

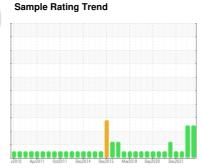
OIL ANALYSIS REPORT



Component

Diesel Engine

PETRO CANADA DURON SHP 15W40 (9 GAL)





DIAGNOSIS

Recommendation

We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress.

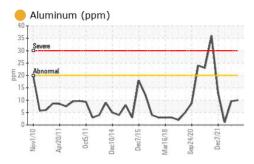
Fluid Condition

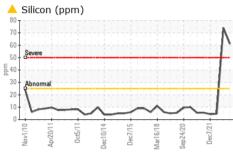
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

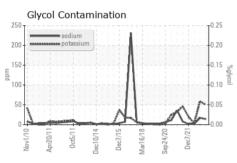
Sample Date Client Info 21 Mar 2024 Machine Age hrs Client Info 2098 20 20 Mage hrs Client Info 2098 20 Mage Machine Age hrs Client Info 382		
Sample Date Client Info 21 Mar 2024 1 Mar 2024	history1	history2
Machine Age hrs Client Info 2098 2 Oil Age hrs Client Info 382 3 Oil Changed Client Info Changed N Sample Status Imit Info Changed N CONTAMINATION Method 3.0 <1.0	GFL0074613	GFL0072044
Oil Age hrs Client Info 382 382 Oil Changed Client Info Changed Nample Status ATTENTION	17 Jan 2024	17 Oct 2023
Oil Changed Sample Status Client Info Changed ATTENTION CONTAMINATION method limit/base current Fuel WC Method >3.0 <1.0	2020	229387
ATTENTION ATT	304	0
CONTAMINATION	Not Changd	N/A
Water	ABNORMAL	NORMAL
Water WC Method >0.2 NEG WEAR METALS method limit/base current Iron ppm ASTM D5185m >130 93 Chromium ppm ASTM D5185m >10 2 Nickel ppm ASTM D5185m >4 <1	history1	history2
WEAR METALS	<1.0	<1.0
Iron	NEG	NEG
Chromium ppm ASTM D5185m >10 2 Nickel ppm ASTM D5185m >4 <1	history1	history2
Nickel	△ 105	<1
Titanium ppm ASTM D5185m >2 0 Silver ppm ASTM D5185m >2 0 Aluminum ppm ASTM D5185m >20 10 Lead ppm ASTM D5185m >20 3 Copper ppm ASTM D5185m >20 3 Copper ppm ASTM D5185m >4 1 Antimony ppm ASTM D5185m 0 0 Vanadium ppm ASTM D5185m 0 0 Cadmium ppm ASTM D5185m 0 0 ADDITIVES method limit/base current Boron ppm ASTM D5185m 0 15 Barium ppm ASTM D5185m 0 0 Molybdenum ppm ASTM D5185m 0 1 Magnesium ppm ASTM D5185m 0 1 Magnesium ppm ASTM D5185m 1070 1217 Phosphorus ppm<	2	0
Silver ppm ASTM D5185m >2 0 Aluminum ppm ASTM D5185m >20 10 Lead ppm ASTM D5185m >20 3 Copper ppm ASTM D5185m >125 67 Tin ppm ASTM D5185m >4 1 Antimony ppm ASTM D5185m 0 0 Vanadium ppm ASTM D5185m 0 0 Cadmium ppm ASTM D5185m 0 0 ADDITIVES method limit/base current Boron ppm ASTM D5185m 0 0 ADDITIVES method limit/base current Boron ppm ASTM D5185m 0 0 ADDITIVES method limit/base current Boron ppm ASTM D5185m 0 0 Molybdenum ppm ASTM D5185m 0 0 Magnesium ppm ASTM D5185m	<1	0
Aluminum ppm ASTM D5185m >20 10 Lead ppm ASTM D5185m >20 3 Copper ppm ASTM D5185m >125 67 Tin ppm ASTM D5185m >4 1 Antimony ppm ASTM D5185m Vanadium ppm ASTM D5185m 0 Vanadium ppm ASTM D5185m 0 0 O O Cadmium ppm ASTM D5185m 0 0 O	0	<1
Lead ppm ASTM D5185m >20 3 Copper ppm ASTM D5185m >125 67 Tin ppm ASTM D5185m >4 1 Antimony ppm ASTM D5185m 0 0 Vanadium ppm ASTM D5185m 0 0 Cadmium ppm ASTM D5185m 0 0 Cadmium ppm ASTM D5185m 0 0 ADDITIVES method limit/base current Boron ppm ASTM D5185m 0 0 ADDITIVES method limit/base current Boron ppm ASTM D5185m 0 0 ADDITIVES method limit/base current Boron ppm ASTM D5185m 0 0 Molybdenum ppm ASTM D5185m 0 0 1 Magnesium ppm ASTM D5185m 1010 956 1217 Phosphorus	0	0
