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Hydro Safe® Trans-Drive FR Fluids

(10W, 20, 30, & 50) TO-4 Fluids

STABILIZED™
by Renewable Lubricants

"Biobased that Perform Like Synthetics"

Hydro Safe® Trans-Drive FR Fluids are BioSynthetic Ultimate Biodegradable¹ transmission and final drive fluids for use in Caterpillar and other off-highway equipment specifying TO-4 and TO-4M Chemistry. They are specifically designed to be more fire resistant (FR) with no to very low VOCs, and higher Flash and Fire point properties over conventional petroleum formulations. They provide the proper chemistry for excellent service in final drives, hydrostatic transmissions, torque converters, wet clutches, hydraulic systems, and all other Original Equipment Manufacturers requiring Allison C-4, Caterpillar power-shift transmissions (SAE 10W and SAE 30), API CD/CF/CF-2, CAT TO-2/TO-4 and TO-4M, CAT BF-2, and Hydro 10 specified fluids for off-road equipment including: Terex, Euclid, Komatsu KES 07.868.1, Komatsu Dresser, Dana Power Shift, ZF Power Shift, ZF TE-ML 03C / ZF TE-ML 07F, Ford Type F (SAE 10W), Hydraulic Eaton Vickers EH-1027, Vickers M-2950-S, 35VQ-25 vane pump requirements, Eaton Fuller and Temec/TTC manual transmissions, and API GL-3 Gear Drives. The super high viscosity index of the BioSynthetic based oils naturally improves the fluid film thermal shear stability of the formulas and load capacity. These high standards for performance and hydraulic-system can potentially provide extended-hour service life when monitored with RLIs' ISO Green Oil Analysis program. Fewer oil changes, reduced disposal expense, less downtime and enhanced hydraulic-system protection combine to lower overall operating costs for the machine owner. Hydro Safe® Trans-Drive FR Fluids are compatible with the same seals, filters, materials and components that are designed to operate with petroleum oil. These New Biodegradable¹ fluids maintain consistent wear and corrosion protection through a wide ambient-temperature range, -30C (-22F) to 45C (113F), and retains its ability to flow easily through filters even when water is present. They are manufactured from >50% renewable raw materials, achieving readily biodegradability and ECO non-toxic.

In forestry equipment, dried Pine needles and saw dust mixing are a major fire hazard around leaking hydraulic systems, electrical wires, hydraulic lines, under cabs, and around and through the engine compartment. If a fire ignites, it can spread rapidly through the engine compartment burning through hydraulic lines. Hydro Safe® Trans-Drive FR Fluids Low VOCs, Higher flash and higher fire points (avg. 20°C to 50°C higher flash points compared to conventional solvent refined ZDP petroleum based of equal viscosities (i.e. CAT Hydro formulas). This extends the time and temperature before a fire can ignite. This extended timeline can be the difference between life and death for an operator. The BioSynthetic Base oils extremely low volatility and excellent oxidation stability improves the flash and fire safety features in these formulas. They are the safest choice for reducing liability for equipment and operators operating in environmentally sensitive areas such as in agriculture, marine, forestry, and in hazardous areas where equipment fires are known to be a major concern. In high temperature environments with potential forest and equipment fires, the use of Hydro Safe® Trans-Drive FR Fluids designed with safer Natural and BioSynthetic polyol ester biobased oils, can help prevent forest and equipment fires and improve operator's safety.

Most conventional Industrial hydraulic oils may shorten hydraulic pump and component life. Often referred to as "AW" (Anti-Wear) oil, these products typically omit or contain reduced levels of the additive agents listed in this TDS. Industrial hydraulic oils are usually formulated to separate water from the oil, a desired characteristic for stationary hydraulic systems. However, in earthmoving equipment this separated water will cause pump and component damage if it is suddenly drawn through the system from the tank as the machine moves. Furthermore, during freezing weather such water may form ice, causing even more extensive damage. In construction equipment avoid hydraulic oils with specifications that indicate they "separate", "shed" or "release" water. These oils do not contain emulsifiers.

Along with the use of Hydro Safe® Trans-Drive FR Fluids, oil cleanliness is essential to achieving the full life of hydraulic system components. New hydraulic oil should be filtered to meet a cleanliness of ISO 16/13 or lower when put into Caterpillar machines to achieve a machine operating cleanliness level of ISO 18/15 or lower, recommended by Caterpillar. Hydraulic oil that has been removed during a repair process must be filtered to a minimum of ISO 16/13 before it is used to refill. Any used oil should be checked using RLI's ISO Green Oil Analysis program before it is reused. Hydro Safe® Trans-Drive FR Fluids is filtered to meet minimum ISO 18/15 during the manufacturing process so you are assured proper machine operating cleanliness level when purchased. They are compatible with the same seals, filters, materials and components that are designed to operate on petroleum oil based formulations.

After repairs that involve exposing any hydraulic component to the atmosphere or contamination, a clean-out hydraulic filter should be installed. See your Caterpillar dealer for part numbers and more information. Also, an oil sample should be taken within several hours of returning the machine to service to assure the recommended operating cleanliness level of ISO 18/15.

Features

- Super high viscosity index and low pour point for wider temperature usage
- Outstanding frictional characteristics for proper clutch performance
- Fortified with additives to resist wear, oxidation, rust and foam
- Excellent thermal protection
- Excellent clutch and gear protection
- Ability to keep water in emulsion
- Sludge control and water damage protection

Typical Specifications

SAE Engine Oil Viscosity	10W FR	20 FR	30 FR	50FR
ISO	32	46	68	100
VISCOSITIES:				
@100°C., cSt. (D-445)	6.2	8.5	11.5	18.48
@40°C., cSt. (D-445)	30.02	43	66	108.15
Viscosity Index (D-2270)	162	180	185	191
HT/HS@ 150°C	2.9	3.5	3.5	5.0
Brookfield Viscosity cP	7500(-35°C)	<3,000-25°C	4500(-25°C)	<45,000(-15°C)
MRV TP-1 cP	<6700@-25°C	<1100@-15°C	<3200@-15°C	<12,000@-5°C
Flash Point, COC, °C (D-92)	240 (464F)	250 (482F)	260 (500F)	270 (518F)
FirePoint COC °C (D-92)	255 (491)	270 (518F)	285 (545)	295(563)
Pour Point, °C (D-97)	-40	-38	-30	-20
Zinc ppm (minimum)	900	900	900	900
Phosphorous ppm (minimum)	800	800	800	800
FZG	12	12	12	12
Copper Corrosion Strip 3hr @ 100°C (D-130)	1A	1A	1A	1A
4 Ball Wear, 1h, 167°F, 1200 RPM, 40kg (D-4172)	.40	.40	.40	.40
Foam Sequence I, II, III (D-892) W//1% WATER	0	0	0	0
Rust Prevention (D-665 A&B)	Pass	Pass	Pass	Pass
Product Code	81260	81270	81280	81290

¹Ultimate/Readily Biodegradation (Pw1) within 28 days in ASTM D-5864 and OECD 301B Aerobic Aquatic Biodegradation of Lubricants

STABILIZED by Renewable Lubricants* is RLI's trademark on their proprietary and patented anti-oxidant, anti-wear, and cold flow technology. High Oleic Base Stock (HOBS) are agricultural vegetable oils. This Stabilized technology allows the HOBS to perform as a high performance formula in high and low temperature applications, reducing oil thickening and deposits. Patented Product: US Patent 6,383,992, US Patent 6,534,454 with additional Pending and Foreign Patents
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