

LIEBHERR

CONSTRUCTION EQUIPMENT



LIEBHERR LH50 11551-1216 - Diesel Engine

Sample No: LHMC163233
 Oil Type: HARTLAND 5W40



BOISE WHITE PAPER
 3RD AVE AND HWY 11, 400 2ND ST
 INTERNATIONAL FALLS, MN
 US 56649
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SAMPLE INFORMATION

Sample Number	LHMC163233	LH0156603	LHMC163422	LHMC163238
Sample Date	29 Aug 2023	25 Apr 2023	26 Jan 2023	03 Dec 2021
Machine Hours	17705	15697	14047	10215
Oil Hours	0	0	0	1882
Oil Changed	Changed	Changed	Changed	Changed
Sample Status	NORMAL	NORMAL	NORMAL	NORMAL



OIL CONDITION

Visc @ 100°C	cSt	12.7	13.2	11.6	12.9
Base Number (BN)	mg KOH/g	7.8	4.9	6.0	3.2
Oxidation (PA)	%	75	92	97	129



CONTAMINATION

Soot %	%	0.1	0.1	0.1	0.2
Nitration (PA)	%	68	89	102	133
Sulfation (PA)	%	58	63	61	74
Glycol	%	NEG	NEG	NEG	NEG
Fuel	%	<1.0	<1.0	<1.0	<1.0
Silicon	ppm	3	6	6	6
Sodium	ppm	<1	2	1	2
Potassium	ppm	<1	2	<1	2



WEAR METALS

Iron	ppm	5	6	9	11
Copper	ppm	0	1	1	6
Lead	ppm	0	0	<1	1
Tin	ppm	0	0	<1	<1
Aluminum	ppm	4	4	6	6
Chromium	ppm	<1	<1	<1	<1
Molybdenum	ppm	9	5	<1	2
Nickel	ppm	0	<1	0	<1
Titanium	ppm	2	47	0	<1
Silver	ppm	0	0	0	<1
Manganese	ppm	<1	<1	<1	<1
Vanadium	ppm	0	<1	0	0



ADDITIVES

Calcium	ppm	1193	1269	1171	1208
Magnesium	ppm	899	829	830	872
Zinc	ppm	924	1071	797	948
Phosphorus	ppm	764	858	598	794
Barium	ppm	0	0	0	0
Boron	ppm	45	48	37	25

Diagnosis

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 BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Depot: BOIINT
 Unique No: 10633434
 Signed: Wes Davis
 Report Date: 06 Sep 2023



GRAPHS

