

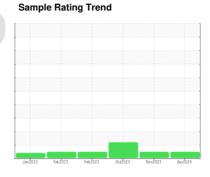
# **OIL ANALYSIS REPORT**



## (62A1N76) TALLASSEE 924017-142594

Diesel Engine

PETRO CANADA DURON SHP 15W40 (--- LTR)





### 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 Date Client Info 03 Apr 2024 08 Nov 2023 18 Oct 2   Machine Age hrs Client Info 1082 722 427954   Oil Age hrs Client Info 1082 722 427954   Oil Changed Client Info Not Changd N/A N/A   Sample Status NORMAL NORMAL ABNORR   CONTAMINATION method limit/base current history1 history1   Fuel WC Method >3.0 <1.0	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 1082 722 427954   Oil Age hrs Client Info 1082 722 0   Oil Changed Client Info Not Change N/A N/A   Sample Status NoRMAL NORMAL NORMAL ABNORI   CONTAMINATION method Imitibase current history1 history1   Fuel WC Method >3.0 <1.0 2.2 4.1   Water WC Method NEG NEG NEG   Glycol WC Method NEG NEG NEG   WEAR METALS method limit/base current history1 history1   Iron ppm ASTM D5185m >120 4 7 56 Chromium   Nickel ppm ASTM D5185m >20 0 <1 51   Iron ppm ASTM D5185m >20 0 <1 0   Aluminum ppm ASTM D5185m >20 <td>Sample Number</td> <td></td> <td>Client Info</td> <td></td> <th>GFL0092431</th> <td>GFL0079715</td> <td>GFL0092429</td>	Sample Number		Client Info		GFL0092431	GFL0079715	GFL0092429
Oil Age hrs Client Info 1082 722 0   Oil Changed Client Info Not Changd N/A N/A   Sample Status Normal Normal NA N/A   CONTAMINATION method limit/base current history1 history1   Fuel WC Method >3.0 <1.0	Sample Date		Client Info		03 Apr 2024	08 Nov 2023	18 Oct 2023
Oil Changed Sample Status Client Info Not Changd NORMAL NORMAL NORMAL ABNORM N/A NORMAL ABNORM   CONTAMINATION method Imitibase current bistory1 bistory1   Fuel WC Method >3.0 <1.0	Machine Age	hrs	Client Info		1082	722	427954
Sample Status	Oil Age	hrs	Client Info		1082	722	0
CONTAMINATION method limit/base current history1 history1   Fuel WC Method >3.0 <1.0 2.2 ▲ 4.1   Water WC Method >0.2 NEG NEG NEG   Used R METALS WC Method NEG NEG NEG NEG   WEAR METALS method limit/base current history1 history1   Iron ppm ASTM D5185m >120 4 7 56   Chromium ppm ASTM D5185m >20 0 <1 1   Nickel ppm ASTM D5185m >20 0 <1 5   Silver ppm ASTM D5185m >2 0 <1 0   Aluminum ppm ASTM D5185m >20 <1 2 8   Lead ppm ASTM D5185m >40 0 0 2   Copper ppm ASTM D5185m >15 0 <1 1	Oil Changed		Client Info		Not Changd	N/A	N/A
Fuel	Sample Status				NORMAL	NORMAL	ABNORMAL
Water Glycol WC Method >0.2 NEG NEG NEG NEG   WEAR METALS method limit/base current history1 history1   Iron ppm ASTM D5185m >120 4 7 56   Chromium ppm ASTM D5185m >20 0 <1	CONTAMINATI	ON	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	2.2	<b>4.1</b>
WEAR METALS method limit/base current history1 history1   Iron ppm ASTM D5185m >120 4 7 56   Chromium ppm ASTM D5185m >20 0 <1	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 0 <1	WEAR METALS	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>120	4	7	56
Titanium ppm ASTM D5185m >2 0 0 <1   Silver ppm ASTM D5185m >2 0 <1	Chromium	ppm	ASTM D5185m	>20	0	<1	<1
Titanium ppm ASTM D5185m >2 0 0 <1   Silver ppm ASTM D5185m >2 0 <1	Nickel		ASTM D5185m	>5	0	1	5
Silver ppm ASTM D5185m >2 0 <1 0   Aluminum ppm ASTM D5185m >20 <1 2 8   Lead ppm ASTM D5185m >40 0 0 2   Copper ppm ASTM D5185m 3330 7 1 4   Tin ppm ASTM D5185m >15 0 <1 1   Vanadium ppm ASTM D5185m 0 0 <1 1   Vanadium ppm ASTM D5185m 0 0 <1 1   Cadmium ppm ASTM D5185m 0 15 17 49   Barium ppm ASTM D5185m 0 0 0 0 0   Barium ppm ASTM D5185m 0 0 66 54 69   Manganese ppm ASTM D5185m 1010 1041 834 336   Calcium ppm ASTM D5185m 1070	Titanium		ASTM D5185m	>2	0	0	<1
Aluminum	Silver		ASTM D5185m	>2	0	<1	0
Lead ppm ASTM D5185m >40 0 0 2   Copper ppm ASTM D5185m >330 7 1 4   Tin ppm ASTM D5185m >15 0 <1 1   Vanadium ppm ASTM D5185m 0 0 0 <1   Cadmium ppm ASTM D5185m 0 0 0 <1   ADDITIVES method limit/base current history1 history1   Boron ppm ASTM D5185m 0 0 0 0   Barium ppm ASTM D5185m 0 0 0 0   Molybdenum ppm ASTM D5185m 0 0 0 0 0   Magnesium ppm ASTM D5185m 0 0 <1 1   Magnesium ppm ASTM D5185m 1010 1041 834 336   Calcium ppm ASTM D5185m 1070 1172	Aluminum		ASTM D5185m	>20	<1	2	8
Copper ppm ASTM D5185m >330 7 1 4   Tin ppm ASTM D5185m >15 0 <1	Lead				0	0	2
Tin ppm ASTM D5185m >15 0 <1 1   Vanadium ppm ASTM D5185m 0 0 <1   Cadmium ppm ASTM D5185m 0 0 0   ADDITIVES method limit/base current history1 history1   Boron ppm ASTM D5185m 0 15 17 49   Barium ppm ASTM D5185m 0 0 0 0 0   Molybdenum ppm ASTM D5185m 60 66 54 69   Manganese ppm ASTM D5185m 0 0 <1 1   Magnesium ppm ASTM D5185m 1010 1041 834 336   Calcium ppm ASTM D5185m 1070 1172 987 1230   Phosphorus ppm ASTM D5185m 1270 1362 1150 986   Sulfur ppm ASTM D5185m 2060 4231	Copper		ASTM D5185m	>330	7	1	4
Vanadium ppm ASTM D5185m 0 0 <1   Cadmium ppm ASTM D5185m 0 0 0 0   ADDITIVES method limit/base current history1 history1   Boron ppm ASTM D5185m 0 15 17 49   Barium ppm ASTM D5185m 0 0 0 0   Molybdenum ppm ASTM D5185m 0 0 0 0   Manganese ppm ASTM D5185m 0 0 <1 1   Magnesium ppm ASTM D5185m 1010 1041 834 336   Calcium ppm ASTM D5185m 1070 1172 987 1230   Phosphorus ppm ASTM D5185m 1270 1362 1150 986   Sulfur ppm ASTM D5185m 2060 4231 2883 2778   CONTAMINANTS method limit/base current hist			ASTM D5185m	>15	0	<1	1
Cadmium ppm ASTM D5185m 0 0 0   ADDITIVES method limit/base current history1 history1   Boron ppm ASTM D5185m 0 15 17 49   Barium ppm ASTM D5185m 0 0 0 0   Molybdenum ppm ASTM D5185m 60 66 54 69   Manganese ppm ASTM D5185m 0 0 <1	Vanadium		ASTM D5185m		0	0	<1
ADDITIVES	Cadmium				0		0
Barium ppm ASTM D5185m 0 0 0 0   Molybdenum ppm ASTM D5185m 60 66 54 69   Manganese ppm ASTM D5185m 0 0 <1 1   Magnesium ppm ASTM D5185m 1010 1041 834 336   Calcium ppm ASTM D5185m 1070 1172 987 1230   Phosphorus ppm ASTM D5185m 1150 1142 951 760   Zinc ppm ASTM D5185m 1270 1362 1150 986   Sulfur ppm ASTM D5185m 2060 4231 2883 2778   CONTAMINANTS method limit/base current history1 history1   Silicon ppm ASTM D5185m >25 4 4 15   Sodium ppm ASTM D5185m >20 0 <1 2   Potassium ppm ASTM D5185m	ADDITIVES		method	limit/base	current	history1	history2
Barium ppm ASTM D5185m 0 0 0 0   Molybdenum ppm ASTM D5185m 60 66 54 69   Manganese ppm ASTM D5185m 0 0 <1	Boron	ppm	ASTM D5185m	0	15	17	49
Manganese ppm ASTM D5185m 0 0 <1 1   Magnesium ppm ASTM D5185m 1010 1041 834 336   Calcium ppm ASTM D5185m 1070 1172 987 1230   Phosphorus ppm ASTM D5185m 1150 1142 951 760   Zinc ppm ASTM D5185m 1270 1362 1150 986   Sulfur ppm ASTM D5185m 2060 4231 2883 2778   CONTAMINANTS method limit/base current history1 history1   Silicon ppm ASTM D5185m >25 4 4 15   Sodium ppm ASTM D5185m >20 0 <1	Barium		ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 1041 834 336   Calcium ppm ASTM D5185m 1070 1172 987 1230   Phosphorus ppm ASTM D5185m 1150 1142 951 760   Zinc ppm ASTM D5185m 1270 1362 1150 986   Sulfur ppm ASTM D5185m 2060 4231 2883 2778   CONTAMINANTS method limit/base current history1 history1   Silicon ppm ASTM D5185m >25 4 4 15   Sodium ppm ASTM D5185m >20 0 <1	Molybdenum	ppm	ASTM D5185m	60	66	54	69
Calcium ppm ASTM D5185m 1070 1172 987 1230   Phosphorus ppm ASTM D5185m 1150 1142 951 760   Zinc ppm ASTM D5185m 1270 1362 1150 986   Sulfur ppm ASTM D5185m 2060 4231 2883 2778   CONTAMINANTS method limit/base current history1 history1   Silicon ppm ASTM D5185m >25 4 4 15   Sodium ppm ASTM D5185m >20 0 <1	·	• •	ASTM D5185m	0	0	<1	1
Calcium ppm ASTM D5185m 1070 1172 987 1230   Phosphorus ppm ASTM D5185m 1150 1142 951 760   Zinc ppm ASTM D5185m 1270 1362 1150 986   Sulfur ppm ASTM D5185m 2060 4231 2883 2778   CONTAMINANTS method limit/base current history1 history1   Silicon ppm ASTM D5185m >25 4 4 15   Sodium ppm ASTM D5185m >20 0 <1	•		ASTM D5185m	1010	1041	834	336
Zinc ppm ASTM D5185m 1270 1362 1150 986   Sulfur ppm ASTM D5185m 2060 4231 2883 2778   CONTAMINANTS method limit/base current history1 history1   Silicon ppm ASTM D5185m >25 4 4 15   Sodium ppm ASTM D5185m >20 0 <1	-		ASTM D5185m	1070	1172	987	1230
Zinc ppm ASTM D5185m 1270 1362 1150 986   Sulfur ppm ASTM D5185m 2060 4231 2883 2778   CONTAMINANTS method limit/base current history1 history1   Silicon ppm ASTM D5185m >25 4 4 15   Sodium ppm ASTM D5185m >20 0 <1	Phosphorus		ASTM D5185m	1150	1142	951	760
Sulfur ppm ASTM D5185m 2060 4231 2883 2778   CONTAMINANTS method limit/base current history1 history1   Silicon ppm ASTM D5185m >25 4 4 15   Sodium ppm ASTM D5185m >20 0 <1 2 6   Potassium ppm ASTM D5185m >20 0 <1 2   INFRA-RED method limit/base current history1 history1   Soot % % *ASTM D7844 >4 0.1 0.4 1.7   Nitration Abs/cm *ASTM D7624 >20 4.9 6.1 9.2   Sulfation Abs/.1mm *ASTM D7415 >30 17.3 18.5 23.4   FLUID DEGRADATION method limit/base current history1 history1   Oxidation Abs/.1mm *ASTM D7414 >25 12.9 13.7 15.0			ASTM D5185m	1270	1362	1150	986
Silicon ppm ASTM D5185m >25 4 4 15   Sodium ppm ASTM D5185m 1 2 6   Potassium ppm ASTM D5185m >20 0 <1 2   INFRA-RED method limit/base current history1 history1 history1   Soot % % *ASTM D7844 >4 0.1 0.4 1.7   Nitration Abs/cm *ASTM D7624 >20 4.9 6.1 9.2   Sulfation Abs/.1mm *ASTM D7415 >30 17.3 18.5 23.4   FLUID DEGRADATION method limit/base current history1 history1 history1 history2   Oxidation Abs/.1mm *ASTM D7414 >25 12.9 13.7 15.0	Sulfur		ASTM D5185m	2060	4231	2883	2778
Sodium ppm ASTM D5185m 1 2 6   Potassium ppm ASTM D5185m >20 0 <1 2   INFRA-RED method limit/base current history1 history1   Soot % % *ASTM D7844 >4 0.1 0.4 1.7   Nitration Abs/cm *ASTM D7624 >20 4.9 6.1 9.2   Sulfation Abs/.1mm *ASTM D7415 >30 17.3 18.5 23.4   FLUID DEGRADATION method limit/base current history1 history1   Oxidation Abs/.1mm *ASTM D7414 >25 12.9 13.7 15.0	CONTAMINAN <sup>*</sup>	TS	method	limit/base	current	history1	history2
Sodium ppm ASTM D5185m 1 2 6   Potassium ppm ASTM D5185m >20 0 <1	Silicon	ppm	ASTM D5185m	>25	4	4	15
Potassium ppm ASTM D5185m >20 0 <1 2   INFRA-RED method limit/base current history1 history1   Soot % % *ASTM D7844 >4 0.1 0.4 1.7   Nitration Abs/cm *ASTM D7624 >20 4.9 6.1 9.2   Sulfation Abs/.1mm *ASTM D7415 >30 17.3 18.5 23.4   FLUID DEGRADATION method limit/base current history1 history1   Oxidation Abs/.1mm *ASTM D7414 >25 12.9 13.7 15.0	Sodium				1	2	6
Soot % % *ASTM D7844 >4 0.1 0.4 1.7   Nitration Abs/cm *ASTM D7624 >20 4.9 6.1 9.2   Sulfation Abs/.1mm *ASTM D7415 >30 17.3 18.5 23.4   FLUID DEGRADATION method limit/base current history1 history1 history1 history1   Oxidation Abs/.1mm *ASTM D7414 >25 12.9 13.7 15.0				>20		<1	
Nitration Abs/cm *ASTM D7624 >20 4.9 6.1 9.2   Sulfation Abs/.1mm *ASTM D7415 >30 17.3 18.5 23.4   FLUID DEGRADATION method limit/base current history1 history1 history1 history1   Oxidation Abs/.1mm *ASTM D7414 >25 12.9 13.7 15.0	INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm *ASTM D7624 >20 4.9 6.1 9.2   Sulfation Abs/.1mm *ASTM D7415 >30 17.3 18.5 23.4   FLUID DEGRADATION method limit/base current history1 history1 history1 history1   Oxidation Abs/.1mm *ASTM D7414 >25 12.9 13.7 15.0	Soot %	%	*ASTM D7844	>4	0.1	0.4	1.7
Sulfation Abs/.1mm *ASTM D7415 >30 17.3 18.5 23.4   FLUID DEGRADATION method limit/base current history1 history1   Oxidation Abs/.1mm *ASTM D7414 >25 12.9 13.7 15.0	Nitration	Abs/cm	*ASTM D7624	>20			9.2
Oxidation Abs/.1mm *ASTM D7414 >25 12.9 13.7 15.0							
	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	12.9	13.7	15.0
<b>Base Number (BN)</b> mg KOH/g ASTM D2896 9.8 <b>8.9</b> 8.6 4.6							



## **OIL ANALYSIS REPORT**







Laboratory Sample No.

: GFL0092431 Lab Number : 06139722 Unique Number : 10964530

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received **Tested** Diagnosed

: 05 Apr 2024 : 06 Apr 2024 : 07 Apr 2024 - Don Baldridge

Multiple Sites Montgomery, AL US 36108 Contact: RICHARD HATFIELD

rhatfield@gflenv.com

Test Package: FLEET (Additional Tests: KV40, VI) Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369.

 $^st$  - 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)

GFL Environmental - 172 - Montgomery-Alexander City-Tallahassee

T:

F: