

# **OIL ANALYSIS REPORT**

#### Sample Rating Trend



# Machine Id 928054

#### 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.

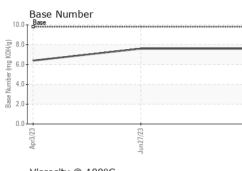
## Fluid Condition

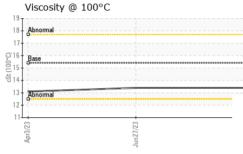
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0066995	GFL0067011	GFL0066963
Sample Date		Client Info		26 Oct 2023	27 Jun 2023	03 Apr 2023
Machine Age	hrs	Client Info		13498	12908	12368
Oil Age	hrs	Client Info		0	0	12368
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
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron		ASTM D5185m	>110	8	10	30
Chromium	ppm ppm	ASTM D5185m	>110	o <1	<1	<1
Nickel		ASTM D5185m		0	0	0
Titanium	ppm ppm	ASTM D5185m	<i>&gt;L</i>	0	0	0
Silver		ASTM D5185m	>2	0	0	0
Aluminum	ppm ppm	ASTM D5185m	>25	4	5	24
Lead	ppm	ASTM D5185m	>25	4	<1	0
Copper	ppm	ASTM D5185m	>85	1	2	3
Tin			>05	0	<1	<1
Vanadium	ppm ppm	ASTM D5185m	>4	0	0	<1
Cadmium		ASTM D5185m		0	0	0
	ppm	ASTIM D3103III		U	-	
ADDITIVES						
		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	5	8	28
Boron Barium	ppm ppm	ASTM D5185m ASTM D5185m	0	5 0	8 0	28 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	5 0 65	8 0 68	28 0 128
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	5 0 65 0	8 0 68 <1	28 0 128 <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	5 0 65 0 944	8 0 68 <1 1023	28 0 128 <1 1382
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	5 0 65 0 944 1125	8 0 68 <1 1023 1287	28 0 128 <1 1382 2118
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	5 0 65 0 944 1125 930	8 0 68 <1 1023 1287 1104	28 0 128 <1 1382 2118 1512
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	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	5 0 65 0 944 1125 930 1246	8 0 68 <1 1023 1287 1104 1335	28 0 128 <1 1382 2118 1512 1894
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	5 0 65 0 944 1125 930	8 0 68 <1 1023 1287 1104	28 0 128 <1 1382 2118 1512 1894 4684
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	5 0 65 0 944 1125 930 1246	8 0 68 <1 1023 1287 1104 1335	28 0 128 <1 1382 2118 1512 1894
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 1010 1070 1150 1270 2060	5 0 65 0 944 1125 930 1246 2779	8 0 68 <1 1023 1287 1104 1335 3767	28 0 128 <1 1382 2118 1512 1894 4684
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 1010 1070 1150 1270 2060	5 0 65 0 944 1125 930 1246 2779 current	8 0 68 <1 1023 1287 1104 1335 3767 history1	28 0 128 <1 1382 2118 1512 1894 4684 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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 <b>method</b>	0 0 60 1010 1070 1150 1270 2060	5 0 65 0 944 1125 930 1246 2779 current 4	8 0 68 <1 1023 1287 1104 1335 3767 history1 5	28 0 128 <1 1382 2118 1512 1894 4684 <b>history2</b> 12
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm 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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b>	5 0 65 0 944 1125 930 1246 2779 current 4 0	8 0 68 <1 1023 1287 1104 1335 3767 history1 5 2	28 0 128 <1 1382 2118 1512 1894 4684 <b>history2</b> 12 6
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b> >30	5 0 65 0 944 1125 930 1246 2779 current 4 0 9	8 0 68 <1 1023 1287 1104 1335 3767 history1 5 2 2 5	28 0 128 <1 1382 2118 1512 1894 4684 history2 12 6 23
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm 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> >30 -20	5 0 65 0 944 1125 930 1246 2779 current 4 0 9	8 0 68 <1 1023 1287 1104 1335 3767 history1 5 2 5 5 history1	28 0 128 <1 1382 2118 1512 1894 4684 history2 12 6 23 history2
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	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >30 200 limit/base >33	5 0 65 0 944 1125 930 1246 2779 <u>current</u> 4 0 9 9 <u>current</u>	8 0 68 <1 1023 1287 1104 1335 3767 history1 5 2 5 2 5 5 history1 0.5	28 0 128 <1 1382 2118 1512 1894 4684 history2 12 6 23 history2 0.7
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	5 0 65 0 944 1125 930 1246 2779 <i>current</i> 4 0 9 <i>current</i> 0.5 8.4	8 0 68 <1 1023 1287 1104 1335 3767 history1 5 2 5 2 5 history1 0.5 8.1	28 0 128 <1 1382 2118 1512 1894 4684 history2 12 6 23 history2 0.7 9.8
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 <b>imit/base</b> >3 20	5 0 65 0 944 1125 930 1246 2779 current 4 0 9 9 current 0.5 8.4 19.9	8 0 68 <1 1023 1287 1104 1335 3767 history1 5 2 5 5 history1 0.5 8.1 19.7	28 0 128 <1 1382 2118 1512 1894 4684 history2 12 6 23 history2 0.7 9.8 22.1
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 ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 2060 2060 2060 200 200 200 200 20	5 0 65 0 944 1125 930 1246 2779 current 4 0 9 current 0.5 8.4 19.9 current	8 0 68 <1 1023 1287 1104 1335 3767 history1 5 2 5 5 history1 0.5 8.1 19.7 history1	28 0 128 <1 1382 2118 1512 1894 4684 history2 12 6 23 history2 0.7 9.8 22.1 history2



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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		*Visual	NONE	NONE	NONE	NONE
	Silt		*Visual	NONE	NONE	NONE	NONE
	Debris		*Visual	NONE	NONE	NONE	NONE
	Sand/Dirt		*Visual	NONE	NONE	NONE	NONE
/23	Appearance		*Visual	NORML	NORML	NORML	NORML
0ct26/23	Odor		*Visual	NORML	NORML	NORML	NORML
	Emulsified Water		*Visual	>0.2	NEG	NEG	NEG
	Free Water		*Visual	20.L	NEG	NEG	NEG
	FLUID PROI		method	limit/base	current	history1	history2
	Visc @ 100°C		ASTM D445		13.4	13.4	13.1
	GRAPHS						
	Ferrous Alloys						
	<sup>30</sup> iron						
	25 - chromium						
	20-						
	<u>۾</u> 15-						
	d 13						
	10						
	5						
		11.0000					
	Apr3/23	7/23 -		6/23 -			
	Apri	Jun27/23		0ct26/23			
	Non-ferrous Me	etals					
	<sup>10</sup> T						
	copper						
	8 -						
	6-						
	mqq						
	4						
	2						
		-					
		23	Construction of the second sec	23			
	Apr3/23	Jun27/23		0ct26/23			
	Viscosity @ 100	2		0			
	<sup>19</sup>	J-C		10	Base Numbe	er	
	18 - Abnormal						
	18 - Abnormal				1		
	17-			(B)	.0 -		
;	17-			g KOH/g)			
	17-			er (mg KOH/g) o	.0		
	<b>Q</b>			8 (B/HO) Aumper (mg KOH/g)			
	17 G 16 Base 00 15 14 13 14			ase Number (mg KOH/g	.0		
	177- G-16- Base 00-15- 33 14-			ase Number (mg KOH/g	.0-		
	17- Base Base 37 14 13 Abnormal 12 11			9)HO) 6 Buy be for the set of the	.0		
	17- Base Base 37 14 13 Abnormal 12 11	21/23		9)HO) 6 Buy be for the set of the	.0	27/23	
atory le No. umber	: WearCheck USA : GFL0066995 : 06002110	Received Diagnose	: 08   d : 09	ry, NC 2751 Nov 2023 Nov 2023	0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.	nvironmental - 910 1799 C	ounty Trunk I DePere,
atory le No. umber Number	: WearCheck USA : GFL0066995 : 06002110 : 10735872	- 501 Madis Received	: 08   d : 09	ry, NC 2751 Nov 2023	0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.	<b>nvironmental - 91</b> 1799 C	ounty Trunk I DePere, ' US 541
atory le No. umber Number Package	: WearCheck USA : GFL0066995 : 06002110	- 501 Madis Received Diagnose Diagnosti	:08  d :09  cian :We	ry, NC 2751 Nov 2023 s Davis	0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.	<b>nvironmental - 91</b> 1799 C Contac	6 - Greenbay I ounty Trunk F DePere, 1 US 541 t: Travis Run ge@gflenv.cc

To discuss this sample \* - 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)

Certificate L2367

F: