



Electronic Stability Control Performance - FMVSS 126 ESC Switch Mode and Driver Selected Vehicle Mode Compliance

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. To demonstrate compliance to Federal Motor Vehicle Safety Standard (FMVSS) 126 Electronic Stability Control Systems section 5.4 as follows:

- **S5.4 Electronic Stability Control (ESC) Off and Other System Controls.** The manufacturer may include an “ESC Off” control whose only purpose is to place the ESC system in a mode or modes in which it will no longer satisfy the performance requirement of S5.2.1 (1.0 s yaw velocity ratio), S5.2.2 (1.75 s yaw velocity ratio) and S5.2.3 (1.07 s lateral displacement). Manufacturers may also provide controls for other systems that have an ancillary effect upon ESC operation. Controls of either kind that place the ESC system in a mode in which it will no longer satisfy the performance requirements of S5.2.1, S5.2.2 and S5.2.3 are permitted, provided that:
 - **S5.4.1** The vehicle’s ESC system must always return to the manufacturer’s original default ESC mode that satisfies the requirements of S5.1 and S5.2 at the initiation of each new ignition cycle, regardless of what ESC mode the driver had previously selected, unless (a) the vehicle is in a low-range four-wheel drive configuration selected by the driver on the previous ignition cycle that is designed for low-speed, off-road driving, or (b) the vehicle is in a four-wheel drive configuration selected by the driver on the previous ignition cycle that is designed for operation at higher speeds on snow-, sand- or dirt-packed roads and that has the effect of locking the drive gears at the front and rear axles together, provided that the vehicle meets the stability performance requirements of S5.2.1 and S5.2.2 in this mode.
 - **S5.4.2** In addition to the requirements of S5.4.1, if the vehicle’s ESC system has more than one ESC mode that satisfies the requirements of S5.1 and S5.2 within the drive configuration selected of the previous ignition cycle, the system must return to the manufacturer’s original default ESC mode.
 - **S5.4.3** As of September 1, 2011, a control whose only purpose is to place the ESC system in a mode or modes in which it will no longer satisfy the performance requirements of S5.2.1, S5.2.2 and S5.2.3 must be identified by the symbol shown for “ESC Off” in Table 1 of Standard No. 101 (49 Code of Federal Regulations (CFR) 571.101) or the text, “ESC Off” as listed under “Word(s) or Abbreviations” in Table 1 of Standard No. 101 (49 CFR 571.101).
 - **S5.4.4** A control for another system that has the ancillary effect of placing the ESC system in a mode in which it no longer satisfies the performance requirements of S5.2.1, S5.2.2 and S5.2.3 need not be identified by the “ESC Off” identifiers in Table 1 of Standard No. 101 (49 CFR 571.101), but the ESC status must be identified by the “ESC Off” Telltale in accordance with S5.5, as of September 1, 2011, except if the vehicle is in a four-wheel drive high gear configuration that has the effect of locking the drive gears at the front and rear axles together provided the vehicle meets the stability performance criteria of S5.2.1 and S5.2.2.

1.2 Applicability. This procedure is applicable to passenger vehicles and light trucks up to 4535.9 kg Gross Vehicle Weight (GVW) sold in the United States.

1.3 Remarks. Not applicable.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

49 CFR 571.101 FMVSS 126

2.2 GM Standards/Specifications.

None

2.3 Additional References. None.

3 Resources

3.1 Facilities. Not applicable.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.2 Equipment. Not applicable.

3.3 Test Vehicle/Test Piece. Chassis Controls Performance Engineer will need to determine the number of vehicle configurations as they relate to EBCM modes accessed using the ESC Off switch or by changing the driver selectable Vehicle Mode. Differences in instrument panel and switch hardware/software must also be considered. This will determine the number of test vehicles that will be required for this test procedure.

3.4 Test Time.

Calendar time: 0.5 d

Test time: 1.0 h per vehicle configuration

Coordination time: 1.0 h

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. FMVSS 126 Vehicle Dynamics Center Compliance Officer or equivalent is required to perform test procedure to determine compliance to FMVSS 126 standard.

4 Procedure

4.1 Preparation. Obtain test procedure template Excel file from FMVSS 126 Vehicle Dynamics Center Compliance Officer. An example of the test procedure template is provided in Appendix A, Figure A1.

4.2 Conditions.

4.2.1 Environmental Conditions. Not applicable.

4.2.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

4.3 Instructions.

4.3.1 Record vehicle fleet number, vehicle identification number, vehicle model year, vehicle make, vehicle model name, vehicle build level (mule, integration vehicle, saleable, etc.), and platform code (E2UB, E2UL, T1 LDPU, etc.)

4.3.2 Cycle ignition on and determine location of ESC related telltales that include Service/ESC active, ESC Off and Traction Control Off. Note that some vehicles may not have all three (3) of these telltales if ESC and/or Traction Control are not allowed to be disabled by the driver. Also note that the telltales can exist as part of a Driver Information Center (DIC) common space.

4.3.3 Record the ESC related telltales and document that they each have at least a 2 s bulb check function after each ignition cycle.

4.3.4 Determine and record whether the vehicle has a starter interlock function that has an effect on ESC operation.

4.3.5 Determine and record whether the vehicle has an ESC and/or Traction Control disable switch. For vehicle with an ESC disable switch, record the switch location and the switch symbol. The switch symbol shall state