REPORT NUMBER: NCAP-CAL-22-007

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

AUDI AG
2022 Audi Q4 e-tron
Five Door SUV

NHTSA No: M20225800

PREPARED BY:
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September 5, 2023

FINAL REPORT

PREPARED FOR:
U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
1200 NEW JERSEY AVE SE
WASHINGTON, D.C. 20590

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Prepared by: _____ Date: September 5, 2023
Quinn Porzio, Test Engineer

Approved by: Vanessa Hansen Date: September 5, 2023
Vanessa Hansen, Operations Manager

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

TECHNICAL REPORT DOCUMENTATION PAGE

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4. Title and Subtitle Final Report of New Car Assessment Program Frontal Impact Testing of a 2022 Audi Q4 e-tron SUV NHTSA No.: M20225800		*5. Report Date* September 5, 2023 *6. Performing Organization Code* CAL
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9. Performing Organization Name and Address Calspan Corporation Transportation Test Operations P.O. Box 400 Buffalo, New York 104625		*10. Work Unit No.* *11. Contract or Grant No.* 693JJ919D000005
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15. Supplementary Notes

16. Abstract

A 56.30 km/h (35 mph), NCAP frontal rigid barrier impact test was conducted on a 2022 Audi Q4 e-tron SUV in accordance with the specifications of the Office of Crashworthiness Standards Laboratory Procedure for NCAP Full Frontal Rigid Barrier Impact Testing. This test was conducted to obtain data related to FMVSS Nos. 208, 212, 219 (partial), 301, and 305 performance. The test was conducted at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on October 14, 2022.

The impact velocity of the vehicle was 56.23 km/h, and the ambient temperature at the barrier face at the time of impact was 21°C. The target vehicle post-test maximum crush was 507 mm at vehicle centerline. The test vehicle's occupant performance data is as follows:

Measurement Description	Units	Driver ATD (Serial No. 142)		Passenger ATD (Serial No. 137)	
		Threshold	Result	Threshold	Result
Head Injury Criteria (HIC_{15})		700	164.638	700	264.190
Maximum Chest Compression	mm	63	-24.767	52	-20.119
Nij		1	0.332	1	0.371
Neck Tension	N	4,170	770.497	2,620	453.012
Neck Compression	N	4,000	-332.388	2,520	-587.687
Left Femur Force	N	10,008	-319.685	6,805	-62.353
Right Femur Force	N	10,008	-698.832	6,805	-112.722

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

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Form DOT F1700.7 (8-69)

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SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

This 56.3 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. 693JJ919D000005. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

The 56.3 km/h frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Procedure for NCAP Full Frontal Rigid Barrier Impact Testing.

SUMMARY

A load cell barrier consisting of 128 load cells was impacted by a 2022 Audi Q4 e-tron SUV at a velocity of 56.23 km/h. The test was performed at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on October 14, 2022. Pre- and post-test photographs of the vehicle and dummies to document the test 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 Data Sheet 6 of 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 seating 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. Seat belt load cells were installed on the driver's and passenger's shoulder belts to measure dummy torso section loading. The driver (position 1) ATD (Serial No. 142) and the right-front passenger (position 2) ATD (Serial No. 137) were qualified prior to this test. Certification details, along with instrumentation calibration data, can be found in Appendix C of this report.

The 486 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 percent windshield retention and no intrusion into the protected zone of the windshield during the event. There was a total of 0.0 grams of stoddard solvent leakage after the event or during any phase of the static rollover. The maximum static crush of the vehicle was 507 mm and both driver and passenger side doors remained closed during the impact event and were operable after the impact.

The driver's visible contact points were as follows: The driver's head contacted the frontal airbag and then the head restraint. The upper torso contacted the frontal airbag. Left knee contacted the steering column adjustment lever.

The passenger's visible contact points were as follows: The passenger's head contacted the frontal airbag and then the head restraint. The upper torso contacted the frontal airbag.

The occupant data is summarized below.

ATD Position	HIC_{15}	Nij	Neck Tension (N)	Neck Comp. (N)	3ms Chest Clip (Gs)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50^{th})	164.638	0.332	770.497	-332.388	37.772	-24.767	-319.685	-698.832
Passenger (5^{th})	264.190	0.371	453.012	-587.687	35.021	-20.119	-62.353	-112.722

GENERAL COMMENTS:

1. P1 (Driver) serial number - 142
2. P2 (Passenger) serial number – 137
3. Driver & Passenger lap load cells were not installed

Data Anomalies:

- Engine Top X Acceleration, Exceeded calibration range at 44.1 ms 49.4 ms 53.1 ms 61.8 ms
- Passenger Shoulder Force, Questionable spikes 190 ms to 274 ms

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

This section contains information reporting for the following Data Sheets:

Data Sheet No. 1 – General Test and Vehicle Parameter Data

Data Sheet No. 2 – Seat Adjustment, Fuel System, and Steering Wheel Data

Data Sheet No. 3 – Dummy Longitudinal Clearance Dimensions

Data Sheet No. 4 – Dummy Lateral Clearance Dimensions

Data Sheet No. 5 – Seat Belt Positioning Data

Data Sheet No. 6 – High-Speed Camera Locations and Data

Data Sheet No. 7 – Vehicle Accelerometer Locations

Data Sheet No. 8 – Photographic Reference Target Locations

Data Sheet No. 9 – Load Cell Locations on Fixed Barrier

Data Sheet No. 10 – Test Vehicle Summary of Results

Data Sheet No. 11 – Post-Test Observations

Data Sheet No. 12 – Vehicle Profile Measurements

Data Sheet No. 13 – Accident Investigation Division Data

Data Sheet No. 14 – Vehicle Intrusion Measurements

Data Sheet No. 15 – Summary of FMVSS No. 212, 219 (Partial) and 301 Data

Data Sheet No. 16 – FMVSS 301 Barrier Impact and Static Rollover Results

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Data Sheet No. 305-2 – Pre-Impact Data for Indicant FMVSS No. 305 Testing

Data Sheet No. 305-3 – Pre-Impact Electrical Isolation Measurements and Calculations for Indicant FMVSS No. 305 Testing

Data Sheet No. 305-4 – Post-Impact Data for Indicant FMVSS No. 305 Testing

Data Sheet No. 305-5 –Static Rollover Test Data for Indicant FMVSS No. 305 Testing

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2022 Audi Q4 e-tron SUV NHTSA No.: M20225800
Test Program: NCAP Frontal Barrier Impact Test Test Date: 10/14/2022

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20225800
Model Year	2022
Make	Audi
Model	Q4 e-tron
Body Style	SUV
VIN	WA1J2BFZ5NP047937
Body Color	Gray
Odometer Reading (km /mi)	14 mi
Engine Displacement (L)	N/A
Type / No. Cylinders	N/A
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	1-Speed
Overdrive	N/A
Final Drive	All Wheel Drive
Roof Rack	No
Sunroof / T-Top	Yes
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes
Automatic Door Locks (ADLs)	Yes

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 –	-

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

DATA FROM CERTIFICATION LABEL

Manufactured By	AUDI AG
Date of Manufacture	06/22

GVWR (kg)	2740
GAWR Front (kg)	1285
GAWR Rear (kg)	1540

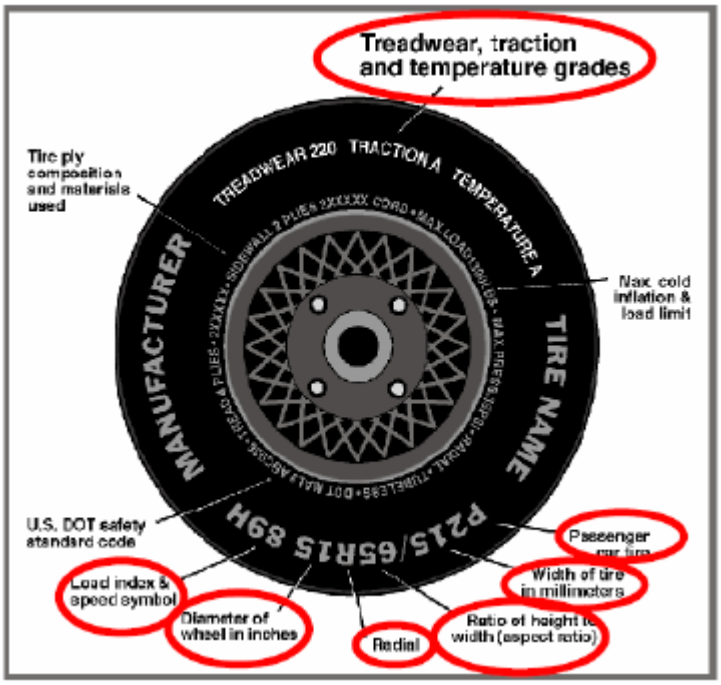
VEHICLE SEATING AND WEIGHT CAPACITY DATA

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)				425
Cargo Wt. (RCLW) (kg)				84.8

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

Test Vehicle:	2022 Audi Q4 e-tron SUV	NHTSA No.:	M20225800
Test Program:	NCAP Frontal Barrier Impact Test	Test Date:	10/14/2022

Collect items circled in red, tire manufacturer, and tire name.



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	340	340
Cold Pressure (kPa)	300	300
Recommended Tire Size	235/50R19	255/50R19
Tire Size on Vehicle	235/50R19	255/50R19
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Alenza Sport	Alenza Sport
Treadwear	500	500
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Polyester	1 Polyester, 2 Steel, 1 Polyester
Load Index / Speed Symbol	105T	107T
Tire Material	Rubber	Rubber
DOT Safety Code Left	2761004EF0722	2761004F01922
DOT Safety Code Right	2761004EF0722	2761004F01922

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

Test Vehicle: 2022 Audi Q4 e-tron SUV NHTSA No.: M20225800
Test Program: NCAP Frontal Barrier Impact Test Test Date: 10/14/2022

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	532.5	609		600	658	
Right	kg	577.5	544.5		587	638	
Ratio	%	49	51		47.8	52.2	
Totals	kg	1110	1153.5	2263.5	1187	1296	2483

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2263.5	(A)
Weight of 1 P572E ATD & 1 P572O ATD	kg	142	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	84.8	(C)
Calculated Vehicle Target Weight (TVTW)	kg	2490.3	(A+B+C)

TEST VEHICLE ATTITUDES AND CG

Condition	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	878	878	884	884	1410
As Tested	mm	872	873	867	866	1444
Post-Test	mm	974	890	909	835	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2766
Total Vehicle Length at Left Side	mm	4511
Total Vehicle Length at Centerline	mm	4592
Total Vehicle Length at Right Side	mm	4511
Weight of Ballast in Cargo Area	kg	46
Weight of Vehicle Components Removed	kg	33.5
Amount of Stoddard Solvent in Fuel Tank	L	Full Electric

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:

Trunk Carpeting, Tool Kit, Compressor

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

Test Vehicle: 2022 Audi Q4 e-tron SUV NHTSA No.: M20225800
Test Program: NCAP Frontal Barrier Impact Test Test Date: 10/14/2022

TARGET VEHICLE STRUCTURAL MEASUREMENT

No.	Description	Pre-Test
1	Total Length	4592
2	Total Width	1857
3*	Bumper Top Height	565
4*	Bumper Bottom Height	440
5*	Longitudinal Member Top Height	586
6	Distance Between Longitudinal Members	956
7	Longitudinal Member Width	96
8*	Engine Top Height	951
9*	Engine Bottom Height	223
10	Engine and Gearbox Width	355
11	Front Bumper-Engine Distance	645
12*	Front Shock Absorber Fixing Height	983
13*	Bonnet Leading Edge Height	896
14	Front Shock Absorber Fixing Width	1156
15	Front Bumper – Front Axle Distance	856
16	Front Axle – A Pillar Distance	554
17	A-Pillar – B-Pillar Distance	1112
18	B-Pillar – Rear Axle Distance	1099
19	B-Pillar – C-Pillar Distance	918
20*	Roof Sill Bottom Height	1543
21*	Roof Sill Top Height	1589
22*	Floor Sill Bottom Height	399
23*	Floor Sill Top Height	475

*Height Measurements are taken from the ground
Note: All measurements are in millimeters

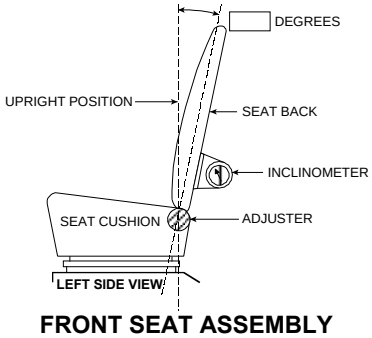
DATA SHEET NO. 2
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle:	2022 Audi Q4 e-tron SUV	NHTSA No.:	M20225800
Test Program:	NCAP Frontal Barrier Impact Test	Test Date:	10/14/2022

NOMINAL DESIGN RIDING POSITION

The driver's seat back was set to the manufacturer's designated angle. The passenger's seat back was positioned in a similar manner as the driver's seat back. Seat back angles are measured at the headrest post bezel using a digital inclinometer.

Seating Position	Degrees
Driver Seat Back Angle	1.9
Passenger Seat Back Angle	1.1



FRONT SEAT ASSEMBLY

SEAT FORE / AFT POSITIONS

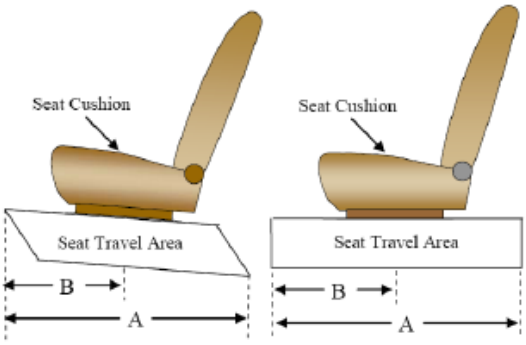
The driver's seat was positioned at the mid-point of fore/aft travel at its lowest position. The passenger's seat was positioned at the most forward position of fore/aft travel. Zero is defined as the forward most position.

Seating Position	Total Fore / Aft Travel	Placed in Position #
Driver Seat	320	160
Passenger Seat	206	0

SEAT BELT UPPER ANCHORAGE

The driver's seat belt anchorage was positioned according to the manufacturer's designated positioning for a 50th percentile adult male ATD. The passenger's seat belt anchorage was positioned according to the manufacturer's designated positioning for a 5th percentile adult female ATD. For this test zero is defined as the uppermost position.

Seating Position	Total # of Positions	Placed in Position #
Driver Seat	4 (0-3)	0
Passenger Seat	4 (0-3)	0



DATA SHEET NO. 2 … (CONTINUED)
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

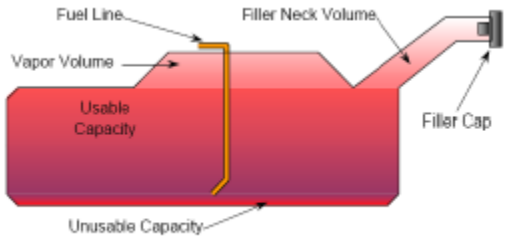
Test Vehicle: 2022 Audi Q4 e-tron SUV NHTSA No.: M20225800
Test Program: NCAP Frontal Barrier Impact Test Test Date: 10/14/2022

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	
Usable Capacity of "Optional Tank"	
92%-94% of Usable Capacity	
Actual Amount of Solvent Used	
1/3 of Usable Capacity	

FUEL PUMP

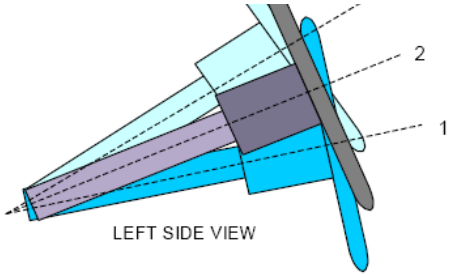
The vehicle is equipped with an electric charge port on the right rear of the vehicle.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. For angular measurements, a digital inclinometer was used to measure a plate which was placed across the steering wheel rim. A tape measure was used to measure the telescoping steering wheel travel.



STEERING COLUMN ASSEMBLY

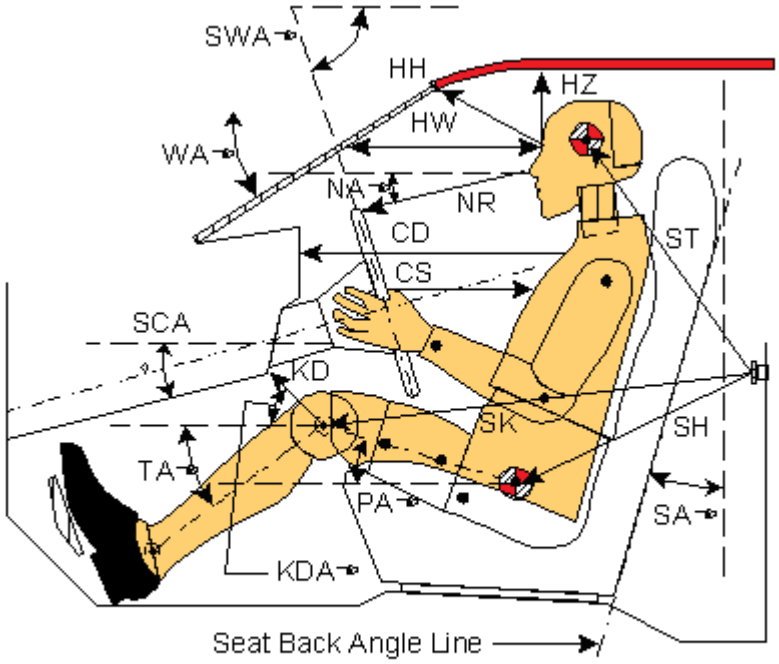
STEERING COLUMN POSITIONS

Description	Degrees	Fore / Aft Position (mm)
Lowermost position No. 1	18.9	
Geometric center position No. 2	21.5	
Uppermost position No. 3	24.1	
Telescoping Steering Wheel Travel		58
Test Position	21.5	29

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2022 Audi Q4 e-tron SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20225800
Test Date: 10/14/2022

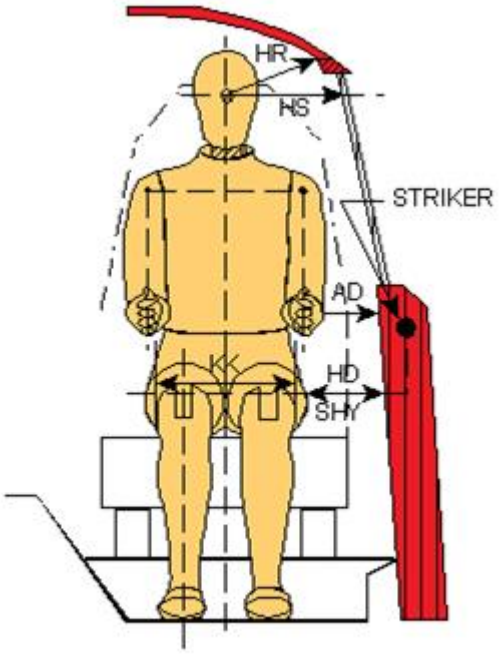


Left Side View

Code	Measurement Description	Driver (SN: 142)		Passenger (SN: 137)	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		25.6		
SWA°	Steering Wheel Angle		21.9		
SCA°	Steering Column Angle		68.1		
SA°	Seat Back Angle (on headrest post)		1.9		1.1
HZ	Head to Roof (Z)	216	90	239	90
HH	Head to Header	426	21.7	377	36.2
HW	Head to Windshield	856	0	758	0
NR	Nose to Rim / Dash	399	4.5	418	16.6
CD	Chest to Dash	575		343	
CS	Chest to Steering Hub	333	0.8		
RA	Rim to Abdomen	227	0		
KDL	Left Knee to Dash	269	32	143	34.6
KDR	Right Knee to Dash	271	36.2	154	41.1
PA°	Pelvic Angle		22.8		19.9
TA°	Tibia Angle		22.7		41.2
SK	Striker to Knee	610	16.9	705	10.8
ST	Striker to Head	430	68.5	428	58.1
SH	Striker to H-Point	328	53.9	403	28.4

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2022 Audi Q4 e-tron SUV
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: M20225800
Test Date: 10/14/2022

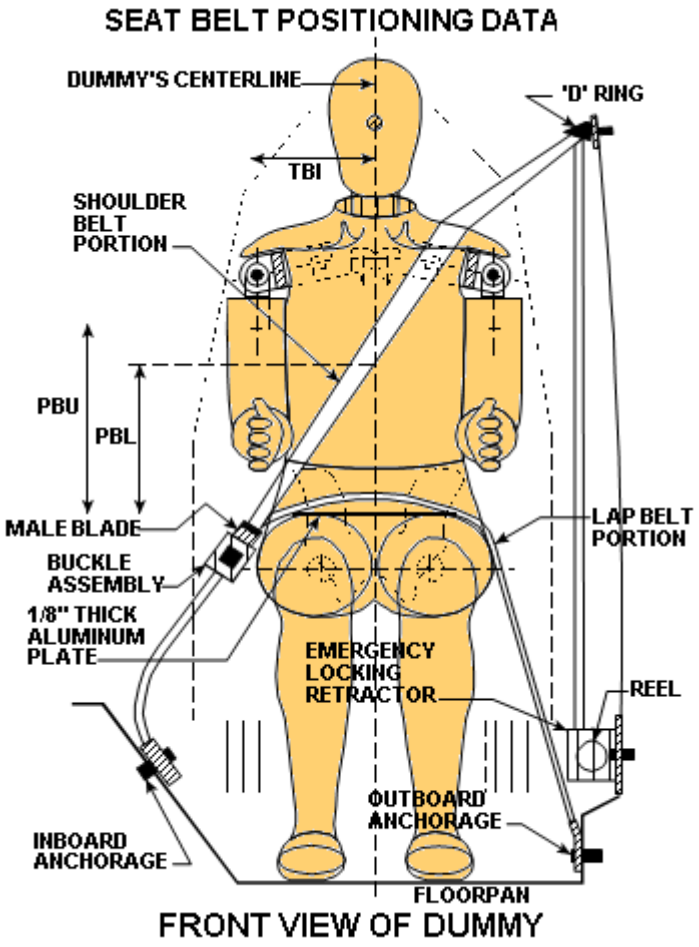


Front View

Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	84	104
HD	H-Point to Door	150	265
HR	Head to Side Header	262	284
HS	Head to Side Window	377	395
KK	Knee to Knee	328	211
SHY	Striker to H-Point (Y Direction)	252	325
AA	Ankle to Ankle	342	166

DATA SHEET NO. 5
SEAT BELT POSITIONING DATA

Test Vehicle:	2022 Audi Q4 e-tron SUV	NHTSA No.:	M20225800
Test Program:	NCAP Frontal Barrier Impact Test	Test Date:	10/14/2022



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU — Top surface of reference to belt upper edge	mm	309	300
PBL — Top surface of reference to belt lower edge	mm	220	210

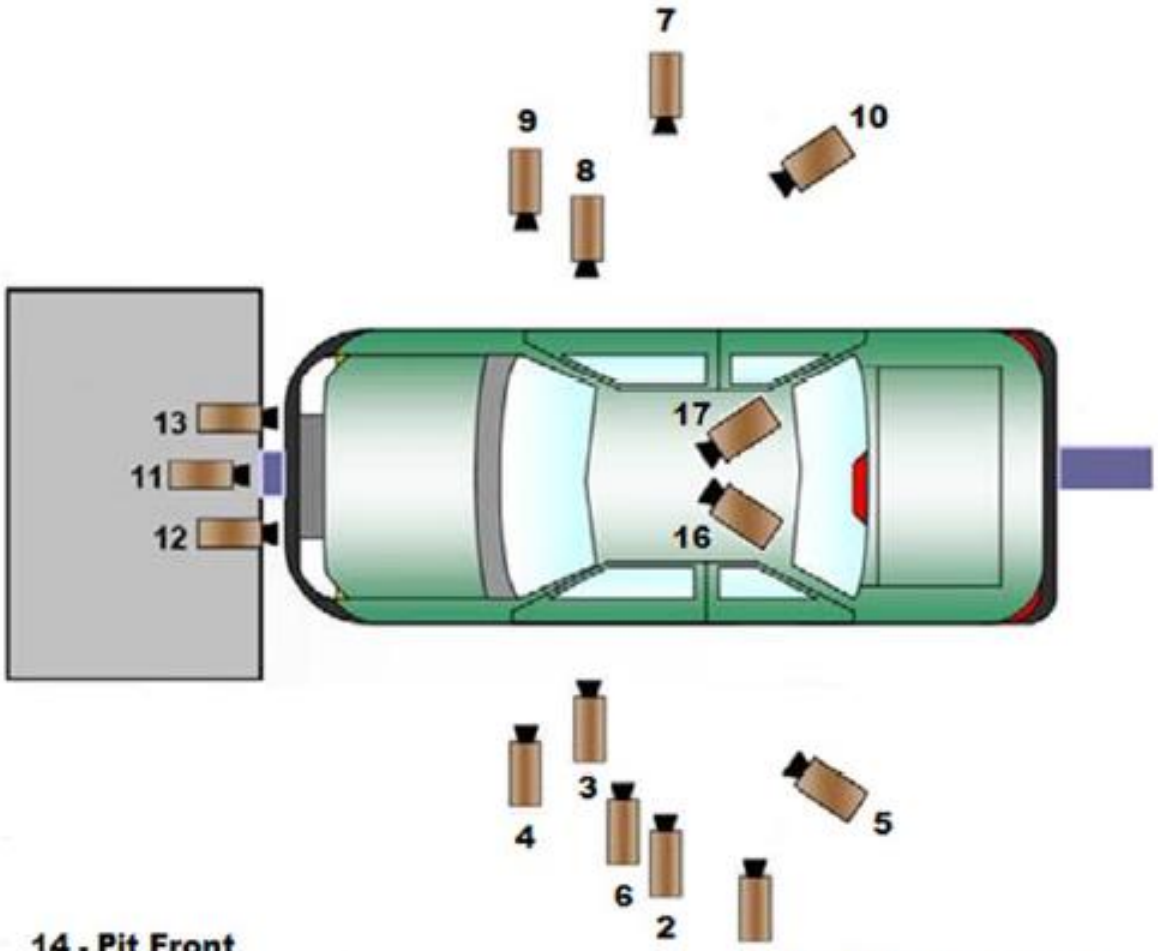
BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	878	960
Lap Belt Length as measured on ATD	mm	530	625
Remainder of belt on reel	mm	1092	915
Total belt length for continuous webbing systems	mm	2500	2550

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

Test Vehicle:	2022 Audi Q4 e-tron SUV	NHTSA No.:	M20225800
Test Program:	NCAP Frontal Barrier Impact Test	Test Date:	10/14/2022

CAMERA POSITIONS FOR FRONTAL IMPACTS



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

Test Vehicle: 2022 Audi Q4 e-tron SUV NHTSA No.: M20225800
Test Program: NCAP Frontal Barrier Impact Test Test Date: 10/14/2022

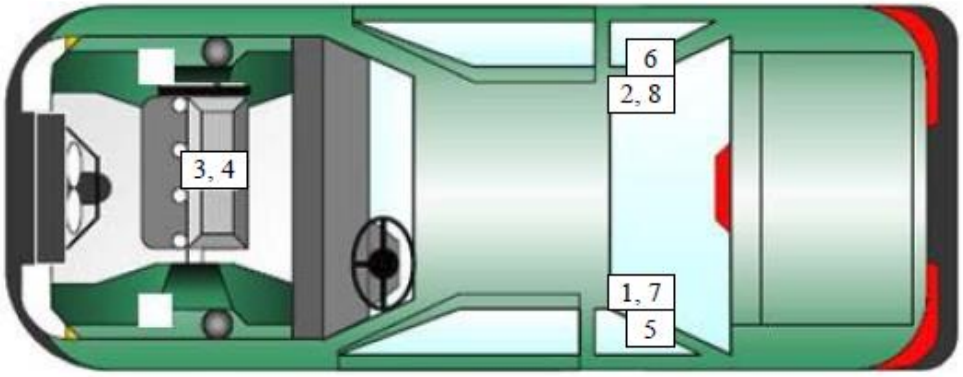
CAMERA LOCATIONS

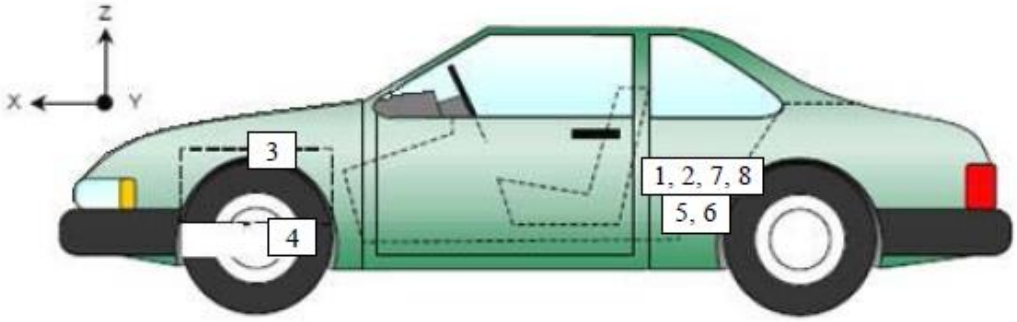
No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall				Zoom	60
2	Left Overall	-2181	-7666	-1676	24	1000
3	Driver Close-Up	-1216	-6959	-1578	50	1000
4	Left Front Half	-685	-6703	-1489	28	1000
5	Left Angle	-4554	-5044	-2551	50	1000
6	Steering Column	-1822	-7467	-2261	75	1000
7	Right Overall	-2227	7297	-1539	24	1000
8	Passenger Close-Up	-1623	6966	-1537	50	1000
9	Right Front Half	-1225	6677	-1454	28	1000
10	Right Angle	-4554	4754	-2560	50	1000
11	Windshield	1163	0	-4125	12.5	1000
12	Driver Windshield	-857	-447	-2360	25	1000
13	Passenger Windshield	-857	405	-2360	25	1000
14	Pit Front	-822	0	2131	12.5	1000
15	Pit Rear	-2361	0	2209	12.5	1000
16	Onboard Driver Airbag (Optional)				8	1000
17	Onboard Passenger Airbag (Optional)				8	1000

** COORDINATES:* *+X = forward of impact plane*
+Y = right of monorail center
+Z = into ground

DATA SHEET NO. 7
VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2022 Audi Q4 e-tron SUV NHTSA No.: M20225800
Test Program: NCAP Frontal Barrier Impact Test Test Date: 10/14/2022





VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	1785	-314	-68
2	Right Rear Accelerometer – X Direction	1784	296	-71
3	Engine Top X	3863	216	-494
4	Engine Bottom X	3590	-40	177
5	Left Rear Accelerometer – Z Direction	1785	-314	-68
6	Right Rear Accelerometer – Z Direction	1784	296	-71
7	Left Rear Accelerometer – X Direction Redundant	1784	-307	-70
8	Right Rear Accelerometer – X Direction Redundant	1784	307	-69

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

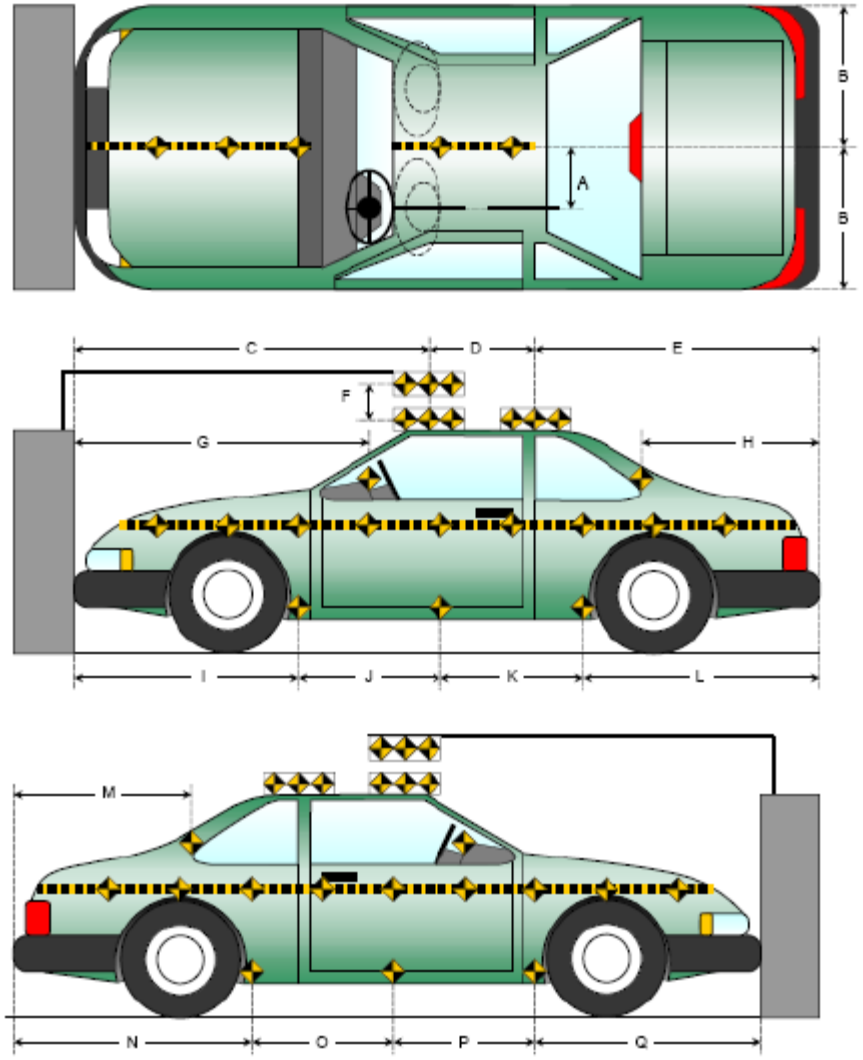
DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2022 Audi Q4 e-tron SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20225800
Test Date: 10/14/2022

Item	Value
A	367
B	929
C	2616
D	609
E	1367
F	267
G	1699
H	1131
I	1342
J	896
K	893
L	1461
M	1130
N	1461
O	891
P	896
Q	1344

All units in millimeters



DATA SHEET NO. 9
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle:	2022 Audi Q4 e-tron SUV	NHTSA No.:	M20225800
Test Program:	NCAP Frontal Barrier Impact Test	Test Date:	10/14/2022

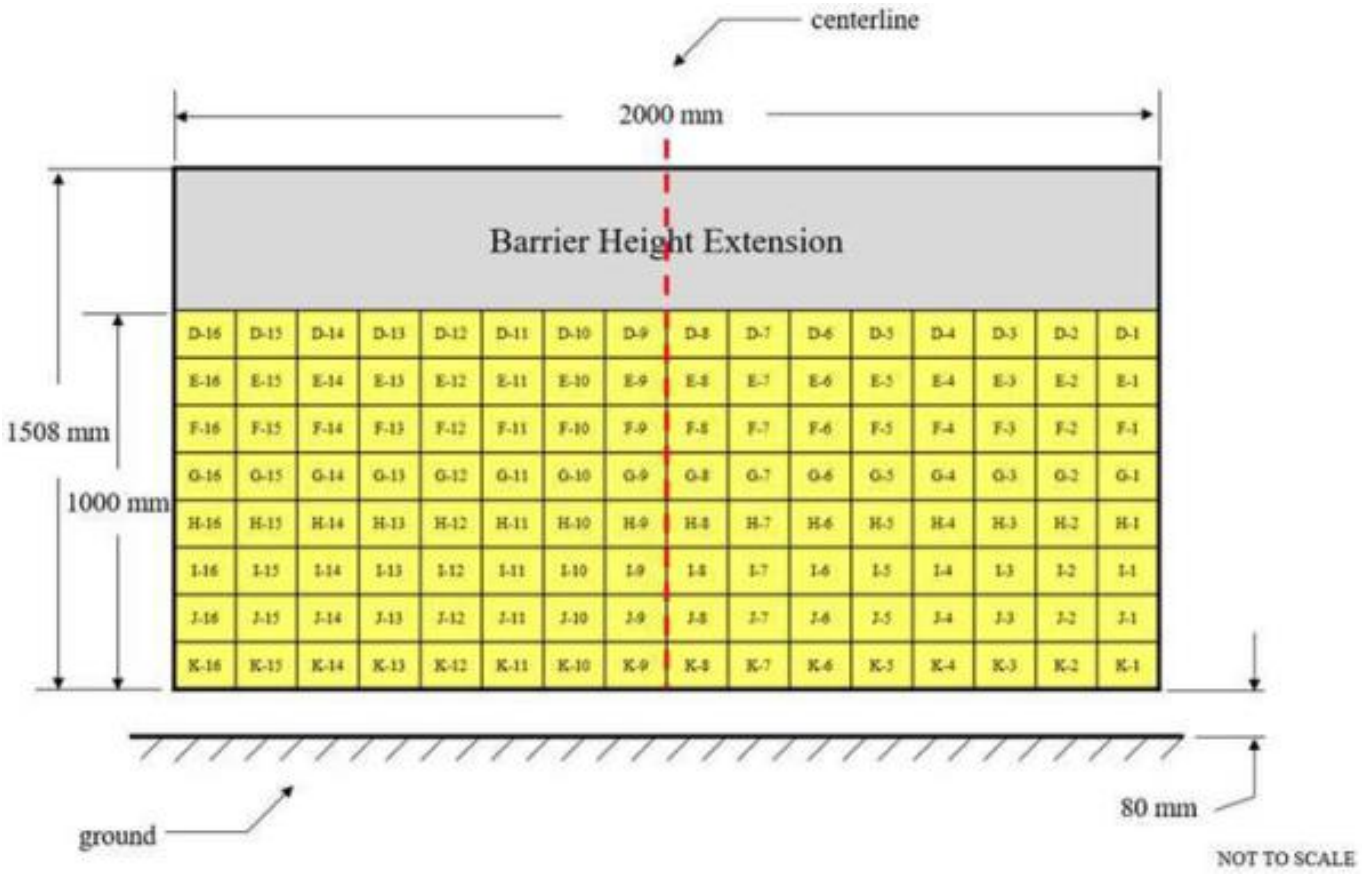


Figure 1 - Load Cell Locations on a 128-Load Cell Barrier with Plywood Height Extension*
Please note above diagram is not actual representation of load cell barrier used.

DATA SHEET NO. 10
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2022 Audi Q4 e-tron SUV NHTSA No.: M20225800
Test Program: NCAP Frontal Barrier Impact Test Test Date: 10/14/2022

INSTRUMENTATION

Instrumentation	Number of Channels Collected
Driver Dummy Accelerometers	47
Passenger Dummy Accelerometers	47
Vehicle Structure Accelerometers	8
Load Cell Barrier	384
Total	486

CAMERA COVERAGE

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

DATA SHEET NO. 11
POST-TEST OBSERVATIONS

Test Vehicle: 2022 Audi Q4 e-tron SUV NHTSA No.: M20225800
Test Program: NCAP Frontal Barrier Impact Test Test Date: 10/14/2022

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type / Serial No.	P572E 50th Male / 142	P5720 5th Female / 137
Head Contact	Frontal Airbag & Headrest	Frontal Airbag & Headrest
Upper Torso Contact	Frontal Airbag	Frontal Airbag
Lower Torso Contact	None	None
Left Knee Contact	Steering Column Lever	None
Right Knee Contact	None	None

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger	Other
Locked / Unlocked Doors	Unlocked	Unlocked	
Front Door Opening	Closed & Operational	Closed & Operational	
Rear Door Opening	Closed & Operational	Closed & Operational	
Trunk/Hatch/Tailgate Opening			Closed & Operational
Seat Track Shift (mm)	0	0	
Seat Back Movement from Initial Position	None	None	

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

POST-TEST STRUCTURAL OBSERVATIONS

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

VEHICLE REBOUND FROM BARRIER

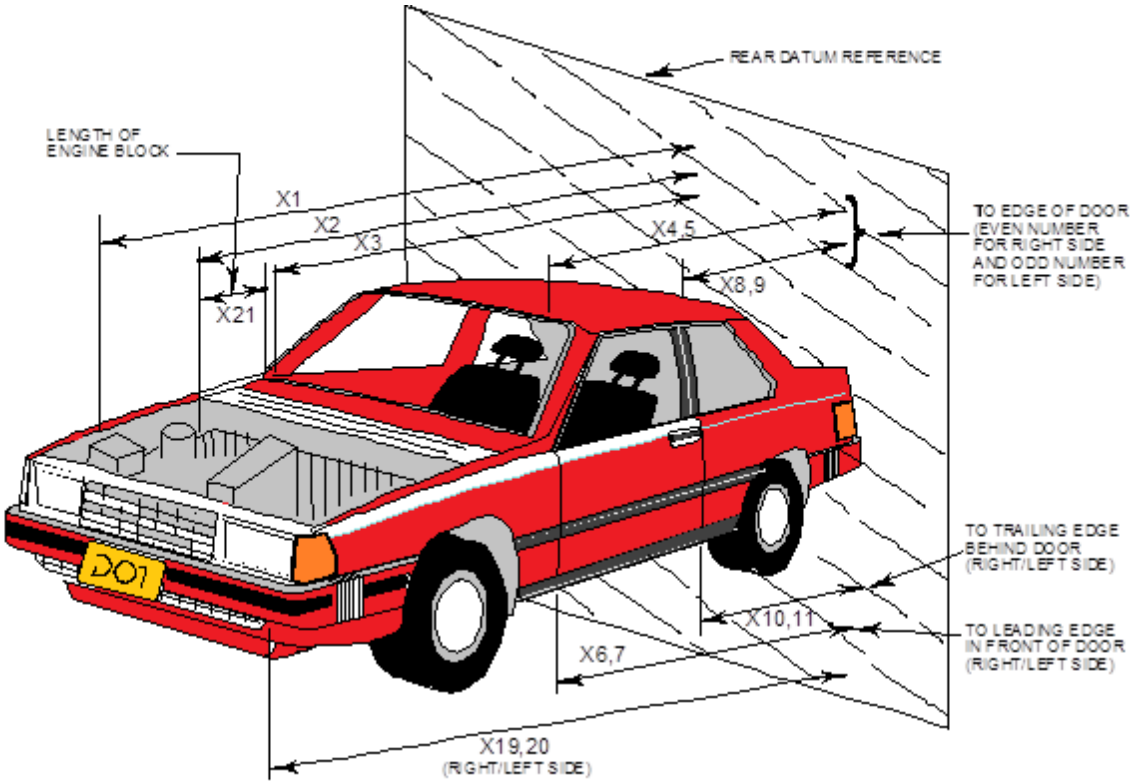
Measured Parameter	Units	Value
Left Side	mm	1350
Center	mm	1340
Right Side	mm	1390
Average	mm	1360

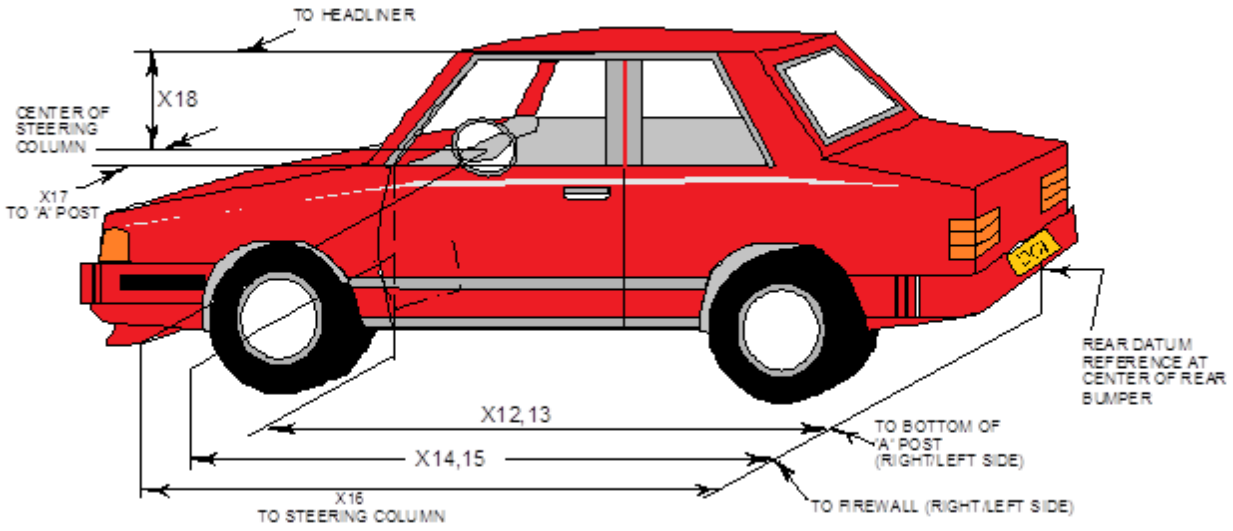
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Driver		Passenger	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	Yes	Yes	Yes
Side Airbag 1 - Curtain	Yes	Yes	Yes	Yes
Side Airbag 2 - Torso/Pelvis 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
Other				

DATA SHEET NO. 12
VEHICLE PROFILE MEASUREMENTS

Test Vehicle:	2022 Audi Q4 e-tron SUV	NHTSA No.:	M20225800
Test Program:	NCAP Frontal Barrier Impact Test	Test Date:	10/14/2022





DATA SHEET NO. 12 … (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2022 Audi Q4 e-tron SUV NHTSA No.: M20225800
Test Program: NCAP Frontal Barrier Impact Test Test Date: 10/14/2022

No.	Measurement Description	Pre-Test	Post-Test	Change
1	Total Length of Vehicle at Centerline	4592	4085	-507
2	Rear Surface of Vehicle (RSOV) to Front of Engine	3947	3812	-135
3	RSOV to Firewall	3679	3682	3
4	RSOV to Upper Leading Edge of Right Door	3177	3176	-1
5	RSOV to Upper Leading Edge of Left Door	3176	3175	-1
6	RSOV to Lower Leading Edge of Right Door	3185	3181	-4
7	RSOV to Lower Leading Edge of Left Door	3187	3185	-2
8	RSOV to Upper Trailing Edge of Right Door	2075	2074	-1
9	RSOV to Upper Trailing Edge of Left Door	2075	2074	-1
10	RSOV to Lower Trailing Edge of Right Door	2104	2100	-4
11	RSOV to Lower Trailing Edge of Left Door	2104	2103	-1
12	RSOV to Bottom of “A” Post of Right Side	3423	3424	1
13	RSOV to Bottom of “A” Post of Left Side	3424	3424	0
14	RSOV to Firewall, Right Side	3798	3789	-9
15	RSOV to Firewall, Left Side	3801	3795	-6
16	RSOV to Steering Column	2716	2776	60
17	Center of Steering Column to “A” Post	300	298	-2
18	Center of Steering Column to Headliner	422	445	23
19	RSOV to Right Side of Front Bumper	4554	4207	-347
20	RSOV to Left Side of Front Bumper	4551	4204	-347
21	Length of Engine Block	184	184	0
RD	RSOV to Right Side of Dash Panel	2868	2867	-1
CD	RSOV to Center of Dash Panel	2854	2857	3
LD	RSOV to Left Side of Dash Panel	2882	2883	1

*UR= Unrecoverable data point
All Dimensions in mm

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

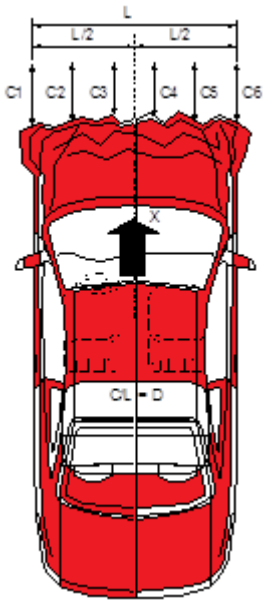
Test Vehicle:	2022 Audi Q4 e-tron SUV	NHTSA No.:	M20225800
Test Program:	NCAP Frontal Barrier Impact Test	Test Date:	10/14/2022

VEHICLE INFORMATION

VIN:	WA1J2BFZ5NP047937	Wheelbase (mm):	2766
Vehicle Size Category:	MPV	Test Weight (kg):	2483

ACCELEROMETER DATA

Accelerometer Locations:	Please See Data Sheet No. 7
Cal. Procedure / Interval:	Calspan Procedure / 6 month
Integration Algorithm:	Trapezoidal
Linearity:	> 99%
Impact Velocity (km/h):	56.23
Velocity Change (km/h):	66.85
Time of Separation (ms):	153



CRUSH PROFILE

Collision Deformation Classification:	12FDEW3
Midpoint of Damage:	C3
Damage Region Length (mm):	1470
Impact Mode:	Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Crush
C1	Crush Zone 1 at Left Side	mm	4425	4095	330
C2	Crush Zone 2 at Left Side	mm	4557	4118	439
C3	Crush Zone 3 at Left Side	mm	4585	4118	467
C4	Crush Zone 4 at Right Side	mm	4585	4114	471
C5	Crush Zone 5 at Right Side	mm	4558	4111	447
C6	Crush Zone 6 at Right Side	mm	4423	4063	360
L	C1 to C6	mm	1420	1470	50

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

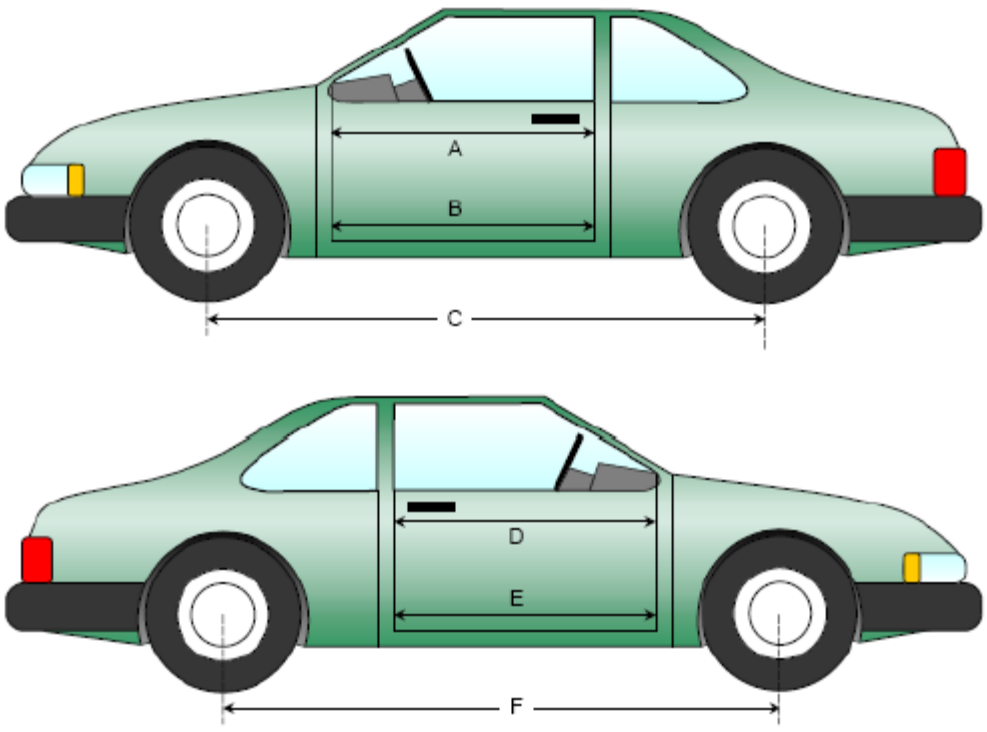
Test Vehicle: 2022 Audi Q4 e-tron SUV
Test Program: NCAP Frontal Barrier Impact Test
NHTSA No.: M20225800
Test Date: 10/14/2022

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Change
A	Left Side Upper	mm	979	979	0
B	Left Side Lower	mm	895	896	1
D	Right Side Upper	mm	978	979	1
E	Right Side Lower	mm	888	888	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Change
C	Left Side Wheelbase	mm	2766	2681	-85
F	Right Side Wheelbase	mm	2766	2654	-112



Left & Right Side Views

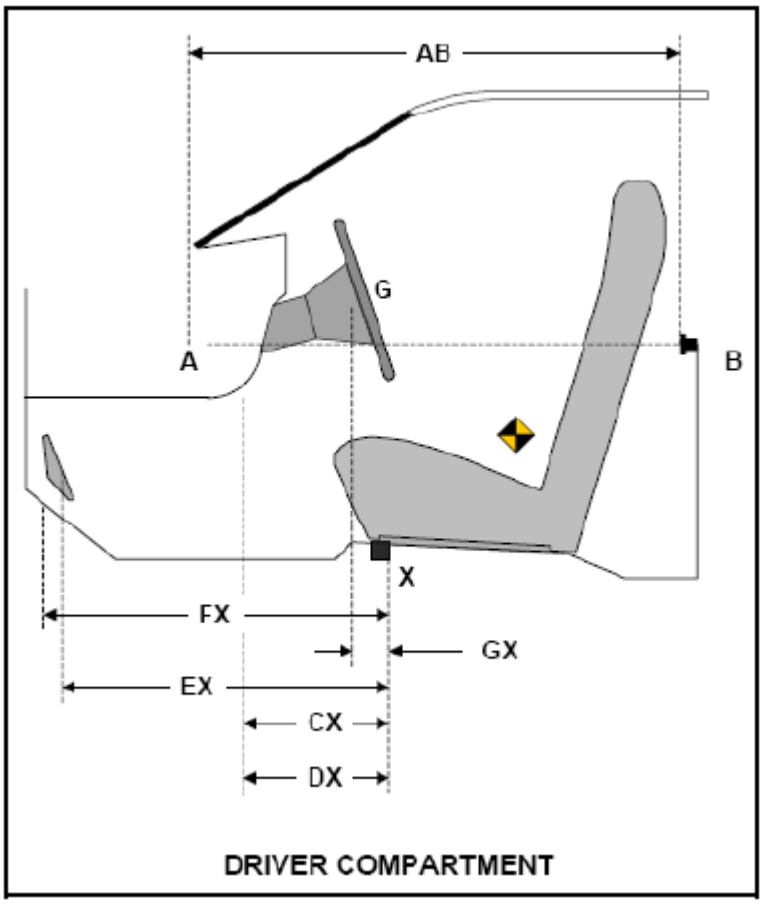
DATA SHEET NO.14 … (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2022 Audi Q4 e-tron SUV NHTSA No.: M20225800
Test Program: NCAP Frontal Barrier Impact Test Test Date: 10/14/2022

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Change
AB	Door Opening (Inside Window Jam)	mm	794	795	1
CX	Left Knee Bolster to X	mm	385	869	484
DX	Right Knee Bolster to X	mm	380	865	485
EX	Brake Pedal to X	mm	575	1054	479
FX	Foot Rest to X	mm	619	1099	480
GX	Center of Steering Column Wheel Hub to X	mm	75	619	544

X = Front of Seat Track (Stationary)



DATA SHEET NO. 15
SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2022 Audi Q4 e-tron SUV NHTSA No.: M20225800
Test Program: NCAP Frontal Barrier Impact Test Test Date: 10/14/2022

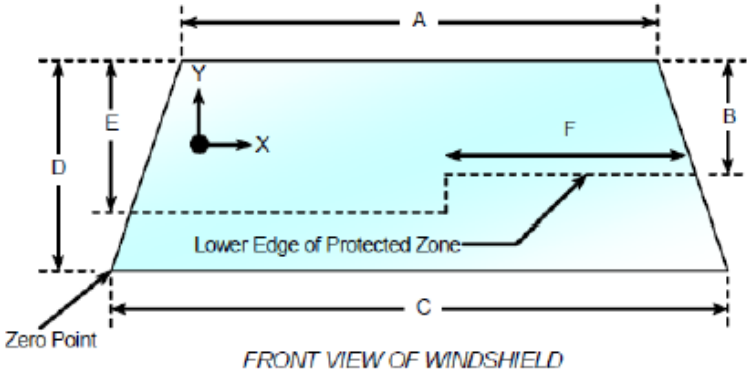
Windshield Mounting Details: A 0.8 mm trim surrounds the top and side of windshield while a plastic shroud is on the bottom.

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

Temperature of windshield molding during test: 21 ° C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2364.5	2364.5	100.0%
Right Side	2364.5	2364.5	100.0%
Total	4729	4729	100.0%



FRONT VIEW OF WINDSHIELD

Item	Units	Value
A	mm	1520
B	mm	435
C	mm	1499
D	mm	855
E	mm	515
F	mm	337

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.*
- No Penetration

X	Y

B. *Provide coordinates of the area beneath the protected zone that the inner surface of the windshield was penetrated by a vehicle component.*
- No Penetration

X	Y

DATA SHEET NO. 15 … (CONTINUED)
SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2022 Audi Q4 e-tron SUV NHTSA No.: M20225800
Test Program: NCAP Frontal Barrier Impact Test Test Date: 10/14/2022

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21 ° C Test Time: 2:29 PM

STODDARD SOLVENT SPILLAGE MEASUREMENTS

A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable is 1 oz.)

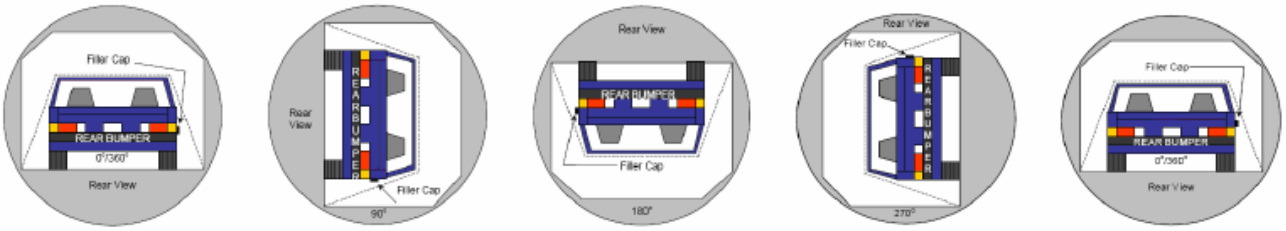
B. For the 5-minute period after motion ceases: 0 oz.
(Maximum allowable is 5 oz.)

C. For the following 25 minutes: 0 oz.
(Maximum allowable is 1 oz./minute)

D. Spillage: No Spillage Occurred

DATA SHEET NO. 16
FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2022 Audi Q4 e-tron SUV NHTSA No.: M20225800
Test Program: NCAP Frontal Barrier Impact Test Test Date: 10/14/2022



0° TO 90° 90° TO 180° 180° TO 270° 270° TO 360°

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: No Spillage Occurred

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	70	300	370
90° to 180°	71	300	371
180° to 270°	65	300	365
270° to 360°	70	300	370

FMVSS 301 SPILLAGE TABLE

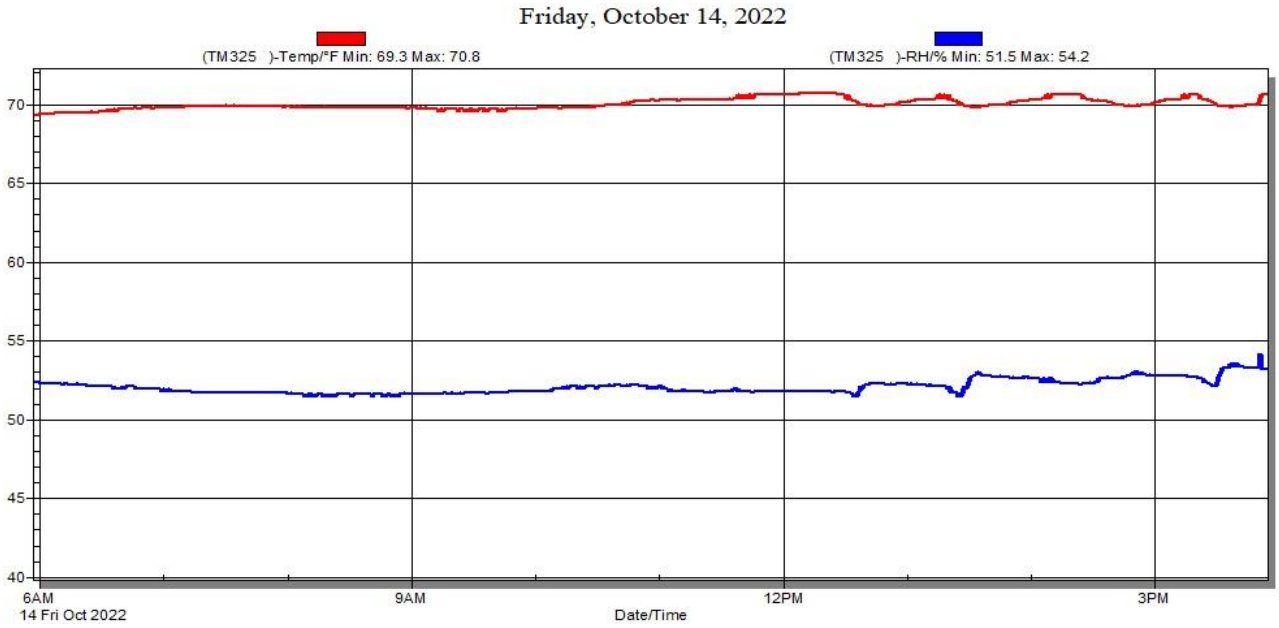
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° to 90°	0	0	0	
90° to 180°	0	0	0	
180° to 270°	0	0	0	
270° to 360°	0	0	0	

SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 17
DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle:	2022 Audi Q4 e-tron SUV	NHTSA No.:	M20225800
Test Program:	NCAP Frontal Barrier Impact Test	Test Date:	10/14/2022



Temperature and Humidity Stabilization Chart/Data for Dummies and Test Vehicle

DATA SHEET NO. 305-1
GENERAL TEST AND VEHICLE PARAMETER DATA FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle: 2022 Audi Q4 e-tron SUV NHTSA No.: M20225800
Test Program: NCAP Frontal Barrier Impact Test Test Date: 10/14/2022

ELECTRIC VEHICLE PROPULSION SYSTEM

Measured Parameter	Value
Type of Electric Vehicle (Electric/Gas-Electric Hybrid/Fuel Cell-Electric Hybrid)	Electric
Propulsion Battery Type	Lithium-Ion
Nominal Voltage (Volts)	372.8
Is this Vehicle equipped with an Automatic Propulsion Battery Disconnect?	Yes
Physical Location of Automatic Propulsion Battery Disconnect, if applicable	Inside HV Battery Housing
Auxiliary Battery Type	Lithium-Ion

PROPULSION BATTERY SYSTEM DATA (COTR SUPPLIED)

Measured Parameter	Value
Electrolyte Fluid Type	LiPF6, EC, EMC
Electrolyte Fluid Specific Gravity	1.29 g/cm^3
Electrolyte Fluid Kinematic Viscosity (centistokes)	3.19 mm^2/sec
Electrolyte Fluid Color	Clear & Colorless
Propulsion Battery Coolant Type, Color and Specific Gravity (if applicable)	G12evo, Pink
Location of Battery Modules (Inside or Outside of Passenger Compartment?)	Outside

PROPULSION BATTERY STATE OF CHARGE

Measured Parameter	Units	Value
For all battery types: Voltage Range corresponding to **useable energy** of the battery:		
Minimum State of Charge	V	240
Maximum State of Charge	V	408
95% of Maximum	V	387.6
Test Voltage *	V	390.5
For batteries that are rechargeable ONLY by an energy source on the vehicle: Voltage range corresponding to **useable energy** of the battery :		
Minimum State of Charge	V	
Maximum State of Charge	V	
95% of Maximum	V	
Test Voltage *	V	

* *For all battery types-No less than 95% of Maximum Operating Voltage; for batteries that are rechargeable ONLY by an energy source on the vehicle-maximum practicable state of charge within normal operating range*.

DATA SHEET NO. 305-2
PRE-IMPACT DATA FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle:	2022 Audi Q4 e-tron SUV	NHTSA No.:	M20225800
Test Program:	NCAP Frontal Barrier Impact Test	Test Date:	10/14/2022

VEHICLE CHASSIS GROUND PT(S) LOCATION(S) & PROPULSION BATTERY SYSTEM

Measured Parameter	Value
Details of Vehicle Chassis Ground Points & Locations	Ground Point is located under the hood on the vehicle chassis
Details of Propulsion Battery Components	Installed the new HV-Adapter box under the vehicle hood in the engine compartment. This box has two extra outputs for measurement the positive and negative points for automatic disconnect and propulsion battery.

DATA SHEET NO. 305-3
PRE-IMPACT ELECTRICAL ISOLATION MEASUREMENTS AND CALCULATIONS FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle: 2022 Audi Q4 e-tron SUV NHTSA No.: M20225800
Test Program: NCAP Frontal Barrier Impact Test Test Date: 10/14/2022

VOLTMETER INFORMATION

Measured Parameter	Units	Value
Make & Model		Fluke 1587
Serial No.		581
Internal Impedance Value	MΩ	10
Resolution	V	0.0001
Last Calibration Date		4/28/2022

NOTES:

- *The voltmeter used in this test shall measure DC values and have an internal impedance of at least 10 M Ω*
- *An oscilloscope meeting the above requirements may need to be used to adequately measure voltage in some vehicles.*

PROPULSION BATTERY VOLTAGE, RESISTANCE & ELECTRICAL ISOLATION MEASUREMENTS & CALCULATIONS

Measured Parameter	Symbol	Units	Value
Normal operating voltage range specified by the manufacturer	V_b	V	240-408
Propulsion Battery Voltage : (ready to drive position)	V_b	V	390.5
Propulsion Battery to Vehicle Chassis	V_1	V	188.0
Propulsion Battery to Vehicle Chassis	V_2	V	307.0
Propulsion Battery to Vehicle Chassis Across Known Resistor	R_o	Ω	200,000
Propulsion Battery to Vehicle Chassis with R_o installed	V_1'	V	34.9
Propulsion Battery to Vehicle Chassis with R_o installed	V_2'	V	61.5
$R_{i1}= R_o*(1+V_2/V_1)*[(V_1-V_1')/V_1']$	R_{i1}	Ω	2,310,080
$R_{i2}= R_o*(1+V_1/V_2)*[(V_2-V_2')/V_2']$	R_{i2}	Ω	1,287,281
Lesser value of R_{i1} and R_{i2}	R_i	Ω	1,287,281
Electrical Isolation Value (Minimum E.I. Value is 500 Ω/V)	R_i/V_b	Ω/V	3,296

Is the Electrical Isolation Value ≥ 500 Ω/V (Yes/No)? [X] Yes [ ] No (Fail)

NOTES:

- *The measurement shall be made with the propulsion battery connected to the vehicle propulsion system, and the vehicle in the "ready-to-drive" (propulsion motor(s) activated) position.*
- *If the voltage measurement is not at the voltage or within the normal operating voltage range specified by the manufacturer, the battery must be charged.*
- *The known resistance Ro (in Ohms) should be approximately 500 times the nominal operating voltage of the vehicle (in volts) per SAE J1766*
- *If measured voltage is zero and results in a division by zero, record "Zero Volts." This "zero voltage" condition is considered as being compliant*

DATA SHEET NO. 305-4
POST-IMPACT DATA FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle:	2022 Audi Q4 e-tron SUV	NHTSA No.:	M20225800
Test Program:	NCAP Frontal Barrier Impact Test	Test Date:	10/14/2022

VOLTMETER INFORMATION

Measured Parameter	Units	Value
Make & Model		Fluke 1587
Serial No.		581
Resolution	V	0.0001
Internal Impedance Value	MΩ	10
Propulsion Battery Voltage (V_b)	V	0.02

NOTES:

- *The voltmeter used in this test shall measure DC values and have an internal impedance of at least 10 M Ω*
- *An oscilloscope meeting the above requirements may need to be used to adequately measure voltage in some vehicles.*

ELECTRICAL ISOLATION MEASUREMENTS & IMPACT CALCULATIONS

Parameter	Value	Units		Value		Value	
V_1 =	0.200	V	Time:	3	Minutes	49	Seconds
V_2 =	1.050	V	Time:	3	Minutes	55	Seconds
$R_{o\,=}$	200,000	Ω	Time:		Minutes		Seconds
V_1' =	0.020	V	Time:	4	Minutes	3	Seconds
V_2' =	0.020	V	Time:	4	Minutes	8	Seconds
R_{i1} =	11,250,000	Ω	Time:	4	Minutes	3	Seconds
R_{i2} =	12,261,905	Ω	Time:	4	Minutes	8	Seconds
R_i =	11,250,000	Ω	Time:	4	Minutes	3	Seconds
R_i/V_b =	562,500,000	Ω/V	Time:	4	Minutes	3	Seconds

Is the Electrical Isolation Value ≥ 500 Ω/V (Yes/No)?	X	Yes		No (Fail)

NOTES:

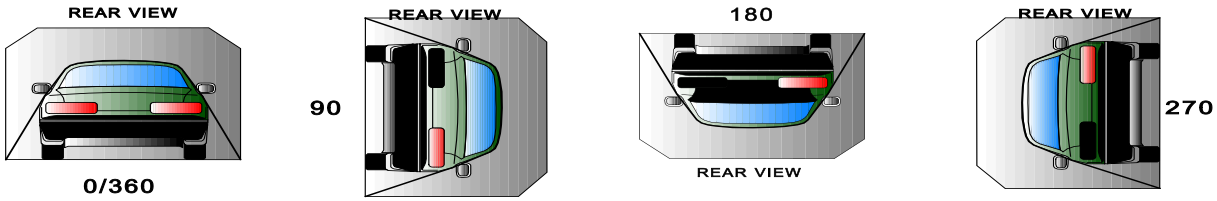
- *R_{i1}= R_o*(1+V_2/V_1)*[(V_1-V_1')/V_1'], R_{i2}= R_o*(1+V_1/V_2)*[(V_2-V_2')/V_2'], R_i = Lesser value of R_{i1} and R_{i2}*
- *If measured voltage is zero and results in a division by zero, record "Zero Volts." This "zero voltage" condition is considered as being compliant*
- *Minimum Electrical Isolation Value is 500 Ω/V*

. **PROPULSION BATTERY SYSTEM COMPONENTS**

Measured Parameter	Comments	Passed	Failed
Propulsion Battery Module movement within the passenger compartment	None	X	
Intrusion of an outside Propulsion Battery Component into the passenger compartment	None	X	
Is propulsion battery electrolyte spillage visible in the passenger compartment?	None	X	

DATA SHEET NO. 305-5
STATIC ROLLOVER TEST DATA FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle: 2022 Audi Q4 e-tron SUV NHTSA No.: M20225800
Test Program: NCAP Frontal Barrier Impact Test Test Date: 10/14/2022



Rear View

DETERMINATION OF PROPULSION BATTERY ELECTROLYTE COLLECTION TIME PERIOD

Rollover Stage	Rotation Time (spec. 1 -3 min)		FMVSS 301 Hold Time	Total Time		Next Whole Minute Interval
	Minutes	Seconds	Minutes	Minutes	Seconds	Minutes
0° to 90°	1	10	5	6	10	7
90° to 180°	1	11	5	6	11	7
180° to 270°	1	5	5	6	5	7
270° to 360°	1	10	5	6	10	7

ACTUAL TEST VEHICLE PROPULSION BATTERY ELECTROLYTE SPILLAGE

Rollover Stage	Propulsion Battery Electrolyte Spillage	Units	Spillage Location
0° to 90°	0.0	Liters	None
90° to 180°	0.0	Liters	None
180° to 270°	0.0	Liters	None
270° to 360°	0.0	Liters	None
Total Spillage	0.0	Liters	None

** FMVSS 305 Requirements: Maximum allowable propulsion battery electrolyte spillage is **5.0 Liters***

Is the total spillage of propulsion battery electrolyte greater than 5.0 Liters? [ ] Yes (Fail) [X] No
Is propulsion battery electrolyte spillage visible in the passenger compartment? [ ] Yes (Fail) [X] No

VOLTMETER INFORMATION

Measured Parameter	Units	Value
Make & Model		Fluke 1587
Serial No.		581
Resolution	V	0.0001
Internal Impedance Value	MΩ	10
Propulsion Battery Voltage (V_b)	V	0

NOTES:

- *The voltmeter used in this test shall measure DC values and have an internal impedance of at least 10 M Ω*
- *An oscilloscope meeting the above requirements may need to be used to adequately measure voltage in some vehicles.*

DATA SHEET NO. 305-5
STATIC ROLLOVER TEST DATA FOR INDICANT FMVSS NO. 305 TESTING (CONT'D)

Test Vehicle: 2022 Audi Q4 e-tron SUV NHTSA No.: M20225800
Test Program: NCAP Frontal Barrier Impact Test Test Date: 10/14/2022

ELECTRICAL ISOLATION MEASUREMENTS & CALCULATIONS

Parameter	Rollover Stage	Value	Units	R_0 = Ω	Minutes	Seconds
V_b	90°	0.0	V	Time:	1	15
	180°	0.0	V		10	30
	270°	0.0	V		16	45
	360°	0.0	V		23	15
V_1 =	90°	0.14	V	Time:	1	18
	180°	0.43	V		10	41
	270°	0.26	V		16	46
	360°	0.36	V		23	15
V_2 =	90°	0.21	V	Time:	1	21
	180°	0.10	V		10	45
	270°	0.09	V		16	50
	360°	0.07	V		23	20
V_1' =	90°	0	V	Time:	1	25
	180°	0	V		10	50
	270°	0	V		16	54
	360°	0	V		23	23
V_2' =	90°	0	V	Time:	1	29
	180°	0	V		10	53
	270°	0	V		16	59
	360°	0	V		23	27
R_{i1} =	90°	Zero Volts	Ω	Time:	1	25
	180°	Zero Volts	Ω		10	50
	270°	Zero Volts	Ω		16	54
	360°	Zero Volts	Ω		23	23
R_{i2} =	90°	Zero Volts	Ω	Time:	1	29
	180°	Zero Volts	Ω		10	53
	270°	Zero Volts	Ω		16	59
	360°	Zero Volts	Ω		23	27
R_i =	90°	Zero Volts	Ω	Time:	1	25
	180°	Zero Volts	Ω		10	50
	270°	Zero Volts	Ω		16	54
	360°	Zero Volts	Ω		23	23
R_i/V_b =	90°	Zero Volts	Ω/V	Time:	1	25
	180°	Zero Volts	Ω/V		10	50
	270°	Zero Volts	Ω/V		16	54
	360°	Zero Volts	Ω/V		23	23

Is the Electrical Isolation Value ≥ 500 Ω/V (Yes/No)? [X] Yes [ ] No (Fail)

APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

[1]**NOTE**: *The underbody views should include the following vehicle components: fuel pump, fuel lines, sender unit, fuel tank filler pipe and any other visible system components.*

