

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id

CATERPILLAR 320 118

Component

Diesel Engine

PETRO CANADA 15W40 (--- GAL)

Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

Contamination

There is no indication of any contamination in the

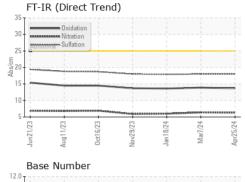
Fluid Condition

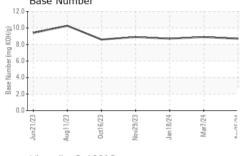
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

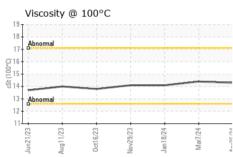
| Sample Status NORMAL NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0 | | | Jun2023 | Aug2023 Oct2023 | Nov2023 Jan2024 Mar2024 | Apr2024 | |
|--|------------------|----------|-------------|-----------------|-------------------------|-------------|-------------|
| Sample Date | SAMPLE INFORM | MATION | method | limit/base | current | history1 | history2 |
| Machine Age hrs Client Info 4916 4662 4391 Oil Age hrs Client Info 254 271 242 Oil Changed Client Info Changed Changed Changed Sample Status NCRMAL NCRMAL NCRMAL NCRMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0 <1.0 <1.0 <1.0 Water WC Method NEG NEG NEG NEG NEG Glycol WC Method Immition Lourent history2 History2 Iron PASTM D5185m >100 16 22 18 Chromium ppm ASTM D5185m >20 <1 <1 1 1 1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 | Sample Number | | Client Info | | WC0893842 | WC0893827 | WC0878761 |
| Oil Age hrs Client Info 254 271 242 Oil Changed Sample Status Client Info Changed Changed Changed Changed Changed NORMAL NORM | Sample Date | | Client Info | | 25 Apr 2024 | 07 Mar 2024 | 18 Jan 2024 |
| Oil Changed Sample Status Client Info Changed NORMAL NORMAL NORMAL Changed NORMAL NORMAL NORMAL Changed NORMAL NORMAL NORMA | Machine Age | hrs | Client Info | | 4916 | 4662 | 4391 |
| Sample Status | Oil Age | hrs | Client Info | | 254 | 271 | 242 |
| CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG NEG Glycol WC Method NEG NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 16 22 18 Chromium ppm ASTM D5185m >20 <1 <1 1 Nickel ppm ASTM D5185m >4 0 <1 <1 <1 Silver ppm ASTM D5185m >3 0 0 0 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 | Oil Changed | | Client Info | | Changed | Changed | Changed |
| Fuel | Sample Status | | | | NORMAL | NORMAL | NORMAL |
| Water WC Method >0.2 NEG NEG NEG Glycol WC Method Imit/base current history1 history2 WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >10.0 16 22 18 Chromium ppm ASTM D5185m >20 <1 <1 1 Nickel ppm ASTM D5185m >4 0 <1 <1 Silver ppm ASTM D5185m >4 0 <1 <1 Silver ppm ASTM D5185m >20 2 3 2 Lead ppm ASTM D5185m >40 0 <1 <1 Copper ppm ASTM D5185m >40 0 <1 <1 Tin ppm ASTM D5185m >15 <1 <1 <1 Vanadium ppm ASTM D5185m 0 <1 0 <1 <th>CONTAMINATION</th> <th>1</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th> | CONTAMINATION | 1 | method | limit/base | current | history1 | history2 |
| WEAR METALS | Fuel | | WC Method | >5 | <1.0 | <1.0 | <1.0 |
| WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 16 22 18 Chromium ppm ASTM D5185m >20 <1 <1 1 Nickel ppm ASTM D5185m >20 <1 <1 <1 Titanium ppm ASTM D5185m >3 0 0 0 <1 <1 <1 1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <t< th=""><th>Water</th><th></th><th>WC Method</th><th>>0.2</th><th>NEG</th><th>NEG</th><th>NEG</th></t<> | Water | | WC Method | >0.2 | NEG | NEG | NEG |
| Iron | Glycol | | WC Method | | NEG | NEG | NEG |
| Chromium ppm ASTM D5185m >20 <1 | WEAR METALS | | method | limit/base | current | history1 | history2 |
| Nickel | Iron | ppm | ASTM D5185m | >100 | 16 | 22 | 18 |
| Titanium ppm ASTM D5185m 0 <1 | Chromium | ppm | ASTM D5185m | >20 | <1 | <1 | 1 |
| Silver | Nickel | ppm | ASTM D5185m | >4 | 0 | <1 | <1 |
| Aluminum ppm ASTM D5185m >20 2 3 2 Lead ppm ASTM D5185m >40 0 <1 <1 Copper ppm ASTM D5185m >330 1 2 2 Tin ppm ASTM D5185m >15 <1 <1 <1 Vanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 2 0 Molybdenum ppm ASTM D5185m 57 66 62 Manganese ppm ASTM D5185m 924 967 999 Calcium ppm ASTM D5185m 983 912 96 Phosphorus ppm ASTM D5185m 983 912 96 Zinc ppm ASTM D5185m 3279 | Titanium | ppm | ASTM D5185m | | 0 | <1 | <1 |
| Lead ppm ASTM D5185m >40 0 <1 | Silver | ppm | ASTM D5185m | >3 | | 0 | |
| Copper ppm ASTM D5185m >330 1 2 2 Tin ppm ASTM D5185m >15 <1 <1 <1 Vanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 2 0 Molybdenum ppm ASTM D5185m 57 66 62 Manganese ppm ASTM D5185m 57 66 62 Manganesium ppm ASTM D5185m 924 967 999 Calcium ppm ASTM D5185m 962 1135 981 Phosphorus ppm ASTM D5185m 983 912 906 Zinc ppm ASTM D5185m 3279 3063 2923 CONTAMINANTS method limit/base current | Aluminum | ppm | ASTM D5185m | >20 | 2 | 3 | 2 |
| Tin ppm ASTM D5185m >15 <1 | Lead | ppm | ASTM D5185m | >40 | 0 | | |
| Vanadium ppm ASTM D5185m 0 <1 | Copper | ppm | ASTM D5185m | >330 | 1 | 2 | 2 |
| Cadmium ppm ASTM D5185m 0 0 <1 | Tin | ppm | ASTM D5185m | >15 | <1 | <1 | |
| ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 1 1 2 Barium ppm ASTM D5185m 0 2 0 Molybdenum ppm ASTM D5185m 57 66 62 Manganese ppm ASTM D5185m 924 967 999 Calcium ppm ASTM D5185m 962 1135 981 Phosphorus ppm ASTM D5185m 983 912 906 Zinc ppm ASTM D5185m 983 912 906 Zinc ppm ASTM D5185m 3279 3063 2923 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 4 Sodium ppm ASTM D5185m >20 <1 3 2 INFRA-RED method limit/base cur | Vanadium | ppm | ASTM D5185m | | - | <1 | |
| Boron | Cadmium | ppm | ASTM D5185m | | 0 | 0 | <1 |
| Barium ppm ASTM D5185m 0 2 0 Molybdenum ppm ASTM D5185m 57 66 62 Manganese ppm ASTM D5185m <1 <1 <1 Magnesium ppm ASTM D5185m 924 967 999 Calcium ppm ASTM D5185m 962 1135 981 Phosphorus ppm ASTM D5185m 983 912 906 Zinc ppm ASTM D5185m 983 912 906 Zinc ppm ASTM D5185m 3279 3063 2923 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 4 Sodium ppm ASTM D5185m >20 <1 3 2 INFRA-RED method limit/base current history1 history2 Soot % "ASTM D7624 >20 | ADDITIVES | | method | limit/base | current | history1 | history2 |
| Molybdenum ppm ASTM D5185m 57 66 62 Manganese ppm ASTM D5185m <1 | Boron | ppm | ASTM D5185m | | 1 | | |
| Manganese ppm ASTM D5185m <1 | Barium | ppm | ASTM D5185m | | 0 | 2 | 0 |
| Magnesium ppm ASTM D5185m 924 967 999 Calcium ppm ASTM D5185m 962 1135 981 Phosphorus ppm ASTM D5185m 983 912 906 Zinc ppm ASTM D5185m 1177 1224 1253 Sulfur ppm ASTM D5185m 3279 3063 2923 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 4 Sodium ppm ASTM D5185m >20 <1 | Molybdenum | ppm | ASTM D5185m | | 57 | 66 | 62 |
| Calcium ppm ASTM D5185m 962 1135 981 Phosphorus ppm ASTM D5185m 983 912 906 Zinc ppm ASTM D5185m 1177 1224 1253 Sulfur ppm ASTM D5185m 3279 3063 2923 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 4 Sodium ppm ASTM D5185m >20 <1 3 2 INFRA-RED method limit/base current history1 history2 Soot % "ASTM D7844 >3 0.2 0.3 0.2 Nitration Abs/cm "ASTM D7624 >20 6.3 6.4 6.0 Sulfation Abs/.1mm "ASTM D7415 >30 18.0 17.9 FLUID DEGRADATION method limit/base current history1 | • | ppm | | | | | |
| Phosphorus ppm ASTM D5185m 983 912 906 Zinc ppm ASTM D5185m 1177 1224 1253 Sulfur ppm ASTM D5185m 3279 3063 2923 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 4 Sodium ppm ASTM D5185m >20 <1 3 2 INFRA-RED method limit/base current history1 history2 Soot % "ASTM D7844 >3 0.2 0.3 0.2 Nitration Abs/cm "ASTM D7624 >20 6.3 6.4 6.0 Sulfation Abs/.1mm "ASTM D7415 >30 18.0 17.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm "ASTM D7414 >25 13.7 13.9 13.6 | | ppm | | | | | |
| Zinc ppm ASTM D5185m 1177 1224 1253 Sulfur ppm ASTM D5185m 3279 3063 2923 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 4 Sodium ppm ASTM D5185m >20 <1 3 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.3 0.2 Nitration Abs/cm *ASTM D7624 >20 6.3 6.4 6.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.0 17.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.7 13.9 13.6 | | ppm | | | | | |
| Sulfur ppm ASTM D5185m 3279 3063 2923 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 4 Sodium ppm ASTM D5185m >20 <1 3 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.3 0.2 Nitration Abs/cm *ASTM D7624 >20 6.3 6.4 6.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.0 17.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.7 13.9 13.6 | | | | | | | |
| CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 4 Sodium ppm ASTM D5185m 4 5 1 Potassium ppm ASTM D5185m >20 <1 3 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.3 0.2 Nitration Abs/cm *ASTM D7624 >20 6.3 6.4 6.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.0 17.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.7 13.9 13.6 | - | | | | | | |
| Silicon ppm ASTM D5185m >25 3 4 4 Sodium ppm ASTM D5185m 4 5 1 Potassium ppm ASTM D5185m >20 <1 | | • • | | | 3279 | | |
| Sodium ppm ASTM D5185m 4 5 1 Potassium ppm ASTM D5185m >20 <1 | | | | | | | |
| Potassium ppm ASTM D5185m >20 <1 | | | | >25 | | | |
| INFRA-RED | | | | 00 | | | |
| Soot % % *ASTM D7844 >3 0.2 0.3 0.2 Nitration Abs/cm *ASTM D7624 >20 6.3 6.4 6.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.0 18.0 17.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.7 13.9 13.6 | | ppm | | | <1 | 3 | 2 |
| Nitration Abs/cm *ASTM D7624 >20 6.3 6.4 6.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.0 18.0 17.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.7 13.9 13.6 | | | | | | | |
| Sulfation Abs/.1mm *ASTM D7415 >30 18.0 18.0 17.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.7 13.9 13.6 | | | | | | | |
| FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.7 13.9 13.6 | | | | | | | |
| Oxidation Abs/.1mm *ASTM D7414 >25 13.7 13.9 13.6 | | | *ASTM D7415 | >30 | 18.0 | | 17.9 |
| | FLUID DEGRADA | TION | method | limit/base | current | history1 | history2 |
| Base Number (BN) mg KOH/g ASTM D2896 8.7 8.9 8.7 | Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 13.7 | 13.9 | 13.6 |
| | Base Number (BN) | mg KOH/g | ASTM D2896 | | 8.7 | 8.9 | 8.7 |



OIL ANALYSIS REPORT



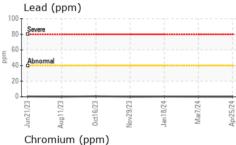


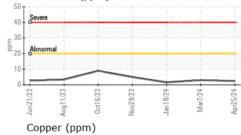


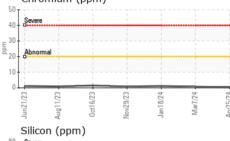
| VISUAL | | method | limit/base | current | history1 | history2 |
|-------------------------|--------|---------|------------|---------|----------|----------|
| White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | NONE | NONE | NONE |
| Silt | scalar | *Visual | NONE | NONE | NONE | NONE |
| Debris | scalar | *Visual | NONE | 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 |
| Free Water | scalar | *Visual | | NEG | NEG | NEG |
| | | | | | | |

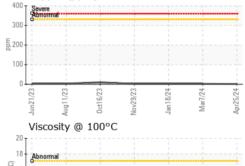
| I LOID I HOI L | ITTILO | memou | | Thistory | HISTOLYZ |
|----------------|--------|-----------|------|----------|----------|
| Visc @ 100°C | cSt | ASTM D445 | 14.3 | 14.4 | 14.1 |

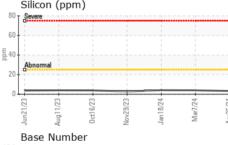
| ppm) | | | | | |
|------|----------|-------|-----------|-----------|-----------|
| | | | | | |
| | | | - 1 | | - 1 |
| | | | | | |
| | | | | | |
| | | | | | |
| · · | | | 4 | 4 | 4 |
| 11/2 | t16/2 | 758/2 | 18/2 | ar7/2 | Apr25/24 |
| Aug | 0 | Š | Jai | Σ | Ap |
| num | (mnm) | | | | |
| | Aug11/23 | | Aug 11/23 | Aug 11/23 | Aug 11/23 |

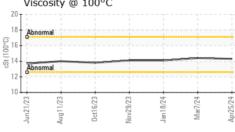


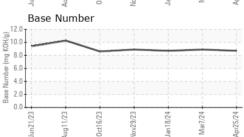
















Certificate 12367

Laboratory

Sample No.

: WC0893842 Lab Number : 06183808 Unique Number : 11035134

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 17 May 2024 **Tested** Diagnosed

: 20 May 2024 : 20 May 2024 - Wes Davis

706 38TH AVE N MYRTLE BEACH, SC US 29577

C.L. BENTON & SONS INC

Contact: JAMIE HUCKS shop@clbenton.com

Test Package : MOB 1 (Additional Tests: TBN) 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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F: