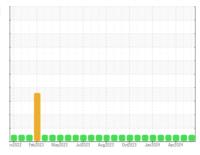


# **OIL ANALYSIS REPORT**

Sample Rating Trend







Machine Id
812090
Component
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

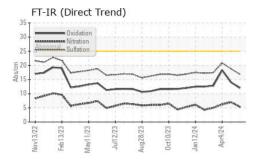
# **Fluid Condition**

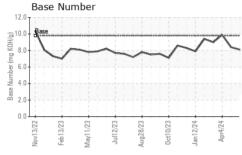
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

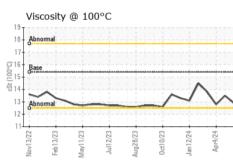
Sample Number   Client Info   GFL01122184   GFL0118060   GFL011575   Sample Date   Client Info   James 2024   23 Apr 2024   04 Apr 2024   3738   3738   01 Apr 2024   3738   01 Apr 2024   3738   01 Apr 2024   3738   01 Apr 2024   01 Apr 2024   02 Apr 2024   04 Apr 2024   03 Apr 2024   03 Apr 2024   04 Apr 20	IAL)		3VZUZZ F80Z	JES MBYZUZS JUIZUZS	Augzuzs Uctzuzs Janzuz4	ADTZUZ4	
Sample Date	SAMPLE INFOR	RMATION	method	limit/base	current	history1	history2
Machine Age   hrs   Client Info   146   557   409	Sample Number		Client Info		GFL0122184	GFL0118060	GFL0115757
Oil Age	Sample Date		Client Info		31 May 2024	23 Apr 2024	04 Apr 2024
Oil Changed   Client Info   Not Changed   Normal   Norm	Machine Age	hrs	Client Info		4042	3896	3738
NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2   history2   NEG   NEG	Oil Age	hrs	Client Info		146	567	409
CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >5         <1.0	Oil Changed		Client Info		Not Changd	Changed	Not Changd
Fuel	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         >100         <1         12         7           Chromium         ppm         ASTM D5185m         >20         0         0         <1           Nickel         ppm         ASTM D5185m         >4         0         0         <1           Silver         ppm         ASTM D5185m         >3         0         0         0           Silver         ppm         ASTM D5185m         >20         2         3         2           Lead         ppm         ASTM D5185m         >40         0         0         <1           Copper         ppm         ASTM D5185m         >330         0         0         <1           Vanadium         ppm         ASTM D5185m         >15         0         0         <1           Vanadium         ppm         ASTM D5185m         0         0         <1	CONTAMINA	TION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>5	<1.0	<1.0	<1.0
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         <1	Water		WC Method	>0.2	NEG	NEG	NEG
Chromium	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METAI	LS	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	<1	12	7
Titanium	Chromium	ppm	ASTM D5185m	>20	0	0	<1
Silver	Nickel	ppm	ASTM D5185m	>4	0	0	<1
Aluminum	Titanium	ppm	ASTM D5185m		0	0	<1
Lead		ppm	ASTM D5185m	>3	0	0	0
Copper         ppm         ASTM D5185m         >330         0         0         2           Tin         ppm         ASTM D5185m         >15         0         0         <1	Aluminum	ppm	ASTM D5185m	>20	2	3	2
Tin	Lead	ppm	ASTM D5185m	>40	0	0	<1
Vanadium         ppm         ASTM D5185m         0         0         <1           Cadmium         ppm         ASTM D5185m         0         0         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1         0         52           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0         0           Manganese         ppm         ASTM D5185m         0         0         0         0         <1           Magnesium         ppm         ASTM D5185m         1010         817         839         532           Calcium         ppm         ASTM D5185m         1070         1065         1424         1449           Phosphorus         ppm         ASTM D5185m         1270         1141         1369         876           Sulfur         ppm         ASTM D5185m         2060         3384         3868         2429           CONTAMINANTS         method         limit/base         current         hist	Copper	ppm	ASTM D5185m	>330	0	0	2
Cadmium         ppm         ASTM D5185m         0         0         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1	Tin	ppm	ASTM D5185m	>15	0	0	<1
ADDITIVES	Vanadium	ppm	ASTM D5185m		0	0	<1
Boron	Cadmium	ppm	ASTM D5185m		0	0	<1
Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         64         65         55           Manganese         ppm         ASTM D5185m         0         0         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         64         65         55           Manganese         ppm         ASTM D5185m         0         0         0         <1           Magnesium         ppm         ASTM D5185m         1010         817         839         532           Calcium         ppm         ASTM D5185m         1070         1065         1424         1449           Phosphorus         ppm         ASTM D5185m         1150         985         1094         723           Zinc         ppm         ASTM D5185m         1270         1141         1369         876           Sulfur         ppm         ASTM D5185m         2060         3384         3868         2429           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         0         1         12           Sodium         ppm         ASTM D5185m         2         2         2         24           Potassium         ppm         ASTM D5185m         >20         4         7         2           INFRA-RED         method         limit/base	Boron	ppm	ASTM D5185m	0		0	52
Manganese         ppm         ASTM D5185m         0         0         <1           Magnesium         ppm         ASTM D5185m         1010         817         839         532           Calcium         ppm         ASTM D5185m         1070         1065         1424         1449           Phosphorus         ppm         ASTM D5185m         1150         985         1094         723           Zinc         ppm         ASTM D5185m         1270         1141         1369         876           Sulfur         ppm         ASTM D5185m         2060         3384         3868         2429           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         0         1         12           Sodium         ppm         ASTM D5185m         >20         4         7         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.4         0.1           Nitration         Abs/.1mm         *ASTM D7415 <td< td=""><td>Barium</td><td>ppm</td><td>ASTM D5185m</td><td>0</td><th>0</th><td>0</td><td>0</td></td<>	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium         ppm         ASTM D5185m         1010         817         839         532           Calcium         ppm         ASTM D5185m         1070         1065         1424         1449           Phosphorus         ppm         ASTM D5185m         1150         985         1094         723           Zinc         ppm         ASTM D5185m         1270         1141         1369         876           Sulfur         ppm         ASTM D5185m         2060         3384         3868         2429           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         0         1         12           Sodium         ppm         ASTM D5185m         >20         4         7         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.4         0.1           Nitration         Abs/.1mm         *ASTM D7415         >30         16.8         18.8         20.8           FLUID DEGRADATION         *ASTM D7414	Molybdenum	ppm	ASTM D5185m	60			55
Calcium         ppm         ASTM D5185m         1070         1065         1424         1449           Phosphorus         ppm         ASTM D5185m         1150         985         1094         723           Zinc         ppm         ASTM D5185m         1270         1141         1369         876           Sulfur         ppm         ASTM D5185m         2060         3384         3868         2429           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         0         1         12           Sodium         ppm         ASTM D5185m         2         2         24           Potassium         ppm         ASTM D5185m         >20         4         7         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.4         0.1           Nitration         Abs/.1mm         *ASTM D7415         >30         16.8         18.8         20.8           FLUID DEGRADATION         method         limit/base <td< td=""><td>Manganese</td><td>ppm</td><td>ASTM D5185m</td><td>0</td><th>0</th><td>0</td><td>&lt;1</td></td<>	Manganese	ppm	ASTM D5185m	0	0	0	<1
Phosphorus         ppm         ASTM D5185m         1150         985         1094         723           Zinc         ppm         ASTM D5185m         1270         1141         1369         876           Sulfur         ppm         ASTM D5185m         2060         3384         3868         2429           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         0         1         12           Sodium         ppm         ASTM D5185m         2         2         24           Potassium         ppm         ASTM D5185m         >20         4         7         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.4         0.1           Nitration         Abs/cm         *ASTM D7624         >20         5.3         7.0         6.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         16.8         18.8         20.8           FLUID DEGRADATION         method         li	•	ppm	ASTM D5185m	1010	817	839	532
Zinc         ppm         ASTM D5185m         1270         1141         1369         876           Sulfur         ppm         ASTM D5185m         2060         3384         3868         2429           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         0         1         12           Sodium         ppm         ASTM D5185m         2         2         2         24           Potassium         ppm         ASTM D5185m         >20         4         7         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.4         0.1           Nitration         Abs/cm         *ASTM D7624         >20         5.3         7.0         6.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         16.8         18.8         20.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm	Calcium	ppm	ASTM D5185m	1070	1065	1424	1449
Sulfur         ppm         ASTM D5185m         2060         3384         3868         2429           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         0         1         12           Sodium         ppm         ASTM D5185m         2         2         24           Potassium         ppm         ASTM D5185m         >20         4         7         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.4         0.1           Nitration         Abs/cm         *ASTM D7624         >20         5.3         7.0         6.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         16.8         18.8         20.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.0         14.0         18.3	Phosphorus	ppm	ASTM D5185m	1150	985	1094	723
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         0         1         12           Sodium         ppm         ASTM D5185m         2         2         24           Potassium         ppm         ASTM D5185m         >20         4         7         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.4         0.1           Nitration         Abs/cm         *ASTM D7624         >20         5.3         7.0         6.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         16.8         18.8         20.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.0         14.0         18.3	Zinc	ppm	ASTM D5185m	1270	1141	1369	876
Silicon         ppm         ASTM D5185m         >25         0         1         12           Sodium         ppm         ASTM D5185m         2         2         2         24           Potassium         ppm         ASTM D5185m         >20         4         7         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.4         0.1           Nitration         Abs/cm         *ASTM D7624         >20         5.3         7.0         6.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         16.8         18.8         20.8           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.0         14.0         18.3	Sulfur	ppm	ASTM D5185m	2060	3384	3868	2429
Sodium         ppm         ASTM D5185m         2         2         24           Potassium         ppm         ASTM D5185m         >20         4         7         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.4         0.1           Nitration         Abs/cm         *ASTM D7624         >20         5.3         7.0         6.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         16.8         18.8         20.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.0         14.0         18.3	CONTAMINA	NTS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         4         7         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.4         0.1           Nitration         Abs/cm         *ASTM D7624         >20         5.3         7.0         6.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         16.8         18.8         20.8           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.0         14.0         18.3	Silicon	ppm	ASTM D5185m	>25	0		12
INFRA-RED	Sodium	ppm	ASTM D5185m		2		24
Soot %         *ASTM D7844         >3         0.2         0.4         0.1           Nitration         Abs/cm         *ASTM D7624         >20         5.3         7.0         6.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         16.8         18.8         20.8           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.0         14.0         18.3	Potassium	ppm	ASTM D5185m	>20	4	7	2
Nitration         Abs/cm         *ASTM D7624         >20         5.3         7.0         6.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         16.8         18.8         20.8           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.0         14.0         18.3	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         16.8         18.8         20.8           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.0         14.0         18.3	Soot %	%	*ASTM D7844	>3	0.2	0.4	0.1
FLUID DEGRADATION method limit/base current history1 history2  Oxidation Abs/.1mm *ASTM D7414 >25 12.0 14.0 18.3	Nitration	Abs/cm	*ASTM D7624	>20	5.3	7.0	6.2
Oxidation Abs/.1mm *ASTM D7414 >25 <b>12.0</b> 14.0 18.3	Sulfation	Abs/.1mm	*ASTM D7415	>30	16.8	18.8	20.8
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
Base Number (BN)         mg KOH/g         ASTM D2896         9.8         8.1         8.4         9.9	Oxidation	Abs/.1mm	*ASTM D7414	>25	12.0	14.0	18.3
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.1	8.4	9.9



# **OIL ANALYSIS REPORT**



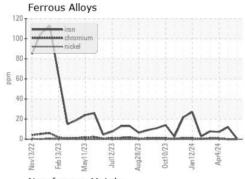


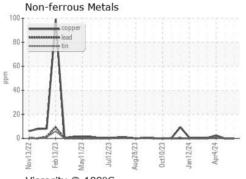


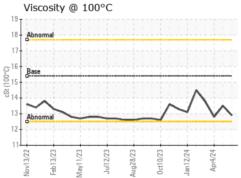
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

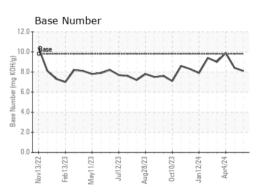
FLUID PROPE	ERTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	12.9	13.5	12.8

# **GRAPHS**













Certificate 12367

Report Id: GFL010 [WUSCAR] 06197292 (Generated: 06/03/2024 17:43:04) Rev: 1

Laboratory Sample No.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Lab Number : 06197292

: GFL0122184 Unique Number : 11059415 Test Package : FLEET

Received : 03 Jun 2024 **Tested** Diagnosed

: 03 Jun 2024 : 03 Jun 2024 - Wes Davis

GFL Environmental - 010 - Stockbridge

1280 Rum Creek Parkway Stockbridge, GA

US 30281

Contact: JOSHUA TINKER joshuatinker@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)

Submitted By: JOSHUA TINKER

T:

F: