



TRAAP

Texas Refinery Advanced Analysis Program

OIL ANALYSIS REPORT

| | |
|-----------------|-----------------|
| WEAR | ABNORMAL |
| CONTAMINATION | ABNORMAL |
| FLUID CONDITION | NORMAL |

Machine Id
FORD VZ086796
 Component
Diesel Engine
 Fluid
TRC MOLY XL PROSPEC III 15W40 (6 GAL)

RECOMMENDATION

We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. Resample at the next service interval to monitor.

WEAR

Cylinder, crank, or cam shaft wear is indicated. All other component wear rates are normal.

CONTAMINATION

Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress.

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.

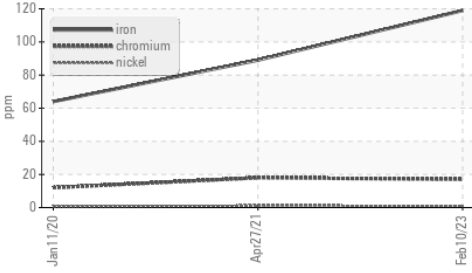
| Test | UOM | Method | Limit/Abn | Current | History1 | History2 |
|----------------|-----|-------------|-----------|--------------------|-------------|-------------|
| Sample Number | | Client Info | | TR05773041 | TR05244586 | TR04890129 |
| Sample Date | | Client Info | | 10 Feb 2023 | 27 Apr 2021 | 11 Jan 2020 |
| Machine Age | mls | Client Info | | 115390 | 113879 | 112958 |
| Oil Age | mls | Client Info | | 0 | 0 | 0 |
| Filter Age | mls | Client Info | | 0 | 0 | 0 |
| Oil Changed | | Client Info | | Not Changd | Not Changd | Not Changd |
| Filter Changed | | Client Info | | Not Changd | Not Changd | Not Changd |
| Sample Status | | | | ABNORMAL | NORMAL | NORMAL |

| | | | | | | |
|--------------|--------|-------------|------|--------------|------|------|
| Iron | ppm | ASTM D5185m | >100 | ▲ 119 | 89 | 64 |
| Chromium | ppm | ASTM D5185m | >20 | 17 | 18 | 12 |
| Nickel | ppm | ASTM D5185m | >2 | 1 | 1 | <1 |
| Titanium | ppm | ASTM D5185m | >2 | <1 | <1 | 0 |
| Silver | ppm | ASTM D5185m | >2 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >25 | ● 13 | 11 | 8 |
| Lead | ppm | ASTM D5185m | >40 | 25 | 27 | 19 |
| Copper | ppm | ASTM D5185m | >330 | 13 | 10 | 7 |
| Tin | ppm | ASTM D5185m | >15 | 2 | 3 | 1 |
| Vanadium | ppm | ASTM D5185m | | 0 | <1 | 0 |
| White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |

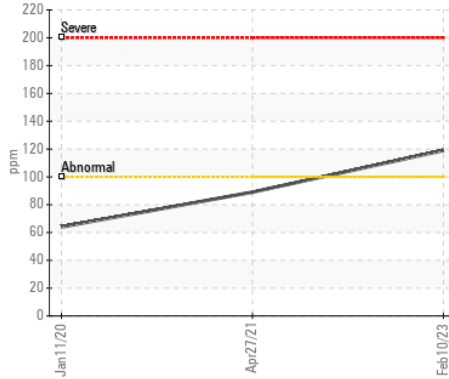
| | | | | | | |
|------------------|----------|-------------|-------|----------------|-------|-------|
| Silicon | ppm | ASTM D5185m | >25 | ▲ 37 | 19 | 16 |
| Potassium | ppm | ASTM D5185m | >20 | 6 | 4 | 4 |
| Fuel | | WC Method | >5 | <1.0 | <1.0 | <1.0 |
| Water | | WC Method | >0.2 | NEG | NEG | NEG |
| Glycol | | WC Method | | NEG | NEG | NEG |
| Soot % | % | *ASTM D7844 | >3 | 2.6 | 2.6 | 2 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | 15.3 | 15.5 | 12.8 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 32.3 | 33.6 | 28.5 |
| 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 |

| | | | | | | |
|------------------|----------|-------------|------|-------------|------|------|
| Sodium | ppm | ASTM D5185m | | 4 | 3 | 4 |
| Boron | ppm | ASTM D5185m | | 215 | 376 | 234 |
| Barium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | | 142 | 86 | 53 |
| Manganese | ppm | ASTM D5185m | | 1 | 1 | <1 |
| Magnesium | ppm | ASTM D5185m | | 264 | 179 | 105 |
| Calcium | ppm | ASTM D5185m | 4500 | 3692 | 3469 | 3027 |
| Phosphorus | ppm | ASTM D5185m | | 1005 | 1094 | 1012 |
| Zinc | ppm | ASTM D5185m | 1400 | 1212 | 1339 | 1141 |
| Sulfur | ppm | ASTM D5185m | | 3437 | 3307 | 3814 |
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 25.7 | 28 | 23.1 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 15 | 8.67 | 9.07 | 7.76 |
| Visc @ 100°C | cSt | ASTM D445 | 15.5 | 16.1 | 16.1 | 15.1 |

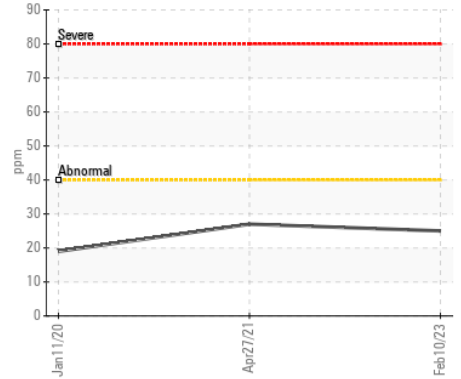
▲ Ferrous Alloys



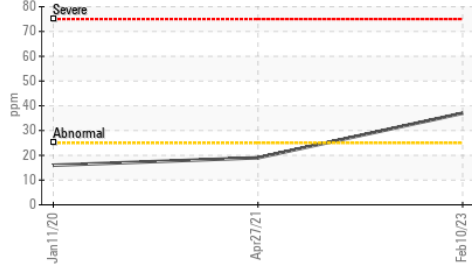
▲ Iron (ppm)



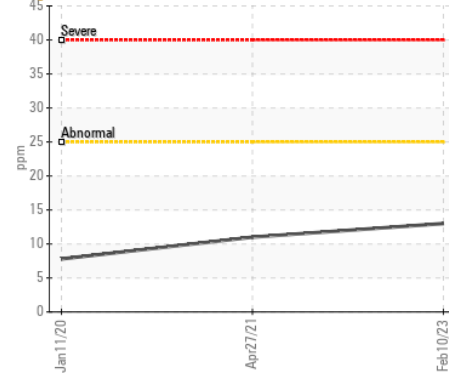
Lead (ppm)



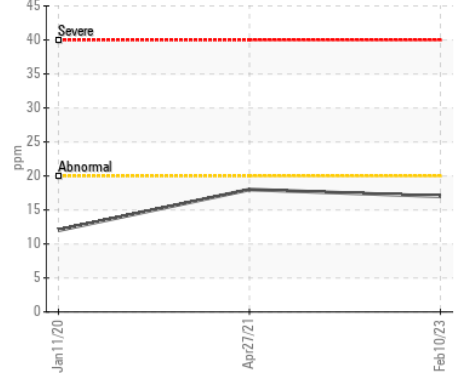
▲ Silicon (ppm)



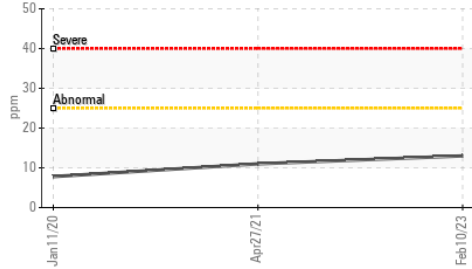
● Aluminum (ppm)



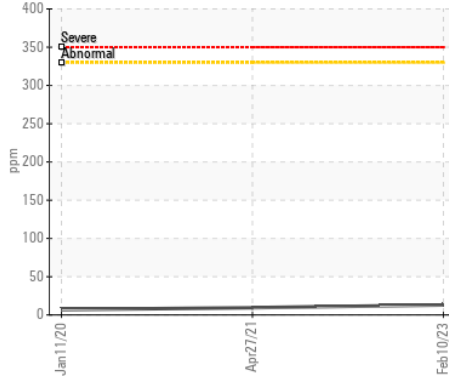
Chromium (ppm)



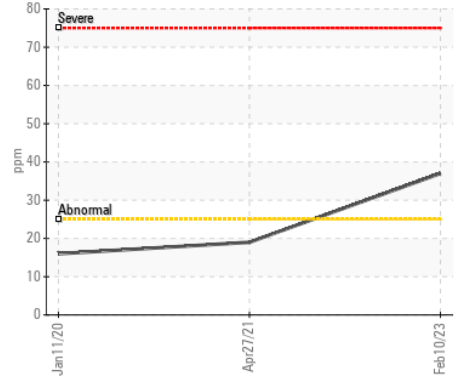
● Aluminum (ppm)



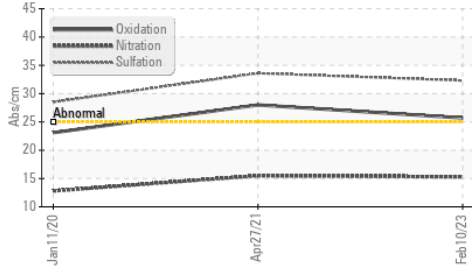
Copper (ppm)



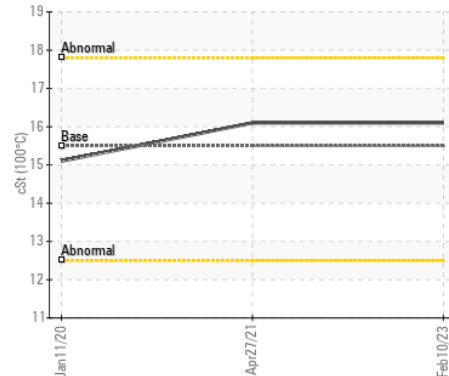
▲ Silicon (ppm)



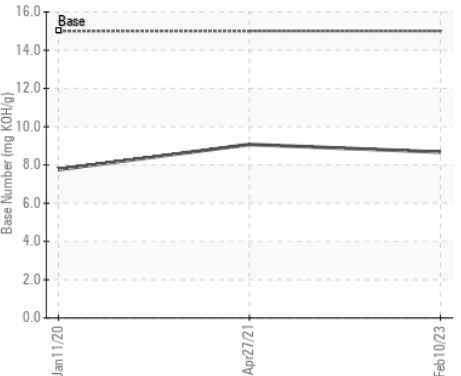
FT-IR (Direct Trend)



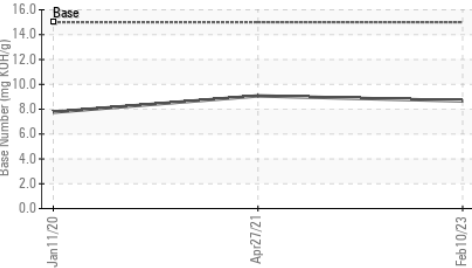
Viscosity @ 100°C



Base Number



Base Number



Certificate L2367

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

Sample No. : TR05773041

Lab Number : 05773041

Unique Number : 10347658

Test Package : MOB 2

Received : 21 Feb 2023

Tested : 22 Feb 2023

Diagnosed : 22 Feb 2023 - Don Baldrige

STAN ISAAC

28624 JUNIPER RD

BRUNEAU, ID

US 83604

Contact: CALVIN KOEHN

To discuss this sample report, contact Customer Service at 1-800-827-0711.

* - 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)

T:

F: