REPORT NUMBER: 305-CAL-08-05

SAFETY COMPLIANCE TESTING FOR FMVSS 305 ELECTRIC POWERED VEHICLES: ELECTROLYTE SPILLAGE AND ELECTRICAL SHOCK PROTECTION

FORD MOTOR COMPANY
2010 FORD FUSION HYBRID
4-DOOR SEDAN

NHTSA NUMBER: CA0200

CALSPAN
TRANSPORTATION SCIENCES CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225

June 29,2009

FINAL REPORT

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance (NVS-224)
1200 New Jersey Avenue, SE
Washington, DC 20590

This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-06-C-00031. This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufactures' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

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16. Abstract

Compliance tests were conducted on the subject 2010 Ford Fusion Hybrid 4-door Sedan in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-305-00 for the determination of FMVSS 305 compliance. Test failures identified were as follows:

The test vehicle appeared to comply with all requirements of FMVSS 305 "Electric Powered Vehicles: Electrolyte Spillage and Electrical Shock Protection."

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SECTION 1

PURPOSE AND TEST PROCEDURE

This rear impact test is part of the FMVSS 305 Compliance Test Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-06-C-00031. The purpose of this test was to determine if the subject vehicle, a 2010 Ford Fusion Hybrid 4-door Sedan, meets the performance requirements of FMVSS No. 305 "Electric Powered Vehicles: Electrolyte Spillage and Electrical Shock Protection." The test was conducted in accordance with the Office of Vehicle Safety Compliance's Laboratory Test Procedure (TP-305D-00, dated December 29, 2005).

SECTION 2

COMPLIANCE TEST RESULTS SUMMARY

A 1876 kg 2010 Ford Fusion Hybrid 4-door Sedan was impacted from the rear by an 1797 kg moving barrier at a velocity of 79.8 kph (49.6 mph). The test was performed by Calspan Corporation on June 29,2009.

The test vehicle was equipped with a 66.2 liter fuel tank which was filled to 92 percent capacity with stoddard fluid prior to impact. Additional ballast (30 kg) was secured in the vehicle cargo area. Two ballast Part 572E 50th percentile male Anthropomorphic Test Device (ATD) were placed in the front occupant seating positions.

The crash event was recorded by three high-speed cameras and one real-time camera. High-speed camera locations and other pertinent camera information are found on page 3-8 of this report. Pre- and post-test photographs of the vehicle can be found in Appendix A.

There was no fuel system fluid or propulsion battery electrolyte spillage following the impact or during any portion of the static rollover test. The vehicle appeared to comply with all the requirements of FMVSS 305 "Electric Powered Vehicles: Electrolyte Spillage and Electrical Shock Protection."

SECTION 3

SUMMARY OF TEST RESULTS

DATA SHEET 1

TEST VEHICLE SPECIFICATIONS

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2010 Ford Fusion Hybrid 4-door Sedan

Vehicle Body Color: Black NHTSA Number: CA0200

Engine Data: 4 Cylinders; - CID; 2.5 Liters; - cc

Transmission: CV Speed; - Manual; X Automatic; - Overdrive

Final Drive: - Rear Wheel Drive; X Front Wheel Drive; - Four Wheel Drive

MAJOR TEST VEHICLE OPTIONS:

X AC; X Pwr Steering; X Power Brakes; X Power Locks; X Power Seats

X ABS; X Tilt Wheel; - Stab Control X Traction Control X Anti-Theft

DEALER AND DELIVERY INFORMATION:

Date Received: 5/21/09 ; Odometer Reading 77 km

Selling Dealer: West Herr Ford

Dealer Address: 5025 Camp Rd Hamburg, New York 14075

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufacturer: Ford Motor Company

Vehicle Build Date: 04/09

VIN:: 3FADP0L38AR132742

GVWR: 2132 kg; GAWR: 1130 kg FRONT; 1002 kg REAR

DATA FROM VEHICLE'S TIRE LABEL AND SIDEWALL:

Location of Tire Placard: Rear Trunk

Type of Spare Tire: Temporary

	Front	Rear
Maximum Tire Pressure (sidewall - kPa)	300	300
Cold Pressure (tire placard - kPa) – test pressure	230	230
Recommended Tire Size (tire placard)	P225/50R17	P225/50R17
Vehicle Tire Size with load index & speed symbol	P225/50R17 93V	P225/50R17 93V
Tire Manufacturer	Michelin	Michelin
Tire Name	Energy	Energy
Treadwear, Traction, Temperature	440 A A	440 A A

VEHICLE CAPACITY DATA:

Type of Front Seats: - Bench; X Bucket; - Split Bench

Number of Occupants: 2 Front; 3 Rear; 5 Total

Vehicle Capacity Weight (VCW) = 385 kg

No. of Occupants x 68.04 kg = 340 kg

Rated Cargo/Luggage Weight (RCLW) = 45 kg

ELECTRIC VEHICLE PROPULSION SYSTEM:

Electric Vehicle Type: - Electric; X Electric/Hybrid

Propulsion Battery Type: NiMH Traction Battery

Nominal Voltage: 230 V

Location of Automatic Propulsion Battery Disconnect Interior of Traction Battery System

Auxiliary Battery Type: N/A

DATA SHEET 2

PRE-TEST DATA

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (with maximum fluids)= UDW:

	Left Side (kg)	Right Side (kg)	Ratio (%)	Total (kg)
Front =	499	510	59.6	1009.0
Rear =	362	321	40.4	683.0
			Total Delivered Weight (UDW) =	1692.0

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight (UDW) =	1692.0	kg
Rated Cargo/Luggage Weight (RCLW) =	45	kg
Weight of 2 p.572E Dummies @ 78 each =	156	kg
TARGET TEST WEIGHT =	1893.0	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 28.0 KG OF CARGO WEIGHT:

	Left Side (kg)	Right Side (kg)	Ratio (%)	Total (kg)
Front =	558	559	59.5	1117.0
Rear =	394	365	40.5	759.0
			Total Vehicle Test Weight (ATW) =	1876.0

Weight of Ballast Secured in Vehicle[1] = 30 kg Ballast Type Lead Shot Bags

Method of securing Ballast: Compartment Placement

Components Removed for Weight Reduction: None

VEHICLE ATTITUDE (all dimension in millimeters):

	Left Front	Right Front	Left Rear	Right Rear	CG[2]
AS DELIVERED:	722	733	722	720	1101
AS TESTED:	703	713	709	712	1104

Vehicle's Wheel Base: 2729 mm

[1]Ballast weight does not include the weight of instrumentation, on-board cameras and data acquisition system

[2]Rearward of the front axle centerline.

VEHICLE PRE-TEST WIDTH AND IMPACT OFFSET MEASUREMENT:

Vehicle Width at Widest Point: 1822 mm Location: Rear Axle

Centerline offset for impact line: 1275 mm

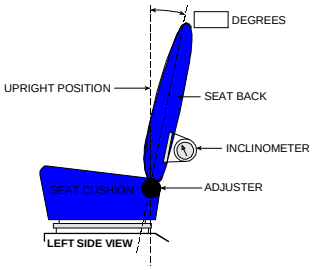
Filler neck side (left/right) Left

DATA SHEET 2 (continued)

PRE-TEST DATA

Vehicle: 2010 Ford Fusion Hybrid 4-door Sedan NHTSA No. CA0200

Nominal 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.



FRONT SEAT ASSEMBLY

Seat back angle for driver's seat: 10.8

Measurement instructions: Seat back was set to 10.8 degrees on head restraint post with sill level

Seat back angle for passenger's seat: 10.8

Measurement instructions: Seat back was set to 10.8 degrees on head restraint post with sill level

2. SEAT FORE AND AFT POSITIONING:

Positioning of the driver's seat: Full forward – Full rear = Travel 296 mm. Seat was positioned at 147 mm on face of the cushion while in full down.

Positioning of the passenger's seat: Full forward – Full rear = Travel 250 mm. Seat was positioned at 125 mm on face of the cushion while in full down.

3. FUEL TANK CAPACITY DATA:

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 66.2 liters

B. "Usable Capacity" of the optional equipment fuel tank is - liters

C. "Usable Capacity" of the vehicle(s) used for certification testing to requirements of FMVSS 301 = 60.9 to 62.2 liters

3.2 Actual Amount of Stoddard solvent added to vehicle for test = 61.6 liters

3.3 Is vehicle equipped with electric fuel pump? Yes- X ; No- -

If YES, explain the vehicle operating conditions under which the fuel pump will pump fuel.

With ignition turned "ON"

4. STEERING COLUMN ADJUSTMENTS:

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine the geometric center.

Operational Instructions: Telescopic travel was 30 mm; centered at 15 mm. Tilt wheel was centered at Center of loci: face of wheel was set at 22.7 degrees

DATA SHEET 1 (continued)

GENERAL TEST VEHICLE PARAMETER DATA

Vehicle: 2010 Ford Fusion Hybrid 4-door Sedan NHTSA No. CA0200

5. SEAT BELT UPPER ANCHORAGE:

Nominal design riding position: 4 detents available – set at detent 1 with 0 as uppermost

6. PROPULSION BATTERY SYSTEM DATA (COTR SUPPLIED):

Electrolyte Fluid Type:	Alkaline
Electrolyte Fluid Specific Gravity:	1.3 grams / cc
Electrolyte Fluid Kinematic Viscosity:	1.75 centistokes at 25ºC
Electrolyte Fluid Color	Clear Liquid
Propulsion Battery Coolant Type,	Air
Color and Specific Gravity:	N/A

Location of Battery Modules: X In Occupant Compartment - Outside Occupant Compartment

7. PROPULSION BATTERY STATE OF CHARGE

Maximum State of Charge:	290 – 330 volts
Test Voltage (≥95% of maximum)	-
OR	
Range of Normal Operating Voltage:	-
Test Voltage (within range)	-

8. Details of Chassis Ground Points and Locations:

By removing the rear seat, located behind the seats trim panel located between the rear door opening and rear seat, a Grounding weld nut is found.

9. Details of Propulsion Battery Components:

The main battery is located behind the rear passenger seat. Propulsion unit located in engine compartment.

10. Comments:

None

DATA SHEET 3

MOVING DEFORMABLE BARRIER (MDB) DATA

Vehicle: 2010 Ford Fusion Hybrid 4-door Sedan NHTSA No. CA0200

MDB FACE MANUFACTURER AND SERIAL NUMBER:

Plascore Block Numbers: 139B1008 124B0309 Unit Number: A0409029

MDB DETAILS:

Overall Width of Framework Carriage	=	1250	millimeters
Overall Length of MDB (incl. honeycomb impact face)	=	4120	millimeters
Wheelbase of Framework Carriage	=	2591	millimeters
Tread of Framework Carriage (Front & Rear)	=	1875	millimeters
C.G. Location Rearward of Front Axle	=	1139	millimeters

MDB WEIGHT:

Left Front	=	357.0	kg	Left Rear	=	323.0	kg
Right Front	=	404.0	kg	Right Rear	=	273.5	kg
TOTAL FRONT =		761.0	kg	TOTAL REAR	=	596.5	kg
TOTAL MDB WEIGHT =		1357.5	kg				

Tires (Mfr, line, size): -

TIRE PRESSURE:

Left Front	=	207	kPa	Left Rear	=	207	kPa
Right Front	=	207	kPa	Right Rear	=	207	kPa

Brake Abort System? (Yes/No) Yes

Date of Last Calibration: 06/07

DATA SHEET 4

PRE-IMPACT ELECTRICAL ISOLATION MEASUREMENTS & CALCULATIONS

Vehicle: 2010 Ford Fusion Hybrid 4-door Sedan NHTSA No. CA0200

VOLTMETER INFORMATION:

Make:	Fluke	**Model:**	87	**S/N:**	65280327
Internal Resistance Value:		0.12	**MΩ**		
Resolution:		.001	**V**		
Last Calibration Date:		4/10/2009			

Propulsion Battery Voltage : (ready to drive position)	V_b	=	260.5	V
Propulsion Battery to Vehicle Chassis:	V_1	=	230	V
Propulsion Battery to Vehicle Chassis:	V_2	=	230	V
Propulsion Battery to Vehicle Chassis Across Known Resistor:	R_o	=	120k	Ω
Propulsion Battery to Vehicle Chassis with R_o installed:	V_1'	=	0.06	V
Propulsion Battery to Vehicle Chassis: with R_o installed:	V_2'	=	0.05	V

ELECTRICAL ISOLATION MEASUREMENTS:

R_{i1}:	919760	kΩ	$R_{i1}= R_o*(1+V_2/V_1)*[(V_1-V_1')/V_1']$
R_{i2}:	1103760	kΩ	$R_{i2}= R_o*(1+V_1/V_2)*[(V_2-V_2')/V_2']$
R_i	919760	kΩ	Lesser value of R_{i1} and R_{i2}
R_i/V_b	3530749	Ω/V	Electrical Isolation Value

	Yes/No
Is the Electrical Isolation Value ≥ 500 Ω/V?	YES

If NO - Failure

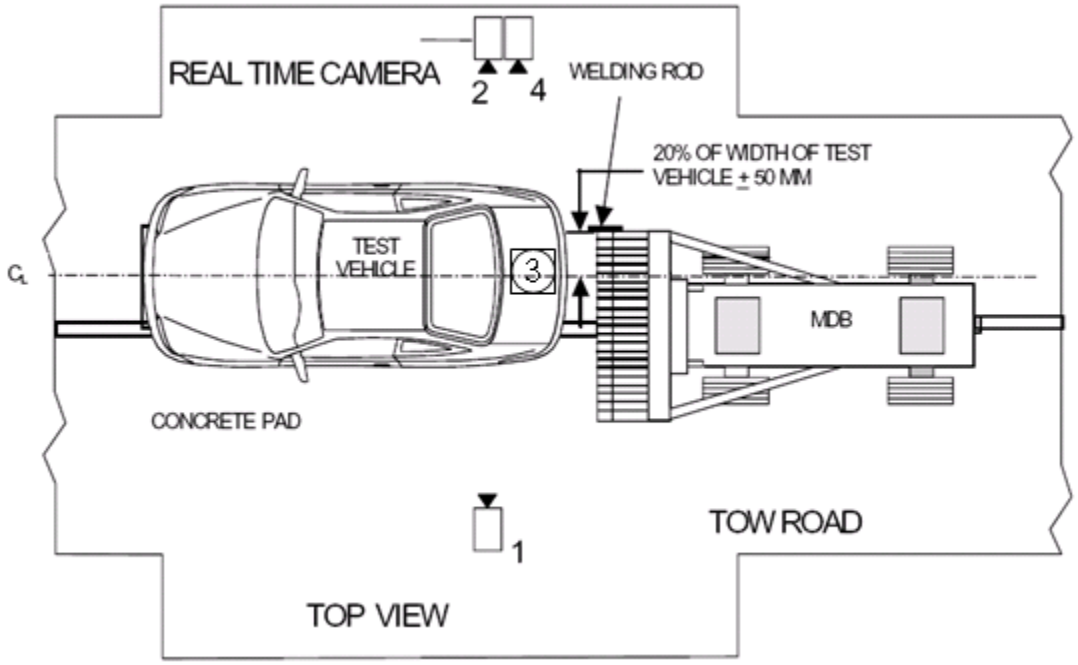
Comments:

None

DATA SHEET 5

HIGH SPEED CAMERA LOCATIONS AND DATA SUMMARY

Vehicle: 2010 Ford Fusion Hybrid 4-door Sedan NHTSA No. CA0200



Camera No.	View	Coordinates (millimeters)			Angle (deg.)	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
1	Left Side View	7345	1195	1094	-3	24	1000
2	Real-Time Camera	-	-	-	-	-	30
3	Overhead View	0	405	4880	-90	20	1000
4	Right Side View	7850	1345	959	-5	24	1000

* Reference (from point of impact); all measurements accurate to within ±6 mm.

X = (Impact Point) + Forward
Y = (Impact Point) + To Right
Z = (Ground Level) + Down

DATA SHEET 6

POST-TEST DATA

Vehicle: 2010 Ford Fusion Hybrid 4-door Sedan NHTSA No. CA0200

REQUIRED IMPACT VELOCITY RANGE:: 78.5 to 80.1 km/h

ACTUAL IMPACT VELOCITY WITHIN 1.5 M OF IMPACT PLANE:

Trap No. 1 = 79.8 km/h Trap No. 2 = 79.8 km/h

Average Impact Speed = 79.8 km/h

WELDING ROD IMPACT POINT:

-10 Vertical distance from target center (+ is above) Tolerance: ±40 mm

-30 Horizontal distance from target center (+ is right) Tolerance: ±50 mm

STODDARD SOLVENT SPILLAGE MEASUREMENT:

A. Front impact until vehicle motion ceases -

Actual = 0 g Maximum Allowable = 28 g

B. For 5 minute period after vehicle motion ceases -

Actual = 0 g Maximum Allowable = 28 g

C. For next 25 minutes -

Actual = 0 g/minute Maximum Allowable = 28 g/minute

D. Provide Spillage Details:

None

ELECTROLYTE SPILLAGE MEASUREMENT:

Is propulsion battery electrolyte spillage visible in occupant compartment? - Yes (fail) X No

For 30 minutes until vehicle motion ceases -

Actual = 0 L Maximum Allowable = 5 L

Provide Spillage Details:

None

DATA SHEET 6

POST-TEST DATA (Continued)

Vehicle: 2010 Ford Fusion Hybrid 4-door Sedan NHTSA No. CA0200

POST TEST SEAT DATA

LOCATION	SEAT MOVEMENT (mm)	SEAT BACK FAILURE
P1 (Left Front)	46 rearward	None – Reclined during impact
P2 (Right Front)	0	None – Reclined during impact

POST TEST ATD CONTACT DATA

LOCATION	Position 1 (Driver)	Position 2 (Passenger)
Head	Rear of head to head restraint	Rear of head to head restraint
Chest	No Contact	No Contact
Abdomen	No Contact	No Contact
Left Knee	No Contact	No Contact
Right Knee	No Contact	No Contact

VEHICLE DIMENSIONS:

Vehicle length:

	Left Side	Centerline	Right Side
Pre-Test	4715	4846	4715
Post-Test	4023	4125	4226
Crush	692	721	489

Vehicle Wheel Base:

	Left Side	Right Side
Pre-Test	2725	2732
Post-Test	2622	2743
Crush	103	-11

DATA SHEET 7

POST-IMPACT ELECTRICAL ISOLATION MEASUREMENTS & CALCULATIONS

Vehicle: 2010 Ford Fusion Hybrid 4-door Sedan NHTSA No. CA0200

VOLTMETER INFORMATION:

Make: Fluke Model: 87 S/N: 65280327

Internal Impedance Value 0.12 MΩ

Normal Propulsion Battery Voltage (V_b): 5.69 V

ELECTICAL ISOLATION MEASUREMENTS

V_1 =	3.0	V Impact		Time:	2	minutes	00	seconds
V_2 =	3.5	V Impact		Time:	2	minutes	00	seconds
V_1' =	.006	V Impact		Time:	2	minutes	00	seconds
V_2' =	.001	V Impact		Time:	2	minutes	00	seconds
R_{i1} =	129740	Ω Impact	$R_{i1}= R_o*(1+V_2/V_1)*[(V_1-V_1')/V_1']$	Time:	2	minutes	00	seconds
R_{i2} =	779777	Ω Impact	$R_{i2}= R_o*(1+V_1/V_2)*[(V_2-V_2')/V_2']$	Time:	2	minutes	00	seconds
R_i =	129740	Ω Impact	Lesser value of R_{i1} and R_{i2}	Time:	2	minutes	00	seconds
R_i/V_b=	2761404	Ω Impact		Time:	2	minutes	00	seconds

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

PROPULSION BATTERY SYSTEM COMPONENTS

Describe Propulsion Battery Module movement within occupant compartment:

None

Has the Propulsion Battery Module moved within the occupant compartment? - Yes(Fail) X No

Describe intrusion of an outside Propulsion Battery Component into the occupant compartment:

None

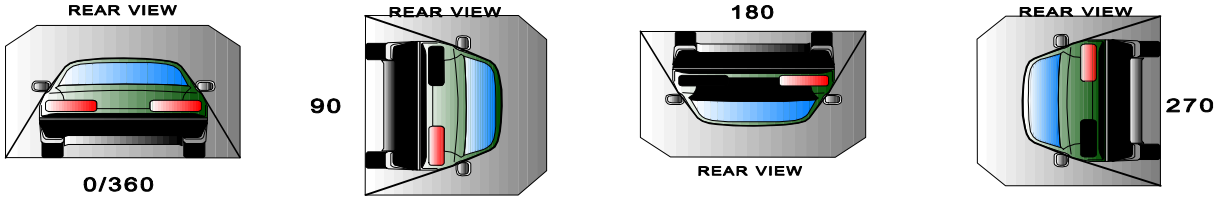
Has an outside Propulsion Battery Component intruded into the occupant compartment? - Yes(Fail) X No

Is Propulsion Battery electrolyte spillage visible in the occupant compartment? - Yes(Fail) X No

DATA SHEET 8

FMVSS 301 ROLLOVER DATA

Vehicle: 2010 Ford Fusion Hybrid 4-door Sedan NHTSA No.: CA0200



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Stage	Rotation Time (spec. 1 -3 min)				FMVSS 301 Hold Time		Total Time				Next Whole Minute Interval	
0º - 90º	1	minutes	08	seconds	5	minutes	6	minutes	8	seconds	7	minutes
90º - 180º	1	minutes	03	seconds	5	minutes	6	minutes	3	seconds	7	minutes
180º-270º	1	minutes	04	seconds	5	minutes	6	minutes	4	seconds	7	minutes
270º-360º	1	minutes	09	seconds	5	minutes	6	minutes	9	seconds	7	minutes

II. FMVSS 301 REQUIREMENTS: (Maximum allowable solvent spillage):

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
142 g	28 g	28 g	28 g

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

Rollover Stage	First 5 minutes from onset of rotation (g)	6th min. (g)	7th min. (g)	8th min. (if required) (g)
0º - 90º	0	0	0	N/A
90º - 180º	0	0	0	N/A
180º-270º	0	0	0	N/A
270º-360º	0	0	0	N/A

Note: Record spillage for whole minute intervals only as determined above.

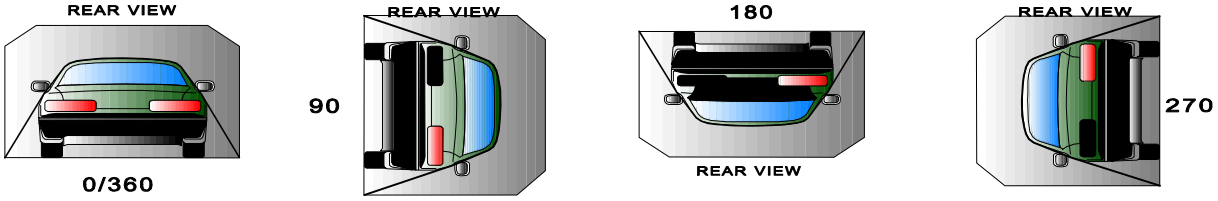
IV. SOLVENT SPILLAGE LOCATION(S):

Rollover Stage	Spillage Location
0º - 90º	None
90º - 180º	None
180º-270º	None
270º-360º	None

DATA SHEET 9

FMVSS 305 ROLLOVER DATA

Vehicle: 2010 Ford Fusion Hybrid 4-door Sedan NHTSA No.: CA0200



I. 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	
0º - 90º	1	minutes	08	seconds	5	minutes	6	minutes	8	seconds	7	minutes
90º - 180º	1	minutes	03	seconds	5	minutes	6	minutes	3	seconds	7	minutes
180º-270º	1	minutes	04	seconds	5	minutes	6	minutes	4	seconds	7	minutes
270º-360º	1	minutes	09	seconds	5	minutes	6	minutes	9	seconds	7	minutes

II. ACTUAL TEST VEHICLE PROPULSION BATTERY ELECTROLYTE SPILLAGE :

Rollover Stage	Propulsion Battery Electrolyte Spillage (L)	Spillage Location
0-90°	0	None
90-180°	0	None
180-270º	0	None
270-360º	0	None

Total Spillage: 0 L **FMVSS 305 permits 5 L maximum**

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 occupant compartment? - YES (Fail) x NO

DATA SHEET 9

FMVSS 305 ROLLOVER DATA (CONTINUED)

Vehicle: 2010 Ford Fusion Hybrid 4-door Sedan NHTSA No.: CA0200

III. ELECTRICAL ISOLATION MEASUREMENTS AND CALCULATIONS:

VOLTMETER INFORMATION:

Make: Fluke Model: 87 S/N: 65280327

Internal Resistance Value (R_O) 0.12 MΩ

Normal Propulsion Battery Voltage (V_b): 3.66 V

$R_{i1}= R_o*(1+V_2/V_1)*[(V_1-V_1')/V_1']$ $R_{i2}= R_o*(1+V_1/V_2)*[(V_2-V_2')/V_2']$ Lesser value of R_{i1} and R_{i2}

Isolation Measurement (Volts)		Stage	R_{i1} Ω	R_{i2} Ω	R_i Ω	R_i/V_b Ω/V	Time (min)	Time (s)
V_1 =	4	90°	479760	959760	479760	31081967	1	08
V_2 =	4							
V_1' =	0.002							
V_2' =	0.001							
V_1 =	0.7	180°	227349	455853	227349	62117096	1	03
V_2 =	3.1							
V_1' =	0.002							
V_2' =	0.001							
V_1 =	1.16	270°	255159	511035	255159	69715659	1	04
V_2 =	3.1							
V_1' =	0.002							
V_2' =	0.001							
V_1 =	1.2	360°	234808	470227	234808	64155191	1	09
V_2 =	2.72							
V_1' =	0.002							
V_2' =	0.001							

Is the measured Electrical Isolation Value ≥ 500 Ω/V? x YES - NO (Fail)

COMMENTS:

None

APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS (Continued)

Figure A-1: Vehicle Certification Placard

Figure A-2: Vehicle Tire Placard

Figure A-3: Vehicle Electric Propulsion System Label

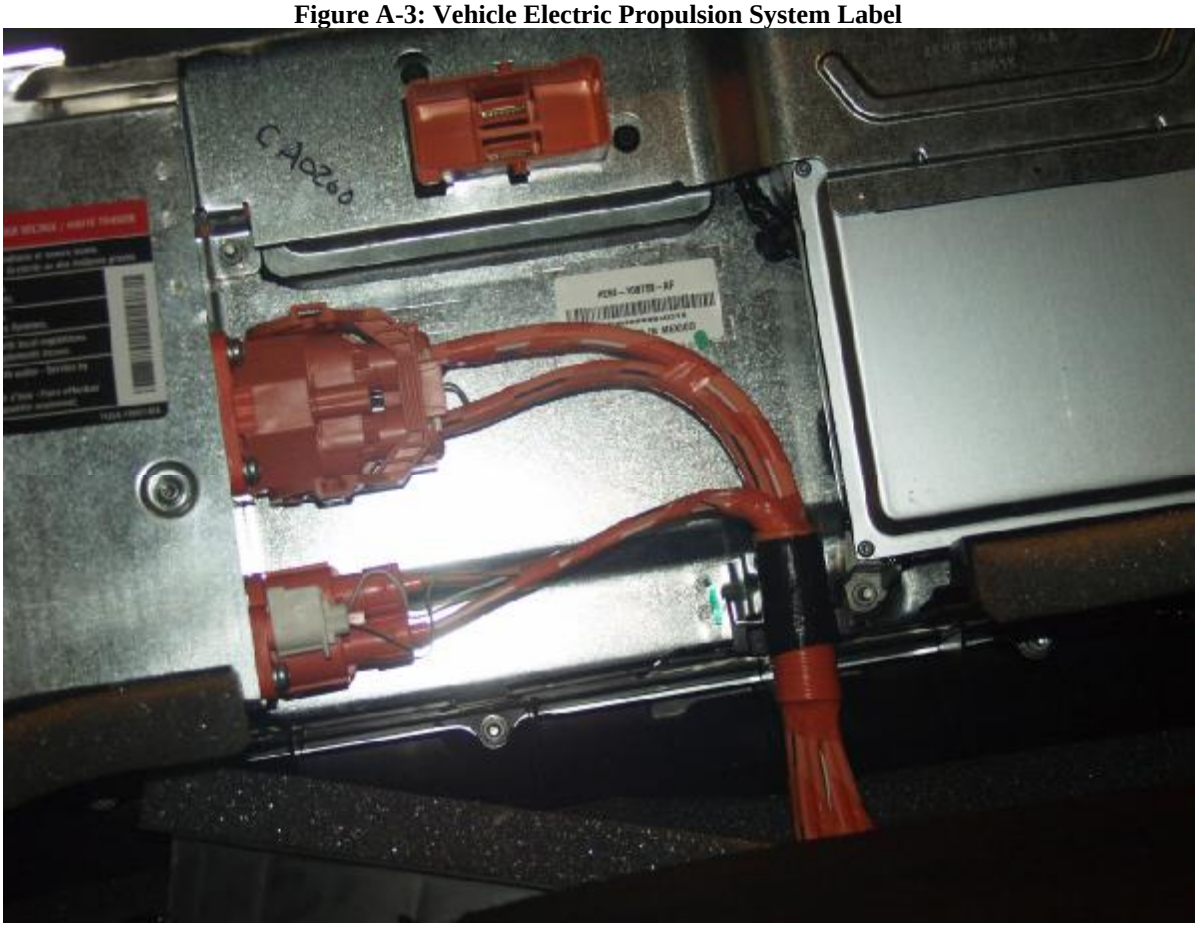


Figure A-4: Pre-Test Test Port Interface Port Installation View

Photo Not Available

Figure A-5: Pre-Test Test Device Installation Views

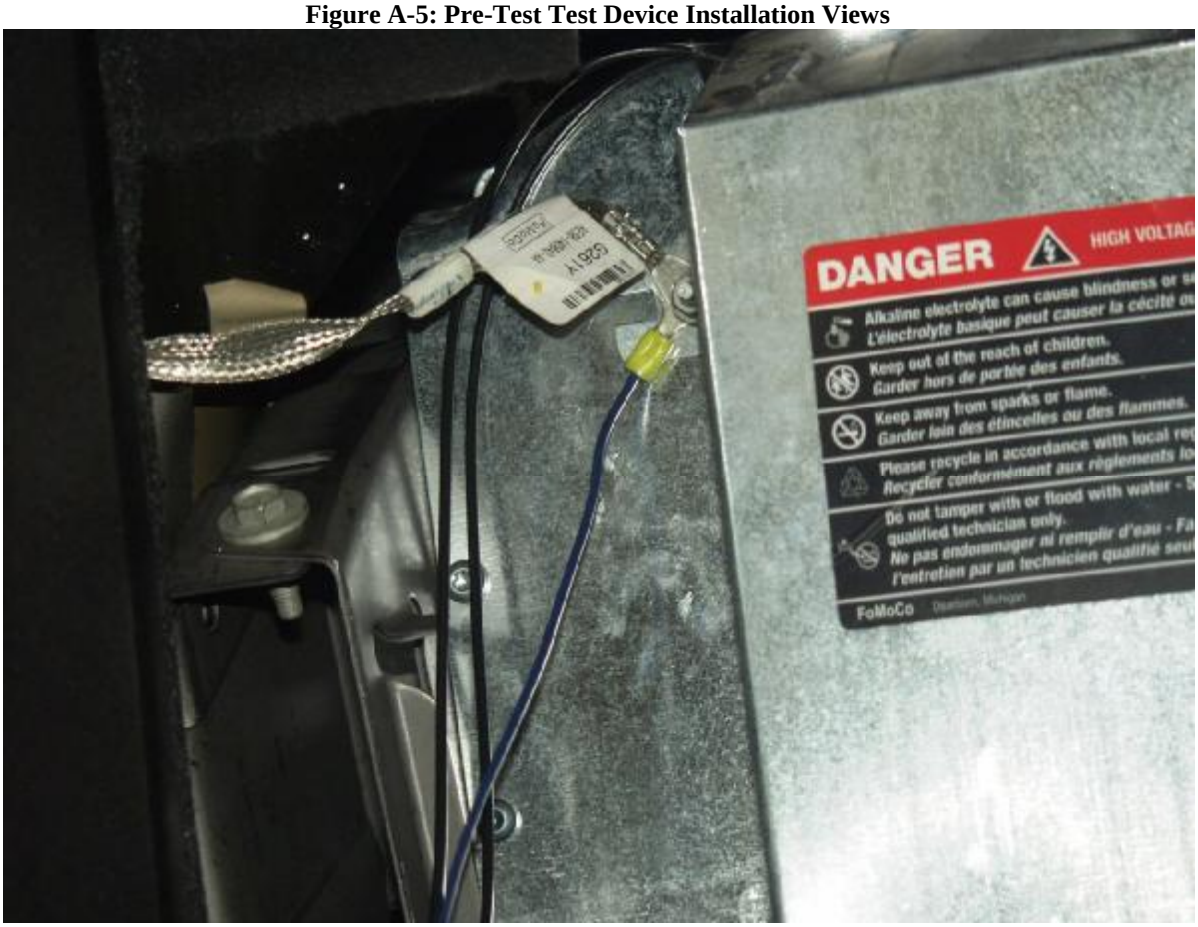


Figure A-6: Pre-Test Chassis Ground Point View

Figure A-7: Pre-Test Front View

Figure A-8: Post-Test Front View

Figure A-9: Pre-Test Left Side View

Figure A-10: Post-Test Left Side View

Figure A-11: Pre-Test Right Side View

Figure A-12: Post-Test Right Side View

Figure A-13: Pre-Test Left Front Three-Quarter View

Figure A-14: Post-Test Left Front Three-Quarter View

Figure A-15: Pre-Test Right Front Three-Quarter View

Figure A-16: Post-Test Right Front Three-Quarter View

Figure A-17: Pre-Test Left Rear Three-Quarter View

Figure A-18: Post-Test Left Rear Three-Quarter View

Figure A-19: Pre-Test Right Rear Three-Quarter View

Figure A-20: Post-Test Right Rear Three-Quarter View

Figure A-21: Pre-Test Rear View

Figure A-22: Post-Test Rear View

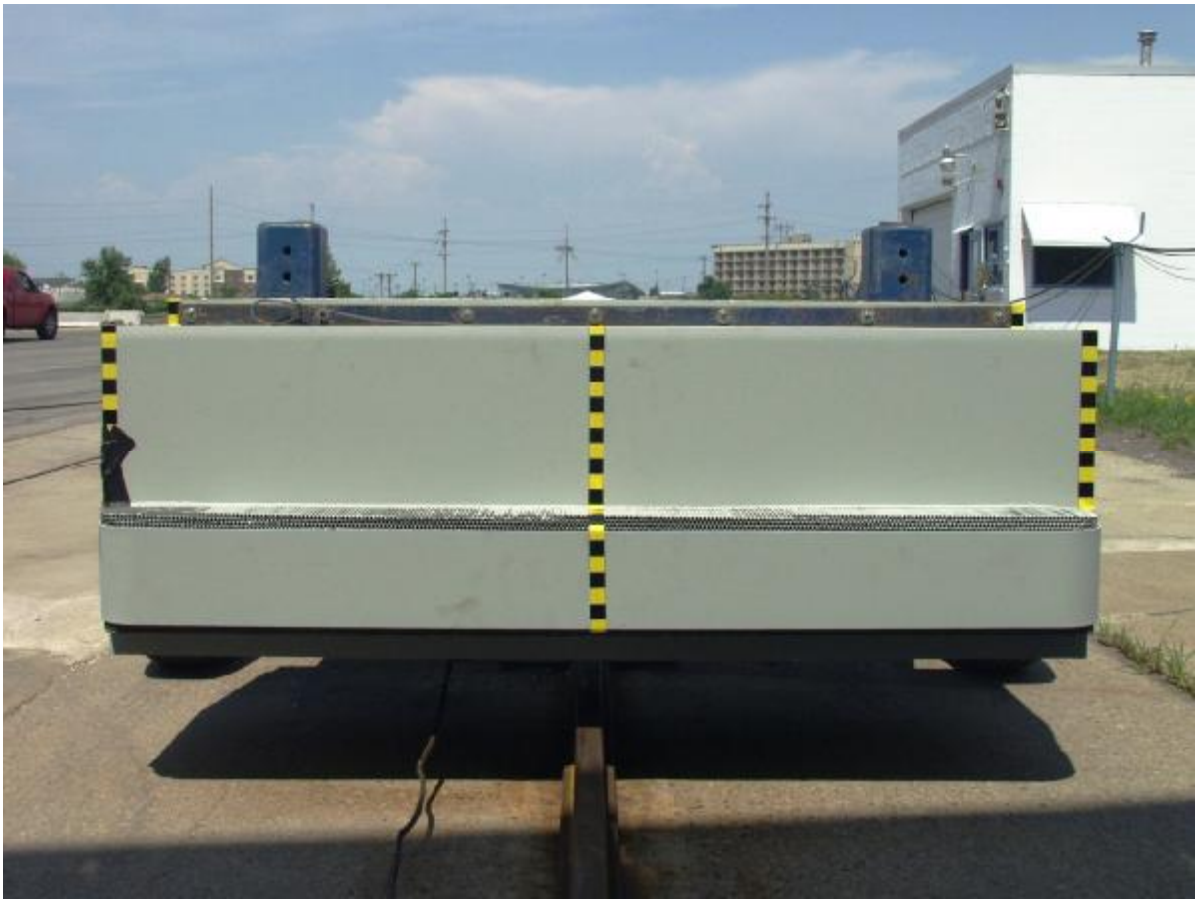


Figure A-23: Pre-Test MDB Front View

Figure A-24: Post-Test MDB Front View

Figure A-25: Pre-Test MDB Left Side View

Figure A-26: Post-Test MDB Left Side View

Figure A-27: Pre-Test MDB Right Side View

Figure A-28: Post-Test MDB Right Side View

Figure A-29: Pre-Test MDB Top View

Figure A-30: Post-Test MDB Top View

Figure A-31: Pre-Test Overhead Vehicle and MDB View

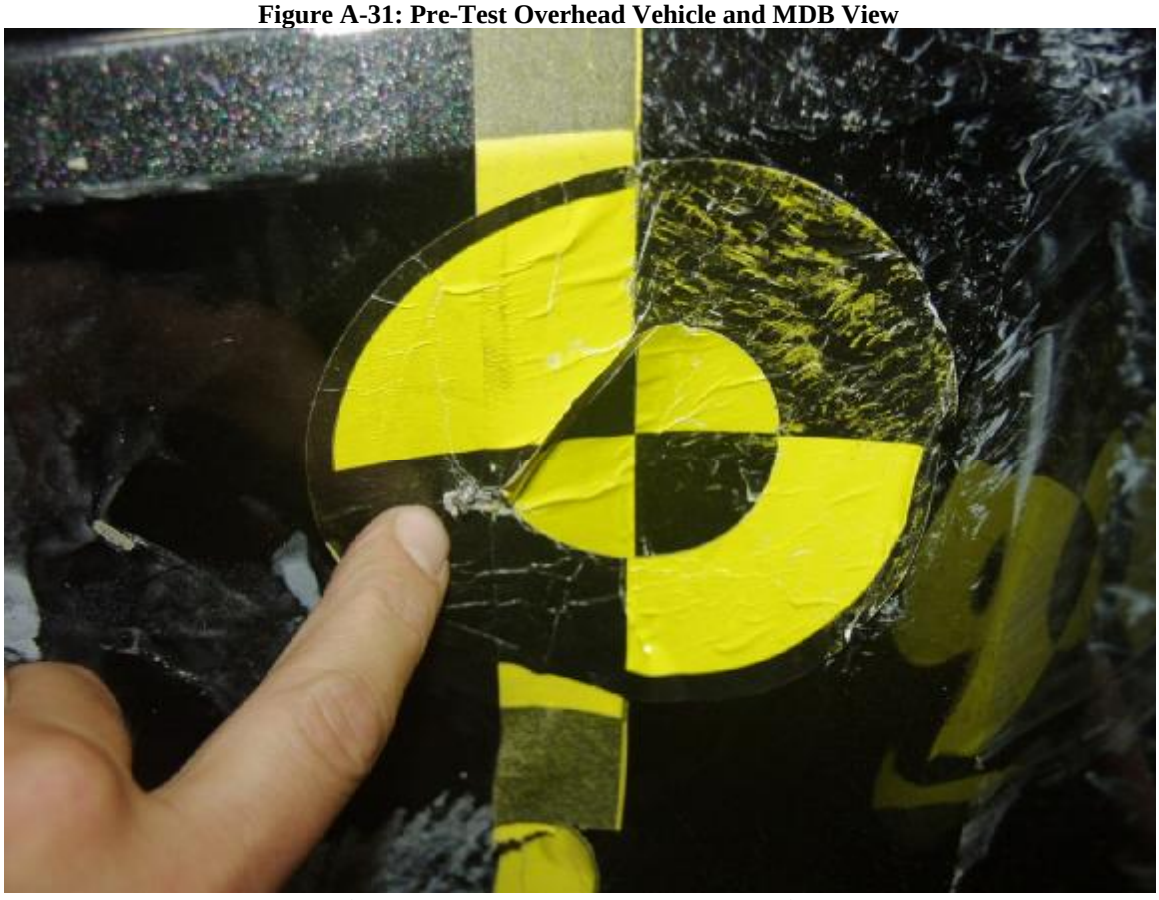


Figure A-32: Post-Test Impact Target View

Figure A-33: Pre-Test Battery Propulsion Module(S) View

Figure A-34: Post-Test Battery Propulsion Module(S) View

Figure A-35: Pre-Test Propulsion Battery View

Photo Not Available

Figure A-36: Post-Test Propulsion Battery View

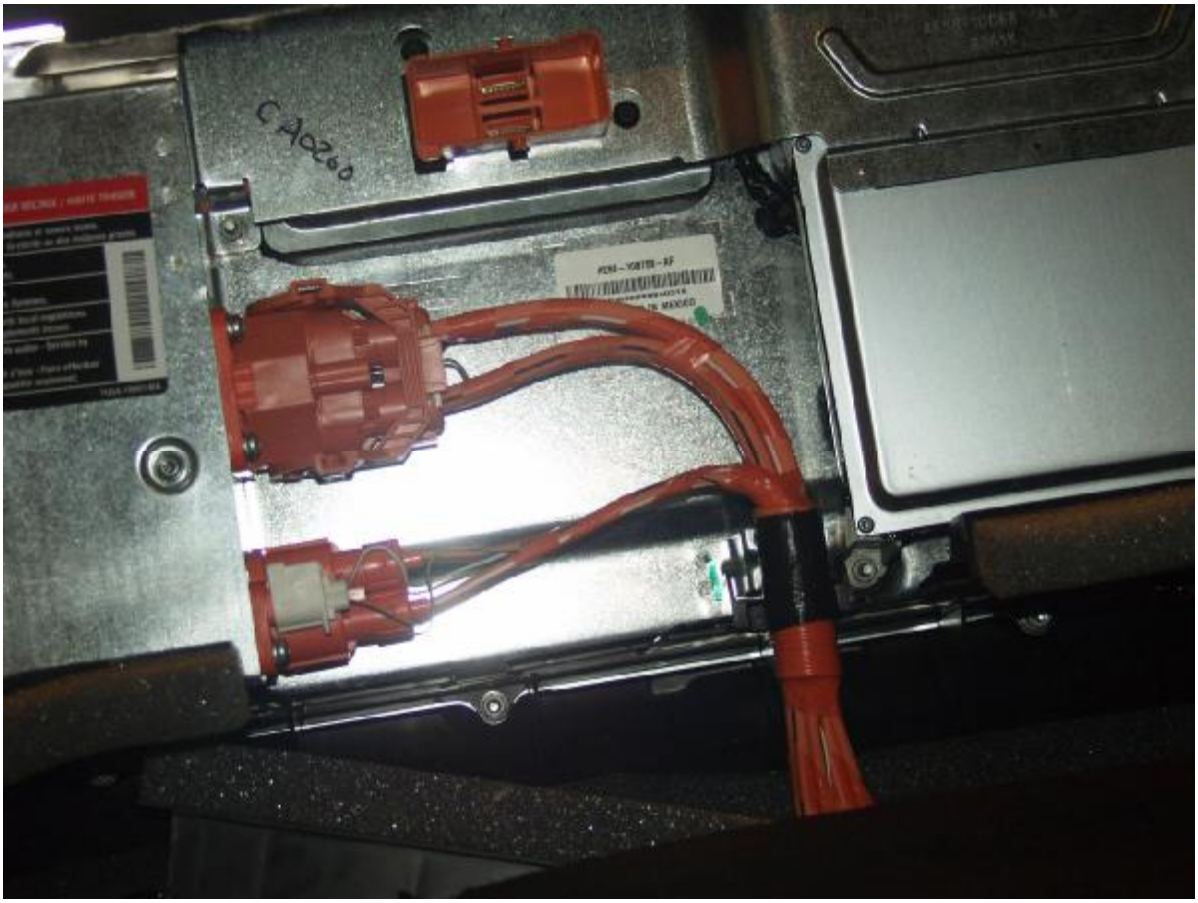


Figure A-37: Pre-Test High Voltage Interconnect View

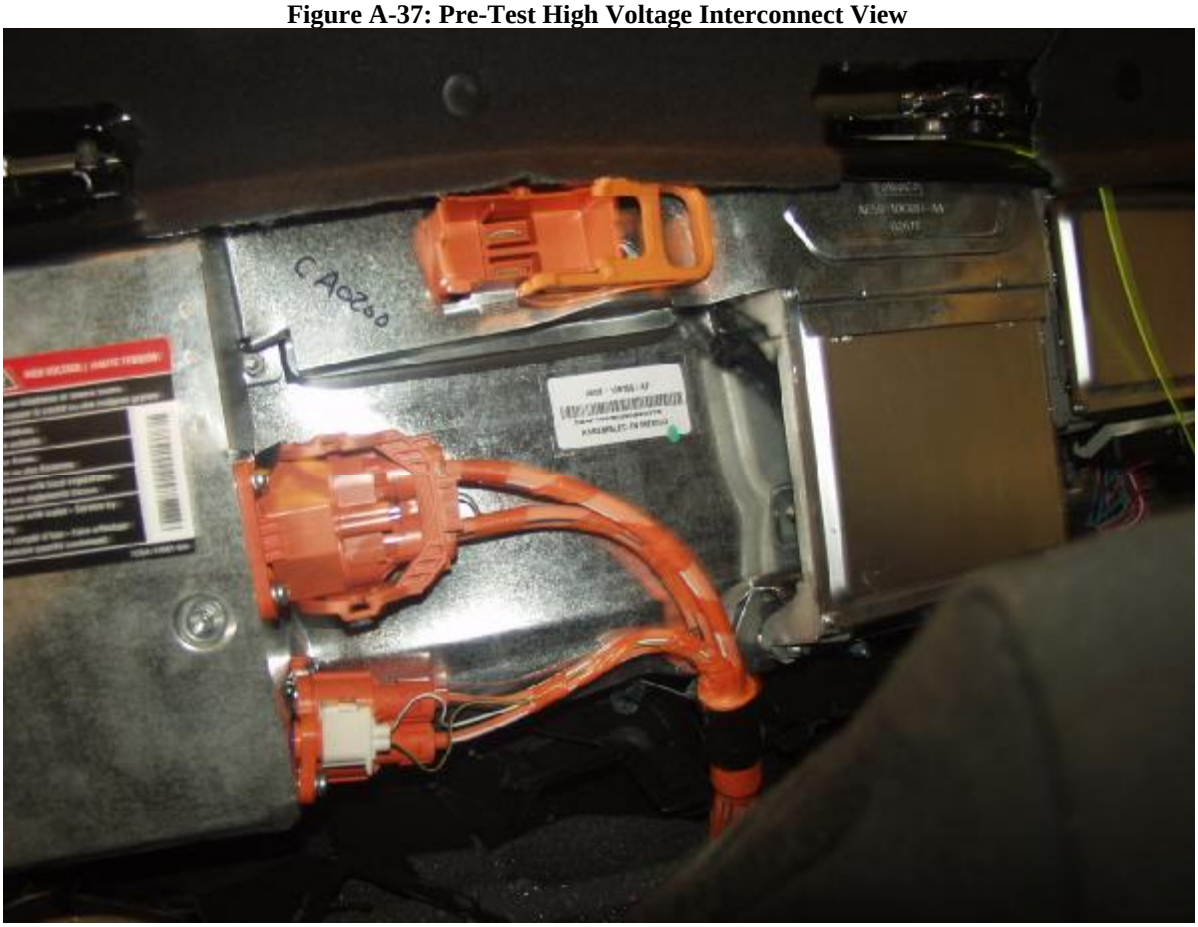


Figure A-38: Post-Test High Voltage Interconnect View

Figure A-39: Pre-Test Battery Compartment View

Figure A-40: Post-Test Battery Compartment View

Figure A-41: Pre-Test Battery Venting System View

Figure A-42: Post-Test Battery Venting System View

Figure A-43: Pre-Test Electric Propulsion Component(S) View

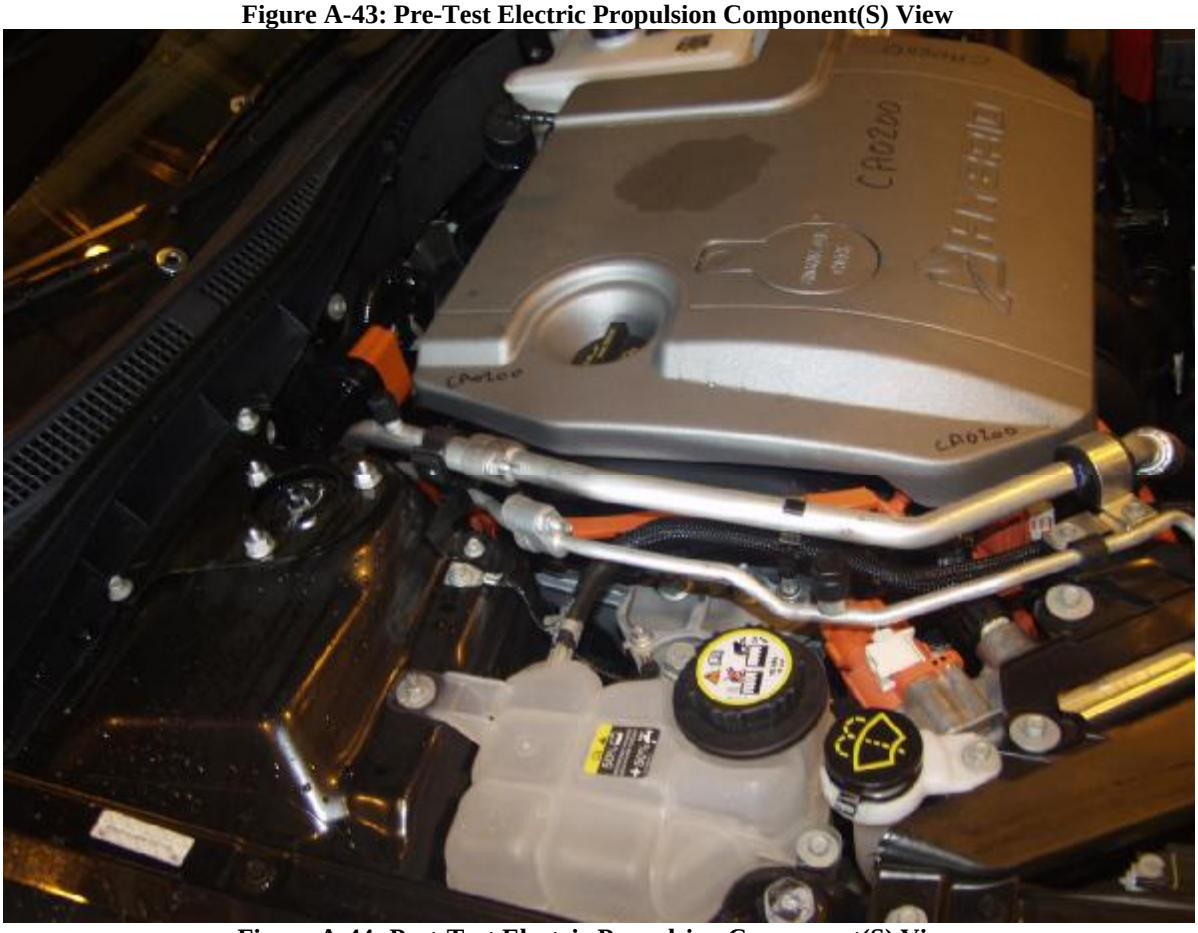


Figure A-44: Post-Test Electric Propulsion Component(S) View

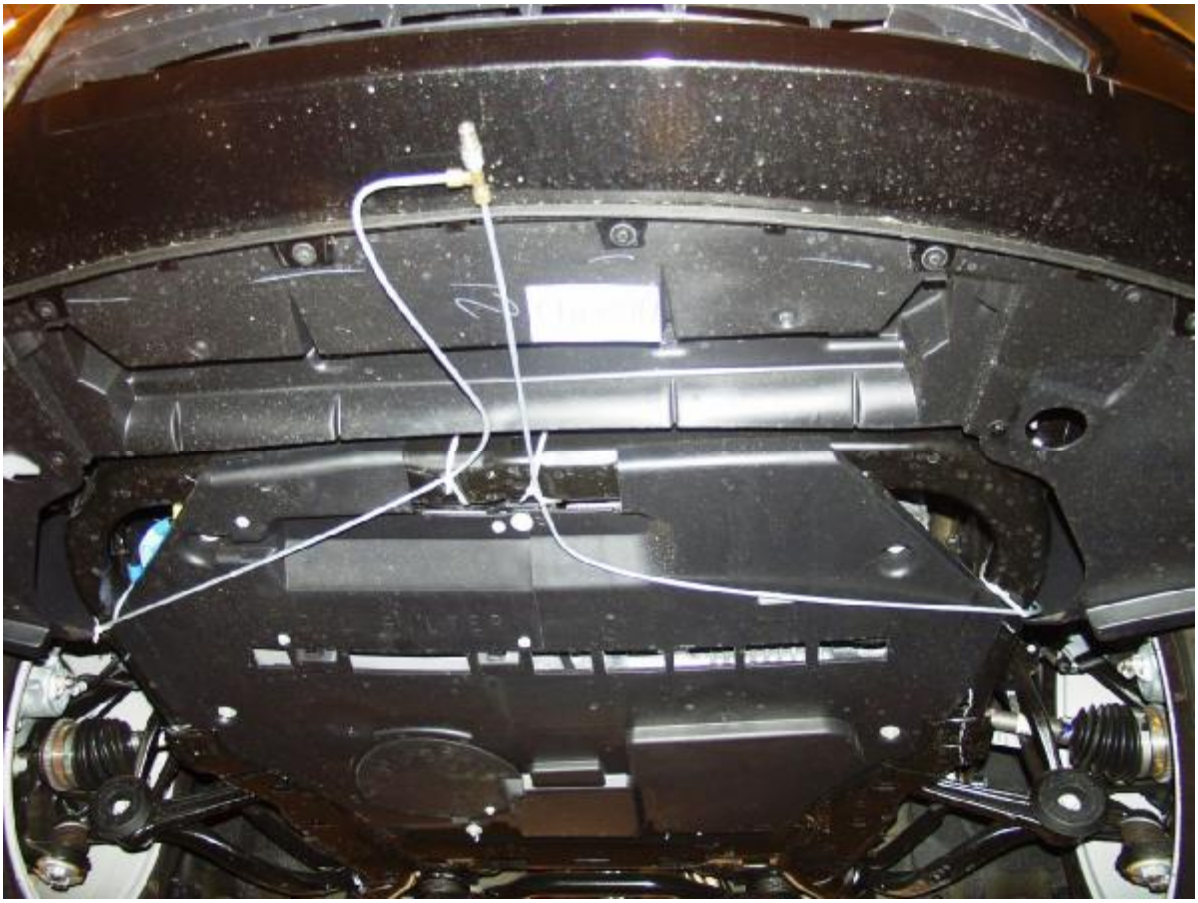


Figure A-45: Pre-Test Electric Propulsion Drive View

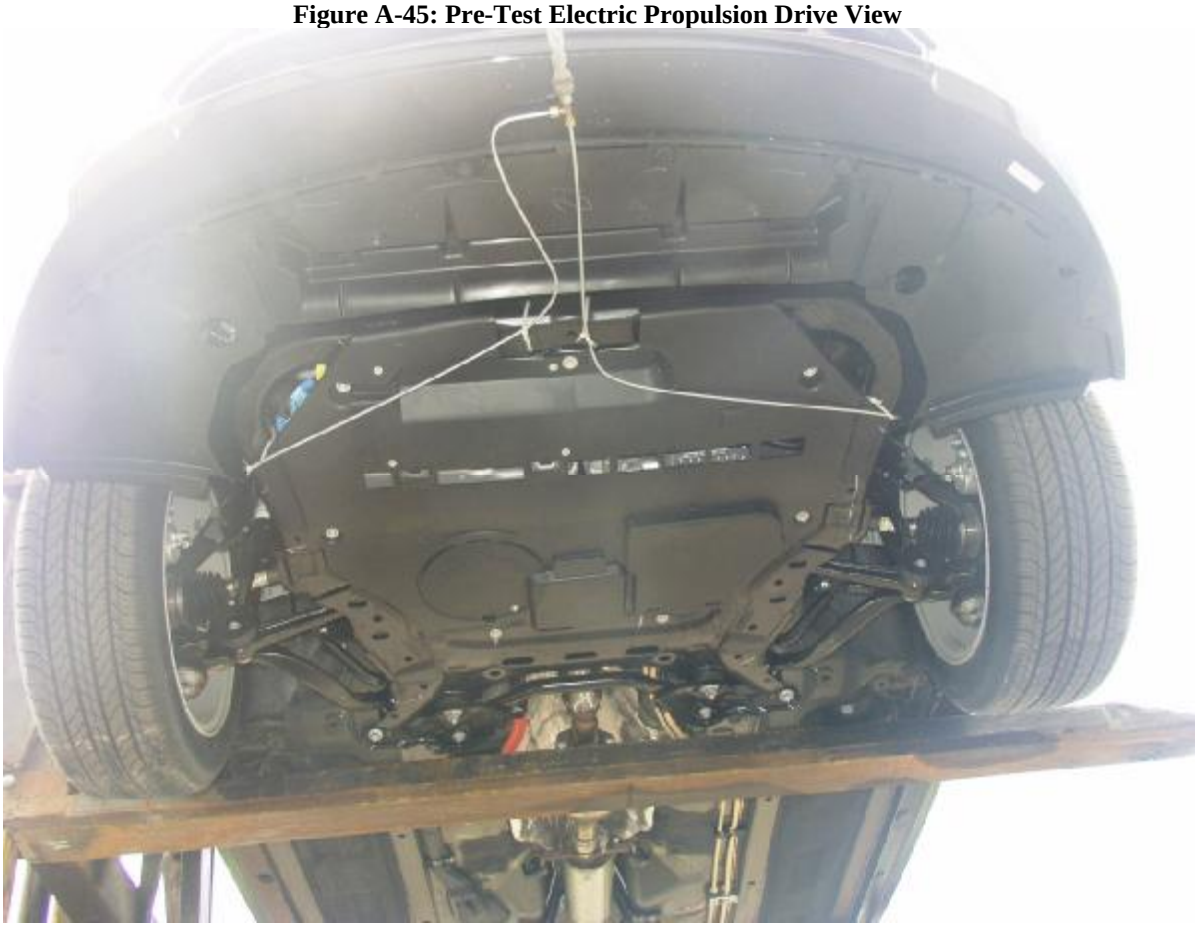


Figure A-46: Post-Test Electric Propulsion Drive View

Figure A-47: Pre-Test Vehicle Passenger Compartment View

Figure A-48: Post-Test Vehicle Passenger Compartment View

No Photograph Necessary

