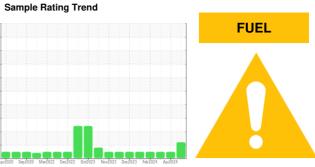


OIL ANALYSIS REPORT

ODT





Machine Id **720022-310085**

Diesel Engine

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

DIAGNOSIS

Recommendation

The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

Wear

All component wear rates are normal.

Contamination

There is a moderate amount of fuel present in the oil. Tests confirm the presence of fuel in the oil.

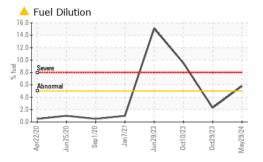
Fluid Condition

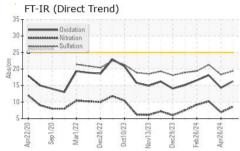
The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

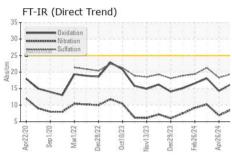
Sample Date Client Info 29 May 2024 26 Apr 2024 05 Apr 2024 Machine Age hrs Client Info 11711 11497 17352 Oil Age hrs Client Info 600 0 Not Changed North Changed Nor	N SHP 15W4U (
Sample Date	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 11711 11497 17352 Oil Age hrs Client Info 600 0 0 Oil Changed Client Info Changed Not Changd Not Changd Sample Status Method Imitibase current history1 history2 Water WC Method >0.2 NEG NEG NEG Glycol WC Method Imitibase current history1 history2 Iron ppm ASTM D5185m >80 37 26 24 Chromium ppm ASTM D5185m >5 3 1 2 Nickel ppm ASTM D5185m >2 <1	Sample Number		Client Info		GFL0120158	GFL0117204	GFL0114054
Oil Age hrs Client Info 600 0 0 Oil Changed Sample Status Client Info Changed ABNORMAL Not Changd Not Changd Not Changd NoRMAL Not Changd NoRMAL	Sample Date		Client Info		29 May 2024	26 Apr 2024	05 Apr 2024
Colient Info	Machine Age	hrs	Client Info		11711	11497	17352
ABNORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2	Oil Age	hrs	Client Info		600	0	0
CONTAMINATION method limit/base current history1 history2 Water WC Method NEG NEG NEG NEG Glycol WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >80 37 26 24 Chromium ppm ASTM D5185m >5 3 1 2 Chromium ppm ASTM D5185m >5 3 1 2 Nickel ppm ASTM D5185m >30 -1 0 <1	Oil Changed		Client Info		Changed	Not Changd	Not Changd
Water WC Method >0.2 NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >80 37 26 24 Chromium ppm ASTM D5185m >5 3 1 2 Nickel ppm ASTM D5185m >2 <1 0 <1 Silver ppm ASTM D5185m >2 <1 0 <1 Silver ppm ASTM D5185m >30 <1 <1 1 Silver ppm ASTM D5185m >30 <1 <1 1 Copper ppm ASTM D5185m >30 <1 <1 1 Vanadium ppm ASTM D5185m >5 <1 <1 1 Vanadium ppm ASTM D5185m 0 0 <1 1 ADDITIVES method limit/base current history1	Sample Status				ABNORMAL	NORMAL	NORMAL
Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >80 37 26 24 Chromium ppm ASTM D5185m >5 3 1 2 Nickel ppm ASTM D5185m >2 -1 0 <1 Silver ppm ASTM D5185m >3 -1 0 <1 Aluminum ppm ASTM D5185m >30 6 3 4 Lead ppm ASTM D5185m >30 <1 <1 1 Copper ppm ASTM D5185m >5 <1 <1 1 Capper ppm ASTM D5185m 0 2 0 4 Capper ppm ASTM D5185m 0 0 0 <1 Capper ppm ASTM D5185m 0 3 <1 <1 1	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >80 37 26 24 Chromium ppm ASTM D5185m >5 3 1 2 Nickel ppm ASTM D5185m >2 <1	Water		WC Method	>0.2	NEG	NEG	NEG
Concord Con	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >5 3 1 2 Nickel ppm ASTM D5185m >2 <1 0 <1 Titianium ppm ASTM D5185m >2 <1 0 <1 Siliver ppm ASTM D5185m >3 <1 0 <1 Aluminum ppm ASTM D5185m >30 6 3 4 Lead ppm ASTM D5185m >30 <1 <1 1 Copper ppm ASTM D5185m >5 <1 <1 1 Vanadium ppm ASTM D5185m 0 0 0 <1 Vanadium ppm ASTM D5185m 0 0 0 <1 Cadmium ppm ASTM D5185m 0 0 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 <1 0	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>80	37	26	24
STIM D5185m STM D5185m S	Chromium	ppm	ASTM D5185m	>5	3	1	2
Silver	Nickel	ppm	ASTM D5185m	>2	<1	0	<1
Aluminum ppm ASTM D5185m >30 6 3 4 Lead ppm ASTM D5185m >30 <1 <1 1 Copper ppm ASTM D5185m >150 2 0 4 Tin ppm ASTM D5185m >5 <1 <1 1 Vanadium ppm ASTM D5185m >5 <1 <1 1 Cadmium ppm ASTM D5185m 0 0 0 <1 Cadmium ppm ASTM D5185m 0 0 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 <1 3 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 1 Magnesium ppm ASTM D5185m 0 0 1 Magnesium ppm ASTM D5185m 0 0 1 Magnesium ppm ASTM D5185m 1010 869 981 967 Calcium ppm ASTM D5185m 1070 11117 1258 1209 Phosphorus ppm ASTM D5185m 1150 1027 11116 1059 Zinc ppm ASTM D5185m 1270 1169 1377 1284 Sulfur ppm ASTM D5185m 2060 3038 3890 3315 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 18 14 8 Sodium ppm ASTM D5185m >20 10 0 3 Fuel % ASTM D5185m >30 10 0 10 0 3 Fuel % ASTM D5185m >30 10 0 10 0 3 Fuel % AST	Titanium	ppm	ASTM D5185m		<1	0	<1
Lead ppm ASTM D5185m >30 <1 <1 1 Copper ppm ASTM D5185m >150 2 0 4 Tin ppm ASTM D5185m >5 <1 <1 1 Vanadium ppm ASTM D5185m 0 0 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 <1 3 Barium ppm ASTM D5185m 0 <1 0 0 Molybdenum ppm ASTM D5185m 0 <1 0 0 Magnesium ppm ASTM D5185m 0 <1 0 1 Magnesium ppm ASTM D5185m 100 1117 1258 120 Calcium ppm ASTM D5185m 1070 1117 1258 120 Zinc ppm ASTM D5185m 1270 1169 <t< td=""><td>Silver</td><td>ppm</td><td>ASTM D5185m</td><td>>3</td><td><1</td><td>0</td><td>0</td></t<>	Silver	ppm	ASTM D5185m	>3	<1	0	0
Copper ppm ASTM D5185m >150 2 0 4 Tin ppm ASTM D5185m >5 <1	Aluminum	ppm	ASTM D5185m	>30	6	3	4
Trin	Lead	ppm	ASTM D5185m	>30	<1	<1	1
Vanadium ppm ASTM D5185m 0 0 <1 Cadmium ppm ASTM D5185m 0 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 <1 3 Barium ppm ASTM D5185m 0 <1 0 0 Molybdenum ppm ASTM D5185m 0 <1 0 1 Manganese ppm ASTM D5185m 0 <1 0 1 Magnesium ppm ASTM D5185m 1010 869 981 967 Calcium ppm ASTM D5185m 1070 1117 1258 1209 Phosphorus ppm ASTM D5185m 1070 1169 1377 1284 Sulfur ppm ASTM D5185m 1270 1169 1377 1284 Sulfur ppm ASTM D5185m 2060 3038 3890	Copper	ppm	ASTM D5185m	>150	2	0	4
Cadmium ppm ASTM D5185m 0 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 <1 3 Barium ppm ASTM D5185m 0 <1 0 0 Molybdenum ppm ASTM D5185m 60 59 61 63 Manganese ppm ASTM D5185m 0 <1 0 1 Magnesium ppm ASTM D5185m 1010 869 981 967 Calcium ppm ASTM D5185m 1070 1117 1258 1209 Phosphorus ppm ASTM D5185m 1270 1169 1377 1284 Sulfur ppm ASTM D5185m 2060 3038 3890 3315 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 18<	Tin	ppm	ASTM D5185m	>5	<1	<1	1
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 <1	Vanadium	ppm	ASTM D5185m		0	0	<1
Boron	Cadmium	ppm	ASTM D5185m		0	0	<1
Barium ppm ASTM D5185m 0 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 59 61 63 Manganese ppm ASTM D5185m 0 <1 0 1 Magnesium ppm ASTM D5185m 1010 869 981 967 Calcium ppm ASTM D5185m 1070 1117 1258 1209 Phosphorus ppm ASTM D5185m 1150 1027 1116 1059 Zinc ppm ASTM D5185m 1270 1169 1377 1284 Sulfur ppm ASTM D5185m 2060 3038 3890 3315 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 18 14 8 Sodium ppm ASTM D5185m 5 9 6 Potassium ppm ASTM D5185m >20 10 0 3 Fuel % ASTM D7844 >3 <td>Boron</td> <td>ppm</td> <td>ASTM D5185m</td> <td>0</td> <td>3</td> <td><1</td> <td>3</td>	Boron	ppm	ASTM D5185m	0	3	<1	3
Manganese ppm ASTM D5185m 0 <1 0 1 Magnesium ppm ASTM D5185m 1010 869 981 967 Calcium ppm ASTM D5185m 1070 1117 1258 1209 Phosphorus ppm ASTM D5185m 1150 1027 1116 1059 Zinc ppm ASTM D5185m 1270 1169 1377 1284 Sulfur ppm ASTM D5185m 2060 3038 3890 3315 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 18 14 8 Sodium ppm ASTM D5185m >20 10 0 3 Fuel % ASTM D5185m >20 10 0 3 Fuel % ASTM D5185m >20 10 0 3 Fuel % ASTM D5185m <td< td=""><td></td><td>ppm</td><td>ASTM D5185m</td><td>0</td><td><1</td><td>0</td><td>0</td></td<>		ppm	ASTM D5185m	0	<1	0	0
Magnesium ppm ASTM D5185m 1010 869 981 967 Calcium ppm ASTM D5185m 1070 1117 1258 1209 Phosphorus ppm ASTM D5185m 1150 1027 1116 1059 Zinc ppm ASTM D5185m 1270 1169 1377 1284 Sulfur ppm ASTM D5185m 2060 3038 3890 3315 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 18 14 8 Sodium ppm ASTM D5185m >20 10 0 3 Fuel % ASTM D5185m >20 10 0 3 Fuel % ASTM D5185m >20 10 0 3 Fuel % ASTM D5185m >20 10 0 3 Soot % % *ASTM D7844 >3	Molybdenum	ppm	ASTM D5185m	60	59	61	63
Calcium ppm ASTM D5185m 1070 1117 1258 1209 Phosphorus ppm ASTM D5185m 1150 1027 1116 1059 Zinc ppm ASTM D5185m 1270 1169 1377 1284 Sulfur ppm ASTM D5185m 2060 3038 3890 3315 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 18 14 8 Sodium ppm ASTM D5185m >20 10 0 3 Fotassium ppm ASTM D5185m >20 10 0 3 Fuel % ASTM D3524 >5 ▲ 5.8 <1.0	Manganese	ppm	ASTM D5185m	0	<1	0	1
Phosphorus ppm ASTM D5185m 1150 1027 1116 1059 Zinc ppm ASTM D5185m 1270 1169 1377 1284 Sulfur ppm ASTM D5185m 2060 3038 3890 3315 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 18 14 8 Sodium ppm ASTM D5185m >20 10 0 3 Fuel % ASTM D5185m >20 10 0 3 Fuel % ASTM D3524 >5 ▲ 5.8 <1.0	Magnesium	ppm	ASTM D5185m	1010	869	981	967
