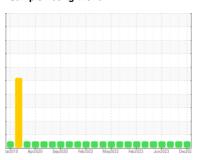


# **OIL ANALYSIS REPORT**

Sample Rating Trend



NORMAL



749007-310060

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

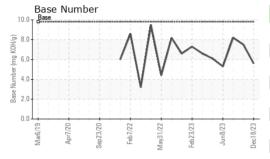
### **Fluid Condition**

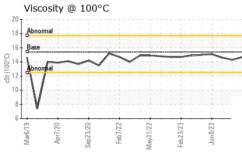
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

SAMPLE INFORMATION   method   imitibase   current   history1   history2	GAL)  w2019						
Sample Date	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         15787         96665         96665           Oil Age         hrs         Client Info         600         68353         0           Oil Changed         Client Info         Changed         NORMAL         NORMAL         NORMAL           Sample Status         WC Method         Imilibase         current         history1         history2           Fuel         WC Method         >5         <1.0         <1.0         <1.0           Water         WC Method         NEG         NEG         NEG         NEG           Glycol         WC Method         Imilibase         NEG         NEG         NEG           WEAR METALS         method         Imilibase         history2         history2           Iron         ppm         ASTM D5185m         >100         7         6         5           Chromium         ppm         ASTM D5185m         >20         <1         <1         <1         <1           Nickel         ppm         ASTM D5185m         >20         2         1         0         0           Silver         ppm         ASTM D5185m         >20         2         1         0         0	Sample Number		Client Info		GFL0092000	GFL0092036	GFL0084708
Oil Age         hrs         Client Info         600         66353         0           Oil Changed Sample Status         Client Info         Changed Not Changed Not Changd Not Changd Not Changd NoRMAL         NoRMAL NORMAL NORMAL NORMAL         NoRMAL NORMAL NORMAL NORMAL         NoRMAL NORMAL NORMAL         NoRMAL NORMAL NORMAL         NoRMAL NORMAL NORMAL         NoRMAL NORMAL NORMAL         NoRMAL NORMAL NORMAL         NoRMAL NORMAL NORMAL         NoRMAL NORMAL NORMAL         NoRMAL NORMAL NORMAL         NoRMAL NORMAL NORMAL         NoRMAL NORMAL NORMAL         NoRMAL NORMAL NORMAL         NoRMAL NORMAL NORMAL         NoRMAL NORMAL         NoRMAL NORMAL NORMAL         NoRMAL NORMAL NORMAL         NoRMAL NORMAL NORMAL         NORMAL NORMAL NORMAL         NoRMAL NORMAL         1.0         -1.0         -1.0         -1.0         -1.0         -1.0         -1.0         -1.1         -1.1         -1.1         -1.0         -1.1         -1.0         -1.1         -1.1         -1.0         -1.0	Sample Date		Client Info		18 Dec 2023	02 Dec 2023	28 Jun 2023
Oil Changed   Sample Status   Client Info   NORMAL   NORMAL   NORMAL   NORMAL	Machine Age	hrs	Client Info		15787	96665	96665
Sample Status	Oil Age	hrs	Client Info		600	66353	0
CONTAMINATION	Oil Changed		Client Info		Changed	Not Changd	Not Changd
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         7         6         5           Chromium         ppm         ASTM D5185m         >20         <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
Silycol	Fuel		WC Method	>5	<1.0	<1.0	<1.0
Iron	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         <1         <1         <1           Nickel         ppm         ASTM D5185m         >4         <1	WEAR METAL	.S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	7	6	5
Titanium	Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Silver         ppm         ASTM D5185m         >3         0         0         0           Aluminum         ppm         ASTM D5185m         >20         2         1         0           Lead         ppm         ASTM D5185m         >40         0         0         <1	Nickel	ppm	ASTM D5185m	>4	<1	0	0
Aluminum	Titanium	ppm	ASTM D5185m		0	0	0
Lead         ppm         ASTM D5185m         >40         0         0         <1           Copper         ppm         ASTM D5185m         >330         <1         <1         <1           Tin         ppm         ASTM D5185m         >15         <1         0         0           Vanadium         ppm         ASTM D5185m         <1         0         0           Cadmium         ppm         ASTM D5185m         <1         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         11         9         33           Barium         ppm         ASTM D5185m         0         11         9         33           Barium         ppm         ASTM D5185m         0         0         2         0           Malagnesum         ppm         ASTM D5185m         0         <1         0         <1           Quidation         ppm         ASTM D5185m         0         <1         0         <1           Abs/lms         ppm         ASTM D5185m         1070         1614         1287         1785	Silver	ppm	ASTM D5185m	>3	0	0	0
Copper         ppm         ASTM D5185m         >330         <1         <1         <1           Tin         ppm         ASTM D5185m         >15         <1	Aluminum	ppm	ASTM D5185m	>20	2	1	0
Tin         ppm         ASTM D5185m         >15         <1         0         0           Vanadium         ppm         ASTM D5185m         <1         0         0           Cadmium         ppm         ASTM D5185m         <1         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         11         9         33           Barium         ppm         ASTM D5185m         0         0         2         0           Molybdenum         ppm         ASTM D5185m         0         54         52         62           Manganese         ppm         ASTM D5185m         0         <1         0         <1           Magnesium         ppm         ASTM D5185m         1070         1614         1287         1785           Phosphorus         ppm         ASTM D5185m         1150         761         769         857           Zinc         ppm         ASTM D5185m         1270         989         970         1052           Sulfur         ppm         ASTM D5185m         2060         2552         2632         3	Lead	ppm	ASTM D5185m	>40	0	0	<1
Vanadium         ppm         ASTM D5185m         <1         0         0           Cadmium         ppm         ASTM D5185m         <1         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         11         9         33           Barium         ppm         ASTM D5185m         0         0         2         0           Molybdenum         ppm         ASTM D5185m         0         0         2         0           Magnesium         ppm         ASTM D5185m         0         <1         0         <1           Magnesium         ppm         ASTM D5185m         1070         1614         1287         1785           Phosphorus         ppm         ASTM D5185m         1150         761         769         857           Zinc         ppm         ASTM D5185m         1270         989         970         1052           Sulfur         ppm         ASTM D5185m         2060         2552         2632         3055           CONTAMINANTS         method         limit/base         current         history1	Copper	ppm	ASTM D5185m	>330	<1	<1	<1
Cadmium         ppm         ASTM D5185m         <1         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         11         9         33           Barium         ppm         ASTM D5185m         0         0         2         0           Molybdenum         ppm         ASTM D5185m         60         54         52         62           Manganese         ppm         ASTM D5185m         0         <1	Tin	ppm	ASTM D5185m	>15	<1	0	
Boron   ppm   ASTM D5185m   0   11   9   33   33   34   35   35   35   35   35	Vanadium	ppm	ASTM D5185m			0	0
Boron	Cadmium	ppm	ASTM D5185m		<1	0	0
Barium         ppm         ASTM D5185m         0         0         2         0           Molybdenum         ppm         ASTM D5185m         60         54         52         62           Manganese         ppm         ASTM D5185m         0         <1         0         <1           Magnesium         ppm         ASTM D5185m         1010         558         630         641           Calcium         ppm         ASTM D5185m         1070         1614         1287         1785           Phosphorus         ppm         ASTM D5185m         1150         761         769         857           Zinc         ppm         ASTM D5185m         1270         989         970         1052           Sulfur         ppm         ASTM D5185m         2060         2552         2632         3055           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         6         5           Sodium         ppm         ASTM D5185m         21         11         18           Potassium         ppm         ASTM D5185m         >20	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         54         52         62           Manganese         ppm         ASTM D5185m         0         <1         0         <1           Magnesium         ppm         ASTM D5185m         1010         558         630         641           Calcium         ppm         ASTM D5185m         1070         1614         1287         1785           Phosphorus         ppm         ASTM D5185m         1150         761         769         857           Zinc         ppm         ASTM D5185m         1270         989         970         1052           Sulfur         ppm         ASTM D5185m         2060         2552         2632         3055           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         6         5           Sodium         ppm         ASTM D5185m         >20         16         9         23           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         'ASTM D7844 <th< td=""><td>Boron</td><td>ppm</td><td></td><td></td><th></th><td></td><td></td></th<>	Boron	ppm					
Manganese         ppm         ASTM D5185m         0         <1         0         <1           Magnesium         ppm         ASTM D5185m         1010         558         630         641           Calcium         ppm         ASTM D5185m         1070         1614         1287         1785           Phosphorus         ppm         ASTM D5185m         1150         761         769         857           Zinc         ppm         ASTM D5185m         1270         989         970         1052           Sulfur         ppm         ASTM D5185m         2060         2552         2632         3055           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         6         5           Sodium         ppm         ASTM D5185m         >20         16         9         23           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0         0.2         0.1           Nitration         Abs/cm         *ASTM D7845 </td <td></td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <th>-</th> <td></td> <td></td>		ppm	ASTM D5185m		-		
Magnesium         ppm         ASTM D5185m         1010         558         630         641           Calcium         ppm         ASTM D5185m         1070         1614         1287         1785           Phosphorus         ppm         ASTM D5185m         1150         761         769         857           Zinc         ppm         ASTM D5185m         1270         989         970         1052           Sulfur         ppm         ASTM D5185m         2060         2552         2632         3055           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         6         5           Sodium         ppm         ASTM D5185m         21         11         18           Potassium         ppm         ASTM D5185m         >20         16         9         23           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         10.1         9.4         7.8           Sulfation         Abs/.1mm         *ASTM D7415	-	ppm					
Calcium         ppm         ASTM D5185m         1070         1614         1287         1785           Phosphorus         ppm         ASTM D5185m         1150         761         769         857           Zinc         ppm         ASTM D5185m         1270         989         970         1052           Sulfur         ppm         ASTM D5185m         2060         2552         2632         3055           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         6         5           Sodium         ppm         ASTM D5185m         >21         11         18           Potassium         ppm         ASTM D5185m         >20         16         9         23           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         10.1         9.4         7.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.4         19.5         19.7           FLUID DEGRADATION         method	-	ppm					
Phosphorus         ppm         ASTM D5185m         1150         761         769         857           Zinc         ppm         ASTM D5185m         1270         989         970         1052           Sulfur         ppm         ASTM D5185m         2060         2552         2632         3055           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         6         5           Sodium         ppm         ASTM D5185m         >25         4         6         5           Sodium         ppm         ASTM D5185m         >20         16         9         23           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         10.1         9.4         7.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.4         19.5         19.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *A							
Zinc         ppm         ASTM D5185m         1270         989         970         1052           Sulfur         ppm         ASTM D5185m         2060         2552         2632         3055           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         6         5           Sodium         ppm         ASTM D5185m         21         11         18           Potassium         ppm         ASTM D5185m         >20         16         9         23           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0         0.2         0.1           Nitration         Abs/.1mm         *ASTM D7624         >20         10.1         9.4         7.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.4         19.5         19.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414							
Sulfur         ppm         ASTM D5185m         2060         2552         2632         3055           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         6         5           Sodium         ppm         ASTM D5185m         21         11         18           Potassium         ppm         ASTM D5185m         >20         16         9         23           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0         0.2         0.1           Nitration         Abs/cm         *ASTM D7624         >20         10.1         9.4         7.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.4         19.5         19.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         17.4         17.3         16.9							
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         6         5           Sodium         ppm         ASTM D5185m         21         11         18           Potassium         ppm         ASTM D5185m         >20         16         9         23           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0         0.2         0.1           Nitration         Abs/cm         *ASTM D7624         >20         10.1         9.4         7.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.4         19.5         19.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         17.4         17.3         16.9							
Silicon         ppm         ASTM D5185m         >25         4         6         5           Sodium         ppm         ASTM D5185m         21         11         18           Potassium         ppm         ASTM D5185m         >20         16         9         23           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0         0.2         0.1           Nitration         Abs/cm         *ASTM D7624         >20         10.1         9.4         7.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.4         19.5         19.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         17.4         17.3         16.9			ASTM D5185m	2060	2552	2632	3055
Sodium         ppm         ASTM D5185m         21         11         18           Potassium         ppm         ASTM D5185m         >20         16         9         23           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0         0.2         0.1           Nitration         Abs/cm         *ASTM D7624         >20         10.1         9.4         7.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.4         19.5         19.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         17.4         17.3         16.9		ITS	method	limit/base	current	history1	
Potassium         ppm         ASTM D5185m         >20         16         9         23           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0         0.2         0.1           Nitration         Abs/cm         *ASTM D7624         >20         10.1         9.4         7.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.4         19.5         19.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         17.4         17.3         16.9				>25	4		
INFRA-RED		ppm					
Soot %         %         *ASTM D7844 >3         0         0.2         0.1           Nitration         Abs/cm         *ASTM D7624 >20         10.1         9.4         7.8           Sulfation         Abs/.1mm         *ASTM D7415 >30         20.4         19.5         19.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         17.4         17.3         16.9	Potassium	ppm	ASTM D5185m	>20	16	9	23
Nitration         Abs/cm         *ASTM D7624         >20         10.1         9.4         7.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.4         19.5         19.7           FLUID DEGRADATION method limit/base current         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         17.4         17.3         16.9	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415 >30         20.4         19.5         19.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         17.4         17.3         16.9	Soot %		*ASTM D7844	>3			0.1
FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     17.4     17.3     16.9	Nitration	Abs/cm	*ASTM D7624	>20	10.1	9.4	7.8
Oxidation	Sulfation	Abs/.1mm	*ASTM D7415	>30	20.4	19.5	19.7
	FLUID DEGRAI	NOITAC	method	limit/base	current	history1	history2
<b>Base Number (BN)</b> mg KOH/g ASTM D2896 9.8 <b>5.6</b> 7.5 8.2	Oxidation	Abs/.1mm	*ASTM D7414	>25	17.4	17.3	16.9
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	5.6	7.5	8.2



# **OIL ANALYSIS REPORT**

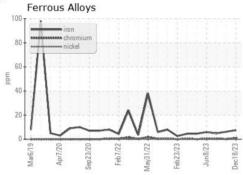


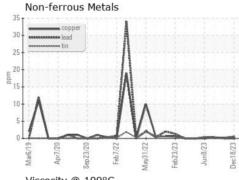


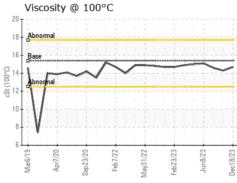
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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

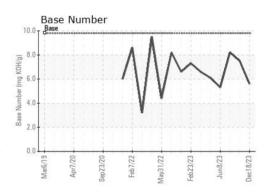
FLUID PROPE	RTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	14.7	14.3	14.6

### **GRAPHS**













Certificate L2367

Laboratory Sample No. Lab Number **Unique Number** 

Test Package : FLEET

: GFL0092000 : 06041355 : 10796584

To discuss this sample report, contact Customer Service at 1-800-237-1369.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Recieved : 20 Dec 2023 : 22 Dec 2023 Diagnosed Diagnostician : Angela Borella

GFL Environmental - 856 - Houston South

8515 Highway 6 South Houston, TX US 77083

Contact: Apolinar Zacarias

pzacariascano@gflenv.com T:

\* - 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)

F: