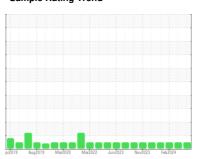


# **OIL ANALYSIS REPORT**

Sample Rating Trend



NORMAL



928093-260350

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

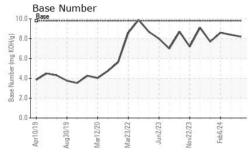
### **Fluid Condition**

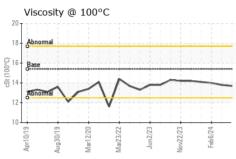
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Number   Client Info   CFL0114167   CFL0108042   OFL01080   CR   CR   CR   CR   CR   CR   CR   C	ARL)		pr2019 Au	2019 Mar2020 Mar2	022 Jun2023 Nov2023 F	eb2024	
Sample Date   Client Info   13954   13835   13673   13673   13673   13874   13835   13673   13673   13874   13835   13673   13673   13874   13835   13673   13673   13673   13874   13835   13673   13673   13673   13673   12876   12876   12876   12876   12876   12919   12757   Not Changed   Normal	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Machine Age     hrs     Client Info     13954     13835     13673       Oil Age     hrs     Client Info     12876     12919     12757       Oil Changed     Client Info     Changed     Not Changed <td>Sample Number</td> <td></td> <td>Client Info</td> <td></td> <th>GFL0114167</th> <td>GFL0108042</td> <td>GFL0108085</td>	Sample Number		Client Info		GFL0114167	GFL0108042	GFL0108085
Oil Age     hrs     Client Info     12876     12919     12757       Oil Changed Sample Status     Client Info     Changed NoRMAL     Not Changd NORMAL     Not Changd NORMAL     Not Changd NORMAL     Not Changd NORMAL     NoRMAL </td <td>Sample Date</td> <td></td> <td>Client Info</td> <td></td> <th>27 Mar 2024</th> <td>07 Mar 2024</td> <td>06 Feb 2024</td>	Sample Date		Client Info		27 Mar 2024	07 Mar 2024	06 Feb 2024
Oil Changed Sample Status     Client Info MORMAL     Changed NORMAL     Not Change NORMAL     Not Change NORMAL       CONTAMINATION     method     limit/base     current     history1     history1       Fuel     WC Method     >5     <1.0     <1.0     <1.0       Water     WC Method     >0.2     NEG     NEG     NEG       Glycol     WC Method     NEG     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history1       Iron     ppm     ASTM D5185m     >100     10     9     4       Chromium     ppm     ASTM D5185m     >20     0     <1     0       Chromium     ppm     ASTM D5185m     >20     0     <1     0       Chromium     ppm     ASTM D5185m     >3     0     0     0       WEAR     ppm     ASTM D5185m     3     0     0     0       Chromium     ppm     ASTM D5185m     3     0     0     0 <td>Machine Age</td> <td>hrs</td> <td>Client Info</td> <td></td> <th>13954</th> <td>13835</td> <td>13673</td>	Machine Age	hrs	Client Info		13954	13835	13673
NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history1   history1   history1   water   WC Method   NEG   NEG	Oil Age	hrs	Client Info		12876	12919	12757
CONTAMINATION     method     limit/base     current     history1     history1       Fuel     WC Method     >5     <1.0	Oil Changed		Client Info		Changed	Not Changd	Not Changd
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water Glycol     WC Method     >0.2     NEG NEG     NEG NEG     NEG NEG       WEAR METALS     method     limit/base     current     history1     history1       Iron     ppm     ASTM D5185m     >100     10     9     4       Chromium     ppm     ASTM D5185m     >20     0     <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>5	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium     ppm     ASTM D5185m     >20     0     <1     0       Nickel     ppm     ASTM D5185m     -4     0     0     <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel     ppm     ASTM D5185m     >4     0     0     <1       Titanium     ppm     ASTM D5185m     0     0     0     0       Silver     ppm     ASTM D5185m     >3     0     0     0     0       Aluminum     ppm     ASTM D5185m     >20     2	Iron	ppm	ASTM D5185m	>100	10	9	4
Description	Chromium	ppm	ASTM D5185m	>20	0	<1	0
Silver	Nickel	ppm	ASTM D5185m	>4	0	0	<1
Aluminum	Titanium	ppm	ASTM D5185m		0	0	0
Lead	Silver	ppm	ASTM D5185m	>3	0	0	0
Copper     ppm     ASTM D5185m     >330     0     <1     0       Tin     ppm     ASTM D5185m     >15     0     0     0       Vanadium     ppm     ASTM D5185m     0     0     0     0       Cadmium     ppm     ASTM D5185m     0     0     0     0       Boron     ppm     ASTM D5185m     0     0     1     3       Barium     ppm     ASTM D5185m     0     0     0     0       Molybdenum     ppm     ASTM D5185m     0     0     0     0       Manganese     ppm     ASTM D5185m     0     0     0     <1	Aluminum	ppm	ASTM D5185m	>20	2	2	2
Tin	Lead	ppm	ASTM D5185m	>40	0	<1	0
Vanadium     ppm     ASTM D5185m     0     0     0       Cadmium     ppm     ASTM D5185m     0     0     0       ADDITIVES     method     limit/base     current     history1     history1       Boron     ppm     ASTM D5185m     0     0     1     3       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     1070     1138     1118     1005       Phosphorus     ppm     ASTM D5185m     1070     1138     1118     1005       Phosphorus     ppm     ASTM D5185m     1270     1257     1294     1271       Sulfur     ppm     ASTM D5185m     2060     3625     3739     3206       CONTAMINANTS     method     limit/base     current     history1<	Copper	ppm	ASTM D5185m	>330	0	<1	0
Cadmium     ppm     ASTM D5185m     0     0     0       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     0     1     3       Barium     ppm     ASTM D5185m     0     0     0     0       Molybdenum     ppm     ASTM D5185m     60     57     59     57       Manganese     ppm     ASTM D5185m     0     0     0     <1	Tin	ppm	ASTM D5185m	>15	0	0	0
ADDITIVES	Vanadium	ppm	ASTM D5185m		0	0	0
Boron	Cadmium	ppm	ASTM D5185m		0	0	0
Barium     ppm     ASTM D5185m     0     0     0     0       Molybdenum     ppm     ASTM D5185m     60     57     59     57       Manganese     ppm     ASTM D5185m     0     0     0     <1       Magnesium     ppm     ASTM D5185m     1010     981     997     930       Calcium     ppm     ASTM D5185m     1070     1138     1118     1005       Phosphorus     ppm     ASTM D5185m     1150     1064     1059     1078       Zinc     ppm     ASTM D5185m     1270     1257     1294     1271       Sulfur     ppm     ASTM D5185m     2060     3625     3739     3206       CONTAMINANTS     method     limit/base     current     history1     history       Silicon     ppm     ASTM D5185m     >25     5     5     5       Sodium     ppm     ASTM D5185m     20     <1     <1     <1       INFRA-RED     method     limit/base<	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum     ppm     ASTM D5185m     60     57     59     57       Manganese     ppm     ASTM D5185m     0     0     0     <1       Magnesium     ppm     ASTM D5185m     1010     981     997     930       Calcium     ppm     ASTM D5185m     1070     1138     1118     1005       Phosphorus     ppm     ASTM D5185m     1150     1064     1059     1078       Zinc     ppm     ASTM D5185m     1270     1257     1294     1271       Sulfur     ppm     ASTM D5185m     2060     3625     3739     3206       CONTAMINANTS     method     limit/base     current     history1     history1       Silicon     ppm     ASTM D5185m     >25     5     5     5       Sodium     ppm     ASTM D5185m     20     <1     <1     <1       INFRA-RED     method     limit/base     current     history1     history1       Soot %     %     *ASTM D7624<	Boron	ppm		0		1	
Manganese     ppm     ASTM D5185m     0     0     <1       Magnesium     ppm     ASTM D5185m     1010     981     997     930       Calcium     ppm     ASTM D5185m     1070     1138     1118     1005       Phosphorus     ppm     ASTM D5185m     1150     1064     1059     1078       Zinc     ppm     ASTM D5185m     1270     1257     1294     1271       Sulfur     ppm     ASTM D5185m     2060     3625     3739     3206       CONTAMINANTS     method     limit/base     current     history1     history1       Silicon     ppm     ASTM D5185m     >25     5     5     5       Sodium     ppm     ASTM D5185m     22     2     2     2       Potassium     ppm     ASTM D5185m     >20     <1	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium     ppm     ASTM D5185m     1010     981     997     930       Calcium     ppm     ASTM D5185m     1070     1138     1118     1005       Phosphorus     ppm     ASTM D5185m     1150     1064     1059     1078       Zinc     ppm     ASTM D5185m     1270     1257     1294     1271       Sulfur     ppm     ASTM D5185m     2060     3625     3739     3206       CONTAMINANTS     method     limit/base     current     history1     history1       Silicon     ppm     ASTM D5185m     >25     5     5     5       Sodium     ppm     ASTM D5185m     20     <1     <1     <1       INFRA-RED     method     limit/base     current     history1     history       Soot %     %     *ASTM D7844     >3     0.4     0.3     0.2       Nitration     Abs/cm     *ASTM D7624     >20     6.7     6.1     5.0       Sulfation     Abs/.1mm     *ASTM D7	Molybdenum	ppm					
Calcium     ppm     ASTM D5185m     1070     1138     1118     1005       Phosphorus     ppm     ASTM D5185m     1150     1064     1059     1078       Zinc     ppm     ASTM D5185m     1270     1257     1294     1271       Sulfur     ppm     ASTM D5185m     2060     3625     3739     3206       CONTAMINANTS     method     limit/base     current     history1     history1       Silicon     ppm     ASTM D5185m     >25     5     5     5       Sodium     ppm     ASTM D5185m     2     2     2     2       Potassium     ppm     ASTM D5185m     >20     <1	Manganese	ppm	ASTM D5185m	0	0		<1
Phosphorus     ppm     ASTM D5185m     1150     1064     1059     1078       Zinc     ppm     ASTM D5185m     1270     1257     1294     1271       Sulfur     ppm     ASTM D5185m     2060     3625     3739     3206       CONTAMINANTS     method     limit/base     current     history1     history       Silicon     ppm     ASTM D5185m     >25     5     5     5       Sodium     ppm     ASTM D5185m     2     2     2     2       Potassium     ppm     ASTM D5185m     >20     <1	-	ppm	ASTM D5185m			997	
Zinc     ppm     ASTM D5185m     1270     1257     1294     1271       Sulfur     ppm     ASTM D5185m     2060     3625     3739     3206       CONTAMINANTS     method     limit/base     current     history1     history       Silicon     ppm     ASTM D5185m     >25     5     5     5       Sodium     ppm     ASTM D5185m     2     2     2     2       Potassium     ppm     ASTM D5185m     >20     <1	Calcium	ppm	ASTM D5185m	1070		1118	1005
Sulfur     ppm     ASTM D5185m     2060     3625     3739     3206       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     5     5     5       Sodium     ppm     ASTM D5185m     2     2     2     2       Potassium     ppm     ASTM D5185m     >20     <1     <1     <1       INFRA-RED     method     limit/base     current     history1     history       Soot %     %     *ASTM D7844     >3     0.4     0.3     0.2       Nitration     Abs/cm     *ASTM D7624     >20     6.7     6.1     5.0       Sulfation     Abs/.1mm     *ASTM D7415     >30     18.4     18.0     17.6       FLUID DEGRADATION     method     limit/base     current     history1     history       Oxidation     Abs/.1mm     *ASTM D7414     >25     14.1     13.8     13.0		ppm					
CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     5     5     5       Sodium     ppm     ASTM D5185m     2     2     2     2       Potassium     ppm     ASTM D5185m     >20     <1		ppm	ASTM D5185m		1257	1294	1271
Silicon     ppm     ASTM D5185m     >25     5     5       Sodium     ppm     ASTM D5185m     2     2     2     2       Potassium     ppm     ASTM D5185m     >20     <1     <1     <1       INFRA-RED     method     limit/base     current     history1     history       Soot %     %     *ASTM D7844     >3     0.4     0.3     0.2       Nitration     Abs/cm     *ASTM D7624     >20     6.7     6.1     5.0       Sulfation     Abs/.1mm     *ASTM D7415     >30     18.4     18.0     17.6       FLUID DEGRADATION     method     limit/base     current     history1     history       Oxidation     Abs/.1mm     *ASTM D7414     >25     14.1     13.8     13.0					3625		
Sodium     ppm     ASTM D5185m     2     2     2     2       Potassium     ppm     ASTM D5185m     >20     <1	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium     ppm     ASTM D5185m     >20     <1     <1     <1       INFRA-RED     method     limit/base     current     history1     history       Soot %     %     *ASTM D7844     >3     0.4     0.3     0.2       Nitration     Abs/cm     *ASTM D7624     >20     6.7     6.1     5.0       Sulfation     Abs/.1mm     *ASTM D7415     >30     18.4     18.0     17.6       FLUID DEGRADATION     method     limit/base     current     history1     history       Oxidation     Abs/.1mm     *ASTM D7414     >25     14.1     13.8     13.0				>25			
INFRA-RED		ppm					
Soot %     %     *ASTM D7844     >3     0.4     0.3     0.2       Nitration     Abs/cm     *ASTM D7624     >20     6.7     6.1     5.0       Sulfation     Abs/.1mm     *ASTM D7415     >30     18.4     18.0     17.6       FLUID DEGRADATION method limit/base current history1     history1     history1       Oxidation     Abs/.1mm     *ASTM D7414     >25     14.1     13.8     13.0	Potassium	ppm	ASTM D5185m	>20	<1	<1	<1
Nitration     Abs/cm     *ASTM D7624     >20     6.7     6.1     5.0       Sulfation     Abs/.1mm     *ASTM D7415     >30     18.4     18.0     17.6       FLUID DEGRADATION method limit/base current     history     history       Oxidation     Abs/.1mm     *ASTM D7414     >25     14.1     13.8     13.0	INFRA-RED		method	limit/base	current	history1	history2
Sulfation     Abs/.1mm     *ASTM D7415     >30     18.4     18.0     17.6       FLUID DEGRADATION     method     limit/base     current     history1     history       Oxidation     Abs/.1mm     *ASTM D7414     >25     14.1     13.8     13.0	Soot %	%	*ASTM D7844	>3	0.4		0.2
FLUID DEGRADATION method limit/base current history1 history1   Oxidation Abs/.1mm *ASTM D7414 >25 14.1 13.8 13.0	Nitration	Abs/cm	*ASTM D7624	>20	6.7	6.1	5.0
Oxidation Abs/.1mm *ASTM D7414 >25 <b>14.1</b> 13.8 13.0	Sulfation	Abs/.1mm	*ASTM D7415	>30	18.4	18.0	17.6
	FLUID DEGRA	OITAC	method	limit/base	current	history1	history2
Base Number (BN)     mg KOH/g     ASTM D2896     9.8     8.2     8.4     8.6	Oxidation	Abs/.1mm	*ASTM D7414	>25	14.1	13.8	13.0
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.2	8.4	8.6



# **OIL ANALYSIS REPORT**

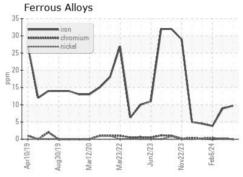


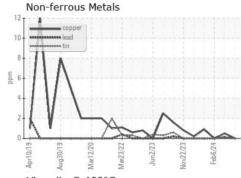


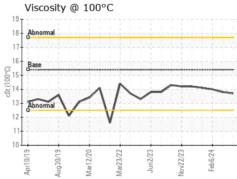
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	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	13.7	13.8	14.0

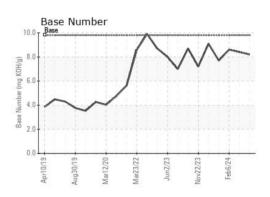
### **GRAPHS**







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







Certificate L2367

Laboratory Sample No.

: GFL0114167 Lab Number : 06135498 Unique Number : 10954963

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received **Tested** 

: 01 Apr 2024 : 02 Apr 2024 Diagnosed : 02 Apr 2024 - Wes Davis

GFL Environmental - 837 - Harrison TS 22820 S State Route 291

Harrisonville, MO US 64701

Contact: JOHNNY PEREZ johnny.perez@gflenv.com

Test Package : FLEET 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.

Submitted By: JEREMY BROWN

T:

F: