



Technical Bulletin / Safety Alert

Unique ID No: TBS2008-TBSA-03

Rev: 0

(This document supersedes SMV TB120801)

Subject: Oil Additive for Dana-Spicer Arco 111 & 211 Axles

Date: 29/12/08

Applicable to: VLI Diesel Driftrunner Machines

Note: Minimum PPE required to carry out any inspections contained in this TBSA shall be protective clothing & footwear, safety glasses, hearing protection & any site specific requirements. A JSA or equivalent should be carried out prior to performing these tasks.

Occurance:

With the necessity to replace the Clark Hurth 171 & 278 axles originally fitted to the Driftrunner machines through discontinued manufacture of these items, some owners have experienced a “shudder” & brake “squawk” in the operation of the new Dana-Spicer Arco 111 & 211 axles now fitted.

Investigation & Cause:

The cause of this is the close clearances & the “slip & stick” action of the limited slip clutches. In discussions with Drivetrain Australia, with information they received from Dana-Spicer, this may be more evident in some axles dependant on clearances & the type of oil used. As the limited slip packs wear & bed in this noise should no longer be evident.

Recommendations:

Immediate Action:

Drain & refill both front & rear axles with new oil & add the recommended additive (see supporting documentation) at the required dose as specified in the Drivetrain document.

Note: this will be between 200 – 300ml per axle.

Future Action:

Assess operation of axles & add additive as required.

Supporting Documentation:

Refer to the attached documents from Drivetrain & the Additive MSDS. Included also are the updated service sheets.

Conclusion:

For those machines fitted with the new 111 & 211 axles this additive should alleviate any of the above mentioned symptoms suffered, should you experience further difficulties please contact VLI Diesel.

The oil additive can be purchased in 1 litre containers – VLI Diesel part no. 5-13100601.

It is recommended that a brake test be carried out prior to & after modifications to ensure that braking effect has not been diminished.

Please ensure this document is circulated to all relevant personnel within your organisation.

Should you have any further queries please contact your VLI Diesel Representative.

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REF.: DANA-SPICER – ARCO AXLE. LIMITED SLIP DIFF NOISE.

Following information is in regards to questions from many OEM's in regards to Limited Slip Diff noise or brake squawk being emitted from Arco axles.

In case of noisy LS diff, due to stick & slip action of the clutches during steering, it could be helpful that any LS additive is added to central housing's oil.

If the machine is on the field,

- 1) Replace the questionable oil with oil for limited slip diff application.
- 2) Add some LSD additive to central case. (2-3% of oil volume)

If the machine is new, add some additive (2-3% of oil volume).

Be aware that the LS additive can reduce the static brake performances.

Additive can be:

- A) Fuchs Konzentrat.
- B) "Limited Slip Diff Add" as available from automotive stores (Eg Super Cheap / Repco / Auto one.)
- C) Stuarco 7098 additive.
- D) Lubrizol additive. (Same as Diff Add)
- E) CAT 1U-9891

PER correspondence with DANA ITALIA s.p.a.
Service Eng. Product Reliability.

Regards.
Rick Brett,

Manager. New Components.
Drivetrain Australia P/L



OILS APPROVED BY DANA

AXLES LUBRICANTS:

OIL CLASSIFICATION REFERENCE API GL5 - LSA - MIL2105B

LUBRICANT APPROVED FOR DANA AXLE WITH :
BRAKE DISCS IN OIL IMMERSED AND LIMITED SLIP
DIFFERENTIAL.

SHELL SPIRAX HD 85W90
SHELL LS 90
FUCHS RENOGEAR OIL LSA SAE 90
FUCHS TITAN GEAR 85w90 LS
CASTROL LSC SAE 90
MOBIL LUBE SHC LS 75W90 (FULL SYNTHETIC)
MOBIL 1 SAE 75W90 LS (E.P.)

OIL CLASSIFICATION REFERENCE API GL4 - MIL L 2105

LUBRICANT APPROVED FOR DANA AXLE WITH
BRAKE DISCS IN OIL IMMERSED.

MOBIL SUPER UNIVERS. 20W40
MOBIL FLUID 422
SHELL DONAX TD
ELF SF3
ESSO TORQUE FLUID 62
IP PONTIAX SP/TR

HYDRAULIC OILS:

MINERAL TYPE ATF DEXRON II & III

HYDRAULIC OIL SUITABLE FOR ANY SERVICE
CIRCUITS.

PRODUCT SERVICE SUPPORT - TECH.DOC. - ARCO (ITALY)
TEL: +39 0464 580 200, 201, 202,237,214 - FAX: +39 0464 580 466



MATERIAL SAFETY DATA SHEET CAT HYDRAULIC OIL ADDITIVE

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME CAT HYDRAULIC OIL ADDITIVE
PART No. Chemtool, 840650, Caterpillar, 1U-9891, 9X-2037
SUPPLIER Chemtool Incorporated
P.O. Box 538
8200 Ridgefield Road
Crystal Lake, IL 60039-0538 USA
Tel: (815) 459-1250
Fax: (815) 459-1955
EMERGENCY TELEPHONE Rocky Mountain Poison Center
Denver, Colorado
In USA and Canada - (800) 458-5924
Outside USA and Canada - +01-303-893-1322

2. COMPOSITION, INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS No.	WEIGHT
9-OCTADECENOIC ACID (Z)-, 3-HYDROXY-2,2-BIS(HYDROXYMETHYL) PROPYL ESTER	10332-32-8	100 %

COMPOSITION COMMENTS Chemical ingredients not regulated by OSHA or SARA are treated confidentially. This product contains no ingredients at greater than 1% which have been assigned exposure limits by regulatory agencies.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

INHALATION No specific health warnings noted.
INGESTION May cause discomfort if swallowed.
SKIN No specific health warnings noted.
EYES Irritating to eyes.

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SENSITIZATION	No known information.
CARCINOGENICITY	IARC: Not listed as a Group 1, 2A, or 2B agent. NTP: Not listed. OSHA: Not regulated.
TERATOGENICITY	No known information.
HEALTH WARNINGS	This product has low toxicity. Only large quantities may have adverse impact on human health.
ROUTE OF ENTRY	Skin and/or eye contact. Ingestion. Inhalation.

4. FIRST AID MEASURES

INHALATION	Remove victim immediately from source of exposure. If breathing stops, provide artificial respiration. For breathing difficulties oxygen may be necessary. Get medical attention if any discomfort continues.
EYES	Important! Immediately rinse with water for at least 15 minutes. Get medical attention if any discomfort continues.
SKIN	Immediately remove contaminated clothing. Wash skin thoroughly with soap and water.
INGESTION	DO NOT induce vomiting. Get medical attention immediately.

5. FIRE FIGHTING MEASURES

FLASH POINT (°C)	274 (525 F) Cd OC (Cleveland open cup).
FLAMMABILITY LIMIT - LOWER(%)	N/D
FLAMMABILITY LIMIT - UPPER(%)	N/D
EXTINGUISHING MEDIA	Use: Dry chemicals, sand, dolomite etc. Foam. Carbon dioxide (CO2).
SPECIAL FIRE FIGHTING PROCEDURES	Use water to keep fire exposed containers cool and disperse vapors. Water spray may be used to flush spills away from exposures and dilute spills to non-flammable mixtures. Avoid water in straight hose stream; will scatter and spread fire. Keep run-off water out of sewers and water sources. Dike for water control. Use special protective clothing. Regular protection may not be safe. Prevent inhalation of fumes and gases.
UNUSUAL FIRE & EXPLOSION HAZARDS	Volume and pressure increases strongly when heated. Risk of container explosion in fire.
HAZARDOUS COMBUSTION PRODUCTS	Acrid smoke/fumes. Oxides of: Carbon.
PROTECTIVE MEASURES IN CASE OF FIRE	Self-contained breathing equipment and chemical resistant clothing recommended.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS	Minimize skin contact. Wear suitable eye protection.
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PRECAUTIONS TO PROTECT THE ENVIRONMENT

Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses or extensive land areas. Assure conformity with applicable government regulations.

SPILL CLEAN-UP PROCEDURES

Carefully collect spilled material in closed containers and leave for disposal according to local regulations. Provide good ventilation. Use appropriate protective clothing. Rinse area with water. Do not let washing down water contaminate ponds or waterways.

7. HANDLING AND STORAGE

HANDLING PRECAUTIONS

Avoid spilling, skin and eye contact. Keep away from heat, sparks and open flame. Ventilate well, avoid breathing vapors. Use approved respirator if air contamination is above accepted level. Containers to be kept tightly closed. Eye wash and emergency shower must be available at the work place.

STORAGE PRECAUTIONS

Store separated from: Acids. No special storage precautions noted.

STORAGE CRITERIA

Chemical storage.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

INGREDIENT COMMENTS

No exposure limits indicated for ingredient(s).

PROTECTIVE EQUIPMENT



ENGINEERING CONTROLS

Use engineering controls to reduce air contamination to permissible exposure level.

VENTILATION

No specific ventilation requirements noted, but forced ventilation may still be required if air contamination exceeds acceptable level.

RESPIRATORS

No specific recommendation made, but respiratory protection may still be required under exceptional circumstances when excessive air contamination exists.

PROTECTIVE GLOVES

For prolonged or repeated skin contact use suitable protective gloves. Use protective gloves made of: Neoprene, nitrile, polyethylene or PVC.

EYE PROTECTION

Wear splash-proof eye goggles to prevent any possibility of eye contact.

PROTECTIVE CLOTHING

Wear appropriate clothing to prevent repeated or prolonged skin contact.

HYGIENIC WORK PRACTICES

Wash at the end of each work shift and before eating, smoking and using the toilet.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE	Clear. Liquid.		
COLOR	Colorless. to Light (or pale). Yellow.		
ODOR	Mild (or faint).		
SOLUBILITY DESCRIPTION	Insoluble in water.		
DENSITY	0.94	Temperature (°C)	15.8 (60°F)
VAPOR DENSITY (air=1)	> 1		
VAPOR PRESSURE	< 0.1 mmHg	Temperature (°C)	20 (68°F)
EVAPORATION RATE	< 1	Reference	BuAc=1

10. STABILITY AND REACTIVITY

STABILITY	Normally stable.
HAZARDOUS POLYMERIZATION	Will not polymerize.
HAZARDOUS DECOMPOSITION PRODUCTS	Oxides of: Carbon.

11. TOXICOLOGICAL INFORMATION

COMPONENT	9-OCTADECENOIC ACID (Z)-, 3-HYDROXY-2,2-BIS(HYDROXYMETHYL) PROPYL ESTER
TOXIC DOSE - LD 50	> 84000 for similar products mg/kg (oral rat)
TOXIC CONC. - LC 50	No Information Available (NIA).
SENSITIZATION	No known information.
GENOTOXICITY	No known information.
CARCINOGENICITY	IARC: Not listed as a Group 1, 2A, or 2B agent.
REPRODUCTION TOXICITY	No known information.

12. ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION	No data on possible environmental effects have been found.
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13. DISPOSAL CONSIDERATIONS

DISPOSAL METHODS	Confirm disposal procedures with environmental engineer and local regulations.
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14. TRANSPORT INFORMATION

DOT HAZARD CLASS Not regulated.
 TDGR CLASS Not regulated.
 SEA TRANSPORT NOTES Not regulated per IMDG.
 AIR TRANSPORT NOTES Not regulated per IATA.

15. REGULATORY INFORMATION

US FEDERAL REGULATIONS

COMPONENT	SARA 302	CERCLA	SARA 313
9-OCTADECENOIC ACID (Z)-, 3-HYDROXY-2,2-BIS(HYDROXYMETHYL) PROPYL ESTER	No	No	No

CLEAN AIR ACT

SARA HAZARD CATEGORIES None

US STATE REGULATIONS

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM - WHMIS

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

CONTROLLED PRODUCT CLASSIFICATION Not a controlled product.

GLOBAL INVENTORIES

COMPONENT	CAN	US	EU	AUS	JAP	KOR	PHLP	CHN
9-OCTADECENOIC ACID (Z)-, 3-HYDROXY-2,2-BIS(HYDROXYMETHYL) PROPYL ESTER	DSL	Yes	EINECS	Yes	Yes	Yes		Yes

CANADA CEPA: All components of this product comply with new substance notification requirements under the Canadian Environmental Protection Act (CEPA).

16. OTHER INFORMATION

NFPA-HMIS HAZARD RATING

HEALTH No health hazards (0). - HMIS/NFPA
FLAMMABILITY Burns only if pre-heated (1) - HMIS/NFPA
REACTIVITY Normally Stable (0) - HMIS/NFPA
PERSONAL PROTECTION INDEX B - Safety Eyewear and Gloves
REVISION COMMENTS Section 11: Toxicological Information
Section 15: WHMIS
PREPARED BY John Dingess
James W. Hermann
Replacement MSDS of 2003-08-04
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DISCLAIMER While the information and recommendations set forth herein are believed to be accurate as of the date thereof, the company makes no warranty with respect thereto and disclaims all liability from reliance therein.

* Information revised since previous MSDS version