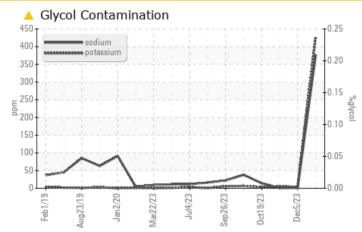


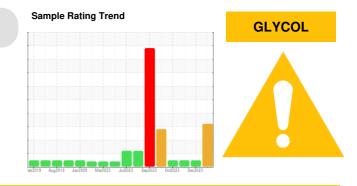
# **PROBLEM SUMMARY**

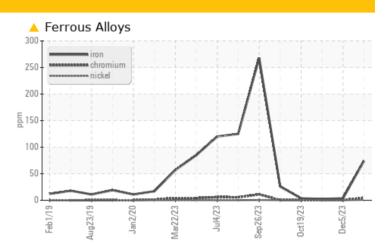
# 721024-361461

Component Diesel Engine Fluid PETRO CANADA DURON SHP 15W40 (--- GAL)

# COMPONENT CONDITION SUMMARY







### RECOMMENDATION

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.

PROBLEMATIC TEST RESULTS								
Sample Status				ABNORMAL	NORMAL	NORMAL		
Iron	ppm	ASTM D5185m	>100	<u> </u>	4	2		
Sodium	ppm	ASTM D5185m		<b>A</b> 377	1	<1		
Potassium	ppm	ASTM D5185m	>20	<u> </u>	4	5		

Customer Id: GFL821 Sample No.: GFL0090343 Lab Number: 06033303 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 <u>customerservice@wearcheck.com</u>

RECOMMENDED	<b>ACTIONS</b>			
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 Glycol Access			?	We advise that you check for the source of the coolant leak.

# **HISTORICAL DIAGNOSIS**



05 Dec 2023 Diag: Sean Felton

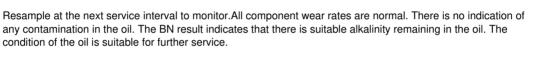
Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.



view report



31 Oct 2023 Diag: Wes Davis



#### 19 Oct 2023 Diag: Wes Davis

#### NORMAL

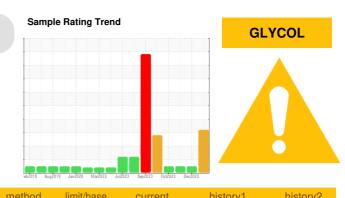


No corrective action is recommended at this time. Resample at the next service interval to monitor.All component wear rates are normal. Fuel content negligible. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The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





# **OIL ANALYSIS REPORT**



## Machine Id 721024-361461

#### Component **Diesel Engine** Fluid PETRO CANADA DURON SHP 15W40 (--- GAL)

### DIAGNOSIS

#### Recommendation

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.

### A Wear

The iron level is marginal.

#### Contamination

Sodium and/or potassium levels are high.

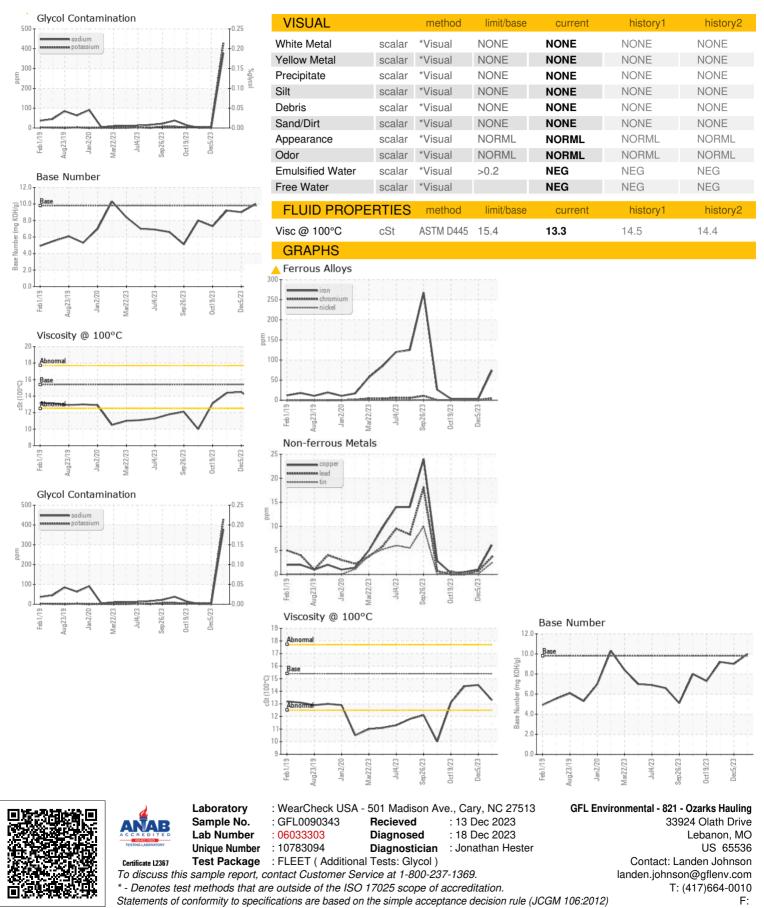
#### Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil.

Sample Number     Client Info     GFL0990343     GFL0990330     GFL0090371       Sample Date     I     Client Info     I1 Dec 2023     65 Dec 2023     61 Cot 2023       Machine Age     hrs     Client Info     IC     7055     16414     6790       Ol Age     hrs<     Client Info     Changed     Not Changd     Not Changd       Sample Status     I     IC     Image     Not Changed     Not Changed       CONTAMINATION     method     5     <1.0     Nistory     Not Changed       Fuel     WC Method     >5     <1.0     Nistory     Not Changed       Water     WC Method     >0     NEG     NEG     NEG       Nickel     ppm     ASTM05185     >10 <b>7</b> 14     4     2       Trainum     ppm     ASTM05185     >20     5     <1     1     0       Silver     ppm     ASTM05185     >20     4     <1     0     0       Silver     ppm     ASTM05185     >10     4 <t< th=""><th>SAMPLE INFOR</th><th>MATION</th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></t<>	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Date     Image of the second	Sample Number		Client Info		GFL0090343	GFL0090330	GFL0090171
Oil Age     hrs     Client Info     600     300     150       Oil Changed     Client Info     Changed     Not Changd			Client Info		11 Dec 2023	05 Dec 2023	31 Oct 2023
Oil Changed Sample Status Client Info Changed ABNORMAL Not Changd NORMAL Not Changd 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 A74 4 2   Chromium ppm ASTM D5185m >20 5 <1.1 0   Nickel ppm ASTM D5185m >30 0 0 1   Aluminum ppm ASTM D5185m >30 0 0 0   Copper ppm ASTM D5185m >30 6 1 <1 0   Vanadium ppm ASTM D5185m >30 6 1 <1 0   Vanadium ppm ASTM D5185m >30 6 1 <1 1   Lead ppm ASTM D5185m 0 1 212 2   Barum ppm ASTM D5185m 0 11 0 4 <t< th=""><th>Machine Age</th><th>hrs</th><th>Client Info</th><th></th><th>7055</th><th>16414</th><th>6790</th></t<>	Machine Age	hrs	Client Info		7055	16414	6790
Sample Status     Image     ABNORMAL     NORMAL     NORMAL       CONTAMINATION     method     limit/base     current     history1     history2       Fuel     WC Method     >5.2     <1.0     <1.0     <1.0       Water     WC Method     >5.2     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5165n     >4.4     4     2       Chromium     ppm     ASTM D5165n     >4     -1     0     <1       Nickel     ppm     ASTM D5165n     >4     -1     0     <1       Silver     ppm     ASTM D5165n     >40     4     <1     0       Cadmium     ppm     ASTM D5165n     >40     4     <1     0       Cadmium     ppm     ASTM D5165n     >15     2     <1     0       Cadmium     ppm     ASTM D5165n     >16     1     <1     1       Cadmium	Oil Age	hrs	Client Info		600	300	150
CONTAMINATION     method     limit/base     current     history1     history2       Fuel     WC Method     >5     <1.0     <1.0     <1.0       Water     WC Method     >5     <1.0     NEG     NEG       Wear     WC Method     >0.2     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >100     74     4     2       Chromium     ppm     ASTM D5185m     >20     5     <1     1       Nickel     ppm     ASTM D5185m     >20     4     2     1       Auminum     ppm     ASTM D5185m     >20     4     2     1       Lead     ppm     ASTM D5185m     >33     0     0     <1     1       Aganes     ppm     ASTM D5185m     >16     1     0     0       Copper     ppm     ASTM D5185m     0     1     0     4	Oil Changed		Client Info		Changed	Not Changd	Not Changd
Fuel     WC Method     >5     <1.0	Sample Status				ABNORMAL	NORMAL	NORMAL
Water     WC Method     >0.2     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >100     74     4     2       Chromium     ppm     ASTM D5185m     >20     5     <1     <1       Nickel     ppm     ASTM D5185m     >4     <1     0     <1       Silver     ppm     ASTM D5185m     >3     0     0     <1       Aluminum     ppm     ASTM D5185m     >30     6     1     <1       Lead     ppm     ASTM D5185m     >330     6     1     <1       Vanadium     ppm     ASTM D5185m     >15     2     <1     0       Vanadium     ppm     ASTM D5185m     0     11     212     2       Boron     ppm     ASTM D5185m     0     11     0     4       Molybdenum     ppm     ASTM D5185m     100     11     0     0 </th <th>CONTAMINAT</th> <th>ION</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >20     5     <1     <1       Ohromium     ppm     ASTM D5185m     >20     5     <1     <1       Nickel     ppm     ASTM D5185m     >24     <1     0     <1       Nickel     ppm     ASTM D5185m     >3     0     0     <1       Aluminum     ppm     ASTM D5185m     >30     4     21     0       Copper     ppm     ASTM D5185m     >30     6     1     <1     <1       Lead     ppm     ASTM D5185m     >15     2     <1     0     0       Cadmium     ppm     ASTM D5185m     >15     2     <1     0     0       Cadmium     ppm     ASTM D5185m     >15     2     <1     1     1       ADDTIVES     method     Imit/base     current     history1     history2       Boron     ppm <td< th=""><th>Fuel</th><th></th><th>WC Method</th><th>&gt;5</th><th>&lt;1.0</th><th>&lt;1.0</th><th>&lt;1.0</th></td<>	Fuel		WC Method	>5	<1.0	<1.0	<1.0
Iron     ppm     ASTM D5185m     >100     ▲ 74     4     2       Chromium     ppm     ASTM D5185m     >20     5     <1     <1       Nickel     ppm     ASTM D5185m     >4     <1     0     <1       Titanium     ppm     ASTM D5185m     >3     0     0     <1       Aluminum     ppm     ASTM D5185m     >30     0     <1     0       Copper     ppm     ASTM D5185m     >30     6     1     <1     0       Copper     ppm     ASTM D5185m     >15     2     <1     0     0     0       Cadadium     ppm     ASTM D5185m     >15     2     <1     0	Water		WC Method	>0.2	NEG	NEG	NEG
Chromium     ppm     ASTM D5185m     >20     5     <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel     ppm     ASTM D5185m     >4     <1	Iron	ppm	ASTM D5185m	>100	<b>A</b> 74	4	2
Titanium     ppm     ASTM D5185m     <1	Chromium		ASTM D5185m	>20	5	<1	<1
Silver     ppm     ASTM D5185m     >3     0     0     <1	Nickel	ppm	ASTM D5185m	>4	<1	0	<1
Atuminum     ppm     ASTM D5185m     >20     4     2     1       Lead     ppm     ASTM D5185m     >40     4     <1     0       Copper     ppm     ASTM D5185m     >330     6     1     <1       Tin     ppm     ASTM D5185m     >15     2     <1     0       Vanadium     ppm     ASTM D5185m     >15     2     <1     0       Cadmium     ppm     ASTM D5185m     0     1     <1     <1       ADDITIVES     method     1mil/base     current     history1     history2     2       Boron     ppm     ASTM D5185m     0     1     0     4       Molybdenum     ppm     ASTM D5185m     0     110     0     0       Marganese     ppm     ASTM D5185m     1010     898     700     862       Calcium     ppm     ASTM D5185m     1100     898     717     898       Zinc     ppm     ASTM D5185m     120     11	Titanium	ppm			<1	11	0
Lead     ppm     ASTM D5185m     >40     4     <1	Silver	ppm	ASTM D5185m	>3	0		
Copper     ppm     ASTM D5185m     >330     6     1     <1	Aluminum	ppm	ASTM D5185m	>20	4	2	1
Tin     ppm     ASTM D5185m     >15     2     <1		ppm			-		0
Vanadium     ppm     ASTM D5185m     0     0     0       Cadmium     ppm     ASTM D5185m     <1     <1     <1       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     1     212     2       Barium     ppm     ASTM D5185m     0     11     0     4       Molybdenum     ppm     ASTM D5185m     0     129     67     58       Manganese     ppm     ASTM D5185m     0     1     0     0       Magnesium     ppm     ASTM D5185m     1010     898     700     862       Calcium     ppm     ASTM D5185m     1070     1027     1507     994       Phosphorus     ppm     ASTM D5185m     1150     995     771     898       Zinc     ppm     ASTM D5185m     1270     1183     862     1145       Sulfur     ppm     ASTM D5185m     2060     3242     3068		ppm			-		
Cadmium     ppm     ASTM D5185m     <1				>15			
ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     1     212     2       Barium     ppm     ASTM D5185m     0     11     0     4       Molybdenum     ppm     ASTM D5185m     60     129     67     58       Manganese     ppm     ASTM D5185m     0     1     0     0       Magnesium     ppm     ASTM D5185m     1010     898     700     862       Calcium     ppm     ASTM D5185m     1010     898     700     862       Calcium     ppm     ASTM D5185m     1070     1027     1507     994       Phosphorus     ppm     ASTM D5185m     1270     1183     862     1145       Sulfur     ppm     ASTM D5185m     2060     3242     3068     3192       CONTAMINANTS     method     limit/base     current     history1     history2       Solium     ppm     ASTM D5185m <td< th=""><th></th><td></td><td></td><td></td><th>-</th><td></td><td></td></td<>					-		
Boron     ppm     ASTM D5185m     0     1     212     2       Barium     ppm     ASTM D5185m     0     11     0     4       Molybdenum     ppm     ASTM D5185m     60     129     67     58       Manganese     ppm     ASTM D5185m     0     1     0     0       Magnesium     ppm     ASTM D5185m     1010     898     700     862       Calcium     ppm     ASTM D5185m     1010     898     700     862       Calcium     ppm     ASTM D5185m     1070     1027     1507     994       Phosphorus     ppm     ASTM D5185m     170     1183     862     1145       Sulfur     ppm     ASTM D5185m     1270     1183     862     1145       Sulfur     ppm     ASTM D5185m     2060     3242     3068     3192       CONTAMINANTS     method     Imit/base     current     history1     history2       Solium     ppm     ASTM D5185m		ppm			<1	<1	<1
Barium     ppm     ASTM D5185m     0     11     0     4       Molybdenum     ppm     ASTM D5185m     60     129     67     58       Manganese     ppm     ASTM D5185m     0     1     0     0       Magnesium     ppm     ASTM D5185m     1010     898     700     862       Calcium     ppm     ASTM D5185m     1070     1027     1507     994       Phosphorus     ppm     ASTM D5185m     1070     1027     1507     994       Phosphorus     ppm     ASTM D5185m     1150     995     771     898       Zinc     ppm     ASTM D5185m     1270     1183     862     1145       Sulfur     ppm     ASTM D5185m     2060     3242     3068     3192       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >20     427     4     5       Glycol     %     *ASTM D28185m							
Molybdenum     ppm     ASTM D5185m     60     129     67     58       Manganese     ppm     ASTM D5185m     0     1     0     0       Magnesium     ppm     ASTM D5185m     1010     898     700     862       Calcium     ppm     ASTM D5185m     1070     1027     1507     994       Phosphorus     ppm     ASTM D5185m     1070     1027     1507     994       Phosphorus     ppm     ASTM D5185m     1070     1027     1507     994       Phosphorus     ppm     ASTM D5185m     1270     1183     862     1145       Sulfur     ppm     ASTM D5185m     1270     1183     862     1145       Sulfur     ppm     ASTM D5185m     2060     3242     3068     3192       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >20     427     4     5       Glycol     %     *A							
Manganese     ppm     ASTM D5185m     0     1     0     0       Magnesium     ppm     ASTM D5185m     1010     898     700     862       Calcium     ppm     ASTM D5185m     1010     898     700     862       Calcium     ppm     ASTM D5185m     1070     1027     1507     994       Phosphorus     ppm     ASTM D5185m     1070     1027     1507     994       Phosphorus     ppm     ASTM D5185m     1270     1183     862     1145       Sulfur     ppm     ASTM D5185m     2060     3242     3068     3192       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     11     4     5       Sodium     ppm     ASTM D5185m     >20     A 427     4     5       Glycol     %     *ASTM D2982     NEG     NEG     NEG     NEG       INFRA-RED     method     limit/bas	Barium	ppm	ASTM D5185m	0		0	4
Magnesium     ppm     ASTM D5185m     1010     898     700     862       Calcium     ppm     ASTM D5185m     1070     1027     1507     994       Phosphorus     ppm     ASTM D5185m     1150     995     771     898       Zinc     ppm     ASTM D5185m     1270     1183     862     1145       Sulfur     ppm     ASTM D5185m     2060     3242     3068     3192       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     11     4     5       Sodium     ppm     ASTM D5185m     >20     427     4     5       Glycol     %     *ASTM D585m     >20     427     4     5       Glycol     %     *ASTM D585m     >20     A27     4     5       Glycol     %     *ASTM D585m     >20     A27     4     5       Soot %     *ASTM D5185m     >20     A237 <th></th> <th></th> <th>AOTH DELOS</th> <th>~~</th> <th></th> <th>07</th> <th>50</th>			AOTH DELOS	~~		07	50
Color     ppm     ASTM D5185m     1070     1027     1507     994       Phosphorus     ppm     ASTM D5185m     1150     995     771     898       Zinc     ppm     ASTM D5185m     1270     1183     862     1145       Sulfur     ppm     ASTM D5185m     2060     3242     3068     3192       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     11     4     5       Sodium     ppm     ASTM D5185m     >20     427     4     5       Glycol     %     *ASTM D5185m     >20     427     4     5       Glycol     %     *ASTM D2982     NEG     NEG     NEG     NEG       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     1.3     0.1     0.1       Nitration     Abs/.mm< *ASTM D7415     >30     <	,				-		
Phosphorus     ppm     ASTM D5185m     1150     995     771     898       Zinc     ppm     ASTM D5185m     1270     1183     862     1145       Sulfur     ppm     ASTM D5185m     1270     1183     862     1145       Sulfur     ppm     ASTM D5185m     2060     3242     3068     3192       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     11     4     5       Sodium     ppm     ASTM D5185m     >20     427     4     5       Glycol     %     *ASTM D2982     NEG     NEG     NEG     NEG       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     1.3     0.1     0.1       Nitration     Abs/m     *ASTM D7624     >20     11.2     4.1     4.2       Sulfation     Abs/1mm     *ASTM D7415	Manganese	ppm	ASTM D5185m	0	1	0	0
Zinc     ppm     ASTM D5185m     1270     1183     862     1145       Sulfur     ppm     ASTM D5185m     2060     3242     3068     3192       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     11     4     5       Sodium     ppm     ASTM D5185m     >25     11     4     5       Sodium     ppm     ASTM D5185m     >20     427     4     5       Glycol     %     *ASTM D2982     NEG     NEG     NEG       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     1.3     0.1     0.1       Nitration     Abs/cm     *ASTM D7624     >20     11.2     4.1     4.2       Sulfation     Abs/.1mm     *ASTM D7415     >30     21.3     17.3     17.5       FLUID DEGRADATION     method     limit/base     curren	Manganese Magnesium	ppm ppm	ASTM D5185m ASTM D5185m	0 1010	1 898	0 700	0 862
SulfurppmASTM D5185m2060324230683192CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>251145SodiumppmASTM D5185m>203771<1PotassiumppmASTM D5185m>2042745Glycol%*ASTM D2982NEGNEGNEGINFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>31.30.10.1NitrationAbs/cm*ASTM D7624>2011.24.14.2SulfationAbs/.1mm*ASTM D7415>3021.317.317.5FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2517.012.712.9	Manganese Magnesium Calcium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070	1 898 1027	0 700 1507	0 862 994
Silicon     ppm     ASTM D5185m     >25     11     4     5       Sodium     ppm     ASTM D5185m     >20     377     1     <1	Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070 1150	1 898 1027 995	0 700 1507 771	0 862 994 898
Sodium     ppm     ASTM D5185m     ▲ 377     1     <1	Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070 1150 1270	1 898 1027 995 1183	0 700 1507 771 862	0 862 994 898 1145
Sodium     ppm     ASTM D5185m     ▲ 377     1     <1	Maganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070 1150 1270 2060	1 898 1027 995 1183 3242	0 700 1507 771 862 3068	0 862 994 898 1145 3192
Glycol%*ASTM D2982NEGNEGINFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>31.30.10.1NitrationAbs/cm*ASTM D7624>2011.24.14.2SulfationAbs/.1mm*ASTM D7415>3021.317.317.5FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2517.012.712.9	Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method	0 1010 1070 1150 1270 2060 limit/base	1 898 1027 995 1183 3242 current	0 700 1507 771 862 3068 history1	0 862 994 898 1145 3192 history2
INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     1.3     0.1     0.1       Nitration     Abs/cm     *ASTM D7624     >20     11.2     4.1     4.2       Sulfation     Abs/.tmm     *ASTM D7415     >30     21.3     17.3     17.5       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.tmm     *ASTM D7414     >25     17.0     12.7     12.9	Maganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	0 1010 1070 1150 1270 2060 limit/base	1 898 1027 995 1183 3242 current 11	0 700 1507 771 862 3068 history1 4	0 862 994 898 1145 3192 history2 5
Soot %     %     *ASTM D7844     >3     1.3     0.1     0.1       Nitration     Abs/cm     *ASTM D7624     >20     11.2     4.1     4.2       Sulfation     Abs/.1mm     *ASTM D7415     >30     21.3     17.3     17.5       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     17.0     12.7     12.9	Maganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm TS ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m ASTM D5185m	0 1010 1070 1150 1270 2060 limit/base >25	1 898 1027 995 1183 3242 current 11 ▲ 377	0 700 1507 771 862 3068 history1 4 1	0 862 994 898 1145 3192 history2 5 <1
Nitration     Abs/cm     *ASTM D7624     >20     11.2     4.1     4.2       Sulfation     Abs/.1mm     *ASTM D7415     >30     21.3     17.3     17.5       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     17.0     12.7     12.9	Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070 1150 1270 2060 limit/base >25	1 898 1027 995 1183 3242 <u>current</u> 11 ▲ 377 ▲ 427	0 700 1507 771 862 3068 history1 4 1 4	0 862 994 898 1145 3192 history2 5 < <1 5
Sulfation     Abs/.1mm     *ASTM D7415     >30     21.3     17.3     17.5       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     17.0     12.7     12.9	Maganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol	ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070 1150 1270 2060 limit/base >25 >20	1 898 1027 995 1183 3242 current 11 ▲ 377 ▲ 427 NEG	0 700 1507 771 862 3068 history1 4 1 4 NEG	0 862 994 898 1145 3192 history2 5 <1 5 <1 5 NEG
FLUID DEGRADATION method limit/base current history1 history2   Oxidation Abs/.1mm *ASTM D7414 >25 17.0 12.7 12.9	Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED	ppm ppm ppm ppm ppm ppm TS ppm ppm ppm %	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D2982	0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base	1 898 1027 995 1183 3242 current 11 ▲ 377 ▲ 427 NEG current	0 700 1507 771 862 3068 history1 4 1 4 1 4 NEG history1	0 862 994 898 1145 3192 history2 5 <1 5 <1 5 NEG NEG
Oxidation     Abs/.1mm     *ASTM D7414     >25     17.0     12.7     12.9	Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm TS ppm ppm ppm %	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D2982 *ASTM D2982	0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >3	1 898 1027 995 1183 3242 current 11 ▲ 377 ▲ 427 NEG current 1.3	0 700 1507 771 862 3068 history1 4 1 4 1 4 NEG history1 0.1	0 862 994 898 1145 3192 history2 5 <1 5 <1 5 NEG history2 0.1
	Maganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm %	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D2982 *ASTM D2982 anethod *ASTM D7844 *ASTM D7844	0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >3 >20	1 898 1027 995 1183 3242 current 11 ▲ 377 ▲ 427 NEG current 1.3 11.2	0 700 1507 771 862 3068 history1 4 1 4 1 4 NEG history1 0.1 0.1 4.1	0 862 994 898 1145 3192 history2 5 <1 5 <1 5 NEG NEG 0.1 4.2
Base Number (BN) mg KOH/g ASTM D2896 9.8 10.0 9.0 9.2	Maganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm %	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D2982 *ASTM D2982 *ASTM D7844 *ASTM D7624	0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >3 >20 >30	1 898 1027 995 1183 3242 current 11 ▲ 377 ▲ 427 NEG current 1.3 11.2 21.3	0 700 1507 771 862 3068 history1 4 1 4 1 4 NEG history1 0.1 4.1 17.3	0 862 994 898 1145 3192 history2 5 <1 5 <1 5 NEG history2 0.1 4.2 17.5
	Maganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm ppm ppm ppm ppm ppm ppm ppm ppm % % Abs/cm Abs/cm Abs/1mm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D2982 <b>method</b> *ASTM D7844 *ASTM D7624 *ASTM D7624	0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >3 >20 >30 limit/base	1 898 1027 995 1183 3242 current 11 ▲ 377 ▲ 427 NEG current 1.3 11.2 21.3 current	0 700 1507 771 862 3068 history1 4 1 4 NEG history1 0.1 4.1 17.3 history1	0 862 994 898 1145 3192 history2 5 <1 5 <1 5 NEG NEG 0.1 4.2 17.5 history2



# **OIL ANALYSIS REPORT**



Submitted By: GFL821, GFL824 and GFL829 - Landen Johnson