

## **OIL ANALYSIS REPORT**

Sample Rating Trend





Component Diesel Engine Fluid

### 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.

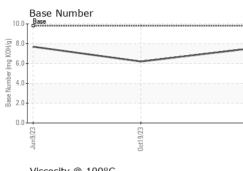
SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0103594	GFL0097838	GFL0085326
Sample Date		Client Info		08 Jan 2024	19 Oct 2023	09 Jun 2023
Machine Age	hrs	Client Info		17932	17932	17932
Oil Age	hrs	Client Info		495	600	164
Oil Changed		Client Info		N/A	N/A	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
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method	20.2	NEG	NEG	NEG
WEAR METAL	c		limit/base	-		history2
		method		current	history1	
Iron	ppm		>120	6	6	2
Chromium	ppm	ASTM D5185m		<1	<1	0
Nickel	ppm	ASTM D5185m	>5	<1	0	0
Titanium	ppm	ASTM D5185m		<1	0	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m		2	1	0
Lead	ppm	ASTM D5185m	>40	<1	<1	<1
Copper	ppm	ASTM D5185m		<1	<1	0
Tin	ppm		>15	<1	<1	<1
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method				history2
			mmbddoc	Current	matory	Thistoryz
Boron	ppm	ASTM D5185m	0	2	1	3
Boron Barium	ppm ppm					
		ASTM D5185m	0	2	1	3
Barium	ppm	ASTM D5185m ASTM D5185m	0	2 0	1 0	3 2
Barium Molybdenum Manganese Magnesium	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	2 0 54 <1 869	1 0 57 <1 950	3 2 60 0 940
Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	2 0 54 <1	1 0 57 <1	3 2 60 0
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 0 54 <1 869	1 0 57 <1 950 1043 975	3 2 60 0 940 1057 1028
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 0 54 <1 869 950	1 0 57 <1 950 1043	3 2 60 0 940 1057 1028 1221
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	2 0 54 <1 869 950 976	1 0 57 <1 950 1043 975	3 2 60 0 940 1057 1028
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 0 54 <1 869 950 976 1129	1 0 57 <1 950 1043 975 1241	3 2 60 0 940 1057 1028 1221
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 0 54 <1 869 950 976 1129 3105	1 0 57 <1 950 1043 975 1241 2836	3 2 60 0 940 1057 1028 1221 3410
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 0 54 <1 869 950 976 1129 3105 current	1 0 57 <1 950 1043 975 1241 2836 history1	3 2 60 0 940 1057 1028 1221 3410 history2
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	2 0 54 <1 869 950 976 1129 3105 current 3	1 0 57 <1 950 1043 975 1241 2836 history1 4	3 2 60 0 940 1057 1028 1221 3410 history2 3
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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b>	2 0 54 <1 869 950 976 1129 3105 current 3 <1	1 0 57 <1 950 1043 975 1241 2836 history1 4 3	3 2 60 0 940 1057 1028 1221 3410 history2 3 0
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>imit/base</b> >25 >20	2 0 54 <1 869 950 976 1129 3105 current 3 <1 2	1 0 57 <1 950 1043 975 1241 2836 history1 4 3 0	3 2 60 0 940 1057 1028 1221 3410 history2 3 0 <1
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 >20 20	2 0 54 <1 869 950 976 1129 3105 current 3 <1 2 current	1 0 57 <1 950 1043 975 1241 2836 history1 4 3 0 bistory1	3 2 60 0 940 1057 1028 1221 3410 history2 3 0 <1 history2
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>	2 0 54 <1 869 950 976 1129 3105 <i>current</i> 3 <1 2 <i>current</i> 0.3	1 0 57 <1 950 1043 975 1241 2836 history1 4 3 0 history1 0.3	3 2 60 0 940 1057 1028 1221 3410 history2 3 0 <1 history2 0.1
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 220 220 1000 225 220 20 20 20 20 20 20 20 20 20 20 20	2 0 54 <1 869 950 976 1129 3105 <i>current</i> 3 <1 2 <i>current</i> 0.3 8.1	1 0 57 <1 950 1043 975 1241 2836 history1 4 3 0 history1 0.3 8.7	3 2 60 0 940 1057 1028 1221 3410 history2 3 0 <1 history2 0.1 5.5
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAD	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 20 220 220 220 20 20 20 20 20 20 20 20	2 0 54 <1 869 950 976 1129 3105 current 3 <1 2 current 0.3 8.1 19.1	1 0 57 <1 950 1043 975 1241 2836 history1 4 3 0 0 history1 0.3 8.7 19.8 history1	3 2 60 0 940 1057 1028 1221 3410 history2 3 0 <1 history2 0.1 5.5 18.7 history2
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 D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 20 <b>imit/base</b> >4 >20	2 0 54 <1 869 950 976 1129 3105 <u>current</u> 3 < <u>1</u> 2 <u>current</u> 0.3 8.1 19.1	1 0 57 <1 950 1043 975 1241 2836 history1 4 3 0 history1 0.3 8.7 19.8	3 2 60 0 940 1057 1028 1221 3410 <b>history2</b> 3 0 <1 <b>history2</b> 0.1 5.5 18.7

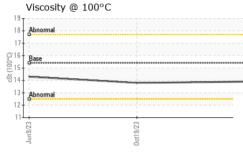
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# **OIL ANALYSIS REPORT**

VISUAL





	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
lan8/24	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
uer	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		method	limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445		13.9	13.8	14.3
	GRAPHS						
	Ferrous Alloys						
	10iron ]						
	8 - Chromium						
	- Hoku						
	6	-					
	ā 4						
	2						
	0						
	Jun9/23	0ct19/23		Jan 8/24			
	Jur	0ct1		Jar			
	Non-ferrous Meta	als					
	10 copper 1						
	8 - lead						
	Line Line						
	6						
	d						
	4						
	4						
	4 - 2 -						
	4						
	4	19/23		n8/24			
	2 0 EZGunp	0ct19/23 -		Taugates			
	Viscosity @ 100°			Jan8/24	Base Number		
	2 0 E22 0 Viscosity @ 100°			Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Handback Han			
	4 0 EZZ 9 19 10 2 0 EZZ 9 19 100°			10.	Base		
	<sup>4</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup>			10.	Base		
	<sup>4</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup>			10.	0 - Base		
	<sup>4</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup>			10.	0 - Base		
	4 2 0 EZZ Bin Viscosity @ 100° 19 Abnomal 17 10 Base 10 10 10 10 10 10 10 10 10 10			10.	0 - Base		
	Viscosity @ 100°			10. (б) НОХ Бш, ва,	0 - Base		
	4 2 0 EZZ Bin Viscosity @ 100° 19 Abnomal 17 10 Base 10 10 10 10 10 10 10 10 10 10			10. (0)HOX 00. Jaquiny aquiny 888 2.	0 - Base		
	Viscosity @ 100°			10.0 (b)HO XO MU (b)HO XO MU (b)HO XO MU (b)HO XO MU (b)HO XO MU (c)HO XO MU (	0 - Base	0et19/23	