

# **OIL ANALYSIS REPORT**

# Sample Rating Trend









(546HPY)
1034A
Component
Diesel Engine

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

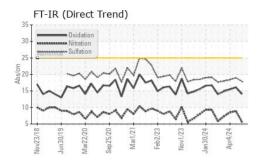
## **Fluid Condition**

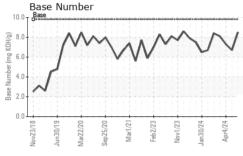
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

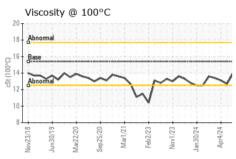
Sample Date   Client Info   O8 May 2024   17 Apr 2024   04 Apr 2024   Machine Age   hrs   Client Info   17676   17556   17474     Oil Age   hrs   Client Info   O   O   0   122819     Oil Changed   Client Info   Not Changed   Normal   Normal	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Machine Age   hrs   Client Info   17676   17556   17474   17	Sample Number		Client Info		GFL0118776	GFL0118808	GFL0114166
Oil Changed Nrs         Client Info         Not Changed Not Changed Not Changed Nort Changed N	Sample Date		Client Info		08 May 2024	17 Apr 2024	04 Apr 2024
Oil Changed Sample Status         Client Info         Not Changd NORMAL         Changed NORMAL         Not Changed NORMAL	Machine Age	hrs	Client Info		17676	17556	17474
NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2   history2	-	hrs	Client Info		0	0	122819
NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2   history2	Oil Changed		Client Info		Not Changd	Changed	Not Changd
Fuel	-				NORMAL	NORMAL	NORMAL
Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >120         0         6         6           Chromium         ppm         ASTM D5185m         >20         0         <1	CONTAMINATION	NC	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
Irron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         0         <1	WEAR METALS	3	method	limit/base	current	history1	history2
Chromium         ppm         ASTM D5185m         >20         0         <1         0           Nickel         ppm         ASTM D5185m         >5         0         <1         0           Titanium         ppm         ASTM D5185m         >5         0         <1         0           Silver         ppm         ASTM D5185m         >20         <1         0           Aluminum         ppm         ASTM D5185m         >20         <1         3         2           Lead         ppm         ASTM D5185m         >40         <1         <1         <1         <1           Copper         ppm         ASTM D5185m         >40         <1         <1         <1         <1           Copper         ppm         ASTM D5185m         >15         0         <1         <1         <1           Vanadium         ppm         ASTM D5185m         0         <1         <1         <1            Vanadium         ppm         ASTM D5185m         0         <1         <1         <1         <1           Vanadium         ppm         ASTM D5185m         0         4         0         <1         <1           Cadmium	Iron	maa	ASTM D5185m	>120	0	6	6
Nickel	-						
Titanium							
Silver         ppm         ASTM D5185m         >2         0         <1         0           Aluminum         ppm         ASTM D5185m         >20         <1         3         2           Lead         ppm         ASTM D5185m         >40         <1         <1         <1           Copper         ppm         ASTM D5185m         330         0         1         <1         <1           Vanadium         ppm         ASTM D5185m         0         <1         <1         <1           Vanadium         ppm         ASTM D5185m         0         <1         <1         <1           Cadmium         ppm         ASTM D5185m         0         <1         <1         <1           Cadmium         ppm         ASTM D5185m         0         4         0         0            Boron         ppm         ASTM D5185m         0         4         0         0         0           Barium         ppm         ASTM D5185m         0         4         0         0         0           Barium         ppm         ASTM D5185m         0         0         0         1         0         0           Mangaesium							
Aluminum         ppm         ASTM D5185m         >20         <1         3         2           Lead         ppm         ASTM D5185m         >40         <1							
Lead         ppm         ASTM D5185m         >40         <1         <1         <1           Copper         ppm         ASTM D5185m         >330         0         1         <1           Tin         ppm         ASTM D5185m         0         <1         <1           Vanadium         ppm         ASTM D5185m         0         <1         <1           Cadmium         ppm         ASTM D5185m         0         <1         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         4         0         0           Boron         ppm         ASTM D5185m         0         4         0         0           Boron         ppm         ASTM D5185m         0         0         0         0           Boron         ppm         ASTM D5185m         0         0         0         0           Boron         ppm         ASTM D5185m         0         0         0         0           Malganesium         ppm         ASTM D5185m         1010         892         861         892           Calcium <th< td=""><td></td><td></td><td></td><td></td><th></th><td></td><td></td></th<>							
Copper         ppm         ASTM D5185m         >330         0         1         <1         <1           Tin         ppm         ASTM D5185m         >15         0         <1							
Tin							
Vanadium         ppm         ASTM D5185m         0         <1         <1           Cadmium         ppm         ASTM D5185m         0         <1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         4         0         0           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         54         57         55           Manganese         ppm         ASTM D5185m         0         0         <1         0           Magnesium         ppm         ASTM D5185m         1010         892         861         892           Calcium         ppm         ASTM D5185m         1070         1049         1007         1031           Phosphorus         ppm         ASTM D5185m         1270         1188         1158         1168           Sulfur         ppm         ASTM D5185m         2060         3474         3113         3383           CONTAMINANTS         method         limit/base         current         history1							
Cadmium         ppm         ASTM D5185m         0         <1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         4         0         0           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         <1				>10			
ADDITIVES							
Boron		ррпі		li-noit/lo-no-n			
Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         54         57         55           Manganese         ppm         ASTM D5185m         0         0         <1         0           Magnesium         ppm         ASTM D5185m         1010         892         861         892           Calcium         ppm         ASTM D5185m         1070         1049         1007         1031           Phosphorus         ppm         ASTM D5185m         1150         1035         1039         1005           Zinc         ppm         ASTM D5185m         1270         1188         1158         1168           Sulfur         ppm         ASTM D5185m         2060         3474         3113         3383           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         5           Sodium         ppm         ASTM D5185m         >20         2         3         16           INFRA-RED         method         limit/base<							
Molybdenum         ppm         ASTM D5185m         60         54         57         55           Manganese         ppm         ASTM D5185m         0         0         <1         0           Magnesium         ppm         ASTM D5185m         1010         892         861         892           Calcium         ppm         ASTM D5185m         1070         1049         1007         1031           Phosphorus         ppm         ASTM D5185m         1150         1035         1039         1005           Zinc         ppm         ASTM D5185m         1270         1188         1158         1168           Sulfur         ppm         ASTM D5185m         2060         3474         3113         3383           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         5           Sodium         ppm         ASTM D5185m         >20         2         3         16           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624					-		
Manganese         ppm         ASTM D5185m         0         <1         0           Magnesium         ppm         ASTM D5185m         1010         892         861         892           Calcium         ppm         ASTM D5185m         1070         1049         1007         1031           Phosphorus         ppm         ASTM D5185m         1150         1035         1039         1005           Zinc         ppm         ASTM D5185m         1270         1188         1158         1168           Sulfur         ppm         ASTM D5185m         2060         3474         3113         3383           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         5           Sodium         ppm         ASTM D5185m         >20         2         3         16           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.1         0.3         0.3           Nitration         Abs/cm         *ASTM D7624         >20		ppm			•		-
Magnesium         ppm         ASTM D5185m         1010         892         861         892           Calcium         ppm         ASTM D5185m         1070         1049         1007         1031           Phosphorus         ppm         ASTM D5185m         1150         1035         1039         1005           Zinc         ppm         ASTM D5185m         1270         1188         1158         1168           Sulfur         ppm         ASTM D5185m         2060         3474         3113         3383           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         5           Sodium         ppm         ASTM D5185m         >20         2         3         16           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.1         0.3         0.3           Nitration         Abs/:nm         *ASTM D7415         >30         17.9         19.0         18.4           FLUID DEGRADATION         *ASTM D7414					-		
Calcium         ppm         ASTM D5185m         1070         1049         1007         1031           Phosphorus         ppm         ASTM D5185m         1150         1035         1039         1005           Zinc         ppm         ASTM D5185m         1270         1188         1158         1168           Sulfur         ppm         ASTM D5185m         2060         3474         3113         3383           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         5           Sodium         ppm         ASTM D5185m         >20         2         3         16           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.1         0.3         0.3           Nitration         Abs/cm         *ASTM D7624         >20         5.6         8.9         8.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         19.0         18.4           FLUID DEGRADATION         *ASTM D	ū	ppm			•		
Phosphorus         ppm         ASTM D5185m         1150         1035         1039         1005           Zinc         ppm         ASTM D5185m         1270         1188         1158         1168           Sulfur         ppm         ASTM D5185m         2060         3474         3113         3383           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         5           Sodium         ppm         ASTM D5185m         >20         2         3         16           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.1         0.3         0.3           Nitration         Abs/cm         *ASTM D7624         >20         5.6         8.9         8.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         19.0         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm	Magnesium	ppm					892
Zinc         ppm         ASTM D5185m         1270         1188         1158         1168           Sulfur         ppm         ASTM D5185m         2060         3474         3113         3383           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         5           Sodium         ppm         ASTM D5185m         1         1         5           Potassium         ppm         ASTM D5185m         >20         2         3         16           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.1         0.3         0.3           Nitration         Abs/cm         *ASTM D7624         >20         5.6         8.9         8.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         19.0         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7		ppm				1007	1031
Sulfur         ppm         ASTM D5185m         2060         3474         3113         3383           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         5           Sodium         ppm         ASTM D5185m         1         1         5           Potassium         ppm         ASTM D5185m         >20         2         3         16           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.1         0.3         0.3           Nitration         Abs/cm         *ASTM D7624         >20         5.6         8.9         8.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         19.0         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.1         16.1         15.5	Phosphorus	ppm	ASTM D5185m	1150	1035	1039	1005
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         5           Sodium         ppm         ASTM D5185m         1         1         5           Potassium         ppm         ASTM D5185m         >20         2         3         16           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.1         0.3         0.3           Nitration         Abs/cm         *ASTM D7624         >20         5.6         8.9         8.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         19.0         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.1         16.1         15.5	Zinc	ppm	ASTM D5185m	1270	1188	1158	1168
Silicon         ppm         ASTM D5185m         >25         3         3         5           Sodium         ppm         ASTM D5185m         1         1         5           Potassium         ppm         ASTM D5185m         >20         2         3         16           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.1         0.3         0.3           Nitration         Abs/cm         *ASTM D7624         >20         5.6         8.9         8.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         19.0         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.1         16.1         15.5	Sulfur	ppm	ASTM D5185m	2060	3474	3113	3383
Sodium         ppm         ASTM D5185m         1         1         5           Potassium         ppm         ASTM D5185m         >20         2         3         16           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.1         0.3         0.3           Nitration         Abs/cm         *ASTM D7624         >20         5.6         8.9         8.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         19.0         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.1         16.1         15.5	CONTAMINANT	TS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         2         3         16           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.1         0.3         0.3           Nitration         Abs/cm         *ASTM D7624         >20         5.6         8.9         8.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         19.0         18.4           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.1         16.1         15.5	Silicon	ppm	ASTM D5185m	>25	3	3	5
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.1         0.3         0.3           Nitration         Abs/cm         *ASTM D7624         >20         5.6         8.9         8.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         19.0         18.4           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.1         16.1         15.5	Sodium	ppm	ASTM D5185m		1	1	5
Soot %         %         *ASTM D7844 >4         0.1         0.3         0.3           Nitration         Abs/cm         *ASTM D7624 >20         5.6         8.9         8.5           Sulfation         Abs/.1mm         *ASTM D7415 >30         17.9         19.0         18.4           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         14.1         16.1         15.5	Potassium	ppm	ASTM D5185m	>20	2	3	16
Nitration         Abs/cm         *ASTM D7624         >20         5.6         8.9         8.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         19.0         18.4           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.1         16.1         15.5	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         19.0         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.1         16.1         15.5	Soot %	%	*ASTM D7844	>4	0.1	0.3	0.3
Sulfation         Abs/.1mm         *ASTM D7415         >30         17.9         19.0         18.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.1         16.1         15.5	Nitration	Abs/cm	*ASTM D7624	>20	5.6	8.9	8.5
Oxidation Abs/.1mm *ASTM D7414 >25 <b>14.1</b> 16.1 15.5	Sulfation						
	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	14.1	16.1	15.5
		mg KOH/g	ASTM D2896	9.8	8.5	6.7	7.3



# **OIL ANALYSIS REPORT**



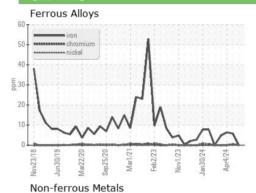


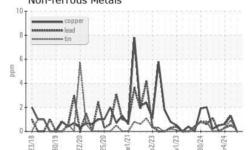


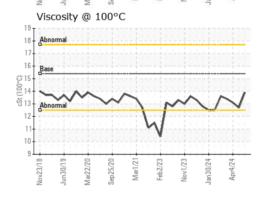
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

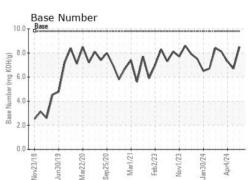
FLUID PROPERTIES		method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.9	12.7	13.1

## **GRAPHS**













Certificate 12367

Laboratory Lab Number : 06175189 Unique Number : 11021242

Test Package : FLEET

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Sample No. : GFL0118776

Received : 10 May 2024 **Tested** Diagnosed

: 11 May 2024 : 11 May 2024 - Wes Davis

GFL Environmental - 837 - Harrison TS 22820 S State Route 291

Harrisonville, MO US 64701

Contact: SARA PATRICK spatrick@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: F: