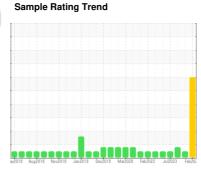


OIL ANALYSIS REPORT

Plymouth & Brockton 11413

Component **Diesel Engine**

PETRO CANADA DURON SHP 15W40 (39 QTS)





DIAGNOSIS

Recommendation

Oil and filter change at the time of sampling has been noted. We advise that you inspect for the source(s) of wear. We recommend an early resample to monitor this condition.

Bearing and/or bushing wear is indicated.

Contamination

There is no indication of any contamination in the

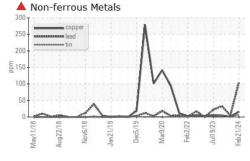
Fluid Condition

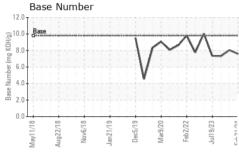
The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

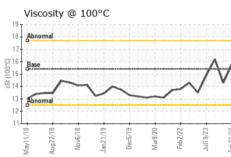
CAMPLE INCOR	MATION		1554.0		led ex	1-1
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		PCA0090545	PCA0104409	PCA0104405
Sample Date		Client Info		21 Feb 2024	03 Nov 2023	13 Sep 2023
Machine Age	mls	Client Info		547352	581107	571789
Oil Age	mls	Client Info		24000	12000	24000
Oil Changed		Client Info		Changed	Not Changd	Changed
Sample Status				SEVERE	NORMAL	ABNORMAL
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		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
					·	· ·
Iron	ppm	ASTM D5185m	>200	61	28	86
Chromium	ppm	ASTM D5185m		2	1	3
Nickel	ppm	ASTM D5185m	>4	<1	0	<1
Titanium	ppm	ASTM D5185m		0	0	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m		7	2	5
Lead	ppm	ASTM D5185m	>30	105	4	<u>^</u> 33
Copper	ppm	ASTM D5185m		16	<1	5
Tin	ppm	ASTM D5185m	>4	7	1	4
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES	ppm	ASTM D5185m method	limit/base	current	0 history1	0 history2
	ppm		limit/base			
ADDITIVES		method ASTM D5185m	0	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	0	current 5	history1	history2
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	0	current 5 0	history1 7 0	history2 7 0
ADDITIVES Boron Barium Molybdenum	ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	current 5 0 64	history1 7 0 66	history2 7 0 68
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	5 0 64 <1	history1 7 0 66 <1	history2 7 0 68 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	current 5 0 64 <1 1066	history1 7 0 66 <1 1039	history2 7 0 68 <1 1132
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	current 5 0 64 <1 1066 1189	history1 7 0 66 <1 1039 1165	history2 7 0 68 <1 1132 1244
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	method ASTM D5185m	0 0 60 0 1010 1070 1150	current 5 0 64 <1 1066 1189 1020	history1 7 0 66 <1 1039 1165 1138	history2 7 0 68 <1 1132 1244 1175
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	0 0 60 0 1010 1070 1150	current 5 0 64 <1 1066 1189 1020 1318	history1 7 0 66 <1 1039 1165 1138 1387	history2 7 0 68 <1 1132 1244 1175 1460
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	current 5 0 64 <1 1066 1189 1020 1318 3196	history1 7 0 66 <1 1039 1165 1138 1387 3115	history2 7 0 68 <1 1132 1244 1175 1460 2984
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	current 5 0 64 <1 1066 1189 1020 1318 3196 current	history1 7 0 66 <1 1039 1165 1138 1387 3115 history1	history2 7 0 68 <1 1132 1244 1175 1460 2984 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base	current 5 0 64 <1 1066 1189 1020 1318 3196 current 12	history1 7 0 66 <1 1039 1165 1138 1387 3115 history1 6	history2 7 0 68 <1 1132 1244 1175 1460 2984 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm	method ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base	current 5 0 64 <1 1066 1189 1020 1318 3196 current 12 5	history1 7 0 66 <1 1039 1165 1138 1387 3115 history1 6 2	history2 7 0 68 <1 1132 1244 1175 1460 2984 history2 9 5
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm	method ASTM D5185m method	0 0 60 0 1010 1070 1150 1270 2060 limit/base >30	current 5 0 64 <1 1066 1189 1020 1318 3196 current 12 5 0 current	history1 7 0 66 <1 1039 1165 1138 1387 3115 history1 6 2 0 history1	history2 7 0 68 <1 1132 1244 1175 1460 2984 history2 9 5 0 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 0 0 1010 1070 1150 1270 2060 limit/base >30 limit/base	current 5 0 64 <1 1066 1189 1020 1318 3196 current 12 5 0 current	history1 7 0 66 <1 1039 1165 1138 1387 3115 history1 6 2 0 history1 1.6	history2 7 0 68 <1 1132 1244 1175 1460 2984 history2 9 5 0 history2 2.9
ADDITIVES 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	method ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 0 0 1010 1150 1270 2060 limit/base >30 >20 limit/base	current 5 0 64 <1 1066 1189 1020 1318 3196 current 12 5 0 current 2.2 15.4	history1 7 0 66 <1 1039 1165 1138 1387 3115 history1 6 2 0 history1 1.6 12.6	history2 7 0 68 <1 1132 1244 1175 1460 2984 history2 9 5 0 history2 2.9 17.4
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm	method ASTM D5185m method ASTM D5185m ASTM D5185m *ASTM D5185m ASTM D5185m *ASTM D5185m ASTM D76185m ASTM D76185m ASTM D76185m ASTM D76185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >30 >20 limit/base >3 >20 >3	current 5 0 64 <1 1066 1189 1020 1318 3196 current 12 5 0 current 2.2 15.4 31.1	history1 7 0 66 <1 1039 1165 1138 1387 3115 history1 6 2 0 history1 1.6 12.6 25.6	history2 7 0 68 <1 1132 1244 1175 1460 2984 history2 9 5 0 history2 2.9 17.4 34.6
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAD	ppm	method ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method *ASTM D7844 *ASTM D7624 *ASTM D7844 *ASTM D7624	0 0 0 1010 1070 1150 1270 2060 limit/base >30 >20 limit/base >3 >20 simit/base	current 5 0 64 <1 1066 1189 1020 1318 3196 current 12 5 0 current 2.2 15.4 31.1 current	history1 7 0 66 <1 1039 1165 1138 1387 3115 history1 6 2 0 history1 1.6 12.6 25.6 history1	history2 7 0 68 <1 1132 1244 1175 1460 2984 history2 9 5 0 history2 2.9 17.4 34.6 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm	method ASTM D5185m method ASTM D5185m ASTM D5185m *ASTM D5185m ASTM D5185m *ASTM D5185m ASTM D76185m ASTM D76185m ASTM D76185m ASTM D76185m	0 0 0 0 1010 1070 1150 1270 2060 limit/base >30 >20 limit/base >3 >20 >30 limit/base	current 5 0 64 <1 1066 1189 1020 1318 3196 current 12 5 0 current 2.2 15.4 31.1	history1 7 0 66 <1 1039 1165 1138 1387 3115 history1 6 2 0 history1 1.6 12.6 25.6	history2 7 0 68 <1 1132 1244 1175 1460 2984 history2 9 5 0 history2 2.9 17.4 34.6



