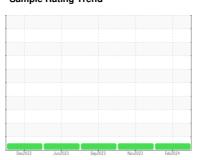


# **OIL ANALYSIS REPORT**

### Sample Rating Trend









Machine Id 156M Component **Diesel Engine** 

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

# DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

### Contamination

There is no indication of any contamination in the

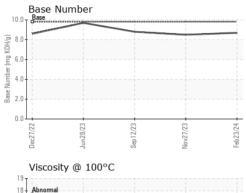
### **Fluid Condition**

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         GFL0029663         GFL0099270         GFL00928           Sample Date         Client Info         23 Feb 2024         27 Nov 2023         12 Sep 2           Machine Age         hrs         Client Info         19665         19488         19218           Oil Age         hrs         Client Info         N/A         N/A         N/A         N/A           Oil Changed         Client Info         N/A         N/A         N/A         N/A         N/A           CONTAMINATION         method         Imitibase         current         bistory1         bistory1         bistory1           Fuel         WC Method         >3.0         <1.0         <1.0         <1.0         <1.0           Water         WC Method         >0.0         <1.0         <1.0         <1.0         <1.0           WEAR METALS         method         limit/base         current         bistory1         bistory1         bistory1           Iron         ppm         ASTM 05185n         >20         <1         0         <1           WEAR METALS         method         limit/base         current         bistory1         bistory1         bistory1           Iron         pm	14 3111 1344-0 (	GAL)	Dec2022	Jun2023	Sep 2023 Nov 2023	Feb 2024	
Sample Date   Client Info   19655   19488   19218	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         19665         19488         19218         19217           Oil Age         hrs         Client Info         19488         19218         19217           Oil Changed         Client Info         N/A         N/A         N/A         N/A           Sample Status         NoRMAL         NORMAL         NORMAL         NORMAL         NORMAL           CONTAMINATION         method         limit/base         current         history1         history1           Fuel         WC Method         3.0         < 1.0         < 1.0         < 1.0           Water         WC Method         NeG         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history1           Iron         ppm         ASTM D5185m         >120         6         8         4           Chromium         ppm         ASTM D5185m         >20         < 1         0         < 1           Nickel         ppm         ASTM D5185m         >2         < 1         0         < 1           Alluminum         ppm         ASTM D5185m         >2         < 1         0         < 1     <	Sample Number		Client Info		GFL0029663	GFL0092970	GFL0092943
Dil Age	Sample Date		Client Info		23 Feb 2024	27 Nov 2023	12 Sep 2023
Colient Info	Machine Age	hrs	Client Info		19665	19488	19218
NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history1	Oil Age	hrs	Client Info		19488	19218	19217
CONTAMINATION         method         limit/base         current         history1         history1           Fuel         WC Method         >3.0         <1.0	Oil Changed		Client Info		N/A	N/A	N/A
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water Glycol         WC Method         >0.2         NEG NEG         NEG NEG           WEAR METALS         method         limit/base         current         history1         history1           Iron         ppm         ASTM D5185m         >120         6         8         4           Chromium         ppm         ASTM D5185m         >20         <1	CONTAMINATI	ION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Chromium	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METALS	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>120	6	8	4
Description	Chromium	ppm	ASTM D5185m	>20	<1	0	<1
Silver	Nickel	ppm	ASTM D5185m	>5	<1	0	<1
Aluminum	Titanium	ppm	ASTM D5185m	>2	<1	0	<1
Lead	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper	Aluminum	ppm	ASTM D5185m	>20	3	2	<1
Tin	Lead	ppm	ASTM D5185m	>40	<1	0	<1
Vanadium         ppm         ASTM D5185m         <1         0         0           Cadmium         ppm         ASTM D5185m         0         0         <1           ADDITIVES         method         limit/base         current         history1         history1           Boron         ppm         ASTM D5185m         0         5         2         4           Barium         ppm         ASTM D5185m         0         0         0         44           Molybdenum         ppm         ASTM D5185m         0         0         0         0         44           Molybdenum         ppm         ASTM D5185m         0         0         0         0         44           Molybdenum         ppm         ASTM D5185m         0         <1         0         1           Magnesium         ppm         ASTM D5185m         1010         931         993         863           Calcium         ppm         ASTM D5185m         1070         1001         1090         954           Phosphorus         ppm         ASTM D5185m         1270         1203         1261         1117           Sulfur         ppm         ASTM D5185m         20         3063	Copper	ppm	ASTM D5185m	>330	<1	1	<1
Cadmium         ppm         ASTM D5185m         0         0         <1           ADDITIVES         method         limit/base         current         history1         history1           Boron         ppm         ASTM D5185m         0         5         2         4           Barium         ppm         ASTM D5185m         0         0         0         44           Molybdenum         ppm         ASTM D5185m         60         63         58         55           Manganese         ppm         ASTM D5185m         0         <1	Tin	ppm	ASTM D5185m	>15	<1	0	1
ADDITIVES         method         limit/base         current         history1         history1           Boron         ppm         ASTM D5185m         0         5         2         4           Barium         ppm         ASTM D5185m         0         0         0         44           Molybdenum         ppm         ASTM D5185m         60         63         58         55           Manganese         ppm         ASTM D5185m         0         <1	Vanadium	ppm	ASTM D5185m		<1	0	0
Boron	Cadmium	ppm	ASTM D5185m		0	0	<1
Barium         ppm         ASTM D5185m         0         0         0         44           Molybdenum         ppm         ASTM D5185m         60         63         58         55           Manganese         ppm         ASTM D5185m         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         63         58         55           Manganese         ppm         ASTM D5185m         0         <1	Boron	ppm	ASTM D5185m	0		2	4
Manganese         ppm         ASTM D5185m         0         <1         0         1           Magnesium         ppm         ASTM D5185m         1010         931         993         863           Calcium         ppm         ASTM D5185m         1070         1001         1090         954           Phosphorus         ppm         ASTM D5185m         1150         1020         1020         915           Zinc         ppm         ASTM D5185m         1270         1203         1261         1117           Sulfur         ppm         ASTM D5185m         2060         3063         3089         3225           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >25         5         5         4           Sodium         ppm         ASTM D5185m         >20         2         0         3           Potassium         ppm         ASTM D5185m         >20         2         0         3           INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         *ASTM D7844         >4	Barium	ppm	ASTM D5185m	0	0	0	44
Magnesium         ppm         ASTM D5185m         1010         931         993         863           Calcium         ppm         ASTM D5185m         1070         1001         1090         954           Phosphorus         ppm         ASTM D5185m         1150         1020         1020         915           Zinc         ppm         ASTM D5185m         1270         1203         1261         1117           Sulfur         ppm         ASTM D5185m         2060         3063         3089         3225           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >25         5         5         4           Sodium         ppm         ASTM D5185m         >20         2         0         3           Potassium         ppm         ASTM D5185m         >20         2         0         3           INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         *ASTM D7624         >20         5.7         6.9         4.9           Sulfation         Abs/.1mm         *ASTM D	Molybdenum	ppm			63		55
Calcium         ppm         ASTM D5185m         1070         1001         1090         954           Phosphorus         ppm         ASTM D5185m         1150         1020         1020         915           Zinc         ppm         ASTM D5185m         1270         1203         1261         1117           Sulfur         ppm         ASTM D5185m         2060         3063         3089         3225           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >25         5         5         4           Sodium         ppm         ASTM D5185m         >20         2         0         3           Potassium         ppm         ASTM D5185m         >20         2         0         3           INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         *ASTM D7844         >4         0.1         0.2         0.1           Nitration         Abs/cm         *ASTM D7415         >30         17.6         18.2         16.9           FLUID DEGRADATION         *ASTM D74	Manganese	ppm	ASTM D5185m	0	<1	0	1
Phosphorus         ppm         ASTM D5185m         1150         1020         1020         915           Zinc         ppm         ASTM D5185m         1270         1203         1261         1117           Sulfur         ppm         ASTM D5185m         2060         3063         3089         3225           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >25         5         5         4           Sodium         ppm         ASTM D5185m         >20         2         0         3           Potassium         ppm         ASTM D5185m         >20         2         0         3           INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         *ASTM D7844         >4         0.1         0.2         0.1           Nitration         Abs/cm         *ASTM D7415         >30         17.6         18.2         16.9           FLUID DEGRADATION         *ASTM D7414         >25         13.7         14.3         12.8	Magnesium	ppm	ASTM D5185m	1010	931	993	863
Zinc         ppm         ASTM D5185m         1270         1203         1261         1117           Sulfur         ppm         ASTM D5185m         2060         3063         3089         3225           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >25         5         5         4           Sodium         ppm         ASTM D5185m         20         2         0         3           Potassium         ppm         ASTM D5185m         >20         2         0         3           INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         *ASTM D7844         >4         0.1         0.2         0.1           Nitration         Abs/cm         *ASTM D7624         >20         5.7         6.9         4.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.6         18.2         16.9           FLUID DEGRADATION         method         limit/base         current         history1         history1           Oxidation         Abs/.1mm	Calcium	ppm	ASTM D5185m	1070	1001	1090	954
Sulfur         ppm         ASTM D5185m         2060         3063         3089         3225           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >25         5         5         4           Sodium         ppm         ASTM D5185m         4         3         2           Potassium         ppm         ASTM D5185m         >20         2         0         3           INFRA-RED         method         limit/base         current         history1         history1         history1           Soot %         %         *ASTM D7844         >4         0.1         0.2         0.1           Nitration         Abs/cm         *ASTM D7624         >20         5.7         6.9         4.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.6         18.2         16.9           FLUID DEGRADATION         method         limit/base         current         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         14.3         12.8	Phosphorus	ppm	ASTM D5185m	1150	1020	1020	915
CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >25         5         5         4           Sodium         ppm         ASTM D5185m         4         3         2           Potassium         ppm         ASTM D5185m         >20         2         0         3           INFRA-RED         method         limit/base         current         history1         history1         history1           Soot %         %         *ASTM D7844         >4         0.1         0.2         0.1           Nitration         Abs/cm         *ASTM D7624         >20         5.7         6.9         4.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.6         18.2         16.9           FLUID DEGRADATION         method         limit/base         current         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         14.3         12.8	Zinc	ppm	ASTM D5185m	1270	1203	1261	1117
Silicon         ppm         ASTM D5185m         >25         5         5         4           Sodium         ppm         ASTM D5185m         4         3         2           Potassium         ppm         ASTM D5185m         >20         2         0         3           INFRA-RED         method         limit/base         current         history1         history1         history1           Soot %         %         *ASTM D7844         >4         0.1         0.2         0.1           Nitration         Abs/cm         *ASTM D7624         >20         5.7         6.9         4.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.6         18.2         16.9           FLUID DEGRADATION         method         limit/base         current         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         14.3         12.8			ASTM D5185m	2060	3063	3089	3225
Sodium         ppm         ASTM D5185m         4         3         2           Potassium         ppm         ASTM D5185m         >20         2         0         3           INFRA-RED         method         limit/base         current         history1         history1         history1           Soot %         %         *ASTM D7844         >4         0.1         0.2         0.1           Nitration         Abs/cm         *ASTM D7624         >20         5.7         6.9         4.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.6         18.2         16.9           FLUID DEGRADATION         method         limit/base         current         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         14.3         12.8	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         2         0         3           INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         *ASTM D7844         >4         0.1         0.2         0.1           Nitration         Abs/cm         *ASTM D7624         >20         5.7         6.9         4.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.6         18.2         16.9           FLUID DEGRADATION         method         limit/base         current         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         14.3         12.8	Silicon	ppm	ASTM D5185m	>25	5		4
INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         *ASTM D7844         >4         0.1         0.2         0.1           Nitration         Abs/cm         *ASTM D7624         >20         5.7         6.9         4.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.6         18.2         16.9           FLUID DEGRADATION         method         limit/base         current         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         14.3         12.8	Sodium	ppm	ASTM D5185m		4	3	2
Soot %         %         *ASTM D7844 >4         0.1         0.2         0.1           Nitration         Abs/cm         *ASTM D7624 >20         5.7         6.9         4.9           Sulfation         Abs/.1mm         *ASTM D7415 >30         17.6         18.2         16.9           FLUID DEGRADATION         method         limit/base         current         history1         history           Oxidation         Abs/.1mm         *ASTM D7414 >25         13.7         14.3         12.8	Potassium	ppm	ASTM D5185m	>20	2	0	3
Nitration         Abs/cm         *ASTM D7624         >20         5.7         6.9         4.9           Sulfation         Abs/.1mm         *ASTM D7615         >30         17.6         18.2         16.9           FLUID DEGRADATION method limit/base current         history1         history1         history           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         14.3         12.8	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         17.6         18.2         16.9           FLUID DEGRADATION method limit/base current history1         history1         history1         history1         12.8           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         14.3         12.8	Soot %		*ASTM D7844	>4	0.1	0.2	0.1
FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 13.7 14.3 12.8	Nitration	Abs/cm	*ASTM D7624	>20	5.7	6.9	4.9
Oxidation Abs/.1mm *ASTM D7414 >25 <b>13.7</b> 14.3 12.8	Sulfation	Abs/.1mm	*ASTM D7415	>30	17.6	18.2	16.9
	FLUID DEGRAD	OATION	method	limit/base	current	history1	history2
Base Number (BN)   mg KOH/g   ASTM D2896   9.8   8.7   8.5   8.8	Oxidation	Abs/.1mm	*ASTM D7414	>25	13.7	14.3	12.8
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.7	8.5	8.8

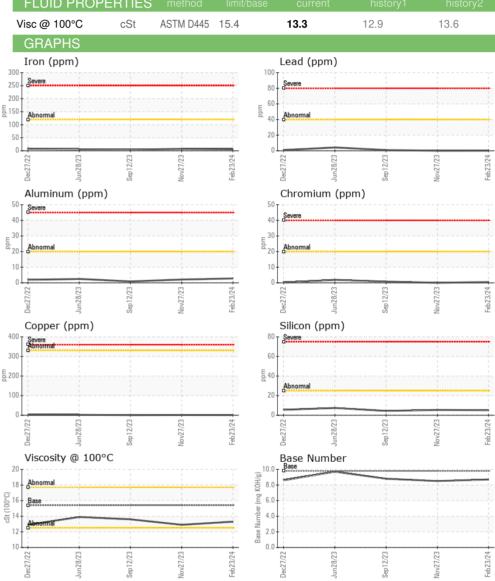


## **OIL ANALYSIS REPORT**



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	RTIFS	method	limit/base	current	historv1	historv2

19 <sub>T</sub>	ty @ 100°			
18 - Abnormal				
17-				
516				
Base 15-				
13 Abnormal				
12				
11				
Dec27/22	Jun28/23	2/2:	Nov27/23	
ec2	un2	ep.	0v2	







Certificate L2367

Laboratory

Sample No.

Lab Number : 06105751 Unique Number : 10903981 Test Package : MOB1+

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0029663 Received : 01 Mar 2024 **Tested** 

: 02 Mar 2024 Diagnosed : 02 Mar 2024 - Wes Davis

GFL Environmental - 463 - Cheboygan 501 N. Western Ave

Cheboygan, MI US 49721 Contact: Chris Gee cgee@gflenv.com T: (231)597-8553

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)

F: