



| | | | |
|--|---|---|---------------------|
|  | SURFACE VEHICLE STANDARD |  | J746 JUN2009 |
| | | Issued 1955-12 Revised 2009-06 | |
| | | Superseding J746 SEP1996 | |
| Hydraulic Motor Test Procedures | | | |

RATIONALE

This SAE standard is revised to make minor changes to the definition and correct errors for clarification.

1. SCOPE

This test code describes tests for determining characteristics of hydraulic positive displacement motors as used on construction and industrial machinery as referenced in SAE J1116. These characteristics are to be recorded on data sheets similar to the one shown in Figure 1. Two sets of data sheets are to be submitted: one at 49 °C (120 °F) and one at 82 °C (180 °F).

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:

- a. SAE volumetric rating
- b. SAE running torque characteristics
- c. SAE stall torque characteristics
- d. Power output
- e. Power loss
- f. Torque efficiency
- g. Overall efficiency

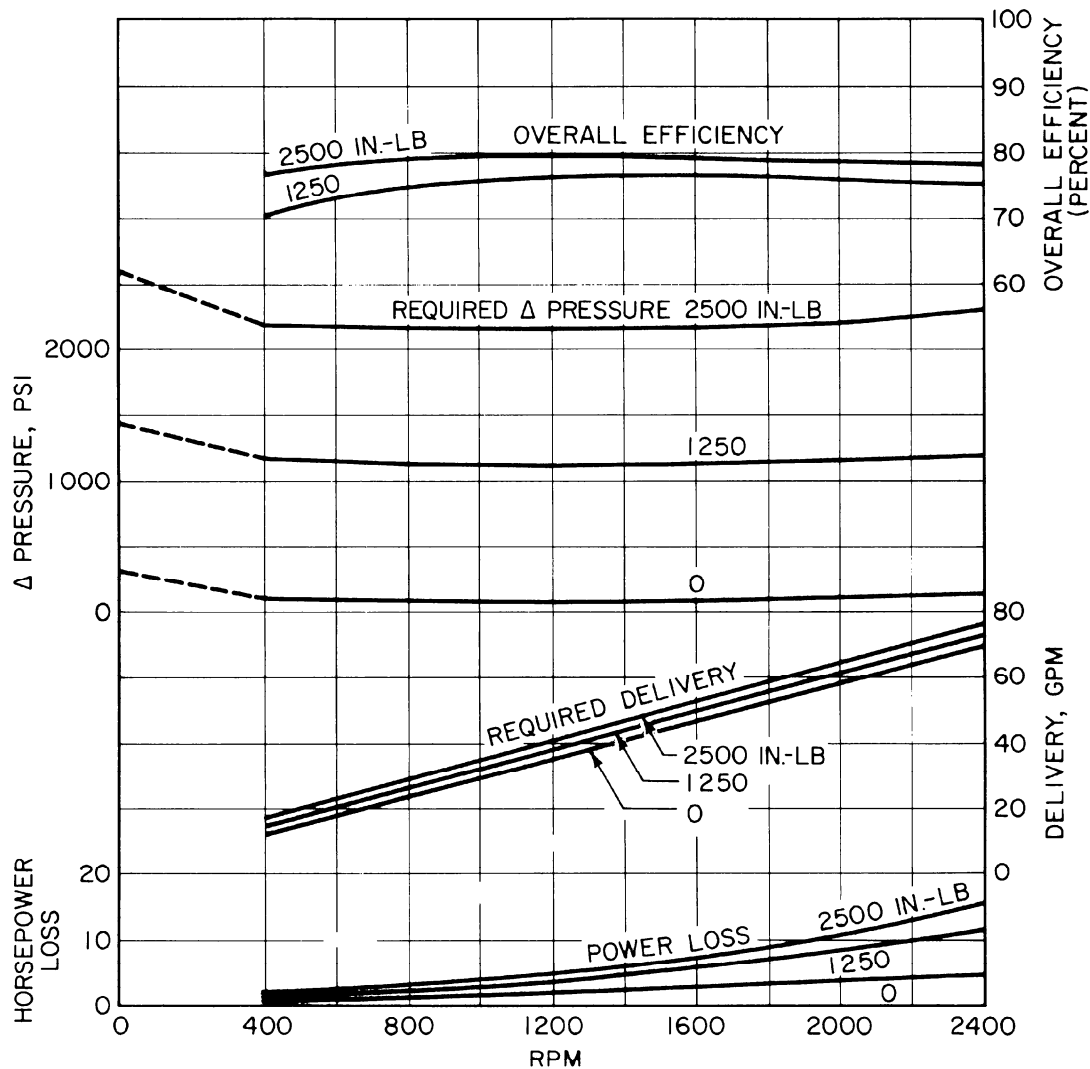
SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2009 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
 Tel: 724-776-4970 (outside USA)
 Fax: 724-776-0790
 Email: CustomerService@sae.org
<http://www.sae.org>



PERFORMANCE DATA ON A CONSTANT DISPLACEMENT HYDRAULIC MOTOR

Manufacturer: Acme Mfg. Co.

Test fluid: Mineral base hydraulic oil

Series or type: ZYX

Fluid viscosity @ test temperature: 100 SUS

Model: 8Z24

Temperature of test fluid: 120 °F

Motor rotation: Double

SAE volumetric rating: 35.5 GPM/1000 RPM

FIGURE 1 - WORK SHEET

2. REFERENCE

2.1 Applicable Publication

The following publication forms 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 724-776-4970 (outside USA), www.sae.org.

SAE J1116 Categories of Off-Road Self-Propelled Work Machines

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 (120 °F) and 50 to 54 SUS at 82 °C (180 °F).

3.2 Motor Torque and Speed Measuring Apparatus

Torque measurement must be accurate within $\pm 1\%$ and speed measurement must 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 ± 2.8 °C (± 5 °F).

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.

4. GENERAL DEFINITIONS AND TEST CONDITIONS

4.1 Temperature

Shall be expressed in degrees Centigrade (C) or Fahrenheit (F).

4.2 Pressure

Shall be expressed in Newtons per square centimeter gage (N/cm²g) or pounds per square inch gage (psig).

4.3 SAE Volumetric Rating

The SAE volumetric rating of a hydraulic motor shall be defined as delivery to the motor in liters per minute (Lpm) or gallons per minute (gpm) at a speed of 1000 rpm and zero torque on the shaft at a fluid temperature of 49 °C (120 °F).