



Coolant Expulsion 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 this procedure is to evaluate the performance of the coolant overflow system and coolant pressure cap systems during simulated coolant boiling conditions.

1.2 Applicability. This test procedure applies to all passenger and commercial vehicles.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW14905 GMW14911

2.3 Additional References.

- Global Document Management System (GDM)
- Vehicle Owner's Manual

3 Resources

3.1 Facilities. A laboratory facility containing a vehicle hoist and compressed air with a pressure regulator is required.

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 A water reserve tank with a capacity of 25 L.

3.2.2 A variable capacity water pump capable of producing 150 kPa head pressure at 10 L/minute flow rate.

3.2.3 Food coloring (optional).

3.3 Test Vehicle/Test Piece. Test a vehicle with a production representative cooling system.

3.4 Test Time.

Calendar time: 1 day

Test hours: 8 hours

Coordination hours: 4 hours

3.5 Test Required Information. Vehicle engine coolant volume capacity (owner's manual).

3.6 Personnel/Skills. Cooling System Technician.

4 Procedure

4.1 Preparation.

4.1.1 Remove coolant pressure cap.

4.1.2 Drain vehicle coolant system.

4.1.3 Remove vehicle operating thermostat and install a thermostat that is mechanically blocked open.

4.1.4 Install a "T" fitting in the vehicle surge tank outlet hose (pressurized overflow/surge tank systems). Reference Figure A1 or Figure A2, as appropriate.

4.1.5 Plumb water pump and compressed air per Figures A1 or A2 in Appendix A, as appropriate.

4.1.6 Fill water reserve tank with volume of water corresponding to vehicle coolant volume capacity. Add food coloring to water (optional).

4.1.7 Refill vehicle coolant system with water using the Service Fill Procedure GMW14905. (Food coloring is optional.)

4.1.8 Replace coolant pressure cap.

4.1.9 Mark rotational location of coolant pressure cap with respect to filler neck.

4.2 Conditions.

4.2.1 **Environmental Conditions.** Test should be run at ambient temperature.

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 **Note:** Do not run the engine during this test.

4.3.2 Turn on water pump and increase pump head pressure until coolant pressure cap releases pressure.

4.3.3 Add air pressure until water "spurts" from overflow system.

4.3.4 Continue until all water in water reserve tank is exhausted.

4.3.5 Subjectively evaluate water discharge path from overflow system per GMW14911.

4.3.6 Turn off pump and air pressure.

4.3.7 Refill water reserve tank to its maximum capacity.

4.3.8 Turn on water pump and increase pump head pressure until vehicle coolant pressure cap releases pressure. Reduce water pump head pressure until vehicle coolant pressure cap is capable of containing system pressure.

4.3.9 Turn vehicle coolant pressure cap until pressure releases. Record number of turns, and mark this position on the filler neck.

4.3.10 Subjectively evaluate water discharge path from overflow system.

4.3.11 While water is still flowing, continue turning vehicle coolant pressure cap until water escapes between cap and filler neck. Record number of turns and mark this position on the filler neck.

4.3.12 While pulling upward, continue turning vehicle coolant pressure cap until cap disengages from filler neck. Record number of turns and mark this position on the filler neck.

4.3.13 Test complete.

5 Data

5.1 **Calculations.** Not applicable.

5.2 Interpretation of Results.

5.2.1 Subjective interpretation of water flow path per GMW14911 Observation Check List.

5.2.2 Objective measurement of coolant pressure cap removal per GMW14911 Observation Check List.

5.2.3 Review test results with the Thermal Performance Engineer at the Thermal Performance Integration Team (TPIT) Meeting.

5.3 **Test Documentation.** Load results to the Global Document Management (GDM) system incorporated with GMW14911 report.

Note: The supplier shall work with the responsible GM Engineer to comprehend this requirement.

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