

## **OIL ANALYSIS REPORT**

#### Sample Rating Trend





### Component

Diesel Engine

#### 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.

•		Phylodel	0002022 0002023	Jun2023 Aug2023 Nov2023	Mar2024	
SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0107694	GFL0096551	GFL0091493
Sample Date		Client Info		05 Mar 2024	28 Nov 2023	16 Aug 2023
Machine Age	hrs	Client Info		16408	11599	10959
Oil Age	hrs	Client Info		600	600	600
Oil Changed		Client Info		N/A	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<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	>110	11	<1	3
Chromium	ppm	ASTM D5185m	>4	0	0	0
Nickel	ppm	ASTM D5185m	>2	4	0	0
Titanium	ppm	ASTM D5185m	-	0	0	0
Silver		ASTM D5185m	>2	0	0	0
Aluminum	ppm		>25	v <1	4	0
	ppm					
Lead	ppm	ASTM D5185m	>45	0	0	0
Copper	ppm		>85	<1	0	<1
Tin	ppm	ASTM D5185m	>4	2	0	0
Vanadium	ppm	ASTM D5185m		0	0	0
Codmium	nnm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTIVI DOTODIII		U	0	0
ADDITIVES	ppm	method	limit/base	current	history1	history2
	ppm		limit/base			
ADDITIVES		method	0	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	0	current 0	history1 <1	history2 0
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	0 0 60	current 0 0	history1 <1 0	history2 0 2
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	ourrent 0 0 56 0	history1 <1 0 58	history2 0 2 62
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	Current 0 0 56 0 1035	history1 <1 0 58 0	history2 0 2 62 0 929
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 0 0 56 0 1035 1173	history1 <1 0 58 0 992 1093	history2 0 2 62 0 929 1161
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 0 56 0 1035 1173 1002	history1 <1 0 58 0 992 1093 911	history2 0 2 62 0 929 1161 1093
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	Current 0 0 56 0 1035 1173	history1 <1 0 58 0 992 1093	history2 0 2 62 0 929 1161
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	0 0 60 0 1010 1070 1150 1270 2060	Current 0 56 0 1035 1173 1002 1298 2854	history1 <1 0 58 0 992 1093 911 1262 2990	history2 0 2 62 0 929 1161 1093 1279 3379
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	Current 0 56 0 1035 1173 1002 1298 2854 Current	history1 <1 0 58 0 992 1093 911 1262 2990 history1	history2 0 2 62 0 929 1161 1093 1279 3379 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	current           0           0           56           0           1035           1173           1002           1298           2854           current           2	<1         0         58         0         992         1093         911         1262         2990         history1         1	history2         0         2         62         0         929         1161         1093         1279         3379         history2         2
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 limit/base >30	current           0           0           56           0           1035           1173           1002           1298           2854           current           2           2           2           2           2           2           2	<1         0         58         0         992         1093         911         1262         2990         history1         1         <1	history2         0         2         62         0         929         1161         1093         1279         3379         history2         2         0
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> >30	current           0           0           56           0           1035           1173           1002           1298           2854           current           2           2           0           0	<1         0         58         0         992         1093         911         1262         2990         history1         1         <1         1         1         1         1         1         1	history2         0         2         62         0         929         1161         1093         1279         3379         history2         2         0         3
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 <b>TS</b>	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>limit/base</b> >30	Current         0         56         0         1035         1173         1002         1298         2854         current         2         2         0         0         current         2         0         current	<1         0         58         0         992         1093         911         1262         2990         history1         1         <1         1         +istory1         1         +istory1	history2         0         2         62         0         929         1161         1093         1279         3379         history2         2         0         3         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 ppm	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>limit/base</b> >30 >20 <b>limit/base</b>	current           0           0           56           0           1035           1173           1002           1298           2854           current           2           2           0           current           0           current           0           current           0.5	<1         0         58         0         992         1093         911         1262         2990         history1         1         <1         1         <1         0         1         0.1	history2         0         2         62         0         929         1161         1093         1279         3379         history2         2         0         3         history2         0.1
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	0 0 0 1010 1070 1150 1270 2060 <i>limit/base</i> >30 <i>limit/base</i> >20	current           0           0           56           0           1035           1173           1002           1298           2854           current           2           2           0           current           0           current           0.5           8.4	<1         0         58         0         992         1093         911         1262         2990         history1         1         <1         1         0.1         6.7	history2         0         2         62         0         929         1161         1093         1279         3379         history2         2         0         3         history2         0.1         6.9
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 ppm	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>limit/base</b> >30 >20 <b>limit/base</b>	current           0           0           56           0           1035           1173           1002           1298           2854           current           2           2           0           current           0           current           0           current           0.5	<1         0         58         0         992         1093         911         1262         2990         history1         1         <1         1         <1         0         1         0.1	history2         0         2         62         0         929         1161         1093         1279         3379         history2         2         0         3         history2         0.1
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	0 0 0 1010 1070 1150 1270 2060 <i>limit/base</i> >30 <i>limit/base</i> >20	current           0           0           56           0           1035           1173           1002           1298           2854           current           2           2           0           current           0           current           0.5           8.4	<1         0         58         0         992         1093         911         1262         2990         history1         1         <1         1         0.1         6.7	history2         0         2         62         0         929         1161         1093         1279         3379         history2         2         0         3         history2         0.1         6.9
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> >30 <b>imit/base</b> >3 20	Current         0         56         0         1035         1173         1002         1298         2854         current         2         2         0         current         0         current         0.5         8.4         19.3	<1         0         58         0         992         1093         911         1262         2990         history1         1         <1         0         0.1         6.7         17.8	history2         0         2         62         0         929         1161         1093         1279         3379         history2         2         0         3         history2         0.1         6.9         17.0
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAD	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm	method           ASTM D5185m           ASTM D7185M           ASTM D7624           *ASTM D7624           *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 2060 2060 2060 200 200 200 200 20	Current         0         0         56         0         1035         1173         1002         1298         2854         current         2         2         0         current         0.5         8.4         19.3         current	<1         0         58         0         992         1093         911         1262         2990         history1         1         <1         0.1         6.7         17.8         history1	history2         0         2         62         0         929         1161         1093         1279         3379         history2         2         0         33         history2         0.1         6.9         17.0         history2



# **OIL ANALYSIS REPORT**

scalar \*Visual

NONE

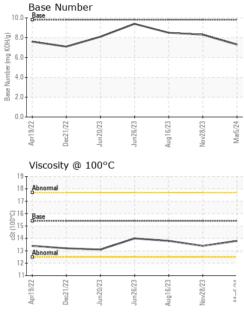
NONE

NONE

NONE

VISUAL

White Metal



Laboratory Sample No. Lab Number Unique Number Test Package To discuss this sample report, * - Denotes test methods that		: WearCheck US : GFL0107694 : 06110807		eived : 0	ry, NC 27513 06 Mar 2024 07 Mar 2024	GFL on Baldridge	Environmental	nvironmental - 465 - Pontiac 888 Baldwin Pontiac, MI US 48340 Contact: Ricky Matthews rickymathews@gflenv.com T: (586)825-9514	
			Apr19/22	Jun20/23 Jun26/23	Aug16/23 Nov28/23	Mar5/24 +	Apr19/22	Jun20/23	Aug 16/23
			13 Abnormal				2.0 -		
			10		$\sim$	A Num	4.0		
			(), 16 (), 00 (), 15 (), 15 (), 15 (), 16 (), 16 ()			ber (n			
			i i i			g KOH/g	5.0		
			18 - Abnormal				8.0	$\sim$	
			<sup>19</sup>			10			
			Viscosity @		A N		Base Numbe	r	
			Apr19/22 Dec21/22	Jun20/23 Jun26/23	Aug16/23 Nov28/23	Mar5/24			
					3 3				
			2-						
			4						
			6- Ed						
			8 - enseense lead						
			10 copper						
			Non-ferrous		A N				
			Apr19/22 Dec21/22	Jun20/23 Jun26/23	Aug 16/23 Nov28/23	Mar5/24			
			2	$\square$	$\sim$ /	/			
			Ed 6			/			
	A N		8						
Jun26/23	Aug16/23 Nov28/23	MC.D.A	10- nickel	•					
· · · · · · · · · · · · · · · · · · ·				ys					
		-	GRAPHS Ferrous Allor	NG.					
******			Visc @ 100°C	cSt	ASTM D445	5 15.4	13.8	13.4	13.8
			FLUID PR	OPERTIES	S method	limit/base	current	history1	history2
C			Free Water	scalar	r *Visual		NEG	NEG	NEG
°C			Emulsified Wa			>0.2	NEG	NEG	NEG
Jun26/23	Aug 16/23 Nov28/23	Mar5/24	Odor	scalar		NORML	NORML	NORML	NORML
/23	/23 -	/24	Appearance	scalar scalar		NORML	NORML	NONE NORML	NONE NORML
			Debris Sand/Dirt	scalar		NONE	NONE NONE	NONE	NONE
			Silt	scalar		NONE	NONE	NONE	NONE
			Precipitate	scalar		NONE	NONE	NONE	NONE
			Yellow Metal	scalar	r *Visual	NONE	NONE	NONE	NONE
			White Metal	scalar	r *Visual	NONE	NONE	NONE	NONE

Ē

Page 2 of 2