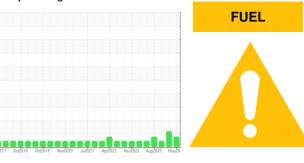


OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id
701039

Diesel Engine

PETRO CANADA DURON SHP 15W40 (20 LTR)

DIAGNOSIS

Recommendation

The oil change at the time of sampling has been noted. Resample at the next service interval to monitor. No other corrective action is recommended at this time.

Wear

Metal levels are typical for a new component breaking in.

Contamination

Elevated aluminum (Al) and/or lead (Pb) and potassium (K) levels in your metals analysis are likely a result of solder flux release into the lubricant and is common on new equipment/components. Light fuel dilution occurring. No other contaminants were detected in the oil.

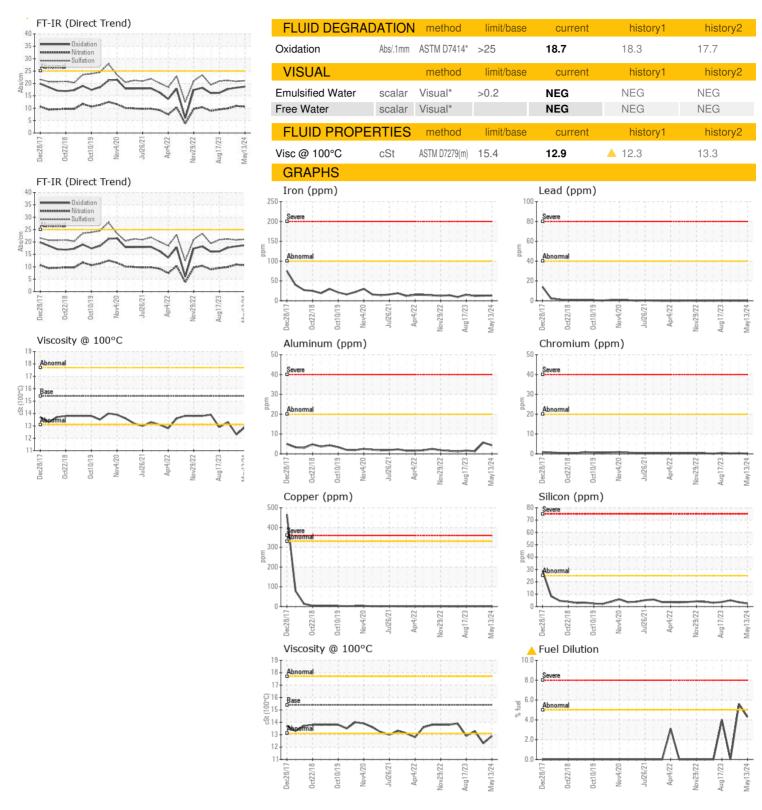
Fluid Condition

The condition of the oil is acceptable for the time in service.

Sample Number Client Info GFL0116846 GFL0110736 GFL009745 Sample Date Client Info 13 May 2024 09 Feb 2024 13 Nov 2024 13 Nov 2024 13 Nov 2024 13 Nov 2024 146 416	.IK)		sc2017 Oct20	018 0ct2019 Nov2020	Jul2021 Apr2022 Nov2022 Aug	,2023 May20.	
Sample Date	SAMPLE INFOR	RMATION	method	limit/base	current	history1	history2
Machine Age hrs	Sample Number		Client Info		GFL0116846	GFL0110736	GFL0097458
Oil Age hrs Client Info 416 416 416 Changed Changed Changed Changed Changed Changed Changed ABNORMAL Changed Changed Changed Changed Changed Changed Changed ABNORMAL Changed MARGINAL ABNORMAL NORMAL NORMAL NORMAL NORMAL NORMAL NEG	Sample Date		Client Info		13 May 2024	09 Feb 2024	13 Nov 2023
Client Info	Machine Age	hrs	Client Info		416	416	416
MARGINAL ABNORMAL NORMAL	Oil Age	hrs	Client Info		416	416	416
CONTAMINATION method limit/base current history1 history2	Oil Changed		Client Info		Changed	Changed	Changed
Water WC Method >0.2 NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185(m) >100 13 13 12 Chromium ppm ASTM D5185(m) >20 <1	Sample Status				MARGINAL	ABNORMAL	NORMAL
WEAR METALS	CONTAMINAT	ΓΙΟΝ	method	limit/base	current	history1	history2
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185(m) >20 <1 <1 <1 Nickel ppm ASTM D5185(m) >4 0 <1	WEAR METAL	_S	method	limit/base	current	history1	history2
Nickel	ron	ppm	ASTM D5185(m)	>100	13	13	12
Description	Chromium	ppm	ASTM D5185(m)	>20	<1	<1	<1
Silver	Nickel	ppm	ASTM D5185(m)	>4	0	<1	0
Aluminum ppm ASTM D5185(m) >20 4 6 1 Lead ppm ASTM D5185(m) >40 0 0 0 Copper ppm ASTM D5185(m) >330 <1 <1 1 Tin ppm ASTM D5185(m) >15 0 0 0 Antimony ppm ASTM D5185(m) 0 0 0 0 Vanadium ppm ASTM D5185(m) 0 0 0 0 Beryllium ppm ASTM D5185(m) 0 0 0 0 Cadmium ppm ASTM D5185(m) 0 0 0 0 ADDITIVES method limit/base current history1 history2 Barium ppm ASTM D5185(m) 0 0 0 0 ADDITIVES method limit/base current bistory1 ppm ASTM D5185(m) 0 0 0 0 ADDITIVES method limit/base current bistory1 1 1170 Barium ppm ASTM D5185(m) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Titanium	ppm	ASTM D5185(m)		0	0	0
Lead ppm ASTM D5185(m) >40 0 0 0 Copper ppm ASTM D5185(m) >330 <1 <1 1 Tin ppm ASTM D5185(m) >15 0 0 0 Antimony ppm ASTM D5185(m) 0 0 0 0 Vanadium ppm ASTM D5185(m) 0 0 0 0 Beryllium ppm ASTM D5185(m) 0 0 0 0 Cadmium ppm ASTM D5185(m) 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 0 1 2 2 Boron ppm ASTM D5185(m) 0 0 0 <1 1 2 2 Barium ppm ASTM D5185(m) 0 0 0 <1 1 2 2 2	Silver	ppm	ASTM D5185(m)	>3	0	0	<1
Copper ppm ASTM D5185(m) >330 <1 <1 1 Tin ppm ASTM D5185(m) >15 0 0 0 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 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 0 0 0 <1	Aluminum	ppm		>20	4	6	1
Tin ppm ASTM D5185(m) >15 0 0 0 0 Antimony ppm ASTM D5185(m) 0 0 0 0 Vanadium ppm ASTM D5185(m) 0 0 0 0 Beryllium ppm ASTM D5185(m) 0 0 0 0 Cadmium ppm ASTM D5185(m) 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 0 1 2 2 Barium ppm ASTM D5185(m) 0 0 0 <1 Molybdenum ppm ASTM D5185(m) 0 0 0 <1 Molybdenum ppm ASTM D5185(m) 0 0 0 0 <1 Manganese ppm ASTM D5185(m) 0 0 0 0 0 Magnesium ppm ASTM D5185(m) 1010 854 861 928 Calcium ppm ASTM D5185(m) 1070 933 962 1020 Phosphorus ppm ASTM D5185(m) 1070 933 962 1020 Phosphorus ppm ASTM D5185(m) 1150 889 896 953 Zinc ppm ASTM D5185(m) 1270 1063 1073 1174 Sulfur ppm ASTM D5185(m) 2060 2252 2371 2350 Lithium ppm ASTM D5185(m) <1 <1 <1 <1 CONTAMINANTS method limit/base current history1 history2 Solicon ppm ASTM D5185(m) >20 9 11 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >20 9 11 <1 INFRA-RED method limit/base current history1 history2 Soot % ASTM D7844* >3 0.2 0.3 0.3 Nitration Abs/cm ASTM D7844* >3 0.2 0.3 0.3	Lead	ppm	ASTM D5185(m)	>40	0	0	0
Antimony ppm ASTM D5185(m) 0 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 1 2 2 Barium ppm ASTM D5185(m) 0 0 0 0 Molybdenum ppm ASTM D5185(m) 0 0 0 0 Magnesium ppm ASTM D5185(m) 0 0 0 0 Magnesium ppm ASTM D5185(m) 10 0 0 0 Magnesium ppm ASTM D5185(m) 10 0 0 0 0 Magnesium ppm ASTM D5185(m) 10 0 0 0 0 Magnesium ppm ASTM D5185(m) 10 0 933 962 1020 Phosphorus ppm ASTM D5185(m) 1150 889 896 953 Zinc ppm ASTM D5185(m) 1270 1063 1073 1174 Sulfur ppm ASTM D5185(m) 1270 1063 1073 1174 Sulfur ppm ASTM D5185(m) 2060 2252 2371 2350 Lithium ppm ASTM D5185(m) < 1 < 1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >25 2 4 5 Sodium ppm ASTM D5185(m) >25 2 1 2 Potassium ppm ASTM D5185(m) >20 9 11 < 1 Fuel % ASTM D593° >5 4.3 5.6 < 1.0 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >3 0.2 0.3 0.3 Nitration Abs/cm ASTM D7624* >20 10.6 10.9 9.9	Copper	ppm	ASTM D5185(m)	>330	<1	<1	1
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 1 2 2 Barium ppm ASTM D5185(m) 0 0 0 <1 Molybdenum ppm ASTM D5185(m) 0 0 0 <1 57 Manganese ppm ASTM D5185(m) 0 0 0 0 0 Magnesium ppm ASTM D5185(m) 1010 854 861 928 Calcium ppm ASTM D5185(m) 1070 933 962 1020 Phosphorus ppm ASTM D5185(m) 1270 1063 1073 1174 Sulfur ppm ASTM D5185(m) 2060 2252	Tin	ppm	ASTM D5185(m)	>15	0	0	0
Beryllium	Antimony	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 1 2 2 Barium ppm ASTM D5185(m) 0 0 0 <1	Vanadium	ppm	ASTM D5185(m)		0	0	0
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 0 1 2 2 Barium ppm ASTM D5185(m) 0 0 0 <1	Beryllium	ppm	ASTM D5185(m)		0	0	0
Boron	Cadmium	ppm	ASTM D5185(m)		0	0	0
Barium ppm ASTM D5185(m) 0 0 <1 Molybdenum ppm ASTM D5185(m) 60 54 54 57 Manganese ppm ASTM D5185(m) 0 0 0 0 Magnesium ppm ASTM D5185(m) 1010 854 861 928 Calcium ppm ASTM D5185(m) 1070 933 962 1020 Phosphorus ppm ASTM D5185(m) 1150 889 896 953 Zinc ppm ASTM D5185(m) 1270 1063 1073 1174 Sulfur ppm ASTM D5185(m) 2060 2252 2371 2350 Lithium ppm ASTM D5185(m) <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185(m) 60 54 54 57 Manganese ppm ASTM D5185(m) 0 0 0 0 Magnesium ppm ASTM D5185(m) 1010 854 861 928 Calcium ppm ASTM D5185(m) 1070 933 962 1020 Phosphorus ppm ASTM D5185(m) 1150 889 896 953 Zinc ppm ASTM D5185(m) 1270 1063 1073 1174 Sulfur ppm ASTM D5185(m) 2060 2252 2371 2350 Lithium ppm ASTM D5185(m) 20 21 <1 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >25 2 4 5 Sodium ppm ASTM D5185(m) >20 9 11 <1 Fuel %	Boron	ppm	ASTM D5185(m)	0	1	2	2
Manganese ppm ASTM D5185(m) 0 0 0 Magnesium ppm ASTM D5185(m) 1010 854 861 928 Calcium ppm ASTM D5185(m) 1070 933 962 1020 Phosphorus ppm ASTM D5185(m) 1150 889 896 953 Zinc ppm ASTM D5185(m) 1270 1063 1073 1174 Sulfur ppm ASTM D5185(m) 2060 2252 2371 2350 Lithium ppm ASTM D5185(m) 2060 2252 2371 2350 Lithium ppm ASTM D5185(m) <1	Barium	ppm	ASTM D5185(m)	0	0	0	<1
Magnesium ppm ASTM D5185(m) 1010 854 861 928 Calcium ppm ASTM D5185(m) 1070 933 962 1020 Phosphorus ppm ASTM D5185(m) 1150 889 896 953 Zinc ppm ASTM D5185(m) 1270 1063 1073 1174 Sulfur ppm ASTM D5185(m) 2060 2252 2371 2350 Lithium ppm ASTM D5185(m) 2060 2252 2371 2350 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >25 2 4 5 Sodium ppm ASTM D5185(m) >20 9 11 <1 Fuel % ASTM D7593* >5 4.3 5.6 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7	Molybdenum	ppm	ASTM D5185(m)	60	54	54	57
Calcium ppm ASTM D5185(m) 1070 933 962 1020 Phosphorus ppm ASTM D5185(m) 1150 889 896 953 Zinc ppm ASTM D5185(m) 1270 1063 1073 1174 Sulfur ppm ASTM D5185(m) 2060 2252 2371 2350 Lithium ppm ASTM D5185(m) 2060 2252 2371 2350 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >25 2 4 5 Sodium ppm ASTM D5185(m) >20 9 11 <1	Manganese	ppm	ASTM D5185(m)	0	0	0	0
Phosphorus ppm ASTM D5185(m) 1150 889 896 953 Zinc ppm ASTM D5185(m) 1270 1063 1073 1174 Sulfur ppm ASTM D5185(m) 2060 2252 2371 2350 Lithium ppm ASTM D5185(m) <1 <1 <1 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >25 2 4 5 Sodium ppm ASTM D5185(m) >20 9 11 <1 Potassium ppm ASTM D5185(m) >20 9 11 <1 Fuel % ASTM D7593* >5 4.3 5.6 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7624* >3 0.2 0.3 0.3 Nitration Abs/cm ASTM D76	Magnesium	ppm	ASTM D5185(m)	1010	854	861	928
Zinc ppm ASTM D5185(m) 1270 1063 1073 1174 Sulfur ppm ASTM D5185(m) 2060 2252 2371 2350 Lithium ppm ASTM D5185(m) <1 <1 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >25 2 4 5 Sodium ppm ASTM D5185(m) >25 2 1 2 Potassium ppm ASTM D5185(m) >20 9 11 <1	Calcium	ppm	ASTM D5185(m)	1070	933	962	1020
Sulfur ppm ASTM D5185(m) 2060 2252 2371 2350 Lithium ppm ASTM D5185(m) <1 <1 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >25 2 4 5 Sodium ppm ASTM D5185(m) 2 1 2 Potassium ppm ASTM D5185(m) >20 9 11 <1	Phosphorus	ppm	ASTM D5185(m)	1150	889	896	953
Lithium ppm ASTM D5185(m) <1 <1 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >25 2 4 5 Sodium ppm ASTM D5185(m) 2 1 2 Potassium ppm ASTM D5185(m) >20 9 11 <1	Zinc	ppm	ASTM D5185(m)	1270	1063	1073	1174
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >25 2 4 5 Sodium ppm ASTM D5185(m) 2 1 2 Potassium ppm ASTM D5185(m) >20 9 11 <1	Sulfur	ppm	ASTM D5185(m)	2060	2252	2371	2350
Silicon ppm ASTM D5185(m) >25 2 4 5 Sodium ppm ASTM D5185(m) 2 1 2 Potassium ppm ASTM D5185(m) >20 9 11 <1 Fuel % ASTM D7593* >5 ▲ 4.3 ▲ 5.6 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >3 0.2 0.3 0.3 Nitration Abs/cm ASTM D7624* >20 10.6 10.9 9.9	Lithium	ppm	ASTM D5185(m)		<1	<1	<1
Sodium ppm ASTM D5185(m) 2 1 2 Potassium ppm ASTM D5185(m) >20 9 11 <1	CONTAMINA	NTS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185(m) >20 9 11 <1 Fuel % ASTM D7593* >5 ▲ 4.3 ▲ 5.6 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >3 0.2 0.3 0.3 Nitration Abs/cm ASTM D7624* >20 10.6 10.9 9.9	Silicon	ppm	ASTM D5185(m)	>25	2	4	5
Fuel % ASTM D7593* >5 ▲ 4.3 ▲ 5.6 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >3 0.2 0.3 0.3 Nitration Abs/cm ASTM D7624* >20 10.6 10.9 9.9	Sodium	ppm	ASTM D5185(m)		2	1	2
INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >3 0.2 0.3 0.3 Nitration Abs/cm ASTM D7624* >20 10.6 10.9 9.9	Potassium	ppm	ASTM D5185(m)	>20	9	11	<1
Soot % % ASTM D7844* >3 0.2 0.3 0.3 Nitration Abs/cm ASTM D7624* >20 10.6 10.9 9.9	Fuel	%	ASTM D7593*	>5	△ 4.3	▲ 5.6	<1.0
Nitration Abs/cm ASTM D7624* >20 10.6 10.9 9.9	INFRA-RED		method	limit/base	current	history1	history2
	Soot %	%	ASTM D7844*	>3	0.2	0.3	0.3
Sulfation Abs/.1mm ASTM D7415* >30 21.1 20.8 21.2	Nitration	Abs/cm	ASTM D7624*	>20	10.6	10.9	9.9
	Sulfation	Abs/.1mm	ASTM D7415*	>30	21.1	20.8	21.2



OIL ANALYSIS REPORT





CALA ISO 17025:2017 Accredited Laboratory

Laboratory Sample No.

Lab Number : 02635507 Unique Number : 5776660

: GFL0116846

To discuss this sample report, contact Customer Service at 1-800-268-2131.

: WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 Received : 15 May 2024 **Tested**

Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab.

Diagnosed Test Package : MOB 1 (Additional Tests: PercentFuel)

: 16 May 2024

: 16 May 2024 - Wes Davis

Windsor, ON **CA N8W 4J5** Contact: Pamela-Jean Butler pamelajean.butler@gflenv.com T: (519)948-8126

GFL Environmental - 221 - Windsor

905 Tecumseh Road W

Validity of results and interpretation are based on the sample and information as supplied. Report Id: GFL221 [WCAMIS] 02635507 (Generated: 05/16/2024 10:46:33) Rev: 1

Submitted By: Pamela-Jean Butler

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