OIL ANALYSIS REPORT





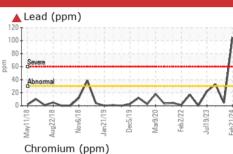


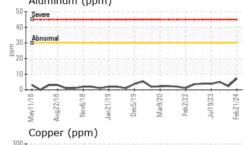
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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

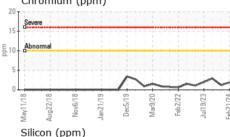
FLUID PROPE	RHES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	15.8	14.3	16.2

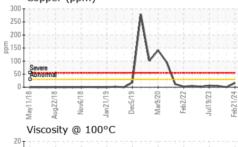
Iron (ppm) 100 Aluminum (ppm)

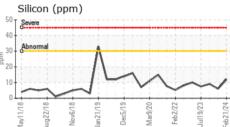
GRAPHS

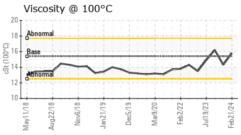


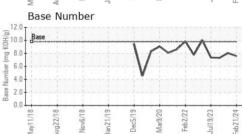
















Certificate L2367

Laboratory Sample No.

Lab Number : 06132249 Unique Number : 10951714

Test Package : MOB 2

: PCA0090545

To discuss this sample report, contact Customer Service at 1-800-237-1369.

Received **Tested** Diagnosed

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : 28 Mar 2024 : 29 Mar 2024

: 02 Apr 2024 - Jonathan Hester

PLYMOUTH, MA US 02360

Contact: Donald Pelpquin Dpeloquin@P-B.com T: (508)732-6039

PLYMOUTH & BROCKTON

8 INDUSTRIAL PARK RD

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

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

Report Id: PLYPLYUS [WUSCAR] 06132249 (Generated: 04/02/2024 15:20:21) Rev: 1

Submitted By: Donald Pelpquin

F: (508)732-6091