DJS 262: 2023
ICS 43.040.40

Specification

for

Motor vehicle brake fluid

BUREAU OF STANDARDS JAMAICA

COMMENT PERIOD:
8 January 2023 – 8 March 2023

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The general policies of the JBS Certification Mark Programme are as follows:

- The JBS provides certification services for manufacturers participating in the programme and licensed to use the gazetted JBS Certification Marks to indicate conformity with Jamaican Standards.
- Where feasible, programmes will be developed to meet special requirements of the submittor.
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Jamaica-Made Mark

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This standard was circulated in the draft form for comment under the reference DJS 262: 2022. Jamaican Standards establish requirements in relation to commodities, processes and practices, but do not purport to include all the necessary provisions of a contract.

The attention of those using this standard specification is called to the necessity of complying with any relevant legislation.

Amendments

No.	Date of issue	Remarks	Entered by and date

Content

Foreword

This standard was developed to provide specific requirements on hydraulic brake systems in motor vehicles and motorcycles as well as for the characteristics of the brake fluid and its packaging, labelling, marking, and certification.

The brake fluid classes are based on the regulations of the United States Department of Transportation (DOT) which should be followed by both locally manufactured imported products.

This standard is compulsory.

Committee representation

Acknowledgement

Acknowledgement is made to the International Organization of Standardization for the use of material taken from ISO and the US Department of Transport for permission to reproduce material from US Code of Federal Regulations Tile 49 571.116.

Related documents

This standard makes reference to the following:

a) *International Organization of Standardization, ISO 4925: 2020 , Road vehicles –Non-petroleum base brake fluid*
b) *Jamaican Standard Specification, JS 1 Part 17: 1986, The labelling of commodities Part 17: The precautionary labelling of hazardous industrial chemicals.*
c) *Jamaican Standard Specification, JS 349: 2020, Labelling of goods:- General requirements*
d) *Legal Information Institute US Code of Federal Regulation ,49 CFR 571.116, Motor vehicle brake fluids*

Draft Jamaican Standard Specification for Motor vehicle brake fluid

1. Scope

This standard provides the specifications and requirements for fluids used in road-vehicle hydraulic brake and clutch systems that are designed for use with such fluids and equipped containers for these fluids, and labelling of the containers.

2. Terms and Definitions

For the purpose of this standard, the following terms and definitions apply:

2.1
blister
a cavity or sac on the surface of a brake cup

2.2
brake fluid
a liquid designed for use in a motor vehicle hydraulic brake system in which it will contact elastomeric components made of styrene and butadiene rubber (SBR), ethylene and propylene rubber (EPR), polychloroprene (CR) brake hose inner tube stock or natural rubber (NR)

2.3
chipping
a condition in which small pieces are missing from the outer surface of a brake cup

2.4
hydraulic system mineral oil
a mineral oil based fluid designed for use in motor vehicle hydraulic brake systems in which the fluid is not in contact with components made of SBR, EPR or NR (see Clause **2.2**)

2.5
packager
a designated person who fills containers with brake fluid that are subsequently distributed for retail sale

2.6
scuffing
a visible erosion of a portion of the outer surface of a brake cup

2.7
stickiness
a condition on the surface of a brake cup such that fibres will be pulled from a wad of United States Pharmaceutical absorbent cotton when it is drawn across the surface

3. Requirements

The brake fluids shall conform to the following requirements for the appropriate grades in accordance with Table 1.

Table 1 – Brake fluid specifications – Requirements

Subclause	Description	Unit	Requirement(s)		
			Dot 3	Dot 4	Dot 5
3.1	Equilibrium reflux boiling point (ERBP)	°C	≥ 205	≥ 230	≥ 260
3.2	Wet Equilibrium reflux boiling point (ERBP)		≥ 140	≥ 155	≥ 180
3.3	Kinematic Viscosity at – 40°C	mm^2/s or cSt	≤ 1500	≤ 1800	
3.4	pH	-	7 to 11.5		
3.5	**Brake fluid stability**				
3.5.1	High- temperature stability at 225 °C	°C	≥ 3 °C ± 0.05 °C		
3.5.2	Chemical stability at 225 °C		≥ 3 °C ± 0.05 °C		-
3.6	**Corrosion**				
3.6.1	**Metal strip characteristics**				
	Maximum weight changes of metal test strips				
	Test strip material				
	Steel, tinned iron, cast iron	mg/cm^2	0.2		
	Aluminium	mg/cm^2	0.1		
	Brass, copper	mg/cm^2	0.1		
3.6.1.1	Aspect • excluding the area of contact (13 ± 1 mm measured from the bolthole end of the test strip)	-	No pitting or roughness outside contact area		
	• staining/discolouration		Permitted		
3.6.2	**Liquid characteristics**				
3.6.2.1	Aspect • water wet brake fluid at 23 ± 5°C	-	No gelling		
	• Crystalline deposits		None adhering crystals		
	• Sediment	% vol.	≤ 0.10		
	• pH	-	7 to 11.5		

*DOT – Department of Transport US
* cSt - centistokes
* IRHD – International rubber hardness degrees

Table 1 (continued)

Subclause	Description	Unit	Requirement(s)		
			Dot 3	Dot 4	Dot 5
3.6.3	**Rubber cup characteristics**				
	Blisters or carbon black separation at surface	-	None		
	Hardness decrease	IRHD	≤ 15		
	Base diameter increase	mm	≤ 1.4		
	Volume increase	%	≤ 16		
3.7	**Fluidity and appearance at low temperatures**				
3.7.1	at – 40 ± 2°C for 144 hr. ± 4.0				
	Aspect	-	Clear and homogeneous		
	Bubble flow time	s	≤ 10		
	Sediments	-	Absence		
3.7.2	at – 50 ± 2°C for 6 hr. ± 0.2				
	Aspect	-	Clear and homogeneous		
	Bubble flow time	s	≤ 35		
	Sediments	-	Absence		
3.8	**Evaporation characteristics**				
3.8.1	Aspect • Gritty or abrasive (no fingerprint)	-	No precipitate		
	Residue pour point	°C	≤ - 5		
	Loss by evaporation	% by weight	80		
3.9	**Water tolerance**				
3.9.1	at – 40 °C for 22 hr.				
	Aspect	-	Clear and homogeneous		
	Bubble flow time	s	≤ 35		
	Sediments	-	Absence		
3.9.2	at 60 °C for 22 hr.				
	Aspect	-	Clear and homogeneous		
	Sediments	% vol.	≤ 0.15		
3.10	**Compatibility/miscibility with ISO 4926 fluid**				
3.10.1	at – 40 °C for 22 hr.				
	Aspect	-	Clear and homogeneous		
	Sediments	-	Absence		
3.10.2	at 60 °C for 22 hr.				
	Aspect	-	Clear and homogeneous		
			No stratification	-	
	Sediments	% vol.	≤ 0.05		

*****DOT – Department of Transport US
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Table 1 (continued)

Subclause	Description	Unit	Requirement(s)		
			Dot 3	Dot 4	Dot 5
3.11	**Resistance to oxidation**				
	Metal strip aspect	-	No pitting or roughness no more than a trace of gum		
	Staining/discolouration	-	Permitted		
	Mass change of aluminium strip	mg/cm^2	- 0.05 to + 0.05		
	Mass change of cast iron strip	mg/cm^2	- 0.03 to + 0.03		
3.12	**Effect on rubber cups**				
3.12.1	Styrene butadiene rubber (SBR)				
	at 120°C				
	Cup diameter increase	mm	0.15 to 1.40		
	Hardness change	IRHD	-15 to 0		
	Volume increase	%	1 to 16		
	Blisters or carbon black separation at surface	-	None		
3.12.2	Ethylene propylene diene monomer (EPDM)				
	at 120°C				
	Hardness change	IRHD	-15 to 0		
	Volume change	%	0 to 10		
	Blisters or carbon black separation at surface	-	None		
3.13	**Stroking properties characteristics**				
3.13.1	Aspect • Metal parts	-	No pitting , etching or gel formation		
	• cylinder diameter	mm	≤ 0.13		
	• hardness decrease	IRHD	≤ 15 to ≤ 17		
	• cups base diameter	mm	≥ 0.90		
	• cups conditions	-	No stickiness, hardness, scuffing, blisters, cracking, chipping		
	• volume loss of fluid				
	at 24000 strokes	ml	≤ 33		
	at 100 strokes		≤ 36		
	Sediment	%	1.5		

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* IRHD – International rubber hardness degrees

4. Packaging and labelling

4.1 General

A label affixed to, or marked on any goods, or its external packing or referring to any goods, shall conform to the following requirements:

a) It shall provide a description of the goods and adequate information to a potential purchaser enabling the purchaser, or consumer to select the goods best suited to their needs. This information shall include the weight, net weight, volume, net volume, measurement, specification, or size, as applicable, and shall include the weight, net weight, volume, net volume, measurement, specification, or size, as applicable, and shall give an accurate description of components of the goods as is necessary.

b) It shall provide a purchaser or consumer with appropriate operating and safety instructions and with information on care, maintenance and precautions in use, where:

1) there is a risk to the health and safety of a consumer;

EXAMPLE: The inclusion of health warnings or allergy risks.

2) any significant deterioration of the quality, performance or life durability which may result, if the goods are not properly stored; and

3) the good is handled, transported, used, installed, cared for, maintained or repaired, the appropriate hazard symbol and instructions for use shall be provided on the label, on the package or on the good.

4.2 Container sealing

4.2.1 The brake fluid or hydraulic system mineral oil container with a capacity of ≥ 170 ml shall be provided with a resealable closure that has a temper proof inner seal impervious to the packaged brake fluid.

4.2.2 The container closure shall include a tamper-proof feature that will either be destroyed or substantially altered when the container closure is initially opened.

4.3 Marking and labeling

4.3.1 Each manufacturer, packager and distributor responsible for the DOT grade brake fluid shall conform to the following information:

(a) the name and identifiable address, the principal place of business or registered office of the manufacturer, agent, distributor, seller, re-filler, packer, importer or organization responsible for the product and the name of the country of origin. It shall be preceded by the words "manufactured by ....", "packed by.....", "distributed by....", "imported by.....", as applicable, and the following words as appropriate:

1) "made in (name of territory)";

2) "product of (name of territory)";

3) "packaged in (name of territory)";

4) "manufactured in (name of territory)"; and

5) "assembled in (name of territory)"

(b) a serial number identifying the production lot and the date of manufacture of the brake fluid;

(c) the grade (Dot 3, Dot 4 or Dot 5) of the brake fluid;

(d) the minimum wet boiling point in Celsius or the brake fluid;

(e) designation of the contents as 'DOT – MOTOR VEHICLE BRAKE FLUID' (with '3', '4', of '5' filled in as applicable).

(f) the label shall be legible and durable up to the point-of-sale to the ultimate consumer, and where appropriate, during normal working life and use;

(g) the label shall not be false, misleading or deceptive;

(h) the label shall provide information regarding any specific dangers which might be related to the use of the good and shall provide first aid instructions where necessary;

(i) the following safety warnings in capitals and lower case letters as given:

1) FOLLOW VEHICLE MANUFACTURER'S RECOMMENDATIONS WHEN ADDING BRAKE FLUID.

2) KEEP BRAKE FLUID CLEAN AND DRY. Contamination with dirt, water, petroleum products or other materials may result in brake failure or costly repairs.

3) STORE BRAKE FLUID ONLY IN ITS ORIGINAL CONTAINER. KEEP CONTAINER CLEAN AND TIGHTLY CLOSED TO PREVENT ABSORPTION OF MOISTURE.

NOTE. The last five words of the second sentence may be omitted from the labelling on DOT 5 CONTAINERS.

(1) CAUTION. DO NOT REFILL CONTAINER, AND DO NOT USE FOR OTHER LIQUID.

(2) CAUTION. BRAKE FLUID IS CORROSIVE AND SHALL BE HANDLED WITH CARE.

NOTE. Not required for containers with a capacity in excess of 2.2 L

4.3.2 Each distributor of hydraulic system mineral oil shall conform to the following information clearly and indelibly marked on each container in any location except a removable part such as a lid:

(a) to ensure the label conforms to **Clause 4.3.1 (a) to (h)**

(b) designation of the contents as HYDRAULIC SYSTEM MINERAL OIL in capital letters at least 3.2 mm (1/8 in).

(c) the following safety warnings in capitals and lower case letters as given:

FOLLOW VEHICLE MANUFACTURER'S RECOMMENDATIONS WHEN ADDING HYDRAULIC SYSTEM MINERAL OIL.

(1) Hydraulic System Mineral Oil is NOT COMPATIBLE with the rubber components of brake systems designed for use with DOT brake fluids.

(2) KEEP HYDRAULIC SYSTEM MINERAL OIL CLEAN. Contamination with dust or other materials may result in brake failure or costly repair.

(3) CAUTION. STORE HYDRAULIC SYSTEM MINERAL OIL ONLY IN ITS ORIGINAL CONTAINER. KEEP CONTAINER CLEAN AND TIGHTLY CLOSED. DO NOT REFILL CONTAINER OR USE OTHER LIQUIDS.

NOTE. The last sentence is not required, for containers with a capacity in excess of 2.2 L.

4.3.3 If a container for brake fluid or hydraulic system mineral oil is not normally visible but designed to be protected by an outer container or carton during use, the outer container or carton rather than the inner container shall meet the appropriate labelling requirements of Clauses **4.3.1** or **4.3.2**.

5. Motor vehicle requirement

Each passenger car, multipurpose passenger vehicle, truck, bus, trailer, and motorcycle that has a hydraulic brake system, shall be equipped with fluid that has been manufactured and packaged in conformity with the requirements of this standard.

End of Document

Standards Council

The Standards Council is the controlling body of the Bureau of Standards Jamaica and is responsible for the policy and general administration of the Bureau.

The Council is appointed by the Minister in the manner provided for in the Standards Act, 1969. Using its powers in the Standards Act, the Council appoints committees for specified purposes.

The Standards Act, 1969 sets out the duties of the Council and the steps to be followed for the formulation of a standard.

Preparation of standards documents

The following is an outline of the procedure which must be followed in the preparation of documents:

1. The preparation of standards documents is undertaken upon the Standard Council's authorisation. This may arise out of representation from national organisations or existing Bureau of Standards' Committees of Bureau staff. If the project is approved it is referred to the appropriate sectional committee or if none exists a new committee is formed, or the project is allotted to the Bureau's staff.

2. If necessary, when the final draft of a standard is ready, the Council authorises an approach to the Minister in order to obtain the formal concurrence of any other Minister who may be responsible for any area which the standard may affect.

3. The draft document is made available to the general public for comments. All interested parties, by means of a notice in the Press, are invited to comment. In addition, copies are forwarded to those known, interested in the subject.

4. The Committee considers all the comments received and recommends a final document to the Standards Council

5. The Standards Council recommends the document to the Minister for publication.

6. The Minister approves the recommendation of the Standards Council.

7. The declaration of the standard is gazetted and copies placed on sale.

8. On the recommendation of the Standards Council the Minister may declare a standard compulsory.

9. Amendments to and revisions of standards normally require the same procedure as is applied to the preparation of the original standard.

Overseas standards documents

The Bureau of Standards Jamaica maintains a reference library which includes the standards of many overseas standards organisations. These standards can be inspected upon request.

The Bureau can supply on demand copies of standards produced by some national standards bodies and is the agency for the sale of standards produced by the International Organization for Standardization (ISO) members.

Application to use the reference library and to purchase Jamaican and other standards documents should be addressed to:

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