SAFETY COMPLIANCE TESTING FOR
FMVSS NO. 214S
SIDE IMPACT PROTECTION (STATIC)

GENERAL MOTORS CORP.
2009 CHEVROLET COBALT, PASSENGER CAR
NHTSA NO. C90103

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

August 12, 2009

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
Final Report of FMVSS 214 Compliance Testing of 2009 CHEVROLET COBALT PASSENGER CAR
NHTSA No. C90103

Compliance tests were conducted on the subject 2009 Chevrolet Cobalt Passenger Car in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-214S-05 for the determination of FMVSS 214 compliance. Test failures identified were as follows:
NONE

Compliance Testing
Safety Engineering
FMVSS 214
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<td></td>
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</tr>
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<td></td>
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<td></td>
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<td></td>
</tr>
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SECTION 1
INTRODUCTION

1.0 PURPOSE OF COMPLIANCE TEST

A 2009 Chevrolet Cobalt passenger car was subjected to Federal Motor Vehicle Safety Standard (FMVSS) No. 214 testing to determine if the vehicle was in compliance with the requirements of the standard. FMVSS No. 214 establishes requirements for the side doors of a Motor Vehicle to minimize the safety hazard caused by intrusion into the passenger compartment as a result of a side impact accident.

1.1 TEST VEHICLE

The test vehicle was a 2009 Chevrolet Cobalt Passenger Car. Nomenclature applicable to the test vehicle are:

A. Vehicle Identification Number: 1G1AP18X197162661
B. NHTSA No.: C90103
C. Manufacturer: GENERAL MOTORS CORP.
D. Manufacture Date: 09/08

The vehicle’s front and rear seating systems were removed for this test. All vehicle windows were closed and all doors were locked for this test.

1.2 TEST DATE

The test vehicle was subjected to FMVSS No. 214 testing on July 31, 2009.
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-214S-05 dated 14 September 1993 and General Testing Laboratories, Inc. (GTL) Test Procedure, TP-214S-05, "Static – Side Impact Protection".

Each vehicle shall be able to meet the requirements of either, at the manufacturer's option, 2.1 or 2.2 when any of its side doors that can be used for occupant egress are tested.

2.1 OPTION ONE

With any seats that may affect load upon or deflection of the side of the vehicle removed from the vehicle, each vehicle must be able to meet the requirements of 2.1.1 through 2.1.3.

2.1.1 INITIAL CRUSH RESISTANCE

The initial crush resistance shall not be less than 2,250 pounds.

2.1.2 INTERMEDIATE CRUSH RESISTANCE

The intermediate crush resistance shall not be less than 3,500 pounds.

2.1.3 PEAK CRUSH RESISTANCE

The peak crush resistance shall not be less than two times the curb weight of the vehicle or 7,000 pounds, whichever is less.

2.2 OPTION TWO

With seats installed in the vehicle, and located in any horizontal or vertical position to which they can be adjusted and at any seat back angle to which they can be adjusted, each vehicle must be able to meet the requirements of 2.2.1 through 2.2.3.

2.2.1 INITIAL CRUSH RESISTANCE

The initial crush resistance shall not be less than 2,250 pounds.

2.2.2 INTERMEDIATE CRUSH RESISTANCE

The intermediate crush resistance shall not be less than 4,375 pounds.
SECTION 2 CONTINUED

2.2.3 PEAK CRUSH RESISTANCE

The peak crush resistance shall not be less than three and one half times the curb weight of the vehicle or 12,000 pounds, whichever is less.
SECTION 3
COMPLIANCE TEST DATA
DATA SHEET 1
TEST VEHICLE RECEIVING-INSPECTION

VEH. MOD YR/MAKE/MODEL/BODY: 2009 CHEVROLET COBALT PASSENGER CAR
VEH. BUILD DATE: 09/08; TEST DATE: JULY 31, 2009
TEST LABORATORY: GENERAL TESTING LABS
OBSERVERS: G. FARRAND, J. LATANE

A. First compliance test by laboratory for this vehicle is the static FMVSS 214 test.

   ___ Yes     ___ No (Go to item 2)
   ___ (1) Label test vehicle with NHTSA Number
   ___ (2) Verify all options on the "window sticker" are present on the vehicle
   ___ (3) Verify tires and wheel rims are new and the same as listed
   ___ (4) Verify there are no dents or other interior or exterior flaws
   ___ (5) Verify the glove box contains an owner's manual, warranty document, consumer information, and extra keys
   ___ (6) Verify the vehicle is equipped with the proper fuel filler cap
   ___ (7) If the vehicle has been delivered from the dealer, verify the vehicle has been properly prepared and is in running condition

B. Verify seat adjusters are working
   ___ Yes     ___ No

C. Verify there is a seat belt at each seating position
   ___ Yes     ___ No

D. Without disturbing the integrity of each seat belt and anchorage, verify that each seat belt is attached to the anchorage. For seat belts that are attached to the seat, also verify the seats are attached to the seat anchors and the seat anchors are attached to the vehicle.
   ___ Yes     ___ No

E. Curb Weight of Vehicle: 2961 LBS. (1343.5 KG)

F. COMMENTS: (Explain any problems here)

RECORDED BY: G. FARRAND              DATE: 07/31/09
APPROVED BY: D. MESSICK
DATA SHEET 2
PRETEST PREPARATION

VEH. MOD YR/MAKE/MODEL/BODY: 2009 CHEVROLET COBALT PASSENGER CAR
VEH. NHTSA NO.: C90103; VIN: 1G1AP18X197162661
VEH. BUILD DATE: 09/08; TEST DATE: JULY 31, 2009
TEST LABORATORY: GENERAL TESTING LABS
OBSERVERS: G. FARRAND, J. LATANE

Prior to testing the following will be accomplished:

<table>
<thead>
<tr>
<th>TEST</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Check the manufacturers certification statement to determine if the vehicle should be tested with or without seats installed.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>B. Remove all seats unless the vehicle has been certified with the seats installed. If the seats remain in the vehicle, they are to be adjusted per the COTR's instructions.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>C. Close all windows</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>D. Lock All doors</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>E. State door tested</td>
<td>LF</td>
<td>RR</td>
</tr>
<tr>
<td>F. State the length of a horizontal line drawn on door through a point 5 inches vertically above lowest point of test door</td>
<td>53.6</td>
<td>53.6</td>
</tr>
<tr>
<td>G. State vertical distance from the lowest part of test door to bottom of loading device</td>
<td>5&quot;</td>
<td>5&quot;</td>
</tr>
<tr>
<td>H. State position of vertical centerline of loading device on the midpoint of line determined step F</td>
<td>26.8</td>
<td>26.8</td>
</tr>
<tr>
<td>I. Determine that the vertical axis of the loading device is perpendicular to the longitudinal and lateral axis of the test vehicle</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>J. Determine that the top of the loading device is above the door window opening but not touching any structure above the window opening</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

RECORDED BY: G. FARRAND
DATE: 07/31/09
APPROVED BY: D. MESSICK
DATA SHEET 3
STATIC LOAD TEST - BACK-UP SYSTEM DATA

VEH. MOD YR/MAKE/MODEL/BODY: 2009 CHEVROLET COBALT PASSENGER CAR
VEH. NHTSA NO.: C90103; VIN: 1G1AP18X197162661
VEH. BUILD DATE: 09/08; TEST DATE: JULY 31, 2009
TEST LABORATORY: GENERAL TESTING LABS
OBSERVERS: G. FARRAND, J. LATANE

RESULTS: Plots of load versus displacement and time versus displacement obtained from the back-up data (attach plots to data sheet) showed that:

TEST #1 - GTL #6273 (LEFT FRONT DOOR)
A. The initial crush resistance was 3385 lbs.
B. The intermediate crush resistance was 5806 lbs.
C. The peak crush resistance was 10,350 lbs at 12.4 inches
D. The rate of loading was .2"/sec

The dial indicator and the inclinometer showed the following deflections.

<table>
<thead>
<tr>
<th>LOADING DEVICE TRAVEL</th>
<th>DIAL INDICATOR</th>
<th>INCLINOMETER</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 inches</td>
<td>0.0000</td>
<td>0</td>
</tr>
<tr>
<td>2 inches</td>
<td>0.01</td>
<td>0</td>
</tr>
<tr>
<td>4 inches</td>
<td>0.07</td>
<td>0</td>
</tr>
<tr>
<td>6 inches</td>
<td>0.14</td>
<td>0</td>
</tr>
<tr>
<td>12 inches</td>
<td>0.34</td>
<td>0</td>
</tr>
<tr>
<td>12.4 Inches (full travel)</td>
<td>0.34</td>
<td>0</td>
</tr>
<tr>
<td>0 inches (removal)</td>
<td>0.13</td>
<td>0</td>
</tr>
</tbody>
</table>

TEST #2 - GTL #6274 (RIGHT REAR DOOR)
A. The initial crush resistance was 3482 lbs.
B. The intermediate crush resistance was 5819 lbs.
C. The peak crush resistance was 10,242 lbs at 12.3 inches
D. The rate of loading was .2"/sec
The dial indicator and the inclinometer showed the following deflections.

<table>
<thead>
<tr>
<th>LOADING DEVICE TRAVEL</th>
<th>DIAL INDICATOR</th>
<th>INCLINOMETER</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 inches</td>
<td>0.0000</td>
<td>0</td>
</tr>
<tr>
<td>2 inches</td>
<td>0.02</td>
<td>0</td>
</tr>
<tr>
<td>4 inches</td>
<td>0.09</td>
<td>0</td>
</tr>
<tr>
<td>6 inches</td>
<td>0.15</td>
<td>0</td>
</tr>
<tr>
<td>12 inches</td>
<td>0.35</td>
<td>0.5</td>
</tr>
<tr>
<td>12.3 Inches (full travel)</td>
<td>0.35</td>
<td>0.5</td>
</tr>
<tr>
<td>0 Inches (removal)</td>
<td>0.27</td>
<td>0</td>
</tr>
</tbody>
</table>

RECORDED BY: G. FARRAND       DATE: 07/31/09
APPROVED BY: D. MESSICK
DATA SHEET 4
DATA REDUCTION

VEH. MOD YR/MAKE/MODEL/BODY: 2009 CHEVROLET COBALT PASSENGER CAR
VEH. NHTSA NO.: C90103; VIN: 1G1AP18X197162661
VEH. BUILD DATE: 09/08; TEST DATE: JULY 31, 2009
TEST LABORATORY: GENERAL TESTING LABS
OBSERVERS: G. FARRAND, J. LATANE

Data from the primary data systems will be analyzed and the plots attached to the data sheet.

RESULTS - The load versus displacement plot showed that - -

TEST #1 - GTL #6273 (LEFT FRONT DOOR)

A. The initial crush resistance was ___3385___ lbs.
B. The intermediate crush resistance was ___5806___ lbs.
C. The peak crush resistance was ___10,350___ lbs at ___12.4___ inches

The time versus displacement plot showed that - -

The rate of loading was ___0.2"/sec___

TEST #2 - GTL #6274 (RIGHT REAR DOOR)

A. The initial crush resistance was ___3482___ lbs.
B. The intermediate crush resistance was ___5819___ lbs.
C. The peak crush resistance was ___10,242___ lbs at ___12.3___ inches

The time versus displacement plot showed that - -

The rate of loading was ___0.2"/sec___

Comparison of the ABOVE DATA with the BACKUP DATA indicates the following - -

Primary and Backup data agree.

RECORDED BY: G. FARRAND DATE: 07/31/09
APPROVED BY: D. MESSICK
## SECTION 4

### TEST EQUIPMENT LIST

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>DESCRIPTION</th>
<th>MODEL/ SERIAL NO.</th>
<th>CAL. DATE</th>
<th>NEXT CAL. DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPUTER</td>
<td>AT&amp;T</td>
<td>486DX266</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>TEST FIXTURE</td>
<td>GTL 214</td>
<td>214</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>A/D INTERFACE</td>
<td>METRABYTE</td>
<td>DAS-16(F)</td>
<td>BEFORE</td>
<td>BEFORE USE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>USE</td>
<td></td>
</tr>
<tr>
<td>SCALES</td>
<td>INTERCOMP</td>
<td>199744</td>
<td>04/09</td>
<td>04/10</td>
</tr>
<tr>
<td>SIGNAL CONDITIONER</td>
<td>METRABYTE</td>
<td>EXP-RES</td>
<td>BEFORE</td>
<td>BEFORE USE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>USE</td>
<td></td>
</tr>
<tr>
<td>LOAD CELL</td>
<td>TRANSDUCER INC.</td>
<td>18550</td>
<td>11/08</td>
<td>11/09</td>
</tr>
<tr>
<td>LINEAR POT.</td>
<td>WALDALE</td>
<td>123456A</td>
<td>BEFORE</td>
<td>BEFORE USE</td>
</tr>
<tr>
<td></td>
<td>WALDALE</td>
<td>123456B</td>
<td>USE</td>
<td></td>
</tr>
<tr>
<td>INCLINOMETER</td>
<td>STARRETT</td>
<td>360/002</td>
<td>BEFORE</td>
<td>BEFORE USE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>USE</td>
<td></td>
</tr>
<tr>
<td>DIAL INDICATOR</td>
<td>MIOTO</td>
<td>0001-2</td>
<td>BEFORE</td>
<td>BEFORE USE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>USE</td>
<td></td>
</tr>
</tbody>
</table>
SECTION 5

PHOTOGRAPHS
FIGURE 5.2
LEFT SIDE VIEW OF VEHICLE PRE-TEST
FIGURE 5.4
REAR VIEW OF VEHICLE PRE-TEST
2009 CHEVROLET COBALT
NHTSA NO. C90103
FMVSS NO. 214

FIGURE 5.5
¾ FRONTAL VIEW FROM LEFT SIDE OF VEHICLE
PRE-TEST
2009 CHEVROLET COBALT
NHTSA NO. C90103
FMVSS NO. 214

FIGURE 5.6
¾ REAR VIEW FROM RIGHT SIDE OF VEHICLE
PRE-TEST
MFD BY GENERAL MOTORS CORP.

DATE
09/08

GVWR
1775 KG

GAWR FRT
923 KG

3913 LB

GAWR RR
852 KG

2034 LB

1879 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.

1G1AP18X197162661 TYPE: PASS CAR
<table>
<thead>
<tr>
<th>TIRE</th>
<th>ORIGINAL SIZE</th>
<th>COLD TIRE PRESSURE</th>
<th>SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRONT</td>
<td>225/40ZR18</td>
<td>230 kPa, 33 PSI</td>
<td></td>
</tr>
<tr>
<td>REAR</td>
<td>225/40ZR18</td>
<td>230 kPa, 33 PSI</td>
<td></td>
</tr>
<tr>
<td>SPARE</td>
<td>T115/70R16</td>
<td>420 kPa, 60 PSI</td>
<td></td>
</tr>
</tbody>
</table>

Seating Capacity: Total 5, Front 2, Rear 3

The combined weight of occupants and cargo should never exceed 404 kg or 891 lbs.
2009 CHEVROLET COBALT
NHTSA NO. C90103
FMVSS NO. 214

FIGURE 5.9
VEHICLE VIN PLATE
FIGURE 5.10
INSTRUMENTATION SET-UP
2009 CHEVROLET COBALT
NHTSA NO. C90103
FMVSS NO. 214

FIGURE 5.12
FRONT VEHICLE TIE DOWN – TEST 1
FIGURE 5.13
INCLINOMETER PRE-TEST 1
2009 CHEVROLET COBALT
NHTSA NO. C90103
FMVSS NO. 214

FIGURE 5.14
DIAL INDICATOR PRE-TEST 1
FIGURE 5.15
LOAD DEVICE AGAINST DOOR – PRE-TEST 1
2009 CHEVROLET COBALT
NHTSA NO. C90103
FMVSS NO. 214

FIGURE 5.16
LOAD DEVICE AGAINST DOOR @ MAX LOAD – TEST 1
2009 CHEVROLET COBALT
NHTSA NO. C90103
FMVSS NO. 214

FIGURE 5.17
INCLINOMETER AT MAX LOAD – TEST 1
FIGURE 5.18
DIAL INDICATOR AT MAX LOAD – TEST 1
2009 CHEVROLET COBALT
NHTSA NO. C90103
FMVSS NO. 214

FIGURE 5.19
POST TEST DOOR OUTSIDE – TEST 1
FIGURE 5.25
LOAD DEVICE AGAINST DOOR – PRE-TEST 2
FIGURE 5.26
LOAD DEVICE AGAINST DOOR @ MAX LOAD – TEST 2
FIGURE 5.27
INCLINOMETER AT MAX LOAD – TEST 2
FIGURE 5.28
DIAL INDICATOR AT MAX LOAD – TEST 2
2009 CHEVROLET COBALT
NHTSA NO. C90103
FMVSS NO. 214

FIGURE 5.29
POST TEST DOOR OUTSIDE – TEST 2
2009 CHEVROLET COBALT
NHTSA NO. C90103
FMVSS NO. 214

FIGURE 5.30
POST TEST DOOR INSIDE – TEST 2
2009 CHEVROLET COBALT
NHTSA NO. C90103
FMVSS NO. 214

FIGURE 5.32
LEFT SIDE VIEW OF VEHICLE POST TEST
2009 CHEVROLET COBALT
NHTSA NO. C90103
FMVSS NO. 214

FIGURE 5.34
REAR VIEW OF VEHICLE POST TEST
2009 CHEVROLET COBALT
NHTSA NO. C90103
FMVSS NO. 214

FIGURE 5.35
¾ FRONTAL VIEW FROM LEFT SIDE OF VEHICLE
POST TEST
SECTION 6
TEST DATA PLOTS
GTL 6273

214, Static Door Crush, Left Door.

Displacement in Inches

Time in Seconds