



Performance Testing of Brake Booster Vacuum Hose

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. Leakage and durability test at -40 °C and +100 °C with simultaneous relative motion of the hose ends of ± 30 mm.

1.2 Applicability. This procedure is intended for the purpose of measuring the performance properties of vacuum booster hoses.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

None

2.3 Additional References.

Subsystem Technical Specification (SSTS)

3 Resources

3.1 Facilities. Not applicable.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.2 Equipment.

3.2.1 Environmental chamber.

3.2.2 Thermometer.

3.2.3 Movement Simulation Device. Compressed air actuator or electric motor with eccentric drive (stroke = ± 30 mm with 2.5 Hz).

3.2.4 Supporting device with hose connection.

3.2.5 Vacuum pump and pressure gage.

3.3 Test Vehicle/Test Piece. Six (6) vacuum hoses.

3.4 Test Time. Not applicable.

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Conform to GM Supplier Quality and/or laboratory certification requirements. Technician training records must be available on request.

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4 Procedure

4.1 Preparation. Not applicable.

4.2 Conditions.

4.2.1 Environmental Conditions. The high temperature test is run at +100 °C; the low temperature test at -40 °C.

4.2.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

4.3 Instructions.

4.3.1 High Temperature Test.

4.3.1.1 Install three (3) vacuum hoses each into the environmental chamber according to the production assembly specification. The mounting conditions depend on the type and location of engine and brake booster.

4.3.1.2 After the assembly, set environmental chamber to +100 °C and the movement simulation device to 2.5 Hz, and run to 1 000 000 strokes or number specified on drawing. A relative motion of ±30 mm shall be induced in longitudinal direction of the hose simultaneously.

4.3.1.3 Check the tightness of the vacuum hoses with the vacuum pump for leaks at -70 kPa at +100 °C without movement simulation.

4.3.1.4 Number of strokes as specified by drawing or Subsystem Technical Specification (SSTS).

4.3.2 Low Temperature Test.

4.3.2.1 Install three (3) vacuum hoses each into the environmental chamber according to the production assembly specification. The mounting conditions depend on the type and location of the engine and brake booster.

4.3.2.2 After the assembly, set the environmental chamber to -40 °C and the movement simulation device to 2.5 Hz, and run to 300 000 strokes or number specified on drawing. A relative motion of ±30 mm shall be induced in longitudinal direction of the hose simultaneously.

4.3.2.3 Check the tightness of the vacuum hoses with the vacuum pump for leaks at -70 kPa at -40 °C without movement simulation.

4.3.2.4 Number of strokes as specified by drawing or SSTS.

5 Data

5.1 Calculations. Not applicable.

5.2 Interpretation of Results. No cracks shall be present after the movement simulation. Parts must be tight after leakage test for 5 minutes. No pressure increase allowed during low pressure testing at -70 kPa.

5.3 Test Documentation. With reference to this test procedure, the test results shall be represented in a test report.

6 Safety

This standard may involve hazardous materials, operations, and equipment. This standard does not propose to address all the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

7 Notes

7.1 Glossary. Not applicable.

7.2 Acronyms, Abbreviations, and Symbols.

SSTS Subsystem Technical Specification

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