

COMPRESSION SET OF COOLANT HOSES**Application**

This method is used for establishing the compression set that could be expected to occur with engine coolant hoses under securing clamps. It seeks to reproduce the type of indentation caused by the clamps in the wall of the hose. An excessive compression set measured by this method would indicate a hose that could eventually allow leakage of coolant past the clamps in service.

Apparatus Required**Compression Fixture**

Refer to Figures 1 through 4

Dial Micrometer

For use in measuring thicknesses according to ASTM D 3767, Method A1. The measuring foot shall be flat with a diameter of 2.5 +/- 0.1 mm and exert a load of 45 g throughout the measuring range.

Feeler Gages or Gage Blocks

For setting the specified compression under the indicators.

Air-circulating Oven

Conforming to ASTM E 145, Type IIA.

Conditioning and Test Conditions

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 °C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

Procedure

1. Using a suitable die, stamp out a 13 +/- 0.5 mm diameter disc from the wall section of the hose (3 samples for each test). If the surface of the outer cover is irregular, it shall be lightly buffed around the test area until smooth.

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2001 08 23	Revised	Editorial – no technical change A. Cockman
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2. Measure the thickness of each sample with the outer cover side down and calculate the required distance between the base plate and the bottom face of the indenter to give the specified compression value.
3. Tighten the compression set fixture plates and, using feeler gages or gage blocks, set each indenter to give the specified compression.
4. Release the top compression plate and insert the hose samples under the preset indentors. Replace the top compression plate and tighten fully.
5. Age the compression fixture in the oven for the specified time and temperature after which the fixture is removed and allowed to cool for 3 +/- 0.25 h. Remove each sample separately and measure the compressed thickness after 10 +/- 0.5 minutes of its withdrawal from the fixture.

Evaluation

Calculate the percent compression set according to the following:

$$\% \text{ Compression Set} = \frac{A - C}{A - B} \times 100$$

Where: A = initial sample thickness
B = compressed thickness before aging
C = compressed thickness after aging after sample removal

Chemicals, materials, parts, and equipment referenced in this document must be used and handled properly. Each party is responsible for determining proper use and handling in its facilities.