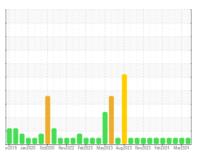


# **OIL ANALYSIS REPORT**

Sample Rating Trend



NORMAL



Machine Id **722021-310026** 

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.

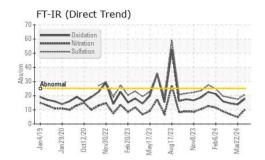
### **Fluid Condition**

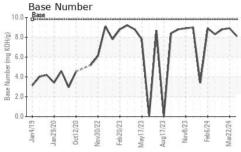
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

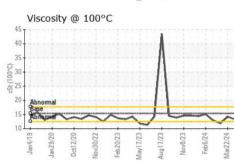
SAMPLE INFORMATION   method   fimit/base   current   history1   history2	AAL)		nzui9 Janzuz	U UCIZUZU NOVZUZZ F80ZUZ	s mayzuza Augzuza Novzuza Feoz	UZ4 Marzuz4	
Sample Date	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         20507         22801         20350           Oil Age         hrs         Client Info         0         0         600           Oil Changed         Client Info         Not Changd         Not Changd         Not Changd         NoRMAL         NORMAL         NORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >5         <1.0         <1.0         1.7           Water         WC Method         >0.2         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ASTM D5185m         >110         22         <1         13           Chromium         ppm         ASTM D5185m         >2         1         0         0           WEAR METALS         method         limit/base         current         history2         1         13         1         1         0         0          1         0         0          1         0         0          1         0         0 <td< th=""><th>Sample Number</th><th></th><th>Client Info</th><th></th><th>GFL0117161</th><th>GFL0114048</th><th>GFL0114038</th></td<>	Sample Number		Client Info		GFL0117161	GFL0114048	GFL0114038
Machine Age         hrs         Client Info         20507         22801         20350           Oil Age         hrs         Client Info         0         0         600           Oil Changed         Client Info         Not Changd         Not Changd         Not Changd         Changed         Changed           Sample Status         Image: Client Info         Not Changd         <			Client Info		23 Apr 2024	22 Mar 2024	20 Mar 2024
Client Info   Not Changd   NORMAL   NORMAL   NORMAL	Machine Age	hrs	Client Info		-	22801	20350
NORMAL   NORMAL   NORMAL	Oil Age	hrs	Client Info		0	0	600
NORMAL   NORMAL   NORMAL	-		Client Info		Not Changd	Not Changd	Changed
Fuel						NORMAL	NORMAL
Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         Imit/base         current         history1         history2           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >11 0         0         <1           Nickel         ppm         ASTM D5185m         >2         1 0         0         0           Silver         ppm         ASTM D5185m         >2         1 0         0         0           Aluminum         ppm         ASTM D5185m         >2         1 0         0         0           Aluminum         ppm         ASTM D5185m         >25         3         <1         5           Lead         ppm         ASTM D5185m         >45         2         0         0           Copper         ppm         ASTM D5185m         >44         1         0         0           Vanadium         ppm         ASTM D5185m         >4         1         0         0           Cadmium         ppm         ASTM D5185m         >1         1         0         0	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>5	<1.0	<1.0	1.7
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >4         2         0         <1           Nickel         ppm         ASTM D5185m         >2         1         0         0           Titanium         ppm         ASTM D5185m         >2         1         0         0           Silver         ppm         ASTM D5185m         >2         <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>110	22	<1	13
Titanium	Chromium	ppm	ASTM D5185m	>4	2	0	<1
Stiver	Nickel	ppm	ASTM D5185m	>2	1	0	0
Aluminum         ppm         ASTM D5185m         >25         3         <1         5           Lead         ppm         ASTM D5185m         >45         2         0         0           Copper         ppm         ASTM D5185m         >45         4         <1	Titanium	ppm	ASTM D5185m		<1	0	0
Lead         ppm         ASTM D5185m         >45         2         0         0           Copper         ppm         ASTM D5185m         >85         4         <1         0           Tin         ppm         ASTM D5185m         >4         1         0         0           Vanadium         ppm         ASTM D5185m         <1         <1         0         0           Cadmium         ppm         ASTM D5185m         <1         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         4         13         2           Barium         ppm         ASTM D5185m         0         4         13         2           Barium         ppm         ASTM D5185m         0         -1         0         0           Molybdenum         ppm         ASTM D5185m         0         1         0         0           Barium         ppm         ASTM D5185m         0         1         0         0           Manganese         ppm         ASTM D5185m         1070         1072         1138         11	Silver	ppm	ASTM D5185m	>2	<1	0	0
Copper         ppm         ASTM D5185m         >85         4         <1         0           Tin         ppm         ASTM D5185m         >4         1         0         0           Vanadium         ppm         ASTM D5185m         <1	Aluminum	ppm	ASTM D5185m	>25	3	<1	5
Tin         ppm         ASTM D5185m         >4         1         0         0           Vanadium         ppm         ASTM D5185m         <1         <1         0         0           Cadmium         ppm         ASTM D5185m         <1         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         4         13         2           Barium         ppm         ASTM D5185m         0         <1         0         0           Molybdenum         ppm         ASTM D5185m         0         <1         0         0           Molybdenum         ppm         ASTM D5185m         0         1         0         0           Manganese         ppm         ASTM D5185m         0         1         0         0           Magnesium         ppm         ASTM D5185m         1070         1072         1138         1165           Phosphorus         ppm         ASTM D5185m         1270         1154         1301         1212           Sulfur         ppm         ASTM D5185m         2060         3057         3781	Lead	ppm	ASTM D5185m	>45	2	0	0
Vanadium         ppm         ASTM D5185m         <1         <1         0           Cadmium         ppm         ASTM D5185m         <1         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         4         13         2           Barium         ppm         ASTM D5185m         0         <1         0         0           Molybdenum         ppm         ASTM D5185m         0         4         13         2           Manganese         ppm         ASTM D5185m         0         1         0         0           Magnesium         ppm         ASTM D5185m         1010         867         943         934           Calcium         ppm         ASTM D5185m         1070         1072         1138         1165           Phosphorus         ppm         ASTM D5185m         1270         1154         1301         1212           Sulfur         ppm         ASTM D5185m         1270         1154         1301         1212           Sulfur         ppm         ASTM D5185m         2060         3057         3781	Copper	ppm	ASTM D5185m	>85	4	<1	0
Cadmium         ppm         ASTM D5185m         <1         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         4         13         2           Barium         ppm         ASTM D5185m         0         <1	Tin	ppm	ASTM D5185m	>4	1	0	0
ADDITIVES	Vanadium	ppm	ASTM D5185m		<1	<1	0
Boron	Cadmium	ppm	ASTM D5185m		<1	0	0
Barium         ppm         ASTM D5185m         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         60         56         59           Manganese         ppm         ASTM D5185m         0         1         0         0           Magnesium         ppm         ASTM D5185m         1010         867         943         934           Calcium         ppm         ASTM D5185m         1070         1072         1138         1165           Phosphorus         ppm         ASTM D5185m         1150         926         937         1068           Zinc         ppm         ASTM D5185m         1270         1154         1301         1212           Sulfur         ppm         ASTM D5185m         2060         3057         3781         3701           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         8         2         5           Sodium         ppm         ASTM D5185m         >20         4         2         37           INFRA-RED         method         limit/base         current         history1         history2           Soot %         "ASTM D7624         >20 <th>Boron</th> <th>ppm</th> <th>ASTM D5185m</th> <th>0</th> <th>4</th> <th>13</th> <th>2</th>	Boron	ppm	ASTM D5185m	0	4	13	2
Manganese         ppm         ASTM D5185m         0         1         0         0           Magnesium         ppm         ASTM D5185m         1010         867         943         934           Calcium         ppm         ASTM D5185m         1070         1072         1138         1165           Phosphorus         ppm         ASTM D5185m         1150         926         937         1068           Zinc         ppm         ASTM D5185m         1270         1154         1301         1212           Sulfur         ppm         ASTM D5185m         2060         3057         3781         3701           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         8         2         5           Sodium         ppm         ASTM D5185m         5         2         44           Potassium         ppm         ASTM D5185m         >20         4         2         37           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20	Barium	ppm	ASTM D5185m	0	<1	0	0
Magnesium         ppm         ASTM D5185m         1010         867         943         934           Calcium         ppm         ASTM D5185m         1070         1072         1138         1165           Phosphorus         ppm         ASTM D5185m         1150         926         937         1068           Zinc         ppm         ASTM D5185m         1270         1154         1301         1212           Sulfur         ppm         ASTM D5185m         2060         3057         3781         3701           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         8         2         5           Sodium         ppm         ASTM D5185m         5         2         44           Potassium         ppm         ASTM D5185m         >20         4         2         37           INFRA-RED         method         limit/base         current         history1         history2           Soot %         *ASTM D7844         >3         0.9         0.1         0.2           Nitration         Abs/cmm         *ASTM D7415         >30         20.8	Molybdenum	ppm	ASTM D5185m	60	60	56	59
Calcium         ppm         ASTM D5185m         1070         1072         1138         1165           Phosphorus         ppm         ASTM D5185m         1150         926         937         1068           Zinc         ppm         ASTM D5185m         1270         1154         1301         1212           Sulfur         ppm         ASTM D5185m         2060         3057         3781         3701           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         8         2         5           Sodium         ppm         ASTM D5185m         5         2         44           Potassium         ppm         ASTM D5185m         >20         4         2         37           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.9         0.1         0.2           Nitration         Abs/cm         *ASTM D7415         >30         20.8         17.5         18.5           FLUID DEGRADATION         *ASTM D7414 <td< td=""><td>Manganese</td><td>ppm</td><td>ASTM D5185m</td><td>0</td><th>1</th><td>0</td><td>0</td></td<>	Manganese	ppm	ASTM D5185m	0	1	0	0
