



Vehicle Integration Test Procedure

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. The purpose of the vehicle integration test is to determine if the parasitic loads of the entire vehicle electrical system meet program requirements and if there is serial data integrity while running on the battery only.

Note: The requirements are contained in the Program Specific Technical Specifications, as applicable to the program, Appendix C of the Statement of Requirements (SOR), i.e., 14 V Electric Power Generation and Storage (EPGS), High Voltage Contactor Control, Plug-In Charging, and Vehicle Start.

1.2 Applicability. This procedure is applicable to all vehicles.

1.3 Remarks. This is a vehicle level procedure used for development and/or validation purposes to monitor the serial data bus for any serial communication after the vehicle is in the Off/Asleep Mode, while monitoring the parasitic current draw throughout the entire procedure for excessive current draws.

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.

- CG2553 Vehicle Integration Test, Non-Hybrid, GM test execution only.
- CG2613 Vehicle Integration Test, Hybrid, GM test execution only.
- Program Specific Technical Specifications, as applicable to the program, Appendix C of the SOR, i.e., 14 V EPGS, High Voltage Contactor Control, Plug-In Charging, and Vehicle Start.
- Test Matrix, collaboration with GM Vehicle Software Integration and GM Electrical Architecture Engineers.

3 Resources

3.1 Facilities. Most of the testing does not require any special test facilities, however, a test garage with access to the required equipment is recommended.

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.

3.2.1 Parasitic Draw Test Tool J38758 or equivalent, also known as a Battery Disconnect Tool available from Kent Moore Tools at Universal Resource Locator (URL) <https://gmttoolsandequipment.com>.

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3.2.2 Serial data monitoring tool, e.g., ETAS INCA available from URL https://www.etas.com/en/products/inca_software_products.php.

3.2.3 Vehicle capable power supply.

3.2.4 Wire, bus shorts to ground/battery.

3.2.5 Parasitic monitor/data logger tool to record the current for extended observation time, preferred for GM test execution.

3.2.6 Electric current monitoring tools, e.g., a variable range digital volt/ohm/amp meter, also known as a multi-meter, optional for service or quick evaluations, and/or current shunts is required.

Note: For GM test execution, the parasitic monitor/data logger tool also known as the Marvel Tool is available from many instrumentation cribs, as are the ETAS INCA tool and current shunts.

3.3 Test Vehicle/Test Piece. A test vehicle with the latest released production intent electrical parts and software. The vehicle should be equipped with all available electrical options to enable testing of the highest electrical load including:

- Vehicle programs with high voltage contactors (global hybrid vehicles).
- Vehicle programs without silent start feature (global hybrid vehicles).
- Vehicle programs without plugged in charging feature (global hybrid vehicles).

3.4 Test Time.

Calendar time: 20 d ^{Note 1}

Test time: 120 h

Coordination time: 40 h

Note 1: Not including any functional design reviews or Captured Test Fleet (CTF) Monitoring.

3.5 Test Required Information.

3.5.1 Collaboration with GM Vehicle Software Integration and GM Electrical Architecture Engineers. Develop a matrix to verify that the vehicle electrical system powers down to the specified parasitic current level from combinations of different starting point and setup scenarios including:

3.5.1.1 Entering OFF ASLEEP power mode from Retained Accessory Power (RAP) suspended by opening a door.

3.5.1.2 Entering OFF ASLEEP power mode from RAP timing out.

3.5.1.3 Entering OFF ASLEEP power mode from inadvertent load protection time-out, e.g., simulating a customer leaving the interior lights on.

3.5.1.4 Closure wakeups, e.g., every latching switch open, close, leave open.

3.5.1.5 Diagnostic mode requests on each serial data bus.

3.5.1.6 OnStar operation, i.e., OnStar calls should end and OnStar module should sleep when RAP ends.

3.5.1.7 Inadvertent Load Protection (ILP).

3.5.1.8 Logistic mode.

3.5.1.9 Remote Vehicle Start (RVS) operation, i.e., remote start/cancel.

3.5.1.10 Periodic or occasional module wakeups. i.e., body controller wakeups that perform Regulator Voltage Control (RVC) functions such as battery State of Charge (SOC) and parasitic diagnostic checks.

3.5.1.11 OnStar Discontinuous Receive (DRx) modes. **Note:** At time of publication, there are two types:

- a. Wake up for 2 minutes every 10 minutes with current spikes for 2 days
- b. Stay awake at a near steady minimum current level for 2 days

3.5.1.12 Periodic or occasional current draws, e.g., engine coolant fan ON for after-boil, Heating, Ventilation, and Air Conditioning (HVAC) after-blow, fuel tank purge solenoid cycled and energized as part of the engine OFF natural vacuum leak detection function.

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