

PROBLEM SUMMARY

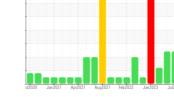
Sample Rating Trend

FUEL

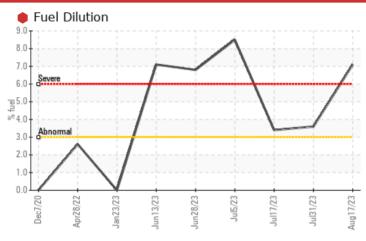
Machine Id **810029**

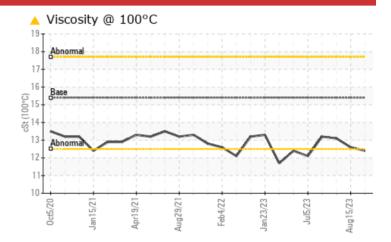
Component **Diesel Engine**

PETRO CANADA DURON SHP 15W40 (28 QTS)









RECOMMENDATION

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

PROBLEMATIC TEST RESULTS								
Sample Status				SEVERE	NORMAL	ABNORMAL		
Fuel	%	ASTM D3524	>3.0	7.1	<1.0	△ 3.6		
Visc @ 100°C	cSt	ASTM D445	15.4	12.4	12.6	13.1		

Customer Id: GFL073 Sample No.: GFL0069196 Lab Number: 05929385 Test Package: FLEET



To manage this report scan the QR code

To discuss the diagnosis or test data: Wes Davis +1 905-569-8600 x223 wesd@wearcheck.ca

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

Action Status Date Done By Description 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

15 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.



31 Jul 2023 Diag: Wes Davis

FUEL



We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition. All component wear rates are normal. There is a moderate amount of fuel present in the oil. Tests confirm the presence of fuel in the oil. 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.

view report

17 Jul 2023 Diag: Wes Davis

FUEL

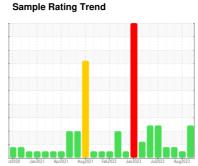


The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition. All component wear rates are normal. There is a moderate amount of fuel present in the oil. Tests confirm the presence of fuel in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable due to the presence of contaminants.





OIL ANALYSIS REPORT





Machine Id 810029 Component

Diesel Engine

PETRO CANADA DURON SHP 15W40 (28 QTS)

DIAGNOSIS

Recommendation

We advise that you check the fuel injection system. The oil 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

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

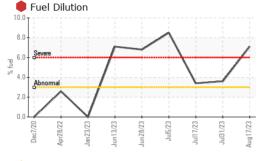
▲ Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

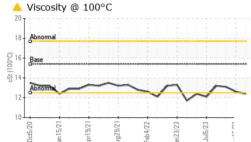
SAMPLE INFORMATION method limit/base current history1 history2 Sample Number Client Info GFL0069196 GFL0069189 GFL0069181 Sample Date Client Info 17 Aug 2023 31 Jul 2023 Machine Age hrs Client Info 8664 8654 Oil Changed Client Info Changed Not Changd Sample Status Nethod NEG NEG CONTAMINATION method limil/base current history1 history2 Glycol WC Method NEG NEG NEG NEG WEAR METALS method limil/base current history1 history2 Iron ppm ASTM D5185m >75 11 9 5 Chromium ppm ASTM D5185m >5 <1 <1 <1 Iron ppm ASTM D5185m >2 0 0 0 Glycel ppm ASTM D5185m >2 0 0 <	QTS)		ct2020 Jan2	2021 Apr2021 Aug202	Feb2022 Jan2023 Jul2023	Aug2023	
Sample Date Client Info 17 Aug 2023 15 Aug 2023 31 Jul 2023 Machine Age hrs Client Info 8664 8554 8541 Oil Age hrs Client Info 224 214 101 Oil Changed Client Info Changed Not Changd Not Changd Sample Status Client Info Changed Not Changd Not Changd CONTAMINATION method Imitibase current history1 history2 Glycol WC Method NEG NEG NEG WEAR METALS method limil/base current history1 history2 Iron ppm ASTM D5185m >5 <1	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 8664 8654 8541 Oil Age hrs Client Info 224 214 101 Oil Changed Not Changed Not Changed Not Changed Not Changed Sample Status SEVERE NORMAL ABNORMAL CONTAMINATION method Ilmit/base current history1 history2 Iron ppm ASTM D5185m 75 11 9 5 Chromium ppm ASTM D5185m >5 <1	Sample Number		Client Info		GFL0069196	GFL0069189	GFL0069161
Oil Age hrs Client Info 224 214 101 Oil Changed Sample Status Client Info Changed Severe Not Changd N	Sample Date		Client Info		17 Aug 2023	15 Aug 2023	31 Jul 2023
Client Info Changed SEVERE Not Changd ABNORMAL	Machine Age	hrs	Client Info		8664	8654	8541
SEVERE NORMAL ABNORMAL	Oil Age	hrs	Client Info		224	214	101
CONTAMINATION	Oil Changed		Client Info		Changed	Not Changd	Not Changd
Region WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >75 11 9 5 Chromium ppm ASTM D5185m >5 <1 <1 <1 Nickel ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >2 0 0 0 Copper ppm ASTM D5185m >4 0 <1 0 Vanadium ppm ASTM D5185m 0 0 <1 0 Cadmium ppm ASTM D5185m 0 4 6 10 Barium ppm ASTM D5185m 0 4 6 10 <th< td=""><td>Sample Status</td><td></td><td></td><td></td><td>SEVERE</td><td>NORMAL</td><td>ABNORMAL</td></th<>	Sample Status				SEVERE	NORMAL	ABNORMAL
WEAR METALS	CONTAMINAT	ION	method	limit/base	current	history1	history2
Irron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >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 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <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	>75	11	9	5
Titanium ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >15 4 4 2 Lead ppm ASTM D5185m >25 <1 0 0 Copper ppm ASTM D5185m >100 2 2 <1 Tin ppm ASTM D5185m 0 0 <1 0 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 4 6 10 Barium ppm ASTM D5185m 0 4 6 10 Barium ppm ASTM D5185m 0 4 4 8	Chromium	ppm	ASTM D5185m	>5	<1	<1	<1
Silver	Nickel	ppm	ASTM D5185m	>4	<1	<1	0
Aluminum	Titanium	ppm	ASTM D5185m	>2	0	0	0
Lead ppm ASTM D5185m >25 <1 0 0 Copper ppm ASTM D5185m >100 2 2 <1 Tin ppm ASTM D5185m >4 0 <1 0 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 4 6 10 Boron ppm ASTM D5185m 0 4 6 10 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 4 6 10 Magnesium ppm ASTM D5185m 0 4 4 5 958 Calcium ppm ASTM D5185m 1070 973 983 1040 Calcium ppm ASTM D5185m 1270 1132 1123 123 1255 Sulfur ppm ASTM D5185m 2060 <td>Silver</td> <td>ppm</td> <td>ASTM D5185m</td> <td>>2</td> <td>0</td> <td>0</td> <td>0</td>	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper ppm ASTM D5185m >100 2 2 <1 Tin ppm ASTM D5185m >4 0 <1	Aluminum	ppm	ASTM D5185m	>15	4	4	2
Tin ppm ASTM D5185m >4 0 <1 0 Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 0 Manganese ppm ASTM D5185m 10 0 0 0 Manganese ppm ASTM D5185m 10 0 0 0 0 Magnesium ppm ASTM D5185m 10 0 44 845 958 Calcium ppm ASTM D5185m 10 0 973 983 1040 Phosphorus ppm ASTM D5185m 1150 919 923 1022 Zinc ppm ASTM D5185m 1270 1132 1123 1255 Sulfur ppm ASTM D5185m 2060 3103 3075 3698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m 3 2 3 Potassium ppm ASTM D5185m 3 2 3 Potassium ppm ASTM D5185m 20 6 5 2 Fuel % ASTM D5185m 20 6 5 2 Fuel % ASTM D5185m 20 6 5 2 Fuel % ASTM D7844 <6 0.8 0.6 0.4 Nitration Abs/mm *ASTM D7415 >30 19.5 18.7 18.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/mm *ASTM D7414 >25 15.7 14.8 14.4	Lead	ppm	ASTM D5185m	>25	<1	0	0
Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 4 6 10 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 <1 <1 <1 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 844 845 958 Calcium ppm ASTM D5185m 1070 973 983 1040 Phosphorus ppm ASTM D5185m 1150 919 923 1022 Zinc ppm ASTM D5185m 1270 1132 1123 1255 Sulfur ppm ASTM D5185m 2060 3103 3075	Copper	ppm	ASTM D5185m	>100	2	2	<1
Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 4 6 10 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 60 60 60 62 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1070 973 983 1040 Phosphorus ppm ASTM D5185m 1150 919 923 1022 Zinc ppm ASTM D5185m 1270 1132 1123 123 1255 Sulfur ppm ASTM D5185m 2060 3103 3075 3698 CONTAMINANTS method limit/base current	Tin	ppm	ASTM D5185m	>4	0	<1	0
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 4 6 10 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 <1	Vanadium		ASTM D5185m		0	0	0
Boron	Cadmium		ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 60 60 62 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 844 845 958 Calcium ppm ASTM D5185m 1070 973 983 1040 Phosphorus ppm ASTM D5185m 1150 919 923 1022 Zinc ppm ASTM D5185m 1270 1132 1123 1255 Sulfur ppm ASTM D5185m 2060 3103 3075 3698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 1 4 Sodium ppm ASTM D5185m >20 6 5 2 Fuel % ASTM D5185m	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 60 60 62 Manganese ppm ASTM D5185m 0 <1	Boron	ppm	ASTM D5185m	0	4	6	10
Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 844 845 958 Calcium ppm ASTM D5185m 1070 973 983 1040 Phosphorus ppm ASTM D5185m 1150 919 923 1022 Zinc ppm ASTM D5185m 1270 1132 1123 1255 Sulfur ppm ASTM D5185m 2060 3103 3075 3698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 1 4 Sodium ppm ASTM D5185m >20 6 5 2 Fuel % ASTM D5185m >20 6 5 2 Fuel % ASTM D5185m >20 6 5 2 Fuel % ASTM D5185m >20 <td>Barium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td>	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 844 845 958 Calcium ppm ASTM D5185m 1070 973 983 1040 Phosphorus ppm ASTM D5185m 1150 919 923 1022 Zinc ppm ASTM D5185m 1270 1132 1123 1255 Sulfur ppm ASTM D5185m 2060 3103 3075 3698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 1 4 Sodium ppm ASTM D5185m >25 2 1 4 Sodium ppm ASTM D5185m >20 6 5 2 Fuel % ASTM D5185m >20 6 5 2 Fuel % ASTM D5185m >20 7.1 <1.0	Molybdenum	ppm	ASTM D5185m	60	60	60	62
Calcium ppm ASTM D5185m 1070 973 983 1040 Phosphorus ppm ASTM D5185m 1150 919 923 1022 Zinc ppm ASTM D5185m 1270 1132 1123 1255 Sulfur ppm ASTM D5185m 2060 3103 3075 3698 CONTAMINANTS method limit/base current history1 history2 Soliicon ppm ASTM D5185m >25 2 1 4 Soliicon ppm ASTM D5185m >20 6 5 2 Fuel ppm ASTM D5185m >20 6 5 2 Fuel % ASTM D5185m >20 6 5 2 Fuel % ASTM D5185m >20 6 5 2 Fuel % ASTM D585m >3.0 7.1 <1.0	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus ppm ASTM D5185m 1150 919 923 1022 Zinc ppm ASTM D5185m 1270 1132 1123 1255 Sulfur ppm ASTM D5185m 2060 3103 3075 3698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 1 4 Sodium ppm ASTM D5185m >20 6 5 2 Fuel % ASTM D5185m >20 6 5 2 Fuel % ASTM D3524 >3.0 7.1 <1.0	Magnesium	ppm	ASTM D5185m	1010	844	845	958
Zinc ppm ASTM D5185m 1270 1132 1123 1255 Sulfur ppm ASTM D5185m 2060 3103 3075 3698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 1 4 Sodium ppm ASTM D5185m 3 2 3 Potassium ppm ASTM D5185m >20 6 5 2 Fuel % ASTM D3524 >3.0 7.1 <1.0	Calcium	ppm	ASTM D5185m	1070	973	983	1040
Sulfur ppm ASTM D5185m 2060 3103 3075 3698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 1 4 Sodium ppm ASTM D5185m 3 2 3 Potassium ppm ASTM D5185m >20 6 5 2 Fuel % ASTM D3524 >3.0 7.1 <1.0	Phosphorus	ppm	ASTM D5185m	1150	919	923	1022
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 1 4 Sodium ppm ASTM D5185m 3 2 3 Potassium ppm ASTM D5185m >20 6 5 2 Fuel % ASTM D3524 >3.0 7.1 <1.0	Zinc	ppm	ASTM D5185m	1270	1132	1123	1255
Silicon ppm ASTM D5185m >25 2 1 4 Sodium ppm ASTM D5185m 3 2 3 Potassium ppm ASTM D5185m >20 6 5 2 Fuel % ASTM D3524 >3.0 7.1 <1.0 △ 3.6 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.8 0.6 0.4 Nitration Abs/cm *ASTM D7624 >20 9.1 8.0 7.3 Sulfation Abs/.1mm *ASTM D7415 >30 19.5 18.7 18.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.7 14.8 14.4	Sulfur	ppm	ASTM D5185m	2060	3103	3075	3698
Sodium ppm ASTM D5185m 3 2 3 Potassium ppm ASTM D5185m >20 6 5 2 Fuel % ASTM D3524 >3.0 7.1 <1.0	CONTAMINAN	NTS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 6 5 2 Fuel % ASTM D3524 >3.0 7.1 <1.0 ▲ 3.6 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.8 0.6 0.4 Nitration Abs/cm *ASTM D7624 >20 9.1 8.0 7.3 Sulfation Abs/.1mm *ASTM D7415 >30 19.5 18.7 18.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.7 14.8 14.4	Silicon	ppm	ASTM D5185m	>25	2	1	4
Fuel	Sodium	ppm	ASTM D5185m		3	2	3
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.8 0.6 0.4 Nitration Abs/cm *ASTM D7624 >20 9.1 8.0 7.3 Sulfation Abs/.1mm *ASTM D7415 >30 19.5 18.7 18.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.7 14.8 14.4	Potassium	ppm	ASTM D5185m	>20	6	5	2
Soot % % *ASTM D7844 > 6 0.8 0.6 0.4 Nitration Abs/cm *ASTM D7624 > 20 9.1 8.0 7.3 Sulfation Abs/.1mm *ASTM D7415 > 30 19.5 18.7 18.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 > 25 15.7 14.8 14.4	Fuel	%	ASTM D3524	>3.0	7.1	<1.0	▲ 3.6
Nitration Abs/cm *ASTM D7624 >20 9.1 8.0 7.3 Sulfation Abs/.1mm *ASTM D7415 >30 19.5 18.7 18.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.7 14.8 14.4	INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm *ASTM D7624 >20 9.1 8.0 7.3 Sulfation Abs/.1mm *ASTM D7415 >30 19.5 18.7 18.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.7 14.8 14.4	Soot %	%	*ASTM D7844	>6	8.0	0.6	0.4
Sulfation Abs/.1mm *ASTM D7415 >30 19.5 18.7 18.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.7 14.8 14.4		Abs/cm	*ASTM D7624	>20			7.3
Oxidation		Abs/.1mm		>30	19.5		
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.7	14.8	14.4
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	7.6	7.9	8.8

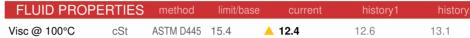


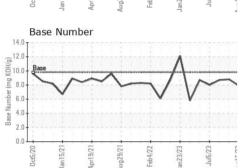
OIL ANALYSIS REPORT

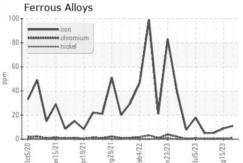


VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

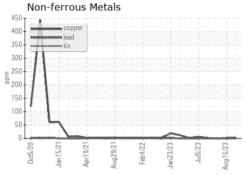


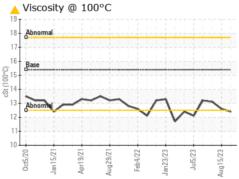


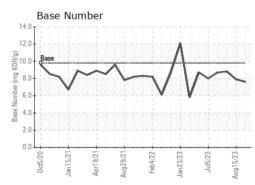




GRAPHS











Laboratory Sample No. Lab Number Unique Number

: GFL0069196 : 05929385 : 10609332

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 21 Aug 2023 Diagnosed

: 22 Aug 2023 Diagnostician : Wes Davis **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 - 073 - Warner Robbins - Transwaste

155 Story Road Warner Robbins, GA US 31093

Contact: JOSH MALONEY

jmaloney@gflenv.com

T: F: