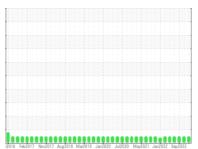


# **OIL ANALYSIS REPORT**

### Sample Rating Trend



NORMAL



# 2643C PETERBILT

Component

**Natural Gas Engine** 

PETRO CANADA DURON GEO LD 15W40 (48 QTS)

## DIAGNOSIS

#### Recommendation

The oil change at the time of sampling has been noted. 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.

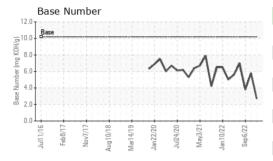
#### **Fluid Condition**

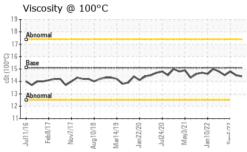
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORMATION   method   limit/bass   current   history1   GFL0052291   GSample Number   Client Info   06 Dec 2023   26 Apr 2023   06 Sep 2022   Machine Age   hrs   Client Info   20155   19064   17605   1760	48 QTS)  ### QTS   ### QTS						
Sample Date   Client Info   06 Dec 2023   26 Apr 2023   06 Sep 2022   Machine Age   hrs   Client Info   20155   19064   17605   17605   1901   1459   911   1459   911   1459   911   1459   911   1459   911   1459   911   1459   1459   911   1459   1459   911   1459	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         20155         19064         17605           Oil Age         hrs         Client Info         1091         1459         911           Oil Changed         Client Info         Changed	Sample Number		Client Info		GFL0103264	GFL0056711	GFL0052291
Oil Age         hrs         Client Info         1091         1459         911           Oil Changed Sample Status         Client Info         Changed Changed Changed Changed Changed NORMAL NORMAL NORMAL         Changed Changed Changed Changed Changed Changed Changed NORMAL NORMAL           CONTAMINATION         method Imitibase current         history1         history2           Water         WC Method         >0.1         NEG         NEG           WEAR METALS         method Imitibase current         history1         history2           Iron         ppm ASTM D5185m >50         16         6         10           Chromium         ppm ASTM D5185m >44         2         <1         2           Nickel         ppm ASTM D5185m >2         0         0         0           Juminum         ppm ASTM D5185m >3         0         0         <1           Aluminum ppm ASTM D5185m >30         10         0         11           Copper ppm ASTM D5185m >35         1         <1         <1         <1           Vanadium ppm ASTM D5185m >4         0         0         <1         <1           Vanadium ppm ASTM D5185m	Sample Date		Client Info		06 Dec 2023	26 Apr 2023	06 Sep 2022
Oil Changed Sample Status         Client Info         Changed NORMAL         NORMAL         NORMAL         CUTYPAL         Inistory 1         history 2         history 2         Med         VEAR         MEG         NEG         NEG </th <th>Machine Age</th> <th>hrs</th> <th>Client Info</th> <th></th> <th>20155</th> <th>19064</th> <th>17605</th>	Machine Age	hrs	Client Info		20155	19064	17605
NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2	Oil Age	hrs	Client Info		1091	1459	911
Water	Oil Changed		Client Info		Changed	Changed	Changed
Water         WC Method         >0.1         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >50         16         6         10           Chromium         ppm         ASTM D5185m         >2         0         0         0           Nickel         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >3         0         0         <1           Aluminum         ppm         ASTM D5185m         >3         0         0         <1           Aluminum         ppm         ASTM D5185m         >30         10         0         11           Copper         ppm         ASTM D5185m         >30         10         0         11           Copper         ppm         ASTM D5185m         >4         0         0         <1           Vanadium         ppm         ASTM D5185m         0         0         0         <1           Vanadium         ppm         ASTM D5185m         50         10         28         11	Sample Status				NORMAL	NORMAL	NORMAL
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >50         16         6         10           Chromium         ppm         ASTM D5185m         >4         2         <1         2           Nickel         ppm         ASTM D5185m         >2         0         0         0           Titanium         ppm         ASTM D5185m         >3         0         0         <1           Sliver         ppm         ASTM D5185m         >3         0         0         <1           Aluminum         ppm         ASTM D5185m         >9         3         2         3           Lead         ppm         ASTM D5185m         >9         3         2         3           Lead         ppm         ASTM D5185m         >4         0         0         <1           Copper         ppm         ASTM D5185m         0         0         0         <1           Vanadium         ppm         ASTM D5185m         0         0         0         <1           Vanadium         ppm         ASTM D5185m         50         10         28	CONTAMINAT	ION	method	limit/base	current	history1	history2
Iron	Water		WC Method	>0.1	NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >4         2         <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel         ppm         ASTM D5185m         >2         0         0         0           Titanium         ppm         ASTM D5185m         <1	Iron	ppm	ASTM D5185m	>50	16	6	10
Titanium         ppm         ASTM D5185m         <1         0         <1           Silver         ppm         ASTM D5185m         >3         0         0         <1	Chromium	ppm	ASTM D5185m	>4	2	<1	2
Silver         ppm         ASTM D5185m         >3         0         0         <1           Aluminum         ppm         ASTM D5185m         >9         3         2         3           Lead         ppm         ASTM D5185m         >30         10         0         11           Copper         ppm         ASTM D5185m         >35         1         <1         <1           Tin         ppm         ASTM D5185m         >4         0         0         <1           Vanadium         ppm         ASTM D5185m         0         0         0         <1           Vanadium         ppm         ASTM D5185m         0         0         0         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         50         10         28         11           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         50         69         51         52           Manganesium         ppm         ASTM D5185m         50         696         580	Nickel	ppm	ASTM D5185m	>2	0	0	0
Aluminum	Titanium	ppm	ASTM D5185m		<1	0	<1
Lead         ppm         ASTM D5185m         >30         10         0         11           Copper         ppm         ASTM D5185m         >35         1         <1	Silver	ppm	ASTM D5185m	>3	0	0	<1
Copper         ppm         ASTM D5185m         >95         1         <1         <1         <1         <1         Tin         ppm         ASTM D5185m         >4         0         0         <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         <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         <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	Aluminum	ppm	ASTM D5185m	>9	3	2	3
Tin         ppm         ASTM D5185m         >4         0         0         <1	Lead	ppm	ASTM D5185m	>30	10	0	11
Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         50         10         28         11           Barium         ppm         ASTM D5185m         50         69         51         52           Molybdenum         ppm         ASTM D5185m         50         69         51         52           Manganese         ppm         ASTM D5185m         50         69         51         52           Magnesium         ppm         ASTM D5185m         560         696         580         512           Calcium         ppm         ASTM D5185m         1510         1977         1617         1573           Phosphorus         ppm         ASTM D5185m         780         898         775         641           Zinc         ppm         ASTM D5185m         2040         3264         2951         2315           CONTAMINANTS         method         limit/base         current <t< td=""><td>Copper</td><td>ppm</td><td>ASTM D5185m</td><td>&gt;35</td><th>1</th><td>&lt;1</td><td>&lt;1</td></t<>	Copper	ppm	ASTM D5185m	>35	1	<1	<1
Cadmium         ppm         ASTM D5185m         0         0         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         50         10         28         11           Barium         ppm         ASTM D5185m         5         3         0         0           Molybdenum         ppm         ASTM D5185m         50         69         51         52           Manganese         ppm         ASTM D5185m         0         0         <1	Tin	ppm	ASTM D5185m	>4	0	0	<1
ADDITIVES	Vanadium	ppm	ASTM D5185m		0	0	0
Boron	Cadmium	ppm	ASTM D5185m		0	0	<1
Barium         ppm         ASTM D5185m         5         3         0         0           Molybdenum         ppm         ASTM D5185m         50         69         51         52           Manganese         ppm         ASTM D5185m         0         0         <1         <1           Magnesium         ppm         ASTM D5185m         560         696         580         512           Calcium         ppm         ASTM D5185m         1510         1977         1617         1573           Phosphorus         ppm         ASTM D5185m         780         898         775         641           Zinc         ppm         ASTM D5185m         870         1160         964         952           Sulfur         ppm         ASTM D5185m         2040         3264         2951         2315           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         12         11         9           Sodium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         50         69         51         52           Manganese         ppm         ASTM D5185m         0         0         <1         <1           Magnesium         ppm         ASTM D5185m         560         696         580         512           Calcium         ppm         ASTM D5185m         1510         1977         1617         1573           Phosphorus         ppm         ASTM D5185m         780         898         775         641           Zinc         ppm         ASTM D5185m         870         1160         964         952           Sulfur         ppm         ASTM D5185m         2040         3264         2951         2315           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         12         11         9           Sodium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         *ASTM D7624         >20 <t< td=""><td>Boron</td><td>ppm</td><td>ASTM D5185m</td><td>50</td><th>10</th><td>28</td><td>11</td></t<>	Boron	ppm	ASTM D5185m	50	10	28	11
Manganese         ppm         ASTM D5185m         0         0         <1         <1           Magnesium         ppm         ASTM D5185m         560         696         580         512           Calcium         ppm         ASTM D5185m         1510         1977         1617         1573           Phosphorus         ppm         ASTM D5185m         780         898         775         641           Zinc         ppm         ASTM D5185m         870         1160         964         952           Sulfur         ppm         ASTM D5185m         2040         3264         2951         2315           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         12         11         9           Sodium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         12.3         8.8         13.5           Sulfation         Abs/.1mm         *ASTM D	Barium	ppm	ASTM D5185m	5	3	0	0
Magnesium         ppm         ASTM D5185m         560         696         580         512           Calcium         ppm         ASTM D5185m         1510         1977         1617         1573           Phosphorus         ppm         ASTM D5185m         780         898         775         641           Zinc         ppm         ASTM D5185m         870         1160         964         952           Sulfur         ppm         ASTM D5185m         2040         3264         2951         2315           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         12         11         9           Sodium         ppm         ASTM D5185m         >+100         12         11         9           Sodium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         12.3         8.8         13.5           Sulfation         Abs/.1mm         *ASTM D7415	Molybdenum	ppm	ASTM D5185m	50	69	51	52
Calcium         ppm         ASTM D5185m         1510         1977         1617         1573           Phosphorus         ppm         ASTM D5185m         780         898         775         641           Zinc         ppm         ASTM D5185m         870         1160         964         952           Sulfur         ppm         ASTM D5185m         2040         3264         2951         2315           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         12         11         9           Sodium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         12.3         8.8         13.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         28.1         19.3         28.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm	Manganese	ppm	ASTM D5185m	0	0	<1	<1
Phosphorus         ppm         ASTM D5185m         780         898         775         641           Zinc         ppm         ASTM D5185m         870         1160         964         952           Sulfur         ppm         ASTM D5185m         2040         3264         2951         2315           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         12         11         9           Sodium         ppm         ASTM D5185m         >+100         6         8           Potassium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         12.3         8.8         13.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         28.1         19.3         28.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 <td>Magnesium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>560</td> <th>696</th> <td>580</td> <td>512</td>	Magnesium	ppm	ASTM D5185m	560	696	580	512
Zinc         ppm         ASTM D5185m         870         1160         964         952           Sulfur         ppm         ASTM D5185m         2040         3264         2951         2315           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         12         11         9           Sodium         ppm         ASTM D5185m         >+100         6         8           Potassium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0         0         0.1           Nitration         Abs/cm         *ASTM D7624         >20         12.3         8.8         13.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         28.1         19.3         28.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25	Calcium	ppm	ASTM D5185m	1510	1977	1617	1573
Sulfur         ppm         ASTM D5185m         2040         3264         2951         2315           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         12         11         9           Sodium         ppm         ASTM D5185m         >+100         6         8           Potassium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0         0         0.1           Nitration         Abs/cm         *ASTM D7624         >20         12.3         8.8         13.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         28.1         19.3         28.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         25.0         16.8         25.9	Phosphorus	ppm	ASTM D5185m	780	898	775	641
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         12         11         9           Sodium         ppm         ASTM D5185m         >20         3         0         2           Potassium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0         0         0.1           Nitration         Abs/cm         *ASTM D7624         >20         12.3         8.8         13.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         28.1         19.3         28.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         25.0         16.8         25.9	Zinc	ppm	ASTM D5185m	870	1160	964	952
Silicon         ppm         ASTM D5185m         >+100         12         11         9           Sodium         ppm         ASTM D5185m         10         6         8           Potassium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0         0         0.1           Nitration         Abs/cm         *ASTM D7624         >20         12.3         8.8         13.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         28.1         19.3         28.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         25.0         16.8         25.9	Sulfur	ppm	ASTM D5185m	2040	3264	2951	2315
Sodium         ppm         ASTM D5185m         10         6         8           Potassium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0         0         0.1           Nitration         Abs/cm         *ASTM D7624         >20         12.3         8.8         13.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         28.1         19.3         28.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         25.0         16.8         25.9	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0         0         0.1           Nitration         Abs/cm         *ASTM D7624         >20         12.3         8.8         13.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         28.1         19.3         28.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         25.0         16.8         25.9	Silicon	ppm	ASTM D5185m	>+100	12	11	9
INFRA-RED	Sodium	ppm	ASTM D5185m		10	6	8
Soot %         %         *ASTM D7844         0         0         0.1           Nitration         Abs/cm         *ASTM D7624         >20         12.3         8.8         13.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         28.1         19.3         28.3           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         25.0         16.8         25.9	Potassium	ppm	ASTM D5185m	>20	3	0	2
Nitration         Abs/cm         *ASTM D7624         >20         12.3         8.8         13.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         28.1         19.3         28.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         25.0         16.8         25.9	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         28.1         19.3         28.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         25.0         16.8         25.9	Soot %	%	*ASTM D7844		0	0	0.1
FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Absl.1mm     *ASTM D7414     >25     25.0     16.8     25.9	Nitration	Abs/cm	*ASTM D7624	>20	12.3	8.8	13.5
Oxidation Abs/.1mm *ASTM D7414 >25 <b>25.0</b> 16.8 25.9	Sulfation	Abs/.1mm	*ASTM D7415	>30	28.1	19.3	28.3
	FLUID DEGRAI	DATION	method	limit/base	current	history1	history2
<b>Base Number (BN)</b> mg KOH/g ASTM D2896 10.2 <b>2.7</b> 5.8 3.8	Oxidation	Abs/.1mm	*ASTM D7414	>25	25.0	16.8	25.9
	Base Number (BN)	mg KOH/g	ASTM D2896	10.2	2.7	5.8	3.8



## **OIL ANALYSIS REPORT**

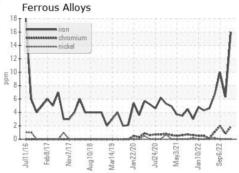


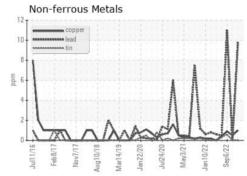


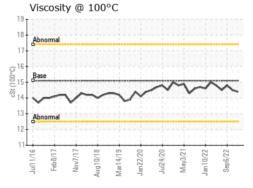
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	scalar	*Visual	>0.1	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

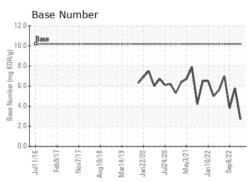
FLUID PROPE	RTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.1	14.4	14.5	14.8

## **GRAPHS**













Certificate L2367

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

: 06029099 : 10778890

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0103264 Received

: 08 Dec 2023 Diagnosed : 11 Dec 2023 Diagnostician : Don Baldridge GFL Environmental - 001 - Raleigh(CNG)

3741 Conquest Drive Garner, NC US 27529

Contact: Craig Johnson craig.johnson@gflenv.com

T: (919)662-7100

F: (919)662-7130

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)