

## **OIL ANALYSIS REPORT**

CATERPILLAR Nova del Mar - Chuchin MP

GUAY SON [CONHER]

Sample Rating Trend NORMAL SAMPLE INFORMATION method



Fluic MOBIL 15W40 (600 LTR)

Component **Diesel Engine** 

### 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.

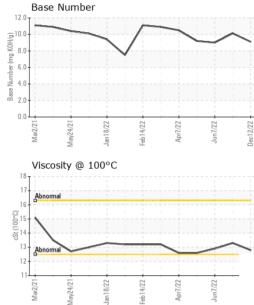
### Fluid Condition

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

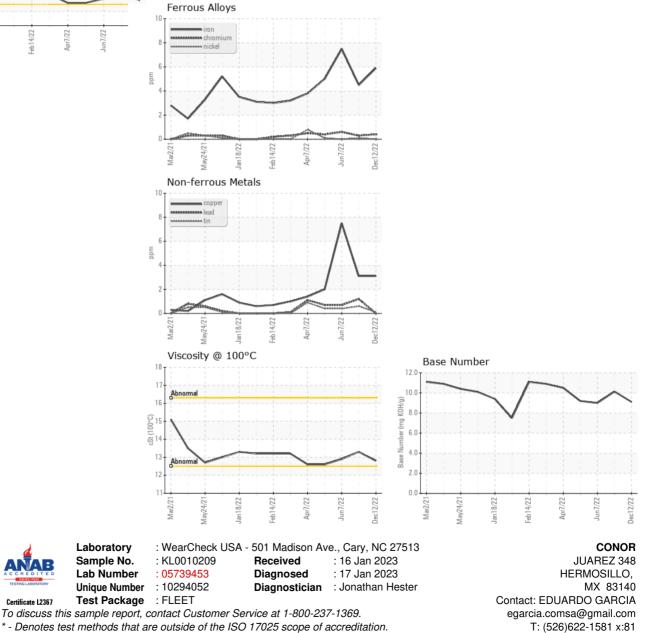
SAMPLE INFORM	ATION	method	limit/base	current	history1	history2
Sample Number		Client Info		KL0010209	KL0010201	KL0010179
Sample Date		Client Info		12 Dec 2022	04 Nov 2022	07 Jun 2022
Machine Age	hrs	Client Info		3539	3034	2545
Oil Age	hrs	Client Info		3439	2935	2445
Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Sample Status				NORMAL	ABNORMAL	NORMAL
-			11 11 11			
CONTAMINATIO	N	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	6	4	8
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm	ASTM D5185m		0	<1	0
Titanium	ppm	ASTM D5185m		<1	<1	<1
Silver	ppm	ASTM D5185m	>2	0	0	<1
Aluminum	ppm	ASTM D5185m	>25	1	2	2
Lead	ppm	ASTM D5185m	>40	0	1	<1
Copper	ppm	ASTM D5185m		3	3	8
Tin	ppm	ASTM D5185m	>15	<1	<1	<1
Vanadium	ppm	ASTM D5185m	210	0	<1	<1
Cadmium	ppm	ASTM D5185m		0	0	<1
	1. 1					
		mathad	limit/bass	ourroat	biotoryd	biotom/Q
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	limit/base	3	4	8
Boron Barium	ppm	ASTM D5185m ASTM D5185m	limit/base	3 1	4	8 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	3 1 3	4 0 2	8 0 3
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	3 1 3 <1	4 0 2 <1	8 0 3 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	3 1 3 <1 40	4 0 2 <1 42	8 0 3 <1 85
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	3 1 3 <1 40 3187	4 0 2 <1 42 3454	8 0 3 <1 85 2883
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	limit/base	3 1 3 <1 40 3187 890	4 0 2 <1 42 3454 980	8 0 3 <1 85 2883 940
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	3 1 3 <1 40 3187 890 1062	4 0 2 <1 42 3454 980 1164	8 0 3 <1 85 2883 940 1163
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	limit/base	3 1 3 <1 40 3187 890	4 0 2 <1 42 3454 980	8 0 3 <1 85 2883 940
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	limit/base	3 1 3 <1 40 3187 890 1062	4 0 2 <1 42 3454 980 1164	8 0 3 <1 85 2883 940 1163
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	limit/base	3 1 3 <1 40 3187 890 1062 3659	4 0 2 <1 42 3454 980 1164 4813	8 0 3 <1 85 2883 940 1163 3505
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	limit/base	3 1 3 <1 40 3187 890 1062 3659 current	4 0 2 <1 42 3454 980 1164 4813 history1	8 0 3 <1 85 2883 940 1163 3505 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	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>	limit/base >25 >118	3 1 3 <1 40 3187 890 1062 3659 current 4	4 0 2 <1 42 3454 980 1164 4813 history1 3	8 0 3 <1 85 2883 940 1163 3505 history2 5
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 ASTM D5185m ASTM D5185m	limit/base >25 >118	3 1 3 <1 40 3187 890 1062 3659 <u>current</u> 4 <1	4 0 2 <1 42 3454 980 1164 4813 history1 3 2	8 0 3 <1 85 2883 940 1163 3505 history2 5 2
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	limit/base >25 >118 >20 limit/base	3 1 3 <1 40 3187 890 1062 3659 <u>current</u> 4 <1 1	4 0 2 <1 42 3454 980 1164 4813 history1 3 2 <1	8 0 3 <1 85 2883 940 1163 3505 history2 5 2 2 2
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	limit/base >25 >118 >20 limit/base >3	3 1 3 <1 40 3187 890 1062 3659 <u>current</u> 4 <1 1	4 0 2 <1 42 3454 980 1164 4813 history1 3 2 <1 history1	8 0 3 <1 85 2883 940 1163 3505 history2 5 2 2 2 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base >25 >118 >20 limit/base >3	3 1 3 <1 40 3187 890 1062 3659 <u>current</u> 4 <1 1 <u>current</u>	4 0 2 <1 42 3454 980 1164 4813 history1 3 2 <1 3 2 <1 history1 0.2	8 0 3 <1 85 2883 940 1163 3505 history2 5 2 2 2 2 history2 0.4
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	limit/base >25 >118 >20 limit/base >3 >20	3 1 3 <1 40 3187 890 1062 3659 current 4 <1 1 current 0.2 7.1	4 0 2 <1 42 3454 980 1164 4813 history1 3 2 <1 3 2 <1 history1 0.2 6.7	8 0 3 <1 85 2883 940 1163 3505 history2 5 2 2 2 history2 0.4 8.0
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 D7844 *ASTM D7624	limit/base >25 >118 >20 limit/base >3 >20 >30 >30	3 1 3 <1 40 3187 890 1062 3659 <i>current</i> 4 <1 1 <i>current</i> 0.2 7.1 16.0 <i>current</i>	4 0 2 <1 42 3454 980 1164 4813 history1 3 2 <1 3 2 <1 history1 0.2 6.7 17.3 history1	8 0 3 <1 85 2883 940 1163 3505 history2 5 2 2 2 history2 0.4 8.0 17.9 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	Imit/base >25 >118 >20 Imit/base >3 >20 >30	3 1 3 <1 40 3187 890 1062 3659 <u>current</u> 4 <1 1 <u>current</u> 0.2 7.1 16.0	4 0 2 <1 42 3454 980 1164 4813 history1 3 2 <1 3 2 <1 0.2 6.7 17.3	8 0 3 <1 85 2883 940 1163 3505 <b>history2</b> 5 2 2 2 <b>history2</b> 0.4 8.0 17.9



# **OIL ANALYSIS REPORT**



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
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
			11 11 11			
FLUID PROPER	HES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445		12.8	13.3	12.9
GRAPHS						



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

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