

## **OIL ANALYSIS REPORT**

Sample Rating Trend





Machine Id 4681M Component

Fluid

Diesel Engine

PETRO CANADA DURON SHP 15W40 (--- QTS)

### 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

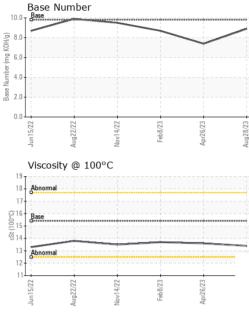
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI	MATION	method	limit/base	current	history1	history2	
Sample Number		Client Info		GFL0087303	GFL0072901	GFL0072876	
Sample Date		Client Info		28 Aug 2023	26 Apr 2023	08 Feb 2023	
Machine Age	hrs	Client Info		16031	14937	14295	
Oil Age	hrs	Client Info		625	642	731	
Oil Changed		Client Info	Changed		Changed	Changed	
Sample Status				NORMAL	NORMAL	NORMAL	
CONTAMINAT		method	limit/base	current	history1	history2	
Fuel			>3.0	<1.0	<1.0	<1.0	
Glycol		WC Method	>0.0	NEG	NEG	NEG	
-				NEG			
WEAR METAL	S	method	limit/base	current	history1	history2	
Iron	ppm	ASTM D5185m	>90	32	11	17	
Chromium	ppm	ASTM D5185m	>20	1	<1	<1	
Nickel	ppm	ASTM D5185m	>2	<1	0	0	
Titanium	ppm	ASTM D5185m	>2	0	<1	0	
Silver	ppm	ASTM D5185m	>2	0	0	0	
Aluminum	ppm	ASTM D5185m	>20	2	2	2	
Lead	ppm	ASTM D5185m	>40	<1	0	0	
Copper	ppm	ASTM D5185m	>330	3	0	1	
Tin	ppm	ASTM D5185m	>15	<1	0	0	
Vanadium	ppm	ASTM D5185m		0	0	0	
Cadmium	ppm	ASTM D5185m		0	0	0	
ADDITIVES		method	limit/base	current	history1	history2	
ADDITIVES					mistory i	matoryz	
Boron	mqq	ASTM D5185m	0		4	<1	
	ppm ppm	ASTM D5185m		5			
Boron Barium	ppm		0		4	<1	
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	5 0 61	4 0 54	<1 0 63	
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0	5 0 61 1	4	<1 0 63 <1	
Boron Barium Molybdenum	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	5 0 61 1 1010	4 0 54 <1 847	<1 0 63	
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	5 0 61 1	4 0 54 <1	<1 0 63 <1 930	
Boron Barium Molybdenum Manganese Magnesium	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 61 1 1010 1175 1083	4 0 54 <1 847 1030 930	<1 0 63 <1 930 1141 1044	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	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 61 1 1010 1175	4 0 54 <1 847 1030	<1 0 63 <1 930 1141	
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	5 0 61 1 1010 1175 1083 1348 3734	4 0 54 <1 847 1030 930 1159 2880	<1 0 63 <1 930 1141 1044 1264 2771	
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	5 0 61 1 1010 1175 1083 1348 3734 current	4 0 54 <1 847 1030 930 1159 2880 history1	<1 0 63 <1 930 1141 1044 1264 2771 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 1010 1070 1150 1270 2060	5 0 61 1 1010 1175 1083 1348 3734 current 8	4 0 54 <1 847 1030 930 1159 2880 history1 8	<1 0 63 <1 930 1141 1044 1264 2771 history2 6	
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 0 1010 1070 1150 1270 2060 <b>limit/base</b>	5 0 61 1 1010 1175 1083 1348 3734 <u>current</u> 8 10	4 0 54 <1 847 1030 930 1159 2880 history1 8 5	<1 0 63 <1 930 1141 1044 1264 2771 history2 6 4	
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	5 0 61 1 1010 1175 1083 1348 3734 current 8 10 6	4 0 54 <1 847 1030 930 1159 2880 history1 8 5 3	<1 0 63 <1 930 1141 1044 1264 2771 history2 6 4 3	
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 0 1010 1070 1150 1270 2060 <b>limit/base</b>	5 0 61 1 1010 1175 1083 1348 3734 current 8 10 6 current	4 0 54 <1 847 1030 930 1159 2880 history1 8 5	<1 0 63 <1 930 1141 1044 1264 2771 history2 6 4 3 3 history2	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	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 >20	5 0 61 1 1010 1175 1083 1348 3734 <b>current</b> 8 10 6 <b>current</b> 0	4 0 54 <1 847 1030 930 1159 2880 history1 8 5 3 3 history1 0.1	<1 0 63 <1 930 1141 1044 1264 2771 history2 6 4 3	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 1imit/base >20	5 0 61 1 1010 1175 1083 1348 3734 current 8 10 6 current	4 0 54 <1 847 1030 930 1159 2880 history1 8 5 3 3 history1	<1 0 63 <1 930 1141 1044 1264 2771 history2 6 4 3 3 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 2060 225 >25 >20 1imit/base >20	5 0 61 1 1010 1175 1083 1348 3734 <b>current</b> 8 10 6 <b>current</b> 0	4 0 54 <1 847 1030 930 1159 2880 history1 8 5 3 3 history1 0.1	<1 0 63 <1 930 1141 1044 1264 2771 history2 6 4 3 3 history2 0.2	
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> >6 >20	5 0 61 1 1010 1175 1083 1348 3734 <i>current</i> 8 10 6 <i>current</i> 0 11.4	4 0 54 <1 847 1030 930 1159 2880 history1 8 5 3 history1 0.1 6.3	<1 0 63 <1 930 1141 1044 1264 2771 history2 6 4 3 history2 0.2 7.6	
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 2060 225 20 225 20 <b>imit/base</b> >6 >20 20	5 0 61 1 1010 1175 1083 1348 3734 <b>current</b> 8 10 6 <b>current</b> 0 11.4 23.7	4 0 54 <1 847 1030 930 1159 2880 history1 8 5 3 3 history1 0.1 6.3 17.5	<1 0 63 <1 930 1141 1044 1264 2771 <b>history2</b> 6 4 3 <b>history2</b> 0.2 7.6 19.2	
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 D7844 *ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 2060 225 20 220 220 20 20 20 20 20 20 20 20 20 2	5 0 61 1 1010 1175 1083 1348 3734 <i>current</i> 8 10 6 <i>current</i> 0 11.4 23.7 <i>current</i>	4 0 54 <1 847 1030 930 1159 2880 history1 8 5 3 history1 0.1 6.3 17.5 history1	<1 0 63 <1 930 1141 1044 1264 2771 history2 6 4 3 0.2 7.6 19.2 history2	



# **OIL ANALYSIS REPORT**

VISUAL



0°C	Feb9/23	Apr/26/23	White Metal Yellow Metal Precipitate Silt Debris Sand/Dirt Appearance Odor Emulsified Water Free Water	scalar scalar scalar scalar scalar scalar scalar scalar scalar scalar	*Visual *Visual *Visual *Visual *Visual *Visual *Visual *Visual *Visual *Visual	NONE NONE NONE NONE NORML NORML >0.2	NONE NONE NONE NONE NONE NORML NORML NEG NEG	NONE NONE NONE NONE NORML NORML NEG NEG history1	NONE NONE NONE NONE NONE NORML NORML NEG NEG
			Visc @ 100°C	cSt	ASTM D445	15.4	13.4	13.6	13.7
			GRAPHS						
			Ferrous Alloys						
Mun.1872	Feb8/23	Apr26/23	Non-ferrous Meta	Nov14/22 F	Au26/23	Aug28/23	Base Number		
			18 - Abnormal			10.0	Base		
			17 <b>Base</b> <b>Base</b> <b>Abnomal</b> 12 11 12 11 12 11 12 12 11 12 12	Nov1 4/22 Feb8/23	Apr26/23	4.0 8.0 0.0 0.0 8386 Mumber (mg KOH(0) 8386 Mumber (mg KOH(0) 9.0 0.0 0.0	)	Nov14/22 Feb8/23	Api26/23
Тс * .	- Denotes tes	t methods that a	: WearCheck USA - : GFL0087303 : 05957523 : 10658736	501 Madis Received Diagnose Diagnost vice at 1-8 17025 sco	son Ave., Ca d : 21 \$ ed : 25 \$ ician : Wes 00-237-1369 pe of accred	ry, NC 27513 Sep 2023 Sep 2023 s Davis D. J. J. J. J. J. J. J. J. J. J. J. J. J.	3 GFL Envi	i <b>ronmental - 4(</b> 7 NO Conta	25 - Arbor Hills 400 Napier Rd RTHVILLE, MI US 48168 act: John Nahal al@gflenv.com T: F:

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