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SAE J1833 NOV88

Hot Impulse Test for Hydraulic Brake Hose Assemblies

SAE Recommended Practice
Issued November 1988

Submitted for Recognition as an American National Standard

SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®
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HIGHWAY VEHICLE PRACTICE

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HOT IMPULSE TEST FOR HYDRAULIC BRAKE HOSE ASSEMBLIES

1. PURPOSE:

This SAE Recommended Practice presents an accelerated test to verify the structural integrity of hydraulic brake hose and the hose-to-fitting seal. It is intended to simulate the effects of environmental aging and braking pressurization on brake hose assemblies. The test is a guide to assist hose designers and/or users in determining brake hose assembly performance characteristics under conditions of heat and pressure.

2. SCOPE:

This recommended practice describes the equipment, test procedure, and performance requirements for high temperature impulsing of automotive brake hose assemblies with hydraulic brake fluid.

3. TEST PROCEDURE:

3.1 Test Equipment:

3.1.1 Pressure Cycling Apparatus: The pressure cycling apparatus shall be capable of applying a pressure of 11 MPa (1600 psi). It shall have automatic control of the time for the pressure apply/release cycle.

3.1.2 Circulating Air Oven: An insulated circulating air oven with a suitable thermostatically-controlled heating system is required to maintain a temperature of 143 ± 3°C (295 ± 5°F).

3.1.3 Pressure Hold and Burst Strength Test Apparatus: An apparatus conforming to the requirements described in SAE J1401.

3.2 Connect the hose assemblies to a pressure cycling apparatus capable of producing a pressure of 0 - 11 MPa (0 - 1600 psi).

3.3 Fill the pressure cycling apparatus and hose assemblies with brake fluid, and bleed free of air.

3.4 Place the assemblies in a circulating air oven, and within 30 min attain an oven temperature of 143 ± 3°C (295 ± 5°F).

3.5 Subject the assemblies to a cycling internal pressure of 11 + 0.5, -0 MPa (1600 + 75, -0 psi) for 1 ± 0.1 min and 0 pressure for 1 ± 0.1 min; pressures to be attained within 2 seconds.

3.6 Pressure cycle assemblies for 150 cycles minimum.

3.7 Remove the assemblies from the oven. Disconnect the assemblies from the impulse apparatus, and drain the fluid.

3.8 Cool the assemblies in air at room temperature for 45 min minimum.

3.9 Fill the assemblies with water or brake fluid, allowing air to escape. Apply 27.6 + 0, -1.4 MPa (4000 + 0, -200 psi) or brake fluid pressure, and hold for 2 min + 0, -10 seconds.

3.10 Subject the assemblies to the burst test per SAE J1401.

4. PERFORMANCE REQUIREMENTS:

4.1 The assemblies shall withstand impulsing for 150 cycles without leakage.

4.2 There shall be no leakage during a 2-min, 27.6 MPa (4000 psi) pressure hold.

4.3 The assembly shall not burst at less than 34.5 MPa (5000 psi).

RATIONALE:

The preceding recommended practice has been developed and evaluated by a task force of the Hydraulic Brake Hose Working Panel. The members of the task group believe that such an impulse test would better check the integrity of the hose components and the hose-to-fitting seal, and would better simulate automotive vehicle usage conditions than the current SAE J1401 compatibility test.

The recommended practice was evaluated with five different hose construction designs, and it was replicated to demonstrate reproducibility. Extensive industrial experience with this test suggests that additional cycling beyond the proposed 150-cycle requirement should be considered for the design and use of brake hose assemblies under severe operating conditions.

RELATIONSHIP OF SAE STANDARD TO ISO STANDARD:

Not applicable.

REFERENCE SECTION:

SAE J1401 JUN85, Road Vehicle - Hydraulic Brake Hose Assemblies for Use with Non-Petroleum Base Hydraulic Fluids

APPLICATION:

This recommended practice describes the equipment, test procedure, and performance requirements for high temperature impulsing of automotive brake hose assemblies with hydraulic brake fluid.

COMMITTEE COMPOSITION:

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