

# **OIL ANALYSIS REPORT**

## DT

# Sample Rating Trend







Machine Id
913019
Component
Diesel Engine
Fluid

PETRO CANADA DURON SHP 15W40 (11 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

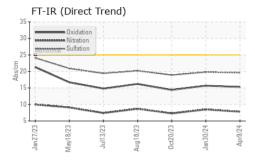
# **Fluid Condition**

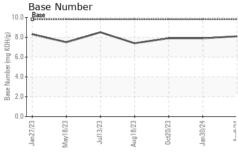
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

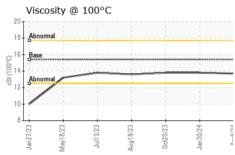
Sample Number   Client Info   GFL0100428   GFL0100425   GFL0038528   Sample Date   Client Info   O9 Apr 2024   30 Jan 2024   20 Oct 2023   Machine Age   hrs   Client Info   372   538   370   Oil Age   hrs   Client Info   372   538   370   Oil Changed   Client Info   GRAMAL   NORIMAL   NORIMAL	SAMPLE INFORM	ATION	method	limit/base	current	history1	history2
Sample Date						•	
Machine Age         hrs         Client Info         2928         2556         2018           Oil Age         hrs         Client Info         372         538         370           Oil Changed         Changed         Changed         Changed         Changed         Changed           Sample Status         WC Method         NoRMAL         NORMAL         NORMAL         NORMAL           Fuel         WC Method         >3.0         <1.0	·						
Oil Age         hrs         Client Info         372         538         370           Oil Changed Sample Status         Client Info         Changed Ch		hrs			•		
Oil Changed Sample Status         Client Info         Changed NORMAL         Changed NEG         Changed NEG         Changed NEG         Changed NEG         Changed NEG         Changed NEG         Changed NEG         Changed NEG         Change NEG         Change NEG         Change NEG         Change NEG         Change							
NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2	-	1110			_		
Fuel						_	_
Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         Imilibase         current         history1         history2           WEAR METALS         method         limilibase         current         history1         history2           Iron         ppm         ASTM D5185m         >120         11         13         10           Chromium         ppm         ASTM D5185m         >20         <1	·	ON	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
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         <1         <1         <1           Nickel         ppm         ASTM D5185m         >5         2         4         2           Tittanium         ppm         ASTM D5185m         >2         0         0         <1	WEAR METALS	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>120	11	13	10
Nickel	Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Titanium         ppm         ASTM D5185m         >2         0         <1         0           Silver         ppm         ASTM D5185m         >2         0         <1         0           Aluminum         ppm         ASTM D5185m         >20         2         4         4           Lead         ppm         ASTM D5185m         >330         1         2         12           Copper         ppm         ASTM D5185m         >330         1         2         12           Tin         ppm         ASTM D5185m         >15         <1         1         <1           Vanadium         ppm         ASTM D5185m         >15         <1         1         <1           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         6         12         10           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         6         12         10           Barium         ppm         ASTM D5185m         0         0         0         <	Nickel		ASTM D5185m	>5			2
Silver         ppm         ASTM D5185m         >2         0         <1         0           Aluminum         ppm         ASTM D5185m         >20         2         4         4           Lead         ppm         ASTM D5185m         >40         <1         0         <1           Copper         ppm         ASTM D5185m         >330         1         2         12           Tin         ppm         ASTM D5185m         >15         <1         1         <1           Vanadium         ppm         ASTM D5185m         >15         <1         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         6         12         10           Barium         ppm         ASTM D5185m         0         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         1         21         1         0           Mangnesium         ppm         ASTM D5185m         <	Titanium		ASTM D5185m	>2	0	0	
Aluminum         ppm         ASTM D5185m         >20         2         4         4           Lead         ppm         ASTM D5185m         >40         <1	Silver					<1	
Lead         ppm         ASTM D5185m         >40         <1         0         <1           Copper         ppm         ASTM D5185m         >330         1         2         12           Tin         ppm         ASTM D5185m         >15         <1         1         <1           Vanadium         ppm         ASTM D5185m         <1         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         6         12         10           Barium         ppm         ASTM D5185m         0         0         0         0           Barium         ppm         ASTM D5185m         0         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0         0         0           Magnesium         ppm         ASTM D5185m         0         <1         <1         <1         0           Calcium         ppm         ASTM D5185m         107	Aluminum			>20			
Copper         ppm         ASTM D5185m         >330         1         2         12           Tin         ppm         ASTM D5185m         >15         <1					<1		<1
Tin         ppm         ASTM D5185m         >15         <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							
Vanadium         ppm         ASTM D5185m         <1         0         0           Cadmium         ppm         ASTM D5185m         0         0         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         6         12         10           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         58         63         62           Manganese         ppm         ASTM D5185m         1010         922         969         884           Calcium         ppm         ASTM D5185m         1070         1094         1098         1047           Phosphorus         ppm         ASTM D5185m         1270         1150         1280         1153           Sulfur         ppm         ASTM D5185m         2060         3313         2979         3319           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20					-		
Cadmium         ppm         ASTM D5185m         0         0         < 1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         6         12         10           Barium         ppm         ASTM D5185m         0							
Boron							
Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         58         63         62           Manganese         ppm         ASTM D5185m         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         58         63         62           Manganese         ppm         ASTM D5185m         0         <1         <1         0           Magnesium         ppm         ASTM D5185m         1010         922         969         884           Calcium         ppm         ASTM D5185m         1070         1094         1098         1047           Phosphorus         ppm         ASTM D5185m         1150         989         1044         973           Zinc         ppm         ASTM D5185m         1270         1150         1280         1153           Sulfur         ppm         ASTM D5185m         2060         3313         2979         3319           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         4         4           Sodium         ppm         ASTM D5185m         >20         20         6         8           INFRA-RED         method         limit/base         current         history1         history2           Soot %         "ASTM D7624         >20<	Boron	ppm	ASTM D5185m	0	6	12	10
Manganese         ppm         ASTM D5185m         0         <1         <1         0           Magnesium         ppm         ASTM D5185m         1010         922         969         884           Calcium         ppm         ASTM D5185m         1070         1094         1098         1047           Phosphorus         ppm         ASTM D5185m         1150         989         1044         973           Zinc         ppm         ASTM D5185m         1270         1150         1280         1153           Sulfur         ppm         ASTM D5185m         2060         3313         2979         3319           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         4         4           Sodium         ppm         ASTM D5185m         >20         20         6         8           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.6         0.4           Nitration         Abs/cm         *ASTM D78	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium         ppm         ASTM D5185m         1010         922         969         884           Calcium         ppm         ASTM D5185m         1070         1094         1098         1047           Phosphorus         ppm         ASTM D5185m         1150         989         1044         973           Zinc         ppm         ASTM D5185m         1270         1150         1280         1153           Sulfur         ppm         ASTM D5185m         2060         3313         2979         3319           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         4         4           Sodium         ppm         ASTM D5185m         >20         20         6         8           INFRA-RED         method         limit/base         current         history1         history2           Soot %         "ASTM D7624         >20         7.8         8.5         7.3           Sulfation         Abs/.1mm         "ASTM D7415         >30         19.6         19.8         18.9           FLUID DEGRADATION         "ASTM D7414	Molybdenum	ppm	ASTM D5185m	60	58	63	62
Calcium         ppm         ASTM D5185m         1070         1094         1098         1047           Phosphorus         ppm         ASTM D5185m         1150         989         1044         973           Zinc         ppm         ASTM D5185m         1270         1150         1280         1153           Sulfur         ppm         ASTM D5185m         2060         3313         2979         3319           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         4         4           Sodium         ppm         ASTM D5185m         >20         20         6         8           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.6         0.4           Nitration         Abs/cm         *ASTM D7624         >20         7.8         8.5         7.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         19.8         18.9           FLUID DEGRADATION         <	Manganese	ppm	ASTM D5185m	0	<1	<1	0
Phosphorus         ppm         ASTM D5185m         1150         989         1044         973           Zinc         ppm         ASTM D5185m         1270         1150         1280         1153           Sulfur         ppm         ASTM D5185m         2060         3313         2979         3319           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         4         4           Sodium         ppm         ASTM D5185m         >20         20         6         8           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.6         0.4           Nitration         Abs/cm         *ASTM D7624         >20         7.8         8.5         7.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         19.8         18.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/	Magnesium	ppm	ASTM D5185m	1010	922	969	884
Zinc         ppm         ASTM D5185m         1270         1150         1280         1153           Sulfur         ppm         ASTM D5185m         2060         3313         2979         3319           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         4         4           Sodium         ppm         ASTM D5185m         >20         20         6         8           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.6         0.4           Nitration         Abs/cm         *ASTM D7624         >20         7.8         8.5         7.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         19.8         18.9           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.3         15.7         14.4	Calcium	ppm	ASTM D5185m	1070	1094	1098	1047
Sulfur         ppm         ASTM D5185m         2060         3313         2979         3319           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         4         4           Sodium         ppm         ASTM D5185m         >20         10         7         7           Potassium         ppm         ASTM D5185m         >20         20         6         8           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.6         0.4           Nitration         Abs/cm         *ASTM D7624         >20         7.8         8.5         7.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         19.8         18.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.3         15.7         14.4	Phosphorus	ppm	ASTM D5185m	1150	989	1044	973
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         4         4           Sodium         ppm         ASTM D5185m         10         7         7           Potassium         ppm         ASTM D5185m         >20         20         6         8           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.6         0.4           Nitration         Abs/cm         *ASTM D7624         >20         7.8         8.5         7.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         19.8         18.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.3         15.7         14.4	Zinc	ppm	ASTM D5185m	1270	1150	1280	1153
Silicon         ppm         ASTM D5185m         >25         3         4         4           Sodium         ppm         ASTM D5185m         10         7         7           Potassium         ppm         ASTM D5185m         >20         20         6         8           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.6         0.4           Nitration         Abs/cm         *ASTM D7624         >20         7.8         8.5         7.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         19.8         18.9           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.3         15.7         14.4	Sulfur	ppm	ASTM D5185m	2060	3313	2979	3319
Sodium         ppm         ASTM D5185m         10         7         7           Potassium         ppm         ASTM D5185m         >20         20         6         8           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.6         0.4           Nitration         Abs/cm         *ASTM D7624         >20         7.8         8.5         7.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         19.8         18.9           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.3         15.7         14.4	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         20         6         8           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.6         0.4           Nitration         Abs/cm         *ASTM D7624         >20         7.8         8.5         7.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         19.8         18.9           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.3         15.7         14.4	Silicon	ppm	ASTM D5185m	>25	3	4	4
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.6         0.4           Nitration         Abs/cm         *ASTM D7624         >20         7.8         8.5         7.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         19.8         18.9           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.3         15.7         14.4	Sodium	ppm	ASTM D5185m		10	7	7
Soot %         %         *ASTM D7844 >4         0.5         0.6         0.4           Nitration         Abs/cm         *ASTM D7624 >20         7.8         8.5         7.3           Sulfation         Abs/.1mm         *ASTM D7415 >30         19.6         19.8         18.9           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         15.3         15.7         14.4	Potassium	ppm	ASTM D5185m	>20	20	6	8
Nitration         Abs/cm         *ASTM D7624         >20         7.8         8.5         7.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         19.8         18.9           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.3         15.7         14.4	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         19.8         18.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.3         15.7         14.4	Soot %	%	*ASTM D7844	>4	0.5	0.6	0.4
FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     15.3     15.7     14.4	Nitration	Abs/cm	*ASTM D7624	>20	7.8	8.5	7.3
Oxidation Abs/.1mm *ASTM D7414 >25 <b>15.3</b> 15.7 14.4	Sulfation		*ASTM D7415	>30		19.8	18.9
	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
Base Number (BN)         mg KOH/g         ASTM D2896         9.8         8.1         7.9         7.9	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.3	15.7	14.4
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.1	7.9	7.9



# **OIL ANALYSIS REPORT**



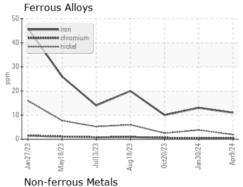


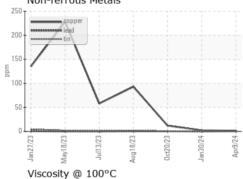


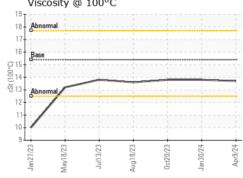
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

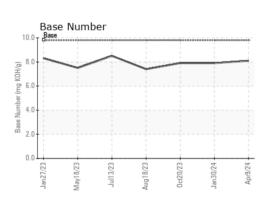
FLUID PROPE	EKITES	method	ilmit/base		nistory i	nistoryz
Visc @ 100°C	cSt	ASTM D445	15.4	13.7	13.8	13.8

# **GRAPHS**













Certificate 12367

Sample No.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0100428 Lab Number : 06150941 Unique Number : 10981019 Test Package : FLEET

Received : 16 Apr 2024 **Tested** Diagnosed

: 17 Apr 2024 : 17 Apr 2024 - Wes Davis

GFL Environmental - 900 - Antigo HC 1715 Deleglise St. Antigo, WI US 54409

Contact: Kirk Koss kirk.koss@gflenv.com T: (715)571-2784

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)

Submitted By: see also GFL927, GFL930 - Kirk Koss