

# **OIL ANALYSIS REPORT**

## Sample Rating Trend







# Machine Id 578M 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

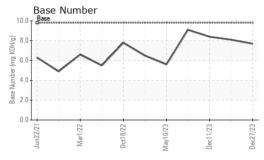
# **Fluid Condition**

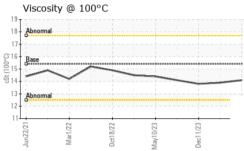
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Date	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2	
Machine Age   hrs   Client Info   13991   13991   13924   13924   13935   13924   13935   13924   13935   13934   13935   13924   13935   13934   13935   13934   13935   13934   13935   13934   13935   13934   13935   13934   13935   13355   13355   13355   13355   13355   13355   13355   13355   13355   13355   13355   13355   13355   13355   13	Sample Number		Client Info		GFL0105792	GFL0105764	GFL0105670	
Oil Age         hrs         Client Info         13924         13924         13924         13924         13925         13924         13924         13924         13924         13924         13924         13924         13924         13924         13924         13924         13924         13924         13835           Oil Changed         Client Info         N/A         NORMAL         <	Sample Date		Client Info		27 Dec 2023	21 Dec 2023	11 Dec 2023	
Oil Changed   Client Info   N/A   Not Changed   NORMAL   NORMAL	Machine Age	hrs	Client Info		13991	13991	13924	
NORMAL   NORMAL   NORMAL   CONTAMINATION   method   imit/base   current   history1   history2   history2	Oil Age	hrs	Client Info		13924	13924	13835	
CONTAMINATION	Oil Changed		Client Info		N/A	Not Changd	Changed	
Fuel	Sample Status				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         >90         7         4         3           Chromium         ppm         ASTM D5185m         >20         <1         <1         0           Nickel         ppm         ASTM D5185m         >2         1         <1         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >20         1         1         <1           Lead         ppm         ASTM D5185m         >40         0         0         0           Copper         ppm         ASTM D5185m         >15         <1         0         0           Vanadium         ppm         ASTM D5185m         >15         <1         0         0 <td col<="" th=""><th>CONTAMINAT</th><th>ION</th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></td>	<th>CONTAMINAT</th> <th>ION</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	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	
Irron	Glycol		WC Method		NEG	NEG	NEG	
Chromium         ppm         ASTM D5185m         >20         <1	WEAR METAL	S	method	limit/base	current	history1	history2	
Nickel	Iron	ppm	ASTM D5185m	>90	7	4	3	
Titanium	Chromium	ppm	ASTM D5185m	>20	<1	<1	0	
Silver	Nickel	ppm	ASTM D5185m	>2	1	<1	0	
Aluminum         ppm         ASTM D5185m         >20         1         1         <1           Lead         ppm         ASTM D5185m         >40         0         0         0           Copper         ppm         ASTM D5185m         >330         3         <1	Titanium	ppm	ASTM D5185m	>2	0	0	0	
Lead	Silver	ppm	ASTM D5185m	>2	0	0	0	
Copper         ppm         ASTM D5185m         >330         3         <1         3           Tin         ppm         ASTM D5185m         >15         <1	Aluminum	ppm	ASTM D5185m	>20	1	1	<1	
Tin	Lead	ppm	ASTM D5185m	>40	0	0	0	
Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0         3         2           Barium         ppm         ASTM D5185m         0         0         <1         0           Molybdenum         ppm         ASTM D5185m         0         0         <1         0           Magnesium         ppm         ASTM D5185m         0         0         <1         0           Magnesium         ppm         ASTM D5185m         1070         1127         1029         1019           Phosphorus         ppm         ASTM D5185m         1270         1230         1264         1208           Sulfur         ppm         ASTM D5185m         2060         2921         3052         3072           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         25         4         6 <th< td=""><th>Copper</th><td>ppm</td><td>ASTM D5185m</td><td>&gt;330</td><th>3</th><td>&lt;1</td><td>3</td></th<>	Copper	ppm	ASTM D5185m	>330	3	<1	3	
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0         3         2           Barium         ppm         ASTM D5185m         0         0         <1	Tin	ppm	ASTM D5185m	>15	<1	0	0	
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0         3         2           Barium         ppm         ASTM D5185m         0         0         <1         0           Molybdenum         ppm         ASTM D5185m         0         0         <1         0           Molybdenum         ppm         ASTM D5185m         0         0         <1         0           Magnesium         ppm         ASTM D5185m         10 10         979         90 1         962           Calcium         ppm         ASTM D5185m         10 70         1127         1029         10 19           Phosphorus         ppm         ASTM D5185m         12 70         1230         1264         1208           Sulfur         ppm         ASTM D5185m         20 60         2921         3052         3072           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         22         4 </td <th>Vanadium</th> <td>• •</td> <td>ASTM D5185m</td> <td></td> <th>0</th> <td>0</td> <td>0</td>	Vanadium	• •	ASTM D5185m		0	0	0	
Boron	Cadmium		ASTM D5185m		0	0	0	
Barium         ppm         ASTM D5185m         0         0         <1	ADDITIVES		method	limit/base	current	history1	history2	
Molybdenum         ppm         ASTM D5185m         60         57         58         52           Manganese         ppm         ASTM D5185m         0         0         <1         0           Magnesium         ppm         ASTM D5185m         1010         979         901         962           Calcium         ppm         ASTM D5185m         1070         1127         1029         1019           Phosphorus         ppm         ASTM D5185m         1150         1017         1094         1040           Zinc         ppm         ASTM D5185m         1270         1230         1264         1208           Sulfur         ppm         ASTM D5185m         2060         2921         3052         3072           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         6         4           Sodium         ppm         ASTM D5185m         2         11         15           Potassium         ppm         ASTM D5185m         >20         0         0         <1           INFRA-RED         method         limit/base         current </td <th>Boron</th> <td>ppm</td> <td>ASTM D5185m</td> <td>0</td> <th>0</th> <td>3</td> <td>2</td>	Boron	ppm	ASTM D5185m	0	0	3	2	
Manganese         ppm         ASTM D5185m         0         0         <1         0           Magnesium         ppm         ASTM D5185m         1010         979         901         962           Calcium         ppm         ASTM D5185m         1070         1127         1029         1019           Phosphorus         ppm         ASTM D5185m         1150         1017         1094         1040           Zinc         ppm         ASTM D5185m         1270         1230         1264         1208           Sulfur         ppm         ASTM D5185m         2060         2921         3052         3072           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         6         4           Sodium         ppm         ASTM D5185m         20         0         0         <1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.4         0.3         0.2           Nitration         Abs/cm         *ASTM D7815	Barium	ppm	ASTM D5185m	0	0	<1	0	
Magnesium         ppm         ASTM D5185m         1010         979         901         962           Calcium         ppm         ASTM D5185m         1070         1127         1029         1019           Phosphorus         ppm         ASTM D5185m         1150         1017         1094         1040           Zinc         ppm         ASTM D5185m         1270         1230         1264         1208           Sulfur         ppm         ASTM D5185m         2060         2921         3052         3072           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         6         4           Sodium         ppm         ASTM D5185m         >20         0         0         <1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.4         0.3         0.2           Nitration         Abs/cm         *ASTM D7624         >20         6.9         7.0         5.5           Sulfation         Abs/.1mm         *ASTM D7	Molybdenum	ppm	ASTM D5185m	60	57	58	52	
Calcium         ppm         ASTM D5185m         1070         1127         1029         1019           Phosphorus         ppm         ASTM D5185m         1150         1017         1094         1040           Zinc         ppm         ASTM D5185m         1270         1230         1264         1208           Sulfur         ppm         ASTM D5185m         2060         2921         3052         3072           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         6         4           Sodium         ppm         ASTM D5185m         2         11         15           Potassium         ppm         ASTM D5185m         >20         0         <1	Manganese	ppm	ASTM D5185m	0	0	<1	0	
Phosphorus         ppm         ASTM D5185m         1150         1017         1094         1040           Zinc         ppm         ASTM D5185m         1270         1230         1264         1208           Sulfur         ppm         ASTM D5185m         2060         2921         3052         3072           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         6         4           Sodium         ppm         ASTM D5185m         2         11         15           Potassium         ppm         ASTM D5185m         >20         0         0         <1	Magnesium	ppm	ASTM D5185m	1010	979	901	962	
Zinc         ppm         ASTM D5185m         1270         1230         1264         1208           Sulfur         ppm         ASTM D5185m         2060         2921         3052         3072           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         6         4           Sodium         ppm         ASTM D5185m         2         11         15           Potassium         ppm         ASTM D5185m         >20         0         0         <1	Calcium	ppm	ASTM D5185m	1070	1127	1029	1019	
Sulfur         ppm         ASTM D5185m         2060         2921         3052         3072           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         6         4           Sodium         ppm         ASTM D5185m         2         11         15           Potassium         ppm         ASTM D5185m         >20         0         0         <1	Phosphorus	ppm	ASTM D5185m	1150	1017	1094	1040	
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         6         4           Sodium         ppm         ASTM D5185m         2         11         15           Potassium         ppm         ASTM D5185m         >20         0         0         <1	Zinc	ppm	ASTM D5185m	1270	1230	1264	1208	
Silicon         ppm         ASTM D5185m         >25         4         6         4           Sodium         ppm         ASTM D5185m         2         11         15           Potassium         ppm         ASTM D5185m         >20         0         0         <1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.4         0.3         0.2           Nitration         Abs/cm         *ASTM D7624         >20         6.9         7.0         5.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.2         18.8         18.1           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.1         15.6         13.7	Sulfur	ppm	ASTM D5185m	2060	2921	3052	3072	
Sodium         ppm         ASTM D5185m         2         11         15           Potassium         ppm         ASTM D5185m         >20         0         0         <1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.4         0.3         0.2           Nitration         Abs/cm         *ASTM D7624         >20         6.9         7.0         5.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.2         18.8         18.1           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.1         15.6         13.7	CONTAMINAN	TS	method	limit/base	current	history1	history2	
Potassium         ppm         ASTM D5185m         >20         0         0         <1	Silicon	ppm	ASTM D5185m	>25	4	6	4	
Potassium         ppm         ASTM D5185m         >20         0         0         <1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.4         0.3         0.2           Nitration         Abs/cm         *ASTM D7624         >20         6.9         7.0         5.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.2         18.8         18.1           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.1         15.6         13.7	Sodium	• •			2	11	15	
Soot %         %         *ASTM D7844 >6         0.4         0.3         0.2           Nitration         Abs/cm         *ASTM D7624 >20         6.9         7.0         5.5           Sulfation         Abs/.1mm         *ASTM D7415 >30         19.2         18.8         18.1           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         15.1         15.6         13.7	Potassium	ppm	ASTM D5185m	>20	0	0	<1	
Nitration         Abs/cm         *ASTM D7624         >20         6.9         7.0         5.5           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.2         18.8         18.1           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.1         15.6         13.7	INFRA-RED		method	limit/base	current	history1	history2	
Sulfation         Abs/.1mm         *ASTM D7415         >30         19.2         18.8         18.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.1         15.6         13.7	Soot %	%	*ASTM D7844	>6	0.4	0.3	0.2	
Sulfation         Abs/.1mm         *ASTM D7415         >30         19.2         18.8         18.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.1         15.6         13.7	Nitration	Abs/cm	*ASTM D7624	>20	6.9	7.0	5.5	
Oxidation Abs/.1mm *ASTM D7414 >25 <b>15.1</b> 15.6 13.7	Sulfation		*ASTM D7415	>30		18.8		
	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2	
	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.1	15.6	13.7	
	Base Number (BN)							



# **OIL ANALYSIS REPORT**

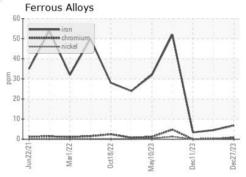


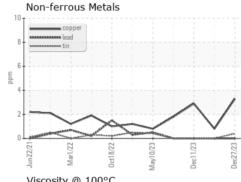


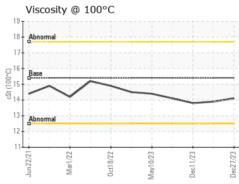
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

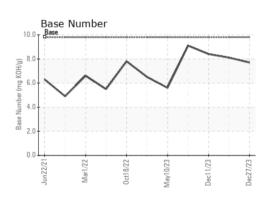
FLUID PROPE	RHES	metnoa	ilmit/base	current	nistory i	nistory2
Visc @ 100°C	cSt	ASTM D445	15.4	14.1	13.9	13.8

# **GRAPHS**













Certificate L2367

Laboratory Sample No. Lab Number **Unique Number** Test Package : FLEET

: GFL0105792 : 06046717 : 10807325

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Recieved Diagnosed Diagnostician : Wes Davis

: 28 Dec 2023 : 28 Dec 2023 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)