CARBON FILTER PAPER ADHESION TEST

Application

This procedure is used to test adhesion of carbon filter paper affixed to the interior cover of the air cleaner component of the air induction system (AIS) when contaminated with engine oil.

Apparatus Required

Laboratory Air Flow Through Oven

Maintained at 110 +/- 2 °C (230°F)

Resin Substrate

Smooth un-grained plaques of production representative material.

Roller

A roller weighing 2.3 kg (5 lbs) for bonding an adhesive backed carbon paper to a resin plaque.

Oil

Current Motorcraft service engine oil

Oil distribution Tool

Hand held rubber scraper attached to a glass rod (rubber policeman)

Tensile Testing Machine

Machine capable of maintaining a constant jaw separation rate of 305 mm/minute (12 in/minute).

90° Peel Test Setup

The test setup for peel adhesion is illustrated in figure 1.

90° Peel Test Fixture

The test fixture for peel adhesion is illustrated in figure 2.

Conditioning and Test Conditions

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 °C (73°F) and 50 +/- 5% relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

Date	Action	Revisions
2010 12 02	Activated	G. Kowalski, NA

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Procedure

1. Adhere the first 102mm of a 178mm X 12.7mm (4" of a 7" X 0.5") carbon filter material pre-bonded with transfer tape onto the appropriate resin substrate. A 2.3 kg (5 lbs) roller should be used to obtain uniform pressure when applying the carbon filter material to the resin plaque. 10 specimens are needed (See Figure 1) for testing. Inspect for streaks, blisters, or wrinkles.

2. Cure bonded test specimens for 24 hours at 23°C (73°F) before starting test. Set 5 specimens aside for initial adhesion testing to be performed in step 8 of this procedure.

3. Apply drop wise 0.25 ml of SAE 10W30 oil heated to 110°C (230°F) over the bonded filter strips.

4. With the use of a rubber policeman distribute the oil evenly over the bonded area.

5. Place samples horizontally in an oven for 2 hours at 110°C (230°F).

6. Remove specimens from oven and allow samples to equilibrate at room temperature for one hour.

7. Examine carbon paper and adhesive backing for visual evidence of peeling, loss of adhesion, wrinkling, loss of printing or legibility, or any other effect which would detract from its proper function.

8. Perform peel strength within one hour of cooling to ambient temperature per ASTM D1000 adhesion test modified using a 90° peel fixture (or variable angle peel fixture set to 90°), test speed 305mm/min (12 in/min). The fixture must permit forward motion of the substrate to maintain the 90°. See Figure 1.

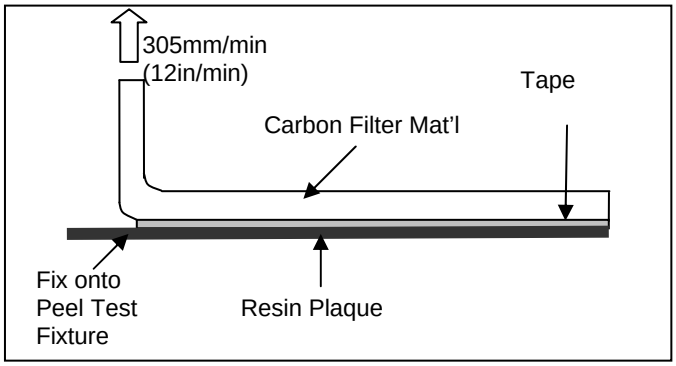

Figure 1: 90º Peel test set-up

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