

OIL ANALYSIS REPORT

Sample Rating Trend





Machine Id 10533 Component Diesel Engine

PETRO CANADA DURON SHP 15W40 (11 GAL)

DIAGNOSIS

Recommendation

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

There is no indication of any contamination in the oil.

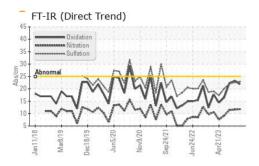
Fluid Condition

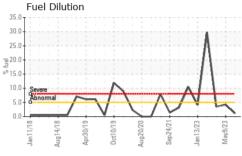
The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

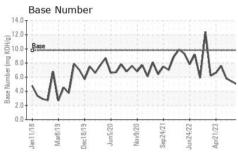
SAMPLE INFORMATION method limit/base current history1 history2	GAL) 1018 Mad2019 Dec2019 Ann/0220 New0020 Sep/021 Ann/0222 Apr/0223						
Client Info	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age	Sample Number		Client Info		GFL0114506	GFL0074645	GFL0074617
Oil Age	Sample Date		Client Info		02 Apr 2024	17 Jan 2024	11 Jan 2024
Contained Client Info Changed Changed ATTENTION ATTENTION ATTENTION NORMAL	Machine Age	hrs	Client Info		15356	14826	14789
ATTENTION NORMAL	Oil Age	hrs	Client Info		530	602	565
Water	Oil Changed		Client Info		Changed	Changed	Not Changd
Water WC Method >0.2 NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >10.0 46 42 37 Chromium ppm ASTM D5185m >20 2 2 1 Nickel ppm ASTM D5185m >4 0 <1 0 Silver ppm ASTM D5185m >4 0 <1 0 Silver ppm ASTM D5185m >3 0 0 0 Silver ppm ASTM D5185m >30 0 0 0 Silver ppm ASTM D5185m >40 1 1 1 1 Copper ppm ASTM D5185m >315 0 <1 <1 <1 Vanadium ppm ASTM D5185m 0 0 <1 <1 <1 Cadmium ppm ASTM D5185m	Sample Status				ATTENTION	ATTENTION	NORMAL
WEAR METALS	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 46 42 37 Chromium ppm ASTM D5185m >20 2 2 1 Nickel ppm ASTM D5185m >4 0 <1	Water		WC Method	>0.2	NEG	NEG	NEG
Common	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 2 2 1 Nickel ppm ASTM D5185m >4 0 <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	46	42	37
Nickel	Chromium		ASTM D5185m	>20	2	2	1
Description	Nickel				0	<1	0
Silver	Titanium		ASTM D5185m		0	0	0
Aluminum ppm ASTM D5185m >20 3 7 6 Lead ppm ASTM D5185m >40 1 1 1 Copper ppm ASTM D5185m >330 6 5 5 Tin ppm ASTM D5185m >15 0 <1	Silver		ASTM D5185m	>3	0		0
Copper ppm ASTM D5185m >330 6 5 5 Tin ppm ASTM D5185m >15 0 <1	Aluminum	• • • • • • • • • • • • • • • • • • • •	ASTM D5185m	>20	3	7	6
Copper ppm ASTM D5185m >330 6 5 5 Tin ppm ASTM D5185m >15 0 <1	Lead	ppm	ASTM D5185m	>40	1	1	1
Trin	Copper		ASTM D5185m	>330	6	5	5
Vanadium ppm ASTM D5185m 0 <1 <1 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 10 40 32 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 813 771 674 Calcium ppm ASTM D5185m 1070 1054 1365 1249 Phosphorus ppm ASTM D5185m 1270 1066 1066 949 Sulfur ppm ASTM D5185m 2060 2947 3012 2610 CONTAMINANTS method limit/base current history1<					0	<1	<1
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 10 40 32 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 64 96 87 Manganese ppm ASTM D5185m 0 0 <1	Vanadium	• • • • • • • • • • • • • • • • • • • •	ASTM D5185m		0	<1	<1
Boron	Cadmium	ppm	ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 64 96 87 Manganese ppm ASTM D5185m 0 0 <1 <1 Magnesium ppm ASTM D5185m 1010 813 771 674 Calcium ppm ASTM D5185m 1070 1054 1365 1249 Phosphorus ppm ASTM D5185m 1150 894 862 826 Zinc ppm ASTM D5185m 1270 1066 1066 949 Sulfur ppm ASTM D5185m 2060 2947 3012 2610 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 11 10 Sodium ppm ASTM D5185m >20 2 5 3 Fuel % ASTM D5185m	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 64 96 87 Manganese ppm ASTM D5185m 0 0 <1 <1 Magnesium ppm ASTM D5185m 1010 813 771 674 Calcium ppm ASTM D5185m 1070 1054 1365 1249 Phosphorus ppm ASTM D5185m 1150 894 862 826 Zinc ppm ASTM D5185m 1270 1066 1066 949 Sulfur ppm ASTM D5185m 2060 2947 3012 2610 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 11 10 Sodium ppm ASTM D5185m >20 2 5 3 Fuel % ASTM D5185m >20 2 5 3 Fuel % ASTM D7844 <	Boron	ppm	ASTM D5185m	0	10	40	32
Manganese ppm ASTM D5185m 0 0 <1 <1 Magnesium ppm ASTM D5185m 1010 813 771 674 Calcium ppm ASTM D5185m 1070 1054 1365 1249 Phosphorus ppm ASTM D5185m 1150 894 862 826 Zinc ppm ASTM D5185m 1270 1066 1066 949 Sulfur ppm ASTM D5185m 2060 2947 3012 2610 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 11 10 Sodium ppm ASTM D5185m >20 2 5 3 Fuel % ASTM D5185m >20 2 5 3 Fuel % ASTM D5185m >20 2 5 3 Fuel % ASTM D5185m >3 <t< td=""><td>Barium</td><td>ppm</td><td>ASTM D5185m</td><td>0</td><th>0</th><td>0</td><td>0</td></t<>	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 813 771 674 Calcium ppm ASTM D5185m 1070 1054 1365 1249 Phosphorus ppm ASTM D5185m 1150 894 862 826 Zinc ppm ASTM D5185m 1270 1066 1066 949 Sulfur ppm ASTM D5185m 2060 2947 3012 2610 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 11 10 Sodium ppm ASTM D5185m >20 2 5 3 Fuel % ASTM D5444 >3	Molybdenum	ppm	ASTM D5185m	60	64	96	87
Calcium ppm ASTM D5185m 1070 1054 1365 1249 Phosphorus ppm ASTM D5185m 1150 894 862 826 Zinc ppm ASTM D5185m 1270 1066 1066 949 Sulfur ppm ASTM D5185m 2060 2947 3012 2610 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 11 10 Sodium ppm ASTM D5185m >20 2 5 3 Fuel % ASTM D5185m >20 2 5 3 Fuel % ASTM D3524 >5 <1.0	Manganese	ppm	ASTM D5185m	0	0	<1	<1
Phosphorus ppm ASTM D5185m 1150 894 862 826 Zinc ppm ASTM D5185m 1270 1066 1066 949 Sulfur ppm ASTM D5185m 2060 2947 3012 2610 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 11 10 Sodium ppm ASTM D5185m >20 2 5 3 Fuel % ASTM D5185m >20 2 5 3 Fuel % ASTM D5185m >20 2 5 3 Fuel % ASTM D3524 >5 <1.0	Magnesium	ppm	ASTM D5185m	1010	813	771	674
Zinc ppm ASTM D5185m 1270 1066 1066 949 Sulfur ppm ASTM D5185m 2060 2947 3012 2610 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 11 10 Sodium ppm ASTM D5185m >20 2 5 3 Foul % ASTM D5185m >20 2 5 3 Fuel % ASTM D3524 >5 <1.0	Calcium	ppm	ASTM D5185m	1070	1054	1365	1249
Sulfur ppm ASTM D5185m 2060 2947 3012 2610 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 11 10 Sodium ppm ASTM D5185m 6 7 7 Potassium ppm ASTM D5185m >20 2 5 3 Fuel % ASTM D5185m >20 2 5 3 Soot % % *ASTM D7844 >3 1 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 11.8 11.6 11.5 Sulfation Abs/.1mm *ASTM D7415 >30 22.9 22.6	Phosphorus	ppm	ASTM D5185m	1150	894	862	826
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 11 10 Sodium ppm ASTM D5185m 6 7 7 Potassium ppm ASTM D5185m >20 2 5 3 Fuel % ASTM D3524 >5 <1.0	Zinc	ppm	ASTM D5185m	1270	1066	1066	949
Silicon ppm ASTM D5185m >25 6 11 10 Sodium ppm ASTM D5185m 6 7 7 Potassium ppm ASTM D5185m >20 2 5 3 Fuel % ASTM D3524 >5 <1.0 1.1 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 11.8 11.6 11.5 Sulfation Abs/.1mm *ASTM D7415 >30 22.9 22.6 22.0 FLUID DEGRADATION method limit/base current history1 history2 Cvidation Abs/.1mm *ASTM D7414 >25 21.9 23.2 22.3	Sulfur	ppm	ASTM D5185m	2060	2947	3012	2610
Sodium ppm ASTM D5185m 6 7 7 Potassium ppm ASTM D5185m >20 2 5 3 Fuel % ASTM D3524 >5 <1.0	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 2 5 3 Fuel % ASTM D3524 >5 <1.0 1.1 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 11.8 11.6 11.5 Sulfation Abs/.1mm *ASTM D7415 >30 22.9 22.6 22.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.9 23.2 22.3	Silicon	ppm	ASTM D5185m	>25	6	11	10
Fuel % ASTM D3524 >5 <1.0 1.1 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 11.8 11.6 11.5 Sulfation Abs/.1mm *ASTM D7415 >30 22.9 22.6 22.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.9 23.2 22.3	Sodium	ppm	ASTM D5185m		6	7	7
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 11.8 11.6 11.5 Sulfation Abs/.1mm *ASTM D7415 >30 22.9 22.6 22.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.9 23.2 22.3	Potassium	ppm	ASTM D5185m	>20	2	5	3
Soot % % *ASTM D7844 >3 1 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 11.8 11.6 11.5 Sulfation Abs/.1mm *ASTM D7415 >30 22.9 22.6 22.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.9 23.2 22.3	Fuel	%	ASTM D3524	>5	<1.0	1.1	<1.0
Nitration Abs/cm *ASTM D7624 >20 11.8 11.6 11.5 Sulfation Abs/.1mm *ASTM D7415 >30 22.9 22.6 22.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.9 23.2 22.3	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 22.9 22.6 22.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.9 23.2 22.3	Soot %	%	*ASTM D7844	>3	1	0.5	0.4
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm 'ASTM D7414 >25 21.9 23.2 22.3	Nitration	Abs/cm	*ASTM D7624	>20	11.8	11.6	11.5
Oxidation Abs/.1mm *ASTM D7414 >25 21.9 23.2 22.3	Sulfation	Abs/.1mm	*ASTM D7415	>30	22.9	22.6	22.0
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 9.8 5.0 5.4 5.8	Oxidation	Abs/.1mm	*ASTM D7414	>25	21.9	23.2	22.3
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	5.0	5.4	5.8

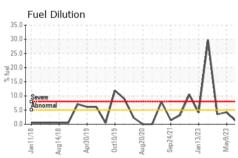


OIL ANALYSIS REPORT





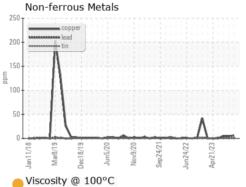


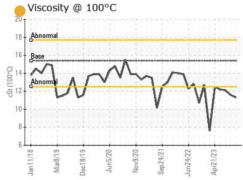


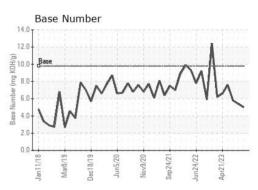
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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 PROPE	ERITES					
Visc @ 100°C	cSt	ASTM D445	15.4	11.3	11.6	12.1

Ferrous Alloys 50











Certificate 12367

Laboratory Sample No.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Lab Number : 06139671

: GFL0114506 Unique Number : 10964479

Received **Tested** Diagnosed

: 05 Apr 2024 : 07 Apr 2024

: 07 Apr 2024 - Don Baldridge

2699 Cochran Industrial Blvd Douglasville, GA US 30127-1332 Contact: Darrell Welch darrell.welch@gflenv.com

GFL Environmental - 095 - Atlanta West

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.

Test Package : FLEET (Additional Tests: FuelDilution)

T: (800)207-6618

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012) Report Id: GFL095 [WUSCAR] 06139671 (Generated: 04/07/2024 10:41:11) Rev: 1

Submitted By: Darrell Welch