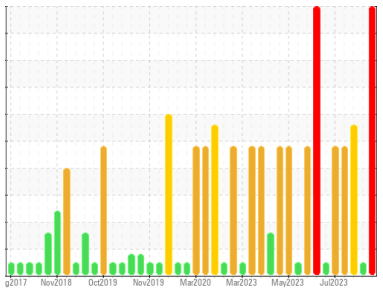
OIL ANALYSIS REPORT

Sample Rating Trend



WEAR

Machine Id
IRGM01BE (S/N CTL0580)
Component
Biogas Engine
Fluid
CHEVRON HDAX 9500 GAS ENGINE OIL 40 (160 GAL)

DIAGNOSIS

▲ Recommendation
We recommend that you drain the oil from the component if this has not already been done. We advise that you inspect for the source(s) of wear. We recommend an early resample to monitor this condition.

▲ Wear
The iron level is marginal. Bearing and/or bushing wear is indicated.

▲ Contamination
Elemental level of silicon (Si) above normal.

Fluid Condition
The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid. The oil is no longer serviceable.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**WC0789154**	WC0789155	WC0789156
Sample Date		Client Info		**09 Apr 2024**	13 Mar 2024	29 Nov 2023
Machine Age	hrs	Client Info		**15938**	15352	15351
Oil Age	hrs	Client Info		**587**	1	450
Oil Changed		Client Info		**Changed**	N/A	Changed
Sample Status				**SEVERE**	NORMAL	SEVERE

CONTAMINATION		method	limit/base	current	history1	history2
Fuel		WC Method	>4.0	**<1.0**	<1.0	<1.0
Water		WC Method	>.11	**NEG**	NEG	NEG
Glycol		WC Method		**NEG**	NEG	NEG

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>15	▲ **13**	5	▲ 17
Chromium	ppm	ASTM D5185m	>4	**1**	<1	<1
Nickel	ppm	ASTM D5185m		**2**	<1	<1
Titanium	ppm	ASTM D5185m		**<1**	<1	0
Silver	ppm	ASTM D5185m		**0**	0	0
Aluminum	ppm	ASTM D5185m	>6	**4**	2	3
Lead	ppm	ASTM D5185m	>9	▲ **9**	<1	0
Copper	ppm	ASTM D5185m	>6	▲ **7**	1	2
Tin	ppm	ASTM D5185m	>4	▲ **8**	2	6
Vanadium	ppm	ASTM D5185m		**<1**	<1	0
Cadmium	ppm	ASTM D5185m		**<1**	<1	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		**2**	0	0
Barium	ppm	ASTM D5185m		**0**	0	0
Molybdenum	ppm	ASTM D5185m		**4**	2	2
Manganese	ppm	ASTM D5185m		**1**	<1	<1
Magnesium	ppm	ASTM D5185m		**22**	8	23
Calcium	ppm	ASTM D5185m		**1978**	1623	1517
Phosphorus	ppm	ASTM D5185m		**342**	276	286
Zinc	ppm	ASTM D5185m		**425**	337	365
Sulfur	ppm	ASTM D5185m		**3626**	2196	2631

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>181	▲ **331**	53	▲ 220
Sodium	ppm	ASTM D5185m	>21	**<1**	0	0
Potassium	ppm	ASTM D5185m	>20	**2**	2	<1

INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844		**0**	0	0
Nitration	Abs/cm	*ASTM D7624		**5.7**	4.6	4.3
Sulfation	Abs/.1mm	*ASTM D7415		**21.5**	15.0	18.5

FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414		**14.1**	7.4	9.8
Acid Number (AN)	mg KOH/g	ASTM D8045	1.0	**2.01**	0.79	1.10
Base Number (BN)	mg KOH/g	ASTM D2896	5.4	**3.42**	4.83	5.27

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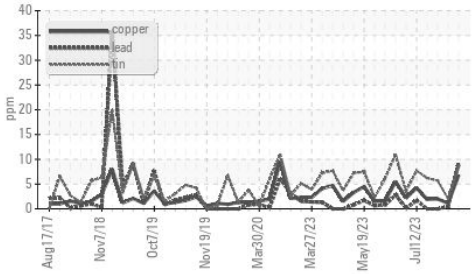
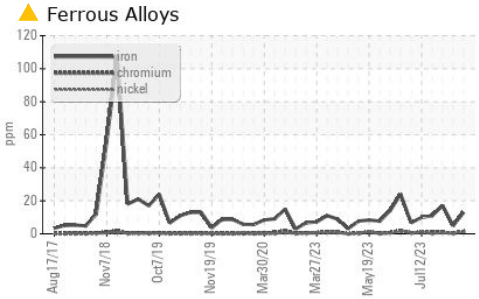
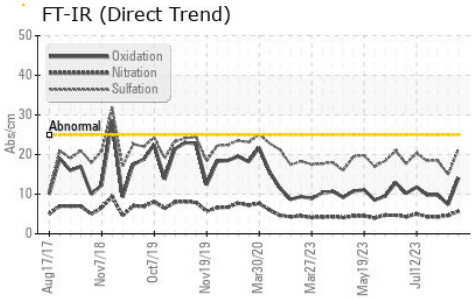
Non-ferrous Metals



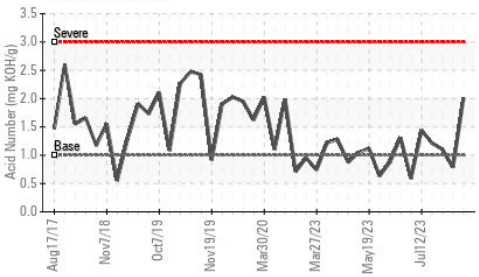
Ferrous Alloys



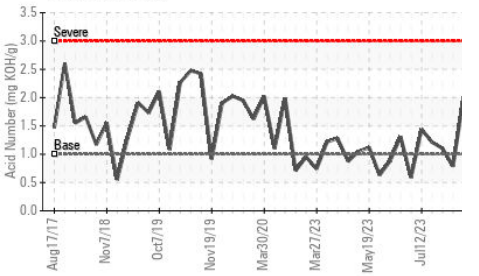
FT-IR (Direct Trend)



Acid Number



Acid Number

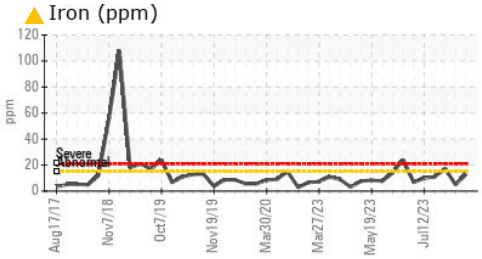


VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Appearance	scalar	*Visual	NORML	**NORML**	NORML	NORML
Odor	scalar	*Visual	NORML	**NORML**	NORML	NORML
Emulsified Water	scalar	*Visual	>.11	**NEG**	NEG	NEG
Free Water	scalar	*Visual		**NEG**	NEG	NEG

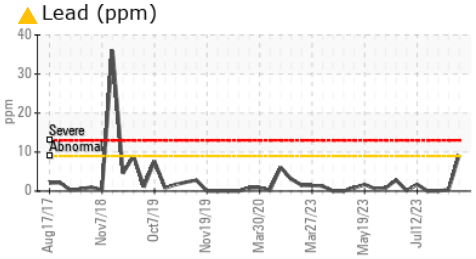
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	13.4	**14.0**	13.6	13.9

GRAPHS

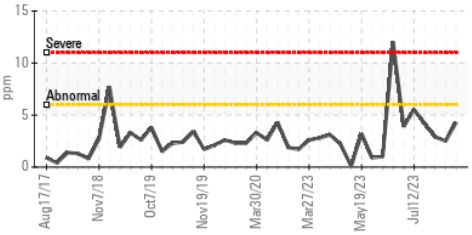
Iron (ppm)



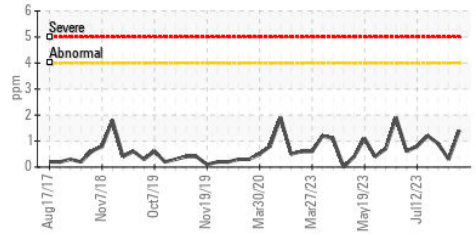
Lead (ppm)



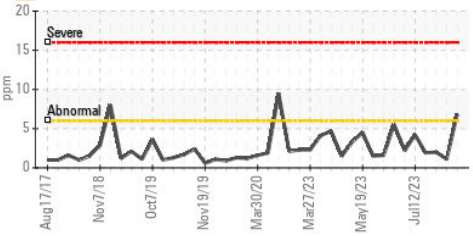
Aluminum (ppm)



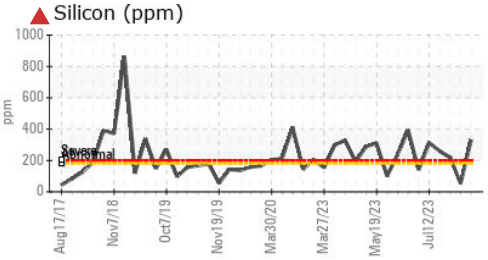
Chromium (ppm)



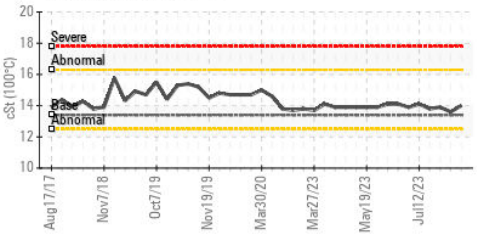
Copper (ppm)



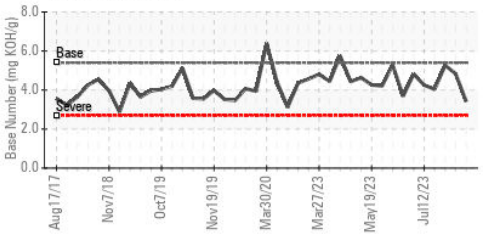
Silicon (ppm)



Viscosity @ 100°C



Base Number



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0789154
Lab Number : 06144482
Unique Number : 10969290
Test Package : MOB 2

Received : 10 Apr 2024
Tested : 11 Apr 2024
Diagnosed : 15 Apr 2024 - Jonathan Hester

Certificate L2367

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)

EDL NA Recips-Iris Glen
IRIS GLEN POWER STATION, 1705 E MAIN ST
JOHNSON CITY, TN
US 37601
Contact: CHRIS SMITH
csmith@stowerscat.com
T:
F:

Report Id: ENEJOH [WUSCAR] 06144482 (Generated: 04/15/2024 09:26:05) Rev: 1

Submitted By: CHRIS SMITH