

## **OIL ANALYSIS REPORT**

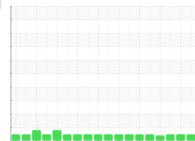
Sample Rating Trend

### NORMAL



Component Diesel Engine

PETRO CANADA DURON SHP 15W40 (11 GAL)





#### 

Sample Number         Client Info         GFL0065737         GFL0055686         GFL00544           Sample Date         i         Client Info         0         0         03 cd 202           Machine Age         hrs         Client Info         0         0         0         0           Oil Age         hrs         Client Info         0         0         0         0           Oil Age         hrs         Client Info         0         0         0         0           Sample Status         Imit base         Current         Not Changd         Not Changd         Not Changd           Sample Status         Imit base         Current         NISory         NoRMAL         NORMAL           Water         WC Method         0         41.0				11 14 11		1.1	
Sample Date         Client Info         09 Feb 2024         21 Nov 2023         03 Oct 202           Machine Age         hrs         Client Info         0         0         11592           Oil Age         hrs         Client Info         0         0         0         0           Oil Changed         Client Info         Not Changd         Nor Mall         Nor Mall           Global         WC Method         >0.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0 <td< th=""><th>SAMPLE INFOR</th><th>RMATION</th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></td<>	SAMPLE INFOR	RMATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         0         0         101592           Oil Age         hrs         Client Info         0         0         0           Oil Age         hrs         Client Info         Not Changd         Not Changd         Not Changd         Not Changd           Sample Status         Imit/base         current         History1         History1         Norskall           CONTAMINATION         method         init/base         current         History1         Norskall           Fuel         WC Method         >0.2         NEG         NEG         NEG           WeAR         WC Method         >0.2         NEG         NEG         NEG           Mistory1         method         Imit/base         current         History1         History1           Iron         ppm         ASTM D5185m<>20         <1	Sample Number					GFL0065686	GFL005445
Oil Age         hrs         Client Info         0         0         0           Oil Changed         Client Info         Not Changd         Not Changd         Not Changd         Not Changd           Sample Status         Imit/base         current         History1         History1         History1           Fuel         WC Method         >3.0         <1.0						21 Nov 2023	03 Oct 2022
Oil Changed Sample Status         Cilient Info         Not Change NORMAL           Fuel         WC Method         >3.0         <1.0	Machine Age	hrs					
Sample Status         NORMAL         NORMAL         NORMAL         NORMAL           CONTAMINATION         method         limit/base         current         history1         history1           Fuel         WC Method         >3.0         <1.0	-	hrs			-	÷	
CONTAMINATION         method         limit/base         current         history1         history1           Fuel         WC Method         >3.0         <1.0	-		Client Info			Not Changd	Not Chango
Fuel         WC Method         >3.0         <1.0         <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         history         history           Iron         ppm         ASTM D5185m         >120         5         <1	Sample Status				NORMAL	NORMAL	NORMAL
Water         WC Method         >0.2         NEG         NEG         NEG         NEG           Glycol         WC Method         Imil/base         current         history1         history1           Iron         ppm         ASTM D5165m         >120         5         <1	CONTAMINA	ΓΙΟΝ	method	limit/base	current	history1	history2
Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history1           Iron         ppm         ASTM D5185m         >120         5         <1	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS         method         limit/base         current         history1         history1           Iron         ppm         ASTM D5185m         >120         5         <1	Water		WC Method	>0.2	NEG	NEG	NEG
Iron         ppm         ASTM D5185m         >120         5         <1         17           Chromium         ppm         ASTM D5185m         >20         <1	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         <1         0         <1           Nickel         ppm         ASTM D5185m         >5         0         0         <1	WEAR METAI	LS	method	limit/base	current	history1	history
Nickel         ppm         ASTM D5185m         >5         0         0         <1           Titanium         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         <1	Iron	ppm	ASTM D5185m	>120	5	<1	17
Titanium         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         <1	Chromium	ppm	ASTM D5185m	>20	<1	0	<1
Silver         ppm         ASTM D5185m         >2         0         0         <1           Aluminum         ppm         ASTM D5185m         >20         1         <1	Nickel	ppm	ASTM D5185m	>5	0	0	<1
Aluminum         ppm         ASTM D5185m         >20         1         <1         4           Lead         ppm         ASTM D5185m         >40         0         <1	Titanium	ppm	ASTM D5185m	>2	0	0	0
Lead         ppm         ASTM D5185m         >40         0         <1         <1           Copper         ppm         ASTM D5185m         >330         1         1         3           Tin         ppm         ASTM D5185m         >15         0         0         <1	Silver	ppm	ASTM D5185m	>2	0	0	<1
Copper         ppm         ASTM D5185m         >330         1         1         3           Tin         ppm         ASTM D5185m         >15         0         0         <1	Aluminum	ppm	ASTM D5185m	>20	1	<1	4
Tin         ppm         ASTM D5185m         >15         0         0         <1           Vanadium         ppm         ASTM D5185m         0         <1	Lead	ppm	ASTM D5185m	>40	0	<1	<1
Tin         ppm         ASTM D5185m         >15         0         0         <1           Vanadium         ppm         ASTM D5185m         0         <1	Copper	ppm	ASTM D5185m	>330	1	1	3
Vanadium         ppm         ASTM D5185m         0         <1         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history           Boron         ppm         ASTM D5185m         0         2         2         3           Barium         ppm         ASTM D5185m         0         8         0         0           Molybdenum         ppm         ASTM D5185m         0         8         0         0           Magnesium         ppm         ASTM D5185m         0         0         0         0         0         2         1114           Phosphorus         ppm         ASTM D5185m         1010         858         950         954         959           Calcium         ppm         ASTM D5185m         1070         952         1077         1114           Phosphorus         ppm         ASTM D5185m         1270         1112         1241         1268           Sulfur         ppm         ASTM D5185m         2060         2846         3213         3053           CONTAMINANTS         meth	••				0	0	<1
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history1           Boron         ppm         ASTM D5185m         0         2         2         3           Barium         ppm         ASTM D5185m         0         8         0         0           Molybdenum         ppm         ASTM D5185m         60         58         59         60           Magnesium         ppm         ASTM D5185m         0         0         0         <1	Vanadium		ASTM D5185m		0	<1	0
Boron         ppm         ASTM D5185m         0         2         2         3           Barium         ppm         ASTM D5185m         0         8         0         0           Molybdenum         ppm         ASTM D5185m         60         58         59         60           Manganese         ppm         ASTM D5185m         0         0         0         <1	Cadmium				0	0	0
Barium         ppm         ASTM D5185m         0         8         0         0           Molybdenum         ppm         ASTM D5185m         60         58         59         60           Manganese         ppm         ASTM D5185m         0         0         0         <1	ADDITIVES		method	limit/base	current	history1	history
Molybdenum         ppm         ASTM D5185m         60         58         59         60           Manganese         ppm         ASTM D5185m         0         0         0         <1	Boron	ppm	ASTM D5185m	0	2	2	3
Manganese         ppm         ASTM D5185m         0         0         0         <1           Magnesium         ppm         ASTM D5185m         1010         858         950         954           Calcium         ppm         ASTM D5185m         1070         952         1077         1114           Phosphorus         ppm         ASTM D5185m         1070         952         1077         1114           Phosphorus         ppm         ASTM D5185m         1070         952         1076         969           Zinc         ppm         ASTM D5185m         1270         1112         1241         1268           Sulfur         ppm         ASTM D5185m         2060         2846         3213         3053           CONTAMINANTS         method         limit/base         current         history1         history           Silicon         ppm         ASTM D5185m         >25         6         15         5           Sodium         ppm         ASTM D5185m         >20         1         0         5           INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         *ASTM D7844	Barium	ppm	ASTM D5185m	0	8	0	0
Magnesium         ppm         ASTM D5185m         1010         858         950         954           Calcium         ppm         ASTM D5185m         1070         952         1077         1114           Phosphorus         ppm         ASTM D5185m         1170         876         1076         969           Zinc         ppm         ASTM D5185m         1270         1112         1241         1268           Sulfur         ppm         ASTM D5185m         2060         2846         3213         3053           CONTAMINANTS         method         limit/base         current         history1         history           Silicon         ppm         ASTM D5185m         >25         6         15         5           Sodium         ppm         ASTM D5185m         >20         1         0         5           INFRA-RED         method         limit/base         current         history1         history           Soot %         %         *ASTM D7624         >20         6.3         4.9         10.4           Sulfation         Abs/.1mm         *ASTM D7624         >20         6.3         4.9         10.4           Sulfation         Abs/.1mm         *ASTM D7	Molybdenum	ppm	ASTM D5185m	60	58	59	60
Calcium         ppm         ASTM D5185m         1070         952         1077         1114           Phosphorus         ppm         ASTM D5185m         1150         876         1076         969           Zinc         ppm         ASTM D5185m         1270         1112         1241         1268           Sulfur         ppm         ASTM D5185m         2060         2846         3213         3053           CONTAMINANTS         method         limit/base         current         history1         history           Silicon         ppm         ASTM D5185m         >25         6         15         5           Sodium         ppm         ASTM D5185m         >20         1         0         5           Potassium         ppm         ASTM D5185m         >20         1         0         5           INFRA-RED         method         limit/base         current         history1         history           Soot %         %         *ASTM D7624         >20         6.3         4.9         10.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.4         17.3         23.1           FLUID DEGRADATION         method         limit/b	Manganese	ppm	ASTM D5185m	0	0	0	<1
Phosphorus         ppm         ASTM D5185m         1150         876         1076         969           Zinc         ppm         ASTM D5185m         1270         1112         1241         1268           Sulfur         ppm         ASTM D5185m         2060         2846         3213         3053           CONTAMINANTS         method         limit/base         current         history1         history           Silicon         ppm         ASTM D5185m         >25         6         15         5           Sodium         ppm         ASTM D5185m         >20         1         0         5           Potassium         ppm         ASTM D5185m         >20         1         0         5           INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         *ASTM D7844         >4         0.2         0.1         1           Nitration         Abs/cm         *ASTM D7624         >20         6.3         4.9         10.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.4         17.3         23.1           FLUID DEGRADATION         method         limit/b	Magnesium	ppm	ASTM D5185m	1010	858	950	954
Zinc         ppm         ASTM D5185m         1270         1112         1241         1268           Sulfur         ppm         ASTM D5185m         2060         2846         3213         3053           CONTAMINANTS         method         limit/base         current         history1         history           Silicon         ppm         ASTM D5185m         >25         6         15         5           Sodium         ppm         ASTM D5185m         >20         1         0         5           Potassium         ppm         ASTM D5185m         >20         1         0         5           INFRA-RED         method         limit/base         current         history1         history           Soot %         %         *ASTM D7844         >4         0.2         0.1         1           Nitration         Abs/cm         *ASTM D7624         >20         6.3         4.9         10.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.4         17.3         23.1           FLUID DEGRADATION         method         limit/base         current         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414 <td>Calcium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>1070</td> <th>952</th> <td>1077</td> <td>1114</td>	Calcium	ppm	ASTM D5185m	1070	952	1077	1114
Zinc         ppm         ASTM D5185m         1270         1112         1241         1268           Sulfur         ppm         ASTM D5185m         2060         2846         3213         3053           CONTAMINANTS         method         limit/base         current         history1         history           Silicon         ppm         ASTM D5185m         >25         6         15         5           Sodium         ppm         ASTM D5185m         >20         1         0         5           Potassium         ppm         ASTM D5185m         >20         1         0         5           INFRA-RED         method         limit/base         current         history1         history           Soot %         %         *ASTM D7844         >4         0.2         0.1         1           Nitration         Abs/cm         *ASTM D7624         >20         6.3         4.9         10.4           Sulfation         Abs/.1mm         *ASTM D7615         >30         17.4         17.3         23.1           FLUID DEGRADATION         method         limit/base         current         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414 <td>Phosphorus</td> <td>ppm</td> <td>ASTM D5185m</td> <td>1150</td> <th>876</th> <td>1076</td> <td>969</td>	Phosphorus	ppm	ASTM D5185m	1150	876	1076	969
CONTAMINANTS         method         limit/base         current         history1         history           Silicon         ppm         ASTM D5185m<>25         6         15         5           Sodium         ppm         ASTM D5185m         20         1         0         5           Potassium         ppm         ASTM D5185m         20         1         0         5           INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         *ASTM D7844         >4         0.2         0.1         1           Nitration         Abs/cm         *ASTM D7624         >20         6.3         4.9         10.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.4         17.3         23.1           FLUID DEGRADATION         method         limit/base         current         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         13.4         18.4	Zinc	ppm	ASTM D5185m	1270	1112	1241	1268
Silicon         ppm         ASTM D5185m         >25         6         15         5           Sodium         ppm         ASTM D5185m         O         3         5           Potassium         ppm         ASTM D5185m         >20         1         0         5           INFRA-RED         method         limit/base         current         history1         history           Soot %         %         *ASTM D7844         >4         0.2         0.1         1           Nitration         Abs/cm         *ASTM D7624         >20         6.3         4.9         10.4           Sulfation         Abs/.1mm         *ASTM D7615         >30         17.4         17.3         23.1           FLUID DEGRADATION         method         limit/base         current         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         13.4         18.4	Sulfur		ASTM D5185m	2060	2846	3213	3053
Sodium         ppm         ASTM D5185m         0         3         5           Potassium         ppm         ASTM D5185m         >20         1         0         5           INFRA-RED         method         limit/base         current         history1         history           Soot %         %         *ASTM D7844         >4         0.2         0.1         1           Nitration         Abs/cm         *ASTM D7624         >20         6.3         4.9         10.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.4         17.3         23.1           FLUID DEGRADATION         method         limit/base         current         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         13.4         18.4	CONTAMINA	NTS	method	limit/base	current	history1	history
Potassium         ppm         ASTM D5185m         >20         1         0         5           INFRA-RED         method         limit/base         current         history1         history           Soot %         %         *ASTM D7844         >4         0.2         0.1         1           Nitration         Abs/cm         *ASTM D7624         >20         6.3         4.9         10.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.4         17.3         23.1           FLUID DEGRADATION         method         limit/base         current         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         13.4         18.4	Silicon	ppm	ASTM D5185m	>25	6	15	5
INFRA-RED         method         limit/base         current         history1         history           Soot %         %         *ASTM D7844         >4         0.2         0.1         1           Nitration         Abs/cm         *ASTM D7624         >20         6.3         4.9         10.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.4         17.3         23.1           FLUID DEGRADATION         method         limit/base         current         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         13.4         18.4	Sodium	ppm	ASTM D5185m		0	3	5
Soot %         %         *ASTM D7844         >4         0.2         0.1         1           Nitration         Abs/cm         *ASTM D7624         >20         6.3         4.9         10.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.4         17.3         23.1           FLUID DEGRADATION         method         limit/base         current         history1         history           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         13.4         18.4	Potassium	ppm	ASTM D5185m	>20	1	0	5
Nitration         Abs/cm         *ASTM D7624         >20         6.3         4.9         10.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.4         17.3         23.1           FLUID DEGRADATION         method         limit/base         current         history1         history           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         13.4         18.4	INFRA-RED		method	limit/base	current	history1	history
Sulfation         Abs/.1mm         *ASTM D7415         >30         17.4         17.3         23.1           FLUID DEGRADATION         method         limit/base         current         history1         history           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         13.4         18.4	Soot %	%	*ASTM D7844	>4	0.2	0.1	1
FLUID DEGRADATION         method         limit/base         current         history1         history           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         13.4         18.4	Nitration	Abs/cm	*ASTM D7624	>20	6.3	4.9	10.4
Oxidation Abs/.1mm *ASTM D7414 >25 <b>13.7</b> 13.4 18.4	Sulfation	Abs/.1mm	*ASTM D7415	>30	17.4	17.3	23.1
	FLUID DEGRA	DATION	method	limit/base	current	history1	history
Base Number (BN) mg KOH/g ASTM D2896 9.8 6.9 9.6 6.9	Oxidation	Abs/.1mm	*ASTM D7414	>25	13.7	13.4	18.4
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	6.9	9.6	6.9

### DIAGNOSIS Recommendation

Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

#### Contamination

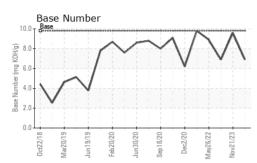
There is no indication of any contamination in the oil.

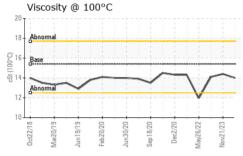
#### Fluid Condition

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

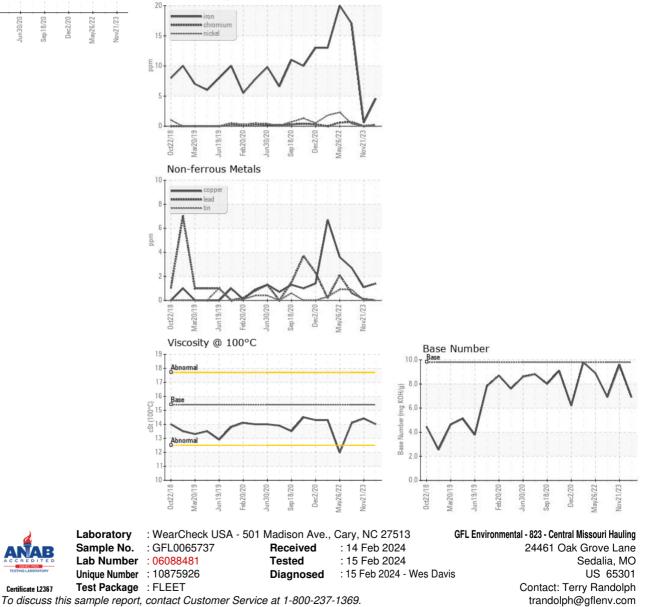


# **OIL ANALYSIS REPORT**





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	14.0	14.4	14.1
GRAPHS						
Ferrous Alloys						



Report Id: GFL823 [WUSCAR] 06088481 (Generated: 02/15/2024 10:45:03) Rev: 1

\* - 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)

Certificate L2367

Submitted By: JASON KING

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F:

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