Figure A-49: Post-Test Propulsion Battery Electrolyte Spillage Location View

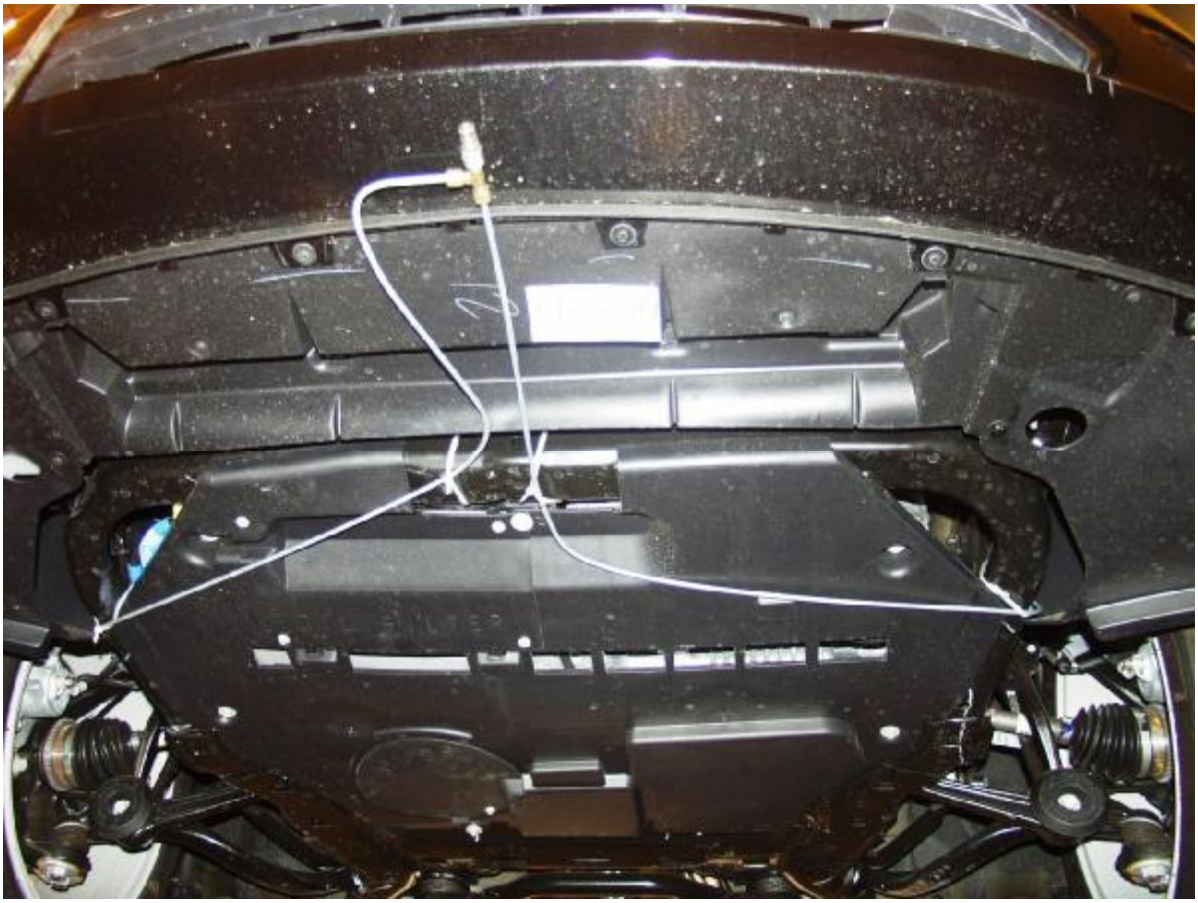


Figure A-50: Pre-Test Front Underbody View

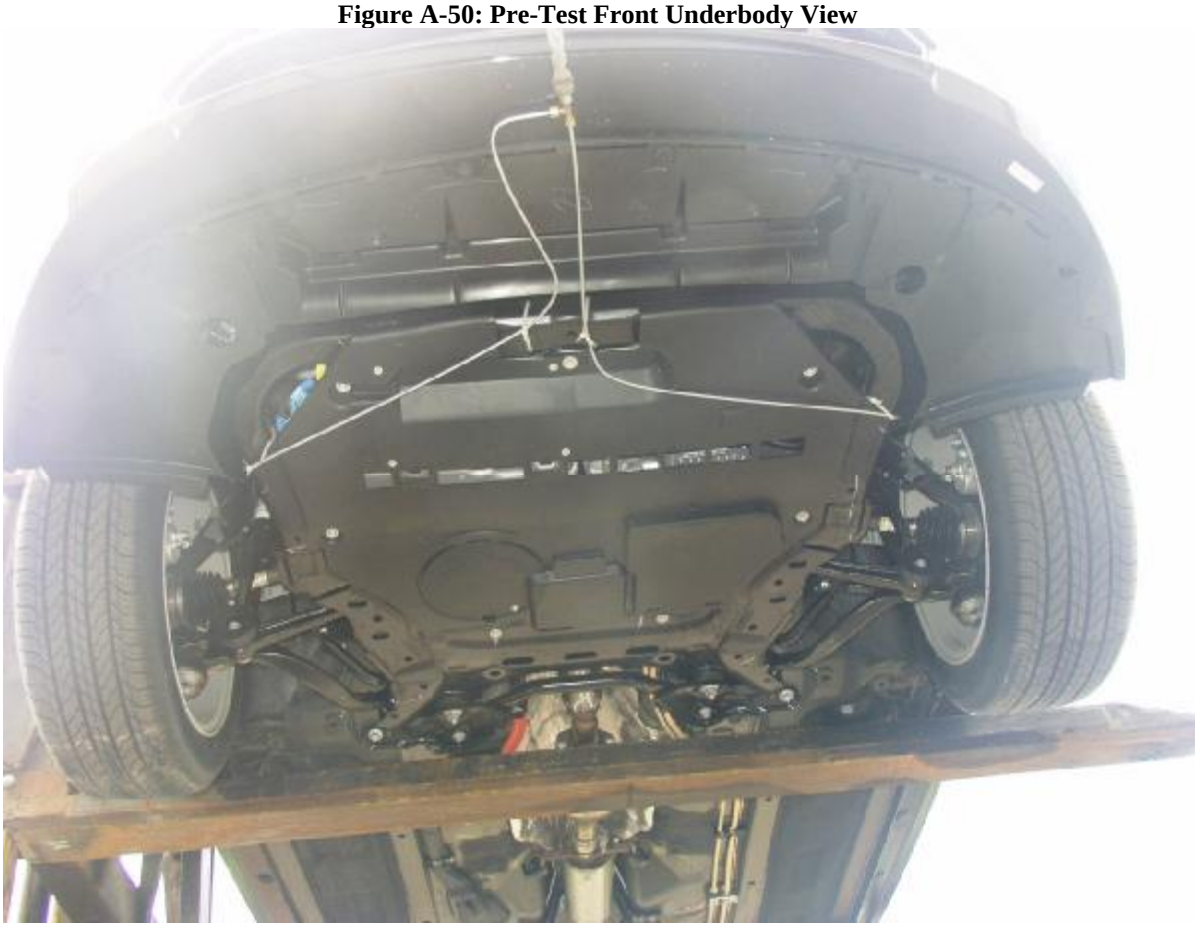


Figure A-51: Post-Test Front Underbody View

Figure A-52: Pre-Test Mid Underbody View

Figure A-53: Post-Test Mid Underbody View

Figure A-54: Pre-Test Rear Underbody View

Figure A-55: Post-Test Rear Underbody View

Figure A-56: Pre-Test Fuel Filler Cap View

Figure A-57: Post-Test Fuel Filler Cap View

Figure A-58: Impact View

No Photograph Necessary

Figure A-59: Post-Test Passenger Contact to Airbag

Figure A-60: Rollover View - 90°

Figure A-61: Rollover View - 180°

Figure A-62: Rollover View - 360°