The Engineering Society For Advancing Mobility Land Sea Air and Space®
SAE INTERNATIONAL
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SURFACE VEHICLE STANDARD

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Submitted for recognition as an American National Standard

FUEL INJECTION PUMPS—HIGH PRESSURE PIPES (TUBING) FOR TESTING

This SAE Standard references ISO 4093.

Foreword—This Reaffirmed Document has been changed only to reflect the new SAE Technical Standards Board format.

1. Scope—This SAE Standard specifies the dimensional requirement of a range of high pressure pipes for use in the bench testing and setting of fuel injection pumps.

Only dimensions and requirements affecting the hydraulic characteristic of the pipes are defined. Other requirements, such as the type of end connections and shape of the pipes when bent, are not included. These depend on the connections provided at pump outlets and injector inlets, and on the design features of individual pumps and test benches.

2. References—There are no referenced publications specified herein.

3. Description—The range of pipes specified enables pump and engine manufacturers to choose suitable pipe sizes for pump deliveries up to 300 mm^3 per stroke per cylinder. The particular pipe to be used shall be identified by the pump manufacturer in the test specification for each individual pump type and application.

4. Dimension—The seven standardized sizes of pipes are shown in Table 1. Dimensions are in millimeters.

5. General Requirements

5.1 The pipes may be of ferrous material, usually cold-drawn mild steel.

5.2 After end connections are made, any closing-in or reduction in opening of the pipe shall be removed to a depth of at least twice the length of the deformed end of the pipe. Any closing-in of the ends after extended use shall also be eliminated.

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TABLE 1—DIMENSIONS

Item #	Internal Diameter	External Diameter min	Length	Minimum Central Line Bend Radius (1)
1	2.0 ± 0.025	6	600 ±5	16
2	2.0 ± 0.025	6	845 ±5	16
3	3.0 ± 0.025	6	600 ± 5	25
4	3.0 ± 0.025	6	1000 ± 5	25
5	3.0 ± 0.025	6	750 ± 5	25
6	1.6 ± 0.025	6	600 ± 5	16
7	2.0 ± 0.025	6	450 ± 5	16

1. Bends may affect the pump fuel delivery. Pipes should be straight and uniform with as large as possible bending radii.

5.3 Pipes shall be cleaned internally after the ends are made and bent in order to remove extraneous matter.

5.4 During storage, the pipes should be protected internally against corrosion and contamination.

5.5 Flow specifications for straight lines are not applicable to bent lines; therefore, straight-line flow specifications are not provided.

PREPARED BY THE SAE DIESEL FUEL INJECTION EQUIPMENT STANDARDS COMMITTEE