

## **OIL ANALYSIS REPORT**

#### Sample Rating Trend





#### 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

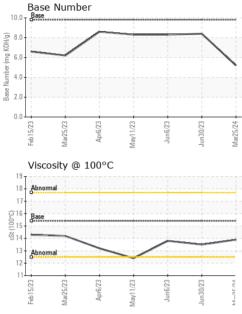
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

	MATION	method	limit/base	current	history1	history2	
Sample Number		Client Info		GFL0111549	GFL0083147	GFL0077418	
Sample Date		Client Info		25 Mar 2024	30 Jun 2023	06 Jun 2023	
Machine Age	hrs	Client Info		0	0	0	
Oil Age	hrs	Client Info	0 0		0	0	
Oil Changed		Client Info		Not Changd	Not Changd	N/A	
Sample Status				NORMAL		NORMAL	
CONTAMINAT	ION	method	limit/base	current	history1	history2	
Fuel		WC Method	>3.0	<1.0	<1.0	<1.0	
Water		WC Method	>0.2	NEG	NEG	NEG	
Glycol		WC Method		NEG	NEG	NEG	
WEAR METAL	S	method	limit/base	current	history1	history2	
Iron	ppm	ASTM D5185m	>165	45	12	12	
Chromium	ppm	ASTM D5185m	>5	2	2	1	
Nickel	ppm	ASTM D5185m	>4	<1	<1	<1	
Titanium	ppm	ASTM D5185m	>2	<1	0	0	
Silver	ppm	ASTM D5185m	>2	0	0	0	
Aluminum	ppm	ASTM D5185m	>20	4	3	1	
Lead	ppm	ASTM D5185m	>150	4	<1	<1	
Copper	ppm	ASTM D5185m	>90	56	8	8	
Tin	ppm	ASTM D5185m	>5	1	<1	<1	
Vanadium	ppm	ASTM D5185m		0	0	0	
Cadmium	nom	ASTM D5185m		•	0	0	
oddinidini	ppm	ASTIVI DOTIODITI		0	0	0	
ADDITIVES	ppm	method	limit/base	0 current	0 history1	history2	
	ppm		limit/base	-	-	-	
ADDITIVES		method		current	history1	history2	
ADDITIVES Boron	ppm	method ASTM D5185m	0	current 12	history1 3	history2 2	
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	0 0 60	current 12 0	history1 3 0	history2 2 2	
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	current 12 0 58	history1 3 0 60	history2 2 2 64	
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	current 12 0 58 <1	history1 3 0 60 <1	history2 2 2 64 <1	
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	current 12 0 58 <1 823	history1 3 0 60 <1 987	history2 2 2 64 <1 906 1098 1023	
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	current           12           0           58           <1           823           1277	history1 3 0 60 <1 987 1117	history2 2 2 64 <1 906 1098 1023 1226	
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	Current 12 0 58 <1 823 1277 868	history1 3 0 60 <1 987 1117 1092	history2 2 2 64 <1 906 1098 1023	
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270	current           12           0           58           <1           823           1277           868           1134	history1 3 0 60 <1 987 1117 1092 1344	history2 2 2 64 <1 906 1098 1023 1226	
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	Current 12 0 58 <1 823 1277 868 1134 2547	history1 3 0 60 <1 987 1117 1092 1344 3988	history2 2 2 64 <1 906 1098 1023 1226 3442	
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	current           12           0           58           <1           823           1277           868           1134           2547           current	history1         3         0         60         <1         987         1117         1092         1344         3988         history1	history2         2         2         64         <1         906         1098         1023         1226         3442         history2	
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 <b>limit/base</b>	current           12           0           58           <1           823           1277           868           1134           2547           current           14	history1           3           0           60           <1           987           1117           1092           1344           3988           history1           11	history2           2           2           64           <1           906           1098           1023           1226           3442           history2           11	
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 <b>limit/base</b>	current           12           0           58           <1           823           1277           868           1134           2547           current           14           4	history1           3           0           60           <1           987           1117           1092           1344           3988           history1           11           3	history2         2         2         64         <1         906         1098         1023         1226         3442         history2         11         2	
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>limit/base</b> >35	current           12           0           58           <1           823           1277           868           1134           2547           current           14           4           <1	history1         3         0         60         <1         987         1117         1092         1344         3988         history1         11         3         history1         0         0.3	history2         2         2         64         <1         906         1098         1023         1226         3442         history2         11         2         1	
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>Imit/base</b> >35 >20 <b>Imit/base</b> >7.5	current           12           0           58           <1           823           1277           868           1134           2547           current           14           4           <1           current	history1         3         0         60         <1         987         1117         1092         1344         3988         history1         11         3         3         history1	history2         2         2         64         <1         906         1098         1023         1226         3442         history2         11         2         1         2         1         bistory2         1         history2	
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b> ppm	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>Imit/base</b> >35 >20 <b>Imit/base</b> >7.5	current           12           0           58           <1           823           1277           868           1134           2547           current           14           4           <1           current           14           4           <1           current           1.4	history1         3         0         60         <1         987         1117         1092         1344         3988         history1         11         3         history1         0         0.3	history2         2         2         64         <1         906         1098         1023         1226         3442         history2         11         2         1         bistory2         1         0.3	
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <i>limit/base</i> >35 >20 <i>limit/base</i> >7.5 >20	current         12         0         58         <1         823         1277         868         1134         2547         current         14         4         <1         current         14         4         <1         current         1.4         12.4	history1         3         0         60         <1         987         1117         1092         1344         3988         history1         11         3         history1         0.3         8.2	history2         2         2         64         <1         906         1098         1023         1226         3442         history2         11         2         1         bistory2         0.3         7.4	
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>Imit/base</b> >35 -20 <b>Imit/base</b> >7.5 >20 >30	current         12         0         58         <1         823         1277         868         1134         2547         current         14         4         <1         current         1.4         12.4         24.3	history1         3         0         60         <1         987         1117         1092         1344         3988         history1         11         3         history1         0.3         8.2         19.9	history2         2         2         64         <1         906         1098         1023         1226         3442         history2         11         2         1         history2         0.3         7.4         19.7	



# **OIL ANALYSIS REPORT**

VISUAL



	White Metal Yellow Metal	scalar scalar	*Visual *Visual	NONE NONE	NONE NONE	NOI		NONE NONE			
$\sim$	Precipitate	scalar	*Visual	NONE	NONE	NO		NONE			
		Silt	scalar	*Visual	NONE	NONE	NO		NONE		
		Debris	scalar	*Visual	NONE	NONE	NOI		NONE		
		Sand/Dirt	scalar	*Visual	NONE	NONE	NO	NE	NONE		
May11/23 Jun6/23	Jun30/23 Mar25/24	Appearance	scalar	*Visual	NORML	NORML	NO	RML	NORM	L	
May	Juni	Odor	scalar	*Visual	NORML	NORML	NO	RML	NORM	L	
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEC	G	NEG		
		Free Water	scalar	*Visual		NEG	NEC	G	NEG		
		FLUID PROPE	RTIES	method	limit/base	current	his	story1	histor	y2	
		Visc @ 100°C	cSt	ASTM D445	15.4	13.9	13.5	5	13.8		
~		GRAPHS									
$\sim$		Ferrous Alloys									
May11/23 Jun6/23	Jun30/23	50 60 10 10 10 10 10 10 10 10 10 1		Jun6/23 Jun6/23 Jun6/23 Jun6/23 Jun6/23 Jun6/23 Jun6/23 Jun6/23 Jun6/24 Jun6/2	Mar25/24-						
		H 2	May11/23	Jun6/23 Jun30/23	Mar25/24						
		Viscosity @ 100°C			10.	Base Numbe	er				
		18 - Abnormal					-				
		17			(B/H)	•					
		D <sup>16</sup> Base			Base Number (mg KOH/g)					1	
		(16) (15) (15) (15) (14)			J) Jaquar Ja Ja Ja Ja Ja Ja Ja Ja Ja Ja Ja Ja Ja	0					
				$\sim$	N ass						
		Abnormal	$\checkmark$			0					
		11									
		Feb 15/23 Mar25/23 Apr6/23	May11/23	Jun6/23 Jun30/23	Mar25/24	Feb 15/23 Mar25/23	Apr6/23	May11/23 Jun6/23	Jun30/23	10.00	
Sample No Lab Number Unique Numb	Laboratory Sample No. Lab Number Unique Number	: WearCheck USA - 50 : GFL0111549 : 06132955 : 10952420		n Ave., Cary ved : 29 d : 01		GFL Er	vironmenta	<b>al - 074 - Doug</b> 1219	l <b>as - Trans</b> Landfill F Douglas US 3	wasi Roa , G.	
		contact Customer Service at 1-800-237-1369. CURTIS.JACOBS@GFLE									



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Submitted By: JOSH MALONEY

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