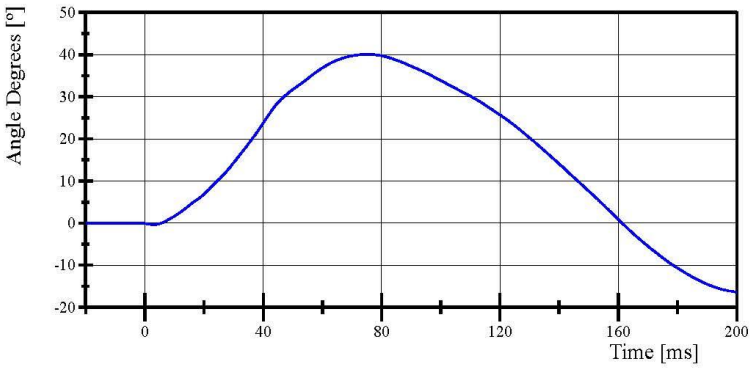
Transportation Research Center Inc.

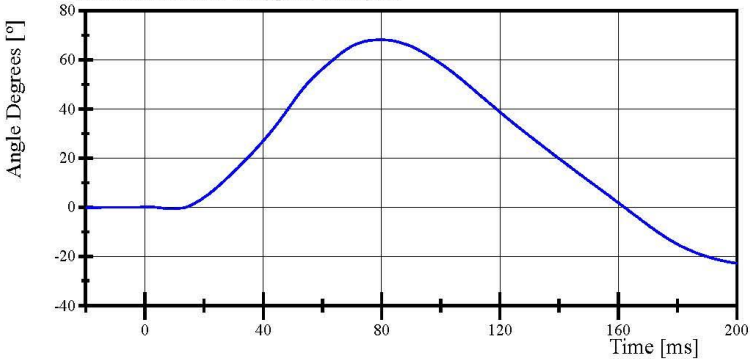
Neck Extension
HIII 5th Serial No. 426 Certification No. 55-1
Test Date: 2/3/2021

Pot Rotation at the Base of Neck



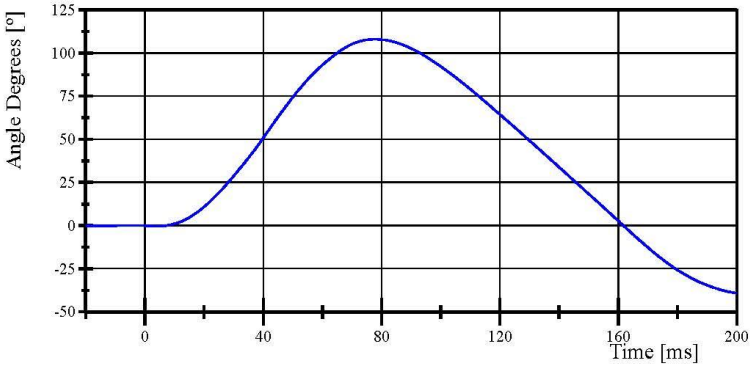
Filter Class: CFC_60
Max: 40.1 ° at 75.2 ms
Min: -16.4 ° at 200.0 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 68.1 ° at 79.6 ms
Min: -22.8 ° at 200.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 108.1 ° at 77.7 ms
Min: -39.2 ° at 200.0 ms

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

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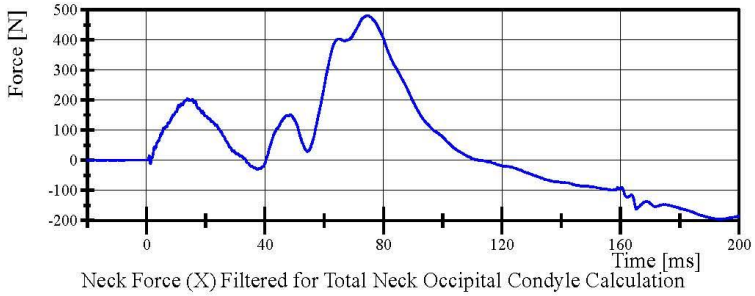
Transportation Research Center Inc.

