

OIL ANALYSIS REPORT

Sample Rating Trend







427083-402340

Component

Diesel Engine

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

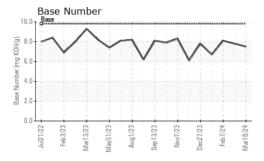
Fluid Condition

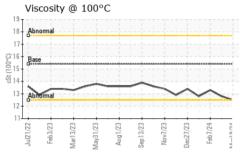
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Number Client Info GFL0111719 GFL0111089 GFL0111089	OAMBLE WEST	4 A TI-ON		11 1-11			
Sample Date	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 18620 18502 18370	Sample Number		Client Info		GFL0113719	GFL0111089	GFL0111099
Oil Age hrs Client Info 668 550 418 Oil Changed Client Info N/A N/A N/A N/A Sample Status NORMAL NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method 3.0 <1.0	Sample Date		Client Info		18 Mar 2024	29 Feb 2024	07 Feb 2024
Oil Changed Client Info N/A N/A N/A NORMAL NORMAL	Machine Age	hrs	Client Info		18620	18502	18370
NORMAL NORMAL NORMAL CONTAMINATION method fimit/base current history1 history2 history2	Oil Age	hrs			668	550	418
CONTAMINATION method limit/base current history1 history2 Fuel WC Method >3.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0	Oil Changed		Client Info		N/A	N/A	N/A
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water WC Method >0.2 NEG NEG NEG Glycol WC Method Imit/base Current history1 history2 WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >120 5 4 <1 Chromium ppm ASTM D5185m >20 0 0 0 Nickel ppm ASTM D5185m >5 0 0 0 Silver ppm ASTM D5185m >2 <1 0 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >20 3 2 1 Lead ppm ASTM D5185m >40 0 0 <1 <1 Copper ppm ASTM D5185m >15 0 1 <1 <1 <1 Vanadium ppm ASTM D5185m 0	CONTAMINATI	ON	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Irron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 0 0 0 Nickel ppm ASTM D5185m >5 0 0 0 Titanium ppm ASTM D5185m >2 <1 0 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >20 3 2 1 Lead ppm ASTM D5185m >40 0 0 <1 Copper ppm ASTM D5185m >40 0 0 <1 Vanadium ppm ASTM D5185m >15 0 1 <1 Vanadium ppm ASTM D5185m 0 0 0 <1 Cadmium ppm ASTM D5185m 0 7 8 11 Barium ppm ASTM D5185m 0 7 8 11 Barium ppm ASTM D5185m 0 0 0 0 </th <th>WEAR METALS</th> <th>S</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	WEAR METALS	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>120	5	4	<1
Titanium	Chromium	ppm	ASTM D5185m	>20	0	0	0
Silver	Nickel	ppm	ASTM D5185m	>5	0	0	0
Aluminum ppm ASTM D5185m >20 3 2 1 Lead ppm ASTM D5185m >40 0 0 <1	Titanium	ppm	ASTM D5185m	>2	<1	0	0
Lead	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper ppm ASTM D5185m >330 2 <1 0 Tin ppm ASTM D5185m >15 0 1 <1	Aluminum	ppm	ASTM D5185m	>20	3	2	1
Tin	Lead	ppm	ASTM D5185m	>40	0	0	<1
Vanadium ppm ASTM D5185m <1 0 <1 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 7 8 11 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 Manganese ppm ASTM D5185m 0 0 0 0 Magnesium ppm ASTM D5185m 1010 846 942 919 Calcium ppm ASTM D5185m 1070 1009 1069 1083 Phosphorus ppm ASTM D5185m 1270 1162 1183 1189 Sulfur ppm ASTM D5185m 2060 3134 3002 3077 CONTAMINANTS method limit/base current history1 <t< td=""><td>Copper</td><td>ppm</td><td>ASTM D5185m</td><td>>330</td><th>2</th><td><1</td><td>0</td></t<>	Copper	ppm	ASTM D5185m	>330	2	<1	0
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 7 8 11 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 Manganese ppm ASTM D5185m 0 0 0 0 Magnesium ppm ASTM D5185m 1010 846 942 919 Calcium ppm ASTM D5185m 1070 1009 1069 1083 Phosphorus ppm ASTM D5185m 1150 823 1015 1029 Zinc ppm ASTM D5185m 1270 1162 1183 1189 Sulfur ppm ASTM D5185m 2060 3134 3002 3077 CONTAMINANTS method limit/base current	Tin	ppm	ASTM D5185m	>15	0	1	<1
ADDITIVES	Vanadium	ppm	ASTM D5185m		<1	0	<1
Boron	Cadmium	ppm	ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 62 67 69 Manganese ppm ASTM D5185m 0 0 0 0 Magnesium ppm ASTM D5185m 1010 846 942 919 Calcium ppm ASTM D5185m 1070 1009 1069 1083 Phosphorus ppm ASTM D5185m 1150 823 1015 1029 Zinc ppm ASTM D5185m 1270 1162 1183 1189 Sulfur ppm ASTM D5185m 2060 3134 3002 3077 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 4 3 Sodium ppm ASTM D5185m >20 3 0 2 INFRA-RED method limit/base <th>ADDITIVES</th> <th></th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 62 67 69 Manganese ppm ASTM D5185m 0 0 0 0 Magnesium ppm ASTM D5185m 1010 846 942 919 Calcium ppm ASTM D5185m 1070 1009 1069 1083 Phosphorus ppm ASTM D5185m 1150 823 1015 1029 Zinc ppm ASTM D5185m 1270 1162 1183 1189 Sulfur ppm ASTM D5185m 2060 3134 3002 3077 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 4 3 Sodium ppm ASTM D5185m >20 3 0 2 INFRA-RED method limit/base current history1 history2 Soot % *6 **ASTM D7844 >4	Boron	ppm	ASTM D5185m	0	7	8	11
Manganese ppm ASTM D5185m 0 0 0 0 Magnesium ppm ASTM D5185m 1010 846 942 919 Calcium ppm ASTM D5185m 1070 1009 1069 1083 Phosphorus ppm ASTM D5185m 1150 823 1015 1029 Zinc ppm ASTM D5185m 1270 1162 1183 1189 Sulfur ppm ASTM D5185m 2060 3134 3002 3077 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 4 3 Sodium ppm ASTM D5185m 5 2 <1	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 846 942 919 Calcium ppm ASTM D5185m 1070 1009 1069 1083 Phosphorus ppm ASTM D5185m 1150 823 1015 1029 Zinc ppm ASTM D5185m 1270 1162 1183 1189 Sulfur ppm ASTM D5185m 2060 3134 3002 3077 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 4 3 Sodium ppm ASTM D5185m >20 3 0 2 Potassium ppm ASTM D5185m >20 3 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.2 0.1 0.1 Nitration Abs/cm *ASTM D74	Molybdenum	ppm	ASTM D5185m	60	62	67	69
Calcium ppm ASTM D5185m 1070 1009 1069 1083 Phosphorus ppm ASTM D5185m 1150 823 1015 1029 Zinc ppm ASTM D5185m 1270 1162 1183 1189 Sulfur ppm ASTM D5185m 2060 3134 3002 3077 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 4 3 Sodium ppm ASTM D5185m >20 3 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.2 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 6.8 5.9 4.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.0 17.8 17.0 FLUID DEGRADATION method <	Manganese	ppm	ASTM D5185m	0	0	0	0
Phosphorus ppm ASTM D5185m 1150 823 1015 1029 Zinc ppm ASTM D5185m 1270 1162 1183 1189 Sulfur ppm ASTM D5185m 2060 3134 3002 3077 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 4 3 Sodium ppm ASTM D5185m 5 2 <1	Magnesium	ppm	ASTM D5185m	1010	846	942	919
Zinc ppm ASTM D5185m 1270 1162 1183 1189 Sulfur ppm ASTM D5185m 2060 3134 3002 3077 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 4 3 Sodium ppm ASTM D5185m 5 2 <1	Calcium	ppm	ASTM D5185m	1070	1009	1069	1083
Sulfur ppm ASTM D5185m 2060 3134 3002 3077 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 4 3 Sodium ppm ASTM D5185m 5 2 <1	Phosphorus	ppm	ASTM D5185m	1150	823	1015	1029
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 4 3 Sodium ppm ASTM D5185m 5 2 <1	Zinc	ppm	ASTM D5185m	1270	1162	1183	1189
Silicon ppm ASTM D5185m >25 5 4 3 Sodium ppm ASTM D5185m 5 2 <1 Potassium ppm ASTM D5185m >20 3 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.2 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 6.8 5.9 4.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.0 17.8 17.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.3 13.4 12.6	Sulfur	ppm	ASTM D5185m	2060	3134	3002	3077
Sodium ppm ASTM D5185m 5 2 <1	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 3 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.2 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 6.8 5.9 4.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.0 17.8 17.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.3 13.4 12.6	Silicon	ppm	ASTM D5185m	>25	5	4	3
INFRA-RED	Sodium	ppm	ASTM D5185m		5	2	<1
Soot % % *ASTM D7844 >4 0.2 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 6.8 5.9 4.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.0 17.8 17.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.3 13.4 12.6	Potassium	ppm	ASTM D5185m	>20	3	0	2
Nitration Abs/cm *ASTM D7624 >20 6.8 5.9 4.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.0 17.8 17.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.3 13.4 12.6	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 18.0 17.8 17.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.3 13.4 12.6	Soot %	%	*ASTM D7844	>4	0.2	0.1	0.1
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.3 13.4 12.6	Nitration	Abs/cm	*ASTM D7624	>20	6.8	5.9	4.5
Oxidation Abs/.1mm *ASTM D7414 >25 14.3 13.4 12.6	Sulfation	Abs/.1mm	*ASTM D7415	>30	18.0	17.8	17.0
	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 9.8 7.5 7.8 8.1	Oxidation	Abs/.1mm	*ASTM D7414	>25	14.3	13.4	12.6
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	7.5	7.8	8.1



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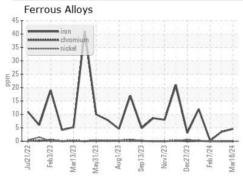


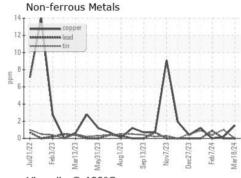


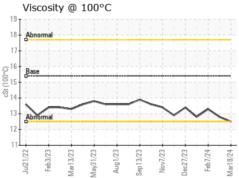
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

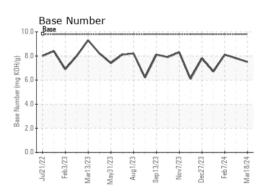
FLUID PROPI	ERTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	12.5	12.8	13.3

GRAPHS













Certificate L2367

Laboratory Sample No. Lab Number : 06130233

: GFL0113719

Unique Number: 10949698 Test Package : FLEET

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 27 Mar 2024

Tested : 27 Mar 2024 Diagnosed : 27 Mar 2024 - Wes Davis

GFL environmental - 867 - Trafford (Blount Hauling)

1130 County Line Rd Trafford, AL US 35172

Contact: Jonathan Williams jonathan.williams@gflenv.com

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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F: