

OIL ANALYSIS REPORT

Sample Rating Trend

DEGRADATION



Machine Id
712030
Component
Diesel Engine
Fluid

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

DIAGNOSIS

Recommendation

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

Wear

An increase in the iron level is noted. All other component wear rates are normal.

Contamination

There is no indication of any contamination in the

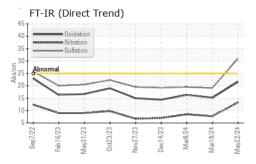
Fluid Condition

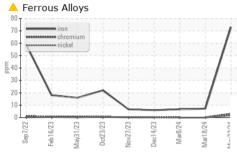
The BN level is low. The oil is no longer serviceable.

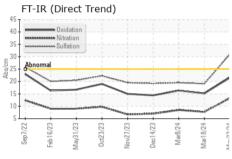
Cample Number Client Info Cample Date Client Info Cample Cample Date Client Info Cample Changed C	ON SHP 15W40 (GAL) Supto 22 Feb. 2023 May 2023 Oct 2023 Movid 23 Oct 2023 May 2024 May 20						
Sample Date Client Info 22 May 2024 18 Mar 2024 08 Mar 2024	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info Dil Changed Changed Changed Changed Sample Status NORMAL NORMAL NORMAL	Sample Number		Client Info		GFL0122496	GFL0108796	GFL0108782
Dil Age	Sample Date		Client Info		22 May 2024	18 Mar 2024	08 Mar 2024
Contained Client Info Changed Changed	Machine Age	hrs	Client Info		8231	7636	7520
ABNORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 history3 history3 Astronomics NEG	Oil Age	hrs	Client Info		7636	7520	6773
CONTAMINATION	Oil Changed		Client Info		Changed	Changed	Changed
Fuel WC Method >3.0	Sample Status				ABNORMAL	NORMAL	NORMAL
Water Glycol WC Method >0.2 NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >90 73 7 7 Chromium ppm ASTM D5185m >20 3 0 0 Nickel ppm ASTM D5185m >2 2 1 0 0 Silver ppm ASTM D5185m >2 4 1 0 0 Aluminum ppm ASTM D5185m >2 4 1 0 0 Aluminum ppm ASTM D5185m >20 6 2 2 2 Lead ppm ASTM D5185m >40 13 0 0 0 Copper ppm ASTM D5185m >15 2 0 0 0 Vanadium ppm ASTM D5185m >16 2 1 0 0	CONTAMINATI	ION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS method limit/base current history1 history2	Water		WC Method	>0.2	NEG	NEG	NEG
Post	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METALS	S	method	limit/base	current	history1	history2
Silver	ron	ppm	ASTM D5185m	>90	△ 73	7	7
Distribution	Chromium	ppm	ASTM D5185m	>20	3	0	0
Silver	Nickel	ppm	ASTM D5185m	>2	2	0	0
Aluminum ppm ASTM D5185m >20 6 2 2 Lead ppm ASTM D5185m >40 13 0 0 Copper ppm ASTM D5185m >330 18 0 Cadmium ppm ASTM D5185m >15 2 0 0 Cadmium ppm ASTM D5185m >10 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 0 0 Magnesium ppm ASTM D5185m 1010 685 960 927 Calcium ppm ASTM D5185m 1070 839 1095 1076 Phosphorus ppm ASTM D5185m 1150 748 1048 1065 Zinc ppm ASTM D5185m 1270 1044 1314 1266 Sulfur ppm ASTM D5185m 2060 2260 3640 3364 CONTAMINANTS method limit/base current history1 history2 Solicon ppm ASTM D5185m 4 2 4 Potassium ppm ASTM D5185m >20 3 1 0 INFRA-RED method limit/base current history1 history2 Solicon Abs/.1mm *ASTM D7414 >25 21.6 15.2 16.3	Γitanium	ppm	ASTM D5185m	>2	<1	0	0
Part	Silver	ppm	ASTM D5185m	>2			
Copper	Aluminum	ppm	ASTM D5185m	>20	6	2	2
Proceedings Proceedings Processes	_ead	ppm	ASTM D5185m	>40		0	
Vanadium ppm ASTM D5185m <1 0 0 Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 6 2 1 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 46 56 59 Manganese ppm ASTM D5185m 0 <1 0 <1 Magnesium ppm ASTM D5185m 1010 685 960 927 Calcium ppm ASTM D5185m 1070 839 1095 1076 Phosphorus ppm ASTM D5185m 1270 1044 1314 1266 Sulfur ppm ASTM D5185m 2060 2260 3640 3364 CONTAMINANTS method limit/base current history1<	Copper	ppm	ASTM D5185m	>330	18	0	0
ADDITIVES		ppm		>15	2		
ADDITIVES	Vanadium	ppm			<1		
Boron ppm ASTM D5185m 0 0 0 0 0 0 0 0 0		ppm	ASTM D5185m		<1	0	0
Barium	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 46 56 59 Manganese ppm ASTM D5185m 0 <1 0 <1 Magnesium ppm ASTM D5185m 1010 685 960 927 Calcium ppm ASTM D5185m 1070 839 1095 1076 Phosphorus ppm ASTM D5185m 1150 748 1048 1065 Zinc ppm ASTM D5185m 1270 1044 1314 1266 Sulfur ppm ASTM D5185m 2060 2260 3640 3364 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m 225 7 2 2 Sodium ppm ASTM D5185m 4 2 4 Potassium ppm ASTM D5185m >20 3 1 0 INFRA-RED method limit/base current	Boron	ppm	ASTM D5185m	0	6	2	1
Manganese ppm ASTM D5185m 0 <1 0 <1 Magnesium ppm ASTM D5185m 1010 685 960 927 Calcium ppm ASTM D5185m 1070 839 1095 1076 Phosphorus ppm ASTM D5185m 1150 748 1048 1065 Zinc ppm ASTM D5185m 1270 1044 1314 1266 Sulfur ppm ASTM D5185m 2060 2260 3640 3364 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 2 2 Sodium ppm ASTM D5185m >20 3 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 5 0.5 0.5 Nitration Abs/cm *ASTM D7415	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 685 960 927 Calcium ppm ASTM D5185m 1070 839 1095 1076 Phosphorus ppm ASTM D5185m 1150 748 1048 1065 Zinc ppm ASTM D5185m 1270 1044 1314 1266 Sulfur ppm ASTM D5185m 2060 2260 3640 3364 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 2 2 Sodium ppm ASTM D5185m >20 3 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 5 0.5 0.5 Sulfation Abs/cm *ASTM D7624 >20 13.3 7.7 8.5 FLUID DEGRADATION method limit/	Molybdenum	ppm	ASTM D5185m	60	46	56	59
Calcium ppm ASTM D5185m 1070 839 1095 1076 Phosphorus ppm ASTM D5185m 1150 748 1048 1065 Zinc ppm ASTM D5185m 1270 1044 1314 1266 Sulfur ppm ASTM D5185m 2060 2260 3640 3364 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 2 2 Sodium ppm ASTM D5185m >20 3 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 5 0.5 0.5 Nitration Abs/cm *ASTM D7624 >20 13.3 7.7 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 31.0 19.1 19.5 FLUID DEGRADATION method <td< td=""><td>Manganese</td><td>ppm</td><td>ASTM D5185m</td><td>0</td><td><1</td><td>0</td><td><1</td></td<>	Manganese	ppm	ASTM D5185m	0	<1	0	<1
Phosphorus ppm ASTM D5185m 1150 748 1048 1065 Zinc ppm ASTM D5185m 1270 1044 1314 1266 Sulfur ppm ASTM D5185m 2060 2260 3640 3364 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 2 2 Godium ppm ASTM D5185m 4 2 4 Potassium ppm ASTM D5185m >20 3 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 5 0.5 0.5 Nitration Abs/cm *ASTM D7415 >30 31.0 19.1 19.5 FLUID DEGRADATION method limit/base current history1 history2 Dxidation Abs/.1mm *ASTM D7414	Magnesium	ppm	ASTM D5185m	1010	685	960	927
Zinc ppm ASTM D5185m 1270 1044 1314 1266 Sulfur ppm ASTM D5185m 2060 2260 3640 3364 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 2 2 Sodium ppm ASTM D5185m 4 2 4 Potassium ppm ASTM D5185m >20 3 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 5 0.5 0.5 Nitration Abs/cm *ASTM D7624 >20 13.3 7.7 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 31.0 19.1 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414	Calcium	ppm	ASTM D5185m	1070	839	1095	1076
Sulfur ppm ASTM D5185m 2060 2260 3640 3364 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 2 2 Sodium ppm ASTM D5185m 4 2 4 Potassium ppm ASTM D5185m >20 3 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 5 0.5 0.5 Nitration Abs/cm *ASTM D7624 >20 13.3 7.7 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 31.0 19.1 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.6 15.2 16.3	Phosphorus	ppm		1150	748	1048	
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 2 2 Sodium ppm ASTM D5185m 4 2 4 Potassium ppm ASTM D5185m >20 3 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 5 0.5 0.5 Nitration Abs/cm *ASTM D7624 >20 13.3 7.7 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 31.0 19.1 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.6 15.2 16.3	Zinc	ppm	ASTM D5185m	1270	1044	1314	
Solition ppm ASTM D5185m >25 7 2 2 4			ASTM D5185m	2060	2260	3640	3364
Sodium ppm ASTM D5185m 4 2 4 Potassium ppm ASTM D5185m >20 3 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 5 0.5 0.5 Nitration Abs/cm *ASTM D7624 >20 13.3 7.7 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 31.0 19.1 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.6 15.2 16.3	CONTAMINAN	TS		limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 3 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 5 0.5 0.5 Nitration Abs/cm *ASTM D7624 >20 13.3 7.7 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 31.0 19.1 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.6 15.2 16.3		ppm	ASTM D5185m	>25	7		
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 5 0.5 0.5 Nitration Abs/cm *ASTM D7624 >20 13.3 7.7 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 31.0 19.1 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.6 15.2 16.3		ppm					
Soot % *ASTM D7844 >6 5 0.5 0.5 Nitration Abs/cm *ASTM D7624 >20 13.3 7.7 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 31.0 19.1 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.6 15.2 16.3	Potassium	ppm	ASTM D5185m	>20	3	1	0
Nitration Abs/cm *ASTM D7624 >20 13.3 7.7 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 31.0 19.1 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.6 15.2 16.3	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 31.0 19.1 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.6 15.2 16.3	Soot %	%	*ASTM D7844	>6	5	0.5	0.5
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.6 15.2 16.3	Nitration	Abs/cm	*ASTM D7624	>20	13.3	7.7	8.5
Oxidation	Sulfation	Abs/.1mm	*ASTM D7415	>30	31.0	19.1	19.5
	FLUID DEGRAD	OATION	method	limit/base	current	history1	history2
Base Number (BN) mg K0H/g ASTM D2896 9.8 ▲ 0.1 8.3 7.8	Oxidation	Abs/.1mm	*ASTM D7414	>25	21.6	15.2	16.3
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	<u> </u>	8.3	7.8

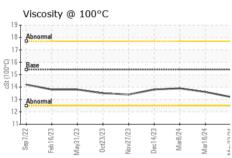


OIL ANALYSIS REPORT





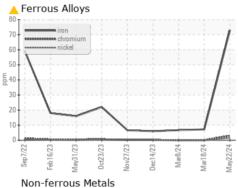


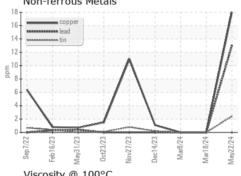


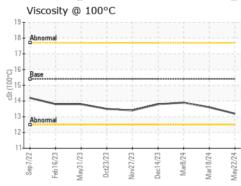
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

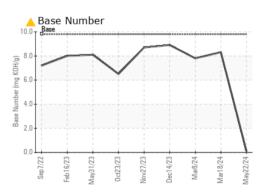
FLUID PROPI	ERITES	method	limit/base	current	history1	history
Visc @ 100°C	cSt	ASTM D445	15.4	13.2	13.6	13.9

GRAPHS













Certificate 12367

Laboratory Sample No.

: GFL0122496 Lab Number : 06190327

Unique Number : 11047079 Test Package : FLEET

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 24 May 2024

Tested : 29 May 2024 Diagnosed : 29 May 2024 - Don Baldridge

GFL Environmental - 415 - Michigan East

6200 Elmridge Sterling Heights, MI US 48313 Contact: Frank Wolak

fwolak@gflenv.com T: (586)825-9514

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)