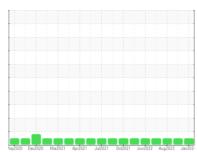


# **OIL ANALYSIS REPORT**

### **Sample Rating Trend**









825022-145

Component

Diesel Engine

PETRO CANADA DURON SHP 15W40 (--- LTR)

# 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

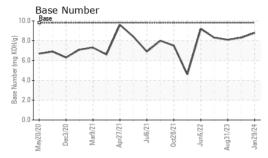
## **Fluid Condition**

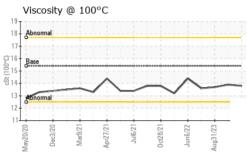
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Number   Client Info   Client Info   29 Jan 2024   GFL0098243   GFL006155   Sample Date   Client Info   29 Jan 2024   02 Nov 2023   31 Aug 202   20 Aug 2024   02 Nov 2023   31 Aug 202   21376   01 Aug 202   01 Aug 202   21376   01 Aug 202   02 Aug 202   0	N SHP 15W40 (	LIK)	1ay2020 Dec2	020 Mar2021 Apr2021	Jul2021 Oct2021 Jun2022 Aug	2023 Jan 202	
Sample Date	SAMPLE INFOR	RMATION	method	limit/base	current	history1	history2
Machine Age   hrs   Client Info   24768   24396   21376     Dit Age   hrs   Client Info   21748   24396   21376     Dit Age   hrs   Client Info   21748   24396   21376     Dit Changed   Client Info   NORMAL   NORMAL   NORMAL     NORMAL   NORMAL   NORMAL   NORMAL     NORMAL   NORMAL   NORMAL   NORMAL     NORMAL   NORMAL   NORMAL   NORMAL     CONTAMINATION   method   Imit/Dase   current   history1   history2     Mater   WC Method   >0.2   NEG   NEG   NEG   NEG     NEG   NEG   NEG   NEG   NEG   NEG   NEG     NEG   NEG   NEG   NEG   NEG   NEG   NEG     NEG   NEG   NEG   NEG   NEG   NEG   NEG   NEG   NEG   NEG     NEG   N	Sample Number		Client Info		GFL0108299	GFL0098243	GFL006155
Dil Age	Sample Date		Client Info		29 Jan 2024	02 Nov 2023	31 Aug 2023
Cilichanged   Cilient Info   Not Changd   Normal   Norm	Machine Age	hrs	Client Info		24768	24396	21376
NORMAL   NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2   history3   hi	Oil Age	hrs	Client Info		21748	24396	21376
Fuel	Oil Changed		Client Info		Not Changd	N/A	N/A
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history1           Iron         ppm         ASTM D5185m         >120         14         3         17           Chromium         ppm         ASTM D5185m         >20         <1         0         <1           Nickel         ppm         ASTM D5185m         >5         <1         <1         <1           Silver         ppm         ASTM D5185m         >2         <1         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >20         4         1         <1           Lead         ppm         ASTM D5185m         >40         0         <1         0           Copper         ppm         ASTM D5185m         >15         0         <1         0           Vanadium         ppm         ASTM D5185m         0         <1         0         <1         0	CONTAMINA	TION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS   method   limit/base   current   history1   history2	Water		WC Method	>0.2	NEG	NEG	NEG
Irron	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METAI	LS	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>120	14	3	17
Titanium	Chromium	ppm	ASTM D5185m	>20	<1	0	<1
Titanium         ppm         ASTM D5185m         >2         <1         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >20         4         1         <1           Lead         ppm         ASTM D5185m         >330         2         0         <1         0           Copper         ppm         ASTM D5185m         >330         2         0         <1         0           Vanadium         ppm         ASTM D5185m         0         <1         0         <1         0           Vanadium         ppm         ASTM D5185m         0         <1         0         <1         0           Vanadium         ppm         ASTM D5185m         0         0         <1         0         <1         0           ADDITIVES         method         Imit/base         current         history1         history2         history2           Boron         ppm         ASTM D5185m         0         0         0         0         0           Barium         ppm         ASTM D5185m         0         0         0         1	Nickel	ppm	ASTM D5185m	>5	<1	<1	<1
Silver	Titanium		ASTM D5185m	>2	<1	0	0
Lead	Silver				0		0
Lead	Aluminum		ASTM D5185m	>20		1	<1
Copper         ppm         ASTM D5185m         >330         2         0         <1         0           Tin         ppm         ASTM D5185m         >15         0         <1	Lead			>40	0	<1	0
Tin	Copper		ASTM D5185m	>330	2	0	<1
Vanadium         ppm         ASTM D5185m         0         <1         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         8         18         7           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0         0           Manganese         ppm         ASTM D5185m         0         0         <1         <1           Magnesium         ppm         ASTM D5185m         1070         1112         1079         1105           Phosphorus         ppm         ASTM D5185m         1270         1176         1276         1280           Sulfur         ppm         ASTM D5185m         2060         3281         3300         3629           CONTAMINANTS         method         limit/base         current         history1         history2           Solicon         ppm         ASTM D5185m         >20         3         <					0	<1	
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         8         18         7           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0         0           Manganese         ppm         ASTM D5185m         0         0         <1         <1           Magnesium         ppm         ASTM D5185m         1010         865         904         959           Calcium         ppm         ASTM D5185m         1070         1112         1079         1105           Phosphorus         ppm         ASTM D5185m         1270         1176         1276         1280           Sulfur         ppm         ASTM D5185m         2060         3281         3300         3629           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         225         3	Vanadium		ASTM D5185m		0	<1	0
Boron   ppm   ASTM D5185m   0   0   0   0   0   0   0   0   0					0		
Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         59         59         56           Manganese         ppm         ASTM D5185m         0         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         59         59         56           Manganese         ppm         ASTM D5185m         0         0         <1         <1           Magnesium         ppm         ASTM D5185m         1010         865         904         959           Calcium         ppm         ASTM D5185m         1070         1112         1079         1105           Phosphorus         ppm         ASTM D5185m         1270         1176         1276         1280           Zinc         ppm         ASTM D5185m         2060         3281         3300         3629           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         4           Sodium         ppm         ASTM D5185m         >20         3         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         *6 **ASTM D7844         >4         0.3         0.2         0.4           Nitration         Abs/cm         *ASTM D7624         >20	Boron	ppm	ASTM D5185m	0	8	18	7
Manganese         ppm         ASTM D5185m         0         0         <1         <1           Magnesium         ppm         ASTM D5185m         1010         865         904         959           Calcium         ppm         ASTM D5185m         1070         1112         1079         1105           Phosphorus         ppm         ASTM D5185m         1150         1011         1012         1030           Zinc         ppm         ASTM D5185m         1270         1176         1276         1280           Sulfur         ppm         ASTM D5185m         2060         3281         3300         3629           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         4           Sodium         ppm         ASTM D5185m         >0         0         3           Potassium         ppm         ASTM D5185m         >20         3         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20 <t< td=""><td>Barium</td><td>ppm</td><td>ASTM D5185m</td><td>0</td><td>0</td><td>0</td><td>0</td></t<>	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium         ppm         ASTM D5185m         1010         865         904         959           Calcium         ppm         ASTM D5185m         1070         1112         1079         1105           Phosphorus         ppm         ASTM D5185m         1150         1011         1012         1030           Zinc         ppm         ASTM D5185m         1270         1176         1276         1280           Sulfur         ppm         ASTM D5185m         2060         3281         3300         3629           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         4           Sodium         ppm         ASTM D5185m         >20         3         1         1           Potassium         ppm         ASTM D5185m         >20         3         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.3         0.2         0.4           Nitration         Abs/:nm         *ASTM D7415	Molybdenum	ppm	ASTM D5185m	60	59	59	56
Calcium         ppm         ASTM D5185m         1070         1112         1079         1105           Phosphorus         ppm         ASTM D5185m         1150         1011         1012         1030           Zinc         ppm         ASTM D5185m         1270         1176         1276         1280           Sulfur         ppm         ASTM D5185m         2060         3281         3300         3629           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         4           Sodium         ppm         ASTM D5185m         >20         3         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.3         0.2         0.4           Nitration         Abs/cm         *ASTM D7624         >20         6.4         5.9         7.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.5         17.5         19.0           FLUID DEGRADATION	•	ppm	ASTM D5185m	0	0	<1	<1
Phosphorus         ppm         ASTM D5185m         1150         1011         1012         1030           Zinc         ppm         ASTM D5185m         1270         1176         1276         1280           Sulfur         ppm         ASTM D5185m         2060         3281         3300         3629           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         4           Sodium         ppm         ASTM D5185m         >20         3         1         1           Potassium         ppm         ASTM D5185m         >20         3         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.3         0.2         0.4           Nitration         Abs/cm         *ASTM D7624         >20         6.4         5.9         7.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.5         17.5         19.0           FLUID DEGRADATION         *AST	Magnesium	ppm	ASTM D5185m	1010	865	904	959
Zinc         ppm         ASTM D5185m         1270         1176         1276         1280           Sulfur         ppm         ASTM D5185m         2060         3281         3300         3629           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         4           Sodium         ppm         ASTM D5185m         0         0         3           Potassium         ppm         ASTM D5185m         >20         3         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.3         0.2         0.4           Nitration         Abs/cm         *ASTM D7624         >20         6.4         5.9         7.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.5         17.5         19.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D74	Calcium	ppm	ASTM D5185m	1070	1112	1079	1105
Sulfur         ppm         ASTM D5185m         2060         3281         3300         3629           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         4           Sodium         ppm         ASTM D5185m         0         0         3           Potassium         ppm         ASTM D5185m         >20         3         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.3         0.2         0.4           Nitration         Abs/cm         *ASTM D7624         >20         6.4         5.9         7.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.5         17.5         19.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.2         13.4         14.7	Phosphorus	ppm	ASTM D5185m	1150	1011	1012	1030
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         4           Sodium         ppm         ASTM D5185m         0         0         3           Potassium         ppm         ASTM D5185m         >20         3         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         *ASTM D7844         >4         0.3         0.2         0.4           Nitration         Abs/cm         *ASTM D7624         >20         6.4         5.9         7.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.5         17.5         19.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.2         13.4         14.7	Zinc .	ppm	ASTM D5185m	1270	1176	1276	1280
Silicon         ppm         ASTM D5185m         >25         3         3         4           Sodium         ppm         ASTM D5185m         0         0         3           Potassium         ppm         ASTM D5185m         >20         3         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.3         0.2         0.4           Nitration         Abs/cm         *ASTM D7624         >20         6.4         5.9         7.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.5         17.5         19.0           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.2         13.4         14.7	Sulfur	ppm	ASTM D5185m	2060	3281	3300	3629
Sodium         ppm         ASTM D5185m         0         0         3           Potassium         ppm         ASTM D5185m         >20         3         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.3         0.2         0.4           Nitration         Abs/cm         *ASTM D7624         >20         6.4         5.9         7.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.5         17.5         19.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.2         13.4         14.7	CONTAMINA	NTS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         3         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.3         0.2         0.4           Nitration         Abs/cm         *ASTM D7624         >20         6.4         5.9         7.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.5         17.5         19.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.2         13.4         14.7	Silicon	ppm	ASTM D5185m	>25	3	3	4
INFRA-RED	Sodium	ppm	ASTM D5185m		0	0	3
Soot %         %         *ASTM D7844         >4         0.3         0.2         0.4           Nitration         Abs/cm         *ASTM D7624         >20         6.4         5.9         7.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.5         17.5         19.0           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.2         13.4         14.7	Potassium	ppm	ASTM D5185m	>20	3	1	1
Nitration         Abs/cm         *ASTM D7624         >20         6.4         5.9         7.7           Sulfation         Abs/.1mm         *ASTM D7615         >30         17.5         17.5         19.0           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.2         13.4         14.7	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         17.5         17.5         19.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.2         13.4         14.7	Soot %	%	*ASTM D7844	>4	0.3	0.2	0.4
Sulfation         Abs/.1mm         *ASTM D7415         >30         17.5         17.5         19.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.2         13.4         14.7	Nitration	Abs/cm	*ASTM D7624	>20	6.4	5.9	7.7
Oxidation Abs/.1mm *ASTM D7414 >25 <b>13.2</b> 13.4 14.7	Sulfation	Abs/.1mm		>30			
	FLUID DEGRA	NOITAD	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g   ASTM D2896   9.8   8.8   8.3   8.1	Oxidation	Abs/.1mm	*ASTM D7414	>25	13.2	13.4	14.7
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.8	8.3	8.1



# **OIL ANALYSIS REPORT**

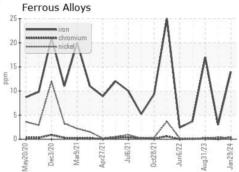


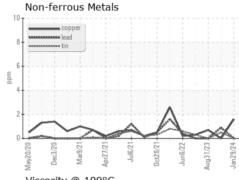


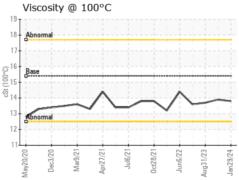
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

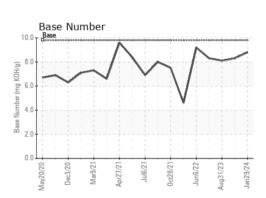
FLUID PROPE	RTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.8	13.9	13.7

# **GRAPHS**













Certificate L2367

Laboratory

Sample No. Lab Number **Unique Number** 

: GFL0108299 : 06077577 : 10859668 Test Package : FLEET

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

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Recieved : 01 Feb 2024

: 02 Feb 2024 Diagnosed Diagnostician : Wes Davis

GFL Environmental - 652 - Fredericksburg Hauling

10954 Houser Drive Fredericksburg, VA US 22408

Contact: WILLIAM MILO

wmilo@gflenv.com

T:

\* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

F: