



SURFACE VEHICLE STANDARD

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Vacuum Brake Hose

RATIONALE

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Documents

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1. Scope

The vacuum brake hose is intended for use in the power braking systems of vehicles or as connections on vacuum lines of vehicles or systems thereof. For the purposes of clearly identifying hose classification and for specification simplification, vacuum brake hose is divided into two types: heavy-wall Type H, and light-wall Type L.

1.1 Rationale

This SAE document is a reaffirmation of the vehicle standard for vacuum brake hoses. Minor editorial changes were made to clarify some sections without affecting the standard's intent.

2. References

2.1 Related Publications

The following publications are provided for information purposes only and are not a required part of this document.

2.1.1 ASTM PUBLICATIONS

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM D 471—Rubber Property—Effect of Liquids

ASTM D 622—Rubber Hose for Automotive Air and Vacuum Brake System

ASTM D 1149—Rubber Deterioration—Surface Ozone Cracking in a Chamber (Flat Specimen)

3. Performance Tests

3.1 Fuel Resistance Test

- 3.1.1 Fill a specimen of vacuum brake hose $300 \text{ mm} \pm 6$ ($11.8 \text{ in} \pm 0.2$) long with ASTM Reference Fuel B.
- 3.1.2 Maintain the reference fuel in the hose at atmospheric pressure and room temperature for $48 \text{ h} \pm 1.0$.
- 3.1.3 Drain the hose and within 5 min determine that every inside diameter of any section of hose is not less than 75% of the nominal inside diameter of the hose for heavy-wall and not less than 70% of the nominal inside diameter of the hose for light-wall hose. This determination can be performed by passage, end-to-end, of a ball having a diameter equal to or greater than the 75%, 70% of nominal I.D.
- 3.1.4 Within 10 min of fuel removal, subject the specimen to a vacuum of $88 + 0, -7 \text{ kPa}$ ($26 + 0, -2 \text{ in Hg}$) for $10 \text{ min} \pm 1$.
- 3.1.5 Conduct the adhesion test for reinforced hose per 3.5.

3.2 Pressure Test

Subject a $450 \text{ mm} \pm 6$ ($18 \text{ in} \pm 0.2$) length of hose to a hydrostatic pressure of $2.41 \text{ MPa} \pm 0.07$ ($350 \text{ psi} \pm 10$) for $1 \text{ min} + 10, -0 \text{ s}$.

3.3 High Temperature Exposure Test

- 3.3.1 Using calipers, measure the outside diameter of a $300 \text{ mm} \pm 6$ ($11.8 \text{ in} \pm 0.2$) straight length of hose.
- 3.3.2 Subject the hose to an internal vacuum of $88 + 0, -7 \text{ kPa}$ ($26 + 0, -2 \text{ in Hg}$) at a temperature of $125 \text{ }^{\circ}\text{C} \pm 2$ ($257 \text{ }^{\circ}\text{F} \pm 3.6$) for $96 \text{ h} \pm 2.0$.
- 3.3.3 Within 5 min after completion of the hot vacuum aging period, measure the outside diameter at the point of greatest collapse using calipers.
- 3.3.4 Cool the hose for $4 \text{ h} \pm 0.25$, and then condition the hose for $30 \text{ min} \pm 5$ at room temperature.
- 3.3.5 Bend the hose around a mandrel having a diameter five times the nominal outside diameter of the hose.
- 3.3.6 Examine the hose for evidence of external and internal embrittlement or other evidence of degradation.
- 3.3.7 Subject the hose to a proof test pressure of $1.21 \text{ MPa} \pm 0.07$ ($175 \text{ psi} \pm 10$) for $1 \text{ min} + 10, -0 \text{ s}$.