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SAE J75 OCT88

Motor Vehicle Brake Fluid Container Compatibility

SAE Information Report
Revised October 1988

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

SAE J75

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Superseding J75 JUL70

Ø MOTOR VEHICLE BRAKE FLUID CONTAINER COMPATIBILITY

1. PURPOSE:

Motor vehicle brake fluid must conform to the requirements of SAE J1703, not only when manufactured, but also after extended storage in any commercial packaging container. The purpose of this report is to generate an awareness of the major problems involved in the storage of brake fluids and, to some extent, provide means of circumventing them. It is also the purpose of this report to relate to experience and to test data accumulated and to list certain conclusions which should aid in the proper selection of containers for brake fluid.

2. BACKGROUND:

A problem in selecting containers for brake fluids is that, in the past, many containers have not been capable of preserving some of the brake fluids in their original state. For instance, SAE J1703 requires that no more than 0.05% by volume of sediment may be found in the fluid at the time of manufacture when tested by the water tolerance test at 140°F. Some commercially packaged brake fluids known to meet the SAE standards when manufactured have been found to exceed the 0.15% sediment permitted for packaged fluid by as much as ten fold, due to contamination from the container.

The reaction of certain inhibitors and other components commonly used in brake fluids with tin plate, soldered seams of metal cans, organic coated steel, and plastic containers, may create a storage problem because of the formation of precipitates. These precipitates may or may not be soluble in the brake fluid but are often precipitated under conditions of the water tolerance test and cause the brake fluid to fail this specification. Other properties of the brake fluid such as boiling point, corrosion and stability may be affected adversely by storage in certain containers.

3. EXPERIMENTAL DATA: METAL CANS:

Extensive tests have shown that storage of many brake fluids in soldered metal cans, as judged by the quantity of precipitate formed, may be improved by limiting the lead content of the solder and preferably having the solder seam on the outside of the can. The least reactive solders, and therefore the best for this use, would be 100% tin. However, there is no assurance that any solder will be suitable with every brake fluid. When metal cans are used, welded seams are preferred.

4. POLYETHYLENE CONTAINERS:

Corrosion tests and water tolerance tests have been run on brake fluids stored in high density polyethylene containers for three years. There was no increase in precipitate in the water tolerance test and the corrosion test was satisfactory.

Any moisture pickup during storage will cause a reduction in boiling point. The moisture pickup is minimized if the wall thickness of a high density polyethylene container is at least 0.03 inches. For increased container strength which is needed for handling and shipping, one gallon high density polyethylene containers should have a minimum wall thickness of 0.04 inches.

5. RECOMMENDATIONS:

Proper container selection is critical with respect to preserving the fluid in a satisfactory condition conforming to SAE J1703 standards. It is recommended that the following SAE J1703 test procedures be used to evaluate containers.

1. Boiling Point, 3.1 and 4.1 - for evaluation of moisture pickups, package sealing efficiency and permeability.

2. Corrosion, 3.5 and 4.5 - for evaluation of possible depletion of brake fluid inhibitor systems under storage conditions.

3. Water tolerance, 3.8 and 4.8 - for evaluation of precipitated, dispersed, or hydrolyzed precipitates resulting from the chemical activity between the brake fluid and container materials under storage conditions.

4. Resistance to oxidation, 3.10 and 4.10 - for evaluation of overall stability of motor vehicle brake fluids under storage conditions.

Valuable storage information can be obtained by subjecting containers of brake fluid to accelerated storage tests at 120 - 140°F. Tests performed on fluid samples withdrawn after 10-30 days will permit the selection of the most suitable container. The moisture pickups in high density polyethylene containers stored at 100% relative humidity and 70-75°F for three months is equivalent to about one year of storage under warehouse conditions where humidity is not controlled.

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.

RATIONALE:

Not applicable.

RELATIONSHIP OF SAE STANDARD TO ISO STANDARD:

Not applicable.

REFERENCE SECTION:

SAE J1703 OCT88, Motor Vehicle Brake Fluid

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