

## **OIL ANALYSIS REPORT**

#### Sample Rating Trend

## NORMAL

#### Machine Id 10949

Component **Diesel Engine** 

Fluic

## PETRO CANADA DURON SHP 15W40 (13 G

## 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.

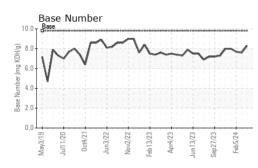
### Fluid Condition

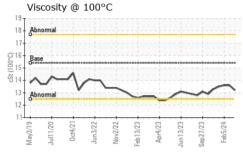
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Number         Client Info         GFL0115758         GFL0112290         GFL0119290           Sample Date         i         Client Info         14364         14166         14045           Oil Age         hrs         Client Info         14364         14166         14045           Oil Age         hrs         Client Info         596         398         277           Oil Changed         Client Info         Changed         Not Changed         Not Changed         Not Changed           Sample Status         Imit/base         Current         History1         History1         History1           Fuel         WC Method         >3.0         <1.0         <1.0         <1.0           Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         >0.2         NEG         NEG         NEG           Ornomium         ppm         ASTM 05185m         >7         7         13         9           Chromium         ppm         ASTM 05185m         >2         0         0         0           Nickel         ppm         ASTM 05185m         >15         2         2         2         2           Nicke							
Sample Number         Client Info         GFL0115758         GFL0112290         GFL0119249           Sample Date         i         Client Info         14364         14166         14045           Machine Age         hrs         Client Info         14364         14166         14045           Oil Age         hrs         Client Info         566         388         277           Oil Changed         Client Info         Sefe         388         277           Oil Changed         Client Info         Sefe         388         277           Oil Changed         Client Info         Sefe         NORMAL         NORMAL         NORMAL           CONTAMINATION         method         limit/base         current         History1         History1           Yater         WC Method         >.0         <1.0         <1.0         <1.0           Water         WC Method         >.2         0         <1         <1         <1           Nickel         ppm         ASTM 05185         >2         0         0         0         0           Nickel         ppm         ASTM 05185         >2         0         0         0         0           Silver         ppm	AL)		10000 v/2019 Jul2020	Oct2021 Jun2022 Nov202	2 Feb2023 Apr2023 Jun2023 Sep20	23 Feb2024	
Sample Date         Client Info         22 Mar 2024         20 Feb 2024         05 Feb 202           Machine Age         hrs         Client Info         14364         14166         14045           Oil Age         hrs         Client Info         S96         398         277           Oil Changed         Client Info         Changed         NOt Changed         NOt Changed         NOt Changed         NORMAL         NORMAL <t< th=""><th>SAMPLE INFOR</th><th>MATION</th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></t<>	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         14364         14166         14045           Oil Age         hrs         Client Info         596         398         277           Oil Changed         Client Info         Changed         Not Changed         Not Changed           Sample Status         Imit/base         current         History!         NorMAL         NorMAL           CONTAMINATION         method         imit/base         current         History!         Neidow           Fuel         WC Method         >3.0         <1.0	Sample Number		Client Info		GFL0115758	GFL0112290	GFL0109941
Oil Age         hrs         Client Info         596         398         277           Oil Changed         Client Info         Changed         Not Standstats	Sample Date		Client Info		22 Mar 2024	20 Feb 2024	05 Feb 2024
Coll Changed Sample Status     Client Info     Changed NORMAL     Not Changed NORMAL     Not Changed NORMAL       CONTAMINATION     method     limit/base     current     history1     history1       Fuel     WC Method     >3.0     <1.0	Machine Age	hrs	Client Info		14364	14166	14045
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		596	398	277
CONTAMINATION         method         limit/base         current         history1         history1           Fuel         WC Method         >3.0         <1.0	Oil Changed		Client Info		Changed	Not Changd	Not Changd
Fuel         WC Method         >3.0         <1.0         <1.0         <1.0         <1.0           Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         Initi/base         current         history1         history1           Iron         ppm         ASTM D5185m         >5         <1	Sample Status				NORMAL	NORMAL	NORMAL
Water         WC Method         >0.2         NEG         NEG         NEG         NEG           Glycol         WC Method         Imit/base         current         history1         history1           Iron         ppm         ASTM D5185m         >5         <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
Salycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history1           ron         ppm         ASTM D5185m         >75         7         13         9           Chromium         ppm         ASTM D5185m         >5         <1	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS         method         limit/base         current         history1         history1           ron         ppm         ASTM D5185m         >75         7         13         9           Chromium         ppm         ASTM D5185m         >5         <1	Water		WC Method	>0.2	NEG	NEG	NEG
ron         ppm         ASTM D5185m         >75         7         13         9           Chromium         ppm         ASTM D5185m         >5         <1	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >5         <1         <1         <1         <1           Nickel         ppm         ASTM D5185m         >4         0         0         0           Titanium         ppm         ASTM D5185m         >2         0         <1	WEAR METAL	.S	method	limit/base	current	history1	history2
Nickel         ppm         ASTM D5185m         >4         0         0         0           Titanium         ppm         ASTM D5185m         >2         0         <1	ron	ppm	ASTM D5185m	>75	7	13	9
Titanium         ppm         ASTM D5185m         >2         0         <1         <1           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >15         2         2         2           Lead         ppm         ASTM D5185m         >100         <1	Chromium	ppm	ASTM D5185m	>5	<1	<1	<1
Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >15         2         2         2           Lead         ppm         ASTM D5185m         >25         0         0         0           Copper         ppm         ASTM D5185m         >100         <1	Nickel	ppm	ASTM D5185m	>4	0	0	0
Attminum         ppm         ASTM D5185m         >15         2         2         2           Lead         ppm         ASTM D5185m         >25         0         0         0           Copper         ppm         ASTM D5185m         >100         <1	Titanium	ppm	ASTM D5185m	>2	0	<1	<1
ead         ppm         ASTM D5185m         >25         0         0         0           Copper         ppm         ASTM D5185m         >100         <1	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper         ppm         ASTM D5185m         >100         <1         <1         <1         <1           Vanadium         ppm         ASTM D5185m         >4         0         <1	Aluminum	ppm	ASTM D5185m	>15	2	2	2
Tin         ppm         ASTM D5185m         >4         0         <1         <1           Vanadium         ppm         ASTM D5185m         <1	_ead	ppm	ASTM D5185m	>25	0	0	0
Vanadium         ppm         ASTM D5185m         <1         <1         <1         <1         <1           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         11         14         11           Barium         ppm         ASTM D5185m         0         0         0         0           Maganese         ppm         ASTM D5185m         0         <1	Copper	ppm	ASTM D5185m	>100	<1	<1	<1
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         11         14         11           Barium         ppm         ASTM D5185m         0         0         0         0         0           Magnesium         ppm         ASTM D5185m         0         41         14         11           Magnesium         ppm         ASTM D5185m         0         41         14         11           Magnesium         ppm         ASTM D5185m         0         41         41         41           Magnesium         ppm         ASTM D5185m         1010         911         859         873           Calcium         ppm         ASTM D5185m         1070         1093         1021         1010           Phosphorus         ppm         ASTM D5185m         1270         1168         1129         1185           Sulfur         ppm         ASTM D5185m         2060         3505         2773         2931           CONTAMINANTS         method         limit/base         cu	Гin	ppm	ASTM D5185m	>4	0	<1	<1
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         11         14         11           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         62         60         59           Magnese         ppm         ASTM D5185m         0         <1	Vanadium	ppm	ASTM D5185m		<1	<1	<1
Boron         ppm         ASTM D5185m         0         11         14         11           Barium         ppm         ASTM D5185m         0         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         62         60         59           Manganese         ppm         ASTM D5185m         0         <1	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         0         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         62         60         59           Manganese         ppm         ASTM D5185m         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         62         60         59           Manganese         ppm         ASTM D5185m         0         <1	Boron	ppm	ASTM D5185m	0	11	14	11
Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         911         859         873           Calcium         ppm         ASTM D5185m         1070         1093         1021         1010           Phosphorus         ppm         ASTM D5185m         1070         1093         1021         1010           Phosphorus         ppm         ASTM D5185m         1150         987         952         974           Zinc         ppm         ASTM D5185m         1270         1168         1129         1185           Sulfur         ppm         ASTM D5185m         2060         3505         2773         2931           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         1         3           Sodium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium         ppm         ASTM D5185m         1010         911         859         873           Calcium         ppm         ASTM D5185m         1070         1093         1021         1010           Phosphorus         ppm         ASTM D5185m         1150         987         952         974           Zinc         ppm         ASTM D5185m         1270         1168         1129         1185           Sulfur         ppm         ASTM D5185m         2060         3505         2773         2931           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         1         3           Sodium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.2         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         5.5         7.0         6.1           Sulfation         Abs/.1mm         *ASTM D7415<	Molybdenum	ppm	ASTM D5185m	60	62	60	59
Calcium         ppm         ASTM D5185m         1070         1093         1021         1010           Phosphorus         ppm         ASTM D5185m         1150         987         952         974           Zinc         ppm         ASTM D5185m         1270         1168         1129         1185           Sulfur         ppm         ASTM D5185m         2060         3505         2773         2931           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         1         3           Sodium         ppm         ASTM D5185m         >25         4         1         3           Sodium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.2         0.2         0.2           Soot %         %         *ASTM D7624         >20         5.5         7.0         6.1           Sulfation         Abs/cm         *ASTM D7615         >30	Vanganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus         ppm         ASTM D5185m         1150         987         952         974           Zinc         ppm         ASTM D5185m         1270         1168         1129         1185           Sulfur         ppm         ASTM D5185m         2060         3505         2773         2931           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         1         3           Sodium         ppm         ASTM D5185m         >25         4         1         3           Potassium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.2         0.2         0.2           Soot %         %         *ASTM D7624         >20         5.5         7.0         6.1           Sulfation         Abs/cm         *ASTM D7624         >20         5.5         7.0         6.1           Sulfation         Abs/.1mm         *ASTM D7624         <	Magnesium	ppm	ASTM D5185m	1010	911	859	873
Zinc         ppm         ASTM D5185m         1270         1168         1129         1185           Sulfur         ppm         ASTM D5185m         2060         3505         2773         2931           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         1         3           Sodium         ppm         ASTM D5185m         >25         4         1         3           Sodium         ppm         ASTM D5185m         >25         4         1         3           Potassium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.2         0.2         0.2           Soot %         %         *ASTM D7624         >20         5.5         7.0         6.1           Sulfation         Abs/cm         *ASTM D7624         >20         5.5         7.0         6.1           Sulfation         Abs/.1mm         *ASTM D7415         >30	Calcium	ppm	ASTM D5185m	1070	1093	1021	1010
SulfurppmASTM D5185m2060350527732931CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25413SodiumppmASTM D5185m>25413PotassiumppmASTM D5185m>20000INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>60.20.20.2NitrationAbs/cm*ASTM D7624>205.57.06.1SulfationAbs/cm*ASTM D7624>3017.318.417.8FLUID DEGRADATION methodlimit/basecurrenthistory1history2OxidationAbs/Imm*ASTM D7414>2512.613.713.3	Phosphorus	ppm	ASTM D5185m	1150	987	952	974
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m<>25413SodiumppmASTM D5185m343PotassiumppmASTM D5185m2000INFRA-REDmethodlimit/basecurrenthistory1Soot %%*ASTM D7844>60.20.2NitrationAbs/cm*ASTM D7624>205.57.0SulfationAbs/cm*ASTM D7624>3017.318.4FLUID DEGRADATIONmethodlimit/basecurrenthistory1OxidationAbs/Imm*ASTM D7414>2512.613.713.3	Zinc	ppm	ASTM D5185m	1270	1168	1129	1185
Silicon         ppm         ASTM D5185m         >25         4         1         3           Sodium         ppm         ASTM D5185m         3         4         3           Potassium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.2         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         5.5         7.0         6.1           Sulfation         Abs/cm         *ASTM D7624         >20         5.5         7.0         6.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.3         18.4         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.6         13.7         13.3	Sulfur	ppm	ASTM D5185m	2060	3505	2773	2931
Sodium         ppm         ASTM D5185m         3         4         3           Potassium         ppm         ASTM D5185m<>20         0         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844<>6         0.2         0.2         0.2           Nitration         Abs/cm         *ASTM D7844<>20         5.5         7.0         6.1           Sulfation         Abs/.1mm         *ASTM D7415<>30         17.3         18.4         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414<>25         12.6         13.7         13.3	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         0         0         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.2         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         5.5         7.0         6.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.3         18.4         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.6         13.7         13.3	Silicon	ppm	ASTM D5185m	>25	4	1	3
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.2         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         5.5         7.0         6.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.3         18.4         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.6         13.7         13.3	Sodium	ppm	ASTM D5185m		3	4	3
Soot %         %         *ASTM D7844         >6         0.2         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         5.5         7.0         6.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.3         18.4         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.6         13.7         13.3	Potassium	ppm	ASTM D5185m	>20	0	0	0
Nitration         Abs/cm         *ASTM D7624         >20         5.5         7.0         6.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.3         18.4         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.6         13.7         13.3	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         17.3         18.4         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.6         13.7         13.3	Soot %	%	*ASTM D7844	>6	0.2	0.2	0.2
FLUID DEGRADATION       method       limit/base       current       history1       history2         Oxidation       Abs/.1mm       *ASTM D7414       >25       12.6       13.7       13.3	Nitration	Abs/cm	*ASTM D7624	>20	5.5	7.0	6.1
Oxidation Abs/.1mm *ASTM D7414 >25 <b>12.6</b> 13.7 13.3	Sulfation	Abs/.1mm	*ASTM D7415	>30	17.3	18.4	17.8
	FLUID DEGRAI	DATION	method	limit/base	current	history1	history2
Base Number (BN)         mg KOH/g         ASTM D2896         9.8         8.3         7.6         7.7	Oxidation	Abs/.1mm	*ASTM D7414	>25	12.6	13.7	13.3
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.3	7.6	7.7



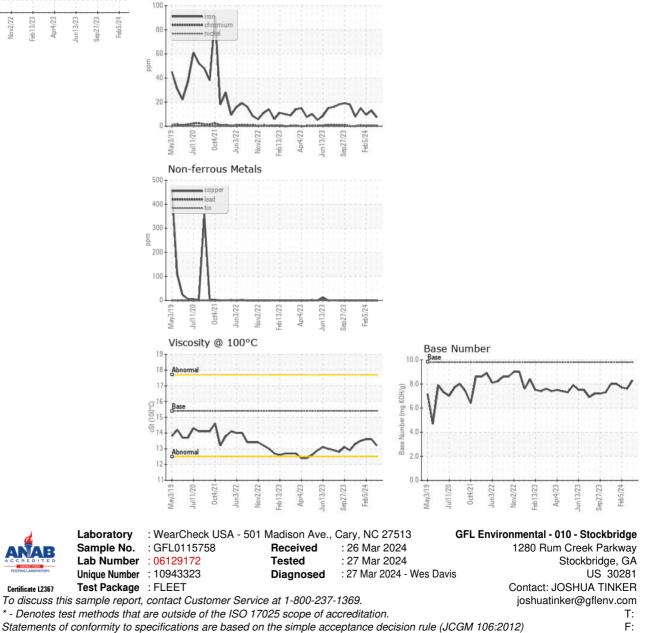
# **OIL ANALYSIS REPORT**





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	13.2	13.6	13.6
GRAPHS						

Ferrous Alloys





Submitted By: JOSHUA TINKER