

PROBLEM SUMMARY

Sample Rating Trend

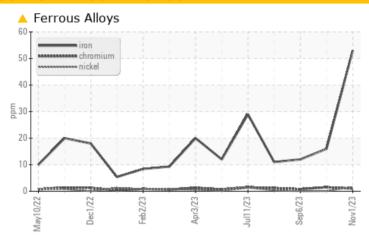
WEAR

731112-310100

Component **Natural Gas Engine**

PETRO CANADA DURON GEO LD 15W40 (--- GAL)

COMPONENT CONDITION SUMMARY



RECOMMENDATION

No corrective action is recommended at this time. Resample at the next service interval to monitor.

PROBLEMATIC TEST RESULTS								
Sample Status				ABNORMAL	NORMAL	NORMAL		
Iron	ppm	ASTM D5185m	>50	△ 53	16	12		

Customer Id: GFL836 **Sample No.:** GFL0095159 Lab Number: 06000305 Test Package: FLEET

To manage this report scan the QR code

To discuss the diagnosis or test data: Sean Felton +1 919-379-4092 sfelton@wearcheckusa.com

To change component or sample information: Customer Service +1 1-800-237-1369 customerservice@wearcheck.com

RECOMMENDED ACTIONS

There are no recommended actions for this sample.

HISTORICAL DIAGNOSIS

03 Oct 2023 Diag: Wes Davis

NORMAL



Resample at the next service interval to monitor. All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.



06 Sep 2023 Diag: Wes Davis

NORMAL



Resample at the next service interval to monitor. All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.



14 Aug 2023 Diag: Wes Davis

NORMAL



Resample at the next service interval to monitor. All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.





OIL ANALYSIS REPORT

Sample Rating Trend

WEAR

731112-310100

Component

Natural Gas Engine

PETRO CANADA DURON GEO LD 15W40 (--- GAL)

DIAGNOSIS

Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

Cylinder, crank, or cam shaft wear is indicated.

Contamination

There is no indication of any contamination in the oil.

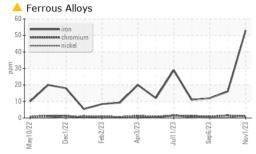
Fluid Condition

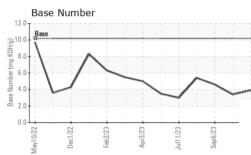
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

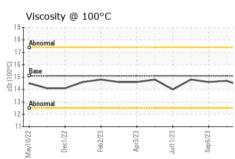
SAMPLE INFORMATION method limit/base current history1 history2	(GAL)							
Sample Date Client Info 01 Nov 2023 03 Oct 2023 06 Sep 2023 Machine Age hrs Client Info 5686 5483 5280 Oil Age hrs Client Info Not Changd Not Changd Not Changd Not Changd NoRMAL WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >50 ♣ 53 16 12 Chromium ppm ASTM D5185m >4 1 2 <1 Nickel ppm ASTM D5185m >2 2 <1 0 Silver ppm ASTM D5185m >2 2 <1 0 Silver ppm ASTM D5185m >3 <1 0 0 Silver ppm ASTM D5185m >3 1 4 1 Copper ppm ASTM D5185m >3 1 4 1 Copper ppm ASTM D5185m >	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2	
Machine Age hrs Client Info 5686 5483 5280 Oil Age hrs Client Info 0 0 0 Oil Changed Client Info Not Changd Not Changd Not Changd Sample Status Image: Company Info North Changd North Changd North Changd WEAR METALS method limit/base current history2 Iron ppm ASTM D5186m >50 \$53 16 12 Chromium ppm ASTM D5186m >2 2 <1	Sample Number		Client Info		GFL0095159	GFL0095110	GFL0090655	
Oil Age hrs Client Info Not Changd Not Changd	Sample Date		Client Info		01 Nov 2023	03 Oct 2023	06 Sep 2023	
Oil Changed Sample Status Client Info Not Changd ABNORMAL Not Changd NORMAL Not Changd NORMAL WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >50 ♣ 53 16 12 Chromium ppm ASTM D5185m >4 1 2 <1	Machine Age	hrs	Client Info		5686	5483	5280	
Sample Status method limit/base current history1 history2 Iron ppm ASTM D5185m >50 53 16 12 Chromium ppm ASTM D5185m >4 1 2 <1	Oil Age	hrs	Client Info		0	0	0	
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >50 ▲ 53 16 12 Chromium ppm ASTM D5185m >4 1 2 <1	Oil Changed		Client Info		Not Changd	Not Changd	Not Changd	
Iron	Sample Status				ABNORMAL	NORMAL	NORMAL	
Chromium ppm ASTM D5185m >4 1 2 <1	WEAR METALS	S	method	limit/base	current	history1	history2	
Nickel	Iron	ppm	ASTM D5185m	>50	53	16	12	
Titanium ppm ASTM D5185m <1 0 0 Silver ppm ASTM D5185m >3 <1 0 0 Aluminum ppm ASTM D5185m >9 3 4 <1 Lead ppm ASTM D5185m >9 3 4 1 Copper ppm ASTM D5185m >35 18 2 1 Tin ppm ASTM D5185m >4 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 <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	Chromium	ppm	ASTM D5185m	>4	1	2	<1	
Silver ppm ASTM D5185m >3 <1 0 0 Aluminum ppm ASTM D5185m >9 3 4 <1 Lead ppm ASTM D5185m >30 1 4 1 Copper ppm ASTM D5185m >35 18 2 1 Tin ppm ASTM D5185m >4 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 <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 <1 <1 <1	Nickel	ppm	ASTM D5185m	>2	2	<1	0	
Aluminum	Titanium	ppm	ASTM D5185m		<1	0	0	
Lead	Silver	ppm	ASTM D5185m	>3		0	0	
Copper ppm ASTM D5185m >35 18 2 1 Tin ppm ASTM D5185m >4 1 <1	Aluminum	ppm						
Tin ppm ASTM D5185m >4 1 <1 <1 <1 Vanadium ppm ASTM D5185m 0 0 <1 <0 <1 Cadmium ppm ASTM D5185m 0 11 7 11 Boron ppm ASTM D5185m 50 11 7 11 Barium ppm ASTM D5185m 50 53 61 56 Molybdenum ppm ASTM D5185m 50 53 61 56 Manganese ppm ASTM D5185m 50 53 61 56 Magnesium ppm ASTM D5185m 560 703 581 584 Calcium ppm ASTM D5185m 1510 1203 1686 1733 Phosphorus ppm ASTM D5185m 870 856 1020 981 Sulfur ppm ASTM D5185m 20 856 1020 981 Sulfur ppm ASTM	Lead	ppm	ASTM D5185m	>30	1	4		
Vanadium ppm ASTM D5185m 0 0 <1 Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 50 11 7 11 Barium ppm ASTM D5185m 5 9 0 0 Molybdenum ppm ASTM D5185m 50 53 61 56 Manganese ppm ASTM D5185m 0 13 <1 <1 Magnesium ppm ASTM D5185m 560 703 581 584 Calcium ppm ASTM D5185m 780 651 748 718 Phosphorus ppm ASTM D5185m 870 856 1020 981 Sulfur ppm ASTM D5185m >40 2269 2786 2854 CONTAMINANTS method limit/base current history1 <t< td=""><td>Copper</td><td>ppm</td><td>ASTM D5185m</td><td>>35</td><th>18</th><td>2</td><td></td></t<>	Copper	ppm	ASTM D5185m	>35	18	2		
Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 50 11 7 11 Barium ppm ASTM D5185m 50 9 0 0 Molybdenum ppm ASTM D5185m 50 53 61 56 Manganese ppm ASTM D5185m 50 703 581 584 Calcium ppm ASTM D5185m 780 651 748 718 Zinc ppm ASTM D5185m 780 651 748 718 Zinc ppm ASTM D5185m 2040 2269 2786 2854 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 38 6 5 Sodium ppm ASTM D5185m >20 5	Tin	ppm	ASTM D5185m	>4				
Map	Vanadium	ppm	ASTM D5185m		0			
Boron	Cadmium	ppm	ASTM D5185m		<1	0	0	
Barium ppm ASTM D5185m 5 9 0 0 Molybdenum ppm ASTM D5185m 50 53 61 56 Manganese ppm ASTM D5185m 0 13 <1 <1 Magnesium ppm ASTM D5185m 560 703 581 584 Calcium ppm ASTM D5185m 1510 1203 1686 1733 Phosphorus ppm ASTM D5185m 780 651 748 718 Zinc ppm ASTM D5185m 870 856 1020 981 Sulfur ppm ASTM D5185m 2040 2269 2786 2854 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 38 6 5 Sodium ppm ASTM D5185m 1 9 6 Potassium ppm ASTM D5185m 20	ADDITIVES		method	limit/base	current	history1	history2	
Molybdenum ppm ASTM D5185m 50 53 61 56 Manganese ppm ASTM D5185m 0 13 <1 <1 Magnesium ppm ASTM D5185m 560 703 581 584 Calcium ppm ASTM D5185m 1510 1203 1686 1733 Phosphorus ppm ASTM D5185m 780 651 748 718 Zinc ppm ASTM D5185m 870 856 1020 981 Sulfur ppm ASTM D5185m 2040 2269 2786 2854 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 38 6 5 Sodium ppm ASTM D5185m >+100 38 6 5 Sodium ppm ASTM D5185m >20 5 1 0 INFRA-RED method limit/base	Boron	ppm	ASTM D5185m	50				
Manganese ppm ASTM D5185m 0 13 <1 <1 Magnesium ppm ASTM D5185m 560 703 581 584 Calcium ppm ASTM D5185m 1510 1203 1686 1733 Phosphorus ppm ASTM D5185m 780 651 748 718 Zinc ppm ASTM D5185m 870 856 1020 981 Sulfur ppm ASTM D5185m 2040 2269 2786 2854 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 38 6 5 Sodium ppm ASTM D5185m >+100 38 6 5 Sodium ppm ASTM D5185m >20 5 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20		ppm	ASTM D5185m	5	9	0		
Magnesium ppm ASTM D5185m 560 703 581 584 Calcium ppm ASTM D5185m 1510 1203 1686 1733 Phosphorus ppm ASTM D5185m 780 651 748 718 Zinc ppm ASTM D5185m 870 856 1020 981 Sulfur ppm ASTM D5185m 2040 2269 2786 2854 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 38 6 5 Sodium ppm ASTM D5185m >+100 38 6 5 Sodium ppm ASTM D5185m >20 5 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0.1 Nitration Abs/cm *ASTM D7415 >30 <td< td=""><td>Molybdenum</td><td>ppm</td><td></td><td></td><th></th><td>61</td><td></td></td<>	Molybdenum	ppm				61		
Calcium ppm ASTM D5185m 1510 1203 1686 1733 Phosphorus ppm ASTM D5185m 780 651 748 718 Zinc ppm ASTM D5185m 870 856 1020 981 Sulfur ppm ASTM D5185m 2040 2269 2786 2854 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 38 6 5 Sodium ppm ASTM D5185m >+100 38 6 5 Sodium ppm ASTM D5185m >20 5 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0.1 Nitration Abs/.1mm *ASTM D7415 >30 22.8 23.6 21.1 FLUID DEGRADATION method limit/bas	•				_			
Phosphorus ppm ASTM D5185m 780 651 748 718 Zinc ppm ASTM D5185m 870 856 1020 981 Sulfur ppm ASTM D5185m 2040 2269 2786 2854 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 38 6 5 Sodium ppm ASTM D5185m >+100 38 6 5 Sodium ppm ASTM D5185m >20 5 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0.1 Nitration Abs/.1mm *ASTM D7415 >30 22.8 23.6 21.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 <	-							
Zinc ppm ASTM D5185m 870 856 1020 981 Sulfur ppm ASTM D5185m 2040 2269 2786 2854 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 38 6 5 Sodium ppm ASTM D5185m >+100 38 6 5 Potassium ppm ASTM D5185m >20 5 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0.1 Nitration Abs/cm *ASTM D7624 >20 12.2 11.0 10.6 Sulfation Abs/.1mm *ASTM D7415 >30 22.8 23.6 21.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414								
Sulfur ppm ASTM D5185m 2040 2269 2786 2854 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 38 6 5 Sodium ppm ASTM D5185m 1 9 6 Potassium ppm ASTM D5185m >20 5 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0.1 Nitration Abs/cm *ASTM D7624 >20 12.2 11.0 10.6 Sulfation Abs/.1mm *ASTM D7415 >30 22.8 23.6 21.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.0 19.5 17.6								
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 38 6 5 Sodium ppm ASTM D5185m 1 9 6 Potassium ppm ASTM D5185m >20 5 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0.1 Nitration Abs/cm *ASTM D7624 >20 12.2 11.0 10.6 Sulfation Abs/.1mm *ASTM D7415 >30 22.8 23.6 21.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.0 19.5 17.6								
Silicon ppm ASTM D5185m >+100 38 6 5 Sodium ppm ASTM D5185m 1 9 6 Potassium ppm ASTM D5185m >20 5 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0.1 Nitration Abs/cm *ASTM D7624 >20 12.2 11.0 10.6 Sulfation Abs/.1mm *ASTM D7415 >30 22.8 23.6 21.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.0 19.5 17.6			ASTM D5185m		2269	2786	2854	
Sodium ppm ASTM D5185m 1 9 6 Potassium ppm ASTM D5185m >20 5 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0.1 Nitration Abs/cm *ASTM D7624 >20 12.2 11.0 10.6 Sulfation Abs/.1mm *ASTM D7415 >30 22.8 23.6 21.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.0 19.5 17.6	CONTAMINAN	TS	method	limit/base	current	history1		
Potassium ppm ASTM D5185m >20 5 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0.1 Nitration Abs/cm *ASTM D7624 >20 12.2 11.0 10.6 Sulfation Abs/.1mm *ASTM D7415 >30 22.8 23.6 21.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.0 19.5 17.6		ppm	ASTM D5185m	>+100				
INFRA-RED	Sodium	ppm	ASTM D5185m		1	9		
Soot % % *ASTM D7844 0 0 0.1 Nitration Abs/cm *ASTM D7624 >20 12.2 11.0 10.6 Sulfation Abs/.1mm *ASTM D7415 >30 22.8 23.6 21.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.0 19.5 17.6	Potassium	ppm	ASTM D5185m	>20	5	1	0	
Nitration Abs/cm *ASTM D7624 >20 12.2 11.0 10.6 Sulfation Abs/.1mm *ASTM D7415 >30 22.8 23.6 21.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.0 19.5 17.6	INFRA-RED		method	limit/base	current	history1	history2	
Sulfation Abs/.1mm *ASTM D7415 >30 22.8 23.6 21.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.0 19.5 17.6	Soot %	%	*ASTM D7844		0	0	0.1	
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.0 19.5 17.6	Nitration	Abs/cm	*ASTM D7624	>20	12.2	11.0	10.6	
Oxidation Abs/.1mm *ASTM D7414 >25 21.0 19.5 17.6	Sulfation	Abs/.1mm	*ASTM D7415	>30	22.8	23.6	21.1	
	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2	
Base Number (BN) mg KOH/g ASTM D2896 10.2 3.9 3.4 4.6	Oxidation	Abs/.1mm	*ASTM D7414	>25	21.0	19.5	17.6	
	Base Number (BN)	mg KOH/g	ASTM D2896	10.2	3.9	3.4	4.6	



OIL ANALYSIS REPORT



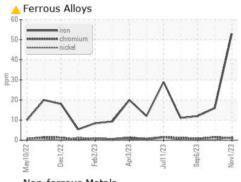


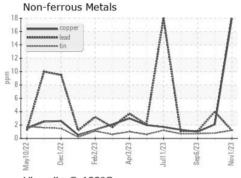


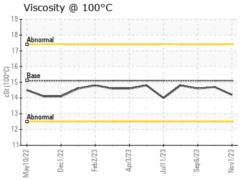
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	LIGHT	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

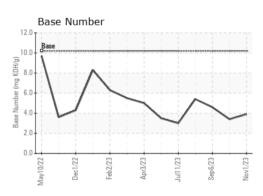
FLUID PROPI	ERHES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.1	14.2	14.7	14.6

GRAPHS













Certificate L2367

Laboratory Sample No. Lab Number **Unique Number** Test Package : FLEET

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0095159 : 06000305 : 10728665

Received Diagnosed Diagnostician

: 07 Nov 2023 : 08 Nov 2023 : Sean Felton

GFL Environmental - 836 - Kansas City Hauling

7801 East Truman Road Kansas City, MO US 64126

Contact: Robert Hart rhart@gflenv.com T: (580)461-1509

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)

Report Id: GFL836 [WUSCAR] 06000305 (Generated: 11/08/2023 15:04:21) Rev: 1

Contact/Location: See also GFL823, 834, 837, 840 - Robert Hart - GFL836