



DPSS – Delphi Lockheed Automotive Ltd
MATERIAL SAFETY DATA SHEET
DOT 3 BRAKE FLUID

This Safety Data Sheet conforms to EC Directive 91/155/EEC or as subsequently amended.

Delphi Lockheed Automotive Limited urges the recipient of this Safety Data Sheet to study it carefully, to become aware of the hazards, if any, of the products involved. In the interest of safety you should:-

- (1) Notify your employees, agents and contractors of the information on this sheet.
- (2) Furnish a copy to each of your customers for the product.
- (3) Request your customers to inform their employees and customers as well.

REFERENCE: DOT 3 Brake Fluid

ISSUE DATE: 16/06/2005

**1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION
AND OF THE COMPANY / UNDERTAKING**

IDENTIFICATION OF THE SUBSTANCE OR PREPARATION

PRODUCT NAME DOT 3 Brake Fluid

APPLICATION Vehicle braking systems

FEATURES Clear to amber coloured liquid

COMPANY IDENTIFICATION

Delphi Lockheed Automotive Limited
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EMERGENCY TELEPHONE NUMBER

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2. COMPONENTS

Blend of polyglycol ethers, glycol ether borate esters and polyglycols with added corrosion and oxidation inhibitors.



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Hazardous Ingredients

Hazardous Risk Ingredients	Einecs/ Eilincs No.	CAS- Number	Concentration in %	Hazard	Phrases
Butyl tri glycol	205-592-6	143-22-6	>20	XI	R36
Di ethylene glycol	203-872-2	111-46-6	<25	Xn	R22
Methyl di glycol	203-906-6	111-77-3	<5	Xn	R63

3. HAZARD IDENTIFICATION

Physical Hazards

Not significant.

Health Hazards

R 36: Irritating to eyes. Mildly irritating to skin. When ingested it may be absorbed and cause renal damage at high dosage.

Environmental Hazards

Low.

4. FIRST AID

INHALATION

Remove to fresh air. If recovery is not rapid, seek medical attention.

EYES

Flush eye with water for at least 10 mins. If irritation persists seek medical attention.

SKIN

Remove contaminated clothing. Wash affected skin with soap and water, if irritation persists seek medical attention.

INGESTION

Obtain medical advice immediately. If patient is fully conscious, wash out mouth with water and give plenty of water to drink. Induce vomiting only under medical supervision.

4.5 Note to Physicians

Medical personnel seeking to administer first aid are referred to the services of the Poisons Information Centre, who can advise in such instances. There is no specific antidote and treatment of over exposure should be directed at control of symptoms and the patient's clinical condition.

5. FIRE AND EXPLOSION DATA

FLAMMABILITY

EXTINGUISHING MEDIA

Suitable Extinguishing Media

Alcohol resistant foam, dry powder or water (fog or fine spray).

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UNCONTROLLED DOCUMENT
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Unsuitable Extinguishing Media

Water jets (although these may be used to cool adjacent containers).

Exposure Hazards

No special risk – combustion products may contain harmful or irritant fumes.

Special Protective Equipment

In extreme conditions self-contained breathing apparatus should be worn.

PRODUCTS OF COMBUSTION

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTION

Avoid contact with eyes, skin, and clothing. When cleaning up large spillages, suitable protective clothing should be worn including eye protection and impervious gloves.

ENVIRONMENTAL PRECAUTIONS

Prevent from entering drains, ditches or rivers. If this happens inform relevant authorities. Prevent gross contamination of soil.

DECONTAMINATION PROCEDURES

Contain spillage using sand or earth. Remove all material to a suitable container for subsequent disposal. Label 'Salvage Container' appropriately. Flush contaminated area with plenty of water.

7. HANDLING AND STORAGE

7.1 Storage

Suitable bulk storage vessels are mild/stainless steel tanks fitted with a dry air breathing system or tight head steel drums. Do not store in lined tanks or drums. Brake fluid absorbs water from the atmosphere - always keep containers tightly closed. Avoid contamination with any other substances and in particular with mineral oils which are incompatible.

Handling

No specific handling precautions are necessary.

8. EXPOSURE CONTROLS- PERSONAL PROTECTION

EYES

Wear close-fitting goggles where there is a risk of splashing. Eye baths should be provided at locations where accidental exposure may occur.

SKIN

Where significant exposure is possible wear impervious body covering. It is recommended that showers are provided at locations where accidental exposure may occur.



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INHALATION

No specific precautions at ambient temperature. If fluid is being heated or atomised, use suitable engineering control measures.

INDUSTRIAL HYGIENE

No special measures required.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Clear liquid - Usually colourless to amber although some grades of brake fluid may be highly dyed.

Odour	Bland	
pH	7.0 to 10.50	SAE J 1703
Boiling point	> 205 Deg.C.	SAE J 1703
Melting point	< -50 Deg.C.	SAE J 1703
Flash point	> 80 Deg.C. DOT 3, > 90 Deg.C. DOT 4	IP 35
Auto ignition temp.	> 300 Deg.C.	ASTM D 286
Flammability limits in the air	Not established	
Density @ 20°C	1.010 – 1.070 g/ml	
Solubility	In water: miscible in any ratio In ethanol: miscible in any ratio	
Partition Coefficient n-Octanol/Water (log POW)	< 2.0 (all main ingredients)	OECD 117
Viscosity @ 20°C	Approx. 5-10 cSt	ASTM D 445
Vapour pressure 20°C	< 2 milibars	Reid
Vapour Density	Not established although heavier than air	
Evaporation Rate	Negligible	

10. STABILITY AND REACTIVITY

10.1 Conditions to Avoid

Product is stable under normal conditions. Glycol Ethers can form peroxide on storage – do not distil to dryness.

Materials to Avoid

Strong oxidising agents. For user safety, brake fluid should never be contaminated with any other substance.



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Hazardous Decomposition Products
None known.

11. TOXICOLOGICAL INFORMATION

11.1 HEALTH EFFECTS ON EYES

Product has an irritating effect on the eye. (Test Method OECD 405).

11.2 SKIN

Not classified as irritant (Test Method OECD 404) although some sensitive individuals may be affected. Repeated contact may de-fat the skin and cause dermatitis.
Product does not contain any known sensitisers.
Acute percutaneous toxicity is low LD50 (sk) Rat = > 2000 mg/kg.

11.3 INHALATION

Unlikely to be hazardous by inhalation at ambient due to low vapour pressure.
If product is inhaled at elevated temperatures or as an aerosol it may irritate respiratory tract and may cause systemic effects similar to ingestion (see above).

11.4 INGESTION

Product is of relatively low acute oral toxicity – however, if any significant amount is ingested there is a risk of renal damage which in extreme cases could lead to kidney failure, coma and death.
LD50 (oral) Rat = > 5000 mg/kg. Sparse experience indicates lethal dose in man could be considerably less.

11.5 CRONIC

General	There are no reports of long term adverse affects in man.
Carcinogenicity	Not known to be carcinogenic.
Mutagenicity	Not known to be mutagenic.
Reproductive Toxicity	Major ingredients have not been shown to cause significant fertility or development problems at levels which are not themselves toxic to the animal concerned. One minor ingredient – Methyl di glycol – has been shown to affect foetus development in some studies and is classified as R63 – possible risk of harm to the unborn child.

11.6 OTHER

12. ECOLOGICAL INFORMATION

12.1 Ecotoxicity – Product is of low acute ecotoxicity.

Fish 96h LC50 = > 100 mg/l (Oncorhynchus Mykiss)

Daphnia 48h EC50 = Not Determined but expected to be virtually non toxic.

Algae 72h EC50 = Not Determined but expected to be virtually non toxic.



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Mobility

Soluble in water and will partition to aqueous phase. Volatilisation from water to air not expected. Mobile in soil until degraded.

Persistence/Degradability

Product is inherently biodegradable and is expected to be readily biodegradable.

OECD 302B (Zahn Wellans/EMPA) = 100% elimination at 21 days.

If admitted into adapted biological water treatment plants, no adverse effects on the degrading action of the live sludge are expected.

Bioaccumulative Potential

Not expected to bioaccumulate. Log POW for all main ingredients = < 2.0

13. DISPOSAL INFORMATION

13.1 Disposal Dangers

Not significant. As for spillages - avoid liquid entering drains, rivers etc.

Disposal Methods

Controlled incineration or recycling is recommended.

Regulations

Dispose of in accordance with local and national regulations. In the E.U. used brake fluids are covered by the Hazardous Waste Directive (91/689/EEC) while the Waste Framework Directive (75/442/EEC) also applies.

14. TRANSPORT INFORMATION

U.K./E.U. Regulations	Not classified
UN No./Class	None
ADR/RID	Not classified
IMO/IMDG	Not classified as hazardous
Marine Pollutant	No
IATA/IACO Class	Not classified

15. REGULATORY INFORMATION

15.1	E.U. Classification (U.K. – CHIP 3) Risk Phrases Safety Phrases	XI - Irritant R36 - Irritating to eyes. S2 - Keep out of reach of children. S26 (Modified) - In case of contact with eyes, rinse immediately with water for 10 minutes. If irritation persists seek medical advice.
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S46 - If swallowed seek medical advice immediately and show this container or label.

Restrictions on use or Exposure

To be in accord with local and national regulations. In the U.K. this would include the HSWA and COSHH.

16. OTHER INFORMATION

The data and advice given apply when the product is sold for the stated application or applications. The product is not sold as suitable for any other application.

Use of the product for applications other than as stated in this sheet may give rise to risks not mentioned in this sheet.

You should not use the product other than for the stated application in section 1, without seeking advice from Delphi Product & Service Solutions Technical services, available for additional help and advice.

It is the responsibility of the user to determine and ensure the conditions for safe use of the product within the workplace.