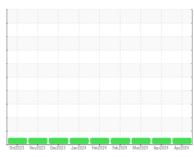


# **OIL ANALYSIS REPORT**

Sample Rating Trend







Machine Id
414118
Component

Component

Diesel Engine

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

# DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor.

#### Wear

Metal levels are typical for a new component breaking in.

### Contamination

Elevated aluminum (Al) and/or lead (Pb) and potassium (K) levels in your metals analysis are likely a result of solder flux release into the lubricant and is common on new equipment/components. There is no indication of any contamination in the oil.

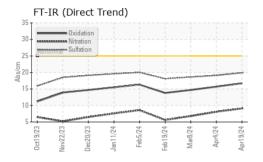
### **Fluid Condition**

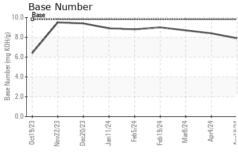
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

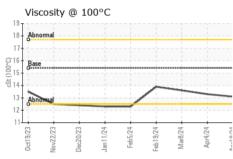
SAMPLE INFORMATION   method   limit/base   current   history1   history2	āAL)		Oct2023 No	v2023 Dec2023 Jan2024	Feb 2024 Feb 2024 Mar 2024 Apr 20	24 Apr2024	
Sample Date   Client Info   19 Apr 2024   04 Apr 2024   08 Mar 2024   Machine Age   hrs   Client Info   1149   1026   875   274   016   Age   hrs   Client Info   548   425   274   As	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age   hrs   Client Info   548   425   274	Sample Number		Client Info		GFL0109423	GFL0109347	GFL0109257
Machine Age   hrs   Client Info   548   425   274			Client Info		19 Apr 2024	04 Apr 2024	08 Mar 2024
Oil Changed   Client Info   Not Changed   North Changed   No		hrs	Client Info			1026	875
Sample Status	Oil Age	hrs	Client Info		548	425	274
CONTAMINATION	Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water Glycol         WC Method VC Method         >0.2         NEG NEG         NEG NEG         NEG NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         22         16         10           Chromium         ppm         ASTM D5185m         >20         1         0         0           Nickel         ppm         ASTM D5185m         >4         1         0         0           Silver         ppm         ASTM D5185m         >3         41         0         0           Aluminum         ppm         ASTM D5185m         >20         14         10         6           Lead         ppm         ASTM D5185m         >40         <1         0         0           Copper         ppm         ASTM D5185m         >40         <1         0         0           Vanadium         ppm         ASTM D5185m         >15         1         0         0           Cadmium         ppm         ASTM D5185m         <1         0         0         0           ADDITIVES         method         limit/base         current         history1 </th <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	>5	<1.0	<1.0	<1.0
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         22         16         10           Chromium         ppm         ASTM D5185m         >20         1         0         0           Nickel         ppm         ASTM D5185m         >20         1         0         0           Titanium         ppm         ASTM D5185m         >3         -1         0         0           Aluminum         ppm         ASTM D5185m         >3         -1         0         0           Aluminum         ppm         ASTM D5185m         >40         -1         0         0           Lead         ppm         ASTM D5185m         >40         -1         0         0           Copper         ppm         ASTM D5185m         >40         -1         0         0           Vanadium         ppm         ASTM D5185m         >15         1         0         -1           Cadmium         ppm         ASTM D5185m         -1         0         0         -1           Cadmium         ppm         ASTM D5185m         0         6         6	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         1         0         0           Nickel         ppm         ASTM D5185m         >4         <1         0         0           Titanium         ppm         ASTM D5185m         >3         <1         0         0           Silver         ppm         ASTM D5185m         >20         14         10         6           Lead         ppm         ASTM D5185m         >40         <1         0         0           Copper         ppm         ASTM D5185m         >40         <1         0         0           Vanadium         ppm         ASTM D5185m         >330         2         <1         <1           Vanadium         ppm         ASTM D5185m         >15         1         0         0           Vanadium         ppm         ASTM D5185m         <1         0         0         <1           Cadmium         ppm         ASTM D5185m         0         6         6         7           Boron         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         6	WEAR METAL	.S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	22	16	10
Titanium	Chromium	ppm	ASTM D5185m	>20	1	0	0
Silver	Nickel	ppm	ASTM D5185m	>4	<1	0	0
Aluminum	Titanium	ppm	ASTM D5185m		8	7	6
Lead         ppm         ASTM D5185m         >40         <1	Silver	ppm	ASTM D5185m	>3	<1	0	0
Copper         ppm         ASTM D5185m         >330         2         <1	Aluminum	ppm	ASTM D5185m	>20	14	10	6
Tin         ppm         ASTM D5185m         >15         1         0         0           Vanadium         ppm         ASTM D5185m         <1	Lead	ppm	ASTM D5185m	>40	<1	0	0
Vanadium         ppm         ASTM D5185m         <1	Copper	ppm	ASTM D5185m	>330	2	<1	<1
Cadmium         ppm         ASTM D5185m         <1	Tin	ppm	ASTM D5185m	>15	1	0	0
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         6         6         7           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         56         56         50           Manganese         ppm         ASTM D5185m         0         <1         0         0           Magnesium         ppm         ASTM D5185m         1010         897         1029         888           Calcium         ppm         ASTM D5185m         1070         1108         1236         1074           Phosphorus         ppm         ASTM D5185m         1150         1102         1134         929           Zinc         ppm         ASTM D5185m         1270         1249         1379         1109           Sulfur         ppm         ASTM D5185m         2060         3402         4110         3340           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m	Vanadium	ppm	ASTM D5185m		<1	0	<1
Boron   ppm   ASTM D5185m   O   0   0   0   0   0   0   0	Cadmium	ppm	ASTM D5185m		<1	0	0
Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         56         56         50           Manganese         ppm         ASTM D5185m         0         <1         0         0           Magnesium         ppm         ASTM D5185m         1010         897         1029         888           Calcium         ppm         ASTM D5185m         1070         1108         1236         1074           Phosphorus         ppm         ASTM D5185m         1150         1102         1134         929           Zinc         ppm         ASTM D5185m         1270         1249         1379         1109           Sulfur         ppm         ASTM D5185m         2060         3402         4110         3340           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         6         4         4           Sodium         ppm         ASTM D5185m         >20         40         24         17           INFRA-RED         method         limit/bas	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         56         56         50           Manganese         ppm         ASTM D5185m         0         <1         0         0           Magnesium         ppm         ASTM D5185m         1010         897         1029         888           Calcium         ppm         ASTM D5185m         1070         1108         1236         1074           Phosphorus         ppm         ASTM D5185m         1150         1102         1134         929           Zinc         ppm         ASTM D5185m         1270         1249         1379         1109           Sulfur         ppm         ASTM D5185m         2060         3402         4110         3340           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         6         4         4           Sodium         ppm         ASTM D5185m         >20         40         24         17           INFRA-RED         method         limit/base         current         history1         history2           Soot %         "ASTM D7844         3	Boron	ppm	ASTM D5185m	0	6	6	7
Manganese         ppm         ASTM D5185m         0         <1	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium         ppm         ASTM D5185m         1010         897         1029         888           Calcium         ppm         ASTM D5185m         1070         1108         1236         1074           Phosphorus         ppm         ASTM D5185m         1150         1102         1134         929           Zinc         ppm         ASTM D5185m         1270         1249         1379         1109           Sulfur         ppm         ASTM D5185m         2060         3402         4110         3340           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         6         4         4           Sodium         ppm         ASTM D5185m         >25         6         4         4           Sodium         ppm         ASTM D5185m         >20         40         24         17           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         9.1         8.1         6.8           Sulfation         Abs/.1mm         *ASTM	Molybdenum	ppm	ASTM D5185m	60	56	56	50
Calcium         ppm         ASTM D5185m         1070         1108         1236         1074           Phosphorus         ppm         ASTM D5185m         1150         1102         1134         929           Zinc         ppm         ASTM D5185m         1270         1249         1379         1109           Sulfur         ppm         ASTM D5185m         2060         3402         4110         3340           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         6         4         4           Sodium         ppm         ASTM D5185m         >25         6         4         4           Sodium         ppm         ASTM D5185m         >20         40         24         17           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         9.1         8.1         6.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.9         19.1         18.6           FLUID DEGRADATION	Manganese	ppm	ASTM D5185m	0	<1	0	0
Phosphorus         ppm         ASTM D5185m         1150         1102         1134         929           Zinc         ppm         ASTM D5185m         1270         1249         1379         1109           Sulfur         ppm         ASTM D5185m         2060         3402         4110         3340           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         6         4         4           Sodium         ppm         ASTM D5185m         >20         40         24         17           Potassium         ppm         ASTM D5185m         >20         40         24         17           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         "ASTM D7844         >3         0.5         0.4         0.3           Nitration         Abs/.1mm         "ASTM D7415         >30         19.9         19.1         18.6           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm	Magnesium	ppm	ASTM D5185m	1010	897	1029	888
Zinc         ppm         ASTM D5185m         1270         1249         1379         1109           Sulfur         ppm         ASTM D5185m         2060         3402         4110         3340           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         6         4         4           Sodium         ppm         ASTM D5185m         0         <1         <1           Potassium         ppm         ASTM D5185m         >20         40         24         17           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         "ASTM D7844         >3         0.5         0.4         0.3           Nitration         Abs/cm         "ASTM D7624         >20         9.1         8.1         6.8           Sulfation         Abs/.1mm         "ASTM D7415         >30         19.9         19.1         18.6           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         "AST	Calcium	ppm	ASTM D5185m	1070	1108	1236	1074
Sulfur         ppm         ASTM D5185m         2060         3402         4110         3340           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         6         4         4           Sodium         ppm         ASTM D5185m         0         <1         <1           Potassium         ppm         ASTM D5185m         >20         40         24         17           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.5         0.4         0.3           Nitration         Abs/cm         *ASTM D7624         >20         9.1         8.1         6.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.9         19.1         18.6           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.7         15.7         14.7	Phosphorus	ppm	ASTM D5185m	1150	1102	1134	929
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         6         4         4           Sodium         ppm         ASTM D5185m         0         <1         <1           Potassium         ppm         ASTM D5185m         >20         40         24         17           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.5         0.4         0.3           Nitration         Abs/cm         *ASTM D7624         >20         9.1         8.1         6.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.9         19.1         18.6           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.7         15.7         14.7	Zinc	ppm	ASTM D5185m	1270	1249	1379	1109
Silicon         ppm         ASTM D5185m         >25         6         4         4           Sodium         ppm         ASTM D5185m         0         <1			ASTM D5185m	2060	3402	4110	3340
Sodium         ppm         ASTM D5185m         0         <1	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         40         24         17           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.5         0.4         0.3           Nitration         Abs/cm         *ASTM D7624         >20         9.1         8.1         6.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.9         19.1         18.6           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.7         15.7         14.7		ppm	ASTM D5185m	>25	6	4	4
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.5         0.4         0.3           Nitration         Abs/cm         *ASTM D7624         >20         9.1         8.1         6.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.9         19.1         18.6           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.7         15.7         14.7		ppm	ASTM D5185m		0	<1	<1
Soot %         %         *ASTM D7844         >3         0.5         0.4         0.3           Nitration         Abs/cm         *ASTM D7624         >20         9.1         8.1         6.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.9         19.1         18.6           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.7         15.7         14.7	Potassium	ppm	ASTM D5185m	>20	40	24	17
Nitration         Abs/cm         *ASTM D7624         >20         9.1         8.1         6.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.9         19.1         18.6           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.7         15.7         14.7	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         19.9         19.1         18.6           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.7         15.7         14.7	Soot %	%	*ASTM D7844	>3	0.5	0.4	0.3
FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2516.715.714.7	Nitration	Abs/cm	*ASTM D7624	>20	9.1	8.1	6.8
Oxidation Abs/.1mm *ASTM D7414 >25 <b>16.7</b> 15.7 14.7	Sulfation	Abs/.1mm	*ASTM D7415	>30	19.9	19.1	18.6
	FLUID DEGRAI	NOITAC	method	limit/base	current	history1	history2
Base Number (BN)         mg KOH/g         ASTM D2896         9.8         7.9         8.4         8.7	Oxidation	Abs/.1mm	*ASTM D7414	>25	16.7	15.7	14.7
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	7.9	8.4	8.7



# **OIL ANALYSIS REPORT**



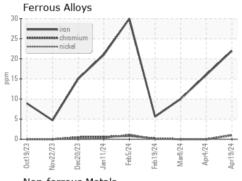


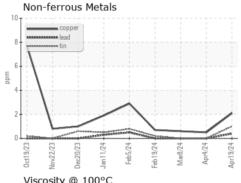


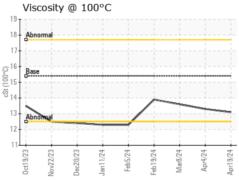
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

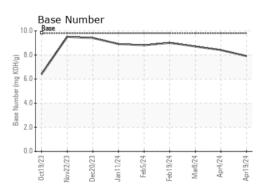
FLUID PROPI	ERTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.1	13.3	13.6

## **GRAPHS**













Certificate 12367

Laboratory Sample No.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0109423 Lab Number : 06156685 Unique Number : 10992108

Test Package : FLEET

Received : 22 Apr 2024 **Tested** : 23 Apr 2024 Diagnosed

: 23 Apr 2024 - Wes Davis

GFL Environmental - 891 - Oklahoma City Hauling

1001 South Rockwell Oklahoma City, OK US 73128

Contact: Andy Smith andrew.smith@gflenv.com T: (405)306-1651

Submitted By: Andy Smith

\* - 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)

To discuss this sample report, contact Customer Service at 1-800-237-1369.