



TRAAP

Texas Refinery Advanced Analysis Program

OIL ANALYSIS REPORT

| | |
|-----------------|--------|
| WEAR | NORMAL |
| CONTAMINATION | SEVERE |
| FLUID CONDITION | NORMAL |

Machine Id
PETERBILT 1

Component
Diesel Engine

Fluid
TRC MOLY XL PRO-SPEC IV XP 15W40 (10 GAL)

RECOMMENDATION

We advise that you check for faulty combustion, plugged air filters, or aftercoolers. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

| Test | UOM | Method | Limit/Abn | Current | History1 | History2 |
|----------------|-----|-------------|-----------|--------------------|-------------|-------------|
| Sample Number | | Client Info | | TR06191250 | TR06082035 | TR05993093 |
| Sample Date | | Client Info | | 14 May 2024 | 29 Jan 2024 | 24 Oct 2023 |
| Machine Age | mls | Client Info | | 107780 | 85598 | 62275 |
| Oil Age | mls | Client Info | | 22182 | 23323 | 25715 |
| Filter Age | mls | Client Info | | 22182 | 23323 | 25715 |
| Oil Changed | | Client Info | | Changed | Changed | Changed |
| Filter Changed | | Client Info | | Changed | Changed | Changed |
| Sample Status | | | | SEVERE | SEVERE | SEVERE |

WEAR

All component wear rates are normal.

| | | | | | | |
|--------------|--------|-------------|------|--------------|------|------|
| Iron | ppm | ASTM D5185m | >200 | 68 | 102 | 143 |
| Chromium | ppm | ASTM D5185m | >20 | 4 | 3 | 6 |
| Nickel | ppm | ASTM D5185m | >2 | <1 | 0 | 0 |
| Titanium | ppm | ASTM D5185m | >2 | <1 | 0 | <1 |
| Silver | ppm | ASTM D5185m | >2 | 1 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >30 | 4 | 2 | 3 |
| Lead | ppm | ASTM D5185m | >30 | 5 | 4 | 6 |
| Copper | ppm | ASTM D5185m | >30 | 5 | 13 | 49 |
| Tin | ppm | ASTM D5185m | >15 | 3 | 2 | 5 |
| Vanadium | ppm | ASTM D5185m | | <1 | 0 | 0 |
| White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |

CONTAMINATION

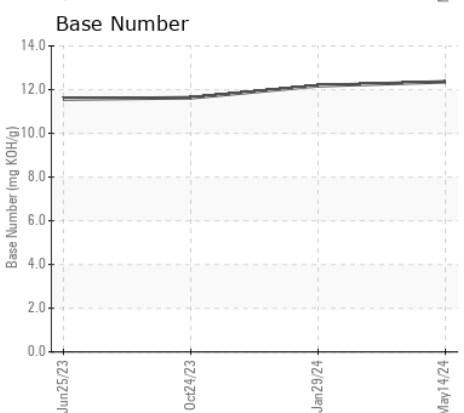
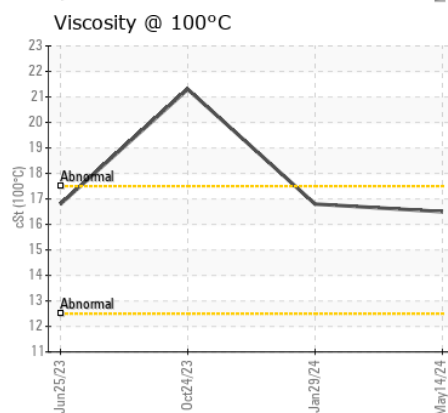
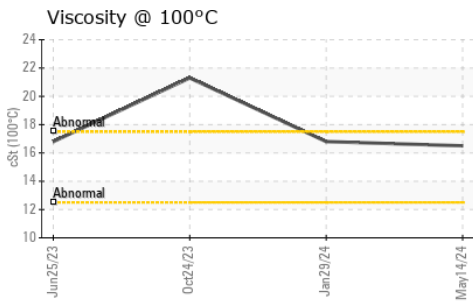
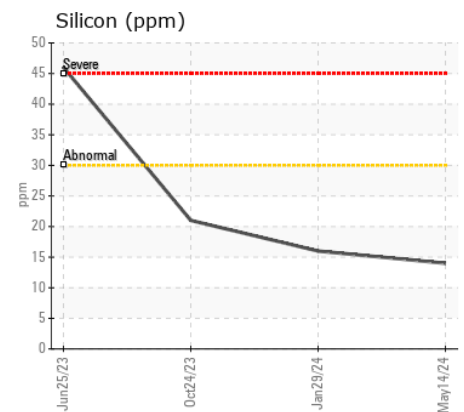
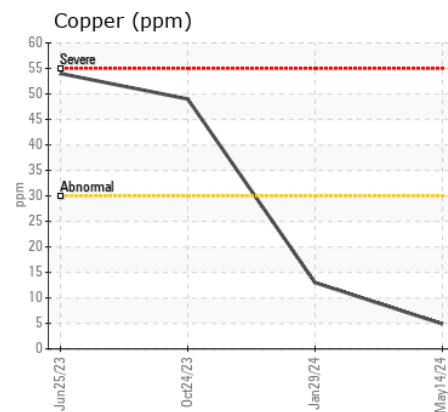
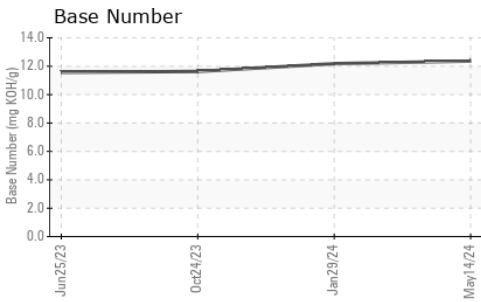
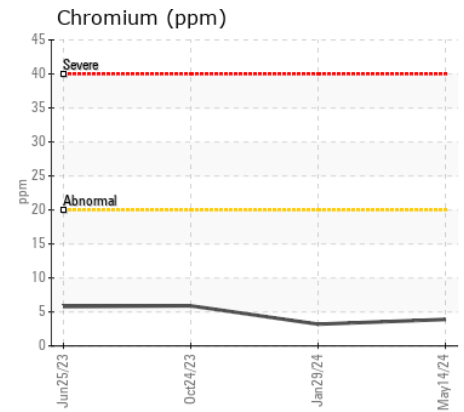
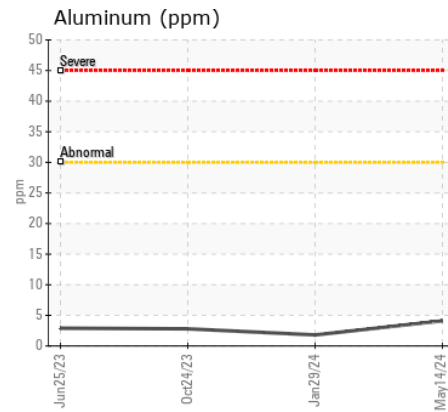
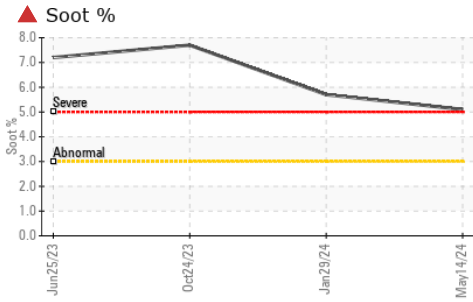
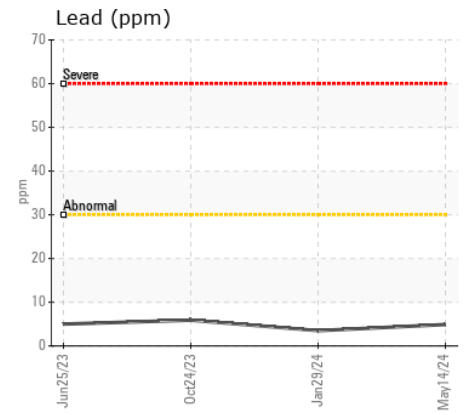
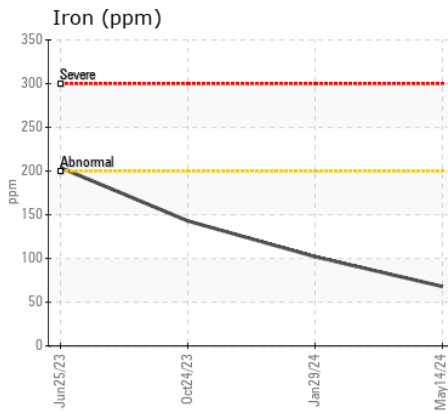
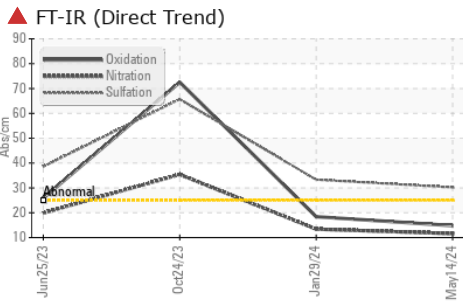
There is an abnormal amount of solids and carbon present in the oil.

| | | | | | | |
|------------------|----------|-------------|-------|----------------|-------|-------|
| Silicon | ppm | ASTM D5185m | >30 | 14 | 16 | 21 |
| Potassium | ppm | ASTM D5185m | >20 | 3 | 3 | 4 |
| Fuel | | WC Method | >3.0 | <1.0 | <1.0 | <1.0 |
| Water | | WC Method | >0.2 | NEG | NEG | NEG |
| Glycol | | WC Method | | NEG | NEG | NEG |
| Soot % | % | *ASTM D7844 | >3 | ▲ 5.1 | ▲ 5.7 | ▲ 7.7 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | 11.6 | 13.4 | 35.4 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 30.2 | 33.3 | 65.7 |
| 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 |

FLUID CONDITION

The BN result indicates that there is suitable alkalinity remaining in the oil.

| | | | | | | |
|------------------|----------|-------------|-----|--------------|-------|--------|
| Sodium | ppm | ASTM D5185m | | <1 | 0 | 4 |
| Boron | ppm | ASTM D5185m | | 198 | 162 | 144 |
| Barium | ppm | ASTM D5185m | | 2 | 6 | 0 |
| Molybdenum | ppm | ASTM D5185m | | 231 | 210 | 185 |
| Manganese | ppm | ASTM D5185m | | 1 | <1 | 2 |
| Magnesium | ppm | ASTM D5185m | | 484 | 457 | 430 |
| Calcium | ppm | ASTM D5185m | | 4273 | 3967 | 3619 |
| Phosphorus | ppm | ASTM D5185m | | 899 | 794 | 667 |
| Zinc | ppm | ASTM D5185m | | 1114 | 1033 | 966 |
| Sulfur | ppm | ASTM D5185m | | 3922 | 3728 | 3180 |
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 14.8 | 18.4 | 72.5 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | | 12.36 | 12.18 | 11.63 |
| Visc @ 100°C | cSt | ASTM D445 | | 16.5 | 16.8 | ▲ 21.3 |



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : TR06191250
Lab Number : 06191250
Unique Number : 11048002
Test Package : MOB 2

Received : 24 May 2024
Tested : 30 May 2024
Diagnosed : 30 May 2024 - Angela Borella

MARSHALL TRUCKING/DANIEL MARSHALL
 9 LONGMEADOW DR
 SALISBURY, MA
 US 01952
 Contact: DON PERCY

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)

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F: