

# **OIL ANALYSIS REPORT**





#### Component Diesel Engine

Fluid

PETRO CANADA DURON SHP 10W30 (--- 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

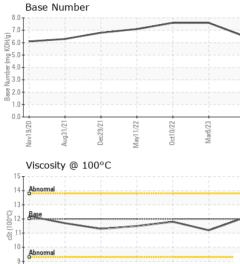
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		PCA0102191	PCA0092510	PCA0081271
Sample Date		Client Info		11 Aug 2023	08 Mar 2023	10 Oct 2022
Machine Age	mls	Client Info		202048	176965	152354
Oil Age	mls	Client Info		25083	152354	152354
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT		method	limit/base	current	history1	history2
Fuel			>5		<1.0	<1.0
			>0	<1.0 NEG	<1.0 NEG	<1.0 NEG
Glycol		WC Method		NEG		
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	15	13	19
Chromium	ppm	ASTM D5185m	>20	<1	<1	1
Nickel	ppm	ASTM D5185m	>4	0	<1	0
Titanium	ppm	ASTM D5185m		0	0	<1
Silver	ppm	ASTM D5185m	>3	0	0	<1
Aluminum	ppm	ASTM D5185m	>20	2	4	4
Lead	ppm	ASTM D5185m	>40	0	<1	<1
Copper	ppm	ASTM D5185m	>330	0	1	2
Tin	ppm	ASTM D5185m	>15	0	<1	<1
Vanadium	ppm	ASTM D5185m		0	0	<1
Cadmium	ppm	ASTM D5185m		0	0	0
			12			
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	ASTM D5185m	limit/base	current 0	history1 4	history2 0
	ppm ppm					
Boron		ASTM D5185m	2	0	4	0
Boron Barium	ppm	ASTM D5185m ASTM D5185m ASTM D5185m	2 0	0 0	4	0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50	0 0 66	4 0 62	0 0 57
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0	0 0 66 0	4 0 62 <1	0 0 57 1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0 950	0 0 66 0 1014	4 0 62 <1 867	0 0 57 1 914
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0 950 1050	0 0 66 0 1014 1280	4 0 62 <1 867 1123	0 0 57 1 914 1113
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	2 0 50 0 950 1050 995	0 0 66 0 1014 1280 1109	4 0 62 <1 867 1123 952	0 0 57 1 914 1113 915
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	2 0 50 950 1050 995 1180	0 0 66 0 1014 1280 1109 1463	4 0 62 <1 867 1123 952 1166	0 0 57 1 914 1113 915 1238
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	2 0 50 950 1050 995 1180 2600	0 0 66 0 1014 1280 1109 1463 4024	4 0 62 <1 867 1123 952 1166 2778	0 0 57 1 914 1113 915 1238 2881
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	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	2 0 50 950 1050 995 1180 2600	0 0 66 0 1014 1280 1109 1463 4024 current	4 0 62 <1 867 1123 952 1166 2778 history1	0 0 57 1 914 1113 915 1238 2881 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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	2 0 50 950 1050 995 1180 2600	0 0 66 0 1014 1280 1109 1463 4024 <i>current</i> 7	4 0 62 <1 867 1123 952 1166 2778 history1 6	0 0 57 1 914 1113 915 1238 2881 history2 8
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	2 0 50 950 1050 995 1180 2600 <b>limit/base</b> >25	0 0 66 0 1014 1280 1109 1463 4024 <u>current</u> 7 0	4 0 62 <1 867 1123 952 1166 2778 history1 6 0	0 0 57 1 914 1113 915 1238 2881 history2 8 <
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m	2 0 50 0 950 1050 995 1180 2600 <b>limit/base</b> >25 >20 <b>limit/base</b>	0 0 66 0 1014 1280 1109 1463 4024 current 7 0 0 0 0	4 0 62 <1 867 1123 952 1166 2778 history1 6 0 4 history1	0 0 57 1 914 1113 915 1238 2881 history2 8 < 1 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 <b>TS</b> ppm ppm	ASTM D5185m ASTM D5185m	2 0 50 0 950 1050 995 1180 2600 <b>Imit/base</b> >25 >20 <b>Imit/base</b> >3	0 0 66 0 1014 1280 1109 1463 4024 <i>current</i> 7 0 0 0 <i>current</i>	4 0 62 <1 867 1123 952 1166 2778 history1 6 0 4 history1 0.5	0 0 57 1 914 1113 915 1238 2881 history2 8 < 1 3 history2 0.6
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 TS ppm ppm ppm	ASTM D5185m ASTM D5185m	2 0 50 950 1050 995 1180 2600 <i>imit/base</i> >25 >20 <i>imit/base</i>	0 0 66 0 1014 1280 1109 1463 4024 <i>current</i> 7 0 0 0 <i>current</i> 0.6 9.1	4 0 62 <1 867 1123 952 1166 2778 history1 6 0 4 history1 0.5 8.8	0 0 57 1 914 1113 915 1238 2881 history2 8 < <1 3 history2 0.6 10.0
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	2 0 50 0 950 1050 995 1180 2600 <b>imit/base</b> >25 20 <b>imit/base</b> >3 >20 >30	0 0 66 0 1014 1280 1109 1463 4024 <b>current</b> 7 0 0 0 0 <b>current</b> 0.6 9.1 20.4	4 0 62 <1 867 1123 952 1166 2778 history1 6 0 4 history1 0.5 8.8 20.0	0 0 57 1 914 1113 915 1238 2881 history2 8 <1 3 <b>history2</b> 0.6 10.0 22.8
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 D7844 *ASTM D7844	2 0 50 950 1050 995 1180 2600 <i>imit/base</i> >25 >20 <i>imit/base</i>	0 0 66 0 1014 1280 1109 1463 4024 <i>current</i> 7 0 0 0 <i>current</i> 0.6 9.1	4 0 62 <1 867 1123 952 1166 2778 history1 6 0 4 history1 0.5 8.8	0 0 57 1 914 1113 915 1238 2881 history2 8 < <1 3 history2 0.6 10.0
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 D7624 *ASTM D7414	2 0 50 0 950 1050 995 1180 2600 <b>imit/base</b> >25 20 <b>imit/base</b> >3 >20 >30	0 0 66 0 1014 1280 1109 1463 4024 <b>current</b> 7 0 0 0 0 <b>current</b> 0.6 9.1 20.4	4 0 62 <1 867 1123 952 1166 2778 history1 6 0 4 history1 0.5 8.8 20.0	0 0 57 1 914 1113 915 1238 2881 <b>history2</b> 8 <1 3 <b>history2</b> 0.6 10.0 22.8
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAC	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844	2 0 50 950 1050 995 1180 2600 <i>imit/base</i> >25 >20 <i>imit/base</i> >3 >20 >30	0 0 66 0 1014 1280 1109 1463 4024 <i>current</i> 7 0 0 0 <i>current</i> 0.6 9.1 20.4 <i>current</i>	4 0 62 <1 867 1123 952 1166 2778 history1 6 0 4 history1 0.5 8.8 20.0 history1	0 0 57 1 914 1113 915 1238 2881 history2 8 <1 3 history2 0.6 10.0 22.8 history2



# **OIL ANALYSIS REPORT**

VISUAL



Dec29/21-

Aug31/21

Nov19/20

Certificate L2367	Laboratory Sample No. Lab Number Unique Number Test Package	: PCA0102191 : 05925301 : 10605248	Receive Diagnos	01 Madison Ave., Cary, NC 27513 Received : 15 Aug 2023 Diagnosed : 16 Aug 2023 Diagnostician : Wes Davis Ce at 1-800-237-1369. 2025 scope of accreditation.			NW WHITE & CO - COLUMBIA DIVISION 100 INDEPENDENCE BLVD COLUMBIA, SC US 29210 Contact: GEORGE EDWARDS gedwards@nwwhite.com T:			
		Aug31/21 +	May11/22	0ct10/22 Mar6/23	eg 1.1 0.1		Uec29/21	Uct10/22	Aug11/23 +	
		14 Abnomal 13 13 13 12 12 12 11 10		~~~	7.( (0)(10)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)	]-			\ 	
		0_02/61/00/ UZ/65/00/ Viscosity @ 100°	C May11/22	0ct10/22 Mar8/23	Aug11/23	Base Number				
		Non-ferrous Met		Oct <sup>1</sup>	Aug					
		Nov19/20 Aug31/21 Dec29/21	May11/22	0ct10/22 Mat6/23	Aug 11/23					
May11/22 -	00010/23 -	60 50 40 30								
		Visc @ 100°C GRAPHS Ferrous Alloys	cSt	ASTM D445	12.00	12.1	11.2	11.8		
		FLUID PROP		method	limit/base	current	history1	history	y2	
2		Emulsified Water Free Water	scalar scalar	*Visual *Visual	>0.2	NEG NEG	NEG NEG	NEG NEG		
May11/22	Mar8/23 Aug11/23	Odor	scalar	*Visual	NORML	NORML	NORML	NORML		
/22	23	_ Sand/Dirt Appearance	scalar scalar	*Visual *Visual	NONE NORML	NONE NORML	NONE NORML	NONE NORML		
		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		
		White Metal	scalar	*Visual	NONE	NONE	NONE	NONE		