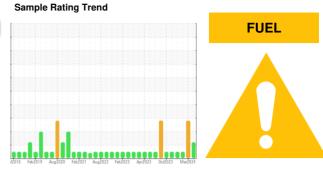


OIL ANALYSIS REPORT

(DXF671) 10628

Diesel Engine

PETRO CANADA DURON SHP 15W40 (28 QTS)



DIAGNOSIS

Recommendation

We recommend that you drain the oil from the component if this has not already been done. 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.

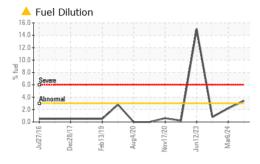
▲ Fluid Condition

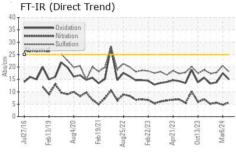
The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

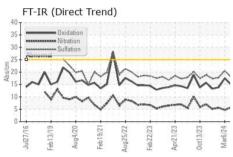
	(13)		IIZUTO PEUZU	is Augzozo reozozi A	ugzuzz Prozuzs Aprzuzs uciżu	23 Mdi2024	
Sample Date	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 0 0 0 0 0 0 0 0 0	Sample Number		Client Info		GFL0111460	GFL0068819	GFL0097231
Oil Age hrs Client Info Not Changed Changed	Sample Date		Client Info		29 Mar 2024	06 Mar 2024	10 Nov 2023
Colient Info	Machine Age	hrs	Client Info		20511	20217	20216
ABNORMAL ATTENTION NORMAL	Oil Age	hrs	Client Info		0	0	0
CONTAMINATION	Oil Changed		Client Info		Not Changd	Changed	Changed
Water WC Method >0.2 NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >5 <1 <1 0 Chromium ppm ASTM D5185m >5 <1 <1 0 Nickel ppm ASTM D5185m >4 0 <1 0 Silver ppm ASTM D5185m >2 0 <1 0 Silver ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >2 0 3 0 Copper ppm ASTM D5185m >10 2 6 0 Tin ppm ASTM D5185m 0 2 1 0 <1 Copper ppm ASTM D5185m 0 17 60	Sample Status				ABNORMAL	ATTENTION	NORMAL
Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >5 <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Chromium	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >5 <1 <1 0 Nickel ppm ASTM D5185m >4 0 <1 0 Titanium ppm ASTM D5185m >2 0 <1 0 Siliver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >2 0 3 0 Copper ppm ASTM D5185m >25 0 3 0 Copper ppm ASTM D5185m >10 2 6 0 Tin ppm ASTM D5185m 0 <1 0 <1 Vanadium ppm ASTM D5185m 0 <1 0 <1 Cadmium ppm ASTM D5185m 0 17 60 6 6 Boron ppm ASTM D5185m 0 17 60 6 6 Barium ppm ASTM D5185m 0 17 <td>WEAR METAL</td> <td>S</td> <td>method</td> <td>limit/base</td> <td>current</td> <td>history1</td> <td>history2</td>	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>75	10	2	3
Description	Chromium	ppm	ASTM D5185m	>5	<1	<1	0
Silver	Nickel	ppm	ASTM D5185m	>4	0	<1	0
Aluminum	Titanium	ppm	ASTM D5185m	>2	0	<1	0
Lead ppm ASTM D5185m >25 0 3 0 Copper ppm ASTM D5185m >100 2 6 0 Tin ppm ASTM D5185m >4 <1 0 <1 Vanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 17 60 6 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 46 39 51 Manganese ppm ASTM D5185m 0 <1 <1 0 Magnesium ppm ASTM D5185m 1010 753 481 874 Calcium ppm ASTM D5185m 1150 846 705 967	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper ppm ASTM D5185m >100 2 6 0 Tin ppm ASTM D5185m >4 <1	Aluminum	ppm	ASTM D5185m	>15	1	2	3
Trin	Lead	ppm	ASTM D5185m	>25	0	3	0
Vanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 17 60 6 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 46 39 51 Manganese ppm ASTM D5185m 0 <1 <1 0 Magnesium ppm ASTM D5185m 1010 753 481 874 Calcium ppm ASTM D5185m 1070 888 1447 923 Phosphorus ppm ASTM D5185m 1270 976 851 1166 Sulfur ppm ASTM D5185m 2060 2986 2398 2911 CONTAMINANTS method limit/base current history1<	Copper	ppm	ASTM D5185m	>100	2	6	0
Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 17 60 6 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 46 39 51 Manganese ppm ASTM D5185m 0 <1	Tin	ppm	ASTM D5185m	>4	<1	0	<1
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 17 60 6 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 46 39 51 Manganese ppm ASTM D5185m 0 <1	Vanadium	ppm	ASTM D5185m		0	<1	0
Boron	Cadmium	ppm	ASTM D5185m		0	<1	0
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 46 39 51 Manganese ppm ASTM D5185m 0 <1 <1 0 Magnesium ppm ASTM D5185m 1010 753 481 874 Calcium ppm ASTM D5185m 1070 888 1447 923 Phosphorus ppm ASTM D5185m 1150 846 705 967 Zinc ppm ASTM D5185m 1270 976 851 1166 Sulfur ppm ASTM D5185m 2060 2986 2398 2911 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 1 4 Sodium ppm ASTM D5185m 3 3 1 Potassium ppm ASTM D5185m >20	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 46 39 51 Manganese ppm ASTM D5185m 0 <1 <1 0 Magnesium ppm ASTM D5185m 1010 753 481 874 Calcium ppm ASTM D5185m 1070 888 1447 923 Phosphorus ppm ASTM D5185m 1150 846 705 967 Zinc ppm ASTM D5185m 1270 976 851 1166 Sulfur ppm ASTM D5185m 2060 2986 2398 2911 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 11 4 Sodium ppm ASTM D5185m >20 0 2 <1 Fuel % ASTM D5185m >20 0 2 <1 Fuel % ASTM D7844 <	Boron	ppm	ASTM D5185m	0	17	6 0	6
Manganese ppm ASTM D5185m 0 <1 <1 0 Magnesium ppm ASTM D5185m 1010 753 481 874 Calcium ppm ASTM D5185m 1070 888 1447 923 Phosphorus ppm ASTM D5185m 1150 846 705 967 Zinc ppm ASTM D5185m 1270 976 851 1166 Sulfur ppm ASTM D5185m 2060 2986 2398 2911 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 11 4 Sodium ppm ASTM D5185m >20 0 2 <1	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 753 481 874 Calcium ppm ASTM D5185m 1070 888 1447 923 Phosphorus ppm ASTM D5185m 1150 846 705 967 Zinc ppm ASTM D5185m 1270 976 851 1166 Sulfur ppm ASTM D5185m 2060 2986 2398 2911 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 11 4 Sodium ppm ASTM D5185m >20 0 2 <1	Molybdenum	ppm	ASTM D5185m	60	46	39	51
Calcium ppm ASTM D5185m 1070 888 1447 923 Phosphorus ppm ASTM D5185m 1150 846 705 967 Zinc ppm ASTM D5185m 1270 976 851 1166 Sulfur ppm ASTM D5185m 2060 2986 2398 2911 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 11 4 Sodium ppm ASTM D5185m >20 0 2 <1	Manganese	ppm	ASTM D5185m	0	<1	<1	0
Phosphorus ppm ASTM D5185m 1150 846 705 967 Zinc ppm ASTM D5185m 1270 976 851 1166 Sulfur ppm ASTM D5185m 2060 2986 2398 2911 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 11 4 Sodium ppm ASTM D5185m >20 0 2 <1	Magnesium	ppm		1010	753	481	874
Zinc ppm ASTM D5185m 1270 976 851 1166 Sulfur ppm ASTM D5185m 2060 2986 2398 2911 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 11 4 Sodium ppm ASTM D5185m 3 3 1 Potassium ppm ASTM D5185m >20 0 2 <1 Fuel % ASTM D5185m >20 0 2 <1 Soot % % *ASTM D7844 >6 0.2 0.1 0.1 Nitration Abs/:mm *ASTM D7415 >30 18.1 20.5<	Calcium	ppm	ASTM D5185m	1070	888	1447	923
Sulfur ppm ASTM D5185m 2060 2986 2398 2911 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 11 4 Sodium ppm ASTM D5185m 3 3 1 Potassium ppm ASTM D5185m >20 0 2 <1	Phosphorus	ppm	ASTM D5185m	1150	846	705	967
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 11 4 Sodium ppm ASTM D5185m 3 3 1 Potassium ppm ASTM D5185m >20 0 2 <1	Zinc	ppm	ASTM D5185m	1270	976	851	1166
Silicon ppm ASTM D5185m >25 11 11 4 Sodium ppm ASTM D5185m 3 3 1 Potassium ppm ASTM D5185m >20 0 2 <1 Fuel % ASTM D3524 >3.0 3.4 2.2 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.2 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 5.7 4.7 5.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 20.5 17.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.0 17.5 13.8	Sulfur	ppm	ASTM D5185m	2060	2986	2398	2911
Sodium ppm ASTM D5185m 3 3 1 Potassium ppm ASTM D5185m >20 0 2 <1	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 0 2 <1 Fuel % ASTM D3524 >3.0 ▲ 3.4 ▲ 2.2 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.2 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 5.7 4.7 5.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 20.5 17.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.0 17.5 13.8	Silicon	ppm	ASTM D5185m	>25	11	11	4
Fuel % ASTM D3524 >3.0 ▲ 3.4 ▲ 2.2 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.2 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 5.7 4.7 5.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 20.5 17.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.0 17.5 13.8	Sodium	ppm	ASTM D5185m		3	3	1
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.2 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 5.7 4.7 5.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 20.5 17.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.0 17.5 13.8	Potassium	ppm	ASTM D5185m	>20	0	2	<1
Soot % % *ASTM D7844 >6 0.2 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 5.7 4.7 5.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 20.5 17.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.0 17.5 13.8	Fuel	%	ASTM D3524	>3.0	△ 3.4	▲ 2.2	<1.0
Nitration Abs/cm *ASTM D7624 >20 5.7 4.7 5.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 20.5 17.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.0 17.5 13.8	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 18.1 20.5 17.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.0 17.5 13.8	Soot %	%	*ASTM D7844	>6	0.2	0.1	0.1
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.0 17.5 13.8	Nitration	Abs/cm	*ASTM D7624	>20	5.7	4.7	5.6
Oxidation Abs/.1mm *ASTM D7414 >25 15.0 17.5 13.8	Sulfation	Abs/.1mm	*ASTM D7415	>30	18.1	20.5	17.7
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.0	17.5	13.8

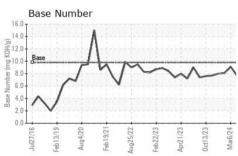


OIL ANALYSIS REPORT





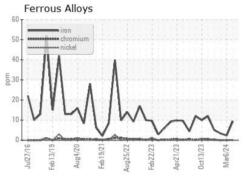


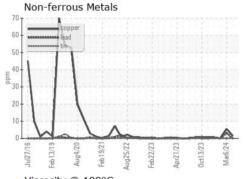


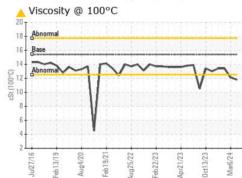
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

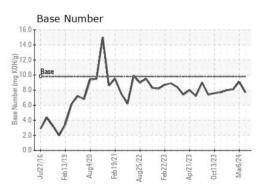
FLUID PROPI	ERITES	method	limit/base	current	history1	history
Visc @ 100°C	cSt	ASTM D445	15.4	<u> </u>	12.1	13.4

GRAPHS













Certificate 12367

Laboratory

Sample No. Lab Number : 06136046

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0111460

Unique Number : 10955511

Received : 02 Apr 2024 **Tested** : 15 Apr 2024 Diagnosed

: 15 Apr 2024 - Wes Davis

155 Story Road Warner Robins, GA US 31093 Contact: Mike Taft

GFL Environmental - 073 - Warner Robins - Transwaste

Test Package: FLEET (Additional Tests: FuelDilution, 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)

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F: