

# **PROBLEM SUMMARY**

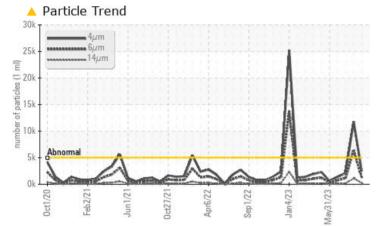
#### Area MELT SHOP - HYDRAULIC Machine Id MELT SHOP I ADLE WALL LADLE DDEHEATED HYDRAULIC LINIT (S/N)

MELT SHOP LADLE WALL LADLE PREHEATER HYDRAULIC UNIT (S/N 15-3000-0741-0020) Component

Tank Hydraulic System

### FIRE-RESISTANT FLUID ISO 46 (20 GAL)

### COMPONENT CONDITION SUMMARY



### RECOMMENDATION

No corrective action is recommended at this time. Resample at the next service interval to monitor.

PROBLEMATIC TEST R	ESULTS				
Sample Status			ATTENTION	SEVERE	ATTENTION
Particles >6µm	ASTM D7647	>1300	<u> </u>	<b>6</b> 431	1166
Particles >14µm	ASTM D7647	>160	🔺 227	1094	<b>1</b> 98
Particles >21µm	ASTM D7647	>40	<u> </u>	<b>A</b> 369	<b>6</b> 7
Particles >38µm	ASTM D7647	>10	<u> </u>	<b>5</b> 7	10
Oil Cleanliness	ISO 4406 (c)	>19/17/14	<u> </u>	<b>1</b> /20/17	▲ 18/17/15

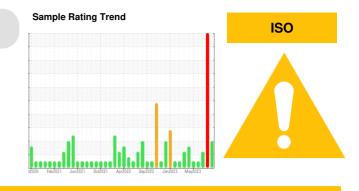
Customer Id: OUTCALAL Sample No.: RP0035495 Lab Number: 05964689 Test Package: IND 2



To manage this report scan the QR code

*To discuss the diagnosis or test data:* Doug Bogart +1 (800)237-1369 x4016 <u>dougb@wearcheckusa.com</u>

*To change component or sample information:* Customer Service +1 1-800-237-1369 <u>customerservice@wearcheck.com</u>



#### **RECOMMENDED ACTIONS**

There are no recommended actions for this sample.

### HISTORICAL DIAGNOSIS

### 29 Aug 2023 Diag: Doug Bogart



We recommend you service the filters on this component. We advise that you inspect for the source(s) of wear. We recommend an early resample to monitor this condition.Bearing and/or bushing wear is indicated. There is a high amount of particulates present in the oil. The pH level of this fluid is within the acceptable limits @ 10.0.

#### 26 Jul 2023 Diag: Jonathan Hester

28 Jun 2023 Diag: Jonathan Hester



No corrective action is recommended at this time. Resample at the next service interval to monitor.All component wear rates are normal. There is a moderate amount of particulates present in the oil. The pH level of this fluid is within the acceptable limits. pH is 9. The condition of the oil is acceptable for the time in service.



view report









No corrective action is recommended at this time. Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the oil. The amount and size of particulates present in the system are acceptable. The pH level of this fluid is within the acceptable limits at 9.0. The condition of the oil is acceptable for the time in service.



# **OIL ANALYSIS REPORT**

### Area MELT SHOP - HYDRAULIC Machine Id MELT SHOP LADLE WALL LADLE PREHEATER HYDRAULIC UNIT (S/N 15-3000-0741-0020) Component

Tank Hydraulic System

FIRE-RESISTANT FLUID ISO 46 (20 GAL)

### DIAGNOSIS

### A Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

### Wear

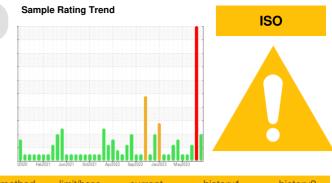
All component wear rates are normal.

### Contamination

There is a moderate amount of particulates present in the oil.

### **Fluid Condition**

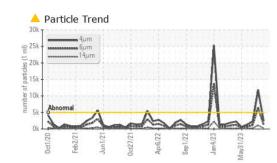
The pH level of this fluid is within the acceptable limits. pH is 11.0. The condition of the oil is acceptable for the time in service.

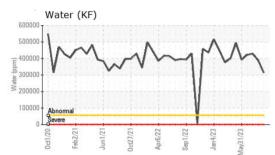


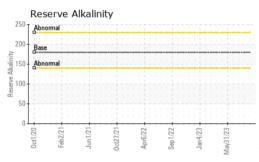
WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >20     0     ● 76     2       Chromium     ppm     ASTM D5185m     >20     0     14     1       Nickel     ppm     ASTM D5185m     >20     0     14     1       Nickel     ppm     ASTM D5185m     >20     0     1     1       Nickel     ppm     ASTM D5185m     >20     0     1	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Machine AgehrsClient Info000Oil AgehrsClient Info000Oil ChangedClient InfoN/AN/AN/ASample StatusImageClient InfoN/AN/AN/AWEAR METALSmethodImit/basecurrenthistory1history2IronppmASTM D5185m>200762ChromiumppmASTM D5185m>2001NickelppmASTM D5185m>2001NickelppmASTM D5185m>2001ItaniumppmASTM D5185m>2001LeadppmASTM D5185m>2001LeadppmASTM D5185m>2001CopperppmASTM D5185m>2001VanadiumppmASTM D5185m>2001CadmiumppmASTM D5185m>2001ADDITIVESmethodImit/basecurrenthistory1history2BoronppmASTM D5185m5001MagneseppmASTM D5185m5001MagnesiumppmASTM D5185m5410AgenovinumppmASTM D5185m5410CodaiumppmASTM D5185m50021 <th>Sample Number</th> <th></th> <th>Client Info</th> <th></th> <th>RP0035495</th> <th>RP0038424</th> <th>RP0035478</th>	Sample Number		Client Info		RP0035495	RP0038424	RP0035478
Oil Age hrs Client Info 0 0 0   Oil Changed Client Info N/A N/A N/A N/A   Sample Status Client Info N/A ATTENTION SEVERE ATTENTION   WEAR METALS method limit/base current history1 history2   Iron ppm ASTM D5185m >20 0 76 2   Chromium ppm ASTM D5185m >20 0 14 <1   Nickel ppm ASTM D5185m >20 0 <1 <1   Nickel ppm ASTM D5185m >20 0 <1 <1   Nickel ppm ASTM D5185m >20 0 <1 <1   Lead ppm ASTM D5185m >20 0 <1 <1   Copper ppm ASTM D5185m >20 0 <1 <1   Cadmium ppm ASTM D5185m >20 0 <1 <1   Cadmium ppm ASTM D5185m >20 <1 4 <1   Vanadium ppm ASTM D5185m >0 0 <1 <1   Cadmium ppm ASTM D5185m	Sample Date		Client Info		27 Sep 2023	29 Aug 2023	26 Jul 2023
Oil Changed   Client Info   N/A   N/A   N/A   N/A     Sample Status   method   limit/base   current   history1   history2     Iron   ppm   ASTM D5165m   >20   0   14   <1	Machine Age	hrs	Client Info		0	0	0
Sample StatusImage: statusATTENTIONSEVEREATTENTIONWEAR METALSmethodlimit/basecurrenthistory1history2IronppmASTM D5185m>20014<1NickelppmASTM D5185m>200<14<1NickelppmASTM D5185m>200<11<1TitaniumppmASTM D5185m200<1<1NickelppmASTM D5185m>200<1<1LeadppmASTM D5185m>200▲ 37<1CopperppmASTM D5185m>200▲ 491TinppmASTM D5185m>20<14<1VanadiumppmASTM D5185m>20<14<1CadmiumppmASTM D5185m>20<14<1CadmiumppmASTM D5185m>20<1<1<1BoronppmASTM D5185m500<1BariumppmASTM D5185m5000<1MolybdenumppmASTM D5185m54<10<1PhosphorusppmASTM D5185m54<10<2<1PhosphorusppmASTM D5185m175527210<1<1PhosphorusppmASTM D5185m175527210<1<1Phosphorus<	Oil Age	hrs	Client Info		0	0	0
WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >20     0     76     2       Chromium     ppm     ASTM D5185m     >20     0     14     <1	Oil Changed		Client Info		N/A	N/A	N/A
Ion     ppm     ASTM D5185m     >20     0     7.6     2       Chromium     ppm     ASTM D5185m     >20     0     14     <1       Nickel     ppm     ASTM D5185m     >20     0     <14	Sample Status				ATTENTION	SEVERE	ATTENTION
Chromium     ppm     ASTM D5185m     >20     0     14     <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel     ppm     ASTM D5185m     >20     0     <1     <1       Titanium     ppm     ASTM D5185m     0     0     0     0       Silver     ppm     ASTM D5185m     >20     0     <1	Iron	ppm	ASTM D5185m	>20	0	<b>•</b> 76	2
Titanium     ppm     ASTM D5185m     0     0     0       Silver     ppm     ASTM D5185m     >20     0     <1	Chromium	ppm	ASTM D5185m	>20	0	14	<1
SilverppmASTM D5185m>200AluminumppmASTM D5185m>200<1	Nickel	ppm	ASTM D5185m	>20	0	<1	<1
Aluminum     ppm     ASTM D5185m     >20     0     <1     <1       Lead     ppm     ASTM D5185m     >20     0     ▲ 37     <1	Titanium	ppm	ASTM D5185m		0	0	0
Lead     ppm     ASTM D5185m     >20     0     ▲ 37     <1       Copper     ppm     ASTM D5185m     >20     0     ▲ 49     1       Tin     ppm     ASTM D5185m     >20     <1	Silver	ppm	ASTM D5185m		0	0	0
Copper     ppm     ASTM D5185m     >20     0     ▲ 49     1       Tin     ppm     ASTM D5185m     >20     <1	Aluminum	ppm	ASTM D5185m	>20	0	<1	<1
Tin     ppm     ASTM D5185m     >20     <1     4     <1       Vanadium     ppm     ASTM D5185m     0     0     <1	Lead	ppm	ASTM D5185m	>20	0	<b>A</b> 37	<1
TinppmASTM D5185m>20<14<1VanadiumppmASTM D5185m00<1	Copper		ASTM D5185m	>20	0	<u> </u>	1
Vanadium     ppm     ASTM D5185m     0     0     <1       Cadmium     ppm     ASTM D5185m     0     0     <1			ASTM D5185m	>20	<1	4	<1
Cadmium     ppm     ASTM D5185m     0     0     <1       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     5     0     0     <1       Barium     ppm     ASTM D5185m     5     0     0     <1       Molybdenum     ppm     ASTM D5185m     5     0     0     0     1       Magnesium     ppm     ASTM D5185m     5     0     0     2     <1       Magnesium     ppm     ASTM D5185m     5     4     <1     0       Calcium     ppm     ASTM D5185m     50     2     272     10       Zinc     ppm     ASTM D5185m     175     5     2722     19       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >15     0     10     2       Sodium     ppm     ASTM D6185m     >20     0	Vanadium		ASTM D5185m		0	0	<1
Boron     ppm     ASTM D5185m     5     0     0     <1       Barium     ppm     ASTM D5185m     5     0     0     1       Molybdenum     ppm     ASTM D5185m     5     0     0     0       Manganese     ppm     ASTM D5185m     5     0     0     0       Magnesium     ppm     ASTM D5185m     5     4     <1	Cadmium				0	0	<1
Barium     ppm     ASTM D5185m     5     0     0     1       Molybdenum     ppm     ASTM D5185m     5     0     0     0       Magnesee     ppm     ASTM D5185m     5     4     <1	ADDITIVES		method	limit/base	current	history1	history2
Barium     ppm     ASTM D5185m     5     0     0     1       Molybdenum     ppm     ASTM D5185m     5     0     0     0       Manganese     ppm     ASTM D5185m     5     4     <1	Boron	ppm	ASTM D5185m	5	0	0	<1
Molybdenum     ppm     ASTM D5185m     5     0     0     0       Manganese     ppm     ASTM D5185m     5     4     <1	Barium		ASTM D5185m	5	0	0	1
Manganese     ppm     ASTM D5185m     0     2     <1       Magnesium     ppm     ASTM D5185m     5     4     <1	Molybdenum		ASTM D5185m	5	0	0	0
Magnesium     ppm     ASTM D5185m     5     4     <1     0       Calcium     ppm     ASTM D5185m     50     2     11     <1	Manganese		ASTM D5185m		0	2	<1
Calcium     ppm     ASTM D5185m     50     2     11     <1       Phosphorus     ppm     ASTM D5185m     175     5     272     10       Zinc     ppm     ASTM D5185m     175     5     272     10       Zinc     ppm     ASTM D5185m     62     11     722     19       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >15     0     10     2       Sodium     ppm     ASTM D5185m     >20     0     <11	•		ASTM D5185m	5	4	<1	0
Phosphorus     ppm     ASTM D5185m     175     5     272     10       Zinc     ppm     ASTM D5185m     62     11     722     19       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >15     0     10     2       Sodium     ppm     ASTM D5185m     >15     0     10     2       Sodium     ppm     ASTM D5185m     >20     0     0     21     7       Potassium     ppm     ASTM D5185m     >20     0     0     22       Water     %     ASTM D6304     >55     31.4     39.0     42.9       ppm Water     ppm     ASTM D6304     >55000     314000     390000     429000       FLUID CLEANLINESS     method     limit/base     current     history1     history2       Particles >4µm     ASTM D7647     >5000     2445     11805     2140       Particles >6µm     ASTM D7647     1300	Calcium		ASTM D5185m	50	2	11	<1
Zinc     ppm     ASTM D5185m     62     11     722     19       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >15     0     10     2       Sodium     ppm     ASTM D5185m     >15     0     10     2       Sodium     ppm     ASTM D5185m     >20     0     0     2       Potassium     ppm     ASTM D6304     >55     31.4     39.0     42.9       ppm Water     ppm     ASTM D6304     >55000     314000     390000     429000       FLUID CLEANLINESS     method     limit/base     current     history1     history2       Particles >4µm     ASTM D7647     >5000     2445     11805     2140       Particles >6µm     ASTM D7647     >1300     1332     6431     1166       Particles >14µm     ASTM D7647     >160     227     1094     198       Particles >21µm     ASTM D7647     >40     76	Phosphorus			175	5	272	10
Silicon     ppm     ASTM D5185m     >15     0     10     2       Sodium     ppm     ASTM D5185m     0     <10     2       Potassium     ppm     ASTM D5185m     >20     0     <1     7       Potassium     ppm     ASTM D5185m     >20     0     0     21     7       Vater     %     ASTM D6304     >55     31.4     39.0     42.9       ppm Water     ppm     ASTM D6304     >55000     314000     390000     429000       FLUID CLEANLINESS     method     limit/base     current     history1     history2       Particles >4µm     ASTM D7647     >5000     2445     11805     2140       Particles >6µm     ASTM D7647     >1300     1332     6431     1166       Particles >14µm     ASTM D7647     >160     227     1094     198       Particles >21µm     ASTM D7647     >40     76     369     67       Particles >38µm     ASTM D7647     10     12     57			ASTM D5185m	62	11	722	19
Sodium     ppm     ASTM D5185m     0     <1	CONTAMINANTS		method	limit/base	current	history1	history2
Sodium     ppm     ASTM D5185m     0     <1     7       Potassium     ppm     ASTM D5185m     >20     0     0     2       Water     %     ASTM D6304     >55     31.4     39.0     42.9       ppm Water     ppm     ASTM D6304     >55000     314000     390000     429000       FLUID CLEANLINESS     method     limit/base     current     history1     history2       Particles >4µm     ASTM D7647     >5000     2445     11805     2140       Particles >6µm     ASTM D7647     >1300     1332     6431     1166       Particles >14µm     ASTM D7647     >160     227     1094     198       Particles >21µm     ASTM D7647     >10     76     369     67       Particles >38µm     ASTM D7647     >10     12     57     10	Silicon	ppm	ASTM D5185m	>15	0	10	2
Water   %   ASTM D6304   >55   31.4   39.0   42.9     ppm Water   ppm   ASTM D6304   >55000   314000   390000   429000     FLUID CLEANLINESS   method   limit/base   current   history1   history2     Particles >4µm   ASTM D7647   >5000   2445   11805   2140     Particles >6µm   ASTM D7647   >1300   1332   6431   1166     Particles >14µm   ASTM D7647   >160   227   1094   198     Particles >21µm   ASTM D7647   >40   76   369   67     Particles >38µm   ASTM D7647   >10   12   57   10	Sodium	ppm	ASTM D5185m		0	<1	7
Water     %     ASTM D6304     >55     31.4     39.0     42.9       ppm Water     ppm     ASTM D6304     >55000     314000     390000     429000       FLUID CLEANLINESS     method     limit/base     current     history1     history2       Particles >4µm     ASTM D7647     >5000     2445     11805     2140       Particles >6µm     ASTM D7647     >1300     1332     6431     1166       Particles >14µm     ASTM D7647     >160     227     1094     198       Particles >21µm     ASTM D7647     >40     76     369     67       Particles >38µm     ASTM D7647     >10     12     57     10	Potassium	ppm	ASTM D5185m	>20	0	0	2
ppm Water     ppm     ASTM D6304     >55000 <b>314000</b> 390000     429000       FLUID CLEANLINESS     method     limit/base     current     history1     history2       Particles >4µm     ASTM D7647     >5000 <b>2445</b> 11805     2140       Particles >6µm     ASTM D7647     >1300 <b>1332</b> 6431     1166       Particles >14µm     ASTM D7647     >160 <b>227</b> 1094     198       Particles >21µm     ASTM D7647     >40 <b>76</b> 369     67       Particles >38µm     ASTM D7647     >10 <b>12</b> 57     10	Water		ASTM D6304	>55	31.4	39.0	42.9
Particles >4µm   ASTM D7647   >5000   2445   ▲ 11805   2140     Particles >6µm   ASTM D7647   >1300   ▲ 1332   ▲ 6431   1166     Particles >14µm   ASTM D7647   >160   ▲ 227   ▲ 1094   ▲ 198     Particles >21µm   ASTM D7647   >40   ▲ 76   ▲ 369   ▲ 67     Particles >38µm   ASTM D7647   >10   ▲ 12   ▲ 57   10	ppm Water	ppm	ASTM D6304	>55000	314000	390000	429000
Particles >6µm     ASTM D7647     >1300     ▲ 1332     ▲ 6431     1166       Particles >14µm     ASTM D7647     >160     ▲ 227     ▲ 1094     ▲ 198       Particles >21µm     ASTM D7647     >40     ▲ 76     ▲ 369     ▲ 67       Particles >38µm     ASTM D7647     >10     ▲ 12     ▲ 57     10	FLUID CLEANLIN	ESS	method	limit/base	current	history1	history2
Particles >14μm     ASTM D7647     >160     ▲ 227     ▲ 1094     ▲ 198       Particles >21μm     ASTM D7647     >40     ▲ 76     ▲ 369     ▲ 67       Particles >38μm     ASTM D7647     >10     ▲ 12     ▲ 57     10	Particles >4µm		ASTM D7647	>5000	2445	▲ 11805	2140
Particles >14μm     ASTM D7647     >160     ▲ 227     ▲ 1094     ▲ 198       Particles >21μm     ASTM D7647     >40     ▲ 76     ▲ 369     ▲ 67       Particles >38μm     ASTM D7647     >10     ▲ 12     ▲ 57     10	Particles >6µm		ASTM D7647	>1300	<u> </u>	<b>6</b> 431	1166
Particles >21µm     ASTM D7647     >40     ▲ 76     ▲ 369     ▲ 67       Particles >38µm     ASTM D7647     >10     ▲ 12     ▲ 57     10	Particles >14µm					▲ 1094	
Particles >38μm     ASTM D7647     >10     ▲ 12     ▲ 57     10	•						
Particles $> 1 \text{ Lum}$ AS LM $V/64/>3$	Particles >71µm		ASTM D7647	>3	1	<u> </u>	1
Oil Cleanliness     ISO 4406 (c)     >19/17/14     ▲ 18/18/15     ▲ 21/20/17     ▲ 18/17/15	•						

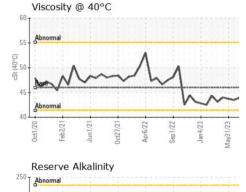


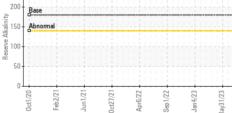
# **OIL ANALYSIS REPORT**











VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	LIGHT
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	🔺 LAYRD	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>55	0.2%	0.2%	0.2%
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPERT	IES	method	limit/base	current	history1	history2
pН	Scale 0-14	ASTM D1287		11.0	10.0	9.00
Visc @ 40°C	cSt	ASTM D445	46	50.3	45.6	43.9
SAMPLE IMAGES	S	method	limit/base	current	history1	history2

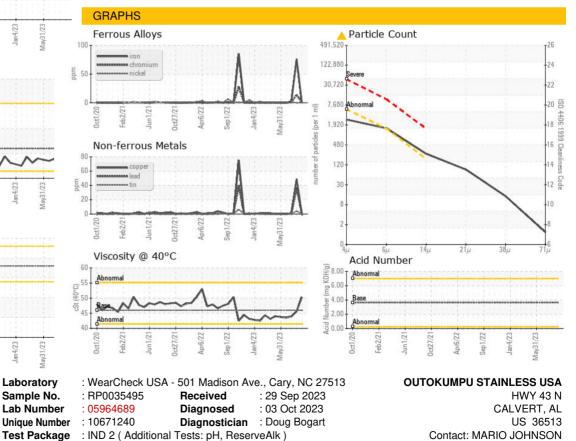


Bottom

To discuss this sample report, contact Customer Service at 1-800-237-1369. \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Color



Report Id: OUTCALAL [WUSCAR] 05964689 (Generated: 10/04/2023 13:16:47) Rev: 1

Certificate L2367

Submitted By: DALE ROBINSON

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