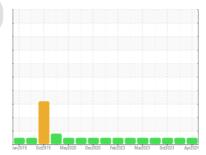


# **OIL ANALYSIS REPORT**

Sample Rating Trend



NORMAL



Machine Id 921039-260311

Component

**Diesel Engine** 

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

## 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

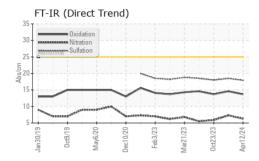
## **Fluid Condition**

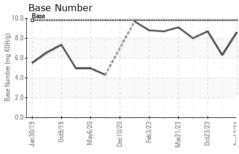
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

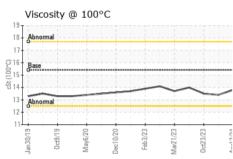
SAMPLE INFORMATION   method   limit/base   current   history1   history2	AAL)		Jan2019 UC	2010 May2020 Dec20	002023 Wal2023 0020	es Apreven	
Sample Date	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age         mls         Client Info         371767         371767         371767         371767         371767         371767         24086         0	Sample Number		Client Info		GFL0104977	GFL0104850	GFL0088202
Oil Age         mls         Client Info         371767         24086         0           Oil Changed         Client Info         N/A         Changed         Not Changed           Sample Status         Contanged         Client Info         N/A         Changed         Not Changed           Eval         WC Method         >5         <1.0	Sample Date		Client Info		12 Apr 2024	24 Jan 2024	23 Oct 2023
Oil Changed Sample Status         Client Info NoRMAL         N/A NORMAL         Changed NORMAL NORMAL         Not Changed NoRMAL         Not Changed NoE         No	Machine Age	mls	Client Info		-	371767	371767
Sample Status	Oil Age	mls	Client Info		371767	24086	0
Fuel	Oil Changed		Client Info		N/A	Changed	Not Changd
Fuel   WC Method   S5	Sample Status				NORMAL	NORMAL	NORMAL
Water Glycol         WC Method WC Method         >0.2         NEG NEG         NEG NEG         NEG NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >110         36         35         15           Chromium         ppm         ASTM D5185m         >4         <1         1         <1           Nickel         ppm         ASTM D5185m         >2         0         <1         <1           Silver         ppm         ASTM D5185m         >2         0         <1         0           Aluminum         ppm         ASTM D5185m         >2         0         <1         0           Aluminum         ppm         ASTM D5185m         >25         2         5         2           Lead         ppm         ASTM D5185m         >45         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
Second   WC Method   NEG   NEG   NEG	Fuel		WC Method	>5	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >4         <1         1         <1           Nickel         ppm         ASTM D5185m         >2         0         <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel         ppm         ASTM D5185m         >2         0         <1         <1           Titanium         ppm         ASTM D5185m         0         0         0           Silver         ppm         ASTM D5185m         >2         0         <1	Iron	ppm	ASTM D5185m	>110	36	35	15
Titanium         ppm         ASTM D5185m         0         0         0           Silver         ppm         ASTM D5185m         >2         0         <1         0           Aluminum         ppm         ASTM D5185m         >25         2         5         2           Lead         ppm         ASTM D5185m         >45         <1         <1         1           Copper         ppm         ASTM D5185m         >85         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1	Chromium	ppm	ASTM D5185m	>4	<1	1	<1
Silver         ppm         ASTM D5185m         >2         0         <1	Nickel	ppm	ASTM D5185m	>2	0	<1	<1
Aluminum	Titanium	ppm	ASTM D5185m		0	0	0
Lead	Silver	ppm	ASTM D5185m	>2	0	<1	0
Copper         ppm         ASTM D5185m         >85         <1	Aluminum	ppm	ASTM D5185m	>25	2	5	2
Tin         ppm         ASTM D5185m         >4         <1	Lead	ppm	ASTM D5185m	>45	<1	<1	1
Vanadium         ppm         ASTM D5185m         <1	Copper	ppm	ASTM D5185m	>85	<1	<1	<1
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0         10         11           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         <1	Tin	ppm	ASTM D5185m	>4	<1	<1	<1
ADDITIVES	Vanadium	ppm	ASTM D5185m		<1	0	0
Boron         ppm         ASTM D5185m         0         0         10         11           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         58         55         50           Manganese         ppm         ASTM D5185m         0         <1	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         58         55         50           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         958         880         813           Calcium         ppm         ASTM D5185m         1070         1091         1059         974           Phosphorus         ppm         ASTM D5185m         1150         1049         1003         989           Zinc         ppm         ASTM D5185m         1270         1203         1264         1125           Sulfur         ppm         ASTM D5185m         2060         3575         3011         2691           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         6         7         5           Sodium         ppm         ASTM D5185m         12         17         13           Potassium         ppm         ASTM D5185m         20 </th <th>ADDITIVES</th> <th></th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         58         55         50           Manganese         ppm         ASTM D5185m         0         <1	Boron	ppm	ASTM D5185m	0	0	10	11
Manganese         ppm         ASTM D5185m         0         <1	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium         ppm         ASTM D5185m         1010         958         880         813           Calcium         ppm         ASTM D5185m         1070         1091         1059         974           Phosphorus         ppm         ASTM D5185m         1150         1049         1003         989           Zinc         ppm         ASTM D5185m         1270         1203         1264         1125           Sulfur         ppm         ASTM D5185m         2060         3575         3011         2691           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         6         7         5           Sodium         ppm         ASTM D5185m         >20         0         2         3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.3         0.4         0.3           Nitration         Abs/cm         *ASTM D7415         >30         17.9         18.5         18.0           FLUID DEGRADATION         *ASTM D7414 <th>Molybdenum</th> <th>ppm</th> <th>ASTM D5185m</th> <th>60</th> <th>58</th> <th>55</th> <th>50</th>	Molybdenum	ppm	ASTM D5185m	60	58	55	50
Calcium         ppm         ASTM D5185m         1070         1091         1059         974           Phosphorus         ppm         ASTM D5185m         1150         1049         1003         989           Zinc         ppm         ASTM D5185m         1270         1203         1264         1125           Sulfur         ppm         ASTM D5185m         2060         3575         3011         2691           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         6         7         5           Sodium         ppm         ASTM D5185m         >20         0         2         3           Potassium         ppm         ASTM D5185m         >20         0         2         3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         6.3         7.3         5.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         18.5         18.0           FLUID DEGRADATION         limit/	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus         ppm         ASTM D5185m         1150         1049         1003         989           Zinc         ppm         ASTM D5185m         1270         1203         1264         1125           Sulfur         ppm         ASTM D5185m         2060         3575         3011         2691           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         6         7         5           Sodium         ppm         ASTM D5185m         >30         6         7         5           Sodium         ppm         ASTM D5185m         >20         0         2         3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         6.3         7.3         5.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         18.5         18.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *	Magnesium	ppm	ASTM D5185m	1010	958	880	813
Zinc         ppm         ASTM D5185m         1270         1203         1264         1125           Sulfur         ppm         ASTM D5185m         2060         3575         3011         2691           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         6         7         5           Sodium         ppm         ASTM D5185m         >30         6         7         13           Potassium         ppm         ASTM D5185m         >20         0         2         3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >3         0.3         0.4         0.3           Nitration         Abs/cm         *ASTM D7624         >20         6.3         7.3         5.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         18.5         18.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm	Calcium	ppm	ASTM D5185m	1070	1091	1059	974
Sulfur         ppm         ASTM D5185m         2060         3575         3011         2691           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         6         7         5           Sodium         ppm         ASTM D5185m         >20         12         17         13           Potassium         ppm         ASTM D5185m         >20         0         2         3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.3         0.4         0.3           Nitration         Abs/cm         *ASTM D7624         >20         6.3         7.3         5.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         18.5         18.0           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         14.6         13.7	Phosphorus	ppm	ASTM D5185m	1150	1049	1003	989
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         6         7         5           Sodium         ppm         ASTM D5185m         12         17         13           Potassium         ppm         ASTM D5185m         >20         0         2         3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.3         0.4         0.3           Nitration         Abs/cm         *ASTM D7624         >20         6.3         7.3         5.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         18.5         18.0           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         14.6         13.7	Zinc	ppm	ASTM D5185m	1270	1203	1264	1125
Silicon         ppm         ASTM D5185m         >30         6         7         5           Sodium         ppm         ASTM D5185m         12         17         13           Potassium         ppm         ASTM D5185m         >20         0         2         3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.3         0.4         0.3           Nitration         Abs/cm         *ASTM D7624         >20         6.3         7.3         5.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         18.5         18.0           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         14.6         13.7	Sulfur	ppm	ASTM D5185m	2060	3575	3011	2691
Sodium         ppm         ASTM D5185m         12         17         13           Potassium         ppm         ASTM D5185m         >20         0         2         3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.3         0.4         0.3           Nitration         Abs/cm         *ASTM D7624         >20         6.3         7.3         5.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         18.5         18.0           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         14.6         13.7	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         0         2         3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.3         0.4         0.3           Nitration         Abs/cm         *ASTM D7624         >20         6.3         7.3         5.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         18.5         18.0           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         14.6         13.7	Silicon	ppm	ASTM D5185m	>30	6	7	5
INFRA-RED	Sodium	ppm	ASTM D5185m		12	17	13
Soot %         %         *ASTM D7844         >3         0.3         0.4         0.3           Nitration         Abs/cm         *ASTM D7624         >20         6.3         7.3         5.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         18.5         18.0           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         14.6         13.7	Potassium	ppm	ASTM D5185m	>20	0	2	3
Nitration         Abs/cm         *ASTM D7624         >20         6.3         7.3         5.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         18.5         18.0           FLUID DEGRADATION method limit/base current         bistory1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         14.6         13.7	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         18.5         18.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         14.6         13.7	Soot %	%	*ASTM D7844	>3	0.3	0.4	0.3
FLUID DEGRADATION method limit/base current history1 history2  Oxidation Abs/.1mm *ASTM D7414 >25 13.7 14.6 13.7	Nitration	Abs/cm	*ASTM D7624	>20	6.3	7.3	5.9
Oxidation Abs/.1mm *ASTM D7414 >25 <b>13.7</b> 14.6 13.7	Sulfation	Abs/.1mm	*ASTM D7415	>30	17.9	18.5	18.0
	FLUID DEGRADATION method limit/base current history1 history2						
Base Number (BN)         mg KOH/g         ASTM D2896         9.8         8.6         6.3         8.7	Oxidation	Abs/.1mm	*ASTM D7414	>25	13.7	14.6	13.7
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.6	6.3	8.7



# **OIL ANALYSIS REPORT**



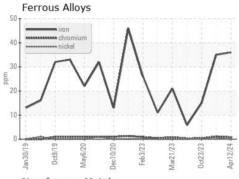


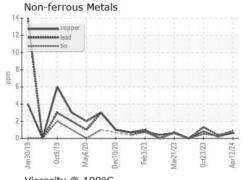


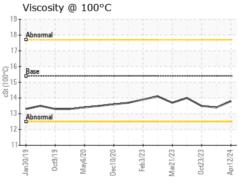
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

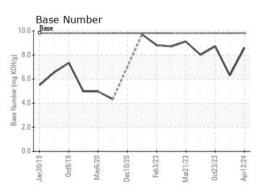
FLUID PROP	ERIIES	metnoa	ilmit/base	current	nistory i	nistory2
Visc @ 100°C	cSt	ASTM D445	15.4	13.8	13.4	13.5

### **GRAPHS**













Laboratory Sample No.

Lab Number : 06154105 Unique Number : 10989528

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0104977

Received : 19 Apr 2024 **Tested** Diagnosed

: 22 Apr 2024 : 22 Apr 2024 - Wes Davis

3700 West 7th Street Joplin, MO

GFL Environmental - 820 - Joplin Hauling

US 64801 Contact: James Jarrett jjarrett@gflenv.com T: (417)310-2802

Certificate 12367

Test Package : FLEET 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)