

# **OIL ANALYSIS REPORT**

Sample Rating Trend



NORMAL



Machine Id 10623 Component

**Diesel Engine** 

PETRO CANADA DURON SHP 15W40 (13 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

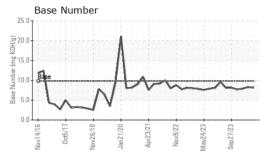
### **Fluid Condition**

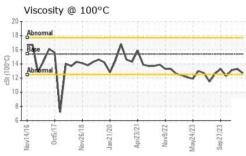
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

WEAR METALS	GAL)						
Sample Date	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         19638         19488         19355           Oil Age         hrs         Client Info         283         133         582           Oil Changed         Client Info         Not Changd         Not Changd         Not Changd         Not Changd         Changed           Sample Status         method         limit/base         current         history1         history2           Fuel         WC Method         >3.0         <1.0         <1.0         ▲ 1.9           Water         WC Method         NEG         NEG         NEG         NEG           Glycol         WC Method         NEG         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history2         history2           Iron         ppm         ASTM D5186m         >5         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1	Sample Number		Client Info		GFL0109926	GFL0109861	GFL0101176
Oil Age         hrs         Client Info         283         133         582           Oil Changed Sample Status         Client Info         Not Changd Not Changd Changed Changed NoRMAL         NoRMAL         NoRMAL         MARGINAL           CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         3.0         < 1.0	Sample Date		Client Info		29 Jan 2024	12 Jan 2024	29 Dec 2023
Client Info	Machine Age	hrs	Client Info		19638	19488	19355
NORMAL   NORMAL   MARGINAL	Oil Age	hrs	Client Info		283	133	582
CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >3.0         <1.0         <1.0         ▲ 1.9           Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         NEG         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5186m         >5         <1         <1         <1         <1         NEG           Nickel         ppm         ASTM D5186m         >4         0         1         1         1         2<	Oil Changed		Client Info		Not Changd	Not Changd	Changed
Fuel   WC Method   S3.0   <1.0   <1.0   A   1.9	Sample Status				NORMAL	NORMAL	MARGINAL
Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         Ilimit/base         current         history1         history2           WEAR METALS         method         Ilimit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >75         8         5         8           Chromium         ppm         ASTM D5185m         >4         0         0         0           Nickel         ppm         ASTM D5185m         >4         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >2         0         0         0           Copper         ppm         ASTM D5185m         >25         0         0         0         0           Tin         ppm         ASTM D5185m         >4         <1         0         <1         <1           Vanadium         ppm         ASTM D5185m         0         0         0         0         0           Boron         ppm         ASTM D5185m         0         8	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	<b>▲</b> 1.9
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Irron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >5         <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>75	8	5	8
Titanium	Chromium	ppm	ASTM D5185m	>5	<1	<1	<1
Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >15         1         2         2           Lead         ppm         ASTM D5185m         >100         2         <1	Nickel	ppm	ASTM D5185m	>4	0	0	0
Aluminum	Titanium	ppm	ASTM D5185m	>2	0	0	0
Lead         ppm         ASTM D5185m         >25         0         0         0           Copper         ppm         ASTM D5185m         >100         2         <1	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper         ppm         ASTM D5185m         >100         2         <1	Aluminum	ppm	ASTM D5185m	>15	1	2	2
Tin         ppm         ASTM D5185m         >4         <1	Lead	ppm	ASTM D5185m	>25	0	0	0
Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         8         7         8           Barium         ppm         ASTM D5185m         0         0         3         0           Molybdenum         ppm         ASTM D5185m         0         0         3         0           Manganese         ppm         ASTM D5185m         0         <1	Copper	ppm	ASTM D5185m	>100	2	<1	<1
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         8         7         8           Barium         ppm         ASTM D5185m         0         0         3         0           Molybdenum         ppm         ASTM D5185m         0         58         60         58           Manganese         ppm         ASTM D5185m         0         <1         0         <1           Magnesium         ppm         ASTM D5185m         1010         827         922         864           Calcium         ppm         ASTM D5185m         1070         931         1028         1002           Phosphorus         ppm         ASTM D5185m         1150         955         958         1018           Zinc         ppm         ASTM D5185m         1270         1123         1180         1176           Sulfur         ppm         ASTM D5185m         2060         2778         3233         2788           CONTAMINANTS         method         limit/base         current <t< th=""><td>Tin</td><td>ppm</td><td>ASTM D5185m</td><td>&gt;4</td><th>&lt;1</th><td>0</td><td></td></t<>	Tin	ppm	ASTM D5185m	>4	<1	0	
