RECOMMENDED PRACTICE SAE J1235

APPROVED AS ANSI/SAE J1235
BY AMERICAN NATIONAL
STANDARDS INSTITUTE

Measuring and Reporting the Internal Leakage of a Hydraulic Fluid Power Valve—SAE J1235

SPONSORED BY:
SOCIETY OF AUTOMOTIVE ENGINEERS, INC.

PUBLISHED BY:
SOCIETY OF AUTOMOTIVE ENGINEERS, INC., 400 Commonwealth Drive, Warrendale, PA 15096

MEASURING AND REPORTING THE INTERNAL LEAKAGE OF A HYDRAULIC FLUID POWER VALVE—SAE J1235

SAE Recommended Practice

Report of Off-Road Machinery Technical Committee approved June 1978.

1. Purpose—To provide a uniform laboratory procedure for measuring and reporting the fluid flow (leakage) across a restricted flow path in a hydraulic fluid power valve.

2. Terms and Definitions—(For definitions of terms not herein defined, see Ref. 1.)

2.1 Test Pressure—The differential pressure between input and output port(s) at which leakage will be determined.

2.2 Input Port—Any port into which flow is directed for purposes of this test.

2.3 Output Port—Any port from which flow exits for purposes of this test.

2.4 Control—Any adjustable feature integral with the test valve that determines the restricted flow path.

2.5 Specified Data—That basic information furnished in the request for the test as indicated in Section 5.

3. Units

3.1 The International System of Units (SI) is used herein in accordance with Ref. 2.

3.2 Approximate conversions to *Customary U.S.* units are given for information purposes. These appear in parentheses after their *SI* counterpart.

4. Graphic Symbols—Graphic symbols used herein are in accordance with Refs. 3 and 4. Where Refs. 3 and 4 are not in agreement, Ref. 3 governs.

5. Summary of Specified Data

5.1 Specify the following information on all requests for this test.

5.1.1 A description of valve.

5.1.2 A description of fluid (if different from paragraph 10.1).

5.1.3 The fluid temperature (if different from the standardized value in paragraph 10.2).

5.1.4 Test pressure.

5.1.5 The input port(s).

5.1.6 The output port(s).

5.1.7 The control position and flow path(s).

6. General Procedure

6.1 Conduct the test in accordance with the fixed values specified by the test request (Ref. Section 8).

6.2 Use only standardized values, shown in Section 10, for catalog information and sales literature.

Note: For close coordination between testing laboratories, similar equipment, fluid, and procedures are recommended.

7. Test Conditions

7.1 Accuracy—Maintain equipment accuracy within the limits shown in the following table:

Test Condition	Maintain Within ±
Flow	2%
Pressure	2%
Temperature	0.6°C (1°F)
Time	2%

7.2 Contamination Level—Limit the number of particles in the system fluid to a maximum of 1000 particles per millilitre greater than 5 μm.

8. Test Procedure

8.1 Install the test valve in the test circuit using the input port(s) and output port(s) indicated in the test request.

8.2 Actuate or set the control for the flow path(s) indicated on the test request.

8.3 Ensure that valve body temperature has stabilized within 3°C (5°F) of the temperature of the oil.

8.4 Establish and maintain the specified test pressure.

The ϕ symbol is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. If the symbol is next to the report title, it indicates a complete revision of the report.

DATE TESTED: _____ TEST LABORATORY: _____

VALVE DESCRIPTION: _____ FLUID _____

COMMENTS: _____

CONTROL POS.	INPUT PORT(S)	OUTPUT PORT(S)	TEST PRESSURE	FLUID TEMP.	BODY TEMP.	TEST NO.	LEAKAGE RATE
						1	
						2	
						3	

FIG. 1—EXAMPLE TEST DATA SUMMARY

8.5 Cycle the input control at least three times within 1 min and return to the specified control position.

8.6 Start the measurement of leakage rate between 15 and 60 s after completion of paragraph 8.5.

8.7 Finish measurement of leakage rate between 15 and 60 s after start of measurement.

8.8 Perform paragraphs 8.2—8.7 three times.

8.9 Record and report all readings (Ref. Fig. 1).

9. Data Presentation—Include the following information with the data presentation.

9.1 Leakage rate (three readings).

9.2 Fluid temperature.

9.3 Valve body temperature.

9.4 Valve description.

9.5 Test pressure.

9.6 Control position and leak path(s).

9.7 Input port(s).

9.8 Output port(s).

9.9 Date of test.

9.10 Test agency.

9.11 Description of fluid.

10. Standardized Values

10.1 A fluid with a viscosity of 21—26 mm^2/s at 50°C (105—125 SUS at 122°F) and 6.6—7.4 mm^2/s at 90°C (48—50 SUS at 194°F) should be used.

10.2 Fluid temperature shall be 50°C (122°F).

11. Identification Statement—Use the following statement in catalogs and sales literature when electing to comply with this voluntary standard:

Leakage rate(s) obtained and presented in accordance with SAE Recommended Practice _____.

12. References

12.1 American National Standard Glossary of Terms for Fluid Power, ANSI/B.93.2-1971, and Supplements thereto (ISO/TC 131/SC 1 (USA-2) 3).

12.2 International Standard Rules for the Use of Units of the International System of Units and a Selection of the Decimal Multiples and Submultiples of SI Units, ISO/R 1000-1969.

12.3 International Standard Graphical Symbols for Hydraulic and Pneumatic Equipment and Accessories for Fluid Power Transmissions, ISO/R 1219-1970. Agrees with ANSI/Y32 10-1967.

12.4 American National Standard Fluid Power Diagrams, ANSI/Y14 17-1966.