

# **OIL ANALYSIS REPORT**

# Sample Rating Trend

# NORMAL



Machine Id 913075 Component Diesel Engine Fluid

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.

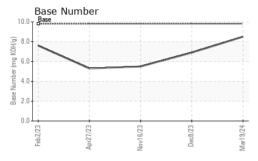
## **Fluid Condition**

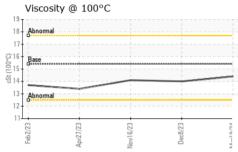
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Number         Client Info         GFL0108884         GFL0105585         GFL01015         GFL01015585         GFL01015         GFL01015885         GFL01015855         GFL0101585         GFL01015855         GFL0101585         GFL0101585         GFL0101585         GFL0101585         GFL0101585         GFL0101585         GFL0101585         GFL010	N SHP 15W40 (-	GAL)	Feb 2023	Apr2023	Nov2023 Dec2023	Mar2024	
Sample Date   Client Info   19 Mar 2024   08 Dec 2023   16 Nov 20	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info	Sample Number		Client Info		GFL0108884	GFL0105585	GFL010153
Dil Age	Sample Date		Client Info		19 Mar 2024	08 Dec 2023	16 Nov 2023
Dil Changed   Client Info   Not Changd   NORMAL   ABNORMAL   AB	Machine Age	hrs	Client Info		4479	3504	3504
CONTAMINATION	Oil Age	hrs	Client Info		1894	3504	1894
CONTAMINATION	Oil Changed		Client Info		Not Changd	Not Changd	N/A
Fuel WC Method S.0.	Sample Status				NORMAL	ABNORMAL	ABNORMAL
Water Glycol         WC Method         >0.2         NEG NEG NEG         NEG NEG           WEAR METALS         method         limit/base         current         history1         history1           Iron         ppm         ASTM D5185m         >90         6         52         43           Chromium         ppm         ASTM D5185m         >20         0         2         1           Nickel         ppm         ASTM D5185m         >2         0         4         5           Silver         ppm         ASTM D5185m         >2         0         4         5           Silver         ppm         ASTM D5185m         >2         0         4         5           Silver         ppm         ASTM D5185m         >2         0         <1         <1           Aluminum         ppm         ASTM D5185m         >2         0         <1         <1           Lead         ppm         ASTM D5185m         >40         0         0         0           Copper         ppm         ASTM D5185m         >40         0         0         0           Caddnium         ppm         ASTM D5185m         0         0         1         1	CONTAMINAT	ION	method	limit/base	current	history1	history2
Colycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history1           Iron         ppm         ASTM D5185m         >90         6         52         43           Chromium         ppm         ASTM D5185m         >20         0         2         1           Nickel         ppm         ASTM D5185m         >2         0         4         5           Titianium         ppm         ASTM D5185m         >2         0         0         -1         -1           Aluminum         ppm         ASTM D5185m         >2         0         0         -1         -1           Aluminum         ppm         ASTM D5185m         >2         0         0         0         0           Lead         ppm         ASTM D5185m         >40         0         0         0         0         0           Copper         ppm         ASTM D5185m         >15         0         1         1         1           Vanadium         ppm         ASTM D5185m         0         0         0         0         0           Cadmium         ppm <td>Fuel</td> <td></td> <td>WC Method</td> <td>&gt;3.0</td> <td>&lt;1.0</td> <td>&lt;1.0</td> <td>&lt;1.0</td>	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Chromium	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         0         2         1           Nickel         ppm         ASTM D5185m         >2         0         4         5           Titanium         ppm         ASTM D5185m         >2         0         0         <1	WEAR METAL	.S	method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >2 0 4 5  Titanium ppm ASTM D5185m >2 0 0 0 <1  Silver ppm ASTM D5185m >2 0 0 0 <1  Aluminum ppm ASTM D5185m >2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Iron	ppm	ASTM D5185m	>90	6	52	43
Titanium         ppm         ASTM D5185m         >2         0         0         <1           Silver         ppm         ASTM D5185m         >2         0         <1	Chromium	ppm	ASTM D5185m	>20	0	2	1
Silver	Nickel	ppm	ASTM D5185m	>2	0	4	5
Aluminum         ppm         ASTM D5185m         >20         2         ▲ 31         ▲ 31           Lead         ppm         ASTM D5185m         >40         0         0         0           Copper         ppm         ASTM D5185m         >330         <1	Titanium	ppm	ASTM D5185m	>2	0	0	<1
Lead         ppm         ASTM D5185m         >40         0         0         0           Copper         ppm         ASTM D5185m         >330         <1         7         8           Tin         ppm         ASTM D5185m         >15         0         1         1           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history1           Boron         ppm         ASTM D5185m         0         0         0         0           Boron         ppm         ASTM D5185m         0         0         0         0           Barium         ppm         ASTM D5185m         0         0         0         0         0           Magnesium         ppm         ASTM D5185m         0         0         1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         1000         959         899           Calcium         ppm         ASTM D5185m         1070	Silver	ppm	ASTM D5185m	>2	0	<1	<1
Copper         ppm         ASTM D5185m         >330         <1         7         8           Tin         ppm         ASTM D5185m         >15         0         1         1           Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           Boron         ppm         ASTM D5185m         0         0         13         0           Barium         ppm         ASTM D5185m         0         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0         0         0         0           Manganese         ppm         ASTM D5185m         0         0         1         <1	Aluminum	ppm	ASTM D5185m	>20	2	<b>△</b> 31	<b>△</b> 31
Trin	Lead	ppm	ASTM D5185m	>40	0	0	0
Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history1           Boron         ppm         ASTM D5185m         0         0         13         0           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0         0           Manganese         ppm         ASTM D5185m         0         0         1         <1           Magnesium         ppm         ASTM D5185m         1010         1000         959         899           Calcium         ppm         ASTM D5185m         1070         1125         1077         1073           Phosphorus         ppm         ASTM D5185m         1270         1349         1329         1192           Sulfur         ppm         ASTM D5185m         2060         3606         2633         2432           CONTAMINANTS         method         limit/base <t< td=""><td>Copper</td><td>ppm</td><td>ASTM D5185m</td><td>&gt;330</td><td>&lt;1</td><td>7</td><td>8</td></t<>	Copper	ppm	ASTM D5185m	>330	<1	7	8
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history1           Boron         ppm         ASTM D5185m         0         0         13         0           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         1         <1	Tin	ppm	ASTM D5185m	>15	0	1	1
ADDITIVES         method         limit/base         current         history1         history1           Boron         ppm         ASTM D5185m         0         0         13         0           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         58         75         62           Manganese         ppm         ASTM D5185m         0         0         1         <1	Vanadium	ppm	ASTM D5185m		0	0	0
Boron ppm ASTM D5185m 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         58         75         62           Manganese         ppm         ASTM D5185m         0         0         1         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         58         75         62           Manganese         ppm         ASTM D5185m         0         0         1         <1           Magnesium         ppm         ASTM D5185m         1010         1000         959         899           Calcium         ppm         ASTM D5185m         1070         1125         1077         1073           Phosphorus         ppm         ASTM D5185m         1150         1062         1058         949           Zinc         ppm         ASTM D5185m         1270         1349         1329         1192           Sulfur         ppm         ASTM D5185m         2060         3606         2633         2432           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >25         2         17         10           Sodium         ppm         ASTM D5185m         >20         <1         6         3           INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         *ASTM D762	Boron	ppm	ASTM D5185m	0	0	13	0
Manganese         ppm         ASTM D5185m         0         0         1         <1           Magnesium         ppm         ASTM D5185m         1010         1000         959         899           Calcium         ppm         ASTM D5185m         1070         1125         1077         1073           Phosphorus         ppm         ASTM D5185m         1150         1062         1058         949           Zinc         ppm         ASTM D5185m         1270         1349         1329         1192           Sulfur         ppm         ASTM D5185m         2060         3606         2633         2432           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >25         2         17         10           Sodium         ppm         ASTM D5185m         >20         <1	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium         ppm         ASTM D5185m         1010         1000         959         899           Calcium         ppm         ASTM D5185m         1070         1125         1077         1073           Phosphorus         ppm         ASTM D5185m         1150         1062         1058         949           Zinc         ppm         ASTM D5185m         1270         1349         1329         1192           Sulfur         ppm         ASTM D5185m         2060         3606         2633         2432           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >25         2         17         10           Sodium         ppm         ASTM D5185m         >20         <1	Molybdenum	ppm	ASTM D5185m	60	58	75	62
Calcium         ppm         ASTM D5185m         1070         1125         1077         1073           Phosphorus         ppm         ASTM D5185m         1150         1062         1058         949           Zinc         ppm         ASTM D5185m         1270         1349         1329         1192           Sulfur         ppm         ASTM D5185m         2060         3606         2633         2432           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >25         2         17         10           Sodium         ppm         ASTM D5185m         >20         <1	Manganese	ppm	ASTM D5185m	0	0	1	<1
Phosphorus         ppm         ASTM D5185m         1150         1062         1058         949           Zinc         ppm         ASTM D5185m         1270         1349         1329         1192           Sulfur         ppm         ASTM D5185m         2060         3606         2633         2432           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >25         2         17         10           Sodium         ppm         ASTM D5185m         >25         2         17         10           Sodium         ppm         ASTM D5185m         >20         <1	Magnesium	ppm	ASTM D5185m	1010	1000	959	899
Zinc         ppm         ASTM D5185m         1270         1349         1329         1192           Sulfur         ppm         ASTM D5185m         2060         3606         2633         2432           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >25         2         17         10           Sodium         ppm         ASTM D5185m         1         ▲ 446         3           Potassium         ppm         ASTM D5185m         >20         <1	Calcium	ppm	ASTM D5185m	1070	1125	1077	1073
Sulfur         ppm         ASTM D5185m         2060         3606         2633         2432           CONTAMINANTS         method         limit/base         current         history1         history           Silicon         ppm         ASTM D5185m         >25         2         17         10           Sodium         ppm         ASTM D5185m         1         ▲ 446         3           Potassium         ppm         ASTM D5185m         >20         <1	Phosphorus	ppm	ASTM D5185m	1150	1062	1058	949
CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >25         2         17         10           Sodium         ppm         ASTM D5185m         1         ▲ 446         3           Potassium         ppm         ASTM D5185m         >20         <1	Zinc	ppm	ASTM D5185m	1270	1349	1329	1192
Silicon         ppm         ASTM D5185m         >25         2         17         10           Sodium         ppm         ASTM D5185m         1         ▲ 446         3           Potassium         ppm         ASTM D5185m         >20         <1         6         3           INFRA-RED         method         limit/base         current         history1         history1         history1           Soot %         %         *ASTM D7844         >6         0.5         1.6         1.4           Nitration         Abs/cm         *ASTM D7624         >20         7.0         12.6         10.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.6         24.5         23.8           FLUID DEGRADATION         method         limit/base         current         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.3         20.3         19.2	Sulfur	ppm	ASTM D5185m	2060	3606	2633	2432
Sodium         ppm         ASTM D5185m         1         ▲ 446         3           Potassium         ppm         ASTM D5185m         >20         <1	CONTAMINAN	NTS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         <1         6         3           INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         *ASTM D7844         >6         0.5         1.6         1.4           Nitration         Abs/cm         *ASTM D7624         >20         7.0         12.6         10.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.6         24.5         23.8           FLUID DEGRADATION         method         limit/base         current         history1         history           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.3         20.3         19.2	Silicon	ppm	ASTM D5185m	>25	2		10
INFRA-RED	Sodium	ppm	ASTM D5185m		1	<u>446</u>	3
Soot %         *ASTM D7844         >6         0.5         1.6         1.4           Nitration         Abs/cm         *ASTM D7624         >20         7.0         12.6         10.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.6         24.5         23.8           FLUID DEGRADATION method limit/base current         history1         history1         history           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.3         20.3         19.2	Potassium	ppm	ASTM D5185m	>20	<1	6	3
Nitration         Abs/cm         *ASTM D7624         >20         7.0         12.6         10.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.6         24.5         23.8           FLUID DEGRADATION method limit/base current         history1         history1         history           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.3         20.3         19.2	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         18.6         24.5         23.8           FLUID DEGRADATION method limit/base current history1         history1         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.3         20.3         19.2	Soot %	%	*ASTM D7844	>6	0.5	1.6	1.4
FLUID DEGRADATION     method     limit/base     current     history1     history1       Oxidation     Abs/.1mm     *ASTM D7414     >25     14.3     20.3     19.2	Nitration	Abs/cm	*ASTM D7624	>20	7.0	12.6	10.2
Oxidation Abs/.1mm *ASTM D7414 >25 <b>14.3</b> 20.3 19.2	Sulfation	Abs/.1mm	*ASTM D7415	>30	18.6	24.5	23.8
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 9.8 <b>8.5</b> 6.9 5.5	Oxidation	Abs/.1mm	*ASTM D7414	>25	14.3	20.3	19.2
, , , , , , , , , , , , , , , , , , , ,	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.5	6.9	5.5



# **OIL ANALYSIS REPORT**

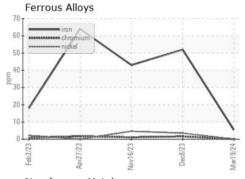


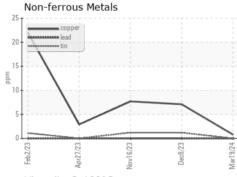


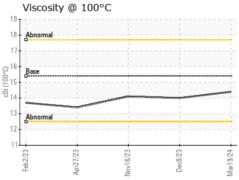
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

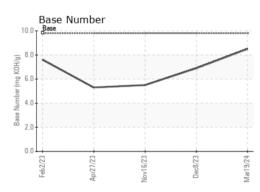
FLUID PROP	ERHES	method			history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	14.4	14.0	14.1

## **GRAPHS**













Certificate L2367

Laboratory Sample No.

Lab Number : 06124604 Unique Number : 10938755 Test Package : FLEET

: GFL0108884

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 21 Mar 2024 **Tested** : 22 Mar 2024

Diagnosed : 22 Mar 2024 - Wes Davis

GFL Environmental - 415 - Michigan East

6200 Elmridge Sterling Heights, MI US 48313

Contact: Frank Wolak fwolak@gflenv.com

T: (586)825-9514

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)