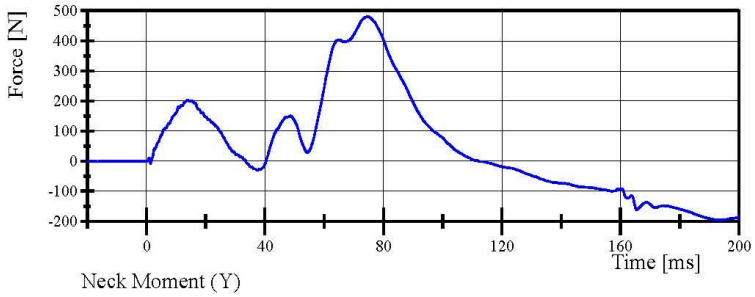
Neck Extension
HIII 5th Serial No. 426 Certification No. 55-1
Test Date: 2/3/2021

Neck Force (X)



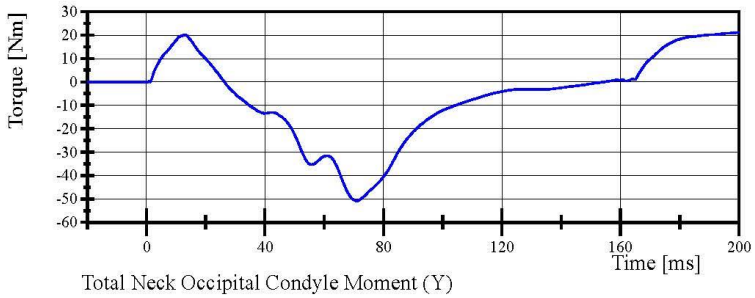
Filter Class: CFC_1000
Max: 481.7 N at 74.8 ms
Min: -196.1 N at 194.1 ms

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



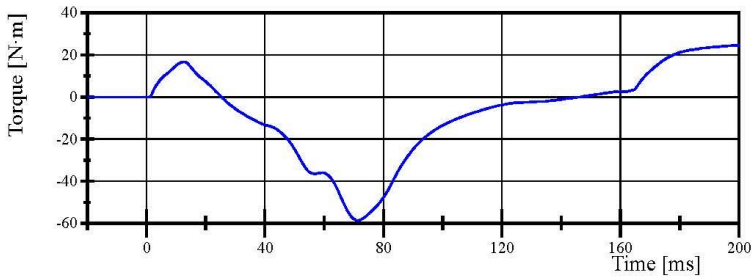
Filter Class: CFC_600
Max: 481.7 N at 74.8 ms
Min: -195.9 N at 194.2 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 21.1 Nm at 200.0 ms
Min: -50.8 Nm at 70.9 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: Without_(Constar
Max: 24.4 N·m at 200.0 ms
Min: -58.6 N·m at 71.4 ms

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

02.03.2021 11:31:41 1972

Transportation Research Center Inc.

Front Thorax
HIII 5th Serial No. 426 Certification No. 55-2
Test Date: 2/3/2021

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.817 m/s	Yes
Probe Force Peak Between 50.0 mm and 58.0 mm Chest Deflection	(-3,900) - (-4,400) N	-4,379.7 N	Yes
Probe Force Peak Between 18.0 mm and 50.0 mm Chest Deflection	>= (-4,600) N	-4,562.2 N	Yes
Maximum Chest Compression	(-50) - (-58) mm	-50.4 mm	Yes
Internal Hysteresis	69 - 85 %	75.6 %	Yes

Test meets specifications.

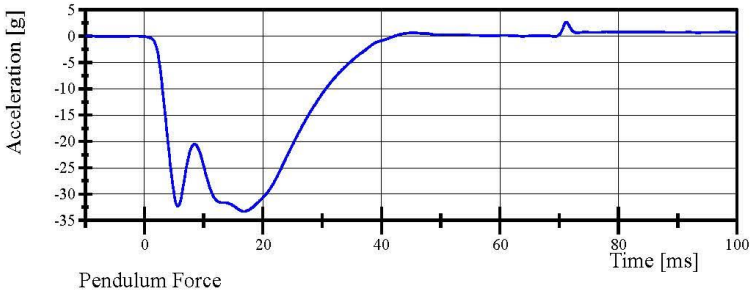
Condition: Used

Comments:
Jacket S/N: DG9935
Rib Set S/N: DJ1164

Transportation Research Center Inc.

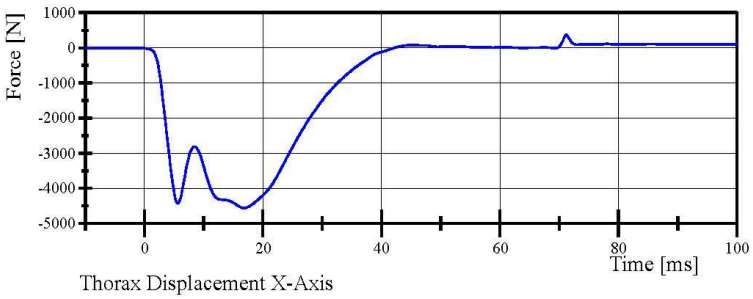
Front Thorax
HIII 5th Serial No. 426 Certification No. 55-2
Test Date: 2/3/2021

Pendulum Acceleration



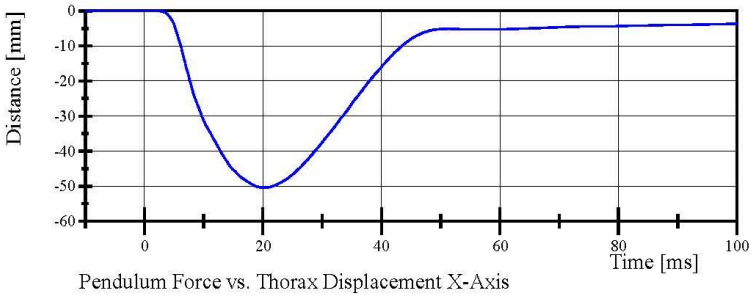
Filter Class: CFC_180
Max: 2.7 g at 71.2 ms
Min: -33.3 g at 16.8 ms

Pendulum Force



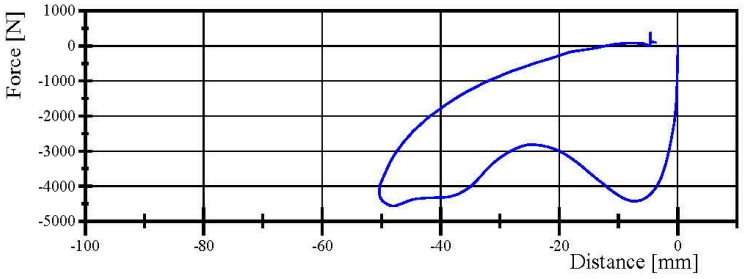
Filter Class: CFC_180
Max: 368.1 N at 71.2 ms
Min: -4,562.2 N at 16.8 ms

Thorax Displacement X-Axis



Filter Class: CFC_600
Max: 0.0 mm at -7.7 ms
Min: -50.4 mm at 20.2 ms

Pendulum Force vs. Thorax Displacement X-Axis



Filter Class: CFC_180
Max: 368.1 N at -4.6 mm
Min: -4,562.2 N at -48.0 mm

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

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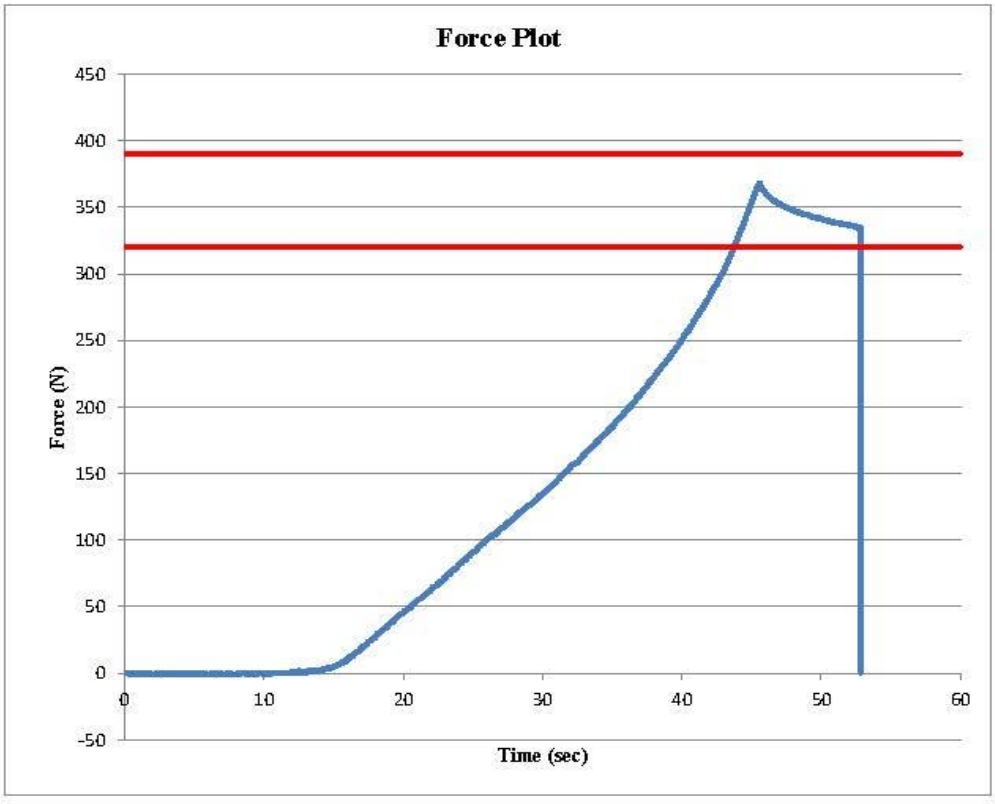
Transportation Research Center Inc.

Hybrid III Small Female Torso Flexion

Customer:	NHTSA		
Serial Number:	426	Date:	2/4/2021
Test Number:	1	Time:	10:01

TEST PARAMETER	SPECIFICATION			TEST RESULTS		
Temperature	18.9	-	25.6	21.7	°C	Pass
Humidity	10	-	70	21	%	Pass
Average Angular Velocity	0.5	-	1.5	0.97	deg/sec	Pass
Initial Angle	0	-	20	14.04	deg	Pass
Peak Force at 45.13°	320	-	390	367.66	N	Pass
Final Angle	-8	-	8	5.39	deg	Pass



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. 55-1
Test Date: 2/3/2021

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	29 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.105 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-4,005.4 N	Yes

Test meets specifications.

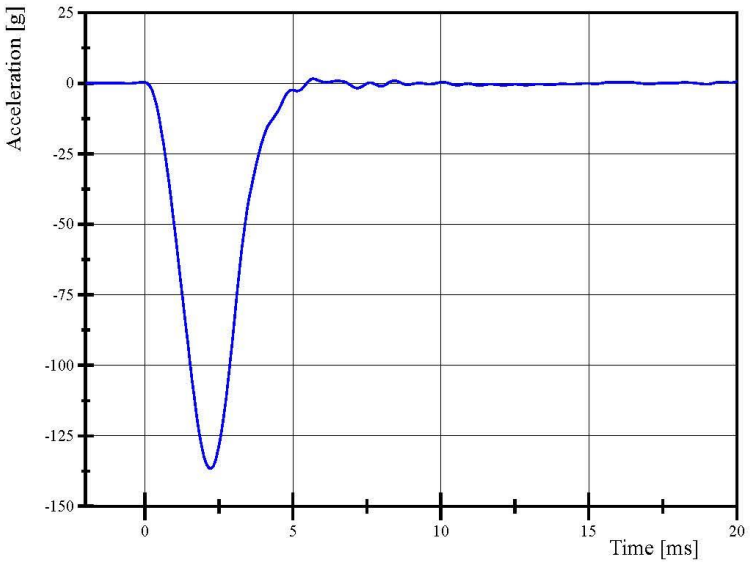
Condition: Used

Comments:
Knee Skin S/N: 1366

Transportation Research Center Inc.

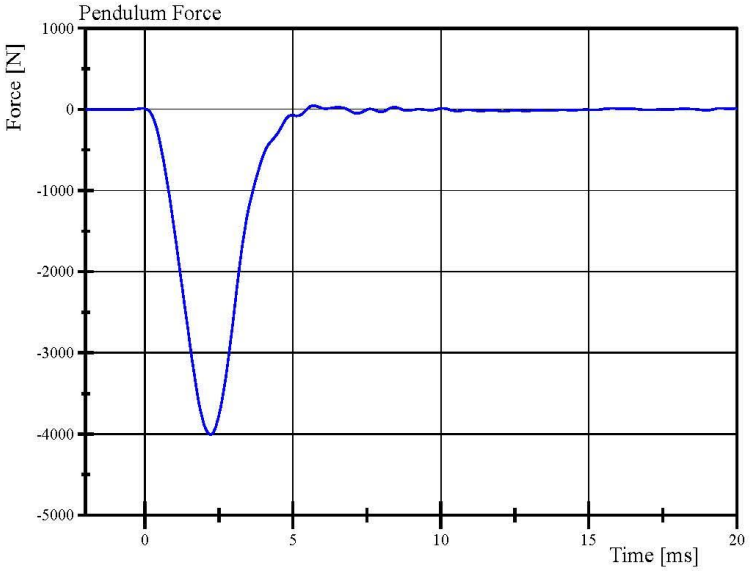
Left Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 55-1
Test Date: 2/3/2021

Pendulum Acceleration



Filter Class: CFC_600
Max: 1.6 g at 5.7 ms
Min: -136.6 g at 2.2 ms

Pendulum Force



Filter Class: CFC_600
Max: 47.4 N at 5.7 ms
Min: -4,005.4 N at 2.2 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. 55-1
Test Date: 2/3/2021

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	28 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.119 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,909.6 N	Yes

Test meets specifications.

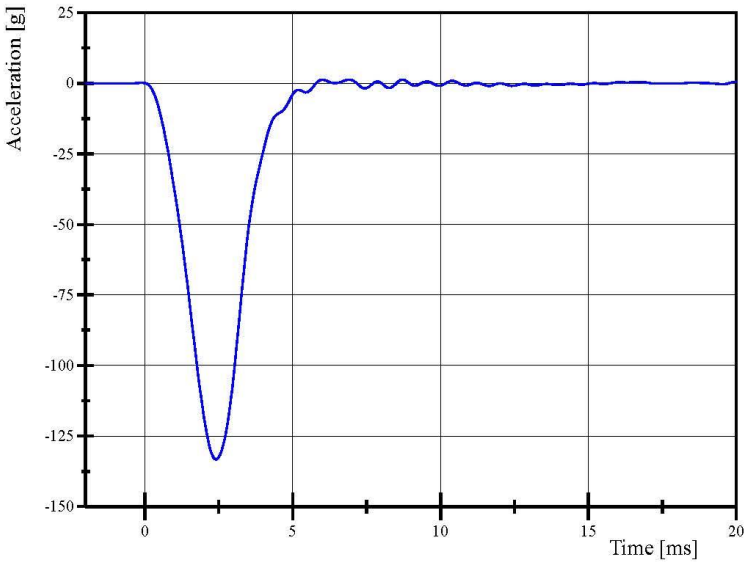
Condition: Used

Comments:
Knee Skin S/N: 1402

Transportation Research Center Inc.

