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Bio-SynXtra™ Trans-Hydraulic

(All-Weather Super Universal Tractor Fluid)

"Biobased Lubricants that Perform Like Synthetics"

Bio-SynXtra™ Trans-Hydraulic is a universal tractor fluid (UTF) that incorporates Stabilized* additive technology with biodegradable[1] biobased / bio-synthetic based stocks for improved performance over conventional tractor oils. This multi-grade formulation contains special frictional modifiers for the Wet Brake's equipment design, and compounded with detergent, dispersant, anti-wear, anti-rust, and anti-foam inhibitors. Bio-SynXtra™ Trans-Hydraulic Fluid is a multi-purpose all-weather super tractor hydraulic fluid that can commonly be used in farm and construction equipment, off-highway vehicles, industrial tractors used in agricultural, industrial, and construction equipment, with proven field performance.

Although it may differ from manufacturers' recommended fluids, Bio-SynXtra™ Trans-Hydraulic Fluid has been highly tested, **Tractor Life.com Authenticated**, and can be used to meet or exceed all of the following performance specifications.; Allison C-3, Cat TO-2 and API GL-4, FZG/Low-Speed/High Torque, J20-C/M1139 High Torque Axle, Wet Brake Chatter/Squawk, PTO Clutch, the North America Performance Requirements for Universal Tractor Transmission Oils (UTTOs), and Multipurpose Tractor Oils (MTO)

Biodegradable Tractor Transmission Oil Providing Excellent Performance, and suitable and commonly used in the following Tractor specifications:

Ford, New Holland M2C134-D, FNHA-2-201, M2C86-C, M2C86-C/B, **M2C41-B/A, M2C48-C/B, M2C92-A, M2C53-B/A, M2C134-C/B/A, CNH MAT 3525

Massey-Ferguson M1135, M1141, M1139, M1143, M1145, **M1110, M1127B/A, M1129A

Kubota, UDT, Super UDT

John Deere J20C, J14A/B/C, **J20D

Steiger, SEMS 1700A

Versatile, 28M, 24M

Case International
**JIC-145/MS-1210
JIC-185/MS-1204, MS-1205, MS-1206
MS-1207, MS-1209, MS1127, M1129-A

Agco, White Farm
Q-1826 Q-1705, Q-1766, Q-1802, Type 55

Agco, Deutz-Allis 821XL
Landini
Fiat-Hesston, AF-87, Multi-F

TRANSMISSION OEM'S
**J20C spec for Allison C4
Caterpillar TO-2, MTO

Hydraulic: Vickers, Denison, Commercial Intertech, Rexroth, Sauer-Sundstrand
**Lower viscosity specifications can be replaced where recommended.

Bio-SynXtra™ Trans-Hydraulic meets the Environmental Protection Agency (EPA) 2013 Vessel General Permit (VGP) guidelines for Environmentally Acceptable Lubricants (EALs), and should be used in hydraulic systems where **LOW TOXICITY**, **BIODEGRADABILITY** and **NON-BIOACCUMULATION** properties are required. This product exceeds the acute toxicity (LC-50 / EC-50 >1000 ppm) criteria adopted by the US Fish and Wildlife Service and the US EPA. Bio-SynXtra™ Trans-Hydraulic is an **ENVIRONMENTALLY ACCEPTED LUBRICANT (EAL)** that is formulated from renewable agricultural biobased resources. We believe Earth's environmental future rests in the use of renewable materials.

[1]Ultimate/Readily Biodegradation (Pw1) within 28 days in ASTM D-5864 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.

Availability	F.O.B.: Hartville, Ohio, USA	1 Gallon	5 Gallon Pail	Drum	Totes	Bulk
RLI Product Item #		81223	81224	81226	81227	81229

Test	Typical Results	Specification Limits
SAE Grade:	5W30	
Viscosity @ 100°C ASTM D-445 SAE 30=	9.72	9.10 min.
Viscosity @ 40°C ASTM D-445	46.38	Report
Viscosity @ 25°C ASTM D-445	82.9	Report
Viscosity Index ASTM D-2270	**202**	140
Shear Stability Orbahn ASTM D-6278		
Vis. @ 100°C (after shear)	9.6	9.10 min.
Brookfield Viscosity ASTM D-2983		
@-20°C 1,500 cP per J20D	1,200 cP	5,500 max.
@-35°C	10,500 cP	70,000 max.
@-40°C 20,000 cP per J20D	18,500 cP	20,000 max.
Flash Point, °C (ASTM D-92)	252	200 min.
Stable Pour Point, °C (ASTM D-97)	-45	-36 max.
Rust Prevention A&B, (ASTM D-665)	Pass Clean	No Visible Rust
Acid Number, mg KOH / g (ASTM D-974)	0.56	Report
Dielectric Strength (ASTM D-877)	48 KV	35 KV (Minimum)
Four Ball Wear (ASTM D-4172)		
1 h, 65°C, 1500 rpm, 40 kg,	0.36	0.40 max.
Oxidation Stability JDQ 16		
Evaporation Loss	0.85%	5.0% max.
Viscosity Increase @ 100°C	3.0%	10.0% max.
Viscosity Increase @ 40°C	3.8%	--------
Sludge Formation	None	None
Additive Separation	None	None
Rust Protection JDQ 22	>100	100 hrs. min.
Copper Corrosion JDQ 32	1A	1B max.
Foaming Characteristics JDQ 33		
Sequence I	0/0	25/0 ml. max.
Foam Breaktime	0	30 sec. max.
Sequence II	40/0	50/0 ml. max.
Foam Breaktime	0	30 sec. max.
Sequence III	0/0	25/0 max.
Foam Breaktime	0	30 sec. max.
Water Sensitivity JDQ 19		
Solids	0.0	0.1 %v max.
Additive Loss	0.0	15.0% wt. max.
Extreme Pressure Properties JDQ 34		
Timken Abrasion Mass Loss	0.5 mg.	1.5 mg. max
Timken OK Load	73 N	45 N min.
Rubber Compatibility JDQ 9		
Volume Change	+2	0 to +5%
Hardness Change	-1	0 to -5 pts.
Precipitation	None	Trace
Rubber Compatibility		
Reference 69X311111		
Volume Change	+3	0 to +5
Hardness Change	-1.5	0 to –5
Precipitation	None	None
Oil Compatibility JDQ 23		
Additive Separation	None	None
Formation	None	None
Low Temperature Fluidity JDQ 73/74		
Cold Soak @ -35°C	20 secs.	30.0 sec. max.*

Slow Cool

@ -30°C	30 mm in 3 sec.	30.0 sec. max.*
@ -35°C flow in 30 sec.	30 mm in 11 sec.	10.0 mm min.**

*Must flow 30 mm in a maximum of 30 seconds to pass.

Test	Typical Results	Specification Limits
JDQ 94 PST Clutch Friction		
Total Cycles	2,000	2,000
Initial Friction Coefficient	0.077	0.15 max.
Final Friction Coefficient	0.105	0.08 min.
Stall Time (sec.)	1.77	5.0 max.
Disk #1 Wear (mm)	0.178	0.38 max.
Disk #2 Wear (mm)	0.174	0.38 max.
Disk #3 Wear (mm)	0.254	0.38 max.
Disk #4 Wear (mm)	0.178	0.38 max.
JDQ 102 Shear Stability		
Viscosity @ 100°C	9.8	
Viscosity @ 100°C (sheared)	9.4	
% Viscosity Loss	6.0%	
JDQ 95 Spiral Bevel/Final Drive Gear Wear		
Gear Surface Condition		
Pinion	None	No Scoring
Ring	None	No Scoring
Spiral Bevel Rating	9	Scale of 1-10, 10 = the best
Sun Pinion Wear		
Left Side Average	<0.025	<0.025
Right Side Average	<0.025	<0.025
JDQ 84 Sundstrand Hydraulic Pump		
Flow Degradation	Better than reference	Equal to or better than reference which is –2.0%.
JDQ 96 Brake Torque Variation and Friction		
Cycles	Computer Results Relative Capacity	Torque Variation / SwRI Variation
1,000	293,131	44,470 / 559,780
10,000	308,090	36,730 / 424,130
20,000	310,651	36,220 / 421,620
30,000	312,768	42,380 / 506,220
Total	1,224,640	159,800 / 1,911,750
Allison C-4 Oxidation Test (J20C Spec.)		
Tan Increase	5.0	7.0 max.
Carbonyl Absorbance	0.9	0.9 max.
Front Pump Seal	Moderate-Hardening Light Sludge	Moderate to Heavy Hardening Light to Medium Sludge
Allison C-4 Wear Test		
Total weight loss	1.4 mg	15.0 max.
Allison C-4 Paper Clutch Friction test		
	<=5,000 Cycles / >5,000	<=5,000 Cycles / >5,000
Slip Time, max.	0.70 / 0.55	0.72 / 0.61
Mid-Point Friction Coeff. min.	0.076 / 0.095	0.068 / 0.088
Allison C-4 Graphite Clutch Friction Test		
	1,500 Cycles	5,500

Slip Time, max.	0.70	0.74	0.71 max.
Mid-Point Friction Coeff. min.	0.101	0.097	0.104 min.

Biodegradability	CEC-L33A93	>80%	80% or greater
	OECD 301B Mod. Sturm	>60%	60% or greater
	ASTM D-5864	>60%	60% or greater
Ecotoxicity			
	Fathead minnow, 96h LC50,	>2000 ppm	EPA requirement >1000
	Daphnia magna, 48h EC50,	>2000 ppm	EPA requirement >1000
	Alga Growth Inhibition EC50	>2000 ppm	EPA requirement >1000

Meets EPA requirements 560/6-82-002, 560/6-82-003

Energy Conserving Formulation – USDA Biobased and BioPreferred

Additional Benefits:

* Biodegradability
* Eco-nontoxicity
*Improved cold weather performance
*Excellent oxidation stability
*Enhanced efficiency in synchronised and glide shift transmissions
*Interchangeable with standard UTTO's
*Improved performance over conventional UTTO's
* High Flash Point / More Fire Resistant
* Eco-nontoxicity
* USDA Biobased
* BioPreferred