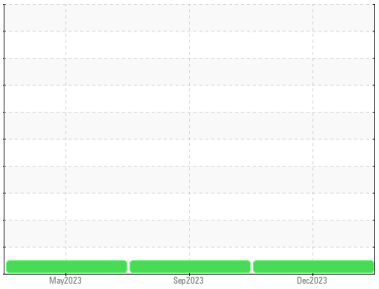
# OIL ANALYSIS REPORT

Sample Rating Trend




NORMAL

Area
## (C-GXNR)
Machine Id
## [C-GXNR] BOEING B737-200 P709396B
Component
**Left Jet Turbine**
Fluid
**BP TURBO OIL 2380 (20 LTR)**

## DIAGNOSIS

**Recommendation**
Resample at the next service interval to monitor.

**Wear**
All component wear rates are normal. The ferrography results are normal indicating no abnormal wear in the system.

**Contaminants**
The water content is negligible. There is no indication of any contamination in the oil.

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

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **WC0861293** | WC0815270 | WC0697558 |
| Sample Date | | Client Info | | **02 Dec 2023** | 02 Sep 2023 | 19 May 2023 |
| TSN | hrs | Client Info | | **47560** | 0 | 48370 |
| TSO | hrs | Client Info | | **0** | 0 | 809 |
| Oil Age | hrs | Client Info | | **0** | 0 | 0 |
| Oil Changed | | Client Info | | **N/A** | N/A | N/A |
| Sample Status | | | | **NORMAL** | NORMAL | NORMAL |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185(m) | >8 | **<1** | 1 | 2 |
| Chromium | ppm | ASTM D5185(m) | >2 | **0** | <1 | 0 |
| Nickel | ppm | ASTM D5185(m) | >2 | **<1** | <1 | <1 |
| Titanium | ppm | ASTM D5185(m) | >2 | **0** | 0 | 0 |
| Silver | ppm | ASTM D5185(m) | >2 | **0** | <1 | 0 |
| Aluminum | ppm | ASTM D5185(m) | >2 | **<1** | <1 | <1 |
| Lead | ppm | ASTM D5185(m) | >3 | **<1** | 0 | <1 |
| Copper | ppm | ASTM D5185(m) | >3 | **0** | <1 | 0 |
| Tin | ppm | ASTM D5185(m) | >2 | **0** | 0 | 0 |
| Antimony | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Vanadium | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Beryllium | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Cadmium | ppm | ASTM D5185(m) | | **0** | 0 | <1 |

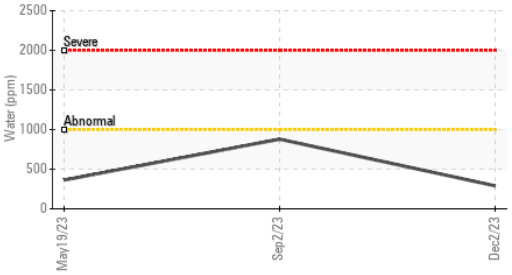
| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185(m) | 0 | **0** | <1 | 1 |
| Barium | ppm | ASTM D5185(m) | 0 | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185(m) | 0 | **0** | 0 | 0 |
| Manganese | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Magnesium | ppm | ASTM D5185(m) | 0 | **<1** | <1 | 0 |
| Calcium | ppm | ASTM D5185(m) | 0 | **<1** | 0 | 0 |
| Phosphorus | ppm | ASTM D5185(m) | 2500 | **2266** | 2194 | 2266 |
| Zinc | ppm | ASTM D5185(m) | 0 | **<1** | 1 | <1 |
| Sulfur | ppm | ASTM D5185(m) | 0 | **0** | 3 | 2 |
| Lithium | ppm | ASTM D5185(m) | | **<1** | <1 | <1 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185(m) | >8 | **0** | 1 | 1 |
| Sodium | ppm | ASTM D5185(m) | | **0** | <1 | 1 |
| Potassium | ppm | ASTM D5185(m) | >20 | **<1** | <1 | 0 |
| Water | % | ASTM D6304* | >0.1 | **0.028** | 0.087 | 0.036 |
| ppm Water | ppm | ASTM D6304* | >1000 | **290** | 879.0 | 362.7 |

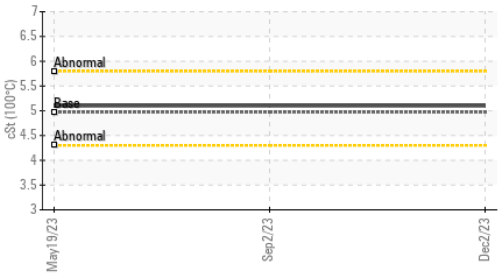
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Acid Number (AN) | mg KOH/g | ASTM D974* | 0.43 | **0.13** | 0.07 | 0.08 |

# OIL ANALYSIS REPORT

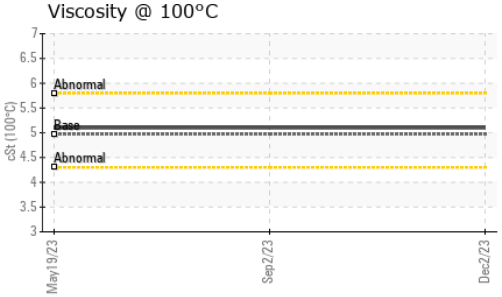
Water (KF)



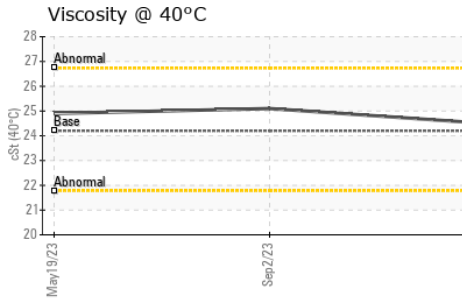

Viscosity @ 100°C




Viscosity @ 100°C




Viscosity @ 40°C



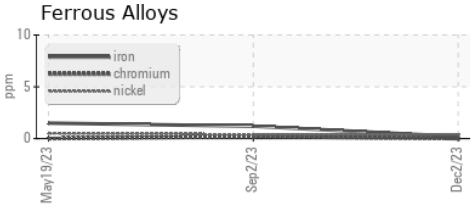

| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | Visual* | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | Visual* | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | Visual* | NONE | **NONE** | NONE | NONE |
|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

| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 40°C | cSt | ASTM D7279(m) | 24.2 | **24.5** | 25.1 | 24.9 |
| Visc @ 100°C | cSt | ASTM D7279(m) | 4.97 | **5.1** | 5.1 | 5.1 |
| Viscosity Index (VI) | Scale | ASTM D2270* | 134 | **141** | 135 | 137 |

| SAMPLE IMAGES | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|
| Color | | |  | | |
| Bottom | | |  | | |

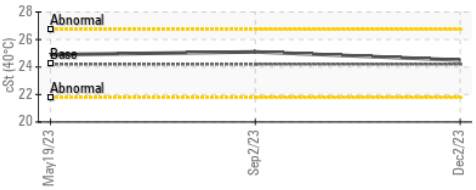
## GRAPHS

Ferrous Alloys

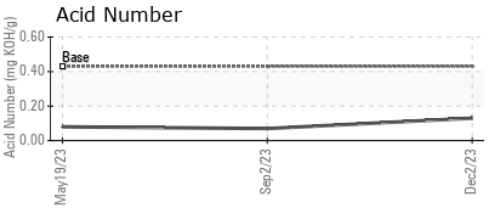



Non-ferrous Metals


Viscosity @ 40°C




Acid Number




ISO 17025:2017 Accredited Laboratory

**Laboratory** : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
**Sample No.** : WC0861293
**Lab Number** : 02604620
**Unique Number** : 5697705
**Test Package** : AVI 3

**Recieved** : 21 Dec 2023
**Diagnosed** : 27 Dec 2023
**Diagnostician** : Kevin Marson

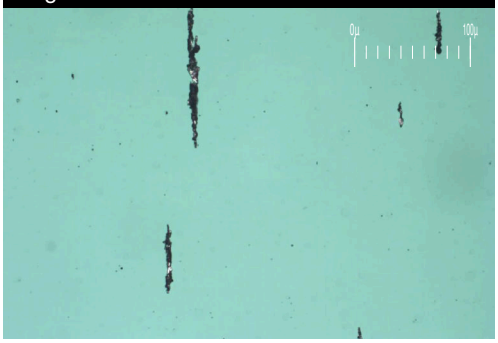
**GLENCORE XSTRATA AVIATION -RAGLAN MINE**
2450 DERRY ROAD EAST, HANGAR # 1
MISSISSAUGA, ON
CA L5S 1B2
Contact: Jeff Rogers
jeffrey.rogers@glencore.ca
T: (905)677-2991
F: (905)677-6616

*To discuss this sample report, contact Customer Service at 1-800-268-2131.*
*Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab.*
*Validity of results and interpretation are based on the sample and information as supplied.*

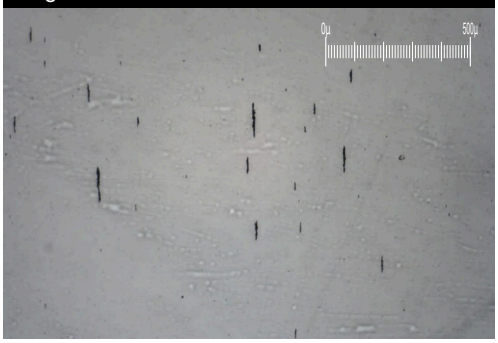
# FERROGRAPHY REPORT

Area
## (C-GXNR)
Machine Id
## [C-GXNR] BOEING B737-200 P709396B
Component
**Left Jet Turbine**
Fluid
**BP TURBO OIL 2380 (20 LTR)**

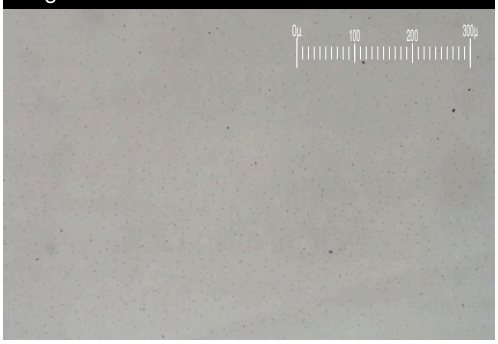
Magn: 200x Illum: BC



Magn: 50x Illum: RW



Magn: 100x Illum: RW

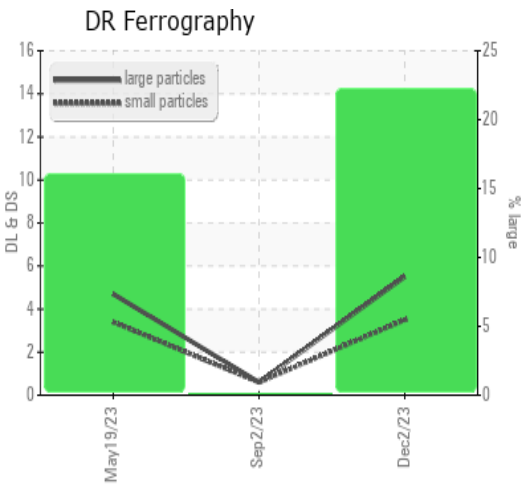


| DR-FERROGRAPHY | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Large Particles | | DR-Ferr* | | **5.5** | 0.6 | 4.7 |
| Small Particles | | DR-Ferr* | | **3.5** | 0.6 | 3.4 |
| Total Particles | | DR-Ferr* | >--- | **9** | 1.2 | 8.1 |
| Large Particles Percentage | % | DR-Ferr* | | **22.2** | 0 | 16 |
| Severity Index | | DR-Ferr* | | **11** | 0 | 6 |

| FERROGRAPHY | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Ferrous Rubbing | Scale 0-10 | ASTM D7684* | | **2** | 2 | 2 |
| Ferrous Sliding | Scale 0-10 | ASTM D7684* | | | | |
| Ferrous Cutting | Scale 0-10 | ASTM D7684* | | | | |
| Ferrous Rolling | Scale 0-10 | ASTM D7684* | | **1** | 1 | 1 |
| Ferrous Break-in | Scale 0-10 | ASTM D7684* | | | | |
| Ferrous Spheres | Scale 0-10 | ASTM D7684* | | | | |
| Ferrous Black Oxides | Scale 0-10 | ASTM D7684* | | **1** | | |
| Ferrous Red Oxides | Scale 0-10 | ASTM D7684* | | | | |
| Ferrous Corrosive | Scale 0-10 | ASTM D7684* | | | | |
| Ferrous Other | Scale 0-10 | ASTM D7684* | | | | |
| Nonferrous Rubbing | Scale 0-10 | ASTM D7684* | | | | |
| Nonferrous Sliding | Scale 0-10 | ASTM D7684* | | | | |
| Nonferrous Cutting | Scale 0-10 | ASTM D7684* | | | | |
| Nonferrous Rolling | Scale 0-10 | ASTM D7684* | | | | |
| Nonferrous Other | Scale 0-10 | ASTM D7684* | | | | |
| Carbonaceous Material | Scale 0-10 | ASTM D7684* | | | | |
| Lubricant Degradation | Scale 0-10 | ASTM D7684* | | | | |
| Sand/Dirt | Scale 0-10 | ASTM D7684* | | **1** | 1 | 1 |
| Fibres | Scale 0-10 | ASTM D7684* | | | | |
| Spheres | Scale 0-10 | ASTM D7684* | | | | |
| Other | Scale 0-10 | ASTM D7684* | | **1** | 1 | 1 |

## WEAR

All component wear rates are normal. The ferrography results are normal indicating no abnormal wear in the system.



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