# LIEBHERR

## **CONSTRUCTION EQUIPMENT**

### LIEBHERR LH50 1216-116574 - Front Right Wheel Hub

Sample No: LH0171124

Oil Type: MOBIL MOBILUBE SHC 75W140

SAMPLEINFORMATION	_						
Sample Date         29 Aug 2023         27 Apr 2023         27 Jan 2023         03 Dec 2021           Machine Hours         17910         16762         14930         8820           Oil Hours         0         0         0         0           Oil Changed         Changed         Changed         Changed         Changed           Sample Status         SEVERE         ABNORMAL         ABNORMAL         ABNORMAL           CONTAMINATION           Silicon         ppm         63         25         14         4           Sodium         ppm         9         7         5         3           Potassium         ppm         9         7         5         3           Potassium         ppm         1546         698         805         152           Copper         ppm         123         52         57         116           Lead         ppm         1         0         2         <1	U SAM	PLE INFO	RMATION				
Sample Date         29 Aug 2023         27 Apr 2023         27 Jan 2023         03 Dec 2021           Machine Hours         17910         16762         14930         8820           Oil Hours         0         0         0         0           Oil Changed         Changed         Changed         Changed         Changed           Sample Status         SEVERE         ABNORMAL         ABNORMAL         ABNORMAL           CONTAMINATION           Silicon         ppm         63         25         14         4           Sodium         ppm         9         7         5         3           Potassium         ppm         9         7         5         3           Potassium         ppm         1546         698         805         152           Copper         ppm         123         52         57         116           Lead         ppm         1         0         2         <1           Chromium         ppm         14         8         3         4           Chromium         ppm         1         <1         <1         <1           Molybdenum	Sample Number		LH0171124	LH0171115	LH0171110	I H0171180	
Machine Hours         17910         16762         14930         8820           Oil Hours         0         0         0         0           Oil Changed         Changed         Changed         Changed           Sample Status         SEVERE         ABNORMAL         ABNORMAL         ABNORMAL           Oil CONDITION           Visc @ 40°C         CSt         186         148         152         163           CONTAMINATION           Silicon         ppm         9         7         5         3           Sodium         ppm         9         7         5         3           VEAR METALS           Iron         ppm         9         7         5         3           Potassium         ppm         9         7         5         3           VEAR METALS           Iron         ppm         9         698         805         152           Copper         ppm         123         52         57         116           Lead         ppm         1         0         2         116           Lead         ppm         14							
Oil Changed							
Oil Changed Sample Status         Changed SEVERE         Changed ABNORMAL         Changed ABNORMAL         Changed ABNORMAL         ABNORMAL <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td></th<>							
Sample Status						-	
Oil CONDITION           CONTAMINATION           Silicon         ppm         63         25         14         4           Sodium         ppm         9         7         5         3           Potassium         ppm         9         7         5         3         9         7         5         3         3         9         1         4         4         4         4         4         52         57         116           Lead         ppm         1         9         4         1         4         9         4         1         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4 <th colspan<="" td=""><td>-</td><td></td><td></td><td>_</td><td>-</td><td>-</td></th>	<td>-</td> <td></td> <td></td> <td>_</td> <td>-</td> <td>-</td>	-			_	-	-
Visc @ 40°C         cSt         ● 186         ● 148         152         ● 163           CONTAMINATION           Silicon         ppm         ● 63         ● 25         ● 14         ● 4           Sodium         ppm         ● 9         ○ 7         ● 5         ● 3           Potassium         ppm         ● 4         ● 3         ● <1         ● <1           WEAR METALS           Iron         ppm         ● 1546         ● 698         ● 805         ● 152           Copper         ppm         ● 123         ● 52         ● 57         ● 116           Lead         ppm         ● 1         ● 0         ● 2         ● <1         ● 116         E           Copper         ppm         ● 1         ● 0         ● 0         ● 1	Sample Status		SEVERE	ADIVOLIVIAL	ADNOTIVIAL	ADINOTIVIAL	
CONTAMINATION  Silicon	OILC	ONDITIO	N				
Silicon				O 148	152	O 163	
Silicon	-4		<b>J</b>			J	
Silicon	CON	TAMINAT	ION				
Sodium         ppm         ● 9         ↑ 7         5         3           Potassium         ppm         ● 4         ③ 3         ○ <1         ○ <1           WEAR METALS           Iron         ppm         ● 1546         ○ 698         ○ 805         ○ 152           Copper         ppm         ● 123         ○ 52         ○ 57         ○ 116           Lead         ppm         ● 1         ○ 0         ○ 2         ○ <1           Lead         ppm         ● 1         ○ 0         ○ 2         ○ <1           Aluminum         ppm         ● 0         ● 0         ○ 0         ○ <1         ○ <1           Aluminum         ppm         ● 14         ● 8         ● 3         ● 4         ○ <1         ○ <1           Chromium         ppm         ○ 4         ○ 4         ○ 5         ○ <1         ○ <1         ○ <1         ○ <1         ○ <1         ○ <1         ○ <1         ○ <1         ○ <1         ○ <1         ○ <1         ○ <1         ○ <1         ○ <1         ○ <1         ○ <1         ○ <1         ○ <1         ○ <1         ○ <1         ○ <1         ○ <1         ○ <1         ○ <1         ○ <1 <t< td=""><td></td><td></td><td></td><td>0.25</td><td>O 14</td><td>0.4</td></t<>				0.25	O 14	0.4	
Potassium         ppm         ● 4         ● 3         <1         <1           WEAR METALS           Iron         ppm         ● 1546         ● 698         ● 805         ● 152           Copper         ppm         ● 123         ● 52         ● 57         ● 116           Lead         ppm         ● 1         ● 0         ● 2         ● <1			_				
WEAR METALS           Iron         ppm         1546         698         805         152           Copper         ppm         123         52         57         116           Lead         ppm         1         0         2         <1							
Iron	.44.	ρριτι	<b>0 4</b>	0 3	0 <1	0 < 1	
Copper         ppm         123         52         57         116           Lead         ppm         1         0         2         <1	<b>◎</b> WEA	R METAL	S				
Lead       ppm       1       0       2       <1	Iron	ppm	<b>1546</b>	O 698	O 805	O 152	
Tin ppm 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Copper	ppm	<b>123</b>	O 52	<b>57</b>	<u> </u>	
Aluminum ppm	Lead	ppm	<b>1</b>	O 0	O 2	O <1	
Chromium         ppm         4         4         5         <1           Molybdenum         ppm         <1	Tin	ppm	<b>0</b>	O 0	O <1	O <1	
Molybdenum         ppm         <1	Aluminum	ppm	<b>14</b>	0 8	<b>3</b>	<b>4</b>	
Nickel         ppm         1         <1         1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1	Chromium	ppm	<b>4</b>	<b>4</b>	<b>5</b>	O <1	
Titanium ppm <1 0 <1 0 Silver ppm 0 0 0 0 0 <1 Manganese ppm 17 9 8 5 Vanadium ppm <1 <1 <1 <1 0  ADDITIVES  Calcium ppm 10 14 11 11 Magnesium ppm <1 <1 <1 2 3 Zinc ppm 101 73 67 86 Phosphorus ppm 0 0 0 0 0 0	Molybdenum	ppm	<1	O <1	<1	<1	
Silver         ppm         0         0         0         <1           Manganese         ppm         17         9         8         5           Vanadium         ppm         <1         <1         <1         0           ADDITIVES           Calcium         ppm         10         14         11         11         11           Magnesium         ppm         <1         <1         2         3         3           Zinc         ppm         101         73         67         86           Phosphorus         ppm         397         1829         1554         1693           Barium         ppm         0         0         0         0	Nickel	ppm	01	O <1	O 1	O <1	
Silver         ppm         0         0         0         <1           Manganese         ppm         17         9         8         5           Vanadium         ppm         <1         <1         <1         0           ADDITIVES           Calcium         ppm         10         14         11         11         11           Magnesium         ppm         <1         <1         2         3         3           Zinc         ppm         101         73         67         86           Phosphorus         ppm         397         1829         1554         1693           Barium         ppm         0         0         0         0	Titanium		<1	0	<1	0	
Manganese         ppm         17         9         8         5           Vanadium         ppm         <1         <1         <1         0    ADDITIVES  Calcium  ppm  10  14  11  11  Magnesium  ppm  > <1         <1         <1         <2         3 Zinc  ppm  101  73  67  86  Phosphorus  ppm  397  1829  1554  1693  Barium  ppm  0  0  0  0	Silver		0	0	0	<1	
Vanadium         ppm         <1         <1         <1         0           ADDITIVES           Calcium         ppm         10         14         11         11           Magnesium         ppm         <1	Manganese		17	O 9	8	5	
ADDITIVES           Calcium         ppm         10         14         11         11           Magnesium         ppm         <1			<1	<1	<1		
Magnesium         ppm         <1         <1         2         3           Zinc         ppm         101         73         67         86           Phosphorus         ppm         397         1829         1554         1693           Barium         ppm         0         0         0         0	ADD						
Zinc         ppm         101         ○ 73         67         86           Phosphorus         ppm         397         ○ 1829         1554         1693           Barium         ppm         0         ○ 0         0         0	Calcium	ppm	10	O 14	11	11	
Phosphorus         ppm         397         1829         1554         1693           Barium         ppm         0         0         0         0	Magnesium	ppm	<1	O <1	2	3	
<b>Barium</b> ppm <b>0</b>	Zinc	ppm	101	O 73	67	86	
	Phosphorus	ppm	397	O 1829	1554	1693	
	Barium	ppm	0	0	0	0	
	Boron	ppm	1	<b>87</b>	121	259	



#### **BOISE WHITE PAPER**

3RD AVE AND HWY 11, 400 2ND ST INTERNATIONAL FALLS, MN US 56649

Contact: GARY MANN

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#### Diagnosis

The oil change at the time of sampling has been noted. We advise that you inspect for the source(s) of wear. We recommend an early resample to monitor this condition.Bearing and/or gear wear is indicated. There is no indication of any contamination in the oil. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

Depot: BOIINT
Unique No: 10633772
Signed: Jonathan Hester
Report Date: 08 Sep 2023

## LIEBHERR

CONSTRUCTION EQUIPMENT





#### **GRAPHS**