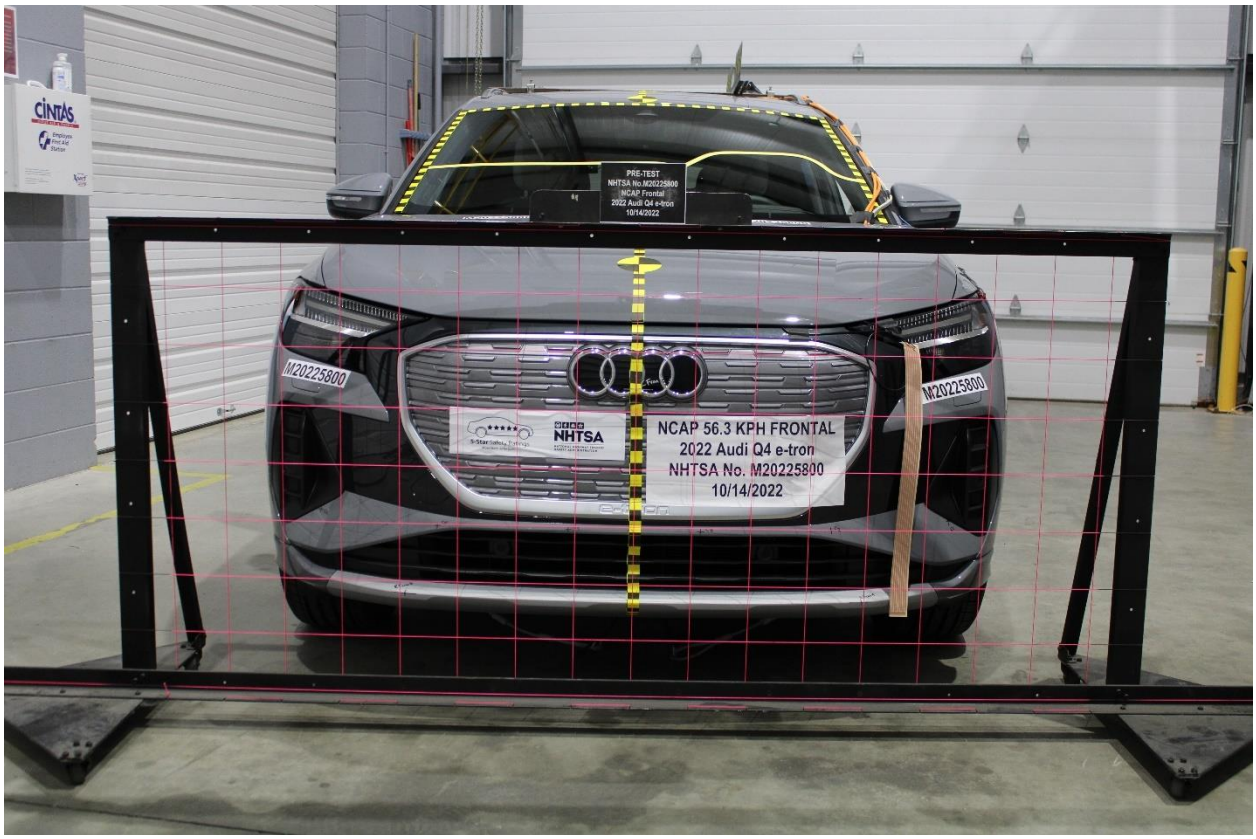


Figure A-1: Load Cell Location

Figure A-2: Pre-Test Load Cell Wall

Figure A-3: Post-Test Load Cell Wall

Figure A-4: Manufacturer's Label

Figure A-5: Tire Placard

Figure A-6: 2022 Audi Q4 e-tron Frontal As Delivered

Figure A-7: Left Rear 3-4 View, As Received

Figure A-8: Pre-Test Front View of Test Vehicle

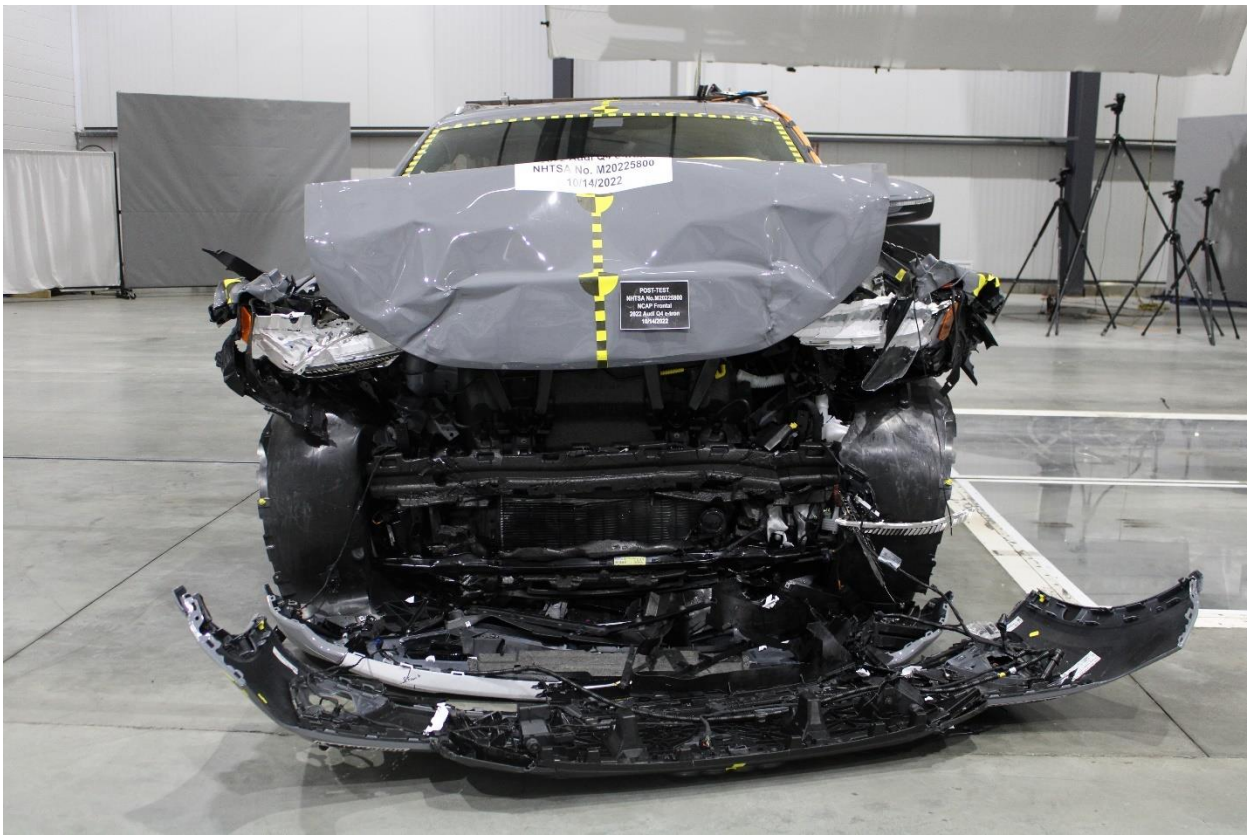


Figure A-9: Post-Test Front View of Test Vehicle

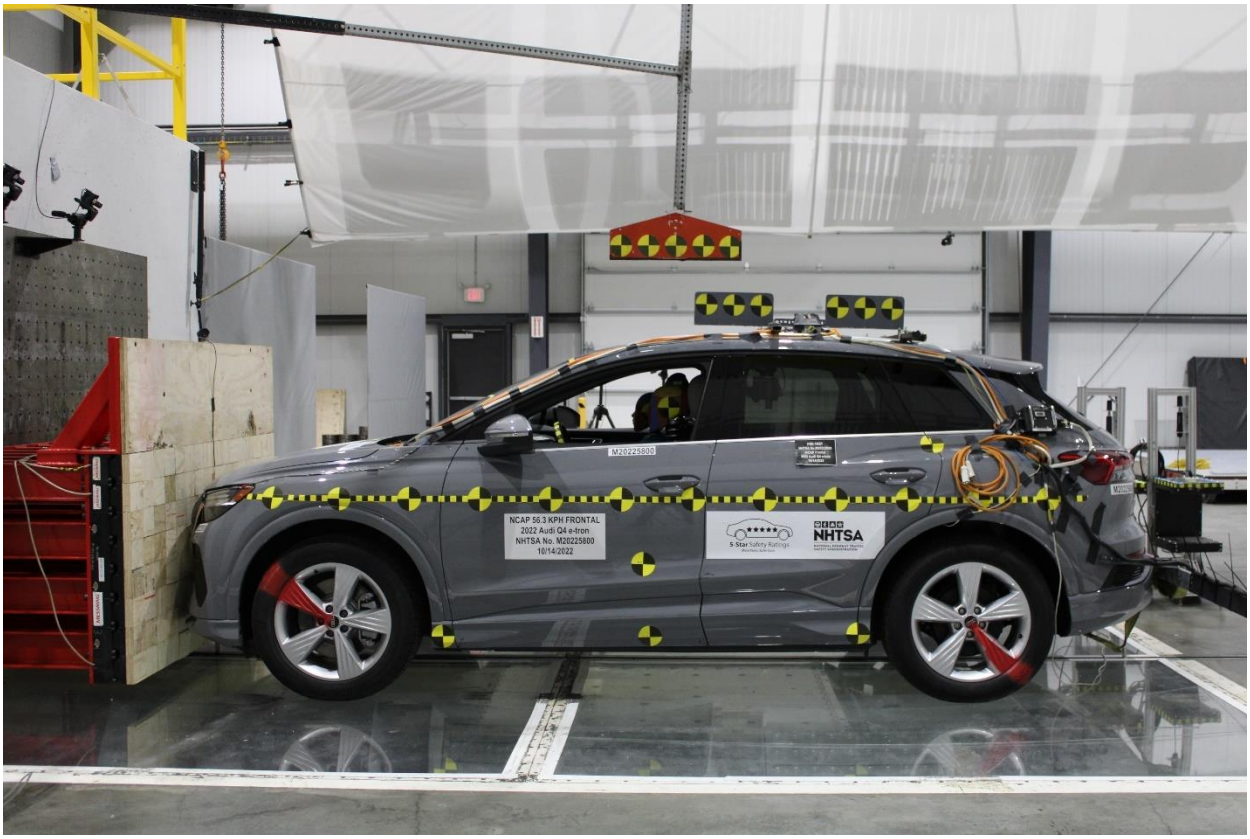


Figure A-10: Pre-Test Left View of Test Vehicle

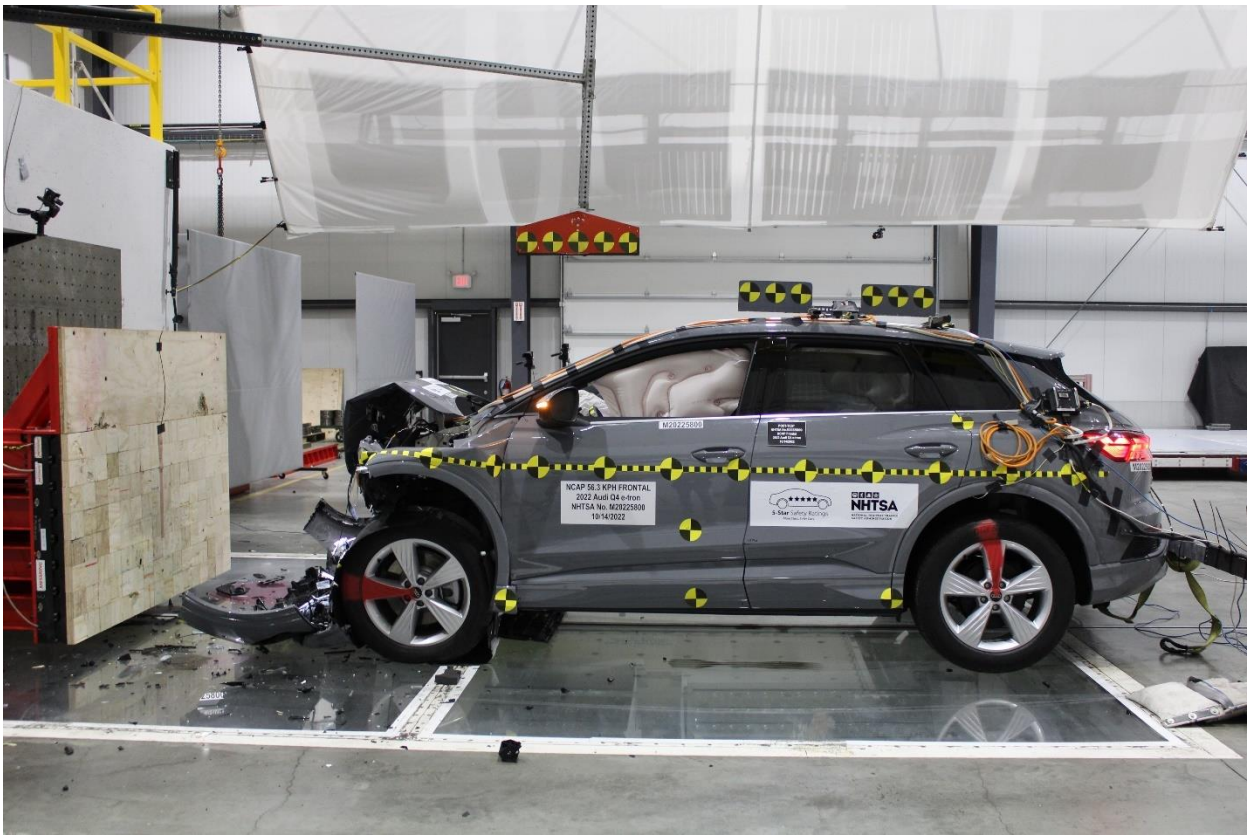


Figure A-11: Post-Test Left View of Test Vehicle

Figure A-12: Pre-Test Right View of Test Vehicle

Figure A-13: Post-Test Right View of Test Vehicle

Figure A-14: Pre-Test Right Front 3-4 View

Figure A-15: Post-Test Right Front 3-4 View

Figure A-16: Pre-Test Left Rear 3-4 View

Figure A-17: Post-Test Left Rear 3-4 View

Figure A-18: Pre-Test Windshield View

Figure A-19: Post-Test Windshield View

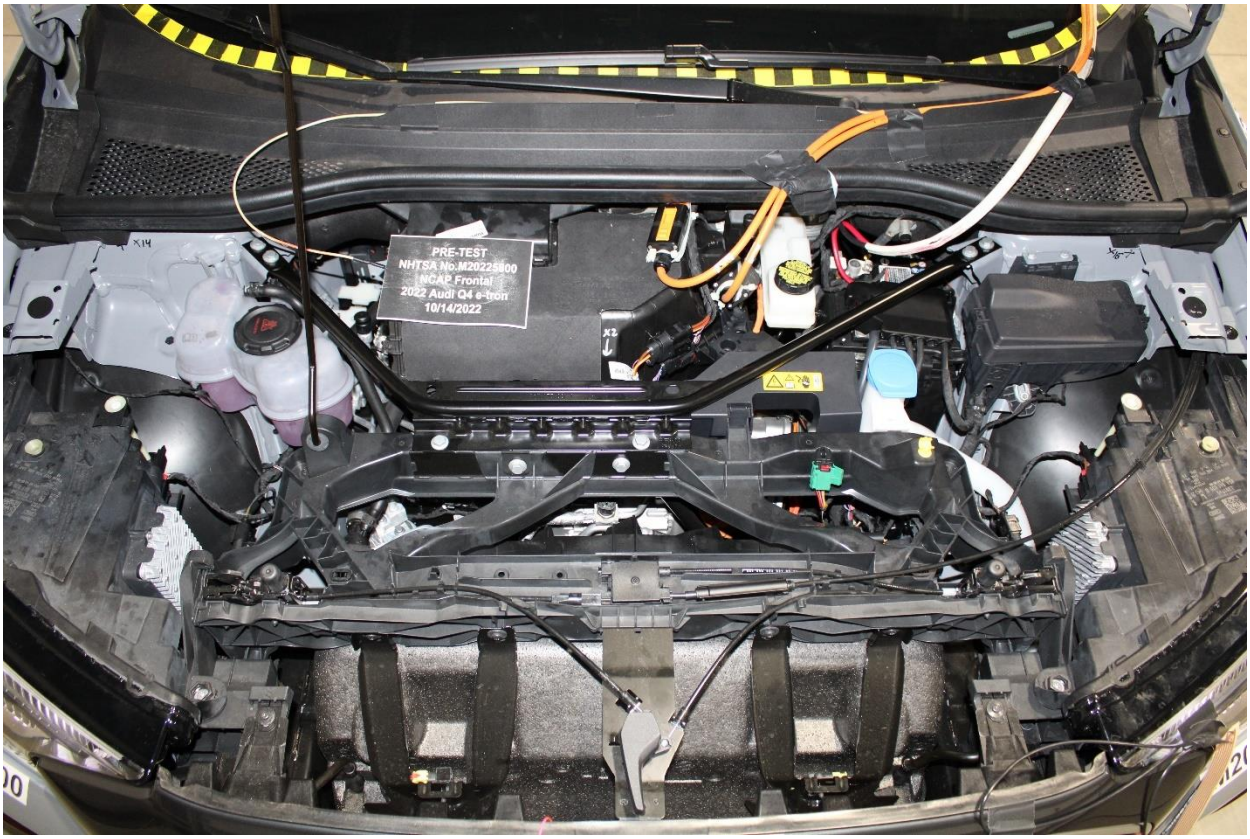


Figure A-20: Pre-Test Engine Compartment View

Figure A-21: Post-Test Engine Compartment View

Figure A-22: Pre-Test Charging Port View

Figure A-23: Post-Test Charging Port View

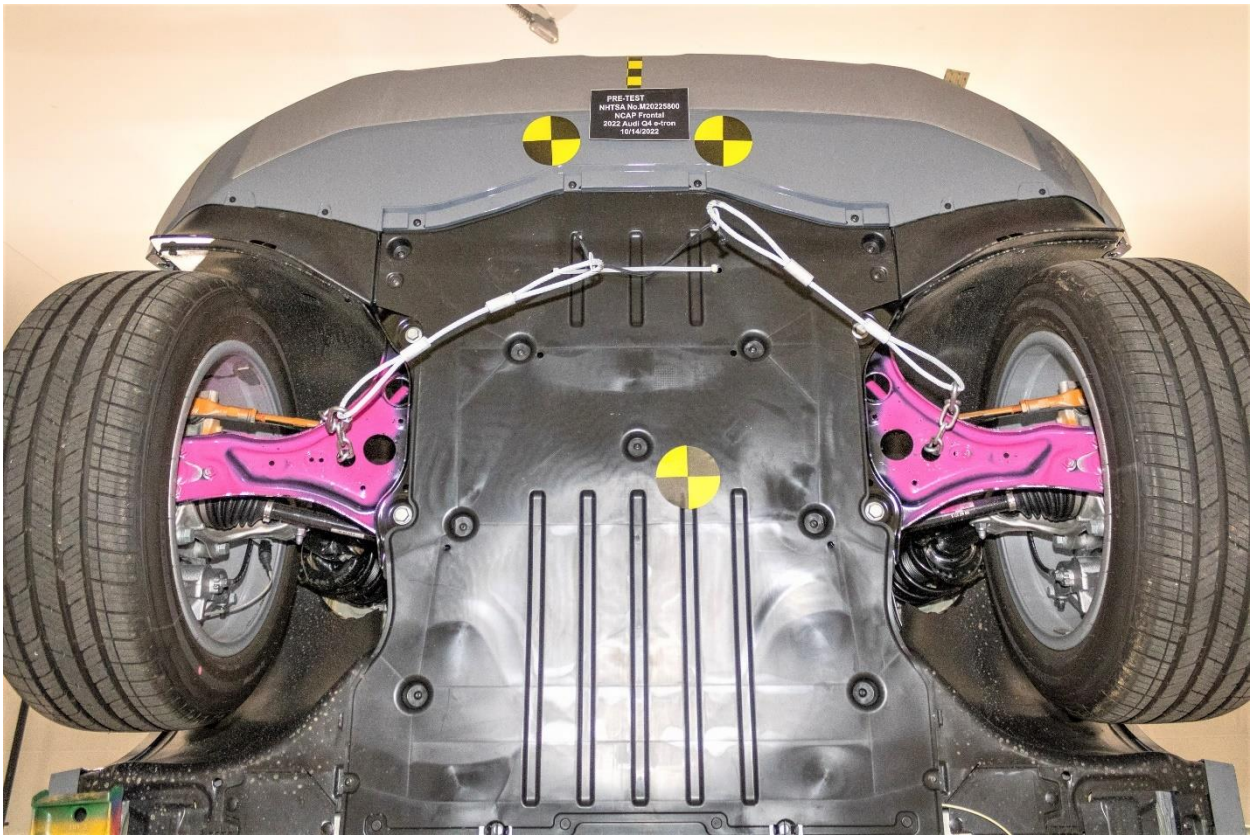


Figure A-24: Pre-Test Front Underbody View[1]

[1]**NOTE**: *The underbody views should include the following vehicle components: fuel pump, fuel lines, sender unit, fuel tank filler pipe and any other visible system components.*

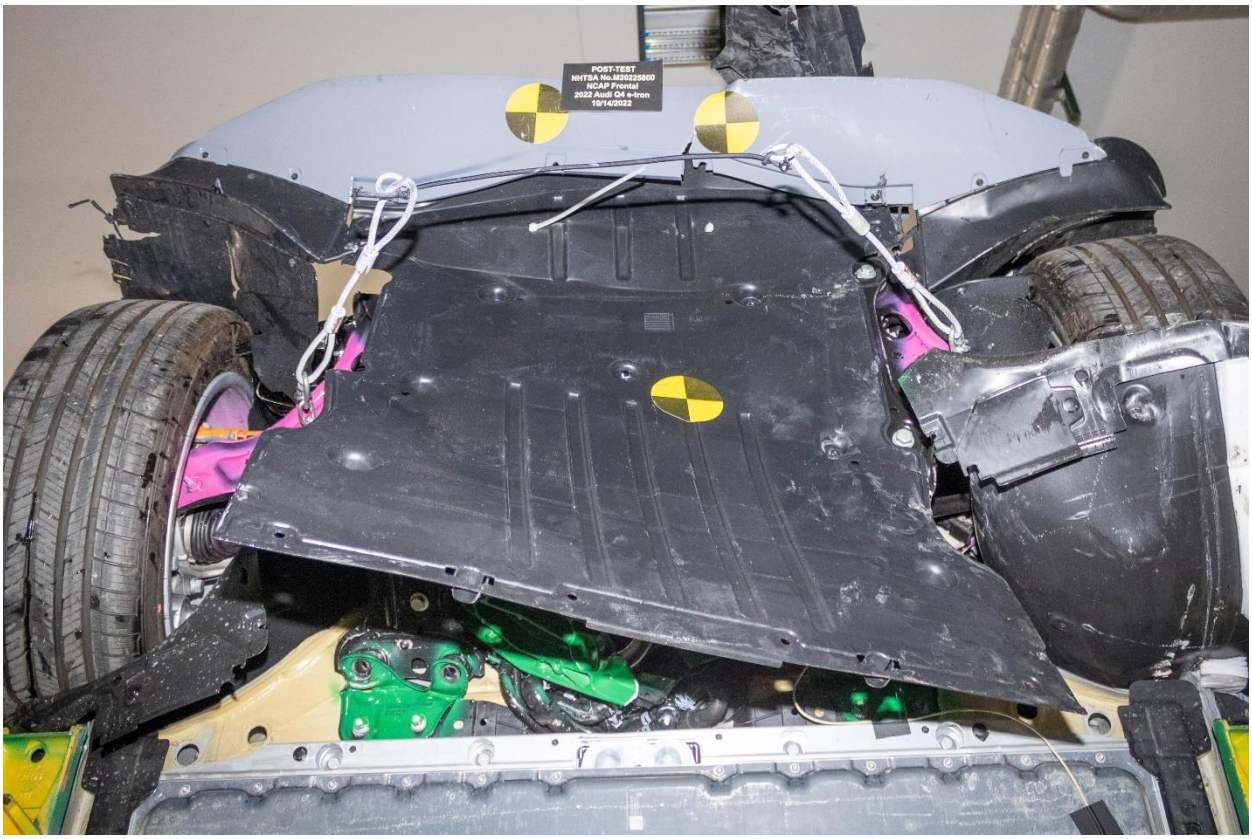


Figure A-25: Post-Test Front Underbody View[1]

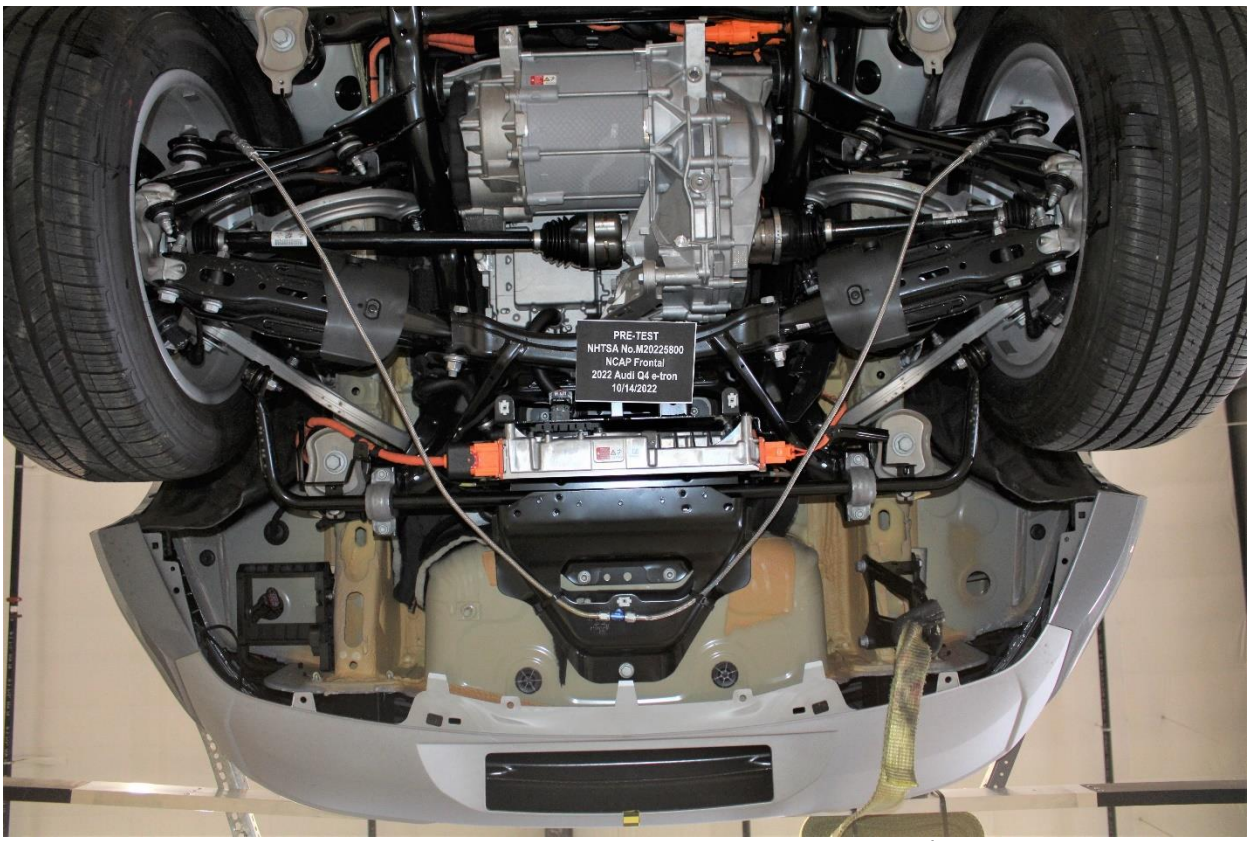


Figure A-26: Pre-Test Rear Underbody View[1]

[1]**NOTE**: *The underbody views should include the following vehicle components: fuel pump, fuel lines, sender unit, fuel tank filler pipe and any other visible system components.*

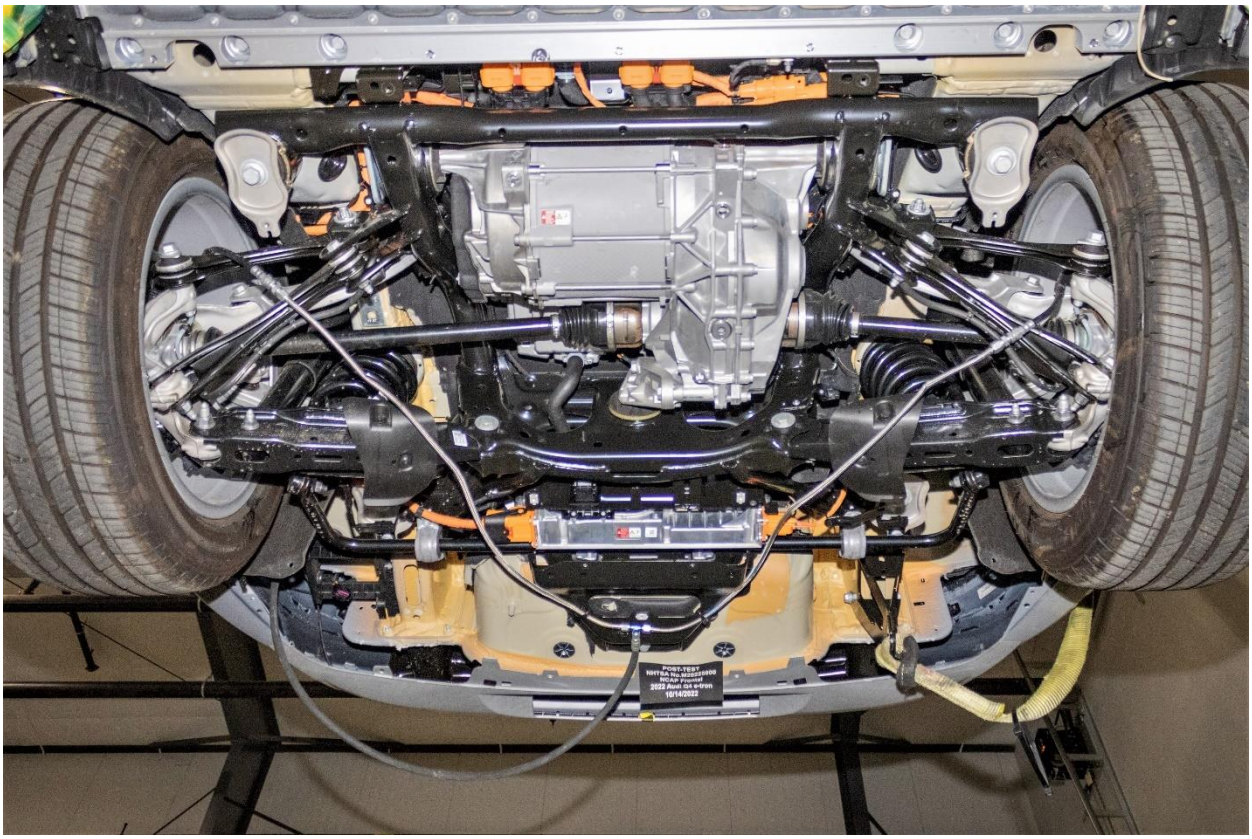


Figure A-27: Post-Test Rear Underbody View[1]

Figure A-28: Pre-Test Dummy Cable Routing

[1]**NOTE**: *The underbody views should include the following vehicle components: fuel pump, fuel lines, sender unit, fuel tank filler pipe and any other visible system components.*

Figure A-29: Post-Test Dummy Cable Routing

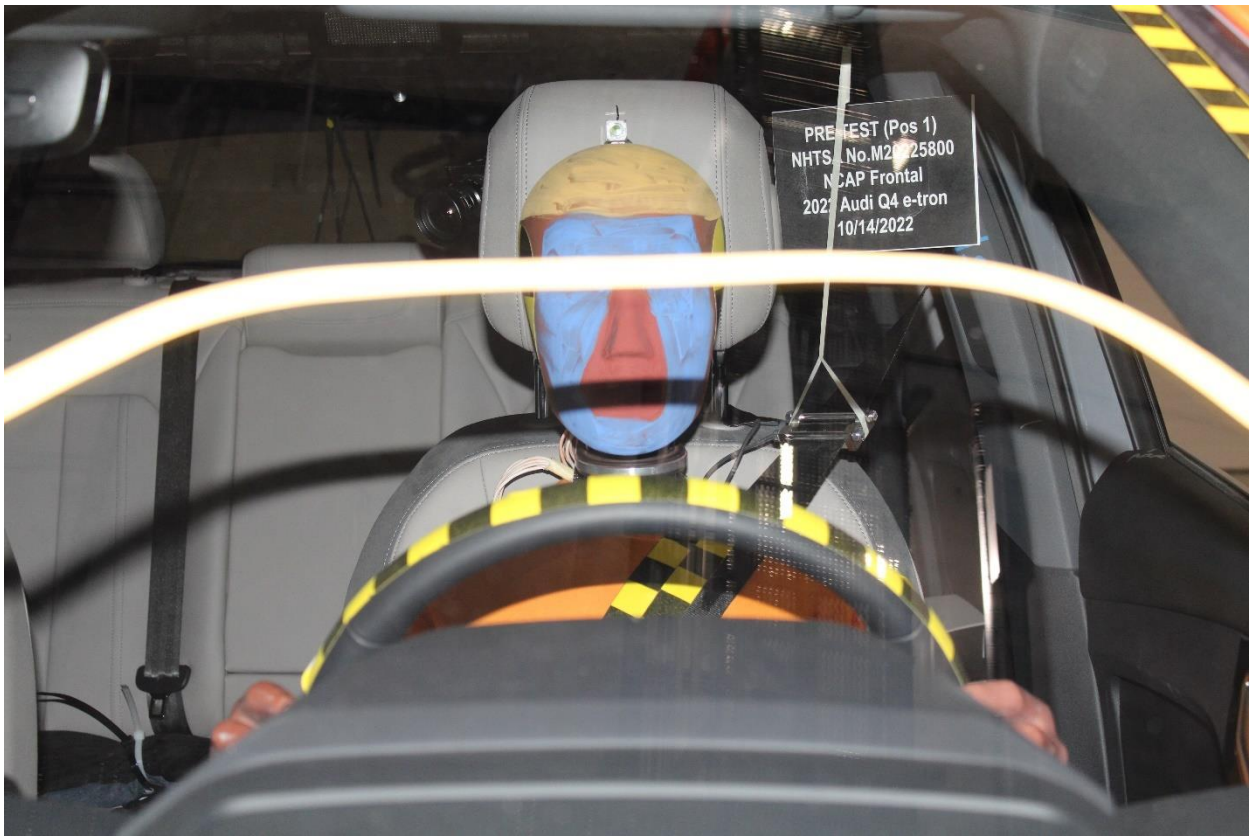


Figure A-30: Pre-Test Driver Dummy Front View

Figure A-31: Post-Test Driver Dummy Front View

Figure A-32: Pre-Test Driver Dummy Window View

Figure A-33: Post-Test Driver Dummy Window View

Figure A-34: Pre-Test Driver Dummy and Vehicle Interior View

Figure A-35: Post-Test Driver Dummy and Vehicle Interior View

Figure A-36: Pre-Test Driver's Seat Fore-Aft Markings

Figure A-37: Post-Test Driver's Seat Fore-Aft Markings

Figure A-38: Pre-Test View of Belt Anchorage for Driver Dummy

Figure A-39: Post-Test View of Belt Anchorage for Driver Dummy

Figure A-40: Pre-Test View of Belt Buckle and Latch Plate for Driver Dummy

Figure A-41: Post-Test View of Belt Buckle and Latch Plate for Driver Dummy

Figure A-42: Pre-Test Driver Dummy Feet

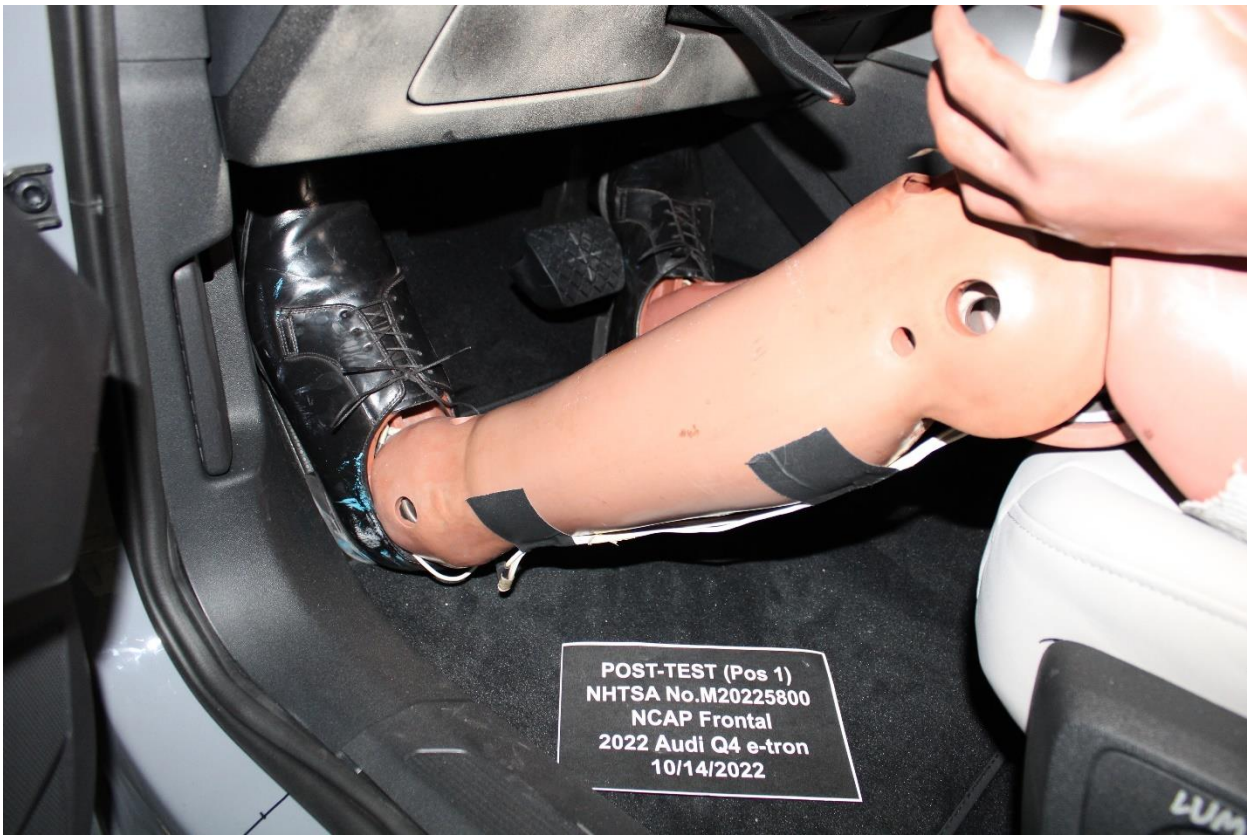


Figure A-43: Post-Test Driver Dummy Feet

Figure A-44: Pre-Test Driver's Side Knee Bolster

Figure A-45: Post-Test Driver's Side Knee Bolster

Figure A-46: Pre-Test Driver's Side Floorpan

Figure A-47: Post-Test Driver's Side Floorpan

Figure A-48: Post-Test Driver Dummy Face

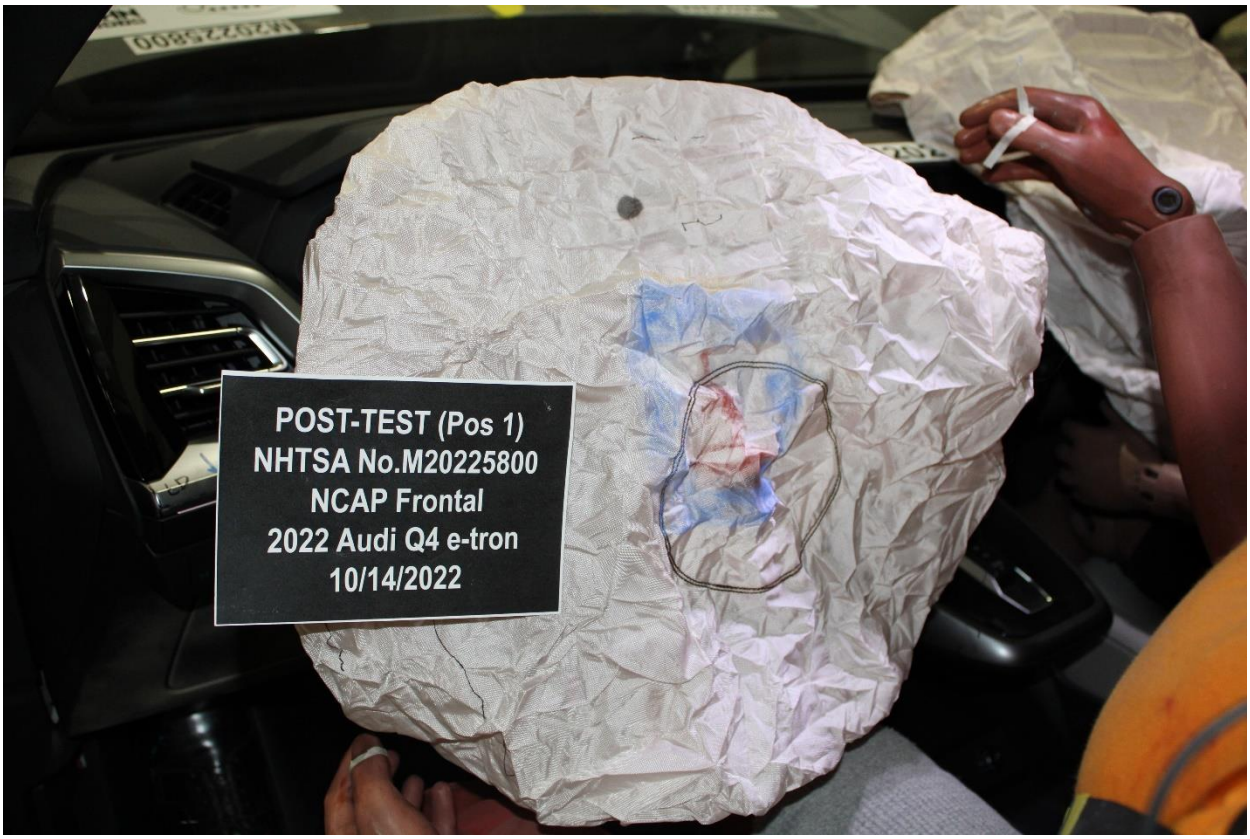


Figure A-49: Post-Test Driver Dummy Contact With Airbag

Figure A-50: Post-Test Driver Dummy Contact With Headrest

Figure A-51: Pre-Test View of the Steering Wheel

Figure A-52: Post-Test View of the Steering Wheel

Figure A-53: Pre-Test Passenger Dummy Front View

Figure A-54: Post-Test Passenger Dummy Front View

Figure A-55: Pre-Test Passenger Dummy Window View

Figure A-56: Post-Test Passenger Dummy Window View

Figure A-57: Pre-Test Passenger Dummy and Vehicle Interior View

Figure A-58: Post-Test Passenger Dummy and Vehicle Interior View

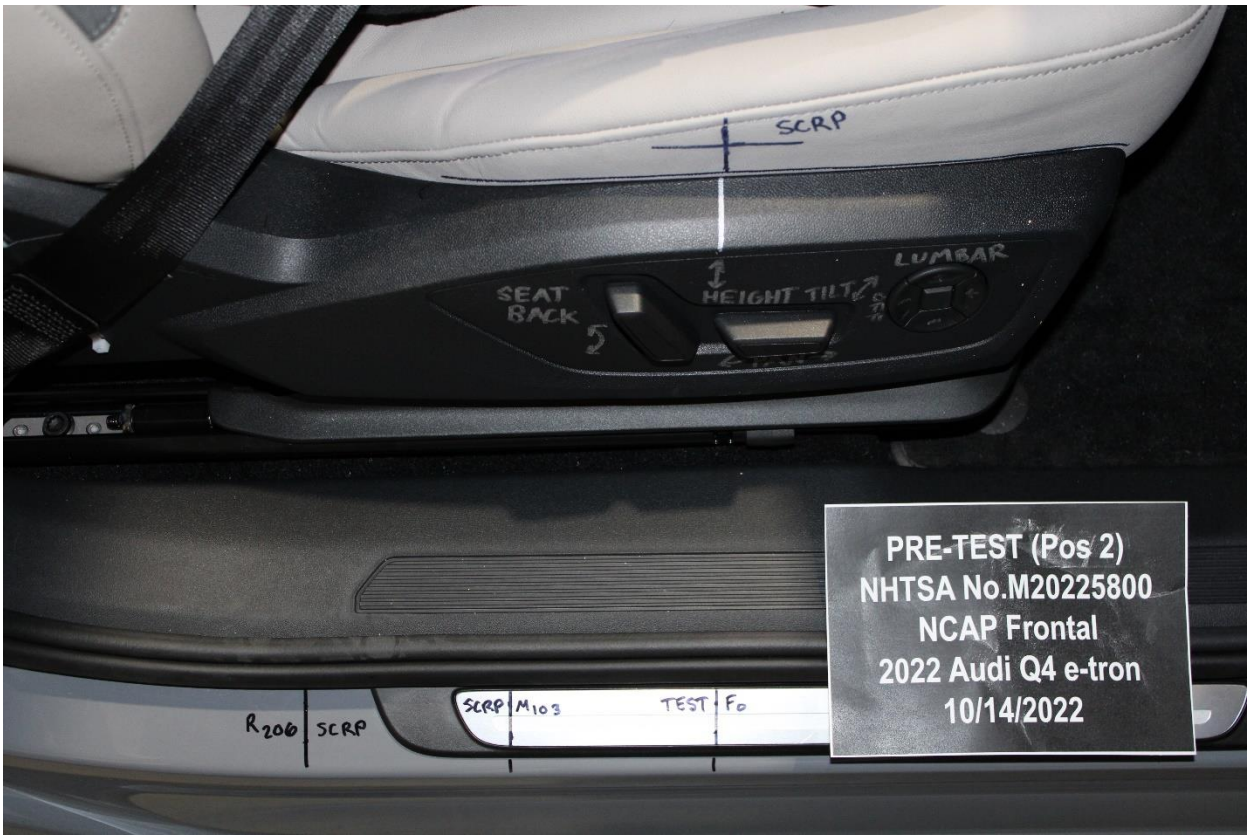


Figure A-59: Pre-Test Passenger's Seat Fore-Aft Markings

Figure A-60: Post-Test Passenger's Seat Fore-Aft Markings

Figure A-61: Pre-Test View of Belt Anchorage for Passenger Dummy

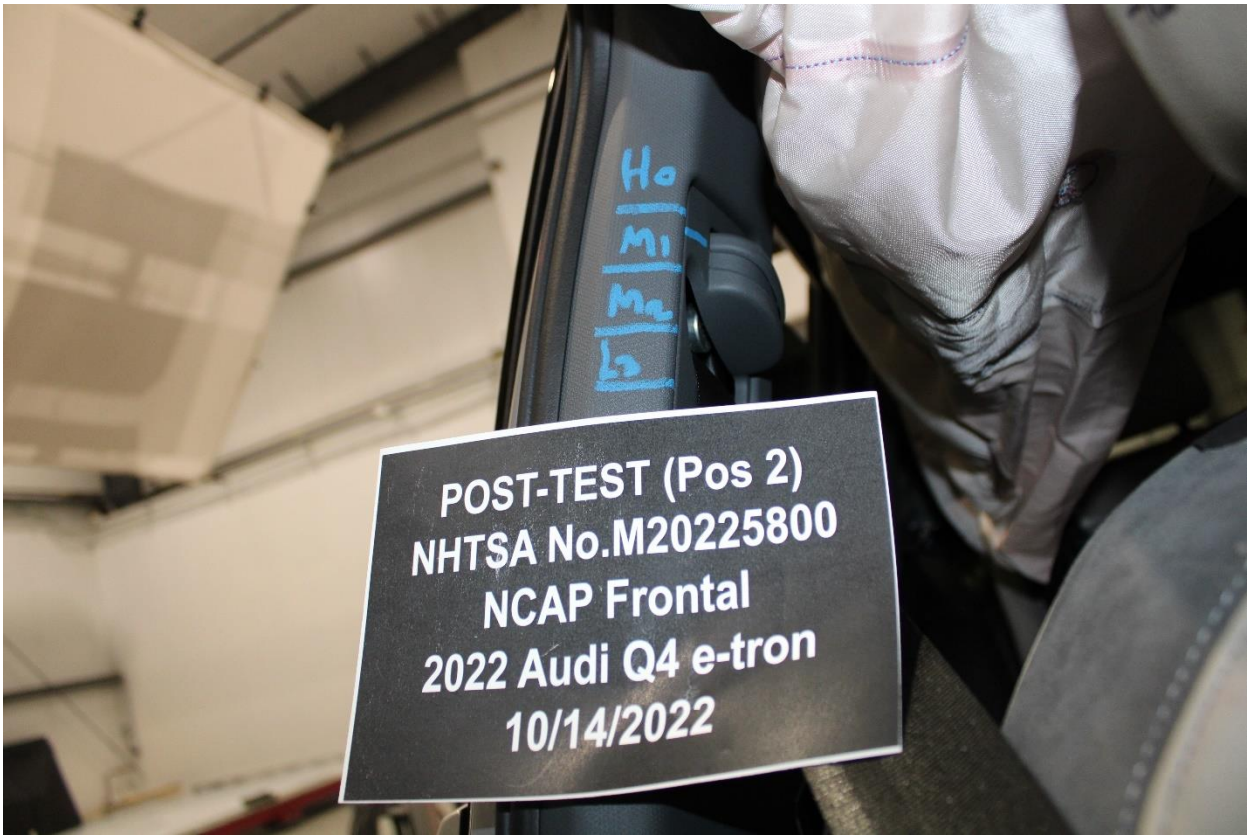


Figure A-62: Post-Test View of Belt Anchorage for Passenger Dummy

Figure A-63: Pre-Test View of Belt Buckle and Latch Plate for Passenger Dummy

Figure A-64: Post-Test View of Belt Buckle and Latch Plate for Passenger Dummy

Figure A-65: Pre-Test Passenger Dummy Feet

Figure A-66: Post-Test Passenger Dummy Feet

Figure A-67: Pre-Test Passenger's Side Knee Bolster

Figure A-68: Post-Test Passenger's Side Knee Bolster

Figure A-69: Pre-Test Passenger's Side Floorpan

Figure A-70: Post-Test Passenger's Side Floorpan

Figure A-71: Post-Test Passenger Dummy Face

Figure A-72: Post-Test Passenger Dummy Contact With Airbag

Figure A-73: Post-Test Passenger Dummy Contact With Headrest

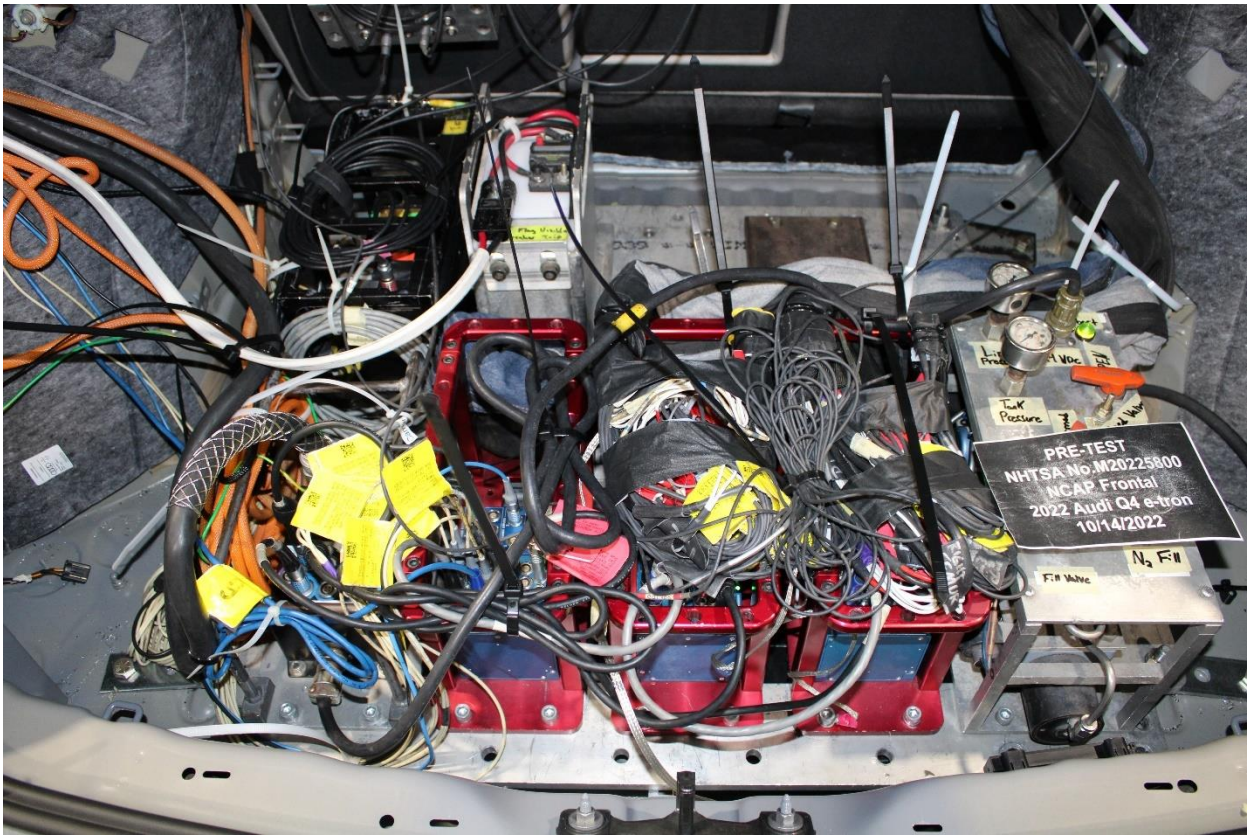


Figure A-74: Photograph of Ballast Installed in Vehicle

Photo Not Applicable

Figure A-75: Post-Test Stoddard Solvent Spillage Location View, If Required

Figure A-76: Post-Test Speed Trap Read-Out

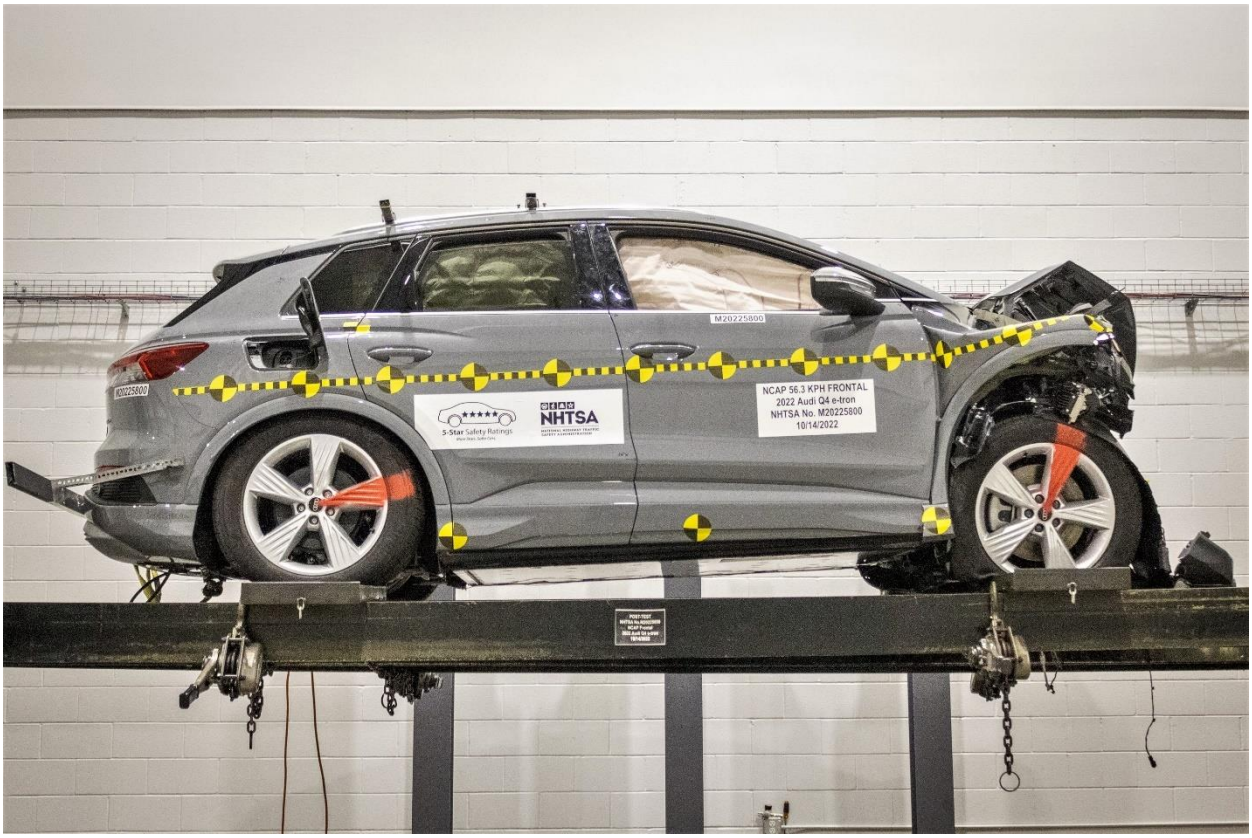


Figure A-77: Vehicle at 0º on Static Rollover Device

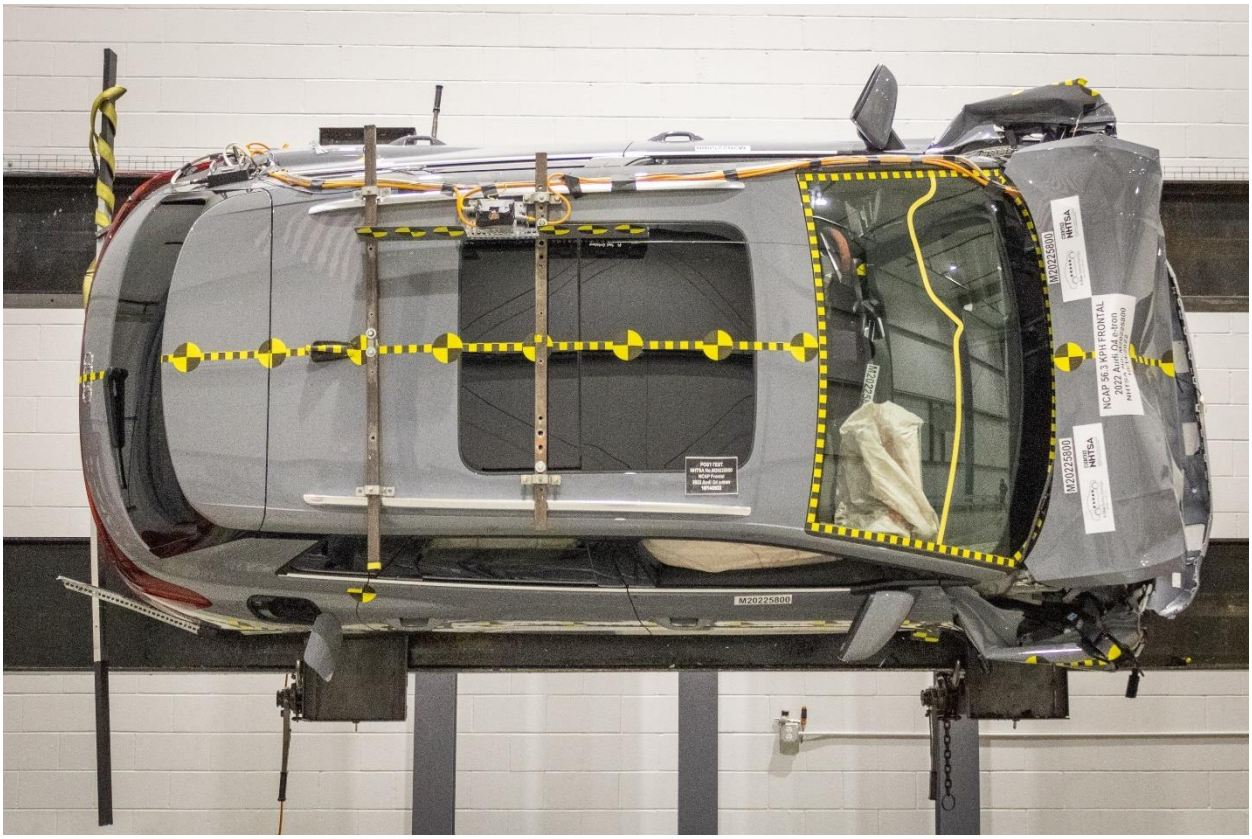


Figure A-78: Vehicle at 90º on Static Rollover Device

Figure A-79: Vehicle at 180º on Static Rollover Device

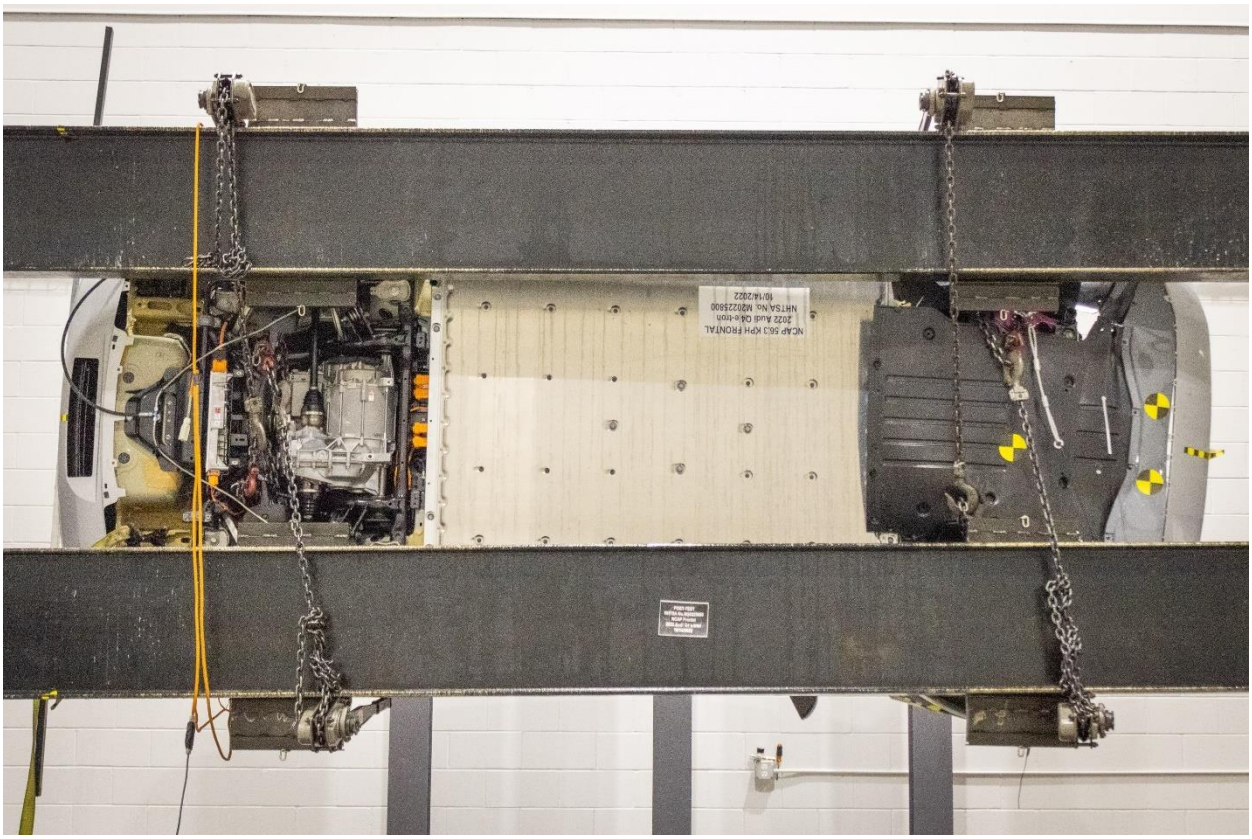


Figure A-80: Vehicle at 270º on Static Rollover Device

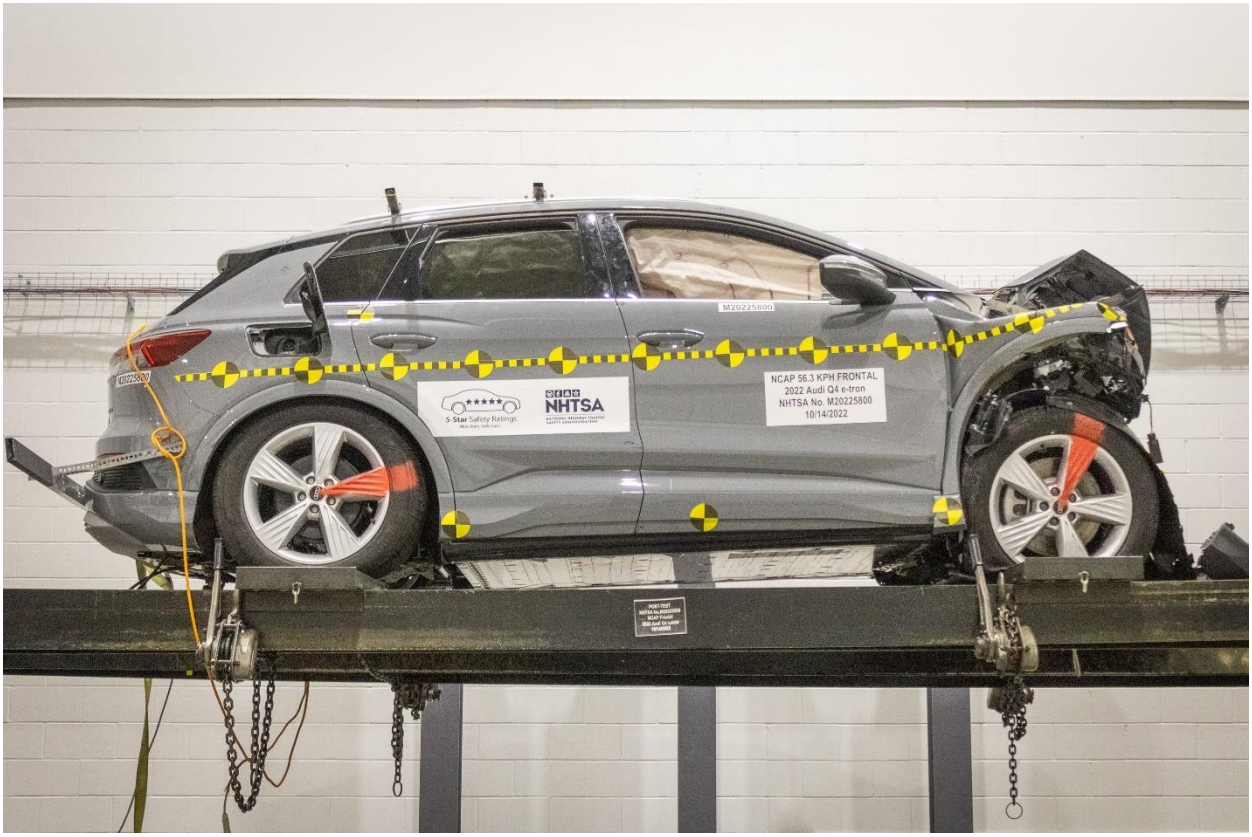


Figure A-81: Vehicle at 360º on Static Rollover Device

Figure A-82: 2022 Audi Q4 e-tron Frontal Impact Event

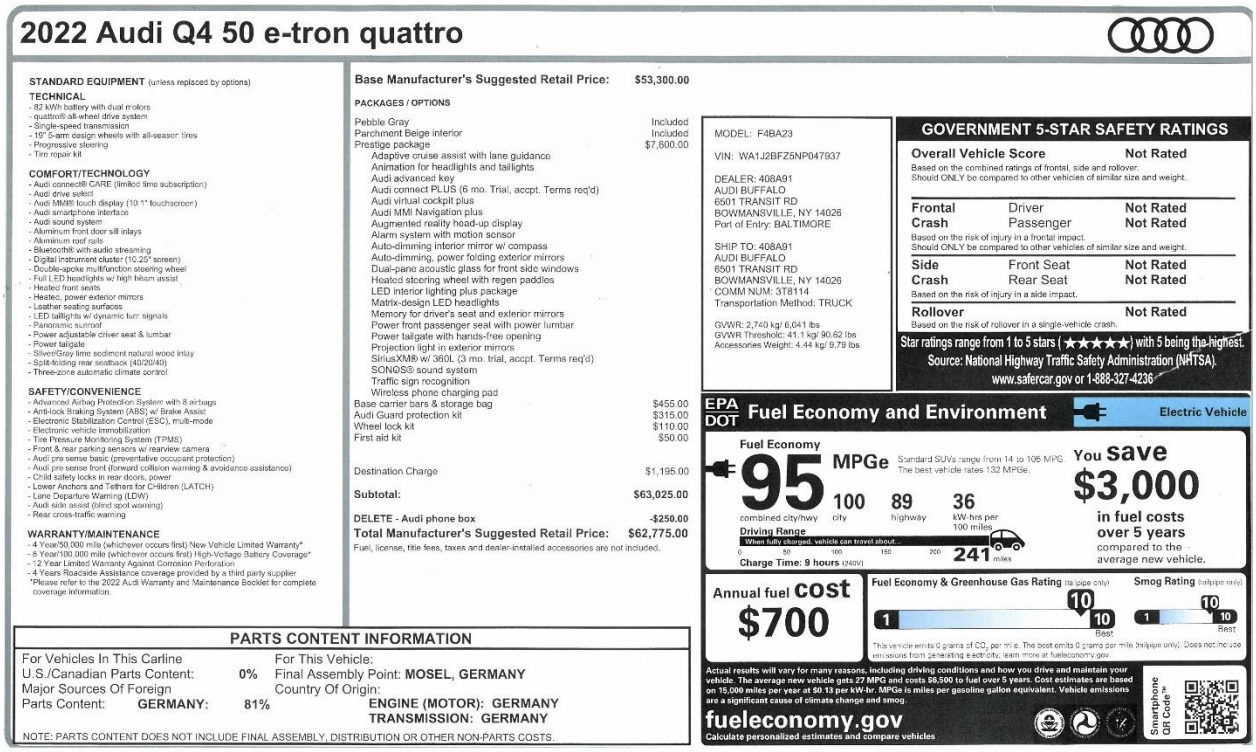


Figure A-83: Monroney Label Photograph

Figure 305-1: Auxiliary Power Module Warning Label

Photo Not Applicable

Figure 305-2: Power Inverter Warning Label

Figure 305-3 First Responder Warning Label

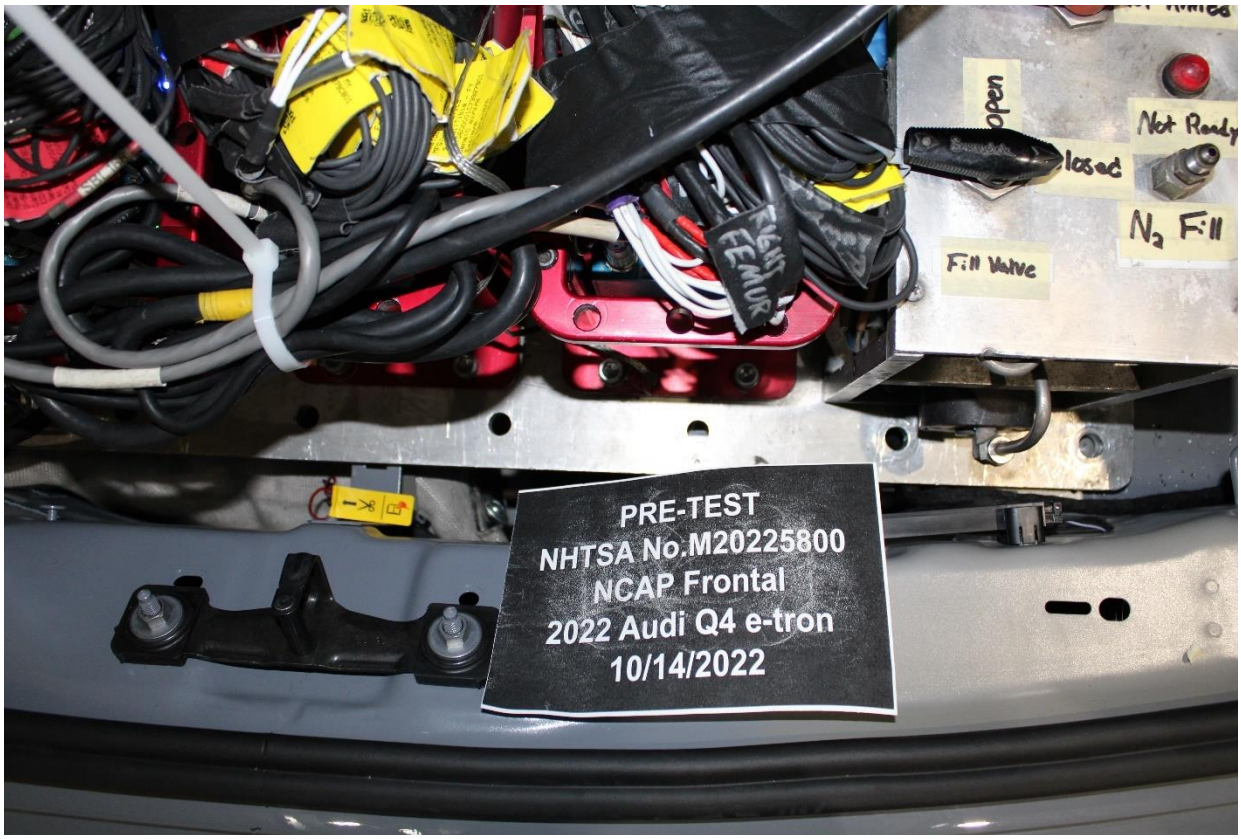


Figure 305-4: First Responder Warning Label Location

Photo Not Applicable

Figure 305-5: Other Vehicle Label Related to Electric Propulsion System

Figure 305-6: Manual High Voltage Service Disconnect in Place

Figure 305-7: Manual High Voltage Service Disconnect Removed (Show Plug)

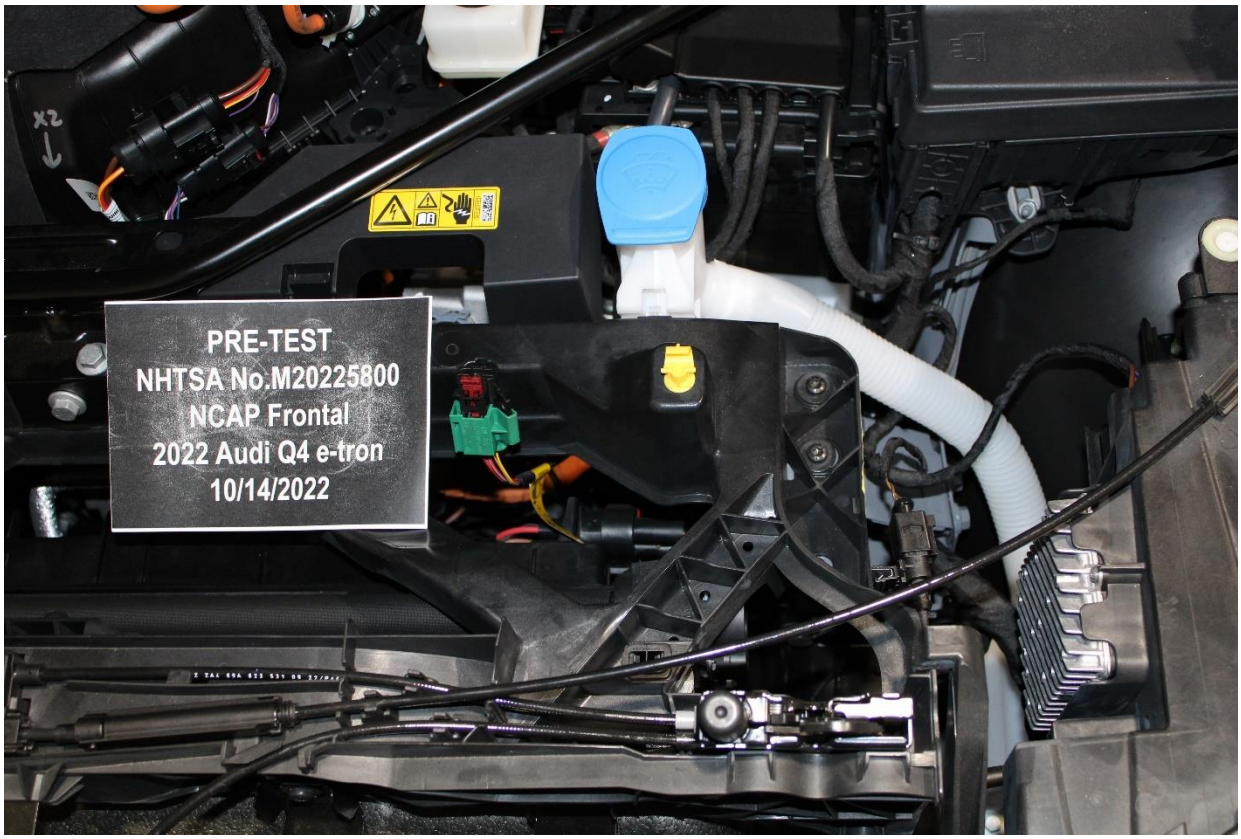


Figure 305-8: Manual High Voltage Service Disconnect Removed Location

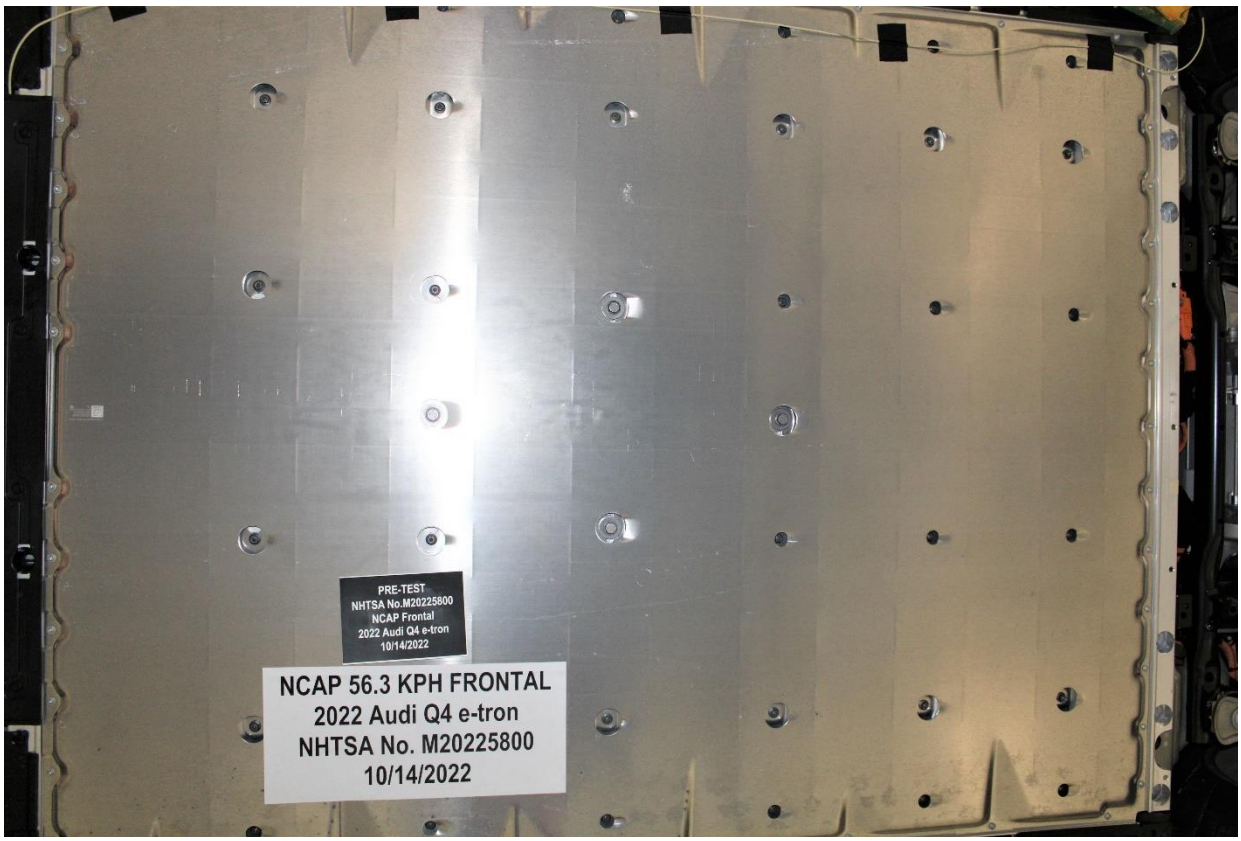


Figure 305-9: Pre-Impact View of Propulsion Battery

Figure 305-10: Post-Impact Front View of Propulsion Battery

Figure 305-11: Post-Impact Rear View of Propulsion Battery (if any part of it is visible)

Figure 305-12: Pre-Impact View of Battery Box(s) or Container(s) Which Holds Individual Battery Modules

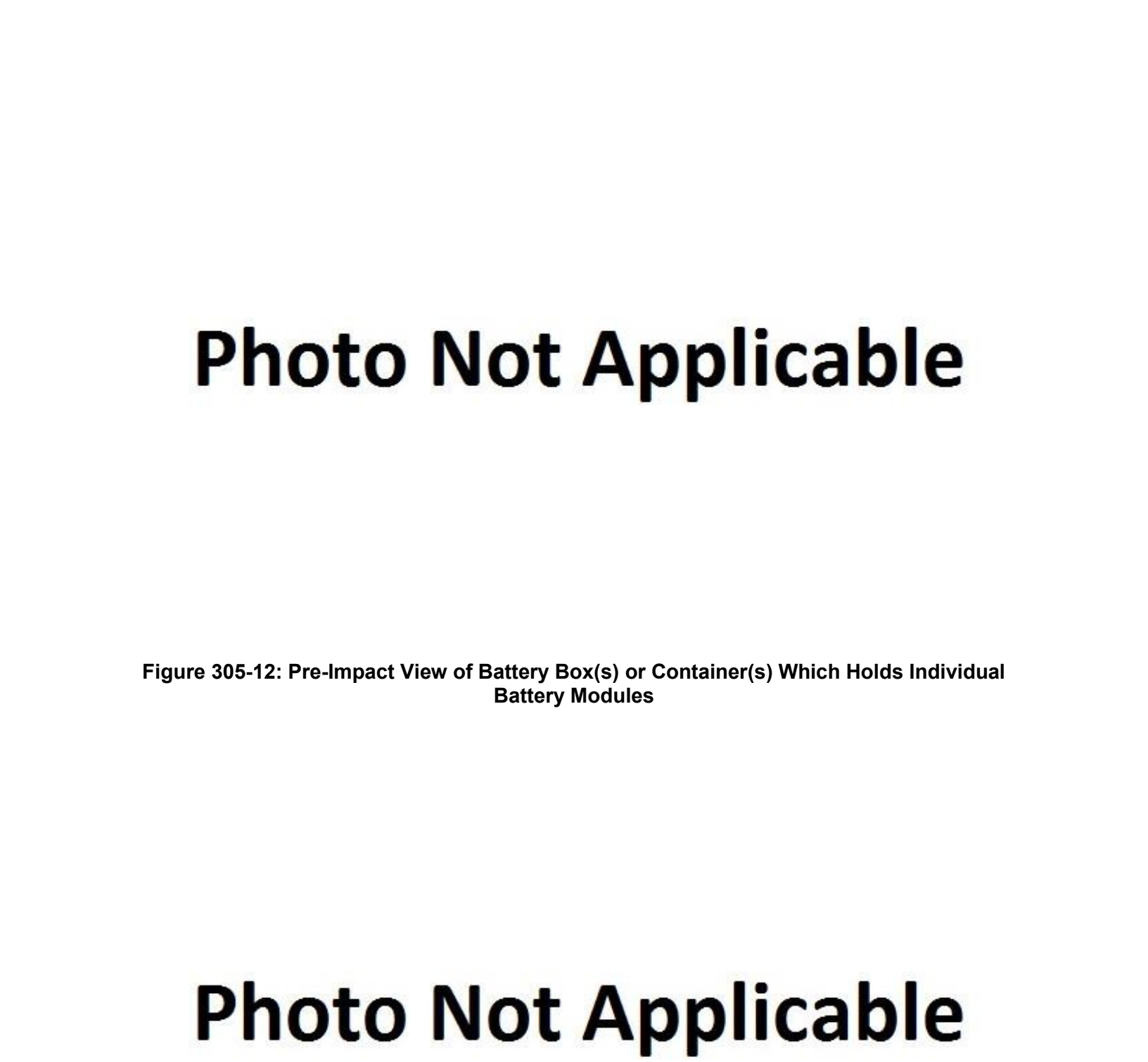


Figure 305-13: Post-Impact View of Battery Box(s) or Container(s) Which Holds Individual Battery Modules

Figure 305-14: Pre-Impact View of Propulsion Battery Module(s)

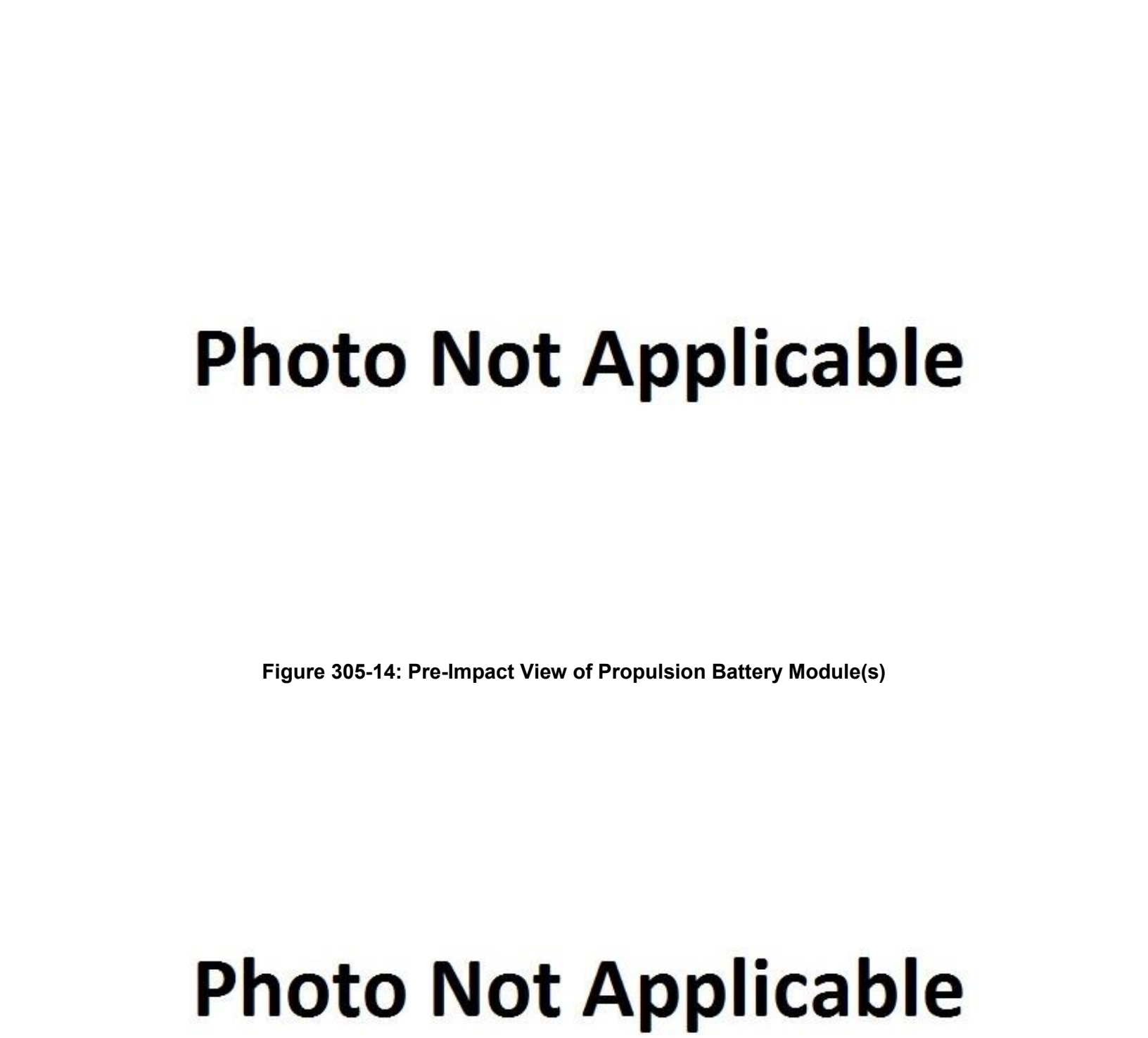


Figure 305-15: Post-Impact View of Propulsion Battery Module(s)

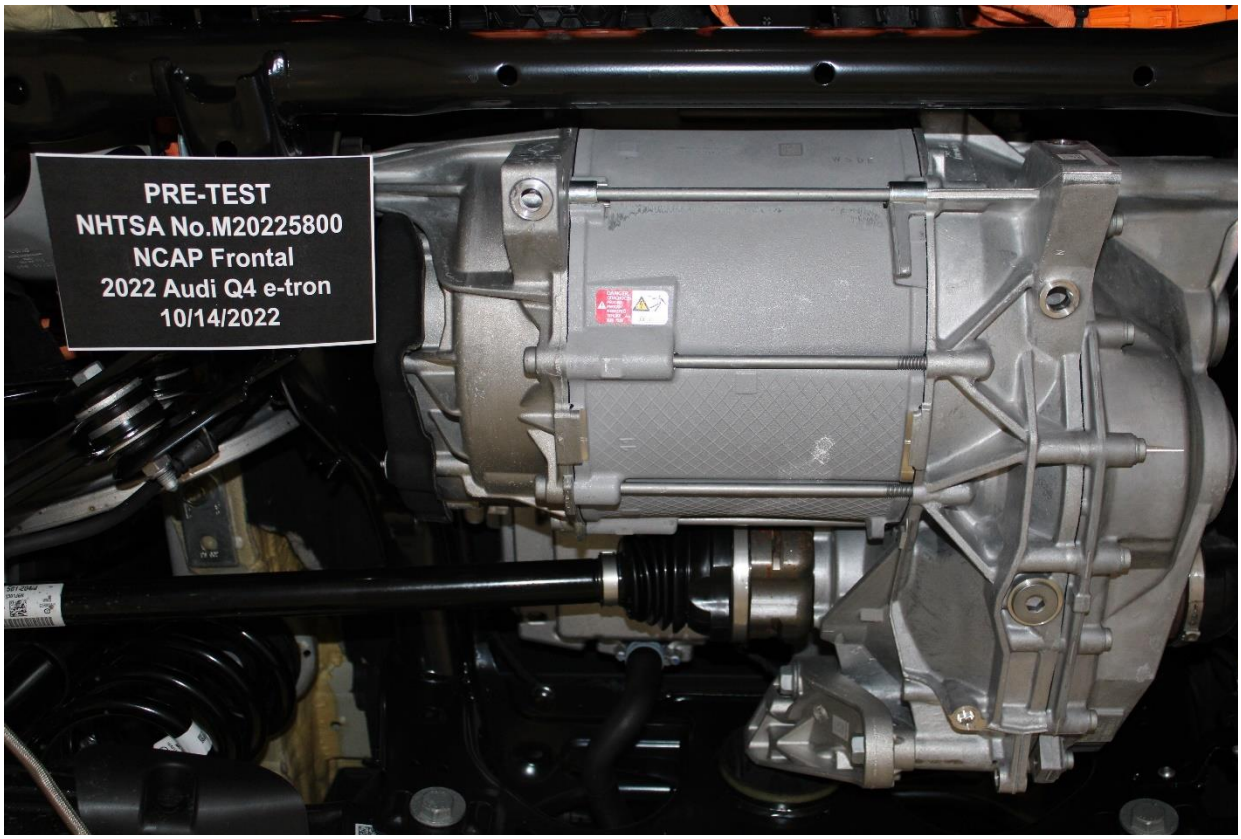


Figure 305-16: Pre-Impact View of Electric Propulsion Drive

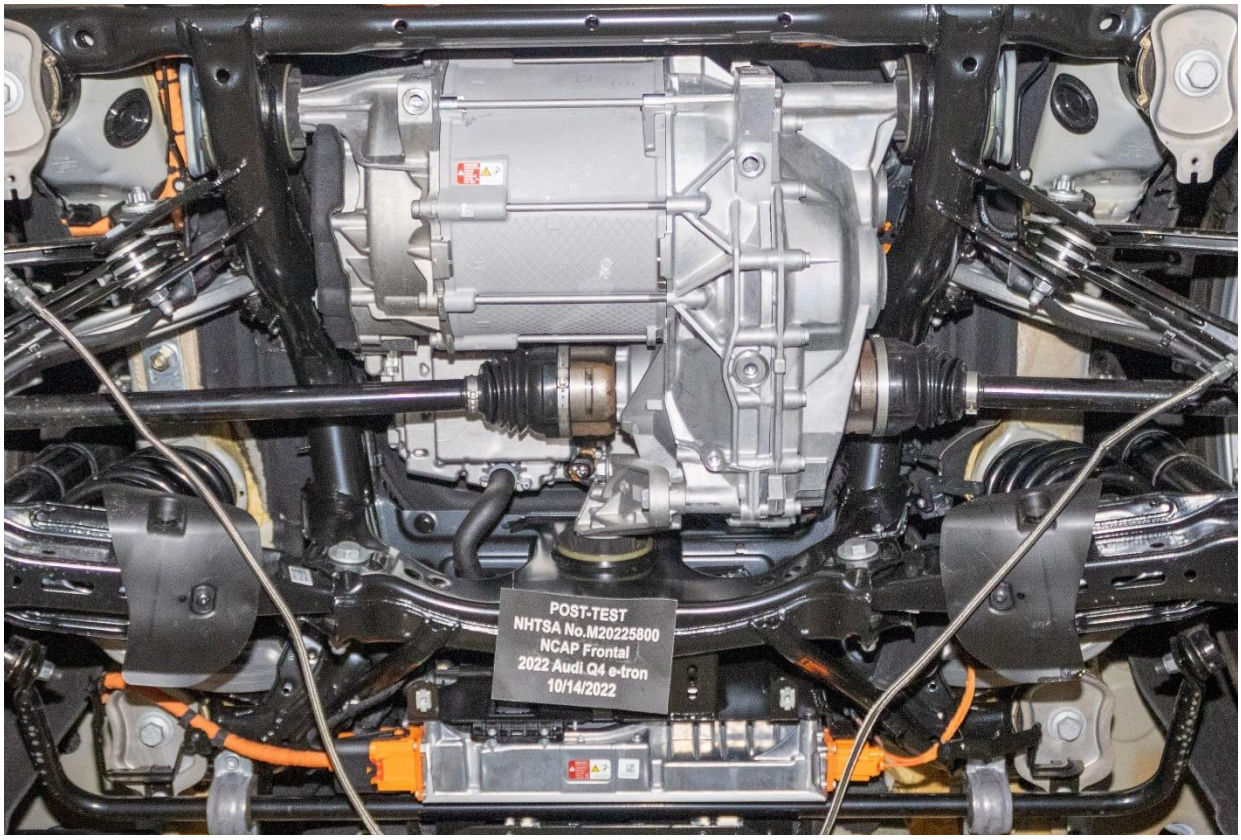


Figure 305-17: Post-Impact View of Electric Propulsion Drive

Figure 305-18: Pre-Impact View of High Voltage Interconnects

Photo Not Applicable

Figure 305-19: Pre-Impact View of Propulsion Battery Venting System

Photo Not Applicable

Figure 305-20: Pre-Impact View of Other Visible Electric Propulsion Components

Figure 305-21: Pre-Impact View of Ground Lead Attached

Figure 305-22: Pre-Impact View of High Voltage Leads Attached

Figure 305-23: Pre-Impact Close Up View of High Voltage Leads Attached

Photo Not Available

Figure 305-24: Pre-Impact View of Installed Test Interface Port

Figure 305-25: Post-Impact View of Installed Test Interface Port

Figure 305-26: Pre-Impact View of Other Test Devices

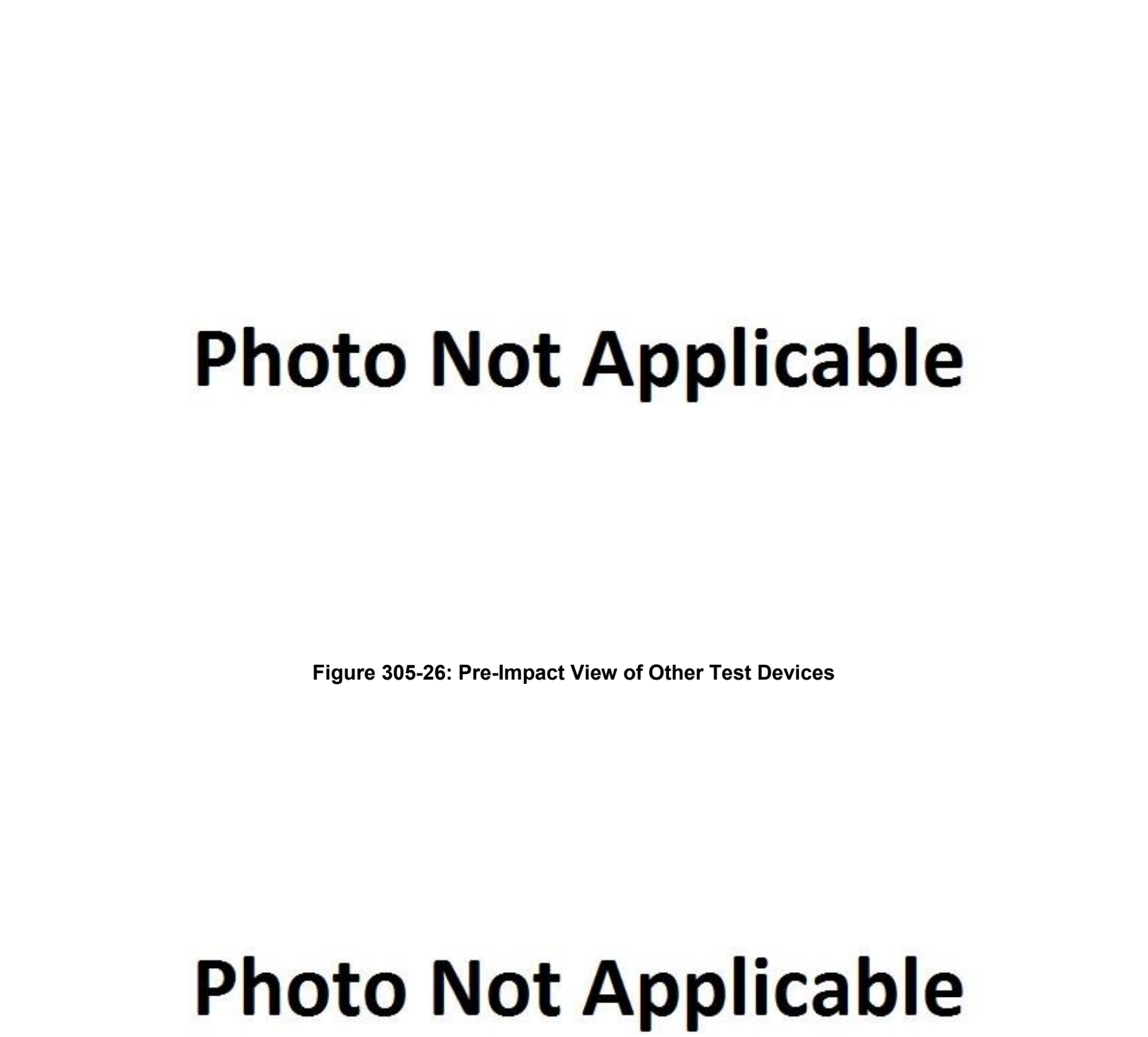


Figure 305-27: Post-Impact View of Other Test Devices

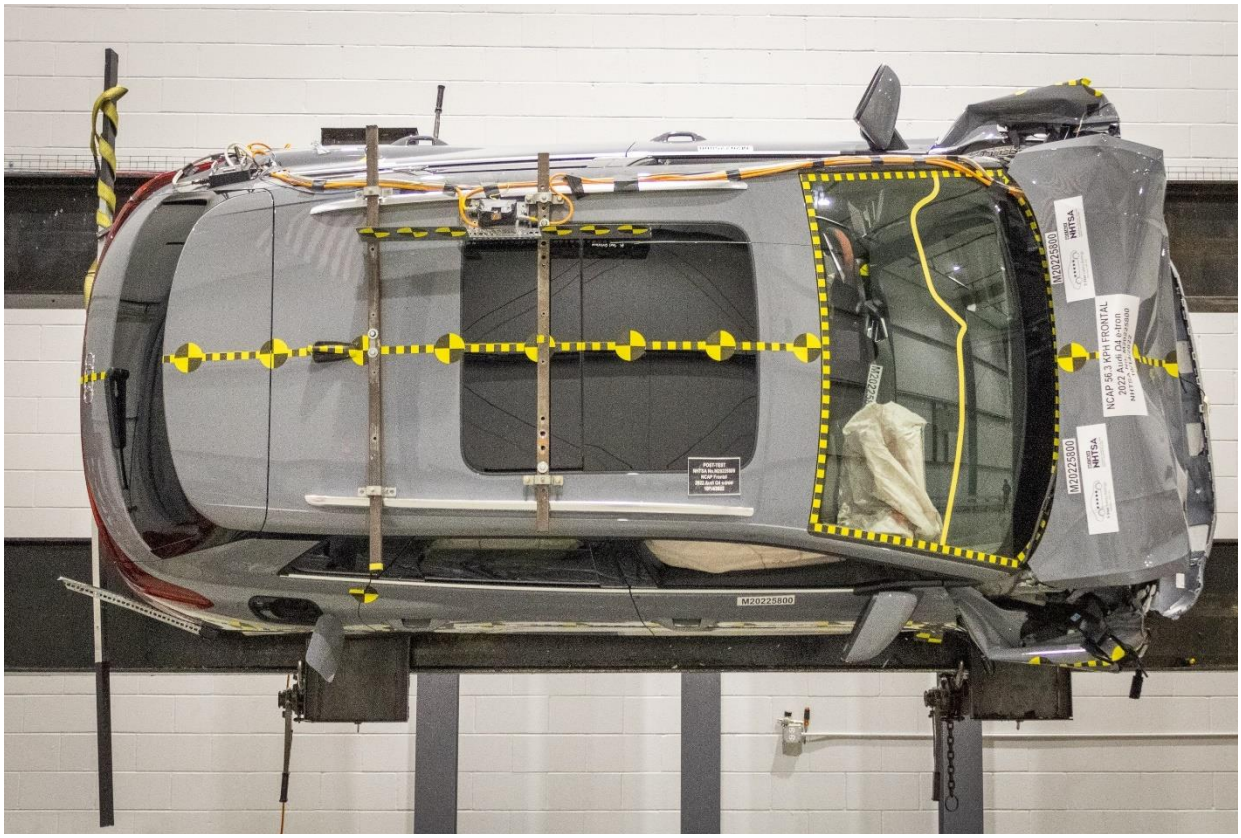


Figure 305-28: FMVSS No. 305 Static Rollover 90 Degrees

Figure 305-29: FMVSS No. 305 Static Rollover 180 Degrees

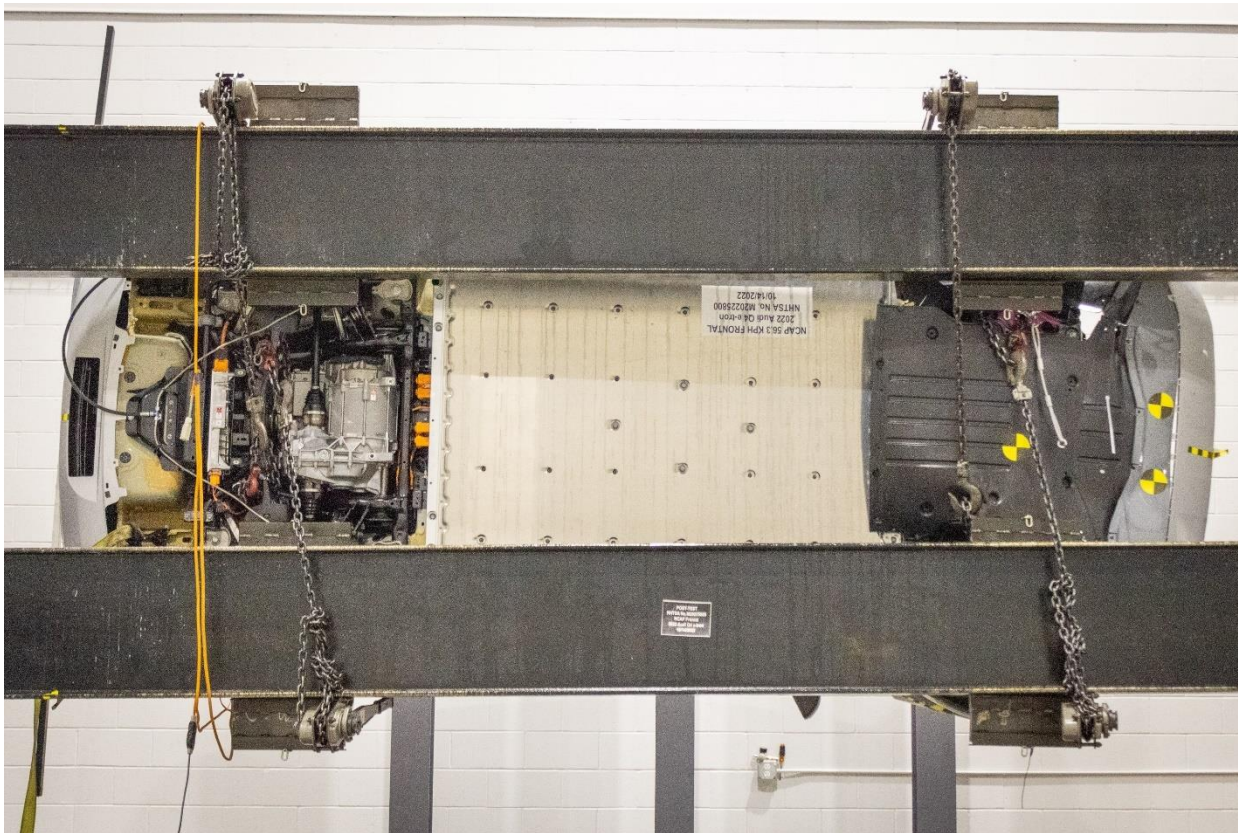


Figure 305-30: FMVSS No. 305 Static Rollover 270 Degrees

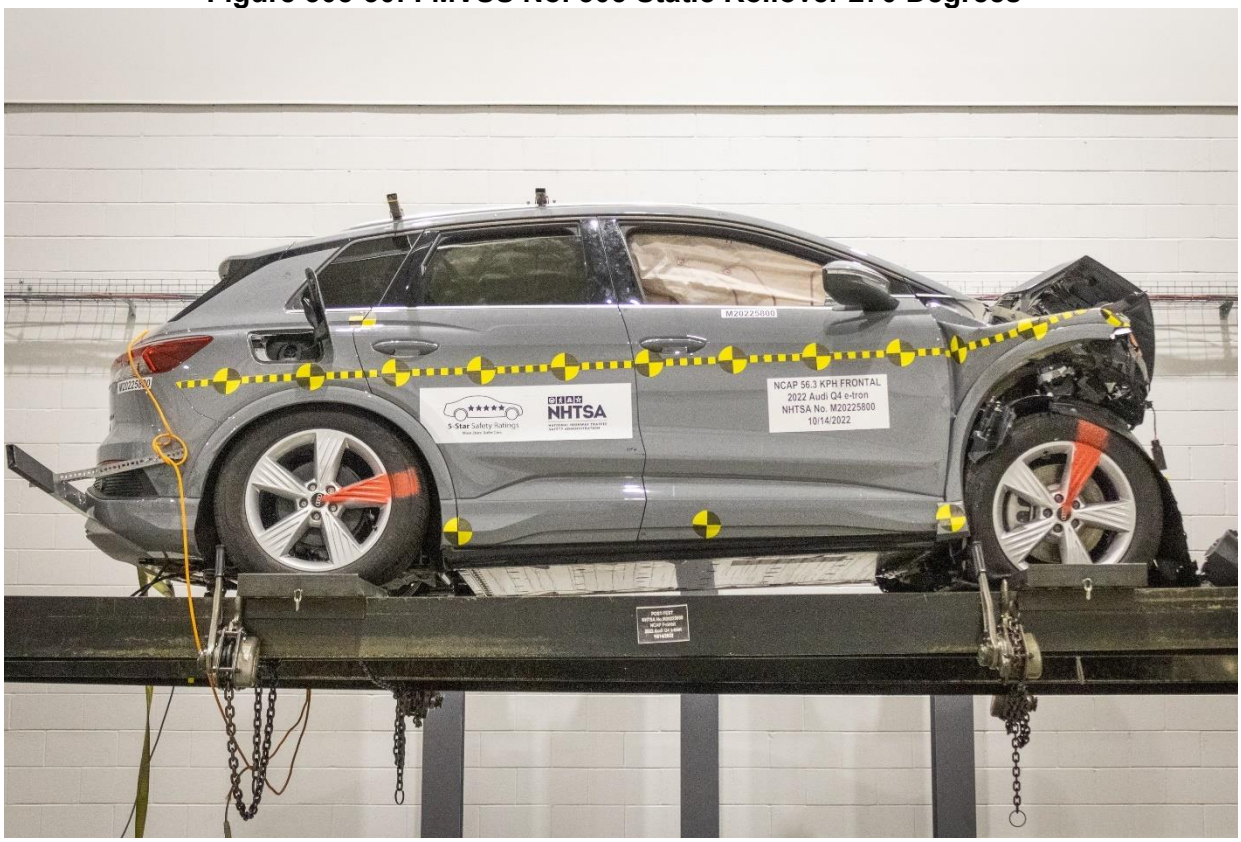


Figure 305-31: FMVSS No. 305 Static Rollover 360 Degrees

Figure 305-32: Pre-Impact View of the Vehicle Passenger Compartment Adjacent to Propulsion Battery

Figure 305-33: Post-Impact View of the Vehicle Passenger Compartment Adjacent to Propulsion Battery

Figure 305-34: Post-Impact Propulsion Battery System Mounting and-or Intrusion Failure(s)

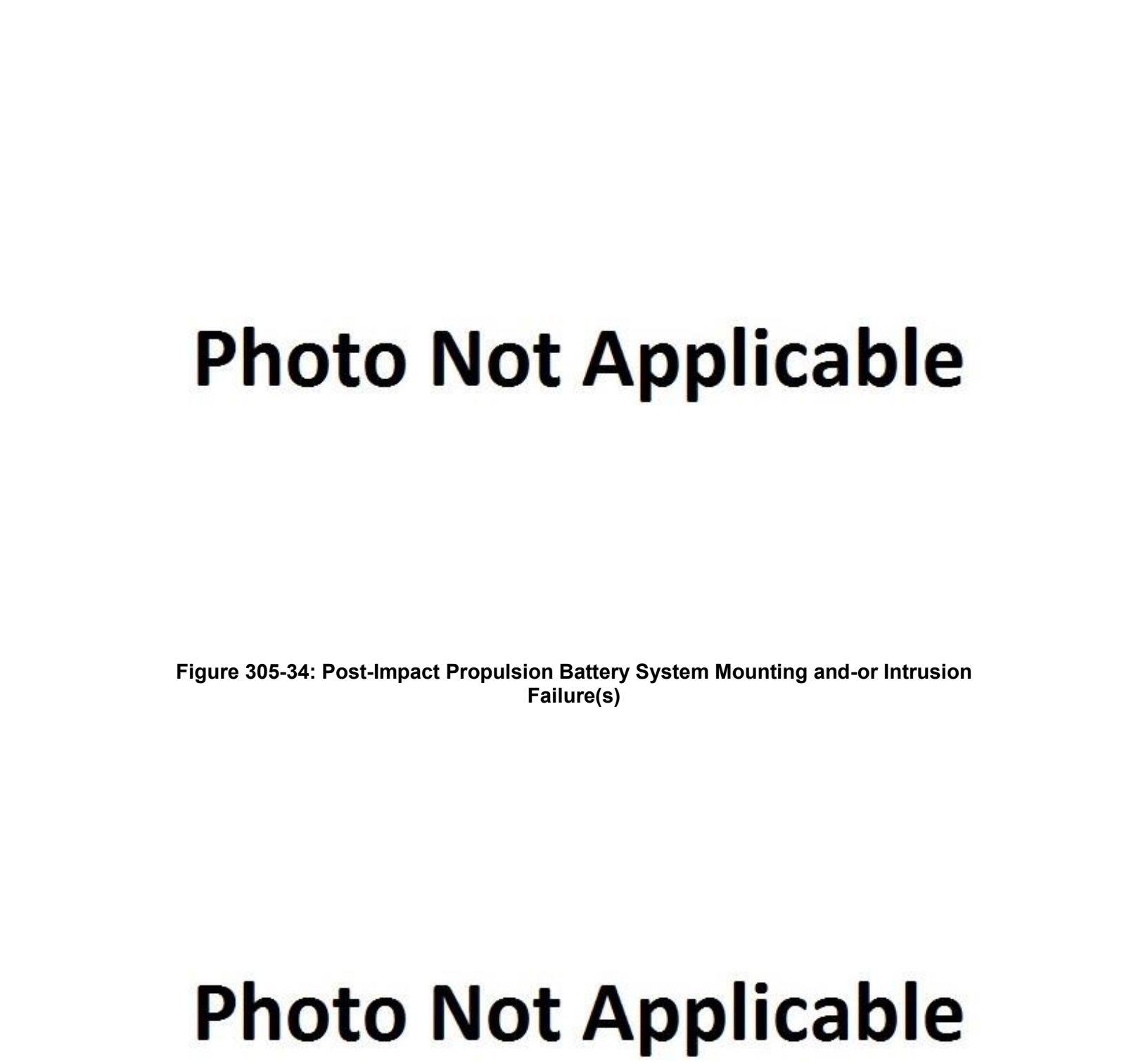


Figure 305-35: Post-Impact View of Battery Component Intrusion (if applicable)

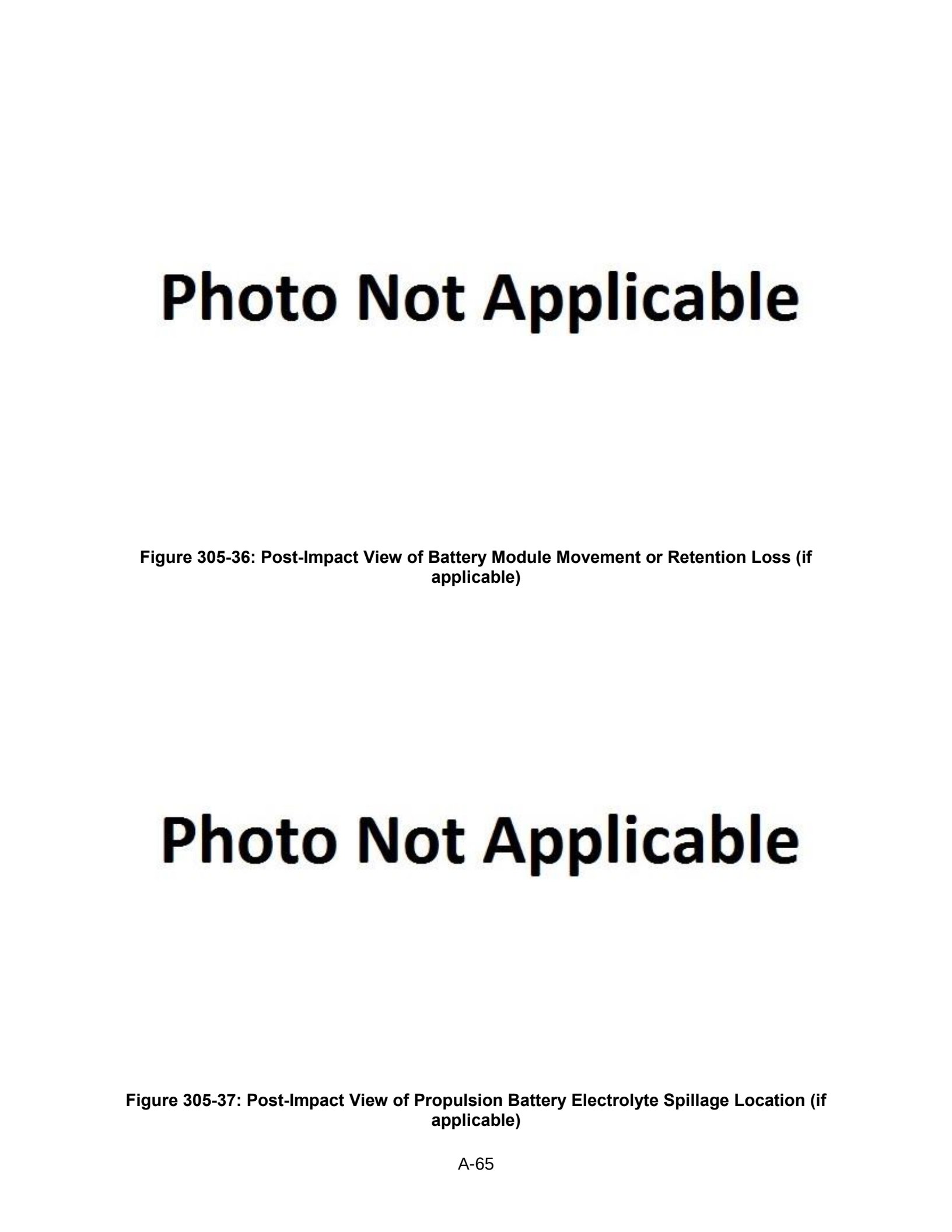


Figure 305-36: Post-Impact View of Battery Module Movement or Retention Loss (if applicable)

Figure 305-37: Post-Impact View of Propulsion Battery Electrolyte Spillage Location (if applicable)

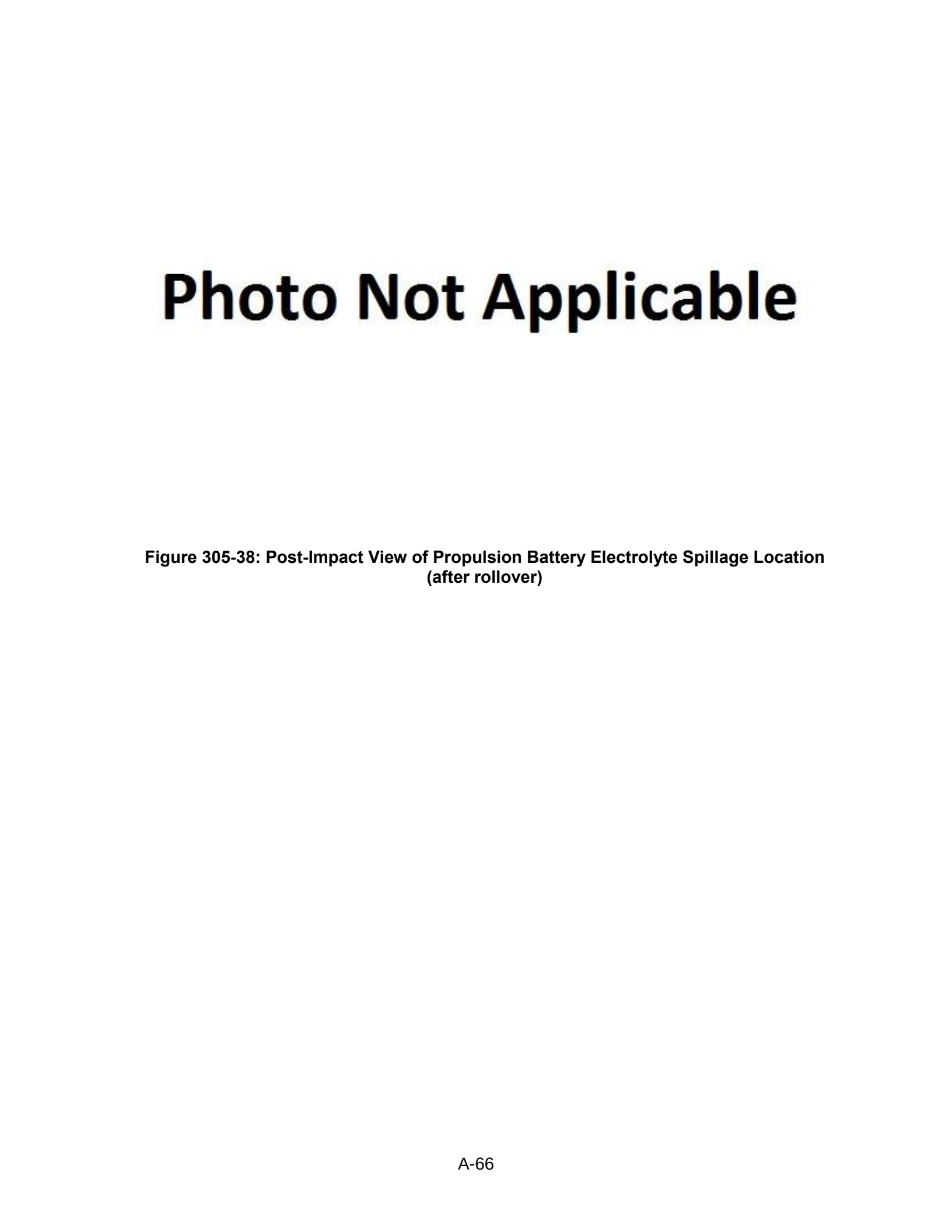


Figure 305-38: Post-Impact View of Propulsion Battery Electrolyte Spillage Location (after rollover)

APPENDIX B
VEHICLE & DUMMY RESPONSE DATA TRACES

Table of Data Plots

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

Driver Head X Acceleration Redundant
Driver Head Y Acceleration Redundant
Driver Head Z Acceleration Redundant
Driver Upper Neck Force Y
Driver Upper Neck Moment X
Driver Upper Neck Moment Z
Driver Chest X Acceleration Redundant
Driver Chest Y Acceleration Redundant
Driver Chest Z Acceleration Redundant
Driver Pelvis X
Driver Pelvis Y
Driver Pelvis Z
Driver Left Femur Redundant
Driver Right Femur Redundant
Driver Left Upper Tibia Moment X
Driver Left Upper Tibia Moment Y

Driver Left Upper Tibia Force Z
Driver Left Lower Tibia Moment X
Driver Left Lower Tibia Moment Y
Driver Left Lower Tibia Force Z
Driver Right Upper Tibia Moment X
Driver Right Upper Tibia Moment Y
Driver Right Upper Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver Right Lower Tibia Force Z
Driver Left Foot Fore Z
Driver Left Foot Aft X
Driver Left Foot Aft Z
Driver Right Foot Fore Z
Driver Right Foot Aft X
Driver Right Foot Aft Z
Driver Shoulder Belt Force
Driver Lap Belt Force
Driver Head Angular Velocity X
Driver Head Angular Velocity Y
Driver Head Angular Velocity Z
Passenger Head X Acceleration Redundant
Passenger Head Y Acceleration Redundant
Passenger Head Z Acceleration Redundant
Passenger Upper Neck Force X
Passenger Upper Neck Force Z
Passenger Upper Neck Moment Y
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 Food Fore Z
Passenger Right Foot Aft X
Passenger Right Foot Aft Z
Passenger Shoulder Belt Force
Passenger Lap Belt Force
Passenger Head Angular Velocity X
Passenger Head Angular Velocity Y
Passenger Head Angular Velocity Z
Left Rear Seat Crossmember X
Left Rear Seat Crossmember Z
Right Rear Seat Crossmember X
Right Rear Seat Crossmember Z
Left Rear Seat Crossmember X Redundant
Right Rear Seat Crossmember X Redundant
Vehicle Engine Top X
Vehicle Engine Bottom X
Load Cell Barrier Forces and Moments

APPENDIX C

DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

HYBRID III 50TH PERCENTILE MALE - DRIVER ATD

SERIAL NO: 142

CALIBRATION TEST RESULTS

PRE-TEST

HYBRID III 5TH PERCENTILE - PASSENGER ATD

SERIAL NO: 288

CALIBRATION TEST RESULTS

POST-TEST

HYBRID III 50TH PERCENTILE MALE - DRIVER ATD

SERIAL NO: 1046

CALIBRATION TEST RESULTS

POST-TEST

HYBRID III 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL NO: 288

APPENDIX D

DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

Table 1 – Driver Dummy Instrumentation

Instrumentation		Axis/Location	Hybrid III 50th S/N: 142		
			Serial Number	Manufacturer	Calibration Date
Head Accelerometers	Primary	X	P51681	Endevco	9/30/2022
		Y	P64151	Endevco	9/30/2022
		Z	P52114	Endevco	9/30/2022
	Redundant	X	P52079	Endevco	9/30/2022
		Y	P58905	Endevco	9/30/2022
		Z	P63996	Endevco	9/30/2022
Head Angular Rate Sensors		X	15693	DTS ARS	3/15/2022
		Y	15224	DTS ARS	3/15/2022
		Z	14919	DTS ARS	3/15/2022
Upper Neck Load Cell		FX, Fy, Fz MX,MY, MZ	2187-FX	Denton	6/13/2022
Chest Accelerometers	Primary	X	P51991	Endevco	9/30/2022
		Y	P51269	Endevco	9/30/2022
		Z	P49185	Endevco	9/30/2022
	Redundant	X	P68059	Endevco	9/30/2022
		Y	P51713	Endevco	9/30/2022
		Z	P78824	Endevco	9/30/2022
Chest Potentiometer		X	0075	JDK	10/3/2022
Pelvis Accelerometer		X	P58800	Endevco	9/30/2022
		Y	P52157	Endevco	9/30/2022
		Z	P83317	Endevco	9/30/2022
Femur Load Cells - Left	Primary	Z	DI4211-FZ1	Denton	6/14/2022
	Redundant	Z	DI4211-FZ2	Denton	6/14/2022
Femur Load Cells - Right	Primary	Z	115-FZ1	Denton	6/14/2022
	Redundant	Z	115-FZ2	Denton	6/14/2022
Tibia Load Cells - Left	Upper	MX, MY, FZ	407-FZ	Denton	6/10/2022
	Lower	MX, MY, FZ	396-FZ	Denton	6/9/2022
Tibia Load Cells – Right	Upper	MX, MY, FZ	362-FZ	Denton	6/9/2022
	Lower	MX, MY, FZ	364-FZ	Denton	6/9/2022
Foot Accelerometers - Left	Rear	X	P82756	Endevco	9/30/2022
	Front	Z	P51872	Endevco	9/30/2022
Foot Accelerometers - Right	Rear	X	P66942	Endevco	9/30/2022
	Front	Z	P58779	Endevco	9/30/2022
Seat belt Load Cells	Lap		NA	NA	NA
	Shoulder		168	GFE	6/10/2022

Table 2 – Front Passenger Dummy Instrumentation

Instrumentation		Axis/Location	Hybrid III 5th S/N: 137		
			Serial Number	Manufacturer	Calibration Date
Head Accelerometers	Primary	X	P79417	Endevco	7/18/2022
		Y	P83335	Endevco	7/18/2022
		Z	P64149	Endevco	7/18/2022
	Redundant	X	P52008	Endevco	7/18/2022
		Y	P52045	Endevco	7/18/2022
		Z	P74774	Endevco	7/18/2022
Head Angular Rate Sensors		X	15217	DTS	3/15/2022
		Y	15697	DTS PRO-18K	3/16/2022
		Z	15696	DTS ARS	3/16/2022
Upper Neck Load Cell		FX, Fy, Fz MX,MY, MZ	1916-FX	Humanetics	6/10/2022
Chest Accelerometers	Primary	X	T21142	Endevco	7/18/2022
		Y	P83346	Endevco	7/18/2022
		Z	P49190	Endevco	7/18/2022
	Redundant	X	P58794	Endevco	7/18/2022
		Y	P69791	Endevco	7/18/2022
		Z	T11253	Endevco	7/18/2022
Chest Potentiometer		X	0720	Servo	7/18/2022
Pelvis Accelerometer		X	P58735	Endevco	7/18/2022
		Y	P77587	Endevco	7/18/2022
		Z	P51285	Endevco	7/18/2022
Femur Load Cells - Left	Primary	Z	135-FZ1	Denton	6/14/2022
	Redundant	Z	135-FZ2	Denton	6/14/2022
Femur Load Cells - Right	Primary	Z	136-FZ1	Denton	6/14/2022
	Redundant	Z	136-FZ2	Denton	6/14/2022
Tibia Load Cells - Left	Upper	MX, MY, FZ	364-FZ	Denton	6/10/2022
	Lower	MX, MY, FZ	398-FZ	Denton	6/8/2022
Tibia Load Cells – Right	Upper	MX, MY, FZ	368-FZ	Denton	6/10/2022
	Lower	MX, MY, FZ	490-FZ	Denton	6/8/2022
Foot Accelerometers - Left	Rear	X	P78959	Endevco	7/18/2022
	Front	Z	P83418	Endevco	7/18/2022
Foot Accelerometers - Right	Rear	X	P83428	Endevco	7/18/2022
	Front	Z	P80265	Endevco	7/18/2022
Seat belt Load Cells	Lap		NA	NA	NA
	Shoulder		298	GFE	6/10/2022

Table 3 – Vehicle Instrumentation

Instrumentation			Axis	Serial Number	Manufacturer	Calibration Date
Crossmember/Rear Seat Accelerometers	Left	Primary	X	A255841	Measurement Specialties	7/21/2022
			Z	A400764	Measurement Specialties	7/21/2022
		Redundant	X	A335453	Measurement Specialties	7/21/2022
	Right	Primary	X	A400760	Measurement Specialties	8/23/2022
			Z	A405576	Measurement Specialties	8/23/2022
		Redundant	X	A400767	Measurement Specialties	8/23/2022
Engine Accelerometers	Top		X	A302689	Measurement Specialties	9/27/2022
	Bottom		X	A428047	Measurement Specialties	7/8/2022