

# **OIL ANALYSIS REPORT**

# Area **RIPPEY** [200005325] Machine Id 82219 SITE 20

Component Hydraulic System Fluid SHELL TELLUS S4 VX 32 (60 LTR)

#### DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor.

#### Wear

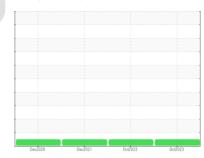
All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil. The amount and size of particulates present in the system are acceptable.

## Fluid Condition

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



Sample Rating Trend

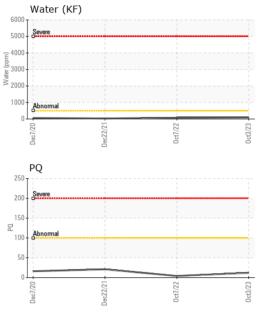


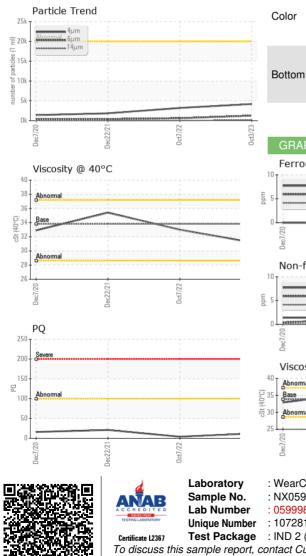
NORMAL

|   |  | Dec202   | ) Dec2021   | 0ct2022 0  |   |  |
|---|--|--|---|--|---|--|
| SAMPLE INFORM   | <b>MATION</b>  | method   | limit/base  | current  | history1  | history2   |
| Sample Number   |  | Client Info  |   | NX05999811   | NX05672217  | NX05440129   |
| Sample Date   |  | Client Info  |   | 03 Oct 2023  | 07 Oct 2022   | 22 Dec 2021  |
| Machine Age   | mths   | Client Info  |   | 0  | 0   | 0  |
| Oil Age   | mths   | Client Info  |   | 0  | 0   | 0  |
| Oil Changed   |  | Client Info  |   | N/A  | N/A   | N/A  |
| Sample Status   |  |  |   | NORMAL   | NORMAL  | NORMAL   |
| WEAR METALS   |  | method   | limit/base  | current  | history1  | history2   |
| PQ  |  | ASTM D8184   |   | 12   | 4   | 21   |
| Iron  | ppm  | ASTM D5185m  | >20   | 0  | 1   | 0  |
| Chromium  | ppm  | ASTM D5185m  | >20   | 0  | 0   | 0  |
| Nickel  | ppm  | ASTM D5185m  | >20   | 0  | 0   | 0  |
| Titanium  | ppm  | ASTM D5185m  |   | 0  | 0   | 0  |
| Silver  | ppm  | ASTM D5185m  |   | 0  | 0   | <1   |
| Aluminum  | ppm  | ASTM D5185m  | >20   | <1   | <1  | <1   |
| Lead  | ppm  | ASTM D5185m  | >20   | 0  | <1  | <1   |
| Copper  | ppm  | ASTM D5185m  | >20   | 0  | <1  | 1  |
| Tin   | ppm  | ASTM D5185m  | >20   | 0  | <1  | 0  |
| Antimony  | ppm  | ASTM D5185m  |   |  |   | 0  |
| Vanadium  | ppm  | ASTM D5185m  |   | 0  | 0   | 0  |
| Cadmium   | ppm  | ASTM D5185m  |   | 0  | 0   | <1   |
| ADDITIVES   |  | method   | limit/base  | current  | history1  | history2   |
|   |  |  |   |  | <b>,</b>  |  |
| Boron   | ppm  | ASTM D5185m  |   | 0  | 0   | 0  |
| Boron<br>Barium   | ppm<br>ppm   |  |   |  |   |  |
|   |  | ASTM D5185m  |   | 0  | 0   | 0  |
| Barium  | ppm  | ASTM D5185m<br>ASTM D5185m   |   | 0<br>0   | 0<br>1  | 0  |
| Barium<br>Molybdenum  | ppm<br>ppm   | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  |   | 0<br>0<br>0  | 0<br>1<br><1  | 0<br>0<br>13   |
| Barium<br>Molybdenum<br>Manganese   | ppm<br>ppm<br>ppm  | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   |   | 0<br>0<br>0  | 0<br>1<br><1<br><1  | 0<br>0<br>13<br><1   |
| 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  |   | 0<br>0<br>0<br>0<br>0  | 0<br>1<br><1<br><1<br><1  | 0<br>0<br>13<br><1<br><1   |
| 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   |   | 0<br>0<br>0<br>0<br>7  | 0<br>1<br><1<br><1<br><1<br><1<br>6   | 0<br>0<br>13<br><1<br><1<br>7  |
| 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   |   | 0<br>0<br>0<br>0<br>0<br>7<br>587  | 0<br>1<br><1<br><1<br><1<br><1<br>6<br>551  | 0<br>0<br>13<br><1<br><1<br>7<br>564   |
| 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  | 0<br>0<br>0<br>0<br>7<br>587<br>38   | 0<br>1<br><1<br><1<br><1<br>6<br>551<br>51  | 0<br>0<br>13<br><1<br><1<br>7<br>564<br>79   |
| 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   | limit/base<br>>15   | 0<br>0<br>0<br>0<br>7<br>587<br>38<br>618  | 0<br>1<br><1<br><1<br><1<br>6<br>551<br>51<br>611   | 0<br>0<br>13<br><1<br><1<br>7<br>564<br>79<br>647  |
| 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  |   | 0<br>0<br>0<br>0<br>7<br>587<br>38<br>618<br>current   | 0<br>1<br><1<br><1<br><1<br>6<br>551<br>51<br>611<br>history1   | 0<br>0<br>13<br><1<br><1<br>7<br>564<br>79<br>647<br>history2  |
| 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<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br><b>method</b>  |   | 0<br>0<br>0<br>0<br>7<br>587<br>38<br>618<br><b>current</b><br>3   | 0<br>1<br><1<br><1<br><1<br>6<br>551<br>51<br>611<br>2<br>0<br><1   | 0<br>0<br>13<br><1<br><1<br>7<br>564<br>79<br>647<br>history2<br>1   |
| 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   | >15   | 0<br>0<br>0<br>0<br>7<br>587<br>38<br>618<br><b>Current</b><br>3<br>0  | 0<br>1<br><1<br><1<br><1<br>6<br>551<br>51<br>611<br>history1<br>2<br>0   | 0<br>0<br>13<br><1<br><1<br>7<br>564<br>79<br>647<br><b>history2</b><br>1<br>0   |
| 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  | >15<br>>20  | 0<br>0<br>0<br>0<br>7<br>587<br>38<br>618<br><b>Current</b><br>3<br>0<br>0   | 0<br>1<br><1<br><1<br><1<br>6<br>551<br>51<br>611<br>2<br>0<br><1   | 0<br>0<br>13<br><1<br><1<br>7<br>564<br>79<br>647<br><b>history2</b><br>1<br>0<br>0  |
| Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>Water  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m   | >15<br>>20<br>>0.05   | 0<br>0<br>0<br>0<br>7<br>587<br>38<br>618<br><u>current</u><br>3<br>0<br>0<br>0<br>0   | 0<br>1<br><1<br><1<br><1<br>6<br>551<br>51<br>611   | 0<br>0<br>13<br><1<br><1<br>7<br>564<br>79<br>647<br><b>history2</b><br>1<br>0<br>0<br>0<br>0<br>0.003                                   |
| Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>Water<br>ppm Water   | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D6304   | >15<br>>20<br>>0.05<br>>500   | 0<br>0<br>0<br>0<br>7<br>587<br>38<br>618<br><b>Current</b><br>3<br>0<br>0<br>0<br>0<br>0<br>99.2  | 0<br>1<br><1<br><1<br>6<br>551<br>51<br>611<br>history1<br>2<br>0<br><1<br>0.007<br>73.8  | 0<br>0<br>13<br><1<br><1<br>7<br>564<br>79<br>647<br>history2<br>1<br>0<br>0<br>0<br>0.003<br>29.8                                       |
| Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>Water<br>ppm Water<br>FLUID CLEANLIN   | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m   | >15<br>>20<br>>0.05<br>>500<br>limit/base   | 0<br>0<br>0<br>0<br>7<br>587<br>38<br>618<br><i>current</i><br>3<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>99.2<br><i>current</i>                         | 0<br>1<br><1<br><1<br>6<br>551<br>51<br>611<br>history1<br>2<br>0<br><1<br>0.007<br>73.8<br>history1                              | 0<br>0<br>13<br><1<br><1<br>7<br>564<br>79<br>647<br>history2<br>1<br>0<br>0<br>0<br>0.003<br>29.8<br>history2                           |
| Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>Water<br>ppm Water<br>FLUID CLEANLIN<br>Particles >4µm                                       | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D6304<br>ASTM D6304<br>ASTM D6304  | >15<br>>20<br>>0.05<br>>500<br>limit/base<br>>20000   | 0<br>0<br>0<br>0<br>7<br>587<br>38<br>618<br><i>current</i><br>3<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>99.2<br><i>current</i>                    | 0<br>1<br><1<br><1<br>6<br>551<br>51<br>611<br>history1<br>2<br>0<br><1<br>0.007<br>73.8<br>history1<br>3203                      | 0<br>0<br>13<br><1<br><1<br>7<br>564<br>79<br>647<br>history2<br>1<br>0<br>0<br>0.003<br>29.8<br>history2<br>1851                        |
| Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>Water<br>ppm Water<br>FLUID CLEANLIN<br>Particles >6µm                                       | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D6304<br>ASTM D6304<br>ASTM D6304<br>ASTM D7647   | >15<br>>20<br>>0.05<br>>500<br>limit/base<br>>20000<br>>2500<br>>320                              | 0<br>0<br>0<br>0<br>7<br>587<br>38<br>618<br><b>current</b><br>3<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>99.2<br><b>current</b><br>4188<br>1257         | 0<br>1<br><1<br><1<br>6<br>551<br>51<br>611<br>1<br>1<br>1<br>1<br>2<br>0<br><1<br>0.007<br>73.8<br>history1<br>3203<br>617       | 0<br>0<br>13<br><1<br><1<br>7<br>564<br>79<br>647<br>history2<br>1<br>0<br>0<br>0.003<br>29.8<br>history2<br>1851<br>403                 |
| Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>Water<br>ppm Water<br>FLUID CLEANLIN<br>Particles >4µm<br>Particles >6µm<br>Particles >14µm  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D6304<br>ASTM D6304<br>ASTM D6304<br>ASTM D6304<br>ASTM D7647<br>ASTM D7647<br>ASTM D7647                 | >15<br>>20<br>>0.05<br>>500<br>limit/base<br>>20000<br>>2500<br>>320                              | 0<br>0<br>0<br>0<br>7<br>587<br>38<br>618<br><u>Current</u><br>3<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0 | 0<br>1<br><1<br><1<br>6<br>551<br>51<br>611<br>1<br>1<br>1<br>1<br>2<br>0<br><1<br>0.007<br>73.8<br>history1<br>3203<br>617<br>35 | 0<br>0<br>13<br><1<br><1<br>7<br>564<br>79<br>647<br>history2<br>1<br>0<br>0<br>0<br>0.003<br>29.8<br>history2<br>1851<br>403<br>22      |
| Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>Water<br>ppm Water<br>FLUID CLEANLIN<br>Particles >4µm<br>Particles >14µm<br>Particles >21µm | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D6304<br>ASTM D6304<br>ASTM D7647<br>ASTM D7647<br>ASTM D7647<br>ASTM D7647 | >15<br>>20<br>>0.05<br>>500<br><b>limit/base</b><br>>20000<br>>2500<br>>320<br>>320<br>>80<br>>20 | 0<br>0<br>0<br>0<br>7<br>587<br>38<br>618<br><b>current</b><br>3<br>0<br>0<br>0<br>0<br>0.009<br>99.2<br><b>current</b><br>4188<br>1257<br>119<br>36       | 0<br>1<br><1<br><1<br>6<br>551<br>51<br>611<br>history1<br>2<br>0<br><1<br>0.007<br>73.8<br>history1<br>3203<br>617<br>35<br>7    | 0<br>0<br>13<br><1<br><1<br>7<br>564<br>79<br>647<br>history2<br>1<br>0<br>0<br>0<br>0.003<br>29.8<br>history2<br>1851<br>403<br>22<br>4 |

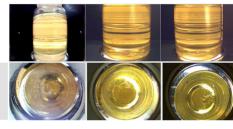


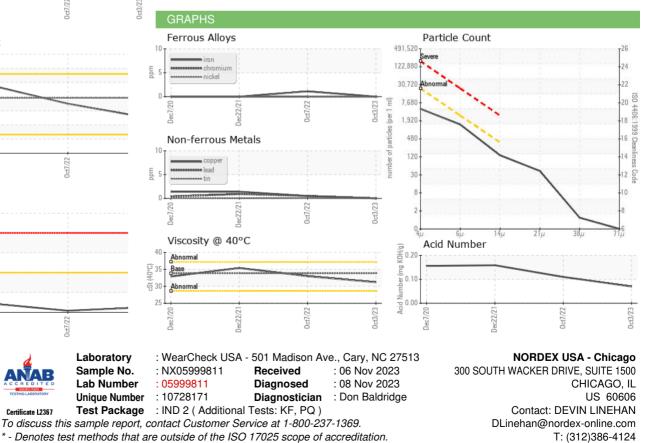
# **OIL ANALYSIS REPORT**





| FLUID DEGRADATION |          | method     | limit/base | current | history1 | history2 |
|-------------------|----------|------------|------------|---------|----------|----------|
| Acid Number (AN)  | mg KOH/g | ASTM D8045 |            | 0.07    | 0.11     | 0.159    |
| 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    | >0.05      | NEG     | NEG      | NEG      |
| Free Water        | scalar   | *Visual    |            | NEG     | NEG      | NEG      |
| FLUID PROPERTIES  |          | method     | limit/base | current | history1 | history2 |
| Visc @ 40°C       | cSt      | ASTM D445  | 33.8       | 31.2    | 33.0     | 35.4     |
| SAMPLE IMAGES     |          | method     | limit/base | current | history1 | history2 |
|                   |          |            |            |         |          |          |





\* - 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)

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