REPORT NUMBER: 305-MGA-2011-001

SAFETY COMPLIANCE TESTING FOR FMVSS 305
Electric Powered Vehicles: Electrolyte Spillage and Electrical Shock Protection

HONDA MOTOR CO., LTD
2011 HONDA CR-Z 3-DR HATCHBACK
NHTSA NUMBER: CB5302

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Test Date: March 23, 2011

Report Date: March 28, 2011

FINAL REPORT

PREPARED FOR:
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NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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Acceptance Date: _____

Technical Report Documentation Page

1. Report No. 305-MGA-2011-001	*2. Government Accession No.*	*3. Recipient's Catalog No.*
4. Title and Subtitle Final Report of FMVSS 305 Compliance Testing of 2011 Honda CR-Z 3-Dr Hatchback; NHTSA No.: CB5302		*5. Report Date* March 28, 2011 *6. Performing Organization Code* MGA
7. Author(s) Donna Janovicz, Project Manager Joe Fleck, Project Engineer		*8. Performing Organization Report No.* 305-MGA-2011-001
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105		*10. Work Unit No.* *11. Contract or Grant No.* DTNH22-07-D-00062
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance (NVS-220) 1200 New Jersey Ave, SE Washington, DC 20590		*13. Type of Report and Period Covered:* Final Test Report 3/23/2011 to 3/28/2011 *14. Sponsoring Agency Code* NVS-220
15. Supplementary Notes		

16. Abstract

A post-test evaluation on the subject 2011 Honda CR-Z 3-Dr Hatchback in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-305-01 was performed.

17. Key Words Compliance Testing Safety Engineering FMVSS 305		*18. Distribution Statement* Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services (TIS) Room E12-100 East Building 1200 New Jersey Ave. Washington, D.C. 20590 e-mail: tis@nhtsa.dot.gov Fax: 202-493-2833	
19. Security Classif. (of this report) Unclassified	*20. Security Classif. (of this page)* Unclassified	*21. No. of Pages* 22	22. Price

Form DOT F1700.7 (8-72)

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SECTION 1
PURPOSE OF COMPLIANCE TEST

This hybrid vehicle, a 2011 Honda CR-Z 3-Dr Hatchback (NHTSA No. CB5302), in conjunction with the FMVSS 214P impact, was tested to FMVSS 305.

The test was performed in accordance with the specifications of the Office of Vehicle Safety Compliance (OVSC) Test Procedure TF-305-01 to determine compliance to the requirements of Federal Motor Vehicle Safety Standard (FMVSS) 305, “Electric Powered Vehicles: Electrolyte Spillage and Electrical Shock Protection”.

Based on the test results, the 2011 Honda CR-Z 3-Dr Hatchback appears to meet the post-test requirements of FMVSS 305 testing.

This program is sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-07-D-00062.

The following data sheets document the results of the FMVSS 305 test.

TEST NOTES

The manufacturer’s details for FMVSS 305 were not received until after the impact test. All documentation was performed after the post-test roll.

SECTION 2
DATA SHEETS

DATA SHEET NO. 1

TEST VEHICLE SPECIFICATIONS

Test Vehicle: 2011 Honda CR-Z 3-Dr Hatchback NHTSA No. CB5302

TEST VEHICLE INFORMATION

Year/Make/Model/Body Style	2011 Honda CR-Z 3-Dr Hatchback
NHTSA No.	CB5302
Color	North Shore Blue
Date Received	3/03/2011
Odometer Reading	44 miles
Selling Dealer	Rosen Honda

DATA FROM CERTIFICATION LABEL

Manufactured By	Honda Motor Co., Ltd.
Date of Manufacture	09/'10
VIN:	JHMZF1D44BS005488

GVWR (kg)	1435
GAWR Front (kg)	815
GAWR Rear (kg)	625

DATA FROM VEHICLE'S TIRE PLACARD & SIDEWALL

Measured Parameter	Front	Rear
Location of Placard of Vehicle	Left Side B-Post	
Recommended Tire Size	P195/55R16	P195/55R16
Recommended Cold Tire Pressure	210 kPa	210 kPa
Size of Tires on Test Vehicle	P195/55R16	P195/55R16
Type of Spare Tire	T135/80D15	

VEHICLE CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total
Type of Front Seats	Bucket			
Number of Occupants	2			2
Capacity Weight (VCW) (kg)				181
Number of Occupants x 68 kg				136
Cargo Weight (RCLW) (kg)				45

ELECTRIC VEHICLE PROPULSION SYSTEM

Type of Electric Vehicle (Electric/Hybrid):	Gas-Electric Hybrid
Propulsion Battery Type:	Ni-MH
Nominal Voltage (V):	100.8 V
Physical Location of Automatic Propulsion Battery Disconnect:	IPU (Intelligent power unit) is located in cargo area.
Auxiliary Battery Type:	Lead-Acid

DATA SHEET 2

PRE-TEST DATA

Test Vehicle: 2011 Honda CR-Z 3-Dr Hatchback NHTSA No. CB5302

CALCULATION OF TARGET TEST WEIGHT (TTW)

Measured Parameter	Units	Value
Unloaded Vehicle Weight (UVW)	kg	1213.8
Rated Cargo & Luggage Weight (RCLW)	kg	45
Weight of 1 P572U ATD (ES-2re) Dummy	kg	77.1
TARGET TEST WEIGHT	kg	1335.9

Note: The target weight is calculated including tolerances as specified in each vehicle crash test procedure.

TEST VEHICLE WEIGHTS

	Units	As Delivered			Fully Loaded			As Tested		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	366.1	253.1		394.2	303.4		395.5	299.8	
Right	kg	358.3	236.3		368.8	269.9		364.7	269.9	
Ratio	%	59.7	40.3		57.1	42.9		57.2	42.8	
Totals	kg	724.4	489.4	1213.8	763.0	573.3	1336.3	760.2	569.7	1329.9

TIRE PRESSURES

	Units	LF	RF	RR	LR
As Delivered	kPa	210	210	210	210
As Tested	kPa	210	210	210	210

PROPULSION BATTERY SYSTEM DATA (COTR SUPPLIED DATA)

Electrolyte Fluid Type:	KOH	
Electrolyte Fluid Specific Gravity:	1.29 g/cm^2	
Electrolyte Kinematic Viscosity (centistokes):	1.8 mPa·s	
Electrolyte Fluid Color:	Clear	
Propulsion Battery Coolant Type, Color, Specific Gravity (if applicable):	Air	
Location of Battery Modules:		Inside Passenger Compartment
	X	Outside Passenger Compartment

DATA SHEET 2 (CONTINUED)

PRE-TEST DATA

MEASURE AND RECORD BATTERY STATE OF CHARGE

	Maximum State of Charge recommended by manufacturer:	
	Test Voltage (≥95% of Maximum State of Charge):	
X	Test Voltage (Within Normal Operating Voltage Range):	See note below

Note: Normal operating range is 4 or 5 segments of IMA battery level gauge on the instrument panel**.**

VEHICLE CHASSIS GROUND POINT(S) LOCATION(S)

Details of Vehicle Chassis Ground Point(s) & Locations(s)	Body ground located on left side of floor extension lead wire. 10 mm bolt.

PROPULSION BATTERY SYSTEM

Details of Propulsion Battery Components	Connector terminal 31 pin Motor ECU Side. Pin 31: VHB0 Battery (+) Pin 1: VHB8 Battery (-)

DATA SHEET 3

PRE-IMPACT ELECTRIC ISOLATION MEASUREMENTS & CALCULATIONS

Test Vehicle: 2011 Honda CR-Z 3-Dr Hatchback NHTSA No. CB5302

VOLTMETER INFORMATION

Make:	
Model:	
Serial Number:	
Internal Impedance Value (MΩ):	
Resolution (V):	
Last Calibration Date:	

PROPULSION BATTERY VOLTAGE

Measurement shall be made with propulsion battery connected to the vehicle propulsion system, and the vehicle in the “ready-to-drive” (Propulsion motor(s) activated) position.
If voltage measurement is not at the voltage or within the normal operating voltage range specified by the manufacturer, the battery must be charged.

Vb (V):	

PROPULSION BATTERY TO VEHICLE CHASSIS

Vehicle chassis point(s) determined and supplied to contractor by COTR.

V1 (V):	
V2 (V):	

PROPULSION BATTERY TO VEHICLE CHASSIS ACROSS RESISTOR

The known resistance Ro (in ohms) should be approximately 500 times the normal operating voltage of the vehicle (in volts) per SAE J1766.

Ro (Ω):	157900 Ω

DATA SHEET 3 (CONTINUED)

PRE-IMPACT ELECTRICAL ISOLAITON MEASUREMENTS & CALCULATIONS

ELECTRICAL ISOLATION MEASUREMENT

Note: If measured voltage is zero and results in a division by zero, record “Zero Volts”. This “zero voltage” condition is considered as being compliant.

V1’ (V):	
Ri1 = Ro (1 + V2/V1) [(V1-V1’)/V1’]	
Ri1 (Ω):	
V2’ (V):	
Ri2 = R0 (1 + V1/V2) [(V2-V2’)/V2’]	
Ri2 (Ω):	
Ri = The lesser of Ti1 and Ri2	
Ri Pre-Test ((Ω):	
Ri/Vb (Ω/V):	
Minimum Electrical Isolation Value is 500 Ω/V	

Note: Measured 6 minutes 24 seconds before impact.

	Yes	No, Fail
Is the measured Electrical Isolation Value $\geq$ 500 Ω/V?		

DATA SHEET 4

POST-IMPACT DATA

Test Vehicle: 2011 Honda CR-Z 3-Dr Hatchback NHTSA No. CB5302

VOLTMETER INFORMATION

Make:	Fluke
Model:	11
Serial Number:	68541895
Internal Impedance Value (MΩ):	> 10 MΩ < 100 pF
Nominal Propulsion Battery Voltage (Vb) (V):	100.8

PROPULSION BATTERY VOLTAGE

NOTE: Record V1, V2, V1', V2' voltage measurements after post-test roll.

V1 =	1.5	V
V2 =	1.4	V
V1' =	0.2	V
V2' =	0.6	V

ELECTRICAL ISOLATION MEASUREMENT

Note: If measured voltage is zero and results in a division by zero, record "Zero Volts". This "zero voltage" condition is considered as being compliant.

Ri1 = Ro (1 + V2/V1) [(V1-V1')/V1']		
Ri1 =	1984 K	Ω
Ri2 = Ro (1 + V1/V2) [(V2-V2')/V2']		
Ri2 =	436 K	Ω
Ri = The lesser of Ri1 and Ri2		
Ri =	436 K	Ω
Ri/Vb = electrical Isolation Value/Nominal Battery Voltage		
Minimum Electrical Value is 500 Ω/V		
Ri/Vb =	3856	Ω/V

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

DATA SHEET 4 (CONTINUED)

POST-IMPACT DATA

PROPULSION BATTERY SYSTEM COMPONENTS

Describe Propulsion Battery Module movement within the passenger compartment [Supply photographs as appropriate]:
No Movement

	Yes	No
Has the Propulsion Battery Module moved within the passenger compartment?		X

Describe intrusion of an outside Propulsion Battery Component into the passenger compartment [Supply photographs as appropriate]:
Not Applicable

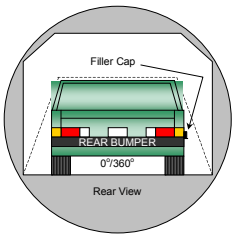
	Yes	No
Has an outside Propulsion Battery Component intruded into the passenger compartment?		X

	Yes	No
Is propulsion battery electrolyte spillage visible in the passenger compartment?		X

DATA SHEET 5

STATIC ROLLOVER TEST DATA

Test Vehicle: 2011 Honda CR-Z 3-Dr Hatchback NHTSA No. CB5302



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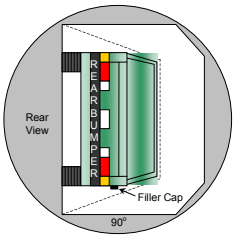

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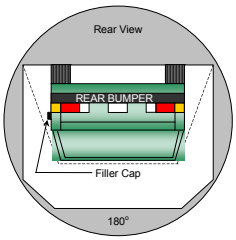

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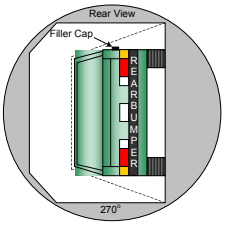

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REAR VIEW

DETERMINATION OF PROPULSION BATTERY ELECTROYTE COLLECTION TIME PERIOD

Rollover Stage	Rotation Time (spec. 1-3 min)				FMVSS 301 Hold Time		Total Time				Next Whole Minute Interval	
0° - 90°	2	minutes	02	seconds	5	minutes	7	minutes	02	seconds	8	minutes
90° - 180°	2	minutes	00	seconds	5	minutes	7	minutes	00	seconds	8	minutes
180° - 270°	1	minutes	44	seconds	5	minutes	6	minutes	44	seconds	7	minutes
270° - 360°	1	minutes	56	seconds	5	minutes	6	minutes	56	seconds	7	minutes

ACTUFMVSS 305 ELECTROLYTE SPILLAGE LOCATION TABLE

Rollover Stage	Propulsion Battery Electrolyte Spillage (L)	Spillage Location
0° to 90°	0	
90° to 180°	0	
180° to 270°	0	
270° to 360°	0	

Total Spillage: _____0____L

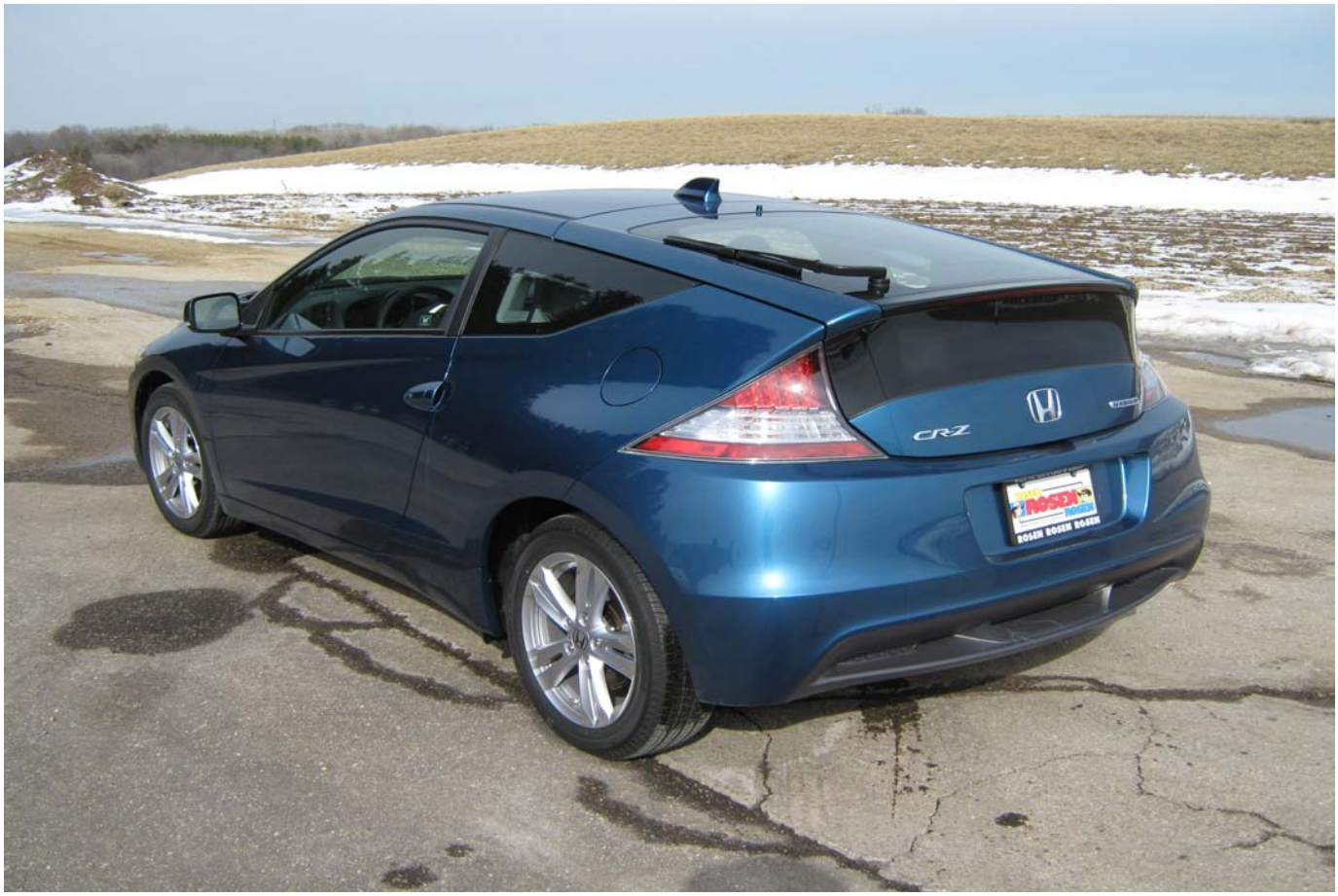
	Yes	No
Is the total spillage of propulsion battery electrolyte greater than 5.0 Liters?		X
Is propulsion battery electrolyte spillage visible in the passenger compartment?		X

APPENDIX A

PHOTOGRAPHS

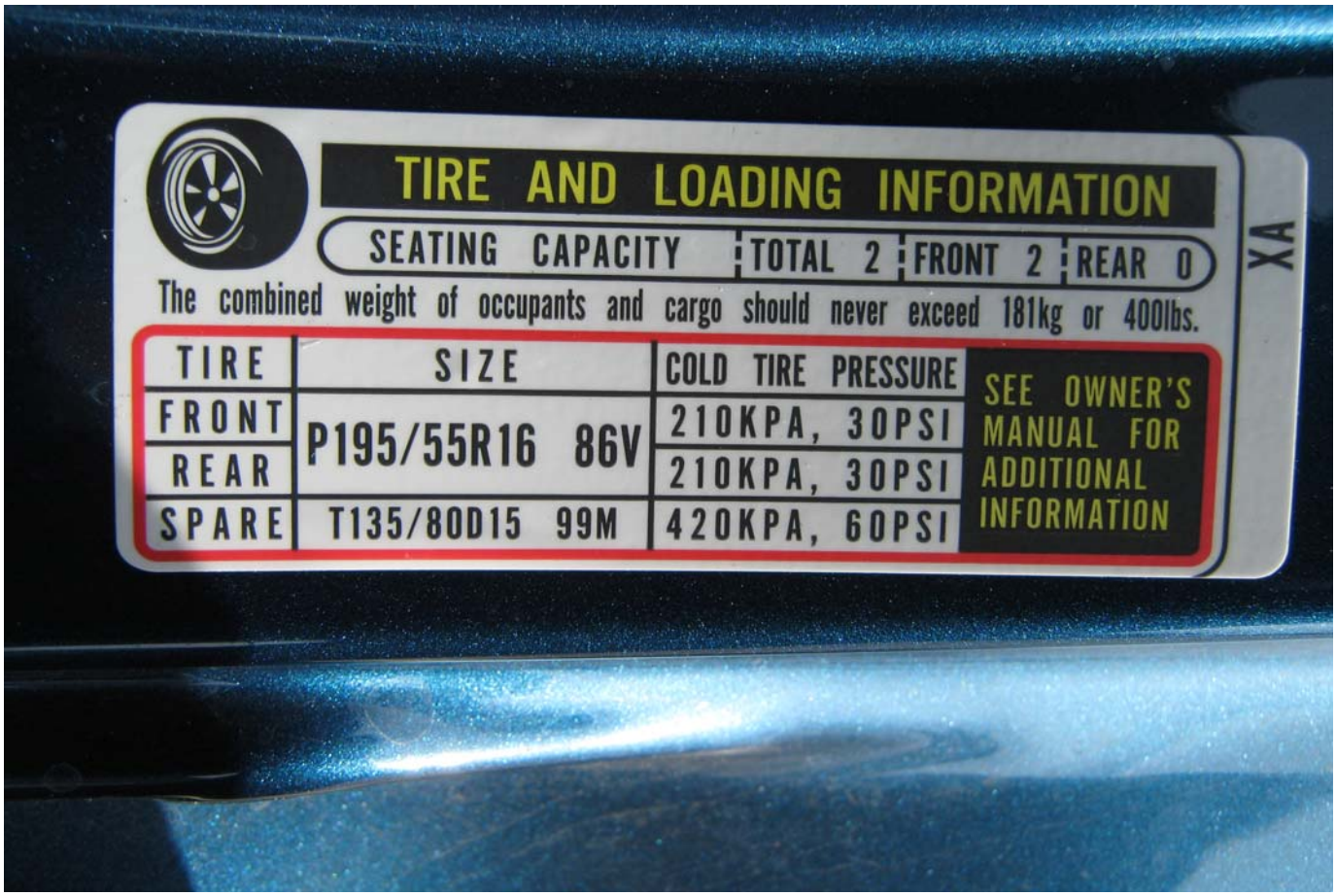
TABLE OF PHOTOGRAPHS

As Delivered Right Front ¾ View of Test Vehicle



As Delivered Left Rear ¾ View of Test Vehicle

Vehicle's Certification Label



Vehicle's Tire Information Placard or Label

Post-Test View of Propulsion Battery

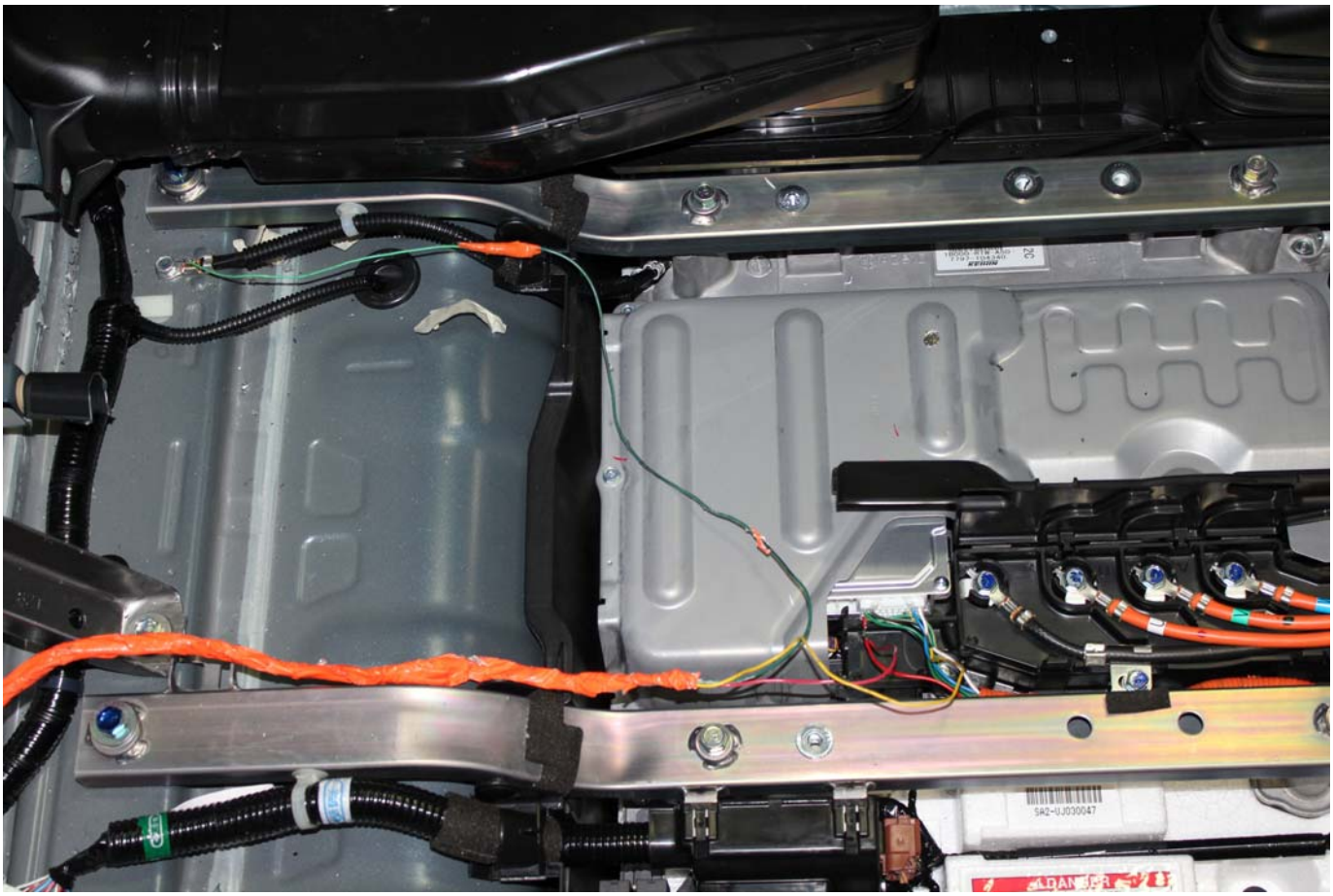
Post-Test View of Electric Propulsion Drive

Post-Test View of Vehicle's Passenger Compartment Adjacent to Propulsion Battery

Labels and Markings

Labels and Markings

Labels and Markings



Ground Location/Close-up of Leads Attached