AS 1960.1—2005

Australian Standard™

Motor vehicle brake fluids

Part 1: Non-petroleum type

STANDARDS AUSTRALIA

This Australian Standard was prepared by Committee CH-004, Brake Fluids for Motor Vehicles. It was approved on behalf of the Council of Standards Australia on 20 January 2005.
This Standard was published on 15 February 2005.

The following are represented on Committee CH-004:

Australian Automobile Association
Australian Automotive Aftermarket Association
Federal Chamber of Automotive Industries
Plastics and Chemicals Industries Association, Inc.
Society of Automotive Engineers, Australasia

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This Standard was issued in draft form for comment as DR 03418.

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Part 1: Non-petroleum type

Originally as part of AS D16—1968.
Previous edition AS/NZS 1960.1:1995.
Revised and designated as AS 1960.1—2005.

Published by Standards Australia GPO Box 5420, Sydney, NSW 2001, Australia

ISBN 0 7337 6479 7

PREFACE

This Standard was prepared by the Australian members of Joint Standards Australia/Standards New Zealand Committee CH-004, Brake Fluids for Motor Vehicles, to supersede AS/NZS 1960.1:1995. After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian, rather than an Australian/New Zealand Standard.

This Standard encompasses non-petroleum type motor vehicle brake fluids, such as polyglycol/glycol ether/borate ester/silicon ester based brake fluids, for use in the braking systems of passenger cars, trucks, buses, trailers or motor bikes. These fluids are designed for use in braking systems fitted with either styrene-butadiene rubber (SBR), or terpolymer of ethylene, propylene and diene (EPDM) seals.

The objective of this revision was to review recent changes in comparable international Standards, and consider new tests which may enhance this Standard.

Changes in this edition of the Standard include:

(a) Introduction of a test property numbering system.

(b) Corrosion test—

  (i) change from FMVSS 116 to SAE J1704 method which incorporates EPDM slab stock;

  (ii) exclusion of zinc from the test bundle;

  (iii) SBR cup percentage volume swell reduced from ≤16% to ≤10%; and

  (iv) inclusion of a dry corrosion test (no added water).

(c) Effect on rubber—

  (i) change from SAE J1703 to SAE J1704 method;

  (ii) criteria reformatted; and

  (iii) SBR volume increase criteria reduced from 1–16% to 0–10%.

(d) Introduction of compatibility with brake fluid component test.

(e) Deletion of the statement of colour required if a colourant is used.

(f) Viscosity and simulated service test methods reference changed from SAE J1703 to SAE J1704.

The term 'informative' has been used in this Standard to define the application of the appendix to which it applies. An 'informative' appendix is only for information and guidance.

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FOREWORD

This Standard specifies three grades of fluid, which are essentially differentiated from each other by their equilibrium reflux boiling point (ERBP), wet ERBP and viscosity (–40°C). Additionally, the minimum ERBP requirements of the fluid grades within this Standard exceed the minimum ERBP requirements for the corresponding Standards FMVSS 116 DOT 3 and 4, *Motor vehicle brake fluids*, SAE J1703, *Motor vehicle brake fluid* and SAE J1704, *Borate Ester based brake fluids*, and ISO 4925, *Road vehicles— Non-petroleum base brake fluid*.

The requirements for fluids that comply with Grades 1, 2 and 3 are as follows:

(a) Fluids, which comply with Grade 1 requirements, exceed the minimum requirements of DOT 3 and SAE J1703 brake fluid.

(b) Fluids, which comply with Grade 2 and Grade 3, exceed the minimum requirements of DOT 4 and SAE J1704 brake fluid.

Furthermore, this Standard also includes testing SBR cup, EPDM slab stock and functional seals in performance tests to ensure compatibility of the brake fluid.

Comparison of properties in this Standard with relevant international standards is shown in the following table:

Property	AS 1960.1			FMVSS 116			SAE		ISO
	Grade 1	Grade 2	Grade 3	DOT 3	DOT 4	DOT 5.1	J1703	J1704	4925
ERBP °C min.	230	260	260	205	230	260	205	230	205
Wet ERBP °C min.	140	155	170	140	155	180	140	155	140
Viscosity (–40°C) mm^2/s max.	1500	1800	1800	1800	1800	900	1800	1800	1800

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1 SCOPE

This Standard specifies the characteristics, test methods and packaging of three grades of automotive brake fluid of the non-petroleum type, for use in the hydraulic braking systems of motor vehicles.

NOTES:

1 These grades are currently met by brake fluids having a polyglycol type base.

2 Appendix A provides guidance on the care and handling of brake fluid.

3 Appendix B provides guidance on the compatibility with brake system components.

2 APPLICATION

The application of this Standard in the selection and use of these fluids shall be made in conjunction with the recommendations of the manufacturer of the motor vehicle in which the fluid is to be used.

NOTE: Fluid compatibility testing should be performed between seals and brake fluids representative of the bulk in common use.

3 REFERENCED DOCUMENTS

The latest issue of publications shall apply.

The following documents are referred to in this Standard:

FMVSS
116 Motor vehicle brake fluids

SAE
J1703 Motor vehicle brake fluid
J1704 Borate Ester based brake fluids

4 DEFINITIONS

For the purpose of this Standard, the definitions below apply.

4.1 Blister

A cavity or sac on the surface of a brake cup.

4.2 Chipping

A condition in which small pieces are missing from the outer surface of a brake cup.

4.3 Etching

Chemical attack on metal components causing typically uniform corrosion, initially seen as dulling or frosting of the surface.

4.4 Pitting

Highly localized corrosion of metal components resulting potentially in small pits or perforations.