Copper ppm ASTM D5185m >125 67 Tin ppm ASTM D5185m >4 1 Antimony ppm ASTM D5185m Vanadium ppm ASTM D5185m 0 Cadmium ppm ASTM D5185m 0 ADDITIVES method limit/base current Boron ppm ASTM D5185m 0 0 ABarium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 Magnesium ppm ASTM D5185m 0 1 1 0 956 0 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 1 0 1 1 0 1 1 1 0 1 <td< td=""><td>10</td><td>1</td></td<>	10	1
Tin ppm ASTM D5185m >-4 1 Antimony ppm ASTM D5185m 0 Cadmium ppm ASTM D5185m 0 Cadmium ppm ASTM D5185m 0 ADDITIVES method limit/base current Boron ppm ASTM D5185m 0 15 Barium ppm ASTM D5185m 0 0 Molybdenum ppm ASTM D5185m 0 1 Magnesium ppm ASTM D5185m 0 1 Magnesium ppm ASTM D5185m 0 1 Magnesium ppm ASTM D5185m 1010 956 Calcium ppm ASTM D5185m 1070 1217 Phosphorus ppm ASTM D5185m 1070 1217 Phosphorus ppm ASTM D5185m 1150 1032 Zinc ppm ASTM D5185m 1270 1271 Sulfur ppm ASTM D5185m 2060 3466 CONTAMINANTS method limit/base current Silicon ppm ASTM D5185m 2060 3466 CONTAMINANTS method limit/base current Silicon ppm ASTM D5185m >-25 ▲ 61 Sodium ppm ASTM D5185m >-20 50 Glycol % *ASTM D5185m >-20 50 Glycol % *ASTM D5185m >-20 50 INFRA-RED method limit/base current Soot % % *ASTM D7844 >-6 1.2 Nitration Abs/.1mm *ASTM D7415 >-30 20.2	3	0
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Vanadium ppm ASTM D5185m 0 Cadmium ppm ASTM D5185m 0 ADDITIVES method limit/base current Boron ppm ASTM D5185m 0 15 Barium ppm ASTM D5185m 0 0 Molybdenum ppm ASTM D5185m 0 1 Magnesium ppm ASTM D5185m 0 1 Magnesium ppm ASTM D5185m 1010 956 Calcium ppm ASTM D5185m 1070 1217 Phosphorus ppm ASTM D5185m 1150 1032 Zinc ppm ASTM D5185m 1270 1271 Sulfur ppm ASTM D5185m 2060 3466 CONTAMINANTS method limit/base current Silicon ppm ASTM D5185m >25 61 Sodium ppm ASTM D5185m >20 50 Glycol *ASTM D5185m >2	3	0
Vanadium ppm ASTM D5185m 0 Cadmium ppm ASTM D5185m 0 ADDITIVES method limit/base current Boron ppm ASTM D5185m 0 15 Barium ppm ASTM D5185m 0 0 Molybdenum ppm ASTM D5185m 0 1 Magnesium ppm ASTM D5185m 0 1 Magnesium ppm ASTM D5185m 1010 956 Calcium ppm ASTM D5185m 1070 1217 Phosphorus ppm ASTM D5185m 1150 1032 Zinc ppm ASTM D5185m 1270 1271 Sulfur ppm ASTM D5185m 2060 3466 CONTAMINANTS method limit/base current Silicon ppm ASTM D5185m >25 61 Sodium ppm ASTM D5185m >20 50 Glycol *ASTM D5185m >2		
Cadmium ppm ASTM D5185m 0 ADDITIVES method limit/base current Boron ppm ASTM D5185m 0 15 Barium ppm ASTM D5185m 0 0 Molybdenum ppm ASTM D5185m 0 1 Magnesium ppm ASTM D5185m 0 1 Magnesium ppm ASTM D5185m 1010 956 Calcium ppm ASTM D5185m 1070 1217 Phosphorus ppm ASTM D5185m 1150 1032 Zinc ppm ASTM D5185m 1270 1271 Sulfur ppm ASTM D5185m 2060 3466 CONTAMINANTS method limit/base current Silicon ppm ASTM D5185m >25 61 Sodium ppm ASTM D5185m >20 50 Glycol % *ASTM D5185m >20 50 INFRA-RED <t< td=""><td><1</td><td><1</td></t<>	<1	<1
Boron ppm ASTM D5185m 0 15 Barium ppm ASTM D5185m 0 0 Molybdenum ppm ASTM D5185m 60 66 Manganese ppm ASTM D5185m 0 1 Magnesium ppm ASTM D5185m 1010 956 Calcium ppm ASTM D5185m 1070 1217 Phosphorus ppm ASTM D5185m 1150 1032 Zinc ppm ASTM D5185m 1270 1271 Sulfur ppm ASTM D5185m 2060 3466 CONTAMINANTS method limit/base current Silicon ppm ASTM D5185m >25 61 Sodium ppm ASTM D5185m >20 50 Glycol % *ASTM D5185m >20 50 Glycol % *ASTM D7824 >6 1.2 NFRA-RED method limit/base current Soot	0	0
Barium ppm ASTM D5185m 0 0 Molybdenum ppm ASTM D5185m 60 66 Manganese ppm ASTM D5185m 0 1 Magnesium ppm ASTM D5185m 1010 956 Calcium ppm ASTM D5185m 1070 1217 Phosphorus ppm ASTM D5185m 1150 1032 Zinc ppm ASTM D5185m 1270 1271 Sulfur ppm ASTM D5185m 2060 3466 CONTAMINANTS method limit/base current Silicon ppm ASTM D5185m >25 ▲ 61 Sodium ppm ASTM D5185m >20 50 Glycol % *ASTM D5185m >20 50 Glycol % *ASTM D782m NEG INFRA-RED method limit/base current Soot % % *ASTM D7624 >20 8.7 Sulfatio	history1	history2
Molybdenum ppm ASTM D5185m 60 66 Manganese ppm ASTM D5185m 0 1 Magnesium ppm ASTM D5185m 1010 956 Calcium ppm ASTM D5185m 1070 1217 Phosphorus ppm ASTM D5185m 1150 1032 Zinc ppm ASTM D5185m 1270 1271 Sulfur ppm ASTM D5185m 2060 3466 CONTAMINANTS method limit/base current Soliicon ppm ASTM D5185m >25 ▲ 61 Sodium ppm ASTM D5185m >20 50 Glycol % *ASTM D5185m >20 50 Glycol % *ASTM D2982 NEG INFRA-RED method limit/base current Soot % % *ASTM D7624 >20 8.7 Sulfation Abs/:1mm *ASTM D76145 >30 20.2	20	2
Manganese ppm ASTM D5185m 0 1 Magnesium ppm ASTM D5185m 1010 956 Calcium ppm ASTM D5185m 1070 1217 Phosphorus ppm ASTM D5185m 1150 1032 Zinc ppm ASTM D5185m 1270 1271 Sulfur ppm ASTM D5185m 2060 3466 CONTAMINANTS method limit/base current Silicon ppm ASTM D5185m >25 ▲ 61 Sodium ppm ASTM D5185m >20 50 Glycol % *ASTM D5185m >20 50 Glycol % *ASTM D2982 NEG INFRA-RED method limit/base current Soot % % *ASTM D7844 >6 1.2 Nitration Abs/cm *ASTM D7624 >20 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.2 <	<1	0
Magnesium ppm ASTM D5185m 1010 956 Calcium ppm ASTM D5185m 1070 1217 Phosphorus ppm ASTM D5185m 1150 1032 Zinc ppm ASTM D5185m 1270 1271 Sulfur ppm ASTM D5185m 2060 3466 CONTAMINANTS method limit/base current Silicon ppm ASTM D5185m >25 ▲ 61 ✓ Sodium ppm ASTM D5185m >20 50 Glycol NEG INFRA-RED method limit/base current Soot % % *ASTM D7844 >6 1.2 Nitration Abs/cm *ASTM D7624 >20 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.2	69	60
Calcium ppm ASTM D5185m 1070 1217 Phosphorus ppm ASTM D5185m 1150 1032 Zinc ppm ASTM D5185m 1270 1271 Sulfur ppm ASTM D5185m 2060 3466 CONTAMINANTS method limit/base current Silicon ppm ASTM D5185m >25 ▲ 61 Sodium ppm ASTM D5185m >20 50 Glycol % *ASTM D5185m >20 50 Glycol % *ASTM D2982 NEG INFRA-RED method limit/base current Soot % % *ASTM D7844 >6 1.2 Nitration Abs/cm *ASTM D7624 >20 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.2	2	0
Calcium ppm ASTM D5185m 1070 1217 Phosphorus ppm ASTM D5185m 1150 1032 Zinc ppm ASTM D5185m 1270 1271 Sulfur ppm ASTM D5185m 2060 3466 CONTAMINANTS method limit/base current Silicon ppm ASTM D5185m >25 ▲ 61 Sodium ppm ASTM D5185m >20 50 Glycol % *ASTM D5185m >20 50 Glycol % *ASTM D2982 NEG INFRA-RED method limit/base current Soot % % *ASTM D7844 >6 1.2 Nitration Abs/cm *ASTM D7624 >20 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.2	987	1000
Zinc ppm ASTM D5185m 1270 1271 Sulfur ppm ASTM D5185m 2060 3466 CONTAMINANTS method limit/base current Silicon ppm ASTM D5185m >25 ▲ 61 Sodium ppm ASTM D5185m 14 Potassium ppm ASTM D5185m >20 50 Glycol % *ASTM D2982 NEG INFRA-RED method limit/base current Soot % % *ASTM D7844 >6 1.2 Nitration Abs/cm *ASTM D7624 >20 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.2	1127	1101
Zinc ppm ASTM D5185m 1270 1271 Sulfur ppm ASTM D5185m 2060 3466 CONTAMINANTS method limit/base current Silicon ppm ASTM D5185m >25 ▲ 61 Sodium ppm ASTM D5185m 14 Potassium ppm ASTM D5185m >20 50 Glycol % *ASTM D2982 NEG INFRA-RED method limit/base current Soot % % *ASTM D7844 >6 1.2 Nitration Abs/cm *ASTM D7624 >20 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.2	1025	1047
Sulfur ppm ASTM D5185m 2060 3466 CONTAMINANTS method limit/base current Silicon ppm ASTM D5185m >25 ▲ 61 Sodium ppm ASTM D5185m >20 50 Glycol % *ASTM D5185m >20 50 Glycol % *ASTM D2982 NEG INFRA-RED method limit/base current Soot % % *ASTM D7844 >6 1.2 Nitration Abs/cm *ASTM D7624 >20 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.2	1272	1306
Silicon ppm ASTM D5185m >25 ♠ 61 Sodium ppm ASTM D5185m 14 Potassium ppm ASTM D5185m >20 50 Glycol % *ASTM D2982 NEG INFRA-RED method limit/base current Soot % % *ASTM D7844 >6 1.2 Nitration Abs/cm *ASTM D7624 >20 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.2	3092	3271
Sodium ppm ASTM D5185m 14 Potassium ppm ASTM D5185m >20 50 Glycol % *ASTM D2982 NEG INFRA-RED method limit/base current Soot % % *ASTM D7844 >6 1.2 Nitration Abs/cm *ASTM D7624 >20 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.2	history1	history2
Potassium ppm ASTM D5185m >20 50 Glycol % *ASTM D2982 NEG INFRA-RED method limit/base current Soot % % *ASTM D7844 >6 1.2 Nitration Abs/cm *ASTM D7624 >20 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.2	<u>^</u> 74	5
Potassium ppm ASTM D5185m >20 50 Glycol % *ASTM D2982 NEG INFRA-RED method limit/base current Soot % % *ASTM D7844 >6 1.2 Nitration Abs/cm *ASTM D7624 >20 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.2	17	2
Glycol % *ASTM D2982 NEG INFRA-RED method limit/base current Soot % % *ASTM D7844 >6 1.2 Nitration Abs/cm *ASTM D7624 >20 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.2	59	3
Soot % % *ASTM D7844 >6 1.2 Nitration Abs/cm *ASTM D7624 >20 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.2	0.0	NEG
Nitration Abs/cm *ASTM D7624 >20 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.2	history1	history2
Nitration Abs/cm *ASTM D7624 >20 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.2	1.3	0.1
Sulfation Abs/.1mm *ASTM D7415 >30 20.2	9.0	4.1
FILLID DECDARATION	20.8	16.6
FLUID DEGRADATION method limit/base current	history1	history2
Oxidation	15.7	12.1
Base Number (BN) mg KOH/g ASTM D2896 9.8 7.8	8.1	9.2

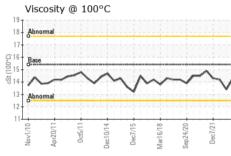


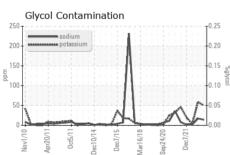
OIL ANALYSIS REPORT









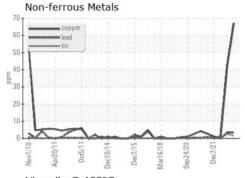


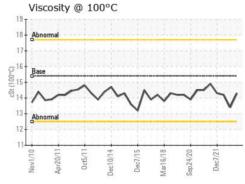
VISUAL						
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	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

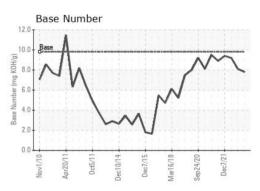
FLUID PROPERTIES							
Visc @ 100°C	cSt	ASTM D445	15.4	14.3	13.4	14.2	

GRAPHS

Ferrous Alloys 120 80 E 60 40









Laboratory Sample No.

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

: GFL0114500 **Lab Number** : 06127542 Unique Number: 10941693

Received **Tested**

Diagnosed

: 27 Mar 2024 : 27 Mar 2024 - Jonathan Hester

: 25 Mar 2024

GFL Environmental - 094 - Cedartown

2097 Buchanan Highway Cedartown, GA US 30125

Contact: WILLIAM FOSTER william.foster@gflenv.com T: (800)207-6618

Test Package: FLEET (Additional Tests: Glycol) 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)

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