

515 ECOSHIELD™ BIODEGRADABLE SIMPLEX UTHF

EcoShield™ Biodegradable Simplex UTHF is a fully formulated multi-grade anti-wear, readily biodegradable, environmentally friendly, ecologically responsive, non-toxic fluid that is designed for use in most farm and industrial tractors. EcoShield™ Biodegradable Simplex UTHF meets and exceeds the service make-up and refill requirements of the transmissions, differentials, final drives, hydraulic, power steering and wet brake systems of this type of equipment, especially those that employ a common reservoir or sump. Biodegradable UTHF meets the USDA definition EO 13101 for Biobased products.

EcoShield™ Biodegradable Simplex UTHF is blended from a unique combination of high oleic vegetable base oils, biodegradable synthetic polyol ester base fluids and a carefully balanced performance additive package. This unique combination provides EcoShield™ Biodegradable Simplex UTHF with the following performance advantages:

- Excellent oxidative and thermal stability.
- Very good low temperature properties.
- High natural viscosity index.
- Very good natural lubricity.
- Low volatility characteristics.
- Very good hydrolytic stability.
- Excellent demulsibility
- Exceptional anti-wear and extreme pressure properties needed to prevent gear and pump wear, especially under heavily loaded conditions.
- Stable and controlled friction performance with various metallic and non-metallic friction materials. This results in the elimination of problems with excessive noise, weak bindings and embrittlement of elastomeric materials.
- Chatter-free power transfer for wet brakes.
- The proper extreme frictional characteristics needed to assure the proper and decisive functioning of power take off clutches in a wet brake system.
- Superior protection against rust and corrosion.
- Excellent water tolerance.
- Enhance filterability which minimizes filter blocking due to water contamination.
- Excellent anti-foaming and air release properties, to ensure smooth, efficient operation and proper lubrication of all components.
- Compatibility with most types of seals and elastomeric materials.
- Improved and increased operating efficiency and durability.
- Longer fluid life with reduced system maintenance.
- Reduced downtime, especially when weather conditions are favorable.
- Longer equipment life for lower overall operating costs.

EcoShield™ Biodegradable Simplex UTHF meets and exceeds the transmission lubricant, hydraulic and hydrostatic fluid fill requirements of virtually all farm and industrial tractors and mobile equipment.

Schaeffer Mfg.'s EcoShield™ Biodegradable Simplex UTHF can be recommended in the following applications &/or specifications for current & non-current equipment.

AGCO-Allis Permatran® 821XL (current)	Ford New Holland ESN-M2C41 A,B & C
ACGO-Allis Power Fluid 821XL (current)	Ford new Holland ESN M2C134D (current)
AGCO Power Fluid 821	Ford New Holland ESN-M2C-159 B & C
Allis Chalmers Part No. 926371	Fiat Hesston AF-87
Allis Chalmers Part No. 924282	IMT
Allis Chalmers Part No. 926372	International Harvester (see Case IH)
Allis Chalmers Part No. 9246634	International-Hough (see Dresser)
Allis Chalmers Part No. 25741	JCB
API GL-4	John Deere J20A & B
Automatic Transmission Fluid Type A	John Deere J20C (current)
CHN (Case-New Holland) MAT 3525 (current)	John Deere J14B & J14C
CHN (Case-New Holland) MAT 3505 (current)	John Deere J21A (All-Weather Hydraulic Fluid)
Case IH MS-1204/JIC 185 (FTD)	John Deere 303 Fluid
Case IH MS-1205 (TFD-II)	John Deere Quatrol®
Case IH MS-1206 (Powergard PTF)	Kioti
Case IH MS-1207 (Hy-Trans® Plus) (current)	Kubota UDT (current)
Case IH MS-1209 (Hy-Tran® Ultra) (current)	Kubota Super UDT (current)
Case IH MS 1210/JIC 145 (current)	Landini Tractor II Hydraulic Fluid
Case IH MS-1230 (Poclair) (current)	Leyland
Case IH JIC 143	Massey Ferguson (ACGO) M-1110
Case IH JIC 144	Massey Ferguson M-1127 A & B
Case IH JIC 145 (TCH Fluid)	Massey Ferguson M-1129A (Permatran)
Case IH JIC 146 (TFD)	Massey Ferguson M-1135 (current)
Case IH JIC 185 (Hi-Vis)	Massey Ferguson M-1141A (Permatran® III)
Case IH B-5	Massey Ferguson M-1143 (current)
Case IH B-6 (Hy-Tran®)	Mitsubishi
Case-IH HTF SEMS 17001 (Steiger) (current)	Minneapolis Moline Part No 10R1336
Clark Lift Truck Transmission TA 12, TA 18 (current)	Minneapolis Moline Part No 10R1337
Clark lift Truck Transmission HR 500, HR 600 (current)	Minneapolis Moline Part No 10P707-A
Denison HF-O, HF-1, HF-2	Minneapolis Moline 10P708A
Deutz Hydraulic Transmission Fluid	Minneapolis Moline Part No 10P3740-41
Deutz-Allis Power Fluid 821 XL (current)	New Holland FNHA-2-C-200 (current)
Deutz-Allis Power Fluid 821	New Holland FHNA-2-C-201.00 (current)
Deutz-Allis 246634	New Holland M2C-134D (current)
Deutz-Allis 25741	New Idea (see White Farm)
Deutz-Allis 272843 (current)	Oliver Type 55
Dresser Transmission Hydraulic Fluid (HMS B806-0002) (current)	Oliver Type 5J
Ford New Holland ESN-M2C41-B	Oliver Q182
Ford New Holland ESN-M2C43	Plessy-Sunstrand
Ford New Holland ESN-M2C48 A & B	Renk Doromat 873
Ford New Holland ESN-M2C53 A & B	Renk Doromat 874 A & B
Ford New Holland ESN –M2C86 B & C	Same Deutz-Fahr
Ford New Holland ESN-M2C92-A	Saur Sunstrand Danfoss Hydrostatic Fluid
Steiger HTFSEMS 17001	White Farm Q-1705
Universal	White Farm Q-1722
Valmet	White Farm Q-1766
Versatile (New Holland) 23M (current)	White Farm Q-1766 B ((UTHF)
Versatile (New Holland 24M (current)	White Farm Q-1802 (Type 55)

Versatile (New Holland) Gear & Hydraulic Transmission Fluid	White Farm Q-1826 (current)
Vickers (Eaton) I-286-S, 35VQ25, M-2950-S	Yanmar
Volvo VME WB 101 (97303) (current)	Zetor OT-H
White Farm Universal Hydraulic Transmission Fluid	ZF TE-ML-03E (current)
White Farm Part No 30-310-5695	ZF TE-ML-05F
White Farm Part No 30-310-5366	ZF TE-ML-06E
White Farm Part No. 30-310-5709	
White Farm Part No. 30-311-5717	

EcoShield™ Biodegradable Simplex UTHF may be used in automatic and heavy duty transmission application where automatic transmission fluid type A fluid is specified.

EcoShield™ Biodegradable Simplex UTHF is not recommended where Allison C-4 requirement is specified for use. Allison Transmissions has revised its C-4 approvals to no longer include tractor hydraulic fluids.

Do not use EcoShield™ Biodegradable Simplex UTHF to replace Dexron, Dexron II, Dexron II, Dexron II-E, Dexron III, Dexron® VI, Ford Type F, Ford Type H, Ford Mercon®, Ford Mercon® V, Ford Mercon® LV, Mercon® C, Mercon® SP, Chrysler ATF +3 and ATF +4 transmission fluids. If EcoShield™ Biodegradable Simplex UTHF is used to replace these fluids in passenger cars and pickup trucks and SUV transmission applications damage may occur.

Do not use EcoShield™ Biodegradable Simplex UTHF in powershift transmission applications that specify the use of a Caterpillar TO-4 type fluid. Damage may occur.

INSTALLATION

To achieve optimum performance from biodegradable tractor transmission hydraulic fluids, a system should be as free of contamination as possible before charging with the final fill of these fluids. Contamination of biodegradable tractor transmission hydraulic fluids can have an adverse effect on their performance.

To prevent biodegradable problems caused by admixtures of other fluids and contaminants, Schaeffer Mfg. recommends a flushing procedure for systems being converted to biodegradable fluids. The degree of flushing depends on the type and condition of the system and the fluid previously used.

New Systems:

Many new systems may have an internal coating of rust preventatives or may have been run on preservative fluids before shipping. Protective coatings on individual components, such as pumps and valves, should be removed and the components cleaned.

To prepare new systems for the biodegradable tractor transmission hydraulic fluid, Schaeffer Mfg. recommends a six-step procedure:

Step 1 – If the system contains oil, drain as much as possible from cylinders, filters, pumps, valves, etc. Wipe the reservoir and other accessible interior spaces with lint-free rags. Look carefully for pipe scale, weld spatter, threading compound, gasket cement, shavings, and other debris left behind after installation.

Step 2 – Replace filters, if necessary.

Step 3 – Charge the system with a sufficient amount of EcoShield™ Biodegradable Simplex UTHF to assure full circulation to all components.

Step 4 – Operate the system at normal temperatures and loads for a minimum of four hours. Monitor the differential pressure drop across the filter. A filter change may be necessary during this flush because contaminants in the system are incompatible with the EcoShield™ Biodegradable Simplex UTHF. If this

is the case, change the filters and continue to operate the system at normal temperatures, but at reduced loads, until the four hours of flushing are completed.

Step 5 – Drain the system while hot and repeat Step 1. Replace filters.

Step 6 – Add the final charge of EcoShield™ Biodegradable Simplex UTHF and begin normal operation.

Conversion From Petroleum Base Universal Tractor Transmission Fluids:

Most petroleum base universal tractor transmission fluids are compatible with EcoShield™ Biodegradable Simplex UTHF. However, the moisture level in systems previously charged with petroleum base universal tractor transmission fluids must be reached to as low a level as possible.

To flush these systems, operate them under normal conditions for at least four hours prior to draining and use the following procedure to flush the system:

Step 1 – Drain the system, including all cylinders, accumulators, and lines, while hot.

Step 2 – Install new filters and clean the filter housings.

Step 3 – Fill the system with sufficient EcoShield™ Biodegradable Simplex UTHF to assure full circulation to all components. If the system was severely contaminated, substitute #115 Simplex Torque Converter Fluid for this phase of flushing.

Step 4 – Operate the system for not less than two hours under normal operating conditions. (If the flushing fluid shows any sign of contamination, repeat Steps 2, 3, 4 and 5)

Step 5 – If the previous flushing charge in the system was not a biodegradable tractor transmission hydraulic fluid, fill the system with just enough EcoShield™ Biodegradable Simplex UTHF for good circulation. Operate the system under normal conditions for 30 minutes. Repeat Steps 2 and 3, and then proceed to Step 7. If the previous charge was a biodegradable tractor transmission hydraulic fluid, skip to Step 6.

Step 6 – After repeating Steps 2 and 3, fill the system with the final charge of EcoShield™ Biodegradable Simplex UTHF. Assume normal operation and monitor filters daily.

SPILLAGE AND DISPOSAL

Depending on the contamination and/or degradation levels, small amounts of spilled or leaked EcoShield™ Biodegradable Simplex UTHF will not adversely affect ground water or the environment. For small spills on the ground uncontaminated product will be readily biodegraded by naturally occurring soil organisms when exposed to air. Nonetheless, spillage of EcoShield™ Biodegradable Simplex UTHF should be handled similarly to currently accepted methods for conventional mineral oil spills.

EcoShield™ Biodegradable Simplex UTHF does not contain hazardous substances reportable under CERCLA. Since all oil spills are reportable, even a spill of this vegetable oil-based product must be reported to the National Response Center (the US Coast Guard). Local environmental agencies should also be consulted to clarify local requirements.

Acceptable methods of disposal include use as a fuel supplement, recycling and reclamation (that is, the same disposal practices available for conventional mineral oils). Since EcoShield™ Biodegradable Simplex UTHF will not be a hazardous waste, additional disposal options may be available, including land farming or processing through sewage treatment facilities. If necessary, approvals are obtained from appropriate regulatory authorities. The flushing solution may not be biodegradable therefore; it should be disposed of in an environmentally safe manner. Follow procedures used for disposing of conventional mineral oils.

TYPICAL PROPERTIES

Specific Gravity 60°F	0.92
Viscosity @ 40°C, cSt (ASTM D445)	53
Viscosity @ 100°C, cSt (ASTM D445)	10.3
Brookfield Viscosity (ASTM D2983)	
@ -4°F/-20°C, cP	2,560
@ -31°F/-35°C, cP	13,500
Viscosity Index (ASTM D2270)	187
Flash Point °F/°C (ASTM D92)	460°/238°
Pour Point °F/°C (ASTM D97)	-40°/-40°
Copper Strip Corrosion Test (ASTM D130)	1a
I.H. BT-10 Oxidation Test:	
Weight Loss, mg:	
Aluminum	0.2
Copper	1
Iron	.01
Brass	.05
Precipitation Number	.002
Glassware Rating	A
John Deere Oxidation Stability Test (JDQ23)	
% Evaporation Loss	0.5
Sludge Formation	None
Additive Separation	None
Humidity Cabinet Rust Test (ASTM D1748)	
Hours to Rust	+200
Rust Test (ASTM D665)	
Procedure A (Distilled Water)	Pass
Procedure B (Salt Water)	Pass
Foam Test (ASTM D892)	
Sequence I	0/0
Sequence II	20/0
Sequence III	0/0
Break Time, seconds	15
Foam Test JDQ-33	
Sequence I	0/0
Sequence II	0/0
Sequence III	0/0
Timken EP Test (ASTM D2782)	
OK Load Lbs.	30lbs.
Four Ball Wear Test (ASTM D4172) (40 kg, 1200 RPM, 1hr)	
Scar Diameter, mm	0.35
Four Ball E.P. (ASTM D2783)	
Weld Point, kg	200
LWI, kg	40
Vane Pump Wear Test (ASTM D2882)	
Ring and Vane Weight Loss, mg	7
John Deere Water Sensitivity Test (JDQ 19)	
Sediment, % Volume	0
Additive Wt. % Loss	0
Appearance	Clear
John Deere Spiral/Bevel Final Drive	
Gear Wear Test (JDQ 95)	
Spiral Bevel Rating	No Pitting, Rippling or Ridging
Sun Pinion Wear, cm of wear	.00026

Gear Surface Condition	No Pitting, Rippling or Ridging
Ford 3000 Gear Wear Test	No Pitting
Modified FZG (ASTM D4998)	
Mg weight loss	10mg
Massey Ferguson Final Gear Wear Test	
Inches of wear	.0001
L-20 Axle Test	
Tooth Wear	Very Light
Surface Fatigue	None
John Deere Brake Performance test (JDQ 96)	Pass
John Deere Brake Chatter Test	Pass
Ford Brake Chatter Test	Pass
JDQ 94 Powershift Clutch Test	
Total Cycles	2000
Friction Coefficient	
Initial	0.122
Final	0.104
Stall Time, sec.	1.75
Wear, mm	
Disk 1	0.195
Disk 2	0.169
Disk 3	0.220
Disk 4	0.152
Allison C-4 THOT Oxidation Test	No sludge or varnish
% Biodegradability CEC-L-33T82	95%
% Biodegradability by OECD 301B Modified StÜrm	61%
Environmental Persistence Classification US Military	PW-1
Ecotoxicity	
Fathead Minnow, 96 hours LC50, ppm	>10,000
Daphnia Magna 48 hours, EC50, ppm	>10,000 WAF
Sludge Respiration Inhibition, EC50, ppm	>10,000