

# **OIL ANALYSIS REPORT**

Sample Rating Trend





CATERPILLAR STEPHEN T

Port Main Engine

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.

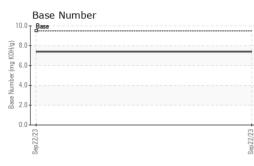
## Fluid Condition

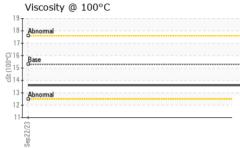
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0843995		
Sample Date		Client Info		22 Sep 2023		
Machine Age	hrs	Client Info		18312		
Oil Age	hrs	Client Info		500		
Oil Changed		Client Info		Changed		
Sample Status				NORMAL		
CONTAMINATION	N	method	limit/base	current	history1	history2
Fuel		WC Method	>4.0	<1.0		
Glycol		WC Method		NEG		
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>120	6		
Chromium	ppm	ASTM D5185m	>10	0		
Nickel	ppm	ASTM D5185m	>5	0		
Titanium	ppm	ASTM D5185m		34		
Silver	ppm	ASTM D5185m	>5	0		
Aluminum	ppm	ASTM D5185m	>20	۰ <1		
Lead	ppm	ASTM D5185m	>20	<1		
Copper		ASTM D5185m		2		
Tin	ppm	ASTM D5185m	>10	ء <1		
Vanadium	ppm	ASTM D5185m	>10	0		
	ppm			0		
Cadmium	ppm	ASTM D5185m		U		
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 50	current 107	history1	history2
	ppm ppm					
Boron		ASTM D5185m		107		
Boron Barium Molybdenum	ppm	ASTM D5185m ASTM D5185m		107 0		
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m		107 0 55		
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	50	107 0 55 <1		
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	50 270	107 0 55 <1 211		
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	50 270 1900	107 0 55 <1 211 2113	  	  
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	50 270 1900 1000	107 0 55 <1 211 2113 1092	   	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	50 270 1900 1000 1260	107 0 55 <1 211 2113 1092 1383	    	    
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	50 270 1900 1000 1260 3400 <b>limit/base</b>	107 0 55 <1 211 2113 1092 1383 4325		
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	50 270 1900 1000 1260 3400 <b>limit/base</b>	107 0 55 <1 211 2113 1092 1383 4325 current	     history1	     history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	50 270 1900 1000 1260 3400 <b>limit/base</b>	107 0 55 <1 211 2113 1092 1383 4325 current 4	     history1	     history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	50 270 1900 1000 1260 3400 <b>limit/base</b> >25	107 0 55 <1 211 2113 1092 1383 4325 <u>current</u> 4 2	      history1 	      history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	50 270 1900 1000 1260 3400 limit/base >25 >20	107 0 55 <1 211 2113 1092 1383 4325 <u>current</u> 4 2 2	     history1  	     history2  
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm	ASTM D5185m ASTM D5185m	50 270 1900 1000 1260 3400 limit/base >25 >20 limit/base	107 0 55 <1 211 2113 1092 1383 4325 current 4 2 2 2 current 0.1	     history1   history1	     history2   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	ASTM D5185m ASTM D5185m	50 270 1900 1000 1260 3400 limit/base >25 >20 limit/base	107 0 55 <1 211 2113 1092 1383 4325 current 4 2 2 2 current	     history1   history1 	     history2  history2
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	ASTM D5185m ASTM D5185m	50 270 1900 1000 1260 3400 limit/base >25 >20 limit/base	107 0 55 <1 211 2113 1092 1383 4325 current 4 2 2 current 0.1 8.0	      history1   history1  	      history2   history2
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	ASTM D5185m ASTM D5185m	50 270 1900 1000 1260 3400 <b>imit/base</b> >25 >20 <b>imit/base</b> >20 >30	107 0 55 <1 211 2113 1092 1383 4325 <u>current</u> 4 2 2 <u>current</u> 0.1 8.0 18.5	      history1  history1  history1	      history2  history2  history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844	50 270 1900 1000 1260 3400 <b>limit/base</b> >25 20 <b>limit/base</b> >20 30	107 0 55 <1 211 2113 1092 1383 4325 current 4 2 2 2 current 0.1 8.0 18.5 current	     history1   history1  history1  history1	      history2   history2  history2   history2



# **OIL ANALYSIS REPORT**





bpm

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10

ppm

Sen 22

19

18 17

()00015

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Laboratory Sample No.

Lab Number

13 Abnorma 12

Sep22/23

: WC0843995

: 05965922

Sen22/23

Non-ferrous Metals

lead

Viscosity @ 100°C

VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE		
Yellow Metal	scalar	*Visual	NONE	NONE		
Precipitate	scalar	*Visual	NONE	NONE		
Silt	scalar	*Visual	NONE	NONE		
Debris	scalar	*Visual	NONE	NONE		
Sand/Dirt	scalar	*Visual	NONE	NONE		
Appearance	scalar	*Visual	NORML	NORML		
Odor	scalar	*Visual	NORML	NORML		
Emulsified Water	scalar	*Visual	>0.1	NEG		
Free Water	scalar	*Visual		NEG		
FLUID PROPER	TIES	method	limit/base	current	history1	history2
FLUID PROPER	ГIES cSt	method ASTM D445	limit/base 15.3	current 13.6	history1	history2
Visc @ 100°C						

Sep22/23

C/22/0

Sep22/23

: 02 Oct 2023

: 02 Oct 2023

10.0 Bas

6 | umber

4 ( Base

0.0

Sen22/23

(mg KOH/g)

Base Number



Unique Number : 10672473 Diagnostician : Wes Davis Test Package : FLEET Contact: DARRELL KEARNS Certificate L2367 To discuss this sample report, contact Customer Service at 1-800-237-1369. darrellkearns@superiormarineinc.com \* - 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)

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

Received

Diagnosed

US 45619

Т:

F:

SUPERIOR MARINE

201 KELLY LANE

CHESAPEAKE, OH