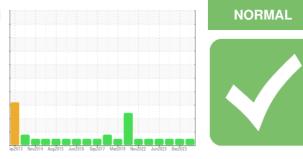


# **OIL ANALYSIS REPORT**

Sample Rating Trend



Component Diesel Engine PETRO CANADA DURON SHP 15W40 (20 LTR)

SAMPLE INFORMATION method

### DIAGNOSIS Recommendation

Resample at the next service interval to monitor.

Machine Id 7939

#### Wear

All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil.

### Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Number     Client Info     GFL012376     GFL0038428     GFL0038451       Sample Date     Client Info     105485     16462     94460       Oil Age     mis     Client Info     105485     16462     94460       Oil Changed     Client Info     105485     16462     94460       Sample Status     Client Info     NORMAL     NORMAL     NORMAL       CONTAMILATI-ON     method     Sample Status     NORMA     NORMAL     NORMAL       CONTAMILATI-ON     method     Sample Status     VC Method     >5     <1.0     <1.0     <1.0       Water     WC Method     >5     <1.0     <1.0     <1.0     <1.0       Water     WC Method     >5     <1.0     <1.0     <1.0     <1.0       Water     WC Method     >5     <1.0     <1.0     <1.0     <1.0       Water     MC Method     >5     <1.0     <1.0     <1.0     <1.0       Water     PDM     ASTM05165     >30     0     <1     <1     <			method	IIIIII/Dase	current	TIIStOLA	TIIStory2
Machine Age     mis     Client Info     105485     16462     94460       Oil Age     mis     Client Info     105485     16462     0       Oil Changed     Client Info     NORMAL     NORMAL     NORMAL     NORMAL       Sample Status     Imit/base     current     History1     History2       Fuel     WC Method     >5     <1.0     <1.0     <1.0       Water     WC Method     >0.2     NEG     NEG     NEG       Glycol     WC Method     >0.2     NEG     NEG     NEG       VEAR METALS     method     Imit/base     current     History1     History2       Iron     ppm     ASTM D5185m     >80     46     67     61       Chromium     ppm     ASTM D5185m     >2     0     1     1       Itatianiam     ppm     ASTM D5185m     >3     0     0     <1     2       Itotad     ppm     ASTM D5185m     >30     2     1     2     3	Sample Number		Client Info		GFL0123786	GFL0098428	GFL0084561
Oil Age     mis     Client Info     105485     16462     0       Oil Changed     Client Info     Changed     Changed     Changed       Sample Status     Imit/base     current     history1     history2       Fuel     WC Method     >5     <1.0     <1.0     <1.0       Water     WC Method     >0.2     NEG     NEG     NEG       Water     WC Method     >0.2     NEG     NEG     NEG       Water     WC Method     >0.2     NEG     NEG     NEG       WeAR METALS     method     imit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >5     2     4     3       Nickel     ppm     ASTM D5185m     >2     0     1     1       Atuminum     ppm     ASTM D5185m     30     0     0     <1     2       Atuminum     ppm     ASTM D5185m     >10     16     2     3     1       Lead     ppm <td< th=""><th>Sample Date</th><th></th><th>Client Info</th><th></th><th>24 May 2024</th><th>06 Dec 2023</th><th>15 Jun 2023</th></td<>	Sample Date		Client Info		24 May 2024	06 Dec 2023	15 Jun 2023
Oil Changed Sample Status     Client Info     Changed NORMAL     Changed NORMAL     Changed NORMAL     Changed 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       Glycol     WC Method     >5.     <1.0     <1.0     <1.0       WC Method     >0.     NEG     NEG     NEG     NEG       Iron     ppm     ASTM D5185m     >2.0     1     1     1       Chromium     ppm     ASTM D5185m     >3.0     0     <1     1       Silver     ppm     ASTM D5185m     >3.0     2     <1     4       Copper     ppm     ASTM D5185m     >3.0     2     <1     2       Copper     ppm     ASTM D5185m     >3.0     2     <1     2       Copper     ppm     ASTM D5185m     >5     0     <1     2	Machine Age	mls	Client Info		105485	16462	94460
Oil Changed Sample Status     Client Info     Changed NORMAL     Changed NORMAL     Changed NORMAL     Changed 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       Glycol     WC Method     >5.     <1.0     <1.0     <1.0       WC Method     >0.     NEG     NEG     NEG     NEG       Iron     ppm     ASTM D5185m     >2.0     1     1     1       Chromium     ppm     ASTM D5185m     >3.0     0     <1     1       Silver     ppm     ASTM D5185m     >3.0     2     <1     4       Copper     ppm     ASTM D5185m     >3.0     2     <1     2       Copper     ppm     ASTM D5185m     >3.0     2     <1     2       Copper     ppm     ASTM D5185m     >5     0     <1     2	Oil Age	mls	Client Info		105485	16462	0
Sample Status     NORMAL     NORMAL     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       Glycol     WC Method     NEG     NEG     NEG     NEG       VEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >80     46     67     61       Chromium     ppm     ASTM D5185m     >2     0     1     1       Titanium     ppm     ASTM D5185m     >3     0     0     <1       Aluminum     ppm     ASTM D5185m     >30     2     <1     4       Copper     ppm     ASTM D5185m     >30     2     <1     2       Vanadium     ppm     ASTM D5185m     0     0     <1     2	0					Changed	Changed
CONTAMINATION     method     limit/base     current     history1     history2       Fuel     WC Method     >0.2     NEG     NEG     NEG       Glycol     WC Method     >0.2     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM 05186m     >5     2     4     3       Nickel     ppm     ASTM 05186m     >5     2     4     3       Nickel     ppm     ASTM 05186m     30     5     10     16       Lead     ppm     ASTM 05186m     >30     2     <1     4       Copper     ppm     ASTM 05186m     >30     2     <1     4       Copper     ppm     ASTM 05186m     >30     2     <1     4       Copper     ppm     ASTM 05186m     0     0     <1     2       Cadmium     ppm     ASTM 05186m     0     0     1     2	-				•	Ũ	0
Fuel     WC Method     >5     <1.0							
Water     WC Method     >0.2     NEG     NEG     NEG     NEG       Glycol     WC Method     NEG     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5165m     >5     2     4     3       Nickel     ppm     ASTM D5165m     >2     0     1     1       Silver     ppm     ASTM D5165m     >3     0     <1     <1       Silver     ppm     ASTM D5165m     >30     5     10     16       Lead     ppm     ASTM D5165m     >30     5     0     <1     2       Copper     ppm     ASTM D5165m     >50     0     <1     2       Vanadium     ppm     ASTM D5165m     0     0     0     12       Copper     ppm     ASTM D5165m     0     0     12     0       Madium     ppm     ASTM D5165m     0     0     122 <t< th=""><th>CONTAMINAT</th><th>ION</th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></t<>	CONTAMINAT	ION	method	limit/base	current	history1	history2
Glycol     WC Method     NEG     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >80     46     67     61       Chromium     ppm     ASTM D5185m     >2     0     1     1       Titanium     ppm     ASTM D5185m     >3     0     0     <1       Aluminum     ppm     ASTM D5185m     >30     5     10     16       Lead     ppm     ASTM D5185m     >30     2     <1     4       Copper     ppm     ASTM D5185m     >5     0     <1     2       Vanadium     ppm     ASTM D5185m     0     <1     <1     2       Vanadium     ppm     ASTM D5185m     0     0     0     <1     <1       Vanadium     ppm     ASTM D5185m     0     0     2     0     10       Vanadium     ppm     ASTM D5185m     0     0	Fuel		WC Method	>5	<1.0	<1.0	<1.0
WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >80     46     67     61       Chromium     ppm     ASTM D5185m     >5     2     4     3       Nickel     ppm     ASTM D5185m     >2     0     1     1       Titanium     ppm     ASTM D5185m     >3     0     0     <1     41       Silver     ppm     ASTM D5185m     >3     0     0     <1     4       Copper     ppm     ASTM D5185m     >30     2     <1     4       Copper     ppm     ASTM D5185m     >30     2     <1     4       Copper     ppm     ASTM D5185m     >10     0     <1     2       Vanadium     ppm     ASTM D5185m     0     0     <1     <1     2       Vanadium     ppm     ASTM D5185m     0     0     11     2     0       Cadmium     ppm     ASTM	Water		WC Method	>0.2	NEG	NEG	NEG
Iron     ppm     ASTM D5185m     >800     46     677     611       Chromium     ppm     ASTM D5185m     >2     0     1     1       Titanium     ppm     ASTM D5185m     >2     0     1     1       Silver     ppm     ASTM D5185m     >30     0     <1     41       Aluminum     ppm     ASTM D5185m     >30     5     10     16       Lead     ppm     ASTM D5185m     >30     5     0     <1     2       Vanadium     ppm     ASTM D5185m     >5     0     <1     2     3       Tin     ppm     ASTM D5185m     >5     0     <1     <1     2       Cadmium     ppm     ASTM D5185m     0     0     <1     <1     2       Boron     ppm     ASTM D5185m     0     0     0     2     2       Magnesium     ppm     ASTM D5185m     0     <1     1     2       Magnesium     ppm	Glycol		WC Method		NEG	NEG	NEG
Iron     ppm     ASTM D5185m     >800     46     677     611       Chromium     ppm     ASTM D5185m     >2     0     1     1       Titanium     ppm     ASTM D5185m     >2     0     1     1       Silver     ppm     ASTM D5185m     >30     0     <1     41       Aluminum     ppm     ASTM D5185m     >30     5     10     16       Lead     ppm     ASTM D5185m     >30     5     0     <1     2       Vanadium     ppm     ASTM D5185m     >5     0     <1     2     3       Tin     ppm     ASTM D5185m     >5     0     <1     <1     2       Cadmium     ppm     ASTM D5185m     0     0     <1     <1     2       Boron     ppm     ASTM D5185m     0     0     0     2     2       Magnesium     ppm     ASTM D5185m     0     <1     1     2       Magnesium     ppm		0	mathad	limit/bass	ourropt	biotorut	biotory ()
Chromium     ppm     ASTM D5185m     >5     2     4     3       Nickel     ppm     ASTM D5185m     >2     0     1     1       Titanium     ppm     ASTM D5185m     >2     0     <1     <1       Silver     ppm     ASTM D5185m     >3     0     0     <1       Aluminum     ppm     ASTM D5185m     >30     2     <1     4       Copper     ppm     ASTM D5185m     >30     2     <1     4       Copper     ppm     ASTM D5185m     >5     0     <1     2     3       Tin     ppm     ASTM D5185m     >5     0     <1     2     3       Cadmium     ppm     ASTM D5185m     0     0     0     <1     1       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     0     0     12     0       Magnagese     ppm     ASTM D5185m<		5	methoa	limit/base			
Nickel     ppm     ASTM D5185m     >2     0     1     1       Titanium     ppm     ASTM D5185m     0     <1     <1       Silver     ppm     ASTM D5185m     >3     0     0     <1       Aluminum     ppm     ASTM D5185m     >30     5     10     16       Lead     ppm     ASTM D5185m     >30     2     <1     4       Copper     ppm     ASTM D5185m     >5     0     <1     2       Vanadium     ppm     ASTM D5185m     >5     0     <1     1       Cadmium     ppm     ASTM D5185m     0     0     0     <1     1       ADDTTVES     method     imit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     0     0     2     0       Molydenum     ppm     ASTM D5185m     0     <1     1     2     2       Magnesium     ppm     ASTM D5185m     100 <td< th=""><th>Iron</th><th>ppm</th><th>ASTM D5185m</th><th>&gt;80</th><th>46</th><th>67</th><th></th></td<>	Iron	ppm	ASTM D5185m	>80	46	67	
Titanium     ppm     ASTM D5185m     0     <1	Chromium	ppm	ASTM D5185m	>5	2	4	3
Silver     ppm     ASTM D5185m     >30     0     0     <1	Nickel	ppm	ASTM D5185m	>2	0	1	1
Aluminum     ppm     ASTM D5185m     >30     5     10     16       Lead     ppm     ASTM D5185m     >30     2     <1     4       Copper     ppm     ASTM D5185m     >150     1     2     3       Tin     ppm     ASTM D5185m     >5     0     <1     2       Vanadium     ppm     ASTM D5185m     0     0     <1     2       Vanadium     ppm     ASTM D5185m     0     0     <1     <1       Cadmium     ppm     ASTM D5185m     0     0     0     2        Boron     ppm     ASTM D5185m     0     0     0     2        Magnaese     ppm     ASTM D5185m     0     0     112     0       Magnesium     ppm     ASTM D5185m     1070     1171     962     1222       Phosphorus     ppm     ASTM D5185m     1070     1171     962     1222       Sulfur     ppm     ASTM D5185m     2060<		ppm	ASTM D5185m		0	<1	<1
Lead     ppm     ASTM D5185m     >30     2     <1	Silver	ppm	ASTM D5185m	>3	0	0	<1
Copper     ppm     ASTM D5185m     >150     1     2     3       Tin     ppm     ASTM D5185m     >5     0     <1     2       Vanadium     ppm     ASTM D5185m     >5     0     <1     2       Vanadium     ppm     ASTM D5185m     0     0     <1     <1       Cadmium     ppm     ASTM D5185m     0     0     <1     <1       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     0     0     2       Barium     ppm     ASTM D5185m     0     0     12     0       Manganese     ppm     ASTM D5185m     0     <1     1     2       Magnesium     ppm     ASTM D5185m     1010     1035     890     1110       Calcium     ppm     ASTM D5185m     1070     1171     962     1222       Phosphorus     ppm     ASTM D5185m     120     3254	Aluminum	ppm	ASTM D5185m	>30	5	10	16
Tin     ppm     ASTM D5185m     >55     0     <1	Lead	ppm	ASTM D5185m	>30	2	<1	4
Vanadium     ppm     ASTM D5185m     0     0     <1	Copper	ppm	ASTM D5185m	>150	1	2	3
Cadmium     ppm     ASTM D5185m     0     <1	Tin	ppm	ASTM D5185m	>5	0	<1	2
ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     0     0     2       Barium     ppm     ASTM D5185m     0     0     12     0       Molybdenum     ppm     ASTM D5185m     60     62     58     70       Manganese     ppm     ASTM D5185m     0     <1     1     2       Magnesium     ppm     ASTM D5185m     1010     1035     890     1110       Calcium     ppm     ASTM D5185m     1070     1171     962     1222       Phosphorus     ppm     ASTM D5185m     1070     1171     962     1222       Phosphorus     ppm     ASTM D5185m     1270     1309     1143     1420       Sulfur     ppm     ASTM D5185m     2060     3254     2695     3482       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m	Vanadium	ppm	ASTM D5185m		0	0	<1
Boron     ppm     ASTM D5185m     0     0     0     12     0       Molybdenum     ppm     ASTM D5185m     60     62     58     70       Manganese     ppm     ASTM D5185m     0     <1     1     2       Magnesium     ppm     ASTM D5185m     0     <1     1     2       Magnesium     ppm     ASTM D5185m     1010     1035     890     1110       Calcium     ppm     ASTM D5185m     1010     1035     890     1110       Calcium     ppm     ASTM D5185m     1070     1171     962     1222       Phosphorus     ppm     ASTM D5185m     1270     1309     1143     1420       Sulfur     ppm     ASTM D5185m     2060     3254     2695     3482       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >20     0     9     9       Sodium     ppm     ASTM D	Cadmium	ppm	ASTM D5185m		0	<1	<1
Boron     ppm     ASTM D5185m     0     0     0     12     0       Molybdenum     ppm     ASTM D5185m     60     62     58     70       Manganese     ppm     ASTM D5185m     0     <1     1     2       Magnesium     ppm     ASTM D5185m     0     <1     1     2       Magnesium     ppm     ASTM D5185m     010     1035     890     1110       Calcium     ppm     ASTM D5185m     1010     1035     890     1110       Calcium     ppm     ASTM D5185m     1070     1171     962     1222       Phosphorus     ppm     ASTM D5185m     170     1309     1143     1420       Sulfur     ppm     ASTM D5185m     2060     3254     2695     3482       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >20     0     9     9  Sodium     ppm     ASTM D5185m							
Barium     ppm     ASTM D5185m     0     0     12     0       Molybdenum     ppm     ASTM D5185m     60     62     58     70       Manganese     ppm     ASTM D5185m     0     <1     1     2       Magnesium     ppm     ASTM D5185m     1010     1035     890     1110       Calcium     ppm     ASTM D5185m     1070     1171     962     1222       Phosphorus     ppm     ASTM D5185m     1070     1171     962     1222       Phosphorus     ppm     ASTM D5185m     1070     1171     962     1222       Phosphorus     ppm     ASTM D5185m     1070     1143     1420       Sulfur     ppm     ASTM D5185m     2060     3254     2695     3482       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >20     0     9     9       Sodium     ppm     ASTM D5185m     >20	ADDITIVES		method				history2
Molybdenum     ppm     ASTM D5185m     60     62     58     70       Manganese     ppm     ASTM D5185m     0     <1     1     2       Magnesium     ppm     ASTM D5185m     1010     1035     890     1110       Calcium     ppm     ASTM D5185m     1070     1171     962     1222       Phosphorus     ppm     ASTM D5185m     1070     1171     962     1222       Phosphorus     ppm     ASTM D5185m     1070     1171     962     1222       Phosphorus     ppm     ASTM D5185m     1270     1309     1143     1420       Sulfur     ppm     ASTM D5185m     2060     3254     2695     3482       CONTAMINANT     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >20     0     9     9       Sodium     ppm     ASTM D5185m     >20     8     25     23       INFRA-RED     method     li		maa					
Marganese     ppm     ASTM D5185m     0     <1	Boron		ASTM D5185m	0	0	0	2
Magnesium     ppm     ASTM D5185m     1010     1035     890     1110       Calcium     ppm     ASTM D5185m     1070     1171     962     1222       Phosphorus     ppm     ASTM D5185m     1150     1090     911     1148       Zinc     ppm     ASTM D5185m     1270     1309     1143     1420       Sulfur     ppm     ASTM D5185m     2060     3254     2695     3482       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >20     0     9     9       Sodium     ppm     ASTM D5185m     >20     0     9     9       Sodium     ppm     ASTM D5185m     >20     8     25     23       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     1.6     2.3     2       Nitration     Abs/mm     *ASTM D7624	Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	0 0	0 12	2
Calcum     ppm     ASTM D5185m     1070     1171     962     1222       Phosphorus     ppm     ASTM D5185m     1150     1090     911     1148       Zinc     ppm     ASTM D5185m     1270     1309     1143     1420       Sulfur     ppm     ASTM D5185m     2060     3254     2695     3482       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >20     0     9     9       Sodium     ppm     ASTM D5185m     >20     0     9     9       Sodium     ppm     ASTM D5185m     >20     0     9     9       Sodium     ppm     ASTM D5185m     >20     8     25     23       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     1.6     2.3     2       Nitration     Abs/.m     *ASTM D7624     >20 <th>Boron Barium Molybdenum</th> <th>ppm ppm</th> <th>ASTM D5185m ASTM D5185m ASTM D5185m</th> <th>0 0 60</th> <th>0 0 62</th> <th>0 12 58</th> <th>2 0 70</th>	Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	0 0 62	0 12 58	2 0 70
Phosphorus     ppm     ASTM D5185m     1150     1090     911     1148       Zinc     ppm     ASTM D5185m     1270     1309     1143     1420       Sulfur     ppm     ASTM D5185m     1270     1309     1143     1420       Sulfur     ppm     ASTM D5185m     2060     3254     2695     3482       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >20     0     9     9       Sodium     ppm     ASTM D5185m     >20     0     9     9       Sodium     ppm     ASTM D5185m     >20     0     9     9       Sodium     ppm     ASTM D5185m     >20     8     25     23       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     1.6     2.3     2     15.6       Sulfation     Abs/.im     *ASTM D7415<	Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	0 0 62 <1	0 12 58 1	2 0 70 2
Zinc     ppm     ASTM D5185m     1270     1309     1143     1420       Sulfur     ppm     ASTM D5185m     2060     3254     2695     3482       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >20     0     9     9       Sodium     ppm     ASTM D5185m     >20     0     9     9       Sodium     ppm     ASTM D5185m     >20     8     25     23       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     1.6     2.3     2       Nitration     Abs/cm     *ASTM D7624     >20     14.3     18.9     15.6       Sulfation     Abs/.tmm     *ASTM D7415     >30     26.8     33.5     30.0       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.tmm     *ASTM D7414<	Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	0 0 62 <1 1035	0 12 58 1 890	2 0 70 2 1110
SulfurppmASTM D5185m2060325426953482CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>20099SodiumppmASTM D5185m>200810PotassiumppmASTM D5185m>2082523INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>31.62.32NitrationAbs/cm*ASTM D7624>2014.318.915.6SulfationAbs/lim*ASTM D7415>3026.833.530.0FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.im*ASTM D7414>2526.338.729.4	Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	0 0 62 <1 1035 1171	0 12 58 1 890 962	2 0 70 2 1110 1222
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>20099SodiumppmASTM D5185m>20810PotassiumppmASTM D5185m>2082523INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>31.62.32NitrationAbs/cm*ASTM D7624>2014.318.915.6SulfationAbs/lmm*ASTM D7415>3026.833.530.0FLUID DEGRADATION methodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2526.338.729.4	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	0 0 62 <1 1035 1171 1090	0 12 58 1 890 962 911	2 0 70 2 1110 1222 1148
Silicon     ppm     ASTM D5185m     >20     0     9     9       Sodium     ppm     ASTM D5185m     10     8     10       Potassium     ppm     ASTM D5185m     >20     8     25     23       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     1.6     2.3     2       Nitration     Abs/cm     *ASTM D7624     >20     14.3     18.9     15.6       Sulfation     Abs/.tmm     *ASTM D7415     >30     26.8     33.5     30.0       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.tmm     *ASTM D7414     >25     26.3     38.7     29.4	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270	0 0 62 <1 1035 1171 1090 1309	0 12 58 1 890 962 911 1143	2 0 70 2 1110 1222 1148 1420
Sodium     ppm     ASTM D5185m     10     8     10       Potassium     ppm     ASTM D5185m     >20     8     25     23       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     1.6     2.3     2       Nitration     Abs/cm     *ASTM D7624     >20     14.3     18.9     15.6       Sulfation     Abs/.1mm     *ASTM D7415     >30     26.8     33.5     30.0       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     26.3     38.7     29.4	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	0 0 62 <1 1035 1171 1090 1309	0 12 58 1 890 962 911 1143 2695	2 0 70 2 1110 1222 1148 1420 3482
Sodium     ppm     ASTM D5185m     10     8     10       Potassium     ppm     ASTM D5185m     >20     8     25     23       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     1.6     2.3     2       Nitration     Abs/cm     *ASTM D7624     >20     14.3     18.9     15.6       Sulfation     Abs/.1mm     *ASTM D7415     >30     26.8     33.5     30.0       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     26.3     38.7     29.4	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	0 0 62 <1 1035 1171 1090 1309 3254	0 12 58 1 890 962 911 1143 2695	2 0 70 2 1110 1222 1148 1420 3482
INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     1.6     2.3     2       Nitration     Abs/cm     *ASTM D7624     >20     14.3     18.9     15.6       Sulfation     Abs/.1mm     *ASTM D7415     >30     26.8     33.5     30.0       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     26.3     38.7     29.4	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	0 0 62 <1 1035 1171 1090 1309 3254 current	0 12 58 1 890 962 911 1143 2695 history1	2 0 70 2 1110 1222 1148 1420 3482 history2
Soot %     %     *ASTM D7844     >3     1.6     2.3     2       Nitration     Abs/cm     *ASTM D7624     >20     14.3     18.9     15.6       Sulfation     Abs/.1mm     *ASTM D7415     >30     26.8     33.5     30.0       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     26.3     38.7     29.4	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm 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 0 60 1010 1070 1150 1270 2060	0 0 62 <1 1035 1171 1090 1309 3254 current 0	0 12 58 1 890 962 911 1143 2695 history1 9	2 0 70 2 1110 1222 1148 1420 3482 history2 9
Nitration     Abs/cm     *ASTM D7624     >20     14.3     18.9     15.6       Sulfation     Abs/.1mm     *ASTM D7415     >30     26.8     33.5     30.0       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     26.3     38.7     29.4	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b>	0 0 62 <1 1035 1171 1090 1309 3254 current 0 10	0 12 58 1 890 962 911 1143 2695 history1 9 8	2 0 70 2 1110 1222 1148 1420 3482 history2 9 10
Nitration     Abs/cm     *ASTM D7624     >20     14.3     18.9     15.6       Sulfation     Abs/.1mm     *ASTM D7415     >30     26.8     33.5     30.0       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     26.3     38.7     29.4	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b> >20	0 0 62 <1 1035 1171 1090 1309 3254 current 0 10 8	0 12 58 1 890 962 911 1143 2695 history1 9 8 25	2 0 70 2 1110 1222 1148 1420 3482 history2 9 10 23
Sulfation     Abs/.1mm     *ASTM D7415     >30     26.8     33.5     30.0       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     26.3     38.7     29.4	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 220 220	0 0 62 <1 1035 1171 1090 1309 3254 current 0 10 8	0 12 58 1 890 962 911 1143 2695 history1 9 8 25 8 25 history1	2 0 70 2 1110 1222 1148 1420 3482 <b>history2</b> 9 10 23 <b>history2</b>
FLUID DEGRADATION method limit/base current history1 history2   Oxidation Abs/.1mm *ASTM D7414 >25 26.3 38.7 29.4	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >20 20 20	0 0 62 <1 1035 1171 1090 1309 3254 <i>current</i> 0 10 8 <i>current</i>	0 12 58 1 890 962 911 1143 2695 history1 9 8 25 history1 2.3	2 0 70 2 1110 1222 1148 1420 3482 history2 9 10 23 history2 2
Oxidation     Abs/.1mm     *ASTM D7414     >25     26.3     38.7     29.4	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b> ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 2060 200 200 200 200 200 200	0 0 62 <1 1035 1171 1090 1309 3254 <i>current</i> 0 10 8 <i>current</i> 1.6 14.3	0 12 58 1 890 962 911 1143 2695 history1 9 8 25 history1 2.3 18.9	2 0 70 2 1110 1222 1148 1420 3482 history2 9 10 23 history2 2 15.6
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 220 20 20 320 320 33 220 330	0 0 62 <1 1035 1171 1090 1309 3254 <i>current</i> 0 10 8 <i>current</i> 1.6 14.3 26.8	0 12 58 1 890 962 911 1143 2695 history1 9 8 25 history1 2.3 18.9 33.5	2 0 70 2 1110 1222 1148 1420 3482 <b>history2</b> 9 10 23 <b>history2</b> 2 15.6 30.0
Base Number (BN) mg KUHig ASIM D2896 9.8 6.9 4.7 6.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 2060 2060 200 200 200 200 200 200	0 0 62 <1 1035 1171 1090 1309 3254 <i>current</i> 0 10 8 <i>current</i> 1.6 14.3 26.8 <i>current</i>	0 12 58 1 890 962 911 1143 2695 history1 9 8 25 history1 2.3 18.9 33.5 history1	2 0 70 2 1110 1222 1148 1420 3482 <b>history2</b> 9 10 23 <b>history2</b> 2 15.6 30.0 <b>history2</b>
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE Oxidation	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm ppm ppm ppm ppm pp	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >20 <b>imit/base</b> >3 >20 30 <b>imit/base</b>	0 0 62 <1 1035 1171 1090 1309 3254 <u>current</u> 0 10 8 <u>current</u> 1.6 14.3 26.8 <u>current</u>	0 12 58 1 890 962 911 1143 2695 history1 9 8 25 history1 2.3 18.9 33.5 history1 38.7	2 0 70 2 1110 1222 1148 1420 3482 <b>history2</b> 9 10 23 <b>history2</b> 2 15.6 30.0 <b>history2</b> 2 2.4

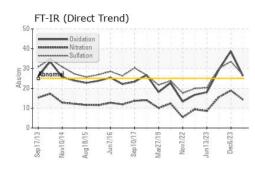


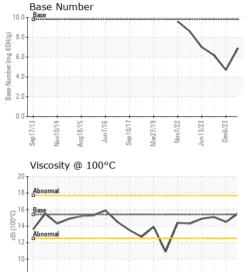
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# **OIL ANALYSIS REPORT**





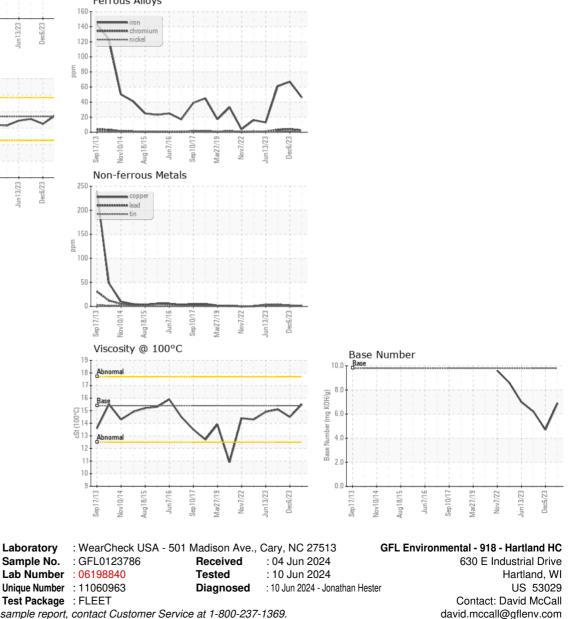
Sep 10/17

Aar77/19 Vov7/22 un13/23

VISUAL		method				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	RTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	15.5	14.5	15.1
GRAPHS						

Ferrous Alloys

Dec6/23 -



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)

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Submitted By: David McCall

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Page 2 of 2

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