

OIL ANALYSIS REPORT





MINING ME-61 CATERPILLAR 980M MK700210 Diesel Engine **CAT DEO ULS 15W40 (10 GAL)**

Recommendation

The oil change at the time of sampling has been noted. Resample at the next service interval to monitor.

Wear

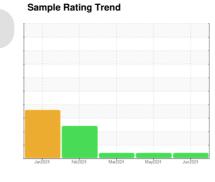
All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

Fluid Condition

The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

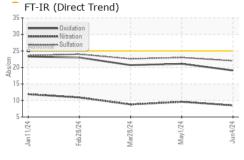


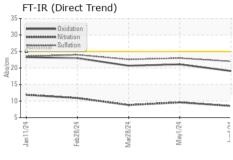
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0950843	WC0910934	WC0909672
Sample Date		Client Info		04 Jun 2024	01 May 2024	28 Mar 2024
Machine Age	hrs	Client Info		12200	11790	11312
Oil Age	hrs	Client Info		500	500	500
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				ATTENTION	ATTENTION	ATTENTION
CONTAMINATION	V	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	1.8	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	23	25	25
Chromium	ppm	ASTM D5185m	>20	<1	<1	1
Nickel	ppm	ASTM D5185m	>2	0	<1	0
Titanium	ppm	ASTM D5185m	>2	<1	<1	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>25	2	2	2
Lead	ppm	ASTM D5185m	>40	<1	2	1
Copper	ppm	ASTM D5185m	>330	3	4	3
Tin	ppm	ASTM D5185m	>15	<1	1	<1
Vanadium	ppm	ASTM D5185m	>10	0	<1	<1
Cadmium	ppm	ASTM D5185m		<1	<1	0
Cadillalli	ppiii	AO IIVI DO IOOIII		\ 1	<u> </u>	O
ADDITIVES		method	limit/hase	current	history1	history2
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	limit/base	15	25	27
Boron Barium	ppm	ASTM D5185m ASTM D5185m	limit/base	15 0	25 0	27 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	15 0 41	25 0 41	27 0 42
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	15 0 41 <1	25 0 41 <1	27 0 42 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	15 0 41 <1 443	25 0 41 <1 445	27 0 42 <1 440
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		15 0 41 <1 443 1523	25 0 41 <1 445 1625	27 0 42 <1 440 1644
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	1000	15 0 41 <1 443 1523 818	25 0 41 <1 445 1625 909	27 0 42 <1 440 1644 879
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 ASTM D5185m ASTM D5185m	1000	15 0 41 <1 443 1523 818 1045	25 0 41 <1 445 1625 909 1088	27 0 42 <1 440 1644 879 1052
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 ASTM D5185m	1000 1090 3000	15 0 41 <1 443 1523 818 1045 2950	25 0 41 <1 445 1625 909 1088 3330	27 0 42 <1 440 1644 879 1052 2976
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	1000 1090 3000 limit/base	15 0 41 <1 443 1523 818 1045 2950	25 0 41 <1 445 1625 909 1088 3330 history1	27 0 42 <1 440 1644 879 1052 2976 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	1000 1090 3000 limit/base	15 0 41 <1 443 1523 818 1045 2950 current	25 0 41 <1 445 1625 909 1088 3330 history1	27 0 42 <1 440 1644 879 1052 2976 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	1000 1090 3000 limit/base >25	15 0 41 <1 443 1523 818 1045 2950 current 7 25	25 0 41 <1 445 1625 909 1088 3330 history1 6 19	27 0 42 <1 440 1644 879 1052 2976 history2 9 29
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	1000 1090 3000 limit/base >25 >20	15 0 41 <1 443 1523 818 1045 2950 current	25 0 41 <1 445 1625 909 1088 3330 history1	27 0 42 <1 440 1644 879 1052 2976 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	1000 1090 3000 limit/base >25 >20	15 0 41 <1 443 1523 818 1045 2950 current 7 25 3	25 0 41 <1 445 1625 909 1088 3330 history1 6 19 3	27 0 42 <1 440 1644 879 1052 2976 history2 9 29 4
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	ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	1000 1090 3000 limit/base >25 >20 limit/base >3	15 0 41 <1 443 1523 818 1045 2950 current 7 25 3 current 0.6	25 0 41 <1 445 1625 909 1088 3330 history1 6 19 3 history1 0.6	27 0 42 <1 440 1644 879 1052 2976 history2 9 29 4 history2 0.5
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	1000 1090 3000 limit/base >25 >20	15 0 41 <1 443 1523 818 1045 2950 current 7 25 3 current 0.6 8.5	25 0 41 <1 445 1625 909 1088 3330 history1 6 19 3	27 0 42 <1 440 1644 879 1052 2976 history2 9 29 4
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	ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	1000 1090 3000 limit/base >25 >20 limit/base >3	15 0 41 <1 443 1523 818 1045 2950 current 7 25 3 current 0.6	25 0 41 <1 445 1625 909 1088 3330 history1 6 19 3 history1 0.6	27 0 42 <1 440 1644 879 1052 2976 history2 9 29 4 history2 0.5
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 Method ASTM D5185m	1000 1090 3000 limit/base >25 >20 limit/base >3 >20	15 0 41 <1 443 1523 818 1045 2950 current 7 25 3 current 0.6 8.5	25 0 41 <1 445 1625 909 1088 3330 history1 6 19 3 history1 0.6 9.6	27 0 42 <1 440 1644 879 1052 2976 history2 9 29 4 history2 0.5 8.8
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 Method *ASTM D5185m *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 D7415	1000 1090 3000 limit/base >25 >20 limit/base >3 >20 >30	15 0 41 <1 443 1523 818 1045 2950 current 7 25 3 current 0.6 8.5 22.0	25 0 41 <1 445 1625 909 1088 3330 history1 6 19 3 history1 0.6 9.6 23.0	27 0 42 <1 440 1644 879 1052 2976 history2 9 29 4 history2 0.5 8.8 22.6
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 Method *ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m Method *ASTM D7844 *ASTM D7624 *ASTM D7615 Method	1000 1090 3000 limit/base >25 >20 limit/base >3 >20 >30 limit/base	15 0 41 <1 443 1523 818 1045 2950 current 7 25 3 current 0.6 8.5 22.0 current	25 0 41 <1 445 1625 909 1088 3330 history1 6 19 3 history1 0.6 9.6 23.0 history1	27 0 42 <1 440 1644 879 1052 2976 history2 9 29 4 history2 0.5 8.8 22.6 history2

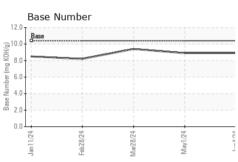
Contact/Location: TRACY KEE - COVCAMTN



OIL ANALYSIS REPORT



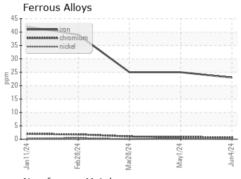


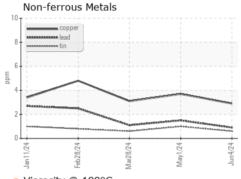


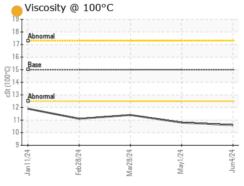
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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
	TIEC	methed	limit/bass	Olivro pt	historyd	history?

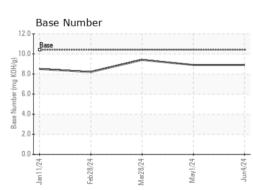
FLUID FROFER	THES					
Visc @ 100°C	cSt	ASTM D445	15.0	10.6	10.8	11.4

GRAPHS













Certificate 12367

Sample No.

: WC0950843 Lab Number : 06206207 Unique Number : 11073668

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

: 11 Jun 2024 Diagnosed

: 13 Jun 2024 : 13 Jun 2024 - Don Baldridge

US 38320 Contact: TRACY KEE tracy.kee@coviacorp.com T:

COVIA - CAMDEN - 094

1700 SAND MILL RD

CAMDEN, TN

Test Package : CONST (Additional Tests: TBN) 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.

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012) Contact/Location: TRACY KEE - COVCAMTN

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