SAE International™ SURFACE VEHICLE STANDARD

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Superseding J2140 JUL2000

General Requirement for Preformed Hoses for Air Induction on Heavy-Duty Engines

1. ***Scope***—This SAE Standard outlines the requirements for a preformed thermosetting hose intended for use in heavy-duty vehicle engines, such as air cleaner to carburetor hose, where it is exposed to normal heat and splash of motor oil.

1.1 Rationale—This document has been reaffirmed to comply with the SAE 5-Year Review policy.

2. ***References***

2.1 Applicable Publications—The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE PUBLICATION—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J200—Classification System for Rubber Materials

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

ASTM D 395—Test Methods for Rubber Property—Compression Set
ASTM D 412—Test Methods for Rubber Properties in Tension
ASTM D 471—Test Method for Rubber Property—Effect of Liquids
ASTM D 573—Test Methods for Rubber-Deterioration in an Air Oven
ASTM D 1149—Test Method for Rubber Deterioration—Surface Ozone Cracking in a Chamber (Flat Specimens)
ASTM D 2137—Test Methods for Rubber Property—Brittleness Point of Flexible Polymers and Coated Fabrics
ASTM D 2240—Test Method for Rubber Property—Durometer Hardness

3. ***Physical Tests and Specifications***—Physical tests and specifications shall be obtained from finished hoses where possible, or as agreed between manufacturer and user.

3.1 Hardness—Hardness, determined in accordance with the procedure in ASTM D 2240 Test Method. Standard durometer hardness for each polymer type shown in Section 5. If another hardness is needed, it should be specified by user.

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3.2 Tensile Strength and Elongation at Break—Tensile strength and elongation at break, determined in accordance with the procedure in ASTM D 412 Test Method. Standard tensile and elongation specifications are shown in Section 5. If other tensile and elongation requirements are needed, they should be specified by user.

3.3 Change in Properties After Heat Aging—Heat aging shall be carried out in accordance with ASTM D 573 Test Method for 168 h at temperatures of 100 °C, 121 °C, 125 °C, 135 °C, 150 °C, or 200 °C. Test temperature should be specified by purchaser based on the application requirements. The change in hardness, tensile strength retention, and absolute elongation at break shall fall within the values shown in Table 1.

TABLE 1—MATERIAL REQUIREMENTS

Paragraph	Characteristic	Unit	Requirement
3.3	Accelerated Aging		
	Change in Hardness, max.	Points	±15
	Tensile Retained, min	%	70
	Absolute Elongation at Break, min	%	100
3.4	Low Temperature Flexibility		No cracks
3.5	Resistance to Oil IRM903		
	Volumetric Change, max		
	Grade A		Not required
	Grade B	%	≤80
	Grade C	%	≤20
3.6	Vacuum Resistance		Pass

NOTE—Not all combinations of the previous properties, 3.3 to 3.6, are available.

3.4 Low Temperature Flexibility—The test shall be carried out in accordance with ASTM D 2137 Method A Test Method. Immerse the specimens for 3.0 min ± 0.5 min at the test temperatures, –40 °C or –54 °C. Test temperature should be specified by purchaser based on the application requirements. After the test period, the specimen shall show no signs of cracks.

3.5 Resistance to Oil IRM903 (Replaces ASTM #3 oil)—Volumetric changes, when tested in accordance with ASTM D 471 Test Method, for 70 h at 100 °C shall not exceed the values shown in the Table 1.

Three grades are available; Grade A, B, and C, depending on the resistance to oil required. Grade should be specified by purchaser based on the application requirements.

3.6 Vacuum Resistance—The test shall be carried out at 8.4, 16.7, 33.3, or 66.7 kPa of negative pressure ±2%. The test temperature shall be selected from 3.3. The entire hose shall be kept in an air circulating oven at the specified temperature for 2 h ± 0.25 h. Vacuum shall be applied for a minimum of 15 s and a maximum of 30 s. The minimum outside diameter shall decrease by no more than 20%. The vacuum requirement should be specified by purchaser based on application requirements. Other vacuum requirements and temperatures may be decided between manufacturer and user.