

# **OIL ANALYSIS REPORT**

## Sample Rating Trend

# NORMAL



# Machine Id CATERPILLAR RH BEYMER Component

Starboard Genset

KENDALL SUPER-D XA 15W40 (--- GAL)

# DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil

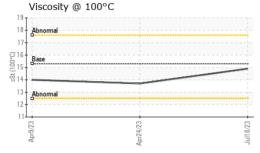
### **Fluid Condition**

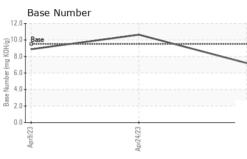
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

			2023	Apr2023 Jul202		
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC05902915	WC05829133	WC05816245
Sample Date		Client Info		18 Jul 2023	24 Apr 2023	09 Apr 2023
Machine Age	hrs	Client Info		16127	14996	14996
Oil Age	hrs	Client Info		0	0	0
Oil Changed		Client Info		N/A	Changed	N/A
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATIO	٧	method	limit/base	current	history1	history2
Fuel		WC Method	>4.0	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>25	14	9	10
Chromium	ppm	ASTM D5185m	>5	<1	0	<1
Nickel	ppm	ASTM D5185m	>5	0	0	0
Titanium	ppm	ASTM D5185m		28	40	48
Silver	ppm	ASTM D5185m	>5	0	0	0
Aluminum	ppm	ASTM D5185m	>10	2	1	1
Lead	ppm	ASTM D5185m	>10	1	0	0
Copper	ppm	ASTM D5185m	>20	2	0	<1
Tin	ppm	ASTM D5185m	>5	<1	0	0
Vanadium	ppm	ASTM D5185m		<1	<1	<1
Cadmium	ppm	ASTM D5185m		0	0	0
				· ·	O	•
ADDITIVES	"	method	limit/base	current	history1	history2
ADDITIVES Boron	ppm		limit/base			
		method		current	history1	history2
Boron	ppm	method ASTM D5185m		current 37	history1 87	history2
Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m		current 37 0	history1 87 0	history2 73 0
Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	50	current 37 0 18	history1  87  0  42  <1  256	history2 73 0 28
Boron Barium Molybdenum Manganese	ppm ppm ppm	method  ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	50	current 37 0 18 <1	history1  87  0 42 <1	history2 73 0 28 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	method  ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	270	current 37 0 18 <1 145	history1  87  0  42  <1  256	history2 73 0 28 <1 253
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	method  ASTM D5185m	270 1900	current  37  0  18  <1  145  3136	history1  87  0 42 <1 256 2020	history2  73  0  28  <1  253  2275
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	method  ASTM D5185m	270 1900 1000	current  37  0  18  <1  145  3136  1029	history1  87  0 42  <1 256 2020 949	history2  73  0 28  <1 253 2275 992
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	270 1900 1000 1260	current  37 0 18 <1 145 3136 1029 1292	history1  87  0 42 <1 256 2020 949 1218	history2  73  0  28  <1  253  2275  992  1263
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	method  ASTM D5185m	270 1900 1000 1260 3400	current  37 0 18 <1 145 3136 1029 1292 4611	history1  87  0  42  <1  256  2020  949  1218  4354  history1	history2  73  0  28  <1  253  2275  992  1263  4477
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	270 1900 1000 1260 3400 limit/base	current  37 0 18 <1 145 3136 1029 1292 4611 current	history1  87  0 42 <1 256 2020 949 1218 4354 history1	history2  73  0  28  <1  253  2275  992  1263  4477  history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	270 1900 1000 1260 3400 limit/base	current  37 0 18 <1 145 3136 1029 1292 4611 current 3	history1  87  0  42  <1  256  2020  949  1218  4354  history1	history2  73  0  28  <1  253  2275  992  1263  4477  history2  3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method  ASTM D5185m	270 1900 1000 1260 3400 limit/base >25	current  37 0 18 <1 145 3136 1029 1292 4611 current 3 4 3 current	history1  87  0 42 <1 256 2020 949 1218 4354 history1  3 2 0 history1	history2  73  0  28  <1  253  2275  992  1263  4477  history2  3  2  1  history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	270 1900 1000 1260 3400 limit/base >25 >20	current  37 0 18 <1 145 3136 1029 1292 4611 current 3 4 3	history1  87  0  42  <1  256  2020  949  1218  4354  history1  3  2  0	history2  73  0  28  <1  253  2275  992  1263  4477  history2  3  2  1  history2  0.1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method  ASTM D5185m	270 1900 1000 1260 3400 limit/base >25 >20	current  37 0 18 <1 145 3136 1029 1292 4611 current 3 4 3 current	history1  87  0 42 <1 256 2020 949 1218 4354 history1  3 2 0 history1	history2  73  0  28  <1  253  2275  992  1263  4477  history2  3  2  1  history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method  ASTM D5185m  method  *ASTM D5185m  ASTM D5185m  ASTM D5185m  ASTM D5185m  ASTM D5185m  ASTM D5185m  ASTM D5185m	270 1900 1000 1260 3400 limit/base >25 >20	current  37 0 18 <1 145 3136 1029 1292 4611 current 3 4 3 current 0.1	history1  87  0 42 <1 256 2020 949 1218 4354 history1  3 2 0 history1 0.1	history2  73  0  28  <1  253  2275  992  1263  4477  history2  3  2  1  history2  0.1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method  ASTM D5185m  method  ASTM D5185m ASTM D5185m  ASTM D5185m  ASTM D5185m  ASTM D5185m  ASTM D5185m  ASTM D5185m  ASTM D5185m  ASTM D5185m	270 1900 1000 1260 3400 limit/base >25 >20	current  37 0 18 <1 145 3136 1029 1292 4611 current 3 4 3 current 0.1 10.9	history1  87  0 42 <1 256 2020 949 1218 4354 history1 3 2 0 history1 0.1 8.5	history2  73  0  28  <1  253  2275  992  1263  4477  history2  3  2  1  history2  0.1  9.4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method  ASTM D5185m  method  ASTM D5185m ASTM D5185m  *ASTM D5185m ASTM D5185m  *ASTM D5185m ASTM D5185m ASTM D5185m  *ASTM D5185m ASTM D5185m  *ASTM D5185m  *ASTM D7844  *ASTM D7624  *ASTM D76185m	270 1900 1000 1260 3400 limit/base >25 >20 limit/base	current  37 0 18 <1 145 3136 1029 1292 4611 current 3 4 3 current 0.1 10.9 21.5	history1  87  0  42  <1  256  2020  949  1218  4354  history1  3  2  0  history1  0.1  8.5  19.0	history2  73  0  28  <1  253  2275  992  1263  4477  history2  3  2  1  history2  0.1  9.4  20.4



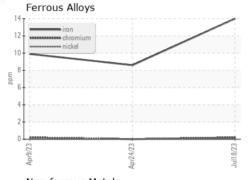
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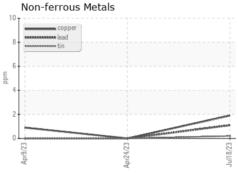


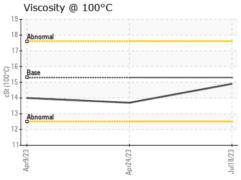


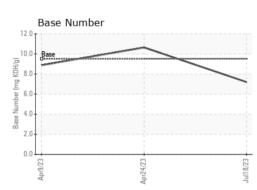
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	scalar	*Visual	>0.1	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

FLUID PROPERTIES		method				history2
Visc @ 100°C	cSt	ASTM D445	15.3	14.9	13.7	14.0













Certificate L2367

Laboratory Sample No. Lab Number Test Package : MAR 2

Unique Number : 10564271

: WC05902915 : 05902915

To discuss this sample report, contact Customer Service at 1-800-237-1369.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 19 Jul 2023 Diagnosed Diagnostician : Sean Felton

: 21 Jul 2023

**SUPERIOR MARINE WAYS** 5852 CO RD 1 SOUTH POINT, OH

US 45680 Contact: DARRELL KEARNS

darrellkerns@superiormarineinc.com T: (740)894-6224

\* - 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)