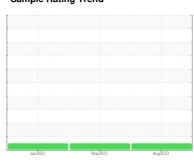


OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Machine Id **R25**Component **Diesel Engine**

DIESEL ENGINE OIL SAE 5W30 (--- GAL)

DIAGNOSIS

Recommendation

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

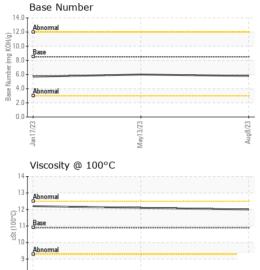
Fluid Condition

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 | | | Jan2023 May2023 Aug2023 | | | | |
|--|------------------|----------|-------------------------|------------|-------------|-------------|-------------|
| Sample Date Client Info 4644 | SAMPLE INFORM | MATION | method | limit/base | current | history1 | history2 |
| Machine Age hrs Client Info 4644 4075 3415 Oil Age hrs Client Info 571 653 506 Oil Changed Client Info Changed Changed Changed Sample Status NORMAL NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method 55 <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 15 13 18 Chromium ppm ASTM D5185m >20 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 | Sample Number | | Client Info | | WC0783976 | WC0783998 | WC0758898 |
| Oil Age | | | Client Info | | 08 Aug 2023 | 13 May 2023 | 17 Jan 2023 |
| Oil Changed Sample Status Client Info Changed NORMAL Changed NORMAL Changed NORMAL Changed NORMAL Changed NORMAL | Machine Age | hrs | Client Info | | 4644 | 4075 | 3415 |
| Sample Status 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 D5188m >100 15 13 18 Chromium ppm ASTM D5188m >100 15 13 18 Chromium ppm ASTM D5188m >20 <1 <1 <1 Nickel ppm ASTM D5188m >4 <1 <1 <1 Silver ppm ASTM D5188m >20 2 2 2 3 Lead ppm ASTM D5188m >40 <1 0 1 1 Copper ppm ASTM D5188m >330 5 7 17 17 Tin ppm ASTM D5188m >330 5 <th>Oil Age</th> <th>hrs</th> <th>Client Info</th> <th></th> <th>571</th> <th>653</th> <th>506</th> | Oil Age | hrs | Client Info | | 571 | 653 | 506 |
| CONTAMINATION 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 15 13 18 Chromium ppm ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >4 <1 <1 <1 Silver ppm ASTM D5185m >4 <1 <1 <1 Silver ppm ASTM D5185m >20 2 2 3 Aluminum ppm ASTM D5185m >40 <1 0 1 Copper ppm ASTM D5185m >30 5 7 17 Tin ppm ASTM D5185m >41 <1 0 Caddium | Oil Changed | | Client Info | | Changed | Changed | Changed |
| Fuel | Sample Status | | | | NORMAL | NORMAL | NORMAL |
| Color Colo | CONTAMINATION | V | method | limit/base | current | history1 | history2 |
| WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >10 15 13 18 Chromium ppm ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >4 <1 <1 <1 Silver ppm ASTM D5185m >3 0 0 <1 Aluminum ppm ASTM D5185m >20 2 2 3 Aluminum ppm ASTM D5185m >40 <1 0 1 Copper ppm ASTM D5185m >20 2 2 3 Lead ppm ASTM D5185m >40 <1 0 1 Copper ppm ASTM D5185m >15 <1 1 1 Capper ppm ASTM D5185m >15 <1 1 1 Vanadium ppm ASTM D5185m 250 50 90 <th>Fuel</th> <th></th> <th>WC Method</th> <th>>5</th> <th><1.0</th> <th><1.0</th> <th><1.0</th> | Fuel | | WC Method | >5 | <1.0 | <1.0 | <1.0 |
| Iron | Glycol | | WC Method | | NEG | NEG | NEG |
| Chromium ppm ASTM D5185m >20 <1 | WEAR METALS | | method | limit/base | current | history1 | history2 |
| Nickel | Iron | ppm | ASTM D5185m | >100 | 15 | 13 | 18 |
| Titanium ppm ASTM D5185m <1 | Chromium | ppm | ASTM D5185m | >20 | <1 | <1 | <1 |
| Silver ppm ASTM D5185m >3 0 0 <1 | Nickel | ppm | ASTM D5185m | >4 | <1 | <1 | 1 |
| Aluminum ppm ASTM D5185m >20 2 2 3 Lead ppm ASTM D5185m >40 <1 0 1 Copper ppm ASTM D5185m >330 5 7 17 Tin ppm ASTM D5185m >15 <1 1 1 Vanadium ppm ASTM D5185m <1 <1 0 0 Cadmium ppm ASTM D5185m <1 <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 250 50 90 81 Barium ppm ASTM D5185m 10 0 0 0 Molybdenum ppm ASTM D5185m 100 4 15 10 Magnesium ppm ASTM D5185m 450 730 641 662 Calcium ppm ASTM D5185m 3000 1363 <td< th=""><th>Titanium</th><th>ppm</th><th>ASTM D5185m</th><th></th><th><1</th><th><1</th><th><1</th></td<> | Titanium | ppm | ASTM D5185m | | <1 | <1 | <1 |
| Lead | Silver | ppm | ASTM D5185m | >3 | 0 | 0 | |
| Copper ppm ASTM D5185m >330 5 7 17 Tin ppm ASTM D5185m >15 <1 1 1 Vanadium ppm ASTM D5185m <1 <1 0 Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 250 50 90 81 Barium ppm ASTM D5185m 10 0 0 0 Molybdenum ppm ASTM D5185m 100 4 15 10 Magnesium ppm ASTM D5185m 450 730 641 662 Calcium ppm ASTM D5185m 3000 1363 1561 1339 Phosphorus ppm ASTM D5185m 1150 677 701 663 Zinc ppm ASTM D5185m 1350 331 848 <td< th=""><th>Aluminum</th><th>ppm</th><th>ASTM D5185m</th><th>>20</th><th>2</th><th>2</th><th>3</th></td<> | Aluminum | ppm | ASTM D5185m | >20 | 2 | 2 | 3 |
| Tin ppm ASTM D5185m >15 <1 | Lead | ppm | ASTM D5185m | >40 | <1 | 0 | 1 |
| Vanadium ppm ASTM D5185m <1 | Copper | ppm | ASTM D5185m | >330 | 5 | 7 | 17 |
| Cadmium ppm ASTM D5185m 0 <1 | * * * * * | ppm | ASTM D5185m | >15 | <1 | 1 | 1 |
| Boron | Vanadium | ppm | ASTM D5185m | | | <1 | |
| Boron | Cadmium | ppm | ASTM D5185m | | 0 | <1 | 0 |
| Barium ppm ASTM D5185m 10 0 0 0 Molybdenum ppm ASTM D5185m 100 4 15 10 Manganese ppm ASTM D5185m 100 4 15 10 Manganese ppm ASTM D5185m 20 730 641 662 Calcium ppm ASTM D5185m 3000 1363 1561 1339 Phosphorus ppm ASTM D5185m 1150 677 701 663 Zinc ppm ASTM D5185m 1350 831 848 829 Sulfur ppm ASTM D5185m 4250 3149 3285 2981 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 7 7 Sodium ppm ASTM D5185m >20 5 3 7 INFRA-RED method limit/base | ADDITIVES | | method | limit/base | current | history1 | history2 |
| Molybdenum ppm ASTM D5185m 100 4 15 10 Manganese ppm ASTM D5185m < 1 | Boron | ppm | ASTM D5185m | 250 | 50 | 90 | 81 |
| Manganese ppm ASTM D5185m <1 | Barium | ppm | ASTM D5185m | 10 | 0 | 0 | 0 |
| Magnesium ppm ASTM D5185m 450 730 641 662 Calcium ppm ASTM D5185m 3000 1363 1561 1339 Phosphorus ppm ASTM D5185m 1150 677 701 663 Zinc ppm ASTM D5185m 1350 831 848 829 Sulfur ppm ASTM D5185m 4250 3149 3285 2981 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 7 7 Sodium ppm ASTM D5185m >20 5 3 7 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 9.9 10.2 10.3 Sulfation Abs/.1mm *ASTM D7415 >30< | Molybdenum | ppm | ASTM D5185m | 100 | 4 | 15 | 10 |
| Calcium ppm ASTM D5185m 3000 1363 1561 1339 Phosphorus ppm ASTM D5185m 1150 677 701 663 Zinc ppm ASTM D5185m 1350 831 848 829 Sulfur ppm ASTM D5185m 4250 3149 3285 2981 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 7 7 Sodium ppm ASTM D5185m >20 5 3 7 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 9.9 10.2 10.3 Sulfation Abs/.1mm *ASTM D7415 >30 21.7 22.5 22.4 FLUID DEGRADATION method | Manganese | ppm | ASTM D5185m | | <1 | <1 | <1 |
| Phosphorus ppm ASTM D5185m 1150 677 701 663 Zinc ppm ASTM D5185m 1350 831 848 829 Sulfur ppm ASTM D5185m 4250 3149 3285 2981 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 7 7 Sodium ppm ASTM D5185m >20 5 3 7 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 9.9 10.2 10.3 Sulfation Abs/.1mm *ASTM D7415 >30 21.7 22.5 22.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1m | <u> </u> | ppm | | 450 | 730 | 641 | 662 |
| Zinc ppm ASTM D5185m 1350 831 848 829 Sulfur ppm ASTM D5185m 4250 3149 3285 2981 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 7 7 Sodium ppm ASTM D5185m >20 5 3 7 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 9.9 10.2 10.3 Sulfation Abs/.1mm *ASTM D7415 >30 21.7 22.5 22.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.3 18.6 18.5 | Calcium | ppm | ASTM D5185m | 3000 | 1363 | 1561 | 1339 |
| Sulfur ppm ASTM D5185m 4250 3149 3285 2981 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 7 7 Sodium ppm ASTM D5185m >20 5 3 7 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 9.9 10.2 10.3 Sulfation Abs/.1mm *ASTM D7415 >30 21.7 22.5 22.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.3 18.6 18.5 | Phosphorus | ppm | | 1150 | - | | |
| CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 7 7 Sodium ppm ASTM D5185m 4 2 2 2 Potassium ppm ASTM D5185m >20 5 3 7 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 9.9 10.2 10.3 Sulfation Abs/.1mm *ASTM D7415 >30 21.7 22.5 22.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.3 18.6 18.5 | | ppm | | | | | |
| Silicon ppm ASTM D5185m >25 5 7 7 Sodium ppm ASTM D5185m 4 2 2 Potassium ppm ASTM D5185m >20 5 3 7 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 9.9 10.2 10.3 Sulfation Abs/.1mm *ASTM D7415 >30 21.7 22.5 22.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.3 18.6 18.5 | | | ASTM D5185m | 4250 | 3149 | | 2981 |
| Sodium ppm ASTM D5185m 4 2 2 Potassium ppm ASTM D5185m >20 5 3 7 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 9.9 10.2 10.3 Sulfation Abs/.1mm *ASTM D7415 >30 21.7 22.5 22.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.3 18.6 18.5 | | | method | limit/base | current | history1 | history2 |
| Potassium ppm ASTM D5185m >20 5 3 7 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 9.9 10.2 10.3 Sulfation Abs/.1mm *ASTM D7415 >30 21.7 22.5 22.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.3 18.6 18.5 | | | | >25 | | | |
| INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 9.9 10.2 10.3 Sulfation Abs/.1mm *ASTM D7415 >30 21.7 22.5 22.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.3 18.6 18.5 | | ppm | | | | | |
| Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 9.9 10.2 10.3 Sulfation Abs/.1mm *ASTM D7415 >30 21.7 22.5 22.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.3 18.6 18.5 | Potassium | ppm | ASTM D5185m | >20 | 5 | 3 | 7 |
| Nitration Abs/cm *ASTM D7624 >20 9.9 10.2 10.3 Sulfation Abs/.1mm *ASTM D7415 >30 21.7 22.5 22.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.3 18.6 18.5 | INFRA-RED | | method | limit/base | current | history1 | history2 |
| Sulfation Abs/.1mm *ASTM D7415 >30 21.7 22.5 22.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.3 18.6 18.5 | | | | | | | |
| FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.3 18.6 18.5 | Nitration | Abs/cm | | | 9.9 | | 10.3 |
| Oxidation Abs/.1mm *ASTM D7414 >25 18.3 18.6 18.5 | Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 21.7 | 22.5 | 22.4 |
| | FLUID DEGRADA | TION | method | limit/base | current | history1 | history2 |
| Base Number (BN) mg KOH/g ASTM D2896 8.5 5.8 6.0 5.7 | Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 18.3 | 18.6 | 18.5 |
| | Base Number (BN) | mg KOH/g | ASTM D2896 | 8.5 | 5.8 | 6.0 | 5.7 |



OIL ANALYSIS REPORT

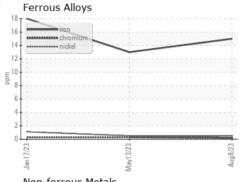


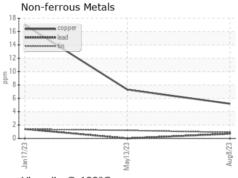
May13/23

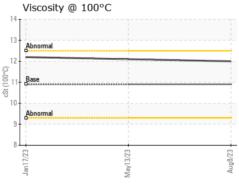
| VISUAL | | method | limit/base | current | history1 | history2 |
|-------------------------|--------|---------|------------|---------|----------|----------|
| White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Precipitate | 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 |
| | | | | | | |

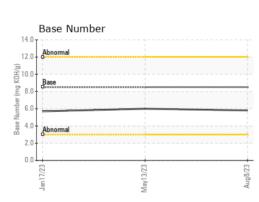
| FLUID PROPER | HES | method | ilmit/base | | nistory i | nistory2 |
|--------------|-----|-----------|------------|------|-----------|----------|
| Visc @ 100°C | cSt | ASTM D445 | 10.9 | 12.0 | 12.1 | 12.2 |

GRAPHS













Laboratory Sample No. Lab Number Unique Number : 10605746

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : WC0783976 : 05925799

Received

: 16 Aug 2023 Diagnosed

: 16 Aug 2023

Diagnostician : Wes Davis

Test Package : CONST (Additional Tests: TBN)

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)

Apple Valley Waste - EHT Location

6626 Delilah Road

US 08234

T:

F:

Egg Harbor Township, NJ

Contact: Service Manager