



Diagnostic Infrastructure Validation Procedure - Component Level

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 this procedure is to test infrastructural diagnostic functionality as specified by the Global General Assembly Service and Engineering (GGSE) team in the GGSE Electronic Control Unit (ECU) Diagnostic Infrastructure Requirements. See Appendix E1 "Electrical Programming and Final Line Testing Bill of Process (BOP)" of the Statement of Requirements (SOR) contractual document.

1.2 Applicability. This procedure applies to all ECUs that are required to meet GGSE ECU Diagnostic Infrastructure Requirements and/or GMW3110 General Motors Local Area Network (GMLAN) Enhanced Diagnostic Test Mode Specification. The type and level of requirements vary, depending on the diagnostic functionality of the ECU. These are defined in the component and the diagnostic specifications.

1.3 Remarks. This procedure is a component/single ECU level test that is executed by the ECU supplier prior to Integration Vehicle Material Required Date (IVMRD). The results shall be approved by GM.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW3110

2.3 Additional References.

- CG2474 GM Diagnostic Infrastructure Validation Procedure - Component Level
- CG2486 Diagnostic testing using CANoe Option DiVa
- CG4077 Ethernet Questionnaire from the SOR
- CG4078 FlexRay Questionnaire from the SOR
- CG4079 Global A Diagnostics Questionnaire from the SOR
- CG4080 Local Interconnect Network (LIN) Questionnaire from the SOR
- CG4081 GMLAN Questionnaire from the SOR
- CG4082 Media Oriented Systems Transport (MOST) Questionnaire from the SOR
- CG4083 Serial Data and Diagnostic Test Plan from the SOR
- ECU Diagnostic Specification (CANdela Document file (cdd)) from the GM Design Release Engineer (DRE)
- ECU Functional Requirements Specification from the GM Bill of Material Family Owner (BFO)
- GGSE ECU Diagnostic Infrastructure Requirements, Appendix E1 of the SOR
- Global Bootloader Specification from the SOR
- GM SupplyPower at <https://gmsupplypower.covisint.com>
- Statement of Requirements

3 Resources

3.1 Facilities. At the supplier site lab, use a bench that allows diagnostic communication between the test tool and the ECU being tested.

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. The minimum required set of equipment to perform this test procedure includes:

3.2.1 Direct Current (DC) Power Supply with 60 A capability (minimum).

3.2.2 Vector CANoe and required hardware from Vector CANtech, Incorporated, Novi, Michigan

3.2.3 GM recommended diagnostic automated testing software, CANoe option DiVa from Vector CANtech. **Note:** See CG2486 "Diagnostic testing using CANoe option DiVa" for instructions on how to generate and run a DiVa configuration.

3.2.4 Additional real and/or simulated loads, if not part of the supplier bench setup.

3.2.5 Measurement equipment for voltage and current.

3.2.6 A computer capable of running the GM recommended diagnostic automated test tool software.

3.2.7 Programmable ECU software with appropriate calibrations or Extensible Markup Language (XML) file.

3.2.8 Rest of the Bus Simulation (RBS) configuration and required hardware from the GM Design Release Engineer (DRE).

3.2.9 Development Programming System (DPS) software, required hardware, and applicable flash programming files.

3.3 Test Vehicle/Test Piece. ECU and all required loads/inputs to test all ECU diagnostics.

3.4 Test Time.

Calendar time: 5 d to 8 d

Test hours: 40 h to 64 h

Coordination hours: 8 h

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills.

3.6.1 Familiarity with specified serial data communications protocol and tool set.

3.6.2 Familiarity with GMLAN diagnostics and requirements.

3.6.3 Familiarity with ECU component functionality.

3.6.4 Familiarity with flash programming procedures and tools.

3.6.5 Familiarity with Vector CANoe and DiVa software.

4 Procedure

4.1 Preparation. The applicable questionnaires (CG4077 Ethernet, CG4078 FlexRay, CG4079 Global A Diagnostics, CG4080 Local Interconnect Network (LIN), CG4081 GMLAN, CG4082 Media Oriented Systems Transport (MOST), and CG4083 Serial Data and Diagnostic Test Plan) shall be submitted to the GM DRE, Component Validation Engineer (CVE), and Subject Matter expert (SME) prior to start of testing.

4.2 Conditions.

4.2.1 Environmental Conditions. Refer to the functional and diagnostic requirement specifications for the ECU as described in 1.3 (ECU Diagnostic Specification, ECU Functional Requirements Specification, GGSE ECU Diagnostic Infrastructure Requirements, and Global Bootloader Specification).

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.