



GM Controller Area Network (CAN) Single Electronic Unit

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 standard is to specify the GM-specific Physical Layer and Protocol Layer requirement test procedures that are required for component level validation testing.

1.2 Applicability. This standard applies to all Electronic Control Units (ECU) that are required to meet General Motors Physical Layer and Protocol Layer requirements for Controller Area Network (CAN) bus devices connected to the in-vehicle CAN networks of Global B architecture vehicles.

1.3 Remarks. This test shall be performed by the ECU supplier and shall be audited by General Motors.

2 References

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

2.1 External Standards/Specifications.

ISO 11898-1 ISO 11898-6 ISO 16845-1 ISO 16845-2
ISO 11898-2

2.2 GM Standards/Specifications.

GMW3097 GMW3172

2.3 Additional References.

- CG3877 GM CAN Physical Layer and Communications Validation Procedure - Component Level
- ECU-specific Component Technical Requirements Specification (CTRS)
- ECU-specific Initial AUTOSAR (ASR) ECUC Automotive Open System Architecture Extensible Markup Language (arxml) file
- GB5200 Communication Strategy Specification
- GB5201 CAN Software Implementation Specification
- GB5210 CAN Private Network Communication Strategy Specification
- GB528X-GB529X CAN Communication System Deployment Specification
- GB6000 Unified Diagnostic Services Specification
- GB6001 Diagnostic Infrastructure Specification
- GB6003 Diagnostic Software Implementation Specification
- GB720x CAN Physical Layer 500 kbps Specification (includes references to ISO 11898-1, ISO 11898-2, ISO 11898-6, ISO 16845-1, ISO 16845-2)
- GB721x CAN Physical Layer 125 kbps Specification
- GB722x CAN Flexible Data (FD) Physical Layer 500 kbps Specification
- GB723x CAN FD Physical Layer 125 kbps Specification
- GB7240 CAN FD Physical Layer Diagnostic Specification
- GB725X CAN Physical Layer Private Specification

- GM Supply Power Portal (<http://gmsupplypower.covisint.com>)
- Statement of Requirements (SOR)
- Vector CANtech, Incorporated, Novi, Michigan

3 Resources

3.1 Facilities.

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.

3.1.3 At the supplier lab, use a bench that allows functional communication between the test tool and the device under test (DUT).

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 minimum capability.

3.2.2 GM-recommended automated scripts for CANoe (software tool for test, development and analysis from Vector CANtech, Incorporated) according to validation tool requirements, as outlined in the respective Statement of Requirements (SOR).

3.2.3 CANoe software from Vector CANtech and required hardware.

3.2.4 Additional real and/or simulated loads as part of the supplier bench setup.

3.2.5 Measurement and plotting equipment for voltage and current.

3.2.6 A computer capable of running the GM-recommended automated test scripts and CANoe.

3.2.7 Rest of the Bus Simulation (RBS) configuration and required hardware.

3.3 Test Vehicle/Test Piece. Electronic Control Unit. Refer to GMW3172 (General Specification for Electrical/Electronic Components Environmental/Durability) and/or the ECU specific SSTS/CTRS for the required operating temperature range of the DUT.

3.4 Test Time.

3.4.1 CG3877 GM CAN Physical Layer and Communications Validation Procedure - Component Level.

Calendar time: 25 days

Test hours: 180 hours

Coordination hours: 20 hours

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills.

3.6.1 Skilled in using electrical measurement equipment and computers.

3.6.2 Familiarity with laboratory equipment, e.g., electrical measurement equipment, such as voltage and resistance meters, hot/cold chambers, etc.

3.6.3 Familiarity with digital storage oscilloscopes (DSO).

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

3.6.5 Familiarity with ECU component functionality.

4 Procedure

4.1 Preparation. Not applicable.

4.2 Conditions.

4.2.1 Environmental Conditions. Conditions shall be consistent with those specified in the ECU functional requirements of the ECU-specific CTRS.

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.