

## **OIL ANALYSIS REPORT**

Sample Rating Trend





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

### 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.

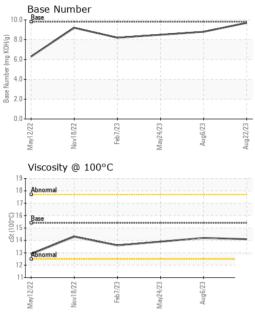
#### Fluid Condition

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		GFL0087294	GFL0087322	GFL0072912
Sample Date		Client Info		22 Aug 2023	06 Aug 2023	24 May 2023
Machine Age	hrs	Client Info		20168	20081	19465
Oil Age	hrs	Client Info		20081	616	562
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
,	0		11 11 11			
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>90	7	8	10
Chromium	ppm	ASTM D5185m		<1	<1	<1
Nickel	ppm	ASTM D5185m	>2	0	0	0
Titanium	ppm	ASTM D5185m	>2	0	<1	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>20	0	1	0
Lead	ppm	ASTM D5185m	>40	<1	<1	<1
Copper	ppm	ASTM D5185m	>330	1	<1	<1
Tin	ppm	ASTM D5185m	>15	<1	<1	0
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium	ppm	ASTM D5185m		0	<1	0
						biete w.O
ADDITIVES		method				history2
Boron	ppm	ASTM D5185m	0	current 4	history1 3	5
	ppm ppm					
Boron	ppm	ASTM D5185m	0	4	3	5
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m	0	4 0	3 0	5 0
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	4 0 59 <1	3 0 59	5 0 61
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	4 0 59 <1 995	3 0 59 <1 1000	5 0 61 0
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	4 0 59 <1 995 1136	3 0 59 <1 1000 1155	5 0 61 0 879 1071
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	4 0 59 <1 995 1136 1087	3 0 59 <1 1000 1155 1051	5 0 61 0 879 1071 1023
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	4 0 59 <1 995 1136	3 0 59 <1 1000 1155	5 0 61 0 879 1071
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	4 0 59 <1 995 1136 1087 1303	3 0 59 <1 1000 1155 1051 1287 3733	5 0 61 0 879 1071 1023 1232 3473
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	4 0 59 <1 995 1136 1087 1303 3861 current	3 0 59 <1 1000 1155 1051 1287 3733 history1	5 0 61 0 879 1071 1023 1232 3473 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	4 0 59 <1 995 1136 1087 1303 3861 current 4	3 0 59 <1 1000 1155 1051 1287 3733 history1 4	5 0 61 0 879 1071 1023 1232 3473 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 0 1010 1070 1150 1270 2060 <b>limit/base</b>	4 0 59 <1 995 1136 1087 1303 3861 current 4 17	3 0 59 <1 1000 1155 1051 1287 3733 history1 4 22	5 0 61 0 879 1071 1023 1232 3473 <b>history2</b> 4 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 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> >25 >20	4 0 59 <1 995 1136 1087 1303 3861 current 4 17 2	3 0 59 <1 1000 1155 1051 1287 3733 history1 4 22 4	5 0 61 0 879 1071 1023 1232 3473 history2 4 4 43 <1
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	4 0 59 <1 995 1136 1087 1303 3861 current 4 17 2 2 current	3 0 59 <1 1000 1155 1051 1287 3733 history1 4 22 4 kistory1	5 0 61 0 879 1071 1023 1232 3473 <b>history2</b> 4 4 33 <1 <b>history2</b>
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 limit/base >25 >20 limit/base >20	4 0 59 <1 995 1136 1087 1303 3861 <i>current</i> 4 17 2 <i>current</i> 0	3 0 59 <1 1000 1155 1051 1287 3733 history1 4 22 4 history1 0.1	5 0 61 0 879 1071 1023 1232 3473 history2 4 4 43 <1 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 <b>TS</b> 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	4 0 59 <1 995 1136 1087 1303 3861 <i>current</i> 4 17 2 <i>current</i> 0 6.3	3 0 59 <1 1000 1155 1051 1287 3733 history1 4 22 4 history1 0.1 5.9	5 0 61 0 879 1071 1023 1232 3473 history2 4 4 43 <1 history2 0.2 6.8
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 limit/base >25 >20 limit/base >20	4 0 59 <1 995 1136 1087 1303 3861 <i>current</i> 4 17 2 <i>current</i> 0	3 0 59 <1 1000 1155 1051 1287 3733 history1 4 22 4 history1 0.1	5 0 61 0 879 1071 1023 1232 3473 history2 4 4 43 <1 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	4 0 59 <1 995 1136 1087 1303 3861 <i>current</i> 4 17 2 <i>current</i> 0 6.3	3 0 59 <1 1000 1155 1051 1287 3733 history1 4 22 4 history1 0.1 5.9	5 0 61 0 879 1071 1023 1232 3473 history2 4 4 43 <1 history2 0.2 6.8
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	4 0 59 <1 995 1136 1087 1303 3861 <u>current</u> 4 17 2 <u>current</u> 0 6.3 20.7	3 0 59 <1 1000 1155 1051 1287 3733 history1 4 22 4 <u>history1</u> 0.1 5.9 18.0	5 0 61 0 879 1071 1023 1232 3473 <b>history2</b> 4 4 43 <1 <b>history2</b> 0.2 6.8 19.6
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 D7844 *ASTM D7844	0 0 0 1010 1070 1150 2260 225 220 220 1imit/base >20 20 20 30 20 30	4 0 59 <1 995 1136 1087 1303 3861 <i>current</i> 4 17 2 <i>current</i> 0 6.3 20.7 <i>current</i>	3 0 59 <1 1000 1155 1051 1287 3733 history1 4 22 4 kistory1 0.1 5.9 18.0 history1	5 0 61 0 879 1071 1023 1232 3473 history2 4 4 43 <1 history2 0.2 6.8 19.6 history2



# **OIL ANALYSIS REPORT**



		VISUAL		method	limit/base	current	history1	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
May24/23	Aug6/23 Aug22/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
May	Aug	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual		NEG	NEG	NEG
		FLUID PROPI	ERTIES	method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445	15.4	14.1	14.2	13.9
		GRAPHS						
		Ferrous Alloys						
ay24/23	23	iron		1				
May24/23	Aug6/23	25 -						
2								
		E 20						
		10-						
		5						
		0-	23					
		May12/22 Nov18/22	Feb7/23 Vlav24/23	Aug6/23	Aug22/23			
		Z Z	Z	4	AL			
		Non-ferrous Meta	ais					
		copper						
		8 - tin						
		6						
		6						
		6						
				DB/223	22/23			
		a d d d d d d d d d d d d d d d d d d d	Feb7/23 - May24/23 -	Aug 5/23	Aug22/23			
			Feb7/23 - May24/23 -	Aug6/23	Aı	Base Number		
		ud d d d d d d d d d d d d d d d d d d	Feb7/23 - May24/23 -	Yno6523	₹ 10.0	Base		
		udd 4 2 0 2727/kew Viscosity @ 100°	Feb7/23 - May24/23 -	Aughora	ā 10.0	Base		
		udd 4 2 0 2727/kew Viscosity @ 100°	Feb7/23 - May24/23 -	Aug623	ā 10.0	Base		
		udd 4 2 0 2727/kew Viscosity @ 100°	Feb7/23 - May24/23 -	Aug6/23	ā 10.0	Base		
		udd 4 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2	Feb7/23 - May24/23 -	czygany	ā 10.0	Base		
		Viscosity @ 100° Abnomal Base 17 16 17 16 17 16 17 16 17 16 16 17 16 16 16 17 16 16 16 16 16 16 16 16 16 16	Feb7/23 - May24/23 -	Aug6223	10.0 (0)HOX (0)HOX (0) A (0) (0) Jaqi	Base		
		Viscosity @ 100° 4 4 4 4 4 4 4 4 4 4 4 4 4	Feb7/23 - May24/23 -	- Understand	4 10.0 (0)HOX But but but but but but but but but but b	Base		
		udd 4 2 0 2 0 2 2 0 2 2 2 0 2 2 2 0 2 2 2 0 1000 1000 10 1000 10 10 10 10 10 10 1	C Feb7/23		4 10.0 (0, 8.0 HOX Bu) Jaquin 4.0 988 g 2.0 0.0	Ase		23
		udd 4 2 0 2 0 2 2 0 2 2 2 0 2 2 2 0 2 2 2 0 1000 1000 10 1000 10 10 10 10 10 10 1	C Feb7/23		4 10.0 (0, 8.0 HOX Bu) Jaquin 4.0 988 g 2.0 0.0	Ase		4up6/23
		udd 4 2 0 2 0 2 2 2 0 2 2 2 0 2 2 2 0 0 2 2 2 0 0 0 2 2 2 0	Feb7/23 - May24/23 -		4 10.0 (0)HOX But but but but but but but but but but b	Base	Feb7/23	Aug6/23
	Laboratory	viscosity @ 100° biomal control of the second sec	C 501 Madia	son Ave., Ca	4 10.0 (0)HOX Bu bu bu bu bu bu bu bu bu bu bu bu bu bu	Base ZZISINON	EZU(qay EZU(qay evironmental - 4	05 - Arbor Hil
NAB	Sample No.	viscosity @ 100°	C 501 Madia Received	son Ave., Ca	4 10.0 (0,400) 10.0 (0,40) 10.0 (0,400) 10.0	Base ZZISINON	EZ/LOPAL EZ/LOPAL EVIRONMENTAL - 4	<b>05 - Arbor Hil</b> 7400 Napier R
	Sample No. Lab Number	Viscosity @ 100°	C 501 Madii Received Diagnos	son Ave., Ca d : 21 f ed : 22 f	4 10.0 10.	Base ZZISINON	EZ/LOPAL EZ/LOPAL EVIRONMENTAL - 4	<b>05 - Arbor Hil</b> 7400 Napier R DRTHVILLE, N
	Sample No. Lab Number Unique Number	Viscosity @ 100° Viscosity @ 100°	C 501 Madia Received	son Ave., Ca d : 21 f ed : 22 f	4 10.0 (0,400) 10.0 (0,40) 10.0 (0,400) 10.0	Base ZZISINON	EZ/LOPA EZ/LOPA EXITORMENTAL - 4	<b>05 - Arbor Hil</b> 7400 Napier F DRTHVILLE, N US 4816
tificate L2367 discuss th	Sample No. Lab Number Unique Numbe Test Package	Viscosity @ 100° Viscosity @ 100°	C 501 Madii Received Diagnos	son Ave., Ca d : 21 : ed : 22 : tician : We	4 10.0 (9,40) 10.0 (9,40) 10.0 (9,40) 10.0 (10,40) 10.0 (	Base ZZISINON	EZ/LOPA EXITORMENTAL - 4 NC COnta	<b>05 - Arbor Hil</b> 7400 Napier F

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Submitted By: John Nahal Page 2 of 2