

## **OIL ANALYSIS REPORT**

Sample Rating Trend





Machine Id **1250M** Component

Fluid

Diesel Engine

## 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

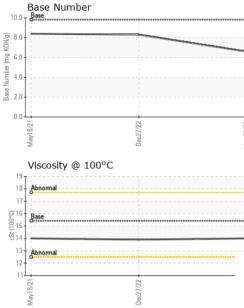
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI	MATION	method	limit/base	current	history 1	history 2					
Sample Number		Client Info		GFL0055938	GFL0067635	GFL0015814					
Sample Date		Client Info		23 Jun 2023	27 Dec 2022	18 May 2021					
Machine Age	hrs	Client Info		12076	11511	0					
Oil Age	hrs	Client Info		596	0	600					
Oil Changed		Client Info		Changed	N/A	N/A					
Sample Status				NORMAL	NORMAL	NORMAL					
CONTAMINAT	ION	method	limit/base	current	history 1	history 2					
Fuel		WC Method	>3.0	<1.0	<1.0	<1.0					
Glycol		WC Method		NEG	NEG	NEG					
WEAR METALS method limit/base current history 1 history 2											
Iron	ppm	ASTM D5185m	>120	24	6	9					
Chromium	ppm	ASTM D5185m	>20	1	<1	<1					
Nickel	ppm	ASTM D5185m	>5	<1	0	<1					
Titanium	ppm	ASTM D5185m	>2	<1	0	0					
Silver	ppm	ASTM D5185m	>2	0	0	<1					
Aluminum	ppm	ASTM D5185m	>20	8	2	3					
Lead	ppm	ASTM D5185m	>40	1	<1	<1					
Copper	ppm	ASTM D5185m	>330	9	<1	2					
Tin	ppm	ASTM D5185m	>15	2	<1	<1					
Antimony	ppm	ASTM D5185m				0					
Vanadium	ppm	ASTM D5185m		0	0	0					
Cadmium	ppm	ASTM D5185m		<1	0	0					
ADDITIVES		method	limit/base	current	history 1	history 2					
ADDITIVES Boron	ppm		limit/base 0	current <1	90	10					
	ppm ppm										
Boron		ASTM D5185m	0	<1	90	10					
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0 0 60	<1 <1	90 0 64 <1	10 0					
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	<1 <1 67	90 0 64 <1 884	10 0 60 <1 903					
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	<1 <1 67 <1 967 1134	90 0 64 <1 884 1111	10 0 60 <1 903 1075					
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	<1 <1 67 <1 967 1134 970	90 0 64 <1 884 1111 975	10 0 60 <1 903 1075 975					
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	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	<1 <1 67 <1 967 1134 970 1268	90 0 64 <1 884 1111 975 1181	10 0 60 <1 903 1075 975 1144					
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	0 0 60 0 1010 1070 1150	<1 <1 67 <1 967 1134 970	90 0 64 <1 884 1111 975	10 0 60 <1 903 1075 975					
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	<1 <1 67 <1 967 1134 970 1268	90 0 64 <1 884 1111 975 1181	10 0 60 <1 903 1075 975 1144					
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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	<1 <1 67 <1 967 1134 970 1268 3100	90 0 64 <1 884 1111 975 1181 3352	10 0 60 <1 903 1075 975 1144 2532					
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 1010 1070 1150 1270 2060	<1 <1 67 <1 967 1134 970 1268 3100 current	90 0 64 <1 884 1111 975 1181 3352 history 1 16 2	10 0 60 <1 903 1075 975 1144 2532 history 2					
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 1010 1070 1150 1270 2060	<1 <1 67 <1 967 1134 970 1268 3100 current 6	90 0 64 <1 884 1111 975 1181 3352 history 1 16	10 0 60 <1 903 1075 975 1144 2532 history 2 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	0 0 60 0 1010 1070 1150 1270 2060 Limit/base >25	<1 <1 67 <1 967 1134 970 1268 3100 current 6 9	90 0 64 <1 884 1111 975 1181 3352 history 1 16 2	10 0 60 <1 903 1075 975 1144 2532 history 2 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	0 0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25 >20	<1 <1 67 <1 967 1134 970 1268 3100 current 6 9 5	90 0 64 <1 884 1111 975 1181 3352 history 1 16 2 2	10 0 60 <1 903 1075 975 1144 2532 history 2 4 4 4 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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25	<1 <1 <1 67 <1 967 1134 970 1268 3100 current 6 9 5 current	90 0 64 <1 884 1111 975 1181 3352 history 1 16 2 2 2 history 1	10 0 60 <1 903 1075 975 1144 2532 <b>history 2</b> 4 4 2 <b>history 2</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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base	<1 <1 <1 67 <1 967 1134 970 1268 3100 current 6 9 5 current 1.4	90 0 64 <1 884 1111 975 1181 3352 history 1 16 2 2 2 history 1 0.6	10 0 60 <1 903 1075 975 1144 2532 history 2 4 4 4 2 history 2 0.7					
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> >4 >20	<1 <1 67 <1 967 1134 970 1268 3100 <i>current</i> 6 9 5 <i>current</i> 1.4 1.4 11.7	90 0 64 <1 884 1111 975 1181 3352 history 1 16 2 2 2 history 1 0.6 7.4	10 0 60 <1 903 1075 975 1144 2532 history 2 4 4 4 2 history 2 0.7 8.6					
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 255 25 20 <b>imit/base</b> >20 <b>imit/base</b> >20 30	<1 <1 <1 67 <1 967 1134 970 1268 3100  current 6 9 5  current 1.4 11.7 23.2	90 0 64 <1 884 1111 975 1181 3352 history 1 16 2 2 2 history 1 0.6 7.4 19.0	10 0 60 <1 903 1075 975 1144 2532 <b>history 2</b> 4 4 4 2 <b>bistory 2</b> 0.7 8.6 21.5					
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 ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 20 220 20 20 20 20 20 20 20 20 20 20 20	<1 <1 67 <1 967 1134 970 1268 3100 Current 6 9 5 Current 1.4 11.7 23.2 Current	90 0 64 <1 884 1111 975 1181 3352 history 1 16 2 2 <b>history 1</b> 0.6 7.4 19.0 history 1	10 0 60 <1 903 1075 975 1144 2532 history 2 4 4 4 2 <b>history 2</b> 0.7 8.6 21.5 history 2					



# **OIL ANALYSIS REPORT**

VISUAL



		VISUAL		method	limit/base	current	history 1	history 2
		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
7/22	3/23 -	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Dec27/22	Jun23/23	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual		NEG	NEG	NEG
		FLUID PROPE	ERTIES	method	limit/base	current	history 1	history 2
		Visc @ 100°C	cSt	ASTM D445	15.4	14.0	13.9	14.0
		GRAPHS						
		Ferrous Alloys						
Dec27/22 -		20 - iron						
Dec2		TICKEI		/				
		15- md		/				
		10-	/	/				
		5-	$\checkmark$					
		0 2	22		23			
		May18/2	Jec27/22		Jun23/23			
		≥ Non-ferrous Meta			7			
		<sup>10</sup> T						
		copper						
		o Terressentin		/				
		6						
		E d 4		/				
		2	/	- in the local division in the local divisio	a da favênin			
		0						
		May18/21	Dec27/22		Jun23/23			
		May	Deci		Jun			
		Viscosity @ 100°	С			Base Number		
		19 18 - Abnormal			10.0			
	18 Abnormal	1						
				0.0 Base Number (mg KOHV6)				
		216 Base 15 314			E 6.0	• • • • • • • • • • • • • • • • • • • •		
		ts 14				   		
		<sup>13</sup> - Abnormal			ase N			
		rwiiviiiigi			<sup>66</sup> 2.0			
		12				1		
		12			0.0	L		
		12	- 22/12:			v18/21	-27/22	
		0	Dec27/22		0.0	May18/21	Dec27/22 -	
	Laboratory	12 11 12 12 12 12 12 12 12 12 12 12 12 1			Jun23/23			
4	Laboratory Sample No.	12 11 12 12 12 12 12 12 12 12 12 12 12 1	501 Madi		<sub>٤٢/٤٢</sub> ۳, NC 27513		vironmental - 46	63 - Cheboyga
NAB	Laboratory Sample No. Lab Number	12 11 12 12 12 12 12 12 12 12 12 12 12 1		d : 28 .	Jun23/23		vironmental - 46 501 N	<b>53 - Cheboyga</b> N. Western Av Cheboygan, N
	Sample No. Lab Number Unique Number	: WearCheck USA - : GFL0055938 : 05885401 : 10535884	501 Madia	d : 28 . ed : 30 .	ry, NC 27513 Jun 2023		vironmental - 46 501 N	<b>53 - Cheboyga</b> N. Western Av Cheboygan, I US 4972
RECEIPTION THE CARDINAL CARDIN	Sample No. Lab Number Unique Number Test Package	: WearCheck USA - : GFL0055938 : 05885401 : 10535884	501 Madia Received Diagnos Diagnos	d : 28 . ed : 30 . tician : We	ry, NC 27513 Jun 2023 Jun 2023 s Davis		vironmental - 46 501 N Con	<b>53 - Cheboyg</b> a N. Western Av



Report Id: GFL463 [WUSCAR] 05885401 (Generated: 06/30/2023 13:52:19) Rev: 1

Submitted By: GFL463 and GFL641 - DYLAN TOLAN