

OIL ANALYSIS REPORT

⊤ Sai





929087-260320

Component

Diesel Engine

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

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

Fuel content negligible. There is no indication of any contamination in the oil.

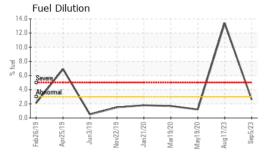
Fluid Condition

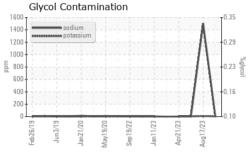
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

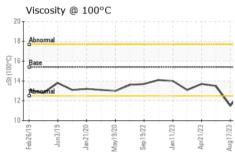
Sample Date Client Info 05 Sep 2023 17 Aug 2023 23 May 2023 23 May 2023 25 May 2023	170111 131140 (J,	eb2019 Juni	2019 Jan2020 May2020	Sep2022 Jan2023 Apr2023	Aug2023	
Sample Date Client Info 05 Sep 2023 17 Aug 2023 23 May 2023 23 May 2023 25 May 2023	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 25700 25597 25817 Oil Age hrs Client Info 600 0 0 0 Oil Changed Client Info Changed Not Changed Not Changed Not Changed Sample Status Image: Changed Status Image: Changed Status Image: Changed Status NoRMAL SEVERE NORMAL WEAR METALS method Ilmit/base current Inistory1 history2 Iron ppm ASTM D5185m >120 11 21 6 Chromium ppm ASTM D5185m >20 <1	Sample Number		Client Info		GFL0090658	GFL0090643	GFL0070163
Oil Age hrs Client Info 600 0 0 Oil Changed Client Info Changed Not Changd Act 1 </td <td>Sample Date</td> <td></td> <td>Client Info</td> <td></td> <th>05 Sep 2023</th> <td>17 Aug 2023</td> <td>23 May 2023</td>	Sample Date		Client Info		05 Sep 2023	17 Aug 2023	23 May 2023
Oil Changed Sample Status	Machine Age	hrs	Client Info		25700	25597	25817
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >120 11 21 6 Chromium ppm ASTM D5185m >20 <1	Oil Age	hrs	Client Info		600	0	0
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >120 11 21 6 Chromium ppm ASTM D5185m >20 <1	Oil Changed		Client Info		Changed	Not Changd	Not Changd
Part	Sample Status				NORMAL	SEVERE	NORMAL
Chromium ppm ASTM D5185m >20 <1 1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <td>WEAR METAL</td> <td>S</td> <td>method</td> <td>limit/base</td> <th>current</th> <td>history1</td> <td>history2</td>	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>120	11	21	6
Titanium ppm ASTM D5185m >2 0 0 <1 Silver ppm ASTM D5185m >2 0 0 <1 Aluminum ppm ASTM D5185m >20 4 4 2 Lead ppm ASTM D5185m >40 1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	Chromium	ppm	ASTM D5185m	>20	<1	1	<1
Silver	Nickel	ppm	ASTM D5185m	>5	<1	<1	<1
Aluminum	Titanium	ppm	ASTM D5185m	>2	0	0	<1
Lead ppm ASTM D5185m >40 1 <1 <1 <1 Copper ppm ASTM D5185m >330 1 18 1 Tin ppm ASTM D5185m >15 <1 <1 <1 <1 Vanadium ppm ASTM D5185m 0 0 0 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	Silver	ppm	ASTM D5185m	>2	0	0	<1
Copper ppm ASTM D5185m >330 1 18 1 Tin ppm ASTM D5185m >15 <1	Aluminum	ppm	ASTM D5185m	>20	4	4	2
Tin ppm ASTM D5185m > 15 <1 <1 <1 <1 <1	Lead	ppm	ASTM D5185m	>40	1	<1	<1
Vanadium ppm ASTM D5185m 0 0 <1 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 4 72 0 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 59 100 58 Manganese ppm ASTM D5185m 0 1 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 931 847 1000 Calcium ppm ASTM D5185m 1070 1175 939 1114 Phosphorus ppm ASTM D5185m 1270 1271 1160 1303 Sulfur ppm ASTM D5185m 1270 1271 1160 1303 Sulfur ppm ASTM D5185m 20 25	Copper	ppm	ASTM D5185m	>330	1	18	1
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 4 72 0 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 59 100 58 Manganese ppm ASTM D5185m 0 1 <1	Tin	ppm	ASTM D5185m	>15	<1	<1	<1
ADDITIVES	Vanadium	ppm	ASTM D5185m		0	0	<1
Boron ppm ASTM D5185m 0 4 72 0 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 60 59 100 58 Manganese ppm ASTM D5185m 1010 931 847 1000 Calcium ppm ASTM D5185m 1070 1175 939 11114 Phosphorus ppm ASTM D5185m 1150 1018 960 1069 Zinc ppm ASTM D5185m 1270 1271 1160 1303 Sulfur ppm ASTM D5185m 2060 3705 3568 3629 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m 20 2 8 2 Fuel % ASTM D5185m 20 2 3 8 2 Fuel % ASTM D5185m 20 2 3 8 2 Fuel % ASTM D5185m 20 2 3 8 2 Fuel % ASTM D5185m 20 2 3 8 2 Fuel % ASTM D5185m 20 2 3 8 2 Fuel % ASTM D5185m 20 2 3 8 2 Fuel % ASTM D5185m 20 2 3 8 2 Fuel % ASTM D5185m 20 3 3 0 3 0 4 Fuel % ASTM D5185m 20 3 3 0 3 0 4 Fuel % ASTM D5185m 20 3 3 0 3 0 4 Fuel % ASTM D5185m 20 3 3 0 3 0 4 Fuel % ASTM D5185m 20 3 3 0 3 3 0 4 Fuel % ASTM D5185m 20 3 3 0 3 3 0 4 Fuel % ASTM D5185m 20 3 3 0 3 3 0 4 Fuel % ASTM D5185m 20 3 3 3 0 3 3 0 4 Fuel % ASTM D5185m 20 3 3 0 3 3 0 4 Fuel % ASTM D5185m 20 3 3 0 3 3 0 4 Fuel % ASTM D5185m 20 3 0 3 3 0 4 Fuel % ASTM D5185m 20 3 0 3 3 0 4 Fuel % ASTM D5185m 20 3 0 3 3 0 4 Fuel % ASTM D5185m 20 3 0 3 0 4 Fuel % ASTM D5185m 20 3 0 3 0 4 Fuel % ASTM D5185m 20 3 0 3 0 4 Fuel % ASTM D5185m 20 3 0 3 0 4 Fuel % ASTM D5185m 20 3 0 3 0 4 Fuel % ASTM D5185m 20 3 0 3 0	Cadmium	ppm	ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 59 100 58 Manganese ppm ASTM D5185m 0 1 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 59 100 58 Manganese ppm ASTM D5185m 0 1 <1 <1 Magnesium ppm ASTM D5185m 1010 931 847 1000 Calcium ppm ASTM D5185m 1070 1175 939 1114 Phosphorus ppm ASTM D5185m 1150 1018 960 1069 Zinc ppm ASTM D5185m 1270 1271 1160 1303 Sulfur ppm ASTM D5185m 2060 3705 3568 3629 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 25 5 Sodium ppm ASTM D5185m >20 2 8 2 Fuel % ASTM D5185m >20 2.6 13.4 <1.0 Glycol % *ASTM D7844	Boron	ppm	ASTM D5185m	0	4	72	0
Manganese ppm ASTM D5185m 0 1 <1 <1 Magnesium ppm ASTM D5185m 1010 931 847 1000 Calcium ppm ASTM D5185m 1070 1175 939 1114 Phosphorus ppm ASTM D5185m 1150 1018 960 1069 Zinc ppm ASTM D5185m 1270 1271 1160 1303 Sulfur ppm ASTM D5185m 2060 3705 3568 3629 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 25 5 Sodium ppm ASTM D5185m >20 2 8 2 Fuel % ASTM D5185m >20 2.6 13.4 <1.0	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 931 847 1000 Calcium ppm ASTM D5185m 1070 1175 939 1114 Phosphorus ppm ASTM D5185m 1150 1018 960 1069 Zinc ppm ASTM D5185m 1270 1271 1160 1303 Sulfur ppm ASTM D5185m 2060 3705 3568 3629 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 25 5 Sodium ppm ASTM D5185m >20 2 8 2 Fuel % ASTM D5185m >20 2 8 2 Fuel % ASTM D5185m >20 2 8 2 Glycol *ASTM D5185m >3.0 2.6 13.4 <1.0	Molybdenum	ppm	ASTM D5185m	60	59	100	58
Calcium ppm ASTM D5185m 1070 1175 939 1114 Phosphorus ppm ASTM D5185m 1150 1018 960 1069 Zinc ppm ASTM D5185m 1270 1271 1160 1303 Sulfur ppm ASTM D5185m 2060 3705 3568 3629 CONTAMINANTS method limit/base current history1 history2 Solicon ppm ASTM D5185m >25 5 25 5 Sodium ppm ASTM D5185m >20 2 8 2 Fuel % ASTM D5185m >20 2 8 2 Fuel % ASTM D3524 >3.0 2.6 13.4 <1.0	Manganese	ppm	ASTM D5185m	0	1	<1	<1
Phosphorus ppm ASTM D5185m 1150 1018 960 1069 Zinc ppm ASTM D5185m 1270 1271 1160 1303 Sulfur ppm ASTM D5185m 2060 3705 3568 3629 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 25 5 Sodium ppm ASTM D5185m >20 2 8 2 Fuel % ASTM D5185m >20 2 8 2 Fuel % ASTM D5185m >20 2 8 2 Fuel % ASTM D5185m >20 2.6 13.4 <1.0	Magnesium	ppm	ASTM D5185m	1010	931	847	1000
Zinc ppm ASTM D5185m 1270 1271 1160 1303 Sulfur ppm ASTM D5185m 2060 3705 3568 3629 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 25 5 Sodium ppm ASTM D5185m 4 1503 4 Potassium ppm ASTM D5185m >20 2 8 2 Fuel % ASTM D5185m >20 2 8 2 Fuel % ASTM D5185m >20 2 8 2 Fuel % ASTM D5185m >20 2.6 13.4 <1.0	Calcium	ppm	ASTM D5185m	1070	1175	939	1114
Sulfur ppm ASTM D5185m 2060 3705 3568 3629 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 25 5 Sodium ppm ASTM D5185m 4 1503 4 Potassium ppm ASTM D5185m >20 2 8 2 Fuel % ASTM D5185m >20 2 8 2 Fuel % ASTM D5185m >20 2.6 13.4 <1.0	Phosphorus	ppm	ASTM D5185m	1150	1018	960	1069
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 25 5 Sodium ppm ASTM D5185m 4 1503 4 Potassium ppm ASTM D5185m >20 2 8 2 Fuel % ASTM D3524 >3.0 2.6 13.4 <1.0	Zinc	ppm	ASTM D5185m	1270	1271	1160	1303
Silicon ppm ASTM D5185m >25 5 △ 25 5 Sodium ppm ASTM D5185m 4 △ 1503 4 Potassium ppm ASTM D5185m >20 2 8 2 Fuel % ASTM D3524 >3.0 2.6 ♠ 13.4 <1.0 Glycol % *ASTM D2982 NEG ♠ 0.10 NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.8 0.3 0.4 Nitration Abs/cm *ASTM D7624 >20 10.7 9.8 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 21.4 17.7 19.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.9 13.2 15.4	Sulfur	ppm	ASTM D5185m	2060	3705	3568	3629
Sodium ppm ASTM D5185m 4 ▲ 1503 4 Potassium ppm ASTM D5185m >20 2 8 2 Fuel % ASTM D3524 >3.0 2.6 ♠ 13.4 <1.0	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 2 8 2 Fuel % ASTM D3524 >3.0 2.6 13.4 <1.0 Glycol % *ASTM D2982 NEG 0.10 NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.8 0.3 0.4 Nitration Abs/cm *ASTM D7624 >20 10.7 9.8 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 21.4 17.7 19.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.9 13.2 15.4	Silicon	ppm	ASTM D5185m	>25	5	<u>^</u> 25	5
Fuel % ASTM D3524 >3.0 2.6 13.4 <1.0 Glycol % *ASTM D2982 NEG 0.10 NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.8 0.3 0.4 Nitration Abs/cm *ASTM D7624 >20 10.7 9.8 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 21.4 17.7 19.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.9 13.2 15.4	Sodium		ASTM D5185m		4	<u>▲</u> 1503	4
Fuel % ASTM D3524 >3.0 2.6 ■ 13.4 <1.0 Glycol % *ASTM D2982 NEG ■ 0.10 NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.8 0.3 0.4 Nitration Abs/cm *ASTM D7624 >20 10.7 9.8 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 21.4 17.7 19.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.9 13.2 15.4	Potassium	ppm	ASTM D5185m	>20	2	8	2
INFRA-RED	Fuel	%	ASTM D3524	>3.0	2.6	13.4	<1.0
Soot % *ASTM D7844 >4 0.8 0.3 0.4 Nitration Abs/cm *ASTM D7624 >20 10.7 9.8 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 21.4 17.7 19.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.9 13.2 15.4	Glycol	%	*ASTM D2982		NEG	0.10	NEG
Nitration Abs/cm *ASTM D7624 >20 10.7 9.8 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 21.4 17.7 19.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.9 13.2 15.4	INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm *ASTM D7624 >20 10.7 9.8 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 21.4 17.7 19.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.9 13.2 15.4	Soot %	%	*ASTM D7844	>4	0.8	0.3	0.4
Sulfation Abs/.1mm *ASTM D7415 >30 21.4 17.7 19.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.9 13.2 15.4				>20			
Oxidation Abs/.1mm *ASTM D7414 >25 17.9 13.2 15.4							
	FLUID DEGRA	OATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	17.9	13.2	15.4
	Base Number (BN)	mg KOH/g			7.2	12.7	8.6

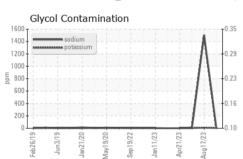


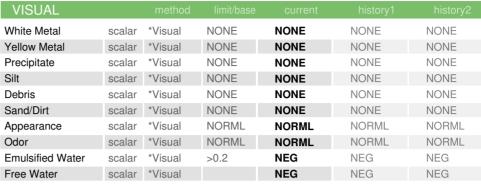
OIL ANALYSIS REPORT





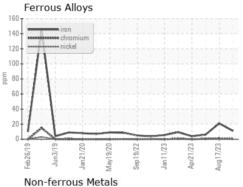


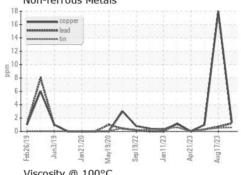


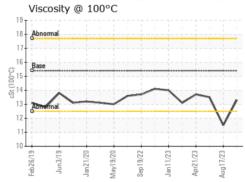


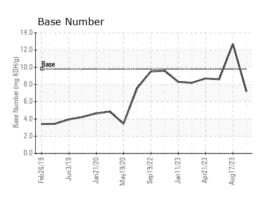
FLUID PROPE	RTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.3	▲ 11.5	13.5

GRAPHS













Certificate L2367

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

: GFL0090658 : 05946885 : 10642844

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 11 Sep 2023

Diagnosed : 13 Sep 2023 Diagnostician : Jonathan Hester

Test Package : FLEET (Additional Tests: PercentFuel) 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. Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

GFL Environmental - 837 - Harrison TS

22820 S State Route 291 Harrisonville, MO

US 64701 Contact: BRYAN SWANSON

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T: F: