

# **OIL ANALYSIS REPORT**

(YA117965) [oil service]

2577

Diesel Engine

PETRO CANADA DURON SHP 15W40 (40 QTS)

Sample Rating Trend



## DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

### Contamination

There is no indication of any contamination in the

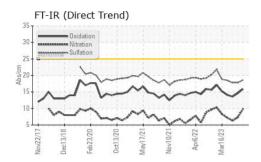
## **Fluid Condition**

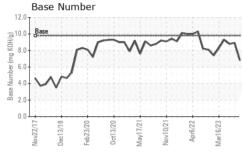
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

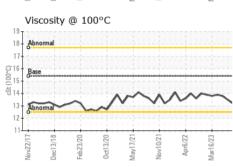
Sample Number   Client Info   GFL0124459   GFL0098496   GFL0097778   Sample Date   Client Info   D5 Jun 2024   04 Dec 2023   01 Sep 2024   02 Sep 2024   0	SAMPLE INFORM	IATIO <u>N</u>	method	limit/base	current	history1	history2
Sample Date					GFL0124459	GFL0098496	GFL0087778
Machine Age         hrs         Client Info         23270         23480         22817           Oil Age         hrs         Client Info         730         600         600           Oil Changed         Client Info         Changed         Changed         Changed         Changed         Changed         NORMAL           Sample Status         WC Method         Imitibase         current         history1         history2           Fuel         WC Method         >5         <1.0			Client Info		05 Jun 2024	04 Dec 2023	01 Sep 2023
Oil Age	·	hrs					
Contained   Client Info   Changed   NoRMAL   NORMAL   NORMAL	, and the second	hrs	Client Info		730	600	600
NORMAL   NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2	-		Client Info		Changed	Changed	Changed
Fuel	-					_	Ü
Water Glycol         WC Method WC Method         >0.2         NEG NEG         NEG NEG         NEG NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         10         5         4           Chromium         ppm         ASTM D5185m         >20         <1	CONTAMINATION	NC	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>5	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Irron	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METALS	)	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	10	5	4
Silver	Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Silver	Nickel	ppm	ASTM D5185m	>4			
Aluminum         ppm         ASTM D5185m         >20         4         1         <1           Lead         ppm         ASTM D5185m         >40         <1	Titanium	ppm	ASTM D5185m		<1	0	0
Lead	Silver	ppm	ASTM D5185m	>3	0	0	0
Copper         ppm         ASTM D5185m         >330         2         <1         1           Tin         ppm         ASTM D5185m         >15         <1	Aluminum	ppm	ASTM D5185m	>20	4	1	<1
Tin	Lead	ppm	ASTM D5185m	>40	<1	0	0
Vanadium         ppm         ASTM D5185m         0         0         <1           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1         2         <1           Barium         ppm         ASTM D5185m         0         1         2         0           Molybdenum         ppm         ASTM D5185m         60         65         59         64           Manganese         ppm         ASTM D5185m         0         0         0         <1           Magnesium         ppm         ASTM D5185m         1010         944         885         1020           Calcium         ppm         ASTM D5185m         1070         1147         1075         1198           Phosphorus         ppm         ASTM D5185m         1270         1272         1180         1326           Sulfur         ppm         ASTM D5185m         2060         3390         3436         3861           CONTAMINANTS         method         limit/base         current         history1	Copper	ppm	ASTM D5185m	>330	2	<1	1
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1	Tin	ppm	ASTM D5185m	>15	<1	0	0
ADDITIVES	Vanadium	ppm	ASTM D5185m		0	0	<1
Boron   ppm   ASTM D5185m   0   1   2   0	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         0         1         2         0           Molybdenum         ppm         ASTM D5185m         60         65         59         64           Manganese         ppm         ASTM D5185m         0         0         0         <1           Magnesium         ppm         ASTM D5185m         1010         944         885         1020           Calcium         ppm         ASTM D5185m         1070         1147         1075         1198           Phosphorus         ppm         ASTM D5185m         1150         984         956         1105           Zinc         ppm         ASTM D5185m         1270         1272         1180         1326           Sulfur         ppm         ASTM D5185m         2060         3390         3436         3861           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         4           Sodium         ppm         ASTM D5185m         >20         2         2         0           INFRA-RED         method         l	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         65         59         64           Manganese         ppm         ASTM D5185m         0         0         0         <1           Magnesium         ppm         ASTM D5185m         1010         944         885         1020           Calcium         ppm         ASTM D5185m         1070         1147         1075         1198           Phosphorus         ppm         ASTM D5185m         1150         984         956         1105           Zinc         ppm         ASTM D5185m         1270         1272         1180         1326           Sulfur         ppm         ASTM D5185m         2060         3390         3436         3861           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         4           Sodium         ppm         ASTM D5185m         >20         2         2         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624 <t< td=""><td>Boron</td><td>ppm</td><td></td><td></td><th>&lt;1</th><td></td><td></td></t<>	Boron	ppm			<1		
Manganese         ppm         ASTM D5185m         0         0         <1           Magnesium         ppm         ASTM D5185m         1010         944         885         1020           Calcium         ppm         ASTM D5185m         1070         1147         1075         1198           Phosphorus         ppm         ASTM D5185m         1150         984         956         1105           Zinc         ppm         ASTM D5185m         1270         1272         1180         1326           Sulfur         ppm         ASTM D5185m         2060         3390         3436         3861           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         4           Sodium         ppm         ASTM D5185m         >20         2         2         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         9.8         7.3         6.3           Sulfation         Abs/:1mm         *ASTM D7415         <	Barium	ppm	ASTM D5185m	0	1	2	0
Magnesium         ppm         ASTM D5185m         1010         944         885         1020           Calcium         ppm         ASTM D5185m         1070         1147         1075         1198           Phosphorus         ppm         ASTM D5185m         1150         984         956         1105           Zinc         ppm         ASTM D5185m         1270         1272         1180         1326           Sulfur         ppm         ASTM D5185m         2060         3390         3436         3861           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         4           Sodium         ppm         ASTM D5185m         >20         2         2         0           Potassium         ppm         ASTM D5185m         >20         2         2         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         % ASTM D7844         >3         0.4         0.2         0.2           Nitration         Abs/cm         *ASTM D7415         >30	Molybdenum	ppm	ASTM D5185m	60	65		64
Calcium         ppm         ASTM D5185m         1070         1147         1075         1198           Phosphorus         ppm         ASTM D5185m         1150         984         956         1105           Zinc         ppm         ASTM D5185m         1270         1272         1180         1326           Sulfur         ppm         ASTM D5185m         2060         3390         3436         3861           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         4           Sodium         ppm         ASTM D5185m         >20         2         2         0           Potassium         ppm         ASTM D5185m         >20         2         2         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.4         0.2         0.2           Nitration         Abs/.1mm         *ASTM D7415         >30         18.6         17.8         17.8           FLUID DEGRADATION         *ASTM D	Manganese	ppm	ASTM D5185m	0	0	0	<1
Phosphorus         ppm         ASTM D5185m         1150         984         956         1105           Zinc         ppm         ASTM D5185m         1270         1272         1180         1326           Sulfur         ppm         ASTM D5185m         2060         3390         3436         3861           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         4           Sodium         ppm         ASTM D5185m         >20         2         2         0           Potassium         ppm         ASTM D5185m         >20         2         2         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.4         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         9.8         7.3         6.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.6         17.8         17.8           FLUID DEGRADATION         method	Magnesium	ppm	ASTM D5185m	1010	944	885	1020
Zinc         ppm         ASTM D5185m         1270         1272         1180         1326           Sulfur         ppm         ASTM D5185m         2060         3390         3436         3861           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         4           Sodium         ppm         ASTM D5185m         0         0         2           Potassium         ppm         ASTM D5185m         >20         2         2         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.4         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         9.8         7.3         6.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.6         17.8         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D74	Calcium	ppm	ASTM D5185m	1070	1147	1075	1198
Sulfur         ppm         ASTM D5185m         2060         3390         3436         3861           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         4           Sodium         ppm         ASTM D5185m         0         0         2           Potassium         ppm         ASTM D5185m         >20         2         2         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.4         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         9.8         7.3         6.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.6         17.8         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.9         14.6         13.6	Phosphorus	ppm	ASTM D5185m	1150	984	956	
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         4           Sodium         ppm         ASTM D5185m         0         0         2           Potassium         ppm         ASTM D5185m         >20         2         2         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.4         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         9.8         7.3         6.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.6         17.8         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.9         14.6         13.6	Zinc	ppm	ASTM D5185m	1270	1272	1180	1326
Silicon         ppm         ASTM D5185m         >25         5         4         4           Sodium         ppm         ASTM D5185m         0         0         2           Potassium         ppm         ASTM D5185m         >20         2         2         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.4         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         9.8         7.3         6.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.6         17.8         17.8           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.9         14.6         13.6			ASTM D5185m	2060	3390	3436	3861
Sodium         ppm         ASTM D5185m         0         0         2           Potassium         ppm         ASTM D5185m         >20         2         2         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.4         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         9.8         7.3         6.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.6         17.8         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.9         14.6         13.6	CONTAMINANT	S	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         2         2         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.4         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         9.8         7.3         6.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.6         17.8         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.9         14.6         13.6				>25			
INFRA-RED		ppm					
Soot %         %         *ASTM D7844 >3         0.4         0.2         0.2           Nitration         Abs/cm         *ASTM D7624 >20         9.8         7.3         6.3           Sulfation         Abs/.1mm         *ASTM D7415 >30         18.6         17.8         17.8           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         15.9         14.6         13.6	Potassium	ppm	ASTM D5185m	>20	2	2	0
Nitration         Abs/cm         *ASTM D7624         >20         9.8         7.3         6.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.6         17.8         17.8           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.9         14.6         13.6	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         18.6         17.8         17.8           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.9         14.6         13.6	Soot %	%	*ASTM D7844	>3	0.4		0.2
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.9 14.6 13.6	Nitration	Abs/cm	*ASTM D7624	>20	9.8	7.3	6.3
Oxidation Abs/.1mm *ASTM D7414 >25 <b>15.9</b> 14.6 13.6	Sulfation	Abs/.1mm	*ASTM D7415	>30	18.6	17.8	17.8
	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
Base Number (BN)         mg KOH/g         ASTM D2896         9.8         6.8         8.9         8.8	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.9	14.6	13.6
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	6.8	8.9	8.8



# **OIL ANALYSIS REPORT**



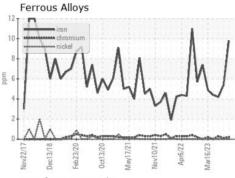


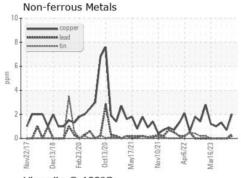


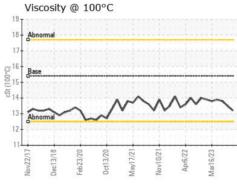
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

FLUID PROPE	RHES	metnoa	ilmit/base	current	nistory i	nistory2
Visc @ 100°C	cSt	ASTM D445	15.4	13.2	13.5	13.8

## **GRAPHS**





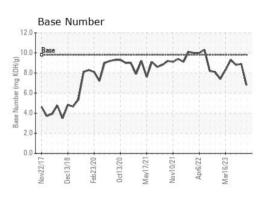


Received

: 06 Jun 2024

: 07 Jun 2024

: 07 Jun 2024 - Wes Davis







Certificate 12367

Laboratory Sample No.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Lab Number : 06201321

: GFL0124459 Unique Number : 11063444

**Tested** Diagnosed GFL Environmental - 006 - Wilmington

3618 US Highway 421 N Wilmington, NC

US 28401 Contact: Eric Wood

F: (910)762-6880

eric.wood@gflenv.com T: (717)723-1956

Test Package : FLEET 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: GFL006 [WUSCAR] 06201321 (Generated: 06/07/2024 05:37:20) Rev: 1

Submitted By: NEIL GRIFFIN