

# **OIL ANALYSIS REPORT**

#### Sample Rating Trend



# Machine Id 713048

#### 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.

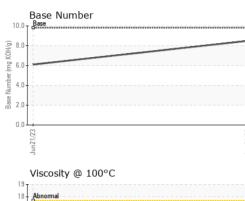
SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0089479	GFL0084535	
Sample Date		Client Info		21 Aug 2023	21 Jun 2023	
Machine Age	hrs	Client Info		2087	1701	
Oil Age	hrs	Client Info		0	0	
Oil Changed		Client Info		Changed	Changed	
Sample Status				NORMAL	NORMAL	
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	
Glycol		WC Method		NEG	NEG	
WEAR METALS		method	limit/base	current	history1	history2
Iron		ASTM D5185m	>100	8	33	
Chromium	ppm ppm	ASTM D5185m	>100	o <1	<1	
Nickel		ASTM D5185m	>20	0	<1	
Titanium	ppm ppm	ASTM D5185m	~7	0	0	
Silver		ASTM D5185m	>3	0	0	
Aluminum	ppm	ASTM D5185m	>20	4	12	
Lead	ppm ppm	ASTM D5185m	>20	4	2	
		ASTM D5185m	>330	۰ <1	4	
Copper Tin	ppm	ASTM D5185m	>330	<1	2	
Vanadium	ppm	ASTM D5185m	>10	0	<1	
	ppm	ASTM D5185m		0	<1	
Cadmium	ppm	ASTIM DOTION		U	<1	
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	0	<1	6	history2
Boron Barium	ppm ppm		0	<1 0	6 0	history2 
Boron		ASTM D5185m	0	<1	6 0 64	
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	<1 0	6 0	
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	<1 0 63	6 0 64 3 1029	
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	<1 0 63 <1	6 0 64 3	
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	<1 0 63 <1 1043 1148 1142	6 0 64 3 1029	
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	<1 0 63 <1 1043 1148	6 0 64 3 1029 1212	
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	0 0 60 0 1010 1070 1150	<1 0 63 <1 1043 1148 1142	6 0 64 3 1029 1212 1063	   
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	<1 0 63 <1 1043 1148 1142 1388	6 0 64 3 1029 1212 1063 1322	    
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	<1 0 63 <1 1043 1148 1142 1388 3975	6 0 64 3 1029 1212 1063 1322 3468	
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	<1 0 63 <1 1043 1148 1142 1388 3975 current	6 0 64 3 1029 1212 1063 1322 3468 history1	
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 <b>method</b> ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	<1 0 63 <1 1043 1148 1142 1388 3975 current 2	6 0 64 3 1029 1212 1063 1322 3468 history1 6	     history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm 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 <b>method</b> ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 kimit/base >25	<1 0 63 <1 1043 1148 1142 1388 3975 <u>current</u> 2 5	6 0 64 3 1029 1212 1063 1322 3468 history1 6 7	     history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25	<1 0 63 <1 1043 1148 1142 1388 3975 current 2 5 4	6 0 64 3 1029 1212 1063 1322 3468 history1 6 7 21	    history2
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> >25	<1 0 63 <1 1043 1148 1142 1388 3975 current 2 5 4	6 0 64 3 1029 1212 1063 1322 3468 history1 6 7 21 history1	     history2   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 <b>TS</b>	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 1imit/base >20	<1 0 63 <1 1043 1148 1142 1388 3975 <u>current</u> 2 5 4 <u>current</u> 0.2	6 0 64 3 1029 1212 1063 1322 3468 history1 6 7 21 history1 0.6	    history2  history2
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 <i>limit/base</i> >25 >20 <i>limit/base</i> >3 >20	<1 0 63 <1 1043 1148 1142 1388 3975 <i>current</i> 2 5 4 <i>current</i> 0.2 8.1	6 0 64 3 1029 1212 1063 1322 3468 history1 6 7 21 6 7 21 history1 0.6 11.1	     history2   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> >3 >20	<1 0 63 <1 1043 1148 1142 1388 3975 <u>current</u> 2 5 4 <u>current</u> 0.2 8.1 18.9	6 0 64 3 1029 1212 1063 1322 3468 history1 6 7 21 6 7 21 history1 0.6 11.1 23.7	    history2  history2  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 D7844 *ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 2260 225 220 220 imit/base >3 >20 >30 >30	<1 0 63 <1 1043 1148 1142 1388 3975 Current 2 5 4 Current 0.2 8.1 18.9 Current	6 0 64 3 1029 1212 1063 1322 3468 history1 6 7 21 6 7 21 history1 0.6 11.1 23.7 history1	    history2  history2  history2  history2



17-(2)16-Base 00(1)5-\$314-

# **OIL ANALYSIS REPORT**

VISUAL



	VISUAL		method	limit/base		history1	history2
	White Metal	scalar	*Visual	NONE	NONE	NONE	
	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	
	Precipitate	scalar	*Visual	NONE	NONE	NONE	
	Silt	scalar	*Visual	NONE	NONE	NONE	
	Debris		*Visual	NONE	NONE	NONE	
		scalar					
	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	
Aug21/23	Appearance	scalar	*Visual	NORML	NORML	NORML	
		scalar	*Visual	NORML	NORML	NORML	
٥°C	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	
	Free Water	scalar	*Visual		NEG	NEG	
	FLUID PROPE	RTIES	method	limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445		14.2	14.1	
		COL	A31101 D443	13.4	14.2	14.1	
	GRAPHS						
	Ferrous Alloys						
	iron						
	nickel						
	25						
	20						
	E 15						
	10						
	5						
	1/23			1/23 -			
	Jun 21/23			Aug21/23			
	Non-ferrous Metal	5		4			
	<sup>10</sup> T						
	copper						
	8 - management						
	6						
	u dd						
	4						
	2						
	2 - 2						
	0						
	Jun21/23			Aug21/23			
	unf			Aug			
	Viscosity @ 100°C				Base Number		
	19 T :			10.0			
	18 - Abnormal						
	17-			(B∦ <sup>8.0</sup>	• • • • • • • • • • • • • • • • • • • •		
	G 16 Base 15 3 14			0.9 Base Number (mg KOH/g)			
	0_15			per (r			
	<sup>3</sup> 14			4.0	1		
	13 Abnormal			2.0			
	12						
	11			0.0	L		
	Jun21/23			Aug21/23	Jun21/23		Aug21/23
	Jur			Aug	Jur		Aug
Laboratory Sample No. Lab Number Unique Number Test Package To discuss this sample report,	: 05934764 I : 10620035 I : FLEET contact Customer Servi	Received Diagnose Diagnost	l : 25 / ed : 25 / ician : Wes	Aug 2023 Aug 2023 s Davis 9.	GFL Envi	Contact david.mcca	ndustrial Drive Hartland, WI US 53029 : David McCall Ill@gflenv.com
* - Denotes test methods that a Statements of conformity to spec					ICGM 106:2012)	T:	(262)369-3069 F:

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