SURFACE VEHICLE RECOMMENDED PRACTICE

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Air Brake Valve - Performance Requirements

RATIONALE

This technical report has been revised to include the option of performing corrosion testing using the alternate approach detailed in the comprehensive SAE J2721 Recommended Practice.

1. SCOPE

This SAE Recommended Practice establishes minimum performance requirements for new pneumatic valves when tested in accordance with the test procedure outlined in SAE J1409. The performance requirements will include:

a. Input-output performance

b. Leakage characteristics

c. Low temperature performance

d. Elevated temperature performance

e. Corrosion resistance performance

f. Endurance testing

g. Structural integrity

1.1 Purpose

The document establishes uniform performance requirements for pneumatic valves designed to operate at 931 kPa (135 psi) nominal pressure in truck and bus air brake vehicles.

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https://www.sae.org/standards/content/J1410_202012

2. REFERENCES

2.1 Applicable Documents

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 Publications

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 J1409 Air Brake Valves Test Procedure

3. DEFINITIONS

The same definitions and valve types listed in SAE J1409 are also applicable to this document. Refer to SAE J1859 for additional examples of valve types.

4. GENERAL NOTES

The same general notes listed in SAE J1409 are also applicable to this document.

5. INPUT-OUTPUT PERFORMANCE

Refer to SAE J1859. The test and acceptance criteria for the input-output characteristics shall be determined by the intended design and functions as agreed upon by the valve manufacturer and purchaser.

6. LEAKAGE CHARACTERISTICS

6.1 No Delivery Condition Test

6.1.1 Low Supply Pressure Test

When tested per test procedure 6.1.1 of SAE J1409, supply air leakage must not exceed 60 std. cm^3/min.

6.1.2 Full Supply Pressure Test

When tested per test procedure 6.1.2 of SAE J1409, supply air leakage must not exceed 60 std. cm^3/min.

6.1.3 Automatic Pressure Actuating Type Valves Only

When tested per test procedure 6.1.3 of SAE J1409, the total air leakage must not exceed 100 std. cm^3/min.

6.2 Applied Condition Test

6.2.1 Low Delivery Pressure Test

When tested per test procedure 6.2.1 of SAE J1409, total air leakage must not exceed 60 std. cm^3/min for through type valves, 100 std. cm^3/min for all other applicable valve types.

6.2.2 Intermediate Delivery Pressure Test

When tested per test procedure 6.2.2 of SAE J1409, total air leakage must not exceed 60 std. cm^3/min for through type valves, 100 std. cm^3/min for all other applicable valve types.

6.2.3 Full Delivery Pressure Test

When tested per test procedure 6.2.3 of SAE J1409, total air leakage must not exceed 60 std. cm^3/min for modulating and non-modulating type valves, 100 std. cm^3/min for all other applicable valve types.

7. STRUCTURAL INTEGRITY

7.1 Over Pressurization

When tested per test procedure 7.1 of SAE J1409, the input-output characteristics and leakage must be within the limits specified in Sections 5 and 6.

7.2 Maximum Pressure Test

When tested per test procedure 7.2 of SAE J1409, the valve must not show visible cracks, permanent deformation, or exterior leakage.

8. LOW TEMPERATURE EVALUATION

8.1 Low Temperature Leakage (First Application)

When tested per test procedure 8.1 of SAE J1409, the total air leakage must not exceed 3000 std. cm^3/min except for modulating type valves in the applied condition where the total air leakage must not exceed 4500 std. cm^3/min. Lower acceptance values may be agreed upon between the manufacturer and customer.

8.2 Low Temperature Function

When tested per test procedure of 8.2 of SAE J1409, the performance requirements for low temperature function of air valves shall be determined by the intended design and functions as agreed upon by the valve manufacturer and purchaser.

8.3 Room Temperature Test (Post-Low Temperature Soak)

When tested per test procedure 8.3 of SAE J1409, the input-output characteristics and leakage must be within the limits specified in Sections 5 and 6.

9. ELEVATED TEMPERATURE EVALUATION

9.1 Elevated Temperature Leakage

When tested per test procedure 9.1 of SAE J1409, the leakage specification must be within the limits specified in Section 6.

9.2 Elevated Temperature Function

When tested per test procedure 9.2 of SAE J1409, the performance requirements for elevated temperature function on air valves shall be determined by the intended design and function as agreed upon by the valve manufacturer and purchaser.

9.3 Elevated Temperature Endurance

After testing per test procedure 9.3 of SAE J1409, the leakage measured per 9.4 of SAE J1409 must not exceed 200 std. cm^3/min and input-output characteristics must be as specified in Section 5.

10. CORROSION RESISTANCE EVALUATION

When tested per test procedure 10 of SAE J1409, the valve must not show visible cracks, permanent deformation, or exterior leakage, and must perform to the requirements in Section 6 of this document.