

# **OIL ANALYSIS REPORT**

#### NORMAL

## Area (D582HW) 10681

### Component

## **Diesel Engine**

Fluid PETRO CANADA DURON SHP 15W40 (--- GAL)

### DIA<u>GNOSIS</u>

#### 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.

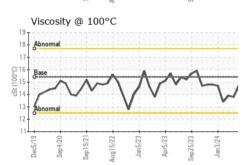
SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0099022	GFL0098876	GFL0098872
Sample Date		Client Info		25 Mar 2024	12 Mar 2024	19 Feb 2024
Machine Age	hrs	Client Info		19347	19082	19082
Oil Age	hrs	Client Info		18768	18768	18768
Oil Changed		Client Info		Changed	N/A	N/A
Sample Status				NORMAL	NORMAL	ABNORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>75	28	8	45
Chromium	ppm	ASTM D5185m	>5	<1	0	1
Nickel	ppm	ASTM D5185m	>4	<1	0	<1
Titanium	ppm	ASTM D5185m	>2	<1	<1	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>15	2	2	3
Lead	ppm	ASTM D5185m	>25	0	0	<1
Copper	ppm	ASTM D5185m	>100	<1	<1	1
Tin	ppm	ASTM D5185m	>4	0	0	0
Vanadium	ppm	ASTM D5185m		<1	<1	0
Cadmium	ppm	ASTM D5185m		•	0	0
oudinium	ppm	ASTIVI DSTOSIII		0	0	0
ADDITIVES	ppm	method	limit/base	current	0 history1	history2
	ppm		limit/base	-	-	-
ADDITIVES		method ASTM D5185m		current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	current	history1 6	history2 <1
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm	method ASTM D5185m ASTM D5185m	0 0 60	current <1 0	history1 6 0	history2 <1 0
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	current <1 0 62	history1 6 0 56	history2 <1 0 67 <1 994
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	<pre>current &lt;1 0 62 &lt;1 1016 1258</pre>	history1 6 0 56 <1	history2 <1 0 67 <1 994 1392
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	<pre>current &lt;1 0 62 &lt;1 1016 1258 1101</pre>	history1 6 0 56 <1 939 1106 1003	history2 <1 0 67 <1 994 1392 1134
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270	current           <1           0           62           <1           1016           1258           1101           1381	history1 6 0 56 <1 939 1106 1003 1268	history2           <1           0           67           <1           994           1392           1134           1362
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	<pre>current &lt;1 0 62 &lt;1 1016 1258 1101</pre>	history1 6 0 56 <1 939 1106 1003	history2 <1 0 67 <1 994 1392 1134
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270	current           <1           0           62           <1           1016           1258           1101           1381	history1 6 0 56 <1 939 1106 1003 1268	history2           <1           0           67           <1           994           1392           1134           1362
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	current           <1           0           62           <1           1016           1258           1101           1381           3842           current           6	history1 6 0 56 <1 939 1106 1003 1268 3802	<1         0         67         <1         994         1392         1134         1362         3198         history2         9
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	current         <1         0         62         <1         1016         1258         1101         1381         3842         current         6         42	history1           6           0           56           <1           939           1106           1003           1268           3802           history1           3           3	history2 <1 0 67 <1 994 1392 1134 1362 3198 history2 9 ▲ 94
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 <b>limit/base</b>	current           <1           0           62           <1           1016           1258           1101           1381           3842           current           6	history1           6           0           56           <1           939           1106           1003           1268           3802           history1           3	<1         0         67         <1         994         1392         1134         1362         3198         history2         9
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 <b>limit/base</b>	current         <1         0         62         <1         1016         1258         1101         1381         3842         current         6         42         36         current	history1         6         0         56         <1         939         1106         1003         1268         3802         history1         3         3         3         3         3         3         3         3         3         3         history1	<1         0         67         <1         994         1392         1134         1362         3198         history2         9         94
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 <b>limit/base</b> >20	current           <1           0           62           <1           1016           1258           1101           1381           3842           current           6           42           36           current           0.6	history1         6         0         56         <1         939         1106         1003         1268         3802         history1         3         3         3         3         3         0.1	<1         0         67         <1         994         1392         1134         1362         3198         history2         9         >1362         3198         0         0         0         0         0         0         0         0         0         0         0.9         0.9
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 <b>limit/base</b> >20	current         <1         0         62         <1         1016         1258         1101         1381         3842         current         6         42         36         current         0.6         10.3	history1         6         0         56         <1         939         1106         1003         1268         3802         history1         3         3         3         3         3         0.1         6.2	history2         <1         0         67         <1         994         1392         1134         1362         3198         history2         9         ▲ 94         ▲ 78         history2         0.9         13.2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 <b>limit/base</b> >20	current           <1           0           62           <1           1016           1258           1101           1381           3842           current           6           42           36           current           0.6	history1         6         0         56         <1         939         1106         1003         1268         3802         history1         3         3         3         3         3         0.1	<1         0         67         <1         994         1392         1134         1362         3198         history2         9         >1362         3198         0         0         0         0         0.9         0.9         0.9         0.9         0.9
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 <i>limit/base</i> >20	current         <1         0         62         <1         1016         1258         1101         1381         3842         current         6         42         36         current         0.6         10.3	history1         6         0         56         <1         939         1106         1003         1268         3802         history1         3         3         3         3         3         0.1         6.2	history2 <ul> <li>&lt;1</li> <li>0</li> <li>67</li> <li>&lt;1</li> <li>994</li> <li>1392</li> <li>1134</li> <li>1362</li> <li>3198</li> </ul> history2 <ul> <li>9</li> <li>94</li> <li>78</li> <li>history2</li> <li>0.9</li> <li>13.2</li> </ul>
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 <b>imit/base</b> >6 >20	current         <1         0         62         <1         1016         1258         1101         1381         3842         current         6         42         36         current         0.6         10.3         22.1	history1         6         0         56         <1         939         1106         1003         1268         3802         history1         3         3         3         0.1         6.2         17.8	history2 <ul> <li>&lt;1</li> <li>0</li> <li>67</li> <li>&lt;1</li> <li>994</li> <li>1392</li> <li>1134</li> <li>1362</li> <li>3198</li> </ul> bistory2 <ul> <li>9</li> <li>94</li> <li>78</li> </ul> history2 <ul> <li>0.9</li> <li>13.2</li> <li>24.6</li> </ul>

Submitted By: GFL084,GFL842,GFL844,GFL846 - ROBERT THIBAULT Page 1 of 2



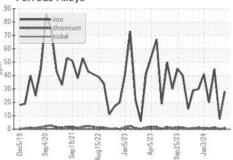
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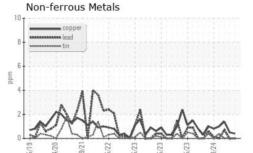
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Dec5/19	Sep4/20 -	Sep19/21-	Aug15/22 -	Jan5/23	Apr5/23	Sep25/23 -	Jan3/24 -	
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_								
Ba 10.0 T Bas	se Nui	mber		5				
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1	se Nur	mber	N	W	N	V	$\sim$	
0.8 8.0 - 0.0 Base Number (mg KOH/g)	se Nur	mber	N	M	N	V	$\sim$	
1	se Nur a OZ/Fdag	Sep19/21	Aug15/22	Jan5/23	Apr5/23 -	Sep 25/23	Jan324	

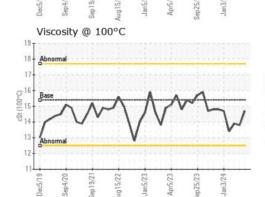


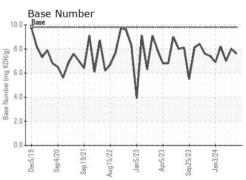
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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 PROPE	RTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	14.7	13.8	13.9
GRAPHS						

Ferrous Alloys









Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 GFL Environmental - 084 - Clarksville Sample No. : GFL0099022 Received : 08 Apr 2024 699 Jack Miller Boulevard Lab Number : 06142066 Tested : 09 Apr 2024 Clarksville, TN Unique Number : 10966874 Diagnosed : 09 Apr 2024 - Wes Davis US 37042 Test Package : FLEET Contact: ROBERT THIBAULT Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369. robert.thibault@gflenv.com T: (931)552-7276 \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. F: (931)572-9674

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Report Id: GFL084 [WUSCAR] 06142066 (Generated: 04/09/2024 15:35:40) Rev: 1

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