

## **OIL ANALYSIS REPORT**

Sample Rating Trend





Machine Id **4552M** Component **Diesel Engine** Fluid

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

## 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.

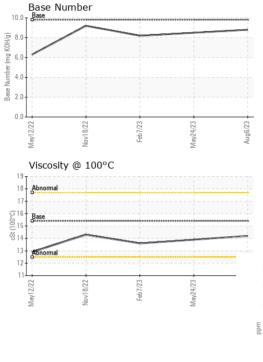
### Fluid Condition

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	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0087322	GFL0072912	GFL0072878
Sample Date		Client Info		06 Aug 2023	24 May 2023	07 Feb 2023
Machine Age	hrs	Client Info		20081	19465	18903
Oil Age	hrs	Client Info		616	562	632
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT		method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
		WC Method	>3.0			
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>90	8	10	18
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm	ASTM D5185m	>2	0	0	0
Titanium	ppm	ASTM D5185m	>2	<1	0	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>20	1	0	1
Lead	ppm	ASTM D5185m	>40	<1	<1	<1
Copper	ppm	ASTM D5185m	>330	<1	<1	<1
Tin	ppm	ASTM D5185m	>15	<1	0	0
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		<1	0	0
		ام و والدو وور	limit/base		In the second	biotory ()
		methoa			nistory i	riistory2
ADDITIVES Boron	maa	method ASTM D5185m			history1	history2 4
Boron	ppm	ASTM D5185m	0	3	5	4
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	3 0	5 0	4
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	3 0 59	5 0 61	4 0 60
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	3 0 59 <1	5 0 61 0	4 0 60 <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	3 0 59 <1 1000	5 0 61 0 879	4 0 60 <1 834
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	3 0 59 <1 1000 1155	5 0 61 0 879 1071	4 0 60 <1 834 1055
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	3 0 59 <1 1000 1155 1051	5 0 61 0 879 1071 1023	4 0 60 <1 834 1055 986
Boron Barium Molybdenum Manganese Magnesium Calcium	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	3 0 59 <1 1000 1155 1051 1287	5 0 61 0 879 1071 1023 1232	4 0 60 <1 834 1055 986 1184
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	3 0 59 <1 1000 1155 1051 1287 3733	5 0 61 0 879 1071 1023 1232 3473	4 0 60 <1 834 1055 986 1184 2783
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	3 0 59 <1 1000 1155 1051 1287 3733 current	5 0 61 0 879 1071 1023 1232 3473 history1	4 0 60 <1 834 1055 986 1184 2783 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	3 0 59 <1 1000 1155 1051 1287 3733 current 4	5 0 61 0 879 1071 1023 1232 3473 history1 4	4 0 60 <1 834 1055 986 1184 2783 history2 4
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	3 0 59 <1 1000 1155 1051 1287 3733 current 4 22	5 0 61 0 879 1071 1023 1232 3473 history1 4 4	4 0 60 <1 834 1055 986 1184 2783 history2 4 35
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	3 0 59 <1 1000 1155 1051 1287 3733 current 4	5 0 61 0 879 1071 1023 1232 3473 history1 4	4 0 60 <1 834 1055 986 1184 2783 history2 4
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	3 0 59 <1 1000 1155 1051 1287 3733 current 4 22	5 0 61 0 879 1071 1023 1232 3473 history1 4 4	4 0 60 <1 834 1055 986 1184 2783 history2 4 35
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	3 0 59 <1 1000 1155 1051 1287 3733 current 4 22 4	5 0 61 0 879 1071 1023 1232 3473 history1 4 4 43 <1	4 0 60 <1 834 1055 986 1184 2783 history2 4 35 3
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>Imit/base</b> >25 >20 <b>Imit/base</b> >20	3 0 59 <1 1000 1155 1051 1287 3733 current 4 22 4 current	5 0 61 0 879 1071 1023 1232 3473 history1 4 43 <1 kistory1	4 0 60 <1 834 1055 986 1184 2783 history2 4 35 3 3
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 <b>Imit/base</b> >25 >20 <b>Imit/base</b> >20	3 0 59 <1 1000 1155 1051 1287 3733 <b>current</b> 4 22 4 <b>current</b> 0.1	5 0 61 0 879 1071 1023 1232 3473 history1 4 4 43 <1 history1 0.2	4 0 60 <1 834 1055 986 1184 2783 history2 4 35 3 3 history2 0.3
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	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 <b>imit/base</b> >6 >20	3 0 59 <1 1000 1155 1051 1287 3733 current 4 22 4 22 4 current 0.1 5.9 18.0	5 0 61 0 879 1071 1023 1232 3473 history1 4 4 33 <1 4 43 <1 0.2 6.8 19.6	4 0 60 <1 834 1055 986 1184 2783 history2 4 35 3 history2 0.3 8.3 19.9
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 D7624	0 0 0 1010 1070 1150 2260 2060 225 220 220 imit/base >6 >20 >20 30 20 30	3 0 59 <1 1000 1155 1051 1287 3733 <i>current</i> 4 22 4 <i>current</i> 0.1 5.9 18.0	5 0 61 0 879 1071 1023 1232 3473 history1 4 4 43 <1 history1 0.2 6.8 19.6 history1	4 0 60 <1 834 1055 986 1184 2783 history2 4 35 3 history2 0.3 8.3 19.9 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 TS ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 <b>imit/base</b> >6 >20	3 0 59 <1 1000 1155 1051 1287 3733 current 4 22 4 22 4 current 0.1 5.9 18.0	5 0 61 0 879 1071 1023 1232 3473 history1 4 4 33 <1 4 43 <1 0.2 6.8 19.6	4 0 60 <1 834 1055 986 1184 2783 history2 4 35 3 history2 0.3 8.3 19.9



# **OIL ANALYSIS REPORT**



	Laboratory Sample No. Lab Number Unique Number Test Package		501 Madis Received Diagnose Diagnose	d :17/	ry, NC 27513 Aug 2023 Aug 2023 s Davis	GFL Environmental - 405 - Arbor Hil 7400 Napier F NORTHVILLE, N US 4816 Contact: John Nah jnahal@gflenv.co T			
		13 <b>Abnormal</b> 12	Feb7/23	May24,23	0.0 Pm08203	May12/22	Feb7/23	May24,/23	
		Base 15 14 13 10 10 15 14 13 10 10 10 10 10 10 10 10 10 10			6.0 Base Number (mg KOH/g)				
		19 18 - Abnormal 17 -				Base	-		
		0 27 27 27 27 27 27 27 27 27 27	Feb7/23	May24/23	Aug6/23	Base Number			
		4			4111111111				
		8							
		Non-ferrous Meta		W					
		May12/22	Feb7/23	May24/23	Aug6/23				
		€ <sup>20</sup> - 15- 10-							
Feb7/23 + .	May24,23 -	30 - chromium 25 - nickel							
		Ferrous Alloys							
		Visc @ 100°C GRAPHS	cSt	ASTM D445	15.4	14.2	13.9	13.6	
		FLUID PROPE		method	limit/base	current	history1	history2	
		Free Water	scalar	*Visual		NEG	NEG	NEG	
	2	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG	
Feb7/23	May24/23 Aug6/23	Appearance Odor	scalar scalar	*Visual *Visual	NORML NORML	NORML NORML	NORML NORML	NORML NORML	
		Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE	
		Debris	scalar	*Visual	NONE	NONE	NONE	NONE	
		Silt	scalar	*Visual	NONE	NONE	NONE	NONE	
		Yellow Metal Precipitate	scalar scalar	*Visual *Visual	NONE NONE	NONE NONE	NONE NONE	NONE NONE	
		White Metal	scalar	*Visual	NONE	NONE	NONE	NONE	

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