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Cooperative Engineering Program

# SAE J1403 JUN85

# Vacuum Brake Hose

SAE Standard
Revised June 1985





An American National Standard

# VACUUM BRAKE HOSE—SAE J1403 JUN85

**SAE Standard**

Report of the Motorcoach and Motor Truck Division, approved January 1942, last revised, Nonmetallic Materials Committee, June 1985. This hose was formerly designated SAE 40R3.

[The specifications in this SAE Standard originated in the SAE-ASTM Technical Committee on Automotive Rubber (other than tires). They represent the correlation of the best information available from research investigation and production experience on the minimum constructional and performance characteristics essential for new brakehose assemblies used as original or replacement equipment. They also represent the minimum quality recognized by car manufacturers and hose suppliers as essential for satisfactory and safe operation by the hose itself and other coacting parts of the braking system.]

*Scope*—Vacuum brake hose is intended for use in the power braking systems of vehicles or as connections on transmission lines in combinations of vehicles or systems thereof. For the purpose of clearly identifying the scopes and simplification of the specification, the vacuum brake hose specification is divided into two types with two classes as follows: Heavy-Wall Type H, Class A and B and Light-Wall Type L, Class A and B.

*Classes*

**Class A (HWA and LWA)**—This class is intended for use in service applications where resistance to oil, fuel, and vapors thereof is necessary.

**Class B (HWB and LWB)**—This class is intended for use in applications where resistance to oil, fuel, and vapors thereof is not required.

*General Requirements*

**Manufacture**—The construction of hose for this service embodies a smooth bore tube of flexible material, reinforced with a cord, yarn, or fabric ply, or plies thereof, or a combination, and a cover of flexible elastomeric material. The hose shall be so manufactured as to comply with the test requirements set forth in this SAE Standard.

**Hose Identification**—The manufacturer's name, code, or trademark; the date code; and the type and class designations shall appear on the outer cover of the hose at intervals not greater than 15 in (381 mm) apart.

The date code shall consist of 6 digits: the first 2 digits shall represent the month (01 through 12) of the year, the next 2 shall represent the day of the month (01 through 31), and the last 2 shall be the last 2 digits of the year.

Type and Class shall be indicated HWA for heavy-wall Class A, HWB for heavy-wall Class B, LWA for light-wall Class A, and LWB for light-wall Class B. In addition, each hose manufacturer shall incorporate into the construction of the hose identification yarn as assigned by RMA and ϕ as shown in Appendix B of SAE J1401.

*Manufacturer's Testing and Inspection*—Measurement and testing will be performed in accordance with ASTM D 622, except where otherwise specified.

**Production Proof Testing**—All hose shall be proof tested at pressure shown in Table 4 and as specified in ASTM D 380.

**Initial Sample Approval**—Qualification testing for initial sample approval shall be based on testing in accordance with the complete specification.

**Production Lot Control**—Production hose will be sampled by lot, as defined in ASTM D 380 and tested for original physical properties 1 through 9, including tests that are performed on the tube and cover and on the whole hose and/or assembly. The first occurrence of production in each month will be sampled and tested in accordance with the complete specification and dimensions in accordance with the appropriate table.

Upon failure of any characteristic, two additional samples will be selected at random for retesting the failed characteristic. In the event of failure of the same characteristic on either of the two additional samples, production from the same code date shall be isolated and suitable disposition performed.

*Hose Test Requirements*

**1. Heavy-Wall Vacuum Brake Hose Dimensions and Tolerances**—See Table 1.

**2. Light-Wall Vacuum Brake Hose Dimensions and Tolerances**—See Table 2.

**3. Tube Material**—The original physical properties shall be as specified in Table 3.

**TABLE 1—HEAVY-WALL VACUUM BRAKE HOSE DIMENSIONS AND TOLERANCES**

| Dimension | Hose Size, in | | | | | |
|---|---|---|---|---|---|---|
| | 1/4 | 3/8 | 1/2 | 5/8 | 3/4 | 1 |
| Inside diameter | | | | | | |
| in | 0.25 | 0.38 | 0.50 | 0.62 | 0.75 | 1.00 |
| mm | 6.35 | 9.53 | 12.70 | 15.88 | 19.05 | 25.40 |
| Tolerance | | | | | | |
| ±in | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.06 |
| ±mm | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | 1.52 |
| Outside diameter | | | | | | |
| in | 0.56 | 0.81 | 0.94 | 1.06 | 1.19 | 1.47 |
| mm | 14.22 | 20.57 | 23.88 | 26.92 | 30.23 | 37.34 |
| Tolerance | | | | | | |
| ±in | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.06 |
| ±mm | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | 1.52 |

**4. Cover Material**—The original physical properties shall be as specified in Table 3.

**5. Burst Test**—The hose or hose assembly shall not burst, leak, or show signs of failure at a hydrostatic pressure lower than specified in Table 4. Destroy samples.

**6. Vacuum Test**—The collapse of the outside diameter of the hose under internal vacuum of 26 in Hg (88 kPa) for 5 min shall not exceed 0.06 in (1.52 mm).

**7. Bend Test**—The collapse of the outside diameter of the hose at the middle point of the test length, when tested in accordance with ASTM D 622, shall not exceed the values given in Table 4.

**8. Adhesion Test**—The minimum load required to separate the tube from plies, the plies, and the cover from the plies shall be 8 lb/in of width (1400 N/m of width).

**9. Hose Identification**—Inspection of the hose marking and manufacturer's identification shall be performed.

**10. Aging Test**—The hose shall show no cracks, charring, or disintegration externally or internally when straightened after being conditioned as in ASTM D 622 for a period of 70 h in an air oven at 100 ±1°C (212 ±1.8°F). Hose shall show no leaks when proof pressure tested after the aging test. Destroy samples.

**11. Cold Test**—After being subjected to the cold test as described in ASTM D 622, the hose shall show no cracking or breaking. Hose

**TABLE 2—LIGHT-WALL VACUUM BRAKE HOSE DIMENSIONS AND TOLERANCES**

| Dimension | Hose Size, in | | |
|---|---|---|---|
| | 7/32 | 11/32 | 15/32 |
| Inside diameter | | | |
| in | 0.22 | 0.34 | 0.47 |
| mm | 5.56 | 8.73 | 11.91 |
| Tolerance | | | |
| ±in | 0.03 | 0.03 | 0.03 |
| ±mm | 0.76 | 0.76 | 0.76 |
| Outside diameter | | | |
| in | 0.44 | 0.69 | 0.81 |
| mm | 11.18 | 17.53 | 20.57 |
| Tolerance | | | |
| ±in | 0.03 | 0.03 | 0.03 |
| ±mm | 0.76 | 0.76 | 0.76 |



The ϕ symbol is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. If the symbol is next to the report title, it indicates a complete revision of the report.