

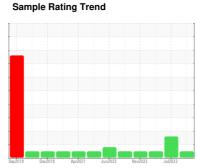
OIL ANALYSIS REPORT



Machine Id 801108 Component

Diesel Engine

PETRO CANADA DURON XL SYN BLEND 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.

Oil Changed Sample Status Client Info Changed NORMAL Changed ABNORMAL ABNORMAL Changed NORMAL ABNORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0 <1.0 <1.0 WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185(m) >5 <1 1 <1 Nickel ppm ASTM D5185(m) >5 <1 1 <1 <1 Nickel ppm ASTM D5185(m) >2 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	<u> </u>	,	Sep2018	Dec2018 Apr2021	Jun2022 Nov2022 J	ui2023	
Sample Date Client Info 1240 12671 0	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 1240 12671 0 Oil Age hrs Client Info 0 592 0 Oil Changed Client Info Changed Changed Changed Changed Sample Status NORMAL ABNORMAL NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0	Sample Number		Client Info		GFL0091653	GFL0084283	GFL0063758
Oil Age hrs Client Info 0 592 0 Oil Changed Sample Status Client Info Changed NoRMAL Changed Changed Changed Changed NORMAL Changed NORMAL NORMAL CONTAMINATION method limit/bass current history1 history2 Fuel WC Method >5 <1.0 <1.0 <1.0 <1.0 WEAR METALS method limit/bass current history1 history2 Iron ppm ASTM D5185(m) >80 27 36 24 Chromium ppm ASTM D5185(m) >5 <1 1 <1 <1 Nickel ppm ASTM D5185(m) >3 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <2 <2 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 </th <th>Sample Date</th> <th></th> <th>Client Info</th> <th></th> <th>28 Sep 2023</th> <th>17 Jul 2023</th> <th>05 Feb 2023</th>	Sample Date		Client Info		28 Sep 2023	17 Jul 2023	05 Feb 2023
Oil Changed Sample Status	Machine Age	hrs	Client Info		1240	12671	0
Sample Status	Oil Age	hrs	Client Info		0	592	0
Fuel WC Method S S S S S S S S S	Oil Changed		Client Info		Changed	Changed	Changed
Fuel WC Method S	Sample Status				NORMAL	ABNORMAL	NORMAL
WEAR METALS	CONTAMINAT	ION	method	limit/base	current	history1	history2
Iron	Fuel		WC Method	>5	<1.0	<1.0	<1.0
Chromium	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185(m)	>80	27	36	24
Titanium	Chromium	ppm	ASTM D5185(m)	>5	<1	1	<1
Silver	Nickel	ppm	ASTM D5185(m)	>2	<1	<1	<1
Aluminum ppm ASTM D5185(m) >30 10 8 3 Lead ppm ASTM D5185(m) >30 0 0 0 Copper ppm ASTM D5185(m) >150 1 2 2 Tin ppm ASTM D5185(m) >5 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) 1 2 2 2 Boron ppm ASTM D5185(m) 1 <1	Titanium	ppm	ASTM D5185(m)		0	0	<1
Lead ppm ASTM D5185(m) >30 0 0 0 Copper ppm ASTM D5185(m) >150 1 2 2 Tin ppm ASTM D5185(m) >5 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) 1 2 2 2 2 Boron ppm ASTM D5185(m) 1 <1 0 0 0 Abdrois a method limit/base current history1 history2 Barium ppm ASTM D5185(m) 1070 1064 </td <th>Silver</th> <td>ppm</td> <td>ASTM D5185(m)</td> <td>>3</td> <th><1</th> <td><1</td> <td>0</td>	Silver	ppm	ASTM D5185(m)	>3	<1	<1	0
Copper ppm ASTM D5188(m) >150 1 2 2 Tin ppm ASTM D5185(m) >5 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) 1 2 2 2 Barium ppm ASTM D5185(m) 1 <1	Aluminum	ppm	ASTM D5185(m)	>30	10	8	3
Tin ppm ASTM D5185(m) >5 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) 1 2 2 2 Boron ppm ASTM D5185(m) 1 <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 1 2 2 2 Barium ppm ASTM D5185(m) 1010 949 962 969 Calcium ppm ASTM D5185(m) 1070 1064 <th< td=""><th>Lead</th><td>ppm</td><td>ASTM D5185(m)</td><td>>30</td><th>0</th><td>0</td><td>0</td></th<>	Lead	ppm	ASTM D5185(m)	>30	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) 1 2 2 2 2 Barium ppm ASTM D5185(m) 1 <1	Copper	ppm	ASTM D5185(m)	>150	1	2	2
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) 1 2 2 2 2 Barium ppm ASTM D5185(m) 1 <1 0 0 0 Molybdenum ppm ASTM D5185(m) 1 <1 0 <1 <1 Magnesium ppm ASTM D5185(m) 1010 949 962 969 Calcium ppm ASTM D5185(m) 1070 1064 1034 1119 Phosphorus ppm ASTM D5185(m) 1270 1204 1181 1217 Sulfur ppm ASTM D5185(m) 2060 2446 2338 2481 Lithium ppm ASTM D5185(m)	Tin	ppm	ASTM D5185(m)	>5	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) 1 2 2 2 Barium ppm ASTM D5185(m) 1 <1	Vanadium	ppm	ASTM D5185(m)		0	0	0
ADDITIVES	Beryllium	ppm	ASTM D5185(m)		0	0	0
Boron ppm ASTM D5185(m) 1 2 2 2 Barium ppm ASTM D5185(m) 1 <1	Cadmium	ppm	ASTM D5185(m)		0	0	0
Barium ppm ASTM D5185(m) 1 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185(m) 60 62 62 63 Manganese ppm ASTM D5185(m) 1 0 <1	Boron	ppm	ASTM D5185(m)	1	2	2	2
Manganese ppm ASTM D5185(m) 1 0 <1	Barium	ppm	ASTM D5185(m)	1	<1	0	0
Magnesium ppm ASTM D5185(m) 1010 949 962 969 Calcium ppm ASTM D5185(m) 1070 1064 1034 1119 Phosphorus ppm ASTM D5185(m) 1150 984 1026 1093 Zinc ppm ASTM D5185(m) 1270 1204 1181 1217 Sulfur ppm ASTM D5185(m) 2060 2446 2338 2481 Lithium ppm ASTM D5185(m) 20 1 <1 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >20 15 36 9 Sodium ppm ASTM D5185(m) >20 14 8 2 Glycol % ASTM D7922* 0.0 0.0 0.0 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7624*	Molybdenum	ppm	ASTM D5185(m)	60	62	62	63
Calcium ppm ASTM D5185(m) 1070 1064 1034 1119 Phosphorus ppm ASTM D5185(m) 1150 984 1026 1093 Zinc ppm ASTM D5185(m) 1270 1204 1181 1217 Sulfur ppm ASTM D5185(m) 2060 2446 2338 2481 Lithium ppm ASTM D5185(m) 20 1 <1 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >20 15 36 9 Sodium ppm ASTM D5185(m) >20 14 8 2 Glycol % ASTM D7922* 0.0 0.0 0.0 0.0 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7624* >3 0.9 1.4 0.5 Nitration Abs/cm <t< th=""><th>Manganese</th><th>ppm</th><th>ASTM D5185(m)</th><th>1</th><th>0</th><th><1</th><th><1</th></t<>	Manganese	ppm	ASTM D5185(m)	1	0	<1	<1
Phosphorus ppm ASTM D5185(m) 1150 984 1026 1093 Zinc ppm ASTM D5185(m) 1270 1204 1181 1217 Sulfur ppm ASTM D5185(m) 2060 2446 2338 2481 Lithium ppm ASTM D5185(m) 2060 2446 2338 2481 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >20 15 36 9 Sodium ppm ASTM D5185(m) >20 14 8 2 Glycol % ASTM D5185(m) >20 14 8 2 Glycol % ASTM D7922* 0.0 0.0 0.0 0.0 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7624* >3 0.9 1.4 0.5 Nitration Abs/cm A	Magnesium	ppm	ASTM D5185(m)	1010	949	962	969
Zinc ppm ASTM D5185(m) 1270 1204 1181 1217 Sulfur ppm ASTM D5185(m) 2060 2446 2338 2481 Lithium ppm ASTM D5185(m) <1 <1 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >20 15 36 9 Sodium ppm ASTM D5185(m) >20 14 8 2 Glycol ppm ASTM D5185(m) >20 14 8 2 Glycol % ASTM D7922* 0.0 0.0 0.0 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7624* >3 0.9 1.4 0.5 Nitration Abs/cm ASTM D7624* >20 9.7 11.0 9.5	Calcium	ppm	ASTM D5185(m)	1070	1064	1034	1119
Sulfur ppm ASTM D5185(m) 2060 2446 2338 2481 Lithium ppm ASTM D5185(m) <1 <1 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >20 15 36 9 Sodium ppm ASTM D5185(m) >20 14 114 105 Potassium ppm ASTM D5185(m) >20 14 8 2 Glycol % ASTM D7922* 0.0 0.0 0.0 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >3 0.9 1.4 0.5 Nitration Abs/cm ASTM D7624* >20 9.7 11.0 9.5	Phosphorus	ppm	ASTM D5185(m)	1150	984	1026	1093
Lithium ppm ASTM D5185(m) <1	Zinc	ppm	ASTM D5185(m)	1270	1204	1181	1217
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >20 15 ▲ 36 9 Sodium ppm ASTM D5185(m) 84 114 105 Potassium ppm ASTM D5185(m) >20 14 8 2 Glycol % ASTM D7922* 0.0 0.0 0.0 0.0 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >3 0.9 1.4 0.5 Nitration Abs/cm ASTM D7624* >20 9.7 11.0 9.5	Sulfur	ppm	ASTM D5185(m)	2060	2446	2338	2481
Silicon ppm ASTM D5185(m) >20 15 ▲ 36 9 Sodium ppm ASTM D5185(m) 84 114 105 Potassium ppm ASTM D5185(m) >20 14 8 2 Glycol % ASTM D7922* 0.0 0.0 0.0 0.0 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >3 0.9 1.4 0.5 Nitration Abs/cm ASTM D7624* >20 9.7 11.0 9.5	Lithium	ppm	ASTM D5185(m)		<1	<1	<1
Sodium ppm ASTM D5185(m) 84 114 105 Potassium ppm ASTM D5185(m) >20 14 8 2 Glycol % ASTM D7922* 0.0 0.0 0.0 0.0 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >3 0.9 1.4 0.5 Nitration Abs/cm ASTM D7624* >20 9.7 11.0 9.5	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185(m) >20 14 8 2 Glycol % ASTM D7922* 0.0 0.0 0.0 0.0 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >3 0.9 1.4 0.5 Nitration Abs/cm ASTM D7624* >20 9.7 11.0 9.5	Silicon	ppm	ASTM D5185(m)	>20	15	▲ 36	9
Glycol % ASTM D7922* 0.0 0.0 0.0 0.0 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >3 0.9 1.4 0.5 Nitration Abs/cm ASTM D7624* >20 9.7 11.0 9.5	Sodium	ppm	ASTM D5185(m)		84	114	105
INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >3 0.9 1.4 0.5 Nitration Abs/cm ASTM D7624* >20 9.7 11.0 9.5	Potassium	ppm	ASTM D5185(m)	>20	14	8	2
Soot % % ASTM D7844* >3 0.9 1.4 0.5 Nitration Abs/cm ASTM D7624* >20 9.7 11.0 9.5	Glycol	%	ASTM D7922*		0.0	0.0	0.0
Nitration Abs/cm ASTM D7624* >20 9.7 11.0 9.5	INFRA-RED		method	limit/base	current	history1	history2
	Soot %	%	ASTM D7844*	>3	0.9	1.4	0.5
Sulfation Abs/.1mm ASTM D7415* >30 21.8 24.2 22.1	Nitration	Abs/cm	ASTM D7624*	>20	9.7	11.0	9.5
	Sulfation	Abs/.1mm	ASTM D7415*	>30	21.8	24.2	22.1



OIL ANALYSIS REPORT





CALA ISO 17025:2017 Accredited

Laboratory

Laboratory Sample No. Lab Number Unique Number

: WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 GFL Environmental - 550 - Rocky View County

: GFL0091653 : 02586975

: 5656041

Received : 05 Oct 2023 Diagnosed : 06 Oct 2023

: Wes Davis Diagnostician

Test Package : MOB 2 (Additional Tests: Glycol) 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.

220 Carmek Blvd

Rocky View County, AB **CA T1X 1X1**

Contact: GFL Calgary calgarymaintenance@gflenv.com

> T: F: (403)369-6163

Submitted By: GFL Calgary