

PROBLEM SUMMARY

Sample Rating Trend

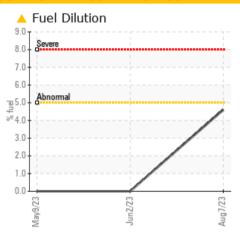
GLYCOL

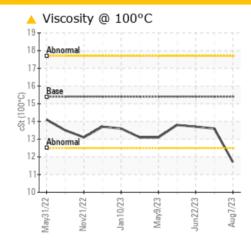
Machine Id 711011
Component

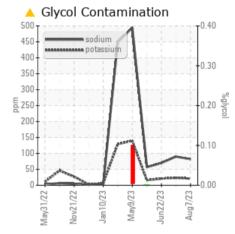
Diesel Engine

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

COMPONENT CONDITION SUMMARY







RECOMMENDATION

We advise that you check the fuel injection system. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

PROBLEMATIC	TEST RESULTS
0	

Sample Status				ABNORMAL	ATTENTION	NORMAL
Sodium	ppm	ASTM D5185m		<u>^</u> 82	4 90	70
Fuel	%	ASTM D3524	>5	4.6	<1.0	<1.0
Visc @ 100°C	cSt	ASTM D445	15.4	11.7	13.6	13.7

Customer Id: GFL821 Sample No.: GFL0076809 Lab Number: 05933144 Test Package: FLEET



To manage this report scan the QR code

To discuss the diagnosis or test data: Jonathan Hester +1 919-379-4092 x4092 jhester@wearcheckusa.com

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

RECOMMENDED ACTIONS

Action	Status	Date	Done By	Description
Change Fluid			?	Oil and filter change at the time of sampling has been noted.
Change Filter			?	Oil and filter change at the time of sampling has been noted.
Resample			?	We recommend an early resample to monitor this condition.
Check Fuel/injector System			?	We advise that you check the fuel injection system.

HISTORICAL DIAGNOSIS

13 Jul 2023 Diag: Jonathan Hester

GLYCOL



No corrective action is recommended at this time. Resample at the next service interval to monitor. All component wear rates are normal. Sodium and/or potassium levels are high. Test for glycol is negative. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.



22 Jun 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.



02 Jun 2023 Diag: Don Baldridge

NORMAL

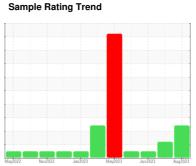


Resample at the next service interval to monitor. All component wear rates are normal. Test for glycol is negative. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time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





OIL ANALYSIS REPORT



GLYCOL



Machine Id 711011 Component

Diesel Engine

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

DIAGNOSIS

Recommendation

We advise that you check the fuel injection system. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

Wear

All component wear rates are normal.

Contamination

Sodium and/or potassium levels are high. There is a moderate amount of fuel present in the oil. Test for glycol is negative.

Fluid Condition

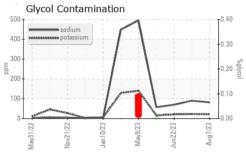
Fuel is present in the oil and is lowering the viscosity. The BN result indicates that there is suitable alkalinity remaining in the oil.

