

OIL ANALYSIS REPORT

Sample Rating Trend

NORMAL



Machine Id **300-64**

Component **Diesel Engine**

PETRO CANADA DURON SHP 15W40 (--- 0

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor. Please specify the component make and model with your next sample.

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

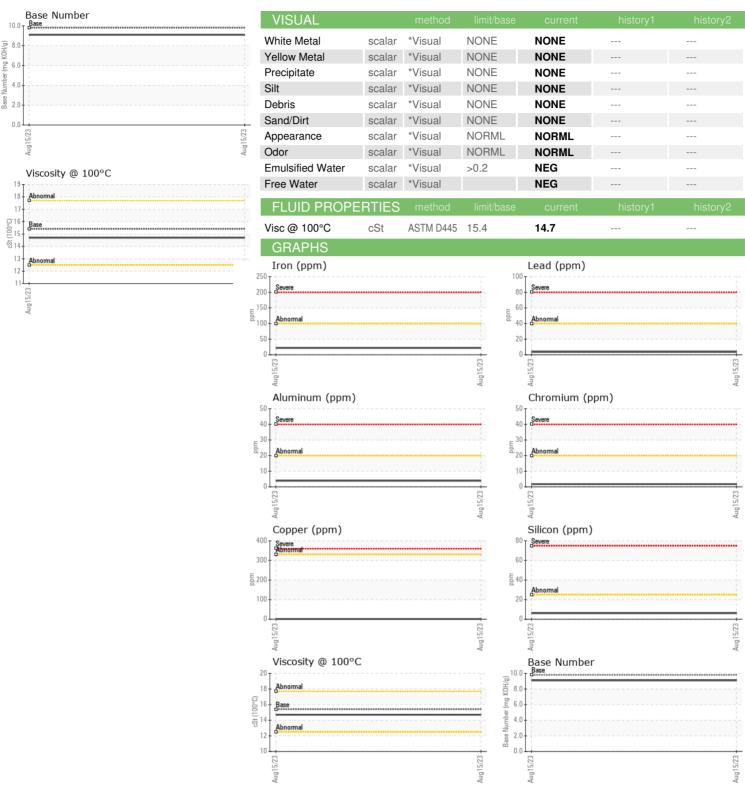
Fluid Condition

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

Machine Age hrs Client Info 1801	GAL)				Aug ² 023		
Sample Date	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 1801	Sample Number		Client Info		PCA0089577		
Oil Age hrs Client Info N/A Oil Changed Client Info N/A Sample Status NoRMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0 Glycol WC Method >5 <1.0 WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 22 WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >20 2 Chromium ppm ASTM D5185m >20 4 Silver ppm ASTM D5185m >20 4 Copper ppm ASTM D5185m >330	Sample Date		Client Info		15 Aug 2023		
Contamped Client Info N/A	Machine Age	hrs	Client Info		1801		
CONTAMINATION	Oil Age	hrs	Client Info		0		
CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0	Oil Changed		Client Info		N/A		
Fuel WC Method SE	Sample Status				NORMAL		
WEAR METALS	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 22 Chromium ppm ASTM D5185m >20 2 Nickel ppm ASTM D5185m >4 0 Silver ppm ASTM D5185m >3 0 Aluminum ppm ASTM D5185m >20 4 Lead ppm ASTM D5185m >20 4 Copper ppm ASTM D5185m >20 4 Copper ppm ASTM D5185m >20 4 Copper ppm ASTM D5185m 0 0 Vanadium ppm ASTM D5185m 0 0 ADDITIVES method limit/base current	Fuel		WC Method	>5	<1.0		
Irron	Glycol		WC Method		NEG		
Chromium ppm ASTM D5185m >20 2	WEAR METAL	S	method	limit/base	current	history1	history2
Chromium ppm ASTM D5185m >20 2 Nickel ppm ASTM D5185m >4 0 Titanium ppm ASTM D5185m >3 0 Silver ppm ASTM D5185m >20 4 Aluminum ppm ASTM D5185m >40 4 Lead ppm ASTM D5185m >40 4 Copper ppm ASTM D5185m >33.0 1 Tin ppm ASTM D5185m 0 Vanadium ppm ASTM D5185m 0 Vanadium ppm ASTM D5185m 0 Cadmium ppm ASTM D5185m 0 5 Boron ppm ASTM D5185m 0 0<	Iron	ppm	ASTM D5185m	>100	22		
Titanium	Chromium	• • • • • • • • • • • • • • • • • • • •	ASTM D5185m	>20	2		
Titanium	Nickel		ASTM D5185m	>4	0		
Silver	Titanium		ASTM D5185m		<1		
Lead	Silver	ppm	ASTM D5185m	>3	0		
Copper ppm ASTM D5185m >330 1 Tin ppm ASTM D5185m >15 <1	Aluminum	ppm	ASTM D5185m	>20	4		
Tin	Lead	ppm	ASTM D5185m	>40	4		
Vanadium ppm ASTM D5185m 0 Cadmium ppm ASTM D5185m 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 5 Barium ppm ASTM D5185m 0 0 Molybdenum ppm ASTM D5185m 0 0 Manganese ppm ASTM D5185m 0 1 Magnesium ppm ASTM D5185m 1070 1066 Calcium ppm ASTM D5185m 1070 1207 Phosphorus ppm ASTM D5185m 1270 1421 Sulfur ppm ASTM D5185m 2060 4035 CONTAMINANTS method limit/base current history1	Copper	ppm	ASTM D5185m	>330	1		
