



Area
VQU
Machine Id
VQU
Component
Center Main Engine
Fluid
CHEVRON DELO 710 LS (350 GAL)

RECOMMENDATION

We advise that you check for the source of the coolant leak. Check for low coolant level. We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

WEAR

Cylinder, crank, or cam shaft wear is indicated. Bearing and/or bushing wear is indicated.

CONTAMINATION

Sodium and/or potassium levels are high. Elemental level of sodium (Na) and/or boron (B) indicates a possible cooling water leak. 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.

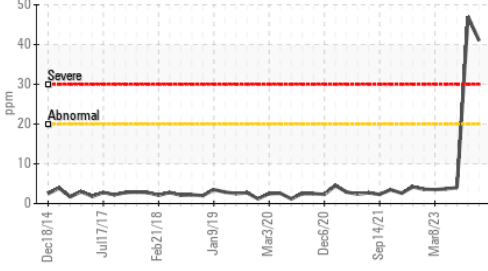
| Test | UOM | Method | Limit/Abn | Current | History1 | History2 |
|----------------|-----|-------------|-----------|--------------------|-------------|-------------|
| Sample Number | | Client Info | | MW0060714 | MW0039990 | MW0044014 |
| Sample Date | | Client Info | | 18 Dec 2023 | 08 Nov 2023 | 26 Jun 2023 |
| Machine Age | hrs | Client Info | | 9983 | 1200 | 95163 |
| Oil Age | hrs | Client Info | | 10284 | 9315 | 6364 |
| Filter Age | hrs | Client Info | | 884 | 1200 | 1208 |
| Oil Changed | | Client Info | | Changed | Not Changd | Not Changd |
| Filter Changed | | Client Info | | Changed | Changed | Changed |
| Sample Status | | | | SEVERE | SEVERE | NORMAL |

| | | | | | | |
|--------------|--------|-------------|------|--------------|------|------|
| Iron | ppm | ASTM D5185m | >75 | ▲ 69 | ▲ 73 | 31 |
| Chromium | ppm | ASTM D5185m | >8 | 1 | 1 | 1 |
| Nickel | ppm | ASTM D5185m | >2 | 2 | 2 | 2 |
| Titanium | ppm | ASTM D5185m | >3 | <1 | <1 | 0 |
| Silver | ppm | ASTM D5185m | >2 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >15 | ▲ 6 | ▲ 6 | 4 |
| Lead | ppm | ASTM D5185m | >18 | ▲ 22 | ▲ 25 | 10 |
| Copper | ppm | ASTM D5185m | >80 | ▲ 62 | ▲ 69 | 26 |
| Tin | ppm | ASTM D5185m | >14 | 11 | 11 | 9 |
| Vanadium | ppm | ASTM D5185m | | <1 | 0 | <1 |
| White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |

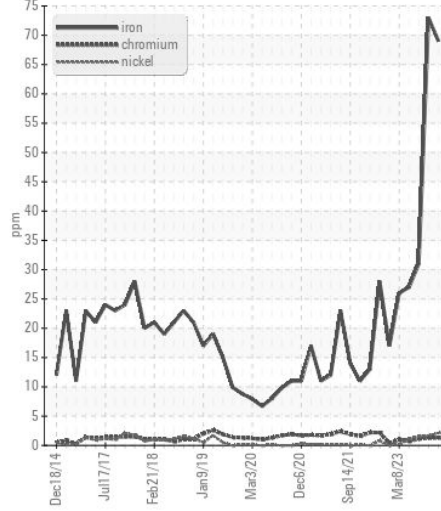
| | | | | | | |
|------------------|----------|-------------|-------|----------------|-------|-------|
| Silicon | ppm | ASTM D5185m | >20 | ◆ 41 | ◆ 47 | 4 |
| Potassium | ppm | ASTM D5185m | >20 | ▲ 11 | ▲ 14 | 0 |
| Fuel | | WC Method | >4.0 | <1.0 | <1.0 | <1.0 |
| Water | | WC Method | >0.1 | NEG | NEG | NEG |
| Glycol | % | *ASTM D2982 | | NEG | NEG | NEG |
| Soot % | % | *ASTM D7844 | >3 | 1.5 | 1.5 | 1.1 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | 10.4 | 10.4 | 9.2 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 21.9 | 21.3 | 18.7 |
| 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 | >0.1 | NEG | NEG | NEG |

| | | | | | | |
|------------------|----------|-------------|------|--------------|-------|------|
| Sodium | ppm | ASTM D5185m | >75 | ▲ 399 | ▲ 487 | 2 |
| Boron | ppm | ASTM D5185m | | 97 | 103 | 44 |
| Barium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | | 45 | 44 | 51 |
| Manganese | ppm | ASTM D5185m | | 2 | 2 | <1 |
| Magnesium | ppm | ASTM D5185m | | 24 | 24 | 15 |
| Calcium | ppm | ASTM D5185m | | 3340 | 3435 | 3852 |
| Phosphorus | ppm | ASTM D5185m | | 4 | 5 | 9 |
| Zinc | ppm | ASTM D5185m | | 4 | <1 | 0 |
| Sulfur | ppm | ASTM D5185m | | 2197 | 2293 | 2697 |
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 11.6 | 10.7 | 11.4 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 10.5 | 7.4 | 8.7 | 6.6 |
| Visc @ 100°C | cSt | ASTM D445 | 15.5 | 14.8 | 14.8 | 14.7 |

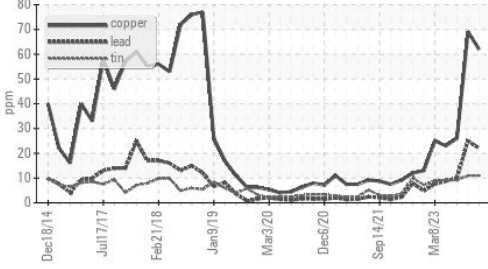
● Silicon (ppm)



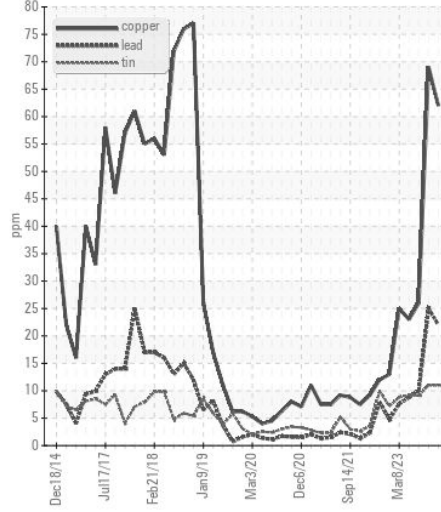
▲ Ferrous Alloys



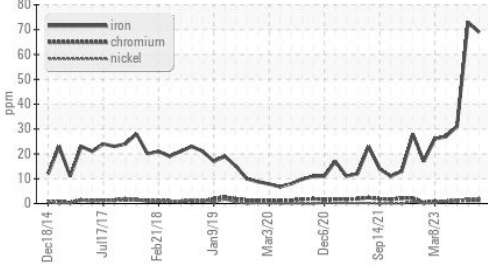
▲ Non-ferrous Metals



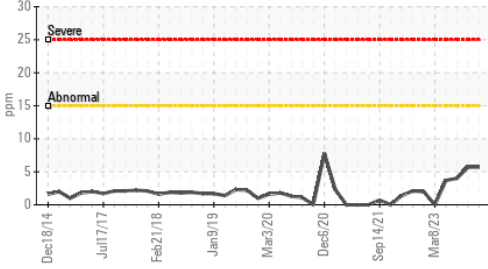
▲ Non-ferrous Metals



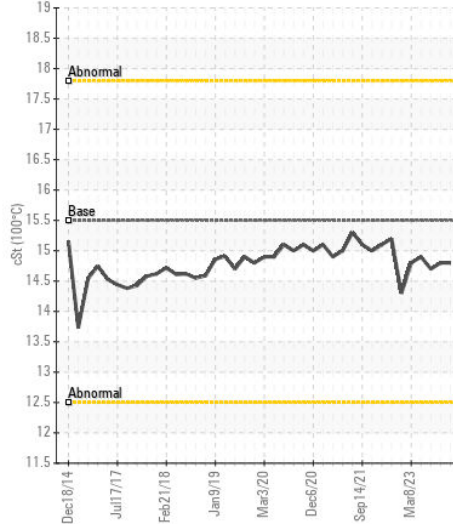
▲ Ferrous Alloys



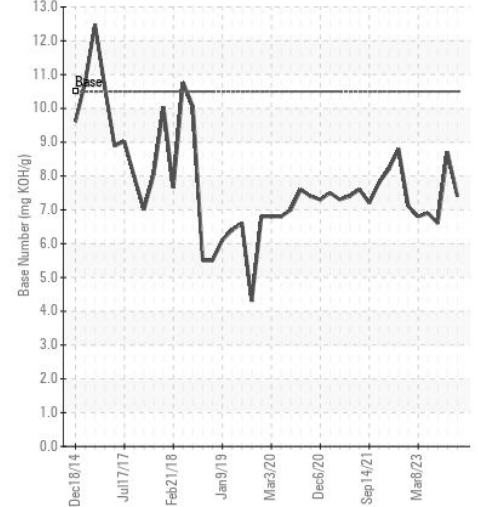
▲ Aluminum (ppm)



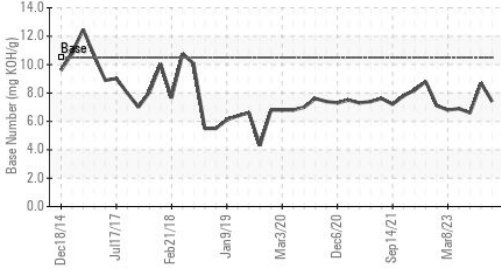
Viscosity @ 100°C



Base Number



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : MW0060714 **Received** : 30 Jan 2024
Lab Number : 06074356 **Diagnosed** : 01 Feb 2024
Unique Number : 10856447 **Diagnostician** : Jonathan Hester
Test Package : MAR 2 (Additional Tests: Glycol)

AMERICAN RIVER TRANSPORTATION CO.
 P.O. BOX 2889
 ST. LOUIS, MO
 US 63111
 Contact: BRIAN GRIEWING
 brian.griewing@adm.com
 T:
 F: (314)481-5278

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)