

Final Report Number: NCAP-TRC-24-002

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

**FCA US LLC
2024 Jeep Wrangler 4-Door Sport
NHTSA Number: Q20240301**

**PREPARED BY:
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10820 State Route 347
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Report Date: December 31, 2024

FINAL REPORT

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

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Prepared By: ILO Project Operations Group

Approved By: John Shultz

Approval Date: December 31, 2024

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date _____

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

Date _____

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16. Abstract A 56.0 km/h NCAP Frontal Impact Test was conducted on a 2024 Jeep Wrangler 4-Door Sport, 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 August 14, 2024. The impact velocity was 56.51 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 425 millimeters at vehicle C5. The test vehicle's performance is as follows:																																																																										
<table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Driver ATD</th> <th colspan="3">Passenger ATD</th> </tr> <tr> <th>Units</th> <th>Threshold</th> <th>Result</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>NA</td> <td>700</td> <td>153.100</td> <td>NA</td> <td>700</td> <td>280.640</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-29.890</td> <td>mm</td> <td>52</td> <td>-16.480</td> </tr> <tr> <td>3ms Chest Clip</td> <td>Gs</td> <td>60</td> <td>50.000</td> <td>Gs</td> <td>60</td> <td>45.760</td> </tr> <tr> <td>Nij</td> <td>NA</td> <td>1</td> <td>0.341</td> <td>NA</td> <td>1</td> <td>0.380</td> </tr> <tr> <td>Neck Tension</td> <td>Newtons</td> <td>4170</td> <td>1497.310</td> <td>Newtons</td> <td>2620</td> <td>966.080</td> </tr> <tr> <td>Neck Compression</td> <td>Newtons</td> <td>4000</td> <td>-356.790</td> <td>Newtons</td> <td>2520</td> <td>-452.480</td> </tr> <tr> <td>Left Femur Force</td> <td>Newtons</td> <td>10008</td> <td>-1853.880</td> <td>Newtons</td> <td>6805</td> <td>-1202.410</td> </tr> <tr> <td>Right Femur Force</td> <td>Newtons</td> <td>10008</td> <td>-2050.660</td> <td>Newtons</td> <td>6805</td> <td>-2401.310</td> </tr> </tbody> </table>						Measurement Description	Driver ATD			Passenger ATD			Units	Threshold	Result	Units	Threshold	Result	Head Injury Criteria (HIC ₁₅)	NA	700	153.100	NA	700	280.640	Maximum Chest Compression	mm	63	-29.890	mm	52	-16.480	3ms Chest Clip	Gs	60	50.000	Gs	60	45.760	Nij	NA	1	0.341	NA	1	0.380	Neck Tension	Newtons	4170	1497.310	Newtons	2620	966.080	Neck Compression	Newtons	4000	-356.790	Newtons	2520	-452.480	Left Femur Force	Newtons	10008	-1853.880	Newtons	6805	-1202.410	Right Femur Force	Newtons	10008	-2050.660	Newtons	6805	-2401.310
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17. Key Words 56.3 km/h (35 mph) Full Frontal Rigid Barrier Impact Test New Car Assessment Program (NCAP)			18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division 1200 New Jersey Ave, SE Washington, DC 20590																																																																							
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SECTION 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 2024 Jeep Wrangler 4-Door Sport at a velocity of 56.51 km/h. The test was performed at Transportation Research Center, Inc. on August 14, 2024. 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. DH1659) were qualified prior to this test. Certification details, along with instrumentation calibration data, are found in Appendix C of this report.

The 102 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 event¹.

The maximum static crush of the vehicle was 425 mm and both the driver front door opened during testing. The driver side rear & passenger side doors remained closed during the impact event and were operable after the impact.

The driver's visible contact points were as follows: Frontal airbag, head restraint and knee bolster. The passenger's visible contact points were as follows: Frontal airbag, head restraint 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)	153.100	0.341	1497.310	-356.790	50.000	-29.890	-1853.880	-2050.660
Passenger (5 th Female)	280.640	0.380	966.080	-452.480	45.760	-16.480	-1202.410	-2401.310

TEST COMMENTS:

Vehicle Engine Top X – channel failed at 50.0 ms

SECTION 2: DATA SHEETS

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

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
 Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
 Test Date: 8/14/2024

TEST VEHICLE INFORMATION

NHTSA No.	Q20240301
Model Year	2024
Make	Jeep
Model	Wrangler
Body Style	MPV
VIN	1C4PJXDN1RW332176
Body Color	Granite Crystal Metallic
Odometer Reading (km/mi)	96 mi
Engine Displacement (L)	2.0
Type/No. Cylinders	Inline/4
Engine Placement	Front
Transmission Type	Automatic
Transmission Speeds	8
Overdrive	Yes
Final Drive	4WD
Roof Rack	No
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes
Automatic Door Locks (ADLs)	No

TEST VEHICLE OPTIONS

Traction Control System (TCS)	Yes
Power Steering	Yes
Power Window Auto-Reverse	No
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	No
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	GVWR (kg)	2495 (5500 lbs)
Date of Manufacture		6-24	GAWR Front (kg)
		GAWR Rear (kg)	1361 (3000 lbs)

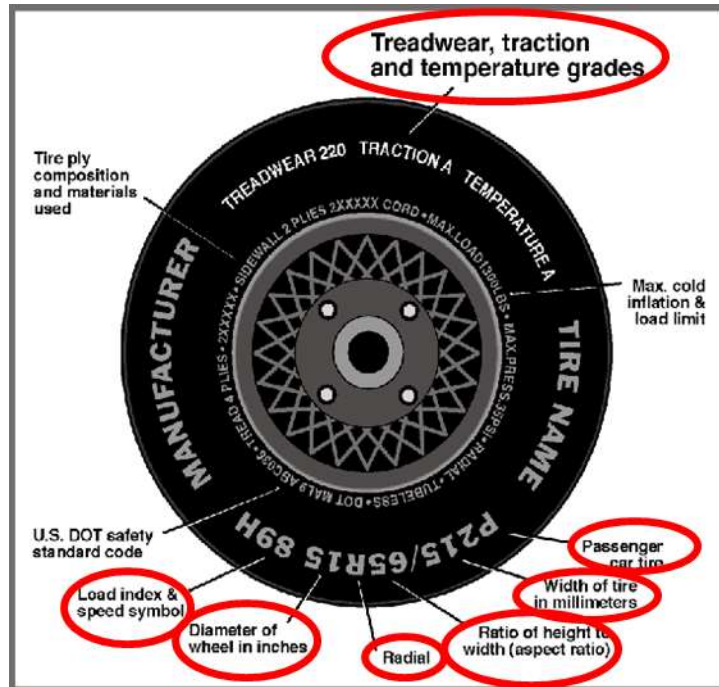
VEHICLE SEATING AND WEIGHT CAPACITY

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench	N/A	
Number of Occupants	2	3	N/A	5
Capacity Wt. (VCW) (kg)				385.0
Cargo Wt. (RCLW) (kg)				45.0

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

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
 Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
 Test Date: 8/14/2024



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold / Test Pressure (kPa)	250	250
Recommended Tire Size	245/75R17	245/75R17
Tire Size on Vehicle	245/75R17	245/75R17
Tire Manufacturer	Nexen	Nexen
Tire Model	Rodian	Rodian
Treadwear	700	700
Traction Grade	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index/Speed Symbol	112S	112S
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon
DOT Safety Code Right	18E AY AHAH 1424	18E AY AHAH 1424
DOT Safety Code Left	18E AY AHAH 1424	18E AY AHAH 1424

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

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
 Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
 Test Date: 8/14/2024

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	498.5	440.2		533.2	498.4	
Right	kg	519.8	451.3		542.0	513.6	
Ratio	%	53.3	46.7		51.5	48.5	
Totals	kg	1018.3	891.5	1909.8	1075.2	1012.0	2087.2

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1909.8
Weight of 1 P572E ATD & 1 P572O ATD	kg	139.3
Rated Cargo/Luggage Weight (RCLW)	kg	45.0
Vehicle Target Weight (TVTW)	kg	2094.1

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front)
As Delivered	mm	935	936	964	967	1405
As Tested	mm	922	924	948	941	1459
Post Test	mm	904	951	934	961	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheelbase	mm	3010
Total Vehicle Length at Left Side	mm	4695
Total Vehicle Length at Centerline	mm	4747
Total Vehicle Length at Right Side	mm	4695
Weight of Ballast in Cargo Area	kg	11.3
Weight of Vehicle Components Removed	kg	25.8
Amount of Stoddard Solvent in Fuel Tank	liters	75.7

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT: _____

Spare Tire

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

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
 Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
 Test Date: 8/14/2024

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4747
2	Total Width	1867
3	Bumper Top Height	650
4	Bumper Bottom Height	483
5	Longitudinal Member Top Height	612
6	Distance Between Longitudinal Members	711
7	Longitudinal Member Width	106
8	Engine Top Height	1139
9	Engine Bottom Height	307
10	Engine and Gearbox Width	600
11	Front Bumper-Engine Distance	735
12	Front Shock Absorber Fixing Height	840
13	Bonnet Leading Edge Height	1100
14	Front Shock Absorber Fixing Width	812
15	Front Bumper – Front Axle Distance	721
16	Front Axle – A-Pillar Distance	1020
17	A-Pillar – B-Pillar Distance	992
18	B-Pillar – Rear Axle Distance	2140
19	B-Pillar – C-Pillar Distance	878
20	Roof Sill Bottom Height	1635
21	Roof Sill Top Height	1681
22	Floor Sill Bottom Height	560
23	Floor Sill Top Height	600

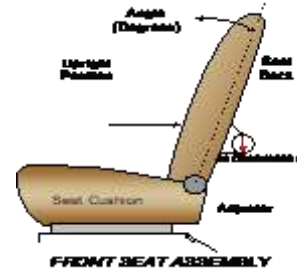
DATA SHEET NO. 2 - SEAT ADJUSTMENT, FUEL SYSTEM AND STEERING WHEEL DATA

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
 Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
 Test Date: 8/14/2024

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:	5.4
Passenger Seat back angle:	1.8

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	234	16
Passenger Seat	190	0

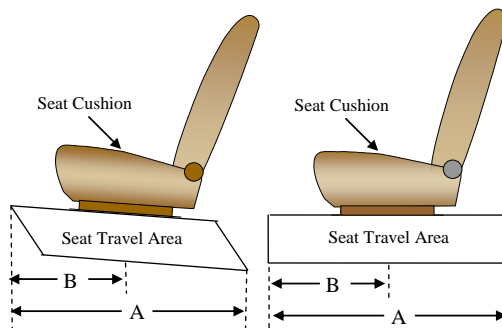
SEAT BELT UPPER ANCHORAGE

Describe the method of positioning seat belt upper anchorages.

Driver: One below uppermost, Positioned according to Form 1

Passenger: One below uppermost, Positioned according to Form 1

	Total No. of Positions	Placed in Position No.
Driver Seat	5	0
Passenger Seat	5	0



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

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
 Test Program: NCAP Frontal Impact

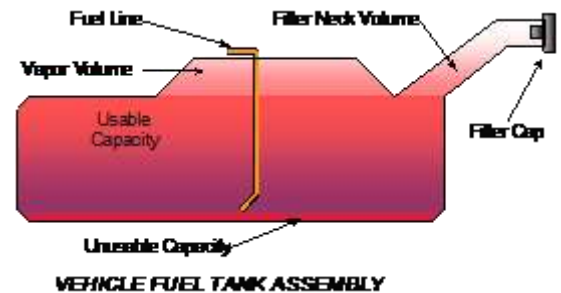
NHTSA No.: Q20240301
 Test Date: 8/14/2024

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	81.4
Usable Capacity of "Optional Tank"	N/A
92%-94% of Usable Capacity	75.7
Actual Amount of Solvent Used	75.7
1/3 of Usable Capacity	27.1

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

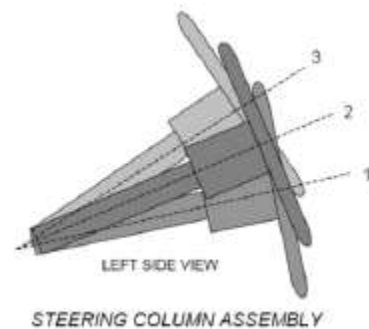
The fuel pump will pump fuel when the ignition is keyed on for approximately 2-3 seconds to prime the system and then turn off. Once the vehicle is started, the pump runs continuously until the vehicle is turned off. The restraint control module will send a message to the engine control module if the vehicle is in an impact condition and the fuel pump will be turned off.



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.



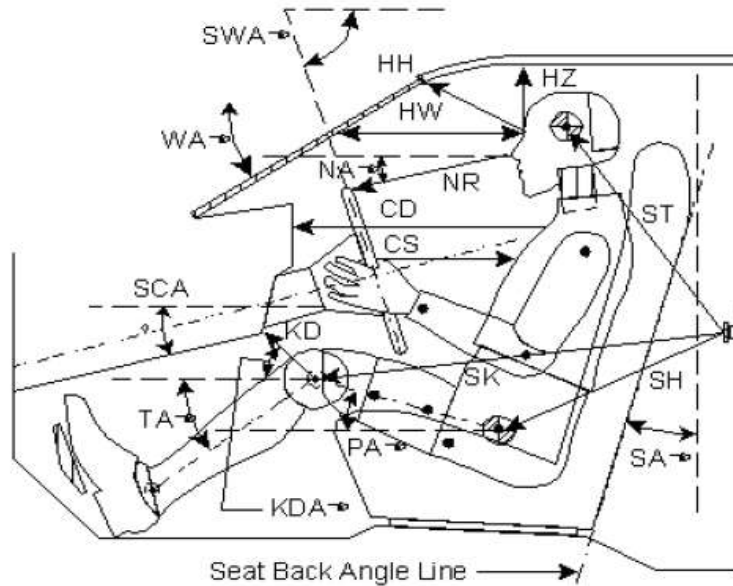
STEERING COLUMN POSITIONS

	Degrees	Fore/Aft Position (mm)
Lowermost Position No. 1	18.5	
Geometric Center Position No. 2	21.5	
Uppermost Position No. 3	24.4	
Telescoping Steering Wheel Travel		32
Test Position	21.5	16

DATA SHEET NO. 3 - DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
 Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
 Test Date: 8/14/2024

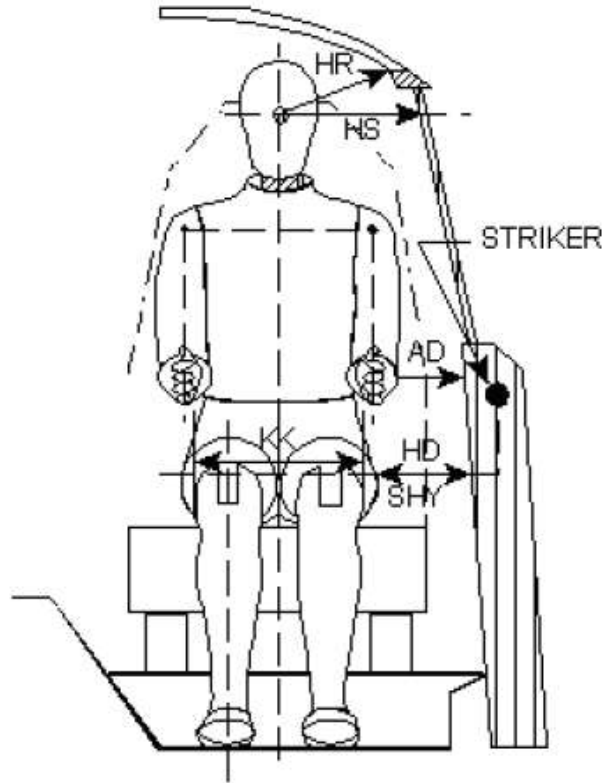


Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		53.5		
SWA°	Steering Wheel Angle		21.05		
SCA°	Steering Column Angle		21.55		
SA°	Seat Back Angle (on head rest post)		5.5		1.8
HZ	Head to Roof (Z)	275		372	
HH	Head to Header	468		417	
HW	Head to Windshield	605		542	
NR	Nose to Rim	385	12.5		
CD	Chest to Dash	525		342	
CS	Chest to Steering Hub	280			
RA	Rim to Abdomen	180			
KDL	Left Knee to Dash	130	22.0	96	13.5
KDR	Right Knee to Dash	125	24.5	95	13.2
PA°	Pelvic Angle		22.8		21.9
TA°	Tibia Angle		50.1		69.3
SK	Striker to Knee	657	2.4	710	2.1
ST	Striker to Head	666	67.5	610	60.5
SH	Striker to H-Point	278	10.6	416	3.2

DATA SHEET NO. 4 - DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
 Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
 Test Date: 8/14/2024

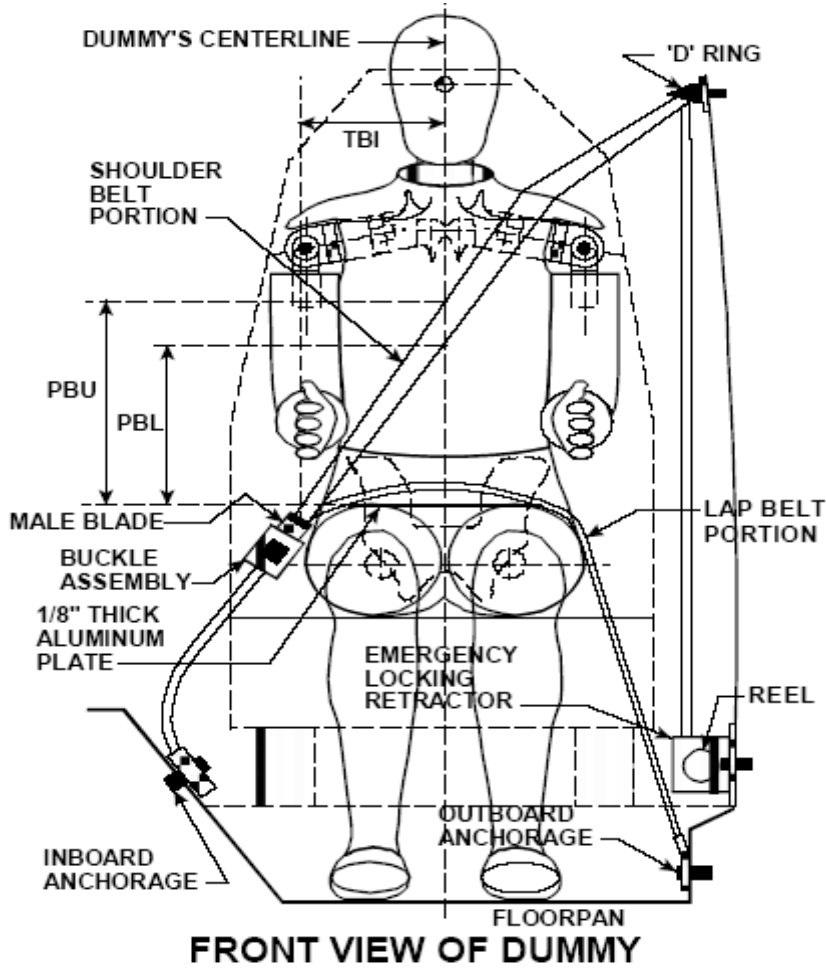


Code	Measurement Description	Driver	Passenger
AD	Arm to Door	80	61
HD	H-Point to Door	115	160
HR	Head to Side Header	310	350
HS	Head to Side Window	344	365
KK	Knee to Knee	210	167
SHY	Striker to H-Point (Y Direction)	143	215
AA	Ankle to Ankle	189	180

DATA SHEET NO. 5 - SEAT BELT POSITIONING DATA

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
 Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
 Test Date: 8/14/2024



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU – Top surface of reference to belt upper edge	mm	333	256
PBL – Top surface of reference to belt lower edge	mm	207	172

BELT LENGTH DATA

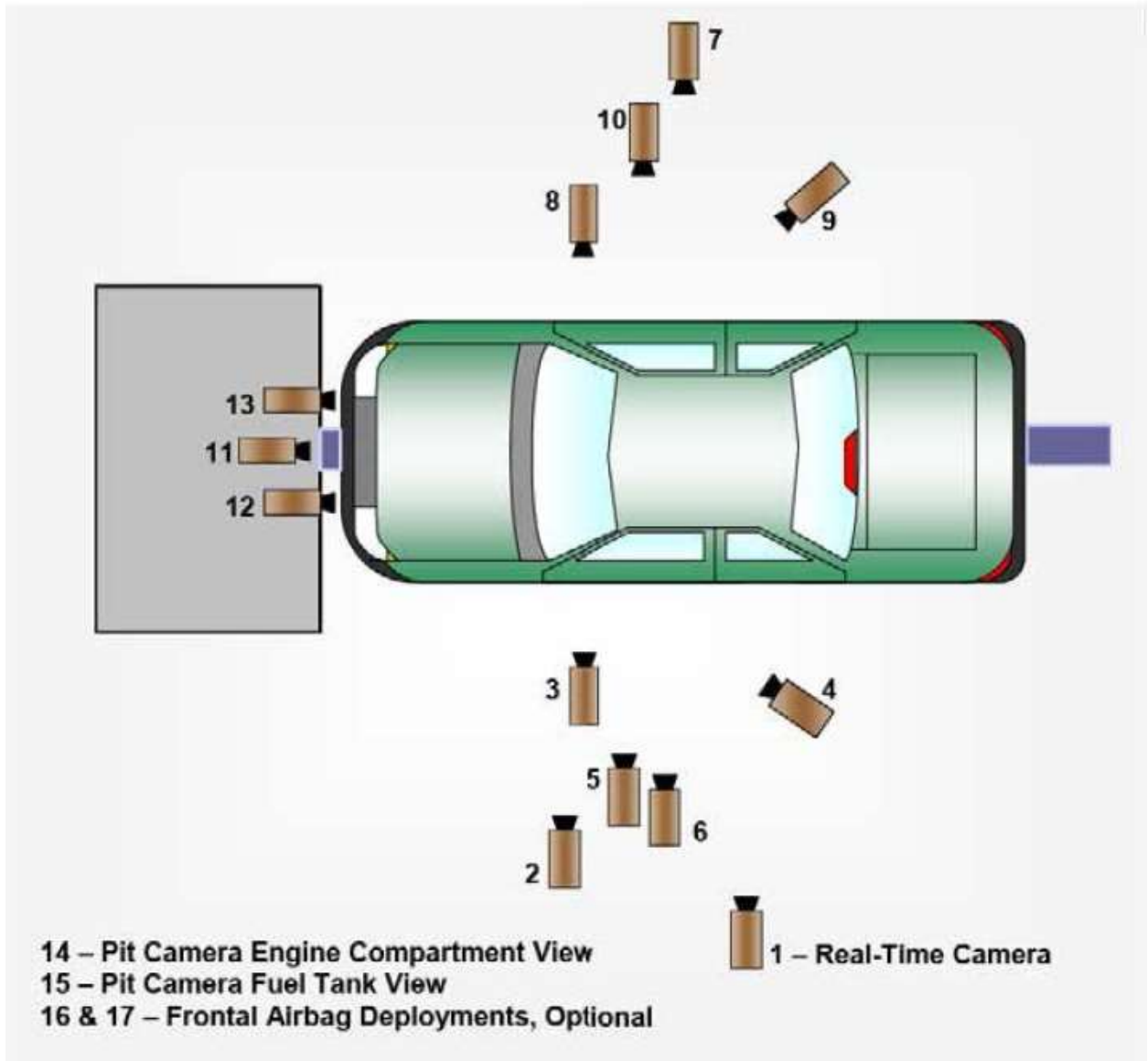
Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	800	830
Lap belt length as measured on ATD	mm	642	673
Remainder of belt on reel	mm	1004	927
Total belt length for continuous webbing systems	mm	2446	2430

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

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
Test Date: 8/14/2024

CAMERA POSITIONS FOR FRONTAL IMPACTS



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

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
 Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
 Test Date: 8/14/2024

CAMERA LOCATIONS

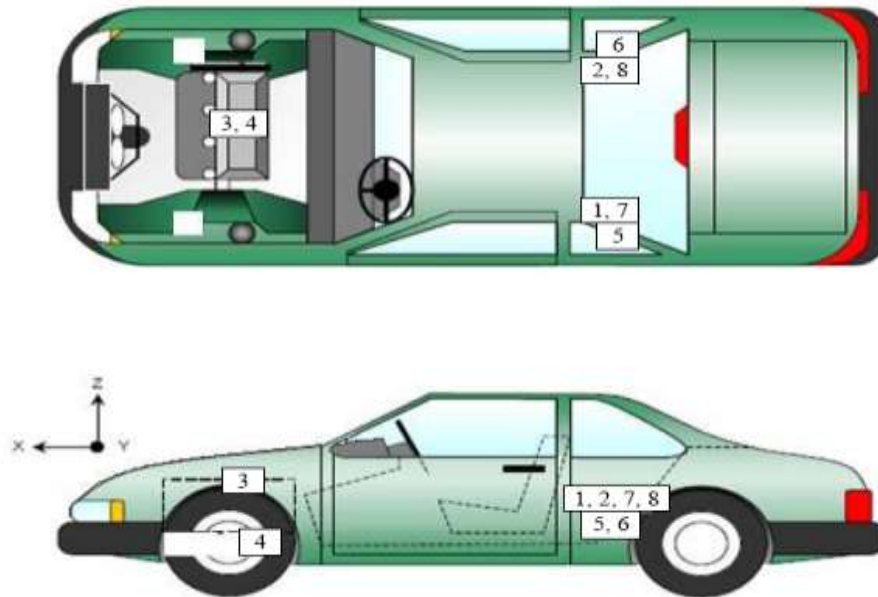
No.	Camera View	Location (mm)			Lens (mm)	Frame Speed (fps)
		X	Y	Z		
1	REAL-TIME LEFT OVERALL	-4109	-9113	-1430	Zoom	30
2	LEFT OVERALL	-2134	-4186	-1207	8.5	1000
3	DRIVER CLOSE-UP	-1421	-4009	-1460	50	1000
4	LEFT FRONT HALF	-815	-4607	-1439	25	1000
5	LEFT ANGLE	-2961	-2354	-1728	20	1000
6	STEERING COLUMN	-1641	-3739	-1281	50	1000
7	RIGHT OVERALL	-2237	3331	-1256	8.5	1000
8	PASSENGER CLOSE-UP	-1637	3975	-1399	50	1000
9	RIGHT FRONT HALF	-1226	4459	-1339	25	1000
10	RIGHT ANGLE	-2796	2471	-1674	20	1000
11	WINDSHIELD	0	0	-2551	20	1000
12	DRIVER WINDSHIELD	0	-417	-2551	20	1000
13	PASSENGER WINDSHIELD	0	469	-2551	20	1000
14	PIT FRONT	-978	0	334	12.5	1000
15	PIT REAR	-3235	0	653	12.5	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: 2024 Jeep Wrangler 4-Door Sport
 Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
 Test Date: 8/14/2024



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	1322	-346	-719
2	Right Rear Accelerometer – X Direction	1311	339	-712
3	Engine Top X	3523	-60	-1037
4	Engine Bottom X	3665	64	-317
5	Left Rear Accelerometer – Z Direction	1322	-346	-719
6	Right Rear Accelerometer – Z Direction	1311	339	-712
7	Left Rear Accelerometer – X Direction Redundant	1312	-381	-715
8	Right Rear Accelerometer- X Direction Redundant	1313	376	-708

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

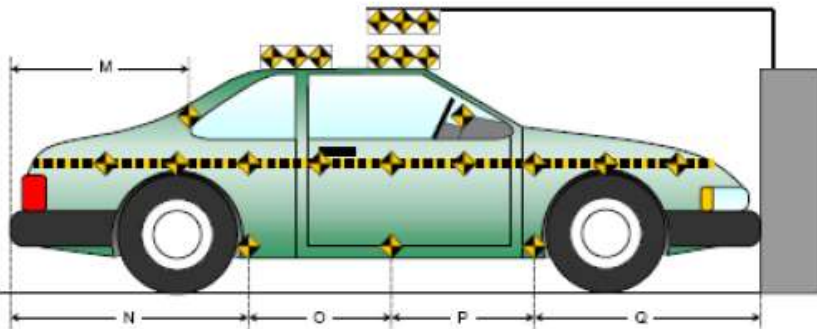
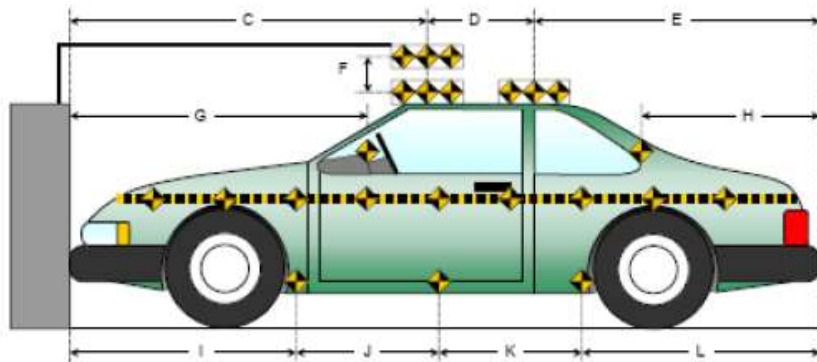
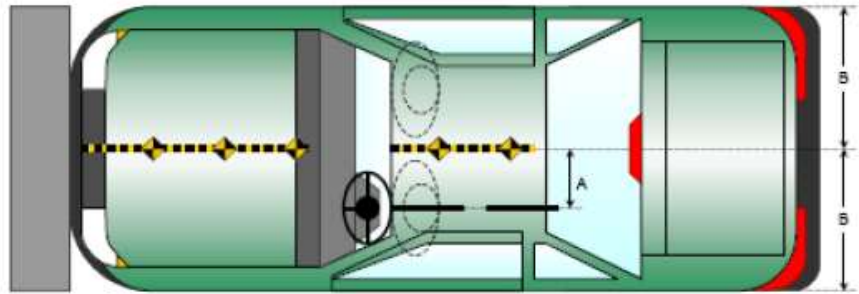
DATA SHEET NO. 8 - PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
 Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
 Test Date: 8/14/2024

Item	Value
A	N/A
B	934
C	N/A
D	N/A
E	N/A
F	N/A
G	1640
H	1305
I	1500
J	694
K	850
L	1703
M	1302
N	1699
O	841
P	703
Q	1504

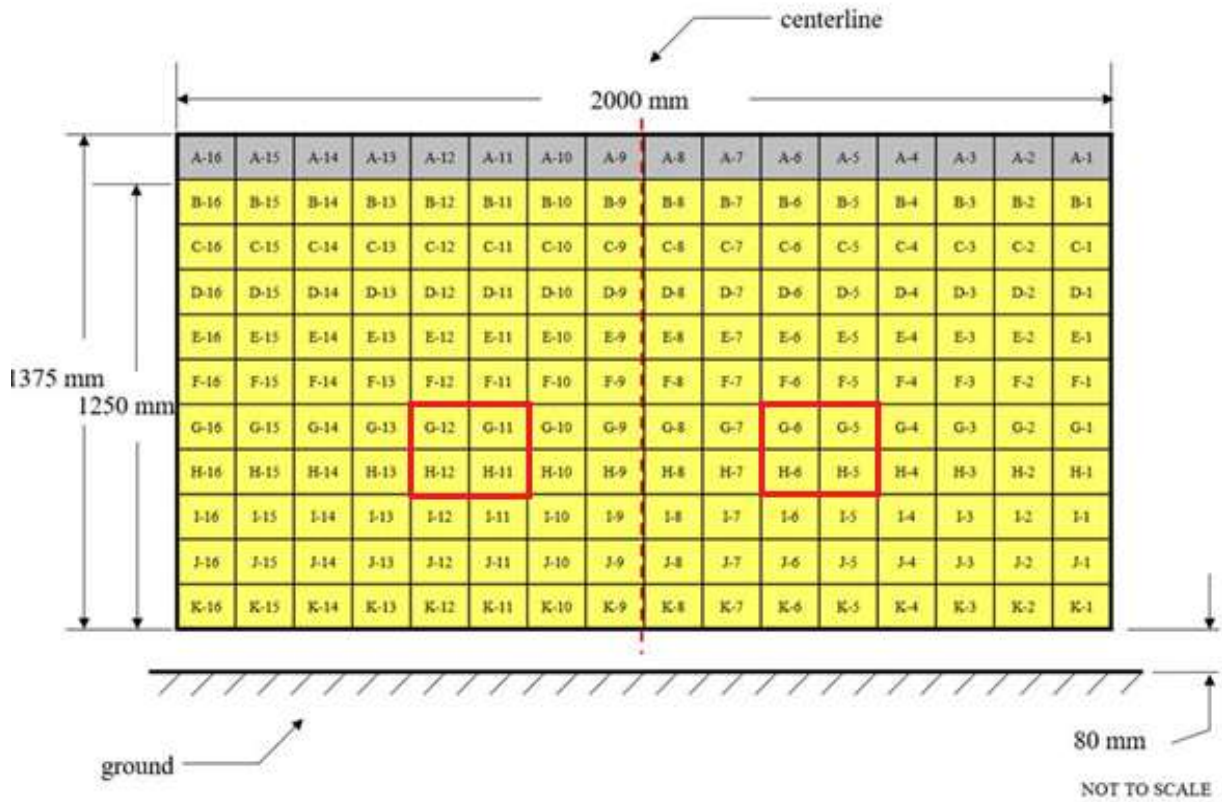
All units in millimeters



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

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
 Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
 Test Date: 8/14/2024



*Red squares represent 2x2 blocks at frame rail impact location

DATA SHEET NO. 10 - TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
Test Date: 8/14/2024

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: 2024 Jeep Wrangler 4-Door Sport
 Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
 Test Date: 8/14/2024

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type / Serial No.	Hybrid III 50th / 037	Hybrid III 5th / DH1659
Head Contact	Frontal Airbag, Head Restraint	Frontal Airbag, Head Restraint
Upper Torso Contact	Frontal Airbag	Frontal Airbag
Lower Torso Contact	Frontal Airbag	Frontal Airbag
Left Knee Contact	Knee Bolster	Glove box
Right Knee Contact	Knee Bolster	Glove box

DOOR OPENING, TRUNK OPENING, AND SEAT TRACK INFORMATION

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

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

POST- OTHER VEHICLE POST-TEST OBSERVATIONS

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

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	1995
Center	mm	1985
Right Side	mm	1985
Average	mm	1988

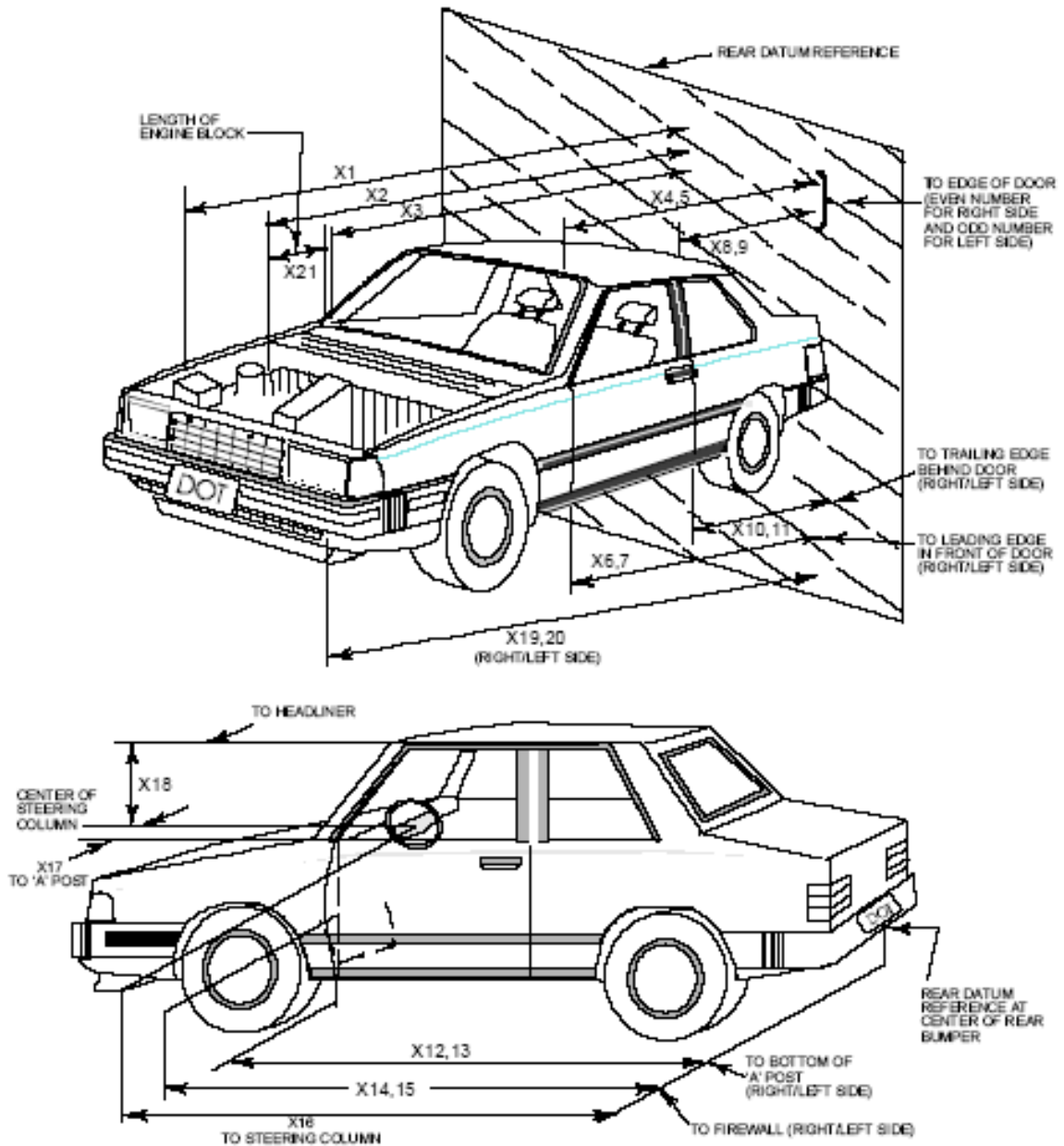
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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	No	N/A	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: Anchor	Yes	Yes	Yes	Yes

DATA SHEET NO. 12 - VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
 Test Program: NCAP Frontal Impact

NHTSA No.: Q02040301
 Test Date: 8/14/2024



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

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
 Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
 Test Date: 8/14/2024

No.	Measurement Description	Pre-Test	Post-Test	Change
1	Total Length of Vehicle at Centerline	4747	4328	-419
2	Rear Surface of Vehicle (RSOV) to Front of Engine	3947	3898	-49
3	RSOV to Firewall	3507	3478	-29
4	RSOV to Upper Leading Edge of Right Door	3090	3084	-6
5	RSOV to Upper Leading Edge of Left Door	3096	3078	-18
6	RSOV to Lower Leading Edge of Right Door	3075	3047	-28
7	RSOV to Lower Leading Edge of Left Door	3082	3040	-42
8	RSOV to Upper Trailing Edge of Right Door	2183	2183	0
9	RSOV to Upper Trailing Edge of Left Door	2202	2180	-22
10	RSOV to Lower Trailing Edge of Right Door	2290	2260	-30
11	RSOV to Lower Trailing Edge of Left Door	2289	2246	-43
12	RSOV to Bottom of "A" Post-of Right Side	3101	3090	-11
13	RSOV to Bottom of "A" Post-of Left Side	3102	3086	-16
14	RSOV to Firewall, Right Side	3488	3452	-36
15	RSOV to Firewall, Left Side	3477	3445	-32
16	RSOV to Steering Column	2910	2343	-567
17	Center of Steering Column to "A" Post	351	355	4
18	Center of Steering Column to Headliner	447	500	53
19	RSOV to Right Side of Front Bumper	4695	4352	-343
20	RSOV to Left Side of Front Bumper	4695	4365	-330
21	Length of Engine Block	530	530	0
RD	RSOV to Right Side of Dash Panel	2973	2967	-6
CD	RSOV to Center of Dash Panel	2903	2907	4
LD	RSOV to Left Side of Dash Panel	2981	2964	-17

All Dimensions in mm

DATA SHEET NO. 13 - ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
 Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
 Test Date: 8/14/2024

VEHICLE INFORMATION

VIN: 1C4PJXDN1RW332176
 Vehicle Size Category: MPV

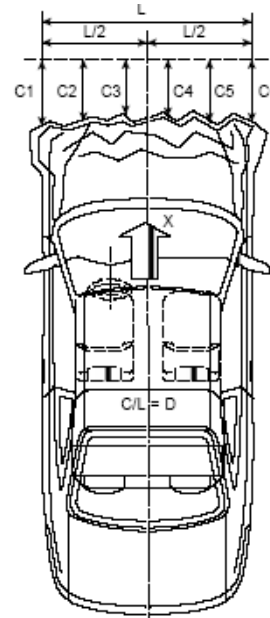
Wheelbase: 3010
 Test Weight (kg): 2087.2

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): 56.51
 Velocity Change (km/h): 64.84
 Time of Separation (ms): 138

CRUSH PROFILE

Collision Deformation Classification: 12FDEW2
 Midpoint of Damage: Centerline
 Damage Region Length (mm): 1220
 Impact Mode: Frontal



No.	Measurement Description	Units	Pre-Test	Post-Test	Crush
C1	Crush zone 1 at left side	mm	80	410	330
C2	Crush zone 2 at left side	mm	0	420	420
C3	Crush zone 3 at left side	mm	45	443	398
C4	Crush zone 4 at right side	mm	40	448	408
C5	Crush zone 5 at right side	mm	5	430	425
C6	Crush zone 6 at right side	mm	80	423	343
L	C1 to C6	mm	1220	1461	241

DATA SHEET NO. 14 - VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
 Test Program: NCAP Frontal Impact

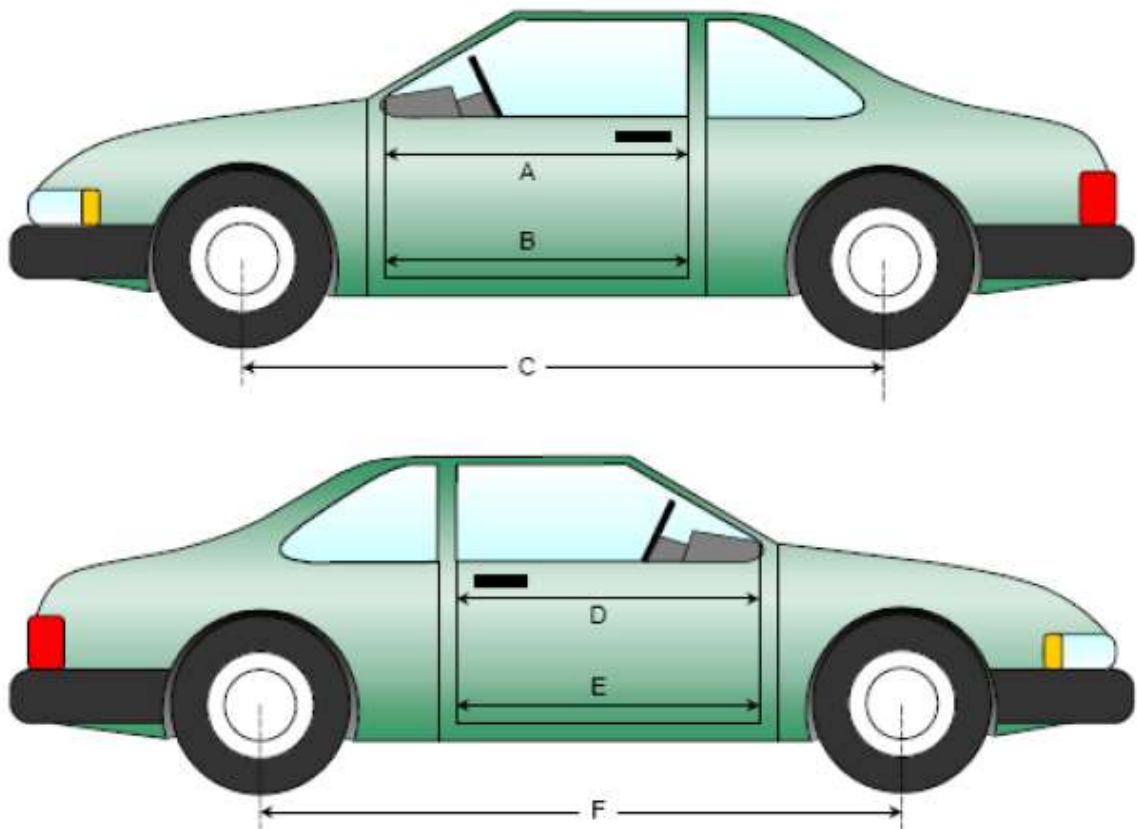
NHTSA No.: Q20240301
 Test Date: 8/14/2024

DOOR OPENING WIDTH

No.	Description	Units	Pre-Test	Post-Test	Change
A	Left Side Upper	mm	907	903	-4
B	Left Side Lower	mm	893	890	-3
D	Right Side Upper	mm	915	911	-4
E	Right Side Lower	mm	888	890	2

WHEELBASE MEASUREMENTS

No.	Description	Units	Pre-Test	Post-Test	Change
C	Left Side Wheelbase	mm	3010	2950	-60
F	Right Side Wheelbase	mm	3010	2948	-62



¹ Front suspension damaged and wheels fell off measurements not available

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

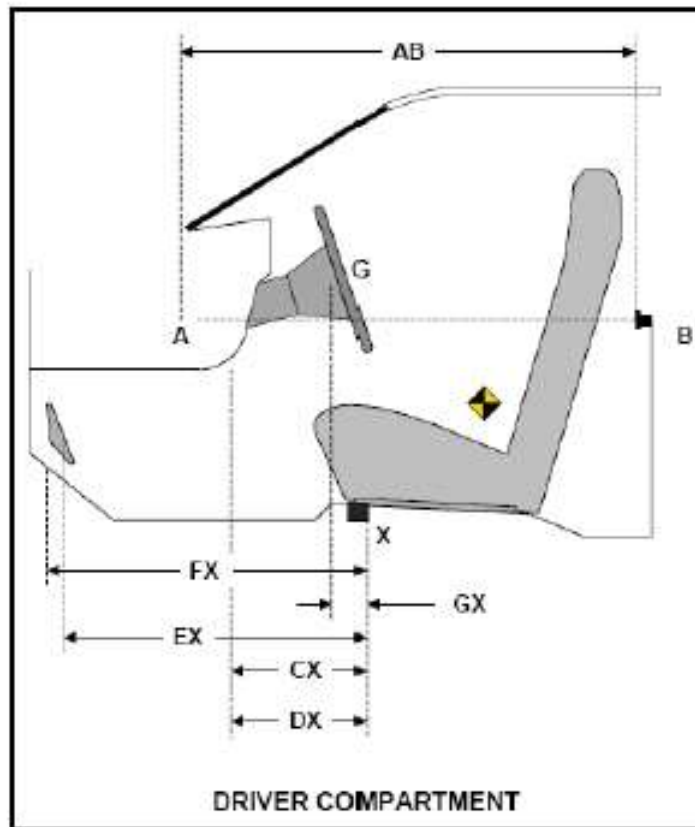
Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
 Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
 Test Date: 8/14/2024

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Change
AB	Door Opening (Inside Window Jam)	mm	658	662	4
CX	Left Knee Bolster to X	mm	240	238	-2
DX	Right Knee Bolster to X	mm	225	227	2
EX	Brake Pedal to X	mm	498	498	0
FX	Foot Rest to X	mm	N/A	N/A	N/A
GX	Center of Steering Column Wheel Hub to X	mm	105	156	51

X = Front of Seat Track (Stationary)



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

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
 Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
 Test Date: 8/14/2024

Please provide windshield mounting details.

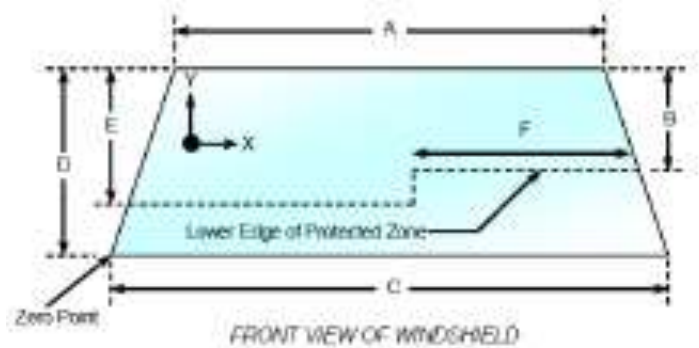
The standard requires that the post-test retention measurement be a minimum of 75% of the pre-test total periphery measurement for vehicle not equipped with occupant passive restraint and 50% for each side of the windshield for vehicle which are equipped with occupant passive restraints.

Temperature of windshield molding during test: 21.4°C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	1885.5	1885.5	100.0
Right Side	1885.5	1885.5	100.0
Total	3770	3770	100.0

Item	Units	Value
A	mm	1355
B	mm	263
C	mm	1436
D	mm	490
E	mm	262
F	mm	240



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
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

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

X	Y
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

DATA SHEET NO. 16 - FMVSS 301 BARRIER IMPACT AND STATIC ROLLOVER RESULTS

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
Test Date: 8/14/2024

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21.4°C

Test Time: 19:50

Stoddard Solvent Spillage Measurements

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

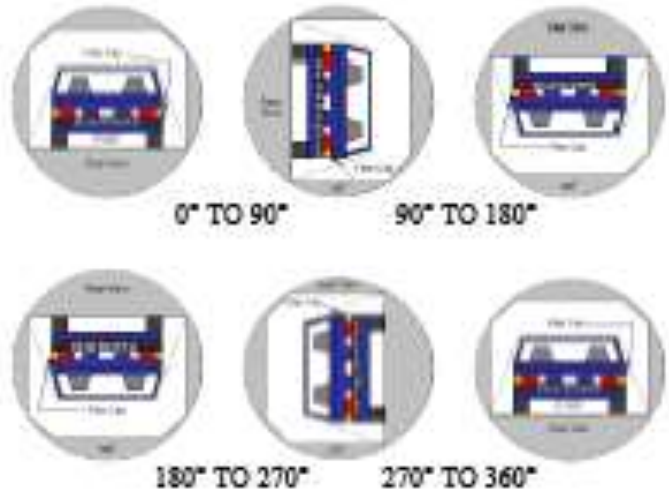
DATA SHEET NO. 16 - FMVSS 301 BARRIER IMPACT AND STATIC ROLLOVER RESULTS (CONT'D)

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
 Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
 Test Date: 8/14/2024

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

Static roll not conducted to do non-conforming test



SOLVENT COLLECTION TIME TABLE IN SECONDS

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

FMVSS 301 SPILLAGE TABLE

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

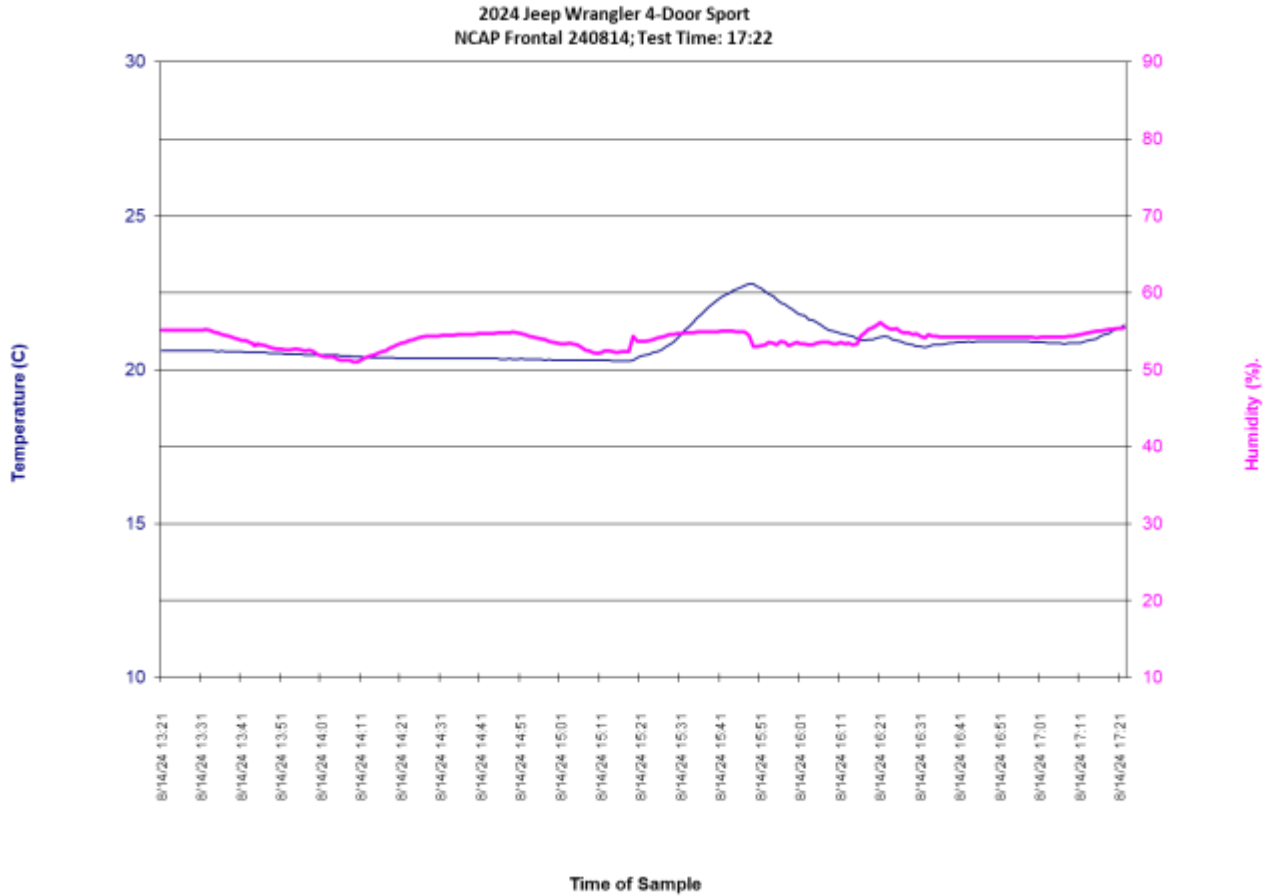
SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	N/A
90° to 180°	N/A
180° to 270°	N/A
270° to 360°	N/A

DATA SHEET NO. 17 - DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2024 Jeep Wrangler 4-Door Sport
Test Program: NCAP Frontal Impact

NHTSA No.: Q20240301
Test Date: 8/14/2024



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

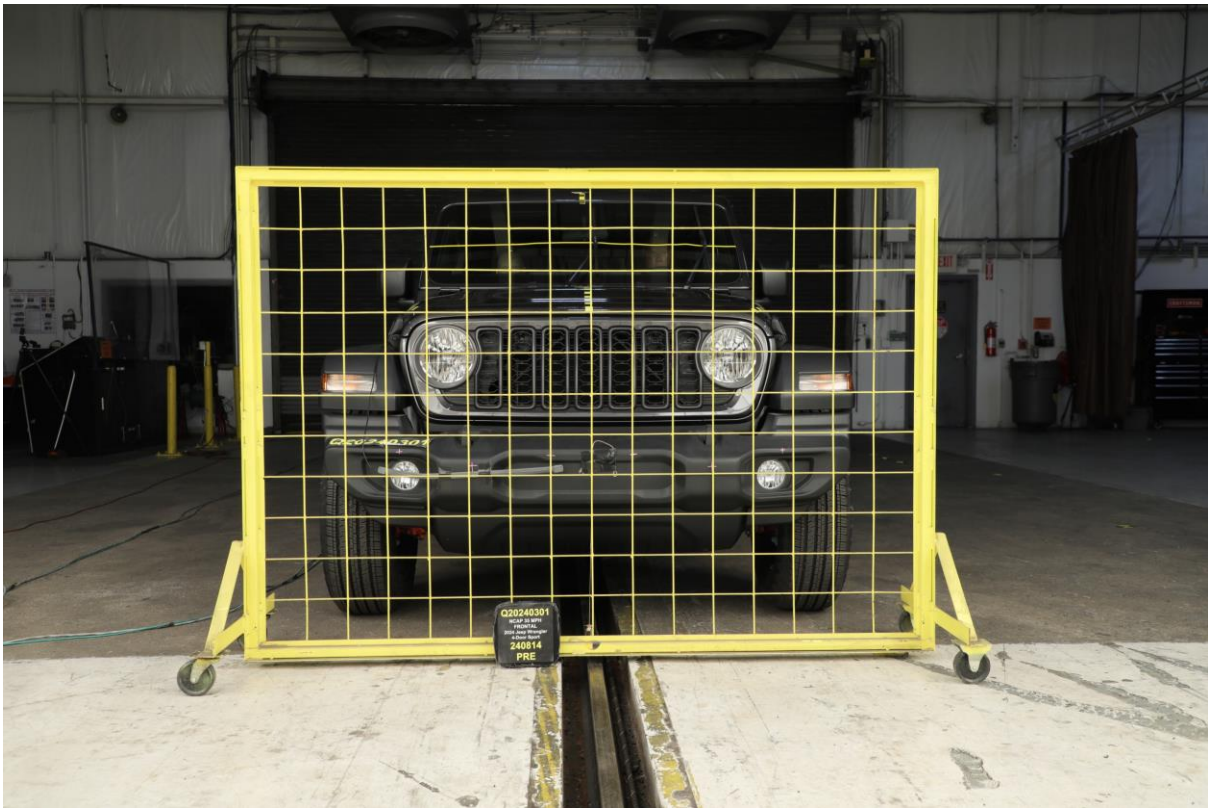
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3	Post-Test Load Cell Wall	A-6
4	Manufacturer's Label	A-6
5	Tire Placard	A-7
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44	Pre-Test Driver's Side Knee Bolster	A-29
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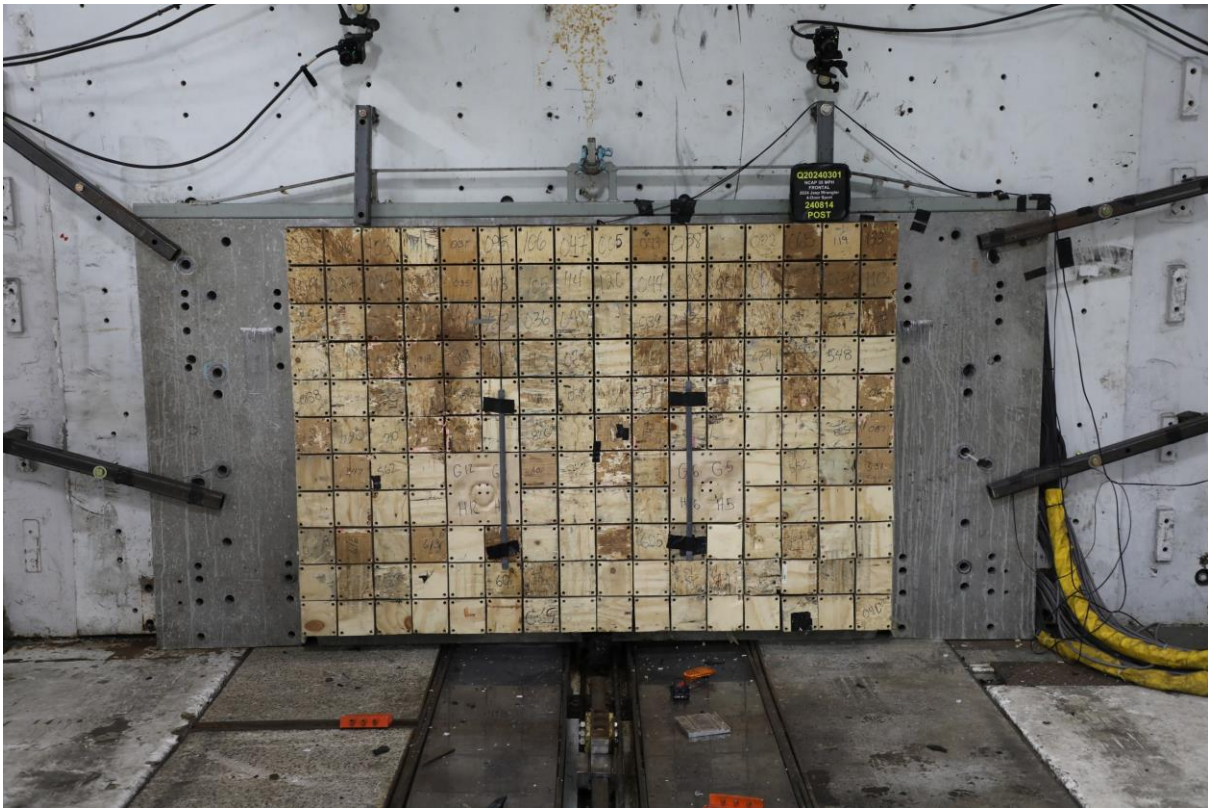
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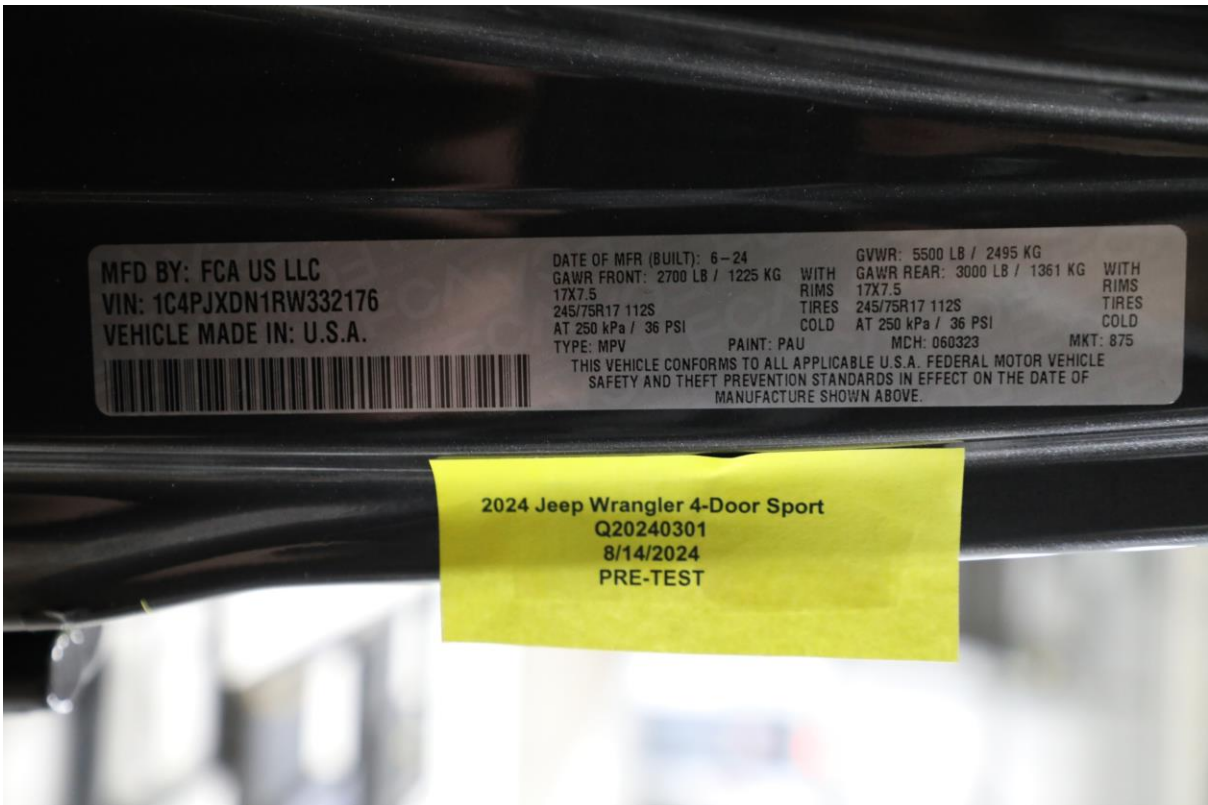
001 Load Cell Location



002 Pre-Test Load Cell Wall



003 Post-Test Load Cell Wall



004 Manufacturer's Label



005 Tire Placard

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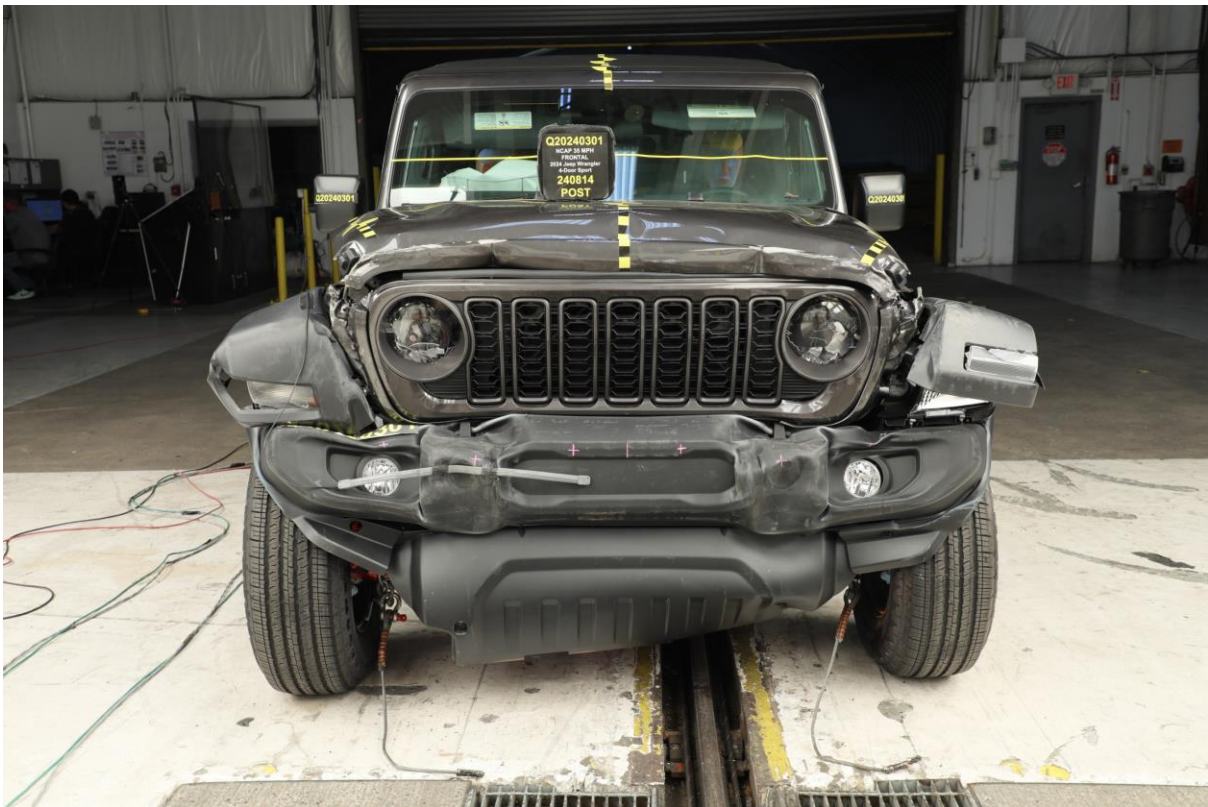
006 2024 Jeep Wrangler 4-Door Sport Frontal As Delivered



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



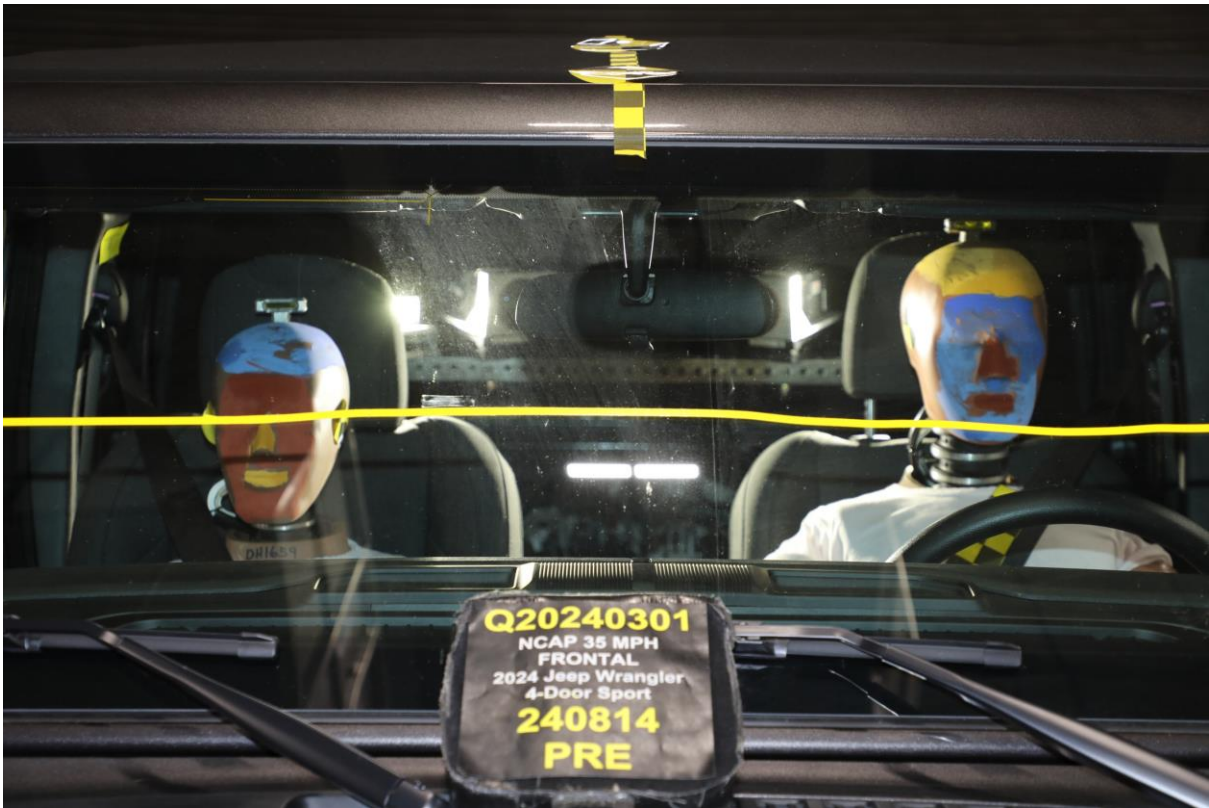
015 Post-Test Right Front 3-4 View



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



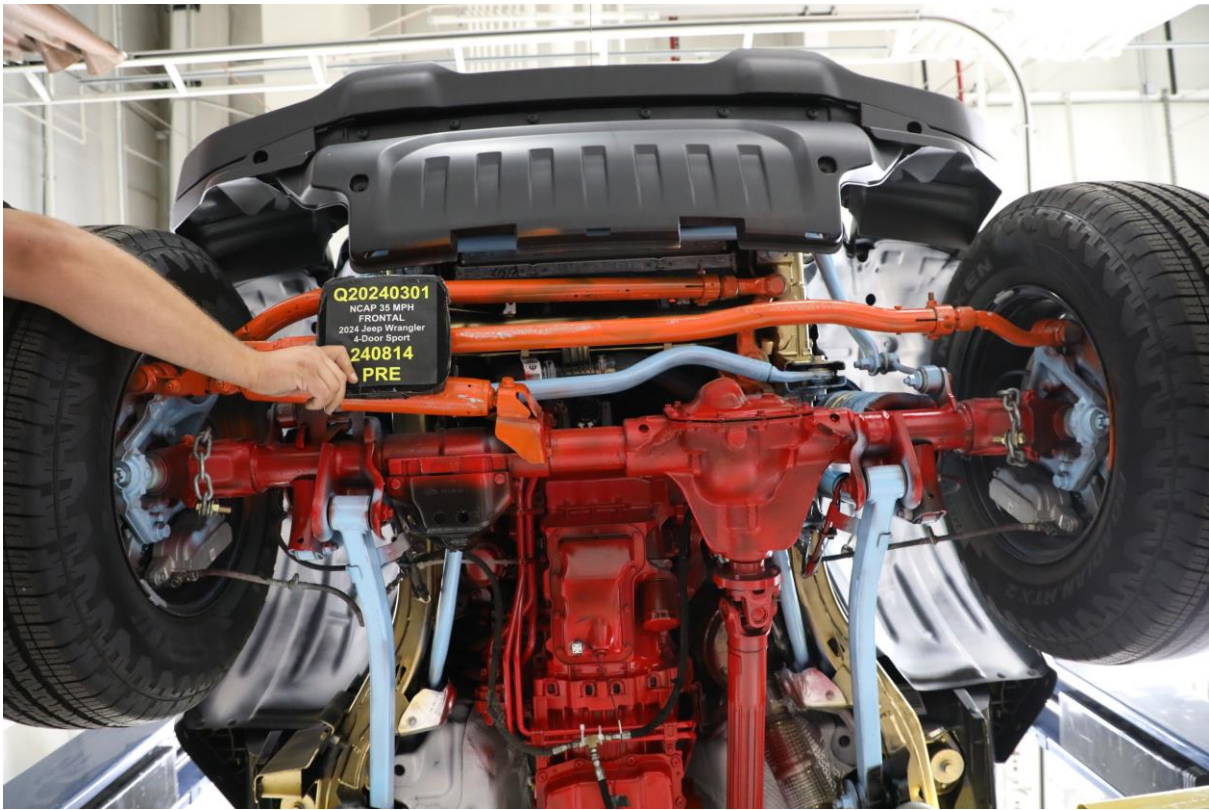
021 Post-Test Engine Compartment View



022 Pre-Test Fuel Filler Cap View



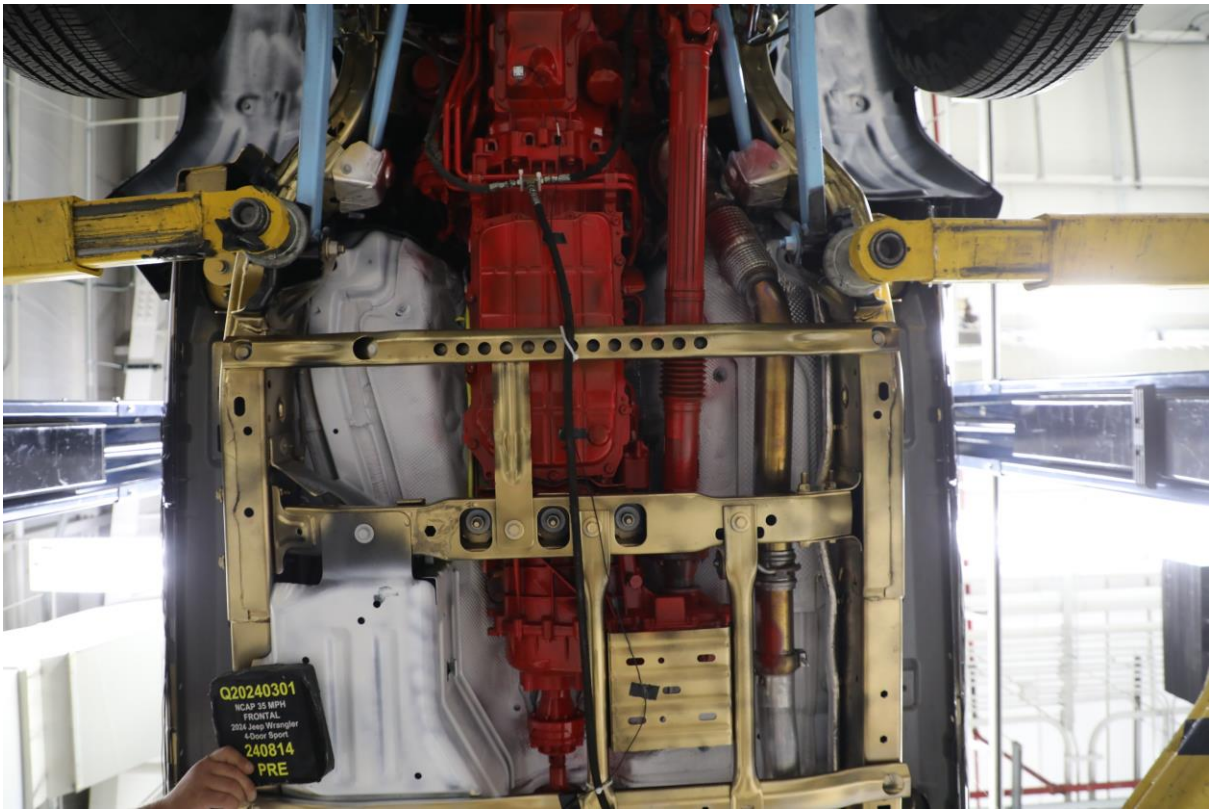
023 Post-Test Fuel Filler Cap View



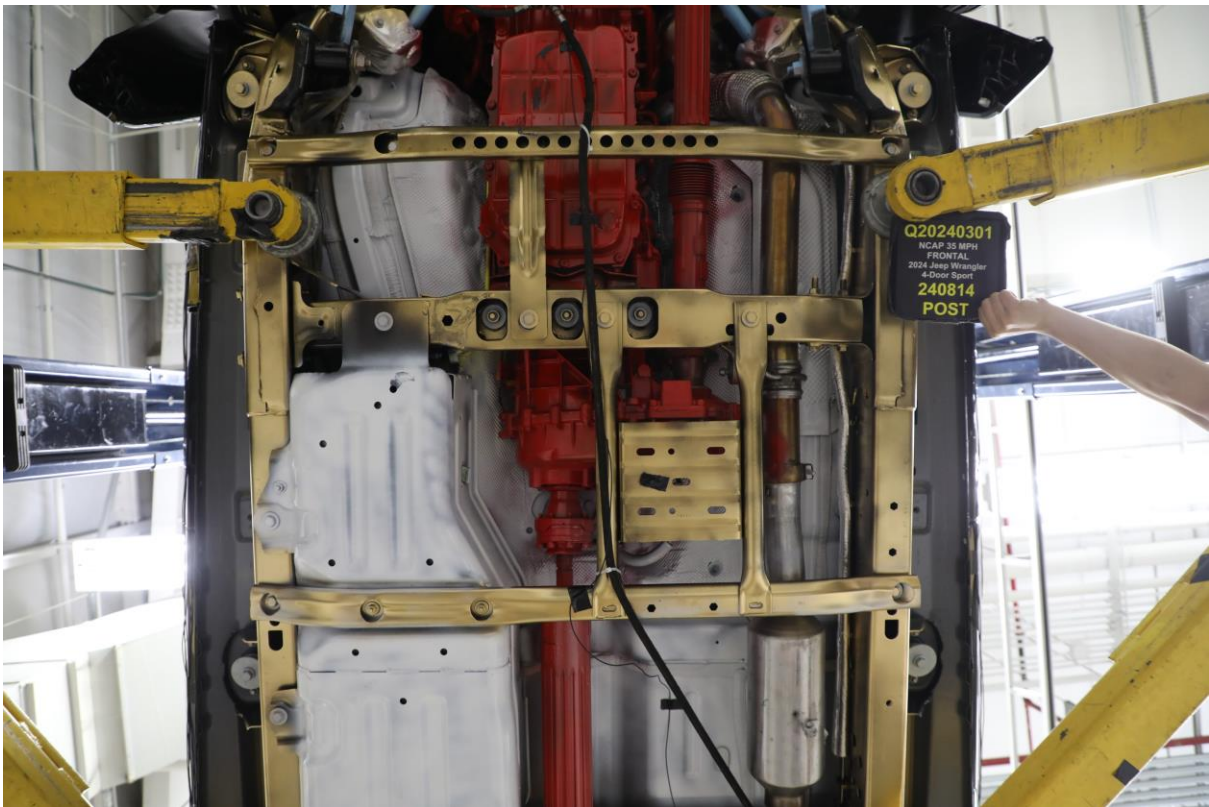
024 Pre-Test Front Underbody View



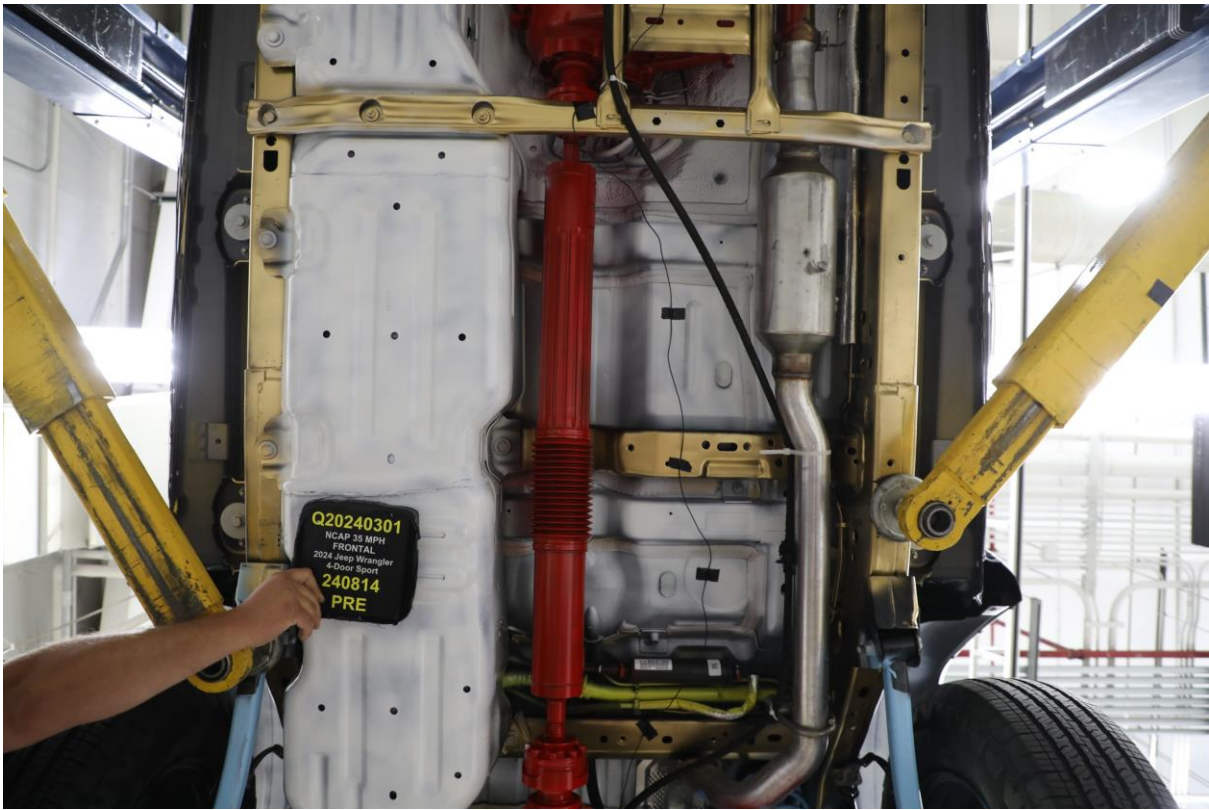
025 Post-Test Front Underbody View



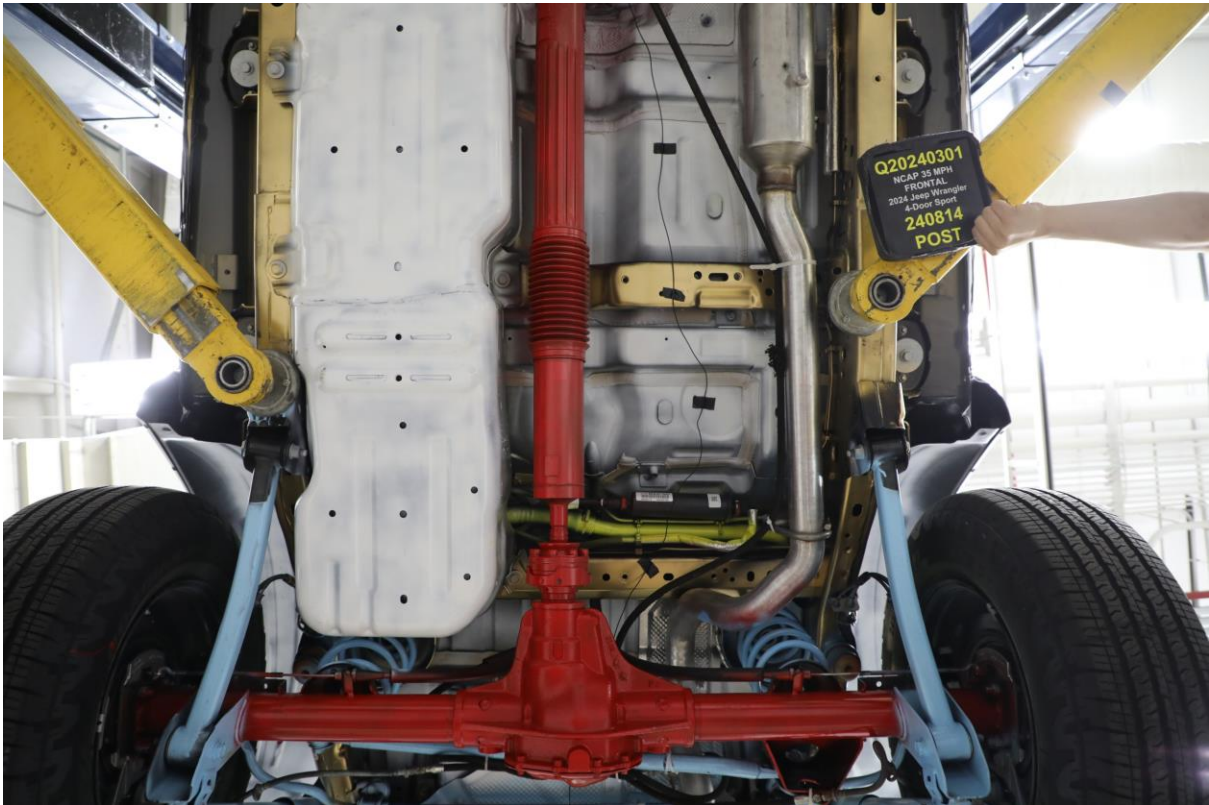
025a Pre-Test Mid Front Underbody View



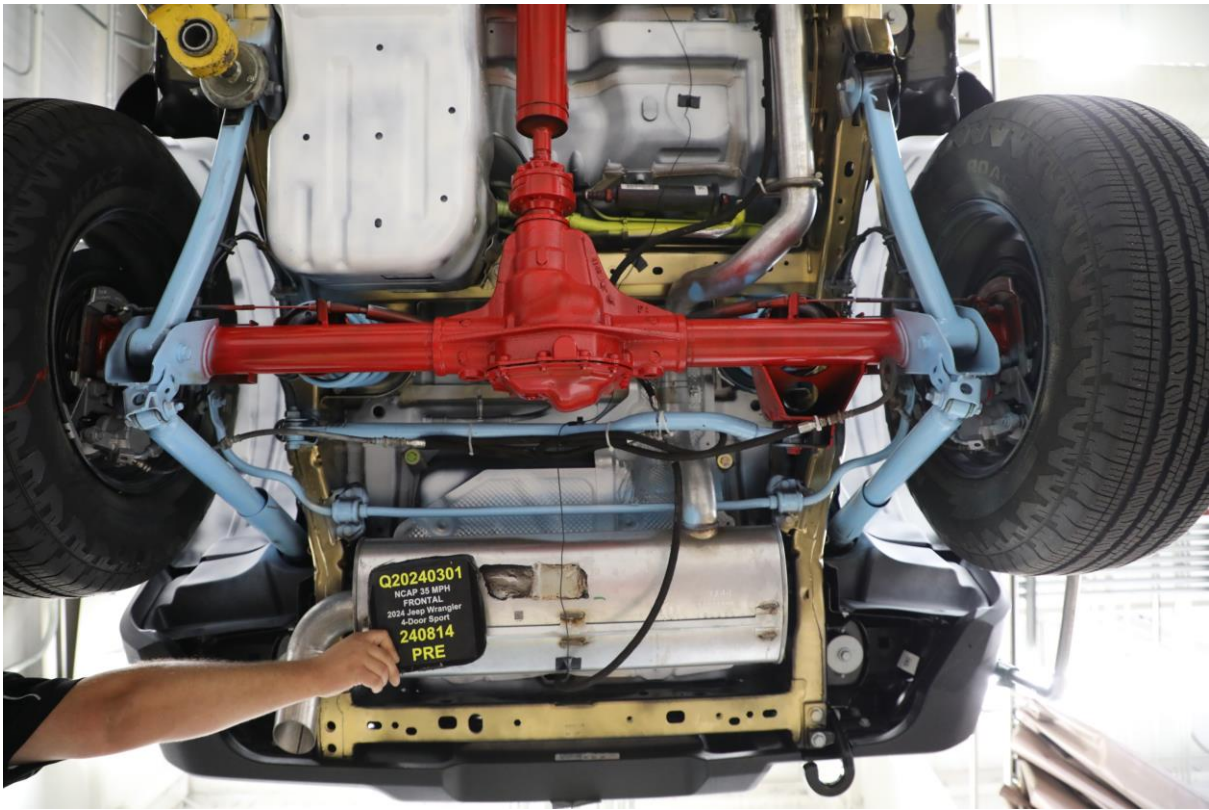
025b Post-Test Mid Front Underbody View



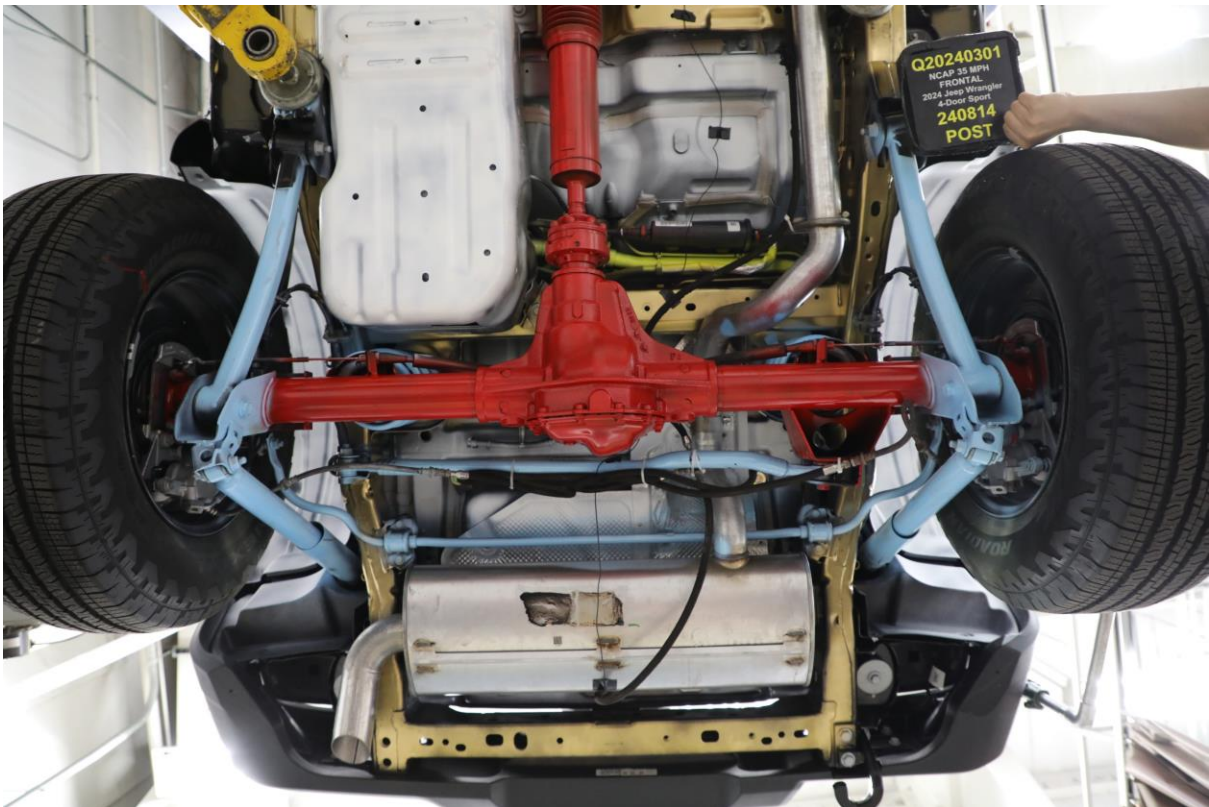
025c Pre-Test Mid Rear Underbody View



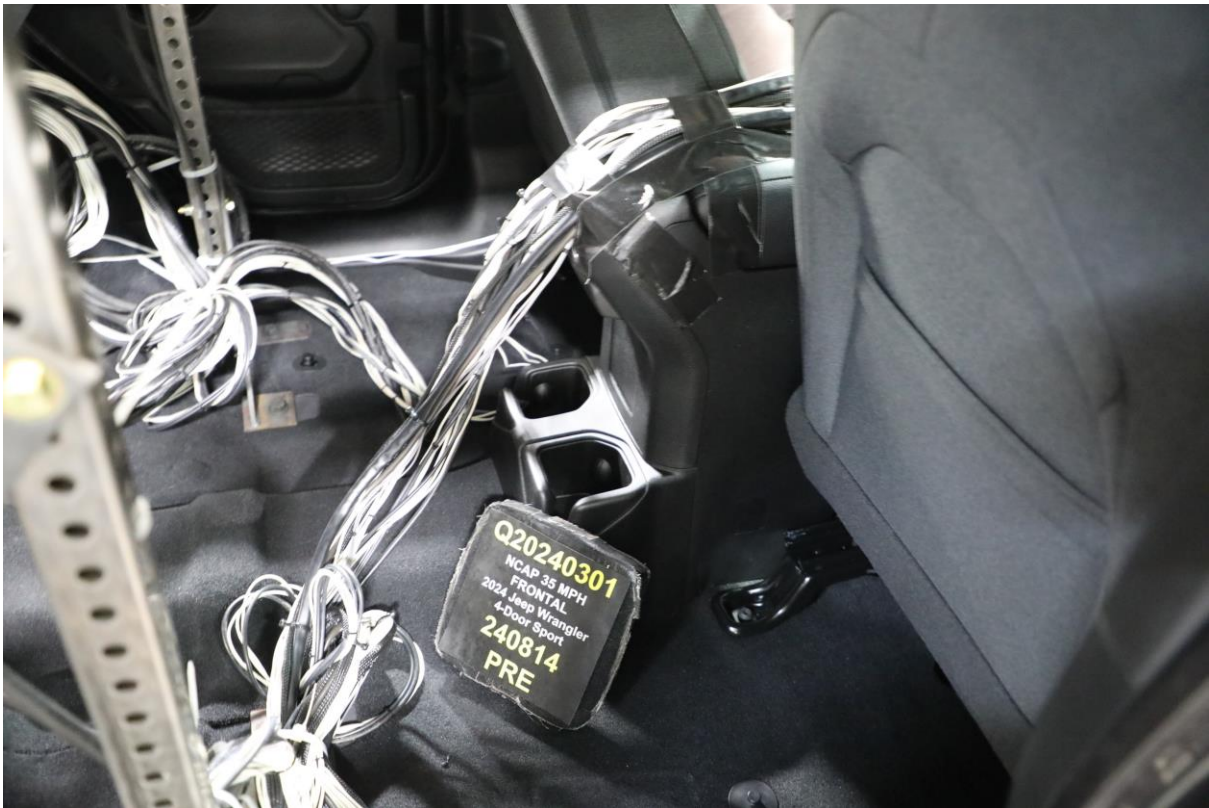
025d Post-Test Mid Rear Underbody View



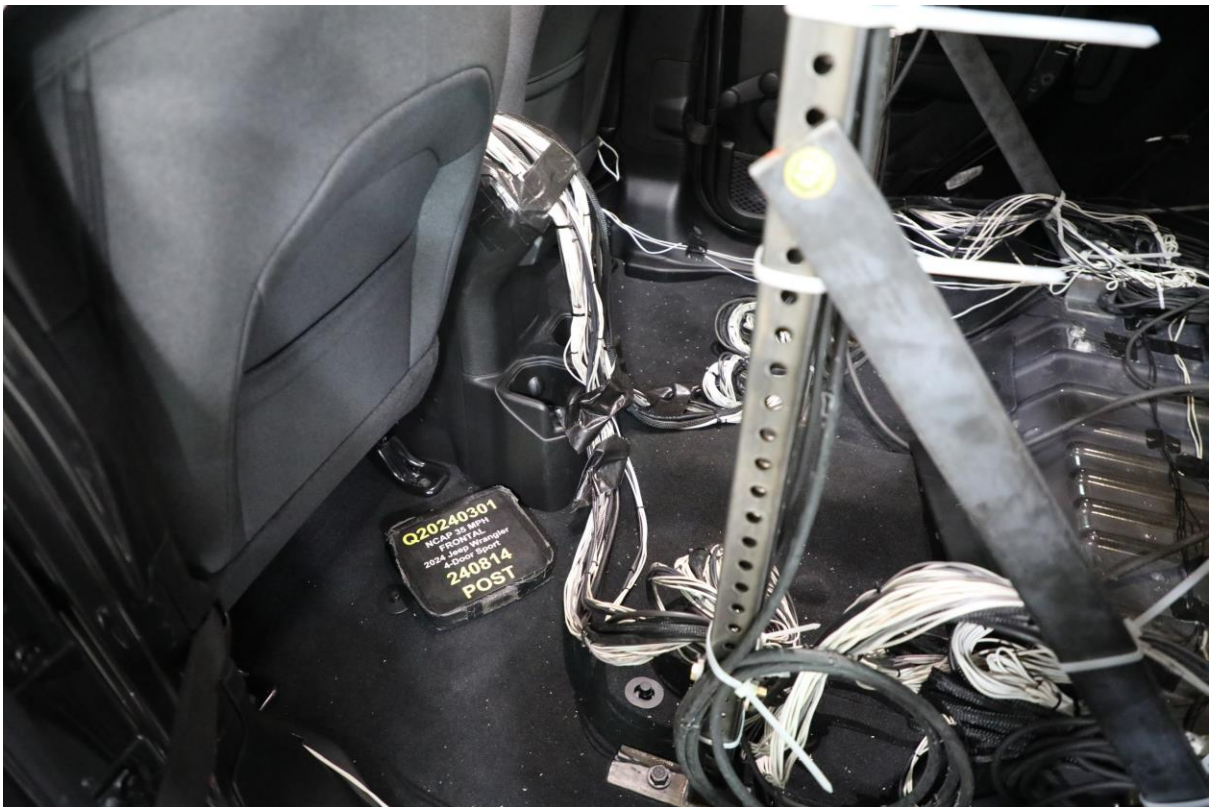
026 Pre-Test Rear Underbody View



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



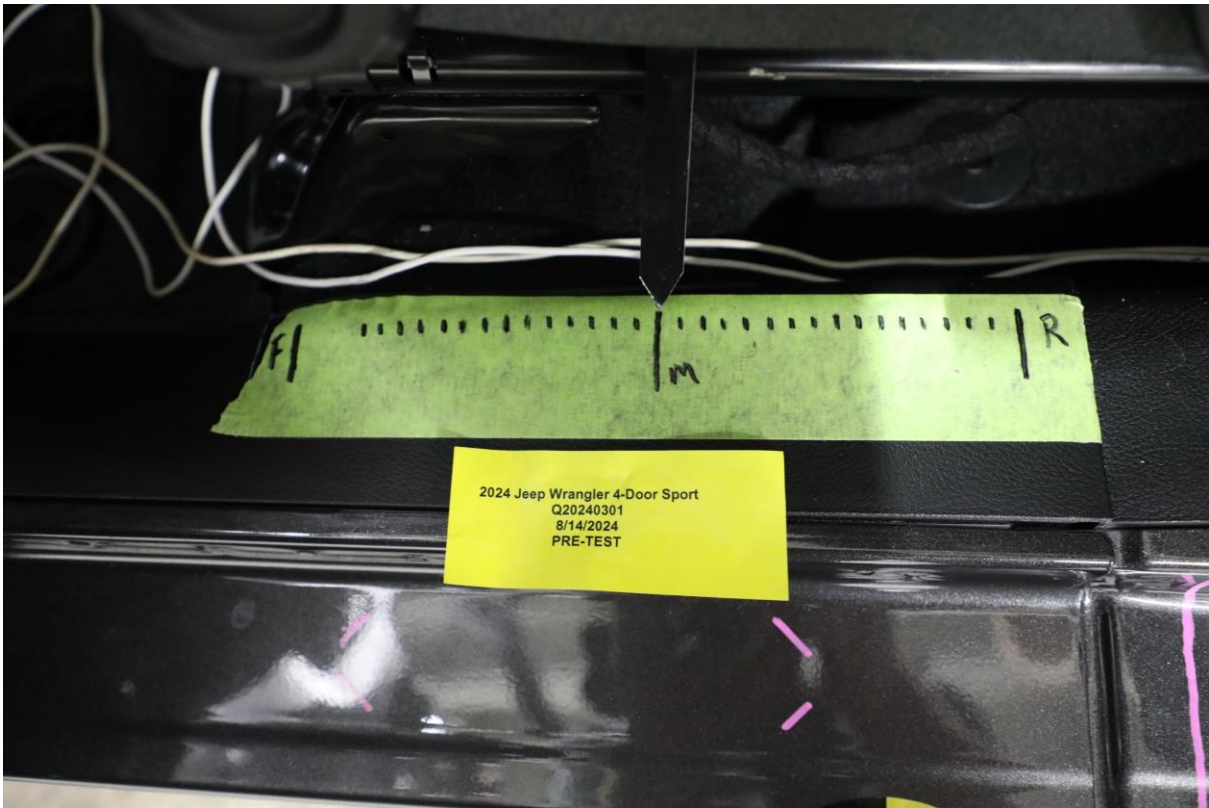
033 Post-Test Driver Dummy Window View



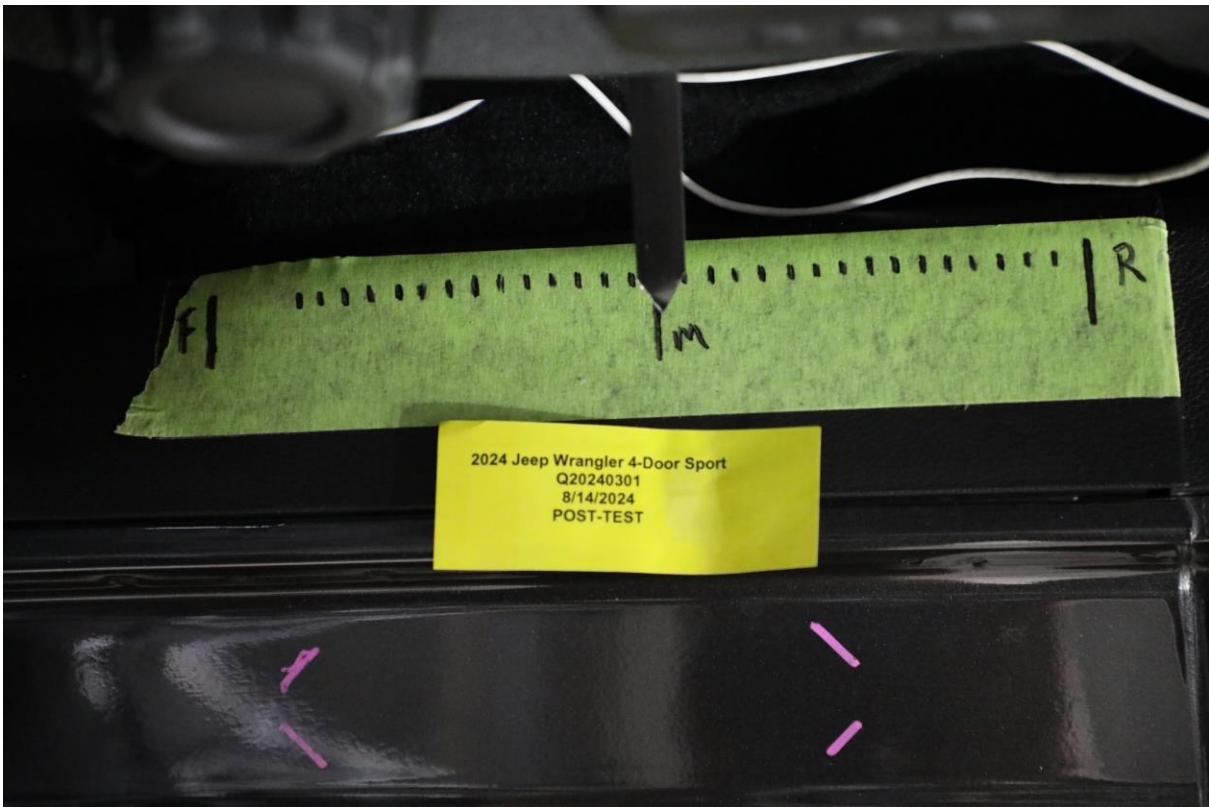
034 Pre-Test Driver Dummy and Vehicle Interior View



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



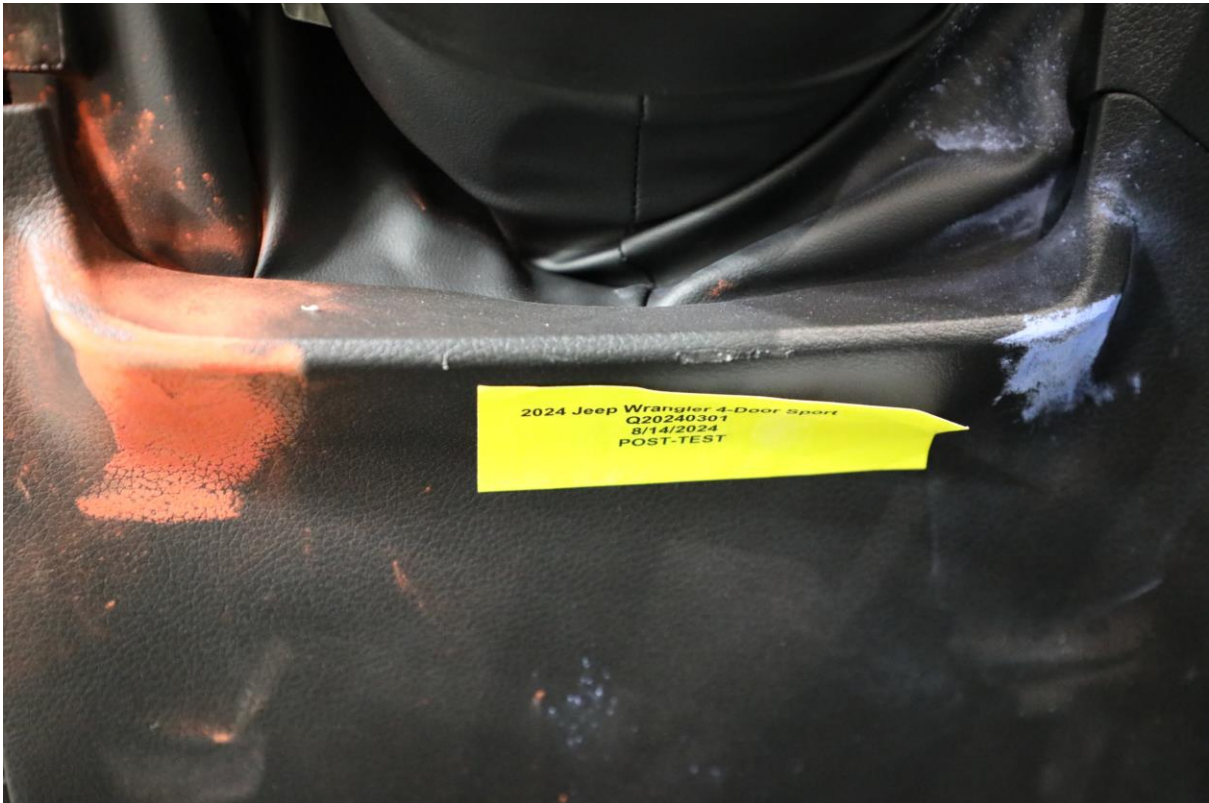
042 Pre-Test Driver Dummy Feet



043 Post-Test Driver Dummy Feet



044 Pre-Test Driver's Side Knee Bolster



045 Post-Test Driver's Side Knee Bolster



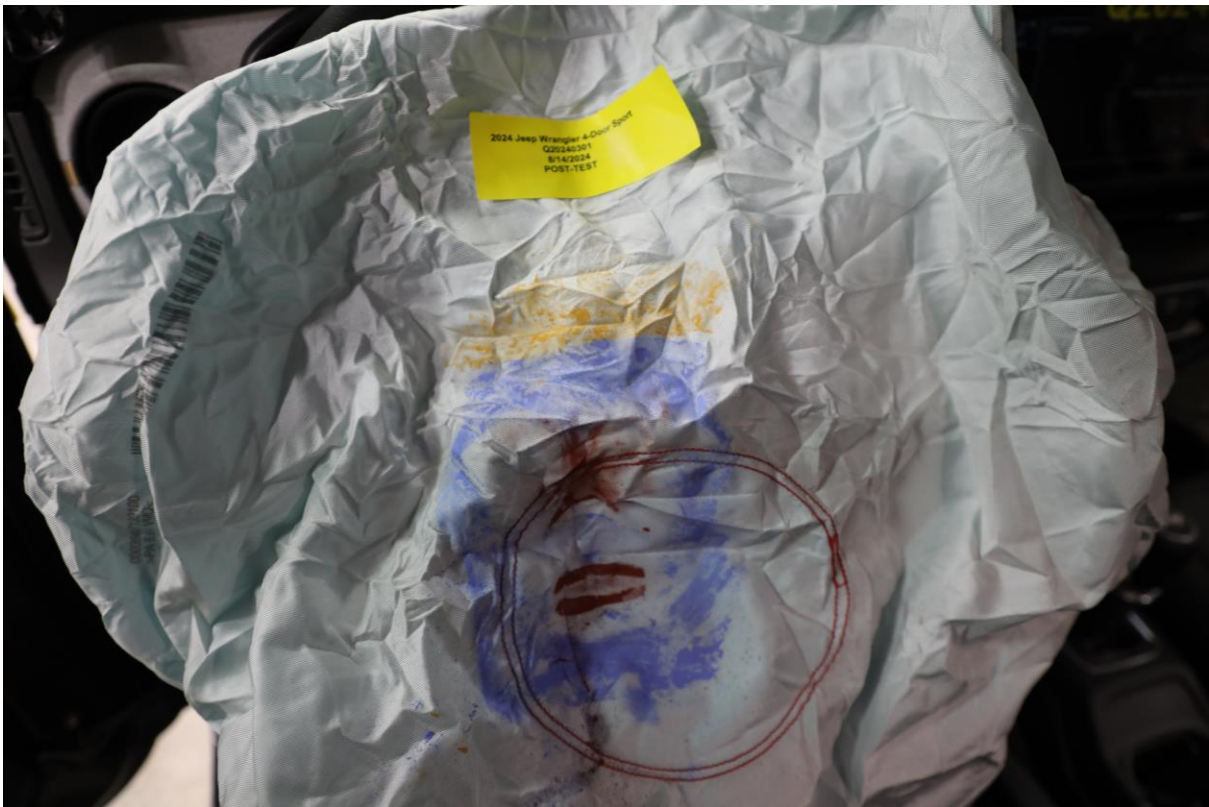
046 Pre-Test Driver's Side Floorpan



047 Post-Test Driver's Side Floorpan



048 Post-Test Driver Dummy Face

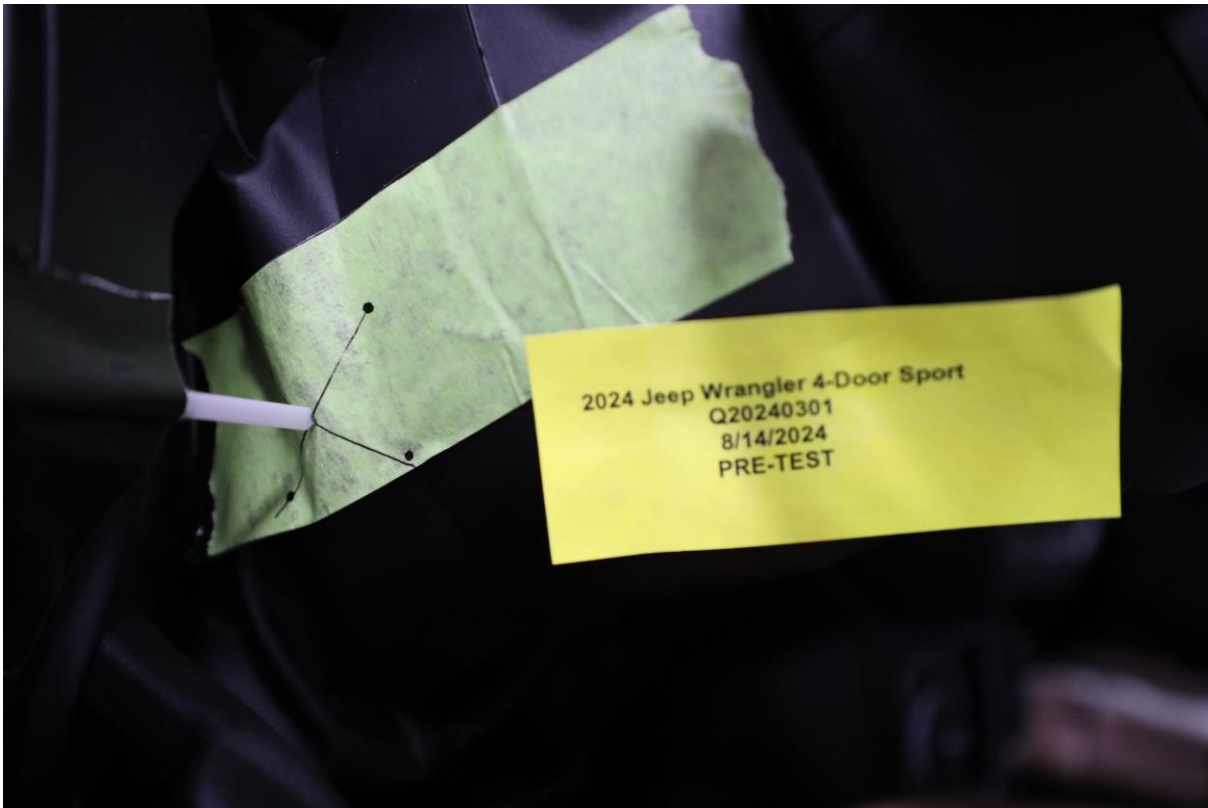


049 Post-Test Driver Dummy Contact with Airbag



050 Post-Test Driver Dummy Contact with Headrest

Intentionally Left Blank



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



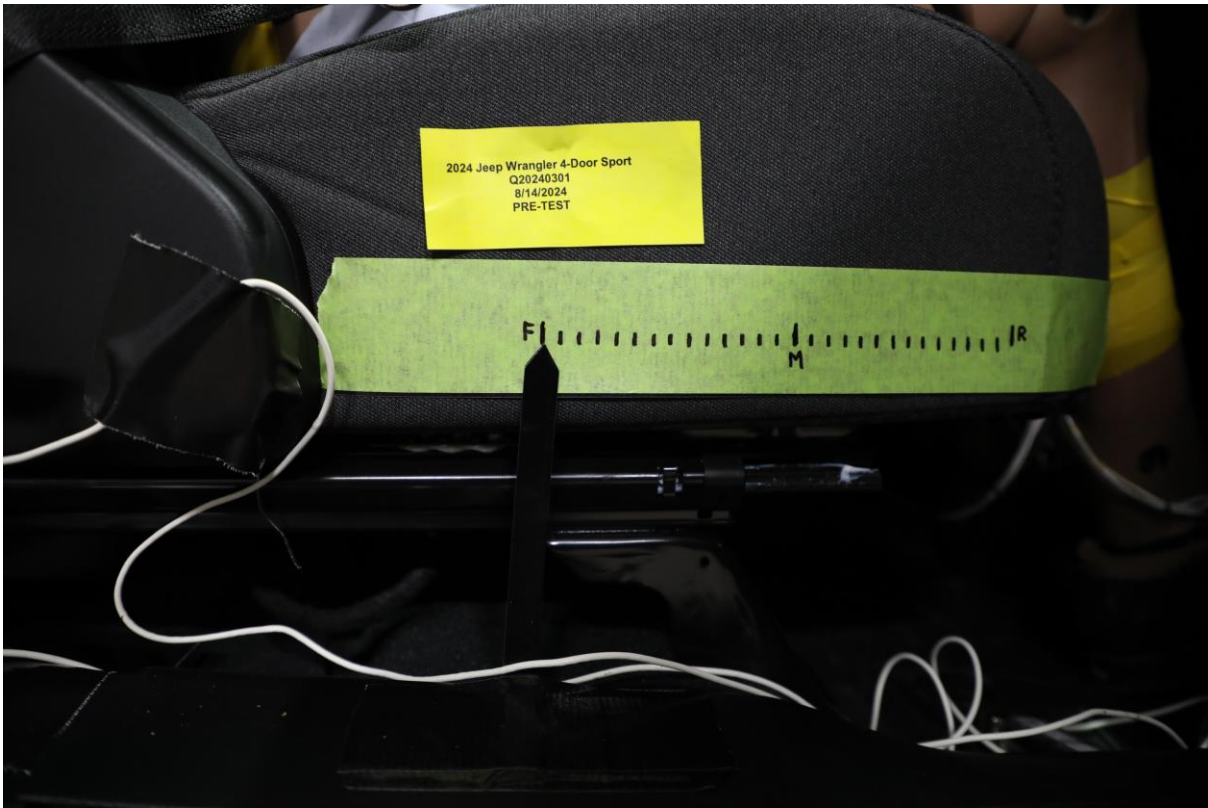
056 Post-Test Passenger Dummy Window View



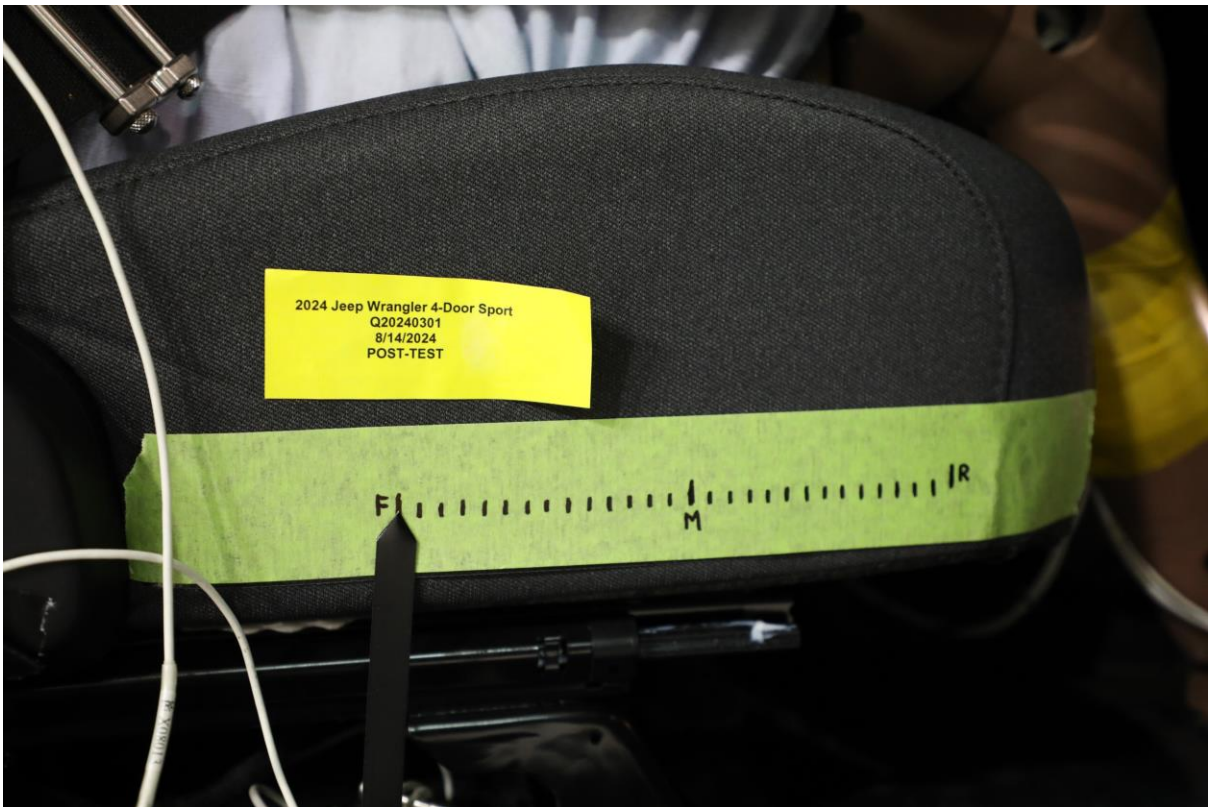
057 Pre-Test Passenger Dummy and Vehicle Interior View



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



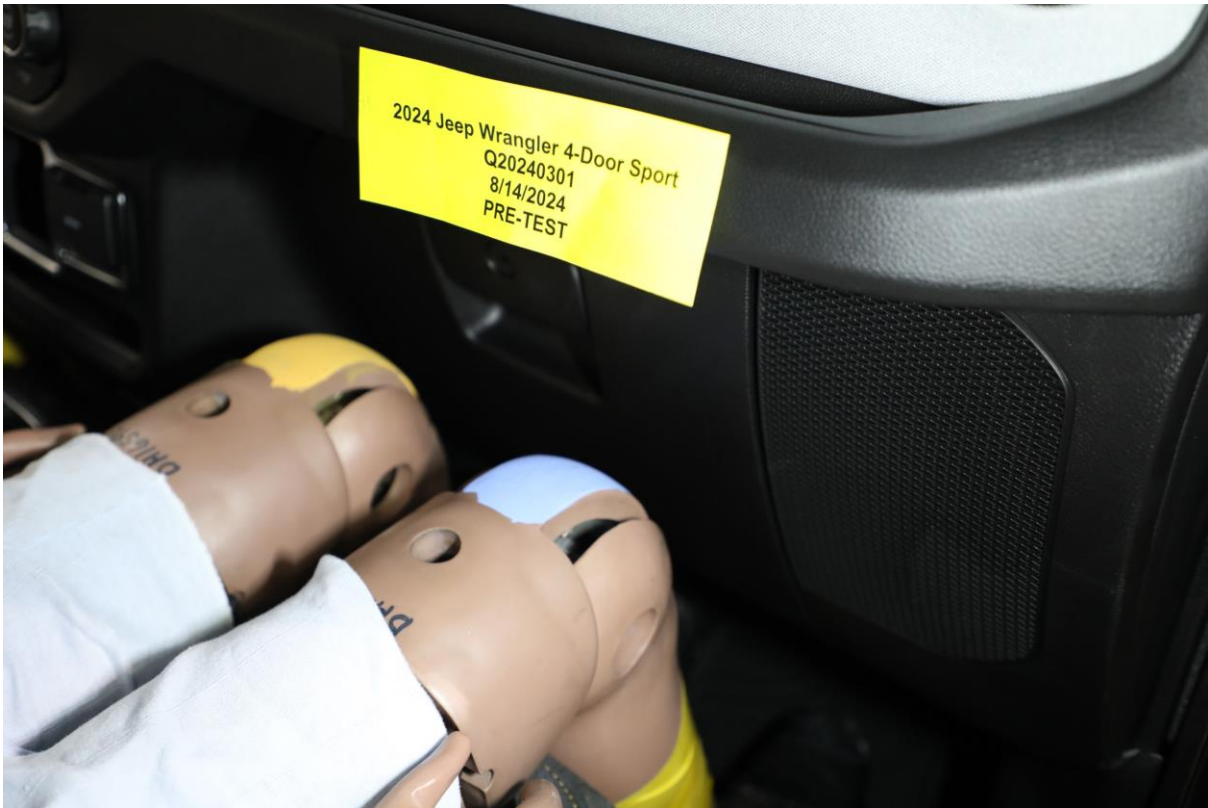
064 Post-Test View of Belt Buckle and Latch Plate for Passenger Dummy



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



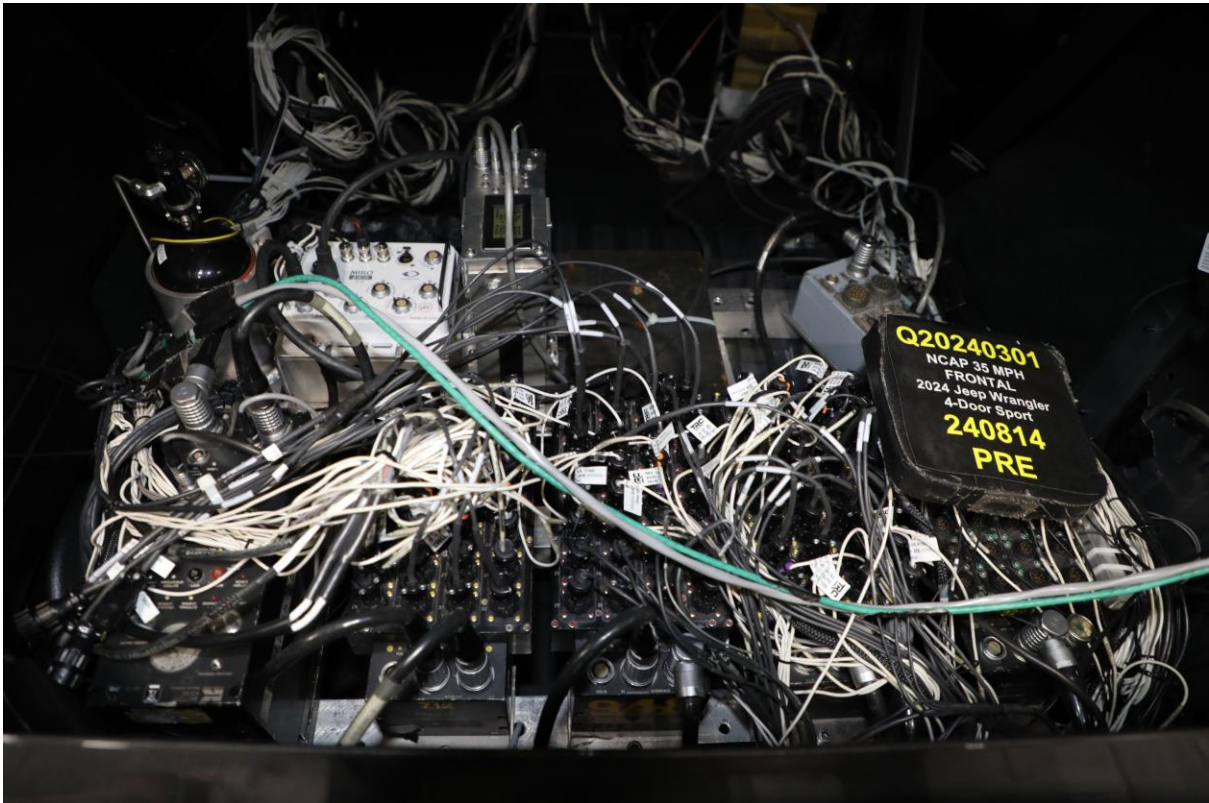
071 Post-Test Passenger Dummy Face



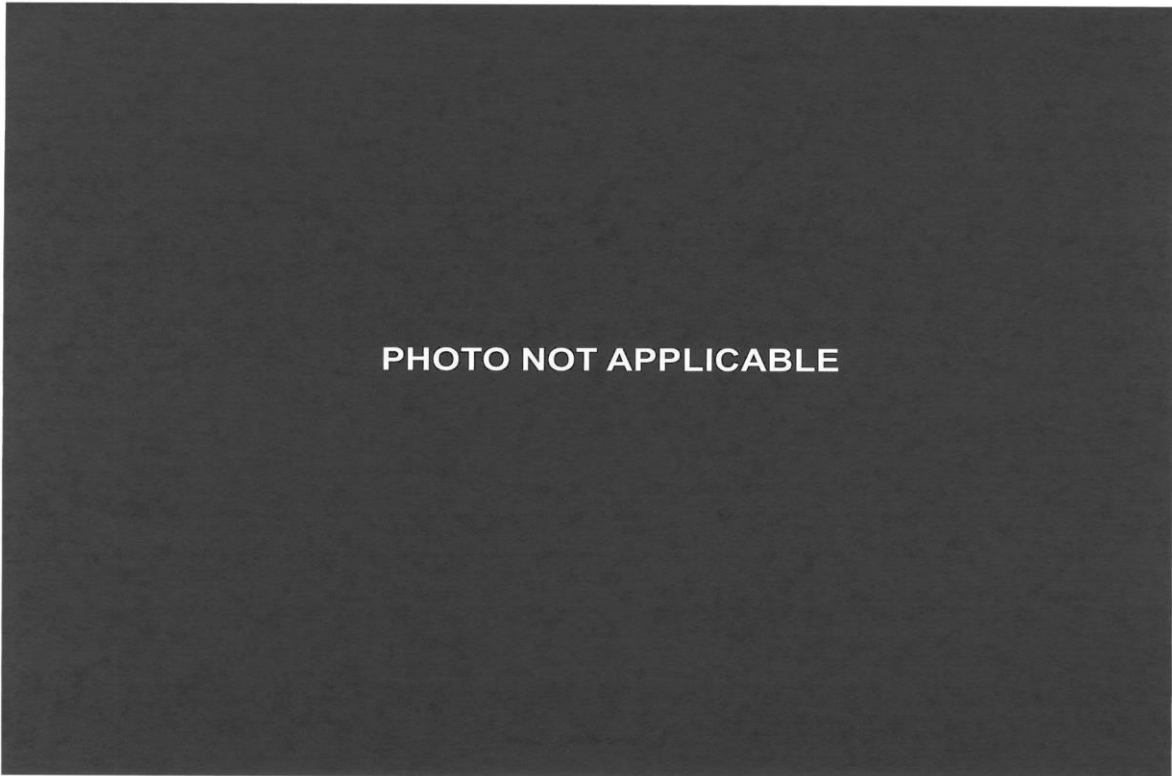
072 Post-Test Passenger Dummy Contact with Airbag



073 Post-Test Passenger Dummy Contact with Headrest



074 Photograph of Ballast Installed in Vehicle



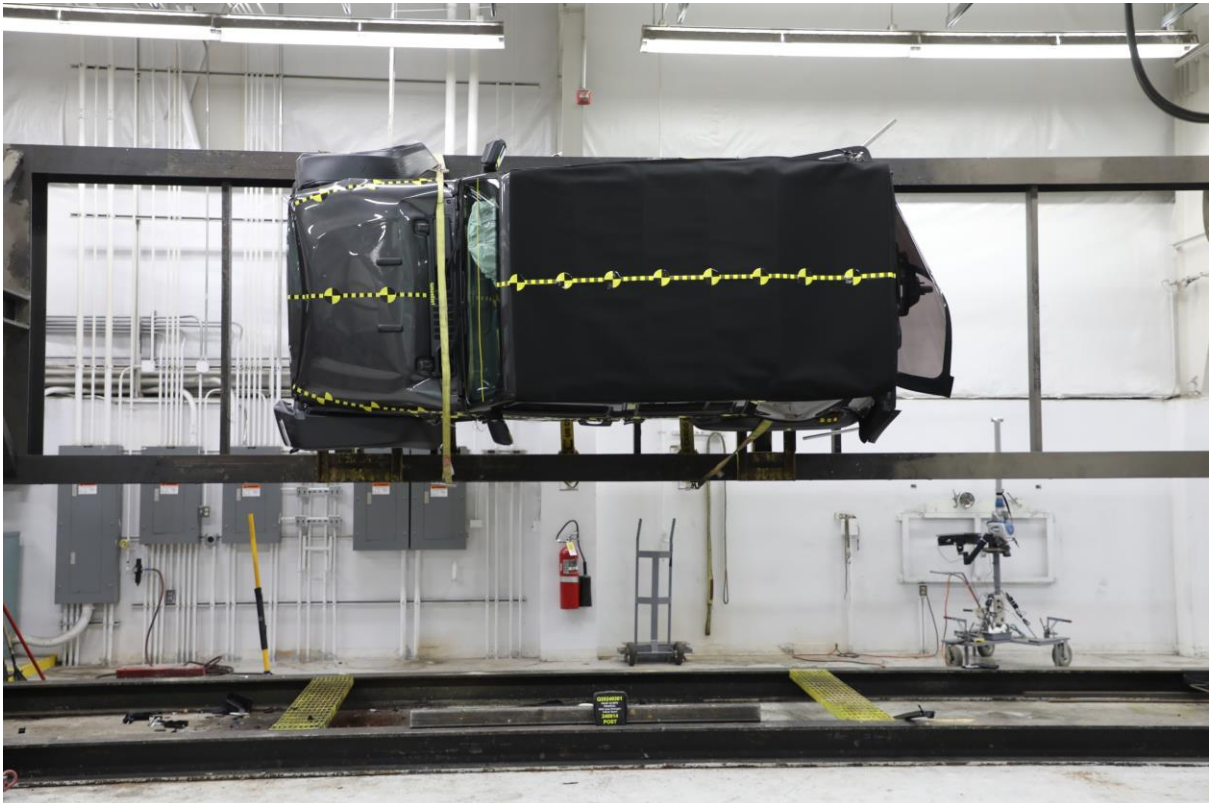
075 Post-Test Stoddard Spillage Location View



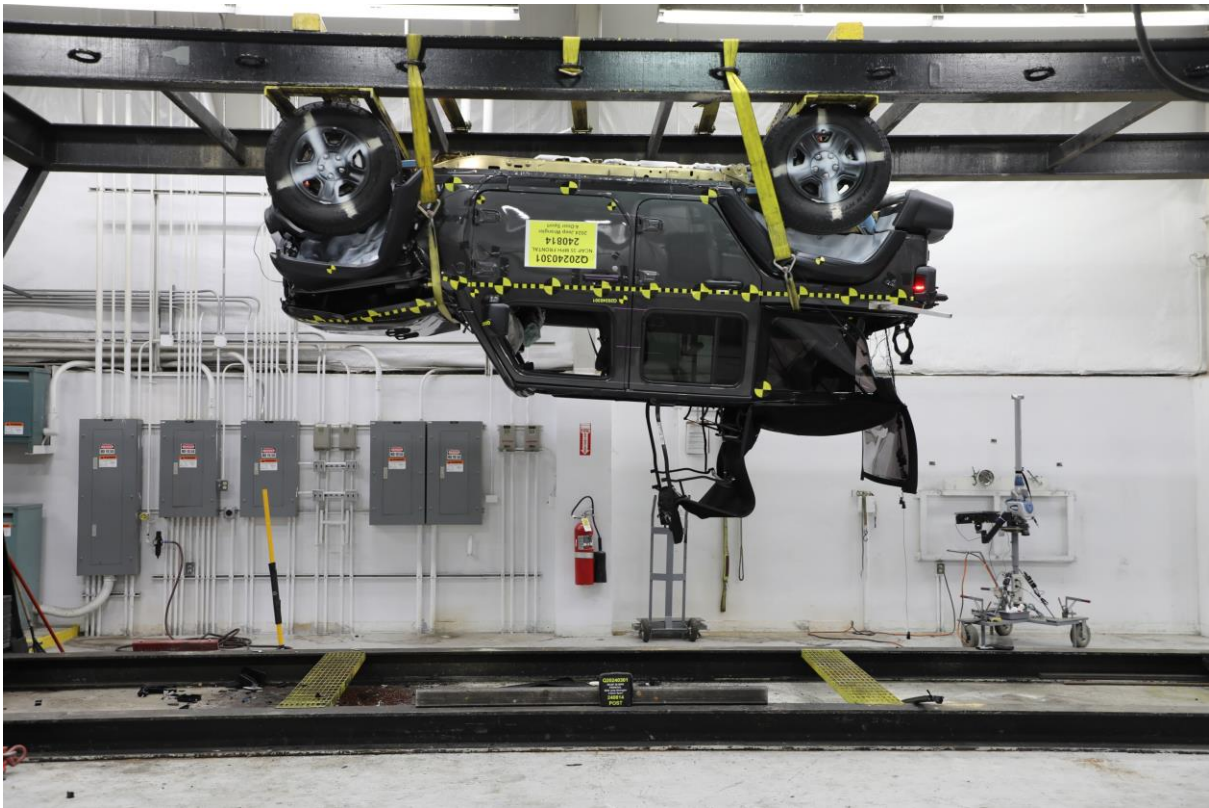
076 Post-Test Speed Trap Read out



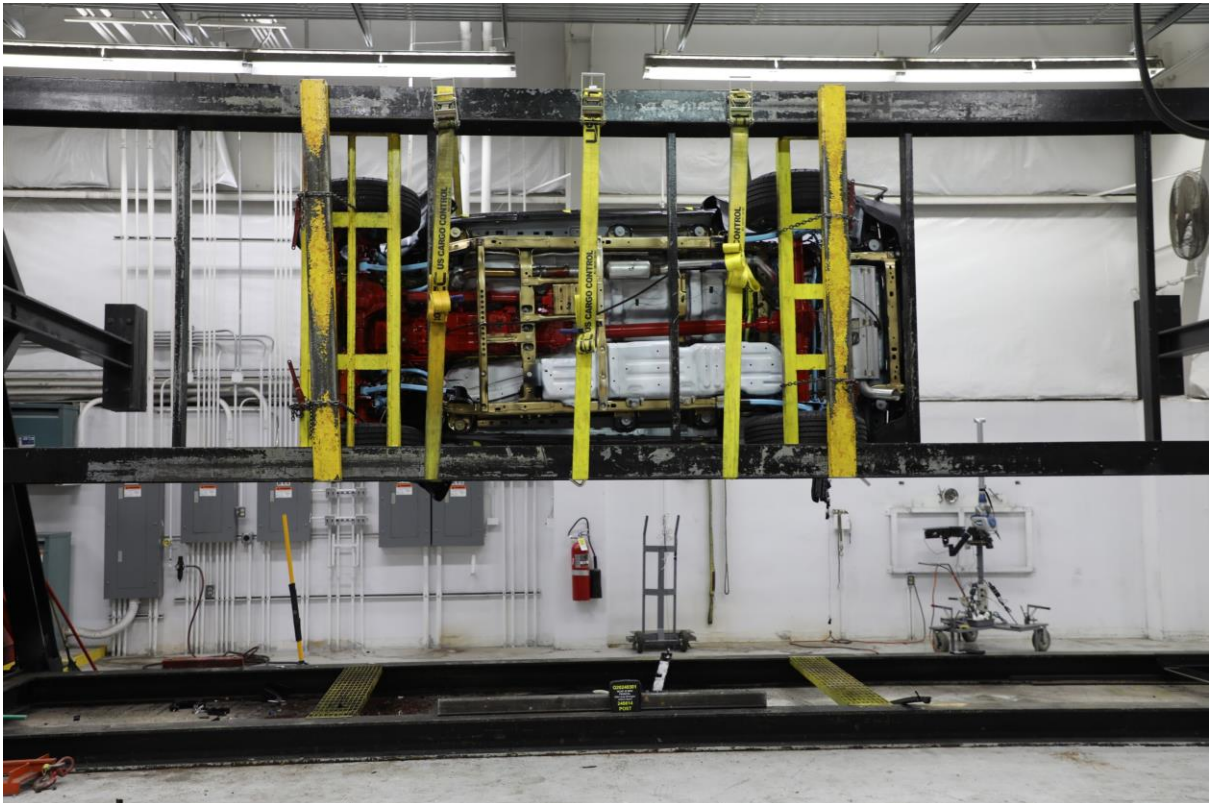
077 Vehicle at 0° on Static Rollover Device



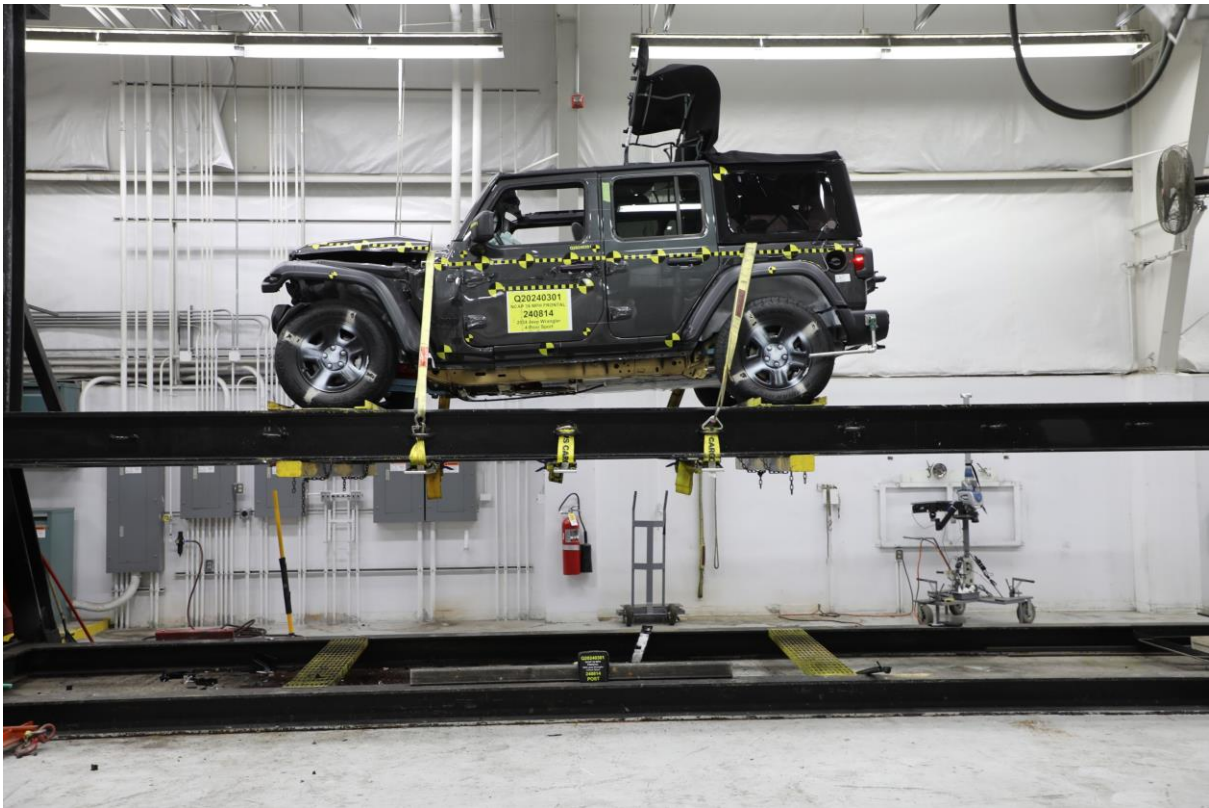
078 Vehicle at 90° on Static Rollover Device



079 Vehicle at 180° on Static Rollover Device



080 Vehicle at 270° on Static Rollover Device



081 Vehicle at 360° on Static Rollover Device



082 2024 Jeep Wrangler 4-Door Sport Frontal Impact Event



2024 MODEL YEAR
WRANGLER 4-DOOR SPORT 4X4

For more information visit: www.jeep.com
or call 1-877-IAM-JEEP

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: \$36,595

JEEP WRANGLER 4-DOOR SPORT
Exterior Color: Granite Crystal Metallic Clear-Coat Exterior Paint
Interior Color: Black Interior Color
Interior: Cloth Low-Back Bucket Seats
Engine: 2.0L I4 DODG Di Turbo Engine with Stop/Start
Transmission: 8-Speed Automatic 850RE Transmission

STANDARD EQUIPMENT (UNLESS REPLACED BY OPTIONAL EQUIPMENT)

FUNCTIONAL SAFETY FEATURES

Command Trac® Part-Time 4WD System
Fuel Tank Skid-Plate Shield
Transfer Case Skid-Plate Shield
Transmission Skid-Plate
Heavy-Duty 4-Wheel Anti-Lock Disc Brakes
Off-Road Info Pages

HILL-START ASSIST

ParkView® Rear Back-Up Camera
Push-Button Start
Sentry Key® Theft Deterrent System
Tire Pressure Monitoring Display
Advanced Multistage Front Air Bags
Supplemental Front Seat-Mounted Side Air Bags
Supplemental Side Air Bags

INTERIOR FEATURES

Uconnect® 5 with 12.3-inch Touch Screen Display
Apple CarPlay®
Google Android Auto™
SiriusXM® 360, with 3-Month Sub Call 800-643-2112
Jeep Connect (Connected Services) w/ Trial
4G LTE Wi-Fi Hot Spot Trial (NA in PR or USVI)
Handsfree Phone and Audio
Vehicle Information Center
8 Speakers
Full-Function Media Hub with 2-USB Plus Aux Port
Cluster 3.5-inch TFT Black and White Display
Ambient LED Interior Lighting
6-Way Manual Adjustable Driver Seat
2-Way Manual Lumbar Adjustable Driver Seat
12-Volt Auxiliary Power Outlet
Driver and Passenger Assist Handles
Air Conditioning
Manual Door Locks

EXTERIOR FEATURES

Manual Windows
Front and Rear Floor Mats
Locking Glove Box

17-inch x 7.5-inch Black Steel Styled Wheels
245/75R17 All-Season Tires
Full-Size Spare Tire
Matching Spare Wheel
Premium Black Sunrider® Soft Top
2-Front and 1-Rear Tow Hooks
Integrated Window Antenna
Halogen Headlamps
Front Fog Lamps
Molded-In-Color Fender Flares
Blow-Molded Black Rear Bumper
Jeep Tool-Kit

OPTIONAL EQUIPMENT (May Replace Standard Equipment)

Granite Crystal Metallic Clear-Coat Exterior Paint \$595
Customer Preferred Package 228
Anti-Lock 4-Wheel Disc Brakes
All-Weather Floor Mats by Mopar® \$170
8-Speed Automatic 850RE Transmission \$2,500
Anti-Lock 4-Wheel Disc Brakes
Deep-Tint Sunscreens Windows \$595

DESTINATION CHARGE \$1,895

TOTAL PRICE: * \$42,350

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.

5 YEAR/60,000 MILE POWERTRAIN WARRANTY

Assembly Plant/Port of Entry, TOLEDO, OHIO, U.S.A.

SHIP TO: 4884 3K PERFORMANCE CHRYSLER JEEP DODGE DAYTONVILLE OH 45424

SHIP TO: 4884 3K PERFORMANCE CHRYSLER JEEP DODGE DAYTONVILLE OH 45424

1C4-PXD01RW-332176 LA000 8223

SHIP TO: 4884 3K PERFORMANCE CHRYSLER JEEP DODGE DAYTONVILLE OH 45424

SHIP TO: 4884 3K PERFORMANCE CHRYSLER JEEP DODGE DAYTONVILLE OH 45424

1C4-PXD01RW-332176 LA000 8223

SHIP TO: 4884 3K PERFORMANCE CHRYSLER JEEP DODGE DAYTONVILLE OH 45424

SHIP TO: 4884 3K PERFORMANCE CHRYSLER JEEP DODGE DAYTONVILLE OH 45424

1C4-PXD01RW-332176 LA000 8223

SHIP TO: 4884 3K PERFORMANCE CHRYSLER JEEP DODGE DAYTONVILLE OH 45424

SHIP TO: 4884 3K PERFORMANCE CHRYSLER JEEP DODGE DAYTONVILLE OH 45424

EPA DOT Fuel Economy and Environment

Gasoline Vehicle

These estimates reflect new EPA methods beginning with 2017 models. Small SUV 4WD range from: 14 to 116 MPG. The best vehicle rates 140 MPG.

Fuel Economy
21 MPG combined city/hwy
20 MPG city
22 MPG highway
4.8 gallons per 100 miles

You spend \$3,000 more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$2,550

Fuel Economy & Greenhouse Gas Rating (tailpipe only) 4

Smog Rating (tailpipe only) 7

This vehicle emits 426 grams CO2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions. Learn more at fuelconomy.gov

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 24 MPG and cost \$3,760 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.60 per gallon. MPG is miles per gasoline gallon equivalent. Vehicle emissions are a significant source of climate change and smog.

fuelconomy.gov
Calculate personalized estimates and compare vehicles

Smartphone QR 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 Passenger	Not Rated	Not Rated
Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.			
Side Crash	Front seat Rear seat	Not Rated	Not Rated
Based on the risk of injury in a side impact.			
Rollover		★★★	
Based on the risk of rollover in a single-vehicle crash.			

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

PARTS CONTENT INFORMATION FOR VEHICLES IN THIS COUNTRY: U.S./CANADIAN PARTS CONTENT: 64% MAJOR SOURCES OF FOREIGN PARTS CONTENT: MEXICO: 18% NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.

FOR THIS VEHICLE:
FINAL ASSEMBLY POINT: TOLEDO, OHIO, U.S.A.
COUNTRY OF ORIGIN: UNITED STATES
TRANSMISSION: UNITED STATES

VEHICLE PROTECTION
MOPAR. Ask for Mopar Vehicle Protection for your vehicle. We built it. We back it.

083 Monroney Label Photograph

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

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

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

NHTSA

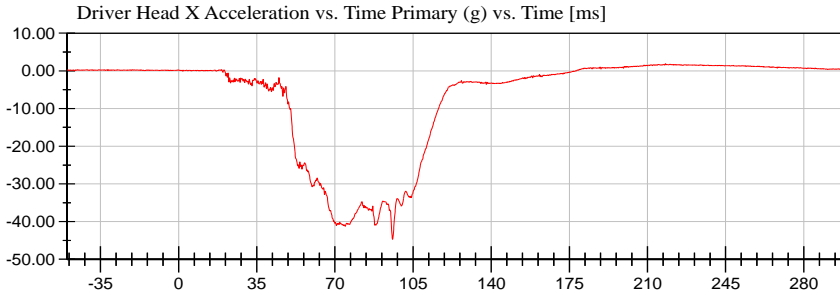
Test Lab: CTF

Test Number: 240814 (Q20240301)

Test Date: 08/14/2024

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

Position #2 Hybrid III Small Adult Female (DH1659)



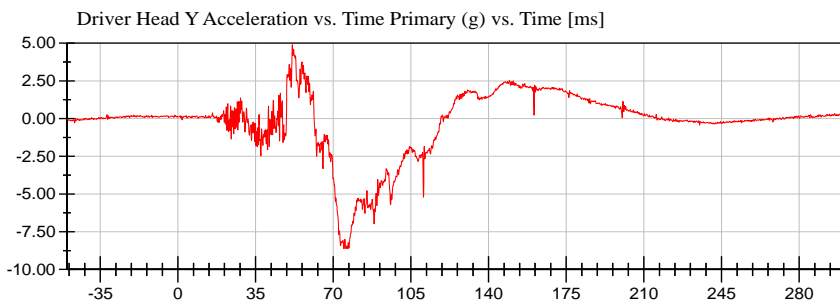
<Max>

1.89 g at 218.08 ms

<Min>

-44.71 g at 95.84 ms

CFC_1000



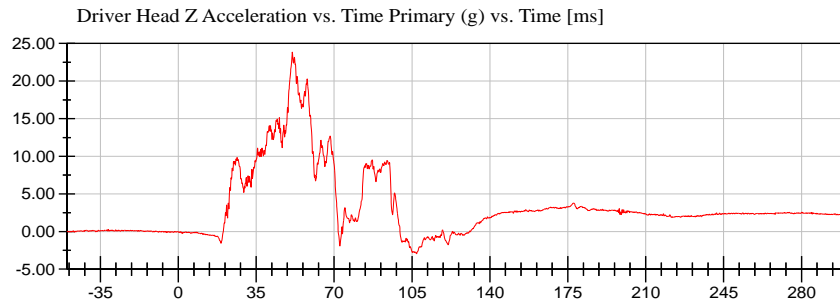
<Max>

4.89 g at 51.52 ms

<Min>

-8.63 g at 75.84 ms

CFC_1000



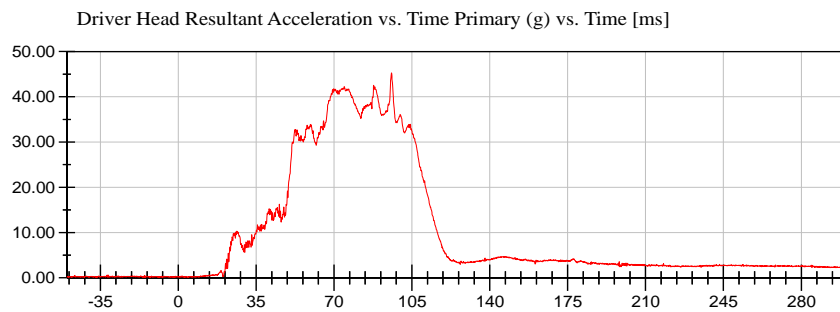
<Max>

23.83 g at 51.28 ms

<Min>

-2.96 g at 107.04 ms

CFC_1000



<Max>

45.31 g at 95.84 ms

<Min>

0.07 g at -15.12 ms

Prefiltered_> CFC 1000



NHTSA

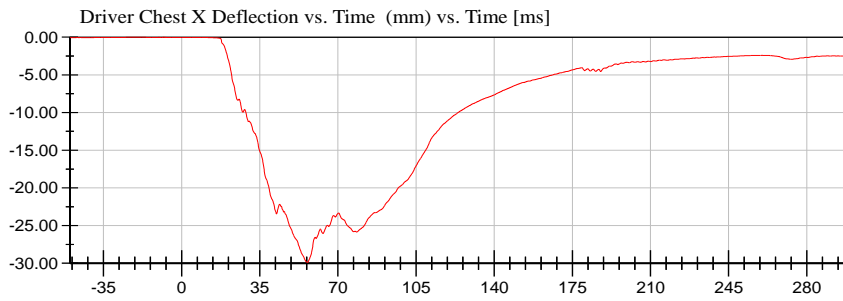
Test Lab: CTF

Test Number: 240814 (Q20240301)

Test Date: 08/14/2024

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

Position #2 Hybrid III Small Adult Female (DH1659)



<Max>

-0.02 mm at -21.04 ms

<Min>

-29.89 mm at 56.40 ms

CFC_600



NHTSA

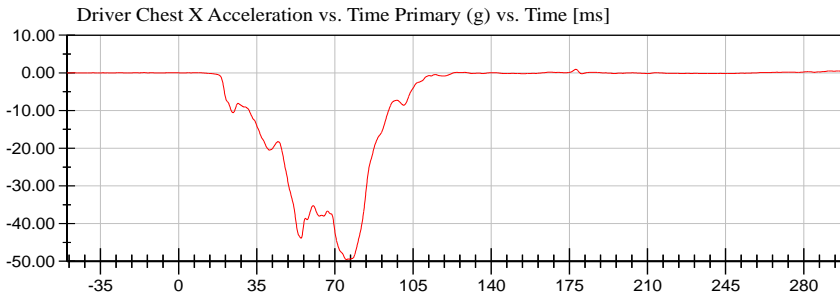
Test Lab: CTF

Test Number: 240814 (Q20240301)

Test Date: 08/14/2024

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

Position #2 Hybrid III Small Adult Female (DH1659)



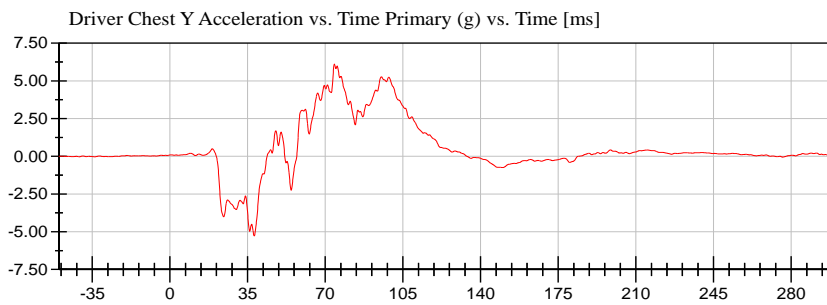
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0.93 g at 177.92 ms

<Min>

-49.55 g at 75.20 ms

CFC_180



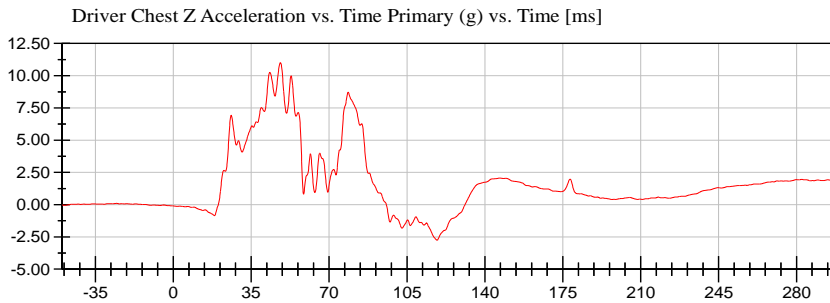
<Max>

6.11 g at 74.08 ms

<Min>

-5.28 g at 38.00 ms

CFC_180



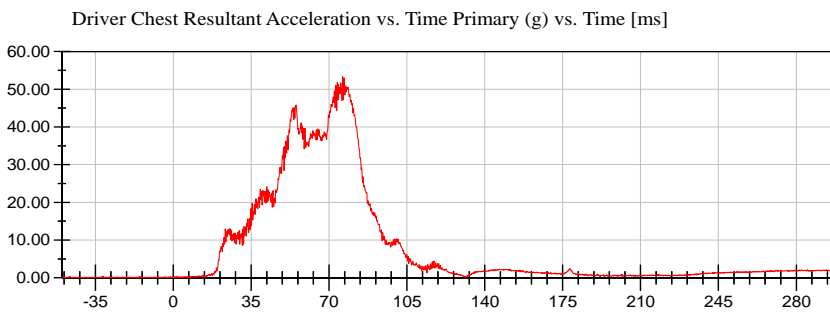
<Max>

11.01 g at 48.08 ms

<Min>

-2.75 g at 118.48 ms

CFC_180



<Max>

53.38 g at 76.16 ms

<Min>

0.03 g at -49.76 ms

Prefiltered_> CFC 1000



NHTSA

Test Lab: CTF

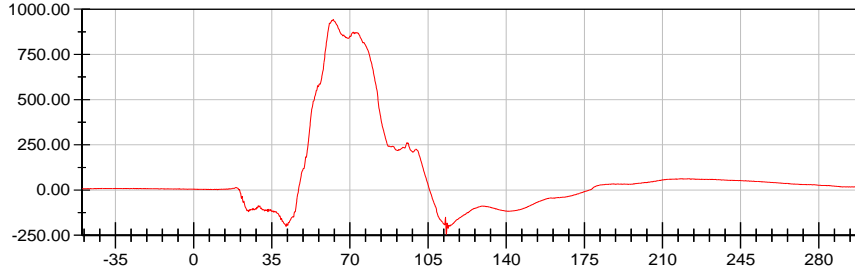
Test Number: 240814 (Q20240301)

Test Date: 08/14/2024

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

Position #2 Hybrid III Small Adult Female (DH1659)

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



<Max>

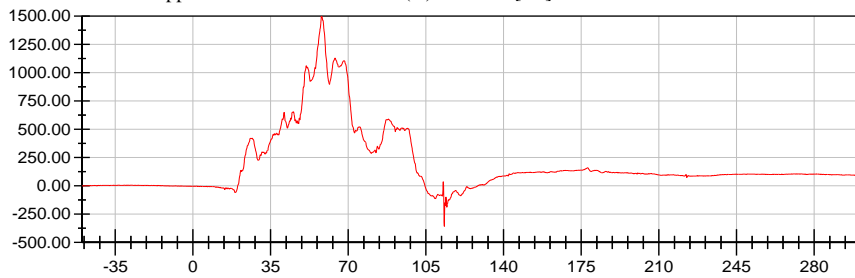
943.47 N at 62.48 ms

<Min>

-244.28 N at 113.20 ms

CFC_1000

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



<Max>

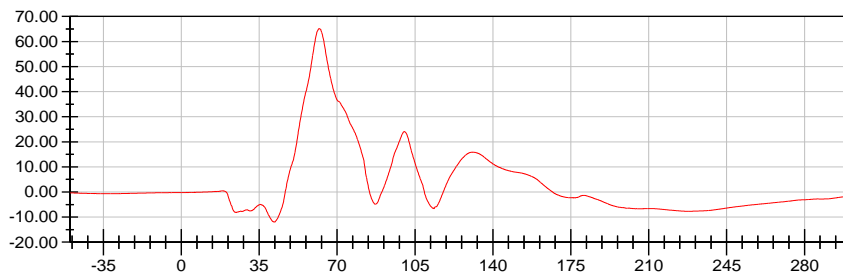
1,497.31 N at 58.00 ms

<Min>

-356.79 N at 113.28 ms

CFC_1000

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



<Max>

65.16 Nm at 61.92 ms

<Min>

-11.96 Nm at 41.92 ms

CFC_600



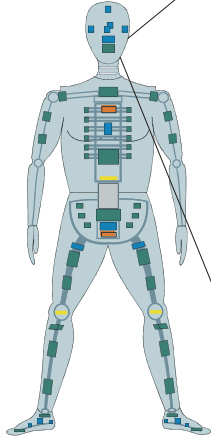


2024 Jeep Wrangler 4-Door Sport NCAP 35 mph Frontal Impact Neck Injury Predictor (NIJ)

Date: 08/14/2024
Time: 17:22

Customer: NHTSA
Test Number: Q20240301

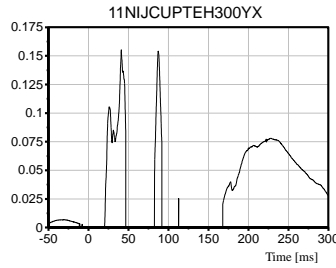
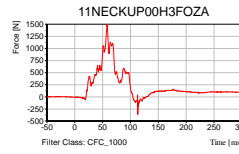
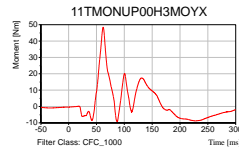
Test Orientation = Frontal
Fzc(Tension) = 6806
Fzc(Compression) = 6160
Myc(Extension) = 135
Myc(Flexion) = 310



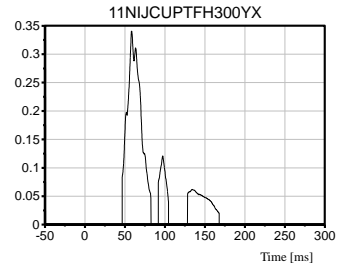
Dummy: HIII 50th Male
Seating Position:
Driver

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

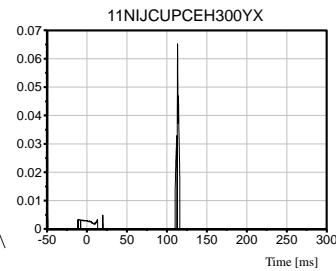
TRC Inc. Test Lab: CTF
Test Number: 240814



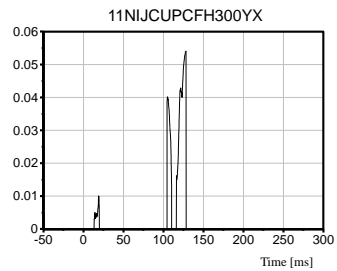
Max [NTE] 0.1553 at 41.12 ms



Max [NTF] 0.3405 at 58.56 ms



Max [NCE] 0.0652 at 113.36 ms



Max [NCF] 0.0541 at 128.24 ms

NHTSA

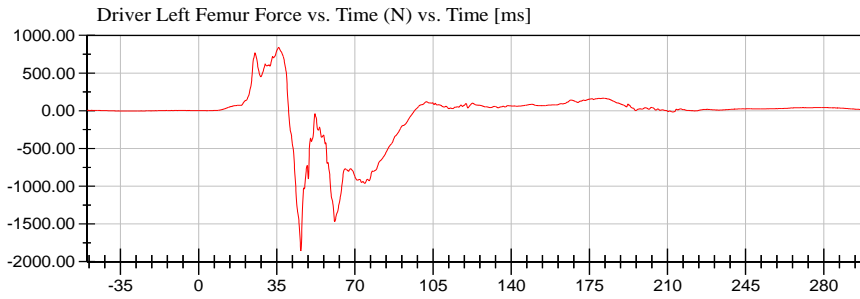
Test Lab: CTF

Test Number: 240814 (Q20240301)

Test Date: 08/14/2024

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

Position #2 Hybrid III Small Adult Female (DH1659)



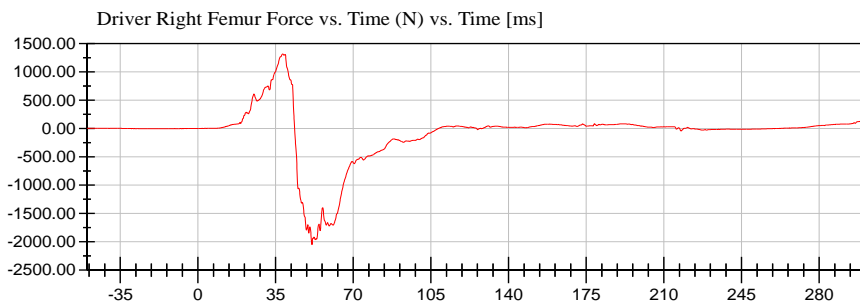
<Max>

839.76 N at 35.84 ms

<Min>

-1,853.88 N at 45.84 ms

CFC_600



<Max>

1,319.82 N at 38.24 ms

<Min>

-2,050.66 N at 51.36 ms

CFC_600



NHTSA

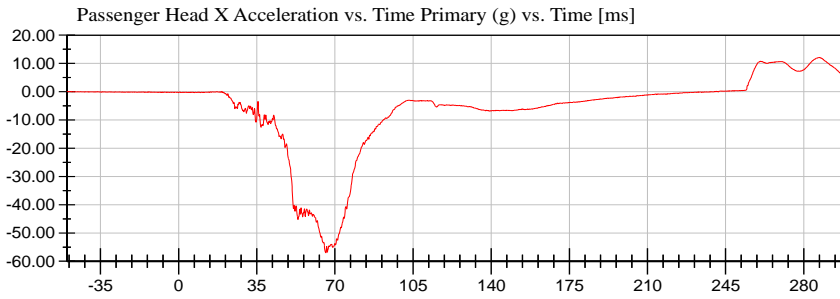
Test Lab: CTF

Test Number: 240814 (Q20240301)

Test Date: 08/14/2024

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

Position #2 Hybrid III Small Adult Female (DH1659)



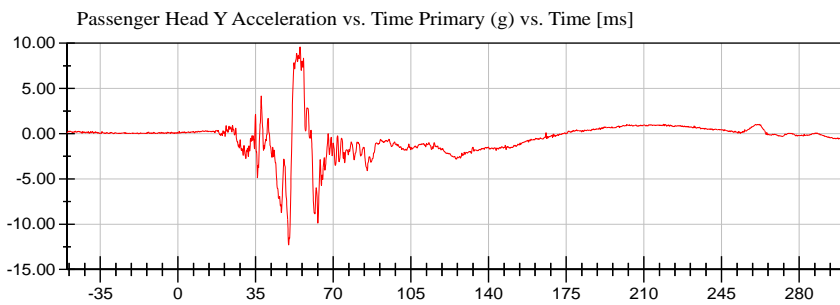
<Max>

12.10 g at 287.12 ms

<Min>

-56.99 g at 65.92 ms

CFC_1000



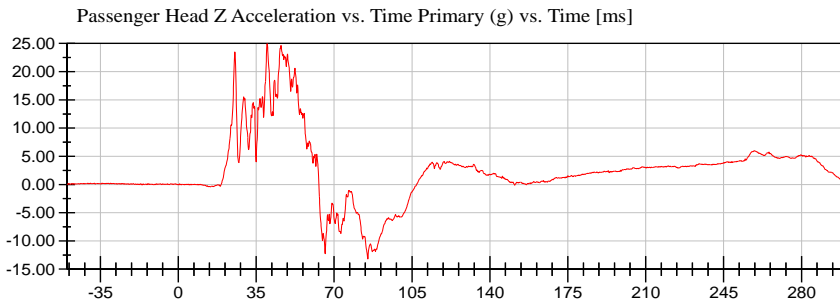
<Max>

9.58 g at 55.04 ms

<Min>

-12.30 g at 49.92 ms

CFC_1000



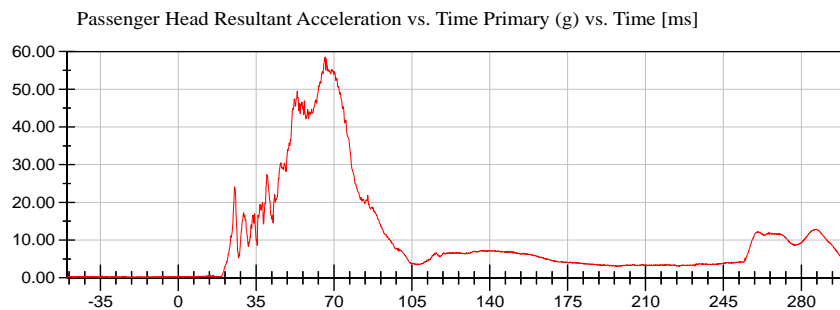
<Max>

24.95 g at 39.92 ms

<Min>

-13.19 g at 85.12 ms

CFC_1000



<Max>

58.55 g at 66.00 ms

<Min>

0.06 g at -44.08 ms

Prefiltered_> CFC 1000



NHTSA

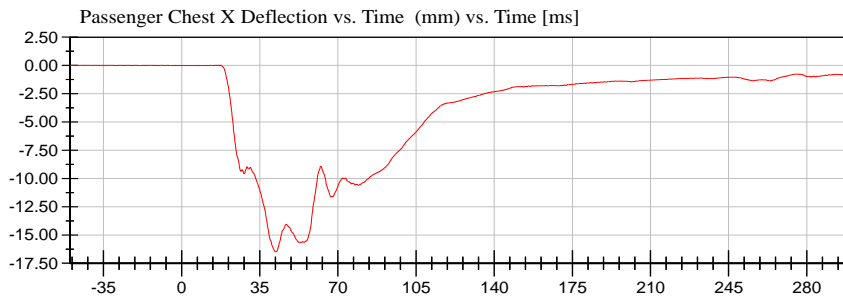
Test Lab: CTF

Test Number: 240814 (Q20240301)

Test Date: 08/14/2024

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

Position #2 Hybrid III Small Adult Female (DH1659)



<Max>

0.01 mm at -39.28 ms

<Min>

-16.48 mm at 42.48 ms

CFC_600



NHTSA

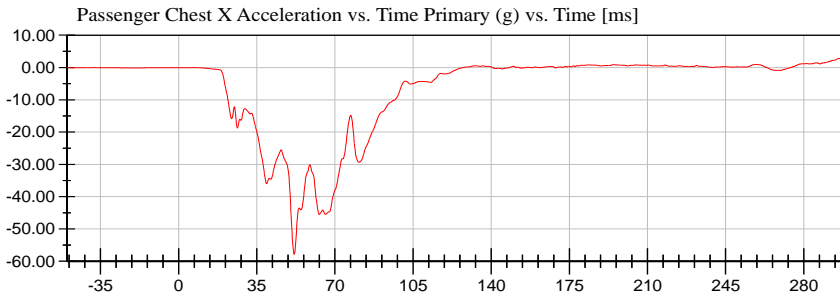
Test Lab: CTF

Test Number: 240814 (Q20240301)

Test Date: 08/14/2024

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

Position #2 Hybrid III Small Adult Female (DH1659)



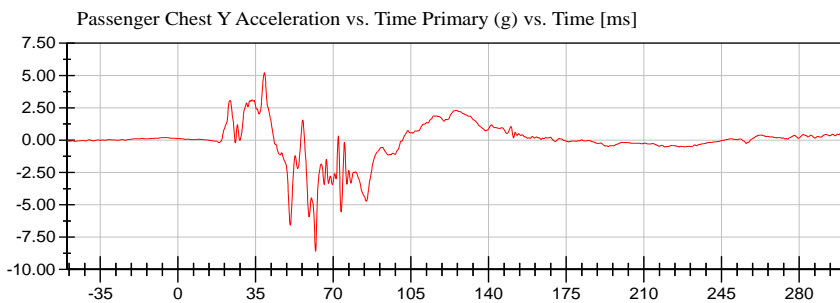
<Max>

3.19 g at 300.00 ms

<Min>

-57.81 g at 51.76 ms

CFC_180



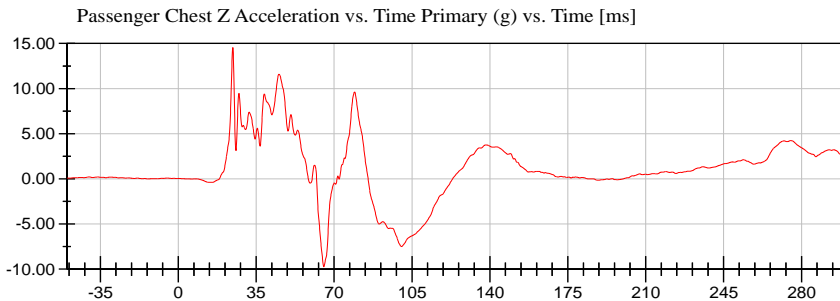
<Max>

5.22 g at 38.96 ms

<Min>

-8.59 g at 62.00 ms

CFC_180



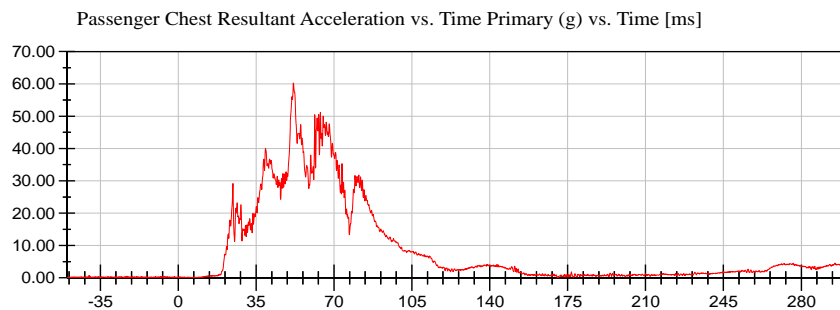
<Max>

14.54 g at 24.48 ms

<Min>

-9.73 g at 65.44 ms

CFC_180



<Max>

60.29 g at 51.76 ms

<Min>

0.04 g at 3.76 ms

Prefiltered_> CFC 1000



NHTSA

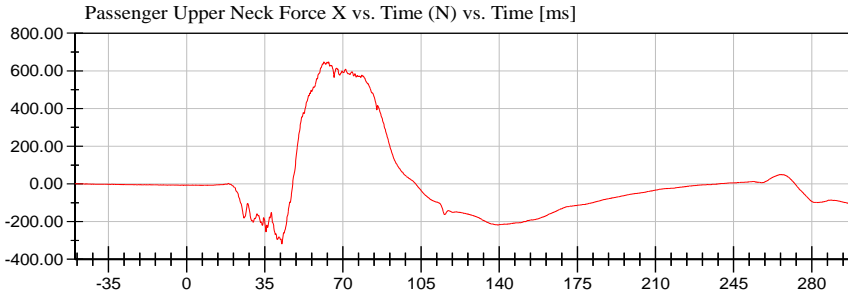
Test Lab: CTF

Test Number: 240814 (Q20240301)

Test Date: 08/14/2024

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

Position #2 Hybrid III Small Adult Female (DH1659)



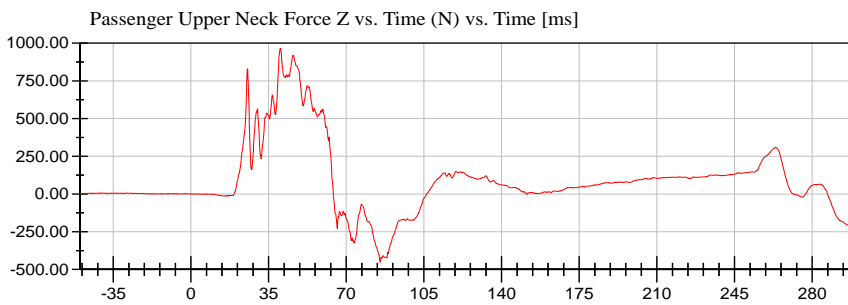
<Max>

647.63 N at 61.52 ms

<Min>

-318.58 N at 42.64 ms

CFC_1000



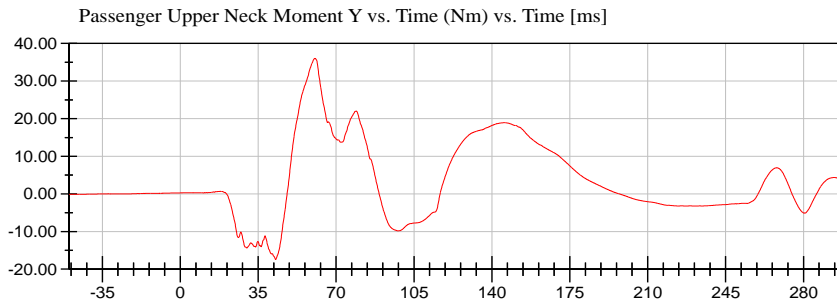
<Max>

966.08 N at 40.32 ms

<Min>

-452.48 N at 85.28 ms

CFC_1000



<Max>

36.02 Nm at 60.56 ms

<Min>

-17.45 Nm at 42.88 ms

CFC_600



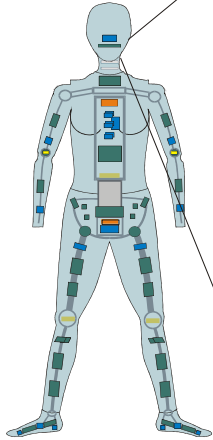


2024 Jeep Wrangler 4-Door Sport NCAP 35 mph Frontal Impact Neck Injury Predictor (NIJ)

Date: 08/14/2024
Time: 17:22

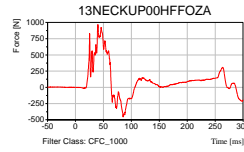
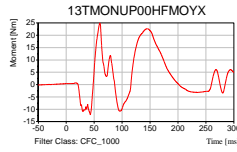
Customer: NHTSA
Test Number: Q20240301

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

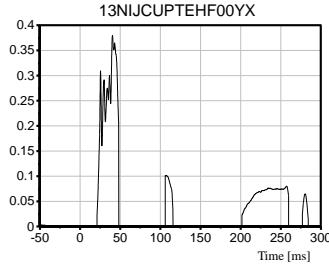


Dummy: HIII 5th Female
Seating Position:
Right Front Passenger

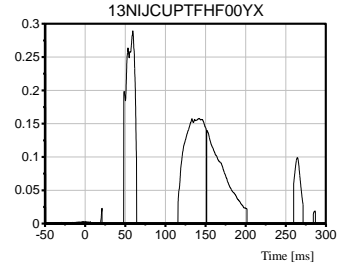
NIJ Source Code: (Fz/Fzc)+(Myc/Myc)



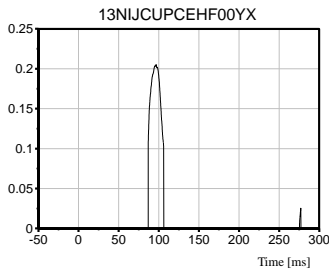
TRC Inc. Test Lab: CTF
Test Number: 240814



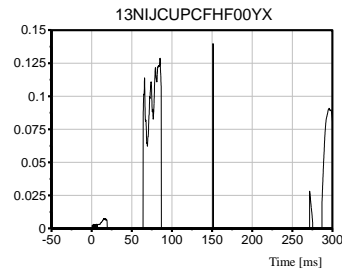
Max [NTE] 0.3796 at 40.40 ms



Max [NTF] 0.2893 at 59.44 ms



Max [NCE] 0.2053 at 96.64 ms



Max [NCF] 0.1399 at 151.20 ms

NHTSA

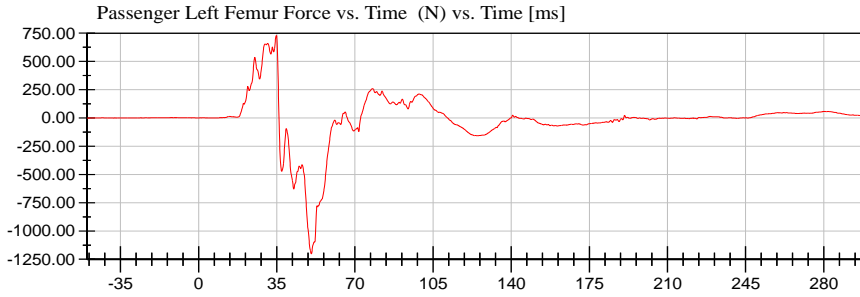
Test Lab: CTF

Test Number: 240814 (Q20240301)

Test Date: 08/14/2024

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

Position #2 Hybrid III Small Adult Female (DH1659)



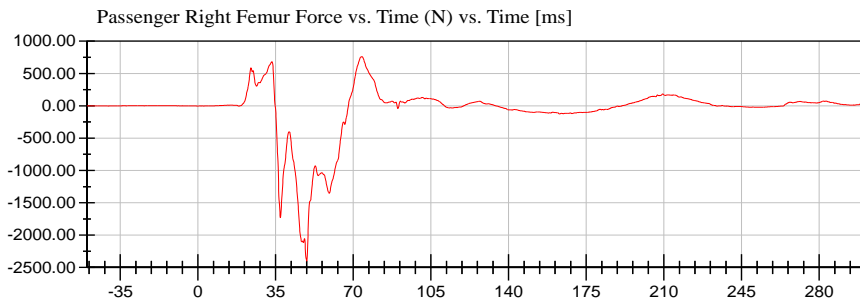
<Max>

729.21 N at 34.80 ms

<Min>

-1,202.41 N at 50.48 ms

CFC_600



<Max>

759.20 N at 73.92 ms

<Min>

-2,401.31 N at 49.04 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. 93

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	86	Yes
D	H-Point From Seatback	134.6 - 139.7	137	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	90	Yes
F	Thigh Clearance	139.7 - 154.9	151	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	295	Yes
H	Skull Cap To Backline	40.6 - 45.7	45	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	337	Yes
J	Elbow Rest Height	190.5 - 210.8	198	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	223	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



Revised 8/10/12

Report Number: 037_H3F93

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Transportation Research Center Inc.

Front Head Drop
HIII 50th Serial No. 037 Certification No. 93-1
Test Date: 7/24/2024

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	68 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	241.5 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	6.7 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	< 10 %	4.67 %	Yes

Test meets specifications.

Condition: Used

Comments:

Head Skin S/N: N/A

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

07.24.2024 10:15:57 612

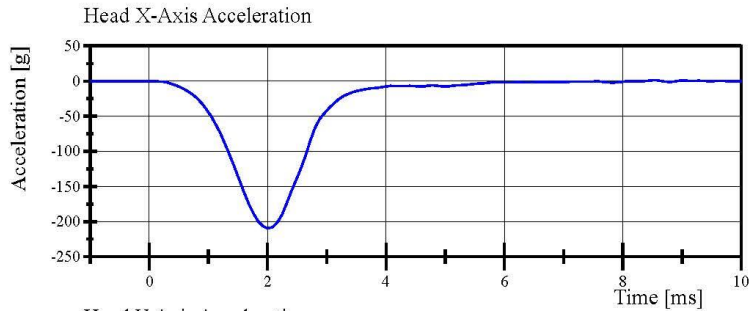


Transportation Research Center Inc.

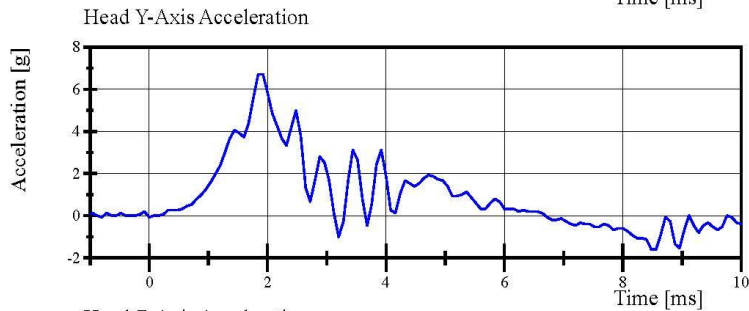
Front Head Drop

HIII 50th Serial No. 037 Certification No. 93-1

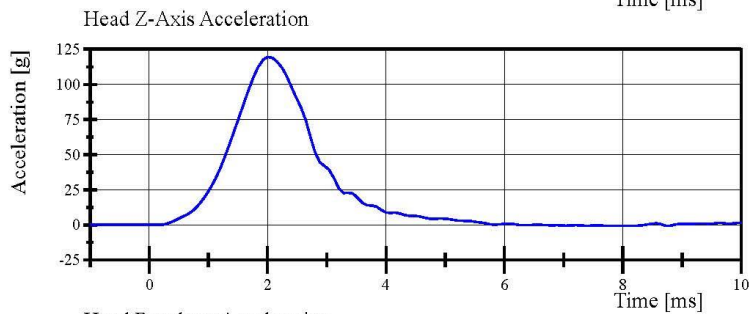
Test Date: 7/24/2024



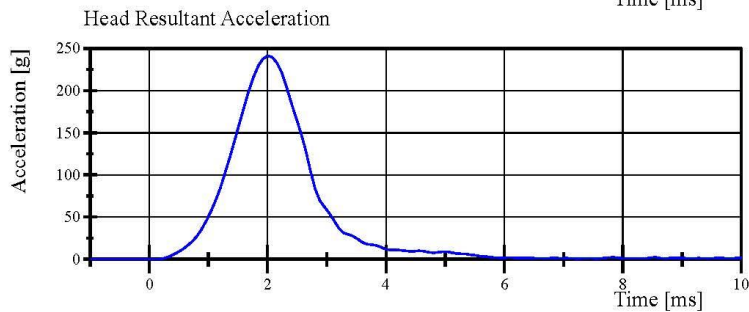
Filter Class: CFC_1000
Max: 1.4 g at 8.6 ms
Min: -209.6 g at 2.0 ms



Filter Class: CFC_1000
Max: 6.7 g at 1.8 ms
Min: -1.6 g at 8.5 ms



Filter Class: CFC_1000
Max: 119.7 g at 2.0 ms
Min: -0.7 g at 8.2 ms



Filter Class: CFC_1000
Max: 241.5 g at 2.0 ms
Min: 0.1 g at -1.0 ms

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

07.24.2024 10:16:29 612



Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 93-4

Test Date: 7/29/2024

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	70 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.978 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	36.1 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-24.84 g	Yes
at 20ms	(-17.6) - (-22.6) g	-22.06 g	Yes
at 30ms	(-12.5) - (-18.5) g	-16.96 g	Yes
> 30ms	>= (-29.0) g	-16.96 g	Yes
Total Head D-Plane Rotation Peak	(-64) - (-78) °	-73.7 °	Yes
Time of Peak	57 - 64 ms	59.1 ms	Yes
Decay to 0°	113 - 128 ms	117.3 ms	Yes
Total Neck Occipital Condyles Moment Peak	88.1 - 108.4 N·m	101.61 N·m	Yes
Time of Peak	47 - 58 ms	49.6 ms	Yes
Decay to 0 N·m	97 - 107 ms	97.6 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: 4728

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

07.29.2024 08:49:55 1862

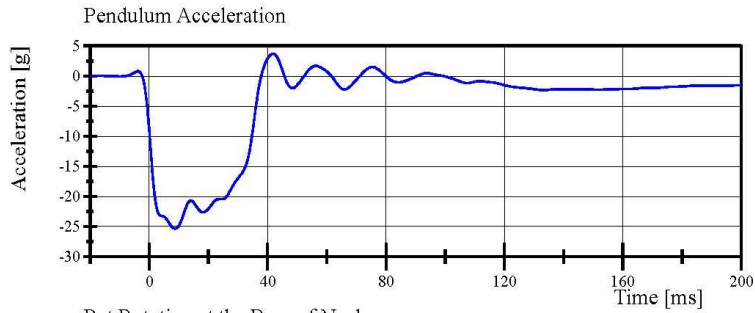


Transportation Research Center Inc.

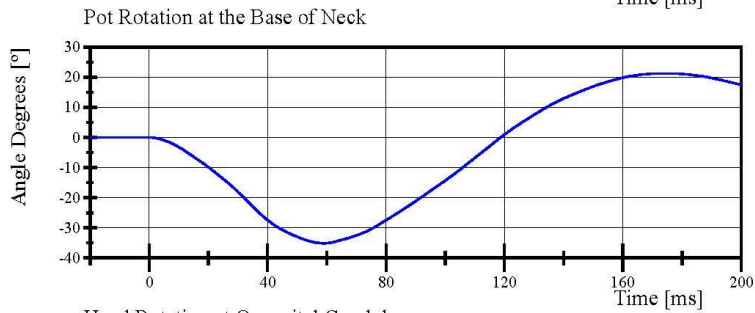
Neck Flexion

HIII 50th Serial No. 037 Certification No. 93-4

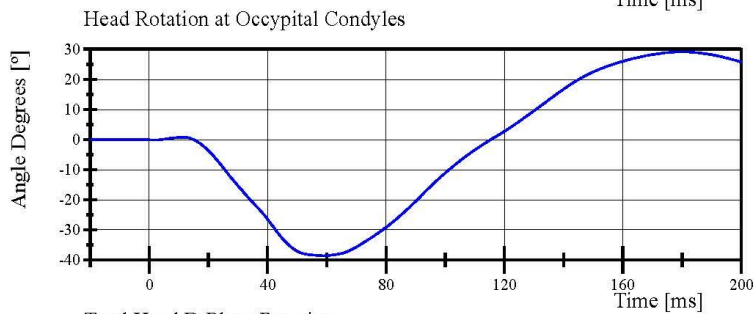
Test Date: 7/29/2024



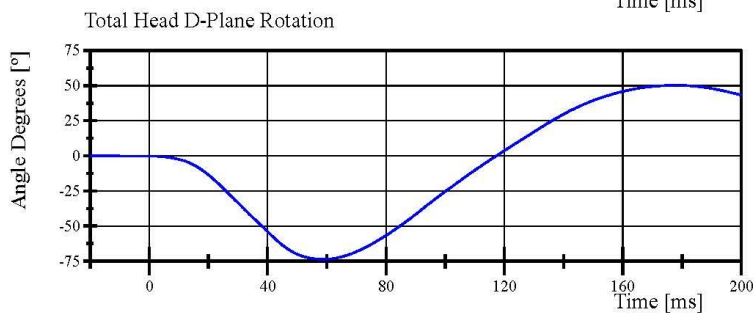
Filter Class: CFC_60
Max: 3.7 g at 41.9 ms
Min: -25.3 g at 8.7 ms



Filter Class: CFC_60
Max: 21.3 ° at 173.9 ms
Min: -35.1 ° at 59.1 ms



Filter Class: CFC_60
Max: 29.1 ° at 179.9 ms
Min: -38.5 ° at 59.0 ms



Filter Class: CFC_60
Max: 50.3 ° at 177.9 ms
Min: -73.7 ° at 59.1 ms

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

07.29.2024 08:50:24 1862

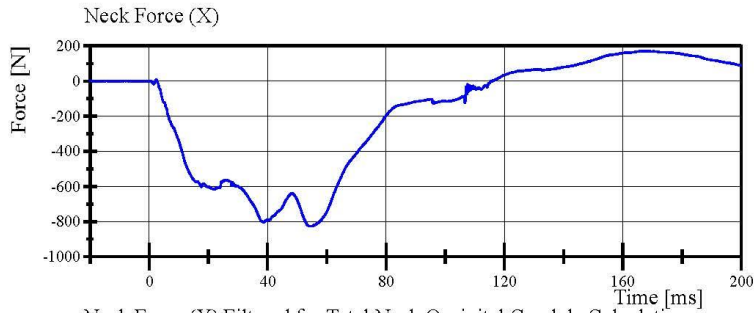


Transportation Research Center Inc.

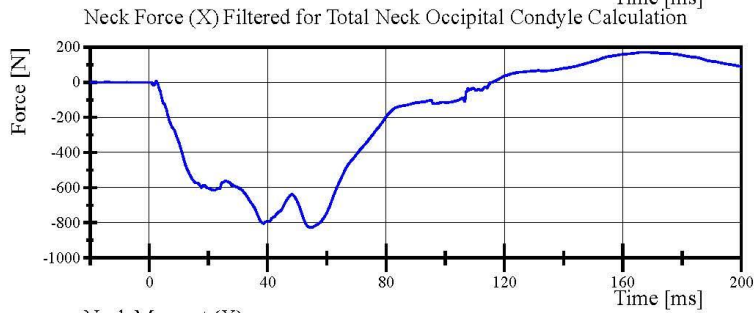
Neck Flexion

HIII 50th Serial No. 037 Certification No. 93-4

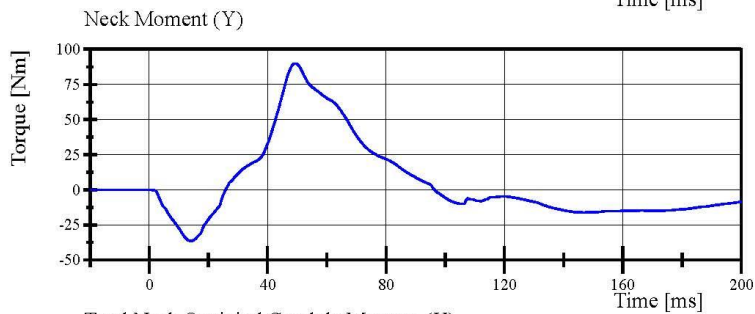
Test Date: 7/29/2024



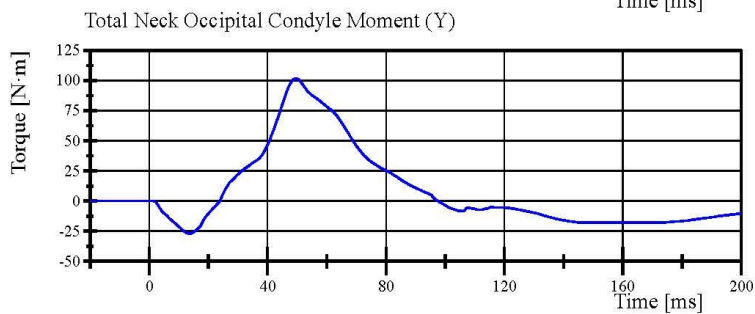
Filter Class: CFC_1000
Max: 170.8 N at 166.3 ms
Min: -826.8 N at 54.3 ms



Filter Class: CFC_600
Max: 170.6 N at 167.2 ms
Min: -826.5 N at 54.4 ms



Filter Class: CFC_600
Max: 90.0 Nm at 49.3 ms
Min: -36.4 Nm at 14.2 ms



Filter Class: Without_(Constar)
Max: 101.6 N·m at 49.6 ms
Min: -27.0 N·m at 13.6 ms

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

07.29.2024 08:50:24 1862



Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 93-2

Test Date: 7/29/2024

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	67 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-6.016 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	41.8 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	18.11 g	Yes
at 20ms	14.0 - 19.0 g	17.64 g	Yes
at 30ms	11.0 - 16.0 g	13.13 g	Yes
> 30ms	<= 22.0 g	13.13 g	Yes
Total Head D-Plane Rotation Peak	81 - 106 °	97.2 °	Yes
Time of Peak	72 - 82 ms	78.5 ms	Yes
Decay to 0°	147 - 174 ms	160.4 ms	Yes
Total Neck Occipital Condyles Moment Peak	(-52.9) - (-80) N·m	-64.92 N·m	Yes
Time of Peak	65 - 79 ms	72.7 ms	Yes
Decay to 0 N·m	120 - 148 ms	143.3 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: 4728

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

07.29.2024 09:22:52 2009

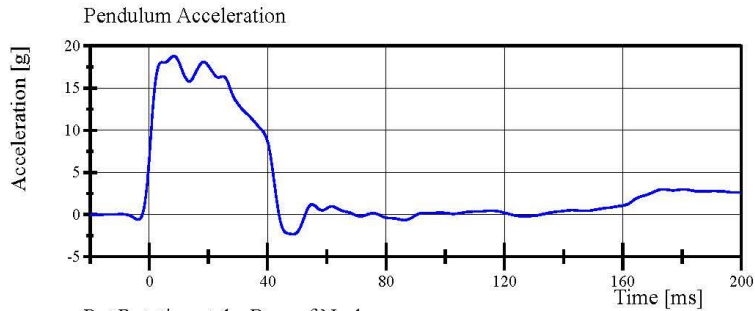


Transportation Research Center Inc.

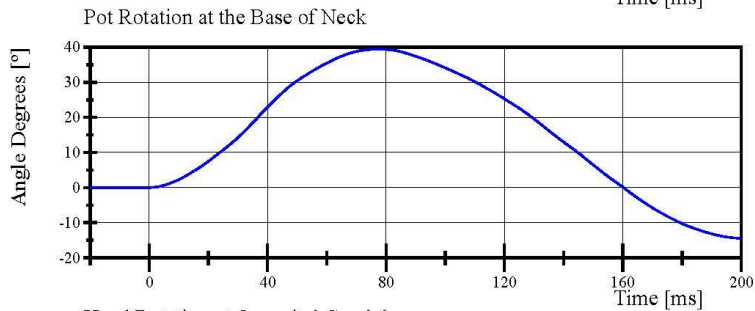
Neck Extension

HIII 50th Serial No. 037 Certification No. 93-2

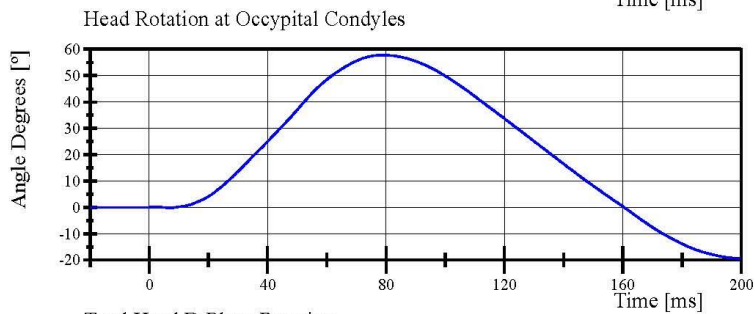
Test Date: 7/29/2024



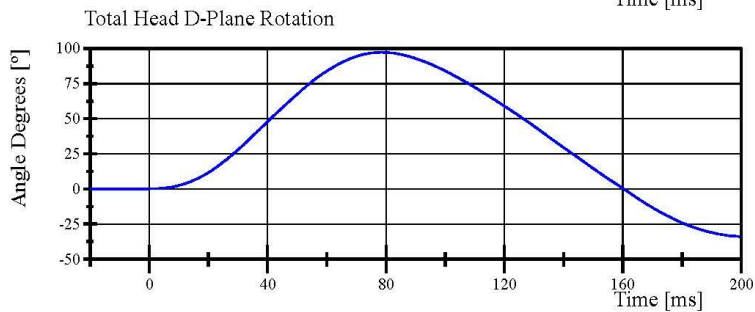
Filter Class: CFC_60
Max: 18.8 g at 8.3 ms
Min: -2.3 g at 48.6 ms



Filter Class: CFC_60
Max: 39.4 ° at 77.3 ms
Min: -14.4 ° at 199.6 ms



Filter Class: CFC_60
Max: 57.8 ° at 79.0 ms
Min: -19.4 ° at 199.6 ms



Filter Class: CFC_60
Max: 97.2 ° at 78.5 ms
Min: -33.9 ° at 199.6 ms

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

07.29.2024 09:23:24 2029

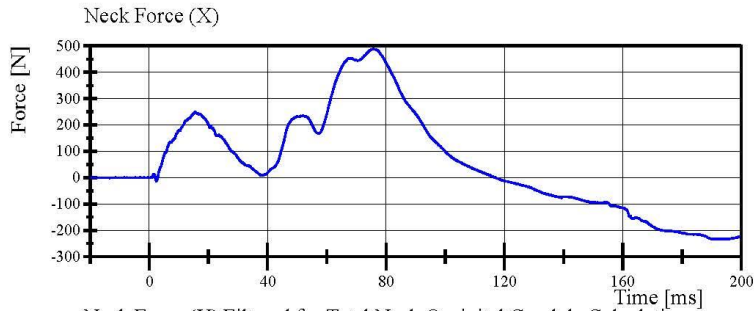


Transportation Research Center Inc.

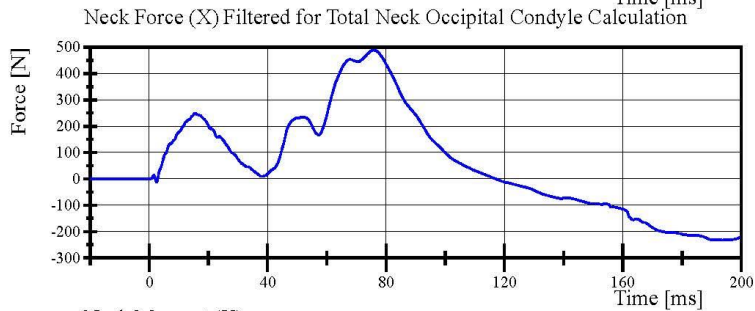
Neck Extension

HIII 50th Serial No. 037 Certification No. 93-2

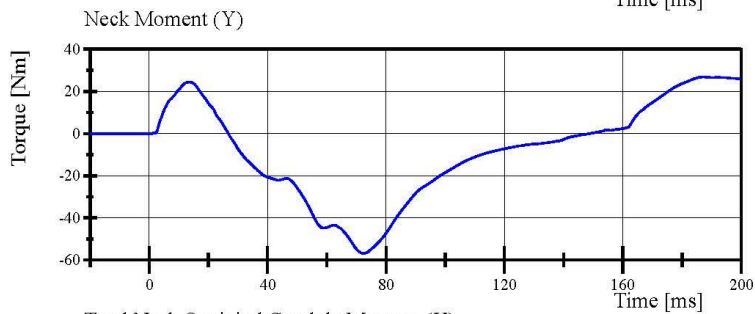
Test Date: 7/29/2024



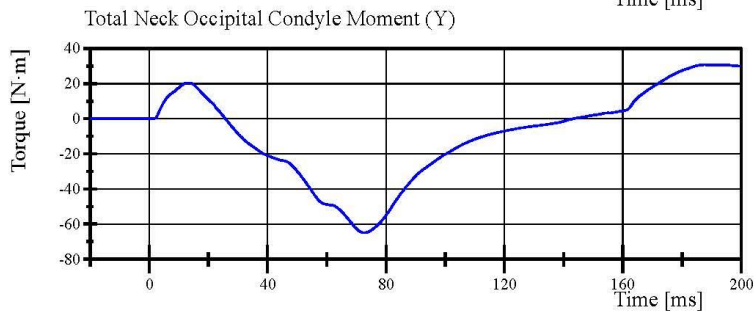
Filter Class: CFC_1000
Max: 488.5 N at 75.5 ms
Min: -233.1 N at 191.5 ms



Filter Class: CFC_600
Max: 488.4 N at 75.7 ms
Min: -232.7 N at 193.6 ms



Filter Class: CFC_600
Max: 26.9 Nm at 187.3 ms
Min: -56.8 Nm at 72.2 ms



Filter Class: Without_(Constar)
Max: 30.8 N·m at 187.7 ms
Min: -64.9 N·m at 72.7 ms

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

07.29.2024 09:23:24 2009



Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 037 Certification No. 93-1

Test Date: 7/24/2024

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	67 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.630 m/s	Yes
Probe Force Peak	(-5,160) - (-5,894) N	-5,482.9 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-65.84 mm	Yes
Internal Hysteresis	69 - 85 %	73.7 %	Yes

Test meets specifications.

Condition: Used

Comments:

Jacket S/N: EX0700

Rib Set S/N: 10362

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

07.24.2024 08:53:58 416

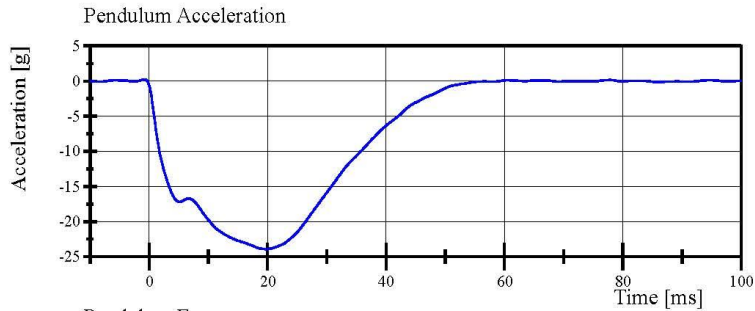


Transportation Research Center Inc.

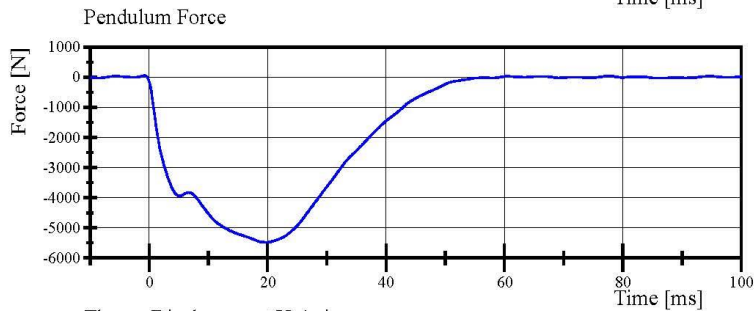
Front Thorax

HIII 50th Serial No. 037 Certification No. 93-1

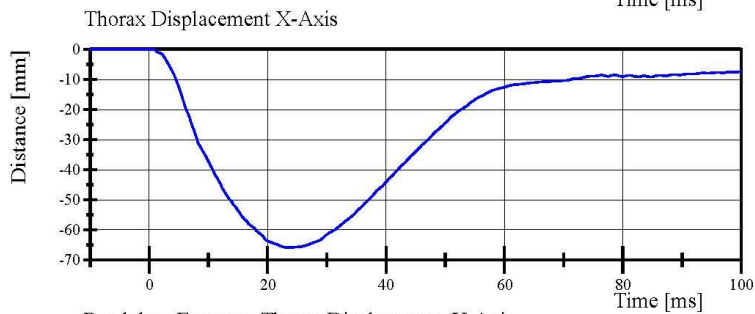
Test Date: 7/24/2024



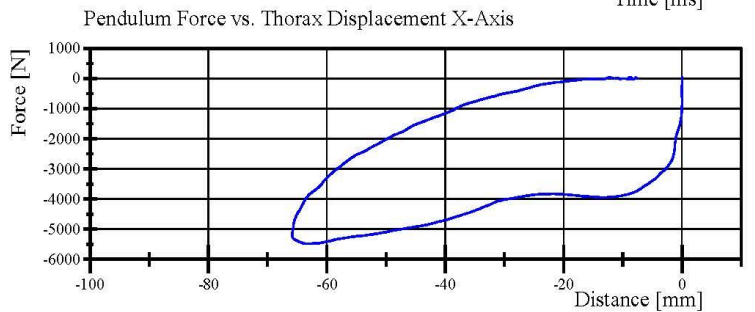
Filter Class: CFC_180
Max: 0.2 g at -0.8 ms
Min: -23.9 g at 19.7 ms



Filter Class: CFC_180
Max: 55.0 N at -0.8 ms
Min: -5,482.9 N at 19.7 ms



Filter Class: CFC_600
Max: 0.0 mm at -10.0 ms
Min: -65.8 mm at 23.6 ms



Filter Class: CFC_180
Max: 55.0 N at -0.0 mm
Min: -5,482.9 N at -63.3 mm

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

07.24.2024 08:54:21 416

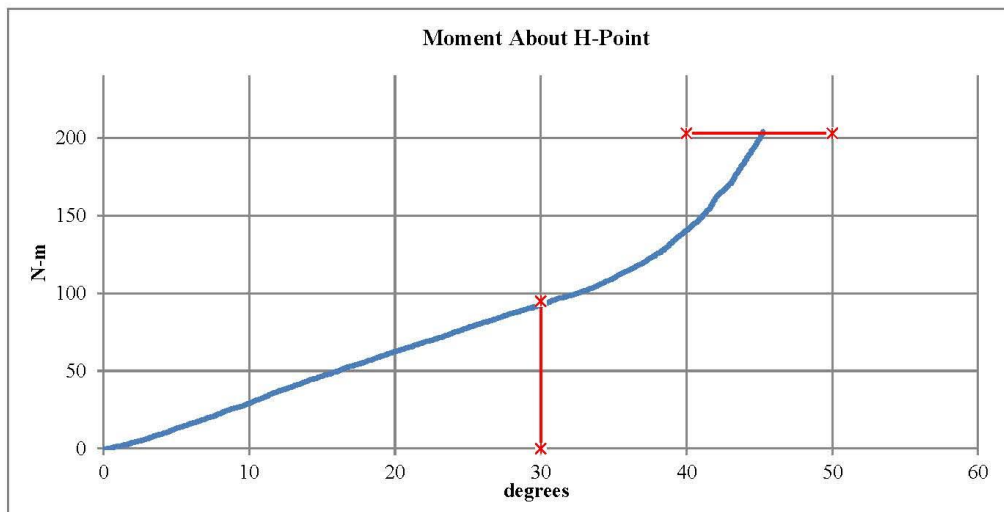


Transportation Research Center Inc.
Hybrid III 50th Male Hip Range of Motion

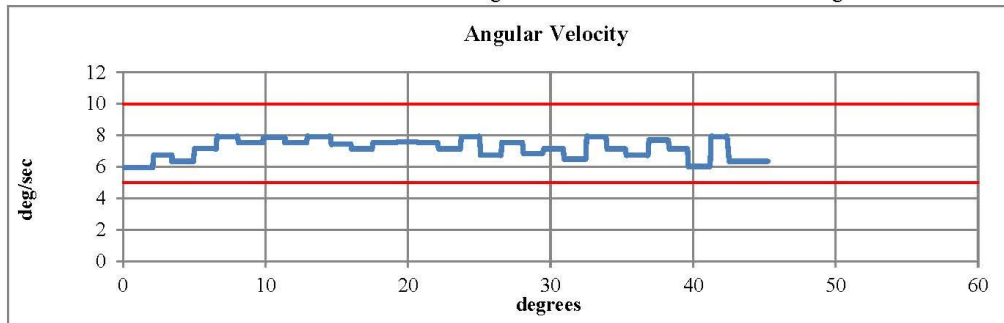


Serial Number: 037 Date: 24-Jul-2024
Side Tested: Left Hip Time: 10:16
Test Number: 1

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21 °C Pass
Humidity	10 - 70	68 % Pass
Moment at 30°	0 ≤ 94.9	92.29 N-m Pass
Angle at 203 Nm	40 - 50	45.24 deg Pass
Average Velocity	5 - 10	7.15 deg/sec Pass



Max: 7.93 deg/sec Min: 5.95 deg/sec



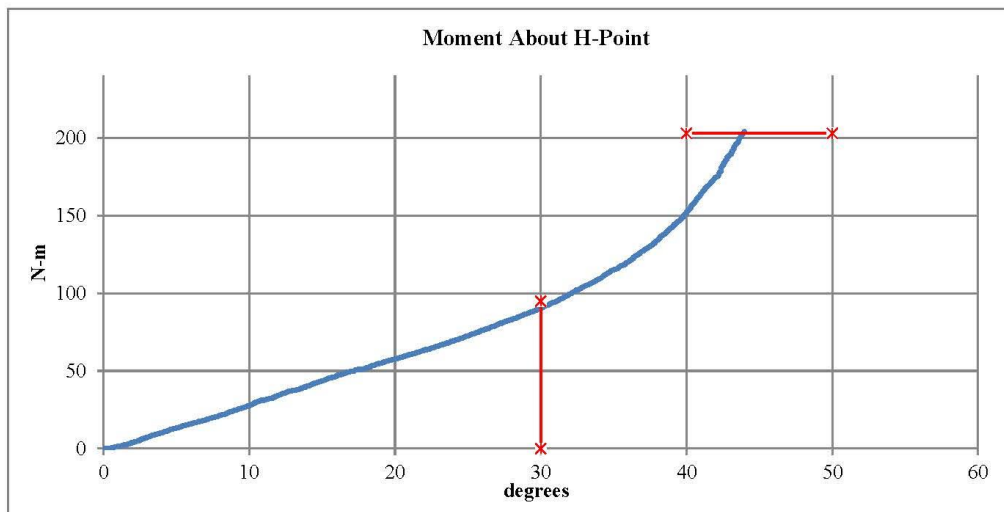
Comments: Pelvis S/N: EU6859

Transportation Research Center Inc.
Hybrid III 50th Male Hip Range of Motion

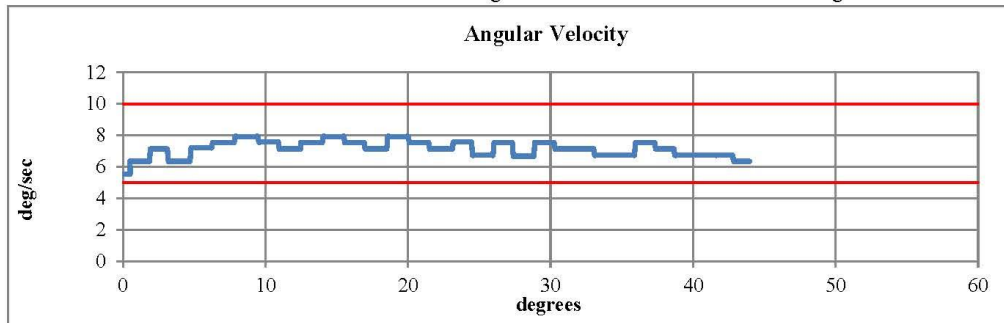


Serial Number: 037 Date: 24-Jul-2024
Side Tested: Right Hip Time: 10:51
Test Number: 1

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	20.8 °C Pass
Humidity	10 - 70	69 % Pass
Moment at 30°	0 ≤ 94.9	90.24 N-m Pass
Angle at 203 Nm	40 - 50	43.97 deg Pass
Average Velocity	5 - 10	7.15 deg/sec Pass



Max: 7.93 deg/sec Min: 5.55 deg/sec



Comments: Pelvis S/N: EU6859

Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 93-1
Test Date: 7/24/2024

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	69 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.114 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,517.11 N	Yes

Test meets specifications.

Condition: Used

Comments:

Knee Skin S/N: 2672

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

07.24.2024 13:30:23 1750

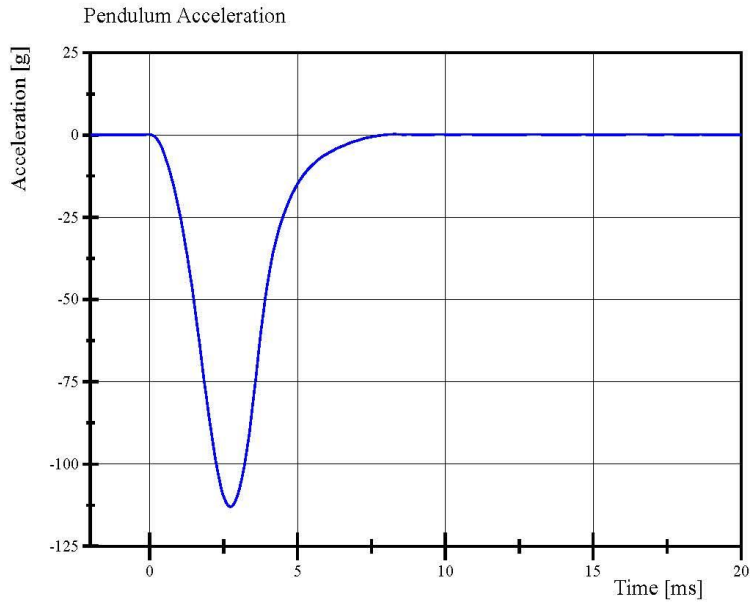


Report Number: 037_H3F93

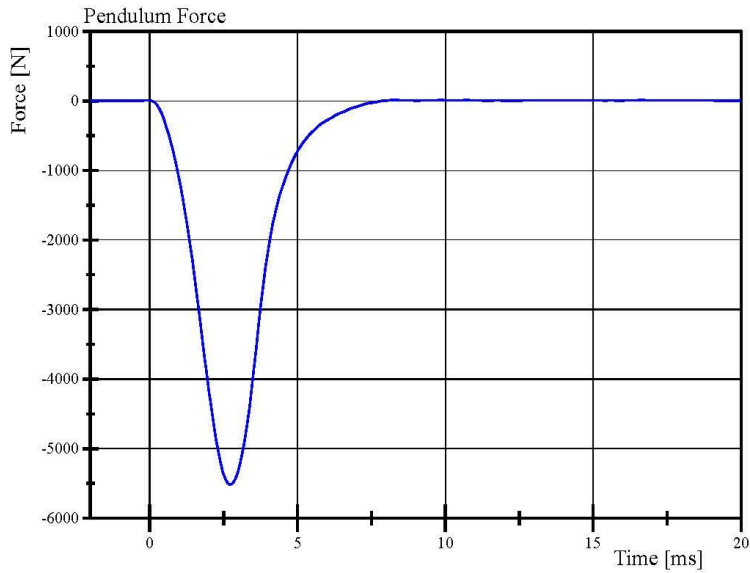
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Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 93-1
Test Date: 7/24/2024



Filter Class: CFC_600
Max: 0.2 g at 8.2 ms
Min: -113.0 g at 2.7 ms



Filter Class: CFC_600
Max: 11.2 N at 8.2 ms
Min: -5,517.1 N at 2.7 ms

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

07.24.2024 13:30:53 1750



Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 93-1
Test Date: 7/24/2024

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	70 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.111 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,093.18 N	Yes

Test meets specifications.

Condition: Used

Comments:

Knee Skin S/N: 1248

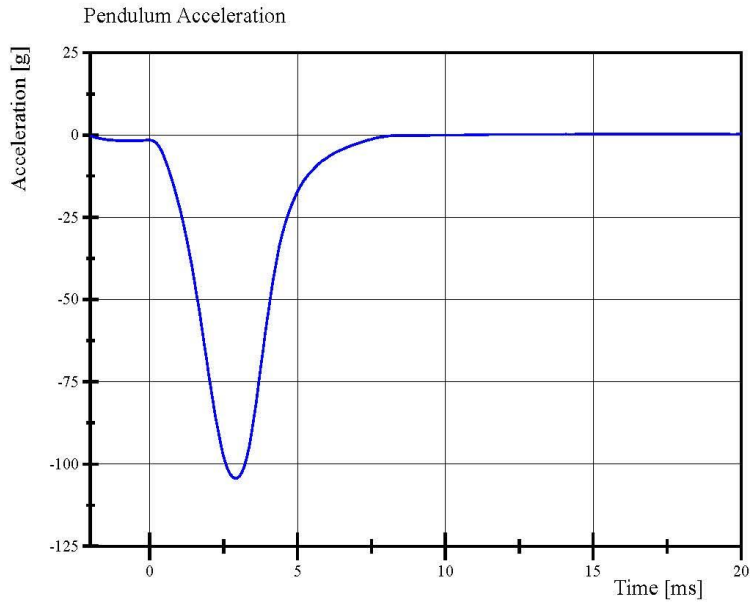
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

07.24.2024 13:34:12 1747

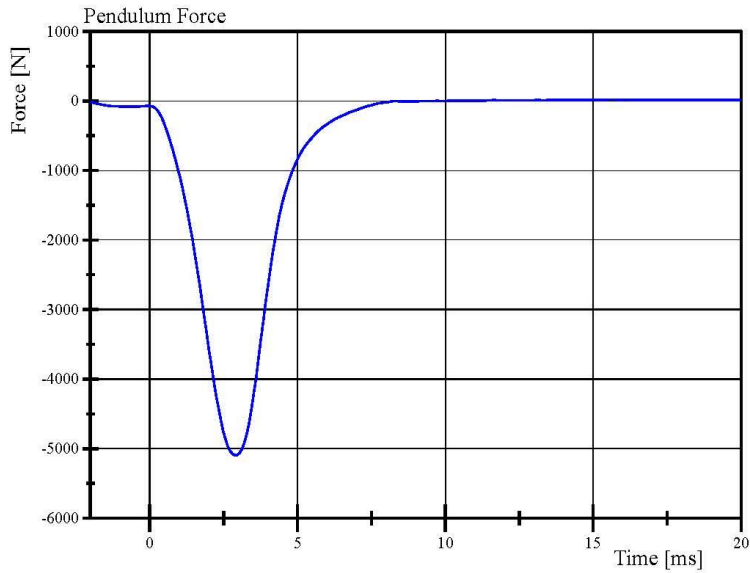


Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 93-1
Test Date: 7/24/2024



Filter Class: CFC_600
Max: 0.4 g at 15.6 ms
Min: -104.3 g at 2.9 ms



Filter Class: CFC_600
Max: 17.4 N at 15.6 ms
Min: -5,093.2 N at 2.9 ms

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

07.24.2024 13:34:34 1747



**Post-Test Calibration Sheets
Driver S/N 037**

Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 037
Calibration No. 94

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	881	Yes
B	Shoulder Pivot Height	505.5 - 520.7	510	Yes
C	H-Point Height	83.8 - 88.9	86	Yes
D	H-Point From Seatback	134.6 - 139.7	137	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	90	Yes
F	Thigh Clearance	139.7 - 154.9	150	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	295	Yes
H	Skull Cap To Backline	40.6 - 45.7	45	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	337	Yes
J	Elbow Rest Height	190.5 - 210.8	198	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	223	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



Revised 8/10/12

Report Number: 037_H3F94

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Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 037 Certification No. 94-1

Test Date: 8/15/2024

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	67 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	228.3 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	3.8 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	< 10 %	0.78 %	Yes

Test meets specifications.

Condition: Used

Comments:

Head Skin S/N: N/A

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

08.15.2024 13:12:54 613



Report Number: 037_H3F94

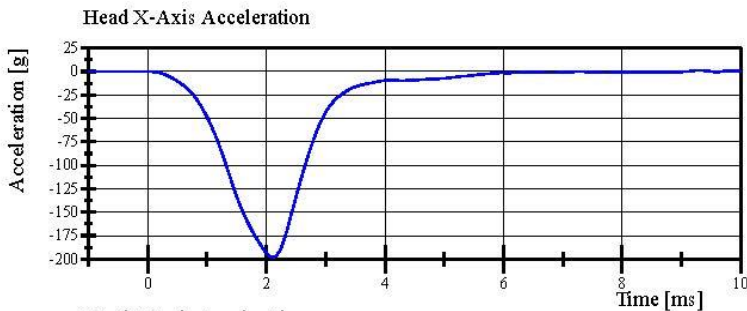
Page 9 of 27

Transportation Research Center Inc.

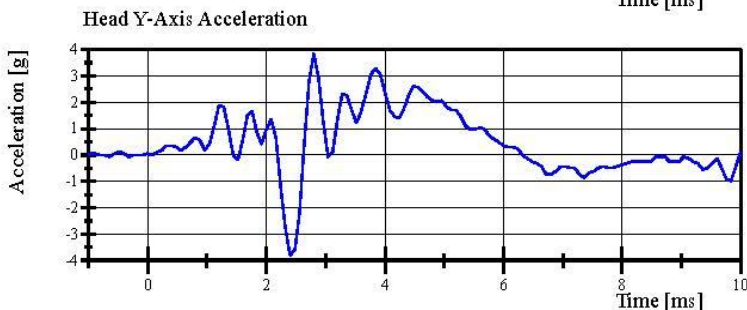
Front Head Drop

HIII 50th Serial No. 037 Certification No. 94-1

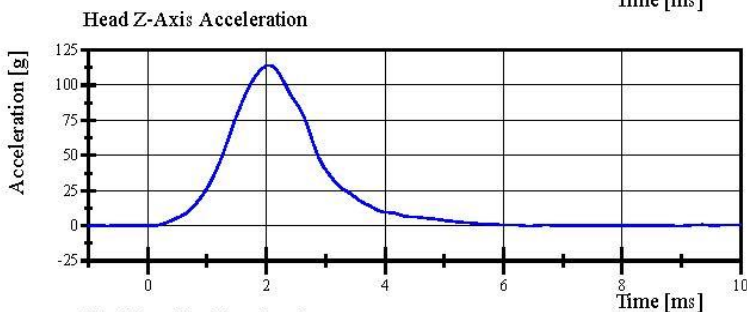
Test Date: 8/15/2024



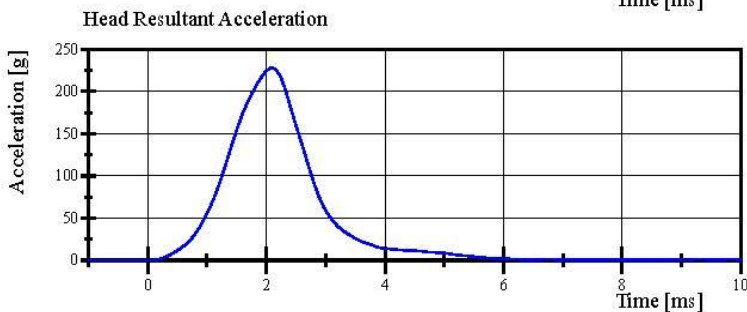
Filter Class: CFC_1000
Max: 1.2 g at 9.3 ms
Min: -197.7 g at 2.1 ms



Filter Class: CFC_1000
Max: 3.8 g at 2.8 ms
Min: -3.8 g at 2.4 ms



Filter Class: CFC_1000
Max: 114.0 g at 2.1 ms
Min: -0.2 g at 6.4 ms



Filter Class: CFC_1000
Max: 228.3 g at 2.1 ms
Min: 0.0 g at -0.8 ms

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

08.15.2024 13:13:25 613



Transportation Research Center Inc.

Neck Flexion

HIH 50th Serial No. 037 Certification No. 94-1

Test Date: 8/16/2024

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	69 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.991 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	36.7 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-23.70 g	Yes
at 20ms	(-17.6) - (-22.6) g	-21.42 g	Yes
at 30ms	(-12.5) - (-18.5) g	-17.41 g	Yes
> 30ms	>= (-29.0) g	-17.41 g	Yes
Total Head D-Plane Rotation Peak	(-64) - (-78) °	-67.3 °	Yes
Time of Peak	57 - 64 ms	60.0 ms	Yes
Decay to 0°	113 - 128 ms	118.0 ms	Yes
Total Neck Occipital Condyles Moment Peak	88.1 - 108.4 N·m	101.34 N·m	Yes
Time of Peak	47 - 58 ms	50.2 ms	Yes
Decay to 0 N·m	97 - 107 ms	98.5 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: 4728

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

08.16.2024 08:29:53 1865

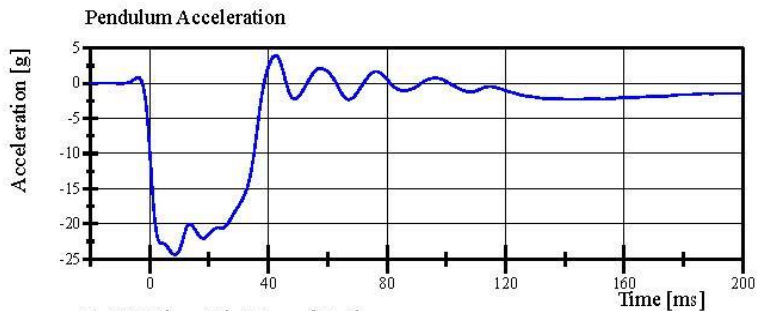


Transportation Research Center Inc.

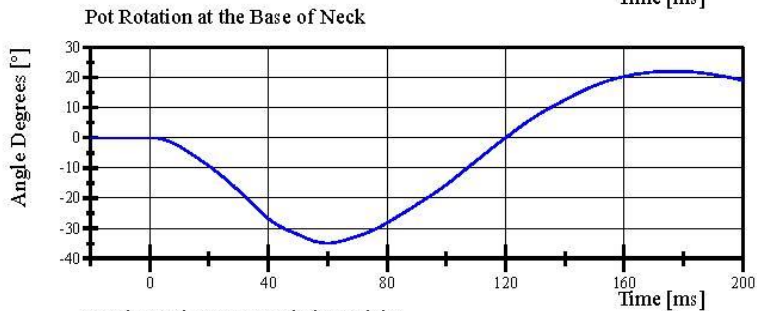
Neck Flexion

HIII 50th Serial No. 037 Certification No. 94-1

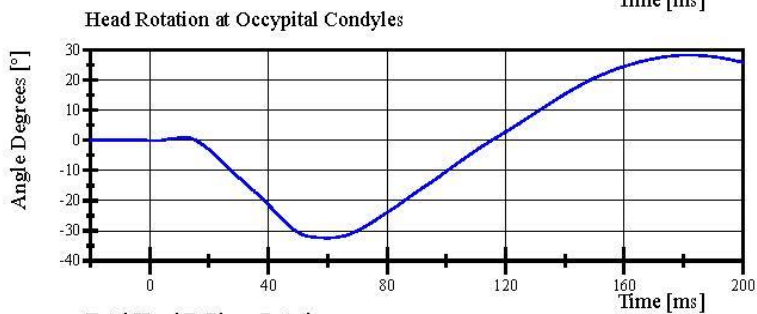
Test Date: 8/16/2024



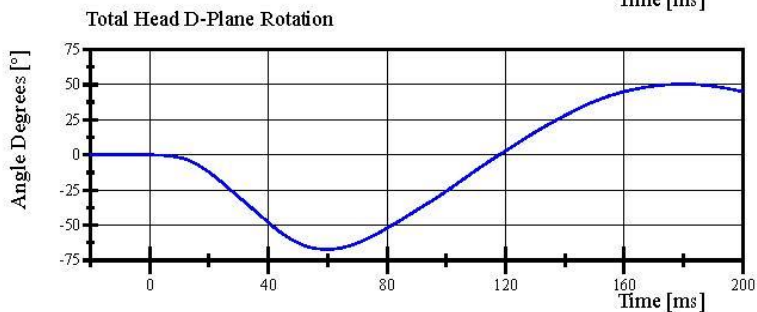
Filter Class: CFC_60
Max: 3.9 g at 42.4 ms
Min: -24.4 g at 8.5 ms



Filter Class: CFC_60
Max: 22.1 ° at 175.9 ms
Min: -34.9 ° at 60.1 ms



Filter Class: CFC_60
Max: 28.3 ° at 181.9 ms
Min: -32.4 ° at 60.0 ms



Filter Class: CFC_60
Max: 50.3 ° at 180.4 ms
Min: -67.3 ° at 60.0 ms

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

08.16.2024 08:30:54 1865

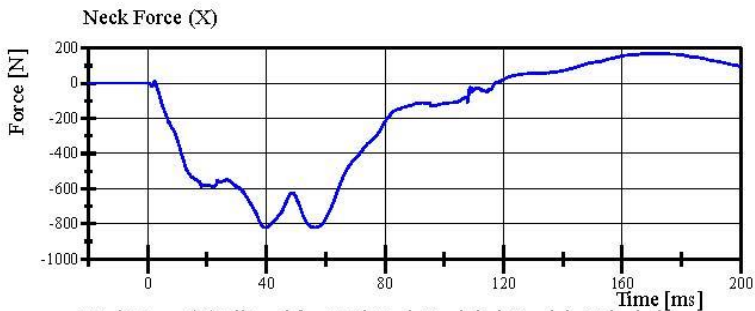


Transportation Research Center Inc.

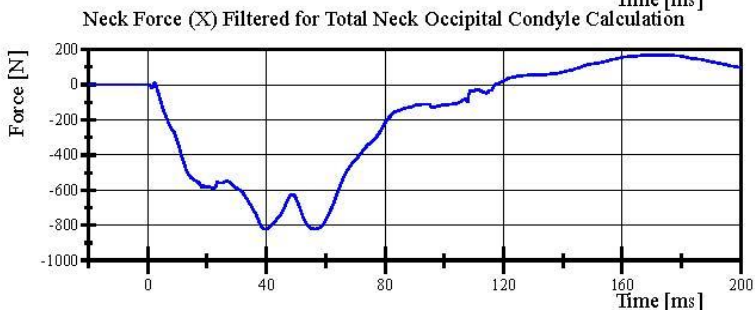
Neck Flexion

HIII 50th Serial No. 037 Certification No. 94-1

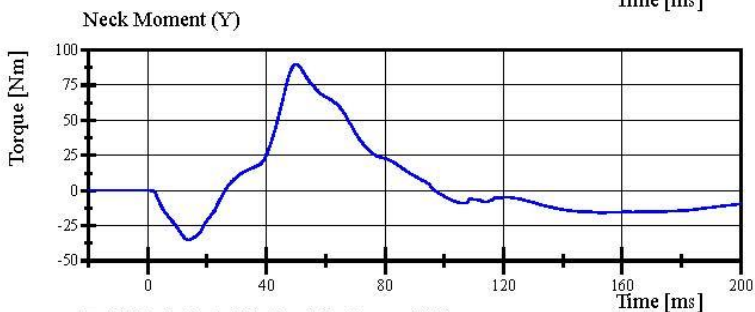
Test Date: 8/16/2024



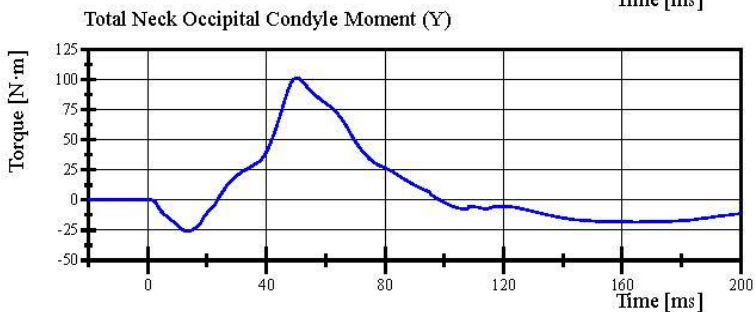
Filter Class: CFC_1000
Max: 169.9 N at 169.7 ms
Min: -822.2 N at 39.9 ms



Filter Class: CFC_600
Max: 169.7 N at 169.7 ms
Min: -822.0 N at 39.9 ms



Filter Class: CFC_600
Max: 89.9 Nm at 50.0 ms
Min: -35.0 Nm at 13.8 ms



Filter Class: Without_(Constar
Max: 101.3 N·m at 50.2 ms
Min: -26.1 N·m at 13.3 ms

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

08.16.2024 08:30:55 1865



Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 94-2

Test Date: 8/16/2024

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	67 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-6.016 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	41.1 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	18.42 g	Yes
at 20ms	14.0 - 19.0 g	16.48 g	Yes
at 30ms	11.0 - 16.0 g	13.62 g	Yes
> 30ms	<= 22.0 g	13.62 g	Yes
Total Head D-Plane Rotation Peak	81 - 106 °	94.3 °	Yes
Time of Peak	72 - 82 ms	78.6 ms	Yes
Decay to 0°	147 - 174 ms	159.9 ms	Yes
Total Neck Occipital Condyles Moment Peak	(-52.9) - (-80) N·m	-67.33 N·m	Yes
Time of Peak	65 - 79 ms	72.5 ms	Yes
Decay to 0 N·m	120 - 148 ms	145.4 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: 4728

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

08.16.2024 09:51:00 2011

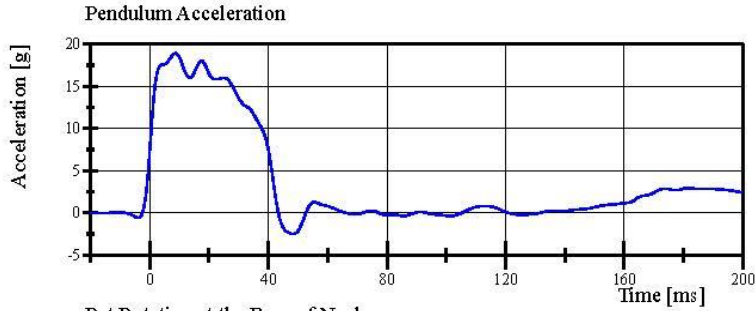


Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 94-2

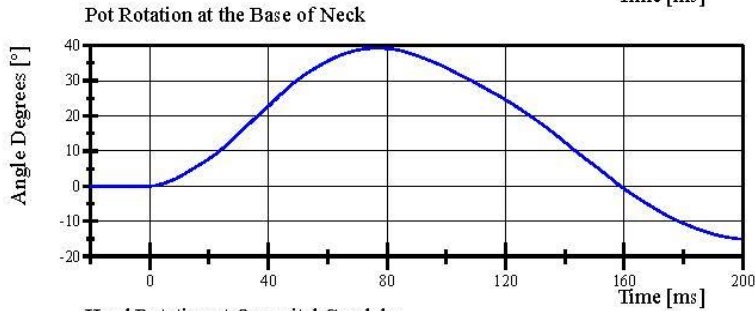
Test Date: 8/16/2024



Filter Class: CFC_60

Max: 18.9 g at 8.7 ms

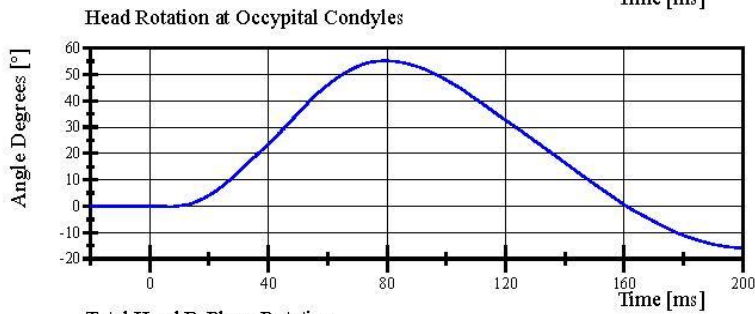
Min: -2.5 g at 48.4 ms



Filter Class: CFC_60

Max: 39.2 ° at 76.5 ms

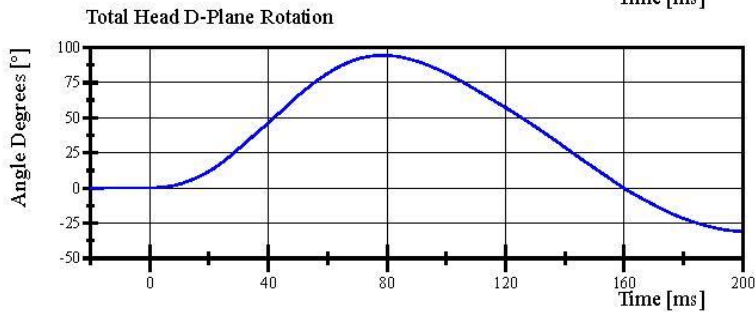
Min: -15.1 ° at 199.5 ms



Filter Class: CFC_60

Max: 55.1 ° at 79.4 ms

Min: -15.9 ° at 199.5 ms



Filter Class: CFC_60

Max: 94.3 ° at 78.6 ms

Min: -31.0 ° at 199.5 ms

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

08.16.2024 09:51:29 2011

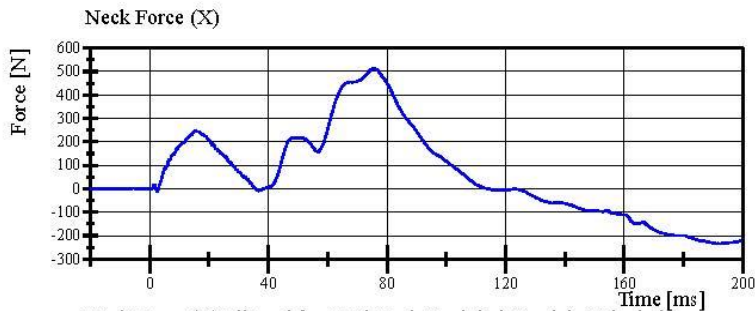


Transportation Research Center Inc.

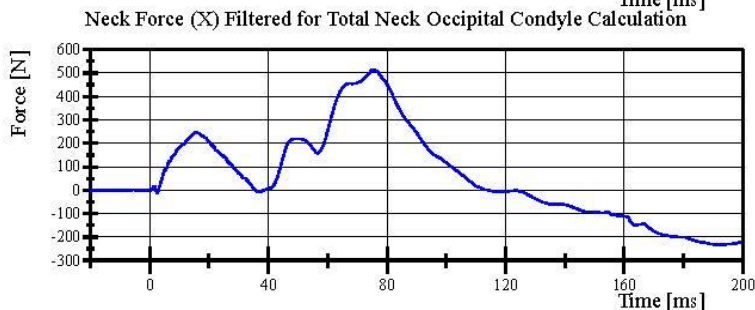
Neck Extension

HIII 50th Serial No. 037 Certification No. 94-2

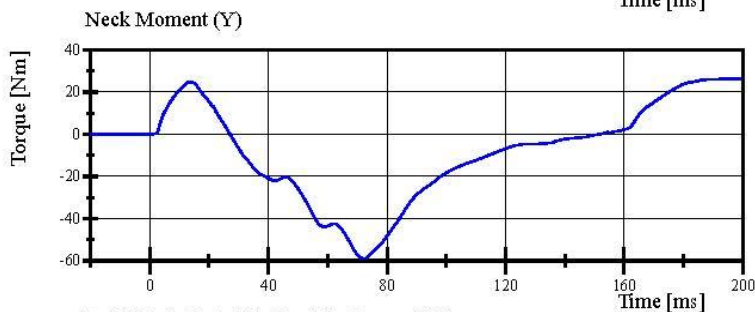
Test Date: 8/16/2024



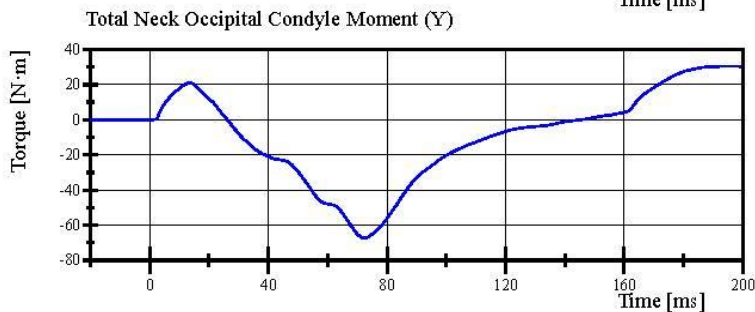
Filter Class: CFC_1000
Max: 513.6 N at 75.7 ms
Min: -234.1 N at 192.5 ms



Filter Class: CFC_600
Max: 513.1 N at 75.7 ms
Min: -233.7 N at 192.4 ms



Filter Class: CFC_600
Max: 26.4 Nm at 195.0 ms
Min: -58.9 Nm at 72.2 ms



Filter Class: Without_(Constar
Max: 30.5 N.m at 194.9 ms
Min: -67.3 N.m at 72.5 ms

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

08.16.2024 09:51:30 2011



Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 037 Certification No. 94-2

Test Date: 8/15/2024

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	62 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.652 m/s	Yes
Probe Force Peak	(-5,160) - (-5,894) N	-5,443.7 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-67.50 mm	Yes
Internal Hysteresis	69 - 85 %	72.9 %	Yes

Test meets specifications.

Condition: Used

Comments:

Jacket S/N: EX0700

Rib Set S/N: 10362

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

08.15.2024 11:35:42.438



Report Number: 037_H3F94

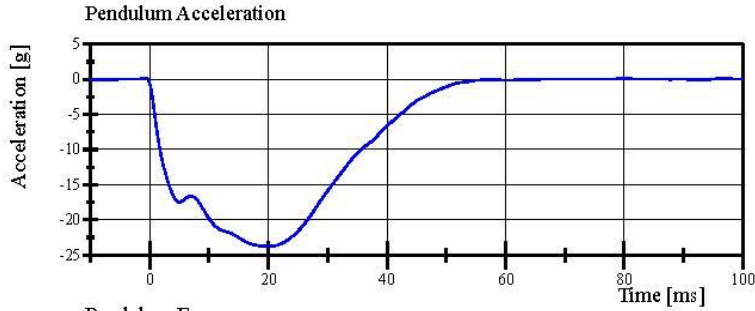
Page 17 of 27

Transportation Research Center Inc.

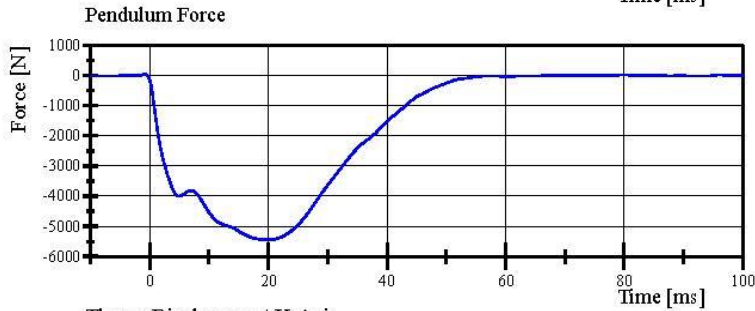
Front Thorax

HIII 50th Serial No. 037 Certification No. 94-2

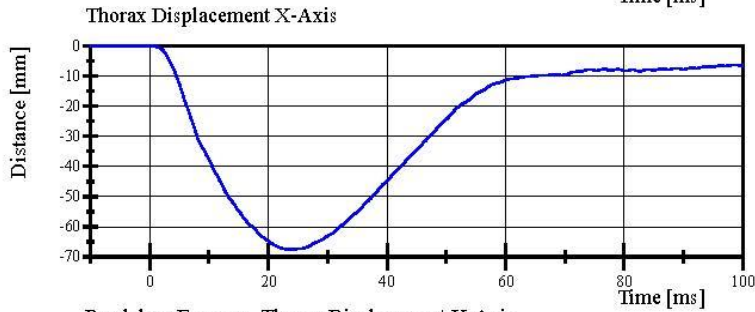
Test Date: 8/15/2024



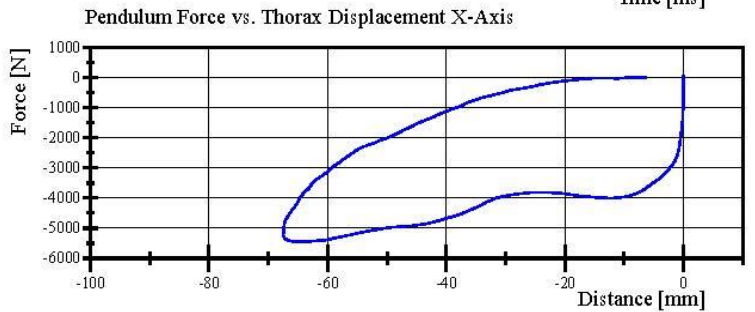
Filter Class: CFC_180
Max: 0.2 g at -0.8 ms
Min: -23.8 g at 19.5 ms



Filter Class: CFC_180
Max: 47.4 N at -0.8 ms
Min: -5,443.7 N at 19.5 ms



Filter Class: CFC_600
Max: 0.0 mm at -7.0 ms
Min: -67.5 mm at 23.4 ms



Filter Class: CFC_180
Max: 47.4 N at -0.0 mm
Min: -5,443.7 N at -64.1 mm

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

08.15.2024 11:36:07 438

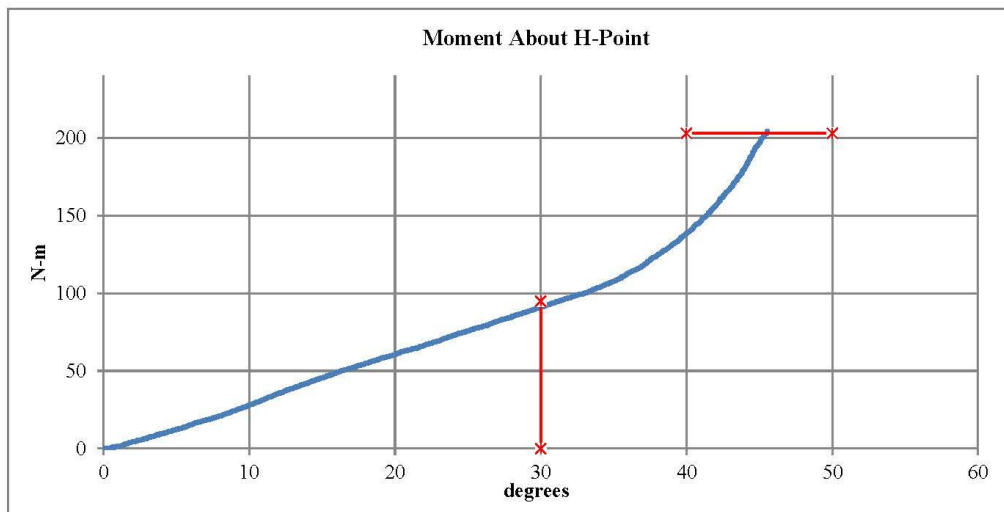


Transportation Research Center Inc.
Hybrid III 50th Male Hip Range of Motion

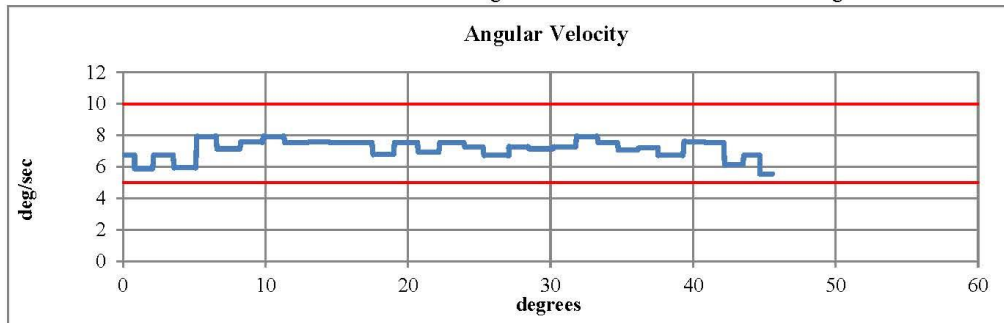


Serial Number: 037 Date: 15-Aug-2024
Side Tested: Left Hip Time: 14:20
Test Number: 1

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.5 °C Pass
Humidity	10 - 70	67 % Pass
Moment at 30°	0 ≤ 94.9	91.26 N-m Pass
Angle at 203 Nm	40 - 50	45.55 deg Pass
Average Velocity	5 - 10	7.14 deg/sec Pass



Max: 7.93 deg/sec Min: 5.55 deg/sec



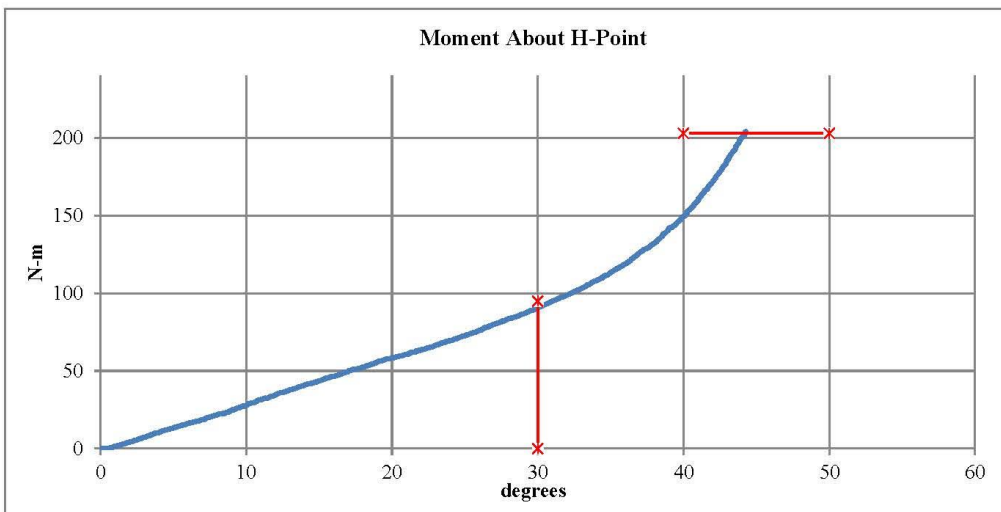
Comments: Pelvis S/N: EU6859

Transportation Research Center Inc.
Hybrid III 50th Male Hip Range of Motion

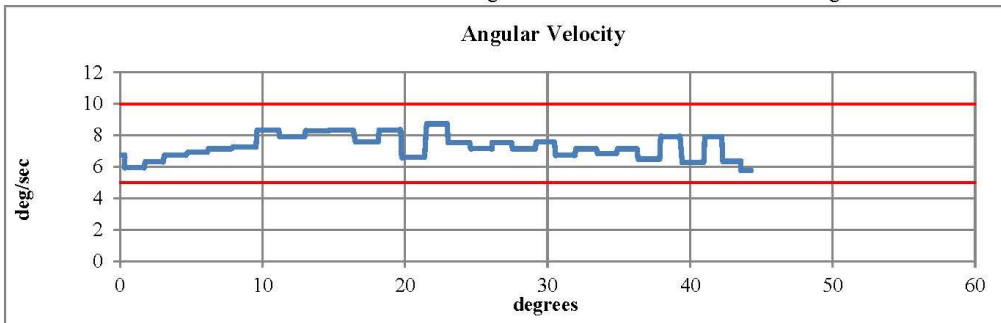


Serial Number: 037 Date: 15-Aug-2024
Side Tested: Right Hip Time: 14:54
Test Number: 1

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.3 °C Pass
Humidity	10 - 70	65 % Pass
Moment at 30°	0 ≤ 94.9	90.58 N-m Pass
Angle at 203 Nm	40 - 50	44.28 deg Pass
Average Velocity	5 - 10	7.26 deg/sec Pass



Max: 8.73 deg/sec Min: 5.77 deg/sec



Comments: Pelvis S/N: EU6859

Transportation Research Center Inc.

Left Knee Femur Response Test

HIII 50th Serial No. 037 Certification No. 94-1

Test Date: 8/15/2024

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	62 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.113 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,436.03 N	Yes

Test meets specifications.

Condition: Used

Comments:

Knee Skin S/N: 2672

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

08.15.2024 10:30:15 1822



Report Number: 037_H3F94

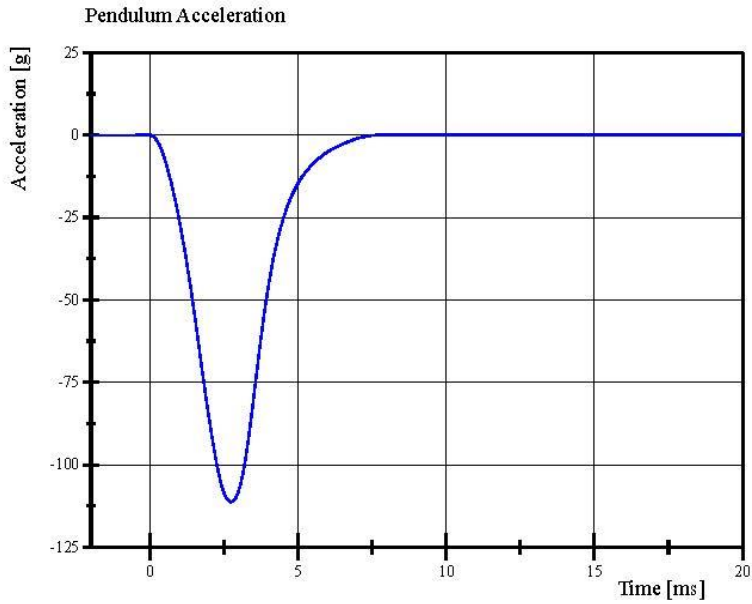
Page 21 of 27

Transportation Research Center Inc.

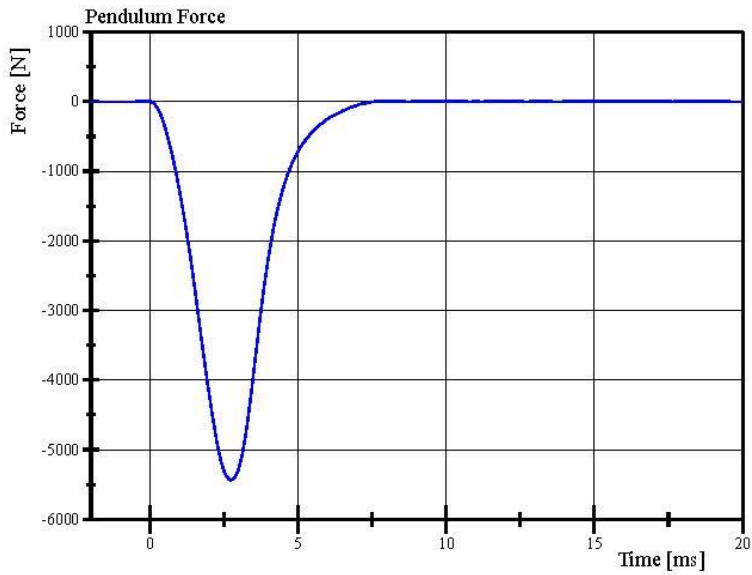
Left Knee Femur Response Test

HIII 50th Serial No. 037 Certification No. 94-1

Test Date: 8/15/2024



Filter Class: CFC_600
Max: 0.2 g at 8.0 ms
Min: -111.3 g at 2.7 ms



Filter Class: CFC_600
Max: 9.7 N at 8.0 ms
Min: -5,436.0 N at 2.7 ms

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

08.15.2024 10:30:46 1822



Transportation Research Center Inc.

Right Knee Femur Response Test

HIII 50th Serial No. 037 Certification No. 94-1

Test Date: 8/15/2024

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	64 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.113 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,053.77 N	Yes

Test meets specifications.

Condition: Used

Comments:

Knee Skin S/N: 1248

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

08.15.2024 10:35:20 1819



Report Number: 037_H3F94

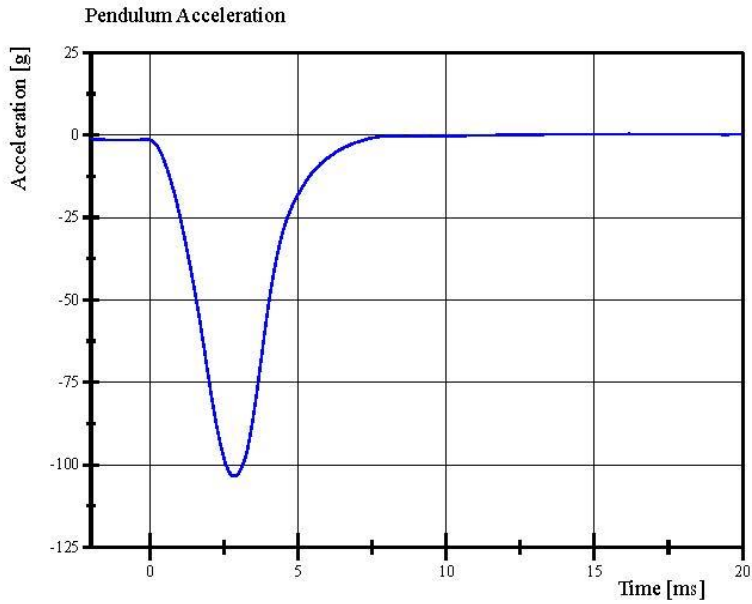
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Transportation Research Center Inc.

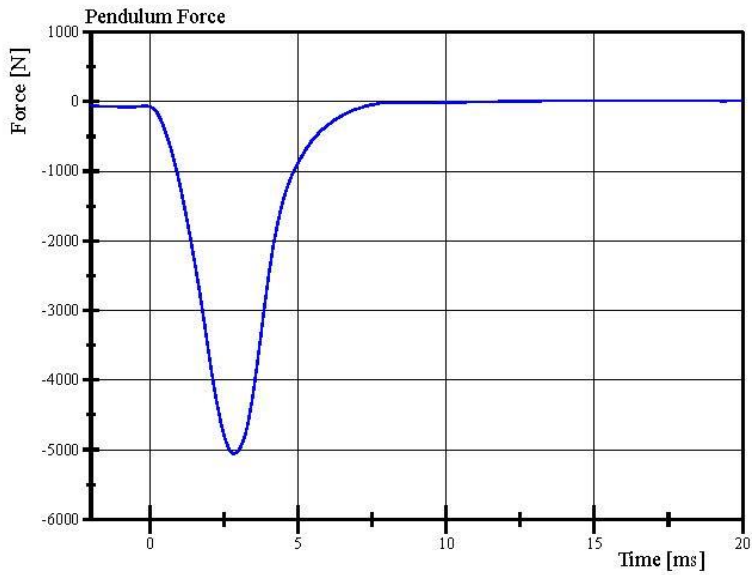
Right Knee Femur Response Test

HIII 50th Serial No. 037 Certification No. 94-1

Test Date: 8/15/2024



Filter Class: CFC_600
Max: 0.4 g at 16.2 ms
Min: -103.5 g at 2.8 ms



Filter Class: CFC_600
Max: 17.2 N at 16.2 ms
Min: -5,053.8 N at 2.8 ms

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

08.15.2024 10:35:46 1819



Pre-Test Calibration Sheets
Passenger S/N DH1659

Transportation Research Center Inc.
5720 HIII 5th Dummy
External Dimensions
Serial No. DH1659 Calibration No. 20

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	774.7 - 800.1	781	Yes
B	Shoulder Pivot Height	431.8 - 457.2	445	Yes
C	Hip Pivot Height	81.3 - 86.3	86	Yes
D	Hip Pivot from Backline	144.8 - 149.8	148	Yes
E	Shoulder Pivot from Backline	68.6 - 83.8	80	Yes
F	Thigh Clearance	119.4 - 134.6	131	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	533	Yes
L	Popliteal Height	355.6 - 376.0	360	Yes
M	Knee Pivot Height	393.7 - 419.1	409	Yes
N	Buttock Popliteal Length	414.0 - 439.4	430	Yes
O	Chest Depth without Jacket	175.3 - 190.5	185	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	305	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	869	Yes
Z	Waist Circumference	759.5 - 789.9	776	Yes
AA	Reference Location for Chest Circumference	332.7 - 358.1	345	Yes
BB	Reference Location for Waist Circumference	160.0 - 170.2	165	Yes

Revised 8/10/12



Report Number: DH1659_HFH20

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Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. DH1659 Certification No. 20-1

Test Date: 7/24/2024

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	68 %	Yes
Peak Head Resultant Acceleration	250 - 300 g	276.5 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	5.6 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	< 10 %	1.64 %	Yes

Test meets specifications.

Condition: Used

Comments:

Head Skin S/N: 2864

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

07.24.2024 13:18:27 614



Report Number: DH1659_HFH20

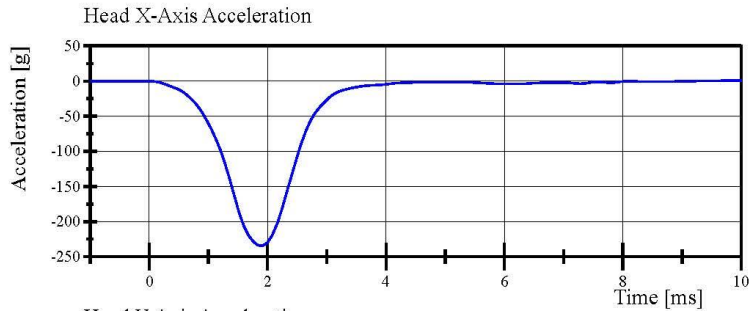
Page 9 of 28

Transportation Research Center Inc.

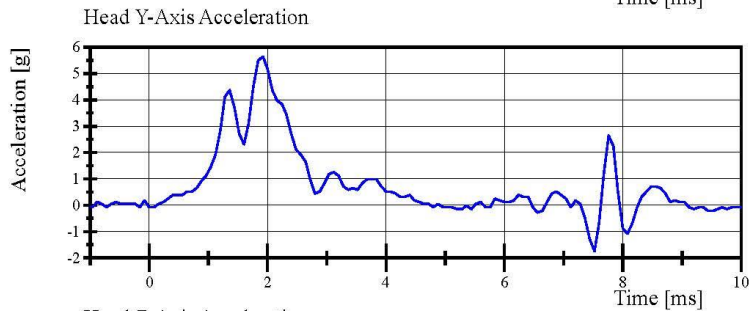
Front Head Drop

HIII 5th Serial No. DH1659 Certification No. 20-1

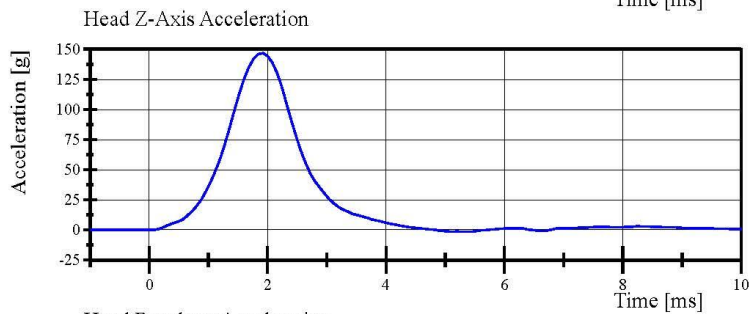
Test Date: 7/24/2024



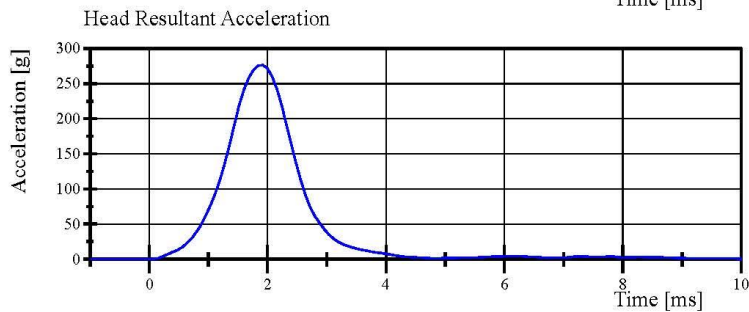
Filter Class: CFC_1000
Max: 0.8 g at 9.8 ms
Min: -234.3 g at 1.9 ms



Filter Class: CFC_1000
Max: 5.6 g at 1.9 ms
Min: -1.7 g at 7.5 ms



Filter Class: CFC_1000
Max: 146.8 g at 1.9 ms
Min: -1.5 g at 5.4 ms



Filter Class: CFC_1000
Max: 276.5 g at 1.9 ms
Min: 0.0 g at -1.0 ms

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

07.24.2024 13:18:59 614



Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. DH1659 Certification No. 20-2

Test Date: 7/29/2024

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	70 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	7.113 m/s	Yes
Pendulum Integrated Velocity			
Change at 10ms	(-2.1) - (-2.5) m/s	-2.18 m/s	Yes
Change at 20ms	(-4.0) - (-5.0) m/s	-4.35 m/s	Yes
Change at 30ms	(-5.8) - (-7.0) m/s	-6.29 m/s	Yes
Total Head D-Plane Rotation	(-77) - (-91) °	-79.4 °	Yes
Total Neck Occipital Condyles Moment			
Between -77° and -91° Rotation	69 - 83 N·m	76.8 N·m	Yes
Decay to 10 N·m	80 - 100 ms	89.6 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: EE9454

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

07.29.2024 11:11:07 1844

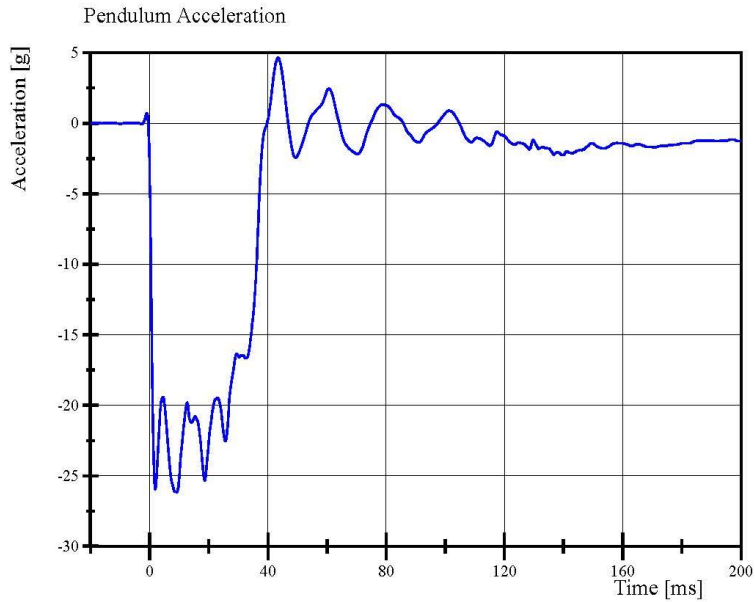


Transportation Research Center Inc.

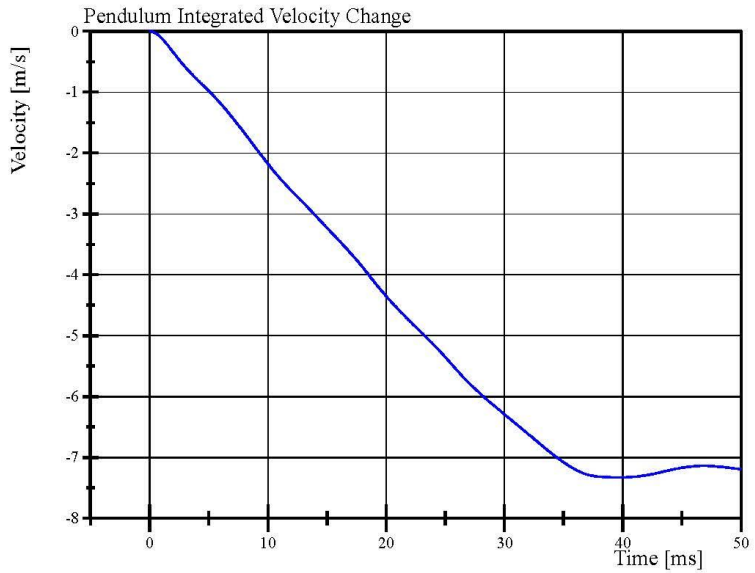
Neck Flexion

HIII 5th Serial No. DH1659 Certification No. 20-2

Test Date: 7/29/2024



Filter Class: CFC_180
Max: 4.6 g at 43.5 ms
Min: -26.2 g at 9.2 ms



Filter Class: CFC_180
Max: 0.0 m/s at 0.0 ms
Min: -7.3 m/s at 39.7 ms

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

07.29.2024 11:11:37 1844

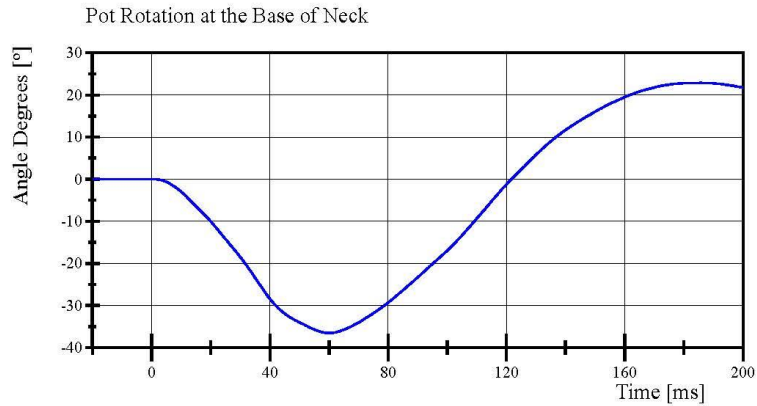


Transportation Research Center Inc.

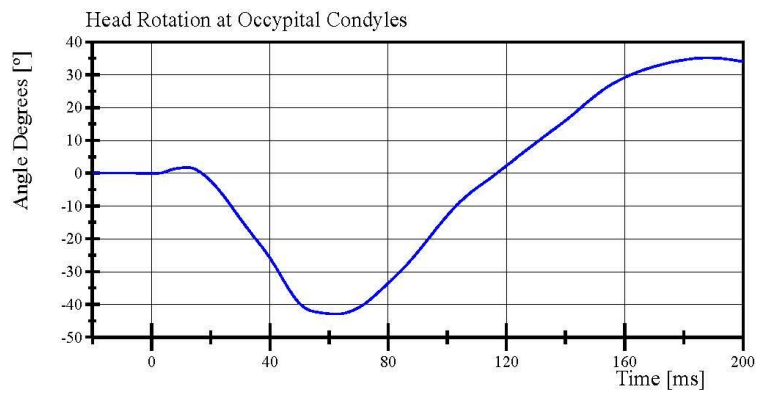
Neck Flexion

HIII 5th Serial No. DH1659 Certification No. 20-2

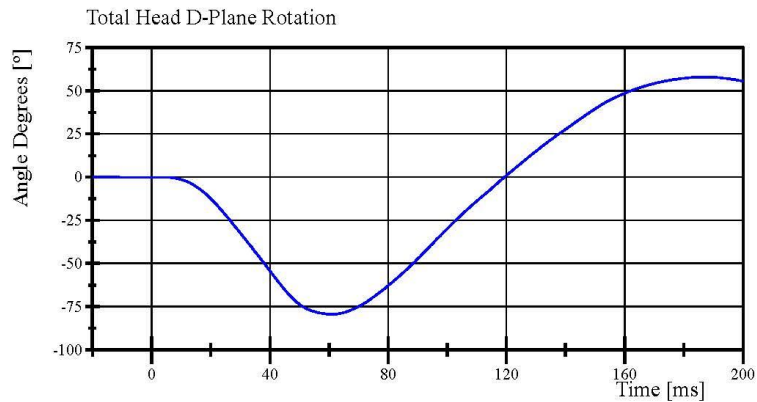
Test Date: 7/29/2024



Filter Class: CFC_60
Max: 22.9 ° at 185.6 ms
Min: -36.5 ° at 60.1 ms



Filter Class: CFC_60
Max: 35.2 ° at 188.0 ms
Min: -43.0 ° at 62.4 ms



Filter Class: CFC_60
Max: 58.0 ° at 187.2 ms
Min: -79.4 ° at 61.1 ms

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

07.29.2024 11:11:37 1844

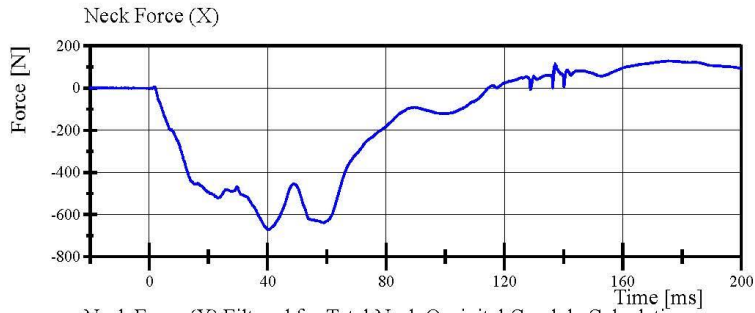


Transportation Research Center Inc.

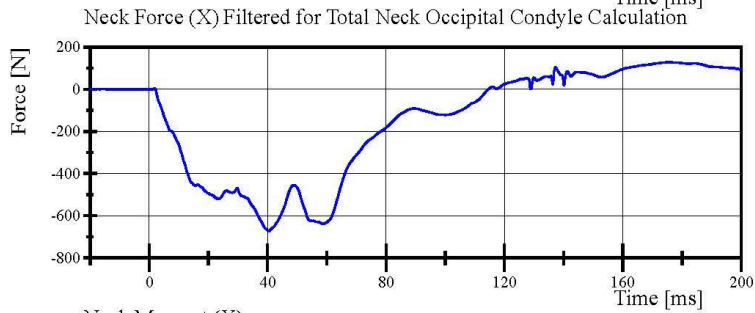
Neck Flexion

HIII 5th Serial No. DH1659 Certification No. 20-2

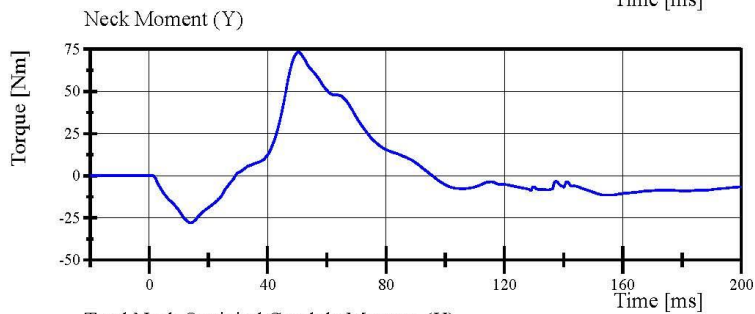
Test Date: 7/29/2024



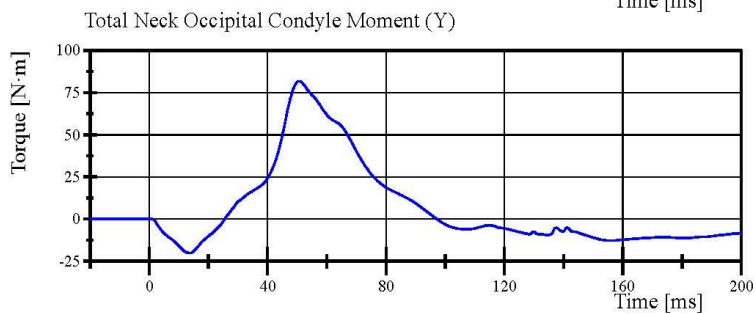
Filter Class: CFC_1000
Max: 129.4 N at 175.3 ms
Min: -673.3 N at 40.3 ms



Filter Class: CFC_600
Max: 129.0 N at 175.2 ms
Min: -673.0 N at 40.3 ms



Filter Class: CFC_600
Max: 73.3 Nm at 50.4 ms
Min: -28.0 Nm at 14.1 ms



Filter Class: Without_(Constar
Max: 81.9 N·m at 50.7 ms
Min: -20.2 N·m at 13.8 ms

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

07.29.2024 11:11:37 1844



Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. DH1659 Certification No. 20-5

Test Date: 7/29/2024

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	67 %	Yes
Pendulum Velocity	(-5.95) - (-6.19) m/s	-6.086 m/s	Yes
Pendulum Integrated Velocity			
Change at 10ms	1.5 - 1.9 m/s	1.83 m/s	Yes
Change at 20ms	3.1 - 3.9 m/s	3.65 m/s	Yes
Change at 30ms	4.6 - 5.6 m/s	5.44 m/s	Yes
Total Head D-Plane Rotation	99 - 114 °	109.4 °	Yes
Total Neck Occipital Condyles Moment			
Between 99° and 114° Rotation	(-53) - (-65) N·m	-61.8 N·m	Yes
Decay to -10 N·m	94 - 114 ms	101.9 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: EE9454

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

07.29.2024 11:41:28 2000

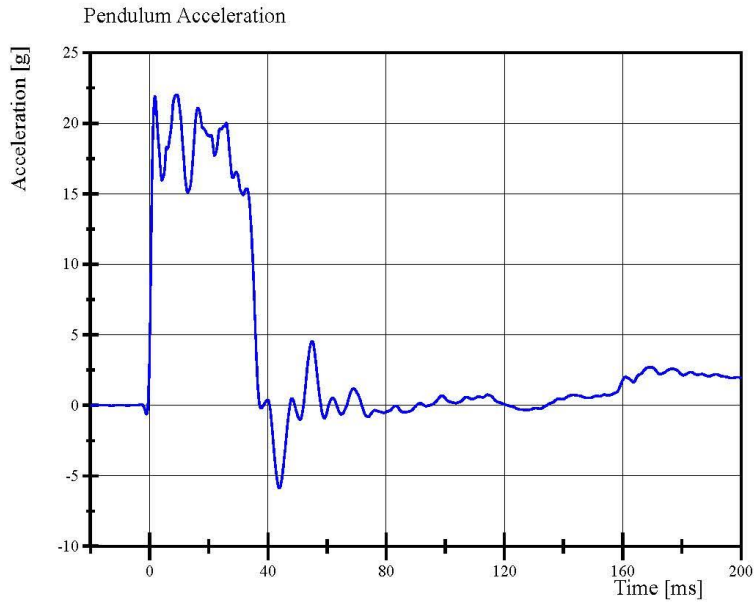


Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. DH1659 Certification No. 20-5

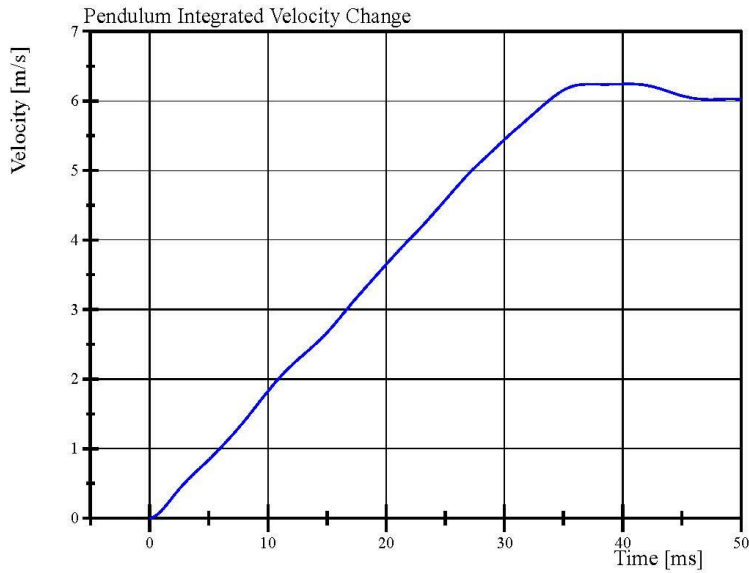
Test Date: 7/29/2024



Filter Class: CFC_180

Max: 22.0 g at 9.2 ms

Min: -5.9 g at 43.9 ms



Filter Class: CFC_180

Max: 6.2 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

07.29.2024 11:41:52 2000

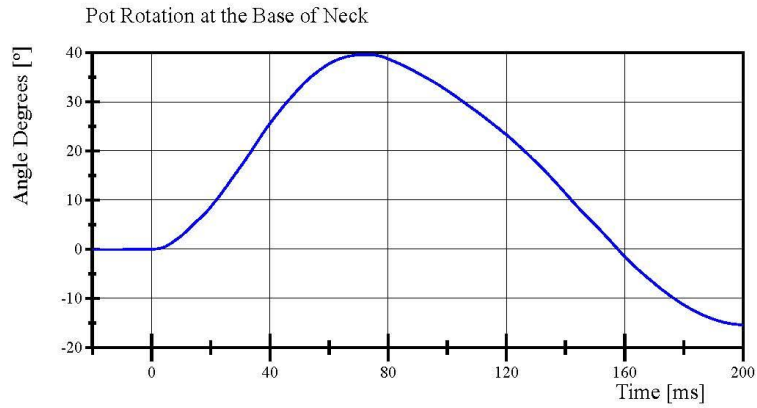


Transportation Research Center Inc.

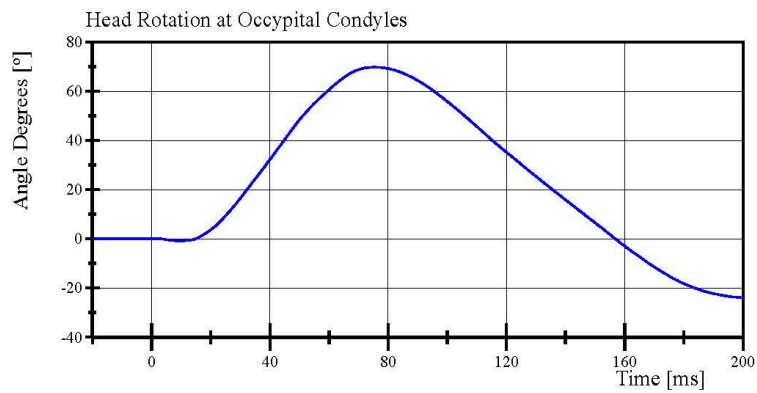
Neck Extension

HIII 5th Serial No. DH1659 Certification No. 20-5

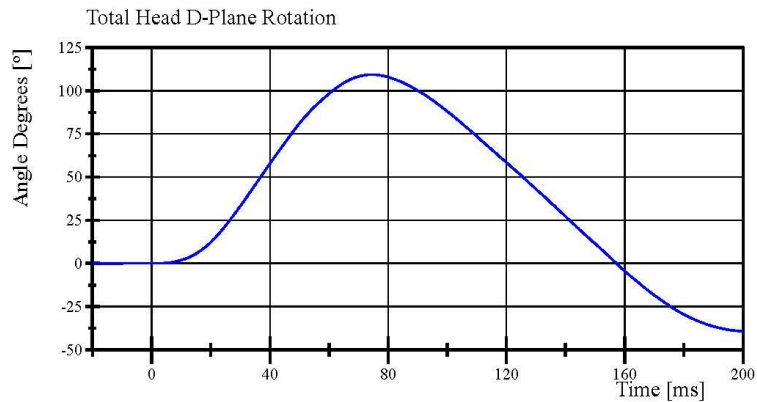
Test Date: 7/29/2024



Filter Class: CFC_60
Max: 39.6 ° at 72.7 ms
Min: -15.4 ° at 200.0 ms



Filter Class: CFC_60
Max: 69.8 ° at 75.4 ms
Min: -24.0 ° at 200.0 ms



Filter Class: CFC_60
Max: 109.4 ° at 74.5 ms
Min: -39.4 ° at 200.0 ms

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

07.29.2024 11:41:52 2000

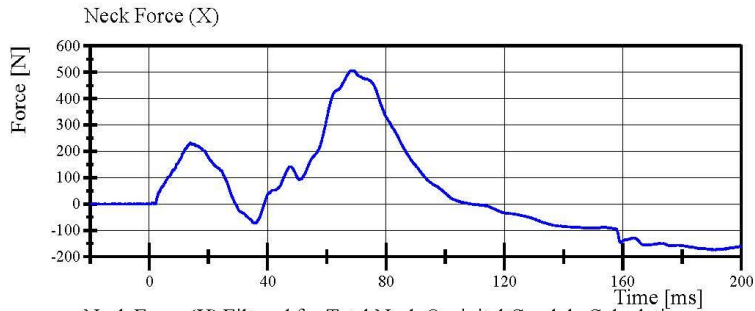


Transportation Research Center Inc.

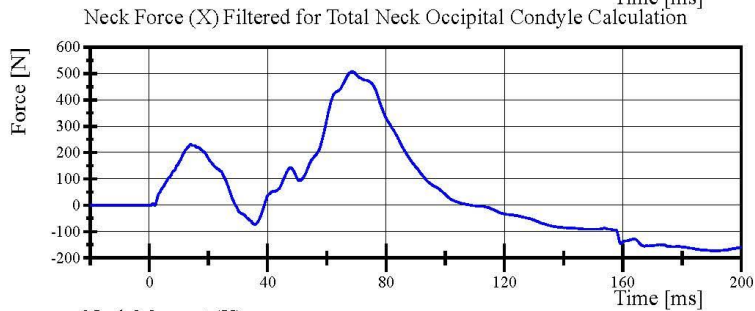
Neck Extension

HIII 5th Serial No. DH1659 Certification No. 20-5

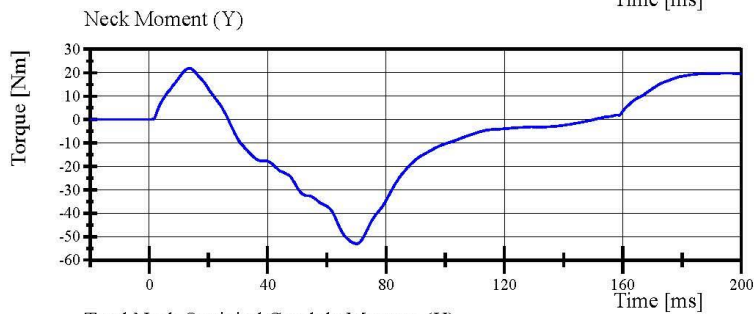
Test Date: 7/29/2024



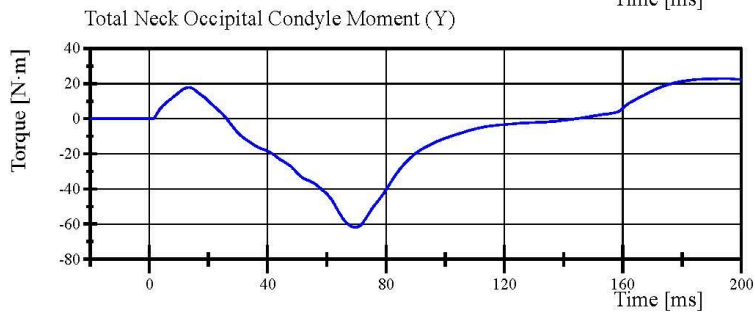
Filter Class: CFC_1000
Max: 506.7 N at 68.5 ms
Min: -174.0 N at 191.3 ms



Filter Class: CFC_600
Max: 506.3 N at 68.5 ms
Min: -173.4 N at 191.3 ms



Filter Class: CFC_600
Max: 21.9 Nm at 13.8 ms
Min: -53.0 Nm at 70.1 ms



Filter Class: Without_(Constar)
Max: 22.8 N·m at 193.7 ms
Min: -61.8 N·m at 69.9 ms

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

07.29.2024 11:41:52 2000



Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. DH1659 Certification No. 20-1

Test Date: 7/24/2024

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	69 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.812 m/s	Yes
Probe Force Peak Between 50.0 mm and 58.0 mm Chest Deflection	(-3,900) - (-4,400) N	-4,157.9 N	Yes
Probe Force Peak Between 18.0 mm and 50.0 mm Chest Deflection	\geq (-4,600) N	-4,157.6 N	Yes
Maximum Chest Compression	(-50) - (-58) mm	-52.6 mm	Yes
Internal Hysteresis	69 - 85 %	73.7 %	Yes

Test meets specifications.

Condition: Used

Comments:

Jacket S/N: EE8365

Rib Set S/N: DI5873

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

07.24.2024 15:01:17.429



Report Number: DH1659_HFH20

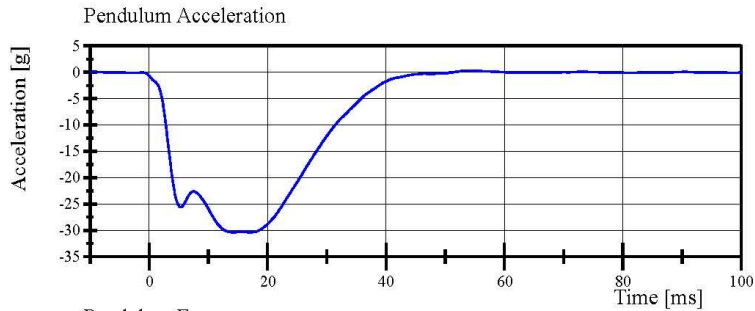
Page 19 of 28

Transportation Research Center Inc.

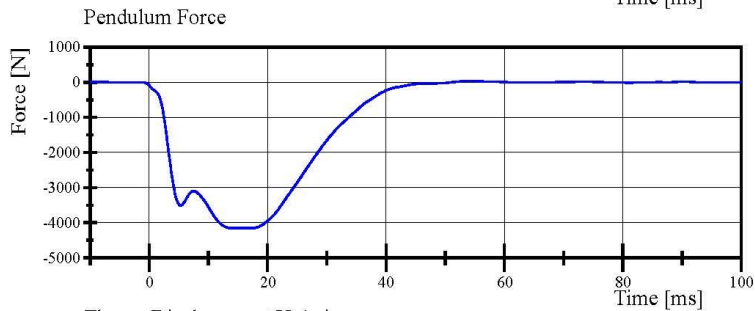
Front Thorax

HIII 5th Serial No. DH1659 Certification No. 20-1

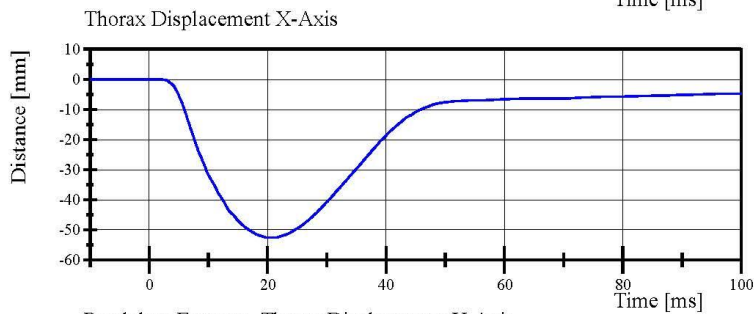
Test Date: 7/24/2024



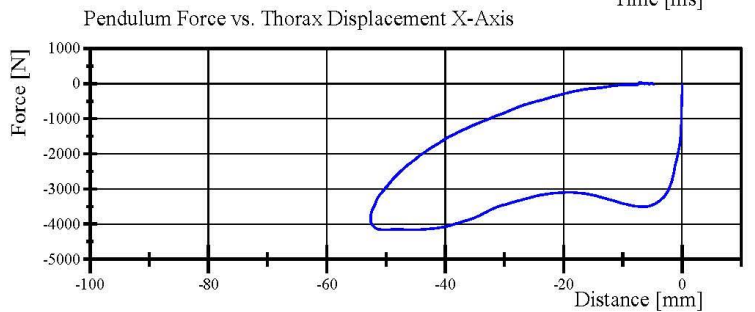
Filter Class: CFC_180
Max: 0.3 g at 53.6 ms
Min: -30.3 g at 17.0 ms



Filter Class: CFC_180
Max: 43.9 N at 53.6 ms
Min: -4,157.9 N at 17.0 ms



Filter Class: CFC_600
Max: 0.0 mm at -6.6 ms
Min: -52.6 mm at 20.2 ms



Filter Class: CFC_180
Max: 43.9 N at -7.0 mm
Min: -4,157.9 N at -50.2 mm

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

07.24.2024 15:02:13.429

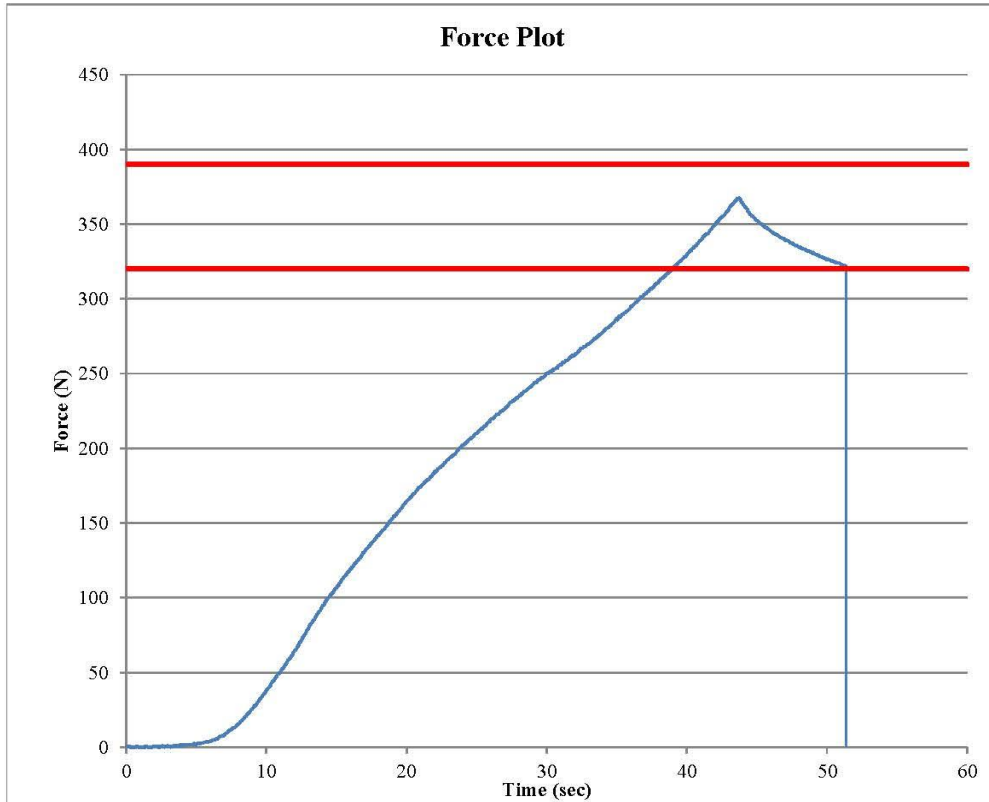


Transportation Research Center Inc.
Hybrid III Small Female Torso Flexion



Customer: NHTSA
 Serial Number: DH1659 Date: 7/24/2024
 Test Number: 1 Time: 13:55

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	20.8 °C Pass
Humidity	10 - 70	68 % Pass
Average Angular Rate	0.5 - 1.5	0.95 deg/sec Pass
Initial Angle	0 - 20	10.4 deg Pass
Peak Force at 45.53°	320 - 390	367.54 N Pass
Final Angle	-8 - 8	3.61 deg Pass



Components: Jacket S/N: EE8385
 Abdomen S/N: EE8393
 Lumbar S/N: EW9168

Comments:

Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. DH1659 Certification No. 20-1
Test Date: 7/24/2024

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	69 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.073 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-4,008.6 N	Yes

Test meets specifications.

Condition: Used

Comments:

Knee Skin S/N: ED6729

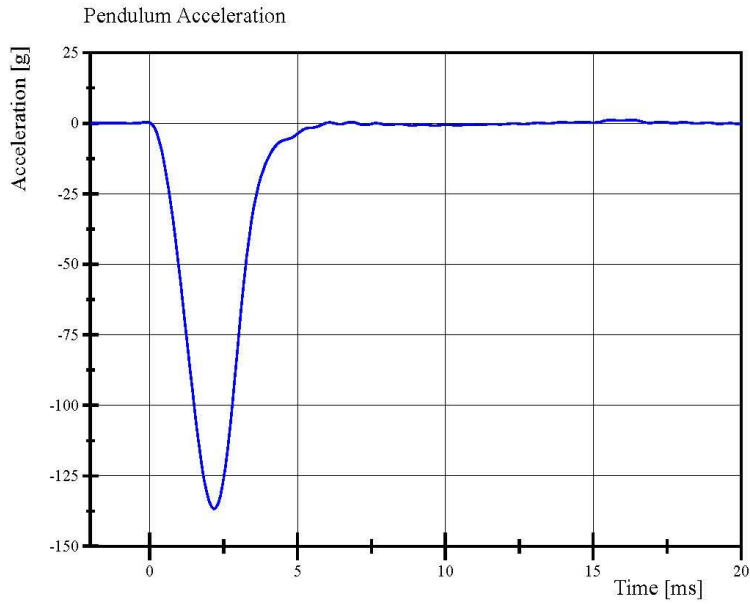
Specification Source: CFR49 Part 572 Subpart O
with Polarity in accordance with J211

07.24.2024 11:34:54 1861

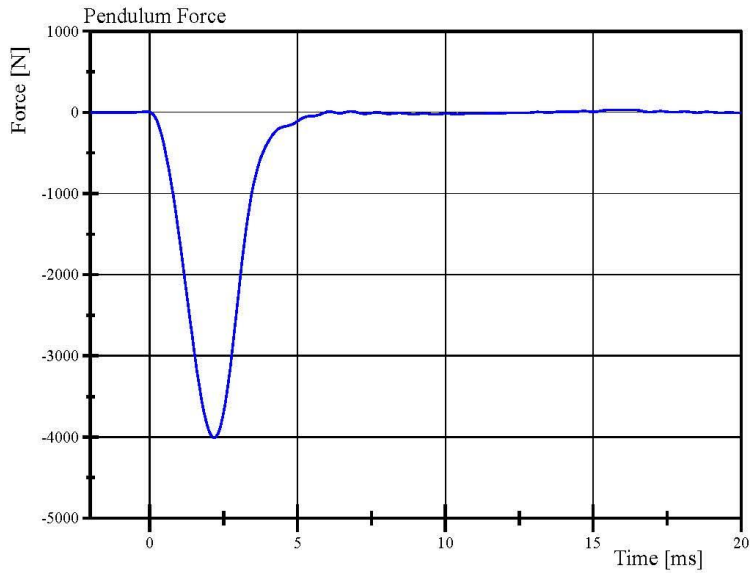


Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. DH1659 Certification No. 20-1
Test Date: 7/24/2024



Filter Class: CFC_600
Max: 1.1 g at 16.3 ms
Min: -136.7 g at 2.2 ms



Filter Class: CFC_600
Max: 33.6 N at 16.3 ms
Min: -4,008.6 N at 2.2 ms

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

07.24.2024 11:35:29 1861



Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. DH1659 Certification No. 20-1
Test Date: 7/24/2024

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	69 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.070 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-4,024.3 N	Yes

Test meets specifications.

Condition: Used

Comments:

Knee Skin S/N: EC5852

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

07.24.2024 11:13:55 1861



Report Number: DH1659_HFH20

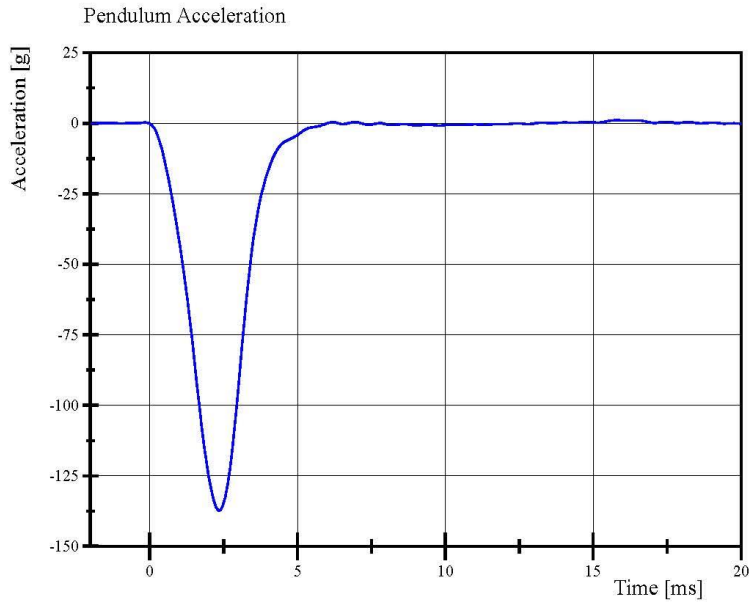
Page 24 of 28

Transportation Research Center Inc.

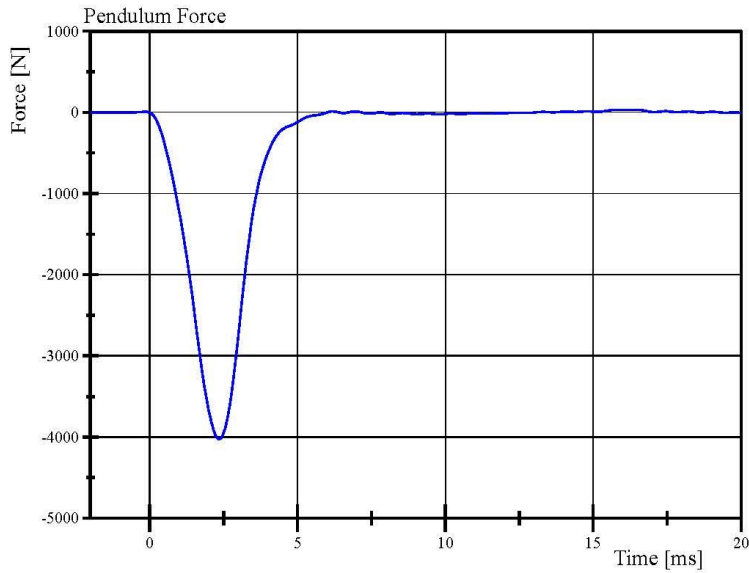
Right Knee Femur Response Test

HIII 5th Serial No. DH1659 Certification No. 20-1

Test Date: 7/24/2024



Filter Class: CFC_600
Max: 1.1 g at 15.8 ms
Min: -137.2 g at 2.3 ms



Filter Class: CFC_600
Max: 32.5 N at 15.8 ms
Min: -4,024.3 N at 2.3 ms

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

07.24.2024 11:14:40 1861



**Post-Test Calibration Sheets
Passenger S/N DH1659**

Transportation Research Center Inc.
5720 HIII 5th Dummy
External Dimensions
Serial No. DH1659 Calibration No. 21

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	774.7 - 800.1	780	Yes
B	Shoulder Pivot Height	431.8 - 457.2	445	Yes
C	Hip Pivot Height	81.3 - 86.3	86	Yes
D	Hip Pivot from Backline	144.8 - 149.8	148	Yes
E	Shoulder Pivot from Backline	68.6 - 83.8	80	Yes
F	Thigh Clearance	119.4 - 134.6	131	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	196	Yes
K	Buttock Knee Length	520.7 - 546.1	533	Yes
L	Popliteal Height	355.6 - 376.0	360	Yes
M	Knee Pivot Height	393.7 - 419.1	409	Yes
N	Buttock Popliteal Length	414.0 - 439.4	430	Yes
O	Chest Depth without Jacket	175.3 - 190.5	185	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	305	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	869	Yes
Z	Waist Circumference	759.5 - 789.9	776	Yes
AA	Reference Location for Chest Circumference	332.7 - 358.1	345	Yes
BB	Reference Location for Waist Circumference	160.0 - 170.2	165	Yes

Revised 8/10/12



Report Number: DH1659_HFH21

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Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. DH1659 Certification No. 21-2

Test Date: 8/16/2024

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	69 %	Yes
Peak Head Resultant Acceleration	250 - 300 g	284.2 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-5.9 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	< 10 %	1.65 %	Yes

Test meets specifications.

Condition: Used

Comments:

Head Skin S/N: 2864

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

08.16.2024 10:58:42 613



Report Number: DH1659_HFH21

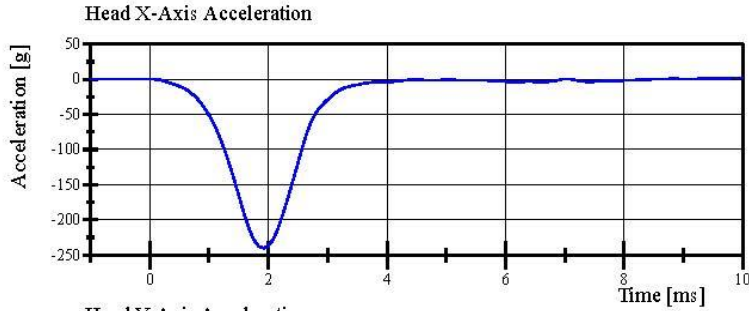
Page 9 of 28

Transportation Research Center Inc.

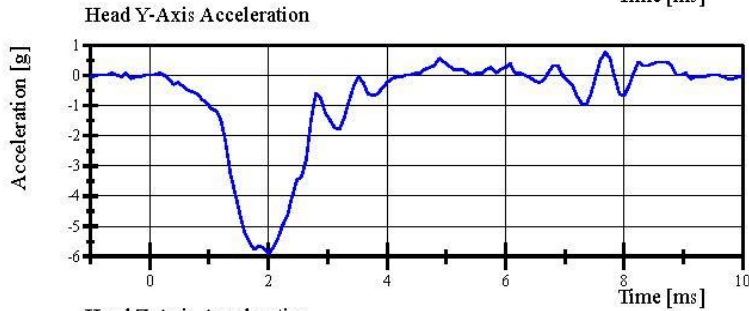
Front Head Drop

HIII 5th Serial No. DH1659 Certification No. 21-2

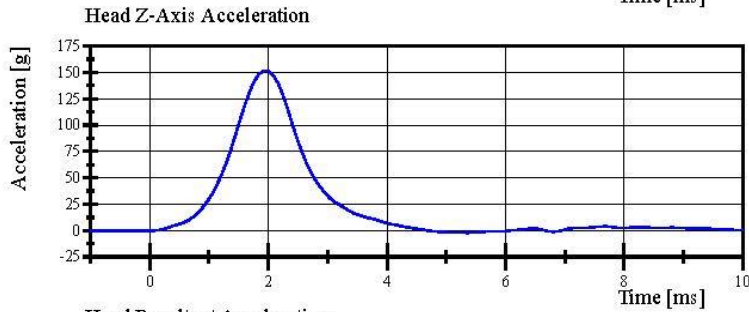
Test Date: 8/16/2024



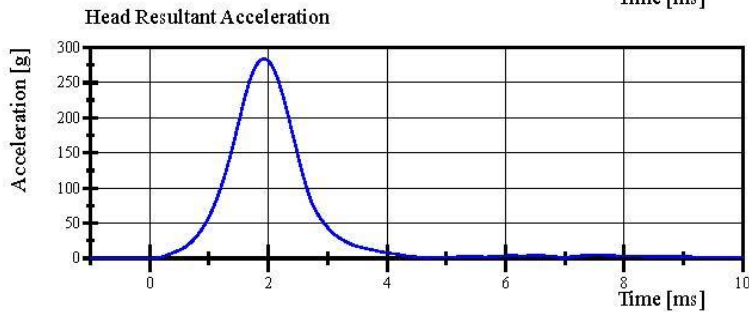
Filter Class: CFC_1000
Max: 1.7 g at 9.8 ms
Min: -240.3 g at 1.9 ms



Filter Class: CFC_1000
Max: 0.8 g at 7.7 ms
Min: -5.9 g at 2.0 ms



Filter Class: CFC_1000
Max: 151.6 g at 1.9 ms
Min: -2.2 g at 5.4 ms



Filter Class: CFC_1000
Max: 284.2 g at 1.9 ms
Min: 0.0 g at -0.9 ms

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

08.16.2024 10:59:25 613



Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. DH1659 Certification No. 21-1

Test Date: 8/16/2024

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	66 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	7.110 m/s	Yes
Pendulum Integrated Velocity			
Change at 10ms	(-2.1) - (-2.5) m/s	-2.18 m/s	Yes
Change at 20ms	(-4.0) - (-5.0) m/s	-4.40 m/s	Yes
Change at 30ms	(-5.8) - (-7.0) m/s	-6.40 m/s	Yes
Total Head D-Plane Rotation	(-77) - (-91) °	-80.9 °	Yes
Total Neck Occipital Condyles Moment			
Between -77° and -91° Rotation	69 - 83 N·m	79.2 N·m	Yes
Decay to 10 N·m	80 - 100 ms	88.5 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: EE9454

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

08.16.2024 11:20:45 1847

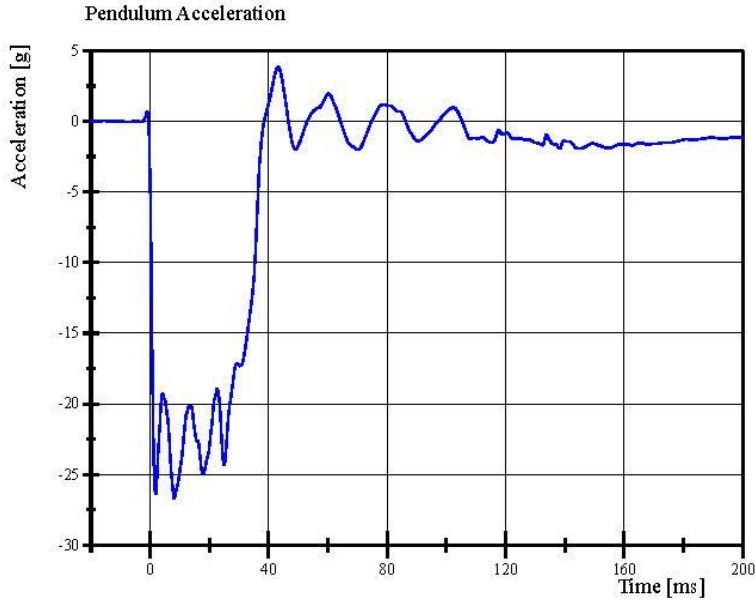


Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. DH1659 Certification No. 21-1

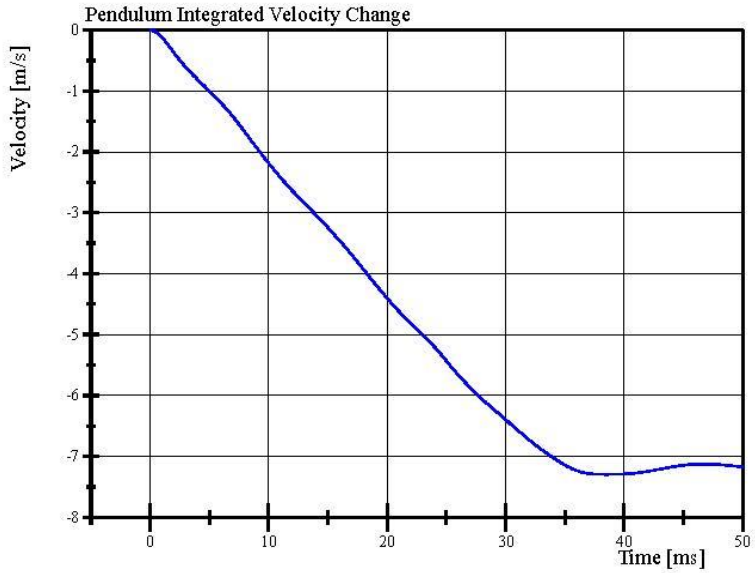
Test Date: 8/16/2024



Filter Class: CFC_180

Max: 3.9 g at 43.2 ms

Min: -26.7 g at 8.2 ms



Filter Class: CFC_180

Max: 0.0 m/s at 0.0 ms

Min: -7.3 m/s at 38.5 ms

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

08.16.2024 11:21:13 1847

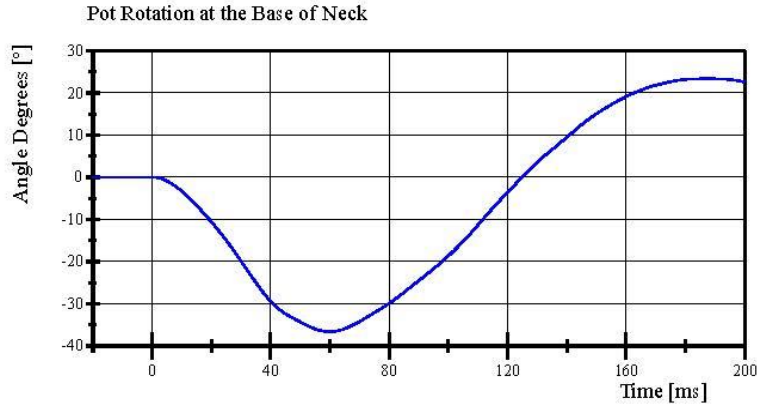


Transportation Research Center Inc.

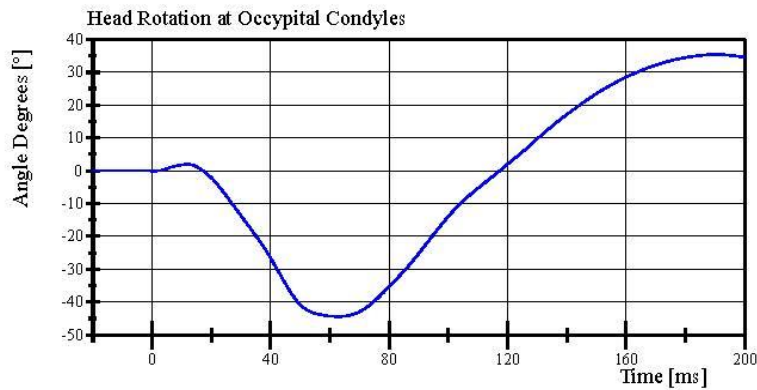
Neck Flexion

HIII 5th Serial No. DH1659 Certification No. 21-1

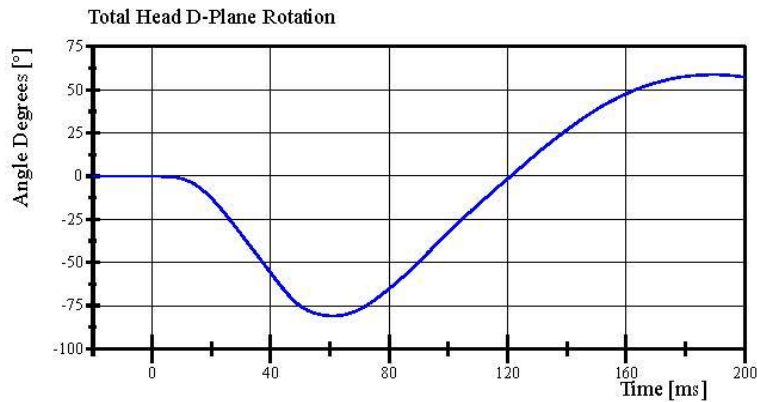
Test Date: 8/16/2024



Filter Class: CFC_60
Max: 23.4 ° at 187.7 ms
Min: -36.6 ° at 60.0 ms



Filter Class: CFC_60
Max: 35.4 ° at 190.4 ms
Min: -44.4 ° at 63.0 ms



Filter Class: CFC_60
Max: 58.7 ° at 189.8 ms
Min: -80.9 ° at 61.1 ms

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

08.16.2024 11:21:13 1847

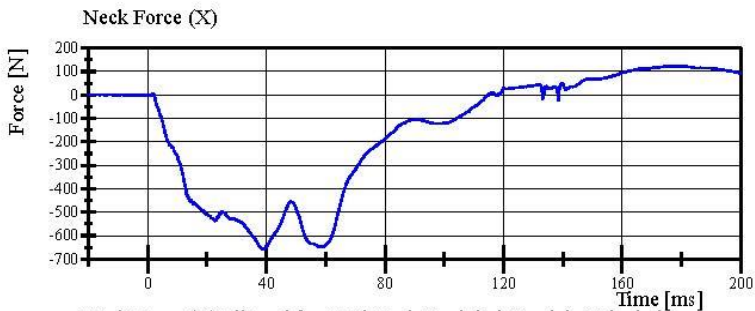


Transportation Research Center Inc.

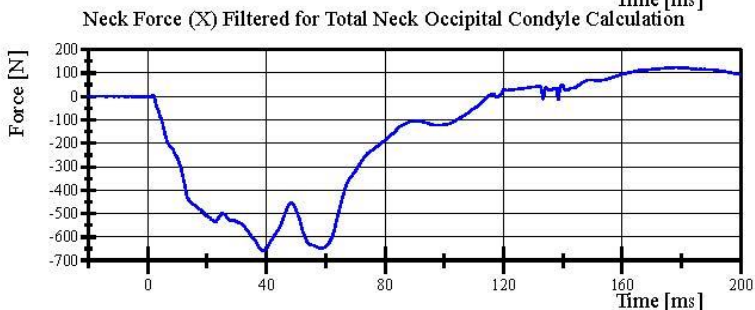
Neck Flexion

HIII 5th Serial No. DH1659 Certification No. 21-1

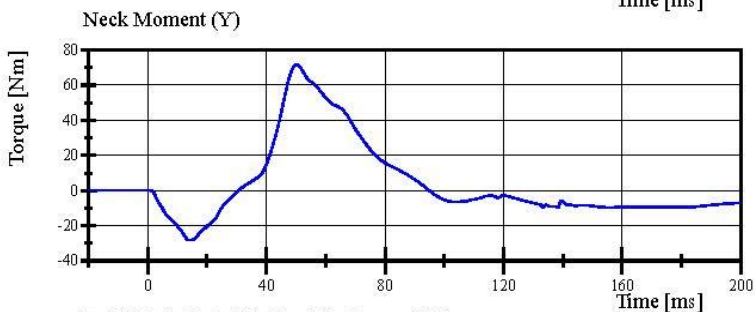
Test Date: 8/16/2024



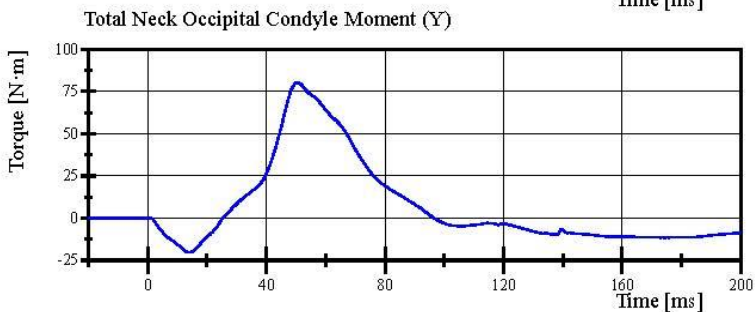
Filter Class: CFC_1000
Max: 124.1 N at 178.4 ms
Min: -659.5 N at 38.9 ms



Filter Class: CFC_600
Max: 123.6 N at 178.3 ms
Min: -659.2 N at 39.0 ms



Filter Class: CFC_600
Max: 71.5 Nm at 50.1 ms
Min: -28.3 Nm at 14.3 ms



Filter Class: Without_(Constar
Max: 80.2 N·m at 50.5 ms
Min: -20.3 N·m at 13.9 ms

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

08.16.2024 11:21:13 1847



Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. DH1659 Certification No. 21-1

Test Date: 8/16/2024

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	68 %	Yes
Pendulum Velocity	(-5.95) - (-6.19) m/s	-6.078 m/s	Yes
Pendulum Integrated Velocity			
Change at 10ms	1.5 - 1.9 m/s	1.77 m/s	Yes
Change at 20ms	3.1 - 3.9 m/s	3.60 m/s	Yes
Change at 30ms	4.6 - 5.6 m/s	5.39 m/s	Yes
Total Head D-Plane Rotation	99 - 114 °	108.5 °	Yes
Total Neck Occipital Condyles Moment			
Between 99° and 114° Rotation	(-53) - (-65) N·m	-62.0 N·m	Yes
Decay to -10 N·m	94 - 114 ms	102.6 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: EE9454

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

08.16.2024 12:03:40 1998

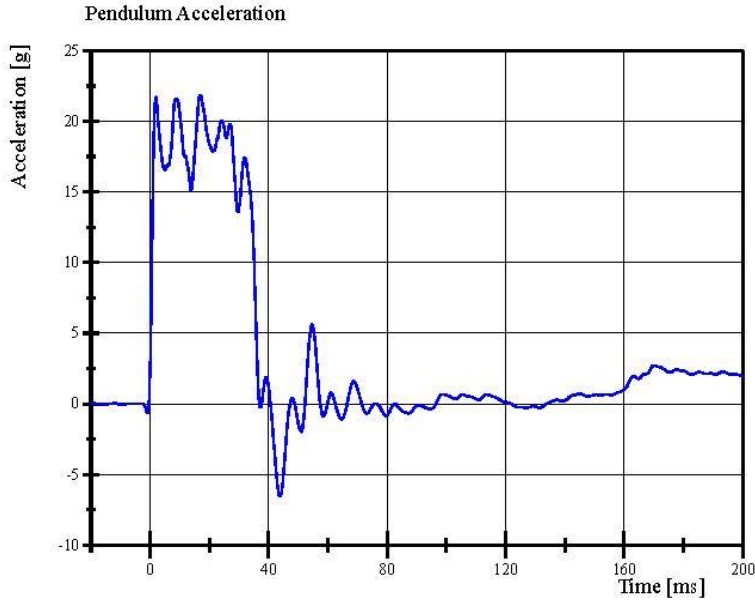


Transportation Research Center Inc.

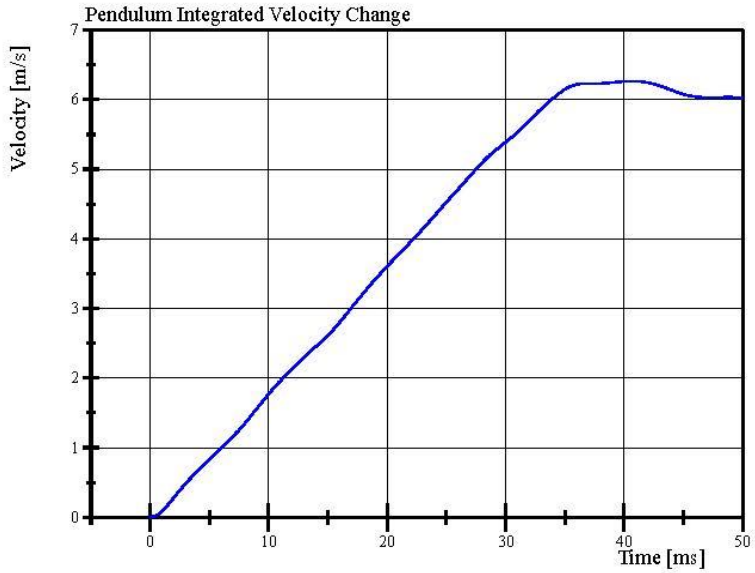
Neck Extension

HIII 5th Serial No. DH1659 Certification No. 21-1

Test Date: 8/16/2024



Filter Class: CFC_180
Max: 21.9 g at 17.0 ms
Min: -6.6 g at 43.9 ms



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

08.16.2024 12:04:38 1998

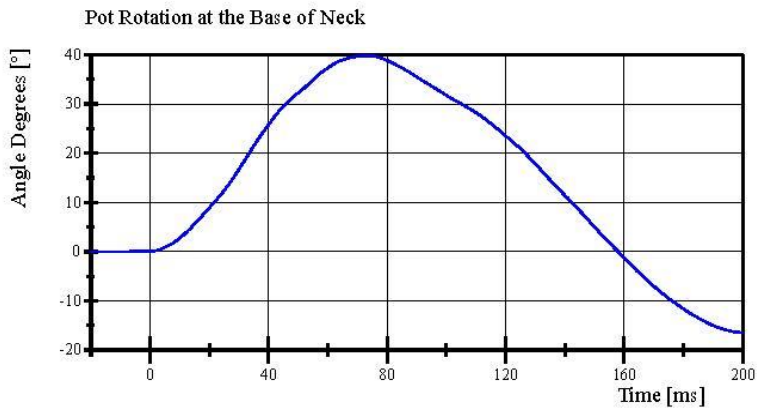


Transportation Research Center Inc.

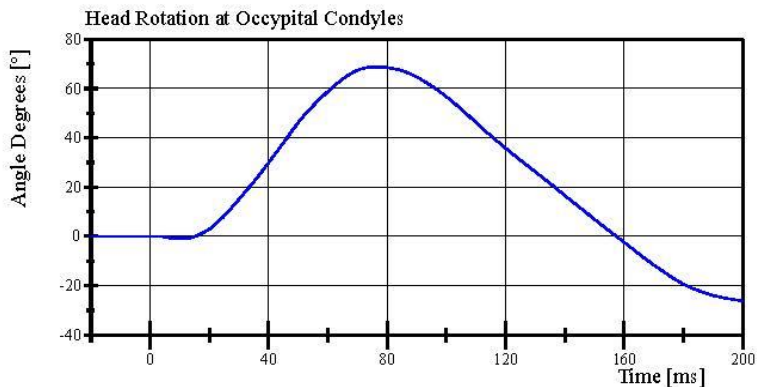
Neck Extension

HIII 5th Serial No. DH1659 Certification No. 21-1

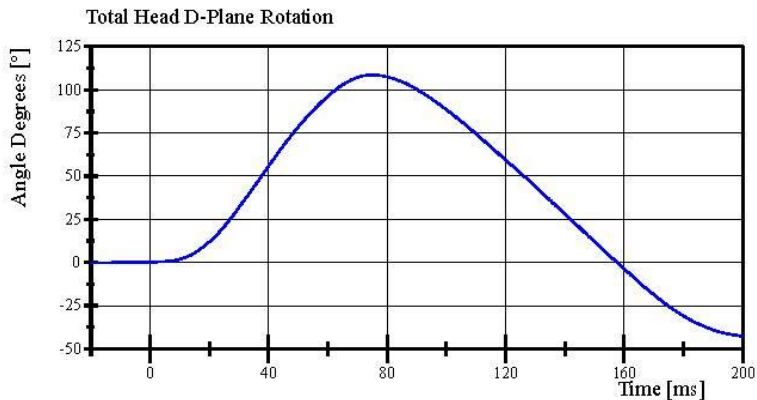
Test Date: 8/16/2024



Filter Class: CFC_60
Max: 39.8 ° at 72.8 ms
Min: -16.5 ° at 200.0 ms



Filter Class: CFC_60
Max: 68.8 ° at 76.3 ms
Min: -26.2 ° at 200.0 ms



Filter Class: CFC_60
Max: 108.5 ° at 74.9 ms
Min: -42.7 ° at 200.0 ms

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

08.16.2024 12:04:38 1998

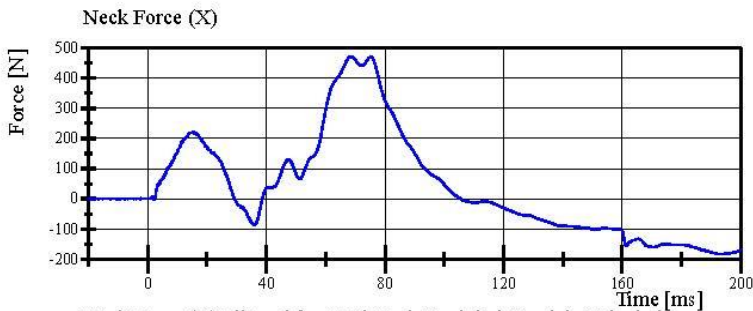


Transportation Research Center Inc.

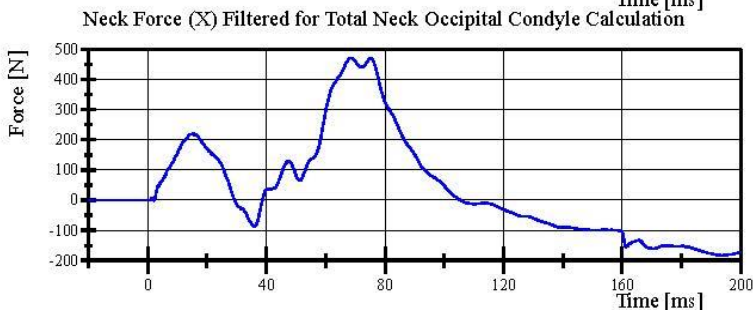
Neck Extension

HIII 5th Serial No. DH1659 Certification No. 21-1

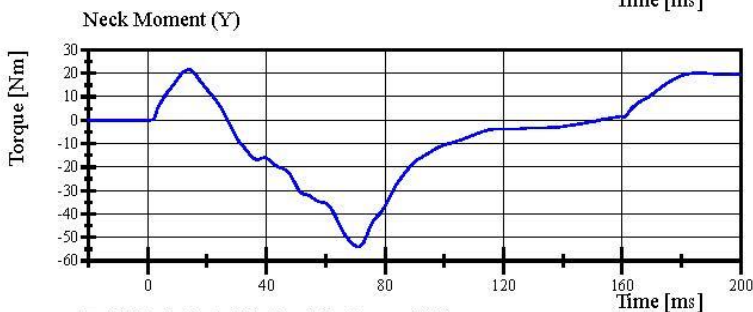
Test Date: 8/16/2024



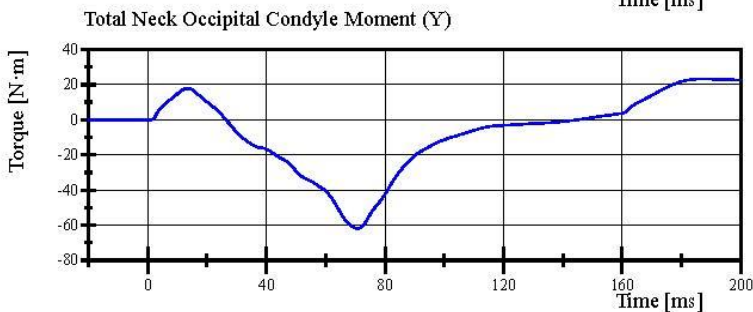
Filter Class: CFC_1000
Max: 472.3 N at 68.5 ms
Min: -183.6 N at 193.4 ms



Filter Class: CFC_600
Max: 472.2 N at 68.7 ms
Min: -183.4 N at 193.6 ms



Filter Class: CFC_600
Max: 21.6 Nm at 13.9 ms
Min: -54.0 Nm at 70.9 ms



Filter Class: Without_(Constar
Max: 23.2 N·m at 187.1 ms
Min: -62.0 N·m at 70.7 ms

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

08.16.2024 12:04:38 1998



Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. DH1659 Certification No. 21-1

Test Date: 8/16/2024

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	68 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.816 m/s	Yes
Probe Force Peak Between 50.0 mm and 58.0 mm Chest Deflection	(-3,900) - (-4,400) N	-4,264.1 N	Yes
Probe Force Peak Between 18.0 mm and 50.0 mm Chest Deflection	\geq (-4,600) N	-4,216.6 N	Yes
Maximum Chest Compression	(-50) - (-58) mm	-53.6 mm	Yes
Internal Hysteresis	69 - 85 %	73.7 %	Yes

Test meets specifications.

Condition: Used

Comments:

Jacket S/N: EE8365

Rib Set S/N: DI5873

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

08.16.2024 13:49:12 420

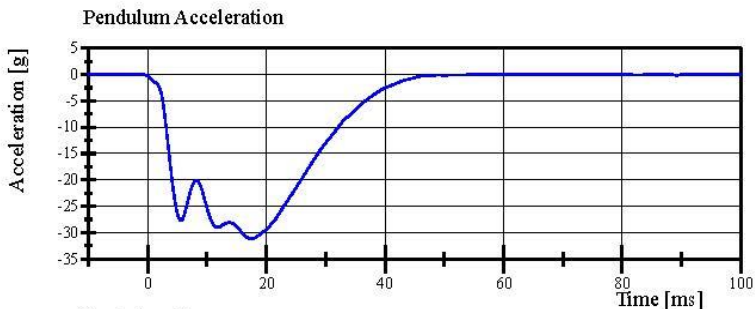


Transportation Research Center Inc.

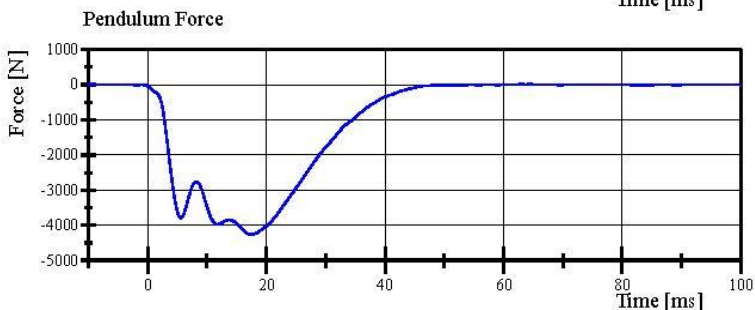
Front Thorax

HIII 5th Serial No. DH1659 Certification No. 21-1

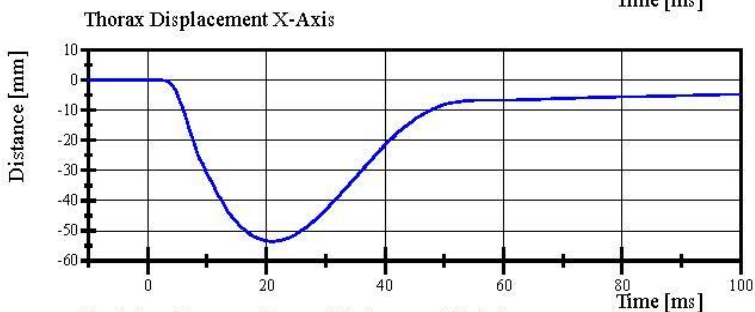
Test Date: 8/16/2024



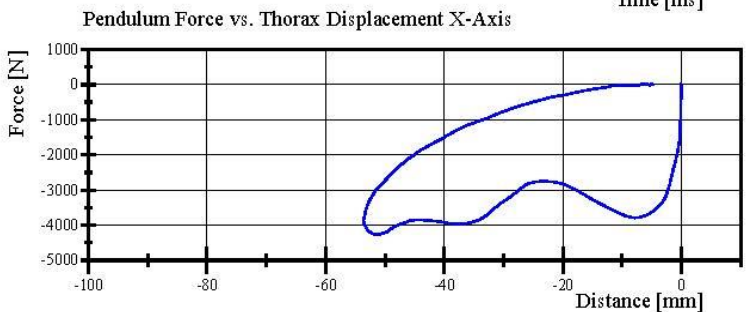
Filter Class: CFC_180
Max: 0.1 g at -9.7 ms
Min: -31.1 g at 17.4 ms



Filter Class: CFC_180
Max: 8.1 N at -9.7 ms
Min: -4,264.1 N at 17.4 ms



Filter Class: CFC_600
Max: 0.0 mm at -5.8 ms
Min: -53.6 mm at 21.0 ms



Filter Class: CFC_180
Max: 8.1 N at -0.0 mm
Min: -4,264.1 N at -51.4 mm

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

08.16.2024 13:50:26 420

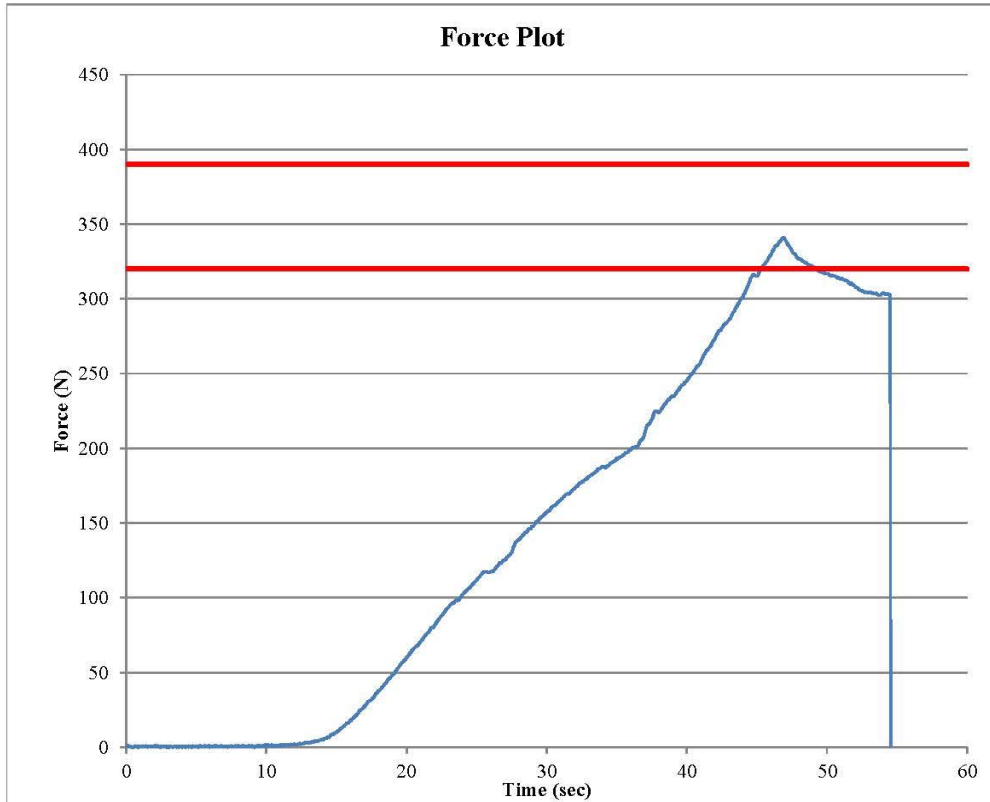


Transportation Research Center Inc.
Hybrid III Small Female Torso Flexion



Customer: NHTSA
 Serial Number: DH1659 Date: 8/15/2024
 Test Number: 1 Time: 11:23

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.1 °C Pass
Humidity	10 - 70	64 % Pass
Average Angular Rate	0.5 - 1.5	0.87 deg/sec Pass
Initial Angle	0 - 20	17.92 deg Pass
Peak Force at 45.53°	320 - 390	341.17 N Pass
Final Angle	-8 - 8	0.41 deg Pass



Components: Jacket S/N: EE8385
 Abdomen S/N: EE8393
 Lumbar S/N: EW9168

Comments:

Transportation Research Center Inc.

Left Knee Femur Response Test

HIII 5th Serial No. DH1659 Certification No. 21-2

Test Date: 8/16/2024

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	68 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.078 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,942.2 N	Yes

Test meets specifications.

Condition: Used

Comments:

Knee Skin S/N: ED6729

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

08.16.2024 08:14:50 1943



Report Number: DH1659_HFH21

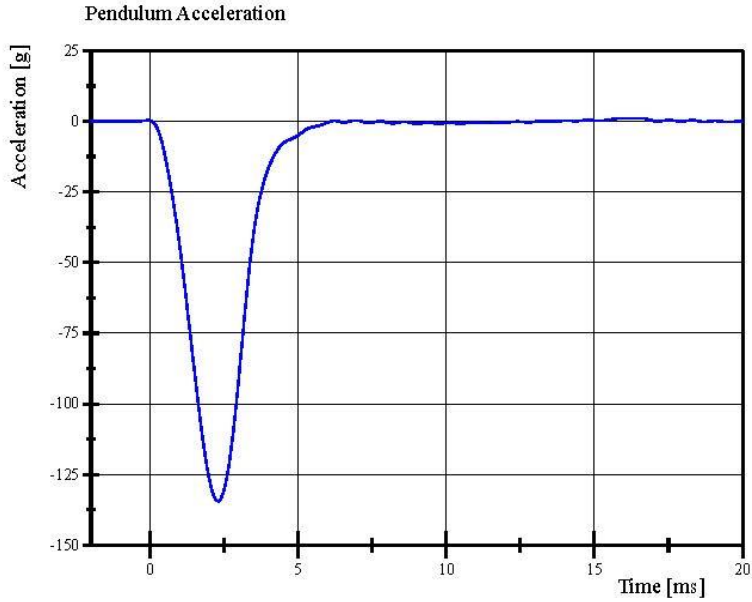
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Transportation Research Center Inc.

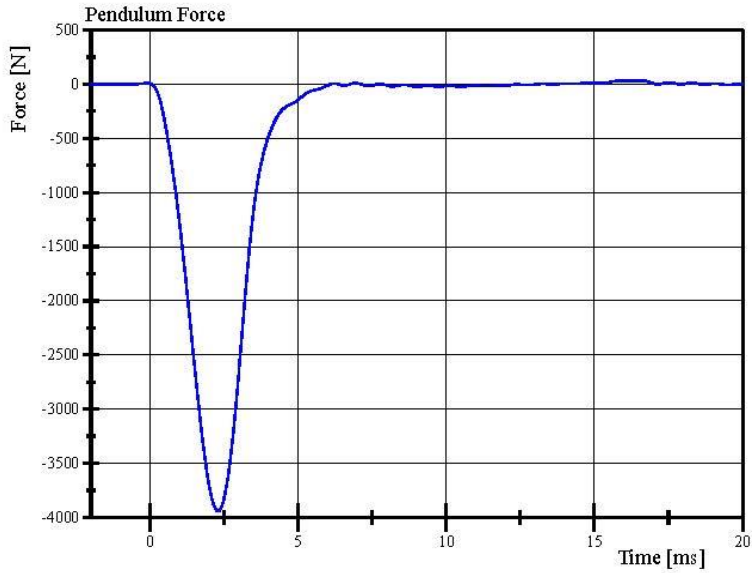
Left Knee Femur Response Test

HIII 5th Serial No. DH1659 Certification No. 21-2

Test Date: 8/16/2024



Filter Class: CFC_600
Max: 1.1 g at 16.6 ms
Min: -134.4 g at 2.3 ms



Filter Class: CFC_600
Max: 33.1 N at 16.6 ms
Min: -3,942.2 N at 2.3 ms

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

08.16.2024 08:15:59 1943



Transportation Research Center Inc.

Right Knee Femur Response Test

HIII 5th Serial No. DH1659 Certification No. 21-3

Test Date: 8/16/2024

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	67 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.080 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,840.8 N	Yes

Test meets specifications.

Condition: Used

Comments:

Knee Skin S/N: EC5852

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

08.16.2024 08:54:19 1942



Report Number: DH1659_HFH21

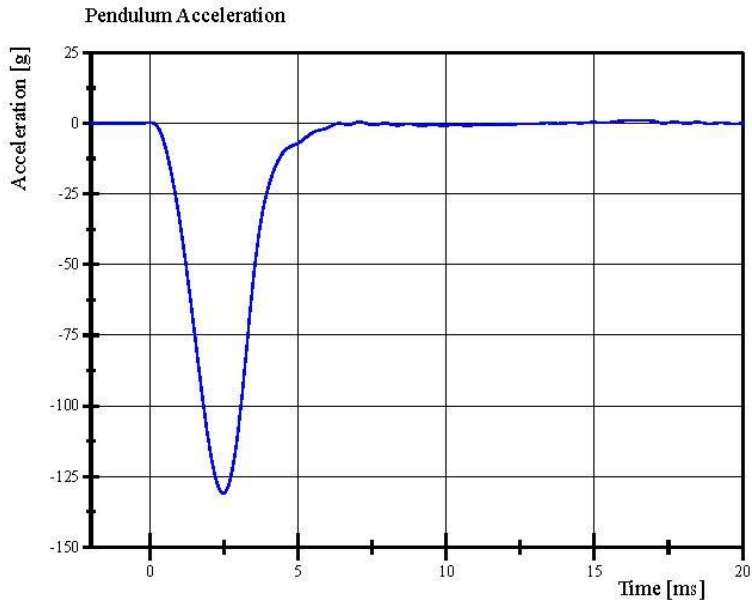
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Transportation Research Center Inc.

Right Knee Femur Response Test

HIII 5th Serial No. DH1659 Certification No. 21-3

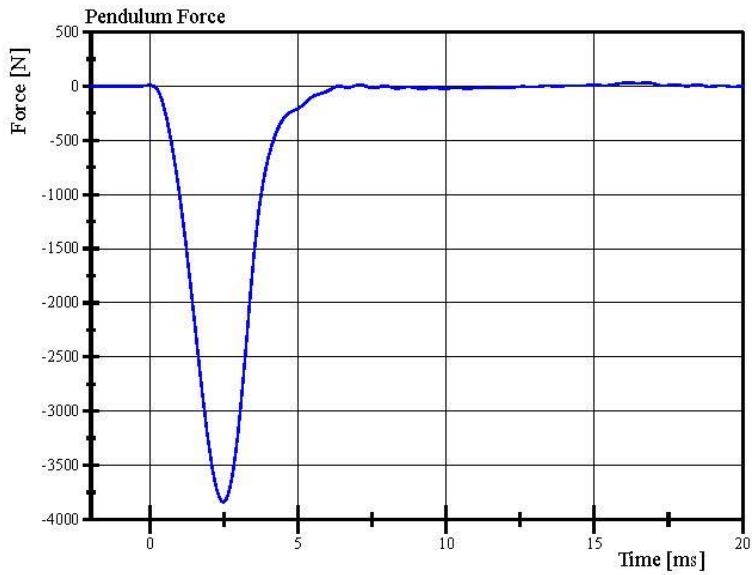
Test Date: 8/16/2024



Filter Class: CFC_600

Max: 1.1 g at 16.8 ms

Min: -131.0 g at 2.5 ms



Filter Class: CFC_600

Max: 31.4 N at 16.8 ms

Min: -3,840.8 N at 2.5 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	19-Apr-2024	
		Y	P94650	Endevco	19-Apr-2024	
		Z	P94622	Endevco	19-Apr-2024	
	Redundant	X	P94431	Endevco	19-Apr-2024	
		Y	P94487	Endevco	19-Apr-2024	
		Z	P94645	Endevco	19-Apr-2024	
Head Angular Rate Sensors			X	ARS14948	DTS	17-Nov-2023
			Y	ARS14952	DTS	17-Nov-2023
			Z	ARS14949	DTS	17-Nov-2023
Upper Neck Load Cell			FX, FY, FZ, MX, MY, MZ	2021	Humanetics	18-Apr-2024
Chest Accelerometers	Primary	X	P97714	Endevco	19-Apr-2024	
		Y	P61255	Endevco	19-Apr-2024	
		Z	P45008	Endevco	19-Apr-2024	
	Redundant	X	P91177	Endevco	19-Apr-2024	
		Y	P94570	Endevco	19-Apr-2024	
		Z	P91172	Endevco	19-Apr-2024	
Chest Potentiometer			X	CST037	Servo	19-Apr-2024
Pelvis Accelerometers			X	T11801	Endevco	19-Apr-2024
			Y	P91876	Endevco	19-Apr-2024
			Z	P93543	Endevco	19-Apr-2024
Femur Load Cells	Left	Primary	Z	DI4215-FZ1	Humanetics	19-Apr-2024
		Redundant	Z	DI4215-FZ2	Humanetics	19-Apr-2024
	Right	Primary	Z	DI4216-FZ1	Humanetics	19-Apr-2024
		Redundant	Z	DI4216-FZ2	Humanetics	19-Apr-2024
Tibia Load Cells	Left	Upper	MX, MY, FZ	3643-94	Denton	18-Apr-2024
		Lower	MX, MY, FZ	3644-370	Denton	18-Apr-2024
	Right	Upper	MX, MY, FZ	3643-413	Denton	19-Apr-2024
		Lower	MX, MY, FZ	3644-401	Denton	18-Apr-2024
Foot Accelerometers	Left	Rear	X	P90848	Endevco	19-Apr-2024
			Z	P91498	Endevco	19-Apr-2024
		Front	Z	P90841	Endevco	19-Apr-2024
	Right	Rear	X	P93467	Endevco	19-Apr-2024
			Z	P97619	Endevco	19-Apr-2024
		Front	Z	P94523	Endevco	19-Apr-2024
Seat Belt Load Cells		Lap	N/A	R141CA	Measurement Specialties	01-Feb-2024
		Shoulder	N/A	T1210D	Measurement Specialties	25-Jan-2024

TABLE 2 – Front Passenger Dummy Instrumentation

Instrumentation			Axis/Location	Hybrid III 5th S/N DH1659			
				Serial Number	Manufacturer	Calibration Date	
Head Accelerometers	Primary	X	P44972	Endevco	25-Apr-2024		
		Y	T11806	Endevco	25-Apr-2024		
		Z	P69062	Endevco	25-Apr-2024		
	Redundant	X	T11046	Endevco	25-Apr-2024		
		Y	P97525	Endevco	25-Apr-2024		
		Z	P73228	Endevco	25-Apr-2024		
Head Angular Rate Sensors			X	ARS10776	DTS	17-Nov-2023	
			Y	ARS14300	DTS	17-Nov-2023	
			Z	ARS15685	DTS	17-Nov-2023	
Upper Neck Load Cell			FX, FY, FZ, MX, MY, MZ	1874	Humanetics	24-Apr-2024	
Chest Accelerometers	Primary	X	P80855	Endevco	25-Apr-2024		
		Y	P93546	Endevco	25-Apr-2024		
		Z	P57791	Endevco	25-Apr-2024		
	Redundant	X	P73221	Endevco	25-Apr-2024		
		Y	T11872	Endevco	25-Apr-2024		
		Z	T16784	Endevco	25-Apr-2024		
Chest Potentiometer			X	CST3410	Servo	25-Apr-2024	
Pelvis Accelerometers			X	P88005	Endevco	09-May-2024	
			Y	P91958	Endevco	25-Apr-2024	
			Z	P80721	Endevco	25-Apr-2024	
Femur Load Cells	Left	Primary	Z	DT0997-FZ1	Humanetics	24-Apr-2024	
		Redundant	Z	DT0997-FZ2	Humanetics	24-Apr-2024	
	Right	Primary	Z	DS4140-FZ1	Humanetics	24-Apr-2024	
		Redundant	Z	DS4140-FZ2	Humanetics	24-Apr-2024	
Tibia Load Cells	Left	Upper	MX, MY, FZ	3643-92	Humanetics	24-Apr-2024	
		Lower	MX, MY, FZ	3644-92	Humanetics	24-Apr-2024	
	Right	Upper	MX, MY, FZ	3643-484	Humanetics	25-Apr-2024	
		Lower	MX, MY, FZ	3644-369	Humanetics	24-Apr-2024	
Foot Accelerometers	Left	Rear	X	P90866	Endevco	25-Apr-2024	
			Z	P93533	Endevco	25-Apr-2024	
		Front	Z	P97890	Endevco	25-Apr-2024	
	Right	Rear	X	P97640	Endevco	25-Apr-2024	
			Z	P91471	Endevco	25-Apr-2024	
		Front	Z	P91907	Endevco	25-Apr-2024	
Seat Belt Load Cells			Lap	N/A	X08013	Measurement Specialties	24-Jan-2024
			Shoulder	N/A	T1210C	Measurement Specialties	01-Feb-2024

TABLE 3 – Vehicle Instrumentation

Instrumentation			Axis	Serial Number	Manufacturer	Calibration Date
Crossmember/Rear Seat Accelerometers	Left	Primary	X	A378375	Measurement Specialties	21-Mar-2024
			Z	A367450	Measurement Specialties	25-Mar-2024
		Redundant	X	A298247	Measurement Specialties	21-Mar-2024
	Right	Primary	X	A349883	Measurement Specialties	21-Mar-2024
			Z	A298374	Measurement Specialties	25-Mar-2024
		Redundant	X	A378311	Measurement Specialties	21-Mar-2024
Engine Accelerometers	Top		X	A373614	Measurement Specialties	21-Mar-2024
	Bottom		X	A298558	Measurement Specialties	22-Mar-2024