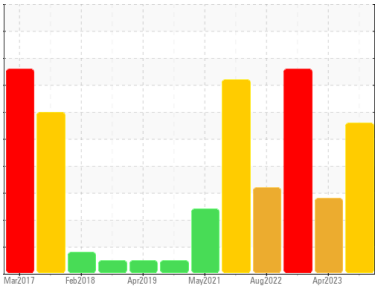
OIL ANALYSIS REPORT

OIL DIAGNOSTICS

Sample Rating Trend



FUEL

Area
Off-Road
Machine Id
E68
Component
Diesel Engine
Fluid
PETRO CANADA DURON SHP 15W40 (--- GAL)

DIAGNOSIS

Recommendation
We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. We advise that you check the fuel injection system. We recommend that you drain the oil and perform a filter service on this component if not already done. We recommend an early resample to monitor this condition.

Wear
Valve wear is indicated.

Contamination
Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress. There is a high amount of fuel present in the oil.

Fluid Condition
Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**PCA0083111**	PCA0090486	PCA0083346
Sample Date		Client Info		**19 Jul 2023**	12 Apr 2023	06 Dec 2022
Machine Age	hrs	Client Info		**7435**	6974	6371
Oil Age	hrs	Client Info		**4254**	4396	4528
Oil Changed		Client Info		**N/A**	N/A	N/A
Sample Status				**SEVERE**	ABNORMAL	SEVERE

CONTAMINATION	method	limit/base	current	history1	history2
Glycol	WC Method		**NEG**	NEG	NEG

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>51	**38**	29	26
Chromium	ppm	ASTM D5185m	>11	**2**	1	2
Nickel	ppm	ASTM D5185m	>5	▲ **17**	▲ 10	▲ 11
Titanium	ppm	ASTM D5185m		**<1**	<1	<1
Silver	ppm	ASTM D5185m	>3	**0**	0	0
Aluminum	ppm	ASTM D5185m	>31	▲ **7**	3	▲ 6
Lead	ppm	ASTM D5185m	>26	**<1**	1	<1
Copper	ppm	ASTM D5185m	>26	**5**	<1	1
Tin	ppm	ASTM D5185m	>4	**<1**	0	1
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	**5**	3	4
Barium	ppm	ASTM D5185m	0	**2**	0	0
Molybdenum	ppm	ASTM D5185m	60	**59**	57	59
Manganese	ppm	ASTM D5185m	0	**1**	<1	<1
Magnesium	ppm	ASTM D5185m	1010	**869**	877	972
Calcium	ppm	ASTM D5185m	1070	**1020**	1014	1077
Phosphorus	ppm	ASTM D5185m	1150	**873**	921	928
Zinc	ppm	ASTM D5185m	1270	**1132**	1135	1214
Sulfur	ppm	ASTM D5185m	2060	**2366**	2730	3047

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>22	▲ **35**	▲ 26	● 47
Sodium	ppm	ASTM D5185m	>31	**0**	3	1
Potassium	ppm	ASTM D5185m	>20	**<1**	<1	<1
Fuel	%	ASTM D3524	>2.1	● **9.2**	<1.0	▲ 3.3

INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844	>3	**0.5**	0.4	0.6
Nitration	Abs/cm	*ASTM D7624	>20	**9.1**	7.9	9.3
Sulfation	Abs/.1mm	*ASTM D7415	>30	**20.3**	18.2	22.0

FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**18.0**	15.8	18.5
Base Number (BN)	mg KOH/g	ASTM D2896	9.8	**6.60**	9.90	7.91

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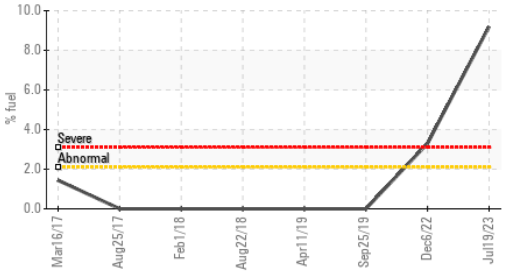
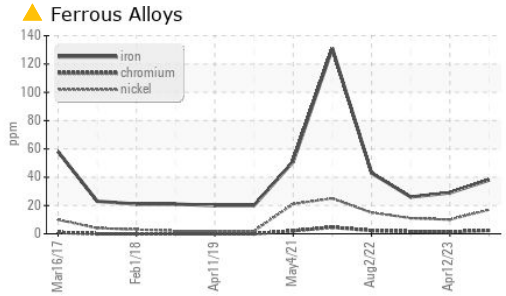
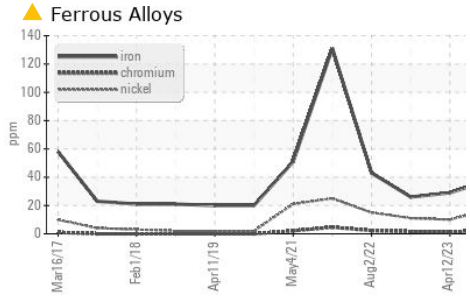
Fuel Dilution



