

## **OIL ANALYSIS REPORT**

Sample Rating Trend



#### Machine Id **4432L** Component **Diesel Engine** Fluid **MOBIL 15W40 (--- QTS)**

#### DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil.

### Fluid Condition

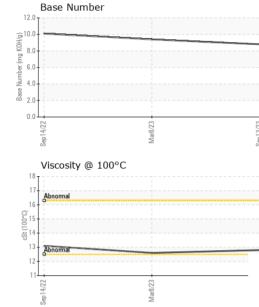
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

| SAMPLE INFORM   | IATION   | method  | limit/base   | current  | history1  | history2  |
|---|--|---|--|--|---|---|
| Sample Number   |  | Client Info   |  | IL0032319  | IL0028917   | IL0023763   |
| Sample Date   |  | Client Info   |  | 13 Sep 2023  | 08 Mar 2023   | 14 Sep 2022   |
| Machine Age   | mls  | Client Info   |  | 80483  | 68082   | 57281   |
| Oil Age   | mls  | Client Info   |  | 12401  | 10797   | 15000   |
| Oil Changed   |  | Client Info   |  | Changed  | Changed   | Changed   |
| Sample Status   |  |   |  | NORMAL   | NORMAL  | NORMAL  |
| CONTAMINATION   | ٧  | 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   | 13   | 15  | 20  |
| Chromium  | ppm  | ASTM D5185m   | >20  | <1   | 1   | 1   |
| Nickel  | ppm  | ASTM D5185m   | >4   | <1   | 0   | 0   |
| Titanium  | ppm  | ASTM D5185m   |  | <1   | 0   | <1  |
| Silver  | ppm  | ASTM D5185m   | >3   | 0  | 0   | 1   |
| Aluminum  | ppm  | ASTM D5185m   | >20  | 6  | 8   | 13  |
| Lead  | ppm  | ASTM D5185m   | >40  | <1   | 0   | <1  |
| Copper  | ppm  | ASTM D5185m   | >330   | 2  | 2   | 3   |
| Tin   | ppm  | ASTM D5185m   | >15  | <1   | 1   | <1  |
| Vanadium  | ppm  | ASTM D5185m   |  | 0  | <1  | <1  |
| Cadmium   | ppm  | ASTM D5185m   |  | 0  | 0   | <1  |
|   |  |   |  |  |   |   |
| ADDITIVES   |  | method  | limit/base   | current  | history1  | history2  |
| ADDITIVES<br>Boron  | ppm  | method<br>ASTM D5185m   | limit/base   | current<br>2   | history1<br>8   | history2<br>35  |
|   | ppm<br>ppm   |   | limit/base   |  |   |   |
| Boron   |  | ASTM D5185m   | limit/base   | 2  | 8   | 35  |
| Boron<br>Barium   | ppm  | ASTM D5185m<br>ASTM D5185m  | limit/base   | 2<br>0   | 8<br>0  | 35<br>2   |
| Boron<br>Barium<br>Molybdenum   | ppm<br>ppm   | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | limit/base   | 2<br>0<br>55   | 8<br>0<br>51  | 35<br>2<br>35   |
| Boron<br>Barium<br>Molybdenum<br>Manganese  | ppm<br>ppm<br>ppm  | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | limit/base   | 2<br>0<br>55<br><1   | 8<br>0<br>51<br>1   | 35<br>2<br>35<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   | limit/base   | 2<br>0<br>55<br><1<br>907  | 8<br>0<br>51<br>1<br>813  | 35<br>2<br>35<br><1<br>531  |
| 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  | limit/base   | 2<br>0<br>55<br><1<br>907<br>978   | 8<br>0<br>51<br>1<br>813<br>1180  | 35<br>2<br>35<br><1<br>531<br>1439  |
| 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  | limit/base   | 2<br>0<br>55<br><1<br>907<br>978<br>982  | 8<br>0<br>51<br>1<br>813<br>1180<br>868   | 35<br>2<br>35<br><1<br>531<br>1439<br>727   |
| 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   | limit/base   | 2<br>0<br>55<br><1<br>907<br>978<br>982<br>1192  | 8<br>0<br>51<br>1<br>813<br>1180<br>868<br>1081   | 35<br>2<br>35<br><1<br>531<br>1439<br>727<br>888  |
| 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<br>ASTM D5185m   |  | 2<br>0<br>55<br><1<br>907<br>978<br>982<br>1192<br>3205  | 8<br>0<br>51<br>1<br>813<br>1180<br>868<br>1081<br>2976   | 35<br>2<br>35<br><1<br>531<br>1439<br>727<br>888<br>2994  |
| 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<br>ASTM D5185m   | limit/base   | 2<br>0<br>555<br><1<br>907<br>978<br>982<br>1192<br>3205<br>current  | 8<br>0<br>51<br>1<br>813<br>1180<br>868<br>1081<br>2976<br>history1   | 35<br>2<br>35<br><1<br>531<br>1439<br>727<br>888<br>2994<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>   | limit/base   | 2<br>0<br>555<br><1<br>907<br>978<br>982<br>1192<br>3205<br>current<br>4   | 8<br>0<br>51<br>1<br>813<br>1180<br>868<br>1081<br>2976<br>history1<br>6  | 35<br>2<br>35<br><1<br>531<br>1439<br>727<br>888<br>2994<br>history2<br>7   |
| 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  | limit/base<br>>25<br>>118  | 2<br>0<br>55<br><1<br>907<br>978<br>982<br>1192<br>3205<br>Current<br>4<br>2   | 8<br>0<br>51<br>1<br>813<br>1180<br>868<br>1081<br>2976<br>history1<br>6<br><1  | 35<br>2<br>35<br><1<br>531<br>1439<br>727<br>888<br>2994<br>history2<br>7<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  | limit/base<br>>25<br>>118<br>>20                                   | 2<br>0<br>55<br><1<br>907<br>978<br>982<br>1192<br>3205<br>current<br>4<br>2<br>8  | 8<br>0<br>51<br>1<br>813<br>1180<br>868<br>1081<br>2976<br>history1<br>6<br><<br>1<br>9   | 35<br>2<br>35<br><1<br>531<br>1439<br>727<br>888<br>2994<br>history2<br>7<br>7<br><1<br>17  |
| 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               | ASTM D5185m<br>ASTM D5185m  | limit/base<br>>25<br>>118<br>>20<br>limit/base                     | 2<br>0<br>55<br><1<br>907<br>978<br>982<br>1192<br>3205<br>current<br>4<br>2<br>8<br>8   | 8<br>0<br>51<br>1<br>813<br>1180<br>868<br>1081<br>2976<br>history1<br>6<br><1<br>9<br>history1                                   | 35<br>2<br>35<br><1<br>531<br>1439<br>727<br>888<br>2994<br>history2<br>7<br><1<br>17<br>history2   |
| 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                            | ASTM D5185m<br>ASTM D5185m   | limit/base<br>>25<br>>118<br>>20<br>limit/base<br>>3               | 2<br>0<br>55<br><1<br>907<br>978<br>982<br>1192<br>3205<br><u>current</u><br>4<br>2<br>8<br><u>current</u><br>0.4                | 8<br>0<br>51<br>1<br>813<br>1180<br>868<br>1081<br>2976<br>history1<br>6<br><1<br>9<br>history1<br>0.4                            | 35<br>2<br>35<br><1<br>531<br>1439<br>727<br>888<br>2994<br>history2<br>7<br><1<br>17<br>17<br>history2<br>0.5                            |
| 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                              | limit/base<br>>25<br>>118<br>>20<br>limit/base<br>>3<br>>20        | 2<br>0<br>55<br><1<br>907<br>978<br>982<br>1192<br>3205<br>current<br>4<br>2<br>8<br>current<br>0.4<br>8.8                       | 8<br>0<br>51<br>1<br>813<br>1180<br>868<br>1081<br>2976<br>history1<br>6<br><1<br>9<br>history1<br>0.4<br>9.3                     | 35<br>2<br>35<br><1<br>531<br>1439<br>727<br>888<br>2994<br>history2<br>7<br><1<br>17<br>17<br>history2<br>0.5<br>11.3                    |
| 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               | Imit/base >25 >118 >20 Imit/base >3 >20 >30                        | 2<br>0<br>55<br><1<br>907<br>978<br>982<br>1192<br>3205<br><u>current</u><br>4<br>2<br>8<br><u>current</u><br>0.4<br>8.8<br>19.2 | 8<br>0<br>51<br>1<br>813<br>1180<br>868<br>1081<br>2976<br>history1<br>6<br><1<br>9<br>history1<br>0.4<br>9.3<br>20.0             | 35<br>2<br>35<br><1<br>531<br>1439<br>727<br>888<br>2994<br>history2<br>7<br><1<br>17<br>history2<br>0.5<br>11.3<br>23.6                  |
| 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 D7624 | limit/base<br>>25<br>>118<br>>20<br>limit/base<br>>3<br>>20<br>>30 | 2<br>0<br>55<br><1<br>907<br>978<br>982<br>1192<br>3205<br>current<br>4<br>2<br>8<br>current<br>0.4<br>8.8<br>19.2<br>current    | 8<br>0<br>51<br>1<br>813<br>1180<br>868<br>1081<br>2976<br>history1<br>6<br><1<br>9<br>history1<br>0.4<br>9.3<br>20.0<br>history1 | 35<br>2<br>35<br><1<br>531<br>1439<br>727<br>888<br>2994<br>history2<br>7<br><1<br>17<br>×<br>history2<br>0.5<br>11.3<br>23.6<br>history2 |



# **OIL ANALYSIS REPORT**

VISUAL



| Laboratory<br>Sample No.<br>Lab Number<br>Unique Number<br>Test Packago |           | : IL00323<br>: <mark>059620</mark><br>: 106685                                  | 819<br><mark>24</mark> | Received<br>Diagnose | i01 Madison Ave., Cary, NC 27513<br>Received : 27 Sep 2023<br>Diagnosed : 28 Sep 2023<br>Diagnostician : Don Baldridge<br>ice at 1-800-237-1369. |                        |                  | RUSH TRUCK CENTER - CHICAGO IDEALEAS<br>4655 SOUTH CENTRAL AVENU<br>CHICAGO,<br>US 6063<br>Contact: MIKE LINLE<br>linleym@rushtruckcenters.co |                 |  |
|---|-----------|---|------------------------|----------------------|--|------------------------|------------------|---|-----------------|--|
|   |           | Sep14/22  |                        | Mar8/23 +            |  | Sep13/23               | Sep14/22         | Mar6/23 +   |                 |  |
|   |           | 13 - Abnorma  |                        |                      |  | Base Nun               | 4.0              |   |                 |  |
|   |           | ()<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>( |                        |                      |  | Base Number (ma KOH/a) | 8.0 -<br>6.0 -   |   |                 |  |
|   |           | 17-<br>Abnorma  |                        |                      |  | (b)                    | 12.0             |   |                 |  |
|   |           | Viscos  | ity @ 100°             | °C                   |  |                        | Base Nur         | nber  |                 |  |
|   |           | Sep14/22  |                        | Mar8/23              |  | Sep 13/23              |                  |   |                 |  |
|   |           |   |                        |                      |  |                        |                  |   |                 |  |
|   |           | 4   |                        |                      |  |                        |                  |   |                 |  |
|   |           | 6 <b>-</b>  |                        |                      |  |                        |                  |   |                 |  |
|   |           | 8 -   | lead                   |                      |  |                        |                  |   |                 |  |
|   |           |   | errous Met             | als                  |  |                        |                  |   |                 |  |
|   |           | Sep14/22  |                        | Mar8/23              |  | Sep13/23 +             |                  |   |                 |  |
|   |           | 5   |                        |                      |  |                        |                  |   |                 |  |
|   |           | 튭 10  |                        |                      |  |                        |                  |   |                 |  |
| Mar   |           | 15-   | mnickel                |                      |  | -                      |                  |   |                 |  |
| Mar8/23 +   |           | 20  | iron<br>chromium       |                      |  |                        |                  |   |                 |  |
|   |           | GRAF<br>Ferrou  | PHS<br>Is Alloys       |                      |  |                        |                  |   |                 |  |
|   |           | Visc @  |                        | cSt                  | ASTM D445  |                        | 12.8             | 12.6  | 13.1            |  |
|   |           | Free Wa   |                        | scalar<br>RTIES      | *Visual<br>method  | limit/bas              | NEG<br>se currer | NEG   | NEG<br>history2 |  |
|   |           |   | ed Water               | scalar               | *Visual  | >0.2                   | NEG              | NEG   | NEG             |  |
| Mar8/23   | Sep 13/23 | Odor  |                        | scalar               | *Visual  | NORML                  | NORML            |   | NORML           |  |
| 23  | 53        | _ Sand/Di<br>Appeara  |                        | scalar<br>scalar     | *Visual<br>*Visual   | NONE<br>NORML          | NONE<br>NORML    | NONE<br>NORML   | NONE            |  |
|   |           | Debris  |                        | scalar               | *Visual  | NONE                   | NONE             | NONE  | NONE            |  |
|   |           | Silt  | 410                    | scalar               | *Visual  | NONE                   | NONE             | NONE  | NONE            |  |
|   |           | Yellow M<br>Precipita   |                        | scalar<br>scalar     | *Visual<br>*Visual   | NONE<br>NONE           | NONE<br>NONE     | NONE  | NONE            |  |



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Contact/Location: MIKE LINLEY - IDECHIIL