



Performance Testing of Vacuum Brake 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. This test procedure describes the performance test requirements for vacuum brake hose.

1.2 Applicability. This test procedure is applicable to all elastomeric vacuum brake hoses.

1.3 Remarks. These tests shall be used to determine the performance properties of vacuum brake hoses.

2 References

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

2.1 External Standards/Specifications.

ASTM D380

ASTM D471

ASTM D622

2.2 GM Standards/Specifications.

GMW16501

3 Resources

3.1 Facilities.

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. Respective test equipment to the tests shown in Section 4.

3.3 Test Vehicle/Test Piece. Per individual test listed in Section 4.

Note: Tests are to be conducted on hoses as supplied.

3.4 Test Time. Per individual test listed in Section 4.

3.5 Test Required Information. Per individual test listed in Section 4.

3.6 Personnel/Skills. Must conform to company and/or laboratory requirements. Technician training records must be available upon request.

4 Procedure

4.1 Preparation. Per individual tests listed in Section 4.

4.2 Conditions.

4.2.1 Environmental Conditions. The minimum time between manufacturing and testing shall be 72 h. The test pieces shall be maintained at a temperature of $23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ and $50\% \pm 5\%$ relative humidity for at least 24 h prior to test, and shall be free from strain during this period.

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. Procedures described in ASTM D622 (Methods of Testing Rubber Hose for Automotive Air and Vacuum Brake System) shall be followed unless otherwise specified.

4.3.1 Burst Test. Conduct Burst Test per ASTM D622.

4.3.2 Pressure Proof Test. Proof test hose per ASTM D380 using 1.2 MPa pressure.

4.3.3 Hot Vacuum Test. Connect hose to a vacuum source per Collapse Resistance Test of ASTM D622. At atmospheric pressure, (no vacuum applied) measure the outside diameter of the hose.

4.3.3.1 While still connected to vacuum source, precondition hose at $125\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$ for a period of 4 h +1 h/-0 h.

4.3.3.2 While maintaining the hose at $125\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$, apply 88 kPa vacuum for a period of 5 minutes.

4.3.3.3 At the end of the 5 minute period, while the hose is still at $125\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$, and under 88 kPa vacuum, measure the outside diameter (OD) of the hose at its minimum value.

4.3.4 Kink Resistance Test. Bend a length of vacuum brake hose, of the length prescribed in Table 1, in the direction of its natural curvature until its ends just touch. (See Figure 1.)

4.3.4.1 Measure the outside diameter of the specimen at Point A (Figure 1) both before and after bending. The difference between the two (2) measurements shall be considered the value for collapse of the hose reported.

Table 1: Dimensions for Kink Resistance Test

Inside Diameter	Specimen Length
5.56 mm (7/32 in)	178 mm (7 in)
8.73 mm (11/32 in)	280 mm (11 in)
11.91 mm (15/32 in)	355 mm (14 in)
12.7 mm (½ in)	406 mm (16 in)

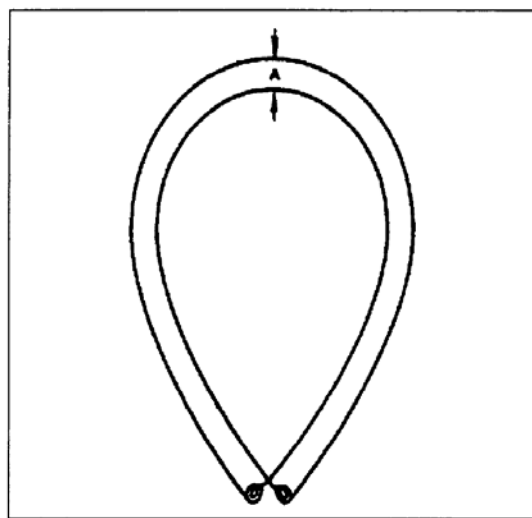


Figure 1: Kink Test Sample Configuration