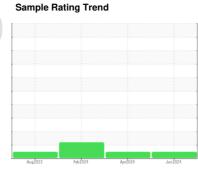


OIL ANALYSIS REPORT

(TB6606) 412070

Diesel Engine

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





DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

Contamination

There is no indication of any contamination in the

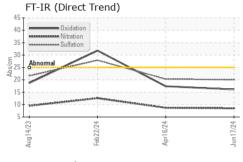
Fluid Condition

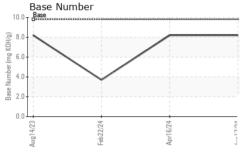
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

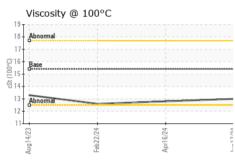
SAMPLE INFORMATION method limit/base current history1 history2	JAL)		Aug202	3 Feb2024	Apr2024 Ji	un2024	
Sample Date	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Date	Sample Number		Client Info		GFL0113028	GFL0113051	GFL0113039
Machine Age hrs Client Info 598 601 0 Oil Age hrs Client Info 598 601 0 Oil Changed Client Info Changed N/A NORMAL NORMAL Sample Status workelod Image: Changed N/A NORMAL ABNORMAL CONTAMINATION method limit/bass current history1 history2 Fuel WC Method >3.0 <1.0 <1.0 <1.0 Water WC Method NEG NEG NEG NEG Glycol WC Method NEG NEG NEG NEG WEAR METALS method limit/bass current history1 history2 WEAR METALS method limit/bass current history1 history2 WEAR METALS method limit/bass current history1 history2 WEAR METALS method limit/bass current history1			Client Info		17 Jun 2024	16 Apr 2024	22 Feb 2024
Oil Changed Sample Status Client Info Changed NORMAL Changed NORMAL N/A CONTAMINATION method limit/base current history1 history2 Fuel WC Method >3.0 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG Gilycol WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >165 12 22 38 Chromium ppm ASTM D5185m >5 <1 1 1 Nickel ppm ASTM D5185m >5 <1 1 <1 0 Silver ppm ASTM D5185m >20 2 4 6 6 Lead ppm ASTM D5185m >5 <1 1 <1 <1 <1 Copper ppm ASTM D5185m >5	•	hrs	Client Info		5086	4780	4261
Oil Changed Sample Status Client Info Changed NORMAL NORMAL NORMAL NARABAL ABNORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >3.0 <1.0 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG Glycol WC Method >0.2 NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >165 12 22 38 WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >5 <1 1 1 Nickel ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 2 4 6	•	hrs	Client Info		598	601	0
CONTAMINATION method limit/base current history1 history2 Fuel WC Method >3.0 <1.0 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG NEG Glycol WC Method Imit/base current history1 history2 WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >165 12 22 38 Chromium ppm ASTM D5185m >5 <1 1 1 Nickel ppm ASTM D5185m >4 0 <1 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >20 2 4 6 Lead ppm ASTM D5185m >90 <1 1 <1 <1 <1 <1 <1 <1 <1 <1	-		Client Info		Changed	Changed	N/A
Fuel	Sample Status				NORMAL	NORMAL	ABNORMAL
Water Glycol WC Method PC Method >0.2 NEG NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >165 12 22 38 Chromium ppm ASTM D5185m >5 <1 1 1 Nickel ppm ASTM D5185m >4 0 <1 0 Silver ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >20 2 4 6 Lead ppm ASTM D5185m >90 <1 1 <1 Copper ppm ASTM D5185m >5 <1 1 <1 Vanadium ppm ASTM D5185m 0 <1 1 <1 Vanadium ppm ASTM D5185m 0 4 12	CONTAMINAT	ION	method	limit/base	current	history1	history2
Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >165 12 22 38 Chromium ppm ASTM D5185m >5 <1 1 1 Nickel ppm ASTM D5185m >4 0 <1 0 Silver ppm ASTM D5185m >2 <1 <1 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >20 2 4 6 Lead ppm ASTM D5185m >90 <1 1 <1 Copper ppm ASTM D5185m >5 <1 1 <1 Vanadium ppm ASTM D5185m 0 <1 1 <1 Cadmium ppm ASTM D5185m 0 4 12 5	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >5 <1 1 1 Nickel ppm ASTM D5185m >4 0 <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>165	12	22	38
Titanium ppm ASTM D5185m >2 <1 <1 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >20 2 4 6 Lead ppm ASTM D5185m >150 <1 1 <1 Copper ppm ASTM D5185m >90 <1 1 <2 Tin ppm ASTM D5185m >0 <1 1 <1 Vanadium ppm ASTM D5185m 0 <1 1 <1 Cadmium ppm ASTM D5185m 0 <1 1 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 4 12 5 Barium ppm ASTM D5185m 0 0 <1 1 2 Barium ppm ASTM D5185m 0 0 <	Chromium	ppm	ASTM D5185m	>5	<1	1	1
Silver	Nickel	ppm	ASTM D5185m	>4	0	<1	0
Aluminum	Titanium	ppm	ASTM D5185m	>2	<1	<1	0
Lead ppm ASTM D5185m >150 <1 1 <1 Copper ppm ASTM D5185m >90 <1 1 2 Tin ppm ASTM D5185m >5 <1 1 <1 Vanadium ppm ASTM D5185m 0 <1 <1 <1 Cadmium ppm ASTM D5185m 0 <1 <1 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 4 12 5 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 Magnesium ppm ASTM D5185m 0 0 <1 <1 Calcium ppm ASTM D5185m 1070 1075 1501 979 Phosphorus ppm ASTM D5185m 1270 1275	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper ppm ASTM D5185m >90 <1 1 2 Tin ppm ASTM D5185m >5 <1	Aluminum	ppm	ASTM D5185m	>20	2	4	6
Tin ppm ASTM D5185m >5 <1 1 <1 Vanadium ppm ASTM D5185m 0 <1 <1 Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 4 12 5 Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 <1 <1 Manganese ppm ASTM D5185m 0 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1070 1075 1501 979 99 Phosphorus ppm ASTM D5185m 1070 1075 1501 979 99 Phosphorus ppm ASTM D5185m 1270 1275 1685 1034 Sulfur ppm	Lead	ppm	ASTM D5185m	>150	<1	1	<1
Vanadium ppm ASTM D5185m 0 <1 <1 Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 4 12 5 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 <1 <1 Manganese ppm ASTM D5185m 1010 963 1315 828 Calcium ppm ASTM D5185m 1010 963 1315 828 Calcium ppm ASTM D5185m 1010 963 1315 828 Calcium ppm ASTM D5185m 1070 1075 1501 979 Phosphorus ppm ASTM D5185m 1270 1275 1685 1034 Sulfur ppm ASTM D5185m 2060 2910 430	Copper	ppm	ASTM D5185m	>90	<1	1	2
Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 4 12 5 Barium ppm ASTM D5185m 0 <	Tin	ppm	ASTM D5185m	>5	<1	1	<1
Boron	Vanadium	ppm	ASTM D5185m		0	<1	<1
Boron ppm ASTM D5185m 0 4 12 5 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 59 90 58 Manganese ppm ASTM D5185m 0 0 <1	Cadmium	ppm	ASTM D5185m		0	<1	0
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 59 90 58 Manganese ppm ASTM D5185m 0 0 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 59 90 58 Manganese ppm ASTM D5185m 0 0 <1 <1 Magnesium ppm ASTM D5185m 1010 963 1315 828 Calcium ppm ASTM D5185m 1070 1075 1501 979 Phosphorus ppm ASTM D5185m 1150 1036 1435 814 Zinc ppm ASTM D5185m 1270 1275 1685 1034 Sulfur ppm ASTM D5185m 2060 2910 4308 2357 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >35 4 7 6 Sodium ppm ASTM D5185m >20 7 9 18 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7415	Boron	ppm	ASTM D5185m	0	4	12	5
Manganese ppm ASTM D5185m 0 0 <1 <1 Magnesium ppm ASTM D5185m 1010 963 1315 828 Calcium ppm ASTM D5185m 1070 1075 1501 979 Phosphorus ppm ASTM D5185m 1150 1036 1435 814 Zinc ppm ASTM D5185m 1270 1275 1685 1034 Sulfur ppm ASTM D5185m 2060 2910 4308 2357 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >35 4 7 6 Sodium ppm ASTM D5185m 3 6 7 Potassium ppm ASTM D5185m >20 7 9 18 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 <td< td=""><td>Barium</td><td>ppm</td><td>ASTM D5185m</td><td>0</td><th>0</th><td>0</td><td>0</td></td<>	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 963 1315 828 Calcium ppm ASTM D5185m 1070 1075 1501 979 Phosphorus ppm ASTM D5185m 1150 1036 1435 814 Zinc ppm ASTM D5185m 1270 1275 1685 1034 Sulfur ppm ASTM D5185m 2060 2910 4308 2357 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >35 4 7 6 Sodium ppm ASTM D5185m >30 6 7 Potassium ppm ASTM D5185m >20 7 9 18 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 8.5 8.7 12.6 Sulfation Abs/.1mm *ASTM D7415	Molybdenum	ppm					
Calcium ppm ASTM D5185m 1070 1075 1501 979 Phosphorus ppm ASTM D5185m 1150 1036 1435 814 Zinc ppm ASTM D5185m 1270 1275 1685 1034 Sulfur ppm ASTM D5185m 2060 2910 4308 2357 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >35 4 7 6 Sodium ppm ASTM D5185m >3 6 7 Potassium ppm ASTM D5185m >20 7 9 18 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 8.5 8.7 12.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 20.3 27.9 FLUID DEGRADATION method	Manganese	ppm	ASTM D5185m		0	<1	<1
Phosphorus ppm ASTM D5185m 1150 1036 1435 814 Zinc ppm ASTM D5185m 1270 1275 1685 1034 Sulfur ppm ASTM D5185m 2060 2910 4308 2357 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >35 4 7 6 Sodium ppm ASTM D5185m 3 6 7 Potassium ppm ASTM D5185m >20 7 9 18 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >7.5 0.4 0.3 0.6 Nitration Abs/.mm *ASTM D7415 >30 20.0 20.3 27.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414	-	ppm					
Zinc ppm ASTM D5185m 1270 1275 1685 1034 Sulfur ppm ASTM D5185m 2060 2910 4308 2357 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >35 4 7 6 Sodium ppm ASTM D5185m 3 6 7 Potassium ppm ASTM D5185m >20 7 9 18 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >7.5 0.4 0.3 0.6 Nitration Abs/.mm *ASTM D7624 >20 8.5 8.7 12.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 20.3 27.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414	Calcium	ppm	ASTM D5185m	1070		1501	979
Sulfur ppm ASTM D5185m 2060 2910 4308 2357 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >35 4 7 6 Sodium ppm ASTM D5185m 3 6 7 Potassium ppm ASTM D5185m >20 7 9 18 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >7.5 0.4 0.3 0.6 Nitration Abs/cm *ASTM D7624 >20 8.5 8.7 12.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 20.3 27.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.1 17.4 31.8							
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >35 4 7 6 Sodium ppm ASTM D5185m 3 6 7 Potassium ppm ASTM D5185m >20 7 9 18 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >7.5 0.4 0.3 0.6 Nitration Abs/cm *ASTM D7624 >20 8.5 8.7 12.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 20.3 27.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.1 17.4 31.8		ppm					
Silicon ppm ASTM D5185m >35 4 7 6 Sodium ppm ASTM D5185m 3 6 7 Potassium ppm ASTM D5185m >20 7 9 18 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >7.5 0.4 0.3 0.6 Nitration Abs/cm *ASTM D7624 >20 8.5 8.7 12.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 20.3 27.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.1 17.4 31.8			ASTM D5185m	2060	2910	4308	2357
Sodium ppm ASTM D5185m 3 6 7 Potassium ppm ASTM D5185m >20 7 9 18 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >7.5 0.4 0.3 0.6 Nitration Abs/cm *ASTM D7624 >20 8.5 8.7 12.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 20.3 27.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.1 17.4 31.8	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 7 9 18 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >7.5 0.4 0.3 0.6 Nitration Abs/cm *ASTM D7624 >20 8.5 8.7 12.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 20.3 27.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.1 17.4 31.8				>35			
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >7.5 0.4 0.3 0.6 Nitration Abs/cm *ASTM D7624 >20 8.5 8.7 12.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 20.3 27.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.1 17.4 31.8		ppm	ASTM D5185m		3	6	7
Soot % % *ASTM D7844 > 7.5 0.4 0.3 0.6 Nitration Abs/cm *ASTM D7624 > 20 8.5 8.7 12.6 Sulfation Abs/.1mm *ASTM D7415 > 30 20.0 20.3 27.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 > 25 16.1 17.4 31.8	Potassium	ppm	ASTM D5185m	>20	7	9	18
Nitration Abs/cm *ASTM D7624 >20 8.5 8.7 12.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 20.3 27.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.1 17.4 31.8	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 20.0 20.3 27.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.1 17.4 31.8	Soot %	%	*ASTM D7844	>7.5	0.4	0.3	0.6
FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2516.117.431.8	Nitration	Abs/cm	*ASTM D7624	>20	8.5	8.7	12.6
Oxidation Abs/.1mm *ASTM D7414 >25 16.1 17.4 31.8	Sulfation	Abs/.1mm	*ASTM D7415	>30	20.0	20.3	27.9
	FLUID DEGRAI	NOITAC	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 9.8 8.2 ▲ 3.7	Oxidation	Abs/.1mm	*ASTM D7414	>25	16.1	17.4	31.8
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.2	8.2	△ 3.7



OIL ANALYSIS REPORT



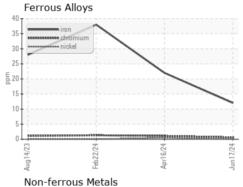


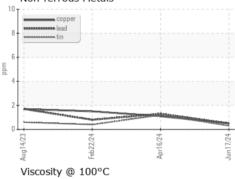


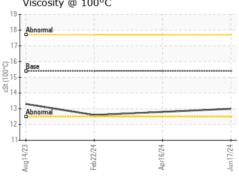
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

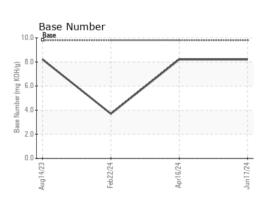
FLUID FROF		memod			HISTOLAL	HISTOLYZ
Visc @ 100°C	cSt	ASTM D445	15.4	13.0	12.8	12.6

GRAPHS













Certificate 12367

Laboratory Sample No.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0113028 Lab Number : 06216599

Unique Number : 11089463 Test Package : FLEET

Received : 21 Jun 2024 **Tested** : 24 Jun 2024 Diagnosed

: 24 Jun 2024 - Wes Davis

GFL Environmental - 924 - Madison HC 300 Raemisch Road

Waunakee, WI US 53597 Contact: Ben Briggs ben.briggs@gflenv.com

T: (608)770-9196

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)