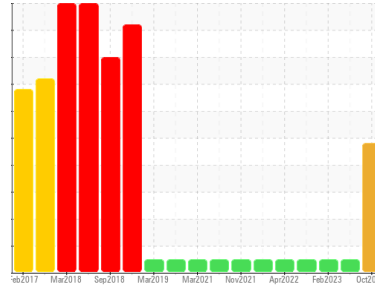




OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id
8411
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 recommend that you drain the oil from the component if this has not already been done. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

Wear

Aluminum and tin ppm levels are abnormal. Iron and nickel ppm levels are marginal. Piston wear is indicated. Slide bearing wear is indicated. The low ferrous density (PQ) index indicates the wear metal levels are due to corrosion.

Contamination

There is a moderate concentration of dirt present in the oil. High amount of ingressed dirt has caused abrasive wear to the component.

Fluid Condition

The oil is no longer serviceable as a result of the abnormal and/or severe wear.

SAMPLE INFORMATION

method	limit/base	current	history1	history2
Sample Number	Client Info	GFL0064978	GFL0064975	GFL0064967
Sample Date	Client Info	04 Oct 2023	11 Sep 2023	21 Feb 2023
Machine Age	hrs	1599	1516	729
Oil Age	hrs	83	559	478
Oil Changed	Client Info	Changed	Changed	Changed
Sample Status		ABNORMAL	NORMAL	NORMAL

CONTAMINATION

method	limit/base	current	history1	history2
Fuel	WC Method >5	<1.0	<1.0	<1.0
Glycol	WC Method	NEG	0.0	NEG

WEAR METALS

method	limit/base	current	history1	history2
PQ	ASTM D8184* >65	38	---	---
Iron	ppm ASTM D5185(m) >80	▲ 80	46	25
Chromium	ppm ASTM D5185(m) >5	4	2	1
Nickel	ppm ASTM D5185(m) >2	▲ 2	<1	<1
Titanium	ppm ASTM D5185(m)	0	0	<1
Silver	ppm ASTM D5185(m) >3	<1	0	0
Aluminum	ppm ASTM D5185(m) >30	▲ 53	5	6
Lead	ppm ASTM D5185(m) >30	21	8	<1
Copper	ppm ASTM D5185(m) >150	164	292	3
Tin	ppm ASTM D5185(m) >5	▲ 8	<1	<1
Antimony	ppm ASTM D5185(m)	0	0	0
Vanadium	ppm ASTM D5185(m)	0	0	0
Beryllium	ppm ASTM D5185(m)	0	0	0
Cadmium	ppm ASTM D5185(m)	0	0	0

ADDITIVES

method	limit/base	current	history1	history2
Boron	ppm ASTM D5185(m) 0	2	3	18
Barium	ppm ASTM D5185(m) 0	<1	0	0
Molybdenum	ppm ASTM D5185(m) 60	60	62	60
Manganese	ppm ASTM D5185(m) 0	1	<1	<1
Magnesium	ppm ASTM D5185(m) 1010	974	1023	895
Calcium	ppm ASTM D5185(m) 1070	1069	1133	1195
Phosphorus	ppm ASTM D5185(m) 1150	985	1073	1033
Zinc	ppm ASTM D5185(m) 1270	1193	1269	1147
Sulfur	ppm ASTM D5185(m) 2060	2375	2033	2604
Lithium	ppm ASTM D5185(m)	<1	<1	<1

CONTAMINANTS

method	limit/base	current	history1	history2
Silicon	ppm ASTM D5185(m) >20	▲ 25	10	8
Sodium	ppm ASTM D5185(m)	6	10	6
Potassium	ppm ASTM D5185(m) >20	<1	2	<1

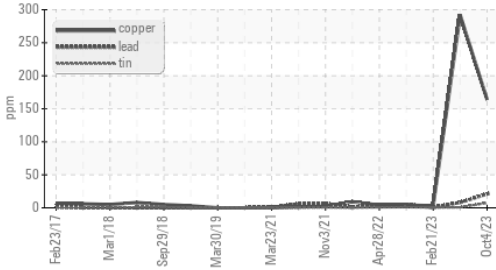
INFRA-RED

method	limit/base	current	history1	history2
Soot %	% ASTM D7844* >3	0.7	1.6	0.5
Nitration	Abs/cm ASTM D7624* >20	7.4	11.3	8.8
Sulfation	Abs./1mm ASTM D7415* >30	20.1	24.3	21.3

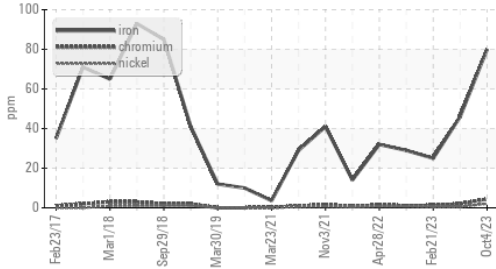


OIL ANALYSIS REPORT

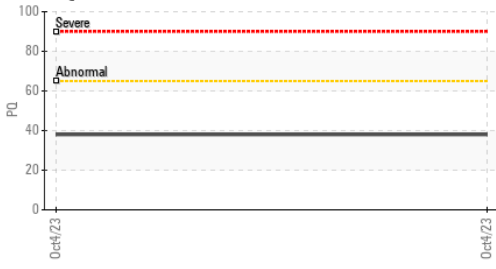
Non-ferrous Metals



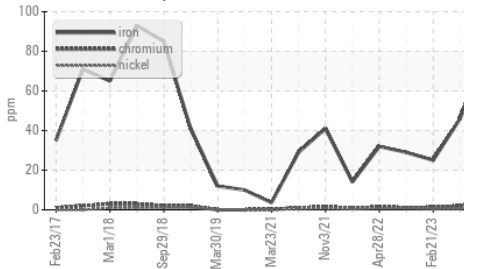
Ferrous Alloys



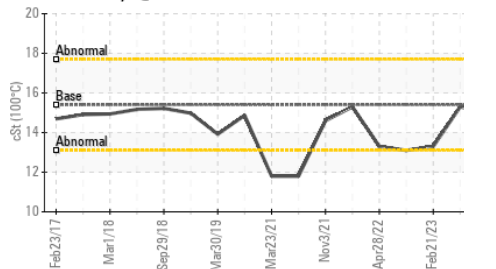
PQ



Ferrous Alloys



Viscosity @ 100°C



FLUID DEGRADATION

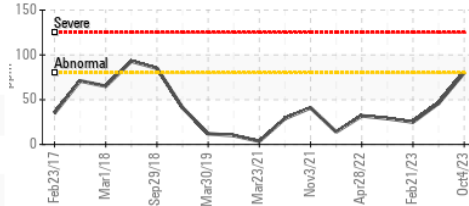
method	limit/base	current	history1	history2	
Oxidation	Abs./1mm ASTM D7414*	>25	14.5	20.7	15.6
VISUAL					
method	limit/base	current	history1	history2	
White Metal	scalar Visual*	NONE	NONE	---	---
Yellow Metal	scalar Visual*	NONE	NONE	---	---
Precipitate	scalar Visual*	NONE	VLITE	---	---
Silt	scalar Visual*	NONE	NONE	---	---
Debris	scalar Visual*	NONE	NONE	---	---
Sand/Dirt	scalar Visual*	NONE	VLITE	---	---
Appearance	scalar Visual*	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	NEG

FLUID PROPERTIES

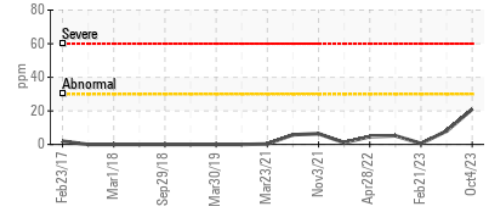
method	limit/base	current	history1	history2	
Visc @ 100°C	cSt ASTM D7279(m)	15.4	15.0	15.3	13.3

GRAPHS

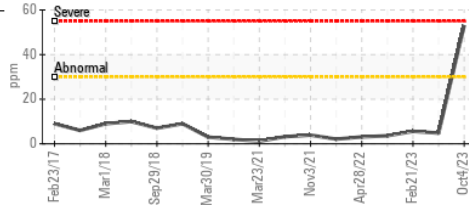
Iron (ppm)



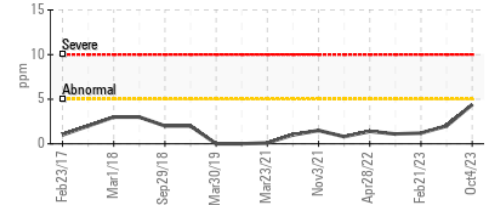
Lead (ppm)



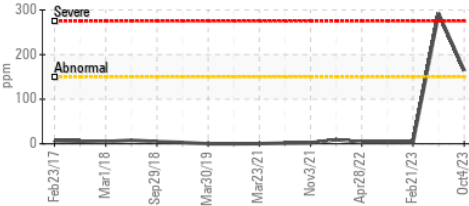
Aluminum (ppm)



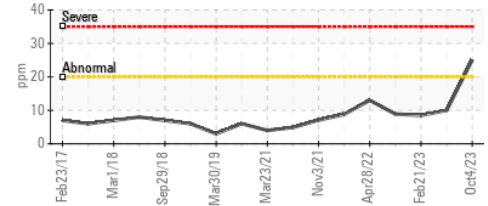
Chromium (ppm)



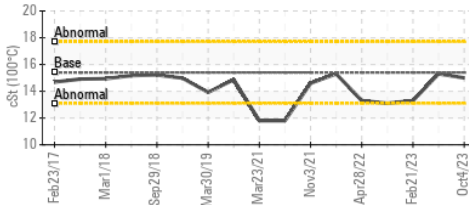
Copper (ppm)



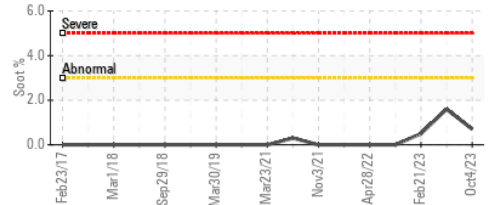
Silicon (ppm)



Viscosity @ 100°C



Soot %



ISO 17025:2017
Accredited
Laboratory

Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 GFL Environmental - 556 - Whitecourt
Sample No. : GFL0064978
Lab Number : 02587927
Unique Number : 5656993
Test Package : MOB 1 (Additional Tests: PQ, Visual)

Received : 10 Oct 2023
Diagnosed : 10 Oct 2023
Diagnostician : Kevin Marson
 4138 - 42 Street,
 Whitecourt, AB
 CA T7S 1P1
 Contact: Kash Wagoner
 kwagoner@gflenv.com
 T: (780)778-4888
 F: (780)778-8707

To discuss this sample report, contact Customer Service at 1-800-268-2131.
 Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab.
 Validity of results and interpretation are based on the sample and information as supplied.