

## **OIL ANALYSIS REPORT**

#### Sample Rating Trend





#### DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor. Please specify the component make and model with your next sample.

#### Wear

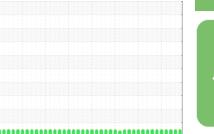
All component wear rates are normal.

#### Contamination

The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The system and fluid cleanliness is acceptable.

#### Fluid Condition

The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.



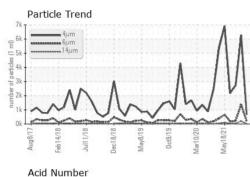


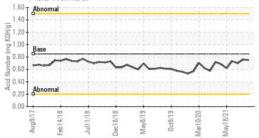
### a2017 Feb2018 Juc2018 Dec2018 Max2019 Oct2019 Max2020 Max2021

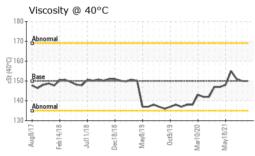
| SAMPLE INFORM  | <b>IATION</b>   | method  | limit/base  | current  | history1  | history2   |
|--|---|---|---|--|---|--|
| Sample Number  |   | Client Info   |   | PTK0000387   | PTK0000350  | PTK0001281   |
| Sample Date  |   | Client Info   |   | 09 Nov 2023  | 13 Jun 2023   | 23 Nov 2022  |
| Machine Age  | mths  | Client Info   |   | 0  | 0   | 0  |
| Oil Age  | mths  | Client Info   |   | 0  | 0   | 0  |
| Oil Changed  |   | Client Info   |   | N/A  | N/A   | N/A  |
| Sample Status  |   |   |   | NORMAL   | NORMAL  | NORMAL   |
| CONTAMINATIO   | N   | method  | limit/base  | current  | history1  | history2   |
| Water  |   | WC Method   | >0.2  | NEG  | NEG   | NEG  |
| WEAR METALS  |   | method  | limit/base  | current  | history1  | history2   |
| Iron   | ppm   | ASTM D5185m   | >200  | 0  | 4   | 5  |
| Chromium   | ppm   | ASTM D5185m   | >10   | 0  | 0   | 0  |
| Nickel   | ppm   | ASTM D5185m   | >10   | 0  | 0   | <1   |
| Titanium   | ppm   | ASTM D5185m   |   | 0  | 0   | 0  |
| Silver   | ppm   | ASTM D5185m   |   | 0  | 0   | 0  |
| Aluminum   | ppm   | ASTM D5185m   | >25   | 0  | 0   | <1   |
| Lead   | ppm   | ASTM D5185m   | >50   | 0  | <1  | <1   |
| Copper   | ppm   | ASTM D5185m   | >200  | <1   | 1   | 2  |
| Tin  | ppm   | ASTM D5185m   | >10   | 0  | 0   | <1   |
| Antimony   | ppm   | ASTM D5185m   | >5  |  |   |  |
| Vanadium   | ppm   | ASTM D5185m   |   | 0  | 0   | 0  |
| Cadmium  | ppm   | ASTM D5185m   |   | 0  | 0   | 0  |
|  |   |   |   |  |   |  |
| ADDITIVES  |   | method  | limit/base  | current  | history1  | history2   |
| ADDITIVES<br>Boron   | ppm   | method<br>ASTM D5185m   | limit/base<br>50  | current<br>27  | history1<br>2   | history2<br>0  |
|  | ppm<br>ppm  |   |   |  |   |  |
| Boron  |   | ASTM D5185m   | 50  | 27   | 2   | 0  |
| Boron<br>Barium  | ppm   | ASTM D5185m<br>ASTM D5185m  | 50<br>15  | 27<br>0  | 2<br>2  | 0  |
| Boron<br>Barium<br>Molybdenum  | ppm<br>ppm  | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 50<br>15  | 27<br>0<br>0   | 2<br>2<br>0   | 0<br>0<br>0  |
| Boron<br>Barium<br>Molybdenum<br>Manganese   | ppm<br>ppm<br>ppm   | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 50<br>15<br>15  | 27<br>0<br>0<br>0  | 2<br>2<br>0<br>0  | 0<br>0<br>0<br>0   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium  | ppm<br>ppm<br>ppm<br>ppm                                    | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 50<br>15<br>15<br>50  | 27<br>0<br>0<br>0<br>0   | 2<br>2<br>0<br>0<br><1  | 0<br>0<br>0<br><1  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium   | ppm<br>ppm<br>ppm<br>ppm<br>ppm                             | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 50<br>15<br>15<br>50<br>50  | 27<br>0<br>0<br>0<br>0<br><1   | 2<br>2<br>0<br>0<br><1<br>3   | 0<br>0<br>0<br><1<br>2   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus   | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm                      | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 50<br>15<br>15<br>50<br>50<br>350   | 27<br>0<br>0<br>0<br>0<br><1<br>313  | 2<br>2<br>0<br>0<br><1<br>3<br>305  | 0<br>0<br>0<br><1<br>2<br>320  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc   | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm               | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 50<br>15<br>15<br>50<br>50<br>350<br>100  | 27<br>0<br>0<br>0<br>0<br><1<br>313<br>7   | 2<br>2<br>0<br><1<br>3<br>305<br>7  | 0<br>0<br>0<br><1<br>2<br>320<br>3   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur   | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm               | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 50<br>15<br>15<br>50<br>50<br>350<br>100<br>12500   | 27<br>0<br>0<br>0<br>0<br><1<br>313<br>7<br>14267  | 2<br>2<br>0<br><1<br>3<br>305<br>7<br>15969   | 0<br>0<br>0<br><1<br>2<br>320<br>3<br>15510  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS   | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm               | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 50<br>15<br>15<br>50<br>50<br>350<br>100<br>12500   | 27<br>0<br>0<br>0<br><1<br>313<br>7<br>14267<br>current  | 2<br>2<br>0<br>0<br><1<br>3<br>305<br>7<br>15969<br>history1  | 0<br>0<br>0<br><1<br>2<br>320<br>3<br>15510<br>history2  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm        | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br><b>method</b>   | 50<br>15<br>15<br>50<br>50<br>350<br>100<br>12500<br>limit/base<br>>50  | 27<br>0<br>0<br>0<br><1<br>313<br>7<br>14267<br>current<br>0   | 2<br>2<br>0<br>0<br><1<br>3<br>305<br>7<br>15969<br>history1<br>0   | 0<br>0<br>0<br><1<br>2<br>320<br>3<br>15510<br>history2<br>2   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br><b>method</b><br>ASTM D5185m  | 50<br>15<br>15<br>50<br>50<br>350<br>100<br>12500<br>limit/base<br>>50  | 27<br>0<br>0<br>0<br>0<br><1<br>313<br>7<br>14267<br><i>current</i><br>0<br>1  | 2<br>2<br>0<br>0<br><1<br>3<br>305<br>7<br>15969<br>history1<br>0<br>0  | 0<br>0<br>0<br><1<br>2<br>320<br>3<br>15510<br>history2<br>2<br>2  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>FLUID CLEANLIN<br>Particles >4µm                                       | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m  | 50<br>15<br>15<br>50<br>50<br>350<br>100<br>12500<br>limit/base<br>>50<br>>20   | 27<br>0<br>0<br>0<br>0<br>(<br>1<br>313<br>7<br>14267<br><i>current</i><br>0<br>1<br>0<br>0<br>1<br>0<br><i>current</i><br>668   | 2<br>2<br>0<br>0<br><1<br>3<br>305<br>7<br>15969<br>history1<br>0<br>0<br>2   | 0<br>0<br>0<br><1<br>2<br>320<br>3<br>15510<br>history2<br>2<br>2<br>2<br>2<br><1  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium   | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m  | 50<br>15<br>15<br>50<br>350<br>100<br>12500<br>limit/base<br>>50<br>>20<br>limit/base   | 27<br>0<br>0<br>0<br>3<br>1<br>313<br>7<br>14267<br>current<br>0<br>1<br>0<br>0<br>1<br>0<br>0   | 2<br>2<br>0<br>0<br>1<br>3<br>305<br>7<br>15969<br>history1<br>0<br>0<br>2<br>history1                                  | 0<br>0<br>0<br><1<br>2<br>320<br>3<br>15510<br>history2<br>2<br>2<br>2<br><1<br>history2   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>FLUID CLEANLIN<br>Particles >4µm                                       | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m   | 50<br>15<br>15<br>50<br>350<br>100<br>12500<br>limit/base<br>>50<br>>20<br>limit/base   | 27<br>0<br>0<br>0<br>0<br>(<br>1<br>313<br>7<br>14267<br><i>current</i><br>0<br>1<br>0<br>0<br>1<br>0<br><i>current</i><br>668   | 2<br>2<br>0<br>0<br>(<br>1<br>3<br>305<br>7<br>15969<br>history1<br>0<br>0<br>2<br>history1<br>6271                     | 0<br>0<br>0<br>2<br>320<br>3<br>15510<br>history2<br>2<br>2<br>2<br>2<br>1<br>history2<br>2<br>2730  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>FLUID CLEANLIN<br>Particles >4µm<br>Particles >6µm                     | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m  | 50<br>15<br>15<br>50<br>50<br>350<br>100<br>12500<br>12500<br>100<br>12500<br>100<br>12500<br>100<br>12500<br>100<br>12500<br>100<br>100<br>100<br>100<br>100<br>100<br>100<br>100<br>100 | 27<br>0<br>0<br>0<br>0<br><1<br>313<br>7<br>14267<br><i>current</i><br>0<br>1<br>0<br>0<br><i>current</i><br>668<br>200  | 2<br>2<br>0<br>0<br>1<br>3<br>305<br>7<br>15969<br>history1<br>0<br>0<br>2<br><u>history1</u><br>6271<br>1380           | 0<br>0<br>0<br>2<br>320<br>3<br>15510<br>history2<br>2<br>2<br>2<br>2<br>1<br>history2<br>2<br>2<br>2<br>3<br>15510<br>2<br>1<br>7<br>3<br>15510   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>FLUID CLEANLIN<br>Particles >4µm<br>Particles >6µm<br>Particles >14µm  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m  | 50<br>15<br>15<br>50<br>50<br>350<br>100<br>12500<br>12500<br>100<br>12500<br>100<br>12500<br>100<br>12500<br>100<br>12500<br>100<br>100<br>100<br>100<br>100<br>100<br>100<br>100<br>100 | 27<br>0<br>0<br>0<br>0<br>3<br>1<br>313<br>7<br>14267<br>0<br>14267<br>0<br>1<br>0<br>1<br>0<br>0<br>1<br>0<br>0<br>1<br>0<br>0<br>0<br>1<br>0<br>0<br>0<br>1<br>0<br>0<br>1<br>0<br>0<br>1<br>1<br>0<br>0<br>1<br>1<br>0<br>0<br>1<br>1<br>0<br>0<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1 | 2<br>2<br>0<br>0<br>(<br>1<br>3<br>305<br>7<br>15969<br>history1<br>0<br>0<br>0<br>2<br>history1<br>6271<br>1380<br>208 | 0<br>0<br>0<br>10<br>2<br>320<br>3<br>15510<br>history2<br>2<br>2<br>2<br>2<br>2<br>1<br>5<br>1<br>5<br>1<br>0<br>1<br>5<br>5<br>10<br>1<br>1<br>5<br>5<br>10<br>1<br>1<br>5<br>5<br>10<br>1<br>1<br>5<br>5<br>10<br>1<br>1<br>5<br>5<br>10<br>1<br>1<br>1<br>5<br>5<br>10<br>1<br>1<br>1<br>1 |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>FLUID CLEANLIN<br>Particles >4µm<br>Particles >14µm<br>Particles >21µm | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D7647<br>ASTM D7647<br>ASTM D7647<br>ASTM D7647 | 50<br>15<br>15<br>50<br>50<br>350<br>100<br>12500<br><b>limit/base</b><br>>50<br><b>limit/base</b><br>>20<br><b>limit/base</b><br>>20   | 27<br>0<br>0<br>0<br>0<br>3<br>1<br>3<br>13<br>7<br>14267<br>0<br>14267<br>0<br>1<br>14267<br>0<br>1<br>0<br>0<br>0<br>1<br>0<br>0<br>0<br>0<br>1<br>0<br>0<br>0<br>0<br>1<br>1<br>0<br>0<br>1<br>0<br>0<br>1<br>1<br>0<br>0<br>1<br>1<br>0<br>0<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1   | 2<br>2<br>0<br>0<br><1<br>3<br>305<br>7<br>15969<br>history1<br>0<br>0<br>2<br>history1<br>6271<br>1380<br>208<br>66    | 0<br>0<br>0<br>2<br>3<br>320<br>3<br>15510<br>history2<br>2<br>2<br>2<br>2<br>2<br>2<br>3<br>15510<br>2<br>15510<br>2<br>15510<br>2<br>15510<br>2<br>15510<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2                                      |



# **OIL ANALYSIS REPORT**



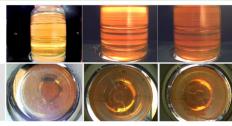


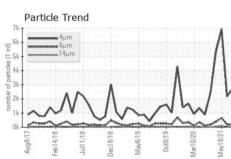


| FLUID DEGRADATION |            | method   |            |            |          | history2 |          |
|-------------------|------------|----------|------------|------------|----------|----------|----------|
| Acid N            | umber (AN) | mg KOH/g | ASTM D8045 | 0.85       | 0.75     | 0.76     | 0.70     |
| VISU              | IAL        |          | method     | limit/base | current  | history1 | history2 |
| White I           | Vetal      | scalar   | *Visual    | NONE       | NONE     | NONE     | NONE     |
| Yellow            | Metal      | scalar   | *Visual    | NONE       | NONE     | NONE     | NONE     |
| Precipi           | tate       | scalar   | *Visual    | NONE       | NONE     | NONE     | NONE     |
| Silt              |            | scalar   | *Visual    | NONE       | NONE     | NONE     | NONE     |
| Debris            |            | scalar   | *Visual    | NONE       | NONE     | LIGHT    | NONE     |
| Sand/E            | Dirt       | scalar   | *Visual    | NONE       | NONE     | NONE     | NONE     |
| Appear            | rance      | scalar   | *Visual    | NORML      | NORML    | NORML    | NORML    |
| Odor              |            | scalar   | *Visual    | NORML      | NORML    | NORML    | NORML    |
| Emulsi            | fied Water | scalar   | *Visual    | >0.2       | NEG      | NEG      | NEG      |
| Free W            | /ater      | scalar   | *Visual    |            | NEG      | NEG      | NEG      |
| FLUI              | D PROPERT  | IES      | method     | limit/base | current  | history1 | history2 |
| Visc @            | 40°C       | cSt      | ASTM D445  | 150        | 150      | 150      | 151      |
| SAMPLE IMAGES     |            | method   | limit/base | current    | history1 | history2 |          |
|                   |            |          |            | _          |          |          |          |

Color

Bottom





Ferrous Alloys Particle Count 491,520 122,880 30,720 7.680 lec18/1 per eb 1,920 480 Non-ferrous Metals 120 30 /av18/21 Dec18/1 Mav8/1 0ct9/1 11m feb 1 Viscosity @ 40°C (B/H0) 2.00 Acid Number 180 Abnormal Ab ber (mg 1 1.00 Ba Abr na 120 Acid N 0.00 Aug8/17. Jul11/18 Jul11/18 May18/21 May18/21 Feb14/18 Aav8/19 Mar10/20 Mar10/20 Dec18/18 Dec18/18 May8/19 0ct9/19 Feb 1.

**GRAPHIC PACKAGING** Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 Sample No. : PTK0000387 Received : 24 Nov 2023 1500 NICHOLAS BLVD Lab Number Diagnosed : 28 Nov 2023 ELK GROVE, IL :06017329 Unique Number : 10756473 : Wes Davis US 60017 Diagnostician Test Package : MOB 2 (Additional Tests: PrtCount) Contact: TONY HILDY Certificate L2367 To discuss this sample report, contact Customer Service at 1-800-237-1369. anthonyhildy@graphicpkg.com \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. T: (847)437-1700 F:

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Contact/Location: TONY HILDY - GRAELK

ISO 4406:1999 Clea -20

18

16

14

12 8