



SURFACE VEHICLE STANDARD	J746™	NOV2024
	Issued 1955-12 Reaffirmed 1996-09 Revised 2024-11 Superseding J746 NOV2019	
Hydraulic Motor Test Procedures		

RATIONALE

Removed imperial unit equivalents from all sections. Updated ISO 4406 cleanliness code in 3.8 to 19/17/14.

1. SCOPE

This test code describes tests for determining characteristics of hydraulic positive displacement motors as used on off-road self-propelled work machines as referenced in SAE J1116.

1.1 Purpose

This test code establishes conditions for motor tests, outlines a procedure for tests, and establishes a method of presenting motor test data.

The procedure covers the following determinations:

- SAE volumetric rating
- SAE running torque characteristics
- SAE stall torque characteristics
- Power output
- Power loss
- SAE power and torque efficiency
- Overall efficiency
- Required delivery

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Documents

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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.

2.1.1 SAE Publication

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 J1116 Categories of Off-Road Self-Propelled Work Machines

2.1.2 ISO Publications

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

ISO 4406 Hydraulic Fluid Power - Fluids - Method for Coding the Level of Contamination by Solid Particles

3. MATERIAL AND APPARATUS

3.1 Test Fluid

Test fluid shall preferably be a mineral base oil designed for hydraulic service. Fluid viscosity shall be within the limits of 95 to 115 SUS at 49 °C and 50 to 54 SUS at 82 °C.

3.2 Motor Torque and Speed Measuring Apparatus

Torque measurement shall be accurate within $\pm 1\%$ and speed measurement shall be accurate within $\pm 0.5\%$. The test setup shall not impose radial or axial loads upon the driveshaft of the hydraulic motor under test.

3.3 Flow Measurement

Flow measurement shall be accurate within $\pm 2.0\%$.

3.4 Pressure Measurement

Pressure measurement shall be accurate within $\pm 2.0\%$.

3.5 Temperature Measurement and Control

Fluid temperature shall be measured in the motor outlet line by means of a thermometer or thermocouple. Fluid temperature shall be maintained at the prescribed level throughout the test within ± 3 °C.

3.6 Drain Line

Total pressure drop in drain line, if required, shall be as low as possible.

3.7 Motor Outlet Line

Total pressure drop in outlet line shall be as low as possible.

3.8 System Cleanliness

Test system shall have a contamination level not to exceed ISO 4406 Code 19/17/14.