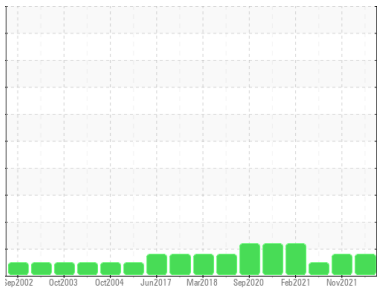
OIL ANALYSIS REPORT

Sample Rating Trend



WEAR

Machine Id
CAT MARTA PERRY 1 (S/N 3WR00482)
Component
Natural Gas Engine
Fluid
HPN GEO 40 PLUS (45 GAL)

DIAGNOSIS

Recommendation
No corrective action is recommended at this time. Resample at the next service interval to monitor. (Customer Sample Comment: HPNGEO40PLUS)

Wear
The copper level has decreased, but is still abnormal. All other 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 AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**WC0923566**	RP195115	HPL008926
Sample Date		Client Info		**01 May 2024**	30 Nov 2021	26 Jun 2021
Machine Age	hrs	Client Info		**35716**	28645	27622
Oil Age	hrs	Client Info		**3159**	1700	677
Oil Changed		Client Info		**Not Changd**	Not Changd	Not Changd
Sample Status				**ABNORMAL**	ABNORMAL	NORMAL

CONTAMINATION		method	limit/base	current	history1	history2
Water		WC Method	>0.1	**NEG**	NEG	NEG

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>50	**10**	9	6
Chromium	ppm	ASTM D5185m	>4	**<1**	<1	<1
Nickel	ppm	ASTM D5185m	>2	**<1**	<1	<1
Titanium	ppm	ASTM D5185m		**<1**	<1	<1
Silver	ppm	ASTM D5185m	>3	**0**	<1	<1
Aluminum	ppm	ASTM D5185m	>9	**4**	2	1
Lead	ppm	ASTM D5185m	>30	**2**	1	<1
Copper	ppm	ASTM D5185m	>35	▲ **65**	▲ 222	90
Tin	ppm	ASTM D5185m	>4	**1**	<1	<1
Antimony	ppm	ASTM D5185m		**---**	0	0
Vanadium	ppm	ASTM D5185m		**<1**	<1	0
Cadmium	ppm	ASTM D5185m		**<1**	0	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		**1**	3	2
Barium	ppm	ASTM D5185m		**0**	0	0
Molybdenum	ppm	ASTM D5185m		**4**	4	1
Manganese	ppm	ASTM D5185m		**<1**	<1	<1
Magnesium	ppm	ASTM D5185m		**19**	15	9
Calcium	ppm	ASTM D5185m		**4619**	4568	3663
Phosphorus	ppm	ASTM D5185m		**378**	308	278
Zinc	ppm	ASTM D5185m		**467**	388	387
Sulfur	ppm	ASTM D5185m		**15426**	12056	13097

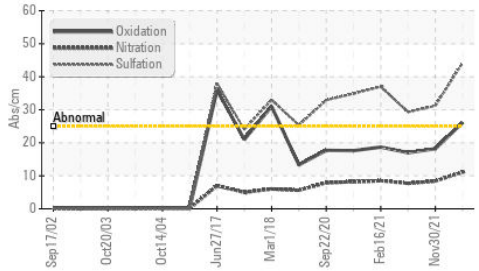
CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>+100	**10**	10	2
Sodium	ppm	ASTM D5185m		**0**	10	<1
Potassium	ppm	ASTM D5185m	>20	**3**	<1	<1

INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844		**0.1**	0.1	0.1
Nitration	Abs/cm	*ASTM D7624	>20	**11.1**	8.4	7.7
Sulfation	Abs/.1mm	*ASTM D7415	>30	**44.2**	31.2	29.3

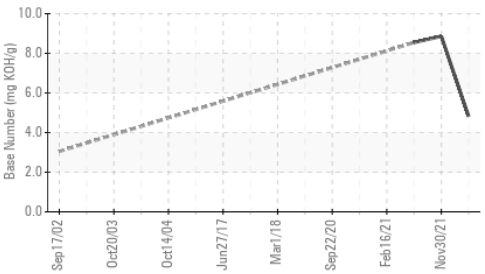
FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**26.1**	18.2	17
Acid Number (AN)	mg KOH/g	ASTM D8045		**1.20**	0.758	---
Base Number (BN)	mg KOH/g	ASTM D2896		**4.82**	8.86	8.55

OIL ANALYSIS REPORT

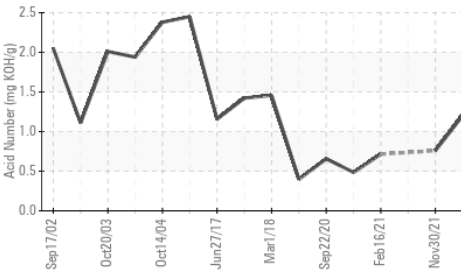
FT-IR (Direct Trend)



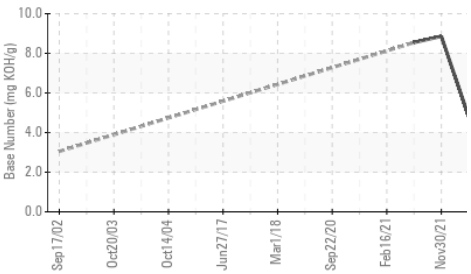
Base Number



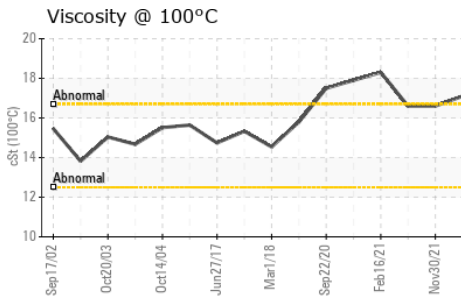
Acid Number



Base Number



Viscosity @ 100°C

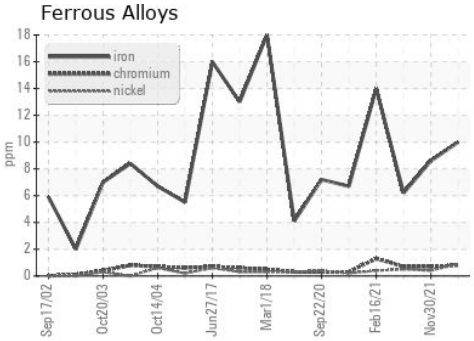


VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Appearance	scalar	*Visual	NORML	**NORML**	NORML	NORML
Odor	scalar	*Visual	NORML	**NORML**	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	**NEG**	NEG	NEG
Free Water	scalar	*Visual		**NEG**	NEG	NEG

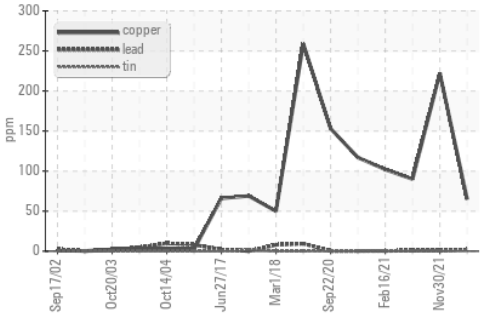
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445		**17.1**	16.6	16.6

GRAPHS

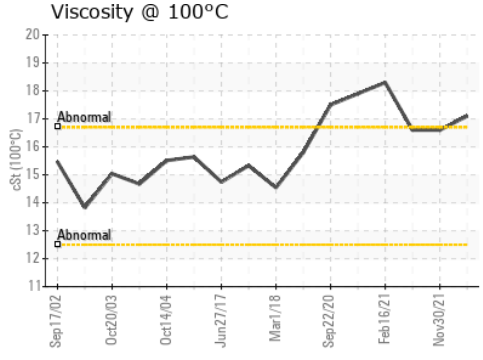
Ferrous Alloys



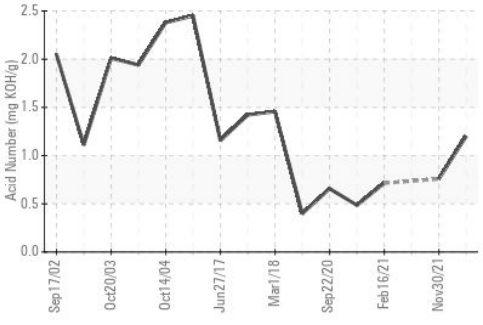
Non-ferrous Metals



Viscosity @ 100°C



Acid Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0923566
Lab Number : 06174036
Unique Number : 11020089
Test Package : IND 2

Received : 09 May 2024
Tested : 10 May 2024
Diagnosed : 12 May 2024 - Don Baldridge

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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