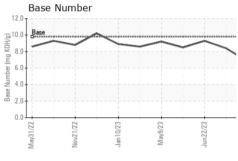
SAMPLE INFORMATION method limit/base current history1 history2 Sample Number Client Info GFL0076809 GFL0076763 GFL0076783 GFL0076783 GPL0076783 Jour Qu23 13 Jul 2023 22 Jun 2023 13 Jul 2023 22 Jun 2023 15 Jul 2023 150 Not Changd	BAL)		May2022	Nov2022 Jan2023	May2023 Jun2023	Aug 2023	
Sample Date Client Info 6919 6812 6651	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 6919 6812 6651 Oil Age hrs Client Info 0 150 150 150 Oil Changed Client Info Changed Not Changd Not Changd Not Changd Sample Status method limit/base current history1 history2 Iron ppm ASTM D5185m >100 21 15 11 Chromium ppm ASTM D5185m >20 1 <1 <1 Nickel ppm ASTM D5185m >20 1 <1 <1 Silver ppm ASTM D5185m >20 <1 0 <1 Silver ppm ASTM D5185m >20 <1 2 3 Silver ppm ASTM D5185m >20 <1 2 3 Lead ppm ASTM D5185m >30 0 0 0 Copper ppm ASTM D5185m >30 0 <	Sample Number		Client Info		GFL0076809	GFL0076763	GFL0076783
Oil Age hrs Client Info Changed Not Changd Not Changd No	Sample Date		Client Info		07 Aug 2023	13 Jul 2023	22 Jun 2023
Oil Changed Sample Status Client Info Changed ABNORMAL ATTENTION Not Changed Not Changed ABNORMAL Not Changed Not Changed ABNORMAL Not Changed Not Changed ATTENTION NORMAL WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 21 15 11 Chromium ppm ASTM D5185m >20 1 <1 <1 Nickel ppm ASTM D5185m >4 0 0 0 Silver ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >30 0 0 0 Caded ppm ASTM D5185m >30 0 0 0 Caded up ASTM D5185m >40 0 0 0 0 Caded up ASTM D5185m >33 15 3 3 3 Tin ppm ASTM D5185m 0 0 0 1 0	Machine Age	hrs	Client Info		6919	6812	6651
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 21 15 11 Chromium ppm ASTM D5185m >20 1 <1	Oil Age	hrs	Client Info		0	150	150
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 21 15 11 Chromium ppm ASTM D5185m >20 1 <1	Oil Changed		Client Info		Changed	Not Changd	Not Changd
Iron	Sample Status				ABNORMAL	ATTENTION	NORMAL
Chromium ppm ASTM D5185m >20 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 <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 <td>WEAR METAL</td> <td>.S</td> <td>method</td> <td>limit/base</td> <td>current</td> <td>history1</td> <td>history2</td>	WEAR METAL	.S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	21	15	11
Titanium	Chromium	ppm	ASTM D5185m	>20	1	<1	<1
Silver	Nickel	ppm	ASTM D5185m	>4	0	0	0
Aluminum ppm ASTM D5185m >20 <1 2 3 Lead ppm ASTM D5185m >40 0 0 0 Copper ppm ASTM D5185m >330 15 3 3 Tin ppm ASTM D5185m >15 0 0 <1	Titanium	ppm	ASTM D5185m		0	<1	0
Lead ppm ASTM D5185m >40 0 0 0 Copper ppm ASTM D5185m >330 15 3 3 Tin ppm ASTM D5185m >15 0 0 <1 Vanadium ppm ASTM D5185m 0 0 <1 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 1 Barium ppm ASTM D5185m 0 2 0 0 Molybdenum ppm ASTM D5185m 0 2 0 0 Magnesium ppm ASTM D5185m 0 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	Silver	ppm	ASTM D5185m	>3	0	0	0
Copper ppm ASTM D5185m >330 15 3 3 Tin ppm ASTM D5185m >15 0 0 <1	Aluminum	ppm	ASTM D5185m	>20	<1	2	3
Tin	Lead	ppm	ASTM D5185m	>40	0	0	0
Vanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 1 Barium ppm ASTM D5185m 0 2 0 0 Molybdenum ppm ASTM D5185m 60 60 66 66 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 795 966 969 Calcium ppm ASTM D5185m 1070 999 1109 1078 Phosphorus ppm ASTM D5185m 1270 1148 1229 1330 Sulfur ppm ASTM D5185m 2060 2846 3505 3806 CONTAMINANTS method limit/base current history1	Copper	ppm	ASTM D5185m	>330	15	3	3
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 1 Barium ppm ASTM D5185m 0 2 0 0 Molydenum ppm ASTM D5185m 60 60 66 66 Manganese ppm ASTM D5185m 0 <1	Tin	ppm	ASTM D5185m	>15	0	0	<1
ADDITIVES	Vanadium	ppm	ASTM D5185m		0	<1	0
Boron	Cadmium	ppm	ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 0 2 0 0 Molybdenum ppm ASTM D5185m 60 60 66 66 Manganese ppm ASTM D5185m 0 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 60 66 66 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 795 966 969 Calcium ppm ASTM D5185m 1070 999 1109 1078 Phosphorus ppm ASTM D5185m 1150 928 1029 1059 Zinc ppm ASTM D5185m 1270 1148 1229 1330 Sulfur ppm ASTM D5185m 2060 2846 3505 3806 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 4 Sodium ppm ASTM D5185m >20 21 23 21 Fuel % ASTM D5185m >20 21 23 21 Fuel % ASTM D3524 >	Boron	ppm	ASTM D5185m	0	0	0	1
Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 795 966 969 Calcium ppm ASTM D5185m 1070 999 1109 1078 Phosphorus ppm ASTM D5185m 1150 928 1029 1059 Zinc ppm ASTM D5185m 1270 1148 1229 1330 Sulfur ppm ASTM D5185m 2060 2846 3505 3806 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 4 Sodium ppm ASTM D5185m >20 21 23 21 Fuel % ASTM D3524 >5 4.6 <1.0	Barium	ppm	ASTM D5185m	0	2	0	0
Magnesium ppm ASTM D5185m 1010 795 966 969 Calcium ppm ASTM D5185m 1070 999 1109 1078 Phosphorus ppm ASTM D5185m 1150 928 1029 1059 Zinc ppm ASTM D5185m 1270 1148 1229 1330 Sulfur ppm ASTM D5185m 2060 2846 3505 3806 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 4 Sodium ppm ASTM D5185m >25 9 5 4 Sodium ppm ASTM D5185m >20 21 23 21 Fuel % ASTM D5185m >20 21 23 21 Fuel % ASTM D524 >5 4 4.6 <1.0 <1.0 INFRA-RED method limit/bas	Molybdenum	ppm	ASTM D5185m	60	60	66	66
Calcium ppm ASTM D5185m 1070 999 1109 1078 Phosphorus ppm ASTM D5185m 1150 928 1029 1059 Zinc ppm ASTM D5185m 1270 1148 1229 1330 Sulfur ppm ASTM D5185m 2060 2846 3505 3806 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 4 Sodium ppm ASTM D5185m >25 9 5 4 Sodium ppm ASTM D5185m >20 21 23 21 Fuel % ASTM D3524 >5 4.6 <1.0	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus ppm ASTM D5185m 1150 928 1029 1059 Zinc ppm ASTM D5185m 1270 1148 1229 1330 Sulfur ppm ASTM D5185m 2060 2846 3505 3806 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 4 Sodium ppm ASTM D5185m >25 9 5 4 Sodium ppm ASTM D5185m >20 21 23 21 Fuel % ASTM D5185m >20 21 23 21 Fuel % ASTM D5185m >20 21 23 21 Fuel % ASTM D524 >5 4.6 <1.0	Magnesium	ppm	ASTM D5185m	1010	795	966	969
Zinc ppm ASTM D5185m 1270 1148 1229 1330 Sulfur ppm ASTM D5185m 2060 2846 3505 3806 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 4 Sodium ppm ASTM D5185m >25 9 5 4 Sodium ppm ASTM D5185m >20 21 23 21 Fuel % ASTM D5185m >20 21 23 21 Fuel % ASTM D3524 >5 4.6 <1.0	Calcium	ppm	ASTM D5185m	1070	999	1109	1078
Sulfur ppm ASTM D5185m 2060 2846 3505 3806 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 4 Sodium ppm ASTM D5185m A82 90 70 Potassium ppm ASTM D5185m >20 21 23 21 Fuel % ASTM D3524 >5 A6 <1.0	Phosphorus	ppm	ASTM D5185m	1150	928	1029	1059
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 4 Sodium ppm ASTM D5185m ≥20 21 23 21 Potassium ppm ASTM D5185m >20 21 23 21 Fuel % ASTM D3524 >5 ▲ 4.6 <1.0	Zinc	ppm	ASTM D5185m	1270	1148	1229	1330
Silicon ppm ASTM D5185m >25 9 5 4 Sodium ppm ASTM D5185m ≥20 21 23 21 Potassium ppm ASTM D5185m >20 21 23 21 Fuel % ASTM D3524 >5 ▲ 4.6 <1.0 <1.0 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.6 0.6 0.5 Nitration Abs/cm *ASTM D7624 >20 8.1 8.2 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.0 19.7 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 14.9 14.5	Sulfur	ppm	ASTM D5185m	2060	2846	3505	3806
Sodium ppm ASTM D5185m ▲ 82 ♠ 90 70 Potassium ppm ASTM D5185m >20 21 23 21 Fuel % ASTM D3524 >5 ▲ 4.6 <1.0	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 21 23 21 Fuel % ASTM D3524 >5 ▲ 4.6 <1.0 <1.0 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.6 0.6 0.5 Nitration Abs/cm *ASTM D7624 >20 8.1 8.2 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.0 19.7 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 14.9 14.5	Silicon	ppm	ASTM D5185m	>25	9	5	4
Fuel % ASTM D3524 >5 ▲ 4.6 <1.0 <1.0 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.6 0.6 0.5 Nitration Abs/cm *ASTM D7624 >20 8.1 8.2 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.0 19.7 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 14.9 14.5	Sodium	ppm	ASTM D5185m		△ 82	4 90	70
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.6 0.6 0.5 Nitration Abs/cm *ASTM D7624 >20 8.1 8.2 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.0 19.7 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 14.9 14.5	Potassium	ppm	ASTM D5185m	>20	21	23	21
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.6 0.6 0.5 Nitration Abs/cm *ASTM D7624 >20 8.1 8.2 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.0 19.7 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 14.9 14.5	Fuel	%	ASTM D3524	>5	4.6	<1.0	<1.0
Soot % % *ASTM D7844 >3 0.6 0.6 0.5 Nitration Abs/cm *ASTM D7624 >20 8.1 8.2 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.0 19.7 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 14.9 14.5	Glycol	%	*ASTM D2982		NEG	NEG	NEG
Nitration Abs/cm *ASTM D7624 >20 8.1 8.2 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.0 19.7 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 14.9 14.5	INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm *ASTM D7624 >20 8.1 8.2 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.0 19.7 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 14.9 14.5	Soot %	%	*ASTM D7844	>3	0.6	0.6	0.5
Sulfation Abs/.1mm *ASTM D7415 >30 19.0 19.7 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 14.9 14.5		Abs/cm	*ASTM D7624	>20	8.1	8.2	7.2
Oxidation Abs/.1mm *ASTM D7414 >25 14.2 14.9 14.5							
	FLUID DEGRAI	DATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	14.2	14.9	14.5
	Base Number (BN)	mg KOH/g			6.8	8.4	9.3

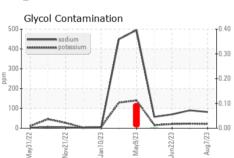


OIL ANALYSIS REPORT





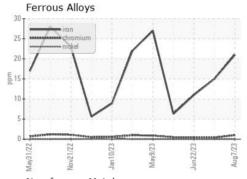


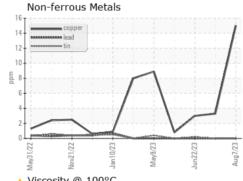


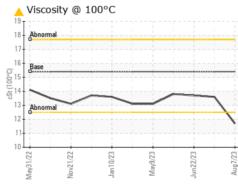
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

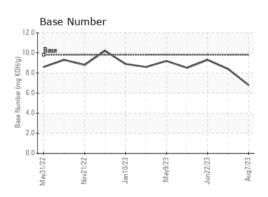
FLUID PROP	ELLIES	method	iiiiii/base	current	riistory i	riistoryz
Visc @ 100°C	cSt	ASTM D445	15.4	<u> </u>	13.6	13.7

GRAPHS













Laboratory Sample No. Lab Number **Unique Number**

: 05933144 : 10618415

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0076809 Received : 24 Aug 2023 Diagnosed

: 28 Aug 2023 Diagnostician : Jonathan Hester

Test Package : FLEET (Additional Tests: FuelDilution, Glycol, PercentFuel)

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)

GFL Environmental - 821 - Ozarks Hauling

33924 Olath Drive Lebanon, MO US 65536

Contact: Landen Johnson landen.johnson@gflenv.com

T: (417)664-0010