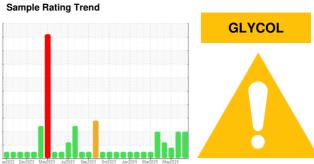


# **OIL ANALYSIS REPORT**

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Machine Id
711011
Component
Diesel Engine

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

## DIAGNOSIS

#### Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

#### Wear

The aluminum level is abnormal. All other component wear rates are normal.

### Contamination

Sodium and/or potassium levels are high. Test for glycol is negative.

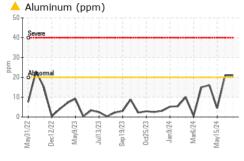
#### **Fluid Condition**

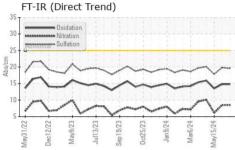
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

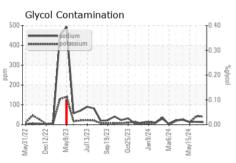
Sample Date	AL)		ayzuzz Deczuz	sz mayzoza Julzoza sep	2023 UCC2023 Jan2024 Mar2024	May2024	
Sample Date	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         9101         9125         8829           Oil Age         hrs         Client Info         150         600         150           Oil Changed         Client Info         Not Changed         ABNORMAL         Mol Changed           Sample Status         BANORMAL         MARGINAL         MARGINAL           CONTAMINATION         method         Imitibase         current         history1         history2           Fuel         WC Method         >5         <1.0	Sample Number		Client Info		GFL0121486	GFL0121539	GFL0105229
Oil Age         hrs         Client Info         150         600         150           Oil Changed Sample Status         Client Info         Not Changd ABNORMAL         AND Changd ABNORMAL         Not Changd ABNORMAL         MARGINAL           CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >5         <1.0         <1.0         ▲ 2.4           Water         WC Method         >5         <1.0         <1.0         ▲ 2.6           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         17         17         5           Chromium         ppm         ASTM D5185m         >20         1         1         <1         1           Nickel         ppm         ASTM D5185m         >20         1         1         <1         0           Silver         ppm         ASTM D5185m         >3         <1         <1         <1         0           Silver         ppm         ASTM D5185m         >30         2         2         <1         <1         0 <th< td=""><td>Sample Date</td><td></td><td>Client Info</td><td></td><td>20 Jun 2024</td><td>20 Jun 2024</td><td>15 May 2024</td></th<>	Sample Date		Client Info		20 Jun 2024	20 Jun 2024	15 May 2024
Colient Info	Machine Age	hrs	Client Info		9101	9125	8829
ABNORMAL   ABNORMAL   ABNORMAL   CONTAMINATION   method   limit/base   current   history1   history2	Oil Age	hrs	Client Info		150	600	150
Fuel	Oil Changed		Client Info		Not Changd	Changed	Not Changd
Fuel	Sample Status				ABNORMAL	ABNORMAL	MARGINAL
Water         WC Method         >0.2         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         17         17         5           Chromium         ppm         ASTM D5185m         >20         1         1         <1           Nickel         ppm         ASTM D5185m         >4         <1         <1         0           Silver         ppm         ASTM D5185m         >4         <1         <1         <1           Aluminum         ppm         ASTM D5185m         >3         <1         <1         <1           Aluminum         ppm         ASTM D5185m         >40         <1         <1         <1           Lead         ppm         ASTM D5185m         >40         <1         <1         <1         <0           Copper         ppm         ASTM D5185m         >40         <1         <1         <1         <0           Cadamium         ppm         ASTM D5185m         >15         <1         <1         <1         <0           ADDITIVES         method         limit/base	CONTAMINATI	ON	method	limit/base	current	history1	history2
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         17         17         5           Chromium         ppm         ASTM D5185m         >20         1         1         <1	Fuel		WC Method	>5	<1.0	<1.0	<u>2.4</u>
Iron	Water		WC Method	>0.2	NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         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         <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	WEAR METALS	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	17	17	5
STIM D5185m   STM D5185m   STM D5185m   STM D5185m   STM D5185m   STM D5185m   STM D5185m   SZM D5185m   S	Chromium	ppm	ASTM D5185m	>20	1	1	<1
Silver	Nickel	ppm	ASTM D5185m	>4	<1	<1	0
Aluminum   ppm   ASTM D5185m   >20	Titanium	ppm	ASTM D5185m		<1	<1	0
Lead         ppm         ASTM D5185m         >40         <1         <1         0           Copper         ppm         ASTM D5185m         >330         2         2         <1           Tin         ppm         ASTM D5185m         >15         <1         <1         0           Vanadium         ppm         ASTM D5185m         <1         <1         0           Cadmium         ppm         ASTM D5185m         <1         <1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0         0         0           Barium         ppm         ASTM D5185m         0         1         1         0           Molybdenum         ppm         ASTM D5185m         0         1         1         0           Molybdenum         ppm         ASTM D5185m         0         1         1         <1         <1           Magnesium         ppm         ASTM D5185m         0         1         1         <1         <1         <1           Calcium         ppm         ASTM D5185m         1070         1032	Silver	ppm	ASTM D5185m	>3	<1	<1	<1
Copper         ppm         ASTM D5185m         >330         2         2         <1         0           Vanadium         ppm         ASTM D5185m         >15         <1	Aluminum	ppm	ASTM D5185m	>20	<u>^</u> 21	<u>^</u> 21	4
Tin ppm ASTM D5185m > 15 <1 <1 0 Vanadium ppm ASTM D5185m	Lead	ppm	ASTM D5185m	>40	<1	<1	0
