



SURFACE VEHICLE RECOMMENDED PRACTICE

J1140™

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Revised 2019-10

Superseding J1140 AUG2012

(R) Filler Pipes and Openings of Motor Vehicle Fuel Tanks

RATIONALE

The following update covers improvements to the existing zone (Method 1) through updated dimensioning and spelled out clearances. In addition, Method 2, with increased clearance, and Method 3, a fully static version used for both automotive and nozzle manufacturers, have been added. The changes were developed with CARB, automotive, and nozzle industries, all working to improve the interface.

1. SCOPE

This SAE Recommended Practice was developed primarily for gasoline-powered passenger car and truck applications to interface vapor recovery systems, but may be used in diesel applications, marine, industrial, and similar applications where a nozzle is required for filling. The zones cover nozzle spout access and handle clearance to a refilling port. In addition, this practice includes a design window for nozzle manufacturers to develop with.

1.1 Purpose

The purpose of this document is to ensure compatibility between new vehicle designs and refueling vapor recovery nozzles by their dimensions and specifications.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

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2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J285	Dispenser Nozzle Spouts for Liquid Fuels Intended for Use with Spark Ignition and Compression Ignition Engines
SAE J829	Fuel Tank Filler Cap and Cap Retainer
SAE J1114	Fuel Tank Filler Cap and Cap Retainer, Threaded
SAE J3144	Fuel Tank Filler, Capless Closure

2.1.2 ISO Publications

Copies of these documents are available online at <http://webstore.ansi.org/>.

ISO 13331	Road Vehicles - Filler Pipes and Openings of Motor Vehicle Fuel Tanks - Vapor Recovery Systems
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3. SPECIFICATIONS

3.1 Fuel Pipe Seal Surface and Interface Access Zone

The sealing surface for cap seal/gaskets (if interface style required) and/or for interface to boot style Phase 2/EVR nozzles as called out in SAE J285.

- 3.1.1 The filler pipe-sealing surface shall be round in cross section, and shall have an outer diameter between 52.0 mm and 57.9 mm. The sealing surface inner diameter must be less than 49.8 mm. The seal surface must be within 0.25 TIR.
- 3.1.2 The filler pipe interface and surrounding vehicle components must not occupy the shaded zones of the access zone in Figure 1. The zone is placed by aligning the centerlines of the access zone and filler pipe sealing surface. The access zone must be aligned flush with the sealing surface.

For improved performance with existing Phase 2 EVR market nozzles, it is recommended to increase the clearance from 2.5 mm, to as much as 12 mm.

- 3.1.3 The closure's latching lip shall be provided around at least 100 degrees of the inside circumference of the filler pipe. The closure's latching lip shall be oriented such that it extends at least 35 degrees to either side of the reference plane.
- 3.1.4 The height of the lip shall not be less than 2.5 mm as measured from the inside wall of the filler pipe, or shall not be less than 8.5 mm as measured from the outside wall of the filler pipe if the outside diameter of the filler pipe is between 52.0 mm and 57.9 mm.
- 3.1.5 The depth of the lip shall be not less than 4.0 mm, nor more than 13.0 mm, into the filler pipe, as measured in the reference plane from the filler pipe face.

Lip depth of less than 11 mm is preferred to reduce insertion forces with nozzles.

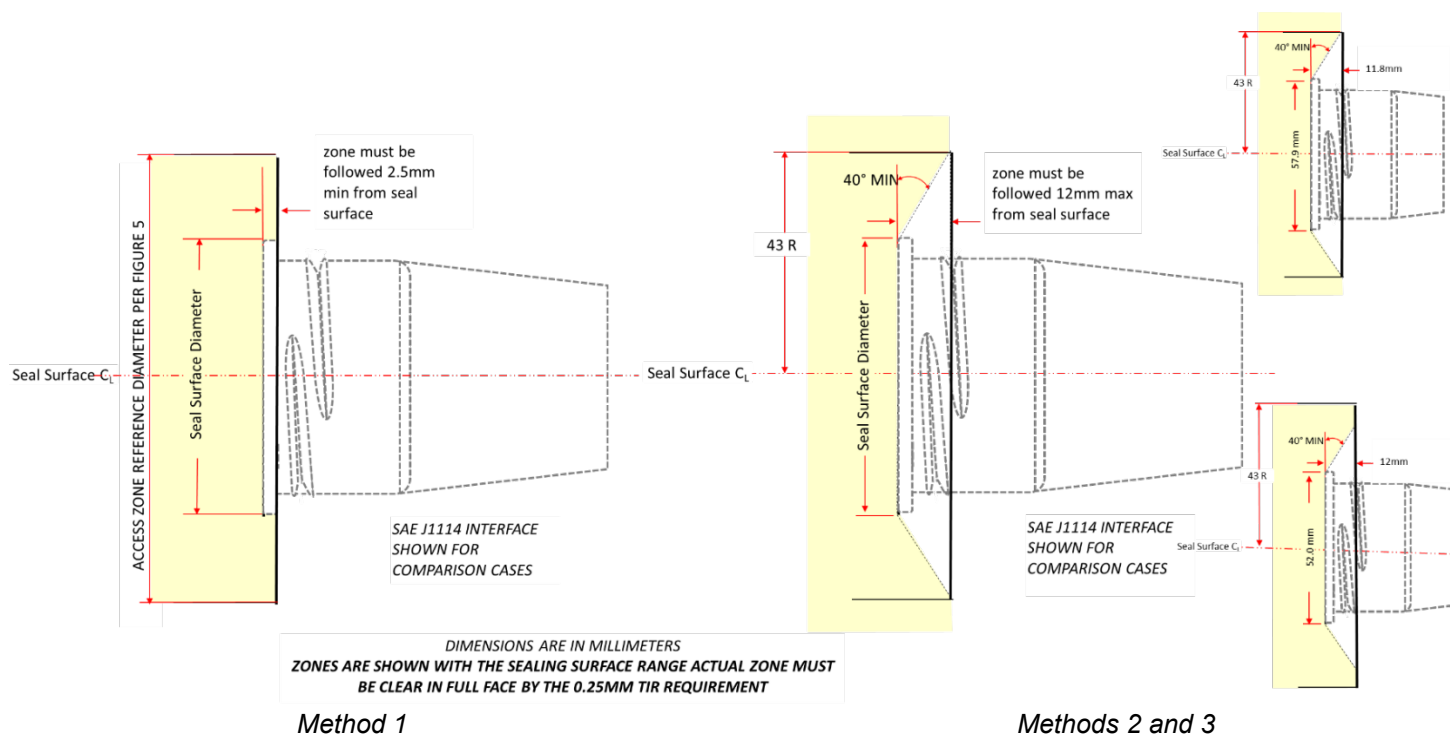


Figure 1 - Fuel pipe seal surface and interface access zones

3.2 Test Nozzle Spout

The rod, with dimensions as shown in Figure 2, used to establish the reference lines around which the filler pipe access zone is defined.

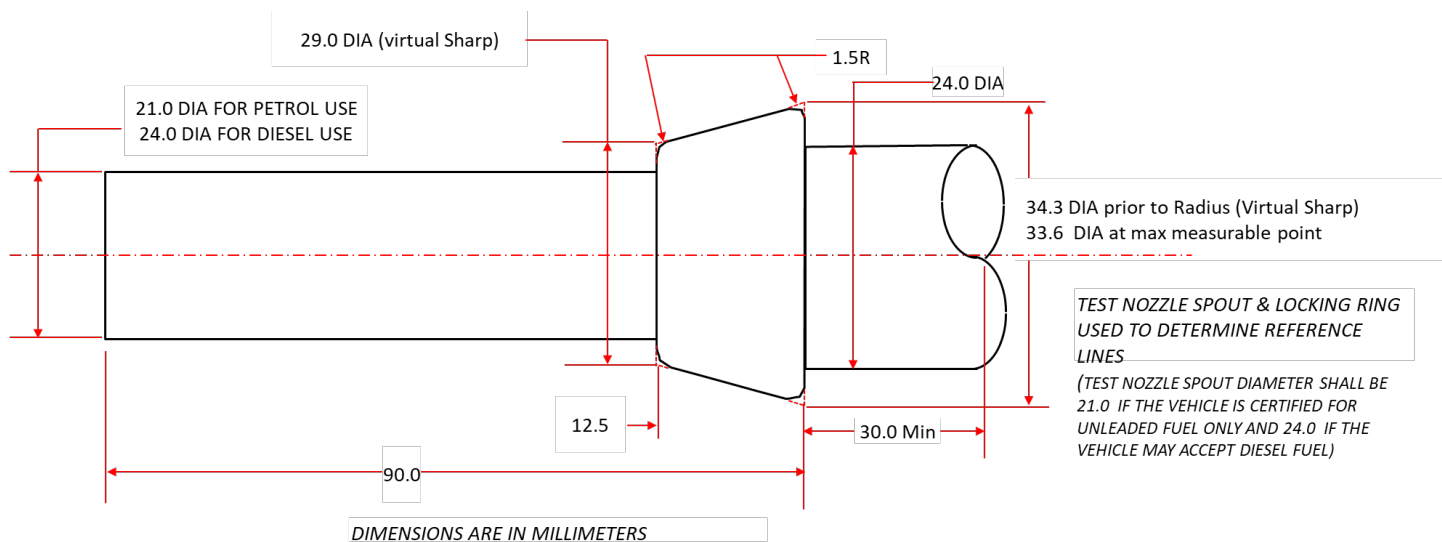


Figure 2 - Test nozzle spout

3.3 Reference Plane

The plane which contains the axial centerline of the filler pipe sealing surface, and is turned in the direction which the manufacturer of the automobile has determined to be the orientation in which the nozzle is to be inserted.

3.4 Nozzle Resting Position of Test Nozzle Spout

The resting position is achieved when the test nozzle spout meets the following conditions:

- 3.4.1 The test nozzle spout is inserted into the filler pipe, such that the axial centerline of the test nozzle spout lies in the reference plane.
- 3.4.2 The spout anchor of the test nozzle spout is located immediately on the inside (that is, the vehicle tank side) of the closure's latching lip.
- 3.4.3 Either the test nozzle spout anchor rests upon the filler pipe wall, or the test nozzle spout shaft rests upon the closure's latching lip, as shown in Figure 3.
- 3.4.4 The fuel dispensing end of the test nozzle spout (as indicated in Figure 3) is in contact with a restraining point.

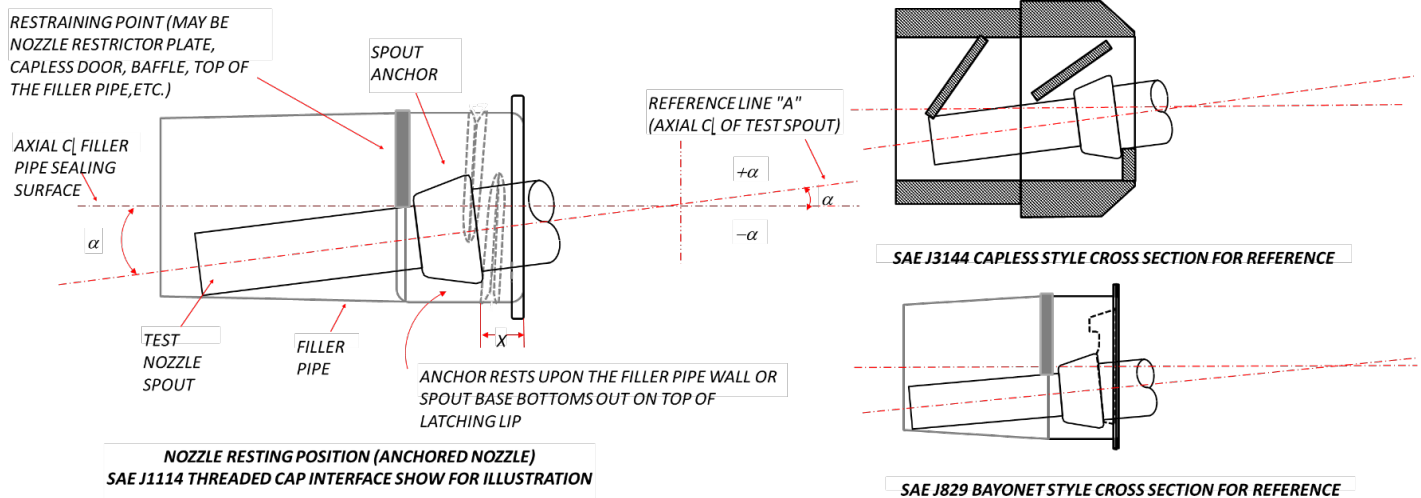


Figure 3 - Filler pipe (nozzle resting position)

3.5 Insertion Position of the Test Nozzle Spout

The insertion position is achieved when the test nozzle spout meets the following conditions:

- 3.5.1 The test nozzle is inserted into the filler pipe with the axial centerline of the test nozzle spout contained in the reference plane.
- 3.5.2 The spout anchor of the test nozzle spout is resting on the upper surface of the closure latching lip so as to raise the nozzle handle through the minimum angle (from the normal resting position) required to affect the test nozzle spout insertion into the filler pipe, as shown in Figure 4.
- 3.5.3 The fuel dispensing end of the test nozzle spout (as indicated in Figure 4) is in contact with a restraining point.

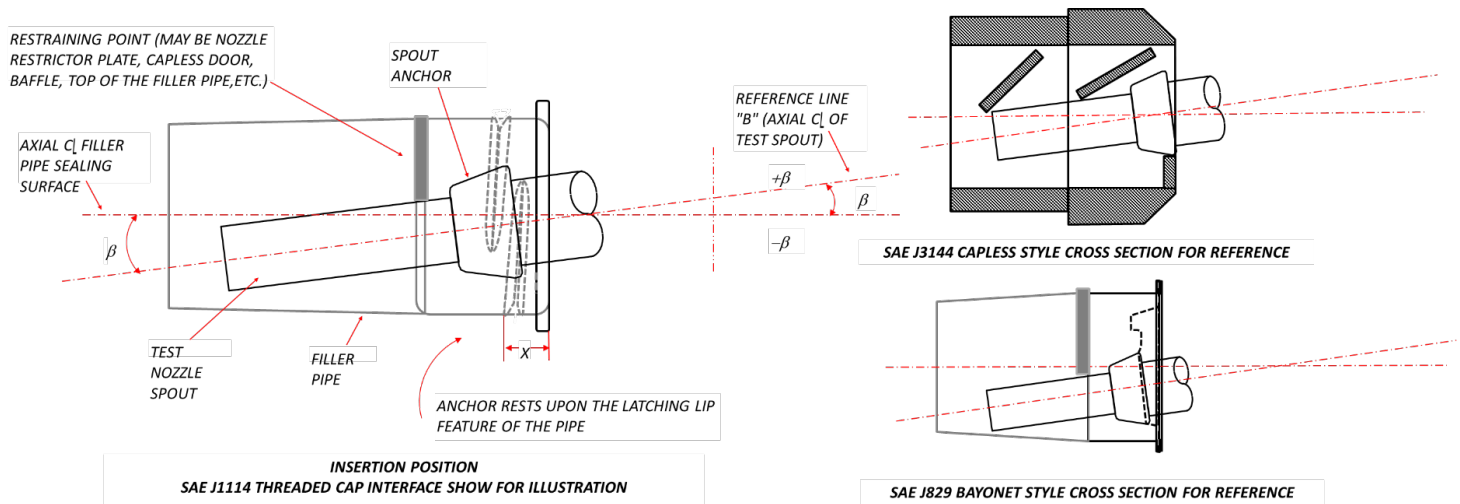


Figure 4 - Filler pipe (insertion position)

3.6 Angle Alpha, α

The angle between the axial centerline of the test nozzle spout, as described in Figure 3, and the axial centerline of the filler pipe sealing surface, expressed in degrees. Alpha is considered a positive angle when the dispensing end of the test nozzle spout is pointing down relative to the centerline of the filler pipe sealing surface, as illustrated in Figure 3.

3.7 Angle Beta, β

The angle between the axial centerline of the test nozzle spout, as described in Figure 4, and the axial centerline of the filler pipe sealing surface, expressed in degrees. Beta is considered a positive angle when the fuel dispensing end of the test nozzle spout is pointing down relative to the axial centerline of the filler pipe sealing surface, as illustrated in Figure 4.