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SURFACE VEHICLE STANDARD

SAE J1949

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ROAD VEHICLES—HIGH PRESSURE FUEL INJECTION PIPE END—CONNECTIONS WITH 60 DEGREE FEMALE CONE

This document is a word-for-wrod equivalent of ISO/DIS 2974.

1. ***Scope—***This SAE Standard specifies the dimensional requirements for the assembly of high-pressure pipe connections for compression-ignition (diesel) engine fuel injection equipment.

It applies to 60 degrees female cones with external threaded connectors types 1 and 2 (see Figures 1, 2, and 3), and to the internal threaded tube nuts and male cone type end assembly (see Figure 4) of high-pressure pipe connections for tubes with diameters up to 12 mm inclusive.

2. ***References***

2.1 **Applicable Publications—**The following publication forms a part of this specification to the extent herein.

2.1.1 ISO PUBLICATION—Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002.

ISO 261—ISO general purpose metric screw threads—General plan
ISO/DIS 2974—Diesel engines—High-pressure fuel injection pipe end-connection with 60° female cone
ISO 3508—Thread run-outs for fasteners with thread in accordance with ISO 261 and ISO 262

3. ***Requirements***

3.1 **Dimensions and Tolerances—**Figures 1 and 2 indicate the basic requirements for the connector at the fuel injector and fuel injection pump to allow interchangeability for high-pressure fuel injection pipe assemblies.

The 60 degree female cone and its relationship to the external thread of the connector shall meet the requirements of Figure 1: variations at the smaller end of the female cone as shown in Figure 3 are acceptable.

Dimensions and tolerances are given in Table 1. Details not specified are left to the manufacturer's choice.

With reference to dimension a in Figures 1 and 2, the external thread may be made optionally to type 1 or 2. However, it shall be possible to screw the GO-gauge for the thread up to the plane specified by dimension a for both types.

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Dimensions in millimetres

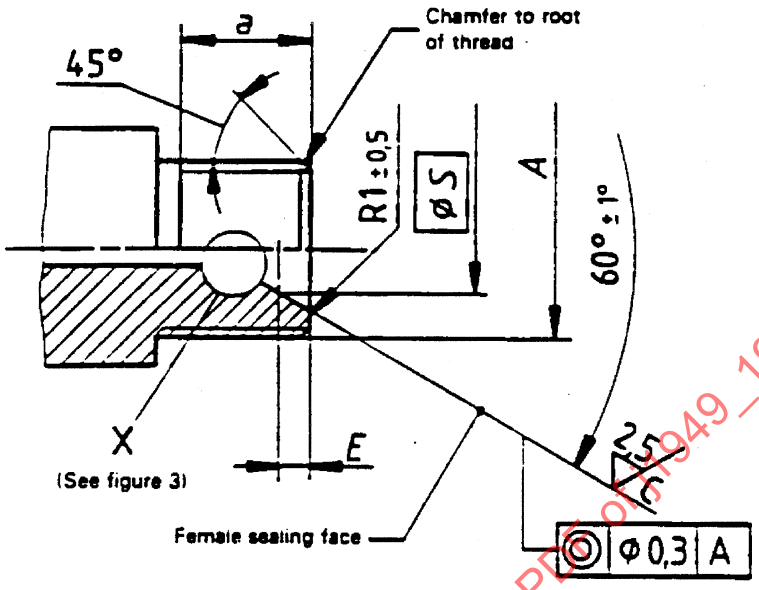

FIGURE 1—EXTERNAL THREADED CONNECTOR, TYPE 1

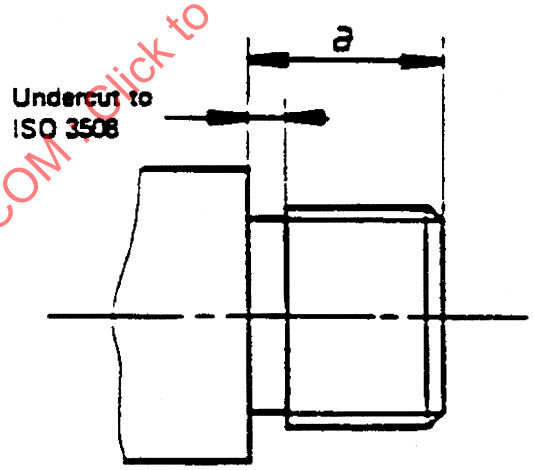

FIGURE 2—EXTERNAL THREADED CONNECTOR, TYPE 2

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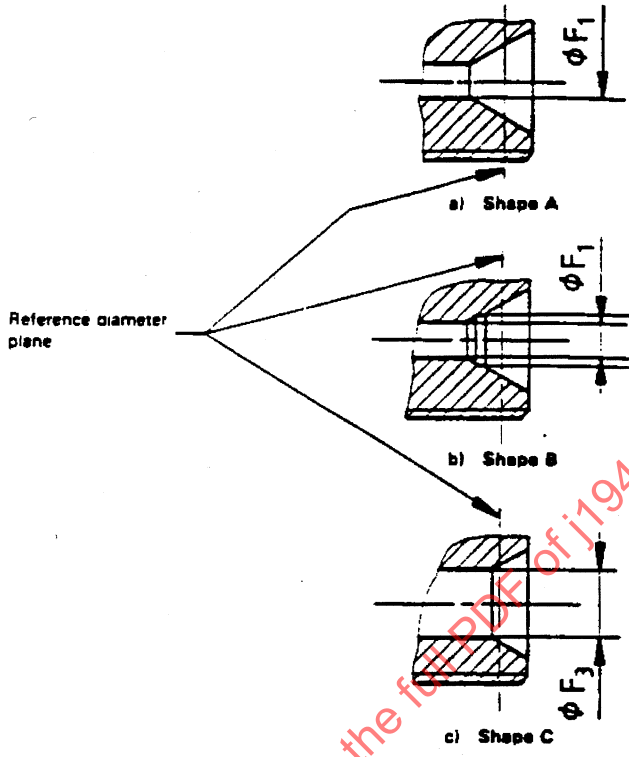
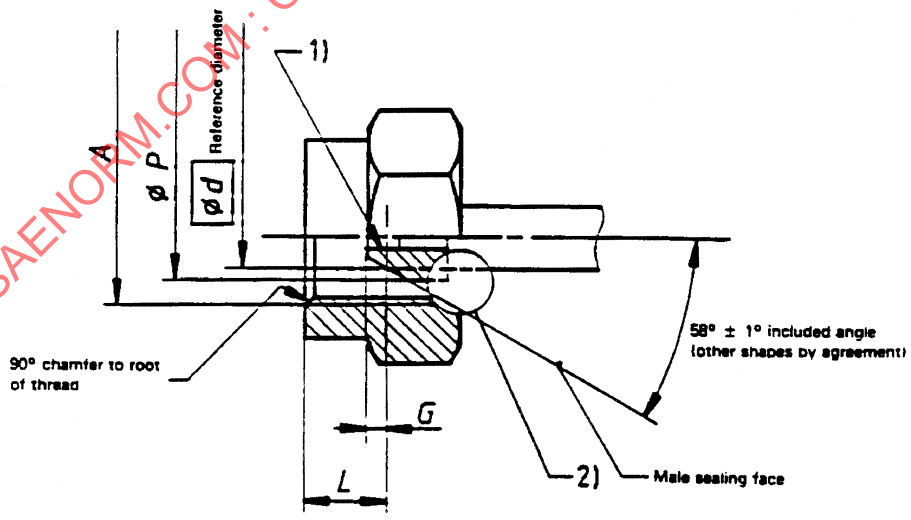


FIGURE 3—SHAPES OF DETAIL X ON EXTERNAL THREADED CONNECTORS, TYPES 1 AND 2



1) The tube end bore entrance configuration shall be so chosen that, after final assembly, the inside diameter of the tube is not reduced.
2) Design of the sealing cone shoulder and the cap nut shall be agreed between customer and manufacturer.

FIGURE 4—NUT AND TUBE END ASSEMBLY

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Figure 4 identifes the nut and tube assembly dimensions which are important to sealing, normally on the leading edge of the cone on the high-pressure fuel injction pipe (see also the note in 3.2).

3.2 Materials—The specification of material and heat treatment shall be chosen according to the use intended.

NOTE—To ensure that deformation takes place at the sealing face of the tube and cone, when sealing, the material of the cone shall be softer than the material of the external threaded connector.

4. Designation—An end-connection, in accordance with this International Standard, shall be designated by the following elements, in the order given:

a. Reference to this standard
b. The shape in accordance with Figure 3
c. The tube outside diameter, in millimeters
d. The thread designation, in accordance with ISO 261

Example—An end connection of shape A, of tube outside diameter 10 mm, with an M22 X 1.5 thread is designated: SAE J1949 - A 10 - M22 X 1.5.

TABLE 1—DIMENSIONS AND TOLERANCES

Tube Outside Diameter	Thread[1] A	Reference Diameter, d	F_1[2] ±0.1	F_2 +0.3 0	F_3[2] max.	E +0.3 0	P ±0.5	G +0.5 0	L max	a min.
5	M10 X 1.25 M12 X 1.5	5.5	1.25 to 2.5	2.5		0.8	7.5	0.5	7	10
6	M12 X 1.5 M14 X 1.5	6.5	1.5 to 3	5	6.1	0.8	9.0	0.8	8	11
8	M16 X 1.5 M18 X 1.5 M22 X 1.5	8.5	2 to 4	4	7.3	2.6	11.5	0.9	11	16.5
10	M20 X 1.5 M22 X 1.5 M24 X 1.5	10.5	2.5 to 5	5	9.3	2.6	13.5	0.9	12.5	18
12	M22 X 1.5 M26 X 1.5	12.5	3 to 5	5	10.3	2.6	15.5	1.8	15.5	21

1. Tolerance classes of threads. og for external threaded connector: 6H for connector nuts.
2. Dimension F shall be adapted to the tube inner diameter for the sake of optimum flow conditions. If required, for instance for edge filters, application of dimension F_3 is allowed.

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