The Engineering Society For Advancing Mobility Land Sea Air and Space®

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SAE J1532 APR89

Transmission Oil Cooler Hose

SAE Standard
Revised April 1989

Submitted for Recognition as an American National Standard

The Engineering Society For Advancing Mobility Land Sea Air and Space®
400 COMMONWEALTH DRIVE, WARRENDALE, PA 15096

MATERIALS STANDARD

Submitted for recognition as an American National Standard

SAE J1532

Issued October 1988
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TRANSMISSION OIL COOLER HOSE

1. SCOPE:

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This specification covers two types of hose, Type A and B, for use with automatic transmission fluid within a temperature range of -40 to +125°C (-40 to +257°F). Recommended maximum operating pressure for Type A hose is 1.73 MPa (250 psi) and 1.03 MPa (150 psi) for Type B hose. The lower pressure Type B hose is specifically for auxiliary cooler applications only.

2. DIMENSIONS:

The dimensions of this hose are listed in Table 1. Concentricity based on total indicator reading between the inside bore and outer surface cannot exceed 0.8 mm (0.03 in).

3. QUALIFICATION TESTS:

a. Original Burst Test: When hydrostatically tested in accordance with ASTM D 380, two hose samples, a minimum of 460 mm (18.1 in) in length, shall not burst or show any signs of failure below the burst pressure defined in Table 2.

b. Ozone Test: Test procedure and apparatus shall be in accordance with ASTM D 1149-86, Test Method for Rubber Deterioration - Surface Ozone Cracking in a Chamber, where applicable. A specimen of hose of sufficient length shall be bent around a mandrel of non-ozone absorbing material with OD eight times the nominal OD of the specimen. The two ends shall be tied at their crossing with enameled copper or aluminum wire. After mounting, the specimen shall be allowed to rest in an ozone-free atmosphere for 24 h at room temperature of 23 ± 2°C (73 ± 3.6°F). The mounted specimen shall be placed in a test chamber with ozone concentration of 100 ± 5 mPa partial pressure at a temperature of 40 ± 2°C (104 ± 3.6°F). After 70-72 h of exposure, the specimen shall be

3. (Continued):

removed and allowed to cool to a temperature of 23 ± 2°C (73 ± 3.6°F) and then inspected. The specimen shall be visually inspected under 7X magnification. There shall be no evidence of surface cracking except for the area immediately adjacent to the wire, which shall be ignored.

c. Automatic Transmission Fluid ATF Resistance Test: The hose shall be filled with Sunamatic® 141 automatic transmission fluid and aged for 168 h at 125 ± 2°C (257 ± 3.6°F). After draining oil and allowing hose to cool to 23 ± 2°C (73 ± 3.6°F), five specimens of the aged hose shall then be subjected to the tests described below so that each specimen is subjected to one and only one of the tests.

1. Vacuum Collapse Test: Measure the outside diameter of the hose with calipers. Seal one end air tight and connect the other to a vacuum source. Then expose to a vacuum of 508 mm (20 in) of Hg for 30 seconds. The O.D. of the hose must not collapse more than 25% compared to the O.D. of the hose before it is exposed to the vacuum.

2. Kink Resistance: Hose shall not kink to the extent that a steel ball having a diameter equal to one-half the hose size will not pass freely through the hose when tested as follows:

Use a board approximately 20 mm thick with hole diameter, center distance and sample length as shown in Table 3. Insert one end of the hose into the board with the end flush on the opposite side of the board. Carefully bend the hose along its natural curvature and inset the other end carefully into the second hole until it projects 65 mm out of the other side. After the hose has been in this position for 5 min, a steel ball having a diameter equal to one-half the hose nominal I.D. must be able to roll from one end of the hose to the other.

3. Burst Test: When hydrostatically tested in accordance with ASTM D 380, two hose samples, a minimum of 460 mm (18.1 in) in length, shall not burst or show any signs of failure below the burst pressure defined in Table 2.

4. Cold Flexibility: The hose shall be placed in a cold box in a straight position for 70 h at -40 ± 2°C (-40 ± 3.6°F). While still in the cold box, the hose shall be bent 180 deg around a mandrel stabilized at -40 ± 2°C (-40 ± 3.6°F), having a diameter 10 times the outside diameter of the hose in 4 to 8 seconds. The hose shall not fracture and shall not show any cracks, checks or breaks in the tube or cover.

5. Adhesion: The minimum force required to separate the reinforcement from cover and tube shall be 1.4 N/mm of width (8.0 lb/in) as tested against the machine method in ASTM D 413.

3. (Continued):

d. Hot Oil Circulation Test: Sunamatic® 141 ATF fluid shall be circulated
Ø through the hose at 125 ± 3°C (257 ± 5.4°F) for 1008 h (42 days) at a pressure of 0.34 ± 0.02 MPa (50 ± 3 psi). The hose shall not leak or burst.

e. Accelerated Impulse Test: Impulse testing shall be conducted in
Ø accordance with the procedure outlined in SAE J343. The test fluid shall be Sunamatic® 141 ATF fluid circulating at 125 ± 3°C (257 ± 5.4°F), the test pressure shall be 1.03 ± 0.10 MPa (150 ± 15 psi), the low pressure shall range between 0 and 0.14 MPa (0 and 20 psi), the impulse rate shall be 30-40 cpm, and the minimum bend radius as specified in Table 4. The hose must not burst or show any signs of failure for a minimum of 150 000 cycles for Type A hose and 50 000 cycles for Type B hose.

f. Identification Marking: The hose shall be identified with the SAE number, type, size of inside diameter in fractions, date code in days of the year and last digit of the year (for example, 1707 represents the 170th day of 1987), and hose manufacturer's code marking. This marking shall appear on the outer cover of the hose at intervals of not greater than 10 inches. Additional identification may be added as agreed upon by user and supplier.

The phi (Ø) 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.

TABLE 1 - Dimensions

Hose Size mm	Hose Size in	Inside Diameter mm	Inside Diameter in	Outside Diameter mm	Outside Diameter in
7.9	5/16	7.62/8.64	0.300/0.340	13.5/15.1	0.531/0.594
8.7	11/32	8.43/9.45	0.332/0.372	14.3/15.9	0.563/0.625
9.5	3/8	9.22/10.24	0.363/0.403	15.1/16.7	0.594/0.657

Ø TABLE 2 - Burst Pressure

Hose Size mm	ID in	Burst Pressure Type A MPa	Burst Pressure Type A psi	Burst Pressure Type B MPa	Burst Pressure Type B psi
7.9	5/16	6.9	1000	4.1	600
8.7	11/32	6.9	1000	4.1	600
9.5	3/8	6.2	900	4.1	600

TABLE 3 - Kink Resistance Dimensions

Hose Size mm	ID in	Hose Sample Length (mm)	Hole Center Distance (mm)	Hole Diameter (mm)
7.9	5/16	275	45	15.5 - 16.0
8.7	11/32	275	50	16.0 - 16.5
9.5	3/8	300	75	17.0 - 17.5

TABLE 4 - Minimum Bend Radius

Hose Size mm	ID in	Bend Radius (mm)
7.9	5/16	31.8
8.7	11/32	36.0
9.5	3/8	40.2

RATIONALE:

Not applicable.

RELATIONSHIP OF SAE STANDARD TO ISO STANDARD:

Not applicable.

REFERENCE SECTION:

Not applicable.

APPLICATION:

This specification covers two types of hose, Type A and B, for use with automatic transmission fluid within a temperature range of -40 to +125°C (-40 to +257°F). Recommended maximum operating pressure for Type A hose is 1.73 MPa (250 psi) and 1.03 MPa (150 psi) for Type B hose. The lower pressure Type B hose is specifically for auxiliary cooler applications only.

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