



SURFACE VEHICLE STANDARD

J1605

NOV2014

Issued 1974-04
Revised 2014-11

Superseding J1605 MAR1992

Brake Master Cylinder Reservoir Diaphragm Gasket

RATIONALE

The purpose of this standard is to establish a common approach of testing and evaluating the performance of brake master cylinder reservoir diaphragm gaskets. The results may be used for the characterization of a singular gasket design, or the comparison of multiple gasket designs. It should be noted that this standard is not applicable to vented diaphragm designs. This revision was established primarily to update references to the contact information for SAE and ASTM, as well as the brake fluid referee material batch code and source.

1. SCOPE

This SAE Standard covers performance requirements and methods of test for master cylinder reservoir diaphragm gaskets that will provide a functional seal and protection from outside dirt and water.

2. REFERENCES

2.1 Applicable Documents

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 Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J1601 Rubber Cups for Hydraulic Actuating Cylinders

SAE J1703 Motor Vehicle Brake Fluid

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2.1.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org

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 Method 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 1415 Test Method for Rubber Property - International Hardness

3. GENERAL MATERIAL REQUIREMENTS

3.1 Composition

The materials used in the diaphragm gaskets shall be a rubber elastomer or combinations of elastomers and moisture barrier materials suitable for use with motor vehicle brake fluids of the nonpetroleum type conforming to SAE J1703.

3.2 Workmanship and Finish

The diaphragm gaskets shall be free from blisters, pin holes, cracks, embedded foreign material, or other physical defects, and shall conform to the dimensions specified on the drawings.

3.3 Marking

The identification mark of the manufacturer, as designated by the Rubber Manufacturers Association, and other details as specified on the drawing shall be molded into each diaphragm gasket.

4. INSPECTION AND REJECTION

4.1 All tests and inspections shall be made at the place of manufacture prior to shipment, unless otherwise specified. The manufacturer shall afford the inspector all reasonable facilities for the tests and specimens.

4.2 The purchaser may make tests and inspections to govern the acceptance or rejection of the diaphragm gaskets at a laboratory of choice. Such tests and inspections shall be made not later than 60 days after receipt of the material.

4.3 Any lot which fails to conform to one or more of the test requirements on the first sampling may be retested. For this purpose, two additional tests shall be made for the requirement in which failure occurred. Failure of either of the retests shall be cause for final rejection.

4.4 All rejected diaphragm gaskets shall be destroyed by the manufacturer to insure that no substandard diaphragms will be used.

5. CLASSIFICATION OF TESTS

5.1 Qualification Tests

The qualification tests shall include all tests specified herein.

5.2 Lot Acceptance Tests

Quality control tests for production lot acceptance shall include tests specified in 6.1.2, 6.3, and 6.4.1.

5.3 Sampling and Test Frequency

The quantity of parts and the frequency of qualification tests and lot acceptance tests used to control production shall be agreed upon by the supplier and purchaser.

6. PHYSICAL PROPERTIES REQUIREMENTS

6.1 Rubber Hardness

6.1.1 Qualification

When tested as specified in 7.1, the rubber hardness shall be within the limits of 45 to 67 points. Hardness determinations from any one lot shall not vary more than ± 5 points.

6.1.2 Lot Acceptance

When tested as specified in 7.1, the rubber hardness shall be equal to the qualifying value within ± 5 points providing it is within the limits of 45 to 67 points.

6.2 Rubber Tension and Tear

6.2.1 Qualification - Original Properties

When tested per ASTM D 412 and ASTM D 624, the rubber materials shall meet the following requirements:

- a. Tensile Strength: 6.9 MPa (1000 psi) min
- b. Ultimate Elongation: 250% min
- c. Tear, Die C: 21.9 kN/m (125 lb) min

6.2.2 Qualification—accelerated Aging At 100 °C (212 °F)

The change from the original properties and compression set after dry heat aging per 7.2 shall conform to the following requirements:

- a. Change in Hardness (IRHD or Durometer): 0 to +10 points
- b. Change in Tensile Strength: -20% max
- c. Change in Ultimate Elongation: -30% max
- d. Compression Set: 25% max

6.3 Low Temperature Bendability at -40 °C (-40 °F)

After the low temperature test as described in 7.3, the diaphragm shall not crack and shall return to its approximate original shape within 1 min.

NOTE: Residual kinking of some convolutions shall not be cause for rejection.