Vanadium         ppm         ASTM D5185m         <1         <1         0           Cadmium         ppm         ASTM D5185m         <1         <1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0         0         0           Barium         ppm         ASTM D5185m         0         1         1         0           Molybdenum         ppm         ASTM D5185m         0         1         1         0           Manganese         ppm         ASTM D5185m         0         1         1         <1           Magnesium         ppm         ASTM D5185m         1010         879         880         935           Calcium         ppm         ASTM D5185m         1070         1032         1027         1042           Phosphorus         ppm         ASTM D5185m         1270         1218         1211         1230           Sulfur         ppm         ASTM D5185m         2060         3052         3029         3610           CONTAMINANTS         method         limit/base         current         history1	Copper	ppm	ASTM D5185m	>330	2	2	<1
Cadmium         ppm         ASTM D5185m         <1         <1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0         0         0           Barium         ppm         ASTM D5185m         0         1         1         0           Molybdenum         ppm         ASTM D5185m         60         57         58         56           Manganese         ppm         ASTM D5185m         0         1         1         <1	Tin	ppm	ASTM D5185m	>15	<1	<1	0
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0         0         0           Barium         ppm         ASTM D5185m         0         1         1         0           Molybdenum         ppm         ASTM D5185m         0         1         1         0           Magnese         ppm         ASTM D5185m         0         1         1         <1	Vanadium	ppm	ASTM D5185m		<1	<1	0
Boron	Cadmium	ppm	ASTM D5185m		<1	<1	0
Barium         ppm         ASTM D5185m         0         1         1         0           Molybdenum         ppm         ASTM D5185m         60         57         58         56           Manganese         ppm         ASTM D5185m         0         1         1         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         57         58         56           Manganese         ppm         ASTM D5185m         0         1         1         <1	Boron	ppm	ASTM D5185m	0	0	0	0
Manganese         ppm         ASTM D5185m         0         1         1         <1           Magnesium         ppm         ASTM D5185m         1010         879         880         935           Calcium         ppm         ASTM D5185m         1070         1032         1027         1042           Phosphorus         ppm         ASTM D5185m         1150         1052         1048         1020           Zinc         ppm         ASTM D5185m         1270         1218         1211         1230           Sulfur         ppm         ASTM D5185m         2060         3052         3029         3610           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         6         6         3           Sodium         ppm         ASTM D5185m         >20         42         41         12           Glycol         %         *ASTM D5185m         >20         NEG         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624	Barium	ppm	ASTM D5185m	0	1	1	0
Magnesium         ppm         ASTM D5185m         1010         879         880         935           Calcium         ppm         ASTM D5185m         1070         1032         1027         1042           Phosphorus         ppm         ASTM D5185m         1150         1052         1048         1020           Zinc         ppm         ASTM D5185m         1270         1218         1211         1230           Sulfur         ppm         ASTM D5185m         2060         3052         3029         3610           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         6         6         3           Sodium         ppm         ASTM D5185m         >20         42         41         12           Regular         NEG         NEG         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         8.5         8.5         6.1           Sulfation         Abs/:nm         *ASTM D7415         >30 <t< td=""><td>Molybdenum</td><td>ppm</td><td>ASTM D5185m</td><td>60</td><td>57</td><td>58</td><td>56</td></t<>	Molybdenum	ppm	ASTM D5185m	60	57	58	56
Calcium         ppm         ASTM D5185m         1070         1032         1027         1042           Phosphorus         ppm         ASTM D5185m         1150         1052         1048         1020           Zinc         ppm         ASTM D5185m         1270         1218         1211         1230           Sulfur         ppm         ASTM D5185m         2060         3052         3029         3610           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         6         6         3           Sodium         ppm         ASTM D5185m         >25         6         6         3           Potassium         ppm         ASTM D5185m         >20         42         41         12           Glycol         *ASTM D5185m         >20         42         A1         12           Glycol         *ASTM D5185m         >20         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         8.5         8.5 <td>Manganese</td> <td>ppm</td> <td>ASTM D5185m</td> <td>0</td> <td>1</td> <td>1</td> <td>&lt;1</td>	Manganese	ppm	ASTM D5185m	0	1	1	<1
Phosphorus         ppm         ASTM D5185m         1150         1052         1048         1020           Zinc         ppm         ASTM D5185m         1270         1218         1211         1230           Sulfur         ppm         ASTM D5185m         2060         3052         3029         3610           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         6         6         3           Sodium         ppm         ASTM D5185m         >25         6         6         3           Sodium         ppm         ASTM D5185m         >20         42         41         12           Glycol         %         *ASTM D5185m         >20         A2         A1         12           Glycol         %         *ASTM D2982         NEG         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         8.5         8.5         6.1           Sulfation         Abs/.1mm         *ASTM D7415         >30	Magnesium	ppm	ASTM D5185m	1010	879	880	935
Zinc         ppm         ASTM D5185m         1270         1218         1211         1230           Sulfur         ppm         ASTM D5185m         2060         3052         3029         3610           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         6         6         3           Sodium         ppm         ASTM D5185m         >20         42         41         12         13           Potassium         ppm         ASTM D5185m         >20         42         41         12         13           Glycol         %         *ASTM D5185m         >20         A2         41         12         13           Potassium         ppm         ASTM D5185m         >20         A2         A1         12         12           Glycol         %         *ASTM D5185m         >20         A2         A1         12         12           MEG         NEG         NEG         NEG         NEG         NEG         NEG         NEG           Soot %         %         *ASTM D7844         >3         0.8         0.8         0.3 </td <td>Calcium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>1070</td> <td>1032</td> <td>1027</td> <td>1042</td>	Calcium	ppm	ASTM D5185m	1070	1032	1027	1042
Sulfur         ppm         ASTM D5185m         2060         3052         3029         3610           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         6         6         3           Sodium         ppm         ASTM D5185m         >20         42         41         12         13           Potassium         ppm         ASTM D5185m         >20         42         41         12           Glycol         %         *ASTM D2982         NEG         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.8         0.8         0.3           Nitration         Abs/cm         *ASTM D7624         >20         8.5         8.5         6.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         19.8         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2	Phosphorus	ppm	ASTM D5185m	1150	1052	1048	1020
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         6         6         3           Sodium         ppm         ASTM D5185m         14         12         13           Potassium         ppm         ASTM D5185m         >20         42         41         12           Glycol         %         *ASTM D2982         NEG         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.8         0.8         0.3           Nitration         Abs/cm         *ASTM D7624         >20         8.5         8.5         6.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         19.8         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8         14.8         13.5	Zinc	ppm	ASTM D5185m	1270	1218	1211	1230
Silicon         ppm         ASTM D5185m         >25         6         6         3           Sodium         ppm         ASTM D5185m         14         12         13           Potassium         ppm         ASTM D5185m         >20         42         41         12           Glycol         %         *ASTM D2982         NEG         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.8         0.8         0.3           Nitration         Abs/cm         *ASTM D7624         >20         8.5         8.5         6.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         19.8         17.8           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8         14.8         13.5	Sulfur	ppm	ASTM D5185m	2060	3052	3029	3610
Sodium         ppm         ASTM D5185m         14         12         13           Potassium         ppm         ASTM D5185m         >20         42         41         12           Glycol         %         *ASTM D2982         NEG         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.8         0.8         0.3           Nitration         Abs/cm         *ASTM D7624         >20         8.5         8.5         6.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         19.8         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8         14.8         13.5	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         42         41         12           Glycol         %         *ASTM D2982         NEG         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.8         0.8         0.3           Nitration         Abs/cm         *ASTM D7624         >20         8.5         8.5         6.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         19.8         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8         14.8         13.5	Silicon	ppm	ASTM D5185m	>25	6	6	3
NEG   NEG	Sodium	ppm	ASTM D5185m		14	12	13
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.8         0.8         0.3           Nitration         Abs/cm         *ASTM D7624         >20         8.5         8.5         6.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         19.8         17.8           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8         14.8         13.5	Potassium	ppm	ASTM D5185m	>20	<b>42</b>	<u></u> 41	12
Soot %         %         *ASTM D7844 >3         0.8         0.8         0.3           Nitration         Abs/cm         *ASTM D7624 >20         8.5         8.5         6.1           Sulfation         Abs/.1mm         *ASTM D7415 >30         19.6         19.8         17.8           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         14.8         14.8         13.5	Glycol	%	*ASTM D2982		NEG	NEG	NEG
Nitration         Abs/cm         *ASTM D7624         >20         8.5         8.5         6.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         19.8         17.8           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8         14.8         13.5	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         19.8         17.8           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8         14.8         13.5	Soot %	%	*ASTM D7844	>3	8.0	0.8	0.3
FLUID DEGRADATION method limit/base current history1 history2  Oxidation Abs/.1mm *ASTM D7414 >25 14.8 14.8 13.5	Nitration	Abs/cm	*ASTM D7624	>20	8.5	8.5	6.1
Oxidation Abs/.1mm *ASTM D7414 >25 <b>14.8</b> 14.8 13.5	Sulfation	Abs/.1mm	*ASTM D7415	>30	19.6	19.8	17.8
	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	14.8	14.8	13.5
					8.4	8.5	

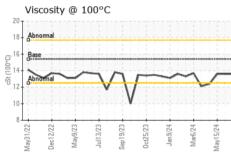


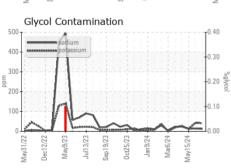
## **OIL ANALYSIS REPORT**







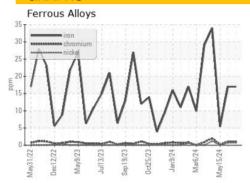


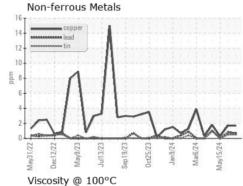


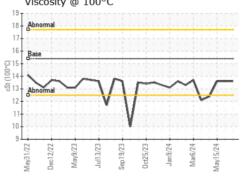
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

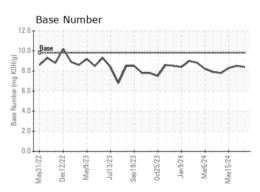
FLUID PROPE	ERITES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.6	13.6	13.6

### **GRAPHS**













Certificate 12367

Laboratory Sample No. Lab Number : 06219280

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0121486

Received **Tested** Unique Number : 11097477

: 25 Jun 2024 : 26 Jun 2024 Diagnosed

: 26 Jun 2024 - Jonathan Hester

Lebanon, MO US 65536 Contact: Landen Johnson landen.johnson@gflenv.com T: (417)664-0010

33924 Olath Drive

GFL Environmental - 821 - Ozarks Hauling

\* - 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)

Test Package : FLEET ( Additional Tests: Glycol )

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