

REPORT NUMBER: 305-MGA-2012-002

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

**MITSUBISHI MOTORS CORPORATION, JAPAN
2012 Mitsubishi i-MiEV 5-Dr Hybrid Hatchback
NHTSA NUMBER: CC5602**

**PREPARED BY:
MGA RESEARCH CORPORATION
5000 WARREN ROAD
BURLINGTON, WI 53105**



Test Date: May 23, 2012

Report Date: July 19, 2012

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
1200 NEW JERSEY AVENUE, SE
WEST BUILDING (NVS-220)
WASHINGTON, DC 20590**

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 manufacturers' 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.

Prepared by: Joe Fleck
Joe Fleck, Project Engineer

Approved by: David Winkelbauer
David Winkelbauer, Project Manager

Approval Date: July 19, 2012

Accepted by: Edward E. Chan

Digitally signed by Edward E. Chan
DN: cn=Edward E. Chan, o=Office of Vehicle Safety
Compliance, ou=National Highway Traffic Safety
Administration, email=ed.chan@dot.gov, c=US
Date: 2012.07.19 12:16:58 -04'00'

Acceptance Date: _____

Technical Report Documentation Page

1. Report No. 305-MGA-2012-002		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of FMVSS 305 Compliance Testing of 2012 Mitsubishi i-MiEV 5-Dr Hatchback; NHTSA No.: CC5602			5. Report Date July 19, 2012		
			6. Performing Organization Code MGA		
7. Author(s) Joe Fleck, Project Engineer David Winkelbauer, Project Manager			8. Performing Organization Report No. 305-MGA-2012-002		
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 May 23, 2012 to July 19, 2012		
			14. Sponsoring Agency Code NVS-220		
15. Supplementary Notes					
16. Abstract An indicant compliance test was conducted on the subject 2012 Mitsubishi i-MiEV 5-Dr Hatchback in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-305-01 for the determination of FMVSS 305 compliance. Test failures identified were as follows: None.					
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 29	22. Price		

TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	Purpose of Compliance Test	1
2	Data Sheets	2
 <u>Data Sheet</u>		 <u>Page No.</u>
1	Test Vehicle Specifications	3
2	Pre-Test Data	4
3	Pre-Impact Electric Isolation Measurements and Calculations	6
4	Post-Impact Data	8
5	Static Rollover Test Data	10
 <u>Appendix</u>		
A	Photographs	A-1

SECTION 1
PURPOSE OF COMPLIANCE TEST

This electric vehicle, a 2012 Mitsubishi i-MiEV 5-Dr Hatchback, (NHTSA No. CC5602), 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 TP-305-01 to determine indicant 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 2012 Mitsubishi i-MiEV 5-Dr Hatchback appears to meet the 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

None.

MGA does not endorse or certify products. The manufacturer's name appears solely for identification purposes.

SECTION 2
DATA SHEETS

DATA SHEET NO. 1
TEST VEHICLE SPECIFICATIONS

Test Vehicle: 2012 Mitsubishi i-MiEV 5-Dr Hatchback NHTSA No. CC5602

TEST VEHICLE INFORMATION

Year/Make/Model/Body Style	2012 Mitsubishi i-MiEV 5-Dr Hatchback
NHTSA No.	CC5602
Color	Raspberry Metallic
Date Received	04/25/2012
Odometer Reading	117 miles
Selling Dealer	Continental Mitsubishi

DATA FROM CERTIFICATION LABEL

Manufactured By	MITSUBISHI MOTORS CORPORATION	GVWR (kg)	1510
Date of Manufacture	NOV 2011	GAWR Front (kg)	675
VIN:	JA3215H12CU012517	GAWR Rear (kg)	890

DATA FROM VEHICLE'S TIRE PLACARD & SIDEWALL

Measured Parameter	Front	Rear
Location of Placard of Vehicle	Left Side B-Post	
Recommended Tire Size	145/65R15	175/60R15
Recommended Cold Tire Pressure	250 kPa	250 kPa
Size of Tires on Test Vehicle	P175/60R15	175/60R15
Type of Spare Tire	None.	

VEHICLE CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total
Type of Front Seats	Bucket	Split Bench		
Number of Occupants	2	2		4
Capacity Weight (VCW) (kg)				300
Number of Occupants x 68 kg				272
Cargo Weight (RCLW) (kg)				28

ELECTRIC VEHICLE PROPULSION SYSTEM

Type of Electric Vehicle (Electric/Hybrid):	Electric
Electric Energy Storage/Device:	Lithium-Ion
Nominal Voltage (V):	330 V
Physical Location of the High Voltage Source Automatic Disconnect:	Inside of Battery Pack
Auxiliary Battery Type:	12 V Battery (Lead Storage)

DATA SHEET 2
PRE-TEST DATA

Test Vehicle: 2012 Mitsubishi i-MiEV 5-Dr Hatchback NHTSA No. CC5602

CALCULATION OF TARGET TEST WEIGHT (TTW)

Measured Parameter	Units	Value
Unloaded Vehicle Weight (UVW)	kg	1175.7
Rated Cargo & Luggage Weight (RCLW)	kg	28
Weight of 1 P572U ATD (ES-2re) Dummy	kg	77.1
TARGET TEST WEIGHT	kg	1280.8

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	273.1	319.8		308.9	355.2		301.2	344.3	
Right	kg	265.3	317.5		276.2	340.2		283.5	345.2	
Ratio	%	45.8	54.2		45.7	54.3		45.9	54.1	
Totals	kg	538.4	637.3	1175.7	575.1	695.4	1280.5	584.7	689.5	1274.2

TIRE PRESSURES

	Units	LF	RF	RR	LR
As Delivered	kPa	250	250	250	250
As Tested	kPa	250	250	250	250

DATA SHEET 2 (CONTINUED)

PRE-TEST DATA

ELECTRIC ENERGY STORAGE CONVERSION/DEVICE SYSTEM DATA (COTR SUPPLIED DATA)

Electrolyte Fluid Type:	Lithium Hexafluorophosphate and Carbonate Ester	
Electrolyte Fluid Specific Gravity:	About 23.5 kg	
Electrolyte Kinematic Viscosity (centistokes):	2.8 mPas (25° C)	
Electrolyte Fluid Color:	Clear and Colorless	
Electric Energy Storage/Conversion System Coolant Type, Color, Specific Gravity (if applicable):	None (Air Cooled System)	
Location of Battery Modules:	☐	Inside Passenger Compartment
	☒	Outside Passenger Compartment
	Under Vehicle Body	
Electric Energy Storage/Conversion System State of Charge:	☒	Maximum State of Charge
	☐	Range of Normal Operating Voltage
Maximum State of Charge	360 V	
Test Voltage - No less than 95% of maximum State of Charge:	358 V	
Range of Normal Operating Voltage:	No Data Available	
Test Voltage – Within Normal Operative Voltage Range:	359 V	
Test Vehicle Equipped with Electrical Isolation Monitoring	Not Stated	

VEHICLE CHASSIS GROUND POINT(S) LOCATION(S)

Details of Vehicle Chassis Ground Point(s) & Location(s)	Ground located on the vehicle underbody on the passenger side of the HV battery pack. Wire is connected with a 10 mm socket bolt.
--	--

ELECTRIC ENERGY STORAGE/CONVERSION TEST POINTS

Details of Electric Energy Storage/Conversion System Test Points:	The access panel is on the bottom of the HV pack on the passenger side. The panel is removed to access the positive and negative terminals. The wires are connected with 10 mm socket bolts.
---	--

DATA SHEET 3

PRE-IMPACT ELECTRIC ISOLATION MEASUREMENTS & CALCULATIONS

Test Vehicle: 2012 Mitsubishi i-MiEV 5-Dr Hatchback NHTSA No. CC5602

VOLTMETER INFORMATION

Make:	Fluke
Model:	11
Serial Number:	68541895
Internal Impedance Value (M Ω):	> 10 M Ω < 100 pF
Resolution (V):	.001 Volts
Last Calibration Date:	01/23/2012

ELECTRIC ENERGY STORAGE/CONVERSION SYSTEM VOLTAGE

Measurement shall be made with Energy Storage/Conversion System connected to the vehicle propulsion system, and the vehicle in the "ready-to-drive" (propulsion system energized) 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):	359.0
---------	-------

ELECTRIC ENERGY STORAGE/CONVERSION SYSTEM TO VEHICLE CHASSIS

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

V1 (V):	173.8
V2 (V):	185.1

ELECTRIC ENERGY STORAGE/CONVERSION SYSTEM 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):	197000
------------------	--------

DATA SHEET 3 (CONTINUED)

PRE-IMPACT ELECTRICAL ISOLATION 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):	12.0
$R_{i1} = R_o (1 + V_2/V_1) [(V_1 - V_1')/V_1']$	
Ri1 (Ω):	5485133
V2' (V):	12.7
$R_{i2} = R_o (1 + V_1/V_2) [(V_2 - V_2')/V_2']$	
Ri2 (Ω):	5185215
Ri = The lesser of Ri1 and Ri2	
Ri Pre-Test ((Ω):	5185215
Ri/Vb (Ω/V):	14443
Minimum Electrical Isolation Value is 500 Ω/V	

Note: Measurements completed within 15 minutes prior to impact.

Is the measured Electrical Isolation Value:	Yes, Pass	No, Fail
$\geq 500 \Omega/V$ without electrical isolation monitoring	X	
$\geq 100 \Omega/V$ with electrical isolation monitoring		

DATA SHEET 4
POST-IMPACT DATA

Test Vehicle: 2012 Mitsubishi i-MiEV 5-Dr Hatchback NHTSA No. CC5602

VOLTMETER INFORMATION

Make:	Fluke
Model:	11
Serial Number:	17210161
Internal Impedance Value (MΩ):	> 10 MΩ < 100 pF
Nominal Propulsion Battery Voltage (Vb) (V):	330
Resolution (V):	0.001
NOTE: Record V1, V2, V1', V2' voltage measurements at a minimum of 5 seconds after impact.	

**ELECTRIC ENERGY STORAGE/CONVERSION SYSTEM
VOLTAGE LOCATION OF MEASUREMENT**

Measurement is made from the side of the automatic disconnect connected to the electric powertrain.

Vb (V):	6.0 V
---------	-------

ELECTRIC ENERGY STORAGE/CONVERSION SYSTEM VOLTAGE

V1 =	5.3	V	Impact Time:	0	Minutes	50	s
V2 =	3.4	V	Impact Time:	0	Minutes	57	s
V1' =	0.02	V	Impact Time:	1	Minutes	16	s
V2' =	0.02	V	Impact Time:	1	Minutes	24	s

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 =	85371623	Ω	Impact Time:	1	Minutes	16	s
$Ri2 = Ro (1 + V1/V2) [(V2-V2')/V2']$							
Ri2 =	85190912	Ω	Impact Time:	1	Minutes	24	s
Ri = The lesser of Ri1 and Ri2							
Ri =	851909012	Ω	Impact Time:	1	Minutes	24	s
Ri/Vb = electrical Isolation Value/Nominal Battery Voltage							
Minimum Electrical Value is 500 Ω/V							
Ri/Vb =	237301	Ω/V	Impact Time:	1	Minutes	24	s

Is the measured Electrical Isolation Value:	Yes, Pass	No, Fail
≥500 Ω/V without electrical isolation monitoring	X	
≥100 Ω/V with electrical isolation monitoring		

DATA SHEET 4 (CONTINUED)

POST-IMPACT DATA

ELECTRIC ENERGY STORAGE/CONVERSION DEVICE

	Inside Passenger Compartment	Outside Passenger Compartment
Location of Electric Energy Storage/Conversion Device:		X

	Yes, Pass	No, Fail
All Components of Electrical Energy Storage/Conversion Device remained attached to the vehicle with at least one mounting location.	X	

Describe Electric Energy Storage/Conversion Device movement within the passenger compartment [Supply photographs as appropriate]:
Not Applicable

	Yes, Fail	No, Pass
Has the Electric Energy Storage/Conversion Device moved within the passenger compartment?		X

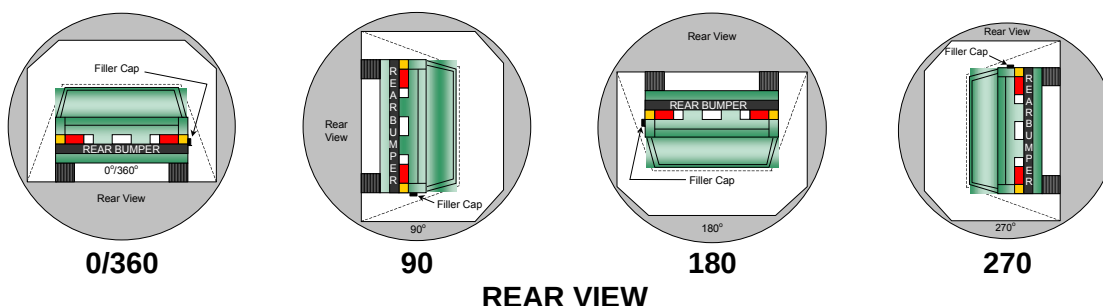
Describe intrusion of an outside Electric Energy Storage/Conversion Device into the passenger compartment [Supply photographs as appropriate]:
No Movement

	Yes, Fail	No, Pass
Has an outside Electric Energy Storage/Conversion Device intruded into the passenger compartment?		X

	Yes, Fail	No, Pass
Is Electric Energy Storage/Conversion Device electrolyte spillage visible in the passenger compartment?		X

DATA SHEET 5 **STATIC ROLLOVER TEST DATA**

Test Vehicle: 2012 Mitsubishi i-MiEV 5-Dr Hatchback NHTSA No. CC5602



DETERMINATION OF ELECTRIC ENERGY STORAGE/CONVERSION DEVICE ELECTROLYTE 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	56	seconds	5	minutes	7	minutes	56	seconds	8	minutes
90° - 180°	2	minutes	25	seconds	5	minutes	7	minutes	25	seconds	8	minutes
180° - 270°	2	minutes	11	seconds	5	minutes	7	minutes	11	seconds	8	minutes
270° - 360°	2	minutes	36	seconds	5	minutes	7	minutes	36	seconds	8	minutes

ACTUAL TEST VEHICLE ELECTRIC ENERGY STORAGE/CONVERSION DEVICE ELECTROLYTE SPILLAGE

Rollover Stage	Electric Energy Storage/Conversion Device Electrolyte Spillage (L)	Spillage Location
0° to 90°	0	Not Applicable
90° to 180°	0	Not Applicable
180° to 270°	0	Not Applicable
270° to 360°	0	Not Applicable

Total Spillage: 0 L

	Yes, Fail	No, Pass
Is the total spillage of Electric Energy Storage/Conversion Device electrolyte greater than 5.0 Liters?		X
Is Electric Energy Storage/Conversion Device electrolyte spillage visible in the passenger compartment?		X

DATA SHEET 5 (CONTINUED)
STATIC ROLLOVER TEST DATA

Test Vehicle: 2012 Mitsubishi i-MiEV 5-Dr Hatchback NHTSA No. CC5602

VOLTMETER INFORMATION

Make:	Fluke
Model:	11
Serial Number:	17210161
Internal Impedance Value (MΩ):	> 10 MΩ < 100 pF
Nominal Electric Energy Storage/Conversion Device Voltage (Vb) (V):	330
Record V1, V2, V1', V2' voltage measurements at the start of each successive increment of 90°, 180°, 270°, and 360° of the static rollover test.	

ELECTRICAL ISOLATION MEASUREMENT

V1 =	0.04	V	0°	Time:		Minutes		s
V1 =	0.1	V	90°	Time:	0	Minutes	24	s
V1 =	0.1	V	180°	Time:	0	Minutes	28	s
V1 =	0.1	V	270°	Time:	0	Minutes	34	s
V1 =	0.2	V	360°	Time:	0	Minutes	38	s
V2 =	1.8	V	0°	Time:		Minutes		s
V2 =	0.1	V	90°	Time:	0	Minutes	30	s
V2 =	0.2	V	180°	Time:	0	Minutes	35	s
V2 =	2.1	V	270°	Time:	0	Minutes	40	s
V2 =	2.3	V	360°	Time:	0	Minutes	48	s
V1' =	0.01	V	0°	Time:		Minutes		s
V1' =	0.01	V	90°	Time:	0	Minutes	37	s
V1' =	0.01	V	180°	Time:	0	Minutes	42	s
V1' =	0.01	V	270°	Time:	0	Minutes	45	s
V1' =	0.01	V	360°	Time:	0	Minutes	53	s
V2' =	0.01	V	0°	Time:		Minutes		s
V2' =	0.01	V	90°	Time:	0	Minutes	40	s
V2' =	0.01	V	180°	Time:	0	Minutes	46	s
V2' =	0.01	V	270°	Time:	0	Minutes	50	s
V2' =	0.01	V	360°	Time:	0	Minutes	57	s
Vb =	3.8	V	0°	Time:		Minutes		s
Vb =	3.8	V	90°	Time:	0	Minutes	19	s
Vb =	3.8	V	180°	Time:	0	Minutes	14	s
Vb =	3.8	V	270°	Time:	0	Minutes	25	s
Vb =	3.8	V	360°	Time:	0	Minutes	31	s

DATA SHEET 5 (CONTINUED)
STATIC ROLLOVER TEST DATA

Test Vehicle: 2012 Mitsubishi i-MiEV 5-Dr Hatchback NHTSA No. CC5602

ELECTRICAL ISOLATION CALCULATION

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.

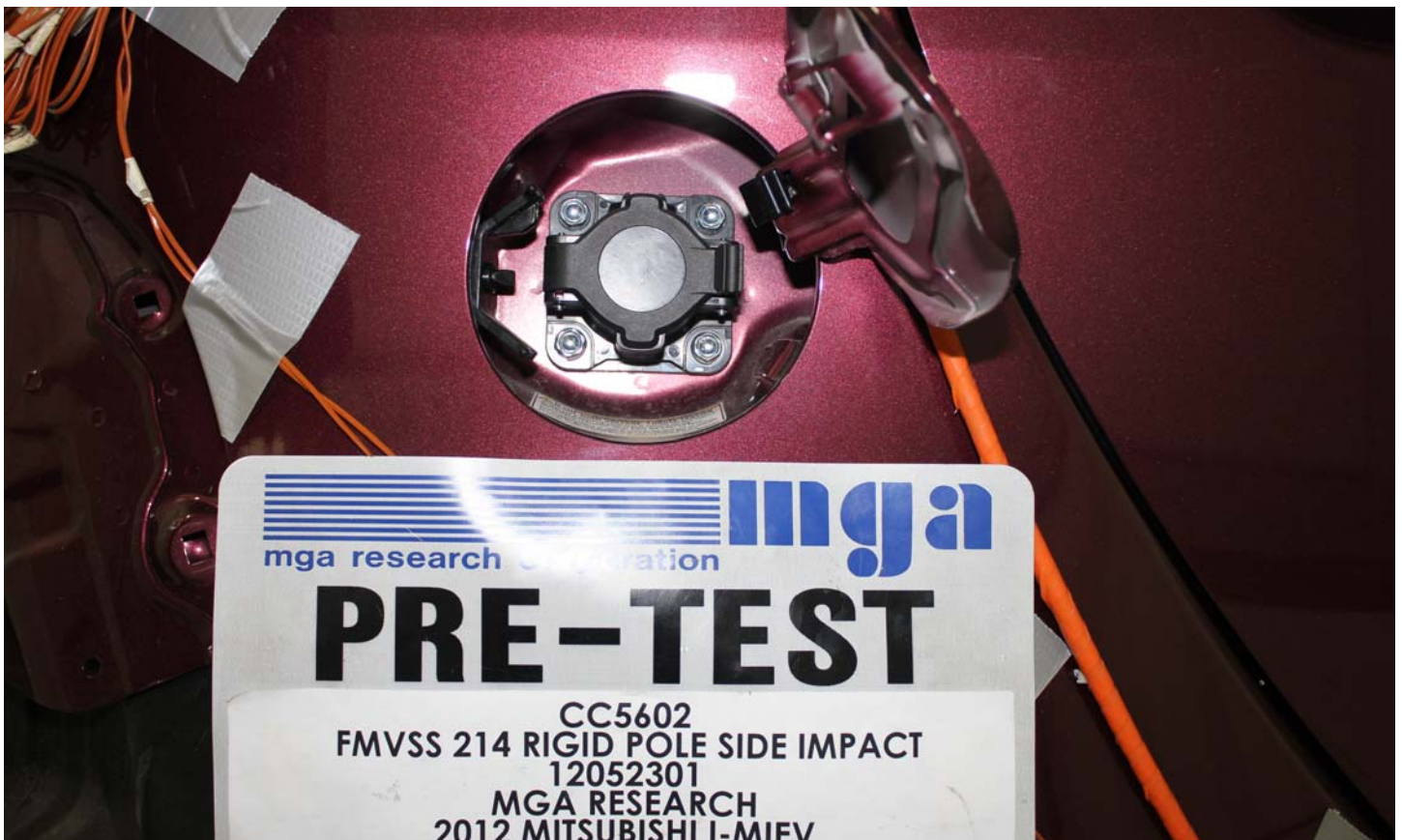
Ri1 = Ro (1 + V2/V1) [(V1-V1')/V1']								
Ri1 =	27186000	Ω	0°	Time:		Minutes		s
Ri1 =	3546000	Ω	90°	Time:	0	Minutes	24	s
Ri1 =	5319000	Ω	180°	Time:	0	Minutes	28	s
Ri1 =	39006000	Ω	270°	Time:	0	Minutes	34	s
Ri1 =	46787500	Ω	360°	Time:	0	Minutes	38	s
Ri2 = Ro (1 + V1/V2) [(V2-V2')/V2']								
Ri2 =	36046622	Ω	0°	Time:		Minutes		s
Ri2 =	3546000	Ω	90°	Time:	0	Minutes	30	s
Ri2 =	5614500	Ω	180°	Time:	0	Minutes	35	s
Ri2 =	43133619	Ω	270°	Time:	0	Minutes	40	s
Ri2 =	49035870	Ω	360°	Time:	0	Minutes	48	s
Ri = The lesser of Ri1 and Ri2								
Ri =	27186000	Ω	0°	Time:		Minutes		s
Ri =	3546000	Ω	90°	Time:	0	Minutes	24	s
Ri =	5319000	Ω	180°	Time:	0	Minutes	28	s
Ri =	39006000	Ω	270°	Time:	0	Minutes	40	s
Ri =	46787500	Ω	360°	Time:	0	Minutes	38	s
Ri/Vb = Electrical Isolation Value/Nominal Battery Voltage								
Minimum Electrical Isolation Value is 500 Ω /V								
Ri/Vb =	75727	Ω/V	0°	Time:		Minutes		s
Ri/Vb =	9877	Ω/V	90°	Time:	0	Minutes	24	s
Ri/Vb =	14816	Ω/V	180°	Time:	0	Minutes	28	s
Ri/Vb =	108652	Ω/V	270°	Time:	0	Minutes	40	s
Ri/Vb =	130327	Ω/V	360°	Time:	0	Minutes	38	s

Is the measured Electrical Isolation Value:	Yes, Pass	No, Fail
≥500 Ω/V without electrical isolation monitoring	X	
≥100 Ω/V with electrical isolation monitoring		

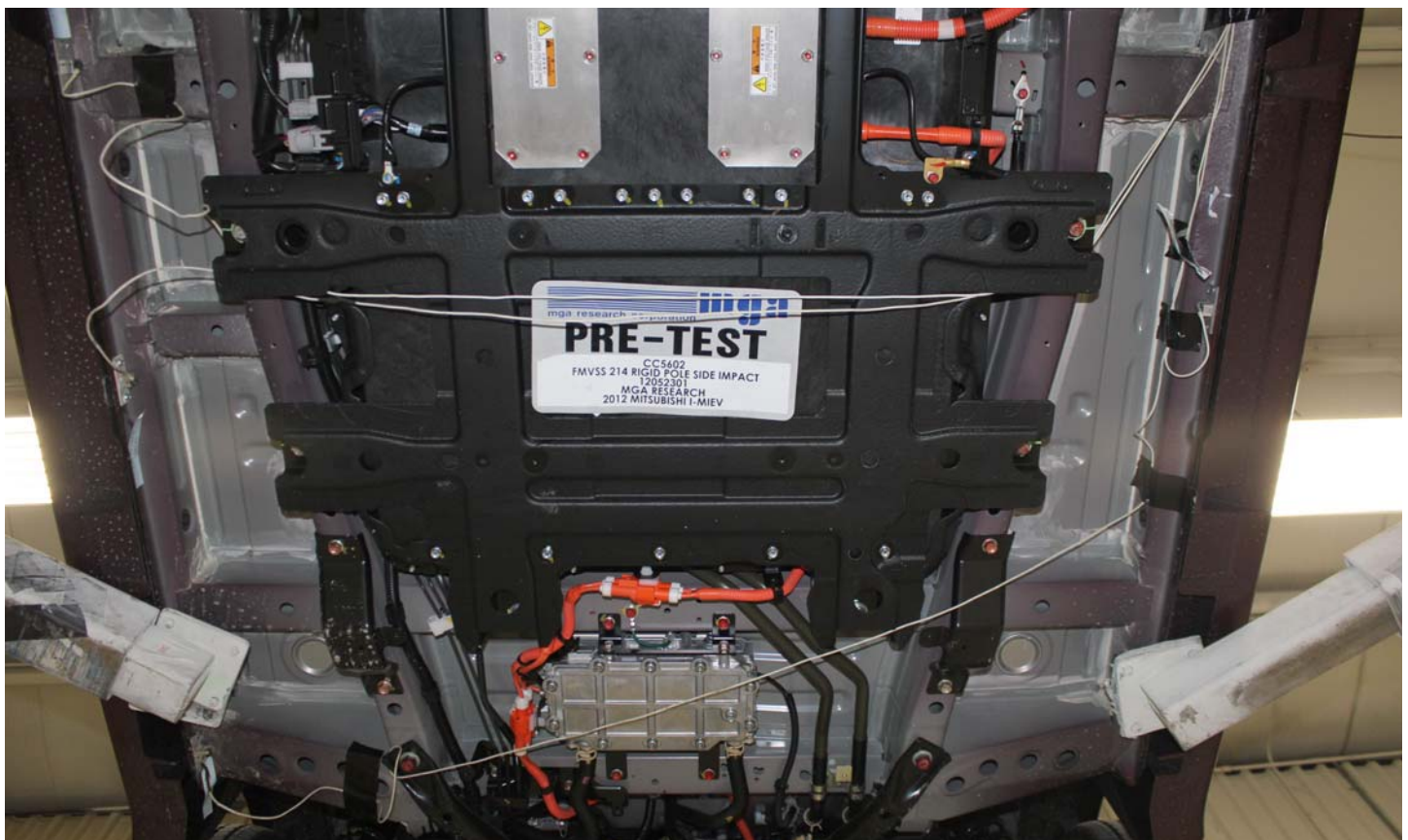
APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

	<u>Page No.</u>
Charging Port	A-1
Pre-Impact Front View of Propulsion Battery	A-1
Pre-Impact Rear View of Propulsion Battery	A-2
Post-Impact Front View of Propulsion Battery	A-2
Post-Impact Mid View of Propulsion Battery	A-3
Post-Impact Rear View of Propulsion Battery	A-3
Pre-Impact View of Electric Propulsion Drive	A-4
Post-Impact View of Electric Propulsion Drive	A-4
Pre-Impact View of Ground Lead Attached	A-5
Pre-Impact View of High Voltage Leads Attached	A-5
Post-Impact View of Installed Impact Interface Port	A-6
FMVSS No. 305 Static Rollover at 90°	A-6
FMVSS No. 305 Static Rollover at 180°	A-7
FMVSS No. 305 Static Rollover at 270°	A-7
FMVSS No. 305 Static Rollover at 360°	A-8
Post-Impact Propulsion Battery System Mounting and/or Intrusion Failure	A-8
Post-Impact Propulsion Battery System Mounting and/or Intrusion Failure	A-9
As Delivered Right Front $\frac{3}{4}$ View of Impact Vehicle	A-9
As Delivered Left Rear $\frac{3}{4}$ View of Impact Vehicle	A-10
Vehicle's Certification Label	A-10
Vehicle's Tire Information Placard or Label	A-11



No. 001 Charging Port



No. 002 Pre-Impact Front View of Propulsion Battery



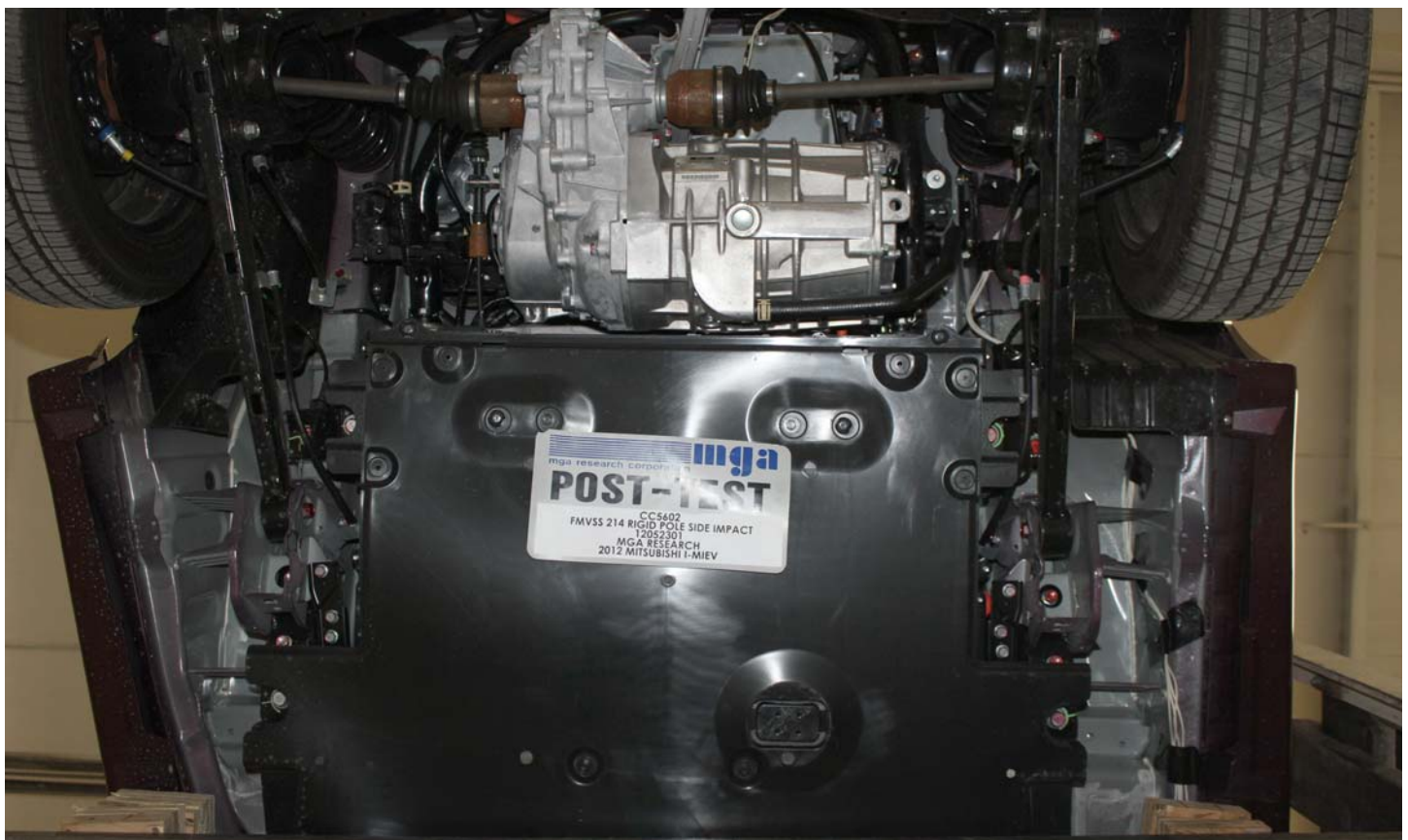
No. 003 Pre-Impact Rear View of Propulsion Battery



No. 004 Post-Impact Front View of Propulsion Battery



No. 005 Post-Impact Mid View of Propulsion Battery



No. 006 Post-Impact Rear View of Propulsion Battery



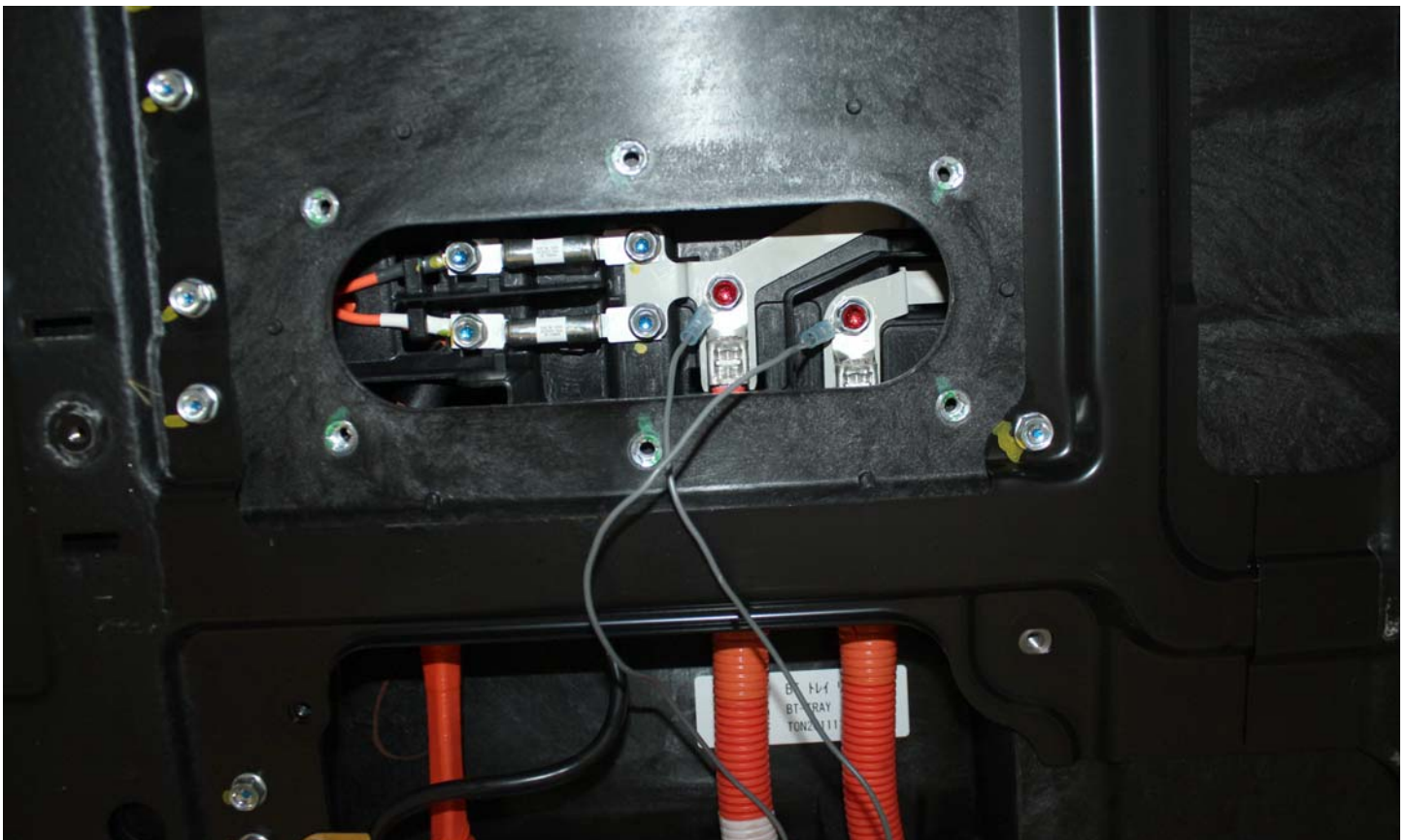
No. 007 Pre-Impact View of Electric Propulsion Drive



No. 008 Post-Impact View of Electric Propulsion Drive



No. 009 Pre-Impact View of Ground Lead Attached



No. 010 Pre-Impact View of High Voltage Leads Attached



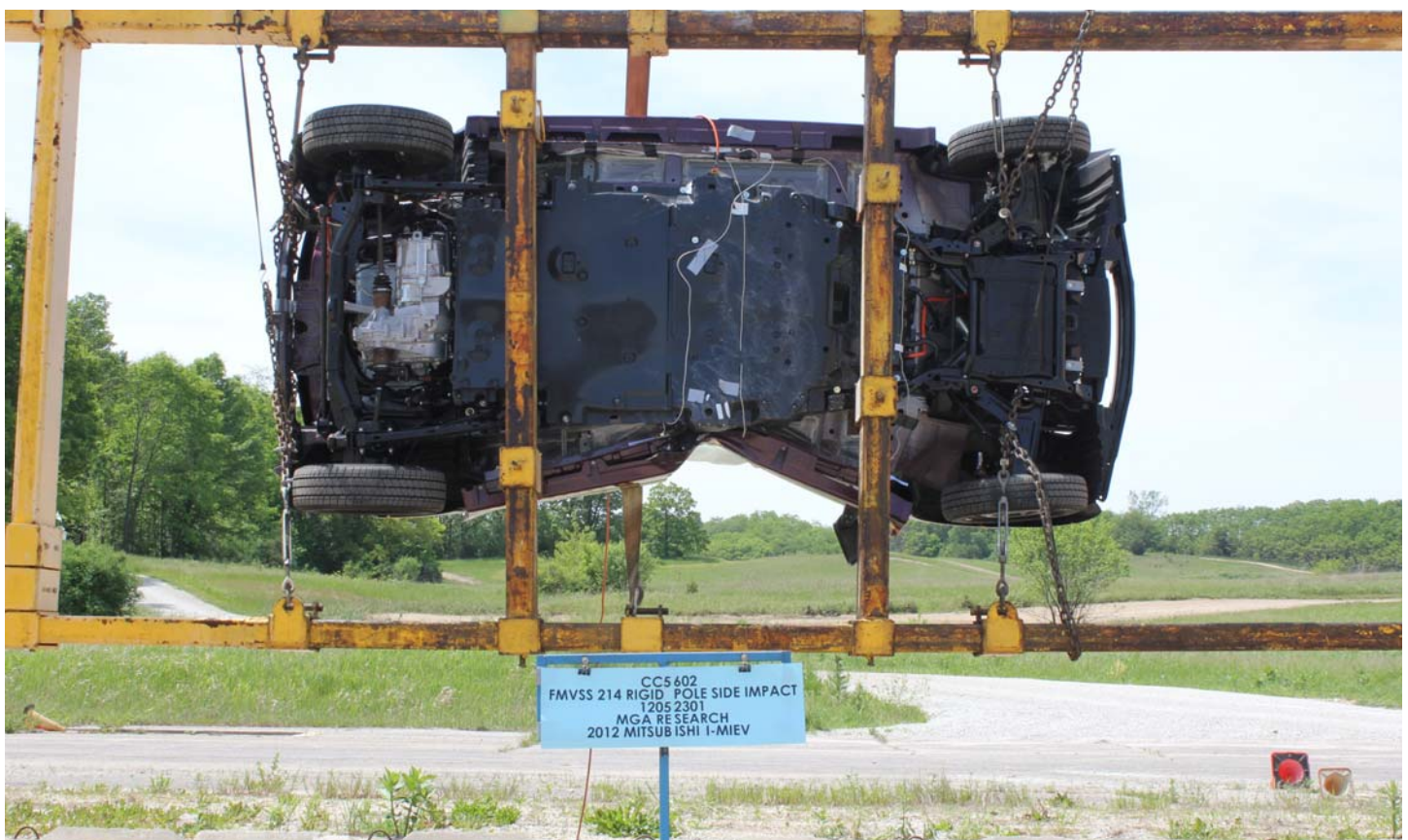
No. 011 Post-Impact View of Installed Impact Interface Port



No. 012 FMVSS No. 305 Static Rollover at 90°



No. 013 FMVSS No. 305 Static Rollover at 180°



No. 014 FMVSS No. 305 Static Rollover at 270°



No. 015 FMVSS No. 305 Static Rollover at 360°



No. 016 Post-Impact View of Battery Module Movement or Retention Loss



No. 017 Post-Impact View of Battery Module Movement or Retention Loss



No. 018 As Delivered Right Front $\frac{3}{4}$ View of Impact Vehicle



No. 019 As Delivered Left Rear ¾ View of Impact Vehicle



No. 020 Vehicle's Certification Label



No. 021 Vehicle's Tire Information Placard or Label