

## **OIL ANALYSIS REPORT**

#### Sample Rating Trend



## Machine Id 713050

#### 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.

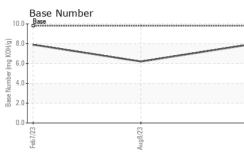
## Fluid Condition

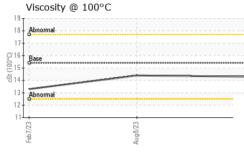
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0098416	GFL0089496	GFL0058682
Sample Date		Client Info		07 Nov 2023	08 Aug 2023	07 Feb 2023
Machine Age	hrs	Client Info		2269	1773	4526
Oil Age	hrs	Client Info		2269	0	0
Oil Changed		Client Info		Changed	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	12	40	26
Chromium	ppm	ASTM D5185m	>4	<1	1	<1
Nickel	ppm	ASTM D5185m	>2	<1	<1	0
Titanium	ppm	ASTM D5185m		<1	<1	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>25	3	3	2
Lead	ppm	ASTM D5185m	>45	0	0	0
Copper	ppm	ASTM D5185m	>85	1	3	16
Tin	ppm	ASTM D5185m	>4	0	<1	<1
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 0	history1 2	history2 47
	ppm ppm					
Boron		ASTM D5185m	0	0	2	47
Boron Barium	ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0	0 0	2 0	47 3
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	0 0 62	2 0 66	47 3 41
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	0 0 62 0	2 0 66 1	47 3 41 5
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	0 0 62 0 945	2 0 66 1 1078	47 3 41 5 537
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	0 0 62 0 945 1069	2 0 66 1 1078 1272	47 3 41 5 537 1544
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	0 0 62 0 945 1069 1033	2 0 66 1 1078 1272 1118	47 3 41 5 537 1544 721
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	0 0 62 0 945 1069 1033 1229	2 0 66 1 1078 1272 1118 1406	47 3 41 5 537 1544 721 907
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	0 0 62 0 945 1069 1033 1229 2860	2 0 66 1 1078 1272 1118 1406 3667	47 3 41 5 537 1544 721 907 2437
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	0 0 60 1010 1070 1150 1270 2060	0 0 62 0 945 1069 1033 1229 2860 current	2 0 66 1 1078 1272 1118 1406 3667 history1	47 3 41 5 537 1544 721 907 2437 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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b>	0 0 62 0 945 1069 1033 1229 2860 current 3	2 0 66 1 1078 1272 1118 1406 3667 history1 6	47 3 41 5 537 1544 721 907 2437 history2 9
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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b>	0 0 62 0 945 1069 1033 1229 2860 current 3 2	2 0 66 1 1078 1272 1118 1406 3667 history1 6 8	47 3 41 5 537 1544 721 907 2437 <b>history2</b> 9 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b> >30	0 0 62 0 945 1069 1033 1229 2860 current 3 2 2	2 0 66 1 1078 1272 1118 1406 3667 <b>history1</b> 6 8 5	47 3 41 5 537 1544 721 907 2437 history2 9 3 6
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>Jimit/base</b> >30 >20 <b>Jimit/base</b>	0 0 62 0 945 1069 1033 1229 2860 current 3 2 2 10 current	2 0 66 1 1078 1272 1118 1406 3667 history1 6 8 5 5 history1	47 3 41 5 537 1544 721 907 2437 history2 9 3 6 kistory2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>Jimit/base</b> >30 >20 <b>Jimit/base</b>	0 0 62 0 945 1069 1033 1229 2860 current 3 2 10 2 0.4	2 0 66 1 1078 1272 1118 1406 3667 history1 6 8 5 5 history1 0.6	47 3 41 5 537 1544 721 907 2437 history2 9 3 6 history2 0.3
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	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >30 220 imit/base >3 20	0 0 62 0 945 1069 1033 1229 2860 current 3 2 10 2 0.4 9.4	2 0 66 1 1078 1272 1118 1406 3667 history1 6 8 5 5 history1 0.6 11.6	47 3 41 5 537 1544 721 907 2437 history2 9 3 6 history2 0.3 10.5
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 D7844 *ASTM D7624 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >30 >20 <b>imit/base</b> >3 >20 >30	0 0 62 0 945 1069 1033 1229 2860 current 3 2 2 10 current 0.4 9.4 20.1 current	2 0 66 1 1078 1272 1118 1406 3667 <b>history1</b> 6 8 5 <b>history1</b> 0.6 11.6 22.9 <b>history1</b>	47 3 41 5 537 1544 721 907 2437 history2 9 3 6 history2 0.3 10.5 21.9 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> >30 >20 <b>Imit/base</b> >3 >20	0 0 62 0 945 1069 1033 1229 2860 current 3 2 10 2 10 0.4 9.4 20.1	2 0 66 1 1078 1272 1118 1406 3667 history1 6 8 5 5 history1 0.6 11.6 22.9	47 3 41 5 537 1544 721 907 2437 history2 9 3 6 history2 0.3 10.5 21.9



# **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
Nov7/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Ž	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	RTIES	method	limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445	15.4	14.3	14.4	13.3
	GRAPHS						
	Ferrous Alloys						
	iron						
	30 - nickel						
	25						
	튭 20 -						
	15						
	10						
	5	1					
	3	/23		/23			
	Feb 7/23	Aug8/23		Nov7/23			
	Non-ferrous Meta	ls					
	16 copper 1						
	14 - management lead						
	12 10						
	ud 8						
	6						
	4						
	2-	-					
		~					
	Feb7/23	Aug8/23		Nov7/23			
				2			
	Viscosity @ 100°C			10.0	Base Number		
	18 - Abnormal			10.0	0		
	17						
:	Base			но в 6.0			
	(3) 16 Base 00 15 37 14			E 0.0			
	·3 14			0.8 ( 0.6 (mg k0H/d) 9.4 (mg k0H/d) 9.5 (mg k0H/d)			
	13 Abnormal			2.0			
	12						
	a a 1			0.0	53	33	2
	11 <del>4</del>			24	29	2	5
		ug8/23		lov7	-eb7	(g Bri	1200
	Feb.1/23	Aug8/23		Nov7/23	Feb7/23	Aug8/23	5 <i>0 E</i> .v.W
ooratory	Feb7/23		son Ave., Ca			vironmental - 91	
boratory mple No. b Number	: WearCheck USA - : : GFL0098416		d : 20 l			vironmental - 91	



 Certificate L2367
 Test Package
 : FLEET

 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)

Diagnostician : Wes Davis

Unique Number : 10751182

Contact: David McCall

T: (262)369-3069

david.mccall@gflenv.com

US 53029

F: