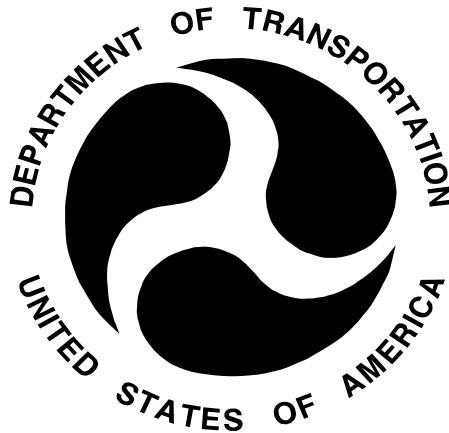


126-TRC-11-002

**SAFETY COMPLIANCE TESTING FOR FMVSS 126
Electronic Stability Control Systems**

General Motors LLC
2011 Chevrolet Cruze
NHTSA No. CB0106

TRANSPORTATION RESEARCH CENTER INC.
10820 State Route 347
East Liberty, Ohio 43319



May 23, 2011

FINAL REPORT

Prepared Under Contract No.: DTNH22-08-D-00097

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance
1200 New Jersey Avenue, SE
West Building, 4th Floor (NVS-221)
Washington, DC 20590

Prepared for the Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-08-D-00097.

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 of manufacturers.

Prepared By: 
Alan Ida

Approved By: 
Ken Webster

Approval Date: 4/19/11

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: 

Acceptance Date: 6/6/11

1. Report No. 126-TRC-11-002	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of FMVSS 126 Compliance Testing of 2011 Chevrolet Cruze, NHTSA No. CB0106		5. Report Date May 23, 2011	
		6. Performing Organization Code TRC 20080734 / 1102	
7. Author(s) Alan Ida, Project Engineer Ken Webster, Manager, DDO Project Operations		8. Performing Organization Report No. TRC-DOT-126-11-002	
9. Performing Organization Name and Address Transportation Research Center Inc. 10820 State Route 347 East Liberty, OH 43319		10. Work Unit No.	
		11. Contract or Grant No. DTNH22-08-D-00097	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Enforcement Office of Vehicle Safety Compliance 1200 New Jersey Avenue, SE, West Building, 4 th Floor (NVS-221) Washington, D.C. 20590		13. Type of Report and Period Covered Final test report March 31, 2011 to May 23, 2011	
		14. Sponsoring Agency Code NVS-220	
15. Supplementary Notes			
16. Abstract A test was conducted on a 2011 Chevrolet Cruze, NHTSA No. CB0106, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-126-02 for the determination of FMVSS 126 compliance. Test failures identified were as follows: None			
17. Key Words Compliance Testing Safety Engineering FMVSS 126		18. Distribution Statement Copies of this report are available from: NHTSA Technical Information Services (TIS) (NPO 411) 1200 New Jersey Avenue, SE Washington, D.C. 20590 Email: 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 76	22.

TABLE OF CONTENTS

<u>SECTION</u>		<u>PAGE</u>
1.0	PURPOSE OF COMPLIANCE TEST	1
2.0	TEST PROCEDURE AND DISCUSSION OF RESULTS	1
3.0	TEST DATA	5
4.0	TEST EQUIPMENT LIST AND CALIBRATION INFORMATION	27
5.0	PHOTOGRAPHS	28
6.0	DATA PLOTS	46
7.0	OTHER DOCUMENTATION	51
	7.1 Owner's Manual Pages	52
	7.2 Vehicle Arrival Condition Report	71
	7.3 Vehicle Completion Condition Report	72
	7.4 Sine with Dwell Test Results	73
	7.5 Slowly Increasing Steer Test Results	75
	7.6 Inertial Sensing System Location Coordinates	76

1.0 PURPOSE OF COMPLIANCE TEST

The purpose of this test is to determine if the test vehicle, a MY 2011 Chevrolet Cruze meets the minimum equipment and performance requirements stated in Federal Motor Vehicle Safety Standard (FMVSS) 126, "Electronic Stability Control Systems."

This standard establishes performance and equipment requirements for Electronic Stability Control (ESC) Systems installed in passenger cars, multipurpose passenger vehicles, trucks, and buses with a gross vehicle weight rating of 4,536 kilograms or less.

2.0 TEST PROCEDURE AND DISCUSSION OF RESULTS

Testing of the MY 2011 Chevrolet Cruze was conducted at Transportation Research Center Inc. (TRC Inc.) in accordance with NHTSA TP-126-02, dated November 19, 2008.

The vehicle was inspected to ensure it was equipped with an ESC System that:

- Augments vehicle directional stability by applying and adjusting brake torques individually at each wheel to induce a correcting yaw moment to a vehicle;
- Is computer controlled with the computer using a closed-loop algorithm to limit vehicle oversteer and to limit vehicle understeer;
- Has a means to determine the vehicle's yaw rate and to estimate its side slip or side slip derivative with respect to time;
- Has a means to monitor driver steering inputs;
- Has an algorithm to determine the need, and a means to modify engine torque, as necessary, to assist the driver in maintaining control of the vehicle, and
- Is operational over the full speed range of the vehicle (except at vehicle speeds less than 20km/h (12.4mph), when being driven in reverse, or during system initialization).

The vehicle was subjected to a 0.7Hz Sine with Dwell (SWD) Steering Maneuver to ensure that it would meet the stability and responsiveness requirements of the standard as follows:

- At 1.0 second after completion of a required sine with dwell steering input, the yaw rate of the vehicle must not exceed 35 percent of the first peak value of yaw rate recorded after the steering wheel angle changes sign (between first and second peaks during the same test run).
- At 1.75 seconds after completion of a required sine with dwell steering input, the yaw rate of the vehicle must not exceed 20 percent of the first peak value of yaw rate recorded after the steering wheel angle changes sign (between first and second peaks during the same test run).

- The lateral displacement of the vehicle center of gravity with respect to its initial straight path must be at least 1.83 m (6 feet) (for vehicles with a GVWR of 3,500kg (7,716 lb) or less) when computed 1.07 seconds after the Beginning of Steer (BOS) at the specified steering wheel angles.

System malfunction simulations were executed to verify vehicle could identify and indicate a malfunction.

The vehicle's ESC System appears to meet the performance and equipment requirements as required by FMVSS 126. The test results are summarized on the following summary sheet.

2.0 TEST PROCEDURE AND DISCUSSION OF RESULTS ...continued

DATA SUMMARY (Sheet 1 of 2)

VEHICLE MAKE/MODEL/BODY STYLE: Chevrolet / Cruze / Passenger Car

VEHICLE NHTSA NO.: CB0106 VIN: 1G1PF5S98B7210290

VEHICLE TYPE: Passenger Car DATE OF MANUFACTURE: 02/11

LABORATORY: Transportation Research Center Inc.

REQUIREMENTS

PASS/FAIL

ESC Equipment and Operational Characteristics (Data Sheet 2)

The vehicle is to be equipped with an ESC System that meets the equipment PASS and operational characteristics requirements. (S126, S5.1, S5.6)

ESC Malfunction Telltale (Data Sheet 3)

The vehicle is equipped with a telltale that indicates one or more PASS ESC System malfunctions. (S126, S5.3)

“ESC Off” and other System Controls and Telltale (Data Sheet 3 & 4)

The vehicle is equipped with an ESC off telltale indicating the vehicle PASS has been put into a mode that renders the ESC System unable to satisfy the performance requirements of the standard, if such a mode exists. (S5.5.1)

If provided, off control and other system controls as well as the ESC PASS off telltale meets the operational requirements (S126, S5.4, S5.4.1, S5.4.2, S5.5.4, and S5.5.9)

2.0 TEST PROCEDURE AND DISCUSSION OF RESULTS ...continued

DATA SUMMARY (Sheet 2 of 2)

REQUIREMENTS	PASS/FAIL
If provided, off control and other system controls as well as the ESC off telltale meets the operational requirements (S126, S5.4, S5.4.1, S5.4.2, S5.5.4, and S5.5.9)	<u>PASS</u>
Vehicle Lateral Stability (Data Sheet 8)	
Yaw Rate Ratio at 1 second after COS is less than 35% of peak value. (S126, S5.2.1)	<u>PASS</u>
Yaw Rate Ratio at 1.75 seconds after COS is less than 20% of peak value. (S126, S5.2.2)	<u>PASS</u>
Vehicle Responsiveness (Data Sheet 8)	
Lateral displacement at 1.07 seconds after BOS is at least 1.83 m (6 feet) for vehicles with a GVWR of 3,500 kg (7,716 lbs.) or less, and 1.52 m (5 feet) for vehicles with a GVWR greater than 3,500 kg (7,716 lbs.). (S126 S5.2.3)	<u>PASS</u>
ESC Malfunction Warning (Data Sheet 9)	
Warning is provided to driver after malfunction occurrence. (S126. S5.3)	<u>PASS</u>
Malfunction telltale stayed illuminated as long as malfunction existed and must extinguish after malfunction was corrected. (S126, S5.3.7)	<u>PASS</u>

REMARKS

3.0 TEST DATA

**DATA SHEET 1 (Sheet 1 of 2)
TEST VEHICLE INSPECTION AND TEST PREPARATION**

VEHICLE MAKE/MODEL/BODY STYLE: Chevrolet / Cruze / Passenger Car

NHTSA No.: CB0106 TEST DATE: 4-05-11

VIN: 1G1PF5S98B7210290 MANUFACTURE DATE: 02/11

GVWR: 1,861 KG FRONT GAWR: 965 KG REAR GAWR 896 KG

SEATING POSITIONS: FRONT 2 REAR 3

ODOMETER READING AT START OF TEST: 60 (97) Miles (Kilometers)

DESIGNATED TIRE SIZE(S) FROM VEHICLE LABELING:

Front Axle P215 / 60R16 S Rear Axle P215 / 60R16 S

INSTALLED TIRE SIZE(S) ON VEHICLE:

<u>From Tire Sidewall</u>	<u>Front Axle</u>	<u>Rear Axle</u>
Manufacturer and Model	<u>Firestone FR710</u>	<u>Firestone FR710</u>
Tire Size Designation	<u>P215 / 60R16 94S</u>	<u>P215 / 60R16 94S</u>

Are installed tire sizes same as labeled tire sizes? X Yes No
If no, contact COTR for further guidance.

DRIVE CONFIGURATIONS (MARK ALL THAT APPLY):

- X Two Wheel Drive (2WD): (X) Front Wheel Drive () Rear Wheel Drive
- All Wheel Drive (AWD)
- Four Wheel Drive Automatic – differential not locked full time (4WD Automatic)
- Four Wheel Drive High Gear Unlocked Center Differential
- Four Wheel Drive High Gear Locked Center Differential
- Four Wheel Drive Low Gear Unlocked Center Differential
- Four Wheel Drive Low Gear Locked Center Differential
- Other (define _____)

3.0 TEST DATA....continued

**DATA SHEET 1 (Sheet 2 of 2)
TEST VEHICLE INSPECTION AND TEST PREPARATION**

DRIVE CONFIGURATIONS AND MODES: (ex. default, performance, off)
(For each of the vehicle's drive configurations identify available operating modes)

Drive Configuration 2WD
Mode(s) default

Drive Configuration _____
Mode(s) _____

Drive Configuration _____
Mode(s) _____

VEHICLE STABILITY SYSTEMS (Check applicable technologies):

ESC Traction Control Roll Stability Control
 Active Suspension Electronic Throttle Control Active Steering
 ABS

List other systems; _____

REMARKS:

RECORDED BY: Alan Ida
APPROVED BY: Ken Webster

DATE: 4-05-11
DATE: 4-19-11

3.0 TEST DATA....continued

DATA SHEET 2 (Sheet 2 of 2)
ESC SYSTEM HARDWARE AND OPERATIONAL CHARACTERISTICS

ESC SYSTEM OPERATIONAL CHARACTERISTICS (continued):

System is capable of modifying engine torque during ESC activation. Yes (PASS)
 No (FAIL)

Method used to modify engine torque: During certain vehicle understeer conditions, vehicle speed may be reduced by reducing engine torque. In order to reduce engine torque, the ESC electronic control unit sends a signal to the powertrain control module requesting an appropriate percent reduction in engine torque. The powertrain control module provides the requested engine torque reduction using its own control algorithm with actuation that utilizes combinations of spark and throttle.

System is capable of activation at speeds of 20 km/h (12.4 mph) and higher. Yes (PASS)
 No (FAIL)

Speed system becomes active. 10.8 km/h (6.7 mph)

System is capable of activation during the following driving phases (acceleration, deceleration, coasting, and during activation of ABS or traction control). Yes (PASS)
 No (FAIL)

Driving phases that the system is capable of activation. The ESC system is active under all driving phases of acceleration, deceleration, coasting, and during activation of ABS or traction control, except if the vehicle is being driven in reverse or if the forward vehicle speed is less than 10.8 km/h.

Vehicle manufacturer submitted documentation explaining how the ESC system mitigates understeer? Yes (PASS)
 No (FAIL)

DATA INDICATES COMPLIANCE

PASS/FAIL PASS

RECORDED BY: Alan Ida
APPROVED BY: Ken Webster

DATE: 4-18-11
DATE: 4-19-11

3.0 TEST DATA....continued

DATA SHEET 3 (Sheet 1 of 2)
ESC MALFUNCTION AND OFF TELLTALES

VEHICLE MAKE/MODEL/BODY STYLE: Chevrolet / Cruze / Passenger Car

VEHICLE NHTSA NO. CB0106 TEST DATE: 4-18-11

ESC Malfunction Telltale

Vehicle is equipped with malfunction telltale? Yes (Pass) No (Fail)

Telltale Location Left side of instrument cluster, inside the tachometer

Telltale Color Yellow

Telltale symbol or abbreviation used.



Or **ESC**

- Vehicle uses this symbol
- Vehicles uses this abbreviation
- Neither symbol or abbreviation is used

If different than identified above, make note of any message, symbol or abbreviation used.

Is telltale part of a common space? Yes No

Is telltale also used to indicate activation of the ESC system? Yes No

If yes, explain telltale operation during ESC activation: The ESC telltale flashes

3.0 DATA SHEETS....continued

DATA SHEET 3 (Sheet 2 of 2)
ESC MALFUNCTION AND OFF TELLTALES

“ESC OFF” Telltale (if provided)

Vehicle is equipped with “ESC Off” telltale? X Yes No

Is “ESC OFF” telltale combined with “ESC Malfunction” telltale utilizing a two part telltale?
 Yes X No

Telltale Location Right side of instrument cluster, inside the speedometer

Telltale Color Yellow

Telltale symbol or abbreviation used.



Or **ESC OFF** X Vehicle uses this symbol
 Vehicle uses this abbreviation
 Neither symbol or abbreviation is used

If different than identified above, make note of any message, symbol or abbreviation used.

Is telltale part of a common space? Yes X No

DATA INDICATES COMPLIANCE PASS/FAIL PASS
(Vehicle is compliant if equipped with a malfunction telltale)

REMARKS:

RECORDED BY: Alan Ida
APPROVED BY: Ken Webster

DATE: 4-18-11
DATE: 4-19-11

3.0 TEST DATA....continued

DATA SHEET 4 (Sheet 1 of 3)
ESC AND ANCILLARY SYSTEM CONTROLS

“ESC OFF” Controls Identification and Operational Check:

Is the vehicle equipped with a control or controls whose purpose is to deactivate the ESC system or place the ESC system in a mode or modes that may no longer satisfy the performance requirements of the standard?

Yes No

Type of control or controls provided? (mark all that apply) Dedicated “ESC Off” control
 Multi-functional control with an “ESC Off” mode
 Other (describe)

Identify each control location, labeling and selectable modes.

First Control: Location Next to gearshift lever
Labeling Skidding car symbol with “OFF” underneath
Modes Traction Control off
ESC off

Identify standard or default drive configuration 2WD - default

Verify standard or default drive configuration selected. Yes No

Does the “ESC Off” telltale illuminate upon activation of the dedicated ESC off control or selection of the “ESC Off” mode on the multi-function control?
 Yes No (fail)

Does the “ESC Off” telltale extinguish when the ignition is cycled from “On” (“Run”) to “Lock” or “Off” and then back again to the “On” (“Run”) position?
 Yes No (fail)

If no, describe how the off control functions:

3.0 TEST DATA....continued

**DATA SHEET 4 (Sheet 3 of 3)
ESC AND ANCILLARY SYSTEM CONTROLS**

Activate each control listed above and record whether the control illuminates the “ESC Off” telltale. Also, record warnings or messages provided regarding the ESC System.

Ancillary Control	Control Activates “ESC Off” Telltale? (Yes/No)	Warnings or Messages Provided
N/A	N/A	N/A

For those controls that illuminate the “ESC Off” telltale above identify if the “ESC Off” telltale extinguishes upon cycling the ignition system.

Ancillary Control	“ESC Off” telltale extinguishes upon cycling ignition? (Yes/No)
N/A	N/A

For each control that illuminates the “ESC Off” telltale, did the telltale extinguish when the ignition is cycled from “On” (“Run”) to “Lock” or “Off” and then back again to the “On” (“Run”) position? If the control activated places the vehicle into a low-range four-wheel drive configuration designed for low-speed, off-road driving, the ESC System may remain turned off after the ignition has been cycled off and then back on and therefore the “ESC Off” telltale may not extinguish.

_____ Yes _____ No (fail)

DATA INDICATES COMPLIANCE:

PASS/FAIL PASS

REMARKS:

RECORDED BY: Alan Ida
APPROVED BY: Ken Webster

DATE: 4-18-11
DATE: 4-19-11

3.0 TEST DATA....continued

**DATA SHEET 5 (Sheet 1 of 3)
VEHICLE AND TEST TRACK DATA**

VEHICLE MAKE/MODEL/BODY STYLE: Chevrolet / Cruze / Passenger Car

NHTSA No.: CB0106 TEST DATE: 4-12-11

Test Track Requirements: Test Surface Slope (0-1 %) 1 %

Peak Friction Coefficient (at least 0.9) 0.96

Full Fluid Levels: Fuel X Coolant X Other Fluids Washer (specify)

Tire Pressures: Required: Front Axle 240 kPa Rear Axle 240 kPa

Actual: LF: 240 kPa RF: 240 kPa LR: 240 kPa RR: 240 kPa

Vehicle Dimensions: Track Width 154.6 cm Wheelbase 268.8 cm

Roof Height 145.9 cm

Vehicle weight ratings: GAWR Front 965 KG GAWR Rear 896 KG

Unloaded Vehicle Weight (UVW)

Front Axle 870.6 KG Left Front 442.2 KG Right Front 428.4 KG

Rear Axle 564.2 KG Left Rear 293.2 KG Right Rear 271.0 KG

Total UVW 1,434.8 KG

Baseline Weight and Outrigger Selection (only for MPVs, Trucks, Buses)

Calculated Baseline Weight (UVW+ 73 kg) 1,507.8 KG

Outrigger size required ("Standard" or "Heavy") N/A

Standard - Baseline weight under 2,722 kg (6,000 lbs.)

Heavy - Baseline weight equal to or greater than 2,722 kg (6,000 lbs.)

3.0 TEST DATA....continued

**DATA SHEET 5 (Sheet 2 of 3)
VEHICLE AND TEST TRACK DATA**

Loaded Vehicle Weight w/ Driver and Instrumentation (No Ballast)

Front Axle 944.0 KG Left Front 487.0 KG Right Front 457.0 KG

Rear Axle 626.4 KG Left Rear 329.0 KG Right Rear 297.4 KG

Total Loaded Vehicle Weight 1,570.4 KG

$$\begin{aligned} \text{Ballast Required} &= [\text{Total Unloaded Vehicle Weight} + 168 \text{ KG}] - \text{Total Loaded Weight w/ Driver and Instrumentation} \\ &= [\underline{1,434.8} \text{ KG} + 168 \text{ KG}] - \underline{1,570.4} \text{ KG} \\ &= \underline{32.4} \text{ KG} \end{aligned}$$

Total Loaded Vehicle Weight

Front Axle 955.6 KG Left Front 487.4 KG Right Front 468.2 KG

Rear Axle 647.2 KG Left Rear 337.0 KG Right Rear 310.2 KG

Total Loaded Vehicle Weight 1,602.8 KG

3.0 TEST DATA....continued

**DATA SHEET 5 (Sheet 3 of 3)
VEHICLE AND TEST TRACK DATA**

Center of Gravity and Inertial Sensing System Location at Loaded Vehicle Condition

x-distance (longitudinal) Point of reference is the front axle centerline.
(Positive from front axle toward rear of vehicle.)

y-distance (lateral) Point of reference is the vehicle centerline.
(Positive from the center toward the right.)

z-distance (vertical) Point of reference is the ground plane.
(Positive from the ground up.)

Locations:

	Center of Gravity	Inertial Sensing System
x-distance	<u>108.5</u> cm	<u>150.3</u> cm
y-distance	<u>-2.2</u> cm	<u>0.5</u> cm
z-distance	<u>55.4</u> cm	<u>80.5</u> cm

Distance Between Ultrasonic Sensors: 177.2 cm

TEST TRACK DATA MEETS REQUIREMENTS: YES/NO YES
If no, explain: _____

REMARKS:

RECORDED BY: Alan Ida
APPROVED BY: Ken Webster

DATE: 4-12-11
DATE: 4-19-11

3.0 TEST DATA....continued

**DATA SHEET 6 (Sheet 1 of 3)
BRAKE AND TIRE CONDITIONING**

VEHICLE MAKE/MODEL/BODY STYLE: Chevrolet / Cruze / Passenger Car

VEHICLE NHTSA No.: CB0106

Measured Cold Tire Pressures: LF 241 kPa RF 241 kPa

LR 241 kPa RR 241 kPa

Wind Speed 1.8 m/sec
(10m/sec (22mph) max for passenger cars; 5m/s (11mph) max. for MPVs and Trucks)

Ambient Temperature (7°C (45°F) - 40°C (104°F)) 10.6 °C

Brake Conditioning Time; 9:25 AM Date; 4-14-11

56 km/h (35 mph) Brake Stops

Number of stops executed (10 required) 10 stops

Observed deceleration rate range (.5g target) 0.50 – 0.60 g

72 km/h (45 mph) Brake Stops

Number of stops executed (3 required) 3 stops

Number of stops ABS activated (3 required) 3 stops

Observed deceleration rate range 1.10 – 1.20 g

72 km/h (45 mph) Brake Cool Down Period

Duration of cool down period (5 minutes min.) 5:17 minutes

3.0 TEST DATA....continued

DATA SHEET 6 (Sheet 2 of 3) BRAKE AND TIRE CONDITIONING

Tire Conditioning Series No. 1 Time: 9:41 AM Date: 4-14-11

Measured Tire Pressures: LF 255 kPa RF 255 kPa

LR 248 kPa RR 248 kPa

Wind Speed 1.3 m/sec
(10m/sec (22mph) max for passenger cars; 5m/s (11mph) max. for MPVs and Trucks)

Ambient Temperature (7°C (45°F) - 40°C (104°F)) 12.8 °C

30 meter (100 ft) Diameter Circle Maneuver				
Test Runs	Steering Direction	Target Lateral Acceleration (g)	Observed Lateral Acceleration (g)	Observed Vehicle Speed (km/h)
1-3	Clockwise	0.5-0.6	0.55	32.2
4-6	Counterclockwise	0.5-0.6	0.55	32.2

1 Hz 5 Cycle Sinusoidal Steering Maneuver to Determine Steering Wheel Angle For 0.5-0.6g Lateral Acceleration				
Test Runs	Vehicle Speed Km/h(mph)	Steering Wheel Angle (degrees)	Target Peak Lateral Acceleration (g)	Observed Peak Lateral Acceleration (g)
1	56±2 (35±1)	30	0.5-0.6	0.30
2	56±2 (35±1)	50	0.5-0.6	0.48
3	56±2 (35±1)	60	0.5-0.6	0.54
4	56±2 (35±1)		0.5-0.6	

Steering wheel angle that corresponds to a peak 0.5–0.6g lateral acceleration; 60 degrees

1 Hz 10 Cycle Sinusoidal Steering Maneuver				
Test Runs	Vehicle Speed Km/h (mph)	Steering Wheel Angle (degrees)	Target Peak Lateral Acceleration (g)	Observed Peak Lateral Acceleration (g)
1 - 3	56±2 (35±1)	60 (cycles 1-10)	0.5-0.6	0.55
4	56±2 (35±1)	60 (cycles 1-9)	0.5-0.6	0.55
		120 (cycle 10)*	N/A	0.86

* The steering wheel angle used for cycle 10 should be twice the angle used for cycles 1-9.

3.0 TEST DATA....continued

DATA SHEET 7 (1 of 2) SLOWLY INCREASING STEER (SIS) MANEUVER

VEHICLE MAKE/MODEL/BODY STYLE: Chevrolet / Cruze / Passenger Car

VEHICLE NHTSA No.: CB0106 TEST DATE: 4-14-11

Wind Speed 1.8 m/sec
(10m/sec (22mph) max for passenger cars; 5m/s (11mph) max. for MPVs and Trucks)

Ambient Temperature (7°C (45°F) - 40°C (104°F)) 13.9 °C

Static Data File Number: 0010

Selected Drive Configuration: 2WD

Selected Mode: default

Preliminary Left Steer Maneuver:

Lateral Acceleration measured at 30 degrees steering wheel angle ($a_{y,30 \text{ degrees}}$)

$$a_{y,30 \text{ degrees}} = \underline{0.42} \text{ g}$$

Assuming a linear relationship the following ratio should be used to calculate the steering wheel angle at .55g.

$$\frac{30 \text{ degrees}}{a_{y,30 \text{ degrees}}} = \frac{\delta_{SIS}}{0.55 \text{ g}}$$

$$\delta_{SIS} = \underline{39} \text{ degrees @ } 0.55\text{g}$$

$$\delta_{SIS} = \underline{40} \text{ degrees (rounded)}$$

Steering Wheel Angle at Corrected 0.3 g Lateral Acceleration:

Maneuver #	Initial Steer Direction	Time Clock (5 min max between runs)	Steering Wheel Angle to nearest 0.1 degree (degrees)	All Conditions Met?
0013	Left	10:14 am	-25.4	Yes
0014	Left	10:17 am	-25.4	Yes
0015	Left	10:22 am	-25.5	Yes
0016	Right	10:24 am	26.3	Yes
0017	Right	10:27 am	26.1	Yes
0018	Right	10:30 am	25.3	Yes

3.0 TEST DATA....continued

DATA SHEET 7 (2 of 2)
SLOWLY INCREASING STEER (SIS) MANEUVER

Average Overall Steering Wheel Angle:

$$\delta_{0.3 \text{ g, overall}} = (|\delta_{0.3 \text{ g, left (1)}}| + |\delta_{0.3 \text{ g, left (2)}}| + |\delta_{0.3 \text{ g, left (3)}}| + \delta_{0.3 \text{ g, right (1)}} + \delta_{0.3 \text{ g, right (2)}} + \delta_{0.3 \text{ g, right (3)}}) / 6$$

$$\delta_{0.3 \text{ g, overall}} = \underline{\quad 25.7 \quad} \text{ degrees} \\ \text{[to nearest 0.1 degree]}$$

REMARKS:

RECORDED BY: Alan Ida
APPROVED BY: Ken Webster

DATE: 4-14-11
DATE: 4-19-11

3.0 TEST DATA....continued

DATA SHEET 8 (1 of 3) VEHICLE LATERAL STABILITY AND RESPONSIVENESS

VEHICLE MAKE/MODEL/BODY STYLE: Chevrolet / Cruze / Passenger Car

VEHICLE NHTSA No.: CB0106 TEST DATE: 4-14-11

Tire conditioning completed	<u>X</u>	Yes		<u> </u>	No
ESC system is enabled	<u>X</u>	Yes		<u> </u>	No
On track calibration checks have been completed	<u>X</u>	Yes		<u> </u>	No
On track static data file for each sensor obtained	<u>X</u>	Yes		<u> </u>	No

Selected Drive Configuration: 2WD
Selected Mode: default

Overall steering wheel angle ($\delta_{0.3g, overall}$) 25.7 degrees

Static Data File Number 0021

Lateral Stability Test Series No. 1 – Counterclockwise Initial Steer Direction

Maneuver #	Clock Time (1.5 – 5 min between each test run)	Commanded Steering Wheel Angle ¹ (degrees)		Yaw Rates (degrees/sec)			YRR at 1.0 sec after COS [$\leq 35\%$]		YRR at 1.75 sec after COS [$\leq 20\%$]	
		Scalar	Angle	$\dot{\psi}_{Peak}$	$\dot{\psi}_{1.0sec}$	$\dot{\psi}_{1.75sec}$	%	Pass/Fail	%	Pass/Fail
0022	1:11 pm	1.5* $\delta_{0.3g}$	39	11.98	-0.14	-0.21	-1.13	Pass	-1.78	Pass
0023	1:14 pm	2.0* $\delta_{0.3g}$	51	15.05	-0.20	-0.22	-1.30	Pass	-1.43	Pass
0024	1:18 pm	2.5* $\delta_{0.3g}$	64	18.56	-0.01	0.03	-0.08	Pass	0.15	Pass
0025	1:21 pm	3.0* $\delta_{0.3g}$	77	21.71	-0.03	-0.01	-0.12	Pass	-0.06	Pass
0026	1:24 pm	3.5* $\delta_{0.3g}$	90	25.23	-0.15	-0.07	-0.58	Pass	-0.30	Pass
0027	1:28 pm	4.0* $\delta_{0.3g}$	103	28.88	-0.10	-0.10	-0.33	Pass	-0.35	Pass
0033	1:56 pm	4.5* $\delta_{0.3g}$	116	33.96	-0.10	0.03	-0.29	Pass	0.09	Pass
0034	2:00 pm	5.0* $\delta_{0.3g}$	129	37.96	-0.19	0.06	-0.50	Pass	0.15	Pass
0035	2:03 pm	5.5* $\delta_{0.3g}$	141	43.17	0.04	-0.02	0.09	Pass	-0.05	Pass
0036	2:06 pm	6.0* $\delta_{0.3g}$	154	44.94	-0.04	-0.36	-0.09	Pass	-0.81	Pass
0037	2:10 pm	6.5* $\delta_{0.3g}$	167	50.31	-0.93	0.16	-1.86	Pass	0.31	Pass
0038	2:13 pm	7.0* $\delta_{0.3g}$	180	51.00	-1.16	-0.34	-2.28	Pass	-0.66	Pass
0039	2:16 pm	7.5* $\delta_{0.3g}$	193	52.78	0.41	-0.05	0.79	Pass	-0.10	Pass
0040	2:19 pm	8.0* $\delta_{0.3g}$	206	54.66	-3.66	0.12	-6.70	Pass	0.21	Pass
0041	2:23 pm	8.5* $\delta_{0.3g}$	218	55.61	-4.65	0.03	-8.35	Pass	0.05	Pass
0042	2:26 pm	9.0* $\delta_{0.3g}$	231	56.73	-4.99	0.04	-8.80	Pass	0.07	Pass
0043	2:29 pm	9.5* $\delta_{0.3g}$	244	55.75	-3.43	-0.01	-6.16	Pass	-0.02	Pass
0044	2:32 pm	10.0* $\delta_{0.3g}$	257	55.42	-3.09	-0.14	-5.57	Pass	-0.26	Pass
0045	2:36 pm	10.5* $\delta_{0.3g}$	270	55.61	-4.37	-0.17	-7.86	Pass	-0.31	Pass

1. Maneuver execution should continue until a steering wheel angle magnitude factor of $6.5*\delta_{0.3g, overall}$ or 270 degrees is utilized, whichever is greater provided the calculated magnitude of $6.5*\delta_{0.3g, overall}$ is less than or equal to 300 degrees. If $6.5*\delta_{0.3g, overall}$ is less than 270 degrees maneuver execution should continue by increasing the steering wheel angle magnitude by multiples of $0.5*\delta_{0.3g, overall}$ without exceeding the 270 degree steering wheel angle.

3.0 TEST DATA....continued

DATA SHEET 8 (2 of 3)
VEHICLE LATERAL STABILITY AND RESPONSIVENESS

Lateral Stability Test Series No. 2 – Clockwise Initial Steer Direction

Maneuver #	Clock Time (1.5 – 5 min between each test run)	Commanded Steering Wheel Angle ¹ (degrees)		Yaw Rates (degrees/sec)			YRR at 1.0 sec after COS [$\leq 35\%$]		YRR at 1.75 sec after COS [$\leq 20\%$]	
		Scalar	Angle	$\dot{\psi}_{Peak}$	$\dot{\psi}_{1.0sec}$	$\dot{\psi}_{1.75sec}$	%	Pass/Fail	%	Pass/Fail
0046	2:39 pm	1.5* $\delta_{0.3g}$	39	-12.04	0.05	0.07	-0.45	Pass	-0.62	Pass
0047	2:42 pm	2.0* $\delta_{0.3g}$	51	-15.78	0.00	-0.09	-0.01	Pass	0.56	Pass
0048	2:47 pm	2.5* $\delta_{0.3g}$	64	-19.19	0.06	-0.03	-0.31	Pass	0.17	Pass
0049	2:50 pm	3.0* $\delta_{0.3g}$	77	-23.04	0.09	0.07	-0.39	Pass	-0.29	Pass
0050	2:53 pm	3.5* $\delta_{0.3g}$	90	-26.98	0.17	0.14	-0.63	Pass	-0.51	Pass
0051	2:57 pm	4.0* $\delta_{0.3g}$	103	-31.55	0.24	0.00	-0.75	Pass	0.00	Pass
0052	3:00 pm	4.5* $\delta_{0.3g}$	116	-36.01	0.18	0.02	-0.50	Pass	-0.05	Pass
0053	3:03 pm	5.0* $\delta_{0.3g}$	129	-41.12	-0.03	0.03	0.07	Pass	-0.07	Pass
0054	3:06 pm	5.5* $\delta_{0.3g}$	141	-44.25	-0.78	-0.09	1.77	Pass	0.20	Pass
0055	3:09 pm	6.0* $\delta_{0.3g}$	154	-48.32	-0.30	0.07	0.63	Pass	-0.14	Pass
0056	3:13 pm	6.5* $\delta_{0.3g}$	167	-50.93	0.73	0.19	-1.44	Pass	-0.36	Pass
0057	3:16 pm	7.0* $\delta_{0.3g}$	180	-53.74	-0.26	0.24	0.48	Pass	-0.44	Pass
0058	3:19 pm	7.5* $\delta_{0.3g}$	193	-56.76	-0.01	0.07	0.01	Pass	-0.12	Pass
0059	3:23 pm	8.0* $\delta_{0.3g}$	206	-57.05	1.79	-0.03	-3.14	Pass	0.05	Pass
0060	3:26 pm	8.5* $\delta_{0.3g}$	218	-60.28	5.44	0.10	-9.03	Pass	-0.17	Pass
0061	3:29 pm	9.0* $\delta_{0.3g}$	231	-58.80	5.30	0.06	-9.02	Pass	-0.11	Pass
0062	3:33 pm	9.5* $\delta_{0.3g}$	244	-60.39	3.42	0.08	-5.66	Pass	-0.12	Pass
0063	3:36 pm	10.0* $\delta_{0.3g}$	257	-60.12	5.89	0.19	-9.80	Pass	-0.32	Pass
0064	3:39 pm	10.5* $\delta_{0.3g}$	270	-59.86	5.26	0.09	-8.78	Pass	-0.15	Pass

1. Maneuver execution should continue until a steering wheel angle magnitude factor of $6.5 * \delta_{0.3g, overall}$ or 270 degrees is utilized, whichever is greater provided the calculated $6.5 * \delta_{0.3g, overall}$ is less than or equal to 300 degrees. If $6.5 * \delta_{0.3g, overall}$ is less than 270 degrees maneuver execution should continue by increasing the steering wheel angle magnitude by multiples of $0.5 * \delta_{0.3g, overall}$ without exceeding the 270 degree steering wheel angle.

During execution of the sine with dwell maneuvers were any of the following events observed?

- Rim-to-pavement contact _____ Yes X No
- Tire debanding _____ Yes X No
- Loss of pavement contact of vehicle tires _____ Yes X No
- Did the test driver experience any vehicle loss of control or spinout? _____ Yes X No

If "Yes" explain the event and consult with the COTR. _____

3.0 TEST DATA....continued

DATA SHEET 8 (3 of 3) VEHICLE LATERAL STABILITY AND RESPONSIVENESS

Responsiveness – Lateral Displacement

Maneuver #	Initial Steer Direction	Commanded Steering Wheel Angle ($5.0^* \delta_{0.3g, overall}$ or greater)		Calculated Lateral Displacement ¹	
		Scalar	Angle (degrees)	Distance (m)	Pass/Fail
0034	Counter Clockwise	$5.0^* \delta_{0.3g}$	129	3.15	Pass
0035	Counter Clockwise	$5.5^* \delta_{0.3g}$	141	3.19	Pass
0036	Counter Clockwise	$6.0^* \delta_{0.3g}$	154	3.27	Pass
0037	Counter Clockwise	$6.5^* \delta_{0.3g}$	167	3.36	Pass
0038	Counter Clockwise	$7.0^* \delta_{0.3g}$	180	3.39	Pass
0039	Counter Clockwise	$7.5^* \delta_{0.3g}$	193	3.34	Pass
0040	Counter Clockwise	$8.0^* \delta_{0.3g}$	206	3.36	Pass
0041	Counter Clockwise	$8.5^* \delta_{0.3g}$	218	3.36	Pass
0042	Counter Clockwise	$9.0^* \delta_{0.3g}$	231	3.39	Pass
0043	Counter Clockwise	$9.5^* \delta_{0.3g}$	244	3.37	Pass
0044	Counter Clockwise	$10.0^* \delta_{0.3g}$	257	3.39	Pass
0045	Counter Clockwise	$10.5^* \delta_{0.3g}$	270	3.35	Pass
0053	Clockwise	$5.0^* \delta_{0.3g}$	129	3.02	Pass
0054	Clockwise	$5.5^* \delta_{0.3g}$	141	3.04	Pass
0055	Clockwise	$6.0^* \delta_{0.3g}$	154	3.15	Pass
0056	Clockwise	$6.5^* \delta_{0.3g}$	167	3.13	Pass
0057	Clockwise	$7.0^* \delta_{0.3g}$	180	3.25	Pass
0058	Clockwise	$7.5^* \delta_{0.3g}$	193	3.24	Pass
0059	Clockwise	$8.0^* \delta_{0.3g}$	206	3.22	Pass
0060	Clockwise	$8.5^* \delta_{0.3g}$	218	3.30	Pass
0061	Clockwise	$9.0^* \delta_{0.3g}$	231	3.27	Pass
0062	Clockwise	$9.5^* \delta_{0.3g}$	244	3.19	Pass
0063	Clockwise	$10.0^* \delta_{0.3g}$	257	3.20	Pass
0064	Clockwise	$10.5^* \delta_{0.3g}$	270	3.17	Pass

1. Lateral displacement should be ≥ 1.83 m (6 ft) for vehicles with a GVWR of 3,500 kg (7,716 lb) or less; and ≥ 1.52 m (5ft) for vehicles with a GVWR greater than 3,500 kg (7,716 lb).

DATA INDICATES COMPLIANCE:

PASS/FAIL PASS

REMARKS:

RECORDED BY: Alan Ida
APPROVED BY: Ken Webster

DATE: 4-14-11
DATE: 4-19-11

3.0 TEST DATA....continued

**DATA SHEET 9 (Sheet 1 of 2)
MALFUNCTION WARNING TEST**

VEHICLE MAKE/MODEL/BODY STYLE: Chevrolet / Cruze / Passenger Car

VEHICLE NHTSA No.: CB0106 TEST DATE: 4-18-11

METHOD OF MALFUNCTION SIMULATION:

Describe method of malfunction simulation: Disconnect the Right Front wheel speed sensor connector.

MALFUNCTION TELLTALE ILLUMINATION:

Telltale illuminates and remains illuminated after ignition locking system is activated and if necessary the vehicle is driven at least 2 minutes.

Yes No

Time for telltale to illuminate after ignition system is activated.

0 Seconds (must be within 2 minutes) Pass Fail

ESC SYSTEM RESTORATION:

Telltale extinguishes after ignition locking system is activated and if necessary the vehicle is driven at least 2 minutes.

Yes No

Time for telltale to extinguish after ignition system is activated and vehicle speed of 48 ± 8 km/h (30 ± 5 mph) is reached.

0 Second (must be within 2 minutes) Pass Fail

DATA INDICATES COMPLIANCE:

PASS/FAIL PASS

REMARKS:

The vehicle did not require driving to illuminate or extinguish the malfunction telltales. When the wheel speed sensor was disconnected, the ESC and ABS malfunction telltales illuminated. The DIC displayed the following messages: "Service Stabilitrak" and "Service Traction Control." After the wheel speed sensor connector was restored, both the ESC and ABS malfunction telltales had extinguished. The DIC did not display any messages.

RECORDED BY: Alan Ida

DATE: 4-18-11

APPROVED BY: Ken Webster

DATE: 4-19-11

3.0 TEST DATA....continued

**DATA SHEET 9 (Sheet 2 of 2)
MALFUNCTION WARNING TEST**

VEHICLE MAKE/MODEL/BODY STYLE: Chevrolet / Cruze / Passenger Car

VEHICLE NHTSA No.: CB0106 TEST DATE: 4-18-11

METHOD OF MALFUNCTION SIMULATION:

Describe method of malfunction simulation: Remove the ABS Valve fuse (underhood fuse #30, 15-amp).

MALFUNCTION TELLTALE ILLUMINATION:

Telltale illuminates and remains illuminated after ignition locking system is activated and if necessary the vehicle is driven at least 2 minutes.

Yes No

Time for telltale to illuminate after ignition system is activated.

0 Seconds (must be within 2 minutes) Pass Fail

ESC SYSTEM RESTORATION:

Telltale extinguishes after ignition locking system is activated and if necessary the vehicle is driven at least 2 minutes.

Yes No

Time for telltale to extinguish after ignition system is activated.

0 Second (must be within 2 minutes) Pass Fail

DATA INDICATES COMPLIANCE:

PASS/FAIL PASS

REMARKS:

The vehicle did not require driving to illuminate or extinguish the malfunction telltales. When the ABS Valve fuse was removed, the ESC, ABS, and Brake malfunction telltales illuminated. After the ABS Valve fuse was restored, the ESC, ABS, and Brake malfunction telltales had extinguished.

RECORDED BY: Alan Ida

DATE: 4-18-11

APPROVED BY: Ken Webster

DATE: 4-19-11

4.0 TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

Type	Output	Range	Resolution	Accuracy	Specifics	Serial Number	Calibration
Tire Pressure Gauge	Vehicle Tire Pressure	0-60psi	0.5 psi	±0.5% of applied pressure	Moroso Model: 89562 0-60psi	<u>N/A</u>	By: <u>TRC</u> Date: <u>3-29-11</u> Due: <u>6-27-11</u>
Platform Scales	Vehicle Total, Wheel, and Axle Load	0-2500 lb per each of four pads	0.5 lb	±1.0% of applied load	Mettler Toledo Model: JXGA1000	<u>5225831-5JC</u>	By: <u>Mettler Toledo</u> Date: <u>2-14-11</u> Due: <u>5-14-11</u>
Automated Steering Machine with Steering Angle Encoder	Handwheel Angle	±800 deg	0.25 deg	±0.25 deg	Heitz Automotive Testing Model: Sprint 3	<u>60303</u>	By: <u>ATI-Heitz</u> Date: <u>2-18-11</u> Due: <u>2-18-12</u>
Multi-Axis Inertial Sensing System	Longitudinal, Lateral, and Vertical Acceleration Roll, Yaw, and Pitch Rate	Accelerometers: ±2 g Angular Rate Sensors: ±100 deg/s	Accelerometers: ≤10 ug Angular Rate Sensors: ≤0.004 deg/s	Accelerometers: ≤0.05% of full range Angular Rate Sensors: 0.05% of full range	BEI Technologies Model: MotionPAK MP-1	<u>0768</u>	By: <u>BEI Tech.</u> Date: <u>1-10-11</u> Due: <u>1-10-12</u>
Radar Speed Sensor and Dashboard Display	Vehicle Speed	0-125 mph	0.009 mph	±0.25% of full scale	A-DAT Corp. Radar Model: DRS-6 Display Model: RD-2	<u>1400603</u>	By: <u>B+S Multidata</u> Date: <u>2-14-11</u> Due: <u>2-14-12</u>
Ultrasonic Distance Measuring System	Left and Right Side Vehicle Height	5-24 inches	0.01 inches	±0.25% of maximum distance	Massa Products Corporation Model: M-5000/220	<u>104619 & 104613</u>	By: <u>Consumers Energy Laboratory Services</u> Date: <u>1-20-11</u> Due: <u>1-20-12</u>
Data Acquisition System [Amplify, Anti-Alias, and Digitize]	Record Time; Velocity; Distance; Lateral, Longitudinal, and Vertical Accelerations; Roll, Yaw, and Pitch Rates; Steering Wheel Angle.	Sufficient to meet or exceed individual sensors	200 Hz	Sufficient to meet or exceed individual sensors	Dewetron Sidehand DAS Model: DA-121-16 Digitizer Model: Dewe-Orion-1616-100 Amplifier/AntiAliasing: MDAQ-FILT-10-S	<u>120601105</u>	By: <u>Dewetron</u> Date: <u>12-02-10</u> Due: <u>12-02-11</u>
Load Cell	Vehicle Brake Pedal Force	0-300 lb	1 lb	±0.05% of full scale	DATRON Model: DTM-LPA	<u>4970-1103</u>	By: <u>TRC</u> Date: <u>per test</u> Due: <u>per test</u>
Coordinate Measurement Machine	Inertial Sensing System Location	0-10 feet	0.001 inch	±0.003% of full scale	FARO International Model: Faro Arm N10	<u>U12-05-08-07108</u>	By: <u>FARO</u> Date: <u>7-30-10</u> Due: <u>7-30-11</u>
Outriggers	No output. Safety Item.	N/A	N/A	N/A	NHTSA Titanium Outriggers Model: Docket 2007-27662-11	N/A	N/A

5.0 PHOTOGRAPHS

- 5.1 ¾ FRONT VIEW FROM LEFT SIDE OF VEHICLE
- 5.2 ¾ REAR VIEW FROM RIGHT SIDE OF VEHICLE
- 5.3 VEHICLE CERTIFICATION LABEL
- 5.4 TIRE AND LOADING INFORMATION LABEL
- 5.5 WINDOW STICKER (MONRONEY LABEL)
- 5.6 ESC MALFUNCTION TELLTALE
- 5.7 ESC OFF TELLTALE
- 5.8 ESC OFF CONTROL
- 5.9 ¾ FRONT VIEW - TEST VEHICLE INSTRUMENTED
- 5.10 ¾ REAR VIEW – TEST VEHICLE INSTRUMENTED
- 5.11 STEERING WHEEL CONTROLLER AND DATA ACQUISITION SYSTEM
- 5.12 STEERING CONTROLLER BATTERY BOX
- 5.13 INERTIA MEASUREMENT UNIT
- 5.14 VEHICLE SPEED SENSOR
- 5.15 BODY ROLL SENSOR (DRIVER SIDE)
- 5.16 BODY ROLL SENSOR (PASSENGER SIDE)
- 5.17 BRAKE PEDAL FORCE TRANSDUCER



29

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

5.1 ¾ FRONT VIEW FROM LEFT SIDE OF VEHICLE



30

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

5.2 ¾ REAR VIEW FROM RIGHT SIDE OF VEHICLE



MFD BY GENERAL MOTORS LLC

DATE	GVWR	GAWR FRT	GAWR RR
02/11	1861 KG	965 KG	896 KG
	4102 LB	2127 LB	1975 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.

31

1G1PF5S98B7210290

TYPE: PASS CAR

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

5.3 VEHICLE CERTIFICATION LABEL



TIRE AND LOADING INFORMATION

SEATING CAPACITY : TOTAL 5 : FRONT 2 : REAR 3

The combined weight of occupants and cargo should never exceed 408 kg or 899 lbs.

TIRE	ORIGINAL SIZE		COLD TIRE PRESSURE
FRONT	P215/60R16	S	240 kPa, 35 PSI
REAR	P215/60R16	S	240 kPa, 35 PSI
SPARE	T115/70R16	M	420 kPa, 60 PSI

**SEE OWNER'S
MANUAL FOR
ADDITIONAL
INFORMATION**

1G1PF5S98B7210290

32

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

5.4 TIRE AND LOADING INFORMATION LABEL



2011 CRUZE 1LT

EXTERIOR: IMPERIAL BLUE METALLIC
 INTERIOR: JET BLACK

ENGINE: 1.4L ECOTEC VVT DOHC
 TRANSMISSION: 6 SPD AUTOMATIC

Visit us at www.chevy.com

STANDARD EQUIPMENT

ITEMS FEATURED BELOW ARE INCLUDED AT NO EXTRA CHARGE IN THE STANDARD VEHICLE PRICE SHOWN

- 5 YEAR/100,000 MILE POWERTRAIN LIMITED WARRANTY SEE DEALER FOR DETAILS

MECHANICAL

- TIRE SEALANT & INFLATOR KIT IN PLACE OF SPARE TIRE
- OIL LIFE MONITOR SYSTEM
- ENGINE, 1.4L ECOTEC VVT DOHC 4 CYL TURBO
- TRANSMISSION, 6 SPD AUTOMATIC

SAFETY AND SECURITY

- AIRBAGS, DRIVER & FRONT PASSENGER FRONTAL, KNEE, SIDE IMPACT & HEAD CURTAIN; REAR OUTBOARD PASSENGERS SIDE IMPACT & HEAD CURTAIN
- STABILITRAK-STABILITY CONTROL SYSTEM W/ TRACTION CONTROL
- 4 WHEEL ANTILOCK BRAKES,

- FRONT DISC/REAR DRUM
- POWER OPERATED REAR DR LOCKS, CHILD SECURITY
- REAR CHILD SEAT LATCH ANCHORS
- THEFT DETERRENT SYSTEM, CONTENT THEFT ALARM
- DAYTIME RUNNING LAMPS
- REMOTE KEYLESS ENTRY
- 6 MTHS ONSTAR DIRECTIONS AND CONNECTIONS WITH AUTOMATIC CRASH RESPONSE & TURN-BY-TURN NAVIGATION (ASK DEALER ABOUT GEOGRAPHIC COVERAGE)
- TIRE PRESSURE MONITOR

EXTERIOR

- WHEELS, 16" STEEL
- OUTSIDE MIRRORS, POWER ADJUSTABLE
- GLASS, SOLAR RAY LIGHT TINTED
- WINDSHIELD WIPERS VARIABLE & INTERMITTENT
- REAR WINDOW ELECTRIC DEFOGGER

INTERIOR

- AM/FM STEREO, CD PLAYER
- FLOOR MATS
- MANUAL SEAT ADJUSTER, DRIVER 8 WAY
- MANUAL SEAT ADJUSTER, PASSENGER 8 WAY
- ACOUSTIC INSULATION PKG
- AIR CONDITIONING
- VISORS, DRIVER/ FRT PASSENGER W/ VANITY MIRRORS
- AUXILIARY AUDIO INPUT JACK
- DRIVER INFO CENTER, PERSONALIZATION, WARNING, MESSAGES AND VEHICLE INFO
- REAR SEAT, 60/40 SPLIT FOLDING SEATBACK
- STEERING COLUMN, TILT & TELESCOPING
- REAR SEAT CENTER ARMREST WITH CUPHOLDERS
- POWER DOOR LOCKS WITH LOCKOUT PROTECTION

- SEAT TRIM, DELUXE CLOTH
- POWER WINDOWS EXPRESS DOWN, DRIVER EXPRESS UP
- XM RADIO - SERVICE SUBSCRIPTION SOLD SEPARATELY BY SIRIUS/XM AFTER 3 MTHS
- AUDIO SYSTEM, 6 SPEAKER

OPTIONS & PRICING

MANUFACTURER'S SUGGESTED RETAIL PRICE

STANDARD VEHICLE PRICE \$18,175.00

OPTIONS INSTALLED BY THE MANUFACTURER (MAY REPLACE STANDARD EQUIPMENT SHOWN)

- CONNECTIVITY PLUS CRUISE PKG: 525.00
- CRUISE CONTROL
- USB AUDIO INTERFACE
- LEATHER WRAP STEERING WHEEL
- BLUETOOTH FOR PHONE
- LEATHER TRIMMED SHIFT LEVER
- STEERING WHEEL CONTROLS

- 1LT DRIVER CONVENIENCE PACKAGE: 685.00
- PWR SEAT ADJ DRIVER 6 WAY
- REMOTE VEHICLE START
- REAR PARKING ASSIST

- RS PACKAGE: 695.00
- ROCKER MOLDINGS AND UNIQUE FRONT AND REAR FASCIAS
- UPLEVEL INSTRUMENT CLUSTER
- FRONT FOG LAMPS
- REAR SPOILER

- 16" ALLOY WHEELS 395.00
- COMPACT SPARE TIRE (REPLACES TIRE SEALANT AND INFLATOR KIT) 100.00

TOTAL OPTIONS \$2,400.00
 TOTAL VEHICLE & OPTIONS \$20,575.00
 DESTINATION CHARGE 720.00

TOTAL VEHICLE PRICE* \$21,295.00

EPA Fuel Economy Estimates

33

CITY MPG

24

Expected range for most drivers
19 to 29 MPG

Estimated Annual Fuel Cost
\$1,606

based on 15,000 miles at \$3.00 per gallon

Combined Fuel Economy

This Vehicle
28

14 41

All COMPACT CARS

HIGHWAY MPG

36

Expected range for most drivers
29 to 43 MPG

Your actual mileage will vary depending on how you drive and maintain your vehicle.

AHV

GOVERNMENT SAFETY RATINGS

Frontal Crash Driver ★★★★★
 Passenger ★★★★★

Star ratings based on the risk of injury in a frontal impact. Frontal ratings should ONLY be compared to other vehicles of similar size and weight.

Side Crash Front seat ★★★★★
 Rear seat ★★★★★

Star ratings based on the risk of injury in a side impact.

Rollover ★★★★★

Star ratings based on the risk of rollover in a single vehicle crash.

Star rating range from 1 to 5 stars (★★★★★), with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA).

www.safercar.gov or 1-888-327-4236

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 45%
MAJOR SOURCES OF FOREIGN PARTS CONTENT: MEXICO 15% AUSTRIA 19%

NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.

FOR THIS VEHICLE:
FINAL ASSEMBLY POINT: LORDSTOWN, OH U.S.A.
COUNTRY OF ORIGIN: ENGINE: AUSTRIA TRANSMISSION: UNITED STATES

This label has been applied pursuant to Federal law - Do not remove prior to delivery to the ultimate purchaser. *Includes Manufacturer's Recommended Pre-Delivery Service. Does not include dealer installed options and accessories not listed above, local taxes or license fees.

© 2009 General Motors LLC GMLBL_PRC02_0020_01/23/2011

ORDER NO PK9KHCV SALES CODE E
 SALES MODEL CODE 1PX69
 DEALER NO 44300
 FINAL ASSEMBLY: LORDSTOWN, OH U.S.A.

VIN 1G1PF5S98B7210290

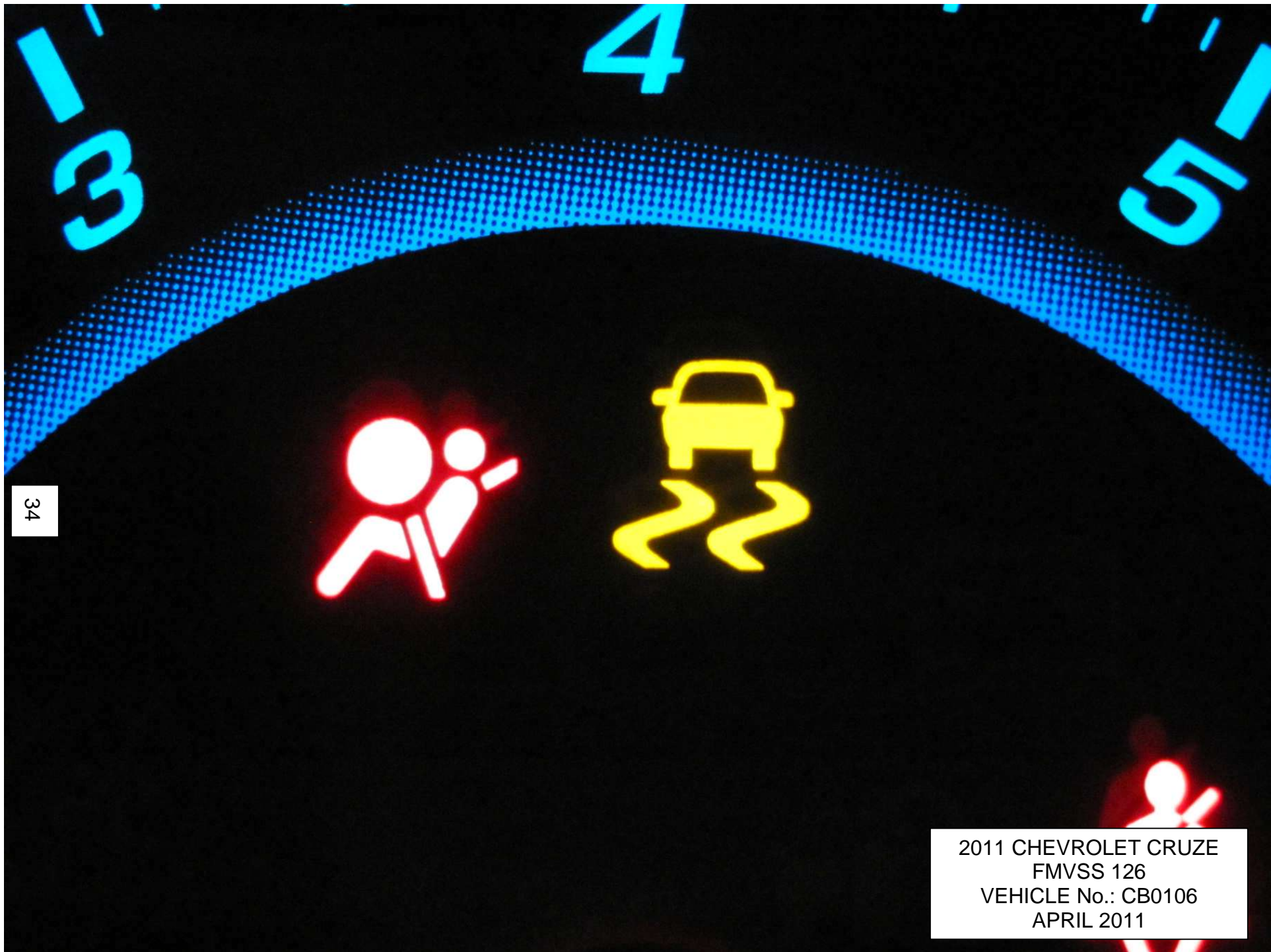
DEALER TO WHOM DELIVERED
 MATTHEWS-HARGREAVES CHEVROLET COMPANY
 PO BOX 278
 ROYAL OAK, MI 48068-0278



UU
 1GA1312958

2011 CHEVROLET CRUZE
 FMVSS 126
 VEHICLE No.: CB0106
 APRIL 2011

5.5 WINDOW STICKER - MONRONEY LABEL



34

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

5.6 ESC MALFUNCTION TELLTALE

35



2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

5.7 ESC OFF TELLTALE



2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

5.8 ESC OFF CONTROL



37

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

5.9 3/4 FRONT VIEW - TEST VEHICLE INSTRUMENTED



38

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

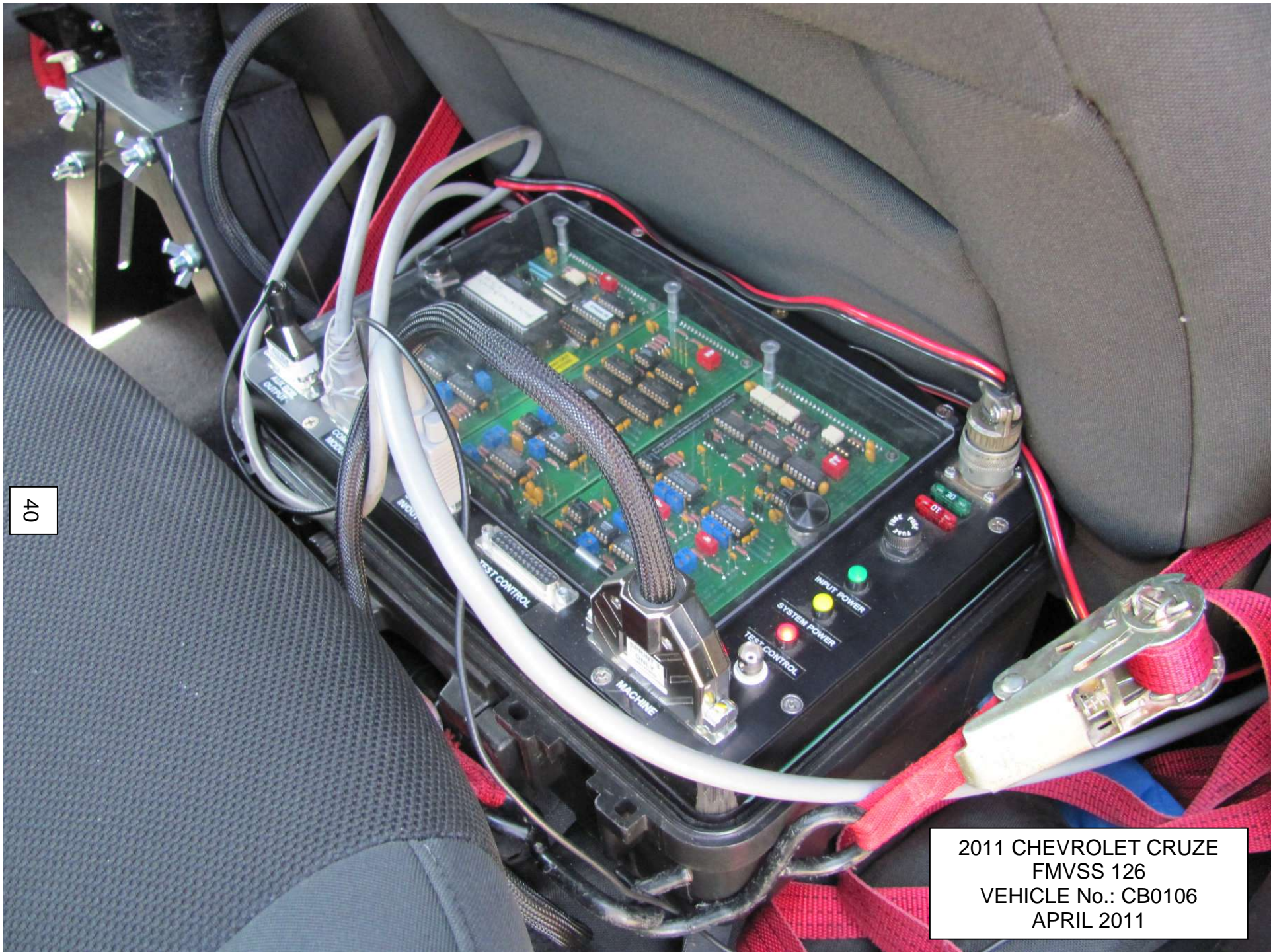
5.10 ¾ REAR VIEW - TEST VEHICLE INSTRUMENTED



39

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

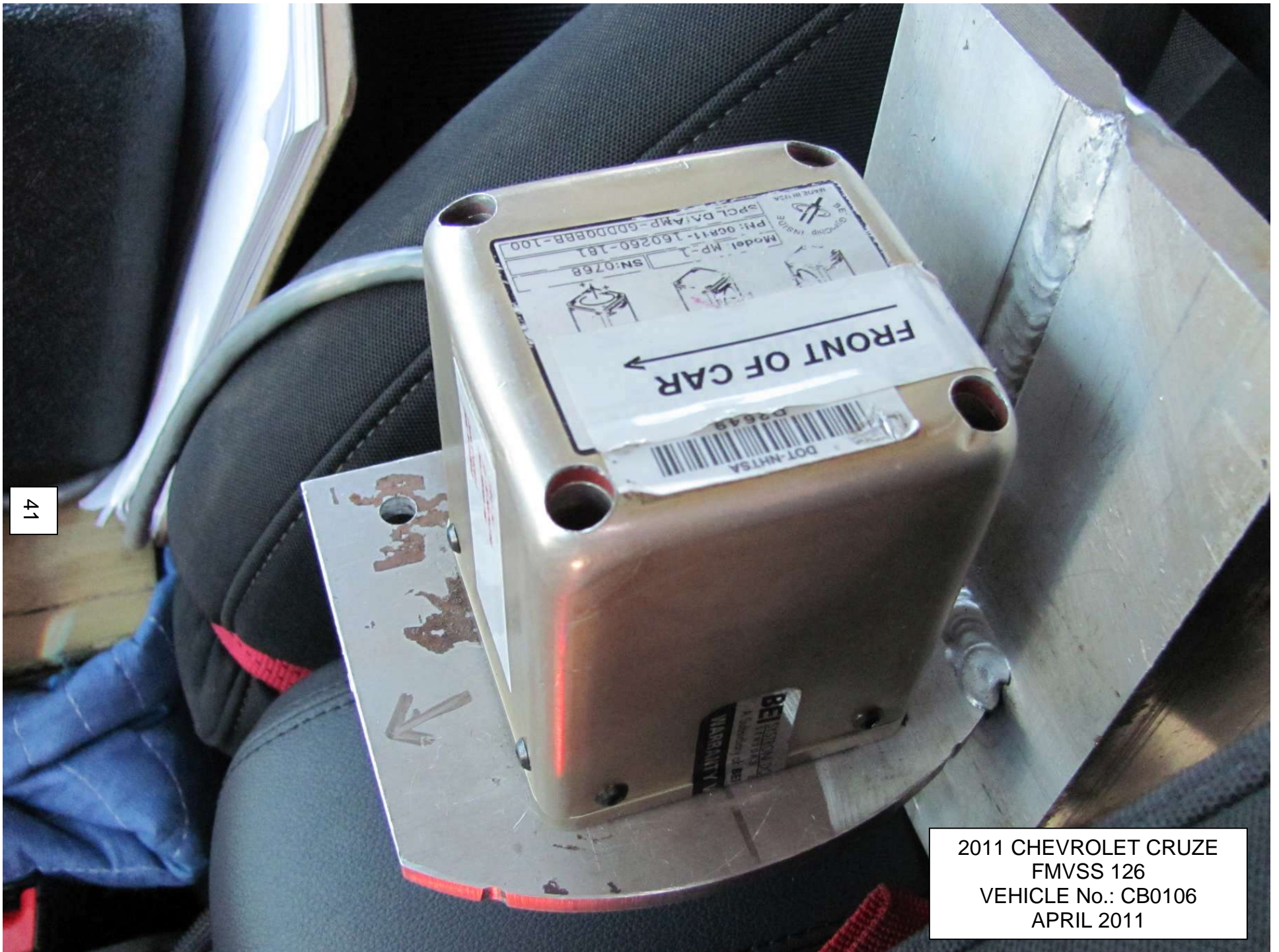
5.11 STEERING WHEEL CONTROLLER AND DATA ACQUISITION SYSTEM



40

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

5.12 STEERING CONTROLLER BATTERY BOX



41

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

5.13 INERTIA MEASUREMENT UNIT



42

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

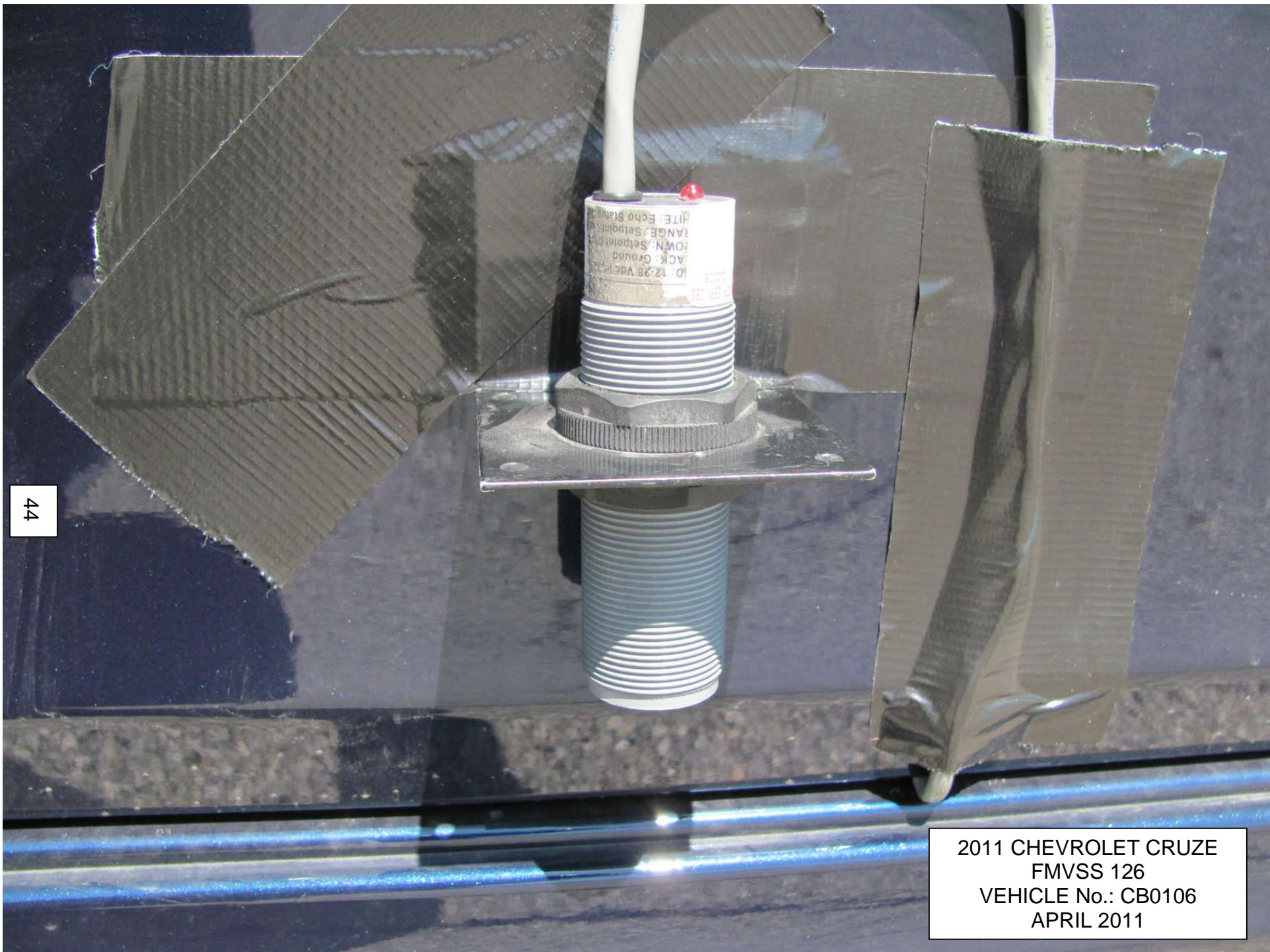
5.14 VEHICLE SPEED SENSOR



43

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

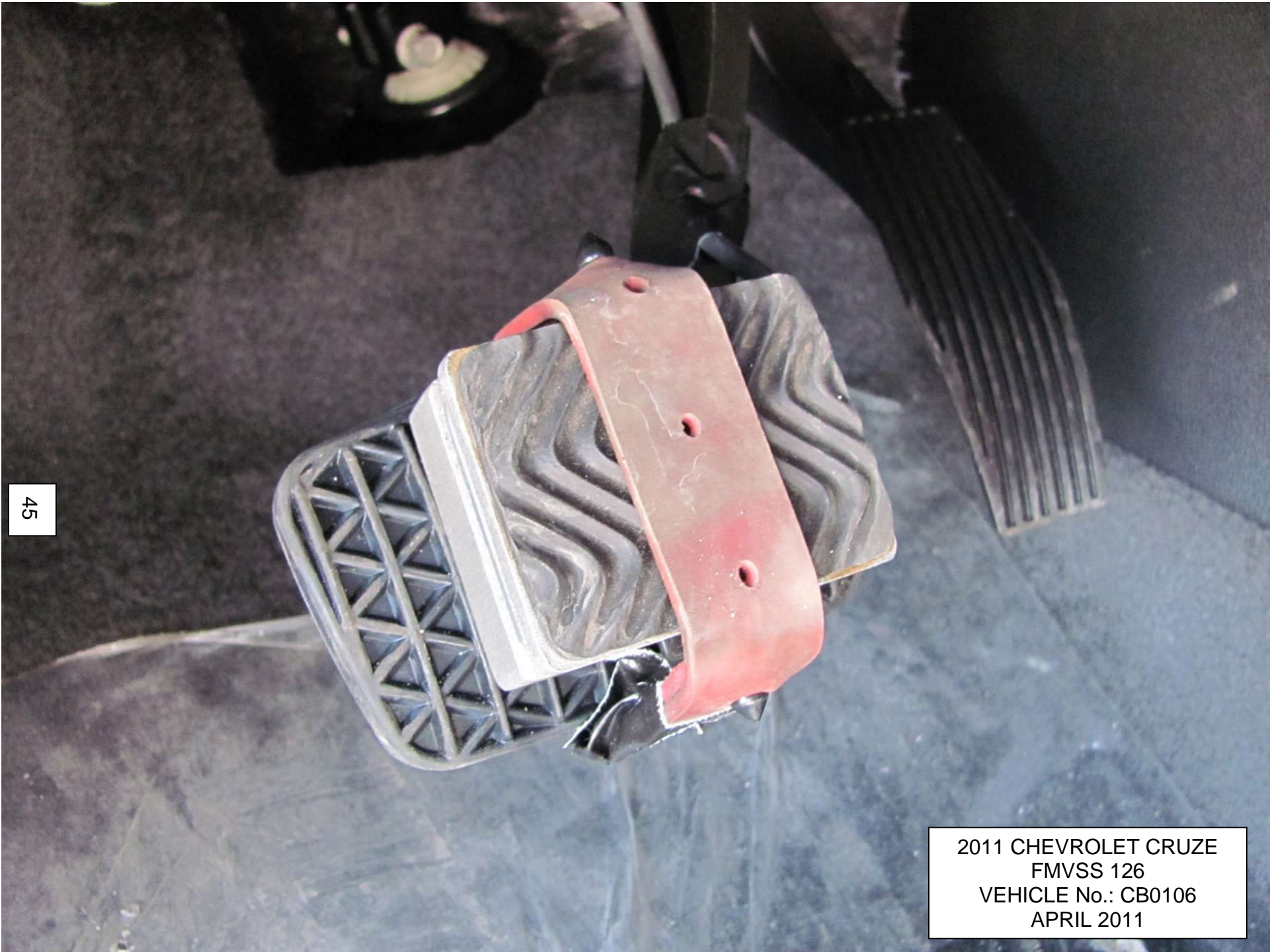
5.15 BODY ROLL SENSOR (DRIVER SIDE)



44

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

5.16 BODY ROLL SENSOR (PASSENGER SIDE)



45

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

5.17 BRAKE PEDAL FORCE TRANSDUCER

6.0 DATA PLOTS

Figure 1. Steering Angle and Yaw Rate Time History, Counter-Clockwise Initial Steer Tests

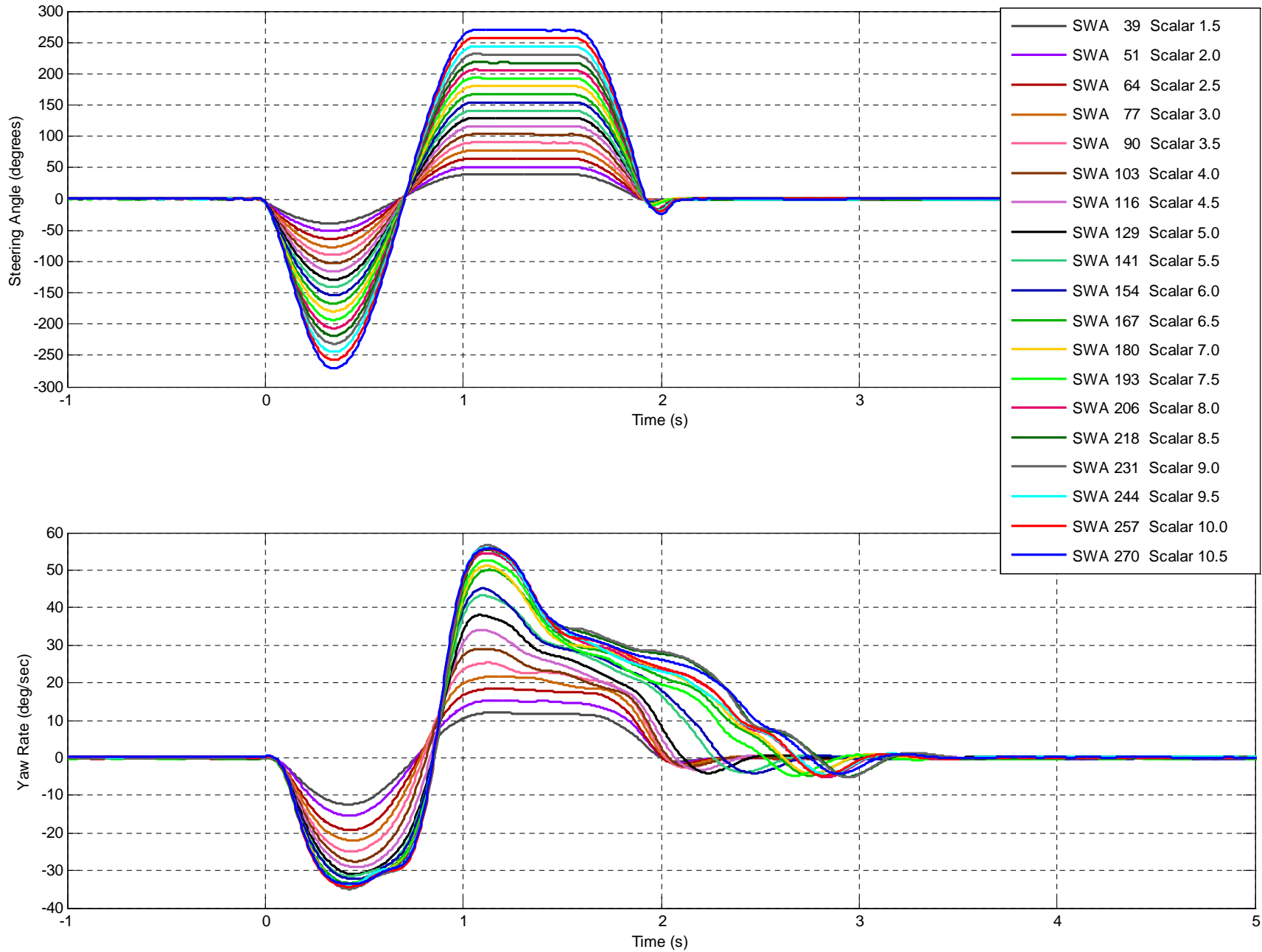
Figure 2. Steering Angle, Lateral Acceleration, and Lateral Displacement Time History, Counter-Clockwise Initial Steer Tests

Figure 3. Steering Angle and Yaw Rate Time History, Clockwise Initial Steer Tests

Figure 4. Steering Angle, Lateral Acceleration, and Lateral Displacement Time History, Clockwise Initial Steer Tests

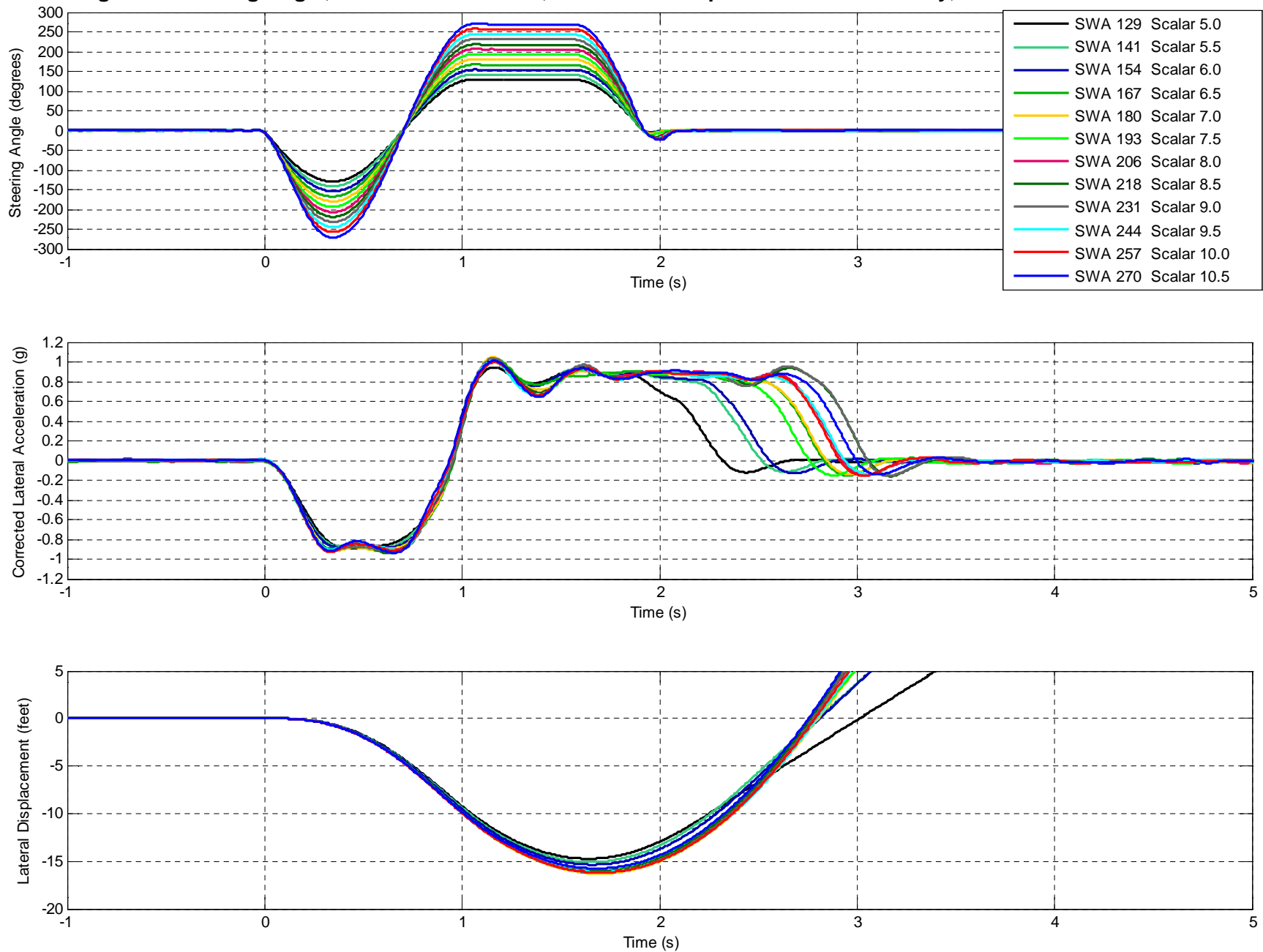
6.0 2011 CHEVROLET CRUZE DATA PLOTS

Figure 1. Steering Angle and Yaw Rate Time History, Counter-Clockwise Initial Steer Tests



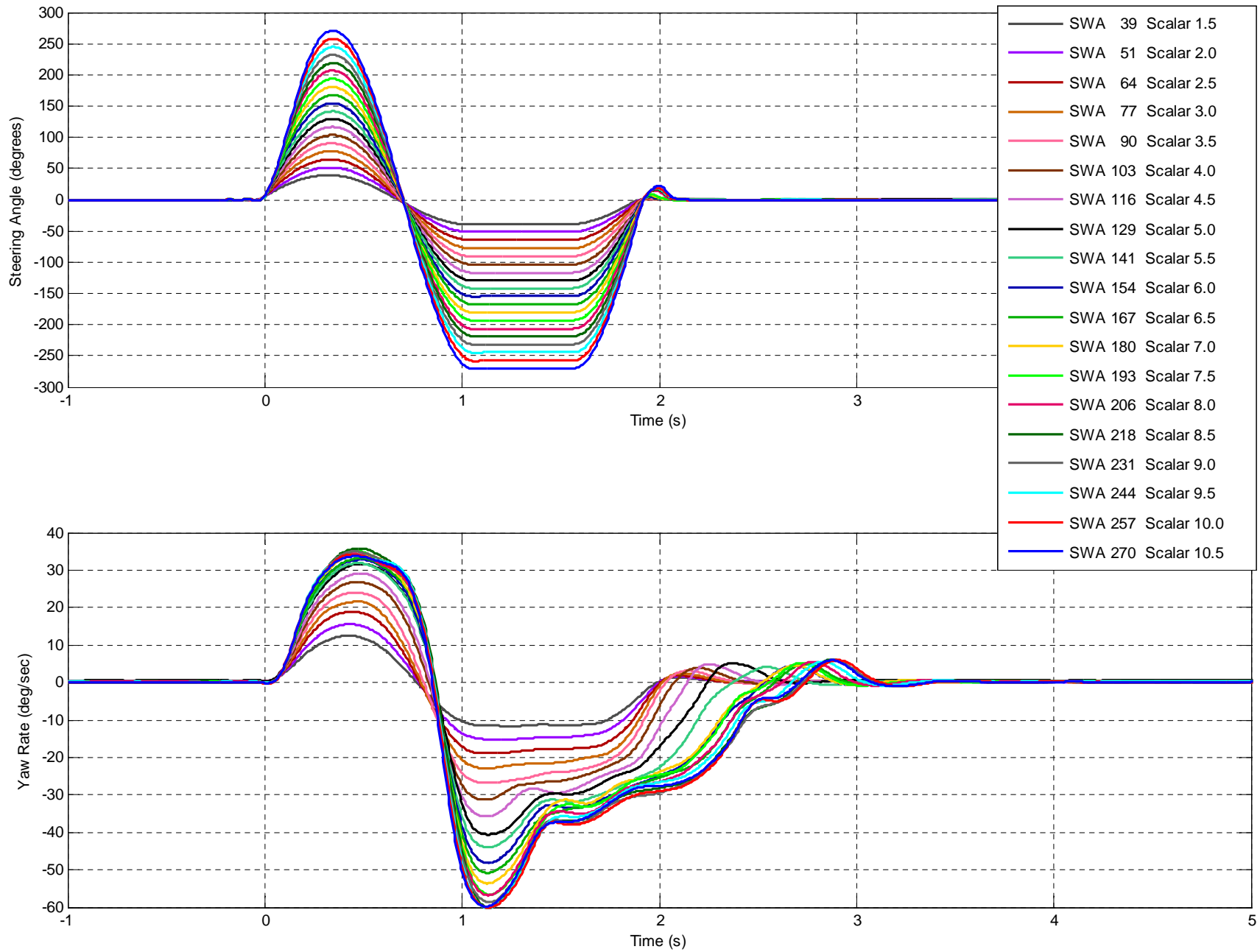
6.0 2011 CHEVROLET CRUZE DATA PLOTS...continued

Figure 2. Steering Angle, Lateral Acceleration, and Lateral Displacement Time History, Counter-Clockwise Initial Steer Tests



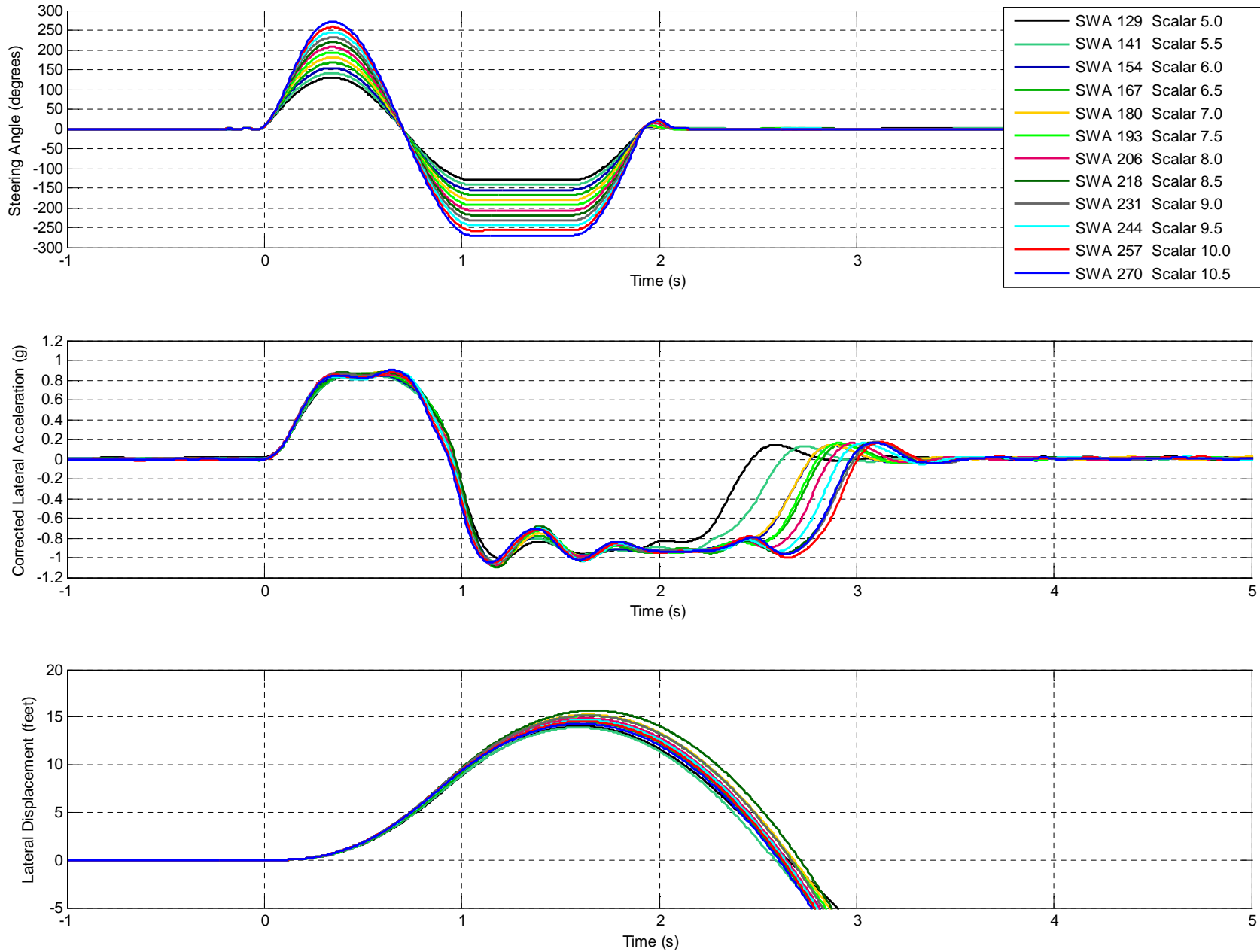
6.0 2011 CHEVROLET CRUZE DATA PLOTS...continued

Figure 3. Steering Angle and Yaw Rate Time History, Clockwise Initial Steer Tests



6.0 2011 CHEVROLET CRUZE DATA PLOTS...continued

Figure 4. Steering Angle, Lateral Acceleration, and Lateral Displacement Time History, Clockwise Initial Steer Tests



7.0 OTHER DOCUMENTATION

- 7.1 OWNER'S MANUAL PAGES
- 7.2 VEHICLE ARRIVAL CONDITION REPORT
- 7.3 VEHICLE COMPLETION CONDITION REPORT
- 7.4 SINE WITH DWELL TEST RESULTS
- 7.5 SLOWLY INCREASING STEER TEST RESULTS
- 7.6 INERTIAL SENSING SYSTEM LOCATION COORDINATES

7.1 OWNER'S MANUAL PAGES

In Brief

Instrument Panel

Instrument Panel Overview 1-2

Initial Drive Information

Initial Drive Information 1-4

Remote Keyless Entry (RKE)
System 1-4

Remote Vehicle Start 1-5

Door Locks 1-6

Seat Adjustment 1-6

Heated Seats 1-8

Head Restraint Adjustment 1-9

Safety Belts 1-9

Sensing System for Passenger
Airbag 1-9

Mirror Adjustment 1-10

Steering Wheel
Adjustment 1-11

Interior Lighting 1-11

Exterior Lighting 1-12

Windshield Wiper/Washer 1-13

Climate Controls 1-13

Transmission 1-14

Vehicle Features

Radio(s) 1-15

Satellite Radio 1-16

Portable Audio Devices 1-16

Bluetooth® 1-16

Steering Wheel Controls 1-17

Cruise Control 1-17

Navigation System 1-18

Driver Information
Center (DIC) 1-18

Power Outlets 1-18

Performance and Maintenance

Traction Control
System (TCS) 1-19

StabiliTrak® System 1-19

Tire Pressure Monitor 1-19

Tire Sealant and
Compressor Kit 1-20

Engine Oil Life System 1-20

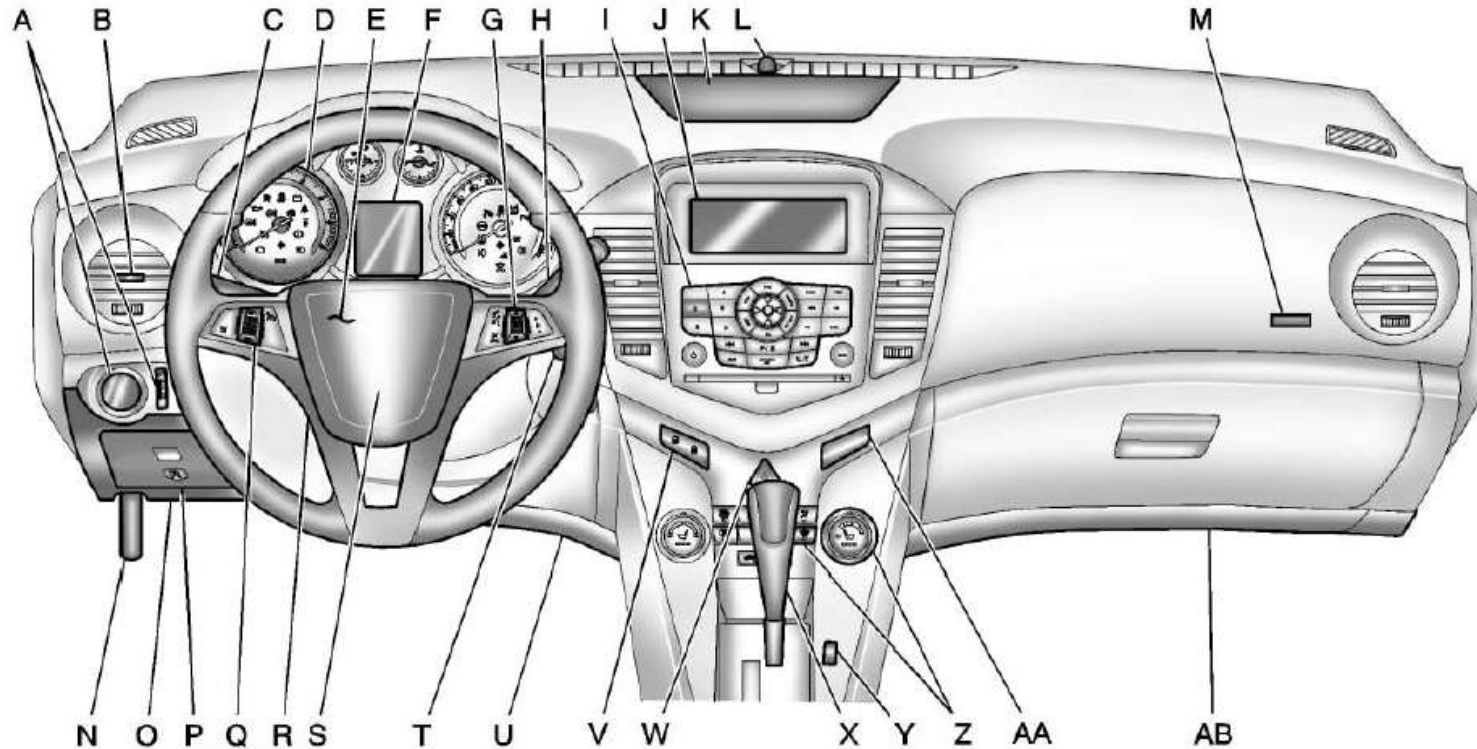
Driving for Better Fuel
Economy 1-21

Roadside Assistance
Program 1-21

OnStar® 1-22

Instrument Panel

Instrument Panel Overview



54

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

- A. *Exterior Lamp Controls on page 6-1.*
Front Fog Lamps on page 6-4 (If Equipped).
Instrument Panel Illumination Control on page 6-5.
- B. *Air Vents on page 8-6.*
- C. *Headlamp High/Low-Beam Changer on page 6-2.*
Turn and Lane-Change Lever. See Turn and Lane-Change Signals on page 6-4.
Driver Information Center (DIC) Buttons. See Driver Information Center (DIC) on page 5-23.
- D. *Instrument Cluster on page 5-8.*
- E. *Horn on page 5-3.*
- F. *Driver Information Center (DIC) on page 5-23.*
- G. *Steering Wheel Controls on page 5-2.*
- H. *Windshield Wiper/Washer on page 5-3.*
- I. *Infotainment on page 7-1.*
Satellite Radio on page 7-13 (If Equipped).
- J. *Infotainment Display Screen.*
- K. *Instrument Panel Storage on page 4-1.*
- L. *Light Sensor. See Automatic Headlamp System on page 6-3.*
- M. *Passenger Airbag. See Where Are the Airbags? on page 3-28.*
- N. *Hood Release. See Hood on page 10-4.*
- O. *Data Link Connector (DLC) (Out of View). See Malfunction Indicator Lamp on page 5-13.*
- P. *Instrument Panel Fuse Block on page 10-38.*
- Q. *Cruise Control on page 9-35.*
- R. *Steering Wheel Adjustment on page 5-2.*
- S. *Driver Airbag. See Where Are the Airbags? on page 3-28.*
- T. *Ignition Switch. See Ignition Positions on page 9-16.*
- U. *Driver Knee Airbag. See Where Are the Airbags? on page 3-28.*
- V. *Power Door Locks on page 2-7.*
- W. *Hazard Warning Flashers on page 6-4.*
- X. *Shift Lever. See Automatic Transmission on page 9-25 or Manual Transmission on page 9-28.*

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

- Y. *Traction Control System (TCS) on page 9-32.*
StabiliTrak® System on page 9-33.
- Z. *Climate Control Systems on page 8-1 (If Equipped).*
Automatic Climate Control System on page 8-3 (If Equipped).
Heated Front Seats on page 3-7 (If Equipped).
- AA. *Passenger Airbag Status Indicator on page 5-12.*
- AB. *Passenger Knee Airbag. See Where Are the Airbags? on page 3-28.*

Initial Drive Information

This section provides a brief overview about some of the important features that may or may not be on your specific vehicle.

For more detailed information, refer to each of the features which can be found later in this owner manual.


Remote Keyless Entry (RKE) System


The Remote Keyless Entry (RKE) transmitter will work up to 20 m (65 ft) away from the vehicle.



RKE Transmitter with Remote Start Shown

Press the key release button to extend the key blade. The key can be used for the ignition and all locks.

Press  to unlock the driver door or all doors.

Press  to lock all doors.




Lock and unlock feedback can be personalized. See *Vehicle Personalization on page 5-33.*

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

Performance and Maintenance

Traction Control System (TCS)





The traction control system limits wheel spin. The system is on when the vehicle is started.

- To turn off traction control, press and release  located on the console.  illuminates and the appropriate DIC message displays. See *Vehicle Messages (Canada Base Level)* on page 5-26 or *Vehicle Messages (Canada Uplevel and United States)* on page 5-27.
- Press and release  again to turn traction control back on.

For more information, see *Traction Control System (TCS)* on page 9-32.

StabiliTrak[®] System

The StabiliTrak system assists with directional control of the vehicle in difficult driving conditions. The system is on when the vehicle is started.

- To turn off both Traction Control and StabiliTrak, press and hold  until  and  illuminate and the appropriate DIC message displays. See *Vehicle Messages (Canada Base Level)* on page 5-26 or *Vehicle Messages (Canada Uplevel and United States)* on page 5-27.
- Press  again to turn on both systems.

For more information, see *StabiliTrak[®] System* on page 9-33.

Tire Pressure Monitor

This vehicle may have a Tire Pressure Monitor System (TPMS).



The TPMS warning light alerts you to a significant loss in pressure of one of the vehicle's tires. If the warning light comes on, stop as soon as possible and inflate the tires to the recommended pressure shown on the Tire and Loading Information label. See *Vehicle Load Limits* on page 9-11. The warning light will remain on until the tire pressure is corrected.

Instruments and Controls

Controls

- Steering Wheel Adjustment ... 5-2
- Steering Wheel Controls 5-2
- Horn 5-3
- Windshield Wiper/Washer 5-3
- Compass 5-4
- Clock 5-5
- Power Outlets 5-5
- Cigarette Lighter 5-6
- Ashtrays 5-7

Warning Lights, Gauges, and Indicators

- Warning Lights, Gauges, and Indicators 5-7
- Instrument Cluster 5-8
- Speedometer 5-9
- Odometer 5-9
- Trip Odometer 5-9
- Tachometer 5-9
- Fuel Gauge 5-9
- Engine Coolant Temperature Gauge 5-10
- Safety Belt Reminders 5-10

- Airbag Readiness Light 5-11
- Passenger Airbag Status Indicator 5-12
- Charging System Light 5-13
- Malfunction Indicator Lamp 5-13
- Service Vehicle Soon Light 5-16
- Brake System Warning Light 5-16
- Antilock Brake System (ABS) Warning Light 5-17
- Up-Shift Light 5-17
- Power Steering Warning Light 5-18
- Traction Off Light 5-18
- StabiliTrak[®] OFF Light 5-18
- Traction Control System (TCS)/StabiliTrak[®] Light 5-19
- Tire Pressure Light 5-19
- Engine Oil Pressure Light 5-20
- Low Fuel Warning Light 5-20
- Security Light 5-21
- Reduced Engine Power Light 5-21
- High-Beam On Light 5-21
- Daytime Running Lamps (DRL) Indicator Light 5-22
- Front Fog Lamp Light 5-22

- Lamps On Reminder 5-22
- Cruise Control Light 5-22
- Door Ajar Light 5-23

Information Displays

- Driver Information Center (DIC) 5-23

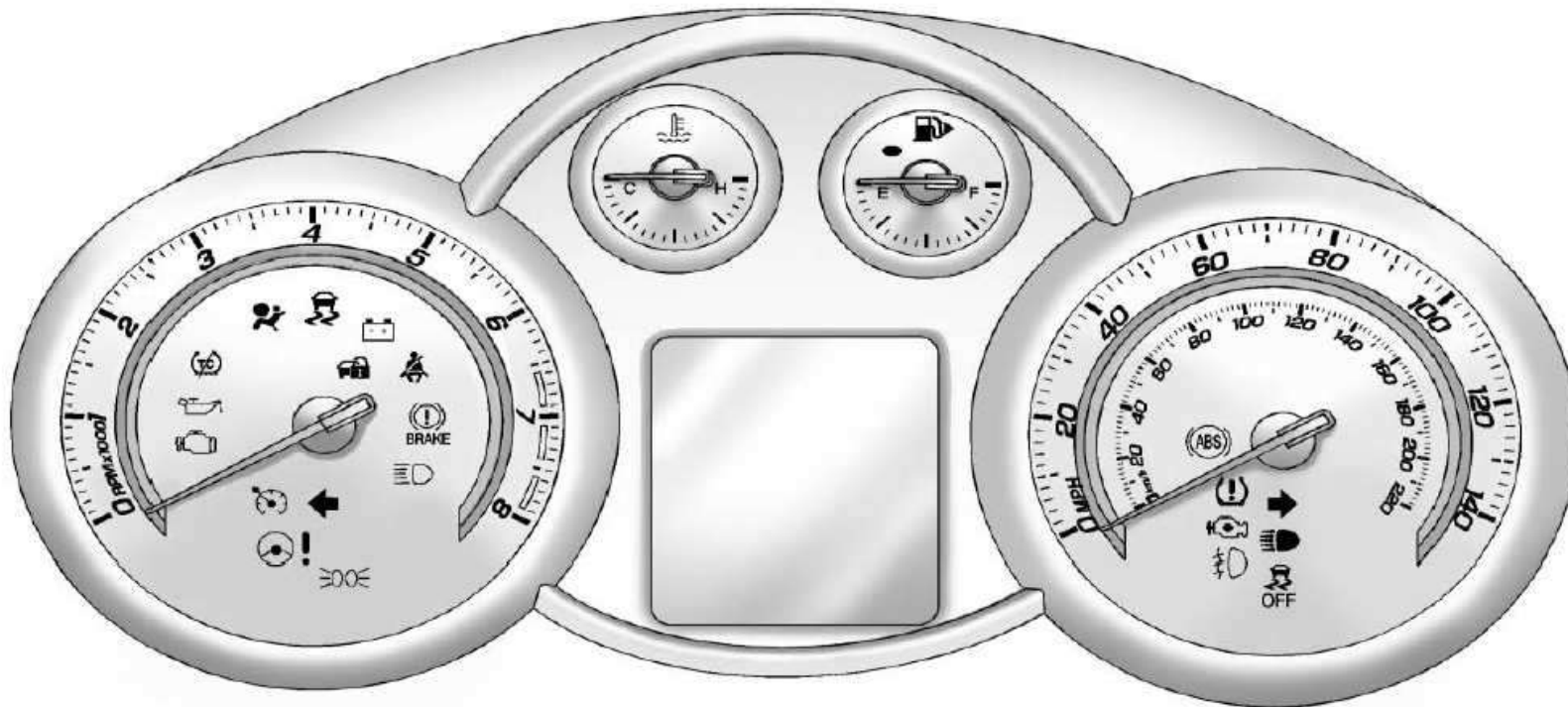
Vehicle Messages

- Vehicle Messages (Canada Base Level) 5-26
- Vehicle Messages (Canada Uplevel and United States) 5-27
- Battery Voltage and Charging Messages 5-27
- Brake System Messages 5-27
- Compass Messages 5-28
- Cruise Control Messages 5-28
- Door Ajar Messages 5-28
- Engine Cooling System Messages 5-28
- Engine Oil Messages 5-29
- Engine Power Messages 5-29
- Fuel System Messages 5-29
- Key and Lock Messages 5-29
- Lamp Messages 5-30
- Object Detection System Messages 5-30

2011 CHEVROLET CRUZE
 FMVSS 126
 VEHICLE No.: CB0106
 APRIL 2011

Instrument Cluster

59



English Automatic Transmission Cluster Shown, Metric Similar

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

Power Steering Warning Light



This light comes on briefly when the ignition is turned to ON/RUN as a check to show it is working.

If it does not come on have the vehicle serviced by your dealer.

9

If this light stays on, or comes on while driving, the system may not be working. If this happens, see your dealer for service.

Traction Off Light



This light comes on briefly while starting the engine. If it does not, have the vehicle serviced by your dealer. If the system is working normally, the indicator light then turns off.

The traction off light comes on when the Traction Control System (TCS) has been turned off by pressing and releasing the traction control button.

This light and the StabiliTrak Off light come on when StabiliTrak is turned off.

If the Traction Control System (TCS) is off, wheelspin is not limited. Adjust driving accordingly.

See *Traction Control System (TCS)* on page 9-32 and *StabiliTrak® System* on page 9-33 for more information.

StabiliTrak® OFF Light



This light comes on briefly while starting the engine. If it does not, have the vehicle serviced by your dealer.

This light comes on when the StabiliTrak system is turned off. If StabiliTrak is off, TCS is also off.

If the Traction Control System (TCS) is off, the system does not assist in controlling the vehicle. Turn on the TCS and the StabiliTrak systems and the warning light turns off.

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

See *Traction Control System (TCS)* on page 9-32 and *StabiliTrak® System* on page 9-33 for more information

Traction Control System (TCS)/StabiliTrak® Light



19

The StabiliTrak system or the Traction Control System (TCS) indicator/warning light come on briefly when the engine is started.

If the light does not come on, have the vehicle serviced by the dealer. If the system is working normally, the indicator light turns off.

If the light is on and not flashing, the TCS, and potentially the StabiliTrak system have been disabled. A DIC message may display. Check the DIC messages to determine which

feature(s) is no longer functioning and whether the vehicle requires service.

If the indicator/warning light is on and flashing, the TCS and/or the StabiliTrak system is actively working.

See *StabiliTrak® System* on page 9-33 and *Traction Control System (TCS)* on page 9-32 for more information.

Tire Pressure Light



For vehicles with the Tire Pressure Monitor System (TPMS), this light comes on briefly when the engine is started. It provides information about tire pressures and the TPMS.

When the Light is On Steady

This indicates that one or more of the tires are significantly underinflated.

A Driver Information Center (DIC) tire pressure message may also display. See *Vehicle Messages (Canada Base Level)* on page 5-26 or *Vehicle Messages (Canada Uplevel and United States)* on page 5-27 for more information. Stop as soon as possible, and inflate the tires to the pressure value shown on the Tire and Loading Information label. See *Tire Pressure* on page 10-47 for more information.

When the Light Flashes First and Then is On Steady

This indicates that there may be a problem with the Tire Pressure Monitor System. The light flashes for about a minute and stays on steady for the remainder of the ignition cycle. This sequence repeats with every ignition cycle.

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

Lamp Messages

AUTOMATIC LIGHT CONTROL ON

This message is displayed when the automatic light control has been turned on. See *Automatic Headlamp System on page 6-3*.

AUTOMATIC LIGHT CONTROL OFF

This message is displayed when the automatic light control has been turned off. See *Automatic Headlamp System on page 6-3*.

2

XXX TURN INDICATOR FAILURE

When one of the turn signals is out, this message displays to show which bulb needs to be replaced. See *Bulb Replacement on page 10-28* and *Replacement Bulbs on page 10-33* for more information on the turn signal bulb replacement.

TURN SIGNAL ON

This message is displayed if the turn signal has been left on. Turn off the turn signal.

Object Detection System Messages

PARK ASSIST OFF

This message is displayed when the park assist system has been turned off. See *Ultrasonic Parking Assist on page 9-37*.

SERVICE PARK ASSIST

This message is displayed if there is a problem with the park assist system. Take the vehicle to your dealer for service.

Ride Control System Messages

SERVICE TRACTION CONTROL

This message displays when there is a problem with the Traction Control System (TCS). See *Traction Control System (TCS) on page 9-32*.

SERVICE STABILITRAK

This message displays if there is a problem with the StabiliTrak[®] system. See *StabiliTrak[®] System on page 9-33*.

Airbag System Messages

SERVICE AIRBAG

This message displays if there is a problem with the airbag system. Take the vehicle to your dealer for service.

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

Driving and Operating

Driving Information

Defensive Driving	9-2
Drunk Driving	9-2
Control of a Vehicle	9-3
Braking	9-3
Steering	9-4
Off-Road Recovery	9-5
Loss of Control	9-6
Driving on Wet Roads	9-7
Highway Hypnosis	9-8
Hill and Mountain Roads	9-8
Winter Driving	9-9
If the Vehicle is Stuck	9-11
Vehicle Load Limits	9-11

Starting and Operating

New Vehicle Break-In	9-16
Ignition Positions	9-16
Starting the Engine	9-18
Engine Heater	9-19
Retained Accessory Power (RAP)	9-20
Shifting Into Park (Automatic Transmission)	9-20

Shifting Out of Park	9-21
Parking	9-23
Parking Over Things That Burn	9-23

Engine Exhaust

Engine Exhaust	9-23
Running the Vehicle While Parked	9-24

Automatic Transmission

Automatic Transmission	9-25
Manual Mode	9-27

Manual Transmission

Manual Transmission	9-28
---------------------------	------

Brakes

Antilock Brake System (ABS)	9-30
Parking Brake	9-31
Brake Assist	9-32

Ride Control Systems

Traction Control System (TCS)	9-32
StabiliTrak [®] System	9-33

Cruise Control

Cruise Control	9-35
----------------------	------

Object Detection Systems

Ultrasonic Parking Assist	9-37
---------------------------------	------

Fuel

Fuel	9-39
Recommended Fuel	9-39
Gasoline Specifications (U.S. and Canada Only)	9-40
California Fuel Requirements	9-40
Fuels in Foreign Countries ...	9-40
Fuel Additives	9-40
Filling the Tank	9-42
Filling a Portable Fuel Container	9-43

Towing

General Towing Information	9-44
Driving Characteristics and Towing Tips	9-44
Trailer Towing (Except Fuel Economy Model)	9-48
Trailer Towing (Fuel Economy Model)	9-49
Towing Equipment	9-49

Conversions and Add-Ons

Add-On Electrical Equipment	9-50
--------------------------------------	------

Brake Assist

This vehicle has a brake assist feature designed to assist the driver in stopping or decreasing vehicle speed in emergency driving conditions. This feature uses the stability system hydraulic brake control module to supplement the power brake system under conditions where the driver has quickly and forcefully applied the brake pedal in an attempt to quickly stop or slow down the vehicle. The stability system hydraulic brake control module increases brake pressure at each corner of the vehicle until the ABS activates. Minor brake pedal pulsation or pedal movement during this time is normal and the driver should continue to apply the brake pedal as the driving situation dictates. The brake assist feature will automatically disengage when the brake pedal is released or brake pedal pressure is quickly decreased.

64

Ride Control Systems

Traction Control System (TCS)


The vehicle has a Traction Control System (TCS) that limits wheel spin. On a front-wheel-drive vehicle, the system operates if it senses that one or both of the front wheels are spinning or beginning to lose traction. When this happens, the system brakes the spinning wheel(s), and/or reduces engine power to limit wheel spin.


The system may be heard or felt while it is working, but this is normal.

TCS is on whenever the vehicle is started. To limit wheel spin, especially in slippery road conditions, the system should always be left on. But, TCS can be turned off if needed.




TCS/StabiliTrak Light


 flashes to indicate that the traction control system is active.

If there is a problem detected with TCS, SERVICE TRACTION CONTROL and SERVICE STABILITRAK may be displayed on the Driver Information Center (DIC). See *Vehicle Messages (Canada Base Level)* on page 5-26 or *Vehicle Messages (Canada Uplevel and United States)* on page 5-27. When this message is displayed and  comes on and stays on, the vehicle is safe to drive but the system is not operational. Driving should be adjusted accordingly.

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

If  comes on and stays on, reset the system by:

1. Stopping the vehicle.
2. Turning the engine off and waiting 15 seconds.
3. Starting the engine.

If  still comes on and stays on at a speed above 20 km/h (13 mi/h), see your dealer for service.

A chime may also sound when the light comes on steady.

Notice: Do not repeatedly brake or accelerate heavily when TCS is off. The vehicle's driveline could be damaged.

65






OFF

TCS/StabiliTrak Button

 is located on the console.



TCS Off Light

TCS can be turned off by pressing and releasing . When TCS is turned off,  comes on and the system will not limit wheel spin. Driving should be adjusted accordingly. Press and release  again to turn the system back on.

It may be necessary to turn the system off if the vehicle gets stuck in sand, mud, or snow and rocking the vehicle is required. See *If the Vehicle is Stuck* on page 9-11 for more information. See also *Winter Driving* on page 9-9 for information on using TCS when driving in snowy or icy conditions.

If cruise control is being used when TCS activates, cruise control will automatically disengage. Press the cruise control button to reengage when road conditions allow. See *Cruise Control* on page 9-35.

Adding non-GM accessories can affect the vehicle's performance. See *Accessories and Modifications* on page 10-3 for more information.

StabiliTrak® System

The vehicle has a vehicle stability enhancement system called StabiliTrak. It is an advanced computer controlled system that assists with directional control of the vehicle in difficult driving conditions.

StabiliTrak activates when the computer senses a difference between the intended path, and the direction the vehicle is actually traveling. StabiliTrak selectively applies braking pressure at any one of the vehicle's brakes to help steer the vehicle in the intended direction.


2011 CHEVROLET CRUZE
 FMVSS 126
 VEHICLE No.: CB0106
 APRIL 2011

9-34 Driving and Operating


StabiliTrak is on automatically whenever the vehicle is started. To assist with directional control of the vehicle, the system should always be left on.




TCS/StabiliTrak Light


When the stability control system activates,  flashes on the instrument panel. This also occurs when traction control is activated. A noise may be heard or vibration may be felt in the brake pedal. This is normal. Continue to steer the vehicle in the intended direction.

If there is a problem detected with StabiliTrak, SERVICE STABILITRAK is displayed on the Driver Information Center (DIC). See *Vehicle Messages (Canada Base Level)* on page 5-26 or *Vehicle Messages (Canada Uplevel*

and United States) on page 5-27. When this message is displayed and/or  comes on and stays on, the vehicle is safe to drive but the system is not operational. Driving should be adjusted accordingly.

If  comes on and stays on, reset the system by:


1. Stopping the vehicle.
2. Turning the engine off and waiting 15 seconds.
3. Starting the engine.

If  still comes on and stays on at a speed above 20 km/h (13 mi/h), see your dealer for service.



OFF

TCS/StabiliTrak Button

 is located on the console.







OFF

StabiliTrak Off Light



TCS Off Light

StabiliTrak can be turned off if needed by pressing and holding  until  and  come on the instrument panel. When StabiliTrak is turned off, the system will not assist with directional control of the vehicle or limit wheel spin. Driving should be adjusted accordingly. Press and release  again to turn the system back on.

If cruise control is being used when StabiliTrak activates, cruise control will automatically disengage. Press the cruise control button to reengage when road conditions allow. See *Cruise Control* on page 9-35 for more information.

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

Cruise Control

With cruise control, the vehicle can maintain a speed of about 40 km/h (25 mph) or more without keeping your foot on the accelerator. Cruise control does not work at speeds below 40 km/h (25 mph).

If the brakes are applied, the cruise control shuts off.


If the vehicle has a Traction Control System (TCS) or StabiliTrak System and begins to limit wheel spin while using cruise control, the cruise control automatically disengages. See *Traction Control System (TCS)* on page 9-32 or *StabiliTrak® System* on page 9-33. When road conditions allow you to safely use it again, the cruise control can be turned back on.

WARNING

Cruise control can be dangerous where you cannot drive safely at a steady speed. So, do not use the cruise control on winding roads or in heavy traffic.


Cruise control can be dangerous on slippery roads. On such roads, fast changes in tire traction can cause excessive wheel slip, and you could lose control. Do not use cruise control on slippery roads.



 **(On/Off):** Press to turn the cruise control system on and off.

RES/+ (Resume/Accelerate): Move the thumbwheel up to resume a previously set speed or to accelerate.

SET/- (Set/Coast): Move the thumbwheel down to set a speed or to make the vehicle decelerate.

 **(Cancel):** Press to disengage cruise control without erasing the set speed from memory.

The following information has important trailering tips and rules for your safety and that of your passengers. Read this section carefully before pulling a trailer.

Pulling a Trailer

Here are some important points:

- There are many laws, including speed limit restrictions that apply to trailering. Check for legal requirements with state or provincial police.
- Do not tow a trailer at all during the first 1 600 km (1,000 miles) the new vehicle is driven. The engine or other parts could be damaged.
- During the first 800 km (500 miles) that a trailer is towed, do not drive over 80 km/h (50 mph) and do not make starts at full throttle. This reduces wear on the vehicle.

- Vehicles with automatic transmissions can tow in D (Drive) but M (Manual Mode) is recommended. See *Manual Mode on page 9-27* for more information. Use a lower gear if the transmission shifts too often. For vehicles with a manual transmission, it is better not to use the highest gear.
- Use the cruise control when towing.
- Obey speed limit restrictions. Do not drive faster than the maximum posted speed for trailers, or no more than 90 km/h (55 mph), to reduce wear on the vehicle.

Driving with a Trailer

Towing a trailer requires experience. Get familiar with handling and braking with the added trailer weight. The vehicle is now longer and not as responsive as the vehicle is by itself.

Check all trailer hitch parts and attachments, safety chains, electrical connectors, lamps, tires, and mirror adjustments. If the trailer has electric brakes, start the vehicle and trailer moving and then apply the trailer brake controller by hand to be sure the brakes are working.

During the trip, check regularly to be sure that the load is secure, and the lamps and trailer brakes are working properly.

Towing with a Stability Control System

When towing, the sound of the stability control system might be heard. The system is reacting to the vehicle movement caused by the trailer, which mainly occurs during cornering. This is normal when towing heavier trailers.

California Proposition 65 Warning

Most motor vehicles, including this one, contain and/or emit chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Engine exhaust, many parts and systems, many fluids, and some component wear by-products contain and/or emit these chemicals.

California Perchlorate Materials Requirements

Certain types of automotive applications, such as airbag initiators, seat belt pretensioners, and lithium batteries contained in Remote Keyless Entry transmitters, may contain perchlorate materials. Special handling may be necessary. For additional information, see www.dtsc.ca.gov/hazardouswaste/perchlorate.

Accessories and Modifications

Adding non-dealer accessories or making modifications to the vehicle can affect vehicle performance and safety, including such things as airbags, braking, stability, ride and handling, emissions systems, aerodynamics, durability, and electronic systems like antilock brakes, traction control, and stability control. These accessories or modifications could even cause malfunction or damage not covered by the vehicle warranty.

Damage to vehicle components resulting from modifications or the installation or use of non-GM certified parts, including control module or software modifications, is not covered under the terms of the vehicle warranty and may affect remaining warranty coverage for affected parts.

GM Accessories are designed to complement and function with other systems on the vehicle. Your GM dealer can accessorize the vehicle using genuine GM Accessories. When you go to your GM dealer and ask for GM Accessories, you will know that GM-trained and supported service technicians will perform the work using genuine GM Accessories.

Also, see *Adding Equipment to the Airbag-Equipped Vehicle* on page 3-38.

Different Size Tires and Wheels

If wheels or tires are installed that are a different size than the original equipment wheels and tires, vehicle performance, including its braking, ride and handling characteristics, stability, and resistance to rollover may be affected. If the vehicle has electronic systems such as antilock brakes, rollover airbags, traction control, and electronic stability control, the performance of these systems can also be affected.

WARNING (Continued)

developed for the vehicle, and have them properly installed by a GM certified technician.

See *Buying New Tires* on page 10-55 and *Accessories and Modifications* on page 10-3 for additional information.

Uniform Tire Quality Grading

Quality grades can be found where applicable on the tire sidewall between tread shoulder and maximum section width. For example:

Treadwear 200 Traction AA Temperature A

The following information relates to the system developed by the United States National Highway Traffic Safety Administration

(NHTSA), which grades tires by treadwear, traction, and temperature performance. This applies only to vehicles sold in the United States. The grades are molded on the sidewalls of most passenger car tires. The Uniform Tire Quality Grading (UTQG) system does not apply to deep tread, winter-type snow tires, space-saver, or temporary use spare tires, tires with nominal rim diameters of 10 to 12 inches (25 to 30 cm), or to some limited-production tires.

While the tires available on General Motors passenger cars and light trucks may vary with respect to these grades, they must also conform to federal safety requirements and additional General Motors Tire Performance Criteria (TPC) standards.

⚠ WARNING

If different sized wheels are used, there may not be an acceptable level of performance and safety if tires not recommended for those wheels are selected. This increases the chance of a crash and serious injury. Only use GM specific wheel and tire systems

(Continued)

2011 CHEVROLET CRUZE
FMVSS 126
VEHICLE No.: CB0106
APRIL 2011

7.2 VEHICLE ARRIVAL CONDITION REPORT

CONTRACT NO. DTNH22-08-D-00097 DATE: 3/31/11

FROM: Automotive Allies

TO: TRC

PURPOSE: (X) Initial Receipt () Received via Transfer () Present vehicle condition

MODEL YEAR/MAKE/MODEL/BODY STYLE: 2011 / Chevrolet / Cruze / Passenger Car

MANUFACTURE DATE: 02/11 NHTSA NO.: CB0106

BODY COLOR: Dark Blue VIN: 1G1PF5S98B7210290

ODOMETER READING: 60 miles GVWR: 1,861 KG

PURCHASE PRICE: \$ rented / leased DEALER'S NAME: Automotive Allies, 209 W. Alameda Avenue, Suite 101, Burbank, CA 91502

X ALL OPTIONS LISTED ON "WINDOW STICKER" ARE PRESENT ON THE TEST VEHICLE

X TIRES AND WHEEL RIMS ARE NEW AND THE SAME AS LISTED

X THERE ARE NO DENTS OR OTHER INTERIOR OR EXTERIOR FLAWS

X THE VEHICLE HAS BEEN PROPERLY PREPARED AND IS IN RUNNING CONDITION

X THE GLOVE BOX CONTAINS AN OWNER'S MANUAL, WARRANTY DOCUMENT, CONSUMER INFORMATION, AND EXTRA SET OF KEYS

X PROPER FUEL FILLER CAP IS SUPPLIED ON THE TEST VEHICLE

X PLACE VEHICLE IN STORAGE AREA

X INSPECT THE VEHICLE'S INTERIOR AND EXTERIOR, INCLUDING ALL WINDOWS, SEATS, DOORS, ETC., TO CONFIRM THAT EACH SYSTEM IS COMPLETE AND FUNCTIONAL PER THE MANUFACTURER'S SPECIFICATIONS. ANY DAMAGE, MISADJUSTMENT, OR OTHER UNUSUAL CONDITION THAT COULD INFLUENCE THE TEST PROGRAM OR TEST RESULTS SHALL BE RECORDED. REPORT ANY ABNORMAL CONDITION TO THE NHTSA COTR BEFORE BEGINNING ANY TEST

RECORDED BY: Alan Ida

DATE: 3-31-11

APPROVED BY: Ken Webster

DATE: 4-19-11

7.3 VEHICLE COMPLETION CONDITION REPORT

CONTRACT NO. DTNH22-08-D-00097 DATE: 4/18/11

MODEL YEAR/MAKE/MODEL/BODY STYLE: 2011 / Chevrolet / Cruze / Passenger Car

MANUFACTURE DATE: 02/11 NHTSA NO.: CB0106

BODY COLOR: Dark Blue VIN: 1G1PF5S98B7210290

ODOMETER READING: 141 miles GVWR: 1,861 KG

LIST OF FMVSS TESTS PERFORMED BY THIS LAB: 126, 135

- THERE ARE NO DENTS OR OTHER INTERIOR OR EXTERIOR FLAWS
- THE VEHICLE HAS BEEN PROPERLY MAINTAINED AND IS IN RUNNING CONDITION
- THE GLOVE BOX CONTAINS AN OWNER'S MANUAL, WARRANTY DOCUMENT, CONSUMER INFORMATION, AND EXTRA SET OF KEYS
- PROPER FUEL FILLER CAP IS SUPPLIED ON THE TEST VEHICLE

REMARKS:

Equipment that is no longer on the test vehicle as noted on Vehicle Arrival Condition Report:

None.

Explanation for equipment removal:

N/A

Test Vehicle Condition:

Like new.

RECORDED BY: Alan Ida

DATE: 4-18-11

APPROVED BY: Ken Webster

DATE: 4-19-11

7.4 SINE WITH DWELL TEST RESULTS
2011 Chevrolet Cruze
NHTSA No.: CB0106

Date Created 14-Apr-11

LEFT-TO-RIGHT (INITIAL COUNTER-CLOCKWISE STEER)

File	SWA @ 5deg Ct	MES	Time@5deg	COS	Time@COS	MOS	Time@MOS	YRR1(%)	YR1 (deg/sec)	YRR1 Ct	YRR175(%)	YR175 (deg/sec)
0022	619	50.076	3.090	999	4.989	755	3.769	-1.129	-0.135	1199	-1.776	-0.213
0023	618	50.239	3.085	1000	4.990	756	3.771	-1.303	-0.196	1200	-1.433	-0.216
0024	618	50.285	3.080	1000	4.990	756	3.771	-0.076	-0.014	1200	0.146	0.027
0025	617	50.289	3.077	999	4.990	756	3.771	-0.123	-0.027	1199	-0.062	-0.013
0026	616	50.390	3.071	999	4.986	755	3.768	-0.583	-0.147	1199	-0.296	-0.075
0027	615	50.235	3.070	999	4.987	755	3.768	-0.331	-0.095	1199	-0.352	-0.102
0033	615	50.580	3.069	999	4.988	755	3.769	-0.285	-0.097	1199	0.094	0.032
0034	615	50.247	3.070	999	4.989	756	3.771	-0.496	-0.188	1199	0.153	0.058
0035	615	50.352	3.065	999	4.985	755	3.767	0.085	0.037	1199	-0.045	-0.019
0036	614	50.332	3.065	999	4.986	755	3.767	-0.089	-0.040	1199	-0.805	-0.362
0037	615	50.525	3.067	999	4.986	755	3.770	-1.858	-0.935	1199	0.309	0.155
0038	614	50.398	3.063	998	4.985	755	3.766	-2.284	-1.165	1198	-0.663	-0.338
0039	615	50.401	3.066	999	4.987	755	3.770	0.786	0.415	1199	-0.104	-0.055
0040	614	50.421	3.062	998	4.984	755	3.766	-6.696	-3.660	1198	0.212	0.116
0041	614	50.483	3.063	998	4.984	755	3.768	-8.353	-4.645	1198	0.054	0.030
0042	614	50.573	3.064	999	4.986	755	3.768	-8.796	-4.990	1199	0.073	0.041
0043	614	50.844	3.063	998	4.985	755	3.768	-6.156	-3.432	1198	-0.019	-0.011
0044	614	50.297	3.063	999	4.987	755	3.768	-5.571	-3.088	1199	-0.261	-0.144
0045	614	50.499	3.064	999	4.988	755	3.769	-7.860	-4.371	1199	-0.310	-0.173

RIGHT-TO-LEFT (INITIAL CLOCKWISE STEER)

0046	619	50.229	3.087	999	4.989	755	3.767	-0.449	0.054	1199	-0.619	0.074
0047	618	50.208	3.084	1000	4.990	756	3.770	-0.006	0.001	1200	0.559	-0.088
0048	617	50.224	3.076	999	4.987	755	3.768	-0.311	0.060	1199	0.171	-0.033
0049	617	50.313	3.076	1000	4.990	755	3.770	-0.392	0.090	1200	-0.286	0.066
0050	616	50.197	3.071	999	4.987	755	3.767	-0.632	0.171	1199	-0.506	0.136
0051	615	50.350	3.070	999	4.988	755	3.768	-0.746	0.235	1199	0.000	0.000
0052	615	50.321	3.068	999	4.987	755	3.767	-0.504	0.181	1199	-0.050	0.018
0053	615	50.411	3.068	999	4.987	755	3.768	0.067	-0.028	1199	-0.069	0.028
0054	615	50.122	3.067	999	4.988	755	3.768	1.774	-0.785	1199	0.199	-0.088
0055	615	50.375	3.066	999	4.986	755	3.767	0.625	-0.302	1199	-0.143	0.069
0056	614	50.306	3.064	998	4.984	755	3.766	-1.443	0.735	1198	-0.363	0.185
0057	615	50.309	3.066	999	4.986	755	3.769	0.479	-0.257	1199	-0.442	0.237
0058	614	50.335	3.063	998	4.984	755	3.766	0.013	-0.007	1198	-0.117	0.066
0059	615	50.159	3.066	999	4.988	755	3.770	-3.138	1.790	1199	0.049	-0.028
0060	614	50.251	3.064	999	4.986	755	3.768	-9.031	5.444	1199	-0.165	0.100
0061	614	50.397	3.063	999	4.986	755	3.767	-9.021	5.305	1199	-0.108	0.064
0062	614	50.202	3.064	999	4.987	755	3.768	-5.656	3.416	1199	-0.124	0.075
0063	614	50.607	3.063	999	4.986	755	3.767	-9.796	5.890	1199	-0.315	0.190
0064	615	50.284	3.066	1000	4.991	756	3.771	-8.779	5.255	1200	-0.147	0.088

7.4 SINE WITH DWELL TEST RESULTS
2011 Chevrolet Cruze
NHTSA No.: CB0106

Date Created 14-Apr-11

LEFT-TO-RIGHT (INITIAL COUNTER-CLOCKWISE STEER)

File	YRR175 Ct	2nd Yaw Peak(deg/sec)	2nd Yaw Peak Ct	Lat Disp (ft)	Lat. Acc. 1.07s (g)	1st SWA Peak(deg)	1st SWA Peak Ct	2nd SWA Mean(deg)
0022	1349	11.978	850	-4.263	0.406	39.080	683	38.857
0023	1350	15.046	857	-5.272	0.507	51.014	684	50.886
0024	1350	18.558	852	-6.466	0.608	64.035	684	63.833
0025	1349	21.708	851	-7.499	0.672	76.980	684	76.866
0026	1349	25.230	842	-8.474	0.713	89.834	684	89.752
0027	1349	28.878	831	-9.177	0.711	103.011	684	103.154
0033	1349	33.957	833	-9.800	0.716	116.077	684	116.064
0034	1349	37.965	832	-10.333	0.736	129.066	684	129.023
0035	1349	43.167	835	-10.473	0.746	140.956	683	140.936
0036	1349	44.938	834	-10.713	0.778	154.061	683	154.276
0037	1349	50.313	842	-11.015	0.788	167.332	684	166.495
0038	1348	50.997	838	-11.121	0.800	179.936	683	180.210
0039	1349	52.781	839	-10.964	0.805	193.369	684	192.736
0040	1348	54.657	838	-11.030	0.831	206.803	683	205.781
0041	1348	55.610	838	-11.023	0.814	218.767	683	217.557
0042	1349	56.731	839	-11.113	0.843	231.618	684	230.708
0043	1348	55.752	837	-11.057	0.841	244.595	683	243.583
0044	1349	55.423	839	-11.122	0.832	257.360	683	256.852
0045	1349	55.614	840	-10.988	0.863	270.732	683	269.554

RIGHT-TO-LEFT (INITIAL CLOCKWISE STEER)

0046	1349	-12.039	870	4.026	-0.403	39.643	683	39.442
0047	1350	-15.777	856	5.071	-0.504	51.601	684	51.354
0048	1349	-19.186	839	6.225	-0.592	64.578	683	64.349
0049	1350	-23.041	841	7.112	-0.658	77.450	684	77.476
0050	1349	-26.981	843	7.845	-0.699	90.355	683	90.379
0051	1349	-31.550	839	8.763	-0.714	103.641	684	103.610
0052	1349	-36.012	840	9.276	-0.746	116.654	684	116.627
0053	1349	-41.117	841	9.916	-0.735	129.665	684	129.570
0054	1349	-44.245	841	9.969	-0.786	141.545	684	141.543
0055	1349	-48.323	841	10.339	-0.774	154.559	684	154.628
0056	1348	-50.926	840	10.282	-0.823	167.611	683	167.486
0057	1349	-53.745	841	10.654	-0.836	180.637	684	180.387
0058	1348	-56.758	842	10.618	-0.858	193.553	683	193.413
0059	1349	-57.049	842	10.570	-0.884	206.828	684	206.629
0060	1349	-60.279	841	10.832	-0.857	218.884	684	218.507
0061	1349	-58.802	842	10.712	-0.891	231.908	683	231.460
0062	1349	-60.388	840	10.478	-0.913	244.918	684	244.374
0063	1349	-60.123	841	10.486	-0.914	257.936	683	257.407
0064	1350	-59.857	839	10.395	-0.937	271.021	684	270.265

7.5 SLOWLY INCREASING STEER TEST RESULTS
2011 Chevrolet Cruze
NHTSA No.: CB0106

Date Created 14-Apr-11

File	Vehicle	EventPt	DOS	MES [mph]	Mean SPD [mph]	AYcount_3	THETAENCF_3 [degree]	AYCG_CD2_3 [g]	r_squared	ZeroBegin	ZeroEnd
0013	2011 Chevrolet Cruze	705	1	50.342	50.087	1079	-25.350	-0.300	0.999	505	705
0014	2011 Chevrolet Cruze	704	1	50.138	50.280	1080	-25.413	-0.306	0.997	504	704
0015	2011 Chevrolet Cruze	703	1	50.188	50.495	1080	-25.499	-0.302	0.997	503	703
0016	2011 Chevrolet Cruze	703	0	50.310	49.643	1088	26.307	0.297	0.999	503	703
0017	2011 Chevrolet Cruze	703	0	49.678	49.886	1085	26.103	0.303	0.997	503	703
0018	2011 Chevrolet Cruze	701	0	49.796	50.405	1073	25.332	0.302	0.997	501	701
Averages							25.7	0.302			

Scalars	Steering Angles (deg)
1.5	39
2	51
2.5	64
3	77
3.5	90
4	103
4.5	116
5	129
5.5	141
6	154
6.5	167
7	180
7.5	193
8	206
8.5	218
9	231
9.5	244
10	257
10.5	270

7.6 INERTIA SENSOR MEASUREMENTS
2011 Chevrolet Cruze
NHTSA No.: CB0106

Device : U12-05-08-07108
device version : 2.24
device certification date : 07/30/10
today is : 4/13/2011
units : Millimeters

Label	ActualX	ActualY	ActualZ
C_DEVICEPOS001			
M_PLANE001	1287.763	-540.820	-315.111
M_LINE001	625.912	5.602	-47.065
M_ORIGIN_-_FRT_AXLE_CENTER	0.000	0.000	0.000
C_COORDSYS001	0.000	0.000	0.000
M_TIRE_CENTER_TREAD	269.624	52.032	-187.854
M_INERTIA_PACK	1502.880	829.732	537.974
M_ROOF	1736.347	829.679	1146.996
M_GROUND	1737.522	-145.158	-311.543

Track Width 1546.225

Roof Height (relative to ground) 1458.538

Motion Pak - x-distance (mm) 1502.880
Motion Pak - y-distance (mm) 4.588
Motion Pak - z-distance (mm) 805.067

Motion Pak - x-distance (inches) 59.168
Motion Pak - y-distance (inches) 0.181
Motion Pak - z-distance (inches) 31.695

x-distance (longitudinal) Point of reference is the front axle centerline.
(Positive from front axle toward rear of vehicle.)

y-distance (lateral) Point of reference is the vehicle centerline.
(Positive from the center toward the right.)

z-distance (vertical) Point of reference is the ground plane.
(Positive from the ground up.)