

REPORT NUMBER: 114-CAL-08-07

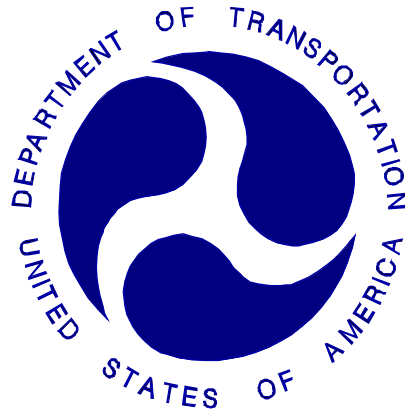
**SAFETY COMPLIANCE TESTING FOR  
FMVSS No. 114  
THEFT PROTECTION AND ROLLOVER PREVENTION**

GENERAL MOTORS CORPORATION  
2008 CHEVROLET MALIBU HYBRID FOUR-DOOR SEDAN

NHTSA NUMBER: C80110

CALSPAN TEST NUMBER: 8858-F114-07

CALSPAN CORPORATION  
P.O. BOX 400  
BUFFALO, NEW YORK 14225



May 29, 2008

FINAL REPORT

U. S. DEPARTMENT OF TRANSPORTATION  
National Highway Traffic Safety Administration  
ENFORCEMENT  
Office of Vehicle Safety Compliance  
Room W43-481, NVS-220  
1200 New Jersey Avenue, SE  
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:   
Vincent M. Paolini, Project Engineer

Approved By:   
David J. Travale, Program Manager  
Transportation Sciences Center

Approval Date: August 20, 2008

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: \_\_\_\_\_

Acceptance Date: \_\_\_\_\_

**TECHNICAL REPORT STANDARD TITLE PAGE**

1. Report No. 114-CAL-08-07	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of FMVSS 114 Compliance Testing of a 2008 Chevrolet Malibu Hybrid Four-Door Sedan NHTSA No.: C80110		5. Report Date May 29, 2008	
		6. Performing Organization Code CAL	
7. Author(s) Vincent M. Paolini, Project Engineer David J. Travale, Program Manager		8. Performing Organization Report No. 8858-F114-07	
9. Performing Organization Name and Address Calspan Corporation Transportation Sciences Center Transportation Sciences Center P.O. Box 400 Buffalo, New York 14225		10. Work Unit No.	
		11. Contract or Grant No. DTNH22-06-C-00031	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Enforcement Office of Vehicle Safety Compliance (NVS-220) 400 Seventh Street, SW, Rm. 6115 Washington, D.C. 20590		13. Type of Report and Period Covered Final Report, May - June 2008	
		14. Sponsoring Agency Code NVS-221	
15. Supplementary Notes			
16. Abstract Compliance tests were conducted on the subject 2008 Chevrolet Malibu Hybrid Four-Door Sedan in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-114-03 for the determination of FMVSS 114 compliance. Test failures were identified as follows: None			
17. Key Words Compliance Testing Safety Engineering FMVSS 114		18. Distribution Statement <u>Copies of this report are available from:</u> National Highway Transportation Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Avenue SE (Room E12-100) Washington DC 20590 Email: <a href="mailto:tis@nhtsa.dot.gov">tis@nhtsa.dot.gov</a> FAX: 202-493-2833	
19. Security Classification of Report UNCLASSIFIED	20. Security Classification of Page UNCLASSIFIED	21. No. of Pages 34	22. Price

## TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	Purpose of Compliance Test	1-1
2	Test Procedure and Discussion of Results	2-1
3	Test Data	3-1
	Data Sheet 1 – All Vehicles	3-2
	Data Sheet 2 – Automatic Transmission Vehicles	3-4
	Data Sheet 3 – Special Devices	3-6
4	Test Equipment List and Calibration Due Dates	4-1
5	Photographs	5-1
	Figure 1: Vehicle Left Front Three-Quarter View	5-2
	Figure 2: Vehicle Certification Placard	5-3
	Figure 3: Vehicle Tire Placard	5-4
	Figure 4: Close-Up Of Ignition Switch	5-5
	Figure 5: Close-Up Of Transmission Shift Lever Mechanism	5-6
	Figure 6: Close-Up Of Special Device Which Allows For Key Removal	5-7
	Figure 7 :Close-Up Of Special Device Which Allows Moving Of Shift Lever	5-8
6	Vehicle Owner’s Manual	6-1
7	Notice of Test Failure	7-1

## **SECTION 1**

### **PURPOSE OF COMPLIANCE TEST**

This test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 114 Compliance Test Program conducted for the National Highway Traffic Safety Administration (NHTSA) by General Dynamics Advanced Information Engineering Services under Contract No. DTNH22-06-C-00031. The purpose of this test was to determine if the subject vehicle, a 2008 Chevrolet Malibu Hybrid Four-Door Sedan, was in compliance with FMVSS No. 114, Theft Protection and Rollaway Prevention. The purpose of this standard is to reduce the incidence of crashes resulting from unauthorized operation of vehicles by specifying requirements for theft protection. Additionally, FMVSS No. 114 specifies requirements to reduce the incidents of crashes from rollaway of parked vehicles with automatic transmissions as a result of children moving the shift mechanism out of the “park” position. This standard applies to passenger cars, trucks and multipurpose passenger vehicles having a Gross Vehicle Weight Rating (GVWR) of 4536 kilograms or less. This compliance test was conducted using the requirements found in the OVSC Laboratory Test Procedure No. TP-114-03, dated May 2, 2008.

## SECTION 2

### TEST PROCEDURE AND DISCUSSION OF RESULTS

A 2008 Chevrolet Malibu Hybrid Four-Door Sedan with an automatic transmission was subjected to FMVSS No. 114 testing in accordance with the NHTSA Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedure TP-114-03, dated May 2, 2008. This test was performed by General Dynamics Advanced Information Engineering Services on May 29, 2008.

The test equipment used for this test included a standard metric tape ruler, a digital inclinometer with digital clinometer function, weight scales and a digital manometer. Testing was performed in the following sequence:

#### **STARTING SYSTEM REQUIREMENT (S5.1.1):**

Normal activation of the vehicle engine was prevented with the key removed from the starting system. Both steering and forward self-mobility were also prevented.

#### **AUDIBLE ALARM REQUIREMENT (S5.1.3):**

With the key left in the vehicle starting system and the driver's door opened, an audible alarm was activated. This "warning to the driver" was verified in all ignition switch positions except "on" and "start".

#### **"PARK" POSITION REQUIREMENT (S5.1.4)**

With the vehicle key in the ignition and the engine shut off, the steering wheel was able to rotate in both directions without locking and the vehicle was free to roll forward in all transmission positions except "park".

#### **ROLLAWAY PREVENTION REQUIREMENT (S5.2.1)**

With the vehicle key in the ignition and the engine shut off, the starting system prevented key removal in all transmission positions other than "park." This vehicle was not equipped with an advanced key and the transmission could not be placed in locations between locking gear selector positions. The vehicle was not equipped with a mechanism that will lock the transmission in "park" as a result of removing the key in a transmission position other than "park."

#### **GEAR SELECTION REQUIREMENT (S5.2.2):**

With the vehicle key removed from the ignition switch, the gear control could not be moved from the "park" position. With the key in the vehicle starting system and the engine running, the transmission could be moved to the "drive" position by depressing the brake pedal.

#### **KEY REMOVAL OVERRIDE REQUIREMENT (S5.2.3):**

This vehicle was not equipped with a key removal override option.

#### **GEAR SELECTION CONTROL OVERRIDE REQUIREMENT (S5.2.4):**

The vehicle was not equipped with a gear selection control override device.

### **TEN PERCENT GRADE “PARK” REQUIREMENT (S5.2.5)**

The vehicle was driven forward and stopped with the service brakes on a 10.3% grade. The parking brake was fully applied and the transmission lever was placed in “park”. When the service and parking brakes were released the vehicle moved 61 mm (150 mm maximum is allowed on a 10% grade). Since the available test grade was more stringent than the specified condition, the subject vehicle appeared to perform within the safety performance requirements.

The vehicle was driven in reverse and stopped with the service brakes on a 10.1% grade. The parking brake was fully applied and the transmission lever was placed in “park”. When the service and parking brakes were released the vehicle moved 46 mm (150 mm maximum is allowed on a 10% grade). Since the available test grade was more stringent than the specified condition, the subject vehicle appeared to perform within the safety performance requirements.

### **BRAKE TRANSMISSION SHIFT INTERLOCK REQUIREMENT (S5.3)**

With the vehicle key in the starting system, the vehicle transmission was unable to be shifted from the “park” position without depressing the brake pedal for each of the starting system key positions..

**SECTION 3**

**TEST DATA**



FMVSS 114, THEFT PROTECTION

DATA SHEET 1 – ALL VEHICLES

TEST DATE: May 29, 2008 LAB: Calspan  
CONTRACT: DTNH22-06-C-00031 VEHICLE NHTSA NUMBER: C80110  
VIN: 1G1ZF575X8F228464 BUILD DATE: 02/08  
MY/MAKE/MODEL/BODY STYLE: 2008 Chevrolet Malibu Hybrid Four-Door Sedan

**TRANSMISSION TYPE:**

Automatic X ; Manual - ; Other (describe: Not Applicable )

**DRIVE TRAIN TYPE:**

Front Wheel X ; Rear Wheel - ; Four Wheel -

**OPTIONAL RELEASE DEVICES:**

Key - ; Transmission - ; None X

**VEHICLE STARTING SYSTEM:**

Location of the starting system: The ignition switch is located on the vehicle dash panel to the right of the steering column.

Selectable settings: “LOCK/OFF”, “ACCESSORY”, “ON/RUN” and “START”

Activation of starting system: Place the key in the ignition, depress the brake pedal and rotate the key clockwise to the “START” position to start the vehicle.

**KEY:**

Description of key: The key is a traditional mechanical type with an integrated microchip that is recognized by the onboard vehicle computer.

**STARTING SYSTEM ACTIVATION:**

Insertion of key into starting system: Insert the key into the ignition switch like a conventional lock and key.

Activation of starting system with key: Place the key in the ignition switch, depress the brake pedal and rotate the key clockwise to the “START” position to activate the vehicle.

Removal of key from starting system: Place the transmission in “PARK”, rotate the key counter-clockwise to the “LOCK/OFF” position and remove the key.

**GEAR SELECTION CONTROL:**

Gear selection control: The gear selector is located in the center console between the front seats.

Activation of gear selection control: With the key in the ignition switch and the engine running, depress the brake pedal to move the transmission out of “PARK”

Selectable settings: “PARK”, “REVERSE”, “NEUTRAL”, “DRIVE”, “INTERMEDIATE” AND “LOW”

FMVSS 114, THEFT PROTECTION

DATA SHEET 1 (Continued)

**IMMOBILIZER:**

Is the vehicle equipped with an immobilizer: Yes     X     No     -    

Description of Immobilizer and how it prevents vehicle theft: The PASS\_Key III system automatically arms when the ignition key is removed. This is a passive system that requires a specific key uniquely recognized by the vehicle computer to start the vehicle engine.

**OPTIONAL RELEASE DEVICES:**

Key Removal     -     Gear selection Control     -     None     X     Other     -    

If other, Explain: Not Applicable

**TIRE PRESSURE:**

Vehicle Manufacturer Recommended (kPa): Front     240     ; Rear     240    

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

**TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:**

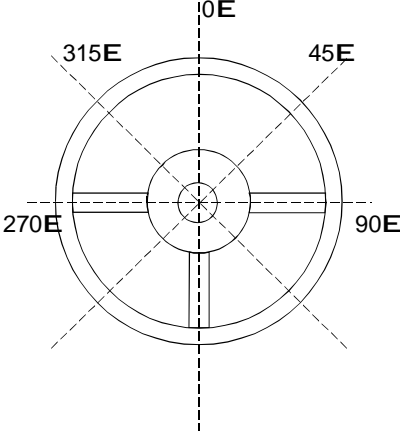
	LEFT SIDE (kg)	RIGHT SIDE (kg)	TOTAL (kg)	PERCENT
<b>FRONT =</b>	486.0	477.0	963.0	60.1%
<b>REAR =</b>	324.0	314.0	638.0	39.9%

**TOTAL DELIVERED WEIGHT (UDW) :**     1601.0     kg

FMVSS 114, THEFT PROTECTION

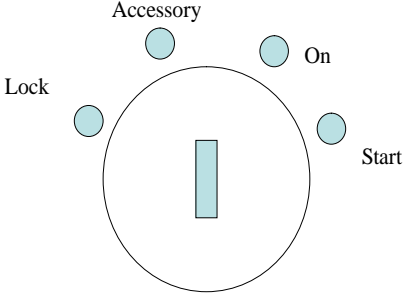
DATA SHEET 2 – THEFT PROTECTION

TEST DATE: May 29, 2008 LAB: Calspan  
 CONTRACT: DTNH22-06-C-00031 VEHICLE NHTSA NUMBER: C80110  
 VIN: 1G1ZF575X8F228464 BUILD DATE: 02/08  
 MY/MAKE/MODEL/BODY STYLE: 2008 Chevrolet Malibu Hybrid Four-Door Sedan

REQUIREMENT S5.1.1	PASS	FAIL
Engine cannot be started without using the key. Yes <u>X</u> No <u>    </u>	<u>X</u>	<u>--</u>
<p>With key removed, steering locks:                      Yes <u>    </u> - <u>    </u> No <u>    </u> X <u>    </u></p> <div style="text-align: center;">  </div> <p>Identify the steering wheel locking position(s) on the circle using arrows                      Clockwise: <u>    </u> N/A <u>    </u> (degrees)                      Counterclockwise: <u>    </u> N/A <u>    </u> (degrees)</p>		
Key removal prevents forward self-mobility: Yes <u>    </u> X <u>    </u> No <u>    </u> - <u>    </u> If <u>yes</u> , describe: <u>The vehicle transmission remains in "PARK" when the key is removed. The vehicle is equipped with an engine immobilizer which only recognizes the specially coded key unique to the vehicle.</u>	<u>X</u>	<u>--</u>
When the key is removed from the starting system, starting of the engine or motor and either steering or self mobility is prevented	<u>X</u>	<u>--</u>

FMVSS 114, THEFT PROTECTION

DATA SHEET 2 – THEFT PROTECTION

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>	<u>  X  </u>	<u>  --  </u>
<p>Identify ALL key/starting system position settings:</p> <div style="text-align: center;">  </div>		

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?</p> <p style="text-align: right;">Yes <u>  X  </u> No <u>  -  </u></p>	<u>  X  </u>	<u>  --  </u>
<p>The vehicle is free to roll forward?</p> <p style="text-align: right;">Yes <u>  X  </u> No <u>  -  </u></p>	<u>  X  </u>	<u>  --  </u>

Remarks: None

RECORDED BY:                     Vincent M. Paolini                          DATE:                     May 29, 2008                      
 APPROVED BY:                     David Travale

FMVSS 114, ROLLAWAY PREVENTION

DATA SHEET 3 – ROLLAWAY PREVENTION  
 (For vehicles equipped with automatic transmission with a 'PARK' position)

TEST DATE: May 29, 2008 LAB: Calspan  
 CONTRACT: DTNH22-06-C-00031 VEHICLE NHTSA NUMBER: C80110  
 VIN: 1G1ZF575X8F228464 BUILD DATE: 02/08  
 MY/MAKE/MODEL/BODY STYLE: 2008 Chevrolet Malibu Hybrid Four-Door Sedan

REQUIREMENT S5.2.1	PASS	FAIL
The starting system prevents key removal in <b>ALL</b> gear selection control positions except "park". Yes <u>  X  </u> No <u>  -  </u>		
Can the gear selection control be placed between each gear selection position and will it remain there without assistance? Yes <u>  -  </u> No <u>  X  </u>		
If <u>yes</u> , can the key be removed from the starting system? Yes <u>  -  </u> No <u>  -  </u>	<u>  X  </u>	<u>  --  </u>
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's transmission or gear selection control shall become locked in "park" as the direct result of removing the key. If such a mechanism exists, <u>describe the mechanism and its function:</u>  NOT APPLICABLE		

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

FMVSS 114, ROLLAWAY PREVENTION

DATA SHEET 3 – ROLLAWAY PREVENTION  
 (For vehicles equipped with automatic transmission with a 'PARK' position)

REQUIREMENT S5.2.3	PASS	FAIL
<p><b><u>ELECTRICAL FAILURE (Battery Discharge)</u></b></p> <p>In the event of an electrical failure, key removal from the starting system when the transmission or gear selection control is not locked in "park" is permitted.                      Yes <u>  X  </u> No <u>  -  </u></p> <p>The vehicle is equipped with an override device that permits key removal from the starting system when the transmission or gear selection control is not locked in "park".                      Yes <u>  -  </u> No <u>  X  </u></p> <p>If <u>yes</u>, select the type of override device that is equipped:                      Override operated with a:                      Opaque Cover <u>  --  </u> No cover <u>  --  </u></p>	<u>  X  </u>	<u>  ---  </u>
<p><b><u>FILL IN THE SECTION BELOW THAT APPLIES:</u></b></p> <p><b><u>OVERRIDE WITH AN OPAQUE COVER:</u></b></p> <p>The opaque surface cover prevents sight of and use of the override device                      Yes <u>  -  </u> No <u>  -  </u></p> <p>The opaque surface cover can be removed only by using a screwdriver or other tool.                      Yes <u>  -  </u> No <u>  -  </u></p> <p>As a direct result of removing the key from the starting system, the following is prevented:                      Steering <u>  -  </u> self mobility <u>  -  </u></p>	<u>  N/A  </u>	<u>  N/A  </u>
<p><b><u>OVERRIDE WITH NO COVER:</u></b></p> <p>The override device requires the use of a tool to activate.                      Yes <u>  -  </u> No <u>  -  </u></p> <p>Simultaneous activation of the override device and removal of the key from the starting system is required.                      Yes <u>  -  </u> No <u>  -  </u></p> <p>As a direct result of removing the key from the starting system, the following is prevented:                      Steering <u>  -  </u> self mobility <u>  -  </u></p>	<u>  N/A  </u>	<u>  N/A  </u>

FMVSS 114, ROLLAWAY PREVENTION

DATA SHEET 3 – ROLLAWAY PREVENTION  
(For vehicles equipped with automatic transmission with a 'PARK' position)

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 <u>yes</u>, select the type of override device that is equipped:                      Override operated with a:                      Key <u>  --  </u> Opaque Cover <u>  -  </u> No cover <u>  --  </u></p> <p>Describe the device design and mode of activation (if equipped):</p>		
<p><b><u>FILL IN THE SECTION BELOW THAT APPLIES:</u></b></p> <p><b><u>OVERRIDE OPERATED WITH A KEY:</u></b></p> <p>A 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 <u>  --  </u> No <u>  --  </u></p>	<p><u>  N/A  </u></p>	<p><u>  N/A  </u></p>
<p><b><u>OVERRIDE WITH AN OPAQUE COVER:</u></b></p> <p>The opaque surface cover prevents sight of and use of the override device                      Yes <u>  -  </u> No <u>  -  </u></p> <p>The opaque surface cover can be removed only by using a screwdriver or other tool.                      Yes <u>  -  </u> No <u>  -  </u></p> <p>As a direct result of removing the key from the starting system, the following is prevented:                      Steering <u>  -  </u> self mobility <u>  -  </u></p>	<p><u>  N/A  </u></p>	<p><u>  N/A  </u></p>
<p><b><u>OVERRIDE WITH NO COVER:</u></b></p> <p>The override device requires the use of a tool to activate.                      Yes <u>  -  </u> No <u>  -  </u></p> <p>Simultaneous activation of the override device and removal of the key from the starting system is required.                      Yes <u>  -  </u> No <u>  -  </u></p> <p>As a direct result of removing the key from the starting system, the following is prevented:                      Steering <u>  -  </u> self mobility <u>  -  </u></p>	<p><u>  N/A  </u></p>	<p><u>  N/A  </u></p>

FMVSS 114, ROLLAWAY PREVENTION

DATA SHEET 3 – ROLLAWAY PREVENTION  
(For vehicles equipped with automatic transmission with a 'PARK' position)

REQUIREMENTS S5.2.5	PASS	FAIL
<p><u>Vehicle facing uphill on 10% Grade:</u> 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>10.3</u> % (9% to 15%) Measured movement: <u>61</u> mm (150mm maximum)</p> <p><b>NOTE:</b> Repeat procedure if vehicle fails on grade in excess of 10%.</p> <p>Test grade: <u>N/A</u> % (9% to 10%) Measured movement: <u>N/A</u> mm (150 mm maximum)</p> <p><u>Vehicle facing downhill on 10% Grade:</u> 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>10.1</u> % (9% to 15%) Measured movement: <u>46</u> mm (150mm maximum)</p> <p><b>NOTE:</b> Repeat procedure if vehicle fails on grade in excess of 10%.</p> <p>Test grade: <u>N/A</u> % (9% to 10%) Measured movement: <u>N/A</u> mm (150 mm maximum)</p>	<p>X</p>	<p>--</p>

Remarks: None

RECORDED BY: Vincent M. Paolini DATE: May 29, 2008  
 APPROVED BY: David Travale



FMVSS 114, ROLLAWAY PREVENTION  
 DATA SHEET 3 – ROLLAWAY PREVENTION  
 (For vehicles equipped with automatic transmission with a 'PARK' position)

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  <div style="text-align: center;"> <input type="checkbox"/> No    <input checked="" type="checkbox"/> X         </div>	<u>  X  </u>	<u>  --  </u>
With the key in the "acc" position, the transmission will shift out of "park" without the service brake being applied  <div style="text-align: center;"> <input type="checkbox"/> No    <input checked="" type="checkbox"/> X         </div>	<u>  X  </u>	<u>  --  </u>
With the key in the "on" position ( <i>engine off</i> ), the transmission will shift out of "park" without the service brake being applied  <div style="text-align: center;"> <input type="checkbox"/> No    <input checked="" type="checkbox"/> X         </div>	<u>  X  </u>	<u>  --  </u>
With the key in the "on" position ( <i>engine running</i> ), the transmission will shift out of "park" without the service brake being applied  <div style="text-align: center;"> <input type="checkbox"/> No    <input checked="" type="checkbox"/> X         </div>	<u>  X  </u>	<u>  --  </u>
With the key in the "start" position, the transmission will shift out of "park" without the service brake being applied  <div style="text-align: center;"> <input type="checkbox"/> No    <input checked="" type="checkbox"/> X         </div>	<u>  X  </u>	<u>  --  </u>
With the key in the "other" position ( <i>please specify</i> ), the transmission will shift out of "park" without the service brake being applied  <div style="text-align: center;"> <input type="checkbox"/> No    <input checked="" type="checkbox"/> -         </div>	<u>  X  </u>	<u>  --  </u>
Does the key stay between starting system positions without being held by operator? If so, please describe <u>  NOT APPLICABLE  </u>	<u>  N/A  </u>	<u>  N/A  </u>
Brake force readings (force required to allow the transmission to shift out of "park"):  Reading 1 <u>  8.0  </u> lbf Reading 2 <u>  8.0  </u> lbf Reading 3 <u>  9.0  </u> lbf Reading 4 <u>  8.0  </u> lbf Reading 5 <u>  8.0  </u> lbf Average <u>  8.2  </u> lbf	<u>  N/A  </u>	<u>  N/A  </u>

Remarks:

RECORDED BY:                         Vincent M. Paolini                              DATE:                         May 29, 2008                          
 APPROVED BY:                         David Travale

**SECTION 4**

**TEST EQUIPMENT LIST AND CALIBRATION DATES**

<b>Equipment</b>	<b>Manufacturer</b>	<b>Name</b>	<b>Range</b>	<b>Accuracy</b>	<b>Calibration Date</b>	<b>Calibration Due</b>
Clinometer	MD	Smart Level	0-100%	0.1%	04/2008	04/2009
Steel Tape	Stanley	Stanley 3137	3 meters	0.5mm	N/A	N/A
Weight Scales	Long Acre	Computer Scales 2000	0-12,000lbs.	0.2%	03/2008	03/2009
Manometer	Meriam Instrument Co.	350 Smart Manometer	0-200 psi.	0.05%	02/2008	02/2009
Plumb Bob	Stanley	Plumb bob	N/A	N/A	N/A	N/A

## SECTION 5

### PHOTOGRAPHS

#### TABLE OF PHOTOGRAPHS

<u>Figure</u>	<u>Photograph Title</u>	<u>Page</u>
Figure 1	VEHICLE LEFT FRONT THREE-QUARTER VIEW	5- 2
Figure 2	VEHICLE CERTIFICATION PLACARD	5- 3
Figure 3	VEHICLE TIRE PLACARD	5- 4
Figure 4	CLOSE-UP OF IGNITION SWITCH	5- 5
Figure 5	CLOSE-UP OF TRANSMISSION SHIFT LEVER MECHANISM	5- 6
Figure 6	CLOSE-UP OF SPECIAL DEVICE WHICH ALLOWS FOR KEY REMOVAL	5- 7
Figure 7	CLOSE-UP OF SPECIAL DEVICE WHICH ALLOWS MOVING OF SHIFT LEVER	5- 8



Figure 1: Vehicle Left Front Three-Quarter View

2008 Chevrolet Malibu Hybrid Four-Door Sedan  
NHTSA No.: C80110



MFD BY GENERAL MOTORS CORP.

DATE  
02/08

GVWR  
2038 KG  
4492 LB

GAWR FRT  
1068 KG  
2354 LB

GAWR RR  
970 KG  
2138 LB

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY, BUMPER, AND THEFT PREVENTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

1G1ZF575X8F228464

TYPE: PASS CAR

C80110

Figure 2: Vehicle Certification Placard

2008 Chevrolet Malibu Hybrid Four-Door Sedan  
NHTSA No.: C80110



5-4

8858-F114-07

Figure 3: Vehicle Tire Placard

2008 Chevrolet Malibu Hybrid Four-Door Sedan  
NHTSA No.: C80110



5-5

8858-F114-07

Figure 4: Close-Up of Ignition Switch

2008 Chevrolet Malibu Hybrid Four-Door Sedan  
NHTSA No.: C80110



Figure 5: Close-Up of Transmission Shift Lever Mechanism

2008 Chevrolet Malibu Hybrid Four-Door Sedan  
NHTSA No.: C80110



NOT APPLICABLE

Figure 6: Close-Up of Special Device Which Allows For Key Removal

2008 Chevrolet Malibu Hybrid Four-Door Sedan  
NHTSA No.: C80110

NOT APPLICABLE

5-8

8858-F114-07

Figure 7: Close-Up of Special Device Which Allows Moving of Shift Lever

2008 Chevrolet Malibu Hybrid Four-Door Sedan  
NHTSA No.: C80110

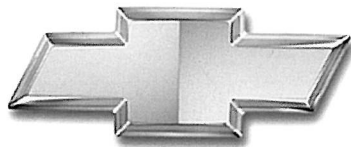
**SECTION 6**

**VEHICLE OWNER'S MANUAL**

2008 Chevrolet Malibu Hybrid Four-Door Sedan  
NHTSA No.: C80110

C80110

**2008**



**MALIBU HYBRID**



## Keys

.....2-39

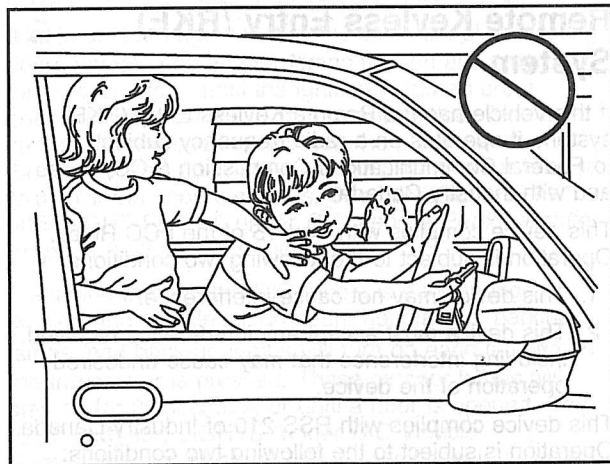
.....2-39

.....2-39

.....2-40

### CAUTION:

Leaving children in a vehicle with the ignition key is dangerous for many reasons, children or others could be badly injured or even killed. They could operate the power windows or other controls or even make the vehicle move. The windows will function with the keys in the ignition and they could be seriously injured or killed if caught in the path of a closing window. Do not leave the keys in a vehicle with children.



The key can be used for the ignition and all locks.

The key has a bar-coded key tag that the dealer/retailer or qualified locksmith can use to make new keys. Store this information in a safe place, not in your vehicle.

**Notice:** If you ever lock your keys in your vehicle, you may have to damage the vehicle to get in. Be sure you have spare keys.

If you are locked out of your vehicle, contact Roadside Assistance. See *Roadside Assistance Program* on page 7-7.

## Doors and Locks

### Door Locks

#### CAUTION:

Unlocked doors can be dangerous.

- Passengers, especially children, can easily open the doors and fall out of a moving vehicle. When a door is locked, the handle will not open it. You increase the chance of being thrown out of the vehicle in a crash if the doors are not locked. So, wear safety belts properly and lock the doors whenever you drive.
- Young children who get into unlocked vehicles may be unable to get out. A child can be overcome by extreme heat and can suffer permanent injuries or even death from heat stroke. Always lock your vehicle whenever you leave it.
- Outsiders can easily enter through an unlocked door when you slow down or stop your vehicle. Locking your doors can help prevent this from happening.


There are several ways to lock and unlock your vehicle.


From the outside, use your key or Remote Keyless Entry (RKE) transmitter, if the vehicle has one. Turn the key counterclockwise to unlock the door.

From the inside, lock and unlock the door by moving the manual lock knob down and up, or by using the power door lock switches.

### Power Door Locks

The power door lock switches are located on the front doors.

 (Unlock): Press to unlock the doors.

 (Lock): Remove the key from the ignition and press to lock the doors.

### Door Ajar Reminder

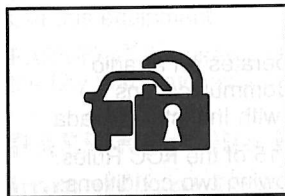
If one of the doors is not fully closed while the ignition is on and the shift lever is moved out of PARK (P) or NEUTRAL (N) the following will occur:

- A chime will sound.
- The DOOR AJAR message will display through the Driver Information Center (DIC) until the door is closed. See *DIC Warnings and Messages on page 3-48*.

## Theft-Deterrent Systems

Vehicle theft is big business, especially in some cities. This vehicle has theft-deterrent features, however, they do not make it impossible to steal.

### Content Theft-Deterrent



Your vehicle may have a content theft-deterrent alarm system.

### Arming the System

With the ignition off, press the Remote Keyless Entry (RKE) transmitter lock button to arm the system.

The system will arm 30 seconds after all the doors are closed, or 60 seconds any door open.

If you press the lock button on the transmitter a second time while all the doors are closed, the system will arm immediately. The system will still arm in 60 seconds if a door is open. When the open door is closed, the system will arm.

The security light, located on the instrument panel cluster, comes on to indicate that arming has been initiated. Once the system is armed, the security light flashes once every three seconds.

If the security light is flashing twice per second, this means that a door is open.

If the system is armed and the key is used to unlock the vehicle, the alarm will be activated.

If you do not want to arm the content theft system, lock the vehicle with the manual lock knob on the doors or with the inside power door lock switches.

The alarm will sound and the exterior lights will flash if any door is opened while armed.

### Disarming the System

To disarm the system, do one of the following:

- Press the RKE transmitter unlock button.
- Turn the ignition to ON/RUN.

Once the system is disarmed, the security light will stop flashing.

## How the System Alarm is Activated

To activate the system if it is armed:

- Open the driver's door or trunk. A ten second pre-alarm chirp will sound followed by a thirty second full alarm of horn and lights.
- Open any other door. A full alarm of horn and lights will immediately sound for thirty seconds.
- Open the hood. If the vehicle has the remote start feature, it will activate the full alarm.

When an alarm event has finished, the system will re-arm itself automatically.

## How to Turn Off the System Alarm

To turn off the system alarm:

- Press the lock button on the RKE transmitter. The system will then re-arm itself.
- Press the unlock button on the RKE transmitter. This will also disarm the system.
- Insert the key in the ignition and turn it on. This will also disarm the system.

## How to Detect a Tamper Condition

If three chirps are heard when the unlock or lock button is pressed on the RKE transmitter, it means that the content theft security system alarm was previously triggered.

## PASS-Key® III+ Electronic Immobilizer

The PASS-Key® III+ system operates on a radio frequency subject to Federal Communications Commission (FCC) Rules and with Industry Canada.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.



This device complies with RSS-210 of Industry Canada. Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference received, including interference that may cause undesired operation of the device.

Changes or modifications to this system by other than an authorized service facility could void authorization to use this equipment.

PASS-Key® III+ uses a radio frequency transponder in the key that matches a decoder in the vehicle.

## **PASS-Key® III+ Electronic Immobilizer Operation**

Your vehicle has PASS-Key® III+ (Personalized Automotive Security System) theft-deterrent system. PASS-Key® III+ is a passive theft-deterrent system.

The system is automatically armed when the key is removed from the ignition.

You do not have to manually arm or disarm the system.

The security light will come on if there is a problem with arming or disarming the theft-deterrent system.

When the PASS-Key® III+ system senses that someone is using the wrong key, it prevents the vehicle from starting. Anyone using a trial-and-error method to start the vehicle will be discouraged because of the high number of electrical key codes.

When trying to start the vehicle if the engine does not start and the security light on the instrument panel cluster comes on, there may be a problem with your theft-deterrent system. Turn the ignition off and try again.

If the engine still does not start, and the key appears to be not damaged, try another ignition key. At this time, you may also want to check the fuse. See *Fuses on page 5-85*. If the engine still does not start with the other key, your vehicle needs service. If your vehicle does start, the first key may be faulty. See your dealer/retailer who can service the PASS-Key® III+ to have a new key made. In an emergency, contact Roadside Assistance. See *Roadside Assistance Program on page 7-7*.

It may be possible for the PASS-Key® III+ decoder to "learn" the transponder value of a new or replacement key. Up to 10 keys may be programmed for the vehicle. The following procedure is for programming additional keys only. If all the currently programmed keys are lost or do not operate, you must see your dealer/retailer or a locksmith who can service PASS-Key® III+ to have keys made and programmed to the system.

See your dealer/retailer or a locksmith who can service PASS-Key® III+ to get a new key blank that is cut exactly as the ignition key that operates the system.

To program the new key:

1. Verify that the new key has a ⊕ stamped on it.
2. Insert the already programmed key in the ignition and start the engine. If the engine will not start, see your dealer/retailer for service.
3. After the engine has started, turn the key to LOCK/OFF, and remove the key.
4. Insert the key to be programmed and turn it to the ON/RUN position within five seconds of the original key being turned to the LOCK/OFF position.

The security light will turn off once the key has been programmed.

5. Repeat Steps 1 through 4 if additional keys are to be programmed.

If you are ever driving and the security light comes on and stays on, you may be able to restart your engine if you turn it off. Your PASS-Key® III+ system, however, is not working properly and must be serviced by your dealer/retailer. Your vehicle is not protected by the PASS-Key® III+ system at this time.

If the PASS-Key® III+ key is lost or damaged, see your dealer/retailer or a locksmith who can service PASS-Key® III+ to have a new key made.

Do not leave the key or device that disarms or deactivates the theft deterrent system in the vehicle.

## Starting and Operating Your Vehicle

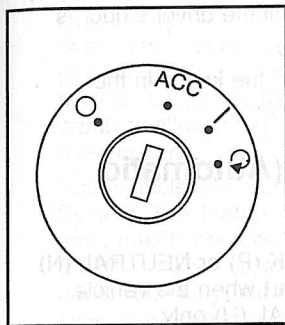
### New Vehicle Break-In

**Notice:** Your vehicle does not need an elaborate break-in. But it will perform better in the long run if you follow these guidelines:

- Do not drive at any one constant speed, fast or slow, for the first 500 miles (805 km). Do not make full-throttle starts. Avoid downshifting to brake or slow the vehicle.
- Avoid making hard stops for the first 200 miles (322 km) or so. During this time the new brake linings are not yet broken in. Hard stops with new linings can mean premature wear and earlier replacement. Follow this breaking-in guideline every time you get new brake linings.
- Do not tow a trailer during break-in. See *Towing a Trailer on page 4-28* for the trailer towing capabilities of your vehicle and more information.

Following break-in, engine speed and load can be gradually increased.

## Ignition Positions



With the key in the ignition switch, you can turn it to four different positions.

In order to shift out of PARK (P), ignition must be in the ON/RUN or ACC/ACCESSORY and the regular brake pedal must be applied.

**Notice:** Using a tool to force the key from the ignition switch could cause damage or break the key. Use the correct key and turn the key only with your hand. Make sure the key is in all the way. If none of this works, then your vehicle needs service.

○ **(LOCK/OFF):** This is the only position from which the key can be removed. It also locks the ignition and transmission. A warning chime sounds if the driver's door is opened while the ignition is off and the key is left in the ignition.

**ACC (ACC/ACCESSORY):** This position lets you use things like the radio and windshield wipers while the engine is not running.

| **(ON/RUN):** This position unlocks the ignition. It is also the position to where the key returns after you release the switch and the engine starts. The switch will stay in this position while the engine is running. But even while the engine is not running, you can use ON/RUN to operate the electrical accessories, and to display some instrument panel warning lights.

The battery could be drained if you leave the key in the ACC/ACCESSORY or ON/RUN position with the engine off. You might not be able to start your vehicle if the battery is allowed to drain for an extended period of time.

⌚ **(START):** This position starts the engine. When the engine starts, release the key. The ignition switch will return to the ON/RUN position for normal driving.

## Key In the Ignition

Never leave your vehicle with the keys inside, as it is an easy target for joy riders or thieves. If you leave the key in the ignition and park your vehicle, a chime sounds, when the driver's door is opened. Always remember to remove the key from the ignition and take it with you. This locks your ignition and transmission. Also, always remember to lock the doors.

The battery could be drained if the key is left in the ignition while your vehicle is parked. You might not be able to start your vehicle after it has been parked for an extended period of time.

## Retained Accessory Power (RAP)

These vehicle accessories can be used for up to 10 minutes after the engine is turned off:

- Audio System
- Power Windows
- Sunroof (if equipped)

These features continue to work up to 10 minutes after the ignition is turned to LOCK/OFF.

The power windows and sunroof will work until any door is opened.

The radio continues to work until the driver's door is opened.

All these features operate when the key is in the ON/RUN or ACC/ACCESSORY.

## Starting the Engine (Automatic Engine Start/Stop)

The shift lever must be in PARK (P) or NEUTRAL (N) for the vehicle to start. To restart when the vehicle is already moving, use NEUTRAL (N) only.

**Notice:** Do not try to shift to PARK (P) if your vehicle is moving. If you do, you could damage the transmission. Shift to PARK (P) only when your vehicle is stopped.

## Starting Procedure

1. With your foot off the accelerator pedal, turn the ignition key to START. When the engine starts, let go of the key. The idle speed goes down as your engine gets warm. Do not race the engine immediately after starting it. Operate the engine and transmission gently to allow the oil to warm up and lubricate all moving parts.

Your vehicle has a Computer-Controlled Cranking System. This feature assists in starting the engine and protects components. If the key is turned to the START position, and then released when the engine begins cranking, the engine continues cranking for a few seconds or until the vehicle starts. If the engine does not start and the key is held in START for many seconds, cranking stops after 15 seconds to prevent cranking motor damage. To prevent gear damage, this system also prevents cranking if the engine is already running. Engine cranking can be stopped by turning the ignition switch to the ACC/ACCESSORY or LOCK/OFF position.

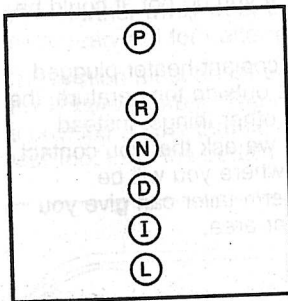
**Notice:** Cranking the engine for long periods of time, by returning the key to the START position immediately after cranking has ended, can overheat and damage the cranking motor, and drain the battery. Wait at least 15 seconds between each try, to let the cranking motor cool down.

2. If the engine does not start after 5-10 seconds, especially in very cold weather (below 0°F or -18°C), it could be flooded with too much gasoline. Try pushing the accelerator pedal all the way to the floor and holding it there as you hold the key in START for up to a maximum of 15 seconds. Wait at least 15 seconds between each try, to allow the cranking motor to cool down. When the engine starts, let go of the key and accelerator. If the vehicle starts briefly but then stops again, do the same thing. This clears the extra gasoline from the engine. Do not race the engine immediately after starting it. Operate the engine and transmission gently until the oil warms up and lubricates all moving parts.

**Notice:** Your engine is designed to work with the electronics in your vehicle. If you add electrical parts or accessories, you could change the way the engine operates. Before adding electrical equipment, check with your dealer/retailer. If you do not, your engine might not perform properly. Any resulting damage would not be covered by your vehicle's warranty.

## Automatic Transmission Operation

The shift lever is located on the console between the seats.



There are several different positions for the automatic transmission.

**PARK (P):** This position locks the front wheels. It is the best position to use when you start the engine because your vehicle cannot move easily.

### CAUTION:

It is dangerous to get out of your vehicle if the shift lever is not fully in PARK (P) with the parking brake firmly set. Your vehicle can roll. Do not leave your vehicle when the engine is running unless you have to. If you have left the engine running, the vehicle can move suddenly. You or others could be injured. To be sure your vehicle will not move, even when you are on fairly level ground, always set your parking brake and move the shift lever to PARK (P). See *Shifting Into PARK (P)* on page 2-29.

Make sure the shift lever is fully in PARK (P) before starting the engine. Your vehicle has an automatic transmission shift lock control system. You have to fully apply the regular brakes first and then press the shift lever button before shifting from PARK (P) when the ignition key is in ON/RUN. If you cannot shift out of PARK (P), ease pressure on the shift lever and push the shift lever all the way into PARK (P) while maintaining brake application. Then press the shift lever button and move the shift lever into another gear. See *Shifting Out of PARK (P)* on page 2-31.

**REVERSE (R):** Use this gear to back up.

**Notice:** Shifting to REVERSE (R) while your vehicle is moving forward could damage the transmission. The repairs would not be covered by your warranty. Shift to REVERSE (R) only after your vehicle is stopped.

To rock your vehicle back and forth to get out of snow, ice or sand without damaging your transmission, see *If Your Vehicle is Stuck in Sand, Mud, Ice, or Snow* on page 4-19.

**NEUTRAL (N):** In this position, your engine does not connect with the wheels. To restart when you are already moving, use NEUTRAL (N) only. Also, use NEUTRAL (N) when your vehicle is being towed.

## CAUTION:

Shifting into a drive gear while the engine is running at high speed is dangerous. Unless your foot is firmly on the brake pedal, your vehicle could move very rapidly. You could lose control and hit people or objects. Do not shift into a drive gear while your engine is running at high speed.

**Notice:** Shifting out of PARK (P) or NEUTRAL (N) with the engine running at high speed may damage the transmission. The repairs would not be covered by your warranty. Be sure the engine is not running at high speed when shifting your vehicle.

**DRIVE (D):** This position is for normal driving with the automatic transmission. It provides the best fuel economy for your vehicle. If you need more power for passing, and you are:

- Going less than about 35 mph (55 km/h), push the accelerator pedal about halfway down.
- Going above 35 mph (55 km/h), push the accelerator all the way down.

Downshifting the transmission in slippery road conditions could result in skidding, see "Skidding" under *Loss of Control* on page 4-12.

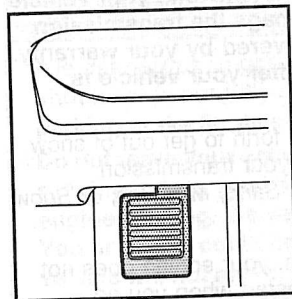
**INTERMEDIATE (I):** This position is also used for normal driving. However, it reduces vehicle speed without using your brakes for slight downgrades where the vehicle would otherwise accelerate due to steepness of grade. If constant upshifting or downshifting occurs while driving up steep hills, this position can be used to prevent repetitive types of shifts. You might choose INTERMEDIATE (I) instead of DRIVE (D) when driving on hilly, winding roads, so that there is less shifting between gears.

The engine will not Auto Stop when the shifter is in INTERMEDIATE (I). See *Starting the Engine (Automatic Engine Start/Stop)* on page 2-20

**LOW (L):** This position reduces vehicle speed more than INTERMEDIATE (I) without actually using the brakes. Use it on very steep hills, or in deep snow or mud. If the shift lever is put in LOW (L), the transmission will not shift into LOW (L) until the vehicle is going slowly enough.

**Notice:** Spinning the tires or holding the vehicle in one place on a hill using only the accelerator pedal may damage the transmission. The repair will not be covered by your warranty. If you are stuck, do not spin the tires. When stopping on a hill, use the brakes to hold the vehicle in place.

## Parking Brake



To set the parking brake, push down the parking brake pedal with your left foot. If the ignition is on, the brake system warning light will come on. See *Brake System Warning Light* on page 3-34.

To release the parking brake, hold the regular brake pedal down with your right foot. Push down momentarily on the parking brake pedal with your left foot until you feel the pedal release. If the parking brake is not released when you begin to drive, the brake system warning light comes on and a chime sounds as a warning that the parking brake is still on.