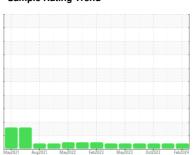


# **OIL ANALYSIS REPORT**

## Sample Rating Trend



VISCOSITY



728057-34

Component **Diesel Engine** 

PETRO CANADA DURON SHP 15W40 (--- GAL)

## DIAGNOSIS

#### ▲ Recommendation

Oil and filter change at the time of sampling has been noted. 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.

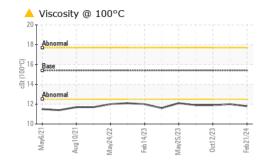
## ▲ Fluid Condition

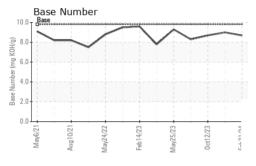
The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

SAMPLE INFORMATION   method   imit/base   current   history1   Sample Number   Cilent Info   Cilent Info   21 Feb 2024   20 Nov 2028   12 Oct 2028   ATTENTION   Machine Age   hrs   Cilent Info   17654   17084   18883   Oil Age   hrs   Cilent Info   17654   17084   18883   Oil Age   hrs   Cilent Info   570   221   600   Changed   Cha	GAL)		May2021	Aug2021 May2022	Feb2023 May2023 Oct2023	Feb2024	
Sample Date	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         570         221         600           Oil Age         hrs         Client Info         570         221         600           Oil Changed         Client Info         Changed	Sample Number		Client Info		GFL0103143	GFL0091977	GFL0091946
Oil Age         hrs         Client Info         570         221         600           Oil Changed         ATTENTION         AT	Sample Date		Client Info		21 Feb 2024	20 Nov 2023	12 Oct 2023
Oil Changed Sample Status         Client Info         Changed ATTENTION         Changed ATTENTION         Changed ATTENTION         Changed ATTENTION         Changed ATTENTION         ATTONTION	Machine Age	hrs	Client Info		17654	17084	16863
Sample Status	Oil Age	hrs	Client Info		570	221	600
Fuel	Oil Changed		Client Info		Changed	Changed	Changed
Fuel         WC Method         >3.0         <1.0	Sample Status				ATTENTION	ATTENTION	ATTENTION
Water Glycol         WC Method WC Method         >0.2         NEG NEG NEG         NEG NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >150         12         8         17           Chromium         ppm         ASTM D5185m         >15         <1	CONTAMINAT	ION	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         >15         <1         0         <1           Nickel         ppm         ASTM D5185m         >4         0         0         0           Titanium         ppm         ASTM D5185m         >3         0         0         0           Silver         ppm         ASTM D5185m         >3         0         0         0           Aluminum         ppm         ASTM D5185m         >15         <1	WEAR METAL	.S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>150	12	8	17
Titanium	Chromium	ppm	ASTM D5185m	>15	<1	0	<1
Silver	Nickel	ppm	ASTM D5185m	>4	0	0	0
Aluminum	Titanium	ppm	ASTM D5185m		0	0	<1
Lead         ppm         ASTM D5185m         >70         <1         <1         <1           Copper         ppm         ASTM D5185m         >175         1         1         2           Tin         ppm         ASTM D5185m         >5         <1         0         <1           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         7         3         11           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         0         <1         <1         <1         <1           Calcium         ppm         ASTM D5185m         1070         1004         1131         1103           Phosphorus         ppm         ASTM D5185m         1270         110	Silver	ppm	ASTM D5185m	>3	0	0	0
Copper         ppm         ASTM D5185m         >175         1         1         2           Tin         ppm         ASTM D5185m         >5         <1	Aluminum	ppm	ASTM D5185m	>15	<1	<1	1
Tin         ppm         ASTM D5185m         >5         <1         0         <1           Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         7         3         11           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         57         61         62           Manganese         ppm         ASTM D5185m         0         <1	Lead	ppm	ASTM D5185m	>70	<1	<1	<1
Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         7         3         11           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         57         61         62           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1070         1004         1131         1103           Phosphorus         ppm         ASTM D5185m         1150         966         1059         1050           Zinc         ppm         ASTM D5185m         1270         1109         1258         1293           Sulfur         ppm         ASTM D5185m         2060         2732         3291         3081           CONTAMINANTS         method         limit/base         current         history1	Copper	ppm	ASTM D5185m	>175	1	1	2
Cadmium         ppm         ASTM D5185m         0         0         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         7         3         11           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         -1         -1         -1           Magnesium         ppm         ASTM D5185m         0         -1         -1         -1           Magnesium         ppm         ASTM D5185m         1010         874         1035         1007           Calcium         ppm         ASTM D5185m         1070         1004         1131         1103           Phosphorus         ppm         ASTM D5185m         1270         1109         1258         1293           Sulfur         ppm         ASTM D5185m         2060         2732         3291         3081           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25	Tin	ppm	ASTM D5185m	>5	<1	0	<1
ADDITIVES	Vanadium	ppm	ASTM D5185m		0	0	0
Boron         ppm         ASTM D5185m         0         7         3         11           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         57         61         62           Manganese         ppm         ASTM D5185m         0         <1	Cadmium	ppm	ASTM D5185m		0	0	<1
Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         57         61         62           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         874         1035         1007           Calcium         ppm         ASTM D5185m         1070         1004         1131         1103           Phosphorus         ppm         ASTM D5185m         1150         966         1059         1050           Zinc         ppm         ASTM D5185m         1270         1109         1258         1293           Sulfur         ppm         ASTM D5185m         2060         2732         3291         3081           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         5         8           Sodium         ppm         ASTM D5185m         >20         0         0         <1           INFRA-RED         method         limit/ba	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         57         61         62           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         874         1035         1007           Calcium         ppm         ASTM D5185m         1070         1004         1131         1103           Phosphorus         ppm         ASTM D5185m         1150         966         1059         1050           Zinc         ppm         ASTM D5185m         1270         1109         1258         1293           Sulfur         ppm         ASTM D5185m         2060         2732         3291         3081           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         5         8           Sodium         ppm         ASTM D5185m         >20         0         0         <1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844	Boron	ppm					
Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         874         1035         1007           Calcium         ppm         ASTM D5185m         1070         1004         1131         1103           Phosphorus         ppm         ASTM D5185m         1150         966         1059         1050           Zinc         ppm         ASTM D5185m         1270         1109         1258         1293           Sulfur         ppm         ASTM D5185m         2060         2732         3291         3081           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         5         8           Sodium         ppm         ASTM D5185m         >20         0         0         <1	Barium	ppm	ASTM D5185m		-		
Magnesium         ppm         ASTM D5185m         1010         874         1035         1007           Calcium         ppm         ASTM D5185m         1070         1004         1131         1103           Phosphorus         ppm         ASTM D5185m         1150         966         1059         1050           Zinc         ppm         ASTM D5185m         1270         1109         1258         1293           Sulfur         ppm         ASTM D5185m         2060         2732         3291         3081           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         5         8           Sodium         ppm         ASTM D5185m         >25         3         4         4           Potassium         ppm         ASTM D5185m         >20         0         0         <1	Molybdenum	ppm					
Calcium         ppm         ASTM D5185m         1070         1004         1131         1103           Phosphorus         ppm         ASTM D5185m         1150         966         1059         1050           Zinc         ppm         ASTM D5185m         1270         1109         1258         1293           Sulfur         ppm         ASTM D5185m         2060         2732         3291         3081           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         5         8           Sodium         ppm         ASTM D5185m         >20         0         0         <1	-	ppm	ASTM D5185m		<1		
Phosphorus         ppm         ASTM D5185m         1150         966         1059         1050           Zinc         ppm         ASTM D5185m         1270         1109         1258         1293           Sulfur         ppm         ASTM D5185m         2060         2732         3291         3081           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         5         8           Sodium         ppm         ASTM D5185m         >25         3         4         4           Potassium         ppm         ASTM D5185m         >20         0         0         <1	_	ppm					
Zinc         ppm         ASTM D5185m         1270         1109         1258         1293           Sulfur         ppm         ASTM D5185m         2060         2732         3291         3081           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         5         8           Sodium         ppm         ASTM D5185m         >20         0         0         <1		ppm					
Sulfur         ppm         ASTM D5185m         2060         2732         3291         3081           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         5         8           Sodium         ppm         ASTM D5185m         >25         3         4         4           Potassium         ppm         ASTM D5185m         >20         0         0         <1							
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         5         8           Sodium         ppm         ASTM D5185m         3         4         4           Potassium         ppm         ASTM D5185m         >20         0         0         <1							
Silicon         ppm         ASTM D5185m         >25         3         5         8           Sodium         ppm         ASTM D5185m         3         4         4           Potassium         ppm         ASTM D5185m         >20         0         0         <1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >20         6.1         5.4         6.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.1         18.1         18.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.9         13.7         14.3			ASTM D5185m	2060	2732	3291	3081
Sodium         ppm         ASTM D5185m         3         4         4           Potassium         ppm         ASTM D5185m         >20         0         0         <1	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         0         0         <1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >20         6.1         5.4         6.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.1         18.1         18.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.9         13.7         14.3				>25			
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >20         6.1         5.4         6.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.1         18.1         18.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.9         13.7         14.3		ppm			3	4	4
Soot %         %         *ASTM D7844 >3         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624 >20         6.1         5.4         6.3           Sulfation         Abs/.1mm         *ASTM D7415 >30         18.1         18.1         18.1           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         13.9         13.7         14.3	Potassium	ppm	ASTM D5185m	>20	0	0	<1
Nitration         Abs/cm         *ASTM D7624         >20         6.1         5.4         6.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.1         18.1         18.1           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.9         13.7         14.3	INFRA-RED			limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415 >30         18.1         18.1         18.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         13.9         13.7         14.3	Soot %	%	*ASTM D7844	>3	0.1		0.1
FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2513.913.714.3	Nitration	Abs/cm	*ASTM D7624	>20	6.1	5.4	6.3
Oxidation Abs/.1mm *ASTM D7414 >25 <b>13.9</b> 13.7 14.3	Sulfation	Abs/.1mm	*ASTM D7415	>30	18.1	18.1	18.1
	FLUID DEGRA	NOITAC	method	limit/base	current	history1	history2
Base Number (BN)         mg KOH/g         ASTM D2896         9.8         8.7         9.0         8.7	Oxidation	Abs/.1mm	*ASTM D7414	>25	13.9	13.7	14.3
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.7	9.0	8.7



# **OIL ANALYSIS REPORT**

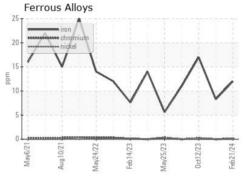


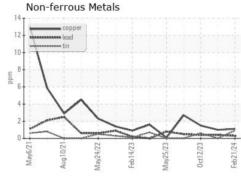


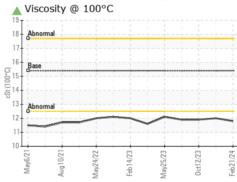
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

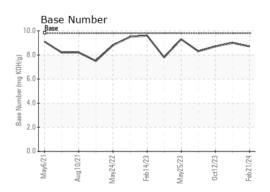
FLUID PROPERTIES		method				history2	
Visc @ 100°C	cSt	ASTM D445	15.4	<b>11.8</b>	<b>12.0</b>	<b>11.9</b>	

## **GRAPHS**













Laboratory Sample No. Lab Number : 06096824

: GFL0103143

Unique Number: 10889677

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 22 Feb 2024 **Tested** 

: 23 Feb 2024 Diagnosed : 23 Feb 2024 - Sean Felton

GFL Environmental - 683 - Ruckersville Hauling 261 INDUSTRIAL DR

Ruckersville, VA US 22698

Contact: Jaf Finney jfinney@gflenv.com T: (434)990-4972

Test Package : FLEET Certificate L2367 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)