

## **OIL ANALYSIS REPORT**

Sample Rating Trend





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

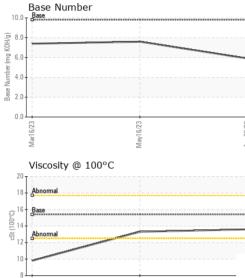
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0089455	GFL0075397	GFL0075349
Sample Date		Client Info		25 Aug 2023	16 May 2023	16 Mar 2023
Machine Age	mls	Client Info		37654	23358	13807
Oil Age	mls	Client Info		37654	0	0
Oil Changed		Client Info		Changed	Changed	N/A
Sample Status				NORMAL	NORMAL	SEVERE
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	<1.0	0.5
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>120	8	8	32
Chromium	ppm	ASTM D5185m	>20	<1	<1	1
Nickel	ppm	ASTM D5185m	>5	0	0	1
Titanium	ppm	ASTM D5185m	>2	0	0	<1
Silver	ppm	ASTM D5185m	>2	<1	1	0
Aluminum	ppm	ASTM D5185m	>20	<1	2	<b>1</b> 6
Lead	ppm	ASTM D5185m	>40	0	1	<1
Copper	ppm	ASTM D5185m	>330	33	164	193
Tin	ppm	ASTM D5185m	>15	0	1	4
Vanadium	ppm	ASTM D5185m		0	0	<1
Cadmium	ppm	ASTM D5185m		0	0	0
			l'and to find a second			histow.0
ADDITIVES		method				history2
Boron	ppm	ASTM D5185m	limit/base	o current	history1 7	174
	ppm ppm					
Boron		ASTM D5185m	0	0	7	174
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	0 0	7 0	174 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	0 0 42	7 0 47	174 0 119
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	0 0 42 <1	7 0 47 <1	174 0 119 4
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 42 <1 10	7 0 47 <1 49	174 0 119 4 612
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 42 <1 10 2506	7 0 47 <1 49 2725	174 0 119 4 612 1471
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 42 <1 10 2506 998	7 0 47 <1 49 2725 1062	174 0 119 4 612 1471 654
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 42 <1 10 2506 998 1228	7 0 47 <1 49 2725 1062 1303	174 0 119 4 612 1471 654 833
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	0 0 42 <1 10 2506 998 1228 3442	7 0 47 <1 49 2725 1062 1303 3775	174 0 119 4 612 1471 654 833 2242
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 42 <1 10 2506 998 1228 3442 current	7 0 47 <1 49 2725 1062 1303 3775 history1	174 0 119 4 612 1471 654 833 2242 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 ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	0 0 42 <1 10 2506 998 1228 3442 current 7	7 0 47 <1 49 2725 1062 1303 3775 history1 16	174 0 119 4 612 1471 654 833 2242 history2
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 kimit/base >25	0 0 42 <1 10 2506 998 1228 3442 <u>current</u> 7 2	7 0 47 <1 49 2725 1062 1303 3775 history1 16 3	174 0 119 4 612 1471 654 833 2242 history2 • 76 2
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> >25 >20	0 0 42 <1 10 2506 998 1228 3442 current 7 2 4	7 0 47 <1 49 2725 1062 1303 3775 history1 16 3 10	174 0 119 4 612 1471 654 833 2242 history2 ◆ 76 2 42
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25	0 0 42 <1 10 2506 998 1228 3442 current 7 2 4 4	7 0 47 <1 49 2725 1062 1303 3775 history1 16 3 10 history1	174 0 119 4 612 1471 654 833 2242 history2 € 76 2 42 42 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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base	0 0 42 <1 10 2506 998 1228 3442 <u>current</u> 7 2 4 4 <u>current</u>	7 0 47 <1 49 2725 1062 1303 3775 history1 16 3 10 history1 0.2	174 0 119 4 612 1471 654 833 2242 history2 € 76 2 42 42 history2 0.4
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> >4 >20	0 0 42 <1 10 2506 998 1228 3442 <i>current</i> 7 2 4 <i>current</i> 0.2 8.0	7 0 47 <1 49 2725 1062 1303 3775 history1 16 3 10 history1 0.2 7.2	174 0 119 4 612 1471 654 833 2242 history2 € 76 2 42 42 history2 0.4 10.2
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	0 0 42 <1 10 2506 998 1228 3442 <u>current</u> 7 2 4 4 <u>current</u> 0.2 8.0 20.3	7 0 47 <1 49 2725 1062 1303 3775 history1 16 3 10 history1 0.2 7.2 18.5	174 0 119 4 612 1471 654 833 2242 <b>history2</b> € 76 2 42 <b>history2</b> 0.4 10.2 24.4
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	0 0 0 1010 1070 1150 2060 2060 225 20 220 220 1imit/base >20 >20 30 20 30 20 30	0 0 42 <1 10 2506 998 1228 3442 <i>current</i> 7 2 2 4 <i>current</i> 0.2 8.0 20.3 <i>current</i>	7 0 47 <1 49 2725 1062 1303 3775 history1 16 3 10 history1 0.2 7.2 18.5 history1	174 0 119 4 612 1471 654 833 2242 history2 ◆ 76 2 42 42 history2 0.4 10.2 24.4 history2



Mar16/23

# **OIL ANALYSIS REPORT**



May16/23

	VISUAL		method				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
5/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Aug25/23	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
	Emulsified Water		*Visual	>0.2	NEG	NEG	NEG
	Free Water	scalar	*Visual		NEG	NEG	NEG
	FLUID PRO			limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445		13.6	13.3	<b>▲</b> 9.8
	GRAPHS						
	Ferrous Alloys						
	iron						
	mannan nickel						
	25						
	15-						
	10						
	5						
	0						
	Mar16/23	May16/23		Aug25/23			
	Marl	May1		Aug2			
	Non-ferrous M	etals					
	200						
	copper lead						
	the second se						
5	150 - tin						
au uu	second lead						
	150- tin						
500 C C	150 - tin						
	150- tin			<b>\</b>			
and and	150 - E 100 - 50	133		<sup>23</sup>			
	150- tin	lay16/23		52/32 dm			
MULU	150 150 50 0 150 50 150 150 150	×		Aug25/23			
	150 - E 100 - 50	×		Ā	Base Number		
MARK	150 6 100 50 Viscosity @ 10 20	×		Aug25/23			
, MANA	150 50 Viscosity @ 10	×					
	150 50 50 Viscosity @ 10 20 16 Base	×			Base		
	150 50 50 Viscosity @ 10 20 16 Base	×			Base		
	150 150 50 50 Viscosity @ 10 20 18 Abnormal 38 4 Abnormal	×			Base		
	150 50 50 Viscosity @ 10 20 16 Base	×		4 (0)HOX 6.0 (0)HOX 9 (0)HOX 9	Base		
	150 150 50 50 Viscosity @ 10 20 18 Abnormal 38 4 Abnormal	×		4 10.0 (0,HOX 6.0 10, 10, 10, 10, 10, 10, 10, 10, 10, 10,	Base		
	150 150 150 150 100 100 100 100	×		4 (0)HOX 6.0 (0)HOX 9 (0)HOX 9	Base		
	150 150 150 150 150 150 100 100	0°C		4 (0,HOX Bu) Jaquin 4.0 888 2.0 0.0	Base		
	150 150 150 150 100 100 100 100	×		-4 (0)HOX Buu buu Paquiny seg 2.0	Base	May16/23	
	150 150 150 150 150 150 100 100	May16/23	son Ave., Ca	4 (0)HOX Bull Bull Bull Bull Bull Bull Bull Bull	Base EZ:01 EZ:	May16/23	
ory No.	Viscosity @ 10	0°C	dd : 31 /	4 (0)H0X Bul Bul Bul Bul Bul Bul Bul Bul Bul Bul	Base EZ:01 EZ:	EZIGIJAE W ironmental - 983 -	Sugar Land Hauli est Belfort Stre
ory No.	Viscosity @ 10 Viscosity @ 10	S 0°C E2001 Madi Received Diagnos	d : 31 / ed : 05 \$	4 10.0 (0)H00 6.0 10,000 6.	Base EZ:01 EZ:	EZIGIJAE W ironmental - 983 -	Sugar Land Hauli est Belfort Stre Sugar Land, T
ory No. Iber Imber	Viscosity @ 10 Viscosity @ 10	0°C	d : 31 / ed : 05 \$	4 (0)H0X Bul Bul Bul Bul Bul Bul Bul Bul Bul Bul	Base EZ:01 EZ:	EZ091/Mey ironmental - 983 - 16011 W	Sugar Land Hauli est Belfort Stre Sugar Land, T US 7749
ory No. Inber Imber kage	Viscosity @ 10 Viscosity @ 10	A - 501 Madi Received Diagnos	d : 31 / ed : 05 s tician : Sea	4 10.0 (0,400, 6.0 10,400, 6	Base EZ:01 EZ:	EZ991-New ironmental - 983 - 16011 W Cont	est Belfort Stre Sugar Land, 1



Certificate L2367 To discuss this s \* - Denotes test Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Submitted By: TECHNICIAN ACCOUNT