

OIL ANALYSIS REPORT



Machine Id

728000

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

Sample Date Client Info 10 May 2024 Machine Age hrs Client Info 0 Oil Age brs Client Info 0 Sample Status Client Info Changed Sample Status Client Info Changed CONTAMINATION method Imit/base current history1 history2 Fuel WC Method >5 <1.0 Water WC Method >0 Glycol WC Method >0 11 WEAR METALS method Imit/base current history1 history2 Iron ppm ASTM 05180m >100 11 Iron ppm ASTM 05180m >20 <1 Iron ppm ASTM 05180m 0 <t< th=""><th>SAMPLE INFORI</th><th>MATION</th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></t<>	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 197764 Oil Age hrs Client Info 0 Oil Changed Client Info 0 Sample Status Imit/base current history1 CONTAMINATION method Imit/base current history1 Water WC Method >0.2 NEG Glycol WC Method >0.2 NEG WEAR METALS method Imit/base current history1 history2 Iron ppm ASTM 05185(m) >10 11 Nickel ppm ASTM 05185(m) >20 <1 Aluminum ppm ASTM 05185(m) >3 0 Licad ppm ASTM 05185(m) 20 6 Auminum<	Sample Number		Client Info		GFL0120254		
Oil Age hrs Client Info 0 Oil Changed Client Info Changed Sample Status MORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0 Water WC Method >0.2 NEG Wet Method >0.2 NEG Wet Method >0 Wet Method >0 Nickel ppm ASTM 05180 >20 <1 Aluminum ppm ASTM 05180 >20 6 Copper ppm ASTM 05180 >30 Auminum ppm ASTM 05180 0	Sample Date		Client Info		10 May 2024		
Oil Changed Client Info Changed Sample Status Image: Status	Machine Age	hrs	Client Info		197764		
Sample Status NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0 Water WC Method >0.2 NEG Glycol WC Method NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185(m) >20 <1 Ohronium ppm ASTM D5185(m) >20 <1 Silver ppm ASTM D5185(m) >3 0 Copper ppm ASTM D5185(m) >30 Antimony ppm ASTM D5185(m) 0 Vanadium ppm ASTM D5185(m) 0 Manimum	Oil Age	hrs	Client Info		0		
CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0 Glycol WC Method >0.2 NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185(m) >100 11 Nickel ppm ASTM D5185(m) >20 <1 Silver ppm ASTM D5185(m) >40 0 Lead ppm ASTM D5185(m) >20 6 Lead ppm ASTM D5185(m) >30 <1 Yanadium ppm ASTM D5185(m) >30 Vanadium ppm ASTM D5185(m) 0 Adminum ppm ASTM D5185(m) 0	Oil Changed		Client Info		Changed		
Fuel WC Method >5 <1.0	Sample Status				NORMAL		
Water WC Method >0.2 NEG Glycol WC Method NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5165(m) >100 11 Othermium ppm ASTM D5165(m) >20 <1 Nickel ppm ASTM D5165(m) >3 0 Aluminum ppm ASTM D5165(m) >3 0 Aluminum ppm ASTM D5165(m) >40 0 Copper ppm ASTM D5165(m) >15 0 Antimony ppm ASTM D5165(m) >15 0 Cadmium pm ASTM D5165(m) 0 ADDTIVES method Iimit/base current history1 his	CONTAMINAT	ION	method	limit/base	current	history1	history2
Glycol WC Method NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185(m) >100 11 Nickel ppm ASTM D5185(m) >20 <1 Nickel ppm ASTM D5185(m) >20 6 Aluminum ppm ASTM D5185(m) >3 0 Aduminum ppm ASTM D5185(m) >3 0 Lead ppm ASTM D5185(m) >30 <1 Antimony ppm ASTM D5185(m) >0 Antimony ppm ASTM D5185(m) 0 Antimony ppm ASTM D5185(m) 0 Antimony ppm ASTM D5185(m) 0 </th <th>Fuel</th> <th></th> <th>WC Method</th> <th>>5</th> <th><1.0</th> <th></th> <th></th>	Fuel		WC Method	>5	<1.0		
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5165(m) >20 <1 Ohromium ppm ASTM D5165(m) >20 <1 Nickel ppm ASTM D5165(m) >4 0 Titanium ppm ASTM D5165(m) >3 0 Aluminum ppm ASTM D5165(m) >30 0 Lead ppm ASTM D5165(m) >40 0 Copper ppm ASTM D5165(m) >30 <1 Antimony ppm ASTM D5165(m) 0 Antimony ppm ASTM D5165(m) 0 Antimony ppm ASTM D5165(m) 0 Cadmium ppm AST	Water		WC Method	>0.2	NEG		
Iron ppm ASTM D5185(m) >100 11 Chromium ppm ASTM D5185(m) >20 <1 Nickel ppm ASTM D5185(m) >4 0 Silver ppm ASTM D5185(m) >3 0 Aluminum ppm ASTM D5185(m) >3 0 Lead ppm ASTM D5185(m) >330 <1 Copper ppm ASTM D5185(m) >330 <1 Matimony ppm ASTM D5185(m) 0 Antimony ppm ASTM D5185(m) 0 Cadmium ppm ASTM D5185(m) 0 ADDTIVES method Imit/base current history1 history2 Boron ppm ASTM	Glycol		WC Method		NEG		
Chromium ppm ASTM 05185(m) >20 <1	WEAR METAL	S	method	limit/base	current	history1	history2
Chromium ppm ASTM 05185(m) >20 <1	Iron	ppm	ASTM D5185(m)	>100	11		
Nickel ppm ASTM D5185(m) >4 0 Titanium ppm ASTM D5185(m) >3 0 Silver ppm ASTM D5185(m) >3 0 Aluminum ppm ASTM D5185(m) >20 6 Lead ppm ASTM D5185(m) >40 0 Copper ppm ASTM D5185(m) >330 <1 Antimony ppm ASTM D5185(m) >15 0 Antimony ppm ASTM D5185(m) 0 Antimony ppm ASTM D5185(m) 0 Antimony ppm ASTM D5185(m) 0 Adaminum ppm ASTM D5185(m) 0 0 Molybdenum ppm	Chromium			>20	<1		
Titanium ppm ASTM D5185(m) 0 Silver ppm ASTM D5185(m) >3 0 Aluminum ppm ASTM D5185(m) >20 6 Lead ppm ASTM D5185(m) >20 6 Copper ppm ASTM D5185(m) >330 <1 Antimony ppm ASTM D5185(m) >330 <1 Antimony ppm ASTM D5185(m) >15 0 Antimony ppm ASTM D5185(m) 0 Antimony ppm ASTM D5185(m) 0 0 Adamium ppm ASTM D5185(m) 0 0 ADDITVES method Imit/base current history1 history2 Boron ppm ASTM D5185(m)			1				
Silver ppm ASTM D5185(m) >3 0 Aluminum ppm ASTM D5185(m) >20 6 Lead ppm ASTM D5185(m) >40 0 Copper ppm ASTM D5185(m) >330 <1 Antimony ppm ASTM D5185(m) >15 0 Antimony ppm ASTM D5185(m) 0 Vanadium ppm ASTM D5185(m) 0 Cadmium ppm ASTM D5185(m) 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 0 0 Marganese ppm ASTM D5185(m) 0.0 Marganesium ppm ASTM D5185(m) 1010 949<	Titanium				0		
Aluminum ppm ASTM D5185(m) >20 6 Lead ppm ASTM D5185(m) >40 0 Copper ppm ASTM D5185(m) >330 <1 Tin ppm ASTM D5185(m) >15 0 Antimony ppm ASTM D5185(m) 0 Vanadium ppm ASTM D5185(m) 0 Beryllium ppm ASTM D5185(m) 0 ADDITIVES method Imit/base current history1 history2 Boron ppm ASTM D5185(m) 0 0 Marganese ppm ASTM D5185(m) 0 0 Marganese ppm ASTM D5185(m) 0.10 949 Marganesium ppm ASTM D5185(m) 1070 10440 <th></th> <td></td> <td></td> <td>>3</td> <th>0</th> <td></td> <td></td>				>3	0		
Lead ppm ASTM D5185(m) >40 0 Copper ppm ASTM D5185(m) >330 <1 Tin ppm ASTM D5185(m) >15 0 Antimony ppm ASTM D5185(m) 0 Vanadium ppm ASTM D5185(m) 0 Beryllium ppm ASTM D5185(m) 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 0 2 Molybdenum ppm ASTM D5185(m) 0 0 Magnesium ppm ASTM D5185(m) 1010 949 Calcium ppm ASTM D5185(m) 1070 1040 Sulfur ppm ASTM	Aluminum		ASTM D5185(m)	>20	6		
Copper ppm ASTM D5185(m) >330 <1			× 7				
Tin ppm ASTM D5185(m) >15 0 Antimony ppm ASTM D5185(m) 0 Vanadium ppm ASTM D5185(m) 0 Beryllium ppm ASTM D5185(m) 0 Cadmium ppm ASTM D5185(m) 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 0 2 Molybdenum ppm ASTM D5185(m) 0 0 Manganese ppm ASTM D5185(m) 0 0 Magnesium ppm ASTM D5185(m) 1010 949 Calcium ppm ASTM D5185(m) 1270 1151 Sulfur ppm ASTM D5185(m) 2060 2494 <	Copper			>330	<1		
Antimony ppm ASTM D5185(m) 0 Vanadium ppm ASTM D5185(m) 0 Beryllium ppm ASTM D5185(m) 0 Cadmium ppm ASTM D5185(m) 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 0 2 Molybdenum ppm ASTM D5185(m) 0 0 Maganese ppm ASTM D5185(m) 0 0 Magnesium ppm ASTM D5185(m) 1010 949 Calcium ppm ASTM D5185(m) 1070 10400 Vanadium ppm ASTM D5185(m) 1270 1151 Sulfur ppm ASTM D5185(m) 2060 2494				>15	0		
Vanadium ppm ASTM D5185(m) 0 Beryllium ppm ASTM D5185(m) 0 Cadmium ppm ASTM D5185(m) 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 0 2 Barium ppm ASTM D5185(m) 0 0 Molybdenum ppm ASTM D5185(m) 0 0 Magnese ppm ASTM D5185(m) 0 0 Magnesium ppm ASTM D5185(m) 010 949 Calcium ppm ASTM D5185(m) 1010 949 Sulfur ppm ASTM D5185(m) 1070 1040 Sulfur ppm ASTM D5185(m) 2060 2494 <th>Antimony</th> <td></td> <td>ASTM D5185(m)</td> <td></td> <th>0</th> <td></td> <td></td>	Antimony		ASTM D5185(m)		0		
Beryllium ppm ASTM D5185(m) 0 Cadmium ppm ASTM D5185(m) 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 0 2 Barium ppm ASTM D5185(m) 0 0 Molybdenum ppm ASTM D5185(m) 0 0 Magnesium ppm ASTM D5185(m) 0 0 Magnesium ppm ASTM D5185(m) 1010 949 Calcium ppm ASTM D5185(m) 1070 1040 Sulfur ppm ASTM D5185(m) 1270 1151 Sulfur ppm ASTM D5185(m) 2060 2494 Stilicon ppm ASTM D5185(m) >	Vanadium		ASTM D5185(m)		0		
Cadmium ppm ASTM D5185(m) 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 0 2 Barium ppm ASTM D5185(m) 0 0 Molybdenum ppm ASTM D5185(m) 0 0 Manganese ppm ASTM D5185(m) 0 0 Magnesium ppm ASTM D5185(m) 1010 949 Calcium ppm ASTM D5185(m) 1070 1040 Calcium ppm ASTM D5185(m) 1270 1151 Sulfur ppm ASTM D5185(m) 2060 2494 Sulfur ppm ASTM D5185(m) >20 <1	Beryllium		ASTM D5185(m)		0		
Boron ppm ASTM D5185(m) 0 2 Barium ppm ASTM D5185(m) 0 0 Molybdenum ppm ASTM D5185(m) 60 60 Manganese ppm ASTM D5185(m) 0 0 Magnesium ppm ASTM D5185(m) 1010 949 Calcium ppm ASTM D5185(m) 1070 1040 Phosphorus ppm ASTM D5185(m) 1270 1151 Zinc ppm ASTM D5185(m) 2060 2494 Sulfur ppm ASTM D5185(m) 2060 2494 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >25 3 Potassium pp	•		ASTM D5185(m)		0		
Barium ppm ASTM D5185(m) 0 0 Molybdenum ppm ASTM D5185(m) 60 60 Manganese ppm ASTM D5185(m) 0 0 Magnesium ppm ASTM D5185(m) 1010 949 Calcium ppm ASTM D5185(m) 1070 1040 Calcium ppm ASTM D5185(m) 1070 1040 Phosphorus ppm ASTM D5185(m) 1270 1151 Zinc ppm ASTM D5185(m) 2060 2494 Sulfur ppm ASTM D5185(m) 2060 2494 Lithium ppm ASTM D5185(m) >25 3 Solicon ppm ASTM D5185(m) >20 <1 Potassium	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185(m) 60 60 Manganese ppm ASTM D5185(m) 0 0 Magnesium ppm ASTM D5185(m) 1010 949 Calcium ppm ASTM D5185(m) 1070 1040 Calcium ppm ASTM D5185(m) 1070 1040 Phosphorus ppm ASTM D5185(m) 1070 1040 Zinc ppm ASTM D5185(m) 1270 1151 Sulfur ppm ASTM D5185(m) 2060 2494 Lithium ppm ASTM D5185(m) 2060 2494 Solicon ppm ASTM D5185(m) >25 3 Silicon ppm ASTM D5185(m) >20 <1 Potassium </th <th>Boron</th> <td>ppm</td> <td>ASTM D5185(m)</td> <td>0</td> <th>2</th> <td></td> <td></td>	Boron	ppm	ASTM D5185(m)	0	2		
Manganese ppm ASTM D5185(m) 0 0 Magnesium ppm ASTM D5185(m) 1010 949 Calcium ppm ASTM D5185(m) 1070 1040 Phosphorus ppm ASTM D5185(m) 1070 1040 Zinc ppm ASTM D5185(m) 1150 976 Zinc ppm ASTM D5185(m) 1270 1151 Sulfur ppm ASTM D5185(m) 2060 2494 Lithium ppm ASTM D5185(m) 2060 2494 Lithium ppm ASTM D5185(m) 206 2494 Silicon ppm ASTM D5185(m) >25 3 Sodium ppm ASTM D5185(m) >20 <1 INFRA-RED method	Barium		ASTM D5185(m)	0	0		
Manganese ppm ASTM D5185(m) 0 0 Magnesium ppm ASTM D5185(m) 1010 949 Calcium ppm ASTM D5185(m) 1070 1040 Phosphorus ppm ASTM D5185(m) 1070 1040 Zinc ppm ASTM D5185(m) 1150 976 Zinc ppm ASTM D5185(m) 1270 1151 Sulfur ppm ASTM D5185(m) 2060 2494 Lithium ppm ASTM D5185(m) 2060 2494 Lithium ppm ASTM D5185(m) 206 2494 Silicon ppm ASTM D5185(m) >25 3 Sodium ppm ASTM D5185(m) >20 <1 INFRA-RED method	Molybdenum	ppm	ASTM D5185(m)	60	60		
Calcium ppm ASTM D5185(m) 1070 1040 Phosphorus ppm ASTM D5185(m) 1150 976 Zinc ppm ASTM D5185(m) 1270 1151 Sulfur ppm ASTM D5185(m) 2060 2494 Lithium ppm ASTM D5185(m) 2060 2494 Lithium ppm ASTM D5185(m) 2060 2494 Solicon ppm ASTM D5185(m) 2060 2494 CONTAMINANTS method limit/base current history1 history2 Solicon ppm ASTM D5185(m) >20 <1 Sodium ppm ASTM D5185(m) >20 <1 INFRA-RED method limit/base current history1 history2 Soot % <td< th=""><th>Manganese</th><td></td><td>ASTM D5185(m)</td><td>0</td><th>0</th><td></td><td></td></td<>	Manganese		ASTM D5185(m)	0	0		
Phosphorus ppm ASTM D5185(m) 1150 976 Zinc ppm ASTM D5185(m) 1270 1151 Sulfur ppm ASTM D5185(m) 2060 2494 Lithium ppm ASTM D5185(m) 2060 2494 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >25 3 Sodium ppm ASTM D5185(m) >25 3 Potassium ppm ASTM D5185(m) >20 <1 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >3 0.1 Nitration Abs/cm ASTM D7624* >20 6.4	Magnesium	ppm	ASTM D5185(m)	1010	949		
Phosphorus ppm ASTM D5185(m) 1150 976 Zinc ppm ASTM D5185(m) 1270 1151 Sulfur ppm ASTM D5185(m) 2060 2494 Lithium ppm ASTM D5185(m) 2060 2494 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >25 3 Sodium ppm ASTM D5185(m) >25 3 Potassium ppm ASTM D5185(m) >20 <1 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >3 0.1 Nitration Abs/cm ASTM D7624* >20 6.4	Calcium		ASTM D5185(m)	1070	1040		
Sulfur ppm ASTM D5185(m) 2060 2494 Lithium ppm ASTM D5185(m) 2060 2494 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >25 3 Sodium ppm ASTM D5185(m) >25 3 Potassium ppm ASTM D5185(m) >20 <1	Phosphorus		ASTM D5185(m)	1150	976		
Lithium ppm ASTM D5185(m) <1	Zinc	ppm	ASTM D5185(m)	1270	1151		
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >25 3 Sodium ppm ASTM D5185(m) >25 3 Potassium ppm ASTM D5185(m) >20 <1 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >3 0.1 Nitration Abs/cm ASTM D7624* >20 6.4	Sulfur	ppm	ASTM D5185(m)	2060	2494		
Silicon ppm ASTM D5185(m) >25 3 Sodium ppm ASTM D5185(m) 5 Potassium ppm ASTM D5185(m) >20 <1	Lithium	ppm	ASTM D5185(m)		<1		
Sodium ppm ASTM D5185(m) 5 Potassium ppm ASTM D5185(m) >20 <1 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >3 0.1 Nitration Abs/cm ASTM D7624* >20 6.4	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185(m) >20 <1	Silicon	ppm	ASTM D5185(m)	>25	3		
INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >3 0.1 Nitration Abs/cm ASTM D7624* >20 6.4	Sodium	ppm	ASTM D5185(m)		5		
Soot % % ASTM D7844* >3 0.1 Nitration Abs/cm ASTM D7624* >20 6.4	Potassium	ppm	ASTM D5185(m)	>20	<1		
Nitration Abs/cm ASTM D7624* >20 6.4	INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm ASTM D7624* >20 6.4	Soot %	%	ASTM D7844*	>3	0.1		
	Sulfation						



35

30

25 4ps/cm 20

10

19 18 **Abnorma**

17-(0.016 - Base 33:15 -

14

Mav10/24

FT-IR (Direct Trend)

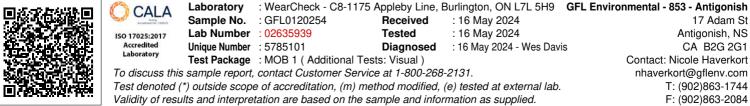
Oxidation

Nitration Sulfation

Viscosity @ 100°C

OIL ANALYSIS REPORT

FLUID DEGRA	DATION	method	limit/base	current	history1	hi
Oxidation	Abs/.1mm	ASTM D7414*	>25	14.9		
VISUAL		method	limit/base	current	history1	hi
White Metal	scalar	Visual*	NONE	NONE		
Yellow Metal	scalar	Visual*	NONE	NONE		
Precipitate	scalar	Visual*	NONE	NONE		
Silt	scalar	Visual*	NONE	VLITE		
Debris	scalar	Visual*	NONE	NONE		
Sand/Dirt	scalar	Visual*	NONE	NONE		
Appearance	scalar	Visual*	NORML	NORML		
Odor	scalar	Visual*	NORML	NORML		
Emulsified Water	scalar	Visual*	>0.2	NEG		
Free Water	scalar	Visual*		NEG		
FLUID PROPE	ERTIES	method	limit/base	current	history1	hi
Visc @ 100°C	cSt	ASTM D7279(m)	15.4	14.4		
GRAPHS						
Iron (ppm)			1	Lead (ppm)		
250 200 Severe				80 Severe		
150 - Abnormal				60		
100 - Abnormal			шd	40 - Abnormal		
50				20		
124			1/24	0		
May10/24			May10/24	May10/24		
Z Aluminum (ppm)			2	∠ Chromium (p	pm)	
50 J				⁵⁰ T 8	F	
40 - Gevere				40 - Severe		
E ³⁰ 20 Abnormal			mdd	30 - Abnormal		
10				20 - 0 10		
0				0		
May10/24			May10/24	May10/24		
			May	May		
Copper (ppm)				Silicon (ppm)		
400 Severe				80 Severe		
300 -				60 -		
200 -			bm	Aphorma		
100-				20		
54			24	0 47		
May10/24			May10/24	May10/24		
	<u>_</u>		M			
Viscosity @ 100°	L		6	Soot %		
				Severe		
D 18 Abnormal 16 Base 3 14			soot soot	Abnormal		
			×2	2.0		
12 Abnormal			n).0		
May10/24			May10/24	May10/24		
)[/			y1(y1t		



Report Id: GFL853 [WCAMIS] 02635939 (Generated: 05/16/2024 12:32:00) Rev: 1

Contact/Location: Nicole Haverkort - GFL853

May10/24.

May10/24

May10/24

May10/24