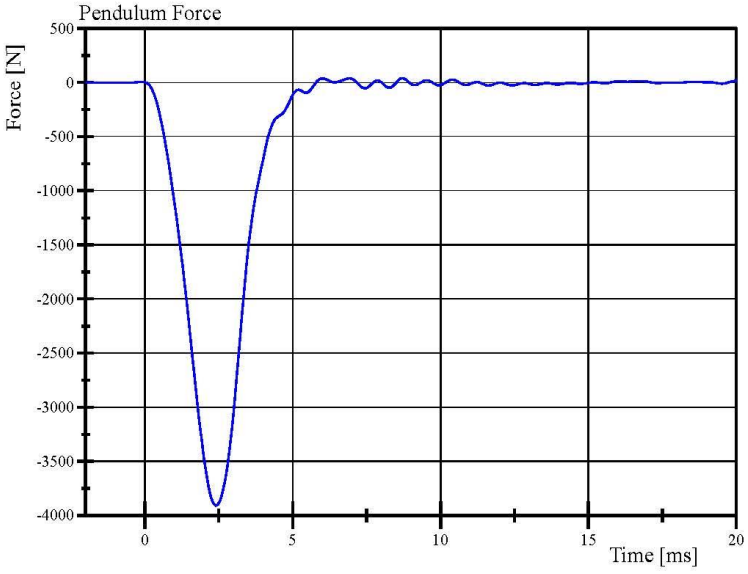
Right Knee Femur Response Test
HIII 5th Serial No. 426 Certification No. 55-1
Test Date: 2/3/2021

Pendulum Acceleration



Filter Class: CFC_600
Max: 1.3 g at 8.7 ms
Min: -133.3 g at 2.4 ms

Pendulum Force



Filter Class: CFC_600
Max: 39.2 N at 8.7 ms
Min: -3,909.6 N at 2.4 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	T10650	Endevco	13-Aug-2020
			Y	P94650	Endevco	13-Aug-2020
			Z	P94622	Endevco	13-Aug-2020
		Redundant	X	P94431	Endevco	13-Aug-2020
			Y	P94487	Endevco	13-Aug-2020
			Z	P94645	Endevco	13-Aug-2020
Head Angular Rate Sensors			X	ARS14245	DTS	23-Aug-2019
			Y	ARS13616	DTS	23-Aug-2019
			Z	ARS4740	DTS	23-Aug-2019
Upper Neck Load Cell			FX, FY, FZ, MX, MY, MZ	2021	Humanetics	14-Aug-2020
Chest Accelerometers		Primary	X	P87834	Endevco	13-Aug-2020
			Y	P61255	Endevco	13-Aug-2020
			Z	P45008	Endevco	13-Aug-2020
		Redundant	X	P91177	Endevco	13-Aug-2020
			Y	P94570	Endevco	13-Aug-2020
			Z	P91172	Endevco	13-Aug-2020
Chest Potentiometer			X	CST037	Servo	13-Aug-2020
Pelvis Accelerometers			X	T11801	Endevco	13-Aug-2020
			Y	P91876	Endevco	13-Aug-2020
			Z	T11390	Endevco	13-Aug-2020
Femur Load Cells	Left	Primary	Z	DI4215-FZ1	Denton	13-Aug-2020
		Redundant	Z	DI4215-FZ2	Denton	13-Aug-2020
	Right	Primary	Z	DI4216-FZ1	Denton	13-Aug-2020
		Redundant	Z	DI4216-FZ2	Denton	13-Aug-2020
Tibia Load Cells	Left	Upper	MX, MY, FZ	3643-94	Denton	13-Aug-2020
		Lower	MX, MY, FZ	3644-370	Denton	13-Aug-2020
	Right	Upper	MX, MY, FZ	3643-413	Denton	13-Aug-2020
		Lower	MX, MY, FZ	3644-401	Denton	14-Aug-2020
Foot Accelerometers	Left	Rear	X	P90848	Endevco	13-Aug-2020
			Z	P91498	Endevco	13-Aug-2020
		Front	Z	P90841	Endevco	13-Aug-2020
	Right	Rear	X	P93467	Endevco	13-Aug-2020
			Z	P97619	Endevco	13-Aug-2020
		Front	Z	P94523	Endevco	13-Aug-2020
Seat Belt Load Cells		Lap	N/A	X08012	Measurement Specialties	07-Jan-2021
		Shoulder	N/A	N100EC	Measurement Specialties	06-Jul-2020

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	17-Dec-2020
			Y	P90302	Endevco	17-Dec-2020
			Z	P94534	Endevco	17-Dec-2020
		Redundant	X	P89014	Endevco	17-Dec-2020
			Y	P90855	Endevco	17-Dec-2020
			Z	P94525	Endevco	17-Dec-2020
Head Angular Rate Sensors			X	ARS13118	DTS	23-Aug-2019
			Y	ARS4737	DTS	23-Aug-2019
			Z	ARS11370	DTS	23-Aug-2019
Upper Neck Load Cell			FX, FY, FZ, MX, MY, MZ	2207	Denton	17-Dec-2020
Chest Accelerometers		Primary	X	P93543	Endevco	17-Dec-2020
			Y	P93533	Endevco	17-Dec-2020
			Z	P93402	Endevco	17-Dec-2020
		Redundant	X	P91664	Endevco	17-Dec-2020
			Y	P93546	Endevco	17-Dec-2020
			Z	P93547	Endevco	17-Dec-2020
Chest Potentiometer			X	CST426	Servo	17-Dec-2020
Pelvis Accelerometers			X	P93514	Endevco	17-Dec-2020
			Y	P87467	Endevco	17-Dec-2020
			Z	P93766	Endevco	17-Dec-2020
Femur Load Cells	Left	Primary	Z	DI4214-FZ1	Denton	17-Dec-2020
		Redundant	Z	DI4214-FZ2	Denton	17-Dec-2020
	Right	Primary	Z	DI4217-FZ1	Denton	17-Dec-2020
		Redundant	Z	DI4217-FZ2	Denton	17-Dec-2020
Tibia Load Cells	Left	Upper	MX, MY, FZ	3643-654	Denton	17-Dec-2020
		Lower	MX, MY, FZ	3644-400	Denton	17-Dec-2020
	Right	Upper	MX, MY, FZ	3643-114	Denton	17-Dec-2020
		Lower	MX, MY, FZ	3644-675	Denton	17-Dec-2020
Foot Accelerometers	Left	Rear	X	P83387	Endevco	17-Dec-2020
			Z	P91953	Endevco	17-Dec-2020
		Front	Z	P77595	Endevco	17-Dec-2020
	Right	Rear	X	T11448	Endevco	17-Dec-2020
			Z	P94569	Endevco	17-Dec-2020
		Front	Z	P87455	Endevco	17-Dec-2020
Seat Belt Load Cells		Lap	N/A	X08013	Measurement Specialties	7-Jan-2021
		Shoulder	N/A	R141CC	Measurement Specialties	12-Jan-2021

TABLE 3 – Vehicle Instrumentation

Instrumentation			Axis	Serial Number	Manufacturer	Calibration Date
Crossmember/Rear Seat Accelerometers	Left	Primary	X	P61501	Endevco	13-Jan-2021
			Z	T11835	Endevco	13-Jan-2021
		Redundant	X	T16770	Endevco	27-Aug-2020
	Right	Primary	X	P50491	Endevco	12-Jan-2021
			Z	P88038	Endevco	12-Jan-2021
		Redundant	X	P57946	Endevco	12-Jan-2021
Engine Accelerometers	Top		X	T23816	Endevco	12-Jan-2021
	Bottom		X	T16780	Endevco	27-Aug-2020