Phosphorus         ppm         ASTM D5185m         1150         926         937         1068           Zinc         ppm         ASTM D5185m         1270         1154         1301         1212           Sulfur         ppm         ASTM D5185m         2060         3057         3781         3701           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         8         2         5           Sodium         ppm         ASTM D5185m         5         2         44           Potassium         ppm         ASTM D5185m         >20         4         2         37           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.9         0.1         0.2           Nitration         Abs/cm         *ASTM D7624         >20         10.2         4.8         6.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.8         17.5         18.5           FLUID DEGRADATION         method	Magnesium	ppm	ASTM D5185m	1010	867	943	934
Zinc         ppm         ASTM D5185m         1270         1154         1301         1212           Sulfur         ppm         ASTM D5185m         2060         3057         3781         3701           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         8         2         5           Sodium         ppm         ASTM D5185m         5         2         44           Potassium         ppm         ASTM D5185m         >20         4         2         37           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.9         0.1         0.2           Nitration         Abs/cm         *ASTM D7624         >20         10.2         4.8         6.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.8         17.5         18.5           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM	Calcium	ppm	ASTM D5185m	1070	1072	1138	1165
Sulfur         ppm         ASTM D5185m         2060         3057         3781         3701           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         8         2         5           Sodium         ppm         ASTM D5185m         5         2         44           Potassium         ppm         ASTM D5185m         >20         4         2         37           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.9         0.1         0.2           Nitration         Abs/cm         *ASTM D7624         >20         10.2         4.8         6.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.8         17.5         18.5           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         17.9         13.7         14.5	Phosphorus	ppm	ASTM D5185m	1150	926	937	1068
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         8         2         5           Sodium         ppm         ASTM D5185m         5         2         44           Potassium         ppm         ASTM D5185m         >20         4         2         37           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.9         0.1         0.2           Nitration         Abs/cm         *ASTM D7624         >20         10.2         4.8         6.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.8         17.5         18.5           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         17.9         13.7         14.5	Zinc	ppm	ASTM D5185m	1270	1154	1301	1212
Silicon         ppm         ASTM D5185m         >30         8         2         5           Sodium         ppm         ASTM D5185m         5         2         44           Potassium         ppm         ASTM D5185m         >20         4         2         37           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.9         0.1         0.2           Nitration         Abs/cm         *ASTM D7624         >20         10.2         4.8         6.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.8         17.5         18.5           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         17.9         13.7         14.5	Sulfur	ppm	ASTM D5185m	2060	3057	3781	3701
Sodium         ppm         ASTM D5185m         5         2         44           Potassium         ppm         ASTM D5185m         >20         4         2         37           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.9         0.1         0.2           Nitration         Abs/cm         *ASTM D7624         >20         10.2         4.8         6.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.8         17.5         18.5           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         17.9         13.7         14.5	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         4         2         37           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.9         0.1         0.2           Nitration         Abs/cm         *ASTM D7624         >20         10.2         4.8         6.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.8         17.5         18.5           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         17.9         13.7         14.5	Silicon	ppm	ASTM D5185m	>30	8	2	5
INFRA-RED	Sodium	ppm	ASTM D5185m		5	2	44
Soot %         %         *ASTM D7844 >3         0.9         0.1         0.2           Nitration         Abs/cm         *ASTM D7624 >20         10.2         4.8         6.8           Sulfation         Abs/.1mm         *ASTM D7415 >30         20.8         17.5         18.5           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         17.9         13.7         14.5	Potassium	ppm	ASTM D5185m	>20	4	2	37
Nitration         Abs/cm         *ASTM D7624         >20         10.2         4.8         6.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.8         17.5         18.5           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         17.9         13.7         14.5	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         20.8         17.5         18.5           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         17.9         13.7         14.5	Soot %	%	*ASTM D7844	>3	0.9	0.1	0.2
FLUID DEGRADATION method limit/base current history1 history2  Oxidation Abs/.1mm *ASTM D7414 >25 17.9 13.7 14.5	Nitration	Abs/cm	*ASTM D7624	>20	10.2	4.8	6.8
Oxidation Abs/.1mm *ASTM D7414 >25 <b>17.9</b> 13.7 14.5	Sulfation	Abs/.1mm	*ASTM D7415	>30	20.8	17.5	18.5
	FLUID DEGRAI	DATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	17.9	13.7	14.5
						8.9	



# **OIL ANALYSIS REPORT**



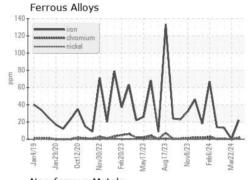


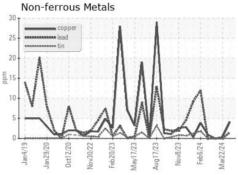


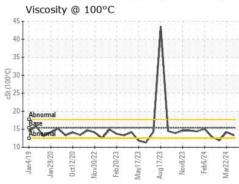
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

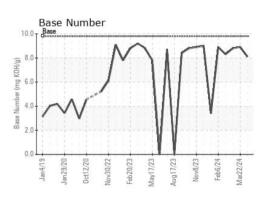
FLUID PROP	ERTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.3	14.2	11.9

### **GRAPHS**













Certificate 12367

Laboratory Sample No.

Lab Number : 06160218 Unique Number : 10995641

Test Package : FLEET

: GFL0117161

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 25 Apr 2024 **Tested** : 26 Apr 2024 Diagnosed

: 26 Apr 2024 - Don Baldridge

GFL Environmental - 836 - Kansas City Hauling

7801 East Truman Road Kansas City, MO US 64126

Contact: Loyce Stewart loyce.stewart@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)

Report Id: GFL836 [WUSCAR] 06160218 (Generated: 04/26/2024 13:44:24) Rev: 1

T:

F: