

REPORT NUMBER 114-GTL-11-006

# SAFETY COMPLIANCE TESTING FOR FMVSS NO. 114 THEFT PROTECTION

GENERAL MOTORS LLC  
2011 CHEVROLET VOLT, PASSENGER CAR  
NHTSA NO. CB0102

GENERAL TESTING LABORATORIES, INC.  
1623 LEEDSTOWN ROAD  
COLONIAL BEACH, VIRGINIA 22443



May 18, 2011

**FINAL REPORT**

**PREPARED FOR**

**U. S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
ENFORCEMENT  
OFFICE OF VEHICLE SAFETY COMPLIANCE  
1200 NEW JERSEY AVE., SE  
WASHINGTON, D.C. 20590**

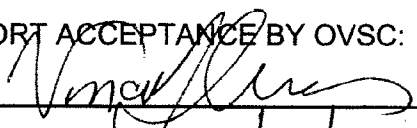
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Approved By: \_\_\_\_\_

Approval Date: 05/18/11

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16. Abstract Compliance tests were conducted on the subject 2011 Chevrolet Volt Passenger Car in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-114-04 for the determination of FMVSS 114 compliance.  Test failures identified were as follows: None		
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## SECTION 1

## PURPOSE OF COMPLIANCE TEST

1.0 PURPOSE OF TEST

A model year 2011 Chevrolet Volt Passenger Car was subjected to Federal Motor Vehicle Safety Standard (FMVSS) No. 114 testing to determine if the vehicle was in compliance with the requirements of the standard. FMVSS 114 specifies requirements to decrease the likelihood that a vehicle is stolen, or accidentally set in motion.

1.1 The test vehicle was a 2011 Chevrolet Volt Passenger Car. The vehicle was identified as follows:

A. Vehicle Identification Number: 1G1RC6E48BU101109

B. NHTSA No.: CB0102

C. Manufacturer: GENERAL MOTORS LLC

D. Manufacture Date: 01/11

E. Color: Silver Ice Metallic

1.2 TEST DATE

The test vehicle was subjected to FMVSS No. 114 testing on March 24, 2011.

## SECTION 2

### TEST PROCEDURE AND SUMMARY OF RESULTS

#### 2.0 TEST PROCEDURE

All tests were conducted in accordance with NHTSA, Office of Vehicle Safety Compliance (OVSC) Laboratory Procedure TP-114-04 and General Testing Laboratories, Inc. (GTL) Test Procedure, TP-114-04, "Theft Protection and Rollaway Prevention".

#### 2.1 SUMMARY OF RESULTS

Test data indicate the FMVSS 114 requirements appear to have been satisfied. All test data resulting from the tests were recorded on test data sheets in Section 3.

## SECTION 3

## TEST DATA

3.0 TEST RESULTS

The following data sheets document the results of FMVSS 114 testing on the 2011 Chevrolet Volt.





FMVSS 114, THEFT PROTECTION  
DATA SHEET 1 continued

GEAR SELECTION CONTROL

Describe the gear selection control:

Gear Selection Lever located on center console between front seats.

Describe how the gear selection control is activated:

Depress brake pedal, while also depressing release button on front of gear selector and move gear selector to desired position.

Describe all of the selectable settings:

Park, Reverse, Neutral, Drive, Low

IMMOBILIZER

Is the vehicle equipped with an immobilizer    YES   X              NO           

Describe the immobilizer device and how it prevents vehicle theft (if equipped):

The key code embedded in the Key FOB must match the vehicle code in order for the drive system to activate.

