A Division of
South West Lubricants, Inc.

Material Safety Data Sheet
DOT 4

Last updated: September 2009

1. Product and Company Identification

Product Trade Name	Brake Fluid DOT 4
CAS Number	Not applicable for mixtures
Synonyms	None
Generic Chemical Name	None
Product Type	Brake Fluid (Glycol Based)
Transportation Emergency	CHEMTREC 1-800-424-9300 (Outside USA 703-527-3887)
MSDS No.	80-86912

2. Composition/Information on Ingredients

Common Name Chemical Name		CAS No.	Range (%)
Triethylene Glycol Monomethyl Borate Ester		71243-41-9	30-40
Triethylene Glycol Monomethyl Ether		112-35-6	28-31
Polyethylene Glycol Methyl Ether		9004-74-4	Not Assigned
Diethylene Glycol		111-46-6	0-5
Triethylene Glycol Monobutyl Ether		143-22-6	0-3.25
Tetraethylene Glycol		112-60-7	0-2
Polyethylene Glycol		25322-68-3	0-2
Tetraethylene Glycol Monobutyl Ether		1559-34-8	0-1.5

3. Hazards Identification

EMERGENCY OVERVIEW
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NFPA: Health: 1 **Flammability:** 1 **Reactivity:** 0 **Specific Hazard:** N/A

HMIS: Health: 2 **Flammability:** 1 **Reactivity:** 0 **PPE:** B

Miscellaneous:
This product does not contain any components above de minimus concentrations that are considered carcinogenic by OSHA, IARC or NTP.

POTENTIAL HEALTH EFFECTS
Target Organs/Primary Route(s) of Entry:

Eye May cause moderate to severe irritation and moderate transient corneal injury depending upon concentration of the glycol ether.

Skin May cause irritation if left in contact with skin. Contact with large areas of skin for extended periods of time may result in absorption of toxic amounts.

Ingestion May cause irritation of the GI tract and central nervous system disturbances.

Inhalation Inhalation of mists may cause respiratory tract irritation, and central nervous system effects including: headache, narcosis, weakness, slurred speech and blurred vision.

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4. First Aid Measures

Eye If the product contacts the eyes, immediately wash the eyes with large quantities of room temperature water for at least 15 minutes, occasionally lifting the lower and upper lids. Get medical attention immediately. A Follow up visit to an ophthalmologist should be made.

Skin If the product contacts the skin, promptly wash the contaminated skin with soap and water for at least 15 minutes. If the product penetrates the clothing, promptly remove the clothing and wash the skin with soap and water.

Ingestion If this product is ingested and the person is conscious, have patient drink several glasses of water. Induce vomiting by having patient tickle back of throat with finger, keep airway clear. GET IMMEDIATE MEDICAL ATTENTION.

Inhalation Move the exposed person to fresh air at once and call emergency medical care. If breathing has stopped, give artificial respiration. If breathing is difficult, give humidified oxygen.

Notes to Physician No data available.

5. Fire Fighting Measures

Flash Point > 121°C (249°F) PMCC

AutoIgnition Temperature 310°C (590°F)

Flammable Limits
Lower Limit Explosive Limit (LEL): N/A
Upper Limit Explosive Limit (UEL): N/A

Extinguishing Media Use water spray, alcohol foam, dry chemical, or carbon dioxide.

Unusual Fire and Explosion Hazards Water or foam may cause frothing.

Special Fire Fighting Procedures Wear NIOSH approved SCBA respirator in the positive pressure mode and chemical protective clothing.

6. Accidental Release Measures

Small Spill Remove sources of heat or ignition, provide adequate ventilation, contain leak using absorbent, inert, non-combustible material.

Large Spill Contain spill, transfer to secure containers. In the event of an uncontrolled material release, the user should determine if release is reportable under applicable laws and regulations.

Reporting Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

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7. Handling and Storage

Handling Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water. Wear recommended protective equipment. Practice good personal hygiene after handling.

Storage Store in closed containers of proper construction. Store away from sources of ignition and in areas of good ventilation. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

8. Exposure Controls/Personal Protection

GENERAL HYGIENE CONSIDERATIONS Use normal hygiene practices.

OTHER PRECAUTIONS None

ENGINEERING CONTROLS

Local Exhaust	Provide local ventilation to maintain exposure levels below recommended exposure limits.
Mechanical (General)	In confined spaces, mechanical ventilation may be required.
Special Ventilation	N/A
Other Ventilation	N/A

PERSONAL PROTECTIVE EQUIPMENT

Eyes/face Use splash proof chemical, safety glasses or appropriate full-face respirator.

Skin Use chemical resistant gloves such as butyl rubber or PVC coated as required.

Respirators If high vapor or mist concentrations are expected, use appropriate NIOSH approved respirator for organic vapors and mists. Respirators must be selected based on airborne levels found in workplace and must not exceed the working limits of the respirator.

Other Protective Clothing/Equipment If there is a possibility of exposure of an individual's body to the product, wear body covering work clothes to avoid prolonged or repeated exposure.

9. Physical and Chemical Properties

Appearance: Liquid. Amber.
Odor: Mild Odor.
Boiling Point/Boiling Range: >232 °C (> 449.6 ° F) @ 760 mm Hg
Freezing Point/ Melting Point: -50 °C (-58 °F)
Flash Point: 121 °C (249.8 °F) PMCC
Auto-Ignition: 310 °C (590 °F)
Flammability: OSHA/NFPA Class IIIB combustible liquid.
Relative Density: 1.05
Solubility (Water): Soluble in water.

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10. Stability and Reactivity Data

Chemical Stability:

Stable Yes

Conditions to Avoid Store in a cool, dry, well ventilated area. Keep away from heat, sparks, and flame. Avoid open heating or agitation; keep container tightly closed when not in use.

Incompatibilities with Other Materials Materials to avoid): Avoid contact with strong oxidizers and high oxygen concentrations.

Hazardous Decomposition Products Incomplete combustion can generate carbon monoxide and/or oxygenated hydrocarbons.

Hazardous Polymerization Hazardous Polymerization May Occur: No

11. Toxicological Information

This substance appears to be of low toxicity, except for possible mild irritant effects in humans. A high dose may produce central nervous system depression, but there are no reports of adverse health effects from occupational exposure.

•Triethylene Glycol Monomethyl Borate Ester 71243-41-9
Acute Toxicity – Lethal Doses
LC50 (Inhl) Rat 200 MG/L 1 HOUR
LD50 (Oral) Rat >5 G/KG
LD50 (Skin) Rabbit >2 G/KG
Irritation
Skin This substance is a mild skin irritant.
Eye This product is suspected to be a mild eye irritant.

•Triethylene Glycol Monomethyl Ether 112-35-6
Acute Toxicity – Lethal Doses
LD50 (Oral) Rat 11.8 G/KG
LD50 (Skin) Rabbit 7.4 G/KG
Irritation
Skin This substance is a mild skin irritant.
Eye This product is suspected to be a mild eye irritant.
Repeated Dose Toxicity: In severe overexposure enough material might be absorbed into the skin to cause systemic injury.
Reproductive Effects: Laboratory tests indicate high doses may cause adverse reproductive effects in rats and mice.
Carcinogenicity: No conclusive data found in literature search. Not listed by IARC, NTP, or OSHA.

•Polyethylene Glycol Methyl Ether 9004-74-4
Acute Toxicity – Lethal Doses
LD50 (Oral) Rat 22 - 40 G/KG
LD50 (Skin) Rabbit > 20 G/KG

Reproductive Effects: Maternally toxic oral doses did not produce malformations and was not selectively toxic to developing conceptus.

•Diethylene Glycol 111-46-6
Acute Toxicity – Lethal Doses
LD50 (Oral) Rat 25,300 MG/KG
Mouse 13,300 MG/KG
LD50 (Skin) Rabbit 11,900 MG/KG
Acute Toxicity – Effects
Inhalation None Expected
Irritation
Skin Slight skin irritant. Not expected to be a sensitizer.
Eye May cause minor eye irritation.
Repeated Dose Toxicity: Diethylene glycol given to rats in the diet for two years caused bladder stones, tumors, and kidney and liver damage. These effects were probably due to contaminating ethylene glycol, and the bladder stones were formed from oxalate crystals.
Reproductive Effects: Reproductive and developmental effects have been noted in animals following very large (>3000 mg/kg bw/day) oral doses. However, comparable internal dose levels are not possible with dermal or inhalation exposures under normal conditions of use. Therefore, Diethylene glycol is not considered a possible reproductive or developmental hazard except during very large oral doses.
Carcinogenicity: Not listed by IARC, NTP, or OSHA. No evidence for carcinogenicity was found with a chronic skinpainting study in mice. No carcinogenic or tumor promoting effects in rats exposed up to 2.5% solutions in drinking water for 108 weeks. Older feed studies utilizing limited number tissues but very high doses also provide no evidence of carcinogenicity. Therefore, this substance should not be considered a concern for carcinogenicity.

•Triethylene Glycol Monobutyl Ether 143-22-6
Acute Toxicity – Lethal Doses
LD50 (Oral) Rat 5300 MG/KG
LD50 (Skin) Rabbit 3540 UL/KG
Irritation
Skin Repeated or prolonged contact may cause slight skin irritation. No significant signs or symptoms indicative of any health hazard are expected to occur as a result of skin absorption exposure. Not expected to be a sensitizer.
Eye Contact may cause severe eye irritation, but not expected to cause permanent damage.
Target Organ Effects: Eye. Skin.
Repeated Dose Toxicity: No known chronic health effects. Repeated or prolonged contact with skin may cause defatting and drying of the skin which may result in dermatitis.
Reproductive Effects: Not expected to occur.
Developmental Effects: Results from animal studies demonstrate that this material is not a teratogen, nor is it toxic to the developing embryo or fetus at non-maternally toxic doses.
Carcinogenicity: Not listed by IARC, NTP, or OSHA.

•Tetraethylene Glycol 112-60-7
Acute Toxicity – Lethal Doses
LD50 (Oral) Rat 29 GM/KG
LD50 (Skin) Rabbit > 20 MG/KG
Carcinogenicity: Not listed by IARC, NTP, or OSHA.

•Polyethylene Glycol 25322-68-3
Acute Toxicity – Lethal Doses

LD50 (Oral) Rat > 30000 MG/KG
LD50 (Skin) Rabbit > 20000 MG/KG
Carcinogenicity: Not listed by IARC, NTP, or OSHA.

•Tetraethylene Glycol Monobutyl Ether 1559-34-8
Repeated Dose Toxicity: No known chronic health effects.
Carcinogenicity: Not listed by IARC, NTP, or OSHA.

12. Ecological Information

Ecotoxicity: This material is highly soluble in water. Laboratory toxicity tests indicate that it is not significantly toxic to fish and aquatic invertebrates, although amphibians may be more sensitive. Wildlife species may be more susceptible since mammals and birds do not readily metabolize this material. The odor and flavor of this material may attract some wildlife and cause them to consume spilled material.
Environmental Fate and Pathway: This material will biodegrade rather rapidly in both soil and water, and will not persist in the environment. Due care should be taken to avoid accidental releases to aquatic or terrestrial systems.
Persistance and Degradability:
Bioaccumulation: This material is highly soluble in water and should not bioaccumulate in aquatic or terrestrial organisms.

•Triethylene Glycol Monomethyl Borate Ester 71243-41-9
Ecotoxicity: No data available
Environmental Fate and Pathway: No data available

•Triethylene Glycol Monomethyl Ether 112-35-6
Ecotoxicity: This material is highly soluble in water. Laboratory toxicity tests indicate that it is not significantly toxic to fish and aquatic invertebrates, although amphibians may be more sensitive. Wildlife species may be more susceptible since mammals and birds do not readily metabolize this material. The odor and flavor of this material may attract some wildlife and cause them to consume spilled material.
Environmental Fate and Pathway: This material will biodegrade rather rapidly in both soil and water, and will not persist in the environment. Due care should be taken to avoid accidental releases to aquatic or terrestrial systems.
Persistance and Degradability:
Bioaccumulation: Because of this materials high solubility and rapid biodegradability, it is unlikely that bioaccumulation will occur in aquatic or terrestrial systems. Models estimate that this material will preferentially partition to water versus air or soil.

