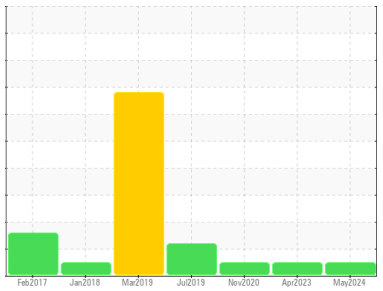
OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL

Machine Id
CATERPILLAR 190-154
Component
Diesel Engine
Fluid
PETRO CANADA DURON SHP 15W40 (--- GAL)

DIAGNOSIS

Recommendation
Resample at the next service interval to monitor.

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.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**PCA0106880**	PCA0082131	PCA0027458
Sample Date		Client Info		**02 May 2024**	19 Apr 2023	16 Nov 2020
Machine Age	hrs	Client Info		**18546**	18063	17518
Oil Age	hrs	Client Info		**500**	562	600
Oil Changed		Client Info		**Changed**	Changed	Changed
Sample Status				**NORMAL**	NORMAL	NORMAL

CONTAMINATION		method	limit/base	current	history1	history2
Fuel		WC Method	>5	**<1.0**	<1.0	<1.0
Water		WC Method	>0.2	**NEG**	NEG	NEG
Glycol		WC Method		**NEG**	NEG	NEG

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	**50**	50	68
Chromium	ppm	ASTM D5185m	>6	**<1**	<1	2
Nickel	ppm	ASTM D5185m	>4	**0**	0	<1
Titanium	ppm	ASTM D5185m	>2	**0**	0	<1
Silver	ppm	ASTM D5185m	>2	**0**	0	<1
Aluminum	ppm	ASTM D5185m	>30	**4**	2	5
Lead	ppm	ASTM D5185m	>10	**3**	1	4
Copper	ppm	ASTM D5185m	>150	**4**	4	6
Tin	ppm	ASTM D5185m	>4	**1**	<1	2
Antimony	ppm	ASTM D5185m		**---**	---	0
Vanadium	ppm	ASTM D5185m		**0**	0	0
Cadmium	ppm	ASTM D5185m		**0**	0	<1

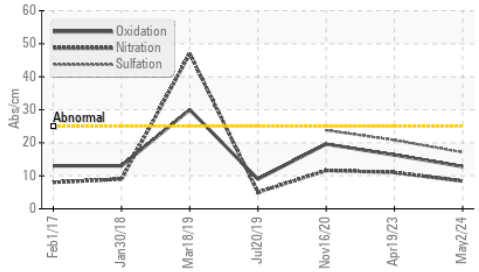
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	**3**	4	7
Barium	ppm	ASTM D5185m	0	**<1**	0	0
Molybdenum	ppm	ASTM D5185m	60	**56**	56	57
Manganese	ppm	ASTM D5185m	0	**<1**	<1	<1
Magnesium	ppm	ASTM D5185m	1010	**884**	974	874
Calcium	ppm	ASTM D5185m	1070	**967**	1002	1024
Phosphorus	ppm	ASTM D5185m	1150	**1018**	1007	970
Zinc	ppm	ASTM D5185m	1270	**1153**	1215	1148
Sulfur	ppm	ASTM D5185m	2060	**3285**	3595	2424
Lithium	ppm	ASTM D5185m		**---**	---	---

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>20	**6**	7	8
Sodium	ppm	ASTM D5185m		**14**	14	54
Potassium	ppm	ASTM D5185m	>20	**15**	7	18

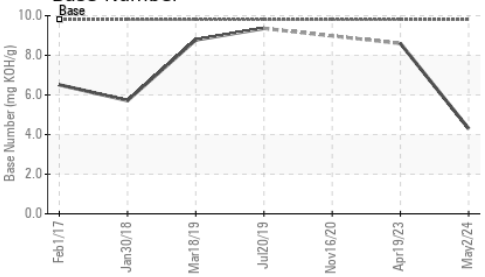
INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844	>3	**1.2**	1.2	1.6
Nitration	Abs/cm	*ASTM D7624	>20	**8.4**	11.0	11.6
Sulfation	Abs/.1mm	*ASTM D7415	>30	**17.1**	20.8	23.8

OIL ANALYSIS REPORT

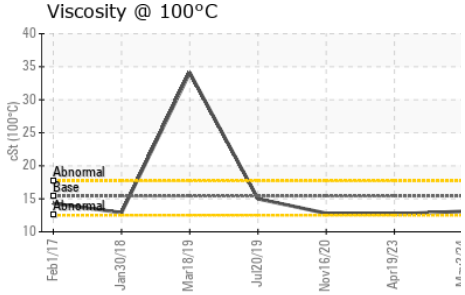
FT-IR (Direct Trend)



Base Number



Viscosity @ 100°C



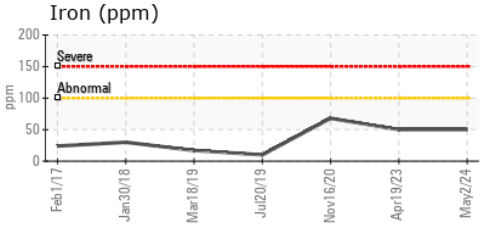
FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**12.8**	16.3	19.6
Base Number (BN)	mg KOH/g	ASTM D2896	9.8	**4.3**	8.6	---

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	>0.2	**NEG**	NEG	NEG
Free Water	scalar	*Visual		**NEG**	NEG	NEG

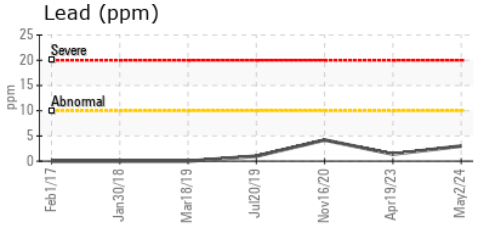
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	**13.1**	12.7	12.8

GRAPHS

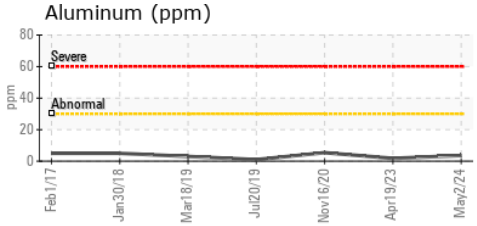
Iron (ppm)



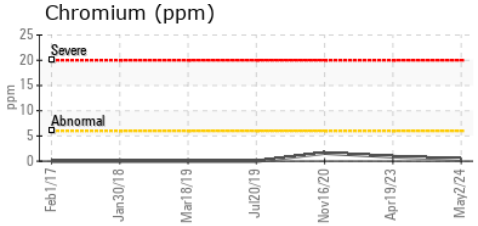
Lead (ppm)



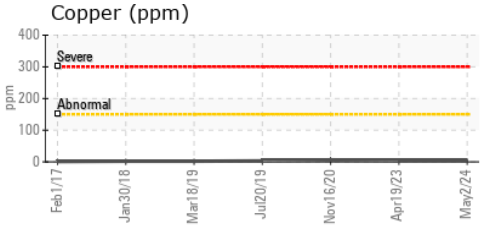
Aluminum (ppm)



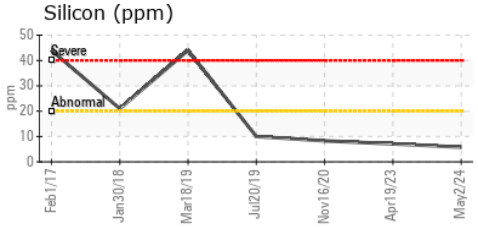
Chromium (ppm)



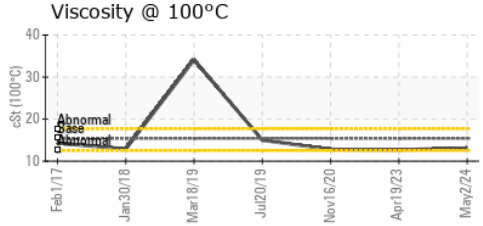
Copper (ppm)



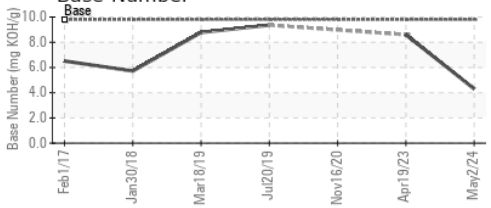
Silicon (ppm)



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : PCA0106880 **Received** : 06 Jun 2024
Lab Number : 06201174 **Tested** : 07 Jun 2024
Unique Number : 11063297 **Diagnosed** : 07 Jun 2024 - Wes Davis
Test Package : MOB 1 (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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1351 JOLIET RD
VALPARAISO, IN
US 46385
Contact: MARK STEFFEL
mark.steffel@gemarshall.com
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F:

Report Id: GEMVAL [WUSCAR] 06201174 (Generated: 06/07/2024 04:47:05) Rev: 1

Contact/Location: MARK STEFFEL - GEMVAL