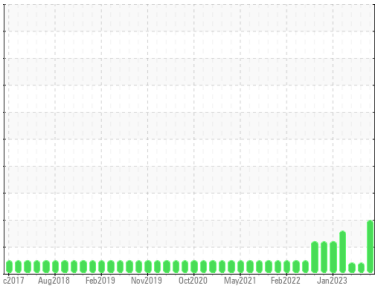
# PROBLEM SUMMARY

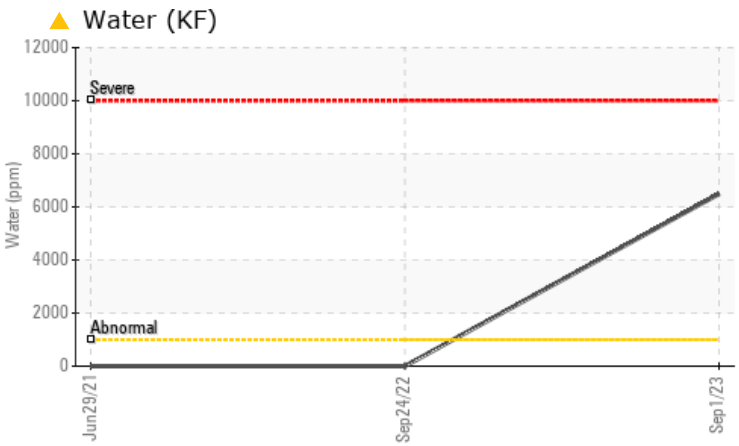
Sample Rating Trend

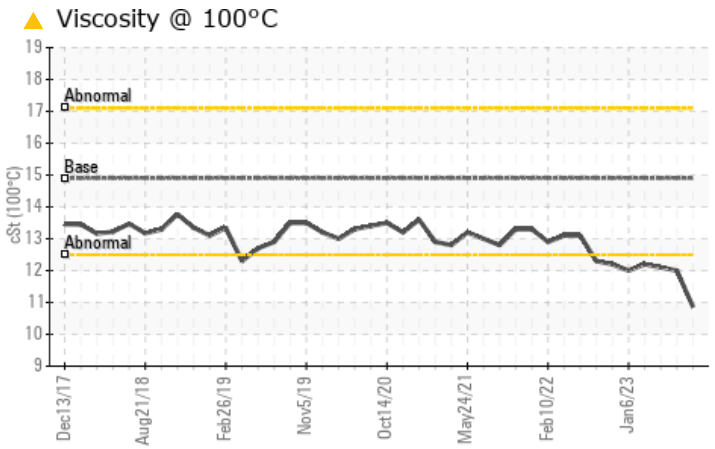


**WATER**

Area
## DENNIS T DELANEY
Machine Id
## [DENNIS T DELANEY] 008 536790-8
Component
**Starboard Genset**
Fluid
**CHEVRON DELO 400 XLE 15W40 (--- GAL)**

## COMPONENT CONDITION SUMMARY




## RECOMMENDATION

We advise that you check for the source of water entry. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition. Please note that there was too much water present in the oil to perform an accurate viscosity test.

## PROBLEMATIC TEST RESULTS

| Sample Status | | | | **ABNORMAL** | ATTENTION | ATTENTION |
|---|---|---|---|---|---|---|
| Water | % | ASTM D6304 | >0.1 | ▲ **0.649** | --- | --- |
| ppm Water | ppm | ASTM D6304 | >1000 | ▲ **6490** | --- | --- |
| Visc @ 100°C | cSt | ASTM D445 | 14.9 | ▲ **10.86** | ▲ 12.0 | ▲ 12.1 |

**Customer Id:** INGPAD
**Sample No.:** MW0058558
**Lab Number:** 06000936
**Test Package:** MAR 2

*To manage this report scan the QR code*

*To discuss the diagnosis or test data:*
Jonathan Hester +1 919-379-4092 x4092
jhester@wearcheckusa.com

*To change component or sample information:*
Customer Service +1 1-800-237-1369
customerservice@wearcheck.com

## RECOMMENDED ACTIONS

| Action | Status | Date | Done By | Description |
|---|---|---|---|---|
| Change Fluid | --- | --- | ? | Oil and filter change at the time of sampling has been noted. |
| Change Filter | --- | --- | ? | Oil and filter change at the time of sampling has been noted. |
| Resample | --- | --- | ? | We recommend an early resample to monitor this condition. |
| Alert | --- | --- | ? | Please note that there was too much water present in the oil to perform a viscosity test. |
| Check Water Access | --- | --- | ? | We advise that you check for the source of water entry. |

## HISTORICAL DIAGNOSIS

**19 Aug 2023 Diag: Don Baldridge**

VISCOSITY

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the oil. The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

view report

**06 Mar 2023 Diag: Sean Felton**

VISCOSITY

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the oil. The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

view report

**01 Feb 2023 Diag: Sean Felton**

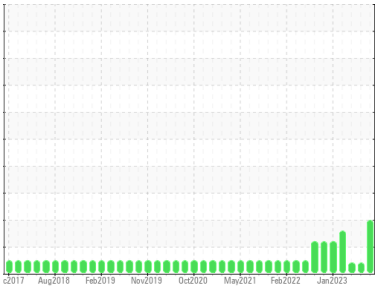
WEAR

Oil and filter change at the time of sampling has been noted. No corrective action is recommended at this time. Resample at the next service interval to monitor.The copper level has decreased, but is still abnormal. Elemental level of copper (Cu) probably due to leaching of copper from copper components (i.e. cooling core) by the oil additives. All other component wear rates are normal. Moderate concentration of visible dirt/debris present in the oil. The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

view report

# OIL ANALYSIS REPORT

Sample Rating Trend



**WATER**

Area
## DENNIS T DELANEY
Machine Id
## [DENNIS T DELANEY] 008 536790-8
Component
**Starboard Genset**
Fluid
**CHEVRON DELO 400 XLE 15W40 (--- GAL)**

## DIAGNOSIS

**Recommendation**

We advise that you check for the source of water entry. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition. Please note that there was too much water present in the oil to perform an accurate viscosity test.

**Wear**

All component wear rates are normal.

**Contamination**

There is a moderate concentration of water present in the oil.

**Fluid Condition**

The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **MW0058558** | MW0035415 | MW0043452 |
| Sample Date | | Client Info | | **01 Sep 2023** | 19 Aug 2023 | 06 Mar 2023 |
| Machine Age | hrs | Client Info | | **4436** | 4370 | 2462 |
| Oil Age | hrs | Client Info | | **66** | 450 | 396 |
| Oil Changed | | Client Info | | **Changed** | Changed | Changed |
| Sample Status | | | | **ABNORMAL** | ATTENTION | ATTENTION |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Glycol | | WC Method | | **NEG** | NEG | NEG |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >50 | **9** | 10 | 8 |
| Chromium | ppm | ASTM D5185m | >4 | **<1** | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >2 | **0** | 0 | <1 |
| Titanium | ppm | ASTM D5185m | | **<1** | <1 | <1 |
| Silver | ppm | ASTM D5185m | >5 | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >12 | **4** | 4 | 3 |
| Lead | ppm | ASTM D5185m | >17 | **0** | 0 | <1 |
| Copper | ppm | ASTM D5185m | >70 | **<1** | <1 | 4 |
| Tin | ppm | ASTM D5185m | >15 | **0** | <1 | <1 |
| Vanadium | ppm | ASTM D5185m | | **0** | 0 | <1 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | | **255** | 262 | 299 |
| Barium | ppm | ASTM D5185m | | **5** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | | **120** | 118 | 123 |
| Manganese | ppm | ASTM D5185m | | **<1** | 1 | <1 |
| Magnesium | ppm | ASTM D5185m | | **593** | 640 | 612 |
| Calcium | ppm | ASTM D5185m | | **1375** | 1502 | 1454 |
| Phosphorus | ppm | ASTM D5185m | 760 | **698** | 690 | 646 |
| Zinc | ppm | ASTM D5185m | 830 | **824** | 826 | 801 |
| Sulfur | ppm | ASTM D5185m | 2770 | **2860** | 2973 | 2392 |

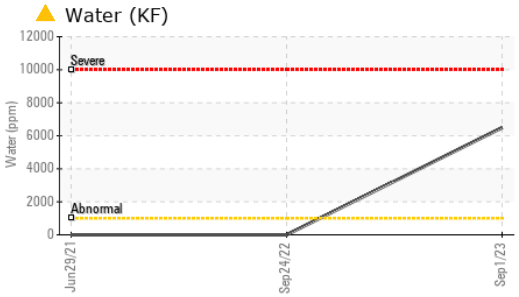
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **8** | 8 | 7 |
| Sodium | ppm | ASTM D5185m | | **2** | 3 | <1 |
| Potassium | ppm | ASTM D5185m | >20 | **2** | 0 | 2 |
| Fuel | % | ASTM D3524 | >4.0 | **<1.0** | <1.0 | <1.0 |
| Water | % | ASTM D6304 | >0.1 | ▲ **0.649** | --- | --- |
| ppm Water | ppm | ASTM D6304 | >1000 | ▲ **6490** | --- | --- |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | | **0.1** | 0.1 | 0.1 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **11.1** | 9.2 | 8.6 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **21.4** | 22.1 | 23.0 |

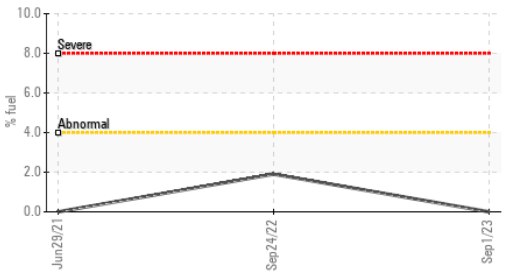
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **18.7** | 18.4 | 18.2 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 10.7 | **9.1** | 7.7 | 9.0 |

# OIL ANALYSIS REPORT

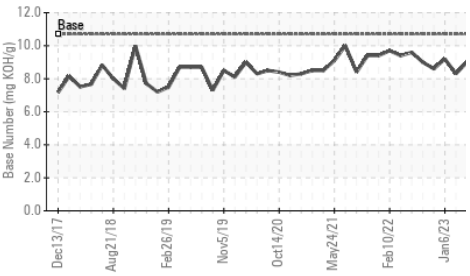
Water (KF)



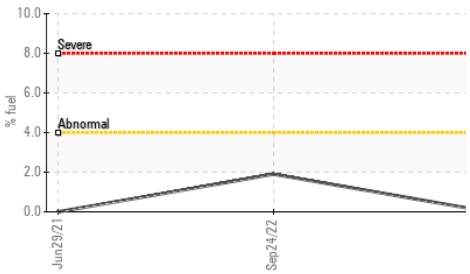

Fuel Dilution




Base Number




Fuel Dilution

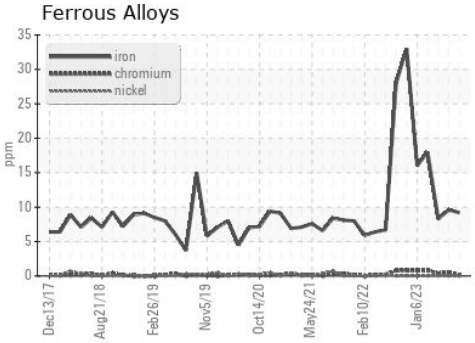



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| 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 | >0.1 | **NEG** | NEG | NEG |
| Free Water | scalar | *Visual | | **NEG** | NEG | NEG |

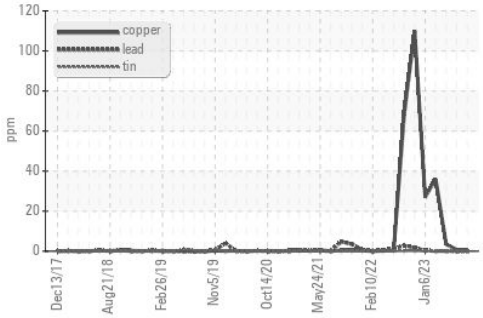
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 14.9 | ▲ **10.86** | ▲ 12.0 | ▲ 12.1 |

## GRAPHS

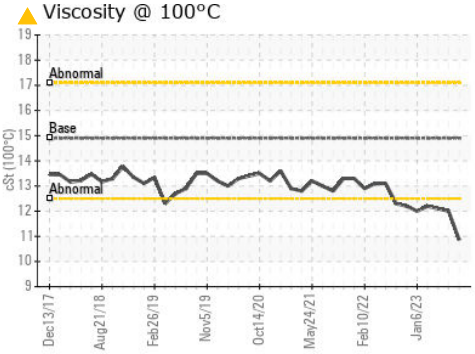
Ferrous Alloys



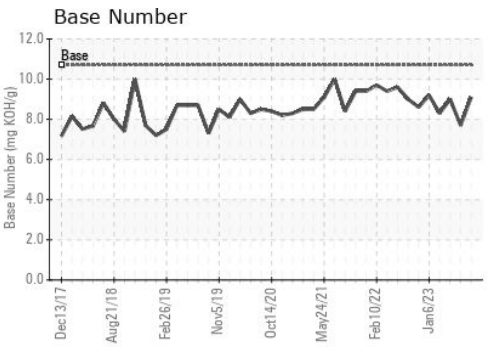

Non-ferrous Metals




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : MW0058558 **Received** : 07 Nov 2023
**Lab Number** : 06000936 **Diagnosed** : 14 Nov 2023
**Unique Number** : 10729296 **Diagnostician** : Jonathan Hester
**Test Package** : MAR 2 ( Additional Tests: FuelDilution, KF )

*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)*

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