

OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Plymouth & Brockton 11451

Component

Diesel Engine

PETRO CANADA DURON SHP 15W40 (39 QTS)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

Contamination

There is no indication of any contamination in the

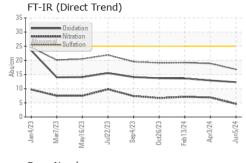
Fluid Condition

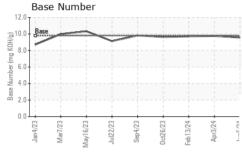
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

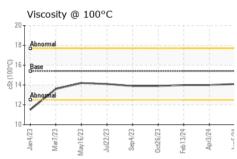
Sample Number Client Info PCA0104511 PCA0109972 PCA0109869 Sample Date Client Info D5 Jun 2024 03 Apr 2024 13 Feb 2024 14 Feb 2024 1	SAMPLE INFORMA	ATION	method	limit/base	current	history1	history2
Sample Date Client Info 05 Jun 2024 03 Apr 2024 13 Feb 2024 Machine Age mls Client Info 119929 107458 96404						•	•
Machine Age mls Client Info 119929 107458 96404	·						
Oil Age		mls					
Client Info Changed Not Changed NORMAL NORMAL NORMAL NORMAL NORMAL	J						
CONTAMINATION	_	11110					
Fuel	-		CHOIL HIIO			Ŭ	
Water Glycol WC Method WC Method >0.2 NEG NEG NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >90 <1 8 8 Chromium ppm ASTM D5185m >20 0 <1 0 Nickel ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >20 <1 2 <1 Lead ppm ASTM D5185m >40 0 0 0 Copper ppm ASTM D5185m >40 0 0 0 Vanadium ppm ASTM D5185m >15 0 0 0 Cadmium ppm ASTM D5185m 0 18 <		DN	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >90 <1			WC Method				
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >90 <1				7 0.2	-		
Chromium			method	limit/base	current	history1	history2
Chromium					-1		8
Nickel	- 1						
Titanium					-		
Silver	'						
Aluminum ppm ASTM D5185m >20 <1 2 <1 Lead ppm ASTM D5185m >40 0 0 0 Copper ppm ASTM D5185m >330 0 <1							
Lead							_
Copper ppm ASTM D5185m >330 0 <1 0 Tin ppm ASTM D5185m >15 0 0 0 Vanadium ppm ASTM D5185m <1							
Tin							
Vanadium ppm ASTM D5185m <1 0 <1 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 18 8 6 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 Manganese ppm ASTM D5185m 0 <1 <1 0 Magnesium ppm ASTM D5185m 1010 951 885 932 Calcium ppm ASTM D5185m 1070 1143 1060 1085 Phosphorus ppm ASTM D5185m 1270 1236 1192 1153 Sulfur ppm ASTM D5185m 2060 3731 3477 3432 CONTAMINANTS method limit/base current history1							
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 18 8 6 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 -1 -1 0 Manganese ppm ASTM D5185m 0 -1 -1 0 Magnesium ppm ASTM D5185m 1010 951 885 932 Calcium ppm ASTM D5185m 1070 1143 1060 1085 Phosphorus ppm ASTM D5185m 1270 1236 1192 1153 Sulfur ppm ASTM D5185m 2060 3731 3477 3432 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 1				>15			
ADDITIVES							
Boron ppm ASTM D5185m 0 0 0 0 0 0 0 0 0	'	ppm			0		
Barium	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 59 62 67 Manganese ppm ASTM D5185m 0 <1 <1 0 Magnesium ppm ASTM D5185m 1010 951 885 932 Calcium ppm ASTM D5185m 1070 1143 1060 1085 Phosphorus ppm ASTM D5185m 1150 1036 1074 1008 Zinc ppm ASTM D5185m 1270 1236 1192 1153 Sulfur ppm ASTM D5185m 2060 3731 3477 3432 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 2 Sodium ppm ASTM D5185m >20 1 1 0 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7824 >20	Boron	ppm			18		
Manganese ppm ASTM D5185m 0 <1 <1 0 Magnesium ppm ASTM D5185m 1010 951 885 932 Calcium ppm ASTM D5185m 1070 1143 1060 1085 Phosphorus ppm ASTM D5185m 1150 1036 1074 1008 Zinc ppm ASTM D5185m 1270 1236 1192 1153 Sulfur ppm ASTM D5185m 2060 3731 3477 3432 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 2 Sodium ppm ASTM D5185m 2 0 2 Potassium ppm ASTM D5185m >20 1 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 951 885 932 Calcium ppm ASTM D5185m 1070 1143 1060 1085 Phosphorus ppm ASTM D5185m 1150 1036 1074 1008 Zinc ppm ASTM D5185m 1270 1236 1192 1153 Sulfur ppm ASTM D5185m 2060 3731 3477 3432 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m 25 3 4 2 Sodium ppm ASTM D5185m 20 1 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.1 1 1.1 Nitration Abs/cm *ASTM D7624 >20 4.6 6.9 7.1 Sulfation Abs/.1mm *	Molybdenum	ppm	ASTM D5185m	60	59	62	
Calcium ppm ASTM D5185m 1070 1143 1060 1085 Phosphorus ppm ASTM D5185m 1150 1036 1074 1008 Zinc ppm ASTM D5185m 1270 1236 1192 1153 Sulfur ppm ASTM D5185m 2060 3731 3477 3432 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 2 Sodium ppm ASTM D5185m 20 1 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.1 1 1.1 Nitration Abs/.1mm *ASTM D7624 >20 4.6 6.9 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 16.8 18.9 19.2 FLUID DEGRADATION <	Manganese	ppm	ASTM D5185m	0	<1	<1	0
Phosphorus ppm ASTM D5185m 1150 1036 1074 1008 Zinc ppm ASTM D5185m 1270 1236 1192 1153 Sulfur ppm ASTM D5185m 2060 3731 3477 3432 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 2 Sodium ppm ASTM D5185m 2 0 2 Potassium ppm ASTM D5185m >20 1 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.1 1 1.1 Nitration Abs/cm *ASTM D7624 >20 4.6 6.9 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 16.8 18.9 19.2 FLUID DEGRADATION method lim	Magnesium	ppm	ASTM D5185m	1010	951	885	932
Zinc ppm ASTM D5185m 1270 1236 1192 1153 Sulfur ppm ASTM D5185m 2060 3731 3477 3432 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 2 Sodium ppm ASTM D5185m 2 0 2 Potassium ppm ASTM D5185m >20 1 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.1 1 1.1 Nitration Abs/cm *ASTM D7624 >20 4.6 6.9 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 16.8 18.9 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414	Calcium	ppm	ASTM D5185m	1070	1143	1060	1085
Sulfur ppm ASTM D5185m 2060 3731 3477 3432 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 2 Sodium ppm ASTM D5185m 2 0 2 Potassium ppm ASTM D5185m >20 1 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.1 1 1.1 Nitration Abs/cm *ASTM D7624 >20 4.6 6.9 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 16.8 18.9 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.3 12.9 13.6	Phosphorus	ppm	ASTM D5185m	1150	1036	1074	1008
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 2 Sodium ppm ASTM D5185m 2 0 2 Potassium ppm ASTM D5185m >20 1 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.1 1 1.1 Nitration Abs/cm *ASTM D7624 >20 4.6 6.9 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 16.8 18.9 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.3 12.9 13.6	Zinc	ppm	ASTM D5185m	1270	1236	1192	1153
Silicon ppm ASTM D5185m >25 3 4 2 Sodium ppm ASTM D5185m 2 0 2 Potassium ppm ASTM D5185m >20 1 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.1 1 1.1 Nitration Abs/cm *ASTM D7624 >20 4.6 6.9 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 16.8 18.9 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.3 12.9 13.6	Sulfur	ppm	ASTM D5185m	2060	3731	3477	3432
Sodium ppm ASTM D5185m 2 0 2 Potassium ppm ASTM D5185m >20 1 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.1 1 1.1 Nitration Abs/cm *ASTM D7624 >20 4.6 6.9 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 16.8 18.9 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.3 12.9 13.6	CONTAMINANT	S	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 1 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.1 1 1.1 Nitration Abs/cm *ASTM D7624 >20 4.6 6.9 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 16.8 18.9 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.3 12.9 13.6	Silicon	ppm		>25	3	4	
INFRA-RED	Sodium	ppm	ASTM D5185m		2	0	2
Soot % % *ASTM D7844 >6 0.1 1 1.1 Nitration Abs/cm *ASTM D7624 >20 4.6 6.9 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 16.8 18.9 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.3 12.9 13.6	Potassium	ppm	ASTM D5185m	>20	1	1	0
Nitration Abs/cm *ASTM D7624 >20 4.6 6.9 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 16.8 18.9 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.3 12.9 13.6	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 16.8 18.9 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.3 12.9 13.6	Soot %	%	*ASTM D7844	>6	0.1	1	1.1
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.3 12.9 13.6	Nitration	Abs/cm	*ASTM D7624	>20	4.6	6.9	7.1
Oxidation Abs/.1mm *ASTM D7414 >25 12.3 12.9 13.6	Sulfation	Abs/.1mm	*ASTM D7415	>30	16.8		
	FLUID DEGRADA	ATION	method	limit/base	current	history1	history2
	Oxidation /	Abs/.1mm	*ASTM D7414	>25	12.3	12.9	13.6
		mg KOH/g	ASTM D2896	9.8	9.56	9.75	9.71



OIL ANALYSIS REPORT





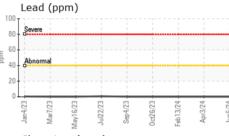


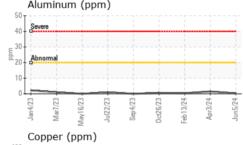
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

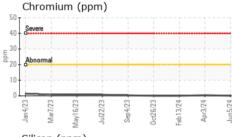
LLUID LUOP		memod			HISTORY	HISTORYZ
Visc @ 100°C	cSt	ASTM D445	15.4	14.1	14.0	14.0

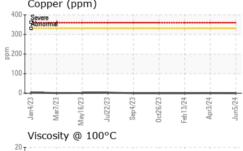
Iror	ı (pp	m)						
Sever	е							
	-							
Abno	mal							
	_	-	_	_				
Jan4/23	7/23	6/23	2/23	4/23	6/23	3/24	3/24	Jun5/24
Jan	Mar7/2	May16	Jul22/2	Sep4/	0ct26/23	Feb13/2	Apr3/2	Jun
Alur	minu	m (pį	om)					

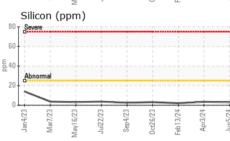
GRAPHS

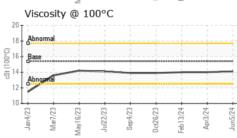


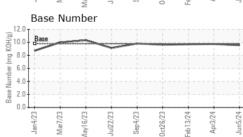
















Laboratory Sample No.

Lab Number : 06214937

: PCA0104511 Unique Number : 11087801

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 19 Jun 2024 **Tested** : 20 Jun 2024

Diagnosed : 20 Jun 2024 - Wes Davis

Test Package : MOB 2 Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369.

* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

PLYMOUTH & BROCKTON

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US 02360 Contact: Donald Pelpquin Dpeloquin@P-B.com

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Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)