OPTIONAL RELEASE DEVICES

Describe if the vehicle is equipped with optional release devices:

NO

OPTIONAL RELEASE DEVICES:

Key Removal                       Gear Selection Control                       None   X              Other           

VEHICLE FLUIDS

Check all vehicle fluids and adjust to the proper levels for operation:   Full  

VEHICLE TIRE PLACARD INFORMATION

Vehicle Mfg. Recommended Tire Inflation Pressure

(kPa): Front   240              Rear   240  

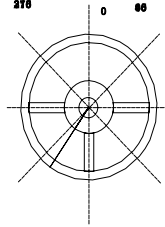
TIRE INFLATION PRESSURES:

Measured (kPa): LF   240              LR   240              RF   240              RR   240  

WEIGHT

Vehicle Curb Weight(kg):   1696   Weight of Driver (kg):   91   (target = 91kg)

FMVSS 114, THEFT PROTECTION  
DATA SHEET 2

REQUIREMENT S5.1.1		PASS	FAIL
Engine cannot be started without using the key <u>    </u> Yes <u>  X  </u> No		X	
<p>With key removed, steering wheel locks: Yes: <u>    </u> No: <u>  X  </u></p> <p>Note:</p> <p>Identify locking position(s) on wheel using arrow(s)</p> <p>Clockwise: <u>                    </u> (degrees) Counterclockwise: <u>                    </u> (degrees)</p> <div style="text-align: right;">  </div>			
Key removal prevents forward self-mobility:		Yes: <u>  X  </u>	No: <u>                    </u>
<p>If yes describe: The immobilizer is automatically armed after the vehicle is put into the off mode. An authorization module verifies the electronic key prior to allowing vehicle operation.</p>			
When key is removed from the starting system, starting of the engine or motor and either steering or self mobility is prevented. YES		X	

REMARKS:

FMVSS 114, THEFT PROTECTION  
DATA SHEET 2 continued

REQUIREMENT S5.1.3	PASS	FAIL
<p>An audible warning is activated whenever the key is in any starting system position with the exception of "on" and "start" and the door closest to the driver's designated seating position is opened.</p> <p style="text-align: right;">Yes <u> X </u> No <u>    </u></p> <p>Identify ALL key/starting system position setting: <u>                    OFF, ACCESSORY, SERVICE ONLY, ON/RUN                    </u></p>	X	

REQUIREMENT S5.1.4	PASS	FAIL
<p>With the vehicle engine or motor shut down and the transmission gear selection control in any position other than "park";</p> <p>The steering wheel can rotate without locking? Yes <u> X </u> No <u>    </u></p> <p>NOTE: Engine cannot be turned off by push button if gear selector is not in the park position.</p>	X	
<p>The vehicle is free to roll forward? Yes <u> X </u> No <u>    </u></p>	X	

REMARKS:

RECORDED BY:  G. Farrand   
APPROVED BY:  D. Messick

DATE:  03/24/11

FMVSS 114, ROLLAWAY PREVENTION  
DATA SHEET 3  
(for vehicles equipped with transmission with a "park" position)

VEH. NHTSA NO.: CB0102

TEST DATE: 03/24/11

REQUIREMENT S5.2.1	PASS	FAIL
<p>The starting system prevents key removal in ALL gear selection control positions except "park". Yes <u>X</u> No _____</p> <p>Can the gear selection control be placed between each gear selection position and will it remain there without assistance? Yes _____ No <u>X</u></p> <p>If yes, can the key be removed from the starting system? Yes _____ No _____</p> <p>If the key can be removed from the vehicle starting system when the gear selection control is not locked in "park", a mechanism shall exist which, upon key removal, the vehicle transmission or gear selection control shall become locked in "park" as the direct result of removing the key. If such a mechanism exists, describe the mechanism and its function: When the power is turned off, the key code is automatically removed and the transmission goes into park. (If vehicle is not moving)</p>	X	

REQUIREMENT S5.2.2	PASS	FAIL
<p>The gear selection control is locked in the "park" position when the key is removed from the starting system. Yes <u>X</u> No _____</p>	X	

REMARKS:

## DATA SHEET 3 continued

REQUIREMENT S5.2.3	PASS	FAIL
<p><u>KEY REMOVAL OVERRIDE OPTION:</u></p> <p>The vehicle is equipped with an override device that allows the user to Remove the key from the “starting system without the transmission or gear selection control in the “park” position. Yes_____ No__<u>X</u></p> <p>If <u>yes</u>, describe the override device design and mode of activation:</p> <p>Fill in the section below that describes the condition for which the user is allowed to remove the key from the starting system without the transmission or gear selection control in the “park” position:</p> <p><u>ELECTRICAL FAILURE</u></p> <p>In the event of an electrical failure, including battery discharge, key removal from the starting system without the transmission or gear selection control locked in “park” is permitted”. Yes_____ No__<u>X</u></p> <p>When power is removed, transmission goes into “Park” mode.</p> <p><u>VERRIDE DEVICE WITH NO COVER:</u></p> <p>The following condition is prevented: Steering_____ Self-Mobility_____</p> <p>The device requires both the use of a tool to activate and simultaneous activation of the override device and removal of the key from the starting system Yes_____ No_____</p> <p><u>VERRIDE DEVICE WITH AN OPAQUE COVER</u></p> <p>The following condition is prevented: Steering_____ Self-Mobility_____</p> <p>The device is covered by an opaque surface which prevents sight of and use of the device. Yes_____ No_____</p> <p>The opaque surface can only be removed by using a screwdriver or other tool: Yes_____ No_____</p>	<p>X</p> <p>N/A</p> <p>N/A</p>	

DATA SHEET 3 continued

REQUIREMENT S5.2.4	PASS	FAIL
<p><b><u>GEAR SELECTION CONTROL OVERRIDE DEVICE</u></b></p> <p>The vehicle is equipped with an override device that allows the user to move the gear selection control from “park” after the key has been removed from the starting system. Yes_____ No__<u>X</u></p> <p>If yes, select the type of override device used: Key_____ Opaque Cover_____ No Cover_____</p> <p>Describe the override device design and mode of activation (if equipped): It is located in the center console storage tray and is accessed by removing rubber mat which allows a key to be inserted to release shifter.</p> <p><b>FILL IN THE SECTION BELOW THAT APPLIES:</b></p> <p><b><u>OVERRIDE OPERATED WITH KEY:</u></b></p> <p>The key is required to operate the override device that allows the user to move the gear selection control from “park” after the key has been removed from the starting system. Yes_____ No_____</p> <p><b><u>OVERRIDE DEVICE WITH NO COVER</u></b></p> <p>As a direct result of removing the key from the starting system, the following is prevented: Steering_____ Self-Mobility_____</p> <p>The override device requires the use of a tool to operate. Yes_____ No_____</p> <p>Simultaneous activation of the override device and movement of the gear selection control from “park” is required Yes_____ No_____</p> <p><b><u>OVERRIDE DEVICE WITH AN OPAQUE COVER</u></b></p> <p>As a direct result of removing the key from the starting system, the following is prevented: Steering_____ Self-Mobility _____</p> <p>The opaque surface cover prevents sight of and use of the device: Yes_____ No_____</p> <p>The opaque surface cover can only be removed by using a screwdriver or other tool: Yes_____ No _____</p>	<p>X</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>	

DATA SHEET 3 continued

REQUIREMENTS S5.2.5	PASS	FAIL
<p><u>VEHICLE FACING UPHILL ON 10% GRADE</u></p> <p>With the gear selection control in "park" measure movement of the vehicle down the slope upon releasing the service brake.</p> <p>Test grade: <u> 15 </u> % (9% to 15%)                      Measured movement: <u> 93 </u> mm (150mm maximum)</p> <p><b>NOTE:</b> Repeat procedure if vehicle fails on grade in excess of 10%.</p> <p>Test grade: _____ % (9% to 10%)                      Measured movement: _____ mm (150 mm maximum)</p> <p><u>VEHICLE FACING DOWNHILL ON 10% GRADE</u></p> <p>With the gear selection control in "park" measure movement of the vehicle down the slope upon releasing the service brake.</p> <p>Test grade: <u> 15 </u> % (9% to 15%)                      Measured movement: <u> 90 </u> mm (150mm maximum)</p> <p><b>NOTE:</b> Repeat procedure if vehicle fails on grade in excess of 10%.</p> <p>Test grade: _____ % (9% to 10%)                      Measured movement: _____ mm (150 mm maximum)</p>	<p>X</p> <p>X</p>	

REMARKS:

## DATA SHEET 3 continued

REQUIREMENTS S5.3	PASS	FAIL														
With the key in the "OFF" position, the transmission will shift out of "PARK" without the service brake being applied. Yes ___ No <u>X</u>	<u>X</u>															
With the key in the "ACC" position, the transmission will shift out of "PARK" without the service brake being applied. Yes ___ No <u>X</u>	<u>X</u>															
With the key in the "ON" position (engine off), the transmission will shift out of "PARK" without the service brake being applied. Yes ___ No <u>X</u>	<u>X</u>															
With the key in the "START" position, the transmission will shift out of "PARK" without the service brake being applied. Yes ___ No <u>X</u>	<u>X</u>															
With the key in the "OTHER" position (please specify), the transmission will shift out of "PARK" without the service brake being applied. Yes ___ No ___	<u>N/A</u>															
Does the key stay between starting system positions without being held by operator? Yes ___ No <u>X</u> If so, please describe.	<u>X</u>															
With the vehicle battery disconnected, the gear selection control is locked in the "PARK" position. Yes <u>X</u> No ___	<u>X</u>															
Brake force readings (force required to allow the transmission to shift out of "park"): The vehicle is equipped with adjustable pedals: Yes ___ No <u>X</u>																
<table border="0"> <tr> <td data-bbox="188 1262 779 1386">Fore Position:</td> <td data-bbox="779 1262 1252 1386">Aft Position (if applicable)</td> </tr> <tr> <td data-bbox="188 1386 779 1425">Reading 1 <u>23.6 N</u></td> <td data-bbox="779 1386 1252 1425">Reading 1 <u>N/A</u></td> </tr> <tr> <td data-bbox="188 1425 779 1465">Reading 2 <u>21.8 N</u></td> <td data-bbox="779 1425 1252 1465">Reading 2 <u>N/A</u></td> </tr> <tr> <td data-bbox="188 1465 779 1505">Reading 3 <u>21.8 N</u></td> <td data-bbox="779 1465 1252 1505">Reading 3 <u>N/A</u></td> </tr> <tr> <td data-bbox="188 1505 779 1545">Reading 4 <u>22.2 N</u></td> <td data-bbox="779 1505 1252 1545">Reading 4 <u>N/A</u></td> </tr> <tr> <td data-bbox="188 1545 779 1585">Reading 5 <u>21.8 N</u></td> <td data-bbox="779 1545 1252 1585">Reading 5 <u>N/A</u></td> </tr> <tr> <td data-bbox="188 1585 779 1654">Avg. <u>22.2 N</u></td> <td data-bbox="779 1585 1252 1654">Avg. <u>N/A</u></td> </tr> </table>	Fore Position:	Aft Position (if applicable)	Reading 1 <u>23.6 N</u>	Reading 1 <u>N/A</u>	Reading 2 <u>21.8 N</u>	Reading 2 <u>N/A</u>	Reading 3 <u>21.8 N</u>	Reading 3 <u>N/A</u>	Reading 4 <u>22.2 N</u>	Reading 4 <u>N/A</u>	Reading 5 <u>21.8 N</u>	Reading 5 <u>N/A</u>	Avg. <u>22.2 N</u>	Avg. <u>N/A</u>	<u>X</u>	
Fore Position:	Aft Position (if applicable)															
Reading 1 <u>23.6 N</u>	Reading 1 <u>N/A</u>															
Reading 2 <u>21.8 N</u>	Reading 2 <u>N/A</u>															
Reading 3 <u>21.8 N</u>	Reading 3 <u>N/A</u>															
Reading 4 <u>22.2 N</u>	Reading 4 <u>N/A</u>															
Reading 5 <u>21.8 N</u>	Reading 5 <u>N/A</u>															
Avg. <u>22.2 N</u>	Avg. <u>N/A</u>															
<p>*For vehicles equipped with adjustable pedals, record readings for both the Fore and Aft positions. For non-adjustable pedal vehicles, use the Fore position column to record values.</p>																

## REMARKS:

RECORDED BY: G. FarrandDATE: 03/24/11APPROVED BY: D. Messick



SECTION 4  
TEST EQUIPMENT LIST

ITEM	MFR	MODEL	S/N	CAL. PERIOD	DATE OF NEXT CALIB.	REMARKS
SLR DIGITAL CAMERA	NIKON	D50	N/A	N/A	N/A	
TIRE PRESSURE GAUGE	WESKLER	45-0/100	107	12 MO.	04/11	
INCLINOMETER	MITUTOYO	PRO 360	950-315	N/A	BEFORE USE	
STEEL TAPE	STANLEY	FAT MAX	33-890	12 MO.	01/12	
WHEEL SCALES	INTERCOMP	SERIES 94	199744	12 MO.	03/12	
WHEEL SCALES	INTERCOMP	SERIES 94	199744	12 MO.	03/12	
WHEEL SCALES	INTERCOMP	SERIES 94	199744	12 MO.	03/12	
WHEEL SCALES	INTERCOMP	SERIES 94	199744	12 MO.	03/12	
SPRING SCALE	CHATILLON	DPP-10	4729	12 MO.	BEFORE USE	

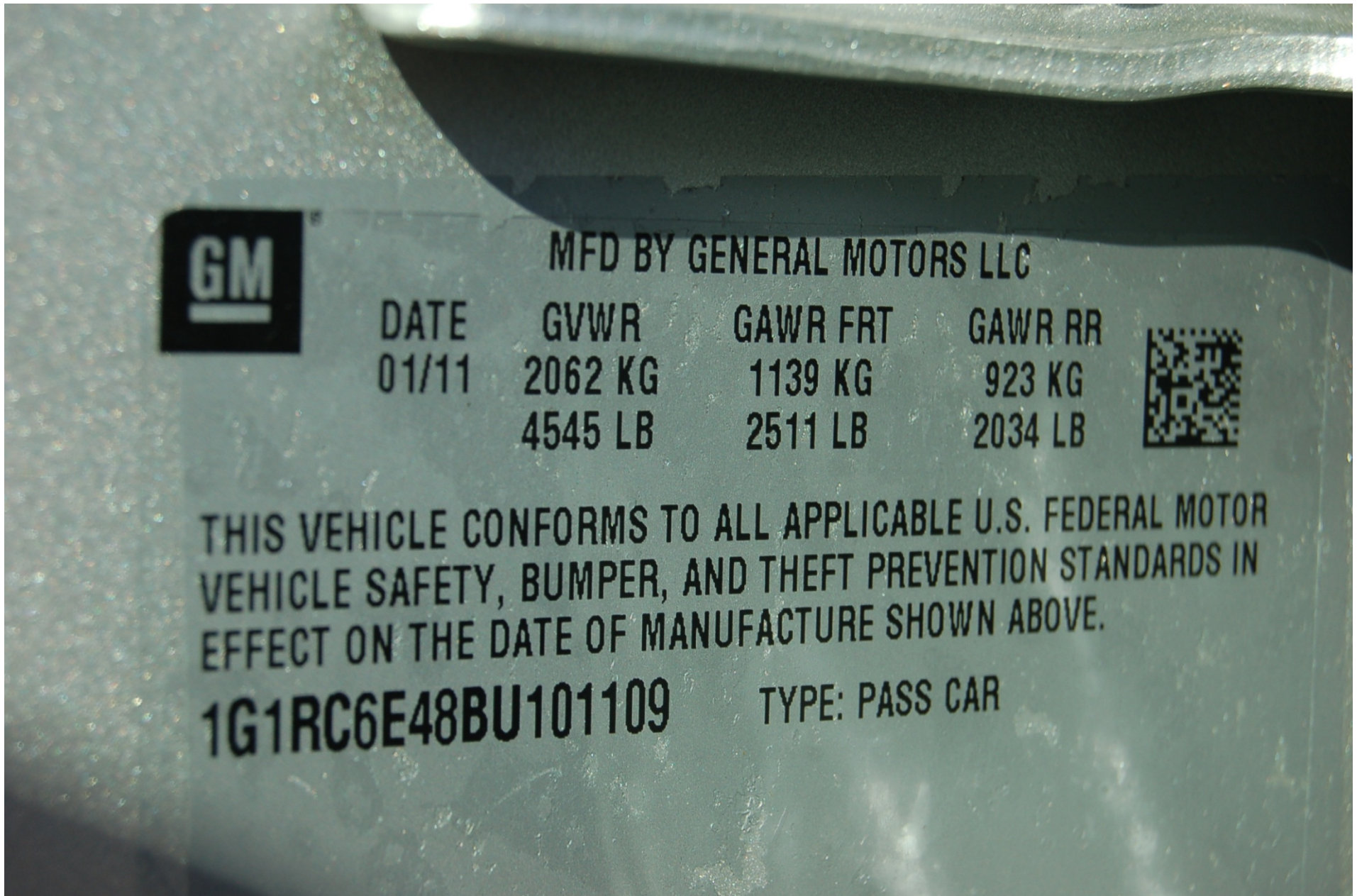
SECTION 5  
PHOTOGRAPHS



2011 CHEVROLET VOLT  
NHTSA NO. CB0102  
FMVSS NO. 114

FIGURE 5.1  
¾ FRONTAL VIEW FROM LEFT SIDE OF VEHICLE





2011 CHEVROLET VOLT  
NHTSA NO. CB0102  
FMVSS NO. 114

FIGURE 5.2  
VEHICLE CERTIFICATION LABEL



CB0102



# TIRE AND LOADING INFORMATION

SEATING CAPACITY : TOTAL 4 : FRONT 2 : REAR 2

The combined weight of occupants and cargo should never exceed 340 kg or 750 lbs.

TIRE	ORIGINAL SIZE	COLD TIRE PRESSURE
FRONT	P215/55R17 H	240 kPa, 35 PSI
REAR	P215/55R17 H	240 kPa, 35 PSI
SPARE	NONE	NONE

SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION

1G1RC6E48BU101109

2011 CHEVROLET VOLT  
NHTSA NO. CB0102  
FMVSS NO. 114

FIGURE 5.3  
VEHICLE TIRE INFORMATION LABEL





2011 CHEVROLET VOLT  
NHTSA NO. CB0102  
FMVSS NO. 114

FIGURE 5.4  
CLOSE-UP VIEW OF KEY FOB





2011 CHEVROLET VOLT  
NHTSA NO. CB0102  
FMVSS NO. 114

FIGURE 5.5  
POWER BUTTON





2011 CHEVROLET VOLT  
NHTSA NO. CB0102  
FMVSS NO. 114

FIGURE 5.6  
PRESS BRAKE TO START WARNING





2011 CHEVROLET VOLT  
NHTSA NO. CB0102  
FMVSS NO. 114

FIGURE 5.7  
NO KEY FOB (REMOTE) DETECTED WARNING





2011 CHEVROLET VOLT  
NHTSA NO. CB0102  
FMVSS NO. 114

FIGURE 5.8  
KEY FOB (REMOTE) LEFT IN VEHICLE WARNING





2011 CHEVROLET VOLT  
NHTSA NO. CB0102  
FMVSS NO. 114

FIGURE 5.9  
TRANSMISSION GEAR SELECTOR CONTROL





2011 CHEVROLET VOLT  
NHTSA NO. CB0102  
FMVSS NO. 114

FIGURE 5.10  
GEAR SELECTOR POSITION IDENTIFICATION