

**(R) PRODUCTION, HANDLING, AND DISPENSING OF
SAE J1703 MOTOR VEHICLE BRAKE FLUIDS**

1. **Scope**—This SAE Recommended Practice is intended to provide basic recommendations to aid in the development and use of safe and efficient practices for all operations involving the production, handling, and dispensing of SAE J1703 Motor Vehicle Brake Fluids.
2. **References**
- 2.1 **Applicable Publications**—The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated the latest revision of SAE publications shall apply.
- 2.1.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.
- SAE J75—Motor Vehicle Brake Fluid Container Compatibility
SAE J1703—Motor Vehicle Brake Fluid
SAE J1707—Service Maintenance of SAE J1703 Brake Fluids in Motor Vehicle Brake Systems
3. **Contamination**—SAE J1703 brake fluids are susceptible to various types of contamination which can be detrimental to the safe and efficient performance of brake actuating systems.
- 3.1 **Water Contamination**—SAE J1703 brake fluids are hygroscopic and absorb moisture when exposed to the atmosphere. The degree of moisture absorption is dependent upon a number of variables. Among these are the relative hygroscopicity of the brake fluid, the area of the surface exposed to the atmosphere, the time of exposure, and the temperature and relative humidity of the atmosphere. Water contamination can also occur from condensation resulting from atmospheric temperature changes or the mechanical entrance of the free water. This water contamination will lower the boiling point and increase the low temperature viscosity (see Figure 1).
- 3.2 **Contamination with Petroleum Products**—Since motor vehicle brake fluids are handled and dispensed under conditions where contamination with petroleum products can occur, specific precautions must be taken to prevent contamination. Motor vehicle brake fluids contaminated by petroleum products will cause excessive swelling and softening of brake system rubber parts, resulting in brake system failure.

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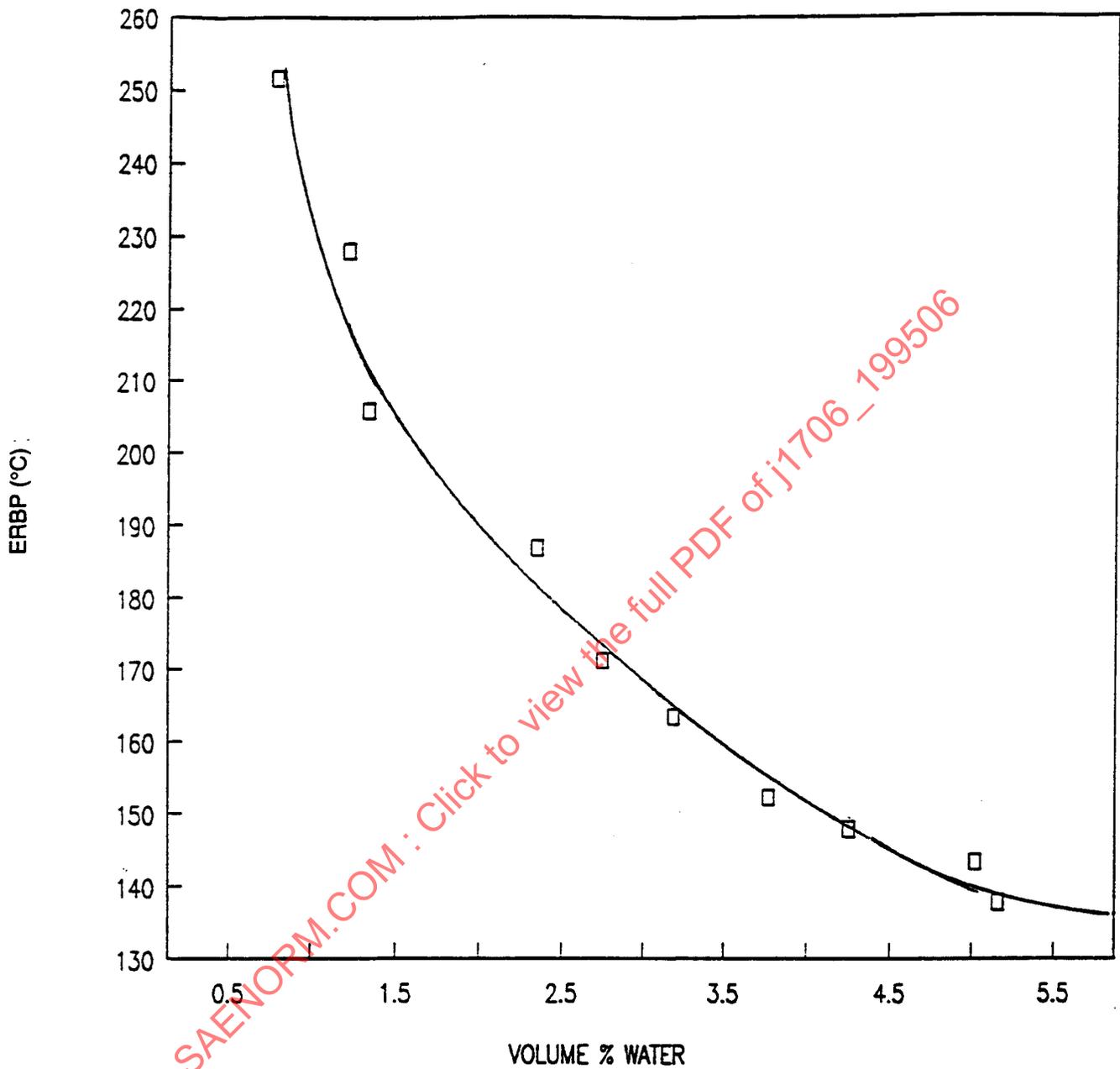


FIGURE 1—EFFECTS OF WATER ON ERBP (°C) OF SAE RM-66-04 COMPATIBILITY FLUID

- 3.3 Particle Contamination**—Specific precautions must be taken to prevent contamination of motor vehicle brake fluids with particles or solid material of any sort which could interfere with the proper operation of the braking system components. In particular, abrasive particles will cause scuffing and wear of the pistons and cylinders and can damage the elastomer seal materials.

- 4. Recommendations**—The following recommendations are applicable to most procedures.
- 4.1 Material Control**—Material specifications should be established for all ingredients of the brake fluid formulation. Chemical and physical tests should be required to ensure that such specifications are met.
- 4.2 Processing**—Processing equipment used in the manufacture of components should be so controlled as to insure the degree of quality and uniformity required by 4.1. Use of dedicated storage tanks, pumps, and lines is suggested for each fluid component. Materials of construction should be compatible with all fluids that they contact. All tanks, pumps, pipes, etc., should be completely isolated from other production processes to reduce the chances of accidental contamination. Since brake fluid and its components are hygroscopic, the manufacturing operations must minimize the water content of the finished brake fluid.
- 4.3 Material Handling and Cleaning Processes**—Normally, blending tanks, tank cars, and tank wagons will be used for handling a number of different motor vehicle brake fluid formulations. It is important to avoid cross-contamination.
- a. Blending tanks should be checked before starting each batch to insure that they are empty and clean.
 - b. Pipelines should be drained and blown out with dry air or nitrogen. When such lines are cleaned or purged with brake fluid, the fluid should be discarded properly.
 - c. Whenever possible, all bulk containers for shipping and storage should be restricted to brake fluid. Bulk containers should be drained, purged with dry air or nitrogen, and inspected before filling.
 - d. New clean drums should be used for brake fluid, and the inner surface should be compatible with the particular fluid formulation. Drums should be visually inspected for foreign material. Lines to drum fillers should be prepared as in 4.3.b.
 - e. Brake fluid should be filtered through a suitable filter of 10 μm or less before any filling operation.
 - f. Extreme care must be exercised in transferring fluid from its original container.
 - g. The possible toxicity hazard and environmental effects of motor vehicle brake fluids must be considered in terms of any applicable laws or regulations.
- 5. Notes**
- 5.1 Marginal Indicia**—The change bar (I) located in the left margin is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. An (R) symbol to the left of the document title indicates a complete revision of the report.

PREPARED BY THE SAE MOTOR VEHICLE BRAKE FLUIDS STANDARDS COMMITTEE