

## **OIL ANALYSIS REPORT**

Sample Rating Trend





## **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		GFL0067683	GFL0067659	GFL0067758
Sample Date		Client Info		14 Aug 2023	18 May 2023	21 Feb 2023
Machine Age	hrs	Client Info		0	0	0
Oil Age	hrs	Client Info		0	0	0
Oil Changed		Client Info		N/A	N/A	N/A
Sample Status				NORMAL	MARGINAL	SEVERE
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	2.0	8.4
Glycol		WC Method	20	NEG	NEG	NEG
-						
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	18	11	36
Chromium	ppm	ASTM D5185m	>20	4	2	3
Nickel	ppm	ASTM D5185m	>4	0	0	0
Titanium	ppm	ASTM D5185m		0	0	0
Silver	ppm	ASTM D5185m	>3	<1	0	0
Aluminum	ppm	ASTM D5185m	>20	5	0	3
Lead	ppm	ASTM D5185m	>40	0	0	1
Copper	ppm	ASTM D5185m	>330	0	1	6
Tin	ppm	ASTM D5185m	>15	0	<1	2
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
			limit/base	current	bin a table	history2
ADDITIVES		method				nistoryz
Boron	ppm	ASTM D5185m	0	5	2	4
	ppm ppm					
Boron Barium		ASTM D5185m	0	5	2	4
Boron	ppm ppm	ASTM D5185m ASTM D5185m	0	5 0	2 0	4 0
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	5 0 73	2 0 57	4 0 50
Boron Barium Molybdenum	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	5 0 73 0	2 0 57 <1	4 0 50 1
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	5 0 73 0 1123	2 0 57 <1 930	4 0 50 1 755
Boron Barium Molybdenum Manganese Magnesium	ppm 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 73 0 1123 1264	2 0 57 <1 930 1079	4 0 50 1 755 980
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 73 0 1123 1264 1223	2 0 57 <1 930 1079 981	4 0 50 1 755 980 812
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 1010 1070 1150 1270 2060	5 0 73 0 1123 1264 1223 1610 4963	2 0 57 <1 930 1079 981 1239 3493	4 0 50 1 755 980 812 983 2671
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	5 0 73 0 1123 1264 1223 1610 4963 Current	2 0 57 <1 930 1079 981 1239 3493 history1	4 0 50 1 755 980 812 983 2671 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 0 1010 1070 1150 1270 2060	5 0 73 0 1123 1264 1223 1610 4963 current 10	2 0 57 <1 930 1079 981 1239 3493 history1 6	4 0 50 1 755 980 812 983 2671 history2 5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm 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	5 0 73 0 1123 1264 1223 1610 4963 <u>current</u> 10 0	2 0 57 <1 930 1079 981 1239 3493 history1 6 2	4 0 50 1 755 980 812 983 2671 history2 5 1
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	5 0 73 0 1123 1264 1223 1610 4963 <u>current</u> 10 0 0	2 0 57 <1 930 1079 981 1239 3493 history1 6 2 3	4 0 50 1 755 980 812 983 2671 history2 5 1 2
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	5 0 73 0 1123 1264 1223 1610 4963 <u>current</u> 10 0 0	2 0 57 <1 930 1079 981 1239 3493 history1 6 2 3 3 history1	4 0 50 1 755 980 812 983 2671 history2 5 1 2 2 1 2 2 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 60 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25	5 0 73 0 1123 1264 1223 1610 4963 <b>current</b> 10 0 0 0 <b>current</b> 0.2	2 0 57 <1 930 1079 981 1239 3493 history1 6 2 3 3 <u>history1</u> 0.2	4 0 50 1 755 980 812 983 2671 history2 5 1 2 2 1 2 2 history2 0.8
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 TS	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25	5 0 73 0 1123 1264 1223 1610 4963 <u>current</u> 10 0 0	2 0 57 <1 930 1079 981 1239 3493 history1 6 2 3 3 <u>history1</u> 0.2 4.8	4 0 50 1 755 980 812 983 2671 history2 5 1 2 2 1 2 2 history2 0.8 7.2
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 >3	5 0 73 0 1123 1264 1223 1610 4963 <b>current</b> 10 0 0 0 <b>current</b> 0.2	2 0 57 <1 930 1079 981 1239 3493 history1 6 2 3 3 <u>history1</u> 0.2	4 0 50 1 755 980 812 983 2671 history2 5 1 2 2 1 2 2 history2 0.8
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	5 0 73 0 1123 1264 1223 1610 4963 <u>current</u> 10 0 0 0 <u>current</u> 0.2 5.2 17.3	2 0 57 <1 930 1079 981 1239 3493 history1 6 2 3 3 <u>history1</u> 0.2 4.8	4 0 50 1 755 980 812 983 2671 history2 5 1 2 2 1 2 2 history2 0.8 7.2
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> >3 >20 >30	5 0 73 0 1123 1264 1223 1610 4963 <b>current</b> 10 0 0 0 <b>current</b> 0.2 5.2 17.3	2 0 57 <1 930 1079 981 1239 3493 history1 6 2 3 3 <u>history1</u> 0.2 4.8 17.4	4 0 50 1 755 980 812 983 2671 history2 5 1 2 2 5 1 2 2 history2 0.8 7.2 18.7
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 2260 2060 225 220 220 1imit/base >3 >20 >30 30	5 0 73 0 1123 1264 1223 1610 4963 <b>current</b> 10 0 0 <b>current</b> 0.2 5.2 17.3	2 0 57 <1 930 1079 981 1239 3493 history1 6 2 3 3 history1 0.2 4.8 17.4 history1	4 0 50 1 755 980 812 983 2671 history2 5 1 2 5 1 2 <i>history2</i> 0.8 7.2 18.7 <i>history2</i>

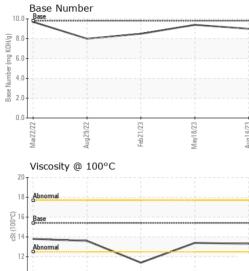


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3.27

Mar22/22

# **OIL ANALYSIS REPORT**



Aug29/22

		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
/23	1/23		scalar	*Visual	NORML	NORML	NORML	NORML
Feb21/23	May18/23 Aug14/23	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
	2	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual	20.L	NEG	NEG	NEG
		FLUID PROP			limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445		13.3	13.4	▲ 11.4
		GRAPHS						
		Ferrous Alloys						
- 1/23	3/23	60 - iron						
Feb21/23	May18/23	50 - njčkel		I I I I				
		40 30						
		B <sub>30</sub>						
		20						
		10-						
		0			**************************************			
		Mar22/22	Feb 21/23	May18/23	Aug14/23			
		Mar2 Aug2	Feb 2	/lay1	ng1			
					<			
		Non-ferrous Meta	als	~	4			
		Non-ferrous Meta	als					
		10 copper	als	-				
		10 copper	als		4			
		8 6	als		4			
		10 copper	als	6	4			
		8 6	als		4			
		8 6	als		4			
		a copper lead	als		4			
		Copper lead						
		a copper lead	als	Vav/18/23	4ug14/23			
		tin Copper lead tin Copper lead tin Copper Cop	Feb21/23					
		Viscosity @ 100°	Feb21/23			Base Number		
		Viscosity @ 100°	Feb21/23		9.01	Base		
		Viscosity @ 100°	Feb21/23		9.01	Base		
		Viscosity @ 100°	Feb21/23		9.01	Base		
		Viscosity @ 100°	Feb21/23		9.01	Base		
		Viscosity @ 100°	Feb21/23		9.0.0	Base		
		Viscosity @ 100° Abnormal Abnormal Abnormal Abnormal	Feb21/23		Aug14/23	Base		
		Viscosity @ 100°	Feb21/23		10.0 (0,H0) Bul Jack 4.0 Bul Jack 4.0 2.0	Base		
		Viscosity @ 1000 Abnormal Abnormal Abnormal	C	EZIB I Vel	10.0 (0)HOX DW1 4.0 880 92.0 0.0	Base	23	23
		Viscosity @ 1000 Abnormal Abnormal Abnormal	C	EZIB I Vel	10.0 (0)HOX DW1 4.0 880 92.0 0.0	Base	ei21/23	lay18/23
		Viscosity @ 100° 4 4 4 4 4 4 4 4 4 4 4 4 4	Feb21/23	May 18/23	10.0 (0)H00y Base Number 10.0 Base Number 2.0 C2/F1 DW F2	Base	Feb21/23	May16/23
	Laboratory	Viscosity @ 100° Abnormal CCCCCPW Viscosity @ 100° CCCCCPW CCCCCCPW CCCCPW CCCCCPW CCCCCPW CCCCCPW CCCCCPW CCCCPW CCCCCPW CCCCCPW CCCCCPW CCCCCPW CCCCCPW CCCCCPW CCCCCPW CCCCPW CCCCCPW CCCCCPW CCCCCPW CCCCCCPW CCCCCPW CCCCPW CCCCCCCPW CCCCCPW	C 501 Madii	EZIBINEW EZIBINEW Son Ave., Ca	CZ/HIDNY CZ/HIDNY 10.0 (0,HOX Bul) and 10.0 (0,HOX Bul) and (0,HOX BUL) and (0,	Base	ironmental - 82	20 - Joplin Hauli
NAR	Sample No.	Viscosity @ 100° Abnormal CCCCCC WearCheck USA - : GFL0067683	C 501 Madii Received	ECTOLINEW ECTOLINEW son Ave., Ca	ECHI Day (0)HOX Du) Jaquiny are (0)HOX DU) Are (0)HOX DU) Jaquiny are (0)HOX DU) Are (0)H	Base	ironmental - 82	20 - Joplin Hauli ) West 7th Stre
	Sample No. Lab Number	Viscosity @ 100° Abnormal CZCZEW Viscosity @ 100° CZCZEW Viscosity @ 100° CZCZEW	C 501 Madii Received Diagnos	E2781/Aey E2781/Aey son Ave., Ca d : 21 / ed : 22 /	C2H1 Day C2H1 D	GFL Env	ironmental - 82	2 <b>0 - Joplin Hauli</b> ) West 7th Stre Joplin, M
	Sample No.	Viscosity @ 100° Viscosity @ 100°	C 501 Madii Received	E2781/Aey E2781/Aey son Ave., Ca d : 21 / ed : 22 /	ECHI Day (0)HOX Du) Jaquiny are (0)HOX DU) Are (0)HOX DU) Jaquiny are (0)HOX DU) Are (0)H	GFL Env	ironmental - 82 3700	20 - Joplin Hauli ) West 7th Stre Joplin, M US 648( cct: James Jame

Contact/Location: James Jarrett - GFL820