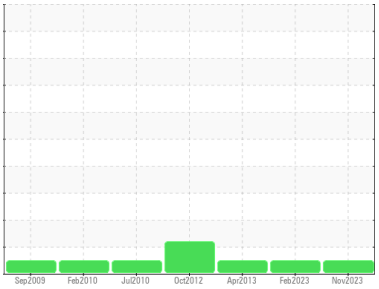
OIL DIAGNOSTICS

OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL

Machine Id
TURBINE LUBE OIL
Component
Turbine
Fluid
CHEVRON GST OIL EP ISO 32 (--- QTS)

DIAGNOSIS

Recommendation
Resample at the next service interval to monitor. Please note that this is a corrected copy for laboratory data update for MPC.

Wear
All component wear rates are normal.

Contamination
MPC (Membrane Patch Colorimetry) test indicates acceptable levels of varnish present. There is no indication of any contamination in the oil. The amount and size of particulates present in the system are acceptable.

Fluid Condition
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		**PCA0112204**	WC0722122	RW03272748
Sample Date		Client Info		**07 Nov 2023**	01 Feb 2023	23 Apr 2013
Machine Age	yrs	Client Info		**33**	0	0
Oil Age	yrs	Client Info		**10**	0	0
Oil Changed		Client Info		**Filtered**	Not Changd	N/A
Sample Status				**NORMAL**	NORMAL	NORMAL

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>15	**0**	0	<1
Chromium	ppm	ASTM D5185m	>4	**0**	0	0
Nickel	ppm	ASTM D5185m	>2	**0**	0	0
Titanium	ppm	ASTM D5185m		**0**	0	0
Silver	ppm	ASTM D5185m		**0**	0	0
Aluminum	ppm	ASTM D5185m	>10	**0**	0	0
Lead	ppm	ASTM D5185m		**0**	0	<1
Copper	ppm	ASTM D5185m	>5	**<1**	0	0
Tin	ppm	ASTM D5185m	>5	**0**	0	0
Antimony	ppm	ASTM D5185m		**---**	---	0
Vanadium	ppm	ASTM D5185m		**0**	0	0
Cadmium	ppm	ASTM D5185m		**0**	0	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		**0**	0	0
Barium	ppm	ASTM D5185m		**0**	0	0
Molybdenum	ppm	ASTM D5185m		**0**	0	<1
Manganese	ppm	ASTM D5185m		**0**	0	0
Magnesium	ppm	ASTM D5185m		**<1**	0	<1
Calcium	ppm	ASTM D5185m		**<1**	2	0
Phosphorus	ppm	ASTM D5185m		**34**	36	90
Zinc	ppm	ASTM D5185m		**0**	0	<1
Sulfur	ppm	ASTM D5185m		**111**	139	993

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>15	**0**	<1	<1
Sodium	ppm	ASTM D5185m		**<1**	<1	<1
Potassium	ppm	ASTM D5185m	>20	**<1**	0	0
Water	%	ASTM D6304	>0.03	**NEG**	NEG	NEG

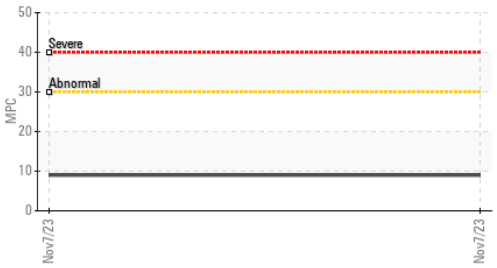
FLUID CLEANLINESS		method	limit/base	current	history1	history2
Particles >4µm		ASTM D7647		**94**	445	78.
Particles >6µm		ASTM D7647	>1300	**38**	114	42.
Particles >14µm		ASTM D7647	>160	**4**	11	7.
Particles >21µm		ASTM D7647	>40	**1**	3	2.
Particles >38µm		ASTM D7647	>10	**0**	1	0.
Particles >71µm		ASTM D7647	>3	**0**	0	0.
Oil Cleanliness		ISO 4406 (c)	>--/17/14	**14/12/9**	16/14/11	13/13/10

FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045		**0.12**	0.13	0.063
MPC Varnish Potential	Scale	ASTM D7843	>15	**9**	---	---

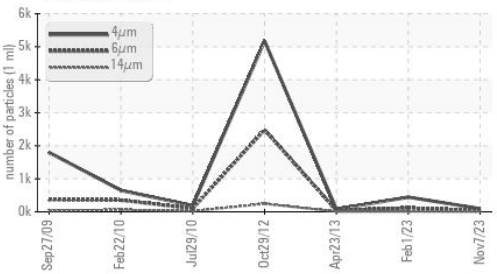
OIL ANALYSIS REPORT

OIL DIAGNOSTICS

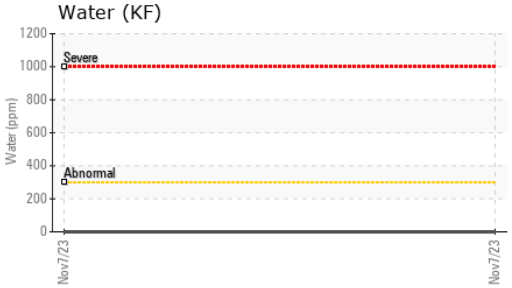
Varnish Potential



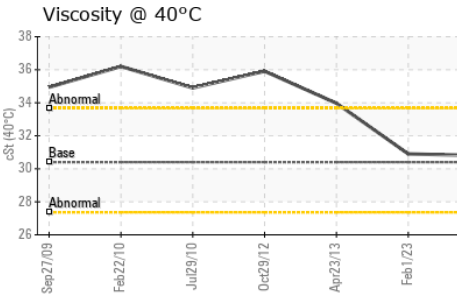
Particle Trend



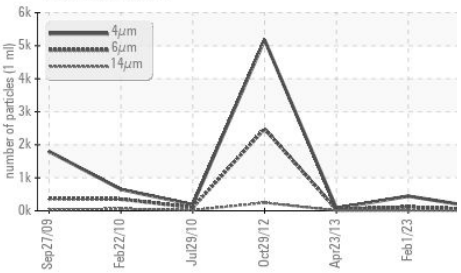
Water (KF)



Viscosity @ 40°C

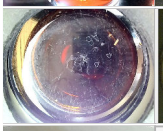
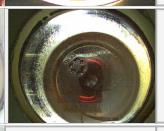


Particle Trend



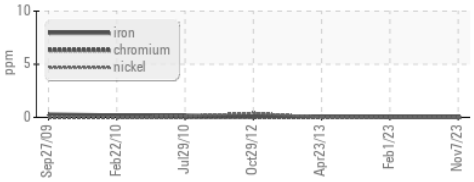
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Appearance	scalar	*Visual	NORML	**NORML**	NORML	NORML
Odor	scalar	*Visual	NORML	**NORML**	NORML	NORML
Emulsified Water	scalar	*Visual	>0.03	**NEG**	NEG	NEG
Free Water	scalar	*Visual		**NEG**	NEG	NEG

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445	30.4	**30.8**	30.9	33.97

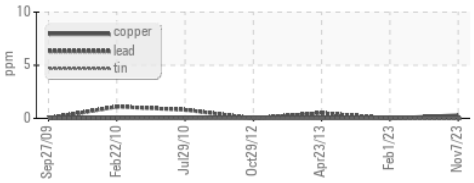
SAMPLE IMAGES	method	limit/base	current	history1	history2
Color					*no image*
Bottom					*no image*
MPC				*no image*	*no image*

GRAPHS

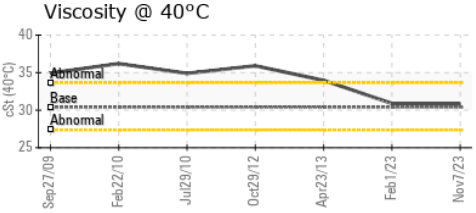
Ferrous Alloys



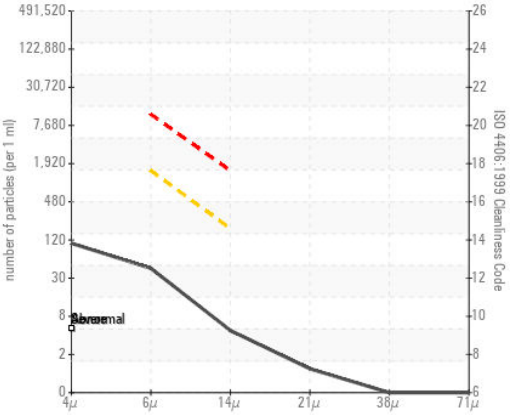
Non-ferrous Metals



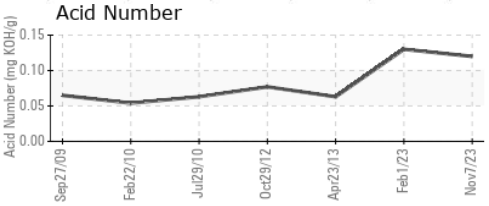
Viscosity @ 40°C



Particle Count



Acid Number



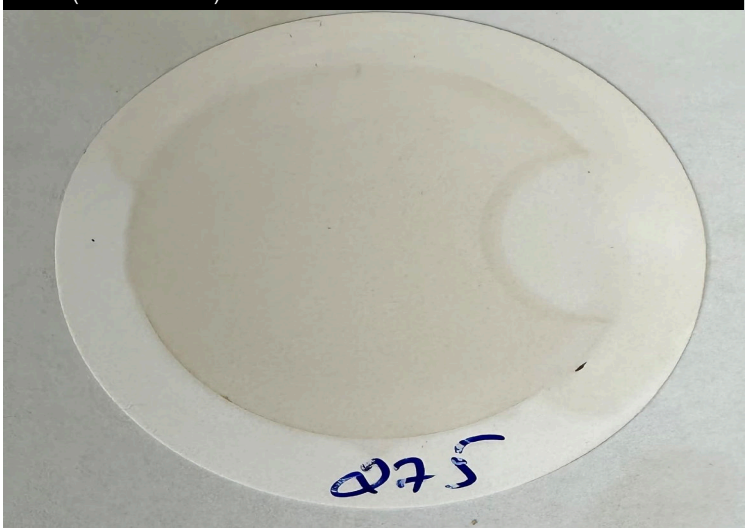
Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : PCA0112204 **Received** : 10 Nov 2023
Lab Number : 06004275 **Diagnosed** : 20 Nov 2023
Unique Number : 10738037 **Diagnostician** : Doug Bogart
Test Package : PLANT (Additional Tests: MPC)

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)

T.E.S. FILER CITY STATION
700 MEE ST.
FILER CITY, MI
US 49634
Contact: CLARK JOHNSON
clark.johnson@cmsenergy.com
T: (231)723-6573
F: (231)723-6630

MPC (Varnish Test)



Sample Color & Clarity

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