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## AIR BRAKE HOSE — SAE J1402

SAE Standard

Report of Motorcoach and Motor Truck Division approved January 1942 and last revised by Nonmetallic Materials Committee March 1967. Editorial change April 1968. This material was formerly designated SAE 40R2.

[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 brake-hose 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 coating parts of the braking system.]

**Scope**—This specification covers five types of air hose intended for use in automotive air brake systems. The system includes all air actuated equipment leading from the air brake line. These types of hose are not to be used from the air compressor to air reservoir if air temperature is in excess of 250 F. The types of hose are as follows:

Type A—Hose shall be mandrel built having a tube and friction of oil resisting rubber, reinforced with cotton or synthetic cord or duck plies or a combination of both, and a cover of oil resisting compounds utilizing polymerized chloroprene as the basic material. Assemble with

reusable or permanent type metal end fittings.

**Type B**—Hose shall be nonmandrel built having a tube and friction of oil resisting rubber, reinforced with cotton or synthetic cord or duck plies or a combination of both, and a cover of oil resisting compounds utilizing polymerized chloroprene as the basic material. Assemble with reusable or permanent type metal end fittings.

**Type C**—Hose shall be mandrel built having a tube of oil resisting rubber, reinforced with one braid of high tensile steel wire and a cover of oil resisting compounds utilizing polymerized chloroprene as the basic material. A cotton braid or other suitable material may be used to anchor the cover to the hose. Assemble with permanent type metal end fittings only.

**Type D**—Hose shall be mandrel built having a tube of oil resisting rubber, reinforced with two cotton braids separated by a high tensile steel wire braid. All braids are to be impregnated with an oil and age resisting compound. This hose is not to be used on any line where abrasion of the outer cover will be encountered in service. Assemble with reusable type metal end fittings only.

**Type E**—Hose shall be mandrel built having a tube of oil resisting rubber, reinforced with two cotton or synthetic braids separated by a wire braid. All braids are to be impregnated with an oil and age resisting compound. This hose is not to be used on any line where abrasion of the outer cover will be encountered in its service. Assemble with reusable type metal end fittings only.

**Type F**—Hose shall be mandrel built having a tube of oil resisting rubber, reinforced with one 300 Series stainless steel braid and one fabric braid separated by an insulation layer of oil resisting rubber. The fabric braid is to be impregnated with an oil and age resistant compound. Assembled with reusable or permanent type metal end fittings.

**Manufacture**—The construction of hose for this service embodies a smooth bore tube of oil resisting material reinforced as described for the types of hose and having a cover of abrasive oil and age resistant compound, except on Types D, E, and F where the cover will be an impregnated cotton cover. The hose shall be so manufactured as to comply with the test requirements set forth in this SAE Standard.

**Reusable End Fittings**—Reusable end fittings shall consist of a nipple inserted into the bore of the hose and an outer sleeve (socket, body, or shell) engaging the nipple. The wall of the hose shall be compressed between the nipple and sleeve. Reusable end fittings on Types A and B shall be of such design and construction that they may be used on all constructions of both types of hose.

**Dichromate Dip**—All zinc plated end fittings are to be dichromate dipped.

**Salt Spray Test**—Hose assembly end connections shall withstand 24 hr exposure to salt spray when tested in accordance with ASTM B 117 Method of Salt Spray (Fog) Testing. Conformance to this requirement shall be determined by observation of the exterior of the fitting.

**Hose Identification**—The type of hose, the name or trademark of the hose manufacturer, and/or the hose assembler shall appear on the outer cover of the hose at intervals not greater than 15 in. apart.

The color of the branding shall be red for Types A, B, C, D, E, and F hose.

**Retests and Rejections**—Any hose which fails in one or more tests may be resampled and retested for which purpose two additional samples shall be selected from the hose for the test that failed to meet the requirements. Failure of either of the retested samples shall be cause for final rejection.

**Sizes**—The hose shall conform to the dimensional requirements given in Table 1.

**Type C Wire, Outside Diameter**—The outside diameter over the wire reinforcement of Type C shall conform to the following:

TYPE C, OD OVER WIRE

ID, in.	Wire OD, in.
1/4	7/16 ± 3/128
3/8	19/32 ± 3/128
1/2	23/32 ± 1/32

**Samples for Tests**—A representative sample of hose approximately 6 ft in length shall be selected from each lot to be tested. If a single length of 6 ft is not available, several sections, each of sufficient length to provide the required test specimens, may be taken.

**Test Requirements**—All measurements and tests necessary for determining the conformity of the hose with these specifications shall be made in accordance with ASTM D 622, Methods of Testing Automotive Air Brake and Vacuum Brake Hose.

To qualify hose under this specification, all of the requirements shown under Qualification Tests and Inspection Tests must be met. Production shipments or lots of the qualified hose shall meet the requirements shown under Inspection Tests, but the user may in addition, if he so desires, test hose from any or all such production shipments or lots to the requirements under the Qualification Tests.

**Qualification Tests**

**Aging Test**—The hose shall show no cracks, charring, or disintegration externally or internally when straightened after being bent over a form having the radius given in Table 2 after a period of 70 hr in an oven at 100 ± 1 C (212 ± 1.8 F).

TABLE 2—AIR BRAKE HOSE AGING TEST

	Hose Size, Inside Diameters, in.						
	1/4	5/16	3/8	7/16	1/2	5/8	5/8 Special
Type A-E: Length of Specimen, in. Radius of form	9 1-1/2	10 1-3/4	10 1-3/4	11 2	11 2	12 2-1/4	14 2-1/2
Type F: Length of Specimen, in. Radius of form	9 1-1/2	11 2	13/32	1/2	5/8		19 3-1/4

TABLE 1—AIR BRAKE HOSE DIAMETER

Size, in.	Inside Diameter Tolerance, in.				Types A and B OD, in.		Type C OD, in.		Type D OD, in.		Type E OD, in.		Type F OD, in.	
	Type A	Type B	Type C	Types D, E and F	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
3/16*	±1/64	±3/128	—	+0.016 +0.005	1/2	9/16	—	—	0.500	0.539	0.472	0.510	0.468	0.507
1/4	±1/64	±3/128	±1/64	+0.020 -0.008	19/32	21/32	19/32	21/32	0.562	0.602	0.535	0.573	—	—
5/16	±1/64	±3/128	—	+0.023 -0.008	21/32	23/32	—	—	0.656	0.695	0.598	0.636	0.593	0.632
3/8	±1/64	±3/128	±1/64	—	23/32	25/32	3/4	13/16	—	—	—	—	—	—
13/32	—	—	—	+0.023 -0.008	—	—	—	—	0.742	0.789	0.714	0.760	0.742	0.788
7/16	±1/64	±1/32	—	—	25/32	27/32	—	—	—	—	—	—	—	—
1/2	±1/64	±1/32	±3/128	+0.023 -0.008	27/32	29/32	7/8	15/16	0.898	0.945	0.808	0.854	0.837	0.883
5/8	±1/64	±1/32	—	+0.023 -0.008	1-3/32	1-1/32	—	—	1.054	1.101	0.933	0.979	0.953	1.015
5/8 Special	±1/64	±1/32	—	—	1-11/32	1-13/32	—	—	—	—	—	—	—	—

\* 3/16 in. size Types A and B may be single-ply reinforcement.