SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

SURFACE VEHICLE INFORMATION REPORT

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Contaminants for Testing Air Brake Components and Auxiliary Pneumatic Devices

1. ***Scope—***This SAE Information Report establishes a minimum level of uniform recipes for contaminants which may be used when durability testing pneumatic components to obtain additional information on how a device may perform under more true-to-life operating conditions. This type of contamination testing, however, is not meant to replace the type of performance testing described in SAE J1409 and J1410. Durability testing in the presence of contamination, however, will yield results more reflective of actual in-service field conditions and provide an additional evaluation of pneumatic devices.

While the contaminant supply rate and other test criteria of the device being tested must be set by the device manufacturer or user, the items covered in this document will be:

1.1 Formula for contaminated oil to be used as a lubricant when testing air compressors.

1.2 Formula for a contaminant to be used when testing pneumatic system components other than air compressors.

1.3 Other contaminants.

2. ***References***

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

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

SAE J1409—Air Brake Valves Test Procedure
SAE J1410—Air Brake Valve—Performance Requirements
SAE HS 806—Oil Filter Test Procedure

2.1.2 FEDERAL SPECIFICATION—Available from Standardization Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

Federal Specification F-F-351c

TO PLACE A DOCUMENT ORDER: +1 (724) 776-4970 FAX: +1 (724) 776-0790
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3. ***Formula for Contaminated Oil to be Used as a Lubricant When Testing Vehicle Air Compressors—*** Contaminated oil mixture consists of 11 parts SAE 15W40CD type oil to 1 part SOFTC-2A contaminant. Contaminant SOFTC-2A is available from Powder Technology Inc., P.O. Box 1464, Burnsville, MN 55337.

SOFTC-2A is specified per SAE Oil Filter Procedure HS 806. SAE HS 806 Specification references federal specification F-F-351c formulation procedure.

Ingredients of SOFTC-2A as specified are as follows in Table 1:

TABLE 1—SOFTC-2A INGREDIENTS

Ingredients	Weight
Carbon Black	16% by weight
Ferric Oxide	2% by weight
PV Resin	4% by weight
Straight Mineral Oil	78% by weight
	100%

The formulation in Table 1 reflects the use in modern trucks of multiviscosity oil with its additive packages. Also included are rust, abrasive ingredients, and road contaminants which find their way into the engine crankcase by fuel combustion or by air drawn into the engine. The combination can accelerate air compressor wear and can cause carbon build-up.

4. ***Formula for a Uniform Contaminant When Durability Testing Vehicle Pneumatic System Components Other Than Compressors—***The formula for a uniform contaminant is listed in 4a, b, and c. This formulation was developed to reflect the oil, abrasive dirt, and water that often find their way into the various pneumatic components. This combination can cause wear and corrosion and often can swell, shrink, or degrade the nonmetallic materials used in these devices.

   a. 1 g of Arizona dust, coarse
   b. 900 mL of SOFTC-2A contaminant
   c. 1800 mL water

When the effect of multiviscosity oil additives is desired in the testing of vehicle pneumatic system components, the addition of SAE 15W40CD type oil may be considered. This addition to the formulation, however, should be clearly noted in the test results.

5. ***Other Contaminants—***In addition, various components of the pneumatic systems being tested may be immersed in other specific chemicals to test for the effect of these contaminants on the materials used to produce the devices. Such chemicals may include, but not be limited to, methyl alcohol (usually water and 97% to 100% methyl alcohol); denatured ethyl alcohol (often labeled methyl hydrate for Canadian Federal Government regulations); and reservoir drainings. A recommended recipe for a synthetic formulation reservoir draining is:

Mix 6 mL of glacial acetic acid and 8.2 g of sodium acetate with enough distilled water to make 1 L of solution. Add 1 or more drops of sulfuric acid to adjust pH to 4.3.

These contaminants reflect the acidic, contaminated water and deicing fluids that find their way into pneumatic systems. The contaminants previously listed may corrode or otherwise degrade the integrity or physical properties of the materials used in the pneumatic devices.

PREPARED BY THE SAE TRUCK AND BUS SUPPLY AND CONTROL COMPONENTS SUBCOMMITTEE
OF THE SAE TRUCK AND BUS BRAKE COMMITTEE