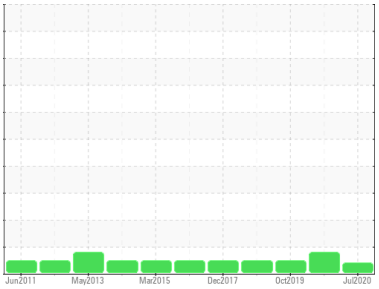
DIAMOND WTG ENGINEERING & SERVICES, INC.
a group company of MITSUBISHI HEAVY INDUSTRIES, LTD.

# PROBLEM SUMMARY

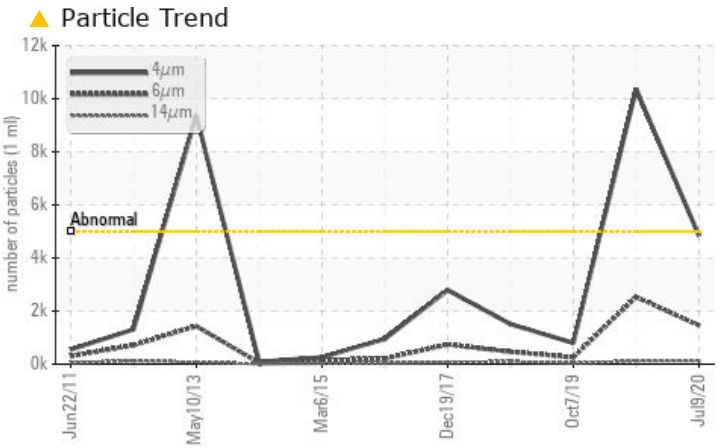
Sample Rating Trend




ISO

Machine Id
**A-23**
Component
**Hydraulic System**
Fluid
**MOBIL DTE 10 EXCEL 32 (165 LTR)**

## COMPONENT CONDITION SUMMARY




## RECOMMENDATION

Re-sample to verify the actual oil condition. Replace filter elements. Change oil if cleanliness level does not improve after replacing the filter(s).

## PROBLEMATIC TEST RESULTS

| Sample Status | | | | **ABNORMAL** | ABNORMAL | NORMAL |
|---|---|---|---|---|---|---|
| Particles >6µm | | ASTM D7647 | >1300 | ▲ **1455** | ▲ 2531 | 255 |
| Oil Cleanliness | | ISO 4406 (c) | >19/17/14 | ▲ **19/18/14** | ▲ 21/19/14 | 17/15/12 |

**Customer Id:** MITSANNM
**Sample No.:** MHI023554
**Lab Number:** 05023609
**Test Package:** IND 2

*To manage this report scan the QR code*

*To discuss the diagnosis or test data:*
Don Baldridge +1
don.b505@comcast.net

*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 Filter | --- | --- | ? | Re-sample to verify the actual oil condition. Replace filter elements. Change oil if cleanliness level does not improve after replacing the filter(s). |
| Resample | --- | --- | ? | Re-sample to verify the actual oil condition. Replace filter elements. Change oil if cleanliness level does not improve after replacing the filter(s). |

## HISTORICAL DIAGNOSIS

**15 Jan 2020 Diag: Doug Bogart**

ISO

Re-sample to verify the actual oil condition. Replace filter elements. Change oil if cleanliness level does not improve after replacing the filter(s).All component wear rates are normal. There is a high amount of silt (particulates < 14 microns in size) present in the oil. The AN level is acceptable for this fluid.

view report

**07 Oct 2019 Diag: Don Baldridge**

NORMAL

Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the component. The amount and size of particulates present in the system is acceptable. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

view report

**12 Mar 2019 Diag: Don Baldridge**

NORMAL

Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the component. The amount and size of particulates present in the system is acceptable. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

view report

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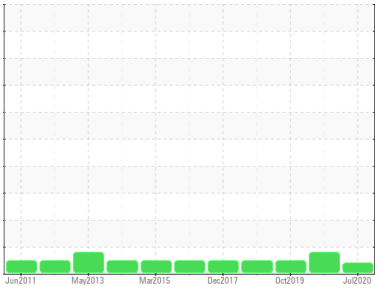
# OIL ANALYSIS REPORT

Sample Rating Trend




ISO

Machine Id
**A-23**
Component
**Hydraulic System**
Fluid
**MOBIL DTE 10 EXCEL 32 (165 LTR)**

## DIAGNOSIS

**Recommendation**
Re-sample to verify the actual oil condition. Replace filter elements. Change oil if cleanliness level does not improve after replacing the filter(s).

**Wear**
All component wear rates are normal.

**Contamination**
There is a moderate amount of silt (particulates < 14 microns in size) present in the oil.

**Fluid Condition**
The AN level is acceptable for this fluid.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **MHI023554** | MHI018518 | MHI04826145 |
| Sample Date | | Client Info | | **09 Jul 2020** | 15 Jan 2020 | 07 Oct 2019 |
| Machine Age | hrs | Client Info | | **0** | 0 | 0 |
| Oil Age | hrs | Client Info | | **95360** | 91747 | 0 |
| Oil Changed | | Client Info | | **Not Changd** | Not Changd | N/A |
| Sample Status | | | | **ABNORMAL** | ABNORMAL | NORMAL |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >50 | **3** | 4 | 4 |
| Chromium | ppm | ASTM D5185m | | **0** | 0 | <1 |
| Nickel | ppm | ASTM D5185m | | **<1** | <1 | <1 |
| Titanium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Silver | ppm | ASTM D5185m | | **0** | <1 | 0 |
| Aluminum | ppm | ASTM D5185m | | **0** | 0 | <1 |
| Lead | ppm | ASTM D5185m | | **<1** | 1 | 4 |
| Copper | ppm | ASTM D5185m | | **<1** | 2 | <1 |
| Tin | ppm | ASTM D5185m | | **0** | <1 | 0 |
| Antimony | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Vanadium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | | **<1** | <1 | 0 |
| Barium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | | **0** | 0 | <1 |
| Manganese | ppm | ASTM D5185m | | **0** | 0 | <1 |
| Magnesium | ppm | ASTM D5185m | | **<1** | <1 | 0 |
| Calcium | ppm | ASTM D5185m | | **92** | 113 | 134 |
| Phosphorus | ppm | ASTM D5185m | | **419** | 475 | 532 |
| Zinc | ppm | ASTM D5185m | | **32** | 40 | 24 |
| Sulfur | ppm | ASTM D5185m | | **1287** | 1335 | 808 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >+30 | **3** | 1 | 0 |
| Sodium | ppm | ASTM D5185m | | **0** | 2 | 2 |
| Potassium | ppm | ASTM D5185m | >20 | **0** | <1 | 0 |
| Water | % | ASTM D6304 | >0.1 | **0.004** | 0.003 | 0.004 |
| ppm Water | ppm | ASTM D6304 | >1000 | **45.8** | 37.9 | 43.3 |

| FLUID CLEANLINESS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Particles >4µm | | ASTM D7647 | >5000 | **4839** | ▲ 10364 | 797 |
| Particles >6µm | | ASTM D7647 | >1300 | ▲ **1455** | ▲ 2531 | 255 |
| Particles >14µm | | ASTM D7647 | >160 | **124** | 116 | 32 |
| Particles >21µm | | ASTM D7647 | >40 | **27** | 34 | 6 |
| Particles >38µm | | ASTM D7647 | >10 | **0** | 4 | 0 |
| Particles >71µm | | ASTM D7647 | >3 | **0** | 1 | 0 |
| Oil Cleanliness | | ISO 4406 (c) | >19/17/14 | ▲ **19/18/14** | ▲ 21/19/14 | 17/15/12 |

| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Acid Number (AN) | mg KOH/g | ASTM D8045 | | **0.14** | 0.106 | 0.107 |

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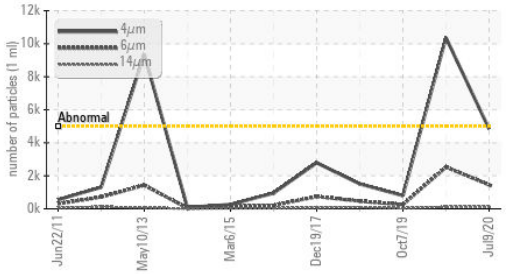
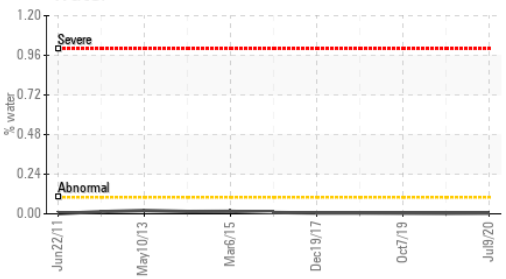
# OIL ANALYSIS REPORT

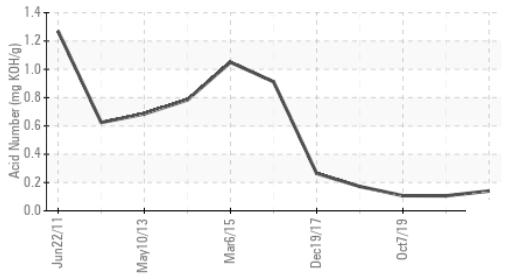
Particle Trend



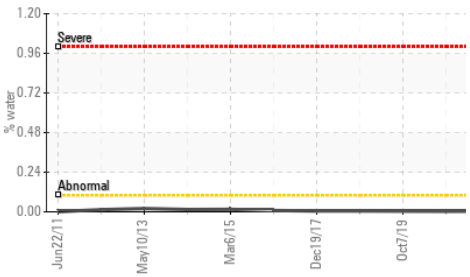

Water



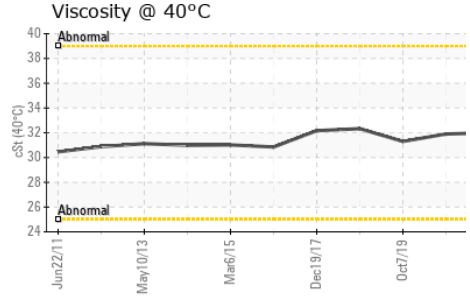

Acid Number




Water




Viscosity @ 40°C



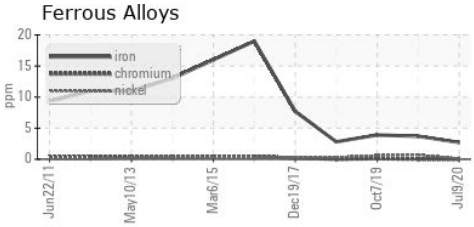

| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Silt | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Debris | scalar | *Visual | NONE | **VLITE** | 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 @ 40°C | cSt | ASTM D445 | | **32.0** | 31.9 | 31.3 |

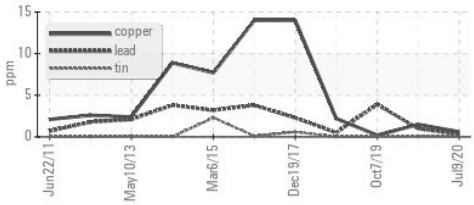
| SAMPLE IMAGES | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|
| Color | | |  | | |
| Bottom | | |  | | |

## GRAPHS

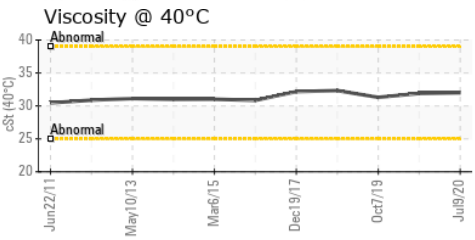
Ferrous Alloys



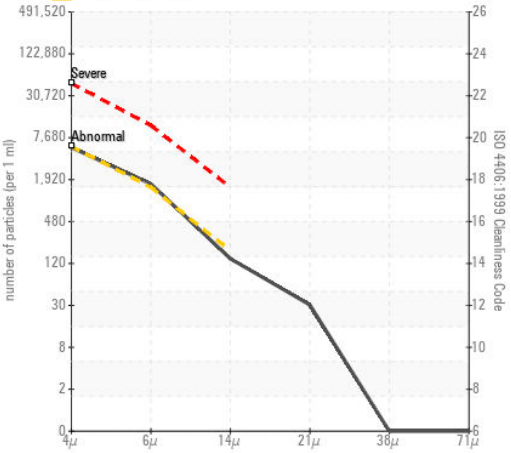

Non-ferrous Metals



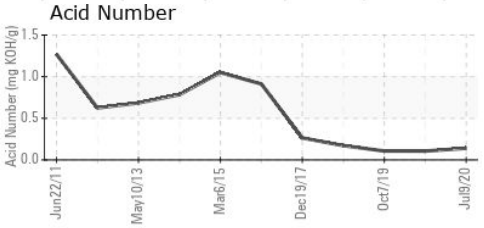

Viscosity @ 40°C




Particle Count




Acid Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : MHI023554 **Received** : 20 Jul 2020
**Lab Number** : 05023609 **Diagnosed** : 21 Jul 2020
**Unique Number** : 9103769 **Diagnostician** : Don Baldridge
**Test Package** : IND 2 ( Additional Tests: 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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