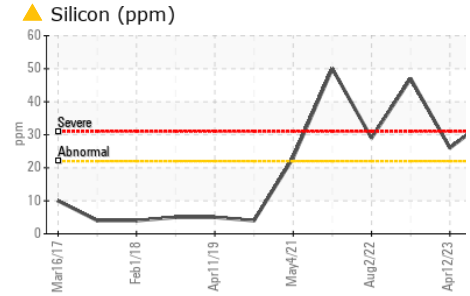
Ferrous Alloys



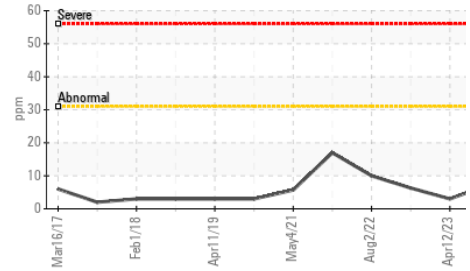
Ferrous Alloys



Silicon (ppm)



Aluminum (ppm)

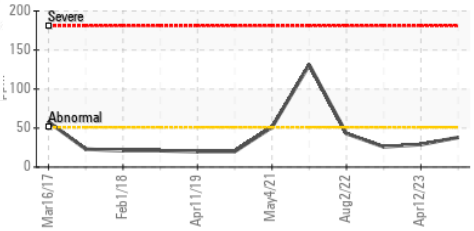


VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Appearance	scalar	*Visual	NORML	**NORML**	NORML	NORML
Odor	scalar	*Visual	NORML	**NORML**	NORML	NORML
Emulsified Water	scalar	*Visual	>0.21	**NEG**	NEG	NEG
Free Water	scalar	*Visual		**NEG**	NEG	NEG

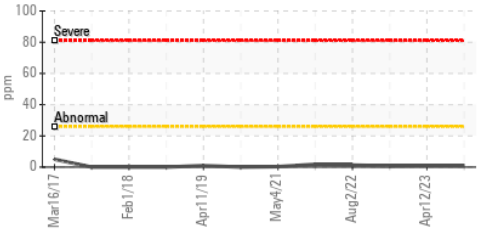
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	▲ **11.1**	▲ 12.2	▲ 12.3

GRAPHS

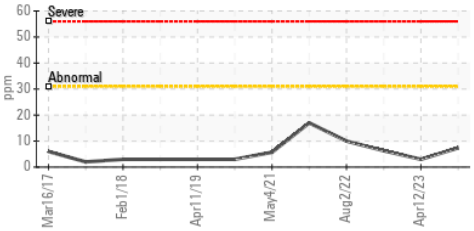
Iron (ppm)



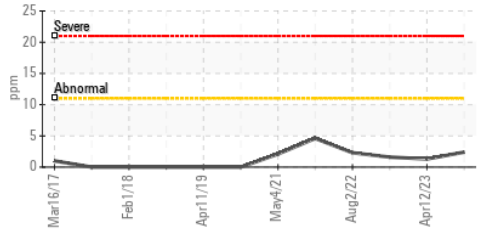
Lead (ppm)



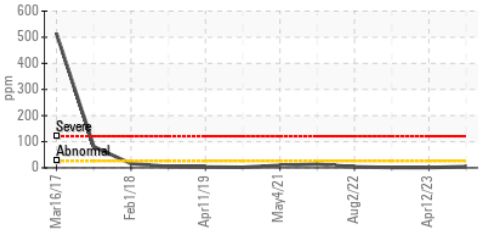
Aluminum (ppm)



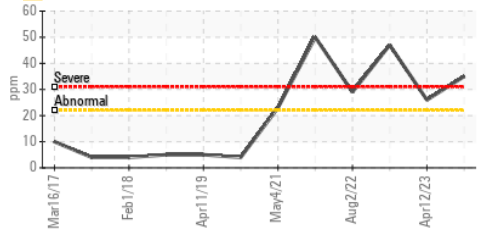
Chromium (ppm)



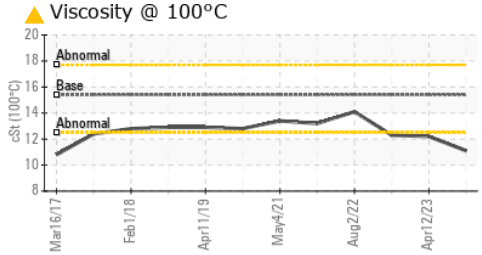
Copper (ppm)



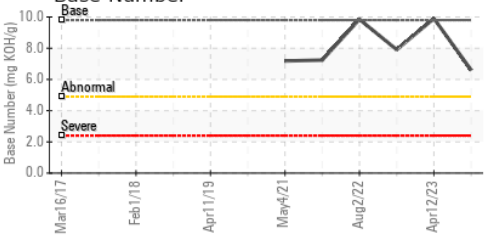
Silicon (ppm)



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : PCA0083111 **Received** : 21 Jul 2023
Lab Number : 05904525 **Diagnosed** : 26 Jul 2023
Unique Number : 10565881 **Diagnostician** : Don Baldridge
Test Package : MOB 2 (Additional Tests: FuelDilution, PercentFuel)

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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