•Polyethylene Glycol Methyl Ether 9004-74-4
Ecotoxicity: No data available.
Environmental Fate and Pathway: No data available.

•Diethylene Glycol 111-46-6
Ecotoxicity: Diethylene glycol (DEG) is highly soluble in water. Laboratory tests indicate that DEG is not significantly toxic to fish or aquatic invertebrates. While there is no wildlife toxicity data available on DEG, laboratory tests on rats would indicate that it should not be highly toxic to mammals.
Environmental Fate and Pathway: This material is volatile and water soluble. It is not expected to absorb onto soils or sediments. Expected to have high mobility in soils. This material is expected to exist solely as a vapor in the ambient atmosphere. Vapor-phase is degraded in the atmosphere by reaction with photochemically produced hydroxyl radicals. The particulate phase of this material may be physically removed from the air by wet and dry deposition. This material is not expected to persist in the environment.

Persistance and Degradability:
Stability in water: Diethylene glycol (DEG) is highly soluble in water.
Biodegradation: This material is expected to be readily biodegradable.
Bioaccumulation: BCF < 1.0 This material is not expected to bioaccumulate.

•Triethylene Glycol Monobutyl Ether 143-22-6
Ecotoxicity: No data available.
Environmental Fate and Pathway: Expected to have high mobility in soils. It is water soluble and is expected to have low volatility. If released to the atmosphere this material should exist in both the vapor and particulate phases. Vapor phase is degraded in the atmosphere by reaction with photochemically produced hydroxyl radicals. The particulate phase of this material may be physically removed from the air by wet and dry deposition.
Persistance and Degradability:
Stability in soil: The KOC value suggests that this compound would be highly mobile if released onto the soil and would not absorb to suspended solids or sediments.
Biodegradation: This material is expected to be partially or slowly biodegradable.
Bioaccumulation: BCF < 1.0 This material is not expected to bioaccumulate.

•Tetraethylene Glycol 112-60-7
Ecotoxicity: This material is highly soluble in water. Limited toxicity tests indicate this material should exhibit low toxicity to aquatic organisms. The odor and flavor of this material may attract some wildlife and cause them to consume spilled material.
Environmental Fate and Pathway: No data available.
Other Adverse Effects: No data available.

•Polyethylene Glycol 25322-68-3
Ecotoxicity: This material is practically non-toxic to aquatic organisms.
Environmental Fate and Pathway: No data available.
Persistance and Degradability:
Biodegradation: This material is expected to be highly biodegradable.
Bioaccumulation: This material is not expected to bioaccumulate.

•Tetraethylene Glycol Monobutyl Ether 1559-34-8
Ecotoxicity: No data available.
Environmental Fate and Pathway: No data available.

13. Disposal Considerations

Dispose of recovered non-usable product in a manner approved for this material. Discarded material is not a RCRA hazardous waste. Before attempting clean up, refer to other sections of the MSDS and dispose of product in accordance with local, state, and federal regulations.

14. Transport Information

Transportation Information Shipping Information (CFR and IMDG):

DOT (Land) **Not Regulated**
IMDG (Ocean) **Not Regulated**
IATA (Air) **Not Regulated**
STATIC ACCUMULATOR (50 picsiemens or less): No

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15. Regulatory Information

SARA Title III:

Section 311/312: Immediate Acute Health
Delayed Chronic Health
Fire Hazard

Section 313:	Component Reporting	Threshold
	Triethylene Glycol Monobutyl Ether / CAS # 143-22-6	1.0%
	Triethylene Glycol Monomethyl Ether / CAS # 112-35-6	1.0%

CERCLA Section 311(b)(4): Requires discharges of crude oil and petroleum products in any kind or form to waters must immediately be reported to the National Response Center at (800) 424-8802.

16. Other Information

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.