



Diesel Exhaust Fluid (DEF) Commercial Station Fill 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. The purpose of this document is to determine:

- Diesel Exhaust Fluid (DEF) fill performance at commercial fill stations with various nozzles and fill rates.
- Ensure DEF Diagnostics are robust to higher flow fill events.

1.2 Applicability. All vehicles with DEF systems.

1.3 Remarks. Customers may choose to refill DEF tanks at commercial fill stations. These stations allow the customers a quicker, less expensive traditional nozzle style fill for their DEF system. Other subsystem tests utilize a sample of nozzles available to retailers; this test intends to capture additional system interactions and to evaluate the customer experience while refilling DEF at commercial stations by:

- Comparing various DEF dispensing systems, nozzle types and fill rates.
- Evaluating volume dispensed for Premature Shut Off (PSO).
- Monitoring for spitback.
- Monitoring for Diagnostic Trouble Codes (DTCs) set when filling.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW16194

2.3 Additional References.

CG5087

GM8762 (ID)

GM8775 (ID)

(ID) = This standard is limited to internal distribution within General Motors and shall not be distributed outside this company. Contact the GM Lead Engineer for further instructions.

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.

3.2 Equipment.

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3.2.1 Tank Drain. Configure tank to allow at least 85% of useable DEF to be drained via one of the options outlined in 3.2.1.1 through 3.2.1.3 or equivalent.

3.2.1.1 In-Tank DEF Pump. Equipment to activate DEF pump using device control capabilities through vehicle service tool interface.

3.2.1.2 Remote DEF Pump. Equipment to drain DEF tank through the DEF fill spud.

3.2.1.3 Modified tank. Modified DEF tank with a physical drain in the bottom surface of the tank.

3.2.2 Equipment for measuring DEF removed from the tank

3.2.3 Stopwatch (or equivalent). To assist in determining DEF nozzle fill rate.

3.3 Test Vehicle/Test Piece. Program specific vehicle with instrumented Engine Control Module and DEF system, and equipment for interfacing with laptop used for data capture and operating parameter manipulation. The Vehicle should include production representative:

- DEF tank.
- DEF tank attachment hardware and torque.
- DEF tank assembly with controller.
- DEF fill pipe assembly.

3.4 Test Time. The following is an estimate on the amount of time (work hours) needed to perform this procedure. Preparation, other downtime, actual test, and analysis of data are considered in capturing a total calendar time.

Calendar time: 7 days

Test time: 40 hours

Coordination time: 16 hours

3.5 Test Required Information.

- DEF Rated Capacity.
- DEF Unusable Capacity.
- Curb Mass.

3.6 Personnel/Skills. Skilled performance or test engineer needs to be present.

4 Procedure

4.1 Preparation.

4.1.1 The engineer shall record the test and vehicle information on CG5087. See example in Appendix A, Data Sheet A1.

4.2 Conditions.

4.2.1 Environmental Conditions. Run at ambient temperatures above -10 °C.

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 Start with a DEF tank that is empty of useable DEF (unusable DEF remains).

4.3.2 Add DEF equal to approximately 15% of useable capacity, record volume of fluid added.

4.3.3 Travel to commercial fill station, record 1 way trip distance.

4.3.4 Turn ignition key to "accessory" mode and power up the instrumentation pack.

Note: Power the instrumentation pack from a separate power source other than the vehicle's battery if necessary.

4.3.4.1 Clear any DTCs present.

4.3.4.2 Record the following parameters (for all test conditions) found in GM8762 or GM8775:

- Any signal communicating DEF DTC codes or DEF diagnostic results.

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