



OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	NORMAL
FLUID CONDITION	NORMAL

Machine Id
22551
Component
Diesel Engine
Fluid
LIEBHERR MOTOROIL 10W-40 LOW ASH (--- GAL)

RECOMMENDATION

Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		WC0950719	WC0786474	WC0671626
Sample Date		Client Info		28 Jun 2024	28 Jun 2023	29 Apr 2022
Machine Age	hrs	Client Info		6257	5772	4745
Oil Age	hrs	Client Info		1250	500	625
Filter Age	hrs	Client Info		1250	500	625
Oil Changed		Client Info		Changed	Changed	Not Changd
Filter Changed		Client Info		Changed	Changed	Not Changd
Sample Status				NORMAL	NORMAL	NORMAL

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>100	13	40	16
Chromium	ppm	ASTM D5185m	>20	<1	1	<1
Nickel	ppm	ASTM D5185m	>4	0	<1	0
Titanium	ppm	ASTM D5185m		<1	<1	1
Silver	ppm	ASTM D5185m	>3	0	0	<1
Aluminum	ppm	ASTM D5185m	>20	2	7	4
Lead	ppm	ASTM D5185m	>40	0	6	<1
Copper	ppm	ASTM D5185m	>330	2	6	5
Tin	ppm	ASTM D5185m	>15	0	<1	0
Vanadium	ppm	ASTM D5185m		0	<1	0
White Metal	scalar	*Visual	NONE	NONE	LIGHT	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE

CONTAMINATION

There is no indication of any contamination in the oil.

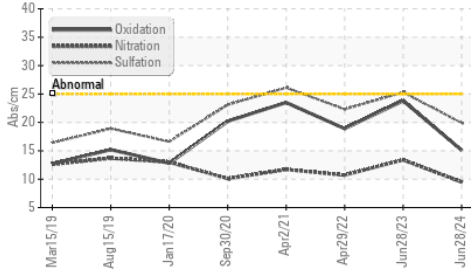
Silicon	ppm	ASTM D5185m	>25	6	9	7
Potassium	ppm	ASTM D5185m	>20	4	3	0
Fuel	%	ASTM D3524	>5	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
Soot %	%	*ASTM D7844	>3	0.1	0.2	0.1
Nitration	Abs/cm	*ASTM D7624	>20	9.5	13.4	10.7
Sulfation	Abs/.1mm	*ASTM D7415	>30	19.9	25.3	22.3
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	LIGHT
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG

FLUID CONDITION

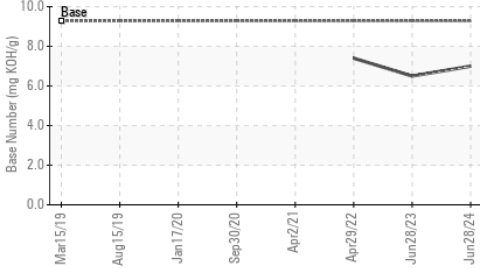
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sodium	ppm	ASTM D5185m		2	5	2
Boron	ppm	ASTM D5185m	169	64	85	90
Barium	ppm	ASTM D5185m	0	0	0	0
Molybdenum	ppm	ASTM D5185m	2	7	0	<1
Manganese	ppm	ASTM D5185m	<1	<1	1	<1
Magnesium	ppm	ASTM D5185m	724	697	766	785
Calcium	ppm	ASTM D5185m	1323	1361	2306	1629
Phosphorus	ppm	ASTM D5185m	678	755	995	811
Zinc	ppm	ASTM D5185m	776	861	1196	880
Sulfur	ppm	ASTM D5185m	2859	2647	4280	2762
Oxidation	Abs/.1mm	*ASTM D7414	>25	15.1	23.8	18.9
Base Number (BN)	mg KOH/g	ASTM D2896	9.28	7.0	6.5	7.4
Visc @ 100°C	cSt	ASTM D445	13.0	12.4	13.3	12.6

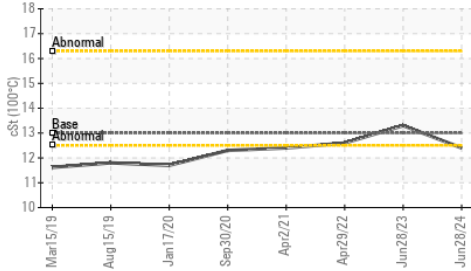
FT-IR (Direct Trend)



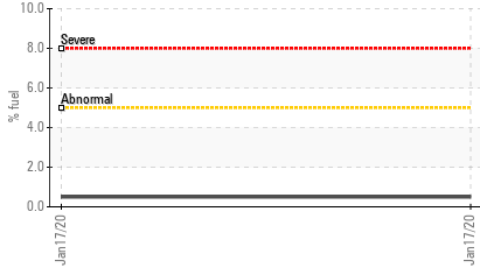
Base Number



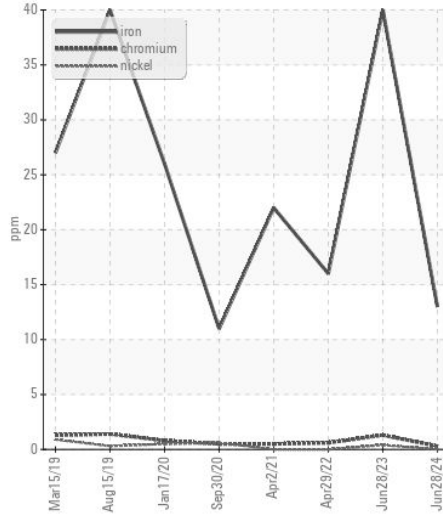
Viscosity @ 100°C



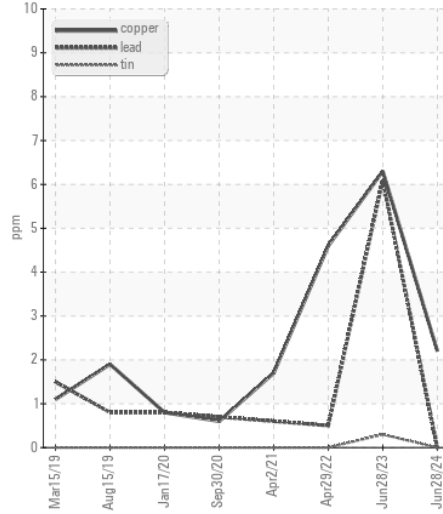
Fuel Dilution



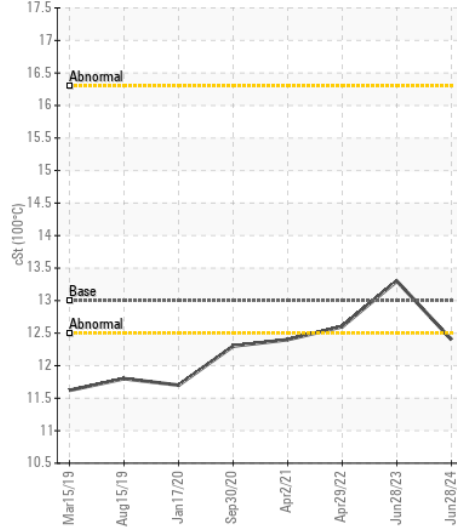
Ferrous Alloys



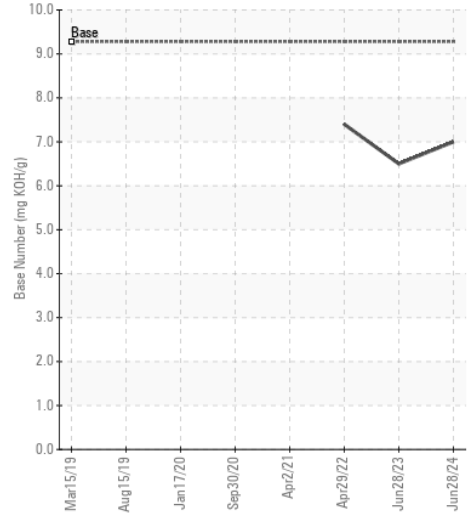
Non-ferrous Metals



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0950719 **Received** : 03 Jul 2024
Lab Number : 06227046 **Tested** : 05 Jul 2024
Unique Number : 11110539 **Diagnosed** : 05 Jul 2024 - Jonathan Hester
Test Package : CONST (Additional Tests: FuelDilution, PercentFuel, TBN)

SULLIVAN EASTERN INC-LIEBHERR
 2860 C SLATER RD
 MORRISVILLE, NC
 US 27560
 Contact: CHRIS CALTON

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)

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