

## **OIL ANALYSIS REPORT**

Sample Rating Trend





MACK 813005

Component Diesel Engine Fluid

DIESEL ENGINE OIL SAE 40 (--- GAL)

### DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor. Please specify the brand, type, and viscosity of the oil on your next sample.

### Wear

All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil.

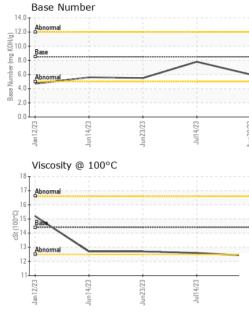
#### **Fluid Condition**

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

SAMPLE INFORMATION     method     limit/base     current     History1     History2       Sample Date     Client Info     30 Aug 2023     14 Jul 2023     23 Jun 2023       Machine Age     hrs     Client Info     2585     2327     2205       Oil Age     hrs     Client Info     2585     2327     2205       Oil Changed     Client Info     2585     2327     2205       Oil Changed     Client Info     2585     2327     2205       Sample Status     Client Info     NAA     N/A     N/A       Sample Status     Client Info     NORMAL     NORMAL     NORMAL       CONTAMINATION     method     imit/base     current     History1     History2       Fuel     WC Method     >3.0     <1.0     <1.0     <1.0     <1.0       Ornorium     ppm     ASTM 05155     >20     <1     1     1       Nickel     ppm     ASTM 05155     >20     <1     0     <1       Nickel     ppm     ASTM 051555     <							
Sample Date     Cilent Info     30 Aug 2023     14 Jul 2023     23 Jun 2023       Machine Age     Irss     Cilent Info     2585     2327     2205       Oil Age     Irss     Cilent Info     2585     2327     2205       Oil Changed     Cilent Info     N/A     N/A     N/A       Sample Status     Cilent Info     N/A     N/A     N/A       CONTAMINATION     method     imit/base     current     history1     history2       Fuel     WC Method     >3.0     <1.0     <1.0     <1.0       Glycol     WC Method     >3.0     <1.0     NEG     NEG     NEG       VEAR METALS     method     imit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >220     <1     <1     1       Nockel     ppm     ASTM D518m     >20     <1     0     <1       Aluminum     ppm     ASTM D518m     >20     <1     0     0       Corper     ppm     AS	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age     hrs     Client Info     2585     2327     2205       Oil Age     irrs     Client Info     2585     2327     2205       Oil Changed     Client Info     N/A     N/A     N/A     N/A       Sample Status     Imit/base     Current     NoRMAL     NORMAL     NORMAL       CONTAMINATION     method     Imit/base     Current     History1     History2       Fuel     WC Method     >3.0     <1.0     <1.0     <1.0       Glycol     Imit/base     Current     History1     History2       Iron     ppm     ASTM D5185m     >120     17     9     40       Chromium     ppm     ASTM D5185m     >5     3     2     11       Nickel     ppm     ASTM D5185m     >2     0     0     <1       Silver     ppm     ASTM D5185m     >2     1     0     0     0       Copper     ppm     ASTM D5185m     >40     -1     0     0     0     0 <th>Sample Number</th> <th></th> <th>Client Info</th> <th></th> <th>GFL0086261</th> <th>GFL0086231</th> <th>GFL0057564</th>	Sample Number		Client Info		GFL0086261	GFL0086231	GFL0057564
Oil Age     hrs     Client Info     2585     2327     2205       Oil Changed     Client Info     N/A     N/A     N/A     N/A       Sample Status     Imit/base     current     history1     history1       Fuel     WC Method     >3.0     <1.0     <1.0     <1.0       Glycol     WC Method     >3.0     <1.0     <1.0     <1.0       Glycol     WC Method     >3.0     <1.0     <1.0     <1.0       Glycol     WC Method     >3.0     <1.0     <1.0     <1.0       Fuel     WC Method     >120     17     9     40       Chromium     ppm     ASTM D5185m     >20     <1     <1     1       Nickel     ppm     ASTM D5185m     >20     <1     0     <1        Silver     ppm     ASTM D5185m     >20     <1     0     0     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     0	Sample Date		Client Info		30 Aug 2023	14 Jul 2023	23 Jun 2023
Oil Changed     Client Info     N/A     N/A     N/A     N/A       Sample Status     I     Image Status     Image Status     Normal No	Machine Age	hrs	Client Info		2585	2327	2205
Sample Status     NORMAL     NORMAL     NORMAL     NORMAL       CONTAMINATION     method     limit/base     current     history1     history2       Fuel     WC Method     >3.0     <1.0     <1.0     <1.0     <1.0       Glycol     WC Method     NEG     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5165m     >5     3     2     11       Nickel     ppm     ASTM D5165m     >2     0     0     <1       Nickel     ppm     ASTM D5165m     >2     0     0     <1       Silver     ppm     ASTM D5165m     >20     <1     3     <1       Lead     ppm     ASTM D5165m     >20     <1     3     <1       Lead     ppm     ASTM D5165m     >15     <1     <1     2       Vanadium     ppm     ASTM D5165m     >10     0     0     0	Oil Age	hrs	Client Info		2585	2327	2205
CONTAMINATION     method     imit/base     current     history1     history2       Fuel     WC Method     >3.0     <1.0     <1.0     <1.0     <1.0       Glycol     WC Method     NEG     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m<>20     <1     <1     1       Nickel     ppm     ASTM D5185m<>20     <1     <1     1       Nickel     ppm     ASTM D5185m<>2     0     0     <1       Silver     ppm     ASTM D5185m<>20     <1     3     <1       Lead     ppm     ASTM D5185m<>20     <1     0     0       Copper     ppm     ASTM D5185m<>330     5     5     5     1       Vanadium     ppm     ASTM D5185m     >15     <1     <1     2       Vanadium     ppm     ASTM D5185m     10     0     0     0       Addmium     ppm	Oil Changed		Client Info		N/A	N/A	N/A
Fuel     WC Method     >3.0     <1.0	Sample Status				NORMAL	NORMAL	NORMAL
Glycol     WC Method     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >20     <1     <1     1       Nickel     ppm     ASTM D5185m     >20     <1     <1     1       Nickel     ppm     ASTM D5185m     >2     0     0     <1       Silver     ppm     ASTM D5185m     >2     <1     0     <1       Lead     ppm     ASTM D5185m     >20     <1     3     <1       Lead     ppm     ASTM D5185m     >20     <1     0     0       Copper     ppm     ASTM D5185m     >15     <1     <1     2       Vanadium     ppm     ASTM D5185m     10     0     0     0       Cadmium     ppm     ASTM D5185m     10     0     14     14       Molybdenum     ppm     ASTM D5185m     10     0     1     1  Magane	CONTAMINAT	ION	method	limit/base	current	history1	history2
Glycol     WC Method     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >20     <1     <1     1       Nickel     ppm     ASTM D5185m     >20     <1     <1     1       Nickel     ppm     ASTM D5185m     >2     0     0     <1       Silver     ppm     ASTM D5185m     >2     <1     0     <1       Lead     ppm     ASTM D5185m     >20     <1     3     <1       Lead     ppm     ASTM D5185m     >20     <1     0     0       Copper     ppm     ASTM D5185m     >15     <1     <1     2       Vanadium     ppm     ASTM D5185m     10     0     0     0       Cadmium     ppm     ASTM D5185m     10     0     14     14       Molybdenum     ppm     ASTM D5185m     10     0     1     1  Magane	Fuel		WC Method	>3.0	<10	<10	<10
WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >120     17     9     40       Chromium     ppm     ASTM D5185m     >20     <1     <1     1       Nickel     ppm     ASTM D5185m     >20     <1     <1     1       Titanium     ppm     ASTM D5185m     >2     0     0     <1       Silver     ppm     ASTM D5185m     >2     <1     0     0       Lead     ppm     ASTM D5185m     >20     <1     3     <1     2       Vanadium     ppm     ASTM D5185m     >20     <1     0     0     0       Cadmium     ppm     ASTM D5185m     >15     <1     <1     2     Vanadium     ppm     ASTM D5185m     0     0     0     0       Cadmium     ppm     ASTM D5185m     10     0     0     14     14     14     14     14     14     14							
Iron     ppm     ASTM D5185m     >120     17     9     40       Chromium     ppm     ASTM D5185m     >20     <1     <1     1       Nickel     ppm     ASTM D5185m     >5     3     2     11       Titanium     ppm     ASTM D5185m     >2     0     0     <1       Silver     ppm     ASTM D5185m     >20     <1     0     0       Lead     ppm     ASTM D5185m     >20     <1     0     0       Copper     ppm     ASTM D5185m     >300     5     5     28       Tin     ppm     ASTM D5185m     >15     <1     <1     2       Vanadium     ppm     ASTM D5185m     >15     <1     <1     2       Cadmium     ppm     ASTM D5185m     10     0     0     14       Molybdenum     ppm     ASTM D5185m     100     65     70     71       Manganese     ppm     ASTM D5185m     100     65     70 </th <th>-</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	-						
Chromium     ppm     ASTM D5185m     >20     <1	WEAR METAL	S					
Nickel     ppm     ASTM D5185m     >2     0     0     <1	Iron	ppm	ASTM D5185m	>120	17		
Titanium     ppm     ASTM D5185m     >2     0     0     <1	Chromium	ppm	ASTM D5185m	>20			
Silver     ppm     ASTM D5185m     >2     <1	Nickel	ppm					
Aluminum     ppm     ASTM D5185m     >20     <1		ppm			-		
Lead     ppm     ASTM D5185m     >40     <1	Silver	ppm	ASTM D5185m	>2			
Copper     ppm     ASTM D5185m     >330     5     5     28       Tin     ppm     ASTM D5185m     >15     <1     <1     2       Vanadium     ppm     ASTM D5185m     >15     <1     <1     0     0       Cadmium     ppm     ASTM D5185m     0     0     0     0       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     250     10     26     5       Barium     ppm     ASTM D5185m     10     0     0     14       Molybdenum     ppm     ASTM D5185m     10     65     70     71       Magnesium     ppm     ASTM D5185m     100     65     70     71       Magnesium     ppm     ASTM D5185m     100     65     70     71       Magnesium     ppm     ASTM D5185m     3000     1124     1143     1187       Phosphorus     ppm     ASTM D5185m     1250<		ppm	ASTM D5185m	>20			
Tin     ppm     ASTM D5185m     >15     <1	Lead	ppm	ASTM D5185m	>40			
Vanadium     ppm     ASTM D5185m     <1	Copper	ppm	ASTM D5185m	>330	5		
Cadmium     ppm     ASTM D5185m     0     0     0       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     250     10     26     5       Barium     ppm     ASTM D5185m     250     10     0     0     14       Molybdenum     ppm     ASTM D5185m     10     0     0     14       Magnesium     ppm     ASTM D5185m     100     65     70     71       Magnesium     ppm     ASTM D5185m     100     65     70     71       Magnesium     ppm     ASTM D5185m     100     65     70     71       Magnesium     ppm     ASTM D5185m     3000     1124     1143     1187       Phosphorus     ppm     ASTM D5185m     150     960     995     887       Zinc     ppm     ASTM D5185m     1350     1210     1189     1232       Sulfur     ppm     ASTM D5185m     >25		ppm	ASTM D5185m	>15			
ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     250     10     26     5       Barium     ppm     ASTM D5185m     10     0     0     14       Molybdenum     ppm     ASTM D5185m     100     65     70     71       Manganese     ppm     ASTM D5185m     100     65     70     71       Magnesium     ppm     ASTM D5185m     450     877     818     875       Calcium     ppm     ASTM D5185m     450     877     818     1187       Phosphorus     ppm     ASTM D5185m     120     960     995     887       Zinc     ppm     ASTM D5185m     1350     1210     1189     1232       Sulfur     ppm     ASTM D5185m     >25     5     5     7       Sodium     ppm     ASTM D5185m     >216     2     0     3       Potassium     ppm     ASTM D5185m     >20	Vanadium	ppm	ASTM D5185m			0	
Boron     ppm     ASTM D5185m     250     10     26     5       Barium     ppm     ASTM D5185m     10     0     0     14       Molybdenum     ppm     ASTM D5185m     100     65     70     71       Manganese     ppm     ASTM D5185m     100     65     70     71       Magnesium     ppm     ASTM D5185m     450     877     818     875       Calcium     ppm     ASTM D5185m     3000     1124     1143     1187       Phosphorus     ppm     ASTM D5185m     1350     1210     1189     1232       Sulfur     ppm     ASTM D5185m     4250     3373     3201     2719       CONTAMINANTS     method     imit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >216     2     0     3       Potassium     ppm     ASTM D5185m     >20     3     1     2       INFERA-RED     method     limit/base	Cadmium	ppm	ASTM D5185m		0	0	0
Barium     ppm     ASTM D5185m     10     0     0     0     14       Molybdenum     ppm     ASTM D5185m     100     65     70     71       Manganese     ppm     ASTM D5185m     100     65     70     71       Magnesium     ppm     ASTM D5185m     450     877     818     875       Calcium     ppm     ASTM D5185m     3000     1124     1143     1187       Phosphorus     ppm     ASTM D5185m     1350     1210     1189     1232       Sulfur     ppm     ASTM D5185m     1350     1210     1189     1232       Sulfur     ppm     ASTM D5185m     4250     3373     3201     2719       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >20     3     1     2       Sodium     ppm     ASTM D5185m     >20     3     1     2       INFRA-RED     method     <	ADDITIVES		method	limit/baco	current	history1	history2
Molybdenum     ppm     ASTM D5185m     100     65     70     71       Manganese     ppm     ASTM D5185m     450     877     818     875       Calcium     ppm     ASTM D5185m     450     877     818     875       Calcium     ppm     ASTM D5185m     3000     1124     1143     1187       Phosphorus     ppm     ASTM D5185m     1350     1210     1189     1232       Sulfur     ppm     ASTM D5185m     1350     1210     1189     1232       Sulfur     ppm     ASTM D5185m     4250     3373     3201     2719       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >216     2     0     3       Potassium     ppm     ASTM D5185m     >20     3     1     2       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     'ASTM D7624 <th>ABBIIIVE0</th> <th></th> <th>memou</th> <th>iiiiii/base</th> <th>Guirchi</th> <th>TIIStOLA</th> <th>motory</th>	ABBIIIVE0		memou	iiiiii/base	Guirchi	TIIStOLA	motory
Manganese     ppm     ASTM D5185m     <1		ppm					
Magnesium     ppm     ASTM D5185m     450     877     818     875       Calcium     ppm     ASTM D5185m     3000     1124     1143     1187       Phosphorus     ppm     ASTM D5185m     3000     1124     1143     1187       Phosphorus     ppm     ASTM D5185m     1150     960     995     887       Zinc     ppm     ASTM D5185m     1350     1210     1189     1232       Sulfur     ppm     ASTM D5185m     4250     3373     3201     2719       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     5     5     7       Sodium     ppm     ASTM D5185m     >216     2     0     3       Potassium     ppm     ASTM D5185m     >20     3     1     2       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844	Boron		ASTM D5185m	250	10	26	5
Calcium     ppm     ASTM D5185m     3000     1124     1143     1187       Phosphorus     ppm     ASTM D5185m     1150     960     995     887       Zinc     ppm     ASTM D5185m     1350     1210     1189     1232       Sulfur     ppm     ASTM D5185m     4250     3373     3201     2719       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     5     5     7       Sodium     ppm     ASTM D5185m     >216     2     0     3       Potassium     ppm     ASTM D5185m     >20     3     1     2       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >4     0.6     0.3     1.1       Nitration     Abs/cm<*ASTM D7624     >20     7.5     5.8     10.4       Sulfation     Abs/.1mm<*ASTM D7415     >30     1	Boron Barium	ppm	ASTM D5185m ASTM D5185m	250 10	10 0	26 0	5 14
Phosphorus     ppm     ASTM D5185m     1150     960     995     887       Zinc     ppm     ASTM D5185m     1350     1210     1189     1232       Sulfur     ppm     ASTM D5185m     4250     3373     3201     2719       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     5     5     7       Sodium     ppm     ASTM D5185m     >216     2     0     3       Potassium     ppm     ASTM D5185m     >20     3     1     2       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >4     0.6     0.3     1.1       Nitration     Abs/cm     *ASTM D7624     >20     7.5     5.8     10.4       Sulfation     Abs/.tm     *ASTM D7415     >30     18.3     17.0     22.4       FLUID DEGRADATION     method     limit/	Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	250 10	10 0 65	26 0 70	5 14 71
Zinc     ppm     ASTM D5185m     1350     1210     1189     1232       Sulfur     ppm     ASTM D5185m     4250     3373     3201     2719       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     5     5     7       Sodium     ppm     ASTM D5185m     >216     2     0     3       Potassium     ppm     ASTM D5185m     >216     2     0     3       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >4     0.6     0.3     1.1       Nitration     Abs/cm     *ASTM D7624     >20     7.5     5.8     10.4       Sulfation     Abs/.tm     *ASTM D7615     >30     18.3     17.0     22.4       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.tm     *ASTM D7741	Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100	10 0 65 <1	26 0 70 <1	5 14 71 1
Sulfur     ppm     ASTM D5185m     4250     3373     3201     2719       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     5     5     7       Sodium     ppm     ASTM D5185m     >216     2     0     3       Potassium     ppm     ASTM D5185m     >216     2     0     3       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >4     0.6     0.3     1.1       Nitration     Abs/cm     *ASTM D7624     >20     7.5     5.8     10.4       Sulfation     Abs/.tmm     *	Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450	10 0 65 <1 877	26 0 70 <1 818	5 14 71 1 875
CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     5     5     7       Sodium     ppm     ASTM D5185m     >216     2     0     3       Potassium     ppm     ASTM D5185m     >20     3     1     2       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >4     0.6     0.3     1.1       Nitration     Abs/cm     *ASTM D7624     >20     7.5     5.8     10.4       Sulfation     Abs/.tmm     *ASTM D7415     >30     18.3     17.0     22.4       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.tmm     *ASTM D7414     >25     13.1     11.8     18.0	Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000	10 0 65 <1 877 1124	26 0 70 <1 818 1143	5 14 71 1 875 1187
Silicon     ppm     ASTM D5185m     >25     5     5     7       Sodium     ppm     ASTM D5185m     >216     2     0     3       Potassium     ppm     ASTM D5185m     >216     2     0     3       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >4     0.6     0.3     1.1       Nitration     Abs/cm     *ASTM D7624     >20     7.5     5.8     10.4       Sulfation     Abs/.tmm     *ASTM D7415     >30     18.3     17.0     22.4       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.tmm     *ASTM D7414     >25     13.1     11.8     18.0	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	250 10 100 450 3000 1150	10 0 65 <1 877 1124 960	26 0 70 <1 818 1143 995	5 14 71 1 875 1187 887
Sodium     ppm     ASTM D5185m     >216     2     0     3       Potassium     ppm     ASTM D5185m     >20     3     1     2       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >4     0.6     0.3     1.1       Nitration     Abs/cm     *ASTM D7624     >20     7.5     5.8     10.4       Sulfation     Abs/.1mm     *ASTM D7415     >30     18.3     17.0     22.4       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.1     11.8     18.0	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	250 10 100 450 3000 1150 1350	10 0 65 <1 877 1124 960 1210	26 0 70 <1 818 1143 995 1189	5 14 71 1 875 1187 887 1232
Potassium     ppm     ASTM D5185m     >20     3     1     2       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >4     0.6     0.3     1.1       Nitration     Abs/cm     *ASTM D7624     >20     7.5     5.8     10.4       Sulfation     Abs/.1mm     *ASTM D7415     >30     18.3     17.0     22.4       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.1     11.8     18.0	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	250 10 100 450 3000 1150 1350 4250	10 0 65 <1 877 1124 960 1210 3373	26 0 70 <1 818 1143 995 1189 3201	5 14 71 1 875 1187 887 1232 2719
INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >4     0.6     0.3     1.1       Nitration     Abs/cm     *ASTM D7624     >20     7.5     5.8     10.4       Sulfation     Abs/.1mm     *ASTM D7415     >30     18.3     17.0     22.4       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.1     11.8     18.0	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	250 10 100 450 3000 1150 1350 4250 Limit/base	10 0 65 <1 877 1124 960 1210 3373 current	26 0 70 <1 818 1143 995 1189 3201 history1	5 14 71 1 875 1187 887 1232 2719 history2
Soot %     %     *ASTM D7844     >4     0.6     0.3     1.1       Nitration     Abs/cm     *ASTM D7624     >20     7.5     5.8     10.4       Sulfation     Abs/.1mm     *ASTM D7415     >30     18.3     17.0     22.4       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.1     11.8     18.0	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 <b>method</b>	250 10 100 450 3000 1150 1350 4250 <i>limit/base</i> >25	10 0 65 <1 877 1124 960 1210 3373 current 5	26 0 70 <1 818 1143 995 1189 3201 history1 5	5 14 71 1 875 1187 887 1232 2719 history2 7
Nitration     Abs/cm     *ASTM D7624     >20     7.5     5.8     10.4       Sulfation     Abs/.1mm     *ASTM D7415     >30     18.3     17.0     22.4       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.1     11.8     18.0	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	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	250 10 100 450 3000 1150 1350 4250 <b>limit/base</b> >25 >216	10 0 65 <1 877 1124 960 1210 3373 <u>current</u> 5 2	26 0 70 <1 818 1143 995 1189 3201 history1 5 0	5 14 71 1 875 1187 887 1232 2719 history2 7 3
Nitration     Abs/cm     *ASTM D7624     >20     7.5     5.8     10.4       Sulfation     Abs/.1mm     *ASTM D7415     >30     18.3     17.0     22.4       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.1     11.8     18.0	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 <b>limit/base</b> >25 >216 >20	10 0 65 <1 877 1124 960 1210 3373 current 5 2 3	26 0 70 <1 818 1143 995 1189 3201 history1 5 0 1	5 14 71 1 875 1187 887 1232 2719 history2 7 3 2
Sulfation     Abs/.1mm     *ASTM D7415     >30     18.3     17.0     22.4       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.1     11.8     18.0	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 <b>limit/base</b> >25 >216 >216 >20	10 0 65 <1 877 1124 960 1210 3373 current 5 2 3 3	26 0 70 <1 818 1143 995 1189 3201 history1 5 0 1 1 history1	5 14 71 1 875 1187 887 1232 2719 history2 7 3 2 2 history2
FLUID DEGRADATION method limit/base current history1 history2   Oxidation Abs/.1mm *ASTM D7414 >25 13.1 11.8 18.0	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 <b>limit/base</b> >25 >216 >20 <b>limit/base</b>	10 0 65 <1 877 1124 960 1210 3373 <u>current</u> 5 2 3 3 <u>current</u> 0.6	26 0 70 <1 818 1143 995 1189 3201 history1 5 0 1 1 history1 0.3	5 14 71 1 875 1187 887 1232 2719 history2 7 3 2 2 history2 1.1
Oxidation     Abs/.1mm     *ASTM D7414     >25     13.1     11.8     18.0	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	250 10 100 450 3000 1150 1350 4250 <b>Iimit/base</b> >25 >216 >20 <b>Iimit/base</b> >4 >20	10 0 65 <1 877 1124 960 1210 3373 current 5 2 3 3 current 0.6 7.5	26 0 70 <1 818 1143 995 1189 3201 history1 5 0 1 5 0 1 history1 0.3 5.8	5 14 71 1 875 1187 887 1232 2719 history2 7 3 2 7 3 2 2 history2 1.1 10.4
	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 ppm ppm ppm	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 <b>imit/base</b> >216 >216 >20 <b>imit/base</b> >4 >20	10 0 65 <1 877 1124 960 1210 3373 <u>current</u> 5 2 3 3 <u>current</u> 0.6 7.5 18.3	26 0 70 <1 818 1143 995 1189 3201 history1 5 0 1 1 history1 0.3 5.8 17.0	5 14 71 1 875 1187 887 1232 2719 history2 7 3 2 history2 1.1 10.4 22.4
Base Number (BN) mg KUH/g ASTM D2896 8.5 6.0 7.8 5.5	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 ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844	250 10 100 450 3000 1150 1350 4250 20 216 >216 >20 >20 imit/base >4 >20 >30	10 0 65 <1 877 1124 960 1210 3373 current 5 2 3 current 0.6 7.5 18.3 current	26 0 70 <1 818 1143 995 1189 3201 history1 5 0 1 history1 0.3 5.8 17.0 history1	5 14 71 1 875 1187 887 1232 2719 history2 7 3 2 7 3 2 2 history2 1.1 10.4 22.4 history2
	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 ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7624 *ASTM D7411	250 10 100 450 3000 1150 1350 4250 <b>limit/base</b> >25 >216 >20 <b>limit/base</b> >4 >20 >30 <b>limit/base</b>	10 0 65 <1 877 1124 960 1210 3373 current 5 2 3 current 0.6 7.5 18.3 current 13.1	26 0 70 <1 818 1143 995 1189 3201 history1 5 0 1 5 0 1 1 history1 0.3 5.8 17.0 history1 11.8	5 14 71 1 875 1187 887 1232 2719 history2 7 3 2 history2 1.1 10.4 22.4 history2 18.0



# **OIL ANALYSIS REPORT**



		VISUAL		method				history2
		White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
		Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
	$\sim$	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
3/23	Jul14/23 - Jug30/23 -		scalar	*Visual	NORML	NORML	NORML	NORML
Jun23/23	Jul14/23	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual		NEG	NEG	NEG
		FLUID PROP	ERTIES	method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445	14.4	12.4	12.6	12.7
		GRAPHS						
		Ferrous Alloys						
1/23	1/23	80 - iron						
Jun23/23	Jul14/23	70 - nanana nickel						
		60						
		E 40						
		30-						
		20						
		10-	anness and the second sec					
		3 3	53	23	53			
		Jan 1 2/23 Jun 1 4/23	Jun23/23	Jul14/23	Aug30/23			
				- T	Au			
		Non-ferrous Met	als					
		copper						
		200 - tin						
		200 - management tin						
		150						
		200 - management tin						
		150 100						
		150						
		150 100 50 0						
		150 100 50 0	23/23	14/23	30/23			
		200 150 0 50 0 50 0 50 0 50 50 50	Jun23/23	Jul 4/23	Aug30/23 A			
		150 100 50 0	,	Jult4/23	cz/0c <sup>bm</sup> W	Base Number		
		200 150 100 50 CZ7 EZ Viscosity @ 100 <sup>c</sup>	,	EZFIInr	14.	Abnormal		
		200 150 100 50 0 EXT in EXT in	,	Juli 4/23	14.	Abnormal		
		200 150 100 50 0 EXT in EXT in	,	Juli 4/23	14.	Abnormal		
		200 150 100 50 0 EZ71 Ling Viscosity @ 100° 18 17 Abnomal	,	Jul 4/23	14.	Abnormal		
		200 150 100 50 0 EXIST E	,	C2/F1/Inf	14.	Abnormal		
		200 150 0 100 50 0 EZ7 100 EZ7 EZ7 EZ7 EZ7 EZ7 EZ7 EZ7 EZ7	,	nul 423	14.0 12.1 (0/HOX Du) = 0.8.0 = 0.6.0 = 0.0 = 0.6.0 = 0.0 = 0.0 = 0.0 = 0.0 = 0.0 = 0.0 = 0.0 = 0.0 = 0	Abnormal Base Abnormal		
		200 150 100 50 0 EXIST E	,	Juli 4/23	14.0 12.1 (0) 10.1 10.0 10.0 10.0 10.0 10.0 10.0 10.0	Abnormal Base Abnormal Abnormal		
		200 150 150 0 100 50 0 100 100 50 0 100 10	2C		14.1 (b)H010.1 (b)H0XI 00.1 (c)H0XI 00.1 (c)	Abnormal Base Abnormal		423
		200 150 150 150 100 50 0 CZ7 LEP Viscosity @ 100 CZ7 LEP Viscosity @ 100 CZ7 LEP LEP LEP LEP LEP LEP LEP LEP	,	Jult 4/23	14.0 12.1 (0) 10.1 10.0 10.0 10.0 10.0 10.0 10.0 10.0	Abnormal Base Abnormal Abnormal	23233	Jul14/23
		200 150 150 0 50 0 50 0 50 0 50 0 50 0 50 0 50 0 50 0 50 0 50 0 50 0 50 100 50 0 50 0 50 100 50 0 50 100 10	2 <b>C</b>	Jul14/23	14.1 12.1 (0)H10.1 B300 KUMU B400 KU	Abnormal Base Abnormal EZZII	Jun23/23	
	Laboratory	200 150 150 150 150 150 150 150 1	2С Е2/22/21/17	son Ave., Ca	14.0 12.1 (0)H10.1 10.0 10	Abnormal Base Abnormal EZZII	nvironmental -	009 - Fairbu
		200 150 150 0 50 0 50 0 50 0 50 0 50 0 50 0 50 0 50 0 50 0 50 0 50 0 50 100 50 0 50 0 50 100 50 0 50 100 10	2 <b>C</b>	son Ave., Ca	14.1 12.1 (0)H10.1 B300 KUMU B400 KU	Abnormal Base Abnormal EZZII	nvironmental -	
	Laboratory Sample No. Lab Number Unique Number	200 150 150 150 150 150 150 150 1	C 501 Madia Received	son Ave., Ca d : 01 3 ed : 01 3	14.0 12.1 10.1	Abnormal Base Abnormal EZZII	EZEZUNG nvironmental - 6905	009 - Fairbu Roosevelt Hv Fairburn, G US 302
	Laboratory Sample No. Lab Number Unique Number Test Package	200 150 150 150 150 150 150 150 1	2C 501 Madia Received Diagnos Diagnos	son Ave., Ca d : 01 S ed : 01 S tician : We	14.1 12.0 10.100 00 00 8.8 10.000 00 00 00 00 10.000 00 00 00 10.000 00 00 10.000 00 00 10.000 00 10.0000 00 10.00000 00 10.000000000000000000000000000000000	Abnormal Base Abnormal EZZII	ezezunr nvironmental - 6905 Con	<b>009 - Fairbu</b> Roosevelt Hy Fairburn, Q