

# **OIL ANALYSIS REPORT**

Sample Rating Trend





### DIAGNOSIS

## Recommendation

Resample at the next service interval to monitor. Please specify the component make and model with your next sample.

# Wear

All component wear rates are normal.

# Contamination

There is no indication of any contamination in the oil.

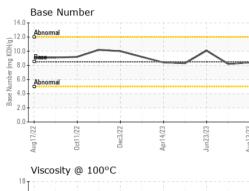
## Fluid Condition

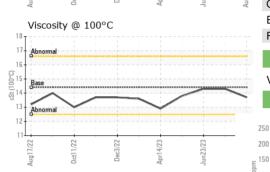
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

|   |  | Aug2022   | Oct2022 Dec2022   | Apr2023 Jun2023   | Aug2023   |   |
|---|--|---|---|---|---|---|
| SAMPLE INFORM   | <b>IATION</b>  | method  | limit/base  | current   | history1  | history2  |
| Sample Number   |  | Client Info   |   | WC0725582   | WC0745284   | WC0774795   |
| Sample Date   |  | Client Info   |   | 13 Aug 2023   | 04 Aug 2023   | 23 Jun 2023   |
| Machine Age   | hrs  | Client Info   |   | 3039  | 11662   | 11400   |
| Oil Age   | hrs  | Client Info   | 0   |   | 0   | 0   |
| Oil Changed   |  | Client Info   | N/A   |   | N/A   | N/A   |
| Sample Status   |  |   |   | NORMAL  | NORMAL  | NORMAL  |
| CONTAMINATIO  | N  | method  | limit/base  | current   | history1  | history2  |
| Fuel  |  | WC Method   | >5  | <1.0  | <1.0  | <1.0  |
| Glycol  |  | WC Method   |   | NEG   | NEG   | NEG   |
| WEAR METALS   |  | method  | limit/base  | current   | history1  | history2  |
| Iron  | ppm  | ASTM D5185m   | >100  | 4   | 5   | 4   |
| Chromium  | ppm  | ASTM D5185m   | >20   | 0   | 0   | <1  |
| Nickel  | ppm  | ASTM D5185m   | >4  | 0   | 0   | <1  |
| Titanium  | ppm  | ASTM D5185m   |   | <1  | <1  | 0   |
| Silver  | ppm  | ASTM D5185m   | >3  | 0   | 0   | 0   |
| Aluminum  | ppm  | ASTM D5185m   | >20   | 0   | 0   | <1  |
| Lead  | ppm  | ASTM D5185m   | >40   | 1   | 1   | <1  |
| Copper  | ppm  | ASTM D5185m   | >330  | 2   | 2   | 2   |
| Tin   | ppm  | ASTM D5185m   | >15   | <1  | <1  | <1  |
| Vanadium  | ppm  | ASTM D5185m   |   | 0   | 0   | 0   |
| Cadmium   | ppm  | ASTM D5185m   |   | 0   | 0   | 0   |
|   |  |   |   |   |   |   |
| ADDITIVES   |  | method  | limit/base  | current   | history1  | history2  |
| ADDITIVES<br>Boron  | ppm  | method<br>ASTM D5185m   | limit/base<br>250   | current<br>2  | history1<br>2   | history2<br>8   |
|   | ppm<br>ppm   |   |   |   |   |   |
| Boron   |  | ASTM D5185m   | 250   | 2   | 2   | 8   |
| Boron<br>Barium   | ppm  | ASTM D5185m<br>ASTM D5185m  | 250<br>10   | 2<br>0  | 2<br>0  | 8   |
| Boron<br>Barium<br>Molybdenum   | ppm<br>ppm   | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 250<br>10   | 2<br>0<br>58  | 2<br>0<br>59  | 8<br>0<br>57  |
| Boron<br>Barium<br>Molybdenum<br>Manganese  | ppm<br>ppm<br>ppm  | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 250<br>10<br>100  | 2<br>0<br>58<br><1  | 2<br>0<br>59<br><1  | 8<br>0<br>57<br><1  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium   | ppm<br>ppm<br>ppm<br>ppm   | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 250<br>10<br>100<br>450   | 2<br>0<br>58<br><1<br>989   | 2<br>0<br>59<br><1<br>1000  | 8<br>0<br>57<br><1<br>846   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium  | ppm<br>ppm<br>ppm<br>ppm<br>ppm                                    | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 250<br>10<br>100<br>450<br>3000   | 2<br>0<br>58<br><1<br>989<br>1251   | 2<br>0<br>59<br><1<br>1000<br>1245  | 8<br>0<br>57<br><1<br>846<br>1130   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm                             | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 250<br>10<br>100<br>450<br>3000<br>1150   | 2<br>0<br>58<br><1<br>989<br>1251<br>1099   | 2<br>0<br>59<br><1<br>1000<br>1245<br>1086  | 8<br>0<br>57<br><1<br>846<br>1130<br>997  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm                      | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 250<br>10<br>100<br>450<br>3000<br>1150<br>1350   | 2<br>0<br>58<br><1<br>989<br>1251<br>1099<br>1369   | 2<br>0<br>59<br><1<br>1000<br>1245<br>1086<br>1369  | 8<br>0<br>57<br><1<br>846<br>1130<br>997<br>1182  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm                      | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 250<br>10<br>100<br>450<br>3000<br>1150<br>1350<br>4250   | 2<br>0<br>58<br><1<br>989<br>1251<br>1099<br>1369<br>4039   | 2<br>0<br>59<br><1<br>1000<br>1245<br>1086<br>1369<br>4046  | 8<br>0<br>57<br><1<br>846<br>1130<br>997<br>1182<br>3215  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm                      | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 250<br>10<br>100<br>450<br>3000<br>1150<br>1350<br>4250   | 2<br>0<br>58<br><1<br>989<br>1251<br>1099<br>1369<br>4039<br>current  | 2<br>0<br>59<br><1<br>1000<br>1245<br>1086<br>1369<br>4046<br>history1  | 8<br>0<br>57<br><1<br>846<br>1130<br>997<br>1182<br>3215<br>history2  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon   | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm               | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br><b>method</b>   | 250<br>10<br>100<br>450<br>3000<br>1150<br>1350<br>4250<br><b>limit/base</b><br>>25   | 2<br>0<br>58<br><1<br>989<br>1251<br>1099<br>1369<br>4039<br>current<br>17  | 2<br>0<br>59<br><1<br>1000<br>1245<br>1086<br>1369<br>4046<br>history1<br>3   | 8<br>0<br>57<br><1<br>846<br>1130<br>997<br>1182<br>3215<br>history2<br>4   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium   | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm               | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 250<br>10<br>100<br>450<br>3000<br>1150<br>1350<br>4250<br><b>limit/base</b><br>>25<br>>216   | 2<br>0<br>58<br><1<br>989<br>1251<br>1099<br>1369<br>4039<br><b>current</b><br>17<br>1                                      | 2<br>0<br>59<br><1<br>1000<br>1245<br>1086<br>1369<br>4046<br>history1<br>3<br>2  | 8<br>0<br>57<br><1<br>846<br>1130<br>997<br>1182<br>3215<br>history2<br>4<br><1   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm               | ASTM D5185m<br>ASTM D5185m   | 250<br>10<br>100<br>450<br>3000<br>1150<br>1350<br>4250<br><b>limit/base</b><br>>25<br>>216<br>>20  | 2<br>0<br>58<br><1<br>989<br>1251<br>1099<br>1369<br>4039<br>current<br>17<br>1<br>1  | 2<br>0<br>59<br><1<br>1000<br>1245<br>1086<br>1369<br>4046<br>history1<br>3<br>2<br>1   | 8<br>0<br>57<br><1<br>846<br>1130<br>997<br>1182<br>3215<br>history2<br>4<br><1<br>1  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>INFRA-RED                                     | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m  | 250<br>10<br>100<br>450<br>3000<br>1150<br>1350<br>4250<br><b>Imit/base</b><br>>25<br>>216<br>>20<br><b>Imit/base</b>                       | 2<br>0<br>58<br><1<br>989<br>1251<br>1099<br>1369<br>4039<br>current<br>17<br>1<br>1<br>1<br>1                              | 2<br>0<br>59<br><1<br>1000<br>1245<br>1086<br>1369<br>4046<br><b>history1</b><br>3<br>2<br>1<br>1<br><b>history1</b>                  | 8<br>0<br>57<br><1<br>846<br>1130<br>997<br>1182<br>3215<br>history2<br>4<br><1<br>1<br>1   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>INFRA-RED<br>Soot %                           | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m   | 250<br>10<br>100<br>450<br>3000<br>1150<br>1350<br>4250<br><b>limit/base</b><br>>25<br>>216<br>>20<br><b>limit/base</b><br>>3               | 2<br>0<br>58<br><1<br>989<br>1251<br>1099<br>1369<br>4039<br><u>current</u><br>17<br>1<br>1<br>1<br>1<br>0.1                | 2<br>0<br>59<br><1<br>1000<br>1245<br>1086<br>1369<br>4046<br><b>history1</b><br>3<br>2<br>1<br>1<br><b>history1</b><br>0.2           | 8<br>0<br>57<br><1<br>846<br>1130<br>997<br>1182<br>3215<br>history2<br>4<br><1<br>1<br>1<br>history2<br>0.2                            |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>INFRA-RED<br>Soot %<br>Nitration              | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m                              | 250<br>10<br>100<br>450<br>3000<br>1150<br>1350<br>4250<br><b>Iimit/base</b><br>>25<br>>216<br>>20<br><b>Iimit/base</b><br>>3<br>>20        | 2<br>0<br>58<br><1<br>989<br>1251<br>1099<br>1369<br>4039<br>current<br>17<br>1<br>1<br>1<br>1<br>0.1<br>6.8                | 2<br>0<br>59<br><1<br>1000<br>1245<br>1086<br>1369<br>4046<br>history1<br>3<br>2<br>1<br>3<br>2<br>1<br>history1<br>0.2<br>6.2        | 8<br>0<br>57<br><1<br>846<br>1130<br>997<br>1182<br>3215<br>history2<br>4<br><1<br>1<br>1<br>history2<br>0.2<br>6.2                     |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>INFRA-RED<br>Soot %<br>Nitration<br>Sulfation | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m               | 250<br>10<br>100<br>450<br>3000<br>1150<br>1350<br>4250<br><b>imit/base</b><br>>25<br>>216<br>>20<br><b>imit/base</b><br>>3<br>>20<br>>30   | 2<br>0<br>58<br><1<br>989<br>1251<br>1099<br>1369<br>4039<br><u>current</u><br>17<br>1<br>1<br>1<br>1<br>0.1<br>6.8<br>18.6 | 2<br>0<br>59<br><1<br>1000<br>1245<br>1086<br>1369<br>4046<br><b>history1</b><br>3<br>2<br>1<br><b>history1</b><br>0.2<br>6.2<br>18.3 | 8<br>0<br>57<br><1<br>846<br>1130<br>997<br>1182<br>3215<br>history2<br>4<br><1<br>1<br>1<br>history2<br>0.2<br>6.2<br>19.2             |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>INFRA-RED<br>Soot %<br>Nitration<br>Sulfation | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D7844<br>*ASTM D7844 | 250<br>10<br>100<br>450<br>3000<br>1150<br>1350<br>4250<br><b>limit/base</b><br>>25<br>>216<br>>20<br><b>limit/base</b><br>>3<br>>20<br>>30 | 2<br>0<br>58<br><1<br>989<br>1251<br>1099<br>1369<br>4039<br>Current<br>17<br>1<br>1<br>1<br>0.1<br>6.8<br>18.6<br>Current  | 2<br>0<br>59<br><1<br>1000<br>1245<br>1086<br>1369<br>4046<br>history1<br>3<br>2<br>1<br>history1<br>0.2<br>6.2<br>18.3<br>history1   | 8<br>0<br>57<br><1<br>846<br>1130<br>997<br>1182<br>3215<br>history2<br>4<br><1<br>1<br>1<br>history2<br>0.2<br>6.2<br>19.2<br>history2 |



# **OIL ANALYSIS REPORT**





|  |  | White Metal   | a a a la v                                     |   |                      |                      |   |          |  |
|--|--|---|--|---|----------------------|----------------------|---|----------|--|
|  |  |   | scalar   | *Visual   | NONE                 | NONE                 | NONE  | NONE     |  |
|  | $\wedge$   | 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     |  |
| Apr14/23   | Jun23/23   | Appearance  | scalar   | *Visual   | NORML                | NORML                | NORML   | NORML    |  |
| Apr  | Jun  | 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   | 14.4                 | 13.7                 | 14.3  | 14.3     |  |
| $\sim$   |  | GRAPHS  |  |   |                      |                      |   |          |  |
|  |  | Iron (ppm)  |  |   | 100                  | Lead (ppm)           |   |          |  |
| /23  | /23  | 200 - Severe  |  |   | 80                   | Severe               |   |          |  |
| Apr14/23   | Jun23/23   | = <sup>150</sup>  |  |   | F 60                 |                      |   |          |  |
|  |  | B 150<br>100 - Abnormal   |  |   | 40                   | Abnormal             |   |          |  |
|  |  | 50 -  |  |   | 20                   |                      |   |          |  |
|  |  |   | 3  | ~   | 0                    | 2                    |   | ~ ~ ~    |  |
|  |  | Aug17/22<br>0ct11/22  | Dec3/22<br>Apr14/23                            | Jun23/23  | Aug13/23             | Aug17/22<br>Oct11/22 | Dec3/22<br>Apr14/23   | Jun23/23 |  |
|  |  |   | 4  | n n   | Au                   |                      | 4   | nh s     |  |
|  |  | Aluminum (ppn   | n)   |   | 50                   | Chromium (pp         | om)   | -,       |  |
|  |  | 40 - Severe   |  |   | 40                   | Severe               |   |          |  |
|  |  | _ 30 -  |  |   | _ 30                 |                      |   |          |  |
|  |  | 20- Abnormal  |  |   | <sup>30</sup> ع      | Abnormal             |   |          |  |
|  |  | 10-   |  |   | 10                   |                      |   |          |  |
|  |  | 0   |  |   | 0                    |                      |   |          |  |
|  |  | Aug17/22<br>0ct11/22  | Dec3/22<br>Apr14/23                            | Jun23/23  | Aug13/23             | Aug17/22<br>Oct11/22 | Dec3/22<br>Apr14/23   | Jun23/23 |  |
|  |  |   | An D   | , nu  | Auq                  |                      | Ap D  | n L      |  |
|  |  | Copper (ppm)  |  |   | 80                   | Silicon (ppm)        |   |          |  |
|  |  | 300   |  |   | 60                   |                      |   |          |  |
|  |  |   |  |   |                      |                      |   |          |  |
|  |  | 톱 200 -   |  |   | 틆 40                 | Abnormal             |   |          |  |
|  |  | 100-  |  |   | 20                   | -                    |   | /        |  |
|  |  |   |  | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~   | 0                    |                      |   |          |  |
|  |  | Aug17/22<br>0ct11/22  | Dec3/22<br>Apr14/23                            | Jun23/23  | Aug13/23             | Aug17/22<br>Oct11/22 | Dec3/22<br>Apr14/23   | Jun23/23 |  |
|  |  | ي<br>Viscosity @ 100  | 4  | , nu  | Au                   |                      | D Ap  | nh v     |  |
|  |  | 18 T  | )-C  |   |                      | Base Number          |   |          |  |
|  |  | Abnormal  |  |   | KOH/g                | Abnormal             |   |          |  |
|  |  | (10<br>Base<br>Abnormal   |  |   | E <sup>10.0</sup>    | Base                 |   | $\sim$   |  |
|  |  |   |  |   | aquin 5.0            | Abnormal             |   |          |  |
|  |  | 12-   |  |   | 0.0 mmper (mg KOH/g) |                      |   |          |  |
|  |  | 10 22 22  | 22   | 23 +  | 0.0                  | 22                   | 22  | 23+      |  |
|  |  | Aug17/22<br>0ct11/22  | Dec3/22<br>Apr14/23                            | Jun23/23  | Aug13/23             | Aug17/22<br>0ct11/22 | Dec3/22<br>Apr14/23   | Jun23/23 |  |
| CREDITED<br>CREDITED<br>STANDARDONTORY<br>entificate L2367 | Laboratory<br>Sample No.<br>Lab Number<br>Unique Numbe<br>Test Package | : WC0725582<br>: 05923975<br>r : 10603922<br>e : MOB 1 ( Addition | Received<br>Diagnos<br>Diagnos<br>al Tests: TE | on Ave., Cary, NC 27513<br>: 14 Aug 2023<br>d : 15 Aug 2023<br>cian : Wes Davis<br>N) |                      |                      | ADEN SLATE LLC<br>22 MCBRIDE RE<br>STATE HILL, NY<br>US 10973<br>Contact: Service Manage<br>ETY@ADENAGGREGATE.COM |          |  |