

PROBLEM SUMMARY

Sample Rating Trend

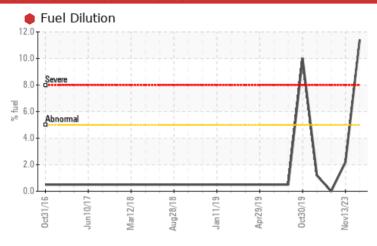
FUEL

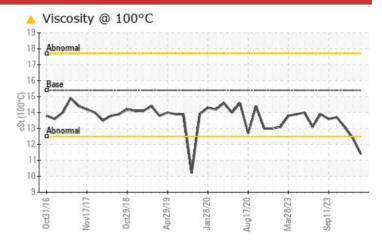
Machine Id **10594**

Component **Diesel Engine**

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

COMPONENT CONDITION SUMMARY





RECOMMENDATION

We advise that you check the fuel injection system. We recommend that you drain the oil and perform a filter service on this component if not already done. We recommend an early resample to monitor this condition. (Customer Sample Comment: resample)

PROBLEMATIC TEST RESULTS								
Sample Status				SEVERE	MARGINAL	NORMAL		
Fuel	%	ASTM D3524	>5	11.4	<u>^</u> 2.2	<1.0		
Visc @ 100°C	cSt	ASTM D445	15.4	11.4	12.4	13.1		

Customer Id: GFL868 Sample No.: GFL0103484 Lab Number: 06025982 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			?	We recommend that you drain the oil and perform a filter service on this component if not already done.		
Change Filter			?	We recommend that you drain the oil and perform a filter service on this component if not already done.		
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 Nov 2023 Diag: Wes Davis

FUEL



No corrective action is recommended at this time. Resample at the next service interval to monitor. All component wear rates are normal. Light fuel dilution occurring. No other contaminants were detected 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.



19 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.



28 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.





OIL ANALYSIS REPORT

Sample Rating Trend





Machine Id 10594 Component

Diesel Engine

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

DIAGNOSIS

Recommendation

We advise that you check the fuel injection system. We recommend that you drain the oil and perform a filter service on this component if not already done. We recommend an early resample to monitor this condition. (Customer Sample Comment: resample

Wear

All component wear rates are normal.

Contamination

There is a high amount of fuel present in the oil.

▲ 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. The oil is no longer serviceable due to the presence of contaminants.

SAMPLE INFORMATION method limit/base current history1 history2	GAL) 2016 Nov2017 Ov2018 Apr2019 Jan2020 Aug/2020 Mag/2023 Sep/2023						
Sample Date	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Date Client Info 29 Nov 2023 13 Nov 2023 19 Oct 2023 Machine Age hrs Client Info 0 0 0 0 Oil Age hrs Client Info 0 0 0 0 Oil Changed Client Info N/A Not Changd N/A Sample Status Client Info N/A Not Changd N/A Word Contradmination method Imitibase current bistory1 history2 Water WC Method Mc Mc Method NEG NEG NEG NEG WEAR METALS method Imitibase current history1 history2 Iron ppm ASTM 05186m >100 27 14 11 Chromium ppm ASTM 05186m >100 27 14 11 Chromium ppm ASTM 05186m >100 2 1 1 Lead ppm ASTM 05186m >20 2 1 1<	Sample Number		Client Info		GFL0103484	GFL0071664	GFL0094805
Machine Age hrs Client Info 15105 15027 14872 Oil Age hrs Client Info 0 0 0 0 Oil Changed Client Info N/A Not Changd N/A Sample Status SEVERE MARGINAL NORMAL CONTAMINATION method limit/base current history1 history2 Water WC Method >0.2 NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >20 2 <1			Client Info		29 Nov 2023	13 Nov 2023	19 Oct 2023
Oil Age hrs Client Info N/A Not Changed N/A Sample Status Client Info N/A Not Changed N/A Sample Status Contamination Inition N/A Not Changed N/A CONTAMINATION method Imilibase current history2 Water WC Method >0.2 NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 27 14 11 Chromium ppm ASTM D5185m >20 2 <1 <1 Nickel ppm ASTM D5185m >20 2 <1 <1 <1 Sliver ppm ASTM D5185m >3 0 0 0 Juminum ppm ASTM D5185m >3 0 0 0 Gopper ppm ASTM D5185m >40 <1 <1 0		hrs					
Oil Changed Sample Status Client Info N/A Not Changd SEVERE N/A NOT Changd NCA N/A CONTAMINATION method limit/base current history1 history2 Water WC Method >0.0.2 NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ASTM D5185m >10.0 27 14 11 Chromium ppm ASTM D5185m >20 2 <1 <1 <1 Chromium ppm ASTM D5185m >20 2 <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 <td></td> <td>hrs</td> <td>Client Info</td> <td></td> <th>0</th> <td>0</td> <td>0</td>		hrs	Client Info		0	0	0
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Water Glycol WC Method Glycol >0.2 NEG NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >10.0 27 1.4 1.1 Chromium ppm ASTM D5185m >2.0 2 <1	-				SEVERE	Ü	NORMAL
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WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 27 14 11 Chromium ppm ASTM D5185m >20 2 <1	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 2 <1 <1 Nickel ppm ASTM D5185m >4 <1 0 <1 Tittanium ppm ASTM D5185m >4 <1 <1 <1 Silver ppm ASTM D5185m >20 3 2 <1 Aluminum ppm ASTM D5185m >40 <1 <1 0 Copper ppm ASTM D5185m >40 <1 <1 0 Copper ppm ASTM D5185m >33.0 1 <1 <1 <1 Vanadium ppm ASTM D5185m >15 <1 0 <1 <1 Vanadium ppm ASTM D5185m >15 <1 0 <1 <1 Vanadium ppm ASTM D5185m >15 <1 0 <1 <1 <1 <1 ABD111VES method limit/base current history1 history2 <	WEAR METAL	.S	method	limit/base	current	history1	history2
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Titanium 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 <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>Chromium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>>20</td> <th>2</th> <td><1</td> <td><1</td>	Chromium	ppm	ASTM D5185m	>20	2	<1	<1
Silver ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >20 3 2 <1 Lead ppm ASTM D5185m >40 <1 <1 0 Copper ppm ASTM D5185m >330 1 <1 <1 Vanadium ppm ASTM D5185m >15 <1 0 <1 Vanadium ppm ASTM D5185m >15 <1 0 <1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 2 1 2 Boron ppm ASTM D5185m 0 2 1 2 Boron ppm ASTM D5185m 0 0 0 19 Molybdenum ppm ASTM D5185m 0 58 58 58 Mangaesium ppm ASTM D5185m 1010 875 925	Nickel	ppm	ASTM D5185m	>4	<1	0	<1
Aluminum ppm ASTM D5185m >20 3 2 <1 Lead ppm ASTM D5185m >40 <1	Titanium	ppm	ASTM D5185m		<1	<1	<1
Lead ppm ASTM D5185m >40 <1 <1 0 Copper ppm ASTM D5185m >330 1 <1 <1 Tin ppm ASTM D5185m >15 <1 0 <1 Vanadium ppm ASTM D5185m 0 <1 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 2 1 2 Barium ppm ASTM D5185m 0 0 0 19 Molybdenum ppm ASTM D5185m 0 2 1 2 Barium ppm ASTM D5185m 0 21 <1 <1 <1 <1 Magnesium ppm ASTM D5185m 0 21 <1 <1 <1 <1 <1 <1 <1 <1	Silver	ppm	ASTM D5185m	>3	0	0	0
Copper ppm ASTM D5185m >330 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	Aluminum	ppm	ASTM D5185m	>20	3	2	<1
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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 2 1 2 Barium ppm ASTM D5185m 0 0 0 19 Molybdenum ppm ASTM D5185m 0 0 0 19 Molybdenum ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 0 <1 <1 <1 <1 Magnesium ppm ASTM D5185m 1070 922 984 857 Phosphorus ppm ASTM D5185m 1070 922 984 857 Phosphorus ppm ASTM D5185m 1270 1153 1160 1030 Sulfur ppm ASTM D5185m 2060 2472	Copper	ppm	ASTM D5185m	>330	1	<1	<1
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ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 2 1 2 Barium ppm ASTM D5185m 0 0 0 19 Molybdenum ppm ASTM D5185m 0 0 19 Molybdenum ppm ASTM D5185m 0 <1	Vanadium	ppm	ASTM D5185m		<1	0	0
Boron ppm ASTM D5185m 0 2 1 2 Barium ppm ASTM D5185m 0 0 0 19 Molybdenum ppm ASTM D5185m 60 58 58 58 Manganese ppm ASTM D5185m 1010 875 925 803 Calcium ppm ASTM D5185m 1070 922 984 857 Phosphorus ppm ASTM D5185m 1150 932 832 870 Zinc ppm ASTM D5185m 1270 1153 1160 1030 Sulfur ppm ASTM D5185m 2060 2472 2874 3462 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 3 Sodium ppm ASTM D5185m >20 3 2 2 Fuel % ASTM D5185m >3	Cadmium	ppm	ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 0 0 0 19 Molybdenum ppm ASTM D5185m 60 58 58 58 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 875 925 803 Calcium ppm ASTM D5185m 1070 922 984 857 Phosphorus ppm ASTM D5185m 1150 932 832 870 Zinc ppm ASTM D5185m 1270 1153 1160 1030 Sulfur ppm ASTM D5185m 2060 2472 2874 3462 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 3 Sodium ppm ASTM D5185m >20 3 2 2 Fuel % ASTM D3524	ADDITIVES		method	limit/base	current	history1	history2
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Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 875 925 803 Calcium ppm ASTM D5185m 1070 922 984 857 Phosphorus ppm ASTM D5185m 1150 932 832 870 Zinc ppm ASTM D5185m 1270 1153 1160 1030 Sulfur ppm ASTM D5185m 2060 2472 2874 3462 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 3 Sodium ppm ASTM D5185m >20 3 2 2 Fuel % ASTM D5185m >20 3 2 2 2 Fuel % ASTM D5185m >20 3 2 2 2 Fuel % <th< td=""><td></td><td>ppm</td><td>ASTM D5185m</td><td>0</td><th>0</th><td>0</td><td>19</td></th<>		ppm	ASTM D5185m	0	0	0	19
Magnesium ppm ASTM D5185m 1010 875 925 803 Calcium ppm ASTM D5185m 1070 922 984 857 Phosphorus ppm ASTM D5185m 1150 932 832 870 Zinc ppm ASTM D5185m 1270 1153 1160 1030 Sulfur ppm ASTM D5185m 2060 2472 2874 3462 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 3 Sodium ppm ASTM D5185m >20 3 2 2 Fuel % ASTM D5185m >20 3 2 2 2 Fuel % ASTM D5185m >20 3 2 2 2 Soot % % *ASTM D7844 >3 0.5 0.4 0.3 Nitration Abs/cm		ppm	ASTM D5185m	60	58	58	58
Calcium ppm ASTM D5185m 1070 922 984 857 Phosphorus ppm ASTM D5185m 1150 932 832 870 Zinc ppm ASTM D5185m 1270 1153 1160 1030 Sulfur ppm ASTM D5185m 2060 2472 2874 3462 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 3 Sodium ppm ASTM D5185m >20 3 2 2 Fuel % ASTM D5185m >20 3 2 2 Fuel % ASTM D5185m >20 3 2 2 Fuel % ASTM D3524 >5 11.4 2.2 <1.0	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus ppm ASTM D5185m 1150 932 832 870 Zinc ppm ASTM D5185m 1270 1153 1160 1030 Sulfur ppm ASTM D5185m 2060 2472 2874 3462 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 3 Sodium ppm ASTM D5185m >20 3 2 2 Fuel % ASTM D5185m >20 3 2 2 Fuel % ASTM D3524 >5 11.4 △ 2.2 <1.0	Magnesium	ppm	ASTM D5185m	1010	875	925	803
Zinc ppm ASTM D5185m 1270 1153 1160 1030 Sulfur ppm ASTM D5185m 2060 2472 2874 3462 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 3 Sodium ppm ASTM D5185m >20 3 2 2 Fuel % ASTM D5185m >20 3 2 2 Fuel % ASTM D5185m >20 3 2 2 Fuel % ASTM D3524 >5 11.4 △ 2.2 <1.0	Calcium	ppm	ASTM D5185m	1070	922	984	857
Sulfur ppm ASTM D5185m 2060 2472 2874 3462 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 3 Sodium ppm ASTM D5185m >20 3 2 2 Potassium ppm ASTM D5185m >20 3 2 2 Fuel % ASTM D3524 >5 11.4 △ 2.2 <1.0	Phosphorus	ppm	ASTM D5185m	1150	932	832	870
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 3 Sodium ppm ASTM D5185m 6 6 6 6 Potassium ppm ASTM D5185m >20 3 2 2 Fuel % ASTM D3524 >5 11.4 △ 2.2 <1.0	Zinc	ppm	ASTM D5185m	1270	1153	1160	1030
Silicon ppm ASTM D5185m >25 5 3 3 Sodium ppm ASTM D5185m 6 6 6 6 Potassium ppm ASTM D5185m >20 3 2 2 Fuel % ASTM D3524 >5 11.4 2.2 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.5 0.4 0.3 Nitration Abs/cm *ASTM D7624 >20 10.2 9.4 7.5 Sulfation Abs/.1mm *ASTM D7415 >30 20.2 19.5 18.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.3 16.8 14.4	Sulfur	ppm	ASTM D5185m	2060	2472	2874	3462
Sodium ppm ASTM D5185m 6 6 6 6 Potassium ppm ASTM D5185m >20 3 2 2 Fuel % ASTM D3524 >5 11.4 △ 2.2 <1.0	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 3 2 2 Fuel % ASTM D3524 >5 11.4 △ 2.2 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.5 0.4 0.3 Nitration Abs/cm *ASTM D7624 >20 10.2 9.4 7.5 Sulfation Abs/.1mm *ASTM D7415 >30 20.2 19.5 18.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.3 16.8 14.4	Silicon	ppm	ASTM D5185m	>25	5	3	3
Fuel % ASTM D3524 >5 11.4 △ 2.2 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.5 0.4 0.3 Nitration Abs/cm *ASTM D7624 >20 10.2 9.4 7.5 Sulfation Abs/.1mm *ASTM D7415 >30 20.2 19.5 18.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.3 16.8 14.4	Sodium	ppm	ASTM D5185m		6	6	6
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.5 0.4 0.3 Nitration Abs/cm *ASTM D7624 >20 10.2 9.4 7.5 Sulfation Abs/.1mm *ASTM D7415 >30 20.2 19.5 18.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.3 16.8 14.4	Potassium	ppm	ASTM D5185m	>20	3	2	2
Soot % % *ASTM D7844 >3 0.5 0.4 0.3 Nitration Abs/cm *ASTM D7624 >20 10.2 9.4 7.5 Sulfation Abs/.1mm *ASTM D7415 >30 20.2 19.5 18.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.3 16.8 14.4	Fuel	%	ASTM D3524	>5	11.4	▲ 2.2	<1.0
Nitration Abs/cm *ASTM D7624 >20 10.2 9.4 7.5 Sulfation Abs/.1mm *ASTM D7415 >30 20.2 19.5 18.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.3 16.8 14.4	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 20.2 19.5 18.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.3 16.8 14.4	Soot %	%	*ASTM D7844	>3	0.5	0.4	0.3
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.3 16.8 14.4	Nitration	Abs/cm	*ASTM D7624	>20	10.2	9.4	7.5
Oxidation Abs/.1mm *ASTM D7414 >25 18.3 16.8 14.4	Sulfation	Abs/.1mm	*ASTM D7415	>30	20.2	19.5	18.2
	FLUID DEGRAI	DATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	18.3	16.8	14.4
	Base Number (BN)	mg KOH/g		9.8	6.8	7.6	8.1

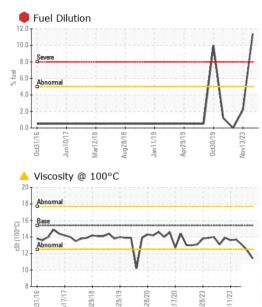


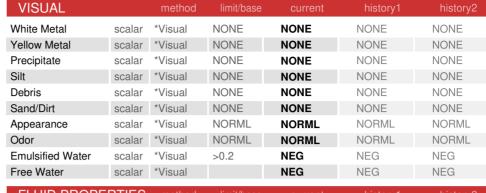
Base Number

20

KOH/g)

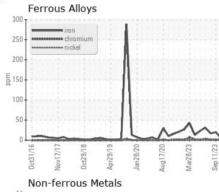
OIL ANALYSIS REPORT

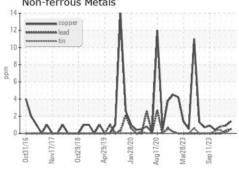


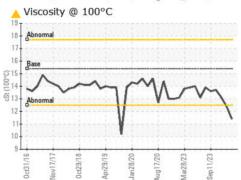


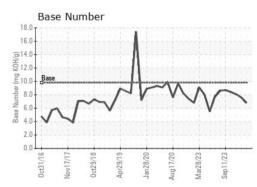
FLUID PROPE	RHES	method	limit/base	current	history1	history
Visc @ 100°C	cSt	ASTM D445	15.4	<u> </u>	12.4	13.1

GRAPHS













Certificate L2367

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

Sep11/23

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0103484 : 06025982

: 10775773

Received : 06 Dec 2023 : 14 Dec 2023 Diagnosed

Diagnostician : Jonathan Hester

Test Package : FLEET (Additional Tests: FuelDilution, 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 - 868 - Childersburg Fines Hauling (Alpine)

13737 Plant Rd Childersburg, AL US 35044

Contact: JONATHAN WILLIAMS jonathan.williams@gflenv.com

T: F:

Report Id: GFL868 [WUSCAR] 06025982 (Generated: 12/14/2023 09:39:02) Rev: 1

Submitted By: see also GFL868 - Chelsea Bryan