

# **PROBLEM SUMMARY**

Sample Rating Trend

VISUAL METAL

Machine Id 43 Component Turbine

**R&O OIL ISO 68 (--- QTS)** 

# **COMPONENT CONDITION SUMMARY**

No relevant graphs to display

## RECOMMENDATION

We recommend you service the filters on this component if applicable. Resample at the next service interval to monitor. We were unable to perform a particle count due to metal particles present in this sample.

PROBLEMATIC T	EST RE	SULTS				
Sample Status				ABNORMAL	ATTENTION	NORMAL
White Metal	scalar	*Visual	NONE	▲ MODER	VLITE	NONE

Customer Id: COLALB Sample No.: WC0813283 Lab Number: 05923399 Test Package: IND 2

To manage this report scan the QR code

To discuss the diagnosis or test data:

Don Baldridge +1 don.b505@comcast.net

To change component or sample information: Customer Service +1 1-800-237-1369 customerservice@wearcheck.com

### **RECOMMENDED ACTIONS**

Action	Status	Date	Done By	Description
Change Filter			?	We recommend you service the filters on this component if applicable.
Alert			?	We were unable to perform a particle count due to metal particles present in this sample.

## HISTORICAL DIAGNOSIS

### 14 Sep 2022 Diag: Jonathan Hester

ISO



No corrective action is recommended at this time. Resample at the next service interval to monitor. All component wear rates are normal. There is a moderate amount of silt (particulates < 14 microns in size) present in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.



## 16 Nov 2021 Diag: Doug Bogart

NORMAL



Resample at the next service interval to monitor. All component wear rates are normal. There is no indication of any contamination in the component. The amount and size of particulates present in the system is acceptable. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.



## 08 Sep 2020 Diag: Don Baldridge

WEAR



We recommend you service the filters on this component. We recommend an early resample to monitor this condition. The iron level is abnormal. There is a high amount of particulates present in the oil. The AN level is acceptable for this fluid. The condition of the oil is acceptable for the time in service.





# **OIL ANALYSIS REPORT**

Sample Rating Trend



**VISUAL METAL** 



Machine Id 43 Component **Turbine** 

**R&O OIL ISO 68 (--- QTS)** 

# **DIAGNOSIS**

### Recommendation

We recommend you service the filters on this component if applicable. Resample at the next service interval to monitor. We were unable to perform a particle count due to metal particles present in this sample.

## Wear

Moderate concentration of visible metal present. All component wear rates are normal.

#### Contamination

No other contaminants were detected in the oil.

### **Fluid Condition**

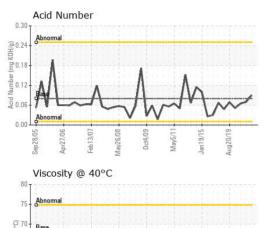
The AN level is acceptable for this fluid. The condition of the oil is acceptable for the time in service.

Sample Date         Client Info         13 Aug 2023         14 Sep 2022         16 Nov 2021           Machine Age         hrs         Client Info         0         0         0         0           Oil Age         hrs         Client Info         0         0         0         0           Oil Changed         Client Info         N/A         N/A         N/A         N/A           Sample Status         Client Info         N/A         N/A         N/A         N/A           WEAR METALS         method         Ilmil/base         current         history1         history2           Iron         ppm         ASTM D5185m         >15         8         5         8           Chromium         ppm         ASTM D5185m         >2         0         0         0         1           Nikckel         ppm         ASTM D5185m         >2         0         0         0         0           Aluminum         ppm         ASTM D5185m         >1         <1         <1         0         0           Lead         ppm         ASTM D5185m         >5         8         9         9         9           Tin         ppm         ASTM D5185m <td< th=""><th></th><th></th><th>32005 Apr20</th><th>06 Feb2007 May2008</th><th>Oct2009 May2011 Jan2015 /</th><th>Aug2019</th><th></th></td<>			32005 Apr20	06 Feb2007 May2008	Oct2009 May2011 Jan2015 /	Aug2019	
Sample Date         Client Info         13 Aug 2023         14 Sep 2022         16 Nov 2021           Machine Age         hrs         Client Info         0         0         0         0           Oil Age         hrs         Client Info         0         0         0         0           Oil Changed         Client Info         N/A         N/A         N/A         N/A           Sample Status         Client Info         N/A         N/A         N/A         N/A           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM DS185m         >15         8         5         8           Chromium         ppm         ASTM DS185m         >4         0         0         <1	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         0         0         0         0           Oil Age         hrs         Client Info         0         0         0         0           Oil Changed         Client Info         N/A         N/A         N/A         N/A         N/A           Sample Status         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >15         8         5         8           Chromium         ppm         ASTM D5185m         >4         0         0         <1	Sample Number		Client Info		WC0813283	WC0700755	WC0577575
Oil Age         hrs         Client Info         N/A         N/A         N/A         N/A           Sample Status         Client Info         N/A         N/A         N/A         N/A           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >15         8         5         8           Chromium         ppm         ASTM D5185m         >4         0         0         <1           Nickel         ppm         ASTM D5185m         >2         0         0         0           Nickel         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         0         <1         0         0           Aluminum         ppm         ASTM D5185m         5         8         9         9           Itin         ppm         ASTM D5185m         5         4         9         9           Itin         ppm         ASTM D5185m         5         4         9         9           Tin         ppm         ASTM D5185m         5         4         1         0         <	Sample Date		Client Info		13 Aug 2023	14 Sep 2022	16 Nov 2021
Oil Changed Sample Status	Machine Age	hrs	Client Info		0	0	0
Sample Status         method         limit/base         current         history1         history2           Iron         ppm         ASTM DS185m         >15         8         5         8           Chromium         ppm         ASTM DS185m         >4         0         0         <1           Nickel         ppm         ASTM DS185m         >2         0         0         0           Silver         ppm         ASTM DS185m         <1         0         0           Osliver         ppm         ASTM DS185m         0         <1         0           Opper         ppm         ASTM DS185m         0         <1         <1           Copper         ppm         ASTM DS185m         >5         8         9         9           Tin         ppm         ASTM DS185m         >5         <1         <1         <1         <1           Antimony         ppm         ASTM DS185m         >5         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1	Oil Age	hrs	Client Info		0	0	0
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >15         8         5         8           Chromium         ppm         ASTM D5185m         >4         0         0         <1           Nickel         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         <1         0         0         <1         0           Aluminum         ppm         ASTM D5185m         0         <1         <1         0            Aluminum         ppm         ASTM D5185m         0         <1         <1         0            Aluminum         ppm         ASTM D5185m         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 <th>Oil Changed</th> <th></th> <th>Client Info</th> <th></th> <th>N/A</th> <th>N/A</th> <th>N/A</th>	Oil Changed		Client Info		N/A	N/A	N/A
Iron	Sample Status				ABNORMAL	ATTENTION	NORMAL
Chromium         ppm         ASTM D5185m         >4         0         0         <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >2	Iron	ppm	ASTM D5185m	>15	8	5	8
Titanium ppm ASTM D5185m	Chromium	ppm	ASTM D5185m	>4	0	0	<1
Silver	Nickel	ppm	ASTM D5185m	>2	0	0	0
Aluminum         ppm         ASTM D5185m         >10         <1         <1         0           Lead         ppm         ASTM D5185m         0         <1	Titanium	ppm	ASTM D5185m		<1	0	0
Lead         ppm         ASTM D5185m         0         <1         <1           Copper         ppm         ASTM D5185m         >5         8         9         9           Tin         ppm         ASTM D5185m         >5         <1         <1         <1           Antimony         ppm         ASTM D5185m           0           Vanadium         ppm         ASTM D5185m         <1         0         0           Cadmium         ppm         ASTM D5185m         <0         0         0           Cadmium         ppm         ASTM D5185m         5         <1         0         0           Boron         ppm         ASTM D5185m         5         <1         0         0         0           Barium         ppm         ASTM D5185m         5         <1         0         0         0           Molybdenum         ppm         ASTM D5185m         5         <1         0         0         0           Magnesium         ppm         ASTM D5185m         5         <7         0         <1         0         <1           Calcium         ppm         ASTM D5185m         5         2         0 </td <td>Silver</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <th>0</th> <td>&lt;1</td> <td>0</td>	Silver	ppm	ASTM D5185m		0	<1	0
Copper         ppm         ASTM D5185m         >5         8         9         9           Tin         ppm         ASTM D5185m         >5         <1	Aluminum	ppm	ASTM D5185m	>10	<1	<1	0
Tin ppm ASTM D5185m >5	Lead	ppm	ASTM D5185m		0	<1	<1
Tin ppm ASTM D5185m >5 <1 <1 <1 <1	Copper	ppm	ASTM D5185m	>5	8	9	9
Vanadium         ppm         ASTM D5185m         <1         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         5         0         0         0           Barium         ppm         ASTM D5185m         5         <1         0         0           Molybdenum         ppm         ASTM D5185m         5         <1         0         0           Manganese         ppm         ASTM D5185m         5         0         0         0           Magnesium         ppm         ASTM D5185m         5         7         0         <1           Calcium         ppm         ASTM D5185m         5         2         0         10           Phosphorus         ppm         ASTM D5185m         100         12         9         12           Zinc         ppm         ASTM D5185m         15         2         0         10           Phosphorus         ppm         ASTM D5185m         1500         19         35         126           CONTAMINANTS         method         limit/base         current         history1         histor	Tin	ppm	ASTM D5185m	>5	<1	<1	<1
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         5         0         0         0           Barium         ppm         ASTM D5185m         5         <1         0         0           Molybdenum         ppm         ASTM D5185m         5         <1         0         0           Manganese         ppm         ASTM D5185m         5         7         0         <1           Magnesium         ppm         ASTM D5185m         5         2         0         10           Phosphorus         ppm         ASTM D5185m         5         2         0         10           Phosphorus         ppm         ASTM D5185m         1500         19         35         126           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         <1         0         0           Sodium         ppm         ASTM D5185m         1         0         0         0	Antimony	ppm	ASTM D5185m				0
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         5         0         0         0           Barium         ppm         ASTM D5185m         5         <1	Vanadium	ppm	ASTM D5185m		<1	0	0
Boron         ppm         ASTM D5185m         5         0         0         0           Barium         ppm         ASTM D5185m         5         <1         0         0           Molybdenum         ppm         ASTM D5185m         5         0         0         0           Manganese         ppm         ASTM D5185m         5         7         0         <1           Magnesium         ppm         ASTM D5185m         5         2         0         10           Magnesium         ppm         ASTM D5185m         5         2         0         10           Phosphorus         ppm         ASTM D5185m         100         12         9         12           Zinc         ppm         ASTM D5185m         1500         19         35         126           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         <1         0         0           Sodium         ppm         ASTM D5185m         >20         0         1         0           FLUID CLEANLINES         method         limit/base         current         history	Cadmium	ppm	ASTM D5185m		0	0	0
Boron         ppm         ASTM D5185m         5         0         0         0           Barium         ppm         ASTM D5185m         5         <1	ADDITIVES		method	limit/base	current	history1	history2
Barium         ppm         ASTM D5185m         5         <1	Boron	ppm	ASTM D5185m	5	0	0	0
Molybdenum         ppm         ASTM D5185m         5         0         0         0           Manganese         ppm         ASTM D5185m         <1         0         <1           Magnesium         ppm         ASTM D5185m         5         7         0         <1           Calcium         ppm         ASTM D5185m         5         2         0         10           Phosphorus         ppm         ASTM D5185m         100         12         9         12           Zinc         ppm         ASTM D5185m         25         29         11         5           Sulfur         ppm         ASTM D5185m         25         29         11         0         0           Sodium         ppm         ASTM D5185m         15         <1         0         0         0           Sodium         ppm         ASTM D5185m         1         0	Barium		ASTM D5185m	5	<1	0	0
Manganese         ppm         ASTM D5185m         <1         0         <1           Magnesium         ppm         ASTM D5185m         5         7         0         <1	Molvbdenum		ASTM D5185m	5	0	0	0
Magnesium         ppm         ASTM D5185m         5         7         0         <1           Calcium         ppm         ASTM D5185m         5         2         0         10           Phosphorus         ppm         ASTM D5185m         100         12         9         12           Zinc         ppm         ASTM D5185m         25         29         11         5           Sulfur         ppm         ASTM D5185m         1500         19         35         126           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         <1         0         0           Sodium         ppm         ASTM D5185m         >15         <1         0         0           Potassium         ppm         ASTM D5185m         >20         0         1         0           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >1300          △         1391         823           Particles >21µm         ASTM D7647         >40 <td>•</td> <td></td> <td></td> <td></td> <th>&lt;1</th> <td>0</td> <td>&lt;1</td>	•				<1	0	<1
Calcium         ppm         ASTM D5185m         5         2         0         10           Phosphorus         ppm         ASTM D5185m         100         12         9         12           Zinc         ppm         ASTM D5185m         25         29         11         5           Sulfur         ppm         ASTM D5185m         1500         19         35         126           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         <1	•		ASTM D5185m	5	7	0	<1
Phosphorus         ppm         ASTM D5185m         100         12         9         12           Zinc         ppm         ASTM D5185m         25         29         11         5           Sulfur         ppm         ASTM D5185m         1500         19         35         126           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         <1				5	2	0	10
Zinc         ppm         ASTM D5185m         25         29         11         5           Sulfur         ppm         ASTM D5185m         1500         19         35         126           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >1         0         0           Sodium         ppm         ASTM D5185m         1         0         0           Potassium         ppm         ASTM D5185m         >20         0         1         0           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >1300          10229         23204           Particles >6µm         ASTM D7647         >1300          41391         823           Particles >21µm         ASTM D7647         >10          65         7           Particles >21µm         ASTM D7647         >10          12         0           Particles >71µm         ASTM D7647         >3          1         0           Particles					12		
Sulfur         ppm         ASTM D5185m         1500         19         35         126           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         <1							
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         <1         0         0           Sodium         ppm         ASTM D5185m         1         0         0           Potassium         ppm         ASTM D5185m         >20         0         1         0           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647          10229         23204           Particles >6μm         ASTM D7647         >1300          Δ         1391         823           Particles >14μm         ASTM D7647         >160          65         7           Particles >21μm         ASTM D7647         >40          12         0           Particles >38μm         ASTM D7647         >3          1         0           Particles >71μm         ASTM D7647         >3          1         0           Oil Cleanliness         ISO 4406 (c)         >/17/14          Δ         21/18/13         22/17/10	Sulfur				-		
Silicon         ppm         ASTM D5185m         >15         <1	CONTAMINANTS		method	limit/base	current	history1	history2
Sodium         ppm         ASTM D5185m         1         0         0           Potassium         ppm         ASTM D5185m         >20         0         1         0           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647          10229         23204           Particles >6μm         ASTM D7647         >1300          1391         823           Particles >14μm         ASTM D7647         >160          65         7           Particles >21μm         ASTM D7647         >40          12         0           Particles >38μm         ASTM D7647         >10          2         0           Particles >71μm         ASTM D7647         >3          1         0           Oil Cleanliness         ISO 4406 (c)         >/17/14          Δ         21/18/13         22/17/10           FLUID DEGRADATION         method         limit/base         current         history1         history2				>15	<1		
Potassium         ppm         ASTM D5185m         >20         0         1         0           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647          10229         23204           Particles >6μm         ASTM D7647         >1300          1391         823           Particles >14μm         ASTM D7647         >160          65         7           Particles >21μm         ASTM D7647         >40          12         0           Particles >38μm         ASTM D7647         >10          2         0           Particles >71μm         ASTM D7647         >3          1         0           Oil Cleanliness         ISO 4406 (c)         >/17/14          Δ         21/18/13         22/17/10           FLUID DEGRADATION         method         limit/base         current         history1         history2			ASTM D5185m				
Particles >4μm       ASTM D7647        10229       23204         Particles >6μm       ASTM D7647       >1300        Δ 1391       823         Particles >14μm       ASTM D7647       >160        65       7         Particles >21μm       ASTM D7647       >40        12       0         Particles >38μm       ASTM D7647       >10        2       0         Particles >71μm       ASTM D7647       >3        1       0         Oil Cleanliness       ISO 4406 (c)       >/17/14        Δ 21/18/13       22/17/10         FLUID DEGRADATION       method       limit/base       current       history1       history2	Potassium			>20		1	0
Particles >6μm       ASTM D7647       >1300        ▲ 1391       823         Particles >14μm       ASTM D7647       >160        65       7         Particles >21μm       ASTM D7647       >40        12       0         Particles >38μm       ASTM D7647       >10        2       0         Particles >71μm       ASTM D7647       >3        1       0         Oil Cleanliness       ISO 4406 (c)       >/17/14        ▲ 21/18/13       22/17/10         FLUID DEGRADATION       method       limit/base       current       history1       history2	FLUID CLEANLIN	IESS	method	limit/base	current	history1	history2
Particles >14μm         ASTM D7647         >160          65         7           Particles >21μm         ASTM D7647         >40          12         0           Particles >38μm         ASTM D7647         >10          2         0           Particles >71μm         ASTM D7647         >3          1         0           Oil Cleanliness         ISO 4406 (c)         >/17/14          Δ 21/18/13         22/17/10           FLUID DEGRADATION         method         limit/base         current         history1         history2	Particles >4µm		ASTM D7647			10229	23204
Particles >14μm         ASTM D7647         >160          65         7           Particles >21μm         ASTM D7647         >40          12         0           Particles >38μm         ASTM D7647         >10          2         0           Particles >71μm         ASTM D7647         >3          1         0           Oil Cleanliness         ISO 4406 (c)         >/17/14          Δ 21/18/13         22/17/10           FLUID DEGRADATION         method         limit/base         current         history1         history2	Particles >6µm		ASTM D7647	>1300		<u> </u>	823
Particles >21μm         ASTM D7647         >40          12         0           Particles >38μm         ASTM D7647         >10          2         0           Particles >71μm         ASTM D7647         >3          1         0           Oil Cleanliness         ISO 4406 (c)         >/17/14          Δ 21/18/13         22/17/10           FLUID DEGRADATION         method         limit/base         current         history1         history2	Particles >14μm						
Particles >38μm         ASTM D7647         >10          2         0           Particles >71μm         ASTM D7647         >3          1         0           Oil Cleanliness         ISO 4406 (c)         >/17/14          Δ         21/18/13         22/17/10           FLUID DEGRADATION         method         limit/base         current         history1         history2	•		ASTM D7647				
Particles >71μm         ASTM D7647         >3          1         0           Oil Cleanliness         ISO 4406 (c)         >/17/14          ▲ 21/18/13         22/17/10           FLUID DEGRADATION method limit/base current history1         history2							
Oil Cleanliness         ISO 4406 (c)         >/17/14          ▲ 21/18/13         22/17/10           FLUID DEGRADATION         method         limit/base         current         history1         history2	·						
FLUID DEGRADATION method limit/base current history1 history2	Oil Cleanliness						
•		ATION	method	limit/base	current		historv2
	Acid Number (AN)		ASTM D8045		0.09		



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# **OIL ANALYSIS REPORT**

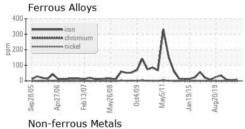


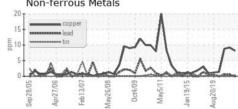
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	▲ MODER	VLITE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	LIGHT	VLITE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	scalar	*Visual	>0.03	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445	68	67.6	67.7	68.1
SAMPLE IMAGES		method	limit/base	current	history1	history2

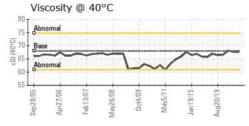
## **GRAPHS**

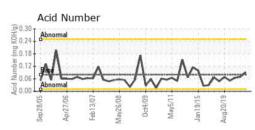
Color

**Bottom** 













Certificate L2367

Laboratory Sample No. Lab Number Unique Number : 10603346

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : 05923399

: WC0813283

Received Diagnosed

: 14 Aug 2023 : 15 Aug 2023

Diagnostician : Don Baldridge

Test Package : IND 2 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.

**AURIA SOLUTIONS** 

P.O. Box 580 Albemarle, NC US 28001

Contact: STEPHEN MOSS

smoss@iacna.com T: (704)983-8334 F: (704)983-8372

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