

## **OIL ANALYSIS REPORT**

Sample Rating Trend



Machine Id 4620M Component Diesel Engine

PETRO CANADA DURON SHP 15W40 (36 QTS)

Sample Number         Client Info         GFL 0104289         GFL 0110155         GFL 0104289         GFL 0110155         GFL 0104289         OZ         Feb 2024         02	N SHP 15W40 (3	6 QIS)	Teb2022 Se	p2022 Aug2023 Sep20;	23 Nov2023 Jan2024 Feb20	24 Mar2024	
Sample Date         Client Into         04 Mar 2024         13 Feb 2024         02 Feb 202           Machine Age         hrs         Client Info         22509         22366         22266           Dil Age         hrs         Client Info         600         600         600           Sample Status         Client Info         Changed         NOT Changed         Control         Changed         NORMAL         NORMAL           CONTAMINATION         method         Imit/base         current         history1         history1           Fuel         WC Method         >0.2         NEG         NEG         NEG           WEAR METALS         method         imit/base         current         history1         history1           fon         ppm         ASTM 05185m         >20         0         <1         <1           Silver         ppm         ASTM 05185m         >2         0         0         0           Silver         ppm         ASTM 05185m         >2         0         0         0         0           Kindo Silsm         >15         <1         2         2         2         2         2           fon         ppm         ASTM 05185m         >15	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         22509         22366         22266           Dil Age         hrs         Client Info         600         600         600           Dil Age         hrs         Client Info         600         600         600           Sample Status         Imit/base         current         NoRMAL	Sample Number		Client Info		GFL0104289	GFL0110155	GFL0110084
Dil Age         hrs         Client Info         600         600         600           Dil Changed         Client Info         Changed         Not Changed         Not Changed         Not Changed         Not Changed         Normal.	Sample Date		Client Info		04 Mar 2024	13 Feb 2024	02 Feb 2024
Dil Changed Sample Status     Client Info     Changed NORMAL     Not Changed NORMAL     Changed NORMAL       CONTAMINATION     method     imit/base     current     history1     history2       Fuel     WC Method     >3.0     <1.0	Machine Age	hrs	Client Info		22509	22366	22266
Sample Status         NORMAL         NORMAL         NORMAL         NORMAL           CONTAMINATION         method         limit/base         current         history1         history1           Fuel         WC Method         >3.0         <1.0	Oil Age	hrs	Client Info		600	600	600
CONTAMINATION         method         limit/base         current         history1         history1           Fuel         WC Method         >3.0         <1.0	Oil Changed		Client Info		Changed	Not Changd	Changed
Fuel         WC Method         >3.0         <1.0         <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         >20         0         <1	Sample Status				NORMAL	NORMAL	NORMAL
Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         Imit/base         current         history1         history1           Iron         ppm         ASTM D5185m         >20         0         <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         0         <1	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS         method         limit/base         current         history1         history2           iron         ppm         ASTM D5185m         >90         6         9         8           Chromium         ppm         ASTM D5185m         >20         0         <1	Water		WC Method	>0.2	NEG	NEG	NEG
ron         ppm         ASTM D5185m         >90         6         9         8           Chromium         ppm         ASTM D5185m         >20         0         <1	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         0         <1         <1           Nickel         ppm         ASTM D5185m         >2         0         0         0           Titanium         ppm         ASTM D5185m         >2         0         <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel         ppm         ASTM D5185m         >2         0         0         0           Titanium         ppm         ASTM D5185m         >2         0         <1	ron	ppm	ASTM D5185m	>90	6	9	8
Titanium         ppm         ASTM D5185m         >2         0         <1         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >20         <1	Chromium	ppm	ASTM D5185m	>20	0	<1	<1
Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >20         <1	Nickel	ppm	ASTM D5185m	>2	0	0	0
Aluminum         ppm         ASTM D5185m         >20         <1         2         2           Lead         ppm         ASTM D5185m         >40         0         0         0           Copper         ppm         ASTM D5185m         >330         0         <1	Titanium	ppm	ASTM D5185m	>2	0	<1	0
Lead         ppm         ASTM D5185m         >40         0         0         0           Copper         ppm         ASTM D5185m         >330         0         <1	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper         ppm         ASTM D5185m         >330         0         <1         0           Tin         ppm         ASTM D5185m         >15         <1	Aluminum	ppm	ASTM D5185m	>20	<1	2	2
Tin         ppm         ASTM D5185m         >15         <1         <1         0           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1	Lead	ppm	ASTM D5185m	>40	0	0	0
Tin         ppm         ASTM D5185m         >15         <1         <1         <1         0           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         <1	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         <1         <1         2           Barium         ppm         ASTM D5185m         0         o         1         <1         2           Barium         ppm         ASTM D5185m         0         0         0         0         0         5           Barium         ppm         ASTM D5185m         0         0         0         0         0         0           Magnesium         ppm         ASTM D5185m         0         0         0         0         0         0           Calcium         ppm         ASTM D5185m         1010         1012         884         890         237           Calcium         ppm         ASTM D5185m         1070         1091         925         946           Phosphorus         ppm         ASTM D5185m         1270         1280         1174         1155           Sulfur         ppm         ASTM D5185m         2060         3274         2903         2937 <td></td> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;15</td> <th>&lt;1</th> <td>&lt;1</td> <td>0</td>		ppm	ASTM D5185m	>15	<1	<1	0
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1	Vanadium	ppm	ASTM D5185m		0	0	0
Boron         ppm         ASTM D5185m         0         <1         <1         2           Barium         ppm         ASTM D5185m         0         0         0         0         5           Molybdenum         ppm         ASTM D5185m         60         58         52         55           Manganese         ppm         ASTM D5185m         0         0         0         0         0           Magnesium         ppm         ASTM D5185m         1010         1012         884         890         60         58         52         946         946           Calcium         ppm         ASTM D5185m         1010         1012         884         890         60         53         53         53         53         53         53         53         54         53         54         53         54         55	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         0         0         0         0         5           Molybdenum         ppm         ASTM D5185m         60         58         52         55           Manganese         ppm         ASTM D5185m         0         0         0         0           Magnesium         ppm         ASTM D5185m         1010         1012         884         890           Calcium         ppm         ASTM D5185m         1070         1091         925         946           Phosphorus         ppm         ASTM D5185m         1070         1091         925         946           Phosphorus         ppm         ASTM D5185m         1070         1087         967         898           Zinc         ppm         ASTM D5185m         1270         1280         1174         1155           Sulfur         ppm         ASTM D5185m         2060         3274         2903         2937           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         0         1         2           INFRA-RED         method         <	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         58         52         55           Manganese         ppm         ASTM D5185m         0         0         0         0           Magnesium         ppm         ASTM D5185m         1010         1012         884         890           Calcium         ppm         ASTM D5185m         1070         1091         925         946           Phosphorus         ppm         ASTM D5185m         1070         1091         925         946           Phosphorus         ppm         ASTM D5185m         1070         1087         967         898           Zinc         ppm         ASTM D5185m         1270         1280         1174         1155           Sulfur         ppm         ASTM D5185m         2060         3274         2903         2937           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         0         1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844	Boron	ppm	ASTM D5185m	0	<1	<1	2
Maganese         ppm         ASTM D5185m         0         0         0         0         0           Magnesium         ppm         ASTM D5185m         1010         1012         884         890           Calcium         ppm         ASTM D5185m         1070         1091         925         946           Phosphorus         ppm         ASTM D5185m         1150         1087         967         898           Zinc         ppm         ASTM D5185m         1270         1280         1174         1155           Sulfur         ppm         ASTM D5185m         2060         3274         2903         2937           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         5         5           Sodium         ppm         ASTM D5185m         >20         0         1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.3         0.5         0           Nitration         Abs/cm         *ASTM D76	Barium	ppm	ASTM D5185m	0	0	0	5
Magnesium         ppm         ASTM D5185m         1010         1012         884         890           Calcium         ppm         ASTM D5185m         1070         1091         925         946           Phosphorus         ppm         ASTM D5185m         1150         1087         967         898           Zinc         ppm         ASTM D5185m         1270         1280         1174         1155           Sulfur         ppm         ASTM D5185m         2060         3274         2903         2937           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         5         5           Sodium         ppm         ASTM D5185m         >20         0         1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.3         0.5         0           Nitration         Abs/cm         *ASTM D7624         >20         6.7         8.8         4.5           Sulfation         Abs/.1mm         *ASTM D7415 <td>Molybdenum</td> <td>ppm</td> <td>ASTM D5185m</td> <td>60</td> <th>58</th> <td>52</td> <td>55</td>	Molybdenum	ppm	ASTM D5185m	60	58	52	55
Calcium         ppm         ASTM D5185m         1070         1091         925         946           Phosphorus         ppm         ASTM D5185m         1150         1087         967         898           Zinc         ppm         ASTM D5185m         1270         1280         1174         1155           Sulfur         ppm         ASTM D5185m         2060         3274         2903         2937           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         5         5           Sodium         ppm         ASTM D5185m         >20         0         1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D5185m         >20         0         1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.3         0.5         0           Nitration         Abs/cm         *ASTM D7624	Manganese	ppm	ASTM D5185m	0	0	0	0
Phosphorus         ppm         ASTM D5185m         1150         1087         967         898           Zinc         ppm         ASTM D5185m         1270         1280         1174         1155           Sulfur         ppm         ASTM D5185m         2060         3274         2903         2937           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         5         5           Sodium         ppm         ASTM D5185m         >26         0         1         2           INFRA-RED         ppm         ASTM D5185m         >20         0         1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.3         0.5         0           Nitration         Abs/cm         *ASTM D7624         >20         6.7         8.8         4.5           Sulfation         Abs/.1mm         *ASTM D7624         >20         6.7         8.8         4.5           Sulfation         Abs/.1mm         *ASTM D7624	Magnesium	ppm	ASTM D5185m	1010	1012	884	890
Zinc         ppm         ASTM D5185m         1270         1280         1174         1155           Sulfur         ppm         ASTM D5185m         2060         3274         2903         2937           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         5         5           Sodium         ppm         ASTM D5185m         >25         4         5         5           Sodium         ppm         ASTM D5185m         >20         0         1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.3         0.5         0           Nitration         Abs/cm         *ASTM D7624         >20         6.7         8.8         4.5           Sulfation         Abs/Inm         *ASTM D7415         >30         18.5         19.4         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414	Calcium	ppm	ASTM D5185m	1070	1091	925	946
Sulfur         ppm         ASTM D5185m         2060         3274         2903         2937           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         5         5           Sodium         ppm         ASTM D5185m         >25         4         5         5           Sodium         ppm         ASTM D5185m         >20         0         1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D5185m         >20         0         1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         6.7         8.8         4.5           Sulfation         Abs/cm         *ASTM D7624         >20         6.7         8.8         4.5           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         25	Phosphorus	ppm	ASTM D5185m	1150	1087	967	898
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m<>25         4         5         5           Sodium         ppm         ASTM D5185m         25         4         5         5           Sodium         ppm         ASTM D5185m         20         0         1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.3         0.5         0           Nitration         Abs/cm         *ASTM D7624         >20         6.7         8.8         4.5           Sulfation         Abs/cm         *ASTM D7624         >30         18.5         19.4         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.5         16.2         13.1	Zinc	ppm	ASTM D5185m	1270	1280	1174	1155
Silicon         ppm         ASTM D5185m         >25         4         5         5           Sodium         ppm         ASTM D5185m         3         3         0           Potassium         ppm         ASTM D5185m         >20         0         1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.3         0.5         0           Nitration         Abs/cm         *ASTM D7624         >20         6.7         8.8         4.5           Sulfation         Abs/cm         *ASTM D7624         >20         6.7         8.8         4.5           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.5         16.2         13.1	Sulfur	ppm	ASTM D5185m	2060	3274	2903	2937
Sodium         ppm         ASTM D5185m         3         3         0           Potassium         ppm         ASTM D5185m<>20         0         1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844<>6         0.3         0.5         0           Nitration         Abs/cm         *ASTM D7844<>20         6.7         8.8         4.5           Sulfation         Abs/.1mm         *ASTM D7415<>30         18.5         19.4         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414<>25         14.5         16.2         13.1	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         0         1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.3         0.5         0           Nitration         Abs/cm         *ASTM D7624         >20         6.7         8.8         4.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.5         19.4         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.5         16.2         13.1	Silicon	ppm	ASTM D5185m	>25	4	5	5
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.3         0.5         0           Nitration         Abs/cm         *ASTM D7624         >20         6.7         8.8         4.5           Sulfation         Abs/cm         *ASTM D7624         >30         18.5         19.4         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.5         16.2         13.1	Sodium	ppm	ASTM D5185m		3	3	0
Soot %         %         *ASTM D7844         >6         0.3         0.5         0           Nitration         Abs/cm         *ASTM D7624         >20         6.7         8.8         4.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.5         19.4         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.5         16.2         13.1	Potassium	ppm	ASTM D5185m	>20	0	1	2
Nitration         Abs/cm         *ASTM D7624         >20         6.7         8.8         4.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.5         19.4         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.5         16.2         13.1	INFRA-RED		method	limit/base	current	history1	history2
Nitration         Abs/cm         *ASTM D7624         >20         6.7         8.8         4.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.5         19.4         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.5         16.2         13.1	Soot %	%	*ASTM D7844	>6	0.3	0.5	0
FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.5         16.2         13.1	Nitration	Abs/cm	*ASTM D7624	>20	6.7	8.8	4.5
Oxidation         Abs/.1mm         *ASTM D7414         >25         14.5         16.2         13.1	Sulfation	Abs/.1mm		>30		19.4	17.8
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	14.5	16.2	13.1
	Base Number (BN)	mg KOH/g			8.6	7.7	8.8

### DIAGNOSIS Recommendation

Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

#### Contamination

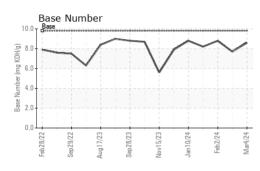
There is no indication of any contamination in the oil.

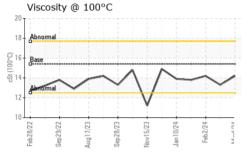
### Fluid Condition

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

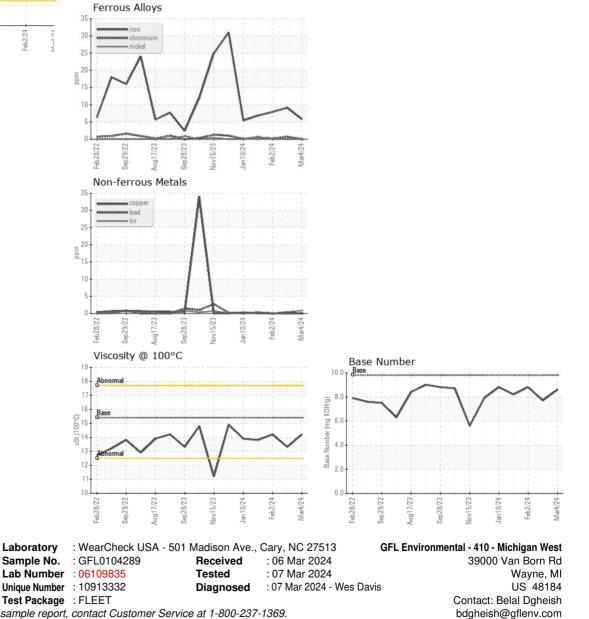


# **OIL ANALYSIS REPORT**





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
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	14.2	13.3	14.2
GRAPHS						



 Certificate 12367
 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.
 Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

F:

T: (734)714-2340