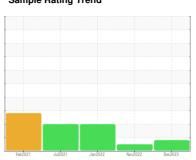


OIL ANALYSIS REPORT

Sample Rating Trend



WEAR



Machine Id **618533** Component

Diesel Engine

PETRO CANADA DURON SHP 10W30 (--- 0

DIAGNOSIS

Recommendation

The oil 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

The aluminum level is abnormal. All other component wear rates are normal.

Contamination

There is no indication of any contamination in the

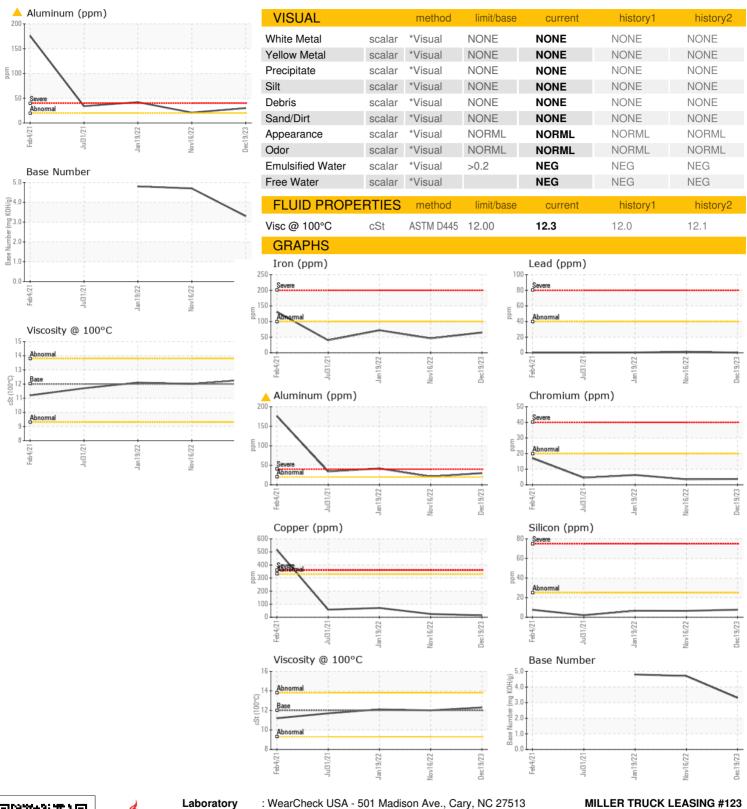
Fluid Condition

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

SAMPLE INFORMATION method limit base current history1 history2 Sample Number Client Info PCA0097343 PCA0071721 PCA0053407 Sample Date Client Info 19 Dec 2023 16 Nov 2022 19 Jan 2022 Machine Age mls Client Info 212579 185812 119755 Oil Changed Client Info 53767 39057 52614 Oil Changed Client Info Changed Changed Changed Changed Sample Status WC Method ABNORMAL NORMAL ABNORMAL CONTAMINATION method Imilibase current history1 history2 Fuel WC Method >5 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1	GAL)		Feb 2021	Jul2021	Jan2022 Nov2022	Dec2023	
Sample Date	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age mls Client Info 212579 158812 119755 Oil Age mls Client Info 53767 39057 52614 Oil Changed Client Info Changed Changed Changed Changed Sample Status Memory ABNORMAL ABNORMAL ABNORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0	Sample Number		Client Info		PCA0097343	PCA0071721	PCA0053407
Oil Age mls Client Info 53767 39057 52614 Oil Changed Client Info Changed Changed Changed Changed Sample Status Image: Control of the properties of the propertie	Sample Date		Client Info		19 Dec 2023	16 Nov 2022	19 Jan 2022
Oil Changed Sample Status Client Info Changed ABNORMAL NORMAL NORMAL ABNORMAL Changed ABNORMAL NORMAL ABNORMAL ABNORMAL ABNORMAL Changed ABNORMAL NORMAL ABNORMAL ABNORMAL ABNORMAL ABNORMAL Contradiction of the property of the	Machine Age	mls	Client Info		212579	158812	119755
CONTAMINATION	Oil Age	mls	Client Info		53767	39057	52614
CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0	Oil Changed		Client Info		Changed	Changed	Changed
Fuel	Sample Status				ABNORMAL	NORMAL	ABNORMAL
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 >100 65 46 72 Chromium ppm ASTM D5185m >4 0 <1 <1 Nickel ppm ASTM D5185m >4 0 <1 <1 Silver ppm ASTM D5185m >4 0 <1 <1 Silver ppm ASTM D5185m >3 0 <1 <1 Aluminum ppm ASTM D5185m >30 21 <1 <1 Copper ppm ASTM D5185m >30 14 25 71 Tin ppm ASTM D5185m >30 14 25 71 Tin ppm ASTM D5185m >30 1 1 <1 <1 <1 <1 <1 <1 <1	CONTAMINATI	ON	method	limit/base	current	history1	history2
Glycol WC Method Imit/base current history1 history2 WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 65 46 72 Chromium ppm ASTM D5185m >20 4 4 6 Nickel ppm ASTM D5185m >4 0 <1 <1 Silver ppm ASTM D5185m >3 0 <1 <1 Aluminum ppm ASTM D5185m >30 0 <1 <1 Aluminum ppm ASTM D5185m >40 <1 1 <1 Lead ppm ASTM D5185m >20 30 21 42 Lead ppm ASTM D5185m >30 14 25 71 Tin ppm ASTM D5185m 0 <1 0 <1 Caddium ppm ASTM D5185m 0 0 <1 <td>Fuel</td> <td></td> <td>WC Method</td> <td>>5</td> <th><1.0</th> <td><1.0</td> <td><1.0</td>	Fuel		WC Method	>5	<1.0	<1.0	<1.0
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 65 46 72 Chromium ppm ASTM D5185m >20 4 4 6 Nickel ppm ASTM D5185m >20 4 4 6 Nickel ppm ASTM D5185m >4 0 <1	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m ≥20 4 4 6 Nickel ppm ASTM D5185m >4 0 <1	WEAR METALS	S	method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >4 0 <1 <1 Titanium ppm ASTM D5185m 15 8 <1	Iron	ppm	ASTM D5185m	>100	65	46	72
Titanium ppm ASTM D5185m 15 8 <1 Silver ppm ASTM D5185m >3 0 <1	Chromium	ppm	ASTM D5185m	>20	4	4	6
Silver ppm ASTM D5185m >3 0 <1 <1 Aluminum ppm ASTM D5185m >20 30 21 ▲ 42 Lead ppm ASTM D5185m >40 <1 1 <1 Copper ppm ASTM D5185m >330 14 25 71 Tin ppm ASTM D5185m >15 2 1 2 Antimony ppm ASTM D5185m 0 <1 0 Vanadium ppm ASTM D5185m 0 0 <1 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0	Nickel	ppm		>4	0	<1	<1
Aluminum ppm ASTM D5185m >20 30 21 ▲ 42 Lead ppm ASTM D5185m >40 <1	Titanium	ppm	ASTM D5185m		15	8	<1
Lead ppm ASTM D5185m >40 <1 1 <1 Copper ppm ASTM D5185m >330 14 25 71 Tin ppm ASTM D5185m >15 2 1 2 Antimony ppm ASTM D5185m 0 Vanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 0	Silver	ppm		>3	0	<1	<1
Copper ppm ASTM D5185m >330 14 25 71 Tin ppm ASTM D5185m >15 2 1 2 Antimony ppm ASTM D5185m 0 Vanadium ppm ASTM D5185m 0 <1	Aluminum	ppm	ASTM D5185m	>20	△ 30	21	<u>42</u>
Tin ppm ASTM D5185m >15 2 1 2 Antimony ppm ASTM D5185m	Lead	ppm	ASTM D5185m	>40		1	
Antimony ppm ASTM D5185m 0 Vanadium ppm ASTM D5185m 0 <1	Copper	ppm	ASTM D5185m	>330	14	25	
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 4 5 4 Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 50 59 55 54 Manganese ppm ASTM D5185m 0 1 <1 2 Magnesium ppm ASTM D5185m 950 1023 926 974 Calcium ppm ASTM D5185m 950 1379 1321 1219 Phosphorus ppm ASTM D5185m 180 1383 1227 1123 Sulfur ppm ASTM D5185m 2600 3223 2962 1915 CONTAMINANTS method limit/base current his	Tin	ppm	ASTM D5185m	>15	2	1	
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 2 4 5 4 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 50 59 55 54 Manganese ppm ASTM D5185m 0 1 <1	Antimony	ppm	ASTM D5185m				0
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 2 4 5 4 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 50 59 55 54 Manganese ppm ASTM D5185m 0 1 <1	Vanadium	ppm				<1	
Boron ppm ASTM D5185m 2 4 5 4 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 50 59 55 54 Manganese ppm ASTM D5185m 0 1 <1 2 Magnesium ppm ASTM D5185m 950 1023 926 974 Calcium ppm ASTM D5185m 950 1379 1321 1219 Phosphorus ppm ASTM D5185m 995 1185 965 959 Zinc ppm ASTM D5185m 180 1383 1227 1123 Sulfur ppm ASTM D5185m 2600 3223 2962 1915 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 6 7 Sodium ppm ASTM D5185m		ppm	ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 50 59 55 54 Manganese ppm ASTM D5185m 0 1 <1 2 Magnesium ppm ASTM D5185m 0 1023 926 974 Calcium ppm ASTM D5185m 1050 1379 1321 1219 Phosphorus ppm ASTM D5185m 1050 1379 1321 1219 Phosphorus ppm ASTM D5185m 995 1185 965 959 Zinc ppm ASTM D5185m 2600 3223 2962 1915 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 6 7 Sodium ppm ASTM D5185m 20 32 28 8 INFRA-RED method limit/base<	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 50 59 55 54 Manganese ppm ASTM D5185m 0 1 <1 2 Magnesium ppm ASTM D5185m 950 1023 926 974 Calcium ppm ASTM D5185m 950 1023 926 974 Calcium ppm ASTM D5185m 1050 1379 1321 1219 Phosphorus ppm ASTM D5185m 995 1185 965 959 Zinc ppm ASTM D5185m 996 1383 1227 1123 Sulfur ppm ASTM D5185m 2600 3223 2962 1915 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 6 7 Sodium ppm ASTM D5185m >20 32 28 88 INFRA-RED method li	Boron	ppm	ASTM D5185m	2		5	4
Manganese ppm ASTM D5185m 0 1 <1 2 Magnesium ppm ASTM D5185m 950 1023 926 974 Calcium ppm ASTM D5185m 1050 1379 1321 1219 Phosphorus ppm ASTM D5185m 995 1185 965 959 Zinc ppm ASTM D5185m 180 1383 1227 1123 Sulfur ppm ASTM D5185m 2600 3223 2962 1915 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 6 7 Sodium ppm ASTM D5185m >25 8 6 7 Sodium ppm ASTM D5185m >20 32 28 88 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 950 1023 926 974 Calcium ppm ASTM D5185m 1050 1379 1321 1219 Phosphorus ppm ASTM D5185m 995 1185 965 959 Zinc ppm ASTM D5185m 1180 1383 1227 1123 Sulfur ppm ASTM D5185m 2600 3223 2962 1915 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 6 7 Sodium ppm ASTM D5185m >20 32 28 88 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 2.4 1.7 1.8 Nitration Abs/cm *ASTM D7624 >20 13.8 12.7 14.6 Sulfation Abs/.1mm *ASTM	Molybdenum	ppm			59	55	
Calcium ppm ASTM D5185m 1050 1379 1321 1219 Phosphorus ppm ASTM D5185m 995 1185 965 959 Zinc ppm ASTM D5185m 1180 1383 1227 1123 Sulfur ppm ASTM D5185m 2600 3223 2962 1915 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 6 7 Sodium ppm ASTM D5185m >20 32 28 88 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 2.4 1.7 1.8 Nitration Abs/cm *ASTM D7624 >20 13.8 12.7 14.6 Sulfation Abs/.1mm *ASTM D7415 >30 31.2 27.6 29.7 FLUID DEGRADATI	•	ppm	ASTM D5185m	0	1	<1	
Phosphorus ppm ASTM D5185m 995 1185 965 959 Zinc ppm ASTM D5185m 1180 1383 1227 1123 Sulfur ppm ASTM D5185m 2600 3223 2962 1915 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 6 7 Sodium ppm ASTM D5185m >20 32 28 88 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 2.4 1.7 1.8 Nitration Abs/cm *ASTM D7624 >20 13.8 12.7 14.6 Sulfation Abs/.1mm *ASTM D7415 >30 31.2 27.6 29.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm <td>Magnesium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>950</td> <th></th> <td>926</td> <td></td>	Magnesium	ppm	ASTM D5185m	950		926	
Zinc ppm ASTM D5185m 1180 1383 1227 1123 Sulfur ppm ASTM D5185m 2600 3223 2962 1915 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 6 7 Sodium ppm ASTM D5185m 20 32 28 ▲ 88 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 2.4 1.7 1.8 Nitration Abs/cm *ASTM D7624 >20 13.8 12.7 14.6 Sulfation Abs/.1mm *ASTM D7415 >30 31.2 27.6 29.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 25.3 22.3 25.3	Calcium	ppm	ASTM D5185m	1050	1379	1321	1219
Sulfur ppm ASTM D5185m 2600 3223 2962 1915 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 6 7 Sodium ppm ASTM D5185m >20 32 28 ▲ 88 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 2.4 1.7 1.8 Nitration Abs/cm *ASTM D7624 >20 13.8 12.7 14.6 Sulfation Abs/.1mm *ASTM D7415 >30 31.2 27.6 29.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 25.3 22.3 25.3	Phosphorus	ppm	ASTM D5185m	995	1185	965	959
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 6 7 Sodium ppm ASTM D5185m 4 4 <1	Zinc	ppm	ASTM D5185m	1180			1123
Silicon ppm ASTM D5185m >25 8 6 7 Sodium ppm ASTM D5185m 4 4 4 <1 Potassium ppm ASTM D5185m >20 32 28 ▲ 88 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 2.4 1.7 1.8 Nitration Abs/cm *ASTM D7624 >20 13.8 12.7 14.6 Sulfation Abs/.1mm *ASTM D7415 >30 31.2 27.6 29.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 25.3 22.3 25.3	Sulfur	ppm	ASTM D5185m	2600	3223	2962	1915
Sodium ppm ASTM D5185m 4 4 <1 Potassium ppm ASTM D5185m >20 32 28 ▲ 88 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 2.4 1.7 1.8 Nitration Abs/cm *ASTM D7624 >20 13.8 12.7 14.6 Sulfation Abs/.1mm *ASTM D7415 >30 31.2 27.6 29.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 25.3 22.3 25.3	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 32 28 ▲ 88 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 2.4 1.7 1.8 Nitration Abs/cm *ASTM D7624 >20 13.8 12.7 14.6 Sulfation Abs/.1mm *ASTM D7415 >30 31.2 27.6 29.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 25.3 22.3 25.3	Silicon	ppm	ASTM D5185m	>25	8	6	7
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 2.4 1.7 1.8 Nitration Abs/cm *ASTM D7624 >20 13.8 12.7 14.6 Sulfation Abs/.1mm *ASTM D7415 >30 31.2 27.6 29.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 25.3 22.3 25.3	Sodium	ppm	ASTM D5185m		4	4	
Soot % % *ASTM D7844 >3 2.4 1.7 1.8 Nitration Abs/cm *ASTM D7624 >20 13.8 12.7 14.6 Sulfation Abs/.1mm *ASTM D7415 >30 31.2 27.6 29.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 25.3 22.3 25.3	Potassium	ppm	ASTM D5185m	>20	32	28	<u></u> 88
Nitration Abs/cm *ASTM D7624 >20 13.8 12.7 14.6 Sulfation Abs/.1mm *ASTM D7415 >30 31.2 27.6 29.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 25.3 22.3 25.3	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 31.2 27.6 29.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 25.3 22.3 25.3	Soot %	%	*ASTM D7844	>3	2.4	1.7	1.8
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 25.3 22.3 25.3	Nitration	Abs/cm	*ASTM D7624	>20	13.8	12.7	14.6
Oxidation Abs/.1mm *ASTM D7414 >25 25.3 22.3 25.3	Sulfation	Abs/.1mm	*ASTM D7415	>30	31.2	27.6	29.7
	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 3.3 4.7 4.8	Oxidation	Abs/.1mm	*ASTM D7414	>25	25.3	22.3	25.3
	Base Number (BN)	mg KOH/g	ASTM D2896		3.3	4.7	4.8



OIL ANALYSIS REPORT







Certificate L2367

Laboratory Sample No. Lab Number **Unique Number**

: 06047619

: PCA0097343 : 10808227

Recieved Diagnosed

: 29 Dec 2023 : 02 Jan 2024 Diagnostician : Don Baldridge

Test Package : MOB 1 (Additional Tests: TBN) 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.

66 KELLER AVENUE LANCASTER, PA US 17601 Contact: RON ROBERTS

rroberts@millertransgroup.com T: (717)945-6205

Contact/Location: RON ROBERTS - MILLAN

F: (717)945-5818

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