LABORATORY ANALYSIS

ENGINEERED LUBRICANTS
11525 Rock Island Court, St. Louis, MO 63043
Tel: 1-800-876-0008 info@englube.com

Department **SUB-ASSY MACHINING OILS**

Equipment No. **942 GRIND-X GRINDER (00004)**

System **Hydraulic System**

Oil Type **ENGINEERED LUBRICANTS ENWAY 15-HWO (--- GAL)**

WOODWARD CORPORATION
6300 WEST HOWARD STREET
NILES, IL
United States 60714
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Diagnosis

Some copper in the system and the additives are slightly depleted. All other aspects of the system are ok. Continue use of oil and filter at this time.Copper (Cu) ppm levels are severe. Oil cooler core leaching or motor piston wear is indicated. The system cleanliness is acceptable for your target ISO 4406 cleanliness code. There is no indication of any contamination in the oil. The system and fluid cleanliness is acceptable. Additive levels indicate the addition of a different brand, or type of oil. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

Sample Information

Lab Number		New	**2311-00553**	2308-00187	2305-00398
Date of Sample		(Typical)	**16 Nov 2023**	03 Aug 2023	04 May 2023
Oil Added			**UNK**	UNK	UNK
Last Drain Date			**--**	--	--
Months on Sample			**116.0**	112.6	109.7
Last Filter Service			**--**	--	--
Sample Point			**---**	---	---
Sample Status			**SEVERE**	ATTENTION	SEVERE

VISCOSITY @ 100F or 40C (ASTM D-445)

SSU Vis. @ 100F	SSU	144.0	**154.7**	154.1	156.5
cSt Vis. @ 40C	cSt		**29.90**	29.77	30.20

COLOR (BASED ON ASTM D1500 STANDARDS)

Color	Scale 0-8	7.0	**4.5**	1.5	4.5

PARTICLE COUNT (PER 1ML)

ISO CODE	ISO 4406(c)	>25/23/17	**17/15/12**	21/19/15	14/12/10
4 Micron & Larger	particles/1ml	>320000	**816**	16,727	102
6 Micron & Larger	particles/1ml	>80000	**286**	2,766	33
14 Micron & Larger	particles/1ml	>1300	**22**	174	6
21 Micron & Larger	particles/1ml	>320	**5**	59	3
38 Micron & Larger	particles/1ml	>80	**1**	4	0
70 Micron & Larger	particles/1ml	>20	**1**	0	0

ICP - OILS (REPORTED IN PARTS PER MILLION)

Aluminum (Al)	ppm		**<5**	<5	<5
Antimony (Sb)	ppm		**<5**	<5	<5
Cadmium (Cd)	ppm	5	**<5**	<5	<5
Chromium (Cr)	ppm		**5**	<5	5
Cobalt (Co)	ppm		**<5**	<5	<5
Copper (Cu)	ppm		▲ **38**	<5	▲ 41
Iron (Fe)	ppm		**12**	90	14
Lead (Pb)	ppm		**22**	<5	23
Manganese (Mn)	ppm	5	**<5**	<5	<5
Molybdenum(Mo)	ppm	5	**<5**	<5	<5
Nickel (Ni)	ppm		**<5**	<5	<5
Silver (Ag)	ppm		**<5**	<5	<5
Tin (Sn)	ppm		**<5**	<5	<5
Titanium (Ti)	ppm		**<5**	<5	<5
Vanadium (V)	ppm		**<5**	<5	<5
Barium (Ba)	ppm	5	**83**	44	120
Boron (B)	ppm	5	**<5**	<5	<5
Calcium (Ca)	ppm	5	**<5**	6	<5
Magnesium (Mg)	ppm	5	**<5**	<5	<5
Phosphorus(P)	ppm	5	**396**	382	465
Silicon (Si)	ppm	5	**<5**	<5	<5
Zinc (Zn)	ppm	5	**221**	28	267
Sulfur (S)	ppm	9540	**2,510**	2,600	3,190

Customer Id: ENC0658001
Sample No.: EN23110553
Lab Number: 23110553
Test Package: TEST

To manage this report scan the QR code

To discuss the diagnosis or test data:
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To change component or sample information:
Tracy Weaks +1 (314)872-9540
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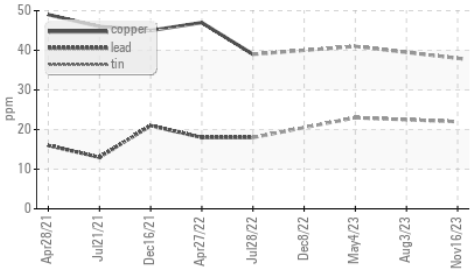
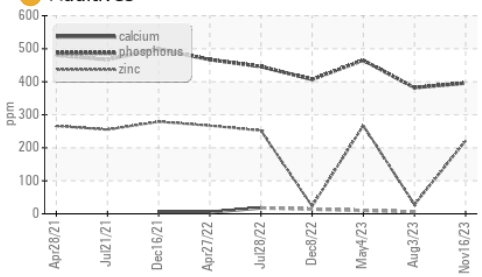
OIL ANALYSIS REPORT

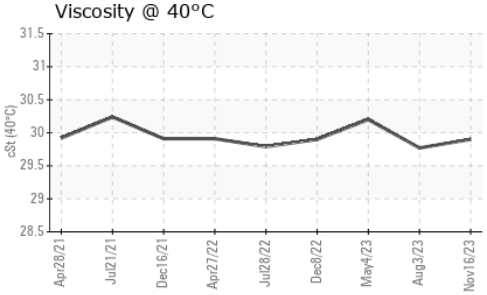
Non-ferrous Metals



Additives



Viscosity @ 40°C



DR FERROGRAPHY READINGS

L			**7.0**	6.1	2.4
S			**1.9**	1.7	0.8
WPC	DL + DS		**8.9**	7.8	3.2

Contamination

Water	>0.05	**NEG**	NEG	NEG