

OIL ANALYSIS REPORT

Area **Plymouth & Brockton** Machine Id **11411** Component

Diesel Engine

PETRO CANADA DURON SHP 15W40 (39 QTS)

DIAGNOSIS

Recommendation

We advise that you check the fuel injection system. The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

Wear

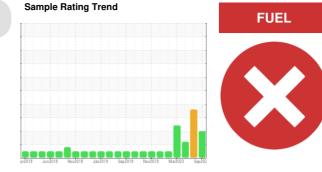
All component wear rates are normal.

Contamination

There is a high amount of fuel present in the oil. Tests confirm the presence of fuel in the oil.

Fluid Condition

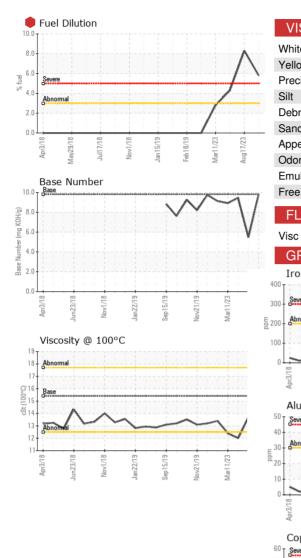
The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable due to the presence of contaminants.



Sample Status Image: Stevene Sevene Sevene Sevene Abnormation Sevene Sevene Sevene Abnormation Sevene Sevene Sevene Abnormation Sevene Se	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Date Client Info 27 Sep 2023 17 Aug 2023 24 May 2023 Machine Age mis Client Info 603723 598649 587760 Oil Age mis Client Info 60300 24000 12000 Sample Status Client Info Changed Net Changed	Sample Number		Client Info		PCA0098695	PCA0013383	PCA0090507
Machine Age mls Client Info 603723 598649 587760 Oil Age mis Client Info 6000 24000 12000 Oil Age mis Client Info Changed Not Changed Sample Status method Imit/base current Historyt ABNORMAL CONTAMINATION method Imit/base current historyt historyt Glycol WC Method Imit/base current historyt historyt Tron ppm ASTM D5185m >200 31 141 62 Chromium ppm ASTM D5185m >20 0 0 <1 Nickel ppm ASTM D5185m >2 0 0 <1 Silver ppm ASTM D5185m >30 1 10 2 Copper ppm ASTM D5185m >30 1 3 3 Copper ppm ASTM D5185m >4 1 4 2	•		Client Info		27 Sep 2023	17 Aug 2023	24 May 2023
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Lead ppm ASTM D5185m >30 2 A 34 9 Copper ppm ASTM D5185m >30 <1	Silver	ppm	ASTM D5185m	>2	0	0	0
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Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 7 1 3 Boron ppm ASTM D5185m 0 7 1 3 Barium ppm ASTM D5185m 0 7 1 3 Barium ppm ASTM D5185m 0 0 0 0 0 Maganese ppm ASTM D5185m 0 4 58 57 Manganese ppm ASTM D5185m 0 4 1 4 Magnesium ppm ASTM D5185m 1010 8666 925 809 Calcium ppm ASTM D5185m 1070 1030 1087 1008 Phosphorus ppm ASTM D5185m 1070 1177 1202 1023 Sulfur ppm ASTM D5185m 2060 2913 3245 2758 CONTAMINANTS method limit/base	Copper	ppm	ASTM D5185m	>30	<1	5	4
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Boron ppm ASTM D5185m 0 7 1 3 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 54 58 57 Manganese ppm ASTM D5185m 0 <1 1 <1 Magnesium ppm ASTM D5185m 1010 866 925 809 Calcium ppm ASTM D5185m 1010 866 925 809 Calcium ppm ASTM D5185m 1070 1030 1087 1008 Phosphorus ppm ASTM D5185m 1270 1177 1202 1023 Sulfur ppm ASTM D5185m 2060 2913 3245 2758 CONTAMINANTS method limit/base current history1 history2 Solium ppm ASTM D5185m >30 4 17 12 Potassium ppm ASTM D5185m <td< th=""><th>Cadmium</th><th>ppm</th><th>ASTM D5185m</th><th></th><th>0</th><th>0</th><th>0</th></td<>	Cadmium	ppm	ASTM D5185m		0	0	0
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Molybdenum ppm ASTM D5185m 60 54 58 57 Manganese ppm ASTM D5185m 0 <1 1 <1 Magnesium ppm ASTM D5185m 1010 866 925 809 Calcium ppm ASTM D5185m 1070 1030 1087 1008 Phosphorus ppm ASTM D5185m 1070 1030 1087 859 Zinc ppm ASTM D5185m 1270 1177 1202 1023 Sulfur ppm ASTM D5185m 2060 2913 3245 2758 CONTAMINANTS method limit/base current history1 history2 Solium ppm ASTM D5185m >30 4 17 12 Potassium ppm ASTM D5185m >20 0 1 0 Fuel % ASTM D5185m >20 0 1 0 Soot % % *ASTM D7844	Boron	ppm	ASTM D5185m	0	7	1	3
Maganese ppm ASTM D5185m 0 <1 1 <1 Magnesium ppm ASTM D5185m 1010 866 925 809 Calcium ppm ASTM D5185m 1070 1030 1087 1008 Phosphorus ppm ASTM D5185m 1150 953 947 859 Zinc ppm ASTM D5185m 1270 1177 1202 1023 Sulfur ppm ASTM D5185m 2060 2913 3245 2758 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >30 4 17 12 Sodium ppm ASTM D5185m >20 0 1 0 Fuel % ASTM D5185m >20 0 1 0 Fuel % ASTM D5185m >20 0 1 0 Soot % % *ASTM D7844 >3	Barium	ppm	ASTM D5185m	0	0		
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Calcium ppm ASTM D5185m 1070 1030 1087 1008 Phosphorus ppm ASTM D5185m 1150 953 947 859 Zinc ppm ASTM D5185m 1270 1177 1202 1023 Sulfur ppm ASTM D5185m 2060 2913 3245 2758 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >30 4 17 12 Sodium ppm ASTM D5185m >30 4 17 12 Potassium ppm ASTM D5185m >20 0 1 0 Fuel % ASTM D5324 >3.0 5.8 8.3 4.3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.8 5.5 2.5 Sulfation Abs/.1mm *ASTM D7415	Manganese	ppm	ASTM D5185m	0	<1	1	<1
Phosphorus ppm ASTM D5185m 1150 953 947 859 Zinc ppm ASTM D5185m 1270 11177 1202 1023 Sulfur ppm ASTM D5185m 2060 2913 3245 2758 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >30 4 17 12 Sodium ppm ASTM D5185m >30 4 17 12 Potassium ppm ASTM D5185m >20 0 1 0 Fuel % ASTM D5324 >3.0 5.8 8.3 4.3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.8 5.5 2.5 Nitration Abs/mm *ASTM D7624 >20 9.6 20.5 12.6 Sulfation Abs/.1mm *ASTM D7415	Magnesium	ppm	ASTM D5185m	1010	866		
Zinc ppm ASTM D5185m 1270 1177 1202 1023 Sulfur ppm ASTM D5185m 2060 2913 3245 2758 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >30 4 17 12 Sodium ppm ASTM D5185m >30 4 17 12 Potassium ppm ASTM D5185m >20 0 1 0 Fuel % ASTM D5185m >20 0 1 0 Sodium ppm ASTM D5185m >20 0 1 0 Fuel % ASTM D5324 >3.0 5.8 8.3 4.3 INFRA-RED method limit/base current history1 history2 Soot % % * ASTM D7624 >30 23.1 40.5 27.5 Sulfation Abs/.1mm *ASTM D7415 >30	Calcium	ppm	ASTM D5185m	1070	1030	1087	
SulfurppmASTM D5185m2060291332452758CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>3041712SodiumppmASTM D5185m>3041712PotassiumppmASTM D5185m>20010Fuel%ASTM D5185m>20010Fuel%ASTM D5185m>205.88.334.33INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>31.85.52.5NitrationAbs/cm*ASTM D7624>209.620.512.6SulfationAbs/lim*ASTM D7415>3023.140.527.5FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/lim*ASTM D7414>2518.136.222.4	Phosphorus	ppm	ASTM D5185m				
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Sodium ppm ASTM D5185m 2 7 12 Potassium ppm ASTM D5185m >20 0 1 0 Fuel % ASTM D3524 >3.0 5.8 8.3 ▲ 4.3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >3 1.8 ▲ 5.5 2.5 Nitration Abs/cm *ASTM D7624 >20 9.6 20.5 12.6 Sulfation Abs/.1mm *ASTM D7615 >30 23.1 40.5 27.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.1 36.2 22.4	CONTAMINAN	TS	method	limit/base	current	history1	history2
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Fuel % ASTM D3524 >3.0 5.8 8.3 4.3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.8 5.5 2.5 Nitration Abs/cm *ASTM D7624 >20 9.6 20.5 12.6 Sulfation Abs/.1mm *ASTM D7415 >30 23.1 40.5 27.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.1 36.2 22.4	Sodium	ppm	ASTM D5185m		2	7	12
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.8 ▲ 5.5 2.5 Nitration Abs/cm *ASTM D7624 >20 9.6 20.5 12.6 Sulfation Abs/.1mm *ASTM D7415 >30 23.1 40.5 27.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.1 36.2 22.4	Potassium	ppm	ASTM D5185m	>20	0	1	
Soot % % *ASTM D7844 >3 1.8 5.5 2.5 Nitration Abs/cm *ASTM D7624 >20 9.6 20.5 12.6 Sulfation Abs/.1mm *ASTM D7415 >30 23.1 40.5 27.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.1 36.2 22.4	Fuel	%	ASTM D3524	>3.0	9 5.8	8.3	4 .3
Nitration Abs/cm *ASTM D7624 >20 9.6 20.5 12.6 Sulfation Abs/.1mm *ASTM D7415 >30 23.1 40.5 27.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.1 36.2 22.4	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 23.1 40.5 27.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.1 36.2 22.4	Soot %	%	*ASTM D7844	>3	1.8	5 .5	2.5
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.1 36.2 22.4	Nitration	Abs/cm	*ASTM D7624	>20	9.6	20.5	12.6
Oxidation Abs/.1mm *ASTM D7414 >25 18.1 36.2 22.4	Sulfation	Abs/.1mm	*ASTM D7415	>30	23.1	40.5	27.5
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 9.8 9.84 5.47 9.47	Oxidation	Abs/.1mm	*ASTM D7414	>25	18.1	36.2	22.4
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	9.84	5.47	9.47



OIL ANALYSIS REPORT



	VISUAL		method	limit/bas	e 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	
1	Debris	scalar	*Visual	NONE	NONE	NONE	NONE	
	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE	
8/19	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML	
Feb18/19 Mar11/23 Aug17/23	Odor	scalar	*Visual	NORML	NORML	NORML	NORML	
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG	
	Free Water	scalar	*Visual	2 V.L	NEG	NEG	NEG	
\mathcal{N}	FLUID PROPE	RTIES	method	limit/bas	e current	history1	history2	
γ	Visc @ 100°C	cSt	ASTM D445		12.8	13.7	▲ 12.0	
	GRAPHS							
	Iron (ppm)				Lead (ppm)			
	400				⁸⁰			
Nov21/19 -	300 - Severe				60 - Severe			
Noví Marl	a 200 - Abnormal				40 Abnormal			
	4200 4			•	0		٨	
	100		~	\sim	20			
		6 6				5 5		
	Apr3/18 Jun23/18 Nov1/18	Jan 22/19 Sep 15/19	Nov21/19 Mar11/23	Sep27/23 .	Apr3/18 - Jun23/18 - Nov1/18 -	Jan 22/19 Sep 15/19	Nov21/19 Mar11/23	
	-	Sep	No:	Set	7		Ma	
	Aluminum (ppm)				Chromium (pp	m)		
\sim 1	40 Severe				20 Severe			
Y					15-			
23+	30			8	10 Abnormal			
Nov21/19 Mar11/23					5-			
2 2			\sim	\sim			\sim	
		19	719	123		6L/	719	
	Apr3/18 - Jun23/18 - Nov1/18 -	Jan 22/19 . Sep 15/19 .	Nov21/19 Mar11/23	Sep27/23	Apr3/18 - Jun23/18 -	Jan 22/19	Nov21/19 Mar11/23	
	Copper (ppm)	റ ഗ്	2 2	63	Silicon (ppm)	л ö	Z Ž	
	⁶⁰ T Severe				50 Severe			
	50 -				40			
	40 E 30 - Abnormal				30 - Abnormal		A	
					30 - Abnormal 20 -		$\langle \rangle$	
	20				10-		14	
	0			~		\sim		
	Apr3/18 - Jun23/18 -	Jan 22/19 - Sep 15/19 -	Nov21/19 -	Sep27/23 -	Apr3/18 -	Jan 22/19 - Sep 15/19 -	Nov21/19 - Mar11/23 -	
	Api Jun2 Nov	Jan 2 Sep 1	Nov2 Mar1	Sep2		Jan2 Sep1	Nov2 Mar1	
	Viscosity @ 100°	C			Base Number			
	18 - Abnormal			(B)/HC	8.0		M	
				ng KC	6.0 -		V	
	3-001 53 14			ber (r	4.0		THE CHARM	
	Abmospial		~~	Base Number (mg KOH/g)	2.0			
	10				0.0			
		2/19	1/19	7/23		2/19 -	1/19	
	Apr3/18 Jun23/18 Nov1/18	Jan 22/19 Sep 15/19	Nov21/19 Mar11/23	Sep27/23	Apr3/18 Jun23/18 Nov1/18	Jan22/19 Sep15/19	Nov21/19 Mar11/23	
Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 Sample No. : PCA0098695 Lab Number : 05970515 Diagnosed : 09 Oct 2023 Unique Number : 10682465 Diagnostician : Wes Davis Test Package : MOB 2 (Additional Tests: PercentFuel) st his sample report, contact Customer Service at 1-800-237-1369. est est methods that are outside of the ISO 17025 scope of accreditation. ts of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)						PLYMOUTH & BROCKTO 8 INDUSTRIAL PARK R PLYMOUTH, M US 0236 Contact: Donald Pelpqui Dpeloquin@P-B.con T: (508)732-603 F: (508)732-609		

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