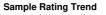


# **OIL ANALYSIS REPORT**





Machine Id 2126925

Component Diesel Engine

PETRO CANADA DURON SHP 10W30 (--- QTS)

# DIAGNOSIS

### Recommendation

Oil and filter change at the time of sampling has been noted. No corrective action is recommended at this time. Resample at the next service interval to monitor.

# 🔺 Wear

Fluid

Exhaust valve wear is indicated.

# Contamination

There is no indication of any contamination in the oil.

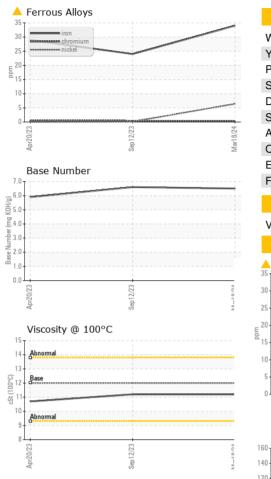
#### Fluid Condition

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

(15)		Api	2023	Sep2023 Mar20	Mar2024			
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2		
Sample Number		Client Info		PCA0111504	PCA0103986	PCA0097128		
Sample Date		Client Info		18 Mar 2024	12 Sep 2023	20 Apr 2023		
Machine Age	mls	Client Info		133225	97325	60571		
Oil Age	mls	Client Info		40000	38325	21512		
Oil Changed		Client Info		Changed	Changed	Changed		
Sample Status				ABNORMAL	NORMAL	NORMAL		
CONTAMINATI	ON	method	limit/base	current	history1	history2		
Fuel		WC Method	>5	<1.0	<1.0	<1.0		
Water		WC Method	>0.2	NEG	NEG	NEG		
Glycol		WC Method		NEG	NEG	NEG		
WEAR METALS	S	method	limit/base	current	history1	history2		
Iron	ppm	ASTM D5185m	>100	34	24	29		
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1		
Nickel	ppm	ASTM D5185m	>4	<u>6</u>	<1	0		
Titanium	ppm	ASTM D5185m		0	<1	0		
Silver	ppm	ASTM D5185m	>3	0	<1	0		
Aluminum	ppm	ASTM D5185m	>20	4	6	8		
Lead	ppm	ASTM D5185m	>40	2	2	2		
Copper	ppm	ASTM D5185m	>330	51	75	146		
Tin	ppm	ASTM D5185m	>15	<1	2	3		
Vanadium	ppm	ASTM D5185m		0	<1	0		
Cadmium	ppm	ASTM D5185m		0	0	0		
ADDITIVES		method	limit/base	current	history1	history2		
Boron	ppm	ASTM D5185m	2	0	0	2		
	ppm ppm	ASTM D5185m ASTM D5185m	2 0	0 0	0	2 0		
Barium								
Barium Molybdenum	ppm	ASTM D5185m	0	0	0	0		
Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m	0 50	0 63	0 62	0 65		
Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 50 0	0 63 <1	0 62 1	0 65 2		
Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 50 0 950	0 63 <1 1035	0 62 1 1045	0 65 2 832		
Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 50 0 950 1050	0 63 <1 1035 1206	0 62 1 1045 1266	0 65 2 832 1102		
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 50 0 950 1050 995	0 63 <1 1035 1206 1037	0 62 1 1045 1266 948	0 65 2 832 1102 815		
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 50 0 950 1050 995 1180	0 63 <1 1035 1206 1037 1309	0 62 1 1045 1266 948 1313	0 65 2 832 1102 815 1077		
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 50 0 950 1050 995 1180 2600	0 63 <1 1035 1206 1037 1309 3513	0 62 1 1045 1266 948 1313 3199	0 65 2 832 1102 815 1077 2295		
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 50 0 950 1050 995 1180 2600	0 63 <1 1035 1206 1037 1309 3513 current	0 62 1 1045 1266 948 1313 3199 history1	0 65 2 832 1102 815 1077 2295 history2		
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	0 50 0 950 1050 995 1180 2600	0 63 <1 1035 1206 1037 1309 3513 current 8	0 62 1 1045 1266 948 1313 3199 history1 8	0 65 2 832 1102 815 1077 2295 history2 13		
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 <b>method</b> ASTM D5185m	0 50 0 950 1050 995 1180 2600 limit/base >25	0 63 <1 1035 1206 1037 1309 3513 current 8 1	0 62 1 1045 1266 948 1313 3199 history1 8 3	0 65 2 832 1102 815 1077 2295 history2 13 <1		
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	0 50 0 950 1050 995 1180 2600 limit/base >25 >20	0 63 <1 1035 1206 1037 1309 3513 current 8 1 1	0 62 1 1045 1266 948 1313 3199 history1 8 3 3 15	0 65 2 832 1102 815 1077 2295 history2 13 <1 29		
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 50 0 950 1050 995 1180 2600 limit/base >25 >20	0 63 <1 1035 1206 1037 1309 3513 current 8 1 12 current	0 62 1 1045 1266 948 1313 3199 history1 8 3 15 history1	0 65 2 832 1102 815 1077 2295 history2 13 <1 29 history2		
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm	ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7624	0 50 0 950 1050 995 1180 2600 limit/base >25 >20 limit/base >3	0 63 <1 1035 1206 1037 1309 3513 current 8 1 12 12 current 0.5	0 62 1 1045 1266 948 1313 3199 history1 8 3 15 history1 0.4	0 65 2 832 1102 815 1077 2295 history2 13 <1 29 history2 0.4		
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 50 0 950 1050 995 1180 2600 limit/base >25 >20 limit/base >3 >20	0 63 <1 1035 1206 1037 1309 3513 current 8 1 12 current 0.5 9.6 20.3	0 62 1 1045 1266 948 1313 3199 history1 8 3 15 history1 0.4 9.5	0 65 2 832 1102 815 1077 2295 history2 13 <1 29 history2 0.4 9.9		
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 50 950 1050 995 1180 2600 limit/base >25 >20 limit/base >3 >20 >30	0 63 <1 1035 1206 1037 1309 3513 current 8 1 12 current 0.5 9.6 20.3	0 62 1 1045 1266 948 1313 3199 history1 8 3 15 history1 0.4 9.5 21.1	0 65 2 832 1102 815 1077 2295 history2 13 <1 29 history2 0.4 9.9 21.6		
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7624 *ASTM D7415	0 50 0 950 1050 995 1180 2600 limit/base >25 20 20 >30 >30 limit/base	0 63 <1 1035 1206 1037 1309 3513 current 8 1 12 current 0.5 9.6 20.3 current	0 62 1 1045 1266 948 1313 3199 history1 8 3 15 history1 0.4 9.5 21.1 history1	0 65 2 832 1102 815 1077 2295 history2 13 <1 29 history2 0.4 9.9 21.6 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
- And Statement	Debris	scalar	*Visual	NONE	NONE	NONE	NONE
NAMES AND ADDRESS OF TAXABLE PARTY.	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
8,24	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Mar18/24	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
	Free Water	scalar	*Visual		NEG	NEG	NEG
	FLUID PROF	PERTIES	method	limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445		11.2	11.2	10.7
	GRAPHS						
	Ferrous Alloys						
	35						
	30 - newspace chromium						
M	25-						
	E 20 15						
	<sup>C</sup> 15						
	10-						
	5		AND DESCRIPTION OF A DESCRIPTION OF	and the state of the			
			And shares the state of the State	_			
	Apr20/23	Sep 12/23		Mar18/24			
	Apri	Sep		Mar			
4 <sup>2</sup>	Non-ferrous Me	tals					
C 8 1-	160						
1 U U	140 - 120 -						
	100						
	<u>a</u> 80						
	60						
	40 -						
	20 -						
	0						
	r20/23	Sep12/23		18/24			
	Apr2	Sep1		Marl			
	Viscosity @ 100	°C			Base Numbe	er	
	15 14 Abnormal			7.0			
	14 - Abnormal	1		6.0			
	13-			B/HOX	-		
	Co 12 Base 11 tg 11			(B) 5.0 HOX Bu 4.0 age 3.0 88 2.0			
	tg 11-			a 3.0			
				N 2.0			
	10-			1.0	1		
	10 Abnormal 9						
	Abnormal			0.0		3	
	9+ 8	2/23		0.0	0/23	2/2	
	Abnormal	Sep12/23		0.0 + +	Apr20/23	Sep 12/2	
	Abnormal 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			Mar18/24	Apr20/23	Sep12/23	
Laboratory	: WearCheck USA - 5	501 Madisc	-	, NC 27513	Apr20/23	PERDUE FAR	
Sample No.	: WearCheck USA - 5 : PCA0111504	501 Madiso <b>Rece</b> i	ived : 25	, NC 27513 Mar 2024	Apr20/23	<b>PERDUE FAR</b> 210 GRIFFINS	QUARTER F
Sample No. Lab Number	: WearCheck USA - 5 : PCA0111504 : 06127590	501 Madiso Recei Teste	ived : 25 ed : 26	, NC 27513 Mar 2024 Mar 2024		<b>PERDUE FAR</b> 210 GRIFFINS	QUARTER F EWISTON, N
Sample No. Lab Number Unique Number	: WearCheck USA - 5 : PCA0111504 : 06127590 : 10941741	501 Madiso Recei Teste	ived : 25 ed : 26	, NC 27513 Mar 2024		<b>PERDUE FAR</b> 210 GRIFFINS L	QUARTER F EWISTON, N US 2784
Sample No. Lab Number Unique Number Test Package	: WearCheck USA - 5 : PCA0111504 : 06127590 : 10941741	501 Madisc Rece Teste Diagr	ived : 25 ed : 26 nosed : 27	, NC 27513 Mar 2024 Mar 2024 Mar 2024 - Sea		<b>PERDUE FAR</b> 210 GRIFFINS	QUARTER F EWISTON, N US 2784 ON WALLAC