

PROBLEM SUMMARY

Sample Rating Trend

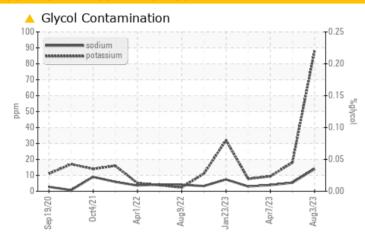
GLYCOL

Machine Id **829027-1078**

Component **Diesel Engine**

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

COMPONENT CONDITION SUMMARY



RECOMMENDATION

Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

PROBLEMATIC TEST RESULTS								
Sample Status				ABNORMAL	NORMAL	NORMAL		
Potassium	ppm	ASTM D5185m	>20	A 88	18	9		

Customer Id: GFL654S Sample No.: GFL0089520 Lab Number: 05918110 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 ihester@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.

HISTORICAL DIAGNOSIS

28 Apr 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.



07 Apr 2023 Diag: Doug Bogart

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.



10 Feb 2023 Diag: Wes Davis

NORMAL

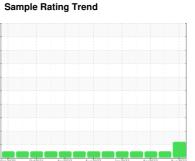


Resample at the next service interval to monitor. All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.





OIL ANALYSIS REPORT



GLYCOL



829027-1078

Component

Diesel Engine

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

DIAGNOSIS

Recommendation

Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

All component wear rates are normal.

Contamination

Sodium and/or potassium levels are high. Test for glycol is negative.

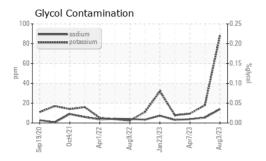
Fluid Condition

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.

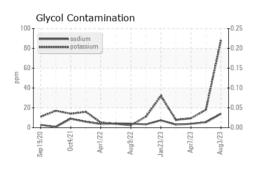
Sample Date Client Info 03 Aug 2023 28 Apr 2023 07 Apr 2023 Machine Age hrs Client Info 11748 79963 11015 Oil Age hrs Client Info 607 76599 0 Oil Changed Client Info Changed N/A Not Changd Sample Status Norman Imilibase current history1 history2 Fuel WC Method 25 <1.0 <1.0 <1.0 WEAR METALS method limil/base current history1 history2 Iron ppm ASTM D5185m >110 11 12 9 Chromium ppm ASTM D5185m >4 1 <1 <1 Iron ppm ASTM D5185m >2 0 0 0 Chromium ppm ASTM D5185m >2 1 0 0 Iron ppm ASTM D5185m >2 1 0 0 Aluminum	.in <i>)</i>		Sep2020	Oct2021 Apr2022	Aug2022 Jan2023 Apr2023	Aug2023	
Sample Date Client Info 03 Aug 2023 28 Apr 2023 07 Apr 2023 Machine Age hrs Client Info 11748 79963 11015 Oil Age hrs Client Info 607 76599 0 Oil Changed Client Info Changed N/A Not Changed Sample Status Client Info Changed N/A Not Changed Sample Status McMark ABNORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Iron ppm ASTM D5185m >11.0 11.0 <1.0 <1.0 WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >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 INFOR</th><th>MATION</th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></td<>	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Date Client Info 03 Aug 2023 28 Apr 2023 07 Apr 2023 Machine Age hrs Client Info 11748 79963 11015 Oil Age hrs Client Info 607 76599 0 Oil Changed Client Info Changed N/A Not Changd Sample Status Norman Imilibase current history1 history2 Fuel WC Method 25 <1.0	Sample Number		Client Info		GFL0089520	GFL0067892	GFL0067972
Machine Age hrs Client Info 11748 79963 11015 Oil Age hrs Client Info 607 76599 0 Oil Changed Client Info Changed N/A Not Changd Sample Status Image: Control of Changed N/A NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0			Client Info		03 Aug 2023	28 Apr 2023	07 Apr 2023
Contained Client Info Changed N/A Not Changed ABNORMAL NORMAL NORMAL NORMAL	•	hrs	Client Info		_		
Contained Client Info Changed ABNORMAL NORMAL NORMAL	Oil Age	hrs	Client Info		607	76599	0
ABNORMAL NORMAL NORMAL	-		Client Info		Changed	N/A	Not Changd
WC Method S	-				_	NORMAL	NORMAL
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >110 11 12 9 Chromium ppm ASTM D5185m >4 1 <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
Iron	Fuel		WC Method	>5	<1.0	<1.0	<1.0
Chromium 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 <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	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>110	11	12	9
Silver	Chromium	ppm	ASTM D5185m	>4	1	<1	<1
Silver	Nickel	ppm	ASTM D5185m	>2	0	0	0
Aluminum ppm ASTM D5185m >25 2 2 0 Lead ppm ASTM D5185m >45 <1	Titanium	ppm	ASTM D5185m		<1	0	0
Aluminum ppm ASTM D5185m >25 2 2 0 Copper ppm ASTM D5185m >45 <1	Silver	ppm	ASTM D5185m	>2	<1	0	0
Lead ppm ASTM D5185m >45 <1 0 <1 Copper ppm ASTM D5185m >85 2 1 1 Tin ppm ASTM D5185m >4 <1 0 0 Vanadium ppm ASTM D5185m <1 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 4 12 6 Barium ppm ASTM D5185m 0 0 0 2 Molybdenum ppm ASTM D5185m 0 4 12 6 Barium ppm ASTM D5185m 0 4 12 6 Magnesium ppm ASTM D5185m 0 4 1 2 6 Calcium ppm ASTM D5185m 1070 1110 1178	Aluminum		ASTM D5185m	>25	2	2	0
Tin	Lead	ppm	ASTM D5185m	>45	<1	0	<1
Vanadium ppm ASTM D5185m <1 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 4 12 6 Barium ppm ASTM D5185m 0 0 0 2 Molybdenum ppm ASTM D5185m 0 0 0 2 Manganese ppm ASTM D5185m 0 <1 <1 0 Magnesium ppm ASTM D5185m 1010 1006 1012 902 Calcium ppm ASTM D5185m 1070 1110 1178 1078 Phosphorus ppm ASTM D5185m 1270 1280 1339 1213 Sulfur ppm ASTM D5185m 1270 1280 1339 1213 Sulfur ppm ASTM D5185m >30 6 6	Copper	ppm	ASTM D5185m	>85	2	1	1
Vanadium ppm ASTM D5185m <1 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 4 12 6 Barium ppm ASTM D5185m 0 0 0 2 Molybdenum ppm ASTM D5185m 0 70 66 58 Manganese ppm ASTM D5185m 0 <1 <1 0 Magnesium ppm ASTM D5185m 1010 1006 1012 902 Calcium ppm ASTM D5185m 1070 1110 1178 1078 Phosphorus ppm ASTM D5185m 1270 1280 1339 1213 Sulfur ppm ASTM D5185m 2060 3602 3501 2826 CONTAMINANTS method limit/base current history1	Tin	ppm	ASTM D5185m	>4	<1	0	0
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 4 12 6 Barium ppm ASTM D5185m 0 0 0 2 Molybdenum ppm ASTM D5185m 60 70 66 58 Manganese ppm ASTM D5185m 0 <1	Vanadium		ASTM D5185m		<1	0	0
Boron ppm ASTM D5185m 0 4 12 6 Barium ppm ASTM D5185m 0 0 0 2 Molybdenum ppm ASTM D5185m 60 70 66 58 Manganese ppm ASTM D5185m 0 <1 <1 0 Magnesium ppm ASTM D5185m 1010 1006 1012 902 Calcium ppm ASTM D5185m 1070 1110 1178 1078 Phosphorus ppm ASTM D5185m 1150 1041 1064 1000 Zinc ppm ASTM D5185m 1270 1280 1339 1213 Sulfur ppm ASTM D5185m 2060 3602 3501 2826 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >30 6 6 6 4 Sodium ppm ASTM D5185m >20 ▲ 88 18 9 Glycol % "ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % "ASTM D7844 >3 0.4 0.4 0.3 Nitration Abs/cm "ASTM D7815 >30 20.1 17.5 18.5 FLUID DEGRADATION method limit/base current history1 history2 Coxidation Abs/.1mm "ASTM D7415 >30 20.1 17.5 18.5	Cadmium		ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 0 0 0 2 Molybdenum ppm ASTM D5185m 60 70 66 58 Manganese ppm ASTM D5185m 0 <1 <1 0 Magnesium ppm ASTM D5185m 1010 1006 1012 902 Calcium ppm ASTM D5185m 1070 1110 1178 1078 Phosphorus ppm ASTM D5185m 1150 1041 1064 1000 Zinc ppm ASTM D5185m 1270 1280 1339 1213 Sulfur ppm ASTM D5185m 2060 3602 3501 2826 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >30 6 6 4 Sodium ppm ASTM D5185m >20 88 18 9 Glycol % *ASTM D584 <th>ADDITIVES</th> <th></th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 70 66 58 Manganese ppm ASTM D5185m 0 <1 <1 0 Magnesium ppm ASTM D5185m 1010 1006 1012 902 Calcium ppm ASTM D5185m 1070 1110 1178 1078 Phosphorus ppm ASTM D5185m 1070 1110 1178 1078 Phosphorus ppm ASTM D5185m 1270 1280 1339 1213 Sulfur ppm ASTM D5185m 2060 3602 3501 2826 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >30 6 6 4 Sodium ppm ASTM D5185m >20 88 18 9 Glycol % *ASTM D5185m >20 88 18 9 Rigor NEG NEG<	Boron	ppm	ASTM D5185m	0	4	12	6
Manganese ppm ASTM D5185m 0 <1 <1 0 Magnesium ppm ASTM D5185m 1010 1006 1012 902 Calcium ppm ASTM D5185m 1070 1110 1178 1078 Phosphorus ppm ASTM D5185m 1150 1041 1064 1000 Zinc ppm ASTM D5185m 1270 1280 1339 1213 Sulfur ppm ASTM D5185m 2060 3602 3501 2826 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >30 6 6 4 Sodium ppm ASTM D5185m >20 88 18 9 Glycol *ASTM D5185m >20 88 18 9 Glycol *ASTM D5185m >20 NEG NEG NEG INFRA-RED method limit/base current	Barium	ppm	ASTM D5185m	0	0	0	2
Magnesium ppm ASTM D5185m 1010 1006 1012 902 Calcium ppm ASTM D5185m 1070 1110 1178 1078 Phosphorus ppm ASTM D5185m 1150 1041 1064 1000 Zinc ppm ASTM D5185m 1270 1280 1339 1213 Sulfur ppm ASTM D5185m 2060 3602 3501 2826 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >30 6 6 4 Sodium ppm ASTM D5185m >20 88 18 9 Glycol % *ASTM D5185m >20 88 18 9 Glycol % *ASTM D5185m >20 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844	Molybdenum	ppm	ASTM D5185m	60	70	66	58
Calcium ppm ASTM D5185m 1070 1110 1178 1078 Phosphorus ppm ASTM D5185m 1150 1041 1064 1000 Zinc ppm ASTM D5185m 1270 1280 1339 1213 Sulfur ppm ASTM D5185m 2060 3602 3501 2826 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >30 6 6 4 Sodium ppm ASTM D5185m >30 6 6 4 Potassium ppm ASTM D5185m >20 88 18 9 Glycol % *ASTM D5185m >20 88 18 9 Glycol % *ASTM D5185m >20 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot %	Manganese	ppm	ASTM D5185m	0	<1	<1	0
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Zinc ppm ASTM D5185m 1270 1280 1339 1213 Sulfur ppm ASTM D5185m 2060 3602 3501 2826 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >30 6 6 4 Sodium ppm ASTM D5185m >30 6 6 4 Potassium ppm ASTM D5185m >20 88 18 9 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.4 0.3 Nitration Abs/cm *ASTM D7624 >20 8.1 7.2 6.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.1 17.5 18.5 FLUID DEGRADATION method limit/base	Phosphorus	ppm	ASTM D5185m	1150	1041	1064	1000
Sulfur ppm ASTM D5185m 2060 3602 3501 2826 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >30 6 6 4 Sodium ppm ASTM D5185m 14 5 4 Potassium ppm ASTM D5185m >20 88 18 9 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.4 0.3 Nitration Abs/cm *ASTM D7624 >20 8.1 7.2 6.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.1 17.5 18.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3	•		ASTM D5185m	1270	1280	1339	1213
Silicon ppm ASTM D5185m >30 6 6 4 Sodium ppm ASTM D5185m 14 5 4 Potassium ppm ASTM D5185m >20 88 18 9 Glycol % *ASTM D2982 NEG NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.4 0.3 Nitration Abs/cm *ASTM D7624 >20 8.1 7.2 6.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.1 17.5 18.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 14.0 14.1	Sulfur		ASTM D5185m	2060	3602	3501	2826
Sodium ppm ASTM D5185m 14 5 4 Potassium ppm ASTM D5185m >20 ▲ 88 18 9 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.4 0.3 Nitration Abs/cm *ASTM D7624 >20 8.1 7.2 6.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.1 17.5 18.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 14.0 14.1	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 ♣88 18 9 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.4 0.3 Nitration Abs/cm *ASTM D7624 >20 8.1 7.2 6.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.1 17.5 18.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 14.0 14.1	Silicon	ppm	ASTM D5185m	>30	6	6	4
NEG NEG	Sodium	ppm	ASTM D5185m		14	5	4
INFRA-RED	Potassium	ppm	ASTM D5185m	>20	88	18	9
Soot % % *ASTM D7844 >3 0.4 0.4 0.3 Nitration Abs/cm *ASTM D7624 >20 8.1 7.2 6.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.1 17.5 18.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 14.0 14.1	Glycol	%	*ASTM D2982		NEG	NEG	NEG
Nitration Abs/cm *ASTM D7624 >20 8.1 7.2 6.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.1 17.5 18.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 14.0 14.1	INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm *ASTM D7624 >20 8.1 7.2 6.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.1 17.5 18.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 14.0 14.1	Soot %	%	*ASTM D7844	>3	0.4	0.4	0.3
Sulfation Abs/.1mm *ASTM D7415 >30 20.1 17.5 18.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 14.0 14.1			*ASTM D7624				
Oxidation Abs/.1mm *ASTM D7414 >25 15.3 14.0 14.1							
	FLUID DEGRAI	NOITAC	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.3	14.0	14.1
	Base Number (BN)	mg KOH/g			8.1	7.6	8.5



OIL ANALYSIS REPORT



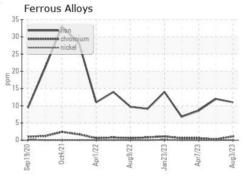
Visco	sity @	100°C				
18 - Abnom	nal					
17-						
Dase Base	*****	******			******	
			_			
13 Abnom	nal					
11		- 2				
Sep 19/2	0ct4/2	Apr1/2	Aug9/2:	Jan23/2.	Apr7/2:	

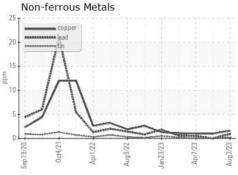


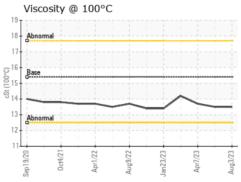
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

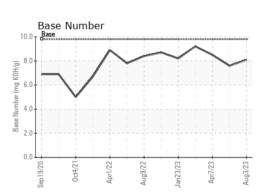
FLUID PROPE	KIIE2	metnoa	ilmit/base	current	nistory i	nistory2
Visc @ 100°C	cSt	ASTM D445	15.4	13.5	13.5	13.7

GRAPHS













Laboratory Sample No. Lab Number Unique Number : 10590024

: GFL0089520 : 05918110

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received Diagnosed

: 07 Aug 2023 : 09 Aug 2023 Diagnostician : Jonathan Hester

Test Package : FLEET (Additional Tests: Glycol) 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 - 654S - Midlothian

12230 Deergrove Road Midlothian, VA US 23112

Contact: Corbin Umphlet cumphlet@gflenv.com

T:

F: