

# **OIL ANALYSIS REPORT**

# Sample Rating Trend









Machine Id **422022-402157** 

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

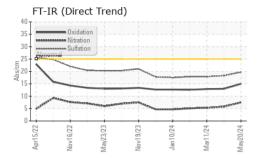
## **Fluid Condition**

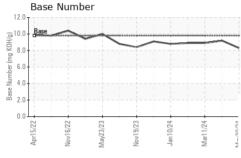
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

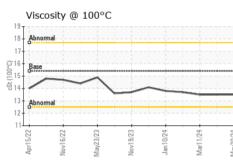
Sample Date   Client Info   20 May 2024   04 Apr 2024   11 Mar 2024   Machine Age   hrs   Client Info   42312   42997   4287	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         42312         42997         42877           Oil Age         hrs         Client Info         0         388         268           Oil Changed         Client Info         0         388         268           Oil Changed         NorMal         NoRMAL         NORMAL         NORMAL           Assmale Status         WC Method         3.0         <1.0	Sample Number		Client Info		GFL0101837	GFL0109399	GFL0109256
Oil Age         hrs         Client Info         Changed         Not Changd	Sample Date		Client Info		20 May 2024	04 Apr 2024	11 Mar 2024
Oil Changed Sample Status         Client Info         Changed NORMAL         Not State         1.0	Machine Age	hrs	Client Info		42312	42997	42877
NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2   history2	Oil Age	hrs	Client Info		0	388	268
CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >3.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0	Oil Changed		Client Info		Changed	Not Changd	Not Changd
Fuel   WC Method   >3.0	Sample Status				NORMAL	NORMAL	NORMAL
Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         Imitibase         current         history1         history2           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >120         18         13         14           Chromium         ppm         ASTM D5185m         >20         <1         <1         <1           Nickel         ppm         ASTM D5185m         >2         <1         0         0           Silver         ppm         ASTM D5185m         >2         <1         0         0           Silver         ppm         ASTM D5185m         >2         <1         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >20         2         1         <1           Lead         ppm         ASTM D5185m         >40         2         1         0           Copper         ppm         ASTM D5185m         >15         1         0         0	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >120         18         13         14           Chromium         ppm         ASTM D5185m         >20         <1	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         ≥20         <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel         ppm         ASTM D5185m         >5         <1         0         0           Titanium         ppm         ASTM D5185m         >2         <1	Iron	ppm	ASTM D5185m	>120	18	13	14
Titanium         ppm         ASTM D5185m         ≥2         <1         0         <1           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >20         2         1         <1	Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >20         2         1         <1           Lead         ppm         ASTM D5185m         >40         2         1         0           Copper         ppm         ASTM D5185m         >330         5         3         3           Tin         ppm         ASTM D5185m         0         0         0         0           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1         <1         1           Barium         ppm         ASTM D5185m         0         <1         <1         1           Barium         ppm         ASTM D5185m         0         <1         0         0           Molybdenum         ppm         ASTM D5185m         0         <1         0         0	Nickel	ppm	ASTM D5185m	>5	<1	0	0
Aluminum         ppm         ASTM D5185m         >20         2         1         <1           Lead         ppm         ASTM D5185m         >40         2         1         0           Copper         ppm         ASTM D5185m         >330         5         3         3           Tin         ppm         ASTM D5185m         0         0         0         0           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         <1	Titanium	ppm	ASTM D5185m	>2	<1	0	<1
Aluminum         ppm         ASTM D5185m         >20         2         1         <1           Lead         ppm         ASTM D5185m         >40         2         1         0           Copper         ppm         ASTM D5185m         >330         5         3         3           Tin         ppm         ASTM D5185m         0         0         0         0           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1	Silver		ASTM D5185m	>2	0	0	0
Lead         ppm         ASTM D5185m         >40         2         1         0           Copper         ppm         ASTM D5185m         >330         5         3         3           Tin         ppm         ASTM D5185m         >15         1         0         0           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         <1         <1         1           Boron         ppm         ASTM D5185m         0         <1         <1         1         1           Barium         ppm         ASTM D5185m         0         <1         0         0         0           Molybdenum         ppm         ASTM D5185m         0         <1         0         0           Manganese         ppm         ASTM D5185m         0         <1         0         0           Magnesium         ppm         ASTM D5185m         1010         868         1045         913           Calcium         ppm         ASTM D5185m         1070         999         1144         1034           Phosphorus         ppm         ASTM D5185m         1270<	Aluminum	• • • • • • • • • • • • • • • • • • • •	ASTM D5185m	>20	2	1	<1
Copper         ppm         ASTM D5185m         >330         5         3         3           Tin         ppm         ASTM D5185m         >15         1         0         0           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1	Lead			>40	2	1	0
Tin         ppm         ASTM D5185m         >15         1         0         0           Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1         <1         1           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         1010         868         1045         913           Calcium         ppm         ASTM D5185m         1070         999         1144         1034           Phosphorus         ppm         ASTM D5185m         1270         1181         1352         1143	Copper	• • • • • • • • • • • • • • • • • • • •	ASTM D5185m	>330	5	3	3
Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1         <1         1           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         999         1144         1034           Phosphorus         ppm         ASTM D5185m         1270         1181         1352         1143           Sulfur         ppm         ASTM D5185m         2060         3189         4065         3325           CONTAMINANTS         method         limit/base         current         history1         hi							0
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1		• • • • • • • • • • • • • • • • • • • •					
ADDITIVES					-		
Barium         ppm         ASTM D5185m         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Barium         ppm         ASTM D5185m         0         <1         0         0           Molybdenum         ppm         ASTM D5185m         60         55         58         55           Manganese         ppm         ASTM D5185m         0         <1         0         0           Magnesium         ppm         ASTM D5185m         1010         868         1045         913           Calcium         ppm         ASTM D5185m         1070         999         1144         1034           Phosphorus         ppm         ASTM D5185m         1150         1033         1131         1006           Zinc         ppm         ASTM D5185m         1270         1181         1352         1143           Sulfur         ppm         ASTM D5185m         2060         3189         4065         3325           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         >20         2         <1         0           INFRA-RED         method         limit/base	Boron	ppm	ASTM D5185m	0	<1	<1	1
Molybdenum         ppm         ASTM D5185m         60         55         58         55           Manganese         ppm         ASTM D5185m         0         <1         0         0           Magnesium         ppm         ASTM D5185m         1010         868         1045         913           Calcium         ppm         ASTM D5185m         1070         999         1144         1034           Phosphorus         ppm         ASTM D5185m         1150         1033         1131         1006           Zinc         ppm         ASTM D5185m         1270         1181         1352         1143           Sulfur         ppm         ASTM D5185m         2060         3189         4065         3325           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         >20         2         <1         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624	Barium		ASTM D5185m	0	<1	0	0
Manganese         ppm         ASTM D5185m         0         <1         0         0           Magnesium         ppm         ASTM D5185m         1010         868         1045         913           Calcium         ppm         ASTM D5185m         1070         999         1144         1034           Phosphorus         ppm         ASTM D5185m         1150         1033         1131         1006           Zinc         ppm         ASTM D5185m         1270         1181         1352         1143           Sulfur         ppm         ASTM D5185m         2060         3189         4065         3325           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         >20         2         <1         1           Potassium         ppm         ASTM D5185m         >20         2         <1         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         % ASTM D7844         >4	Molybdenum		ASTM D5185m	60	55	58	55
Magnesium         ppm         ASTM D5185m         1010         868         1045         913           Calcium         ppm         ASTM D5185m         1070         999         1144         1034           Phosphorus         ppm         ASTM D5185m         1150         1033         1131         1006           Zinc         ppm         ASTM D5185m         1270         1181         1352         1143           Sulfur         ppm         ASTM D5185m         2060         3189         4065         3325           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         >20         2         <1         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.8         0.9         0.7           Nitration         Abs/:mm         *ASTM D7415         >30         19.7         18.3         17.9           FLUID DEGRADATION         *ASTM D7414	•	• • • • • • • • • • • • • • • • • • • •	ASTM D5185m	0	<1		
Calcium         ppm         ASTM D5185m         1070         999         1144         1034           Phosphorus         ppm         ASTM D5185m         1150         1033         1131         1006           Zinc         ppm         ASTM D5185m         1270         1181         1352         1143           Sulfur         ppm         ASTM D5185m         2060         3189         4065         3325           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         >20         2         <1	-				868	1045	913
Phosphorus         ppm         ASTM D5185m         1150         1033         1131         1006           Zinc         ppm         ASTM D5185m         1270         1181         1352         1143           Sulfur         ppm         ASTM D5185m         2060         3189         4065         3325           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         >20         2         <1	-		ASTM D5185m	1070	999	1144	1034
Zinc         ppm         ASTM D5185m         1270         1181         1352         1143           Sulfur         ppm         ASTM D5185m         2060         3189         4065         3325           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         >20         2         <1			ASTM D5185m	1150	1033		
Sulfur         ppm         ASTM D5185m         2060         3189         4065         3325           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         >20         2         <1			ASTM D5185m	1270	1181	1352	1143
Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         <1         <1         1           Potassium         ppm         ASTM D5185m         >20         2         <1         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.8         0.9         0.7           Nitration         Abs/cm         *ASTM D7624         >20         7.5         5.8         5.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.7         18.3         17.9           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.0         13.0         12.9			ASTM D5185m	2060	3189		
Sodium         ppm         ASTM D5185m         <1         <1         1           Potassium         ppm         ASTM D5185m         >20         2         <1         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.8         0.9         0.7           Nitration         Abs/cm         *ASTM D7624         >20         7.5         5.8         5.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.7         18.3         17.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.0         13.0         12.9	CONTAMINAN	TS	method	limit/base	current	history1	history2
Sodium         ppm         ASTM D5185m         <1         <1         1           Potassium         ppm         ASTM D5185m         >20         2         <1         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.8         0.9         0.7           Nitration         Abs/cm         *ASTM D7624         >20         7.5         5.8         5.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.7         18.3         17.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.0         13.0         12.9	Silicon	ppm	ASTM D5185m	>25	4	3	4
Potassium         ppm         ASTM D5185m         >20         2         <1         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.8         0.9         0.7           Nitration         Abs/cm         *ASTM D7624         >20         7.5         5.8         5.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.7         18.3         17.9           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.0         13.0         12.9	Sodium	• • • • • • • • • • • • • • • • • • • •			<1	<1	1
Soot %         %         *ASTM D7844         >4         0.8         0.9         0.7           Nitration         Abs/cm         *ASTM D7624         >20         7.5         5.8         5.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.7         18.3         17.9           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.0         13.0         12.9	Potassium	ppm	ASTM D5185m	>20	2	<1	0
Nitration         Abs/cm         *ASTM D7624         >20         7.5         5.8         5.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.7         18.3         17.9           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.0         13.0         12.9	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         19.7         18.3         17.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.0         13.0         12.9	Soot %	%	*ASTM D7844	>4	0.8	0.9	0.7
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.0 13.0 12.9	Nitration	Abs/cm	*ASTM D7624	>20	7.5	5.8	5.3
Oxidation Abs/.1mm *ASTM D7414 >25 <b>15.0</b> 13.0 12.9	Sulfation	Abs/.1mm	*ASTM D7415	>30	19.7	18.3	17.9
	FLUID DEGRAD	OATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.0	13.0	12.9
	Base Number (BN)	mg KOH/g			8.3		8.9



## **OIL ANALYSIS REPORT**



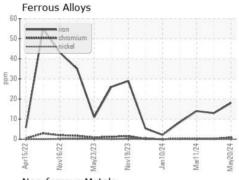


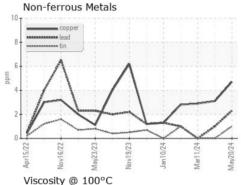


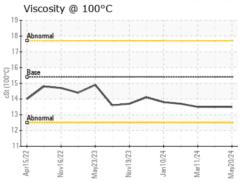
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

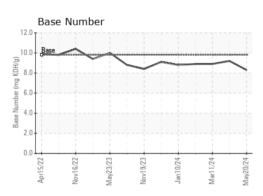
FLUID PROPI	ERTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.5	13.5	13.5

## **GRAPHS**













Certificate 12367

Laboratory Sample No.

: GFL0101837 Lab Number : 06187409 Unique Number : 11044161 Test Package : FLEET

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

Received : 22 May 2024 **Tested** : 31 May 2024 Diagnosed : 31 May 2024 - Wes Davis

GFL Environmental - 891 - Oklahoma City Hauling 1001 South Rockwell Oklahoma City, OK

US 73128 Contact: Andy Smith andrew.smith@gflenv.com

To discuss this sample report, contact Customer Service at 1-800-237-1369. \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

T: (405)306-1651