



SURFACE VEHICLE RECOMMENDED PRACTICE

J1549™

MAR2021

Issued 1988-04
Reaffirmed 2021-03

Superseding J1549 SEP2015

Diesel Fuel Injection Pump - Validation of Calibrating Nozzle Holder Assemblies

RATIONALE

SAE J1549 has been reaffirmed to comply with the SAE Five-Year Review policy.

- 1. Scope**—The fuel injection pump is intended to validate the accuracy of calibrating nozzle and holder assemblies for applications using 0.4 - 0.8 mm diameter orifice plates and to assist in identifying problems in fuel injection pump test stands.

This SAE Recommended Practice is divided into two parts:

Part I—Design, Description and Specifications of the Fuel Injection Pump; and
Part II—Test Procedures for Using the Fuel Injection Pump.

2. References

- 2.1 Applicable Publications**—The following publications form a part of this specification to the extent specified herein. Unless otherwise specified, the latest issue of SAE publications shall apply.

2.1.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J968 MAR85—Calibrating Nozzle and Holder Assembly for Diesel Fuel Injection Systems
SAE J1418 DEC87—Fuel Injection Pumps — High Pressure Pipes (Tubing) for Testing

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

ISO4008/1—Fuel injection pump testing—Dynamic conditions (1980-11-15)
ISO7440—Calibrating nozzle and holder assemblies

- 3. Part 1—Design, Description and Specifications**—Part I of this SAE Recommended Practice describes and establishes specifications and features of a fuel injection pump and its auxiliary equipment required to perform the above purpose.

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Full document details: SAE J1549_202103

For more information on this standard, visit
https://www.sae.org/standards/content/J1549_202103

Documents

Document Sharing Hub

3.1 Design and Description—This fuel injection pump shall be a single-cylinder, self-contained and cam-operated. Details as to the manufacturer's source are available from SAE. This pump shall provide fuel deliveries and injection pressures capable to test calibrating nozzle and holding assemblies as listed in Part II.

It shall incorporate positive control rack positioning and may have preset stops corresponding to a specified delivery for each orifice size of calibrating nozzle holders.

3.2 Pump Specifications—The fuel injection pump described here shall incorporate the following features:

3.2.1 DELIVERY VALVE

9 mm dia
75 mm³ retraction volume
Lower seated

3.2.2 DELIVERY VALVE SPRING

0.9 mm wire dia
4.8 mm spring O.D.
Total number of coils—18
Number of effective coils—16
Free length—26.2 mm
Ends square and ground

3.2.3 DELIVERY VALVE HOLDER

14 x 1.5 mm thread, 60 deg cone seat for injection tubing

3.2.4 SUPPLY PUMP

Plunger dia 22 mm
Stroke 10 mm
Displacement 3800 mm³/stroke
Regulating pressure 2.4 bar
(35 lbf/in²) at 60 rpm (full bypass)

3.2.5 PLUNGER AND BARREL ASSEMBLY

11 mm diameter, left-hand lower helix, 24 mm lead
Lift to Port Closure: 3 mm
Number of Ports: 2
Size of Ports: 3 mm

3.2.6 CAM TYPE, PROFILE

Tangential type
Maximum velocity 1.94 m/s @ 1000 rpm, 10 mm lift

3.2.7 TAPPET ASSEMBLY

Roller dia 25 mm