126-TRC-09-007

SAFETY COMPLIANCE TESTING FOR FMVSS 126
Electronic Stability Control Systems

General Motors Corporation
2009 Chevrolet Express 3500 EXTD WB
NHTSA No. C90113

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

January 4, 2010

FINAL REPORT

Prepared Under Contract No.: DTNH22-08-P-0097

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-P-0097.

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Prepared By: [Signature]

Approved By: [Signature]
Approval Date: 5/8/08

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: [Signature]
Acceptance Date: 1/4/10
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<td>TRC 20080734 / 9267</td>
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<th>7. Author(s)</th>
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<tbody>
<tr>
<td>Alan Ida, Project Engineer</td>
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<td>Jeff Sankey, Manager, DDO Project Operations</td>
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<td>Transportation Research Center Inc.</td>
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<td>East Liberty, OH 43319</td>
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<tr>
<td>East Liberty, OH 43319</td>
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<td>Enforcement</td>
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<td>Office of Vehicle Safety Compliance</td>
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<tr>
<td>1200 New Jersey Avenue, SE,</td>
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<tr>
<td>West Building, 4th Floor (NVS-221)</td>
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<tr>
<td>Washington, D.C. 20590</td>
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<table>
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<tr>
<td>Final test report</td>
</tr>
<tr>
<td>August 24, 2009 to January 4, 2010</td>
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<table>
<thead>
<tr>
<th>16. Abstract</th>
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<tbody>
<tr>
<td>A test was conducted on a 2009 Chevrolet Express 15-passenger bus (not school bus), NHTSA No. C90113, 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</td>
</tr>
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<table>
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<th>17. Key Words</th>
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<tbody>
<tr>
<td>Compliance Testing</td>
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<tr>
<td>Safety Engineering</td>
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<td>FMVSS 126</td>
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<table>
<thead>
<tr>
<th>18. Distribution Statement</th>
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<tr>
<td>Copies of this report are available from:</td>
</tr>
<tr>
<td>NHTSA Technical Information Services (TIS)</td>
</tr>
<tr>
<td>(NPO 411)</td>
</tr>
<tr>
<td>1200 New Jersey Avenue, SE</td>
</tr>
<tr>
<td>Washington, D.C. 20590</td>
</tr>
<tr>
<td>Email: <a href="mailto:tis@nhtsa.dot.gov">tis@nhtsa.dot.gov</a></td>
</tr>
<tr>
<td>FAX: (202) 493-2833</td>
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1.0 PURPOSE OF COMPLIANCE TEST

The purpose of this test is to determine if the test vehicle, an MY 2009 Chevrolet Express 3500 15-passenger bus (not school bus) 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 2009 Chevrolet Express 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 20 km/h (12.4 mph) or when being driven in reverse or during system initialization).

The vehicle was subjected to a 0.7 Hz 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 3,500 kg (7,716 lb.) or less, and 1.52 m (5 feet) for vehicles with a GVWR greater than 3,500 kg (7,716 lb.), 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 / Express / 15-Passenger Bus - not school bus

VEHICLE NHTSA NO.: C90113 VIN: 1GAHG39K791171932

VEHICLE TYPE: Bus - not school bus DATE OF MANUFACTURE: 05/09

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 and operational characteristics requirements. (S126, S5.1, S5.6) PASS

ESC Malfunction Telltale (Data Sheet 3)

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

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

The vehicle is equipped with an ESC off telltale indicating the vehicle 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) PASS
2.0 TEST PROCEDURE AND DISCUSSION OF RESULTS …continued

DATA SUMMARY (Sheet 2 of 2)

<table>
<thead>
<tr>
<th>REQUIREMENTS</th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>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)</td>
<td>PASS</td>
</tr>
</tbody>
</table>

**Vehicle Lateral Stability** (Data Sheet 8)

<table>
<thead>
<tr>
<th>Requirement</th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yaw Rate Ratio at 1 second after COS is less than 35% of peak value.</td>
<td>PASS</td>
</tr>
<tr>
<td>(S126, S5.2.1)</td>
<td></td>
</tr>
<tr>
<td>Yaw Rate Ratio at 1.75 seconds after COS is less than 20% of peak value.</td>
<td>PASS</td>
</tr>
<tr>
<td>(S126, S5.2.2)</td>
<td></td>
</tr>
</tbody>
</table>

**Vehicle Responsiveness** (Data Sheet 8)

<table>
<thead>
<tr>
<th>Requirement</th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lateral displacement at 1.07 seconds after BOS is at least 1.83 m (6 feet) for vehicles with a GVWR of 3,500kg (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)</td>
<td>PASS</td>
</tr>
</tbody>
</table>

**ESC Malfunction Warning** (Data Sheet 9)

<table>
<thead>
<tr>
<th>Requirement</th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warning is provided to driver after malfunction occurrence.</td>
<td>PASS</td>
</tr>
<tr>
<td>(S126, S5.3)</td>
<td></td>
</tr>
<tr>
<td>Malfunction telltale stayed illuminated as long as malfunction existed and must extinguish after malfunction was corrected. (S126, S5.3.7)</td>
<td>PASS</td>
</tr>
</tbody>
</table>
3.0 TEST DATA

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

VEHICLE MAKE/MODEL/BODY STYLE: Chevrolet / Express / Bus – not school bus

NHTSA No.: C90113 TEST DATE: 8-31-09

VIN: 1GAHG39K791171932 MANUFACTURE DATE: 05/09

GVWR: 4,355 KG FRONT GAWR: 1,951 KG REAR GAWR: 2,760 KG

SEATING POSITIONS: 1st Row 2 2nd Row 3 3rd Row 3 4th Row 3 5th Row 4

ODOMETER READING AT START OF TEST: 7 (11.3) Miles (Kilometers)

DESIGNATED TIRE SIZE(S) FROM VEHICLE LABELING:
Front Axle LT245 / 75R 16E S Rear Axle LT245 / 75R 16E S

INSTALLED TIRE SIZE(S) ON VEHICLE:
Manufacturer and Model Bridgestone V-Steel RIB 265 Bridgestone V-Steel RIB 265
Tire Size Designation LT245 / 75R 16 LT245 / 75R 16

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): ( ) Front Wheel Drive ( X ) Rear Wheel Drive
All Wheel Drive (AWD)
Four Wheel Drive Automatic – differential not locked full time (4WD Automatic)
Four Wheel Drive High Gear Locked Differential (4WD HGLD)
Four Wheel Drive Low Gear (4WD Low)
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 - RWD
Mode(s): default

Drive Configuration: ________________________________
Mode(s): ________________________________

Drive Configuration: ________________________________
Mode(s): ________________________________

VEHICLE STABILITY SYSTEMS (Check applicable technologies):

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

List other systems: Tow / Haul Mode ________________________________

REMARKS:

RECORDED BY: Alan Ida DATE: 8-24-09
APPROVED BY: Jeff Sankey DATE: 9-08-09
3.0 TEST DATA….continued

DATA SHEET 2 (Sheet 1 of 2)
ESC SYSTEM HARDWARE AND OPERATIONAL CHARACTERISTICS

VEHICLE MAKE/MODEL/BODY STYLE: Chevrolet / Express / Bus – not school bus

NHTSA No.: C90113 TEST DATE: 8-24-09

ESC SYSTEM IDENTIFICATION:
Manufacturer / Model: TRW Automotive / TRW EBC440

ESC SYSTEM HARDWARE (Check applicable hardware):
X Electronic Control Unit
X Hydraulic Control Unit
X Wheel Speed Sensors
X Steering Angle Sensor
X Yaw Rate Sensor
X Lateral Acceleration Sensor

List other components: __________________________________________________________

