



# OIL ANALYSIS REPORT

|                 |               |
|-----------------|---------------|
| WEAR            | <b>NORMAL</b> |
| CONTAMINATION   | <b>NORMAL</b> |
| FLUID CONDITION | <b>NORMAL</b> |

Machine Id  
**CAT MARC 28**  
 Component  
**Diesel Engine**  
 Fluid  
**BRAD PENN DDS PLUS SAE 40 (--- GAL)**

## RECOMMENDATION

Resample at the next service interval to monitor.

| Test           | UOM | Method      | Limit/Abn | Current            | History1    | History2    |
|----------------|-----|-------------|-----------|--------------------|-------------|-------------|
| Sample Number  |     | Client Info |           | <b>DC0036753</b>   | DC0036556   | DC0034343   |
| Sample Date    |     | Client Info |           | <b>17 Jun 2024</b> | 29 Apr 2024 | 09 Mar 2024 |
| Machine Age    | hrs | Client Info |           | <b>0</b>           | 0           | 0           |
| Oil Age        | hrs | Client Info |           | <b>0</b>           | 0           | 0           |
| Filter Age     | hrs | Client Info |           | <b>0</b>           | 0           | 0           |
| Oil Changed    |     | Client Info |           | <b>Changed</b>     | Not Changd  | Changed     |
| Filter Changed |     | Client Info |           | <b>N/A</b>         | Not Changed | Changed     |
| Sample Status  |     |             |           | <b>NORMAL</b>      | NORMAL      | NORMAL      |

## WEAR

All component wear rates are normal.

|              |        |             |      |              |      |      |
|--------------|--------|-------------|------|--------------|------|------|
| Iron         | ppm    | ASTM D5185m | >100 | <b>11</b>    | 7    | 6    |
| Chromium     | ppm    | ASTM D5185m | >20  | <b>&lt;1</b> | <1   | <1   |
| Nickel       | ppm    | ASTM D5185m | >4   | <b>0</b>     | <1   | 0    |
| Titanium     | ppm    | ASTM D5185m |      | <b>0</b>     | <1   | 0    |
| Silver       | ppm    | ASTM D5185m | >3   | <b>0</b>     | <1   | 0    |
| Aluminum     | ppm    | ASTM D5185m | >20  | <b>1</b>     | 2    | 2    |
| Lead         | ppm    | ASTM D5185m | >40  | <b>&lt;1</b> | <1   | <1   |
| Copper       | ppm    | ASTM D5185m | >330 | <b>3</b>     | 3    | <1   |
| Tin          | ppm    | ASTM D5185m | >15  | <b>0</b>     | <1   | <1   |
| Vanadium     | ppm    | ASTM D5185m |      | <b>&lt;1</b> | <1   | 0    |
| White Metal  | scalar | *Visual     | NONE | <b>NONE</b>  | NONE | NONE |
| Yellow Metal | scalar | *Visual     | NONE | <b>NONE</b>  | NONE | NONE |

## CONTAMINATION

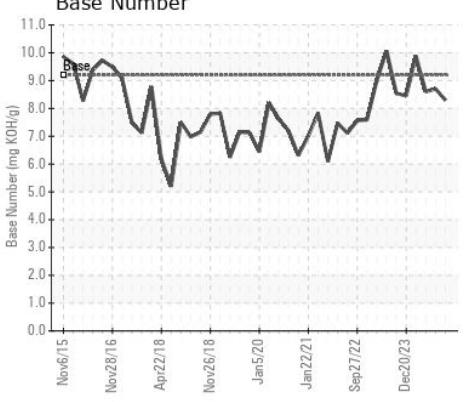
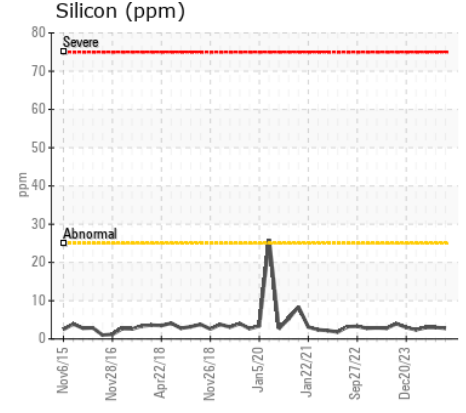
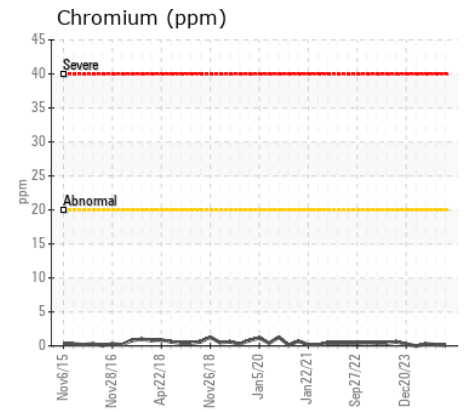
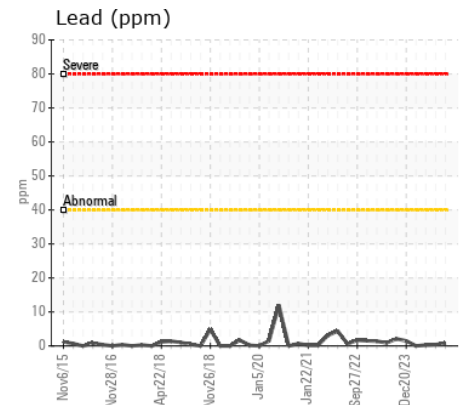
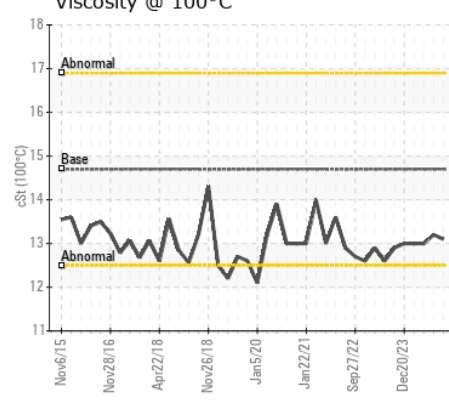
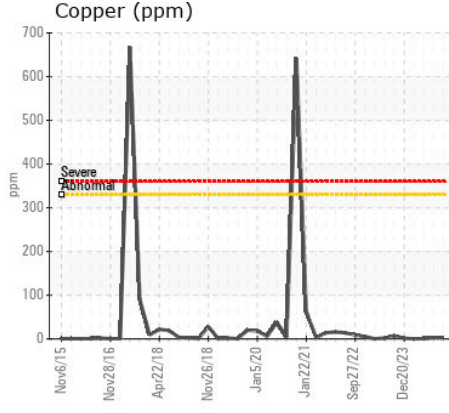
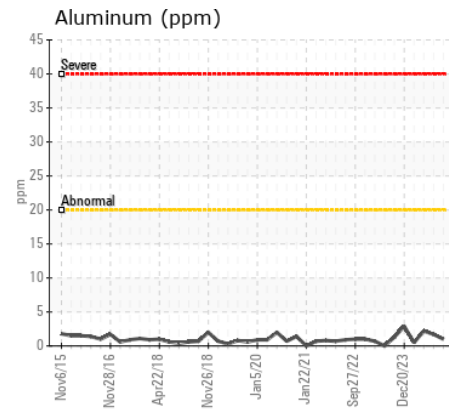
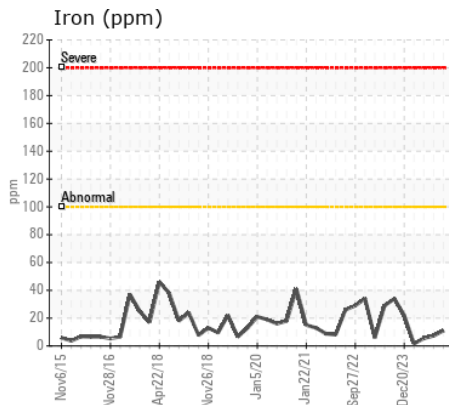
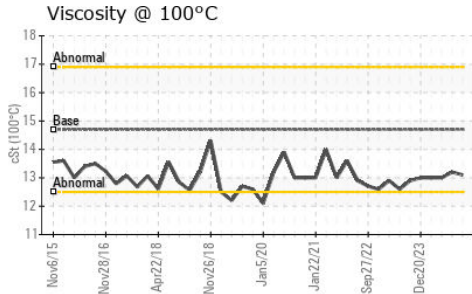
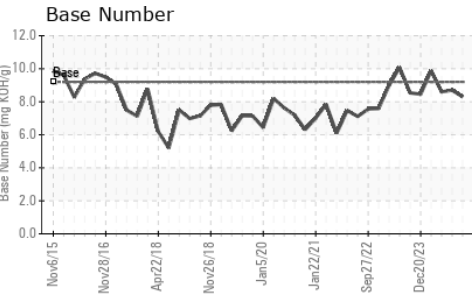
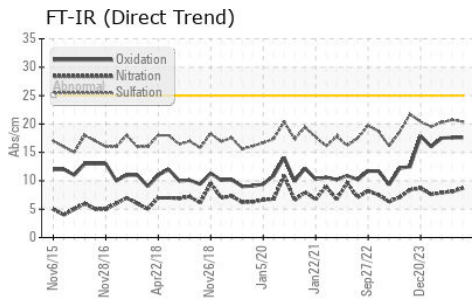
There is no indication of any contamination in the oil.

|                  |          |             |       |                |       |       |
|------------------|----------|-------------|-------|----------------|-------|-------|
| Silicon          | ppm      | ASTM D5185m | >25   | <b>3</b>       | 3     | 3     |
| Potassium        | ppm      | ASTM D5185m | >20   | <b>0</b>       | 2     | 1     |
| Fuel             |          | WC Method   | >5    | <b>&lt;1.0</b> | <1.0  | <1.0  |
| Water            |          | WC Method   | >0.2  | <b>NEG</b>     | NEG   | NEG   |
| Glycol           |          | WC Method   |       | <b>NEG</b>     | NEG   | NEG   |
| Soot %           | %        | *ASTM D7844 | >3    | <b>0.3</b>     | 0.3   | 0.2   |
| Nitration        | Abs/cm   | *ASTM D7624 | >20   | <b>8.7</b>     | 8.1   | 7.9   |
| Sulfation        | Abs/.1mm | *ASTM D7415 | >30   | <b>20.4</b>    | 20.7  | 20.3  |
| Silt             | scalar   | *Visual     | NONE  | <b>NONE</b>    | NONE  | NONE  |
| Debris           | scalar   | *Visual     | NONE  | <b>NONE</b>    | NONE  | NONE  |
| Sand/Dirt        | scalar   | *Visual     | NONE  | <b>NONE</b>    | NONE  | NONE  |
| Appearance       | scalar   | *Visual     | NORML | <b>NORML</b>   | NORML | NORML |
| Odor             | scalar   | *Visual     | NORML | <b>NORML</b>   | NORML | NORML |
| Emulsified Water | scalar   | *Visual     | >0.2  | <b>NEG</b>     | 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 |      | <b>2</b>     | 2    | 2    |
| Boron            | ppm      | ASTM D5185m |      | <b>31</b>    | 35   | 37   |
| Barium           | ppm      | ASTM D5185m |      | <b>0</b>     | 0    | 0    |
| Molybdenum       | ppm      | ASTM D5185m |      | <b>45</b>    | 44   | 48   |
| Manganese        | ppm      | ASTM D5185m |      | <b>&lt;1</b> | <1   | 0    |
| Magnesium        | ppm      | ASTM D5185m |      | <b>781</b>   | 679  | 717  |
| Calcium          | ppm      | ASTM D5185m |      | <b>1338</b>  | 1192 | 1190 |
| Phosphorus       | ppm      | ASTM D5185m |      | <b>787</b>   | 737  | 723  |
| Zinc             | ppm      | ASTM D5185m | 10   | <b>946</b>   | 848  | 878  |
| Sulfur           | ppm      | ASTM D5185m |      | <b>2813</b>  | 2499 | 2437 |
| Oxidation        | Abs/.1mm | *ASTM D7414 | >25  | <b>17.6</b>  | 17.6 | 17.5 |
| Base Number (BN) | mg KOH/g | ASTM D2896  | 9.2  | <b>8.3</b>   | 8.7  | 8.6  |
| Visc @ 100°C     | cSt      | ASTM D445   | 14.7 | <b>13.1</b>  | 13.2 | 13.0 |



Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : DC0036753  
**Lab Number** : 06217956  
**Unique Number** : 11096153  
**Test Package** : MOB 1 ( Additional Tests: TBN )

**Received** : 24 Jun 2024  
**Tested** : 25 Jun 2024  
**Diagnosed** : 25 Jun 2024 - Don Baldrige

**ALSTOM - BALTIMORE**  
 1600 LUDLOW ST  
 BALTIMORE, MD  
 US 21230  
 Contact: SEAN MCCARTY  
 sean.mccarty@rail.bombardier.com

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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