

PROBLEM SUMMARY

Sample Rating Trend



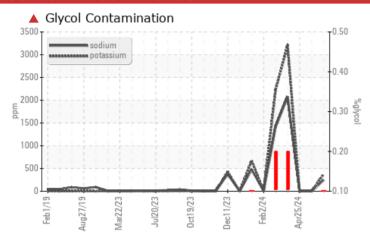
Machine Id

721024-361461

Diesel Engine

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

COMPONENT CONDITION SUMMARY



RECOMMENDATION

We advise that you check for the source of the coolant leak. We recommend that you drain the oil from the component if this has not already been done. We advise that you flush the component thoroughly before re-filling with oil. We recommend an early resample to monitor this condition.

PROBLEMATIC TEST RESULTS								
Sample Status				SEVERE	NORMAL	NORMAL		
Potassium	ppm	ASTM D5185m	>20	△ 375	<1	0		
Glycol	%	*ASTM D2982		▲ 0.10	NEG	NEG		

Customer Id: GFL821 Sample No.: GFL0105299 Lab Number: 06209773 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

RECOMMENDED ACTIONS							
Action	Status	Date	Done By	Description			
Change Fluid	MISSED	Jun 17 2024	?	We recommend that you drain the oil from the component if this has not already been done.			
Flush System	MISSED	Jun 17 2024	?	We advise that you flush the component thoroughly before re-filling with oil.			
Resample	MISSED	Jun 17 2024	?	We recommend an early resample to monitor this condition.			
Check Glycol Access	MISSED	Jun 17 2024	?	We advise that you check for the source of the coolant leak.			

HISTORICAL DIAGNOSIS

15 May 2024 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.



NORMAL



25 Apr 2024 Diag: Jonathan Hester

Resample at the next service interval to monitor. All component wear rates are normal. No evidence of coolant present in the oil. 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.



GLYCOL



19 Mar 2024 Diag: Don Baldridge

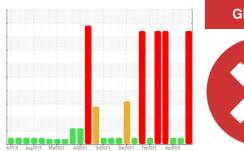
We advise that you check for the source of the coolant leak. Check for low coolant level. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition. All component wear rates are normal. Sodium and/or potassium levels are high. Test for glycol is positive. There is a high concentration of glycol present in the oil. The oil is no longer serviceable due to the presence of contaminants.





OIL ANALYSIS REPORT

Sample Rating Trend



GLYCOL

Machine Id

721024-361461

Diesel Engine

Eluid

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

DIAGNOSIS

Recommendation

We advise that you check for the source of the coolant leak. We recommend that you drain the oil from the component if this has not already been done. We advise that you flush the component thoroughly before re-filling with oil. We recommend an early resample to monitor this condition.

Wear

All component wear rates are normal.

▲ Contamination

Test for glycol is positive. There is a high concentration of glycol present in the oil.

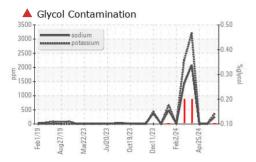
Fluid Condition

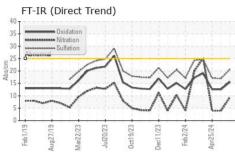
The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable due to the presence of contaminants.

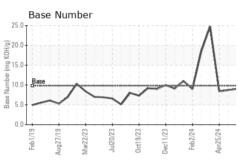
SAMPLE INFORMATION method limit/base current history1 history2	āAL)		162019 Aug2	019 Mar2023 Jul2023	Oct2023 Dec2023 Feb2024	Apr2024	
Sample Date	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Date Client Info 8025 7694 7753 Machine Age hrs Client Info 150 150 150 Oil Age hrs Client Info Not Changd Not Changd	Sample Number		Client Info		GFL0105299	GFL0105101	GFL0105052
Machine Age hrs Client Info 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 Not Changd Not Changd Not Changd Not Changd NorMAL Not Changd NORMAL Not Changd NORMAL Not Changd NORMAL NoRMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0			Client Info		31 May 2024	15 May 2024	25 Apr 2024
Oil Changed Sample Status Client Info Not Changd SEVERE Not Changd Not Changd NORMAL Not Changd NORMAL NoRMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5. <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 39 <1 <1 Chromium ppm ASTM D5185m >20 <1 0 0 Nickel ppm ASTM D5185m >20 <1 0 0 Silver ppm ASTM D5185m >20 3 <1 <1 Lead ppm ASTM D5185m >20 3 <1 <1 Copper ppm ASTM D5185m >330 43 0 0 Vanadium ppm ASTM D5185m 0	•	hrs	Client Info		-		
Sample Status	Oil Age	hrs	Client Info		150	150	150
CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0	Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Fuel WC Method S5	Sample Status				SEVERE	NORMAL	NORMAL
Water WC Method ≥0.2 NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 39 <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 39 <1	Fuel		WC Method	>5	<1.0	<1.0	<1.0
Iron	Water		WC Method	>0.2	NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 <1 0 0 Nickel ppm ASTM D5185m >4 0 0 0 Titanium ppm ASTM D5185m >3 0 <1 0 Silver ppm ASTM D5185m >3 0 <1 0 Aluminum ppm ASTM D5185m >20 3 <1 <1 Lead ppm ASTM D5185m >40 4 0 0 Copper ppm ASTM D5185m >330 43 0 0 Vanadium ppm ASTM D5185m 0 0 0 <1 Cadmium ppm ASTM D5185m 0 0 0 <1 Boron ppm ASTM D5185m 0 3 0 0 <1 Barium ppm ASTM D5185m 0 3 0 0 0 Molybdenum ppm ASTM D5185m 0 1	WEAR METAL	.S	method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >4 0 0 0 Titanium ppm ASTM D5185m 0 0 0 Silver ppm ASTM D5185m >3 0 <1	Iron	ppm	ASTM D5185m	>100	39	<1	<1
Titanium ppm ASTM D5185m 0 0 0 Silver ppm ASTM D5185m >3 0 <1	Chromium	ppm	ASTM D5185m	>20	<1	0	0
Silver ppm ASTM D5185m >3 0 <1 0 Aluminum ppm ASTM D5185m >20 3 <1 <1 Lead ppm ASTM D5185m >40 4 0 0 Copper ppm ASTM D5185m >330 43 0 0 Vanadium ppm ASTM D5185m >1 0 0 <1 Vanadium ppm ASTM D5185m 0 0 0 <1 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 0 0 Boron ppm ASTM D5185m 0 1 0 0 Barium ppm ASTM D5185m 0 1 0 0 Molybdenum ppm ASTM D5185m 0 1 0 0 <td>Nickel</td> <td>ppm</td> <td>ASTM D5185m</td> <td>>4</td> <th>0</th> <td>0</td> <td>0</td>	Nickel	ppm	ASTM D5185m	>4	0	0	0
Aluminum ppm ASTM D5185m >20 3 <1 <1 Lead ppm ASTM D5185m >40 4 0 0 Copper ppm ASTM D5185m >330 43 0 0 Tin ppm ASTM D5185m >15 1 0 0 Vanadium ppm ASTM D5185m 0 0 0 <1	Titanium	ppm	ASTM D5185m		0	0	0
Lead ppm ASTM D5185m >40 4 0 0 Copper ppm ASTM D5185m >330 43 0 0 Tin ppm ASTM D5185m >15 1 0 0 Vanadium ppm ASTM D5185m 0 0 0 <1 Cadmium ppm ASTM D5185m 0 3 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 0 0 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 1 0 0 Magnesium ppm ASTM D5185m 0 1 0 0 Calcium ppm ASTM D5185m 1070 1044 1040 1044 Phosphorus ppm ASTM D5185m 1270 1170 1230	Silver	ppm	ASTM D5185m	>3	0	<1	0
Copper ppm ASTM D5185m >330 43 0 0 Tin ppm ASTM D5185m >15 1 0 0 Vanadium ppm ASTM D5185m 0 0 <1	Aluminum	ppm	ASTM D5185m	>20	3	<1	<1
Tin ppm ASTM D5185m >15 1 0 0 Vanadium ppm ASTM D5185m 0 0 <1 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 0 0 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 1 0 0 Manganese ppm ASTM D5185m 0 1 0 0 Magnesium ppm ASTM D5185m 1070 1044 1040 1044 Phosphorus ppm ASTM D5185m 1150 990 1038 1027 Zinc ppm ASTM D5185m 1270 1170 1230 1237 Sulfur ppm ASTM D5185m >2060 3251 3715 3698<	Lead	ppm	ASTM D5185m	>40	4	0	0
Vanadium ppm ASTM D5185m 0 0 <1 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 0 0 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 108 55 55 Manganese ppm ASTM D5185m 0 1 0 0 Magnesium ppm ASTM D5185m 1010 862 954 932 Calcium ppm ASTM D5185m 1070 1044 1040 1044 Phosphorus ppm ASTM D5185m 1270 1170 1230 1237 Sulfur ppm ASTM D5185m 2060 3251 3715 3698 CONTAMINANTS method limit/base current history1<	Copper	ppm	ASTM D5185m	>330	43	0	0
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 0 0 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 108 55 55 Manganese ppm ASTM D5185m 1010 862 954 932 Calcium ppm ASTM D5185m 1070 1044 1040 1044 Phosphorus ppm ASTM D5185m 1150 990 1038 1027 Zinc ppm ASTM D5185m 1270 1170 1230 1237 Sulfur ppm ASTM D5185m 2060 3251 3715 3698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m <	Tin	ppm	ASTM D5185m	>15	1	0	0
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 0 0 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 108 55 55 Manganese ppm ASTM D5185m 0 1 0 0 Magnesium ppm ASTM D5185m 1010 862 954 932 Calcium ppm ASTM D5185m 1070 1044 1040 1044 Phosphorus ppm ASTM D5185m 1150 990 1038 1027 Zinc ppm ASTM D5185m 1270 1170 1230 1237 Sulfur ppm ASTM D5185m 2060 3251 3715 3698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m	Vanadium	ppm	ASTM D5185m		0	0	<1
Boron ppm ASTM D5185m 0 3 0 0 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 108 55 55 Manganese ppm ASTM D5185m 1010 862 954 932 Calcium ppm ASTM D5185m 1070 1044 1040 1044 Phosphorus ppm ASTM D5185m 1150 990 1038 1027 Zinc ppm ASTM D5185m 1270 1170 1230 1237 Sulfur ppm ASTM D5185m 2060 3251 3715 3698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 4 4 Sodium ppm ASTM D5185m >20 375 <1 0 Glycol % *ASTM D5185m >3<	Cadmium	ppm	ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 108 55 55 Manganese ppm ASTM D5185m 0 1 0 0 Magnesium ppm ASTM D5185m 1010 862 954 932 Calcium ppm ASTM D5185m 1070 1044 1040 1044 Phosphorus ppm ASTM D5185m 1150 990 1038 1027 Zinc ppm ASTM D5185m 1270 1170 1230 1237 Sulfur ppm ASTM D5185m 2060 3251 3715 3698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 4 4 Sodium ppm ASTM D5185m >20 375 <1 0 Glycol % *ASTM D5844	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 108 55 55 Manganese ppm ASTM D5185m 0 1 0 0 Magnesium ppm ASTM D5185m 1010 862 954 932 Calcium ppm ASTM D5185m 1070 1044 1040 1044 Phosphorus ppm ASTM D5185m 1150 990 1038 1027 Zinc ppm ASTM D5185m 1270 1170 1230 1237 Sulfur ppm ASTM D5185m 2060 3251 3715 3698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 4 4 Sodium ppm ASTM D5185m >20 375 <1	Boron	ppm	ASTM D5185m	0	3	0	0
Manganese ppm ASTM D5185m 0 1 0 0 Magnesium ppm ASTM D5185m 1010 862 954 932 Calcium ppm ASTM D5185m 1070 1044 1040 1044 Phosphorus ppm ASTM D5185m 1150 990 1038 1027 Zinc ppm ASTM D5185m 1270 1170 1230 1237 Sulfur ppm ASTM D5185m 2060 3251 3715 3698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 4 4 Sodium ppm ASTM D5185m >20 375 <1	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 862 954 932 Calcium ppm ASTM D5185m 1070 1044 1040 1044 Phosphorus ppm ASTM D5185m 1150 990 1038 1027 Zinc ppm ASTM D5185m 1270 1170 1230 1237 Sulfur ppm ASTM D5185m 2060 3251 3715 3698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 4 4 Sodium ppm ASTM D5185m >25 7 4 4 Sodium ppm ASTM D5185m >20 375 <1	Molybdenum	ppm	ASTM D5185m	60	108	55	55
Calcium ppm ASTM D5185m 1070 1044 1040 1044 Phosphorus ppm ASTM D5185m 1150 990 1038 1027 Zinc ppm ASTM D5185m 1270 1170 1230 1237 Sulfur ppm ASTM D5185m 2060 3251 3715 3698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 4 4 Sodium ppm ASTM D5185m >20 375 <1	Manganese	ppm	ASTM D5185m	0	1	0	0
Phosphorus ppm ASTM D5185m 1150 990 1038 1027 Zinc ppm ASTM D5185m 1270 1170 1230 1237 Sulfur ppm ASTM D5185m 2060 3251 3715 3698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 4 4 Sodium ppm ASTM D5185m >25 7 4 4 Potassium ppm ASTM D5185m >20 375 <1	Magnesium	ppm	ASTM D5185m	1010	862	954	932
Zinc ppm ASTM D5185m 1270 1170 1230 1237 Sulfur ppm ASTM D5185m 2060 3251 3715 3698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 4 4 Sodium ppm ASTM D5185m >26 246 <1	Calcium	ppm	ASTM D5185m	1070	1044	1040	1044
Sulfur ppm ASTM D5185m 2060 3251 3715 3698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 4 4 Sodium ppm ASTM D5185m 246 <1	Phosphorus	ppm	ASTM D5185m	1150	990	1038	1027
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 4 4 Sodium ppm ASTM D5185m ≥26 <1	Zinc	ppm	ASTM D5185m	1270	1170	1230	1237
Silicon ppm ASTM D5185m >25 7 4 4 Sodium ppm ASTM D5185m 246 <1 <1 Potassium ppm ASTM D5185m >20 375 <1 0 Glycol % *ASTM D2982 10 NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.1 0 0.1 Nitration Abs/cm *ASTM D7624 >20 9.5 4.0 4.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.7 17.0 17.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.6 12.6 12.6	Sulfur	ppm	ASTM D5185m	2060	3251	3715	3698
Sodium ppm ASTM D5185m 246 <1 <1 Potassium ppm ASTM D5185m >20 375 <1	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 ▲ 375 <1 0 Glycol % *ASTM D2982 ▲ 0.10 NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.1 0 0.1 Nitration Abs/cm *ASTM D7624 >20 9.5 4.0 4.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.7 17.0 17.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.6 12.6 12.6	Silicon	ppm	ASTM D5185m	>25	7	4	4
Glycol % *ASTM D2982 ▲ 0.10 NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.1 0 0.1 Nitration Abs/cm *ASTM D7624 >20 9.5 4.0 4.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.7 17.0 17.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.6 12.6 12.6	Sodium	ppm	ASTM D5185m		246	<1	<1
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.1 0 0.1 Nitration Abs/cm *ASTM D7624 >20 9.5 4.0 4.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.7 17.0 17.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.6 12.6 12.6	Potassium	ppm	ASTM D5185m	>20	△ 375	<1	0
Soot % % *ASTM D7844 >3 1.1 0 0.1 Nitration Abs/cm *ASTM D7624 >20 9.5 4.0 4.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.7 17.0 17.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.6 12.6 12.6	Glycol	%	*ASTM D2982		▲ 0.10	NEG	NEG
Nitration Abs/cm *ASTM D7624 >20 9.5 4.0 4.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.7 17.0 17.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.6 12.6 12.6	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 20.7 17.0 17.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.6 12.6 12.6	Soot %	%	*ASTM D7844	>3	1.1	0	0.1
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 *>25 15.6 12.6 12.6	Nitration	Abs/cm	*ASTM D7624	>20	9.5	4.0	4.0
Oxidation Abs/.1mm *ASTM D7414 >25 15.6 12.6 12.6	Sulfation	Abs/.1mm	*ASTM D7415	>30	20.7	17.0	17.1
	FLUID DEGRAI	DATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.6	12.6	12.6
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	9.0	8.7	8.4

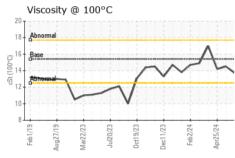


OIL ANALYSIS REPORT





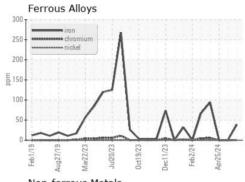


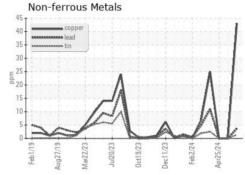


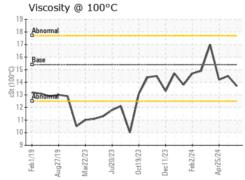
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	LIGHT
Sand/Dirt	scalar	*Visual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

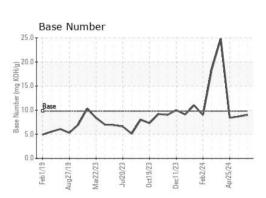
FLUID PROPE	ERITES	metnoa	ilmit/base	current	nistory i	nistory2
Visc @ 100°C	cSt	ASTM D445	15.4	13.7	14.5	14.2

GRAPHS













Laboratory Sample No.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0105299 Lab Number : 06209773 Unique Number : 11082637

Received **Tested** Diagnosed

: 14 Jun 2024 : 17 Jun 2024 : 17 Jun 2024 - Wes Davis

GFL Environmental - 821 - Ozarks Hauling 33924 Olath Drive

Lebanon, MO US 65536

T: (417)664-0010

Test Package : FLEET (Additional Tests: Glycol) Certificate 12367 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)

Contact: Landen Johnson

landen.johnson@gflenv.com