ESC SYSTEM OPERATIONAL CHARACTERISTICS:

System is capable of generating brake torques at each wheel
X Yes (PASS)
No (FAIL)

List and describe component(s): ESC Control Unit
Hydraulic Control Unit

System is capable of determining yaw rate
X Yes (PASS)
No (FAIL)

List and describe component(s): Yaw Rate Sensor

System is capable of monitoring driver steering input
X Yes (PASS)
No (FAIL)

List and describe component(s): Steering Wheel Angle Sensor

System is capable of estimating side slip or side slip derivation
X Yes (PASS)
No (FAIL)

List and describe component(s): ESC Control Unit
Wheel Speed Sensors
Steering Wheel Angle Sensor
Yaw Rate Sensor
Lateral Acceleration Sensor
ESC SYSTEM OPERATIONAL CHARACTERISTICS (continued):

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

Method used to modify engine torque:  
ESC Control Unit sends signal to Powertrain Control Module

System is capable of activation at speeds of 20 km/h (12.4 mph)  
X  Yes (PASS)  
____  No (FAIL)

Speed system becomes active.  
14.76 km/h (9.2 mph)

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

Driving phases that the system is capable of activation.  
Forward driving direction at 14.76 km/h and higher – the system is capable of activation under acceleration, deceleration, coasting, during ABS activation, and during TCS activation

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

DATA INDICATES COMPLIANCE  
PASS/FAIL  _______PASS

REMARKS:

RECORDED BY:  Alan Ida  
DATE:  8-24-09

APPROVED BY:  Jeff Sankey  
DATE:  9-08-09
DATA SHEET 3 (Sheet 1 of 2)
ESC MALFUNCTION AND OFF TELLTALES

VEHICLE MAKE/MODEL/BODY STYLE: Chevrolet / Express / Bus – not school bus

VEHICLE NHTSA NO. C90113 TEST DATE: 8-24-09

ESC Malfunction Telltale

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

Telltale Location The telltale is located inside the instrument cluster – right side next to battery volt gauge:

Telltale Color Yellow

Telltale symbol or abbreviation used.

X Vehicle uses this symbol

Or ESC Vehicles uses this abbreviation

Neither symbol or abbreviation is used

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

Note: In addition to the malfunction telltale located in the instrument cluster, the vehicle driver information center, located in the center of the instrument cluster below the speedometer, displays the message “Service Stabilitrak” when the ESC system is malfunctioning and needs service.

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: telltale symbol 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 (See Remarks)  No

Telltale Location  
The telltale is located inside the instrument cluster – right side next to battery volt gauge:

Telltale Color  
Yellow

Telltale symbol or abbreviation used.

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.

Note: Telltale uses the sliding car symbol but it does not say “Off” under the symbol. In addition to the “ESC Off” telltale located in the instrument cluster, the vehicle driver information center, located in the center of the instrument cluster below the speedometer, displays the message “Stabilitrak Off” or “Stabilitrak Not Ready” when the ESC system is turned off.

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:
The vehicle uses one telltale, the symbol of the sliding car, to identify when the ESC system has been turned off or has a malfunction. The telltale is not considered a two part telltale because it does not include two parts, a sliding car symbol and the word “OFF”, that can illuminate either together or separately to identify the difference between a system that has been turned off and a system that has malfunctioned.
“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?

X Yes  No

Type of control or controls provided?

X 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 Center stack of dash panel, below stereo controls

Labeling Skidding car symbol

Modes ESC / TCS off

Second Control: Location N/A

Labeling N/A

Modes N/A

Identify standard or default drive configuration 2WD – rear wheel drive

Verify standard or default drive configuration selected.  X 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?

X 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?

X Yes  No (fail)

If no, describe how the off control functions:

______________________________________________________________________________
3.0 TEST DATA….continued

DATA SHEET 4 (Sheet 2 of 3)
ESC AND ANCILLARY SYSTEM CONTROLS

If a multi-function control is provided, cycle through each mode setting on the control and record which modes illuminate the “ESC Off” telltale. Also, for those modes that illuminate the ESC Off” telltale identify if the telltale extinguishes upon cycling the ignition system.

<table>
<thead>
<tr>
<th>Control Modes</th>
<th>“ESC Off” telltale illuminates upon activation of control? (Yes/No)</th>
<th>“ESC Off” telltale extinguishes upon cycling ignition? (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<td>N/A</td>
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<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

For each mode that illuminates the “ESC Off” telltale, did the telltale extinguish when the ignition was cycled from “On” (“Run”) to “Lock” or “Off” and then back again to the “On” (“Run”) position?

X Yes  No (fail)

Other System Controls that have an ancillary effect on ESC Operation:

Is the vehicle equipped with any ancillary controls that upon activation may 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?

X Yes  No

List and describe each control (i.e. alternate drive configuration selection controls):

Ancillary Control: System N/A
Control Description N/A
Labeling N/A

Ancillary Control: System N/A
Control Description N/A
Labeling N/A
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.

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

<table>
<thead>
<tr>
<th>Ancillary Control</th>
<th>Control Activates “ESC Off” Telltale? (Yes/No)</th>
<th>Warnings or Messages Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

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  DATE:  8-24-09
APPROVED BY:  Jeff Sankey  DATE:  9-08-09
## DATA SHEET 5 (Sheet 1 of 3)
### VEHICLE AND TEST TRACK DATA

**VEHICLE MAKE/MODEL/BODY STYLE:** Chevrolet / Express / Bus – not school bus

**NHTSA No.:** C90113  
**TEST DATE:** 8-31-09

**Test Track Requirements:**  
- Test Surface Slope (0-1 %): 1 %  
- Peak Friction Coefficient (at least 0.9): 0.93

**Full Fluid Levels:**  
- Fuel [X]  
- Coolant [X]  
- Other Fluids  
- Washer (specify)

**Tire Pressures:**  
- **Required:** Front Axle: 340.0 KPA  
  Rear Axle: 550.0 KPA  
- **Actual:** LF: 340.0 KPA  
  RF: 340.0 KPA  
  LR: 550.0 KPA  
  RR: 550.0 KPA

**Vehicle Dimensions:**  
- Track Width: 173.5 cm  
- Wheelbase: 394.5 cm  
- Roof Height: 209.4 cm

**Vehicle weight ratings:**  
- GAWR Front: 1,951 KG  
- GAWR Rear: 2,760 KG

**Unloaded Vehicle Weight (UVW):**  
- Front Axle: 1,510.5 KG  
  Left Front: 771.1 KG  
  Right Front: 739.4 KG  
- Rear Axle: 1,496.9 KG  
  Left Rear: 739.4 KG  
  Right Rear: 757.5 KG  
- Total UVW: 3,007.4 KG

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

- **Calculated Baseline Weight (UVW + 73 kg):** 3,080.4 KG
- **Outrigger size required (“Standard” or “Heavy”):** Heavy
  - 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

UVW with Outriggers (only for MPVs, Trucks, Buses)

Front Axle 1,546.8 KG
Left Front 789.3 KG
Right Front 757.5 KG

Rear Axle 1,555.8 KG
Left Rear 771.1 KG
Right Rear 784.7 KG

Total UVW w/ Outriggers 3,102.6 KG

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

Front Axle 1,592.1 KG
Left Front 798.3 KG
Right Front 793.8 KG

Rear Axle 1,646.6 KG
Left Rear 843.7 KG
Left Rear 802.9 KG

Total Loaded Weight w/ Driver 3,238.7 KG

Ballast Required = [UVW + 168 KG] - Total Loaded Weight w/ Driver and Instrumentation

= [3,102.6 KG + 168 KG] - 3,238.7 KG

= 31.9 KG

Total Loaded Vehicle Weight

Front Axle 1,664.7 KG
Left Front 848.2 KG
Right Front 816.5 KG

Rear Axle 1,605.8 KG
Left Rear 802.9 KG
Right Rear 802.9 KG

Total Loaded Vehicle Weight 3,270.5 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:

<table>
<thead>
<tr>
<th></th>
<th>Center of Gravity</th>
<th>Inertial Sensing System</th>
</tr>
</thead>
<tbody>
<tr>
<td>x-distance</td>
<td>193.7 cm</td>
<td>152.3 cm</td>
</tr>
<tr>
<td>y-distance</td>
<td>-0.84 cm</td>
<td>-1.60 cm</td>
</tr>
<tr>
<td>z-distance</td>
<td>79.6 cm</td>
<td>71.6 cm</td>
</tr>
</tbody>
</table>

Distance Between Ultrasonic Sensors:  204.5 cm

TEST TRACK DATA MEETS REQUIREMENTS:  YES
If no, explain:  

REMARKS:

RECORDED BY:  Alan Ida  DATE:  8-28-09
APPROVED BY:  Jeff Sankey  DATE:  9-08-09
3.0 TEST DATA…continued

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

VEHICLE MAKE/MODEL/BODY STYLE: _Chevrolet / Express / Bus – not school bus_

VEHICLE NHTSA No.: _C90113_

Measured Cold Tire Pressures: 
LF __340___ KPA  RF __340___ KPA
LR __550___ KPA  RR __550___ 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)) __21.1°C_

Brake Conditioning 

Time; __10:55 AM____ Date; __8-28-09__

56 km/h (35 mph) Brake Stops

Number of stops executed (10 required) __10___ stops

Observed deceleration rate range (.5g target) __0.5 – 0.53___ 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 __0.84 – 0.9___ g

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

Duration of cool down period (5 minutes min.) __5:36___ minutes
3.0 TEST DATA....continued

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

Tire Conditioning Series No. 1  Time: 11:30 AM  Date: 8-31-09

Measured Tire Pressures:  LF 358.5 KPA  RF 358.5 KPA
LR 565.4 KPA  RR 565.4 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))  18.3 °C

<table>
<thead>
<tr>
<th>30 meter (100 ft) Diameter Circle Maneuver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Runs</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>1-3</td>
</tr>
<tr>
<td>4-6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1 Hz 5 Cycle Sinusoidal Steering Maneuver to Determine Steering Wheel Angle For 0.5-0.6g Lateral Acceleration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Runs</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
</tbody>
</table>

Steering wheel angle that corresponds to a peak 0.5–0.6g lateral acceleration;  170 degrees

<table>
<thead>
<tr>
<th>1 Hz 10 Cycle Sinusoidal Steering Maneuver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Runs</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>1 - 3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

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

**ESC activated during sinusoidal steering maneuver. Also engine torque was reduced, which slowed vehicle down from 35 mph (56 km/h) to 20 mph (32 km/h). However, vehicle still maintained lateral acceleration of 0.51 – 0.53g.

***Did not perform the double amplitude sinusoidal steering maneuver due to safety concern. Instead, the 4th maneuver 10th cycle was executed at 170 degrees steering amplitude.
3.0 TEST DATA….continued

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

Tire Conditioning Series No. 2  Time: 1:05 PM  Date: 8-31-09

Measured Tire Pressures:  
   LF  365.4  KPA  RF  365.4  KPA  
   LR  579.2  KPA  RR  579.2  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))  19.4  °C

<table>
<thead>
<tr>
<th>30 meter (100 ft) Diameter Circle Maneuver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Runs</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>1-3</td>
</tr>
<tr>
<td>4-6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1 Hz 5 Cycle Sinusoidal Steering Maneuver to Determine Steering Wheel Angle For 0.5-0.6g Lateral Acceleration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Runs</td>
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<tr>
<td>-----------</td>
</tr>
<tr>
<td>1</td>
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<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
</tbody>
</table>

Steering wheel angle that corresponds to a peak 0.5–0.6g lateral acceleration; 170 degrees

<table>
<thead>
<tr>
<th>1 Hz 10 Cycle Sinusoidal Steering Maneuver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Runs</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>1 - 3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

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

REMARKS:
**ESC activated during sinusoidal steering maneuver. Also engine torque was reduced, which slowed vehicle down from 35 mph (56 km/h) to 20 mph (32 km/h). However, vehicle still maintained lateral acceleration of 0.51 – 0.53g.

***Did not perform the double amplitude sinusoidal steering maneuver due to safety concern. Instead, the 4th maneuver 10th cycle was executed at 170 degrees steering amplitude.

RECORDED BY: Alan Ida  DATE: 8-31-09
APPROVED BY: Jeff Sankey  DATE: 9-08-09
3.0 TEST DATA….continued

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

VEHICLE MAKE/MODEL/BODY STYLE: Chevrolet / Express / 15-passenger Bus – not school bus

VEHICLE NHTSA No.: C90113 TEST DATE: 8-31-09

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)) 18.9°C

Static Data File Number: 0006
Selected Drive Configuration: 2WD - RWD
Selected Mode: default

Preliminary Left Steer Maneuver:
Lateral Acceleration measured at 30 degrees steering wheel angle ($a_{y,30}$)

\[ a_{y,30} = 0.21 \text{ g} \]

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

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

\[ \delta_{SIS} = 78.6 \text{ degrees @ 0.55g} \]

\[ \delta_{SIS} = 80.0^* \text{ degrees (rounded)} \]

*See Remarks

Steering Wheel Angle at Corrected 0.3 g Lateral Acceleration:

<table>
<thead>
<tr>
<th>Maneuver #</th>
<th>Initial Steer Direction</th>
<th>Time Clock (5 min max between runs)</th>
<th>Steering Wheel Angle to nearest 0.1 degree (degrees)</th>
<th>All Conditions Met?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Left</td>
<td>11:54 am</td>
<td>-43.5</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>Left</td>
<td>11:57 am</td>
<td>-44.2</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Left</td>
<td>12:00 pm</td>
<td>-44.1</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>Right</td>
<td>12:04 pm</td>
<td>41.3</td>
<td>Yes</td>
</tr>
<tr>
<td>5</td>
<td>Right</td>
<td>12:07 pm</td>
<td>40.3</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>Right</td>
<td>12:10 pm</td>
<td>40.4</td>
<td>Yes</td>
</tr>
</tbody>
</table>
3.0 TEST DATA….continued

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

Average Overall Steering Wheel Angle:

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

\[
\delta_{0.3 \text{ g, overall}} = 42.3 \text{ degrees}
\]
[to nearest 0.1 degree]

REMARKS:

*Note: The vehicle’s lateral acceleration response to steering wheel angle input was not linear up to the calculated steering wheel angle of 80 degrees. Therefore, the actual steering wheel angle used for Slowly Increasing Steer was 60 degrees, which was sufficient to achieve the required 0.50 – 0.60g lateral acceleration.

RECORDED BY: Alan Ida
DATE: 8-31-09

APPROVED BY: Jeff Sankey
DATE: 9-08-09
3.0 TEST DATA….continued

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

VEHICLE MAKE/MODEL/BODY STYLE:  Chevrolet / Express / Bus – not school bus

VEHICLE NHTSA No.: C90113  TEST DATE:  8-31-09

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

Selected Drive Configuration:  2WD - RWD
Selected Mode:  default

Overall steering wheel angle (δ0.3 g, overall)  42.3 degrees
Static Data File Number  0020

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

<table>
<thead>
<tr>
<th>Maneuver #</th>
<th>Clock Time (1.5 – 5 min between each test run)</th>
<th>Commanded Steering Wheel Angle¹ (degrees)</th>
<th>Yaw Rates (degrees/sec)</th>
<th>YRR at 1.0 sec after COS [≤ 35%] %</th>
<th>YRR at 1.75 sec after COS [≤ 20%] %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Scalar</td>
<td>Angle</td>
<td>ψPeak</td>
<td>ψ1.0sec</td>
</tr>
<tr>
<td>1</td>
<td>1:23 pm</td>
<td>1.5° δ0.3 g</td>
<td>63</td>
<td>13.32</td>
<td>-0.13</td>
</tr>
<tr>
<td>2</td>
<td>1:26 pm</td>
<td>2.0° δ0.3 g</td>
<td>85</td>
<td>16.41</td>
<td>-0.09</td>
</tr>
<tr>
<td>3</td>
<td>1:31 pm</td>
<td>2.5° δ0.3 g</td>
<td>106</td>
<td>20.22</td>
<td>-0.10</td>
</tr>
<tr>
<td>4</td>
<td>1:36 pm</td>
<td>3.0° δ0.3 g</td>
<td>127</td>
<td>23.19</td>
<td>-0.14</td>
</tr>
<tr>
<td>5</td>
<td>1:39 pm</td>
<td>3.5° δ0.3 g</td>
<td>148</td>
<td>25.97</td>
<td>-0.25</td>
</tr>
<tr>
<td>6</td>
<td>1:42 pm</td>
<td>4.0° δ0.3 g</td>
<td>169</td>
<td>30.26</td>
<td>-0.13</td>
</tr>
<tr>
<td>7</td>
<td>1:46 pm</td>
<td>4.5° δ0.3 g</td>
<td>190</td>
<td>33.14</td>
<td>0.00</td>
</tr>
<tr>
<td>8</td>
<td>1:49 pm</td>
<td>5.0° δ0.3 g</td>
<td>212</td>
<td>36.87</td>
<td>0.05</td>
</tr>
<tr>
<td>9</td>
<td>1:53 pm</td>
<td>5.5° δ0.3 g</td>
<td>233</td>
<td>33.94</td>
<td>-0.04</td>
</tr>
<tr>
<td>10</td>
<td>1:56 pm</td>
<td>6.0° δ0.3 g</td>
<td>254</td>
<td>39.90</td>
<td>0.52</td>
</tr>
<tr>
<td>11</td>
<td>2:01 pm</td>
<td>6.5° δ0.3 g</td>
<td>275</td>
<td>41.05</td>
<td>0.91</td>
</tr>
</tbody>
</table>

1. Maneuver execution should continue until a steering wheel angle magnitude factor of 6.5° δ0.3 g, overall or 270 degrees is utilized, whichever is greater provided the calculated magnitude of 6.5° δ0.3 g, overall is less than or equal to 300 degrees. If 6.5° δ0.3 g, overall is less than 270 degrees maneuver execution should continue by increasing the steering wheel angle magnitude by multiples of 0.5° δ0.3 g, 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**

<table>
<thead>
<tr>
<th>Maneuver #</th>
<th>Clock Time (1.5 – 5 min between each test run)</th>
<th>Commanded Steering Wheel Angle¹ (degrees)</th>
<th>Yaw Rates (degrees/sec)</th>
<th>YRR at 1.0 sec after ( \text{COS} ) ([&lt; 35%])</th>
<th>YRR at 1.75 sec after ( \text{COS} ) ([&lt; 20%])</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Scalar Angle</td>
<td>( \psi_{\text{Peak}} )</td>
<td>( \psi_{1.0\text{sec}} )</td>
<td>( \psi_{1.75\text{sec}} )</td>
<td>% Pass/Fail</td>
</tr>
<tr>
<td>1</td>
<td>1:49 pm 1.5° ( \delta_{0.3g} )</td>
<td>63</td>
<td>-12.66</td>
<td>0.23</td>
<td>0.19</td>
</tr>
<tr>
<td>2</td>
<td>1:52 pm 2.0° ( \delta_{0.3g} )</td>
<td>85</td>
<td>-15.72</td>
<td>0.11</td>
<td>0.02</td>
</tr>
<tr>
<td>3</td>
<td>1:56 pm 2.5° ( \delta_{0.3g} )</td>
<td>106</td>
<td>-19.34</td>
<td>0.12</td>
<td>0.06</td>
</tr>
<tr>
<td>4</td>
<td>1:59 pm 3.0° ( \delta_{0.3g} )</td>
<td>127</td>
<td>-23.51</td>
<td>0.14</td>
<td>0.04</td>
</tr>
<tr>
<td>5</td>
<td>2:02 pm 3.5° ( \delta_{0.3g} )</td>
<td>148</td>
<td>-25.72</td>
<td>0.35</td>
<td>0.15</td>
</tr>
<tr>
<td>6</td>
<td>2:05 pm 4.0° ( \delta_{0.3g} )</td>
<td>169</td>
<td>-30.61</td>
<td>0.23</td>
<td>0.27</td>
</tr>
<tr>
<td>7</td>
<td>2:08 pm 4.5° ( \delta_{0.3g} )</td>
<td>190</td>
<td>-31.87</td>
<td>-0.14</td>
<td>-0.07</td>
</tr>
<tr>
<td>8</td>
<td>2:11 pm 5.0° ( \delta_{0.3g} )</td>
<td>212</td>
<td>-36.97</td>
<td>0.01</td>
<td>0.11</td>
</tr>
<tr>
<td>9</td>
<td>2:14 pm 5.5° ( \delta_{0.3g} )</td>
<td>233</td>
<td>-39.29</td>
<td>0.34</td>
<td>0.31</td>
</tr>
<tr>
<td>10</td>
<td>2:18 pm 6.0° ( \delta_{0.3g} )</td>
<td>254</td>
<td>-40.17</td>
<td>0.45</td>
<td>0.10</td>
</tr>
<tr>
<td>11</td>
<td>2:21 pm 6.5° ( \delta_{0.3g} )</td>
<td>275</td>
<td>-37.32</td>
<td>0.31</td>
<td>0.27</td>
</tr>
</tbody>
</table>

1. Maneuver execution should continue until a steering wheel angle magnitude factor of 6.5° \( \delta_{0.3g, \text{overall}} \) or 270 degrees is utilized, whichever is greater provided the calculated 6.5° \( \delta_{0.3g, \text{overall}} \) is less than or equal to 300 degrees. If 6.5° \( \delta_{0.3g, \text{overall}} \) is less than 270 degrees maneuver execution should continue by increasing the steering wheel angle magnitude by multiples of 0.5° \( \delta_{0.3g, \text{overall}} \) 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 debeading: 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

<table>
<thead>
<tr>
<th>Maneuver #</th>
<th>Initial Steer Direction</th>
<th>Commanded Steering Wheel Angle (5.0*δ0.3g – or greater)</th>
<th>Calculated Lateral Displacement1</th>
<th>Distance (m)</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Counter Clockwise</td>
<td>5.0*δ0.3g</td>
<td>212</td>
<td>2.26</td>
<td>Pass</td>
</tr>
<tr>
<td>9</td>
<td>Counter Clockwise</td>
<td>5.5*δ0.3g</td>
<td>233</td>
<td>2.36</td>
<td>Pass</td>
</tr>
<tr>
<td>10</td>
<td>Counter Clockwise</td>
<td>6.0*δ0.3g</td>
<td>254</td>
<td>2.36</td>
<td>Pass</td>
</tr>
<tr>
<td>11</td>
<td>Counter Clockwise</td>
<td>6.5*δ0.3g</td>
<td>275</td>
<td>2.41</td>
<td>Pass</td>
</tr>
<tr>
<td>8</td>
<td>Clockwise</td>
<td>5.0*δ0.3g</td>
<td>212</td>
<td>2.21</td>
<td>Pass</td>
</tr>
<tr>
<td>9</td>
<td>Clockwise</td>
<td>5.5*δ0.3g</td>
<td>233</td>
<td>2.27</td>
<td>Pass</td>
</tr>
<tr>
<td>10</td>
<td>Clockwise</td>
<td>6.0*δ0.3g</td>
<td>254</td>
<td>2.23</td>
<td>Pass</td>
</tr>
<tr>
<td>11</td>
<td>Clockwise</td>
<td>6.5*δ0.3g</td>
<td>275</td>
<td>2.28</td>
<td>Pass</td>
</tr>
</tbody>
</table>

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
DATE: 8-31-09

APPROVED BY: Jeff Sankey
DATE: 9-08-09
3.0 TEST DATA….continued

DATA SHEET 9 (1 of 2)
MALFUNCTION WARNING TEST

VEHICLE MAKE/MODEL/BODY STYLE: Chevrolet / Express / 15-Passenger Bus – not school bus

VEHICLE NHTSA No.: C90113 TEST DATE: 9-04-09

METHOD OF MALFUNCTION SIMULATION:
Describe method of malfunction simulation: Disconnect Left Front wheel speed sensor connector.

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

X Yes No

Time for telltale to illuminate after ignition system is activated.

3 Seconds (must be within 2 minutes) X Pass Fail

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

X Yes No

Time for telltale to extinguish after ignition system is activated.

3 Second (must be within 2 minutes) X Pass Fail

DATA INDICATES COMPLIANCE: PASS/FAIL PASS

REMARKS:
When wheel speed sensor is disconnected, the ABS malfunction telltale also illuminates and the Driver Information Center displays two messages: Service Stabilitrak and Service Traction Control

The vehicle did not require driving to illuminate or extinguish the malfunction telltale.

RECORDED BY: Alan Ida DATE: 9-04-09
APPROVED BY: Jeff Sankey DATE: 9-08-09
DATA SHEET 9 (2 of 2)
MALFUNCTION WARNING TEST

VEHICLE MAKE/MODEL/BODY STYLE:  
Chevrolet / Express / 15-Passenger Bus – not school bus

VEHICLE NHTSA No.: C90113    TEST DATE: 9-04-09

METHOD OF MALFUNCTION SIMULATION:
Describe method of malfunction simulation: Disconnect Electronic Brake Control Module (EBCM) 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.

[X] Yes  [ ] No

Time for telltale to illuminate after ignition system is activated.

____ 3 _____ Seconds (must be within 2 minutes)  [X] Pass  [ ] Fail

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

[X] Yes  [ ] No

Time for telltale to extinguish after ignition system is activated.

____ 3 _____ Second (must be within 2 minutes)  [X] Pass  [ ] Fail

DATA INDICATES COMPLIANCE:  PASS/FAIL  __PASS__

REMARKS:
When the EBCM connector is disconnected, the, the ABS and Brake malfunction telltales illuminate. Also, the Driver Information Center displays the message: Service Air Bag

The vehicle did not require driving to illuminate or extinguish the malfunction telltale.

RECORDED BY:  Alan Ida
DATE:  9-04-09

APPROVED BY:  Jeff Sankey
DATE:  9-08-09
## 4.0 TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

<table>
<thead>
<tr>
<th>Type</th>
<th>Output</th>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
<th>Specifics</th>
<th>Serial Number</th>
<th>Calibration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tire Pressure Gauge</td>
<td>Vehicle Tire Pressure</td>
<td>0-60psi</td>
<td>0.5 psi</td>
<td>±0.5% of applied pressure</td>
<td>Marsh: Model: 89562 0-60psi</td>
<td>N/A</td>
<td>By: TRC</td>
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<tr>
<td></td>
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<td></td>
<td>Date: 6-04-09</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Due: 9-02-09</td>
</tr>
<tr>
<td>Platform Scales</td>
<td>Vehicle Total, Wheel, and Axle Load</td>
<td>0-2500 lb per each of four pads</td>
<td>0.5 lb</td>
<td>±1.0% of applied load</td>
<td>Mettler Toledo: Model: JXGA1000</td>
<td>5225831-5JC</td>
<td>By: Mettler Toledo</td>
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<tr>
<td></td>
<td></td>
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<td></td>
<td>Date: 8-06-09</td>
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<tr>
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<td></td>
<td></td>
<td>Due: 11-06-09</td>
</tr>
<tr>
<td>Automated Steering Machine with Steering Angle Encoder</td>
<td>Handwheel Angle</td>
<td>±800 deg</td>
<td>0.25 deg</td>
<td>±0.25 deg</td>
<td>Heiz Automotive Testing: Model: Sprint 3</td>
<td>60303</td>
<td>By: TRC</td>
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<tr>
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<td></td>
<td>Date: 11-06-08</td>
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<td></td>
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<td></td>
<td>Due: 11-06-09</td>
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<tr>
<td>Multi-Axis Inertial Sensing System</td>
<td>Longitudinal, Lateral, and Vertical Acceleration</td>
<td>Roll, Yaw, and Pitch Rate</td>
<td>Accelerometers: ±2 g</td>
<td>Accelerometers: ±10 ug</td>
<td>BEI Technologies: Model: MotionPAK MP-1</td>
<td>0767</td>
<td>By: BEI Tech.</td>
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<td>Angular Rate Sensors: ±100 deg/s</td>
<td></td>
<td></td>
<td>Date: 10-13-08</td>
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<td></td>
<td>Angular Rate Sensors: ±0.004 deg/s</td>
<td></td>
<td></td>
<td>Due: 10-13-09</td>
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<tr>
<td>Radar Speed Sensor and Dashboard Display</td>
<td>Vehicle Speed</td>
<td>0-125 mph</td>
<td>0.009 mph</td>
<td>±0.25% of full scale</td>
<td>A-DAT Corp: Radar Model: DRS-6 Display Model: RD-2</td>
<td>1400603</td>
<td>By: A-DAT</td>
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<tr>
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<td>Date: 11-05-08</td>
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<td></td>
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<td>Due: 11-05-09</td>
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<tr>
<td>Ultrasonic Distance Measuring System</td>
<td>Left and Right Side Vehicle Height</td>
<td>5-24 inches</td>
<td>0.01 inches</td>
<td>±0.25% of maximum distance</td>
<td>Massa Products Corporation: Model: M-5000/220</td>
<td>104619 &amp; 104613</td>
<td>By: Consumers Energy Laboratory Services</td>
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<tr>
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<td></td>
<td>Date: 12-10-08</td>
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<td></td>
<td>Due: 12-10-09</td>
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<tr>
<td>Data Acquisition System [Amplify, Anti-Alias, and Digitize]</td>
<td>Record Time; Velocity; Distance; Lateral, Longitudinal, and Vertical Accelerations; Roll, Yaw, and Pitch Rates; Steering Wheel Angle</td>
<td>Sufficient to meet or exceed individual sensors</td>
<td>200 Hz</td>
<td>Sufficient to meet or exceed individual sensors</td>
<td>Dewetron Sidehand: DAS Model: DA-121-16 Digitizer Model: Dewe-Orion-1616-100 Amplifier/AntiAliasing: MDAQ-FILT-10-S</td>
<td>12060-1105</td>
<td>By: Dewetron</td>
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<td></td>
<td>Due: 7-01-10</td>
</tr>
<tr>
<td>Load Cell</td>
<td>Vehicle Brake Pedal Force</td>
<td>0-300 lb</td>
<td>1 lb</td>
<td>±0.05% of full scale</td>
<td>DATRON: Model: DTM-LPA</td>
<td>4970-1103</td>
<td>By: TRC</td>
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<td></td>
<td>Due: per test</td>
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<tr>
<td>Coordinate Measurement Machine</td>
<td>Inertial Sensing System Location</td>
<td>0-10 feet</td>
<td>0.001 inch</td>
<td>±0.003% of full scale</td>
<td>FARO International: Model: Faro Arm N10</td>
<td>U12-05-08-0710</td>
<td>By: FARO</td>
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<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td>Date: 9-26-08</td>
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<td></td>
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<td>Due: 9-26-09</td>
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<td>Outriggers</td>
<td>No output. Safety Item.</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>NHTSA Titanium Outriggers: Model: Docket 2007-27662-11</td>
<td>N/A</td>
<td>N/A</td>
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</tbody>
</table>

- **Model:** Docket Outriggers
- **Serial Number:** 110361
- **Date-Calibrated:** 9-26-08
- **Due:** 9-26-08

- **Model:** NHTSA Titanium Outriggers
- **Serial Number:** 5225831-5JC
- **Date-Calibrated:** 11-06-09
- **Due:** 11-06-09

- **Model:** MDAQ-5000/220
- **Serial Number:** 104619 & 104613
- **Date-Calibrated:** 12-10-08
- **Due:** 12-10-09

- **Model:** DTM-LPA
- **Serial Number:** 4970-1103
- **Date-Calibrated:** 6-04-09
- **Due:** 9-02-09

- **Model:** RD-2
- **Serial Number:** 1400603
- **Date-Calibrated:** 11-05-08
- **Due:** 11-05-09

- **Model:** MotionPAK MP-1
- **Serial Number:** 0767
- **Date-Calibrated:** 10-13-08
- **Due:** 10-13-09

- **Model:** DRS-6
- **Serial Number:** 1400603
- **Date-Calibrated:** 11-05-08
- **Due:** 11-05-09

- **Model:** Sprint 3
- **Serial Number:** 12060-1105
- **Date-Calibrated:** 7-01-09
- **Due:** 7-01-10

- **Model:** Faro Arm N10
- **Serial Number:** U12-05-08-0710
- **Date-Calibrated:** 9-26-08
- **Due:** 9-26-09

- **Model:** Docket
- **Serial Number:** N/A
- **Date-Calibrated:** N/A
- **Due:** 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 AND ESC OFF TELLTALE
5.7 MESSAGE INFORMATION CENTER
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 VEHICLE SPEED SENSOR
5.14 BODY ROLL SENSOR (DRIVER SIDE)
5.15 BODY ROLL SENSOR (PASSENGER SIDE)
5.16 BRAKE PEDAL FORCE TRANSDUCER
2009 CHEVROLET EXPRESS
FMVSS 126
VEHICLE No.: C90113
AUGUST 2009

5.1 ¾ FRONT VIEW FROM LEFT SIDE OF VEHICLE
5.2 ¾ REAR VIEW FROM RIGHT SIDE OF VEHICLE
VEHICLE CERTIFICATION LABEL

MFD BY GENERAL MOTORS CORP. 05/09

GVWR 4355KG(9600LB)  GAWR FRT 1951KG(4300LB)  GAWR RR 2760KG(6084LB)

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

1GAHG39K791171932  TYPE: BUS – NOT SCHOOL BUS

MODEL: G33706

GBG7  TIRE SIZE  SPEED RTG  RIM  COLD TIRE PRESSURE
FRT  LT245/75R16E  S  16X6.5J  340KPA(50PSI)
RR  LT245/75R16E  S  16X6.5J  550KPA(80PSI)
SPA  LT245/75R16E  S  16X6.5J  550KPA(80PSI)

SEE OWNER’S MANUAL FOR MORE INFORMATION

2009 CHEVROLET EXPRESS
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5.3 VEHICLE CERTIFICATION LABEL
### TIRE AND LOADING INFORMATION

<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>LT245/75R16E S</td>
<td>340 kPa, 50 PSI</td>
<td></td>
</tr>
<tr>
<td>REAR</td>
<td>LT245/75R16E S</td>
<td>550 kPa, 80 PSI</td>
<td></td>
</tr>
<tr>
<td>SPARE</td>
<td>LT245/75R16E S</td>
<td>550 kPa, 80 PSI</td>
<td></td>
</tr>
</tbody>
</table>

The combined weight of occupants and cargo should never exceed 1316 kg or 2902 lbs.

---

2009 CHEVROLET EXPRESS
FMVSS 126
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AUGUST 2009
2009 CHEVROLET EXPRESS
FMVSS 126
VEHICLE No.: C90113
AUGUST 2009
5.6 ESC MALFUNCTION AND ESC OFF TELLTALE
5.8 ESC OFF CONTROL
5.9 ¾ FRONT VIEW - TEST VEHICLE INSTRUMENTED

2009 CHEVROLET EXPRESS
FMVSS 126
VEHICLE No.: C90113
AUGUST 2009
5.11 STEERING WHEEL CONTROLLER AND DATA ACQUISITION SYSTEM
5.13 VEHICLE SPEED SENSOR
5.14 BODY ROLL SENSOR (DRIVER SIDE)
5.15 BODY ROLL SENSOR (PASSENGER SIDE)
5.16 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 DATA PLOTS

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

Steering Angle (degrees)

Time (s)

Yaw Rate (deg/sec)

Time (s)
Figure 2. Steering Angle, Lateral Acceleration, and Lateral Displacement Time History, Counter-Clockwise Initial Steer Tests
6.0 DATA PLOTS...continued

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
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
Instrument Panel Overview

2009 CHEVROLET EXPRESS
FMVSS 126
VEHICLE No.: C90113
AUGUST 2009

7.1 OWNERS MANUAL PAGES
Instrument Panel Cluster

The instrument panel cluster is designed to display how the vehicle is running. It shows how fast the vehicle is going, how much fuel is being used, and many other things needed to drive safely and economically. If the vehicle has the DURAMAX Diesel engine, see the DURAMAX Diesel manual for more information.

United States version shown, Canada similar
The main components of the instrument panel are the following:

A. Outlet Adjustment on page 3-20.
B. Driver Information Center (DIC) on page 3-41.
C. Turn Signal/Multifunction Lever on page 3-7.
D. Hazard Warning Flashers on page 3-6.
G. Climate Control System on page 3-18.
H. Audio System(s) on page 3-64.
   I. Exterior Lamps on page 3-12.
L. Tilt Wheel on page 3-6.
M. Horn on page 3-6.
N. Audio Steering Wheel Controls on page 3-83.
O. Tow/Haul Mode Button. See “Tow/Haul Mode” under Towing a Trailer on page 4-27.
P. Accessory Power Outlet(s) on page 3-17 and Ashtray(s) and Cigarette Lighter on page 3-18.
Q. StabiliTrak® System on page 4-6 (If Equipped).
S. Storage Areas on page 2-35.
T. Passenger Airbag Status Indicator on page 3-29.
U. Rear Heating System on page 3-21 (If Equipped).
Windshield Washer

The windshield wiper paddle is located on top of the multifunction lever.

(Washer Fluid): Push the paddle to spray washer fluid on the windshield. The wipers will clear the window and then either stop or return to the preset speed.

⚠️ CAUTION:

In freezing weather, do not use your washer until the windshield is warmed. Otherwise the washer fluid can form ice on the windshield, blocking your vision.

Cruise Control

⚠️ CAUTION:

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.

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

When the brakes are applied, cruise control is turned off.

If the vehicle has StabiliTrak®, and the system begins to limit wheel spin, cruise control will automatically disengage. See StabiliTrak® System on page 4-6. When road conditions allow the cruise control to be safely used again, it can be turned back on.
Instrument Panel Cluster

The instrument panel cluster is designed to display how the vehicle is running. It shows how fast the vehicle is going, how much fuel is being used, and many other things needed to drive safely and economically. If the vehicle has the DURAMAX Diesel engine, see the DURAMAX Diesel manual for more information.

United States version shown, Canada similar
StabiliTrak® Indicator Light

For vehicles with the StabiliTrak® system, this light comes on or flashes, according to the description table for the StabiliTrak system.

For more information, see StabiliTrak® System on page 4-6.

Three chimes sound if the light turns on and one chime if the light turns off.

If this light remains on steady, the vehicle needs to be taken in for service.

Engine Coolant Temperature Gage

This gage shows the engine coolant temperature. It also provides an indicator of how hard the vehicle is working. During a majority of the operation, the gage will read 210°F (100°C) or less. If the vehicle is pulling a load or going up hills, it is normal for the temperature to fluctuate and approach the 250°F (122°C) mark. If the gage reaches the 260°F (125°C) mark, it indicates that the cooling system is working beyond its capacity.

See Engine Overheating on page 5-32.
SERVICE A/C SYSTEM
This message displays when the electronic sensors that control the air conditioning and heating systems are no longer working. Have the climate control system serviced by your dealer/retailer if you notice a drop in heating and air conditioning efficiency.

SERVICE AIR BAG
This message displays if there is a problem with the airbag system. Have your dealer/retailer inspect the system for problems. See Airbag Readiness Light on page 3-27 and Airbag System on page 1-56 for more information.

SERVICE BATTERY CHARGING SYSTEM
On some vehicles, this message displays if there is a problem with the battery charging system. Under certain conditions, the charging system light may also turn on in the instrument panel cluster. See Charging System Light on page 3-30. Driving with this problem could drain the battery. Turn off all unnecessary accessories. Have the electrical system checked as soon as possible. See your dealer/retailer.

SERVICE BRAKE SYSTEM
This message displays along with the brake system warning light if there is a problem with the brake system. See Brake System Warning Light on page 3-31. If this message appears, stop as soon as possible and turn off the vehicle. Restart the vehicle and check for the message on the DIC display. If the message is still displayed or appears again when you begin driving, the brake system needs service as soon as possible. See your dealer/retailer.

SERVICE STABILITRAK
If your vehicle has StabiliTrak® and this message displays, it means there may be a problem with the StabiliTrak system. If you see this message, try to reset the system. Stop; turn off the engine for at least 15 seconds; then start the engine again. If this message still comes on, it means there is a problem. You should see your dealer/retailer for service. The vehicle is safe to drive, however, you do not have the benefit of StabiliTrak, so reduce your speed and drive accordingly.
SERVICE THEFT DETERRENT SYSTEM
This message displays when there is a problem with the theft-deterrent system. The vehicle may or may not restart so you may want to take the vehicle to your dealer/retailer before turning off the engine. See PASS-Key® III+ Electronic Immobilizer Operation on page 2-17 for more information.

SERVICE TIRE MONITOR SYSTEM
If your vehicle has the Tire Pressure Monitor System (TPMS), this message displays if a part on the system is not working properly. The tire pressure light also flashes and then remains on during the same ignition cycle. See Tire Pressure Light on page 3-34. Several conditions may cause this message to appear. See Tire Pressure Monitor Operation on page 5-67 for more information. If the warning comes on and stays on, there may be a problem with the TPMS. See your dealer/retailer.

SERVICE TRACTION CONTROL
If your vehicle has StabiliTrak, this message displays when there is a problem with the Traction Control System (TCS). When this message displays, the system will not limit wheel spin. Adjust your driving accordingly. See your dealer/retailer for service. See StabiliTrak® System on page 4-6 for more information.

SERVICE TRANSMISSION
This message displays when there is a problem with the transmission. See your dealer/retailer for service.

SERVICE VEHICLE SOON
This message displays when a non-emissions related malfunction occurs. Have the vehicle serviced by your dealer/retailer as soon as possible.

STABILITRAK NOT READY
If your vehicle has StabiliTrak, this message may display and the StabiliTrak indicator light on the instrument panel cluster may be on after first driving the vehicle and exceeding 20 mph (32 km/h) for 30 seconds. The StabiliTrak system is not functional until the light has turned off. See StabiliTrak® System on page 4-6 for more information.
STABILITRAK OFF

If your vehicle has StabiliTrak, this message displays when you turn off StabiliTrak, or when the stability control has been automatically disabled. To limit wheel spin and realize the full benefits of the stability enhancement system, you should normally leave StabiliTrak on. However, you should turn StabiliTrak off if your vehicle gets stuck in sand, mud, ice, or snow and you want to rock your vehicle to attempt to free it, or if you are driving in extreme off-road conditions and require more wheel spin. See If Your Vehicle is Stuck in Sand, Mud, Ice, or Snow on page 4-18. To turn the StabiliTrak system on or off, see StabiliTrak® System on page 4-6.

There are several conditions that can cause this message to appear.

• One condition is overheating, which could occur if StabiliTrak activates continuously for an extended period of time.
• The message also displays if the brake system warning light is on. See Brake System Warning Light on page 3-31.

• The message could display if the stability system takes longer than usual to complete its diagnostic checks due to driving conditions.
• The message displays if an engine or vehicle related problem has been detected and the vehicle needs service. See your dealer/retailer.
• The message also displays if the vehicle is shifted into 4LO.

The message turns off as soon as the conditions that caused the message to be displayed are no longer present.

STARTING DISABLED SERVICE THROTTLE

This message displays if the starting of the engine is disabled due to the electronic throttle control system. Have your vehicle serviced by your dealer/retailer immediately.

This message only appears while the ignition is in ON/RUN, and will not disappear until the problem is resolved.

This message cannot be acknowledged.
TIGHTEN GAS CAP

This message may display and a chime may be heard along with the check engine light on the instrument panel cluster if the vehicle’s fuel cap is not tightened properly. See Malfunction Indicator Lamp on page 3-34. Reinstall the fuel cap fully. See Filling the Tank on page 5-10. The diagnostic system can determine if the fuel cap has been left off or improperly installed. A loose or missing fuel cap allows fuel to evaporate into the atmosphere. A few driving trips with the cap properly installed should turn this light and message off.

TIRE LEARNING ACTIVE

If your vehicle has the Tire Pressure Monitor System (TPMS), this message displays when the system is re-learning the tire positions on your vehicle. See DIC Operation and Displays on page 3-41 for more information. The tire positions must be re-learned after rotating the tires or after replacing a tire or sensor. See Tire Inspection and Rotation on page 5-71, Tire Pressure Monitor System on page 5-66, and Inflation - Tire Pressure on page 5-64 for more information.

TRACTION CONTROL OFF

If your vehicle has StabiliTrak, this message displays when the Traction Control System (TCS) is turned off. Adjust your driving accordingly. See StabiliTrak System on page 4-6 for more information.

TRANSMISSION HOT IDLE ENGINE

Notice: If you drive your vehicle while the transmission fluid is overheating and the transmission temperature warning is displayed on the instrument panel cluster and/or DIC, you can damage the transmission. This could lead to costly repairs that would not be covered by your warranty. Do not drive your vehicle with overheated transmission fluid or while the transmission temperature warning is displayed.

This message displays along with a chime if the transmission fluid in the vehicle gets hot. Driving with the transmission fluid temperature high can cause damage to the vehicle. Stop the vehicle and let it idle to allow the transmission to cool. This message clears and the chime stops when the fluid temperature reaches a safe level.

TURN SIGNAL ON

This message displays and a chime sounds if a turn signal is left on for 3/4 of a mile (1.2 km). Move the turn signal/multifunction lever to the off position.
StabiliTrak® System

The vehicle may have a vehicle stability enhancement system called StabiliTrak. It is an advanced computer controlled system that assists the driver with directional control of the vehicle in difficult driving conditions. StabiliTrak activates when the computer senses a discrepancy 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 assist the driver with keeping the vehicle on the intended path.

When the vehicle is started and begins to move, the system performs several diagnostic checks to insure there are no problems. The system may be heard or felt while it is working. This is normal and does not mean there is a problem with the vehicle. The system should initialize before the vehicle reaches 20 mph (32 km/h). In some cases, it may take approximately 2 miles (3.2 km) of driving before the system initializes.

For more information, see StabiliTrak® Indicator Light on page 3-33.

Press and hold the StabiliTrak button located on the instrument panel for more than five seconds to turn off StabiliTrak and part of the traction control system.

The StabiliTrak light comes on the instrument panel cluster when the system is turned off or requires service.
For your safety, the system can only be disabled when the vehicle speed is less than 20 mph (32 km/h). Three chimes will be heard and the StabiliTrak light comes on.

To turn on the StabiliTrak system, press the StabiliTrak button again. StabiliTrak will automatically turn back on when the vehicle speed exceeds 20 mph (32 km/h). One chime is heard and the StabiliTrak light will turn off.

When the StabiliTrak system has been turned off, system noises may still be heard as a result of the brake-traction control coming on.

It is recommended to leave the system on for normal driving conditions, but it may be necessary to turn the system off if the vehicle is stuck in sand, mud, ice or snow, and you want to “rock” the vehicle to attempt to free it. See If Your Vehicle is Stuck in Sand, Mud, Ice, or Snow on page 4-18.

StabiliTrak System Operation

The StabiliTrak system is normally on, except when the system is initializing or has been disabled with the StabiliTrak button. The StabiliTrak system will automatically activate to assist the driver in maintaining vehicle directional control in most driving conditions. When activated, the StabiliTrak system may reduce engine power to the wheels and apply braking to individual wheels as necessary to assist the driver with vehicle directional control. If cruise control is being used when StabiliTrak activates, the cruise control automatically disengages. The cruise control can be re-engaged when road conditions allow. See Cruise Control on page 3-9.

The StabiliTrak system may also turn off automatically if it determines that a problem exists with the system. If the problem does not clear itself after restarting the vehicle, see your dealer/retailer for service.
Traction Control Operation
The traction control system is part of the StabiliTrak system. Traction control limits wheel spin by reducing engine power to the wheels and by applying brakes to each individual wheel as necessary.
If the brake-traction control system activates constantly or if the brakes have heated up due to high speed braking, the brake-traction control will be automatically disabled. The system will come back on after the brakes have cooled. This can take up to two minutes or longer depending on brake usage.
The traction control system may activate on dry or rough roads or under conditions such as heavy acceleration while turning or abrupt upshifts/downshifts of the transmission. When this a reduction in acceleration may be noticed, or a noise or vibration may be heard. This is normal.
Adding non-dealer/non-retailer accessories can affect the vehicle’s performance. See Accessories and Modifications on page 5-3 for more information.

Locking Rear Axle
Vehicles with a locking rear axle can give more traction on snow, mud, ice, sand or gravel. It works like a standard axle most of the time, but when traction is low, this feature will allow the rear wheel with the most traction to move the vehicle.

All-Wheel Drive (AWD) System
If the vehicle has this feature, engine power is sent to all four wheels when extra traction is needed. This is like four-wheel drive, but there is no separate lever or switch to engage or disengage the front axle. It is fully automatic, and adjusts itself as needed for road conditions.
Different Size Tires and Wheels

If you add wheels or tires that are a different size than your original equipment wheels and tires, this could affect the way your vehicle performs, including its braking, ride and handling characteristics, stability, and resistance to rollover. Additionally, if your vehicle has electronic systems such as anti-lock brakes, rollover airbags, traction control, and electronic stability control, the performance of these systems can be affected.

⚠️ CAUTION:

If you add different sized wheels, your vehicle may not provide an acceptable level of performance and safety if tires not recommended for those wheels are selected. You may increase the chance that you will crash and suffer serious injury. Only use GM specific wheel and tire systems developed for your vehicle, and have them properly installed by a GM certified technician.

See Buying New Tires on page 5-74 and Accessories and Modifications on page 5-3 for additional information.
7.2 VEHICLE ARRIVAL CONDITION REPORT

CONTRACT NO.  DTNH22-08-P-0097          DATE:  8/24/09

FROM:  Corporate Auto

TO:   TRC

PURPOSE:  Initial  Received  Present
          Receipt  via  Transfer  vehicle condition

MODEL YEAR/MAKE/MODEL/BODY STYLE:  2009 / Chevrolet / Express / 15-
Passenger Bus – not school bus

MANUFACTURE DATE:  05/09          NHTSA NO.:  C90113

BODY COLOR:  Sport Red Metallic   VIN:  1GAHG39K791171932

ODOMETER READING:  7 miles          GVWR:  4,355 KG

PURCHASE PRICE: $  rented / leased  DEALER’S NAME:  Prestige Chevrolet-
Pontiac-Buick-GMC, Inc.,  444 James L Hart Parkway,  Ypsilanti, MI 48197-9790

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:  8-24-09
APPROVED BY:  Jeff Sankey          DATE:  9-08-09
7.3 VEHICLE COMPLETION CONDITION REPORT

CONTRACT NO. DTNH22-08-P-0097 DATE: 9/4/09


MANUFACTURE DATE: 05/09 NHTSA NO.: C90113

BODY COLOR: Sport Red Metallic VIN: 1GAHG39K791171932

ODOMETER READING: 63 miles GVWR: 4,355 KG

LIST OF FMVSS TESTS PERFORMED BY THIS LAB: 126

X THERE ARE NO DENTS OR OTHER INTERIOR OR EXTERIOR FLAWS
X THE VEHICLE HAS BEEN PROPERLY MAINTAINED 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

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: 9-04-09
APPROVED BY: Jeff Sankey DATE: 9-08-09
# 7.4 SINE WITH DWELL TEST RESULTS

## 2009 Chevrolet Express 3500

**NHTSA No.: C90113**

Date Created: 31-Aug-09

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## 7.4 SINE WITH DWELL TEST RESULTS

2009 Chevrolet Express 3500  
NHTSA No.: C90113

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### 7.5 SLOWLY INCREASING STEER TEST RESULTS

**2009 Chevrolet Express**  
NHTSA No.: C90113

**Date Created:** 31-Aug-09

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<tr>
<th>File</th>
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<th>EventPt</th>
<th>DOS</th>
<th>MES [mph]</th>
<th>Mean SPD [mph]</th>
<th>AYcount_3</th>
<th>THETAENCF_3 [degree]</th>
<th>AYCG_CD2_3 [g]</th>
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**Averages**  
- Mean SPD: 50.513436  
- THETAENCF: -43.906379  
- AYCG_CD2: -0.301062

**Scalars**  
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### 7.6 INERTIAL SENSING SYSTEM LOCATION COORDINATES

2009 Chevrolet Express 3500  
NHTSA No.: C90113

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<td>units</td>
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<table>
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<th>ActualY</th>
<th>ActualZ</th>
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</tbody>
</table>

**Track Width:** 1735.137

**Roof Height (relative to ground):** 2094.121

**Motion Pak - x-distance:** 1522.689
**Motion Pak - y-distance:** -15.9707
**Motion Pak - z-distance:** 715.797

**Motion Pak - x-distance (inches):** 59.948
**Motion Pak - y-distance (inches):** -0.629
**Motion Pak - z-distance (inches):** 28.181