Cadmium ppm ASTM D5185m 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 5 Barium ppm ASTM D5185m 0 0 Molybdenum ppm ASTM D5185m 0 1 Manganese ppm ASTM D5185m 0 1 Magnesium ppm ASTM D5185m 1010 1066 Calcium ppm ASTM D5185m 1070 1207 Phosphorus ppm ASTM D5185m 1270 1421 Zinc ppm ASTM D5185m 2060 4035 Silicon ppm ASTM D5185m >25 6 Sodium ppm ASTM D5185m >20 2<	Tin	ppm	ASTM D5185m	>15	<1		
ADDITIVES	Vanadium	ppm	ASTM D5185m		0		
Boron	Cadmium	ppm	ASTM D5185m		0		
Barium ppm ASTM D5185m 0 0 Molybdenum ppm ASTM D5185m 60 62 Manganese ppm ASTM D5185m 0 1 Magnesium ppm ASTM D5185m 1010 1066 Calcium ppm ASTM D5185m 1070 1207 Phosphorus ppm ASTM D5185m 1150 1114 Zinc ppm ASTM D5185m 1270 1421 Sulfur ppm ASTM D5185m 2060 4035 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 Sodium ppm ASTM D5185m >20 2 Potassium ppm	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 62 Manganese ppm ASTM D5185m 0 1 Magnesium ppm ASTM D5185m 1010 1066 Calcium ppm ASTM D5185m 1070 1207 Phosphorus ppm ASTM D5185m 1150 1114 Zinc ppm ASTM D5185m 1270 1421 Sulfur ppm ASTM D5185m 2060 4035 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 Sodium ppm ASTM D5185m >20 2 Potassium ppm ASTM D5185m 3 0.1 INFRA-RED method <	Boron	ppm	ASTM D5185m	0	5		
Manganese ppm ASTM D5185m 0 1 Magnesium ppm ASTM D5185m 1010 1066 Calcium ppm ASTM D5185m 1070 1207 Phosphorus ppm ASTM D5185m 1150 1114 Zinc ppm ASTM D5185m 1270 1421 Sulfur ppm ASTM D5185m 2060 4035 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 Sodium ppm ASTM D5185m >20 2 Potassium ppm ASTM D5185m >20 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624	Barium	ppm	ASTM D5185m	0	0		
Magnesium ppm ASTM D5185m 1010 1066 Calcium ppm ASTM D5185m 1070 1207 Phosphorus ppm ASTM D5185m 1150 1114 Zinc ppm ASTM D5185m 1270 1421 Sulfur ppm ASTM D5185m 2060 4035 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 Sodium ppm ASTM D5185m >20 2 Potassium ppm ASTM D5185m >20 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 8.0 Sulfation Abs/.1mm *ASTM D7414<	Molybdenum	ppm	ASTM D5185m	60	62		
Calcium ppm ASTM D5185m 1070 1207 Phosphorus ppm ASTM D5185m 1150 1114 Zinc ppm ASTM D5185m 1270 1421 Sulfur ppm ASTM D5185m 2060 4035 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 Sodium ppm ASTM D5185m >20 2 Potassium ppm ASTM D5185m >20 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 Nitration Abs/cm *ASTM D7415 >30 18.7 FLUID DEGRADATION *ASTM D7414	Manganese	ppm	ASTM D5185m	0	1		
Phosphorus ppm ASTM D5185m 1150 1114 Zinc ppm ASTM D5185m 1270 1421 Sulfur ppm ASTM D5185m 2060 4035 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 Sodium ppm ASTM D5185m >20 2 Potassium ppm ASTM D5185m >20 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 Nitration Abs/cm *ASTM D7624 >20 8.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 FLUID DEGRADATION method	Magnesium	ppm	ASTM D5185m	1010	1066		
Zinc ppm ASTM D5185m 1270 1421 Sulfur ppm ASTM D5185m 2060 4035 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 Sodium ppm ASTM D5185m >20 2 Potassium ppm ASTM D5185m >20 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 Nitration Abs/cm *ASTM D7624 >20 8.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm	Calcium	ppm	ASTM D5185m	1070	1207		
Sulfur ppm ASTM D5185m 2060 4035 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 Sodium ppm ASTM D5185m >20 2 Potassium ppm ASTM D5185m >20 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 Nitration Abs/cm *ASTM D7624 >20 8.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.1	Phosphorus	ppm	ASTM D5185m	1150	1114		
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 Sodium ppm ASTM D5185m 1 Potassium ppm ASTM D5185m >20 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 Nitration Abs/cm *ASTM D7624 >20 8.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.1	Zinc	ppm	ASTM D5185m	1270	1421		
Silicon ppm ASTM D5185m >25 6 Sodium ppm ASTM D5185m 1 Potassium ppm ASTM D5185m >20 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 Nitration Abs/cm *ASTM D7624 >20 8.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.1	Sulfur	ppm	ASTM D5185m	2060	4035		
Sodium ppm ASTM D5185m 1 Potassium ppm ASTM D5185m >20 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 Nitration Abs/cm *ASTM D7624 >20 8.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.1	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 Nitration Abs/cm *ASTM D7624 >20 8.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.1	Silicon	ppm	ASTM D5185m	>25	6		
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 Nitration Abs/cm *ASTM D7624 >20 8.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.1	Sodium	ppm	ASTM D5185m		1		
Soot % % *ASTM D7844 >3 0.1 Nitration Abs/cm *ASTM D7624 >20 8.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.1	Potassium	ppm	ASTM D5185m	>20	2		
Nitration Abs/cm *ASTM D7624 >20 8.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.1	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.1	Soot %	%	*ASTM D7844	>3	0.1		
Sulfation Abs/.1mm *ASTM D7415 >30 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.1	Nitration	Abs/cm	*ASTM D7624	>20	8.0		
Oxidation Abs/.1mm *ASTM D7414 >25 16.1		Abs/.1mm		>30			
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	16.1		



OIL ANALYSIS REPORT







Certificate L2367

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

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : 05946924

: PCA0089577 : 10642883

Received Diagnosed

: 11 Sep 2023 : 12 Sep 2023 Diagnostician : Wes Davis

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.

GE MARSHALL EXCAVATION

1351 JOLIET RD VALPARAISO, IN US 46385

Contact: MARK STEFFEL mark.steffel@gemarshall.com

T:

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

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