



12V Start/Stop Low Voltage Robustness Development Test

1 Scope

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 investigate the effects of voltage degradation on the operation and functionality of a vehicle's electrical system and subsystems while the vehicle is in dynamic real time conditions during repeated 12V Stop/Start events.

1.2 Foreword. This test is a development test originally written for the 2010 North American Car Group new vehicle programs to test the vehicle under circumstances not currently addressed in any other tests. This test is intended to be a standard test for all new vehicle platforms with 12V Stop/Start capability.

1.3 Applicability. This test procedure applies to all global vehicles with the 12V Stop/Start system.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

None

2.3 Additional References.

CG3364

3 Resources

3.1 Facilities.

3.1.1 The initial vehicle prep portion of the procedure should be performed in a test garage or equivalent facility.

3.1.2 This static test should be performed in a test garage or equivalent facility.

3.2 Equipment.

3.2.1 High electrical contented vehicle with 12V Stop/Start functionality.

3.2.2 One 30% State of Charge (SOC) battery.

3.2.3 One 100% SOC battery or battery charger.

3.2.4 General Motors Local Area Network (GMLAN) vehicle communications data monitoring device.

3.2.5 Tools to disconnect/reconnect vehicle's battery.

3.2.6 Battery jumper cables.

3.2.7 Digital oscilloscope to monitor vehicle system voltage with data storage/export capability.

3.3 Test Vehicle/Test Piece. The test vehicle should be highly electrically contented and include the latest production intent electrical subsystems and components. The tester should also have access to the production intent mechanization/layout of the wiring, components, and their connections.

3.4 Test Time.

Calendar time: 2 days to 3 days
Test hours: 5 hours to 10 hours
Coordination hours: 10 hours to 15 hours

3.5 Test Required Information.

 Not applicable.

3.6 Personnel/Skills.

3.6.1 While it is possible for a single person to execute this procedure, it is recommended to perform this test with two people because of the number of variables and features being monitored.

3.6.2 The person/people performing the test should be familiar with basic vehicle system functionality and know how the 12V Stop/Start subsystem operates.

3.6.3 The Test Engineers performing the test should be familiar with Diagnostic Trouble Codes (DTC) and the 12V Stop/Start system.

4 Procedure

4.1 Preparation.

4.1.1 The requesting Engineer must verify that the latest approved hardware and software is available for all modules for a given test start date, even if there is only one module of concentration for testing. Record module software (SW) information using appropriate GMLAN communication tool.

4.1.2 The requesting Engineer must identify if any GMLAN controlled functions exist that should be monitored during the test.

4.1.3 Set up a device to read the vehicle battery voltage (oscilloscope or voltage recording device).

4.1.4 Check vehicle for proper functional operation of the electrical subsystems and the 12V Stop/Start subsystem. Stop/Start system must be functional using the following electronic control module (ECM) CPID \$31 GMLAN messages:

AutoStop = \$7E0 07 AE 31 05 00 00 00 00

AutoStart = \$7E0 07 AE 31 06 00 00 00 00

4.2 Conditions.

4.2.1 Environmental Conditions. Test to be conducted at room temperature ($(23 \pm 5) ^\circ\text{C}$).

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 Setup Instructions.

4.3.1.1 Clear all DTCs from the vehicle using a communications device.

4.3.1.2 Perform a pretest check of the following items listed in 4.3.1.2.1 thru 4.3.1.3.3. Record the results on the Voltage Threshold Test Data Sheet (CG3364).

4.3.1.2.1 DTC Check. Ensure that all DTCs have been cleared and that none are returning. If they are returning, either remedy the problem or note the DTC on the Voltage Threshold Test Data Sheet (CG3364) to show that it was present prior to start of test.

4.3.1.2.2 Vehicle Functional Check. Ensure that all electrical subsystems are functioning as desired. Record exception results on the Voltage Threshold Test Data Sheet (CG3364).

4.3.1.2.3 Stop/Start Functional Check. Ensure that test vehicle has the Stop/Start subsystem fully functional. The test cannot be run if Stop/Start subsystem is not functional. Verify it is possible to perform a test tool commanded Auto Stop (CPID \$31).

4.3.1.3 Replace the vehicle's original battery with the pre-conditioned 30% SOC battery. This should be done without removing power to the Intelligent Battery Sensor (IBS). This will ensure that the IBS does not send out data that will prevent a Stop/Start event from being commanded by the test tool.