



Fuel Inlet Restrictor Durability

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 evaluate the fatigue durability of a fuel tank inlet restrictor which has components physically displaced by insertion of a fuel dispensing nozzle.

1.2 Applicability. Fuel fill pipes having an inlet restrictor device.

1.3 Remarks. A fuel tank inlet restrictor is a device in the fuel fill pipe that allows a smaller diameter unleaded gasoline nozzle spout to be inserted but prevents the insertion of a larger diameter leaded gasoline or diesel nozzle spout.

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.

Mobile Source Air Pollution Control (MSAPC) Advisory Circular Number 32B, paragraph F.1

3 Resources

3.1 Facilities. Facilities for mounting the test part and the stroking equipment.

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 Air cylinder, hydraulic cylinder or equivalent linear stroking device with a stroke rate of 50 mm/s to 60 mm/s (120 in/minute to 140 in/minute) and a stroke length of 76 mm (3.0 in) minimum.

3.2.2 Related controls for stroking equipment to control stroke rate, stroke length and count cycles.

3.2.3 A fuel dispensing nozzle complete with spring, or an aluminum cylinder or pipe, to simulate that nozzle, having at least the following characteristics:

- 21.34 mm (0.84 in) outer diameter
- 76 mm (3.0 in) length
- Terminal end to have a small radius chamfer
- Provision for attaching to stroking device

3.3 Test Vehicle/Test Piece. Fuel inlet segment including complete restrictor device.

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October 2016

Page 1 of 4

3.4 Test Time.

Calendar time: 2 days
Test hours: 8 hours
Coordination hours: 6 hours

3.5 Test Required Information. There are no legal requirements with respect to cyclic durability of the fuel filler inlet restrictor. This component is part of the vehicle emission system, but its functional requirements with respect to the 80 500 km (50 000 mi) emission certification test are not defined.

3.5.1 The Mobile Source Air Pollution Control (MSAPC) Advisory Circular Number 32B, explains the requirements regarding the use of unleaded fuel. Paragraph F.1 states that this component may, if the vehicle manufacturer desires assurance that it complies with the immediate shutoff requirement, be included on the Part I application for emission certification. If included on the Part I application, the Environmental Protection Agency (EPA) will advise the manufacturer whether or not the design complies.

3.6 Personnel/Skills. Test engineer/technician trained in running the test procedure as specified in Section 4.

4 Procedure

4.1 Preparation.

4.1.1 Record test component part numbers, neck vendor, restrictor vendor, and any other pertinent descriptive data on Data Sheet A1, Appendix A.

4.1.2 Mount the test parts and align the stroking equipment such that the nozzle, or simulation, passes completely through the restrictor device and withdraws completely. For manual insertion where a standard fuel nozzle is used, the stroke is to be such that the spring contacts the restrictor.

4.1.3 Record the minimum distance that the inlet restrictor in the relaxed position, is from the edge of the restrictor opening in the inlet. This distance is referred to as the restrictor relaxed position.

4.1.4 Set stroke rate to 50 mm/s to 60 mm/s (120 in/minute to 140 in/minute) and record strike rate, stroke length, and stroke cycle starting point, 9.5 mm ($\frac{3}{8}$ in) outside restrictor opening, for example.

4.2 Conditions.

4.2.1 Environmental Conditions. Not applicable.

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 the stroking cycle and continue until component failure or 2100 cycles. At 2100 cycles record the restrictor relaxed position.

4.3.2 Continue the stroking cycle until component failure or test termination point as specified by the responsible engineer. When test cycles are completed, record the number of cycles, the restrictor relaxed position and the condition of the test components.

4.3.3 Repeat 4.1 and 4.3 using the remaining test samples for a minimum of five (5) total samples.

5 Data

5.1 Calculations. Not applicable.

5.2 Interpretation of Results. All tested components must complete the 2100 cycles without failure.

5.3 Test Documentation. Record pertinent test results on the supplied data sheet (See Appendix A, Data Sheet A1).

6 Safety

This Engineering Standard may involve safety requirements for hazardous materials, the method of operations and equipment. This standard does not propose to address all the safety issues associated with its use. It is the responsibility of the user of this standard to ensure compliance with all appropriate safety and health practices. This would include any specific training that may be required. The safety and health standards include site

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October 2016

Page 2 of 4

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