

### **OIL ANALYSIS REPORT**

#### Sample Rating Trend



# FORD 002

Component Gasoline Engine Fluid

GASOLINE ENGINE OIL SAE 5W20 (--- GAL)

#### 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.

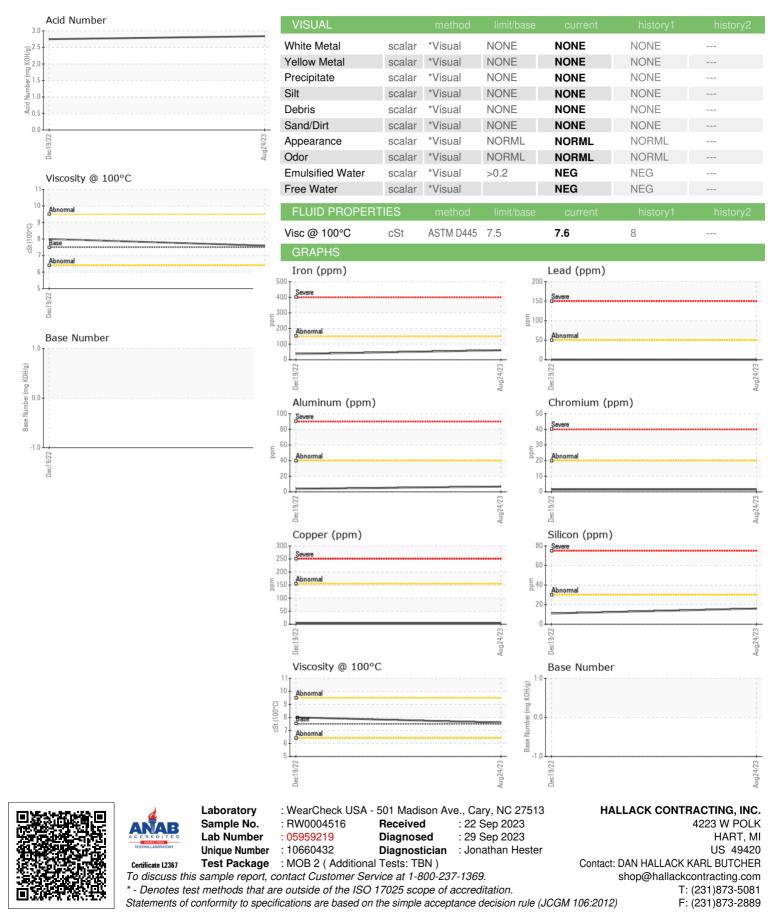
#### Fluid Condition

The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

|   |  |  | Dec2022   | Aug2023   |  |  |
|---|--|--|---|---|--|--|
| SAMPLE INFORM   | IATION   | method   | limit/base  | current   | history1   | history2   |
| Sample Number   |  | Client Info  |   | RW0004516   | RW0004142  |  |
| Sample Date   |  | Client Info  |   | 24 Aug 2023   | 19 Dec 2022  |  |
| Machine Age   | mls  | Client Info  |   | 104950  | 99130  |  |
| Oil Age   | mls  | Client Info  |   | 5820  | 7552   |  |
| Oil Changed   |  | Client Info  |   | Changed   | Changed  |  |
| Sample Status   |  |  |   | NORMAL  | NORMAL   |  |
| CONTAMINATION   | ٧  | method   | limit/base  | current   | history1   | history2   |
| Fuel  |  | WC Method  | >4.0  | <1.0  | <1.0   |  |
| Glycol  |  | WC Method  |   | NEG   | NEG  |  |
| WEAR METALS   |  | method   | limit/base  | current   | history1   | history2   |
| Iron  | ppm  | ASTM D5185m  | >150  | 61  | 37   |  |
| Chromium  | ppm  | ASTM D5185m  | >20   | 2   | 1  |  |
| Nickel  | ppm  | ASTM D5185m  | >5  | 2   | 2  |  |
| Titanium  | ppm  | ASTM D5185m  |   | 1   | 9  |  |
| Silver  | ppm  | ASTM D5185m  | >2  | 0   | 0  |  |
| Aluminum  | ppm  | ASTM D5185m  | >40   | 7   | 4  |  |
| Lead  | ppm  | ASTM D5185m  | >50   | 0   | 0  |  |
| Copper  | ppm  | ASTM D5185m  | >155  | 4   | 4  |  |
| Tin   | ppm  | ASTM D5185m  | >10   | 0   | <1   |  |
| Vanadium  | ppm  | ASTM D5185m  |   | 0   | <1   |  |
| Cadmium   | ppm  | ASTM D5185m  |   | 0   | 0  |  |
|   |  |  |   |   |  |  |
| ADDITIVES   |  | method   | limit/base  | current   | history1   | history2   |
| ADDITIVES<br>Boron  | ppm  | method<br>ASTM D5185m  | limit/base<br>75  | current<br>32   | history1<br>17   | history2   |
|   | ppm<br>ppm   |  |   |   |  |  |
| Boron   |  | ASTM D5185m  | 75  | 32  | 17   |  |
| Boron<br>Barium   | ppm  | ASTM D5185m<br>ASTM D5185m   | 75<br>5   | 32<br>0   | 17<br>12   |  |
| Boron<br>Barium<br>Molybdenum   | ppm<br>ppm   | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 75<br>5   | 32<br>0<br>51   | 17<br>12<br>48   |  |
| Boron<br>Barium<br>Molybdenum<br>Manganese  | ppm<br>ppm<br>ppm  | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 75<br>5<br>100  | 32<br>0<br>51<br><1   | 17<br>12<br>48<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  | 75<br>5<br>100<br>12  | 32<br>0<br>51<br><1<br>578  | 17<br>12<br>48<br><1<br>452  |  |
| 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   | 75<br>5<br>100<br>12<br>2100  | 32<br>0<br>51<br><1<br>578<br>751   | 17<br>12<br>48<br><1<br>452<br>790   |  |
| 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   | 75<br>5<br>100<br>12<br>2100<br>650   | 32<br>0<br>51<br><1<br>578<br>751<br>553  | 17<br>12<br>48<br><1<br>452<br>790<br>492  |  |
| 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<br>ppm               | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 75<br>5<br>100<br>12<br>2100<br>650<br>850  | 32<br>0<br>51<br><1<br>578<br>751<br>553<br>650   | 17<br>12<br>48<br><1<br>452<br>790<br>492<br>578   |  |
| 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<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   | 75<br>5<br>100<br>12<br>2100<br>650<br>850<br>2500  | 32<br>0<br>51<br><1<br>578<br>751<br>553<br>650<br>2427   | 17<br>12<br>48<br><1<br>452<br>790<br>492<br>578<br>1665   |  |
| 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  | 75<br>5<br>100<br>12<br>2100<br>650<br>850<br>2500<br>Limit/base  | 32<br>0<br>51<br><1<br>578<br>751<br>553<br>650<br>2427<br>current  | 17<br>12<br>48<br><1<br>452<br>790<br>492<br>578<br>1665<br>history1   | <br><br><br><br><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                      | 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>  | 75<br>5<br>100<br>12<br>2100<br>650<br>850<br>2500<br>Limit/base<br>>30   | 32<br>0<br>51<br><1<br>578<br>751<br>553<br>650<br>2427<br>current<br>16  | 17<br>12<br>48<br><1<br>452<br>790<br>492<br>578<br>1665<br>history1<br>11   | <br><br><br><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   | 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><br>ASTM D5185m   | 75<br>5<br>100<br>12<br>2100<br>650<br>850<br>2500<br><b>limit/base</b><br>>30<br>>50                                   | 32<br>0<br>51<br><1<br>578<br>751<br>553<br>650<br>2427<br>current<br>16<br>14  | 17<br>12<br>48<br><1<br>452<br>790<br>492<br>578<br>1665<br>history1<br>11<br>14   | <br><br><br><br><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  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm               | ASTM D5185m<br>ASTM D5185m   | 75<br>5<br>100<br>12<br>2100<br>650<br>850<br>2500<br><b>limit/base</b><br>>30<br>>50<br>>20                            | 32<br>0<br>51<br><1<br>578<br>751<br>553<br>650<br>2427<br>current<br>16<br>14<br>3   | 17<br>12<br>48<br><1<br>452<br>790<br>492<br>578<br>1665<br>history1<br>11<br>14<br>0  | <br><br><br><br><br>history2<br><br>   |
| 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        | ASTM D5185m<br>ASTM D5185m   | 75<br>5<br>100<br>12<br>2100<br>650<br>850<br>2500<br><b>limit/base</b><br>>30<br>>50<br>>20                            | 32<br>0<br>51<br><1<br>578<br>751<br>553<br>650<br>2427<br>current<br>16<br>14<br>3<br>Current                                      | 17<br>12<br>48<br><1<br>452<br>790<br>492<br>578<br>1665<br>history1<br>11<br>14<br>0<br>history1                                    | <br><br><br><br><br>history2<br><br><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<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm        | ASTM D5185m<br>ASTM D5185m  | 75<br>5<br>100<br>12<br>2100<br>650<br>850<br>2500<br>limit/base<br>>30<br>>50<br>>20                                   | 32<br>0<br>51<br><1<br>578<br>751<br>553<br>650<br>2427<br><u>current</u><br>16<br>14<br>3<br><u>current</u><br>0.1                 | 17<br>12<br>48<br><1<br>452<br>790<br>492<br>578<br>1665<br>history1<br>11<br>14<br>0<br>history1<br>0.1                             | <br><br><br><br>history2<br><br>history2<br><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 %<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                               | 75<br>5<br>100<br>12<br>2100<br>650<br>850<br>2500<br>imit/base<br>>30<br>>50<br>>20                                    | 32<br>0<br>51<br><1<br>578<br>751<br>553<br>650<br>2427<br>current<br>16<br>14<br>3<br>current<br>0.1<br>14.1                       | 17<br>12<br>48<br><1<br>452<br>790<br>492<br>578<br>1665<br>history1<br>11<br>14<br>0<br>history1<br>0.1<br>0.1<br>14.7              | <br><br><br><br><br>history2<br><br><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 %<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<br>*ASTM D7844  | 75<br>5<br>100<br>12<br>2100<br>650<br>850<br>2500<br>2500<br>>30<br>>50<br>>20<br>20<br>imit/base<br>>20<br>>30<br>>30 | 32<br>0<br>51<br><1<br>578<br>751<br>553<br>650<br>2427<br><i>current</i><br>16<br>14<br>3<br><i>current</i><br>0.1<br>14.1<br>23.7 | 17<br>12<br>48<br><1<br>452<br>790<br>492<br>578<br>1665<br>history1<br>11<br>14<br>0<br>history1<br>0.1<br>14.7<br>24.7<br>history1 | <br><br><br><br><br>history2<br><br>history2<br><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 %<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 | 75<br>5<br>100<br>12<br>2100<br>650<br>850<br>2500<br><b>Imit/base</b><br>>30<br>>50<br>>20<br><b>Imit/base</b><br>>20  | 32<br>0<br>51<br><1<br>578<br>751<br>553<br>650<br>2427<br><u>current</u><br>16<br>14<br>3<br><u>current</u><br>0.1<br>14.1<br>23.7 | 17<br>12<br>48<br><1<br>452<br>790<br>492<br>578<br>1665<br>history1<br>11<br>14<br>0<br>0<br>history1<br>0.1<br>14.7<br>24.7        | <br><br><br><br><br>history2<br><br>history2<br><br>history2<br><br>history2 |



## **OIL ANALYSIS REPORT**



Contact/Location: DAN HALLACK KARL BUTCHER - HALHAR