Zinc ppm ASTM D5185m 1270 1169 1377 1284 Sulfur ppm ASTM D5185m 2060 3038 3890 3315 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 18 14 8 Sodium ppm ASTM D5185m 5 9 6 Potassium ppm ASTM D5185m >20 10 0 3 Fuel % ASTM D3524 >5 ▲ 5.8 <1.0	Calcium	ppm	ASTM D5185m	1070	1117	1258	1209
Sulfur ppm ASTM D5185m 2060 3038 3890 3315 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 18 14 8 Sodium ppm ASTM D5185m 5 9 6 Potassium ppm ASTM D5185m >20 10 0 3 Fuel % ASTM D5185m >20 10 0 3 Soot % % *ASTM D7844 >3 0.5 0.3 0.9 Nitration Abs/cm *ASTM D7624 >20 8.6 6.9 10.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 <	Phosphorus	ppm	ASTM D5185m	1150	1027	1116	1059
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 18 14 8 Sodium ppm ASTM D5185m 5 9 6 Potassium ppm ASTM D5185m >20 10 0 3 Fuel % ASTM D3524 >5 ▲ 5.8 <1.0	Zinc	ppm	ASTM D5185m	1270	1169	1377	1284
Silicon ppm ASTM D5185m >20 18 14 8 Sodium ppm ASTM D5185m 5 9 6 Potassium ppm ASTM D5185m >20 10 0 3 Fuel % ASTM D3524 >5 5.8 <1.0 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.5 0.3 0.9 Nitration Abs/cm *ASTM D7624 >20 8.6 6.9 10.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 18.3 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.3 14.3 18.1	Sulfur	ppm	ASTM D5185m	2060	3038	3890	3315
Sodium ppm ASTM D5185m 5 9 6 Potassium ppm ASTM D5185m >20 10 0 3 Fuel % ASTM D3524 >5 ▲ 5.8 <1.0	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 10 0 3 Fuel % ASTM D3524 >5 ▲ 5.8 <1.0 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.5 0.3 0.9 Nitration Abs/cm *ASTM D7624 >20 8.6 6.9 10.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 18.3 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.3 14.3 18.1							
Fuel % ASTM D3524 >5 ▲ 5.8 <1.0 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.5 0.3 0.9 Nitration Abs/cm *ASTM D7624 >20 8.6 6.9 10.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 18.3 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.3 14.3 18.1	Silicon	ppm	ASTM D5185m	>20		14	8
INFRA-RED				>20	18		
Soot % % *ASTM D7844 >3 0.5 0.3 0.9 Nitration Abs/cm *ASTM D7624 >20 8.6 6.9 10.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 18.3 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.3 14.3 18.1	Silicon Sodium Potassium	ppm	ASTM D5185m		18 5	9	6
Nitration Abs/cm *ASTM D7624 >20 8.6 6.9 10.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 18.3 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.3 14.3 18.1	Sodium Potassium	ppm	ASTM D5185m ASTM D5185m	>20	18 5 10	9	6
Nitration Abs/cm *ASTM D7624 >20 8.6 6.9 10.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 18.3 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.3 14.3 18.1	Sodium Potassium Fuel	ppm	ASTM D5185m ASTM D5185m ASTM D3524	>20 >5	18 5 10 ▲ 5.8	9 0 <1.0	6 3 <1.0
Sulfation Abs/.1mm *ASTM D7415 >30 19.4 18.3 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.3 14.3 18.1	Sodium Potassium Fuel INFRA-RED	ppm ppm %	ASTM D5185m ASTM D5185m ASTM D3524 method	>20 >5 limit/base	18 5 10 ▲ 5.8	9 0 <1.0 history1	6 3 <1.0 history2
Oxidation Abs/.1mm *ASTM D7414 >25 16.3 14.3 18.1	Sodium Potassium Fuel INFRA-RED Soot %	ppm ppm %	ASTM D5185m ASTM D5185m ASTM D3524 method *ASTM D7844	>20 >5 limit/base >3	18 5 10 ▲ 5.8 current 0.5	9 0 <1.0 history1	6 3 <1.0 history2 0.9
	Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm ppm % % Abs/cm	ASTM D5185m ASTM D5185m ASTM D3524 method *ASTM D7844 *ASTM D7624	>20 >5 limit/base >3 >20	18 5 10 ▲ 5.8 current 0.5 8.6	9 0 <1.0 history1 0.3 6.9	6 3 <1.0 history2 0.9 10.2
	Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm % % Abs/cm Abs/.1mm	ASTM D5185m ASTM D5185m ASTM D3524 method *ASTM D7844 *ASTM D7624 *ASTM D7415	>20 >5 limit/base >3 >20 >30	18 5 10 ▲ 5.8 current 0.5 8.6 19.4	9 0 <1.0 history1 0.3 6.9 18.3	6 3 <1.0 history2 0.9 10.2 21.3
	Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm % % Abs/cm Abs/.1mm	ASTM D5185m ASTM D5185m ASTM D3524 method *ASTM D7844 *ASTM D7624 *ASTM D7415 method	>20 >5 limit/base >3 >20 >30 limit/base	18 5 10 ▲ 5.8 current 0.5 8.6 19.4 current	9 0 <1.0 history1 0.3 6.9 18.3 history1	6 3 <1.0 history2 0.9 10.2 21.3 history2

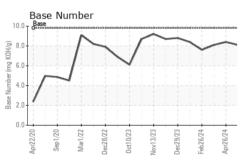


OIL ANALYSIS REPORT





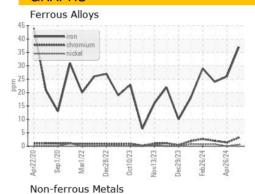


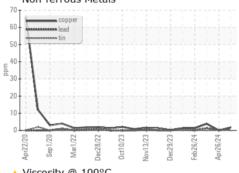


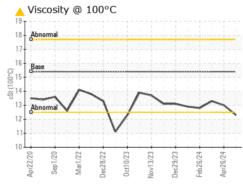
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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

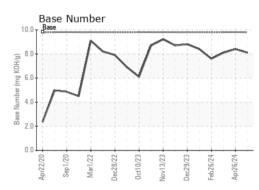
FLUID PROPI	ERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	12.3	13.0	13.3

GRAPHS













Certificate 12367

Laboratory

Sample No. Lab Number : 06196311 Unique Number : 11058434

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0120158

Received **Tested** Diagnosed

: 31 May 2024 : 05 Jun 2024

: 05 Jun 2024 - Wes Davis

22820 S State Route 291 Harrisonville, MO US 64701

GFL Environmental - 837 - Harrison TS

Contact: SARA PATRICK spatrick@gflenv.com

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)

Test Package: FLEET (Additional Tests: FuelDilution, PercentFuel)

T:

F: