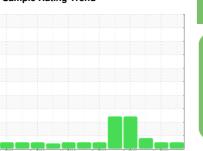


OIL ANALYSIS REPORT

Sample Rating Trend







720022-310085

Component **Diesel Engine**

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

DIAGNOSIS

Recommendation

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

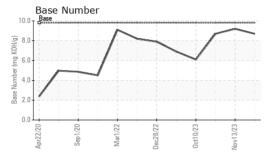
Fluid Condition

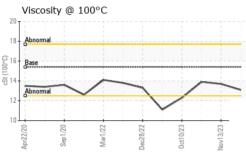
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Date			Apr2020	Sep 2020 Mar 2022	Dec2022 Oct2023 N	ov2023	
Sample Date	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 10548 10414 10270 Oil Age hrs Client Info 0 0 0 0 Oil Changed Client Info N/A N/A N/A N/A Sample Status NORMAL NORMAL NORMAL NORMAL NAMARGINAL CONTAMINATION method Imitibase current history1 history2 Fuel WC Method >5 <1.0 <1.0 ▲ 2.3 Water WC Method NEG NEG NEG NEG Iron ppm ASTM 05185m >80 22 16 6 Chromium ppm ASTM 05185m >5 1 1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <td< th=""><th>Sample Number</th><th></th><th>Client Info</th><th></th><th>GFL0102518</th><th>GFL0098617</th><th>GFL0093683</th></td<>	Sample Number		Client Info		GFL0102518	GFL0098617	GFL0093683
Oil Age hrs Client Info N/A N/A N/A N/A Sample Status Client Info N/A N/A N/A N/A CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0 <1.0 ▲ 2.3 Water WC Method >0.2 NEG NEG NEG Glycol WC Method Imitibase current history1 history2 Iron ppm ASTM D5185m >80 22 16 6 Chromium ppm ASTM D5185m >80 22 16 6 Chromium ppm ASTM D5185m >80 22 16 6 Chromium ppm ASTM D5185m >30 0 <1 0 Nickel ppm ASTM D5185m >30 0 <1 0 Silver ppm ASTM D5185m >30 0 <1 0	Sample Date		Client Info		04 Dec 2023	13 Nov 2023	29 Oct 2023
Oil Changed Sample Status Client Info N/A NAG NEG <	Machine Age	hrs	Client Info		10548	10414	10270
CONTAMINATION method minit base current history1 history2	Oil Age	hrs	Client Info		0	0	0
CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0	Oil Changed		Client Info		N/A	N/A	N/A
Fuel	Sample Status				NORMAL	NORMAL	MARGINAL
Water WC Method >0.2 NEG NEG NEG NEG Glycol WC Method Imitibase current history1 history2 WEAR METALS method limitibase current history1 history2 Iron ppm ASTM D5185m >80 22 16 6 Chromium ppm ASTM D5185m >5 1 1 <1 Nickel ppm ASTM D5185m >2 0 <1 0 Silver ppm ASTM D5185m >20 6 6 1 Aluminum ppm ASTM D5185m >30 0 <1 0 Silver ppm ASTM D5185m >30 0 <1 0 Aluminum ppm ASTM D5185m >30 0 <1 0 Copper ppm ASTM D5185m >5 0 0 0 Vanadium ppm ASTM D5185m 0 0 0	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>5	<1.0	<1.0	<u>2.3</u>
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Irron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >5 1 1 <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>80	22	16	6
Titanium	Chromium	ppm	ASTM D5185m	>5	1	1	<1
Description	Nickel				0	<1	0
Silver ppm ASTM D5185m >3 0 0 <1 Aluminum ppm ASTM D5185m >30 6 6 1 Lead ppm ASTM D5185m >30 0 <1 0 Copper ppm ASTM D5185m >150 1 2 <1 Tin ppm ASTM D5185m >5 0 0 0 Vanadium ppm ASTM D5185m 0 0 0 0 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 1 <1 3 Boron ppm ASTM D5185m 0 0 9 0 Molybdenum ppm ASTM D5185m 0 0 9 0 Manganesium ppm ASTM D5185m 0 0 <1 <1 Magnesium ppm ASTM D5185m 1010 897 868 <t< td=""><td>Titanium</td><td>• • • • • • • • • • • • • • • • • • • •</td><td>ASTM D5185m</td><td></td><th>0</th><td><1</td><td>0</td></t<>	Titanium	• • • • • • • • • • • • • • • • • • • •	ASTM D5185m		0	<1	0
Aluminum ppm ASTM D5185m >30 6 6 1 Lead ppm ASTM D5185m >30 0 <1	Silver		ASTM D5185m	>3	0	0	<1
Lead	Aluminum	• • • • • • • • • • • • • • • • • • • •	ASTM D5185m	>30	6	6	1
Copper ppm ASTM D5185m >150 1 2 <1 Tin ppm ASTM D5185m >5 0 0 0 Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 <1					0		0
Tin		• • • • • • • • • • • • • • • • • • • •					
Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 1 <1 3 Barium ppm ASTM D5185m 0 0 9 0 Molybdenum ppm ASTM D5185m 0 0 9 0 Molybdenum ppm ASTM D5185m 0 0 9 0 Magnesium ppm ASTM D5185m 0 0 <1 <1 Magnesium ppm ASTM D5185m 1070 1006 1020 916 Phosphorus ppm ASTM D5185m 1150 972 994 982 Zinc ppm ASTM D5185m 1270 1165 1162 1141 Sulfur ppm ASTM D5185m 20 9 8 6	• • • • • • • • • • • • • • • • • • • •						
Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 1 <1		• • • • • • • • • • • • • • • • • • • •					
Boron					-		
Barium ppm ASTM D5185m 0 0 9 0 Molybdenum ppm ASTM D5185m 60 57 58 52 Manganese ppm ASTM D5185m 0 0 <1	ADDITIVES		method	limit/base	current	history1	history2
Barium ppm ASTM D5185m 0 0 9 0 Molybdenum ppm ASTM D5185m 60 57 58 52 Manganese ppm ASTM D5185m 0 0 <1	Boron	ppm	ASTM D5185m	0	1	<1	3
Molybdenum ppm ASTM D5185m 60 57 58 52 Manganese ppm ASTM D5185m 0 0 <1 <1 Magnesium ppm ASTM D5185m 1010 897 868 852 Calcium ppm ASTM D5185m 1070 1006 1020 916 Phosphorus ppm ASTM D5185m 1150 972 994 982 Zinc ppm ASTM D5185m 1270 1165 1162 1141 Sulfur ppm ASTM D5185m 2060 3165 3602 2839 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 9 8 6 Sodium ppm ASTM D5185m 3 3 4 Potassium ppm ASTM D5185m 20 17 17 <1 INFRA-RED method limit/base c	Barium	• • • • • • • • • • • • • • • • • • • •	ASTM D5185m	0	0	9	0
Manganese ppm ASTM D5185m 0 0 <1 <1 Magnesium ppm ASTM D5185m 1010 897 868 852 Calcium ppm ASTM D5185m 1070 1006 1020 916 Phosphorus ppm ASTM D5185m 1150 972 994 982 Zinc ppm ASTM D5185m 1270 1165 1162 1141 Sulfur ppm ASTM D5185m 2060 3165 3602 2839 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 9 8 6 Sodium ppm ASTM D5185m >20 9 8 6 Sodium ppm ASTM D5185m >20 17 17 <1	Molybdenum		ASTM D5185m	60	57	58	52
Magnesium ppm ASTM D5185m 1010 897 868 852 Calcium ppm ASTM D5185m 1070 1006 1020 916 Phosphorus ppm ASTM D5185m 1150 972 994 982 Zinc ppm ASTM D5185m 1270 1165 1162 1141 Sulfur ppm ASTM D5185m 2060 3165 3602 2839 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 9 8 6 Sodium ppm ASTM D5185m >20 9 8 6 Sodium ppm ASTM D5185m >20 17 17 <1	•		ASTM D5185m	0	0	<1	<1
Calcium ppm ASTM D5185m 1070 1006 1020 916 Phosphorus ppm ASTM D5185m 1150 972 994 982 Zinc ppm ASTM D5185m 1270 1165 1162 1141 Sulfur ppm ASTM D5185m 2060 3165 3602 2839 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 9 8 6 Sodium ppm ASTM D5185m >20 9 8 6 Sodium ppm ASTM D5185m >20 17 17 <1	-		ASTM D5185m	1010	897	868	852
Phosphorus ppm ASTM D5185m 1150 972 994 982 Zinc ppm ASTM D5185m 1270 1165 1162 1141 Sulfur ppm ASTM D5185m 2060 3165 3602 2839 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 9 8 6 Sodium ppm ASTM D5185m >20 9 8 6 Sodium ppm ASTM D5185m >20 17 17 <1	Calcium		ASTM D5185m	1070		1020	
Zinc ppm ASTM D5185m 1270 1165 1162 1141 Sulfur ppm ASTM D5185m 2060 3165 3602 2839 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 9 8 6 Sodium ppm ASTM D5185m 3 3 4 Potassium ppm ASTM D5185m >20 17 17 <1	Phosphorus				972		
Sulfur ppm ASTM D5185m 2060 3165 3602 2839 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 9 8 6 Sodium ppm ASTM D5185m 3 3 4 Potassium ppm ASTM D5185m >20 17 17 <1	•		ASTM D5185m	1270	_		
Silicon ppm ASTM D5185m >20 9 8 6 Sodium ppm ASTM D5185m 3 3 4 Potassium ppm ASTM D5185m >20 17 17 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.2 0.2 Nitration Abs/cm *ASTM D7624 >20 7.2 6.1 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.3 18.5 18.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.2 14.9 15.8							
Silicon ppm ASTM D5185m >20 9 8 6 Sodium ppm ASTM D5185m 3 3 4 Potassium ppm ASTM D5185m >20 17 17 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.2 0.2 Nitration Abs/cm *ASTM D7624 >20 7.2 6.1 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.3 18.5 18.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.2 14.9 15.8	CONTAMINAN	TS	method	limit/base	current	history1	history2
Sodium ppm ASTM D5185m 3 3 4 Potassium ppm ASTM D5185m >20 17 17 <1			ASTM D5185m	>20	9	8	6
Potassium ppm ASTM D5185m >20 17 17 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.2 0.2 Nitration Abs/cm *ASTM D7624 >20 7.2 6.1 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.3 18.5 18.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.2 14.9 15.8	Sodium						
Soot % % *ASTM D7844 >3 0.3 0.2 0.2 Nitration Abs/cm *ASTM D7624 >20 7.2 6.1 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.3 18.5 18.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.2 14.9 15.8	Potassium	ppm	ASTM D5185m	>20		17	<1
Nitration Abs/cm *ASTM D7624 >20 7.2 6.1 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.3 18.5 18.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.2 14.9 15.8	INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm *ASTM D7624 >20 7.2 6.1 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.3 18.5 18.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.2 14.9 15.8	Soot %	%	*ASTM D7844	>3	0.3	0.2	0.2
Sulfation Abs/.1mm *ASTM D7415 >30 19.3 18.5 18.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.2 14.9 15.8							
Oxidation Abs/.1mm *ASTM D7414 >25 16.2 14.9 15.8							
	FLUID DEGRAD	OATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	16.2	14.9	15.8
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.7	9.2	8.7



OIL ANALYSIS REPORT

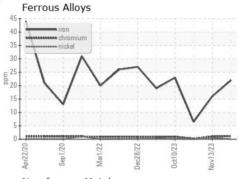


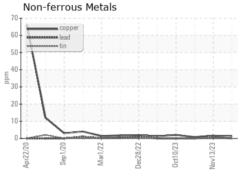


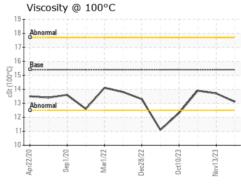
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

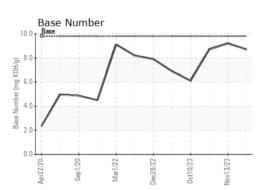
FLUID PROPI	ERTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.1	13.7	13.9

GRAPHS













Certificate L2367

Laboratory Test Package : FLEET

Sample No. Lab Number **Unique Number**

: GFL0102518 : 06034999 : 10790228

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Recieved : 14 Dec 2023 Diagnosed Diagnostician : Wes Davis

: 15 Dec 2023

GFL Environmental - 837 - Harrison TS

22820 S State Route 291 Harrisonville, MO US 64701

Contact: BRYAN SWANSON bryanswanson@gflenv.com

T:

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)

F: