



OIL ANALYSIS REPORT

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

Area
TRUCK - URBAN

Machine Id
WESTERN STAR T147

Component
Diesel Engine

Fluid
SHELL Rotella T5 15W-40 (10 GAL)

RECOMMENDATION

Resample at the next service interval to monitor.

| Test | UOM | Method | Limit/Abn | Current | History1 | History2 |
|----------------|-----|-------------|-----------|--------------------|-------------|-------------|
| Sample Number | | Client Info | | PE0003196 | PE0002253 | PE0001320 |
| Sample Date | | Client Info | | 19 Jan 2024 | 08 Sep 2023 | 17 Jul 2023 |
| Machine Age | hrs | Client Info | | 4524 | 3345 | 2778 |
| Oil Age | hrs | Client Info | | 473 | 567 | 558 |
| Filter Age | hrs | Client Info | | 473 | 567 | 558 |
| Oil Changed | | Client Info | | Changed | Changed | Changed |
| Filter Changed | | Client Info | | Changed | Changed | Changed |
| Sample Status | | | | NORMAL | NORMAL | NORMAL |

WEAR

All component wear rates are normal.

| | | | | | | |
|--------------|--------|-------------|------|--------------|------|------|
| Iron | ppm | ASTM D5185m | >165 | 14 | 23 | 23 |
| Chromium | ppm | ASTM D5185m | >5 | <1 | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >4 | 0 | <1 | <1 |
| Titanium | ppm | ASTM D5185m | >2 | <1 | <1 | 0 |
| Silver | ppm | ASTM D5185m | >2 | 0 | 0 | <1 |
| Aluminum | ppm | ASTM D5185m | >20 | 4 | 8 | 8 |
| Lead | ppm | ASTM D5185m | >150 | 2 | 6 | 3 |
| Copper | ppm | ASTM D5185m | >90 | <1 | 1 | 1 |
| Tin | ppm | ASTM D5185m | >5 | 1 | 1 | <1 |
| Vanadium | ppm | ASTM D5185m | | <1 | <1 | 0 |
| White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |

CONTAMINATION

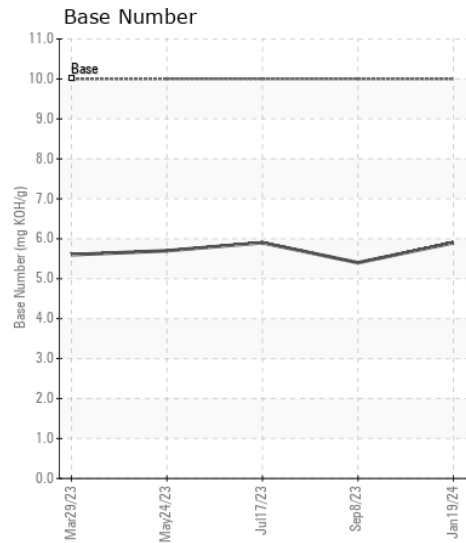
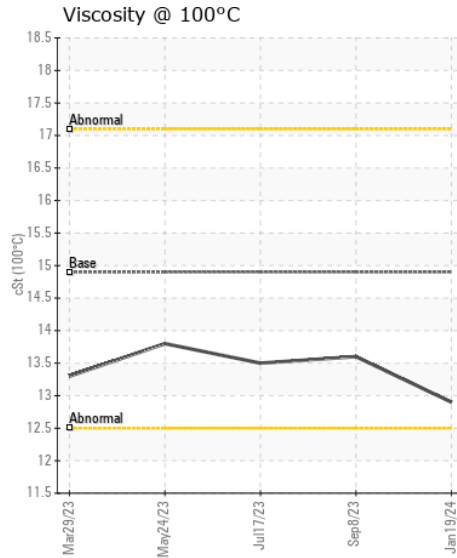
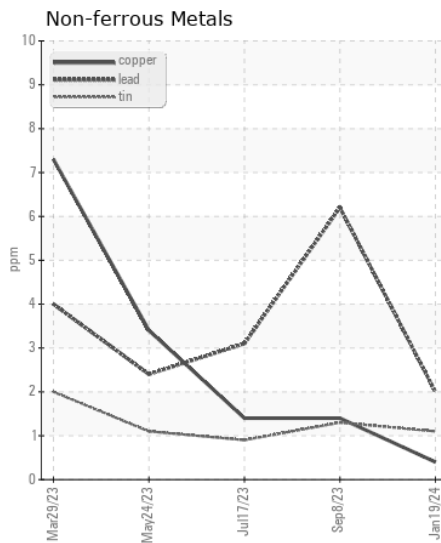
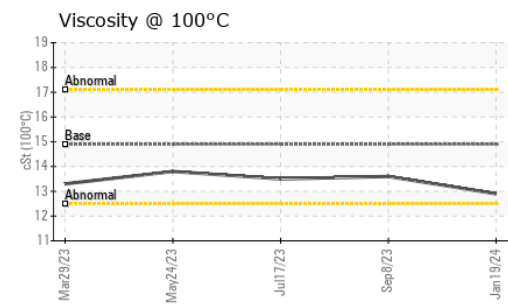
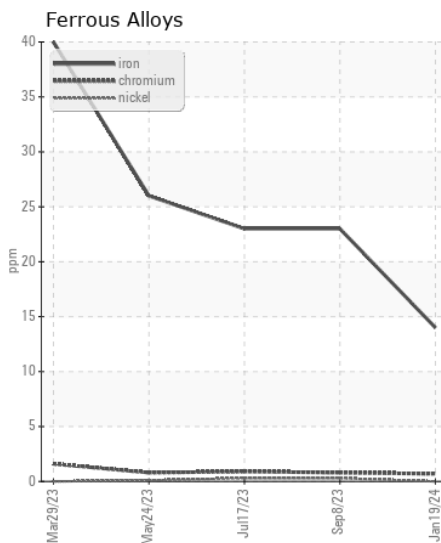
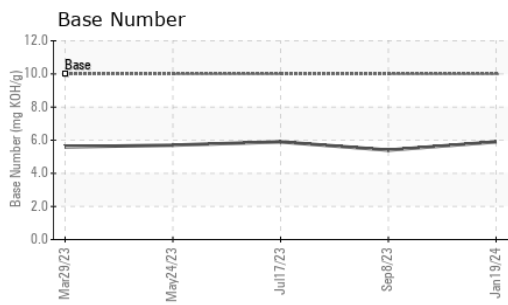
There is no indication of any contamination in the oil.

| | | | | | | |
|------------------|----------|-------------|-------|----------------|-------|-------|
| Silicon | ppm | ASTM D5185m | >35 | 5 | 8 | 7 |
| Potassium | ppm | ASTM D5185m | >20 | 7 | 15 | 15 |
| 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 | >7.5 | 0.4 | 0.5 | 0.4 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | 8.9 | 8.6 | 8.9 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 20.6 | 23.8 | 23.7 |
| 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. The condition of the oil is suitable for further service.

| | | | | | | |
|------------------|----------|-------------|------|--------------|------|------|
| Sodium | ppm | ASTM D5185m | | 1 | 3 | 2 |
| Boron | ppm | ASTM D5185m | | 12 | 152 | 184 |
| Barium | ppm | ASTM D5185m | | 0 | 0 | <1 |
| Molybdenum | ppm | ASTM D5185m | | 54 | 89 | 88 |
| Manganese | ppm | ASTM D5185m | | <1 | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | | 925 | 403 | 358 |
| Calcium | ppm | ASTM D5185m | | 1093 | 1661 | 1625 |
| Phosphorus | ppm | ASTM D5185m | | 961 | 1077 | 1060 |
| Zinc | ppm | ASTM D5185m | | 1179 | 1385 | 1354 |
| Sulfur | ppm | ASTM D5185m | | 2692 | 3857 | 3744 |
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 16.4 | 18.4 | 18.5 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 10 | 5.9 | 5.4 | 5.9 |
| Visc @ 100°C | cSt | ASTM D445 | 14.9 | 12.9 | 13.6 | 13.5 |



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : PE0003196 **Received** : 31 Jan 2024
Lab Number : 06076354 **Diagnosed** : 02 Feb 2024
Unique Number : 10858445 **Diagnostician** : Don Baldrige
Test Package : CONST (Additional Tests: FT-IR, ICP, KV100, SCREEN, TBN)

PetroCard - Aberdeen
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 Contact: Sean McNealley
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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)