

VEHICLE INFORMATION / TEST SPECIFICATIONS

FMVSS No. 126

VEHICLE MODEL YEAR AND MAKE: _____

VEHICLE MODEL AND BODY STYLE: _____

1. Identify stability systems available for the test vehicle and note if system is standard or optional.

<u>System</u>	<u>Standard</u>	<u>Optional</u>
Electronic Stability Control (ESC).....	<input type="checkbox"/>	<input type="checkbox"/>
Traction Control	<input type="checkbox"/>	<input type="checkbox"/>
Roll Stability Control.....	<input type="checkbox"/>	<input type="checkbox"/>
Active Suspension.....	<input type="checkbox"/>	<input type="checkbox"/>
Electronic Throttle Control.....	<input type="checkbox"/>	<input type="checkbox"/>
Active Steering.....	<input type="checkbox"/>	<input type="checkbox"/>
<u>Other:</u>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Other:</u>	<input type="checkbox"/>	<input type="checkbox"/>

2. ESC System Information and Operational Characteristics:

NOTE: Any answers below that refer to a separate document must include reference to the exact page, section, paragraph and sentence(s) within that document where the answers can be found. Manufacturers must verify that the actual answer is included in the referenced document.

- A. Provide a copy of the owner's manual sections that pertain to ESC. Include sections that identify symbols, locations and operation of telltales; identification, location, labeling and operation of any related controls; and ESC system operation and performance.
- B. Provide tier-one ESC system supplier and model number.
- C. Describe separately how the ESC system determines yaw rate and driver steering inputs.
- D. Explain how the system estimates vehicle side slip or side slip derivative with respect to time. For example, if the ESC computer collects actual vehicle

- speed, wheel speed, steering angle and lateral acceleration data and this data is used to calculate an estimated side slip provide this discussion in your explanation. Explain what actual data is collected and used, where the data comes from, whether the side slip or the side slip derivative is calculated or estimated. **If values are calculated the equations used need not be provided.**
- E. Explain how the system generates brake torques individually at each wheel. For example, if the vehicle uses a conventional hydraulic service brake system modified to include a hydraulic manifold and associated electronic control unit including a control algorithm to direct hydraulic pressure to the service brake at each wheel individually to address vehicle instabilities provide this discussion in your explanation.
 - F. Explain how and when your vehicle's ESC system modifies engine torque to maintain vehicle stability. The explanation should include a discussion of what conditions might trigger a command to reduce engine torque, and the identification of what means is used to achieve engine torque reduction (ignition or spark timing, fuel delivery, etc.).
 - G. Provide a vehicle diagram that indicates the approximate location of each ESC system component.
 - H. Provide a system diagram that indicates how all the ESC system components are connected.
 - I. Identify the speed at which the ESC system becomes fully active.
 - J. Is the ESC system active during **ALL** the following driving phases (acceleration, deceleration, coasting, during activation of the ABS or traction control)? If no, explain.
 - K. Identify all vehicle selectable drive configurations (2WD, AWD, 4WD Hi, 4WD Lo, etc.) and corresponding modes within each drive configuration (ESC On, ESC Off, ESC performance, etc.) as defined in FMVSS 126, paragraph S4. Definitions.
 - L. Describe any ESC system operational initialization requirements.
 - M. Describe and provide a simple logic diagram to illustrate how the vehicle's ESC system mitigates oversteer conditions. Include the pertinent inputs to the ESC system computer, a description of how the inputs are used to make calculations and provide data to an algorithm, and the outputs to vehicle components (i.e., brakes, engine, etc.) that mitigate vehicle oversteer conditions.

- N. Describe and provide a simple logic diagram to illustrate how the vehicle's ESC system mitigates understeer conditions. Include the pertinent inputs to the ESC system computer, a description of how the inputs are used to make calculations and provide data to an algorithm, and the outputs to vehicle components (i.e., brakes, engine, etc.) that mitigate vehicle understeer conditions.

3. ESC Malfunction Telltale

- A. Provide details of the vehicle's malfunction telltale location, symbol and/or abbreviations used and illumination color.
- B. State whether or not vehicle displays any ESC system malfunction information or messages on a common display. Specify what ESC information can be displayed.

4. ESC OFF Telltale and Controls (if available)

- A. Provide details of the vehicle's ESC off telltale location, symbol and/or abbreviations used and illumination color.
- B. State whether or not the vehicle displays any ESC system on/off and activation/deactivation information or messages on a common display. Specify what ESC information can be displayed.
- C. For vehicles equipped with an "ESC OFF" control (dedicated or multi-functional) provide details of the control location, labeling, method of operation and selectable settings.
- D. Provide detailed explanation of other system controls that have an ancillary effect on ESC Operation (i.e. low speed off-road axle/transfer case). Include an explanation of how the ESC off telltale is affected by activation or deactivation of each control.

5. ESC Malfunction Simulation

- A. Provide two methods that can be used to simulate an ESC system malfunction. The simulations may include fuse removal, disconnection of power to specific ESC components or disconnection of electrical connections to or between ESC components. Each method specified should be unique (i.e. disconnecting two wheel speed sensors does not constitute two different methods). Provide the following information for each method:
 - 1) Simple instructions that would allow a test lab to execute each method provided without special equipment or tools or without causing damage to the test vehicle.

- 2) Detailed procedures and figures on how to access the necessary ESC system components and/or their connections.
 - 3) The necessary steps to restore the system back to normal and extinguish the ESC malfunction telltale after the malfunction has been corrected. (i.e. driving the vehicle at speed, right/left hand turn inputs, multiple good drive cycles, etc).
- B. List the ESC system component failure modes identified by the vehicle's ESC malfunction indicator.
- C. List other system component and associated failure modes that will also disable the ESC system and are identified by the vehicle's ESC malfunction indicator. (i.e. Check engine light, TPMS, etc)