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Web: www.renewablelube.com

April 1, 2009

Harvey Satterwhite
Altec Industries, Inc.
1550 Aerial Ave.
Creedmore, NC 27522

RE: Bio-Ultimax 1500 Hydraulic Fluid testing

Dear Harvey,

Thank you for evaluating the Bio-Ultimax 1500 ISO 22 in the Vickers Piston Pump Stand Test. It was good to here that the test was successful and the fluid, pump, and system still look good after extending the test over the 1500 hrs. I was also pleased that you are going to continue the pump test with our fluid to see how long it will perform.

As to our phone conversation on Friday March 27, 2009 this will be an up-dated report on the Eton/Vickers Piston Pump Stand Test and we will be adding to this report as you are continuing to run this Pump Stand Test past the 1500 hours. This report will be in-addition to the letter based on the evaluation of the Bio-Ultimax 1500 Dielectric Hydraulic Fluid ISO 22 dated November 27, 2008. This letter provides additional test parameters we discussed after extending past the first 700 hours disassembly of the pump and Altec approval, and now the second disassembly with over 1500 hours. This letter also gives a comparison of the attached Conoco MV22 data to the performance of the Bio-Ultimax 1500. As I suggested, we can show data before the test, but lets look at the data after the extended pump test through independent labs or after the fluid has been run for many hours in the field.
With over 1500 hours on the Bio-Ultimax 1500, the attached test data from outside labs shows that this fluid still has the physical and chemical properties to continue this extended Vickers Pump Stand Test past the 1500 hours. In addition, this data from these two other outside labs helps confirm why you are seeing the good results on our fluid with no pump wear. You can see by the tests, there are additional performance advantages with the Bio-Ultimax 1500 over other fluids. The data shows that the Bio-Ultimax 1500 ISO 22 stayed in grade at a **21 cSt** fluid (only change 0.3 cSt from new fluid and well within the ISO 22 Standard) and provided excellent oxidation stability with a ASTM D-974 acid number of **0.39 TAN** (this data did not change from the beginning of the test as the new fluid was at 0.39 TAN. The 442 PPM of phosphorous falls in the average range of the new oil certificate of analysis and provides additional additives and antiwear for extended oil change protection. The 118 PPM zinc did not come from our Bio-Ultimax 1500 as this formulation is zinc free and I believe this was left over from the prior pump study. But keep in mind that we have tested compatibility with other hydraulic fluids including petroleum with zinc and the data shows good compatibility making the change over easy without flushing the system. The visual remarks have been that the fluid is still clear with good remaining color (not darkening).
After 1500 hours in the Vickers Pump Test the Bio-Ultimax 1500 Dielectric Hydraulic Fluid ISO 22 show a significant rheological advantage with a **super high viscosity index of 198** and a **pour point of -51C (-60F).** The Scanning Brookfield ASTM D-5133 measures the Brookfield viscosity of a sample as it is cooled at a constant rate of 1 degree C/hour. The test reports the gelation point, defined as the temperature

at which the sample reaches 30,000 cP. In the attached data, the used Bio-Ultimax 1500 ISO 22 still shows no gelation and excellent cold temperature performance in ASTM D-5133 with a viscosity of **14,900 cP @ -40 C**. As comparison, John Deere Hydraulic/Transmission Universal Tractor Fluid (UTF) J20C Specification has a Brookfield viscosity maximum 70,000 cP @ -35 C and the J20D Specification (winter grade UTF) has a Brookfield viscosity maximum 20,000 cP @ -40 C.

Advantages of the Bio-Ultimax 1500 Dielectric Hydraulic Fluid ISO 22

1. Super High Viscosity Index (SHVI 198) provides significant rheological advantages within a wider temperature range
2. Reserve Antiwear performance as shown in the extended Vickers Piston Pump Stand Test can provide longer service life
3. Excellent cold temperature performance
4. Excellent Oxidation Stability as shown in the Vickers Piston Pump Stand Test for extended service life
5. Energy conserving SHVI provides reserve fluid value in the higher temperature operating zone-reducing wear
6. Biobase oils provide a shear stable SHVI without the shear problem of polymers that are used in petroleum multi-viscosity (MV) hydraulic fluids
7. Reserve dielectric strength above 35 kV in ASTM D-877 (tested at avg. 47 kV)
8. Ultimate Biodegradable Pw1 in ASTM D-5864, Eco-Nontoxic, and Biobased
9. Complies with USDA/National Forestry/ US Fish and Wildlife Services and EPA new mandates. RLI's Bio-Hydraulic Fluids have been purchased and used by the USDA/National Forestry, DOI, Marine Industry, NOAA Weather Ships, Off-Shore Drilling, US Navy, US Air Force, and US Coast Guard.

Thanks again for your interest and approving the Bio-Ultimax 1500 Dielectric Hydraulic Fluids ISO 22 and 32. I know the fluids will be a great benefit to Altec and help protect Altec Equipment Warranty.

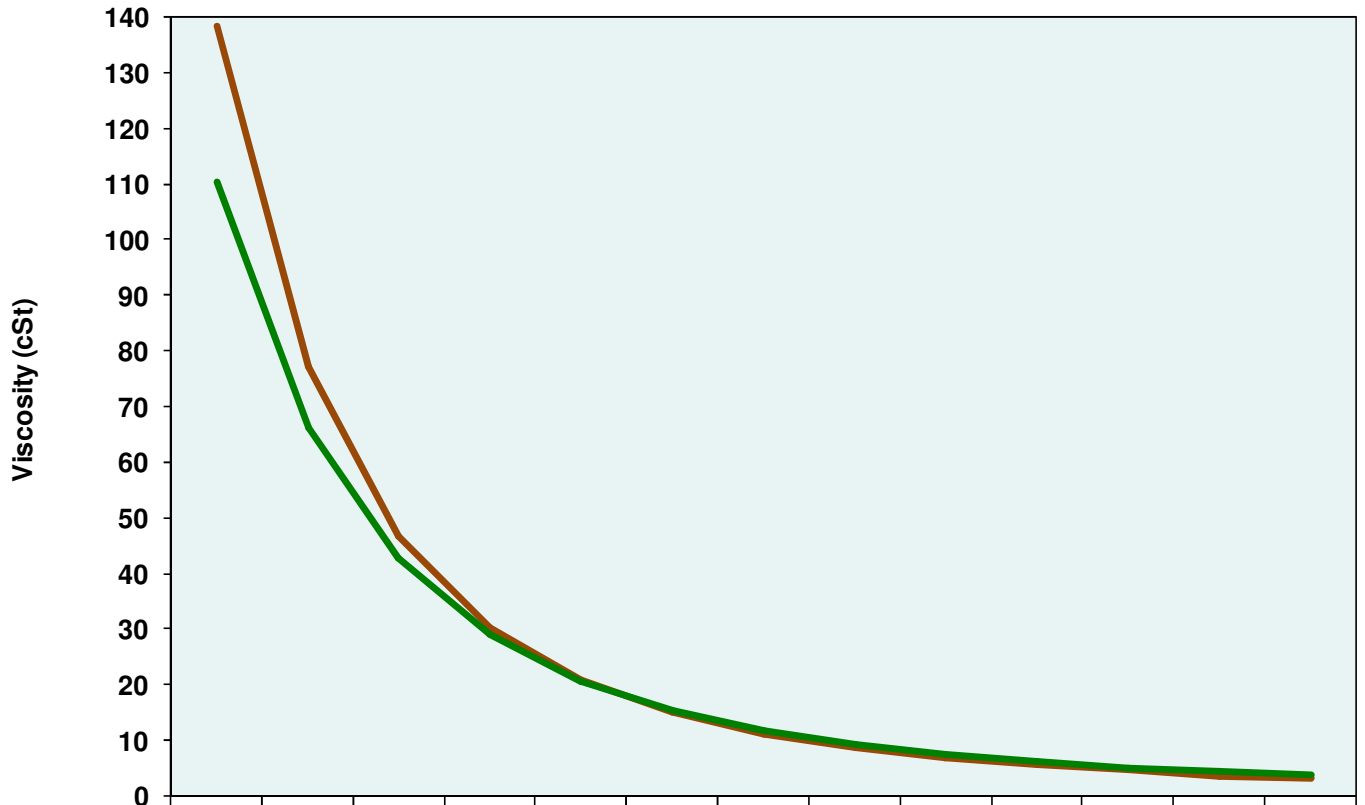
Thanks again for your interest and work on RLI fluids. I know these fluids will be a great benefit to Altec.

Best regards,

Bill

William Garmier, Vice President

Energy Conserving Bio-Ultimax 1500 Hydraulic Fluid With Reserve Fluid Value



	0 C	10 C	20 C	30 C	40 C	50 C	60 C	70 C	80 C	90 C	100 C	110 C	120 C
Conoco MV22	138.3	77.14	46.74	30.32	20.8	14.95	11.17	8.62	6.84	5.55	4.6	3.55	3.32
Bio-Ultimax 1500 ISO22	110.2	66.35	42.69	29.05	20.7	15.34	11.74	9.25	7.46	6.14	5.14	4.37	3.77

Rheological Properites of
Bio-Ultimax 1500 Dielectric ISO 22 Fluid Compared to Conoco MV22

Oil Analysis Report

Summit Industrial Products

Oil Analysis Lab

Summit Industrial Products
Tim Taylor
9010 CR 2120
Tyler, Tx 75707
903-534-8021
903-581-4376

ATW!
Bill Gaehler
1-330-877-2266

Unit No: BIO-ULTIMAX 1500
Serial No:
End User: ALTEC PRODUCT SUPPORT
Location:
Component: Hydraulic
Make Model : VICKERS PISTON PUMP
Oil Capacity:
Oil Type: BIO-ULTIMAX 1500

Maintenance Recommendations for Lab No. ZZZ0302901 Received on 3/2/2009

VI = 198
POUR POINT = -51C

ELEMENTAL CONCENTRATIONS IN PARTS PER MILLION (PPM) BY WEIGHT

LAB NO.	Ag	Al	B	Ba	Ca	Cd	Cr	Cu	Fe	Mg	Mn	Mo	Na	Ni	P	Pb	Sb	Si	Sn	Ti	V	Zn	Sample Drawn
ZZZ0302901	0	0	0	0	97	0	0	9	1	0	0	1	8	0	442	0	0	0	1	0	0	118	N/G

SAMPLE INFORMATION			PHYSICAL TEST RESULTS				
LAB NO.	HR UNIT	HR OIL	KV100	KV40	TAN	H20%	
ZZZ0302901	N/G	1500	5.23	21.00	0.39	< 0.1	

Ag = Silver	Al = Aluminum	B = Boron	KV40 = cSt
Ba = Barium	Ca = Calcium	Cd = Cadmium	KV100 = cSt
Cr = Chromium	Cu = Copper	Fe = Iron	TAN = Total Acid Number
Mg = Magnesium	Mn = Manganese	Mo = Molybdenum	N/G = Not Given
Na = Sodium	Ni = Nickel	P = Phosphorus	
Pb = Lead	Sb = Antimony	Si = Silicon	
Sn = Tin	Ti = Titanium	V = Vanadium	
Zn = Zinc			

146391 09030XA Hydraulic Fluid
Cell # 1 @ 0.3 rpm 3/23/09