



OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	ABNORMAL
FLUID CONDITION	NORMAL

Area
Store 9 - Marietta

Machine Id
KENWORTH 1046

Component
Diesel Engine

Fluid
SHELL ROTELLA T 15W40 (10 GAL)

RECOMMENDATION

We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		LEC0051403	LEC0049236	LEC0044842
Sample Date		Client Info		13 Jun 2024	15 Apr 2024	11 Dec 2023
Machine Age	mls	Client Info		523032	512573	501021
Oil Age	mls	Client Info		10000	10000	10000
Filter Age	mls	Client Info		10000	10000	10000
Oil Changed		Client Info		Changed	Changed	Changed
Filter Changed		Client Info		Changed	Changed	Changed
Sample Status				ABNORMAL	ABNORMAL	ABNORMAL

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>100	30	13	29
Chromium	ppm	ASTM D5185m	>20	1	<1	<1
Nickel	ppm	ASTM D5185m	>4	<1	0	0
Titanium	ppm	ASTM D5185m		2	<1	0
Silver	ppm	ASTM D5185m	>3	<1	0	0
Aluminum	ppm	ASTM D5185m	>20	3	2	5
Lead	ppm	ASTM D5185m	>40	2	0	3
Copper	ppm	ASTM D5185m	>330	13	10	4
Tin	ppm	ASTM D5185m	>15	2	1	<1
Vanadium	ppm	ASTM D5185m		<1	0	0
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE

CONTAMINATION

Elemental level of silicon (Si) above normal.

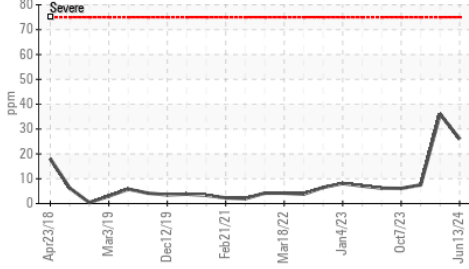
Silicon	ppm	ASTM D5185m	>120	▲ 26	▲ 36	8
Potassium	ppm	ASTM D5185m	>20	2	1	▲ 42
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
Soot %	%	*ASTM D7844	>3	0.3	0.1	0.6
Nitration	Abs/cm	*ASTM D7624	>20	7.5	5.9	9.4
Sulfation	Abs/.1mm	*ASTM D7415	>30	21.7	19.1	25.1
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

FLUID CONDITION

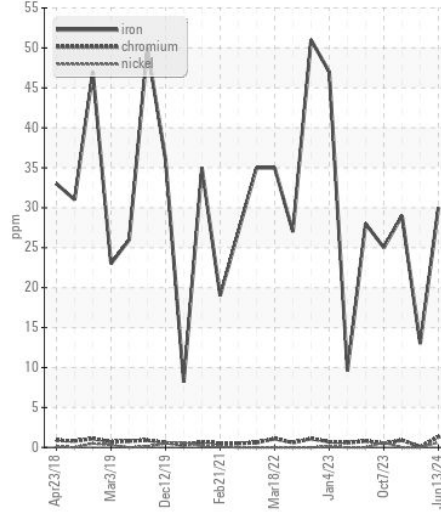
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

Sodium	ppm	ASTM D5185m		<1	4	3
Boron	ppm	ASTM D5185m	316	279	54	295
Barium	ppm	ASTM D5185m	0.0	1	0	0
Molybdenum	ppm	ASTM D5185m	1.2	86	65	218
Manganese	ppm	ASTM D5185m		2	3	<1
Magnesium	ppm	ASTM D5185m	24	432	431	588
Calcium	ppm	ASTM D5185m	2292	1417	1787	1340
Phosphorus	ppm	ASTM D5185m	1064	833	1006	658
Zinc	ppm	ASTM D5185m	1160	1100	1215	751
Sulfur	ppm	ASTM D5185m	4996	2740	3764	2315
Oxidation	Abs/.1mm	*ASTM D7414	>25	15.6	14.4	20.4
Base Number (BN)	mg KOH/g	ASTM D2896	10.1	7.5	9.1	8.2
Visc @ 100°C	cSt	ASTM D445	15.7	13.1	12.8	13.2

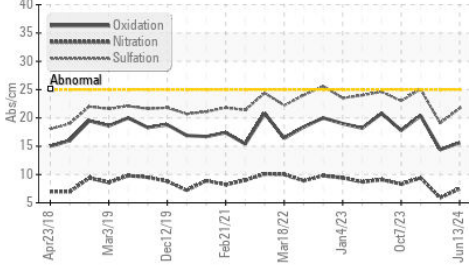
▲ Silicon (ppm)



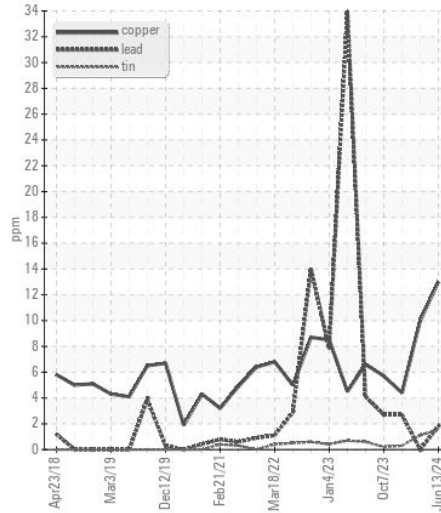
Ferrous Alloys



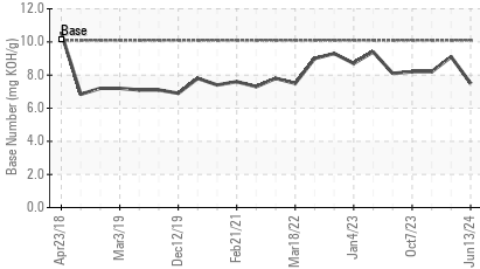
FT-IR (Direct Trend)



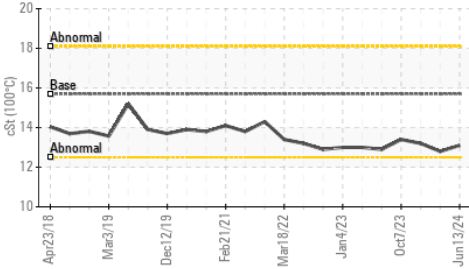
Non-ferrous Metals



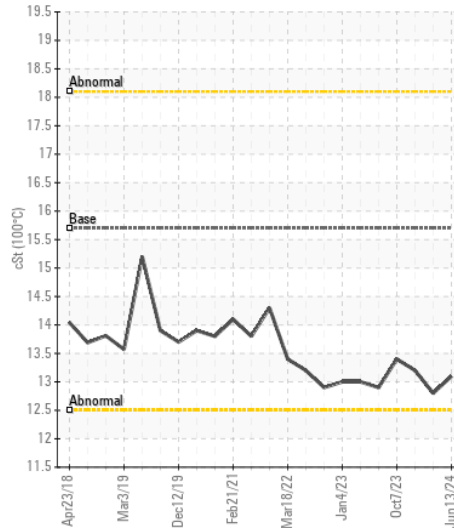
Base Number



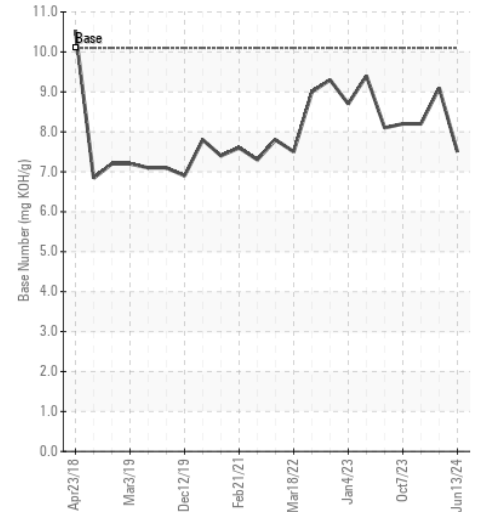
Viscosity @ 100°C



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : LEC0051403 **Received** : 25 Jun 2024
Lab Number : 06219489 **Tested** : 26 Jun 2024
Unique Number : 11097686 **Diagnosed** : 26 Jun 2024 - Don Baldrige
Test Package : CONST (Additional Tests: TBN)

HALL DRILLING LLC
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 ELLENBORO, WV
 US 26346

Contact: CHRIS PETROVICH
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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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