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         8         7         8           Barium         ppm         ASTM D5185m         0         0         3         0           Molybdenum         ppm         ASTM D5185m         60         58         60         58           Manganese         ppm         ASTM D5185m         0         <1         0         <1           Magnesium         ppm         ASTM D5185m         1010         827         922         864           Calcium         ppm         ASTM D5185m         1070         931         1028         1002           Phosphorus         ppm         ASTM D5185m         1270         1123         1180         1176           Sulfur         ppm         ASTM D5185m         2060         2778         3233         2788           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         3         7           Sodium         ppm         ASTM D5185m         >20	Vanadium	ppm	ASTM D5185m		0	0	0
Boron	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         0         0         3         0           Molybdenum         ppm         ASTM D5185m         60         58         60         58           Manganese         ppm         ASTM D5185m         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         58         60         58           Manganese         ppm         ASTM D5185m         0         <1	Boron	ppm	ASTM D5185m	0	8	7	8
Manganese         ppm         ASTM D5185m         0         <1	Barium	ppm	ASTM D5185m	0	0	3	0
Magnesium         ppm         ASTM D5185m         1010         827         922         864           Calcium         ppm         ASTM D5185m         1070         931         1028         1002           Phosphorus         ppm         ASTM D5185m         1150         955         958         1018           Zinc         ppm         ASTM D5185m         1270         1123         1180         1176           Sulfur         ppm         ASTM D5185m         2060         2778         3233         2788           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         3         7           Sodium         ppm         ASTM D5185m         20         3         2         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         % ASTM D7844         >6         0.2         0.2         0.3           Nitration         Abs/cm         *ASTM D7624         >20         7.0         5.5         7.0           Sulfation         Abs/.1mm         *ASTM D7415         >3	Molybdenum	ppm	ASTM D5185m	60	58		
Calcium         ppm         ASTM D5185m         1070         931         1028         1002           Phosphorus         ppm         ASTM D5185m         1150         955         958         1018           Zinc         ppm         ASTM D5185m         1270         1123         1180         1176           Sulfur         ppm         ASTM D5185m         2060         2778         3233         2788           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         3         7           Sodium         ppm         ASTM D5185m         >20         3         2         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.2         0.2         0.3           Nitration         Abs/:mm         *ASTM D7415         >30         18.0         17.2         18.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation	Manganese	ppm	ASTM D5185m	0	<1	0	<1
Phosphorus         ppm         ASTM D5185m         1150         955         958         1018           Zinc         ppm         ASTM D5185m         1270         1123         1180         1176           Sulfur         ppm         ASTM D5185m         2060         2778         3233         2788           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         3         7           Sodium         ppm         ASTM D5185m         >20         3         2         0           Potassium         ppm         ASTM D5185m         >20         3         2         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.2         0.2         0.3           Nitration         Abs/cm         *ASTM D7415         >30         18.0         17.2         18.3           FLUID DEGRADATION         *ASTM D7414         >25         13.4         12.5         13.7	Magnesium	ppm	ASTM D5185m	1010	827	922	864
Zinc         ppm         ASTM D5185m         1270         1123         1180         1176           Sulfur         ppm         ASTM D5185m         2060         2778         3233         2788           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         3         7           Sodium         ppm         ASTM D5185m         >20         3         2         0           Potassium         ppm         ASTM D5185m         >20         3         2         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.2         0.2         0.3           Nitration         Abs/:nm         *ASTM D7624         >20         7.0         5.5         7.0           Sulfation         Abs/:nm         *ASTM D7415         >30         18.0         17.2         18.3           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/:nm         *ASTM		ppm	ASTM D5185m	1070	931	1028	1002
Sulfur         ppm         ASTM D5185m         2060         2778         3233         2788           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         3         7           Sodium         ppm         ASTM D5185m         >20         8         21           Potassium         ppm         ASTM D5185m         >20         3         2         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.2         0.2         0.3           Nitration         Abs/cm         *ASTM D7624         >20         7.0         5.5         7.0           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.2         18.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.4         12.5         13.7	Phosphorus	ppm	ASTM D5185m	1150	955	958	1018
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         3         7           Sodium         ppm         ASTM D5185m         62         8         21           Potassium         ppm         ASTM D5185m         >20         3         2         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.2         0.2         0.3           Nitration         Abs/cm         *ASTM D7624         >20         7.0         5.5         7.0           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.2         18.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.4         12.5         13.7	Zinc	ppm	ASTM D5185m	1270	1123	1180	1176
Silicon         ppm         ASTM D5185m         >25         5         3         7           Sodium         ppm         ASTM D5185m         62         8         21           Potassium         ppm         ASTM D5185m         >20         3         2         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.2         0.2         0.3           Nitration         Abs/cm         *ASTM D7624         >20         7.0         5.5         7.0           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.2         18.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.4         12.5         13.7			ASTM D5185m	2060	2778	3233	2788
Sodium         ppm         ASTM D5185m         62         8         21           Potassium         ppm         ASTM D5185m         >20         3         2         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.2         0.2         0.3           Nitration         Abs/cm         *ASTM D7624         >20         7.0         5.5         7.0           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.2         18.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.4         12.5         13.7	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         3         2         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.2         0.2         0.3           Nitration         Abs/cm         *ASTM D7624         >20         7.0         5.5         7.0           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.2         18.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.4         12.5         13.7	Silicon	ppm	ASTM D5185m	>25	5		
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.2         0.2         0.3           Nitration         Abs/cm         *ASTM D7624         >20         7.0         5.5         7.0           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.2         18.3           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.4         12.5         13.7	Sodium	ppm	ASTM D5185m		62	8	21
Soot %         %         *ASTM D7844 >6         0.2         0.2         0.3           Nitration         Abs/cm         *ASTM D7624 >20         7.0         5.5         7.0           Sulfation         Abs/.1mm         *ASTM D7415 >30         18.0         17.2         18.3           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         13.4         12.5         13.7	Potassium	ppm	ASTM D5185m	>20	3	2	0
Nitration         Abs/cm         *ASTM D7624         >20         7.0         5.5         7.0           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.2         18.3           FLUID DEGRADATION method limit/base current         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.4         12.5         13.7	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.2         18.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.4         12.5         13.7	Soot %		*ASTM D7844	>6	0.2		
FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.4     12.5     13.7	Nitration	Abs/cm	*ASTM D7624	>20	7.0	5.5	7.0
Oxidation Abs/.1mm *ASTM D7414 >25 <b>13.4</b> 12.5 13.7	Sulfation	Abs/.1mm	*ASTM D7415	>30	18.0	17.2	18.3
	FLUID DEGRA	OATION	method	limit/base	current	history1	history2
Base Number (BN)         mg KOH/g         ASTM D2896         9.8         8.1         8.3         7.9	Oxidation	Abs/.1mm	*ASTM D7414	>25	13.4	12.5	13.7
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.1	8.3	7.9



## **OIL ANALYSIS REPORT**

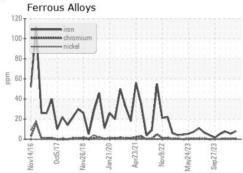


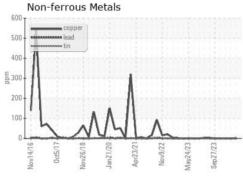


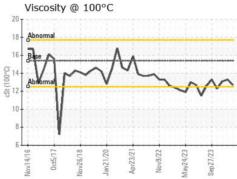
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

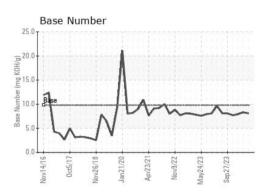
FLUID PROPE	ERTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	12.7	13.3	13.1

### **GRAPHS**













Certificate L2367

Laboratory Sample No. Lab Number **Unique Number** Test Package : FLEET

: GFL0109926 : 06077977

: 10860068

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

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Recieved : 02 Feb 2024

Diagnosed : 02 Feb 2024 Diagnostician : Wes Davis

GFL Environmental - 010 - Stockbridge

1280 Rum Creek Parkway Stockbridge, GA US 30281

Contact: JOSHUA TINKER joshuatinker@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: