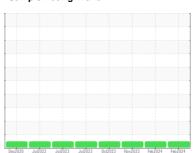


# **OIL ANALYSIS REPORT**

### **Sample Rating Trend**







922004-9921

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

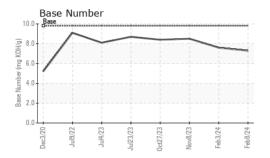
### **Fluid Condition**

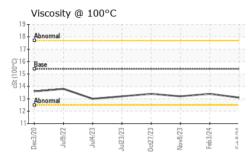
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Number   Client Info   GFL0112762   GFL0101280   GFL0091744   Sample Date   Client Info   08 Feb 2024   03 Feb 2024   08 Nov 2023   08 Achine Age   hrs   Client Info   0   0   0   0   0   0   0   0   0	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Date							
Machine Age         hrs         Client Info         29167         29124         28697           Oil Age         hrs         Client Info         0         0         0         0           Oil Changed         Client Info         Changed         Not Changed         Not Changed         NoRMAL           Sample Status         NoRMAL         NORMAL         NORMAL         NORMAL         NORMAL           VEAR         WC Method         >3.0         <1.0							
Oil Age         hrs         Client Info         0	•	hre					
Client Info   Changed NoRMAL   NORMAL NORMAL   NORMAL							
NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2	-	1113			-		
Fuel	-		Ciletit iiiio				
Fuel							
Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         Imitibase         current         history1         history2           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >120         10         8         10           Chromium         ppm         ASTM D5185m         >20         1         <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0			
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         1         <1	WEAR METAL	_S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>120	10	8	10
Titanium	Chromium	ppm	ASTM D5185m	>20	1	<1	<1
Silver         ppm         ASTM D5185m         >2         <1         0         <1           Aluminum         ppm         ASTM D5185m         >20         2         2         2           Lead         ppm         ASTM D5185m         >40         1         0         <1           Copper         ppm         ASTM D5185m         >15         <1         1         <1           Vanadium         ppm         ASTM D5185m         >15         <1         1         <1           Vanadium         ppm         ASTM D5185m         <1         0         <1         <1           Cadmium         ppm         ASTM D5185m         <1         0         <1         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         4         2         1           Boron         ppm         ASTM D5185m         0         4         2         1           Boron         ppm         ASTM D5185m         0         0         0         <1         <1           Molybdenum         ppm         ASTM D5185m         0         0         <	Nickel	ppm	ASTM D5185m	>5	3	2	2
Aluminum	Titanium	ppm	ASTM D5185m	>2	<1	<1	<1
Lead         ppm         ASTM D5185m         >40         1         0         <1           Copper         ppm         ASTM D5185m         >330         2         1         1           Tin         ppm         ASTM D5185m         >15         <1         1         <1           Vanadium         ppm         ASTM D5185m         <1         <1         <1         <1           Cadmium         ppm         ASTM D5185m         <1         0         <1         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         4         2         1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         4         2         1           ADDITIVES         method         limit/base         current         history1         history2           Barium         ppm         ASTM D5185m         0         4         2         1           Barium         ppm         ASTM D5185m         1010         907         991	Silver	ppm	ASTM D5185m	>2	<1	0	<1
Copper         ppm         ASTM D5185m         >330         2         1         1           Tin         ppm         ASTM D5185m         >15         <1	Aluminum	ppm	ASTM D5185m	>20	2	2	2
Tin	Lead	ppm	ASTM D5185m	>40	1	0	<1
Tin         ppm         ASTM D5185m         >15         <1         1         <1           Vanadium         ppm         ASTM D5185m         <1         <1         <1         <1           Cadmium         ppm         ASTM D5185m         <1         0         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         4         2         1           Barium         ppm         ASTM D5185m         0         0         0         <1	Copper	ppm	ASTM D5185m	>330	2	1	1
Vanadium         ppm         ASTM D5185m         <1         <1         <1           Cadmium         ppm         ASTM D5185m         <1         0         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         4         2         1           Barium         ppm         ASTM D5185m         0         0         0         <1           Molybdenum         ppm         ASTM D5185m         0         58         60         60           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1070         1000         1104         1035           Phosphorus         ppm         ASTM D5185m         1070         1000         1104         1035           Phosphorus         ppm         ASTM D5185m         1270         1158         1291         1215           Sulfur         ppm         ASTM D5185m         2060         3071         3191         3008           CONTAMINANTS         method         limit/base         current         history1<			ASTM D5185m	>15	<1	1	<1
Cadmium         ppm         ASTM D5185m         <1         0         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         4         2         1           Barium         ppm         ASTM D5185m         0         0         0         <1           Molybdenum         ppm         ASTM D5185m         0         <1         <1         <1           Molybdenum         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         907         991         930           Calcium         ppm         ASTM D5185m         1070         1000         1104         1035           Phosphorus         ppm         ASTM D5185m         1150         918         1070         1038           Zinc         ppm         ASTM D5185m         1270         1158         1291         1215           Sulfur         ppm         ASTM D5185m         2060         3071         3191         3008           CONTAMINANTS         method         limit/base         current	Vanadium		ASTM D5185m		<1	<1	<1
Boron	Cadmium				<1	0	<1
Barium         ppm         ASTM D5185m         0         0         0         <1           Molybdenum         ppm         ASTM D5185m         60         58         60         60           Manganese         ppm         ASTM D5185m         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         58         60         60           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         907         991         930           Calcium         ppm         ASTM D5185m         1070         1000         1104         1035           Phosphorus         ppm         ASTM D5185m         1150         918         1070         1038           Zinc         ppm         ASTM D5185m         1270         1158         1291         1215           Sulfur         ppm         ASTM D5185m         2060         3071         3191         3008           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         5         4           Sodium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         *ASTM D7844         >4	Boron	ppm	ASTM D5185m	0	4	2	1
Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         907         991         930           Calcium         ppm         ASTM D5185m         1070         1000         1104         1035           Phosphorus         ppm         ASTM D5185m         1150         918         1070         1038           Zinc         ppm         ASTM D5185m         1270         1158         1291         1215           Sulfur         ppm         ASTM D5185m         2060         3071         3191         3008           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         5         4           Sodium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.3         0.3         0.2           Nitration         Abs/cm         *ASTM D7	Barium	ppm	ASTM D5185m	0	0	0	<1
Magnesium         ppm         ASTM D5185m         1010         907         991         930           Calcium         ppm         ASTM D5185m         1070         1000         1104         1035           Phosphorus         ppm         ASTM D5185m         1150         918         1070         1038           Zinc         ppm         ASTM D5185m         1270         1158         1291         1215           Sulfur         ppm         ASTM D5185m         2060         3071         3191         3008           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         5         4           Sodium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         "ASTM D7624         >20         9.0         7.8         7.4           Sulfation         Abs/:nm         "ASTM D7415         >30         20.4         18.5         18.4           FLUID DEGRADATION         "ASTM D7414         >	Molybdenum	ppm	ASTM D5185m	60	58	60	60
Calcium         ppm         ASTM D5185m         1070         1000         1104         1035           Phosphorus         ppm         ASTM D5185m         1150         918         1070         1038           Zinc         ppm         ASTM D5185m         1270         1158         1291         1215           Sulfur         ppm         ASTM D5185m         2060         3071         3191         3008           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         5         4           Sodium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.3         0.3         0.2           Nitration         Abs/cm         *ASTM D7624         >20         9.0         7.8         7.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.4         18.5         18.4           FLUID DEGRADATION         <	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus         ppm         ASTM D5185m         1150         918         1070         1038           Zinc         ppm         ASTM D5185m         1270         1158         1291         1215           Sulfur         ppm         ASTM D5185m         2060         3071         3191         3008           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         5         4           Sodium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.3         0.3         0.2           Nitration         Abs/cm         *ASTM D7624         >20         9.0         7.8         7.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.4         18.5         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm	Magnesium	ppm	ASTM D5185m	1010	907	991	930
Zinc         ppm         ASTM D5185m         1270         1158         1291         1215           Sulfur         ppm         ASTM D5185m         2060         3071         3191         3008           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         5         4           Sodium         ppm         ASTM D5185m         0         3         0           Potassium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.3         0.3         0.2           Nitration         Abs/cm         *ASTM D7624         >20         9.0         7.8         7.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.4         18.5         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414	Calcium	ppm	ASTM D5185m	1070	1000	1104	1035
Zinc         ppm         ASTM D5185m         1270         1158         1291         1215           Sulfur         ppm         ASTM D5185m         2060         3071         3191         3008           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         5         4           Sodium         ppm         ASTM D5185m         0         3         0           Potassium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.3         0.3         0.2           Nitration         Abs/cm         *ASTM D7624         >20         9.0         7.8         7.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.4         18.5         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414	Phosphorus	ppm	ASTM D5185m	1150	918	1070	1038
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         5         4           Sodium         ppm         ASTM D5185m         0         3         0           Potassium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.3         0.3         0.2           Nitration         Abs/cm         *ASTM D7624         >20         9.0         7.8         7.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.4         18.5         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         17.6         15.0         14.8		ppm	ASTM D5185m	1270	1158	1291	1215
Silicon         ppm         ASTM D5185m         >25         5         5         4           Sodium         ppm         ASTM D5185m         0         3         0           Potassium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.3         0.3         0.2           Nitration         Abs/cm         *ASTM D7624         >20         9.0         7.8         7.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.4         18.5         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         17.6         15.0         14.8	Sulfur	ppm	ASTM D5185m	2060	3071	3191	3008
Sodium         ppm         ASTM D5185m         0         3         0           Potassium         ppm         ASTM D5185m         >20         3         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.3         0.3         0.2           Nitration         Abs/cm         *ASTM D7624         >20         9.0         7.8         7.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.4         18.5         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         17.6         15.0         14.8	CONTAMINAN	NTS	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         >4         0.3         0.3         0.2           Nitration         Abs/cm         *ASTM D7624         >20         9.0         7.8         7.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.4         18.5         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         17.6         15.0         14.8	Silicon	ppm	ASTM D5185m	>25	5	5	4
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.3         0.3         0.2           Nitration         Abs/cm         *ASTM D7624         >20         9.0         7.8         7.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.4         18.5         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         17.6         15.0         14.8	Sodium	ppm	ASTM D5185m		0	3	0
Soot %         %         *ASTM D7844 >4         0.3         0.3         0.2           Nitration         Abs/cm         *ASTM D7624 >20         9.0         7.8         7.4           Sulfation         Abs/.1mm         *ASTM D7415 >30         20.4         18.5         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         17.6         15.0         14.8	Potassium	ppm	ASTM D5185m	>20	3	0	2
Nitration         Abs/cm         *ASTM D7624         >20         9.0         7.8         7.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.4         18.5         18.4           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         17.6         15.0         14.8	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         20.4         18.5         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         17.6         15.0         14.8	Soot %	%	*ASTM D7844	>4	0.3	0.3	0.2
Sulfation         Abs/.1mm         *ASTM D7415         >30         20.4         18.5         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         17.6         15.0         14.8	Nitration	Abs/cm	*ASTM D7624	>20	9.0	7.8	7.4
Oxidation Abs/.1mm *ASTM D7414 >25 <b>17.6</b> 15.0 14.8				>30		18.5	
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	17.6	15.0	14.8
	Base Number (BN)	mg KOH/g			7.3	7.6	8.5



# **OIL ANALYSIS REPORT**

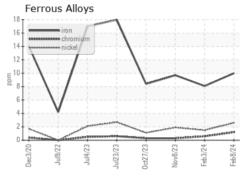


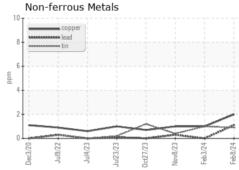


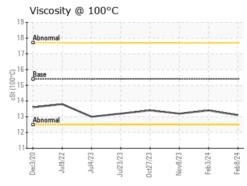
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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

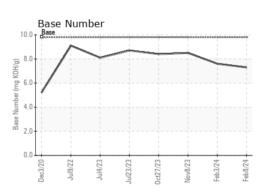
FLUID PROPERTIES		method				history2	
Visc @ 100°C	cSt	ASTM D445	15.4	13.1	13.4	13.2	

## **GRAPHS**













Certificate L2367

Laboratory Sample No.

Test Package : FLEET

: GFL0112762 Lab Number : 06092207 Unique Number : 10885060

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 16 Feb 2024 **Tested** : 19 Feb 2024

Diagnosed : 19 Feb 2024 - Wes Davis

GFL Environmental - 654 - Richmond Hauling

11800 Lewis Road Chester, VA US 23831

Contact: Jimmy Mayes jmayes@gflenv.com

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)

T:

F: