GM WORLDWIDE ENGINEERING STANDARDS	Test Procedure	GMW15696

Fuel Dispensing Spitback Test, Simulated Environmental Protection Agency (EPA)

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 measure the spitback emissions generated during a fuel system fill check.

1.2 Applicability. Non- Onboard Refueling Vapor Recovery (ORVR) passenger cars and trucks up to 6350 kg (14 000 lb) Gross Vehicle Weight (GVW) with gasoline (including alcohol fuel blend) engines. ORVR passenger cars and trucks required only if criteria is met in GMW14508.

1.3 Remarks. This standard describes the procedure for performing a Simulated Environmental Protection Agency (EPA) Fuel Dispensing Spitback test at the Lansing Fuel Lab or comparable facility.

2 References

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

2.1 External Standards/Specifications.

40 CFR Part 86

2.2 GM Standards/Specifications.

GMW14508

2.3 Additional References.

OPW Retail Fueling, Hamilton, Ohio (www.opwglobal.com)

3 Resources

3.1 Facilities. Testing should be at a facility free of ignition sources. If indoors, the test facility should have an explosion-proof room with adequate ventilation to meet all local safety codes.

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 fixture to hold fuel system in the “in vehicle position” (or can be run on a vehicle).

3.2.2 Equipment to fill fuel system at a specified fill rate and fuel Reid Vapor Pressure (RVP).

3.2.3 Equipment to drain fuel system.

3.2.4 Equipment to measure the fuel temperatures, and spitback from fuel filler neck.

3.2.5 Equipment to maintain the fuel tank at a specified temperature.

3.2.6 Spitback collection bag made of a material impermeable to hydrocarbons or methanol. The bag shall be designed and used so that liquid fuel does not spit back into the fuel system/vehicle body, adjacent floor, etc., and it must not impede the free flow of displaced gasoline vapor from the orifice of the filler pipe. The bag must be designed to permit passage of the dispensing nozzle through the bag.

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3.3 Test Vehicle/Test Piece.

3.3.1 Test Vehicle/Fixture. A test buck that simulates fuel tank mounting in an actual vehicle is required for this test. All contact points between the fuel tank and the vehicle body or frame, as well as the fill pipe mounting location and orientation, should be correctly simulated. Be sure to use the correct fuel tank straps and mounting hardware to achieve the proper amount of tank compression.

Fuel tank orientation with reference to ground is critical and must be correct.

As an alternative, an actual production-intent vehicle may be used in place of the test buck. The vehicle should be set to curb mass and vehicle heights should be within specification.

3.3.2 Test Piece. Fuel tank assembly (including fuel pump assembly), fill pipe assembly, fill cap, evaporative emissions canister, evaporative emissions hoses, and canister vent solenoid.

3.4 Test Time.

Calendar time:	2 days
Test hours:	8 hours
Coordination hours:	4 hours

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Lab test personnel with fuel system test experience.

4 Procedure

4.1 Preparation.

4.1.1 Test Setup. Install the fuel tank and vent system in the test buck. Ensure that all vent lines and fuel lines are routed correctly. Plug the fuel feed line, fuel return line, and canister purge hose, as applicable.

4.2 Conditions.

4.2.1 Environmental Conditions. When a system temperature is specified, the ambient temperature, prefill fuel, fuel tank, and all fuel system components are required to be at the specified temperature at the start of the fill test.

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 Mount the fuel system assembly in a lab fixture in the “in vehicle position” (or install in vehicle).

4.3.2 Drain the fuel tank and fill with 9 RVP ± 0.2 RVP test fuel to 10% of the reported nominal fuel tank capacity. The fuel cap shall be installed immediately after refueling.

4.3.3 Heat the fuel tank assembly until the fuel is at the same temperature as at the end of the Urban Dynamometer Driving Schedule portion of the EPA Fuel Dispensing Spitback Procedure (40 CFR Part 86 (146-96)). This needs to be determined by running the EPA Fuel Dispensing Spitback test on a representative vehicle and recording the fuel temperature. When a vehicle is not available, heat the assembly to 27 °C (80 °F).

4.3.4 Measure and record the mass of the spitback bag to be used for collecting spitback emissions to the nearest 0.01 g (0.000022 lb). If the bag has been used for previous testing, sufficient time shall be allowed for the bag to dry out.

4.3.5 The fuel filler neck shall be snugly fitted with the vented spitback bag to capture any fuel emissions. The fuel nozzle shall be inserted through the bag into the filler neck to its maximum penetration. The plane of the nozzle’s handle shall be perpendicular to the floor of the laboratory.

4.3.6 Fill tank assembly at a rate of 37 L/minute ± 1 L/minute (9.8 gpm ± 0.3 gpm). Dispensed fuel temperature is required to be 18 °C ± 2.5 °C (65 °F ± 5 °F). The default fuel nozzle should be an OPW 11-B (available through OPW Retail Fueling). However, if this test is being run due to spitback of 1 mL or greater on any GMW14508 GN-1 or GN-6 fill test, then use the same type fuel nozzle from the GMW14508 GN-1 or GN-6 fill test that had the spitback. Dispensing may not be manually terminated unless the fuel system has already clearly failed the test.

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