

## **OIL ANALYSIS REPORT**

Sample Rating Trend

NORMAL



Machine Id **777M** Component **Diesel Engine** Fluid **PETRO CANADA DURON SHP 15W40 (--- GAL)** 

### 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

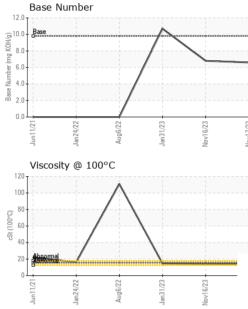
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFOR	MAT <u>ION</u>	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0101494	GFL0101536	GFL0068696
Sample Date		Client Info		17 Nov 2023	16 Nov 2023	31 Jan 2023
Machine Age	hrs	Client Info		9371	9376	8506
Oil Age	hrs	Client Info		8506	8506	0
Oil Changed		Client Info		N/A	N/A	Changed
Sample Status				NORMAL	NORMAL	ATTENTION
CONTAMINAT		method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Water		WC Method	>0.2	<1.0 NEG	NEG	NEG
Glycol		WC Method	>0.2	NEG	NEG	NEG
				-	-	
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>90	31	29	14
Chromium	ppm	ASTM D5185m	>20	1	<1	<1
Nickel	ppm	ASTM D5185m	>2	<1	<1	0
Titanium	ppm	ASTM D5185m	>2	<1	<1	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>20	4	4	<1
Lead	ppm	ASTM D5185m	>40	1	<1	0
Copper	ppm	ASTM D5185m	>330	3	2	<1
Tin	ppm	ASTM D5185m	>15	<1	0	0
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		<1	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 2	history1 0	history2 2
	ppm ppm					
Boron		ASTM D5185m	0	2	0	2
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	2 9	0	2 <1
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	2 9 68	0 0 64	2 <1 58
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	2 9 68 <1	0 0 64 <1 937 1110	2 <1 58 <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 1070 1150	2 9 68 <1 973	0 0 64 <1 937 1110 1027	2 <1 58 <1 838 984 940
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	2 9 68 <1 973 1156	0 0 64 <1 937 1110	2 <1 58 <1 838 984 940 1116
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	2 9 68 <1 973 1156 1061	0 0 64 <1 937 1110 1027	2 <1 58 <1 838 984 940
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	2 9 68 <1 973 1156 1061 1294	0 0 64 <1 937 1110 1027 1234	2 <1 58 <1 838 984 940 1116
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	2 9 68 <1 973 1156 1061 1294 2667	0 0 64 <1 937 1110 1027 1234 2784	2 <1 58 <1 838 984 940 1116 2834
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	2 9 68 <1 973 1156 1061 1294 2667 current	0 0 64 <1 937 1110 1027 1234 2784 history1	2 <1 58 <1 838 984 940 1116 2834 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 0 1010 1070 1150 1270 2060 Limit/base >25	2 9 68 <1 973 1156 1061 1294 2667 current 7	0 0 64 <1 937 1110 1027 1234 2784 history1 5	2 <1 58 <1 838 984 940 1116 2834 history2 5
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 <b>method</b> ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 Limit/base >25	2 9 68 <1 973 1156 1061 1294 2667 <u>current</u> 7 20	0 0 64 <1 937 1110 1027 1234 2784 <b>history1</b> 5 17	2 <1 58 <1 838 984 940 1116 2834 history2 5 ▲ 124
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 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25	2 9 68 <1 973 1156 1061 1294 2667 current 7 20 5	0 0 64 <1 937 1110 1027 1234 2784 history1 5 17 4	2 <1 58 <1 838 984 940 1116 2834 history2 5 5 ▲ 124 4
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 2060 225 >25	2 9 68 <1 973 1156 1061 1294 2667 <i>current</i> 7 20 5 <i>current</i>	0 0 64 <1 937 1110 1027 1234 2784 history1 5 17 4 kistory1	2 <1 58 <1 838 984 940 1116 2834 2834   history2   5   124   4
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 Limit/base >20	2 9 68 <1 973 1156 1061 1294 2667 <i>current</i> 7 20 5 <i>current</i> 0.8	0 0 64 <1 937 1110 1027 1234 2784 history1 5 17 4 history1 0.8	2 <1 58 <1 838 984 940 1116 2834 history2 5 ↓ 124 4 history2 1.4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc 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 2060 225 >20 imit/base >20 imit/base >20	2 9 68 <1 973 1156 1061 1294 2667 <i>current</i> 7 20 5 <i>current</i> 0.8 11.0	0 0 64 <1 937 1110 1027 1234 2784 history1 5 17 4 history1 0.8 10.4	2 <1 58 <1 838 984 940 11116 2834 history2 5 5 124 4 history2 1.4 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 TS ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 2060 225 220 220 220 20 20 20 20 20 20 20 20 20	2 9 68 <1 973 1156 1061 1294 2667 <i>current</i> 7 20 5 <i>current</i> 0.8 11.0 22.7	0 0 64 <1 937 1110 1027 1234 2784 history1 5 17 4 history1 0.8 10.4 22.2 history1	2 <1 58 <1 838 984 940 1116 2834 bistory2 5 124 4 124 4 1.4 7.2 19.7 bistory2
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	2 9 68 <1 973 1156 1061 1294 2667 <i>current</i> 7 20 5 <i>current</i> 0.8 11.0 22.7	0 0 64 <1 937 1110 1027 1234 2784 history1 5 17 4 <u>history1</u> 0.8 10.4 22.2	2 <1 58 <1 838 984 940 1116 2834 5   ▲ 124 4   history2   124 4   1.4 7.2 19.7



# **OIL ANALYSIS REPORT**

VISUAL



White Metal scalar 'Visual NONE NONE NONE NONE NONE Precipitate scalar 'Visual NONE NONE NONE NONE NONE Site scalar 'Visual NONE NONE NONE NONE NONE Site scalar 'Visual NONE NONE NONE NONE NONE NONE Scand/Dirt scalar 'Visual NONE NONE NONE NONE NONE NONE Scand/Dirt scalar 'Visual NONE NONE NONE NONE NONE Scand/Dirt scalar 'Visual NONE NONE NONE NONE NONE Scand/Dirt scalar 'Visual NORML NORML NORML NORML Odor scalar 'Visual NORML NORML NORML NORML NORML Odor scalar 'Visual NORML NORML NORML NORML NORML NORML NORML Odor scalar 'Visual NORML N	$\wedge$	White Metal						
Precipitate scalar 'Visual NONE NONE NONE NONE NONE Sitt scalar 'Visual NONE NONE NONE NONE Sand/Diri scalar 'Visual NONE NONE NONE NONE Appearance scalar 'Visual NORML NORML NORML NORML Odor scalar 'Visual NORML NORML NORML NORML Debris scalar 'Visual NORML NORML NORML NORML NORML NORML NORML NORML NORML NORML NORML NORML NORML NORML NORML State Scalar 'Visual NORML NORML NORML NORML NORML NORML NORML State Scalar 'Visual NORML NORML NORML NORML NORML NORML State Scalar 'Visual NORML NORML NORML NORML NORML NORML State Scalar 'Visual NORML NORML NORML Scalar 'Visual NORML NORML NORML Scalar 'Visual NORML NORML NORML NORML NORML NORML Scalar 'Visual NORML NO		winte weta	scalar	*Visual	NONE	NONE	NONE	NONE
Sitt scalar 'Visual NONE NONE NONE NONE NONE Debris scalar 'Visual NONE NONE NONE NONE Appearance scalar 'Visual NORML NORML NORML NORML Odor scalar 'Visual NORML NORML NORML NORML Odor scalar 'Visual NORML NORML NORML NORML Odor scalar 'Visual NORML NORML NORML NORML Visual NORML NORML NORML NORML Visual NORML NORML NORML NORML Visual NORML NORML NORML NORML Visual NORML NORML NORML Visual NORML NORML NORML NORML NORML NORML Visual NORML N		Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Debris scalar *Visual NONE NONE NONE NONE NONE Sand/Diri scalar *Visual NONE NONE NONE NONE Appearance scalar *Visual NORML NORML NORML NORML NORML Odor scalar *Visual NORML		Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Debris scalar *Visual NONE NONE NONE NONE NONE Sand/Diri scalar *Visual NONE NONE NONE NONE Appearance scalar *Visual NORML NORML NORML NORML NORML Odor scalar *Visual NORML			scalar	*Visual	NONE		NONE	NONE
Sand/Dirt scalar *Visual NONE NONE NONE NONE Appearance scalar *Visual NORML NORML NORML NORML NORML Odor scalar *Visual NORML NORML NORML NORML NORML Emulsified Water scalar *Visual NORM NORML NORML NORML Free Water scalar *Visual NEG NEG NEG Visc@ 100°C cSt ASTM D445 15.4 14.0 14.1 14.8 GRAPHS Ferrous Alloys Non-ferrous Metals								
Appearance scalar *Visual NORML NORM		Sand/Dirt	scalar	*Visual				
Emulsified Water scalar 'Visual >0.2 NEG NEG NEG Free Water scalar 'Visual NEG NEG NEG NEG Free Water scalar 'Visual NEG NEG NEG NEG NEG NEG NEG NEG NEG NEG NEG NEG NEG NEG NEG NEG NEG NEG NEG Scalar 'Visual NEG NEG NEG Scalar 'Visual NEG NEG NEG NEG NEG NEG NEG NEG NEG Scalar 'Visual NEG NEG NEG Scalar 'Visual NEG NEG NEG NEG NEG NEG NEG NEG NEG NEG NEG NEG NEG NEG NEG NEG NEG	1/23							
Emulsified Water scalar *Visual >0.2 NEG NEG NEG Free Water scalar *Visual NEG	Jan 31 Nov16	Odor						
Free Water scalar "Visual NEG NEG NEG FLUID PROPERTIES method limit/base current history1 history2 Visc @ 100°C cSt ASTM D445 15.4 14.0 14.1 14.8 GRAPHS Ferrous Alloys 000 000 000 000 000 000 000 0								
FLUID PROPERTIES       method       limit/base       current       history1       history2         Visc @ 100°C       cSt       ASTM D445       15.4       14.0       14.1       14.8         GRAPHS       Ferrous Alloys       Imit // base         0       0       0       0       0       14.1       14.8         Graphic for the state of the stat					20.L			
Visc @ 100°C cSt ASTM D445 15.4 14.0 14.1 14.8 GRAPHS Ferrous Alloys 0 0 0 0 0 0 0 0 0 0 0 0 0								
EXPENSION EXPENSION EXPENSION EXPENSION Ferrous Alloys Ferrous Alloys Ferrous Alloys Ferrous Alloys Company Ferrous Alloys Company Compa	<b>\</b>							
- Expression	$\mathbf{\lambda}$		cSt	ASTM D445	15.4	14.0	14.1	14.8
EXECUTION         Image: series of the seri	$\mathbf{i}$							
+Crigging								
	nah Vov	60 40 20 1[7]1[unr Non-ferrous Met	,	Nov16/23	Nov17/23			
		8 - copper lead	Aug6/22	Nov16/23	Nov17/23			
Viscosity @ 100°C Base Number		Viscosity @ 1000		Nov16/23	Nov17/23	Base Number		
		Viscosity @ 1000		Nov16/23				
		Viscosity @ 1000		E213 Tour	12.			
		Viscosity @ 100°		EZ/91/volv	12.	D - Base		
		Viscosity @ 100°		Nov16/23	12.	0 - <b>Base</b>		
		Viscosity @ 100°		Nov16/23	12.	0 - <b>Base</b>		
		Copper lead		Nov16/23	12.	0 - Base 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 -		
Base Number		Copper lead ud ud ud ud ud ud ud ud ud ud ud ud ud		Nov16/23	12.) (0) (0) (0) (0) (0) (0) (0) (0) (0) (0	0 - <b>Base</b> 0 - <b>Base</b> 0		
Base Number		Copper lead ud ud ud ud ud ud ud ud ud ud ud ud ud		Nov16/23	12. (0) HOX BU aquin Wester 2.	D - Base		
Base Number		Copper lead			12.) (0,) (0,) (0,) (0,) (0,) (0,) (0,) (0,		22	23
120     Base Number       100     100       80     100       60     60       60     60       40     20		Copper lead			12.) (0,) (0,) (0,) (0,) (0,) (0,) (0,) (0,		Aug6/22 Jan31/23	Novi 6/23
Laboratory       Sample No.       Sterling Heights,       Diagnosed       :21 Nov 2023       Sterling Heights,         Unique Number       10752780       Diagnostician       Wes Davis       Us 483	Sample N Lab Num Unique Nu	viscosity @ 100 <sup>c</sup> viscosity % viscosity @ 100 <sup>c</sup> viscosity % viscosity %	<ul> <li>501 Madis</li> <li>Received</li> <li>Diagnose</li> </ul>	son Ave., Ca I : 21 f ad : 21 f	12.) 10.)	Jan 24/22	ironmental - 415 Ster	<b>5 - Michigan E</b> 6200 Elmrid ling Heights, US 483

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

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