

# **OIL ANALYSIS REPORT**

Sample Rating Trend



Machine Id 412044 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

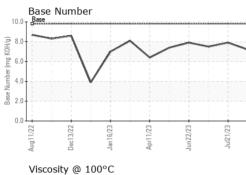
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

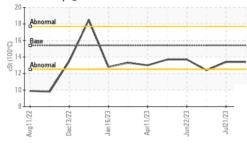
SAMPLE INFORM	VATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0078699	GFL0045447	GFL0045435
Sample Date		Client Info		06 Sep 2023	21 Jul 2023	08 Jul 2023
Machine Age	hrs	Client Info		3327	2990	2919
Oil Age	hrs	Client Info		2036	1699	1628
Oil Changed	1110	Client Info		Changed	Not Changd	Not Changd
Sample Status				NORMAL	NORMAL	NORMAL
				-		
CONTAMINATI	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	<1.0	0.8
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>120	14	8	8
Chromium	ppm	ASTM D5185m	>20	<1	0	<1
Nickel	ppm	ASTM D5185m	>5	4	0	<1
Titanium	ppm	ASTM D5185m	>2	0	0	0
Silver	ppm	ASTM D5185m	>2	<1	0	0
Aluminum	ppm	ASTM D5185m	>20	4	3	3
Lead	ppm	ASTM D5185m	>40	<1	0	0
Copper	ppm	ASTM D5185m	>330	5	5	<1
Tin	ppm	ASTM D5185m	>15	1	0	0
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 7	history1 108	history2 11
	ppm ppm				· · · · ·	
Boron		ASTM D5185m	0	7	108	11
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0 0 60	7 0	108 0	11 2
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	7 0 63	108 0 99	11 2 61
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	7 0 63 1	108 0 99 0	11 2 61 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	7 0 63 1 1000	108 0 99 0 750	11 2 61 <1 710
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	7 0 63 1 1000 1151	108 0 99 0 750 1405	11 2 61 <1 710 1086
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	7 0 63 1 1000 1151 1016	108 0 99 0 750 1405 848	11 2 61 <1 710 1086 883
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270	7 0 63 1 1000 1151 1016 1341	108 0 99 0 750 1405 848 1054	11 2 61 <1 710 1086 883 1103
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	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	7 0 63 1 1000 1151 1016 1341 3470	108 0 99 0 750 1405 848 1054 3018	11 2 61 <1 710 1086 883 1103 2856
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	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	7 0 63 1 1000 1151 1016 1341 3470 current	108 0 99 0 750 1405 848 1054 3018 history1	11 2 61 <1 710 1086 883 1103 2856 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b>	0 0 60 1010 1070 1150 1270 2060 limit/base >25	7 0 63 1 1000 1151 1016 1341 3470 current 8	108 0 99 0 750 1405 848 1054 3018 history1 3	11 2 61 <1 710 1086 883 1103 2856 history2 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base >25	7 0 63 1 1000 1151 1016 1341 3470 current 8 3	108 0 99 0 750 1405 848 1054 3018 history1 3 0	11 2 61 <1 710 1086 883 1103 2856 history2 3 4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25	7 0 63 1 1000 1151 1016 1341 3470 current 8 3 9 current	108 0 99 0 750 1405 848 1054 3018 history1 3 0 3 history1	11 2 61 <1 710 1086 883 1103 2856 history2 3 4 4
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	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 Limit/base >20	7 0 63 1 1000 1151 1016 1341 3470 current 8 3 9 current 0.4	108 0 99 0 750 1405 848 1054 3018 history1 3 0 3 history1 0.2	111 2 61 <1 710 1086 883 1103 2856 history2 3 4 4 4 4 history2 0.8
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	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 Limit/base >20	7 0 63 1 1000 1151 1016 1341 3470 current 8 3 9 current	108 0 99 0 750 1405 848 1054 3018 history1 3 0 3 history1	11 2 61 <1 710 1086 883 1103 2856 history2 3 4 4 4 history2
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	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 <b>imit/base</b> >4 >20 >30	7 0 63 1 1000 1151 1016 1341 3470 current 8 3 9 current 0.4 8.0 19.6	108 0 99 0 750 1405 848 1054 3018 history1 3 0 3 <b>history1</b> 0.2 8.0 21.7	111 2 61 <1 710 1086 883 1103 2856 history2 3 4 4 4 history2 0.8 7.8 19.1
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 TS ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624	0 0 0 1010 1070 1150 1270 2060 2060 225 220 220 imit/base >4 >20 >30	7 0 63 1 1000 1151 1016 1341 3470 current 8 3 9 current 0.4 8.0 19.6	108 0 99 0 750 1405 848 1054 3018 history1 3 0 3 history1 0.2 8.0 21.7 history1	11 2 61 <1 710 1086 883 1103 2856 history2 3 4 4 4 history2 0.8 7.8 19.1 history2
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	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 2060 225 20 220 20 20 20 20 20 20 20 20 20 20 20	7 0 63 1 1000 1151 1016 1341 3470 current 8 3 9 current 0.4 8.0 19.6	108 0 99 0 750 1405 848 1054 3018 history1 3 0 3 <b>history1</b> 0.2 8.0 21.7	111 2 61 <1 710 1086 883 1103 2856 history2 3 4 4 4 history2 0.8 7.8 19.1



# **OIL ANALYSIS REPORT**

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	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
Jun22/23 Jul21/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
	Free Water	scalar	*Visual		NEG	NEG	NEG
	FLUID PROPE		method	limit/base	current	history1	history2
$\sim$ $\sim$	Visc @ 100°C	cSt	ASTM D445	15.4	13.4	13.4	12.4
	GRAPHS						
	Ferrous Alloys						
Jul21/23	iron						
Jun22/23 Jul21/23	150 nickel		1				
E	100						
Ē							
	50						
		~	~~ ~ ~	2			
	Aug11/22 Dec13/22 Jan16/23	Apr11/23	Jun22/23	7/1 710			
	a non-ferrous Metal		٦٢ ٦	2			
	140 T						
	120 - Lead						
	100 tin		· • • • • • • • • • • • • • • • • • • •				
E	80						
8	£ 60		·····				
	40						
	20						
		-		2			
	Aug11/22 Dec13/22 Jan16/23	Apr11/23	Jun22/23	7/1 7/1			
	۽ ۽ Viscosity @ 100°C		Ju Ju	2			
	<sup>20</sup>			10	Base Number		
	18 - Abnormal						
	16 Base			(B/HO		$\wedge$	$\sim$
	Base			Bu (	.0		
	2000114 Abnormal	$\sim$		Jaquan 4			
	12-			Base Number (mg KOH/g)			
	10-			<sup>2</sup> 2	.0 -		
	8				.0		
	Aug11/22 Dec13/22 Jan16/23	Apr11/23	Jun22/23		Aug11/22 Dec13/22	Jan 16/23 Apr1 1/23	Jun22/23 - Jul21/23 -
	Aug Dec	Apr	Jun	2	Aug	Jan	nul lul
Laboratory	: WearCheck USA - 5	01 Madi	son Ave., Ca	ry, NC 2751	3 GFL envir	onmental - 867 - Traffe	ord (Blount Hauling)
Sample No.	: GFL0078699	Receive	d :11 \$	Sep 2023			County Line Rd
Lab Number			Sep 2023			Trafford, AL	
Unique Number	: 10642851 I	tician : We	s Davis		US 35172 Contact: Jonathan Williams		



Test Package : FLEET Certificate L2367 To discuss this sample report, contact Customer Service at 1-800-237-1369. jonathan.williams@gflenv.com \* - 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)

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F:

Contact: Jonathan Williams