CONST

LIEBHERR

OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	NORMAL
FLUID CONDITION	NORMAL

Machine Id
MS20
Component
Diesel Engine
Fluid
DIESEL ENGINE OIL SAE 40 (--- GAL)

RECOMMENDATION

Resample at the next service interval to monitor. Please specify the component make and model with your next sample. Please specify the brand, type, and viscosity of the oil on your next sample.

WEAR

All component wear rates are normal.

CONTAMINATION

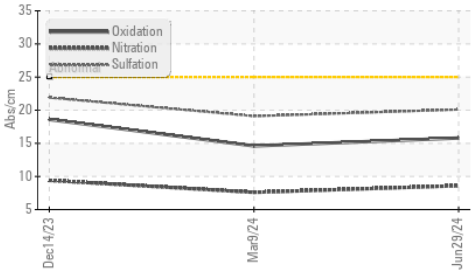
There is no indication of any contamination in the oil.

FLUID CONDITION

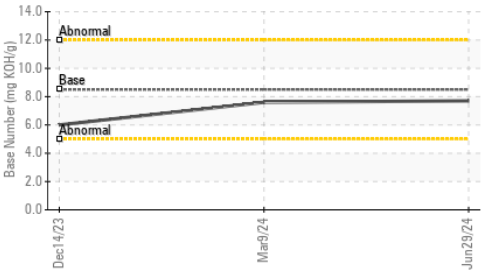
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		**LH0244797**	LH0244825	LH0244841
Sample Date		Client Info		**29 Jun 2024**	09 Mar 2024	14 Dec 2023
Machine Age	hrs	Client Info		**4907**	4046	3388
Oil Age	hrs	Client Info		**0**	500	0
Filter Age	hrs	Client Info		**0**	500	0
Oil Changed		Client Info		**Changed**	N/A	Changed
Filter Changed		Client Info		**N/A**	Changed	N/A
Sample Status				**NORMAL**	NORMAL	NORMAL
Iron	ppm	ASTM D5185m	>100	**16**	14	27
Chromium	ppm	ASTM D5185m	>20	**<1**	<1	<1
Nickel	ppm	ASTM D5185m	>4	**0**	0	0
Titanium	ppm	ASTM D5185m		**<1**	0	0
Silver	ppm	ASTM D5185m	>3	**0**	0	0
Aluminum	ppm	ASTM D5185m	>20	**2**	<1	2
Lead	ppm	ASTM D5185m	>40	**0**	0	0
Copper	ppm	ASTM D5185m	>330	**1**	2	2
Tin	ppm	ASTM D5185m	>15	**0**	<1	0
Vanadium	ppm	ASTM D5185m		**<1**	0	0
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silicon	ppm	ASTM D5185m	>25	**3**	3	6
Potassium	ppm	ASTM D5185m	>20	**2**	0	2
Fuel		WC Method	>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	**0.5**	0.3	0.7
Nitration	Abs/cm	*ASTM D7624	>20	**8.6**	7.6	9.4
Sulfation	Abs/.1mm	*ASTM D7415	>30	**20.1**	19.1	21.9
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**	NORML	NORML
Odor	scalar	*Visual	NORML	**NORML**	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	**NEG**	NEG	NEG
Sodium	ppm	ASTM D5185m	>216	**<1**	2	7
Boron	ppm	ASTM D5185m	250	**5**	8	56
Barium	ppm	ASTM D5185m	10	**0**	0	0
Molybdenum	ppm	ASTM D5185m	100	**61**	59	82
Manganese	ppm	ASTM D5185m		**0**	<1	<1
Magnesium	ppm	ASTM D5185m	450	**958**	895	508
Calcium	ppm	ASTM D5185m	3000	**1164**	1167	2300
Phosphorus	ppm	ASTM D5185m	1150	**1052**	1016	1149
Zinc	ppm	ASTM D5185m	1350	**1273**	1242	1615
Sulfur	ppm	ASTM D5185m	4250	**2562**	3285	4233
Oxidation	Abs/.1mm	*ASTM D7414	>25	**15.8**	14.6	18.6
Base Number (BN)	mg KOH/g	ASTM D2896	8.5	**7.7**	7.6	6.0
Visc @ 100°C	cSt	ASTM D445	14.4	**12.6**	13.1	13.4

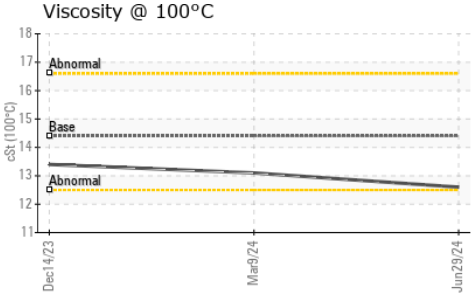
FT-IR (Direct Trend)



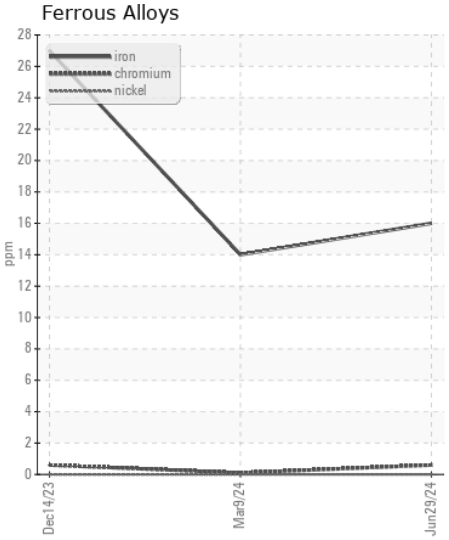
Base Number



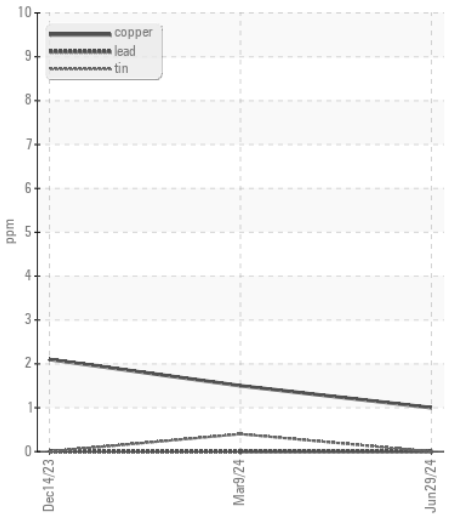
Viscosity @ 100°C



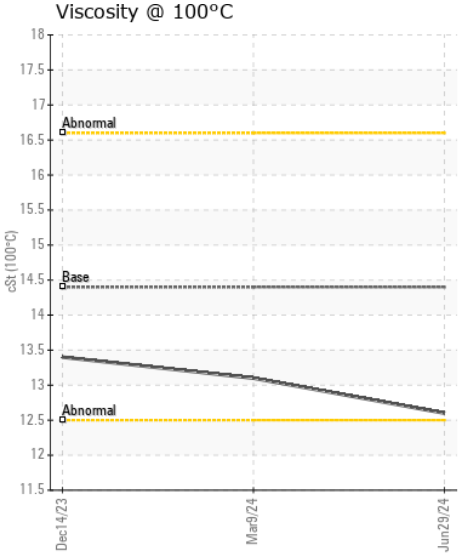
Ferrous Alloys



Non-ferrous Metals



Viscosity @ 100°C



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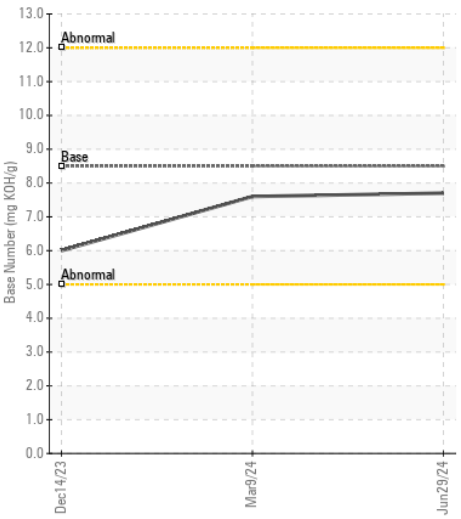

Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : LH0244797 **Received** : 12 Jul 2024
Lab Number : 06234699 **Tested** : 15 Jul 2024
Unique Number : 11123533 **Diagnosed** : 15 Jul 2024 - Wes Davis
Test Package : CONST (Additional Tests: TBN)

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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