



Outside Air Temperature Functional Test

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. To test the function of the Outside Air Temperature (OAT) subsystem.

1.2 Applicability. This procedure is applicable to all vehicles with OAT systems.

1.3 Remarks. This is a vehicle level procedure and should not be performed until the components have passed the component level tests. The following components make up the OAT system:

- OAT sensor.
- Temperature display (may be part of the Inside Rearview Mirror, Driver Information Center, Heating, Ventilation, Air Conditioning (HVAC) Control Head, etc.)

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.

- CG3889 HVAC OAT Corrected Failsofting Software.
- Control Climate Algorithm (CCA) Release Notes.
- Functional Unit (FU) Class-07 HVAC Settings Report.
- FU Class-042 Customization Electronic Climate Control (ECC).
- HVAC OAT Corrected Failsofting Software Subsystem Technical Specification (SSTS).
- OAT Failsoft Determination Requirements.
- Vehicle Technical Specification (VTS) specific to the vehicle under test.

3 Resources

3.1 Facilities. This procedure should be performed at approved GM test facility.

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 Serial data interface and supporting Personal Computer (PC) application software, e.g., Intrepid NeoVI and Vehicle Spy3.

3.2.2 Two (2) thermocouples.

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3.2.3 Device to read thermocouple output.

3.3 Test Vehicle/Test Piece. Electrical Global A or Global B Architecture System Bench and/or a test vehicle with representative hardware and software.

3.4 Test Time. Test time is based on Hot and Cold weather testing and the ECC Regular Production Option (RPO) as follows:

Calendar time:	2 hot days (> room ambient) 2 cold days (< freezing)
Test hours:	24 hours for 3 hot days 24 hours for 3 cold days
Coordination hours:	24 hours
C24	3 days
C42	3 days
C60	3 days
C67	3 days
C68	3 days
CJ2	3 days
CJ3	3 days
CJ4	3 days

3.5 Test Required Information. Refer to Data Sheet A1 in Appendix A and, if required by the GM Requesting Engineer, the setup instructions in CG3889 test procedure listed in 2.3 for details on test procedure execution.

- Applicable hardware and software bundle, i.e., Air Flow calibrations, System calibrations, Software/Utility file.
- Hardware, Software, Supplier Software (SSW), CCA Release Notes.

3.6 Personnel/Skills. The minimum required skill set to fully understand and execute this test procedure includes the following:

- Familiarity with General Motors Local Area Network (GMLAN).
- General networking concept with the subsystem bench hardware and software.
- Ability to read and interpret serial data and to transmit functional and physical serial data messages using the serial data interface tool and software, e.g., Intrepid NeoVI and Vehicle Spy3.

4 Procedure

4.1 Preparation. Install thermocouples by the outside air temperature sensor and on outside rearview mirror.

4.1.1 Determine accuracy requirements from the VTS.

4.1.2 All components on the subsystem bench or test vehicle must have the latest supported hardware and software levels, i.e., ECC RPOs.

4.1.3 The subsystem bench or test vehicle should contain the latest hardware and software for interface modules, e.g., Human Machine Interface (HMI), Body Control Module (BCM), Radio Tuner, Electronic Controller Module (ECM), and Integrated Center Stack (ICS).

4.2 Conditions. The full test procedure should be performed at a system voltage of 13.5 V Direct Current (DC). Normal functionality should be tested at a system bench voltage between 9.0 VDC $\pm$ 0.1 VDC to 16.0 VDC $\pm$ 0.1 VDC.

4.2.1 Environmental Conditions. Cold weather and hot weather testing as specified in here and in CG3889.

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.

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4.3 Instructions. Perform test as specified on Data Sheet A1 and record data. In addition, if required by the GM Requesting Engineer, follow the detailed test steps in CG3889, listed in 2.3, available in the GM Global Document Management (GDM) system, General Forms and Templates folder.

4.3.1 Document specific failures/deviations in the appropriate Problem Resolution Tracking System (PRTS) or Electrical and Software Issue Management System (ESIMS) systems. Refer to 5.3.

5 Data

5.1 Calculations. Not applicable.

5.2 Interpretation of Results. The system must meet the accuracy requirements of the VTS. CG3889, referenced in 2.3, document the user actions and expected results for each test step. The test engineer is to perform the test steps and compare the actual results to the expected results; then determine if the subsystem meets the requirements or does not meet the requirements. Refer to Appendix B: Specification References, Table B1: Requirements Documents for a list of requirements used within the test procedures. Some test steps may not be applicable to the configuration and/or calibration being tested.

5.3 Test Documentation. For each requirement tested, the test engineer is to document the result in the results column of the test procedure. The completed procedure should then be reported to the program lead with the test procedure included as supporting documentation. Use ESIMS or PRTS to document deviations.

Note: The ESIMS system is for issues which detail non-conformances. These issues are processed through the normal workflow.

Note: The PRTS system is for problems/deviations which cannot be solved before non-saleable Manufacturing Validation Build (MVB) or which have an error classification of 1 or 2.

6 Safety

This standard may involve hazardous materials, operations, and equipment. This standard does not propose to address all the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

7 Notes

7.1 Glossary. RPO code descriptions:

C24	Quad Zone (everyone can control their heat or Air Conditioning (AC))
C42	Heater only
C60	Single Zone Manual (Cable Controls)
C67	Single Zone Manual
C68	Single Zone, Auto Feature
CJ2	Color Connected Radio (CCR) (Up Level), Dual Zone Auto
CJ3	Dual Zone Manual (Lambda, GMT900)
CJ4	Trizone with Rear Control

7.2 Acronyms, Abbreviations, and Symbols.

AC	Air Conditioning
BCM	Body Control Module
CCA	Control Climate Algorithm
CCR	Color Connected Radio
DC	Direct Current
ECC	Electronic Climate Control
ECM	Electronic Controller Module
ESIMS	Electrical and Software Issue Management System
FU	Functional Unit

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