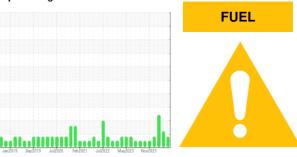


OIL ANALYSIS REPORT

Sample Rating Trend





Machine Id CATERPILLAR D10T 15105048 (S/N CATOD10TCRJG01478) Component Diesel Engine

ROYAL PURPLE MOTOR OIL 15W40 (--- GAL)

DIAGNOSIS

Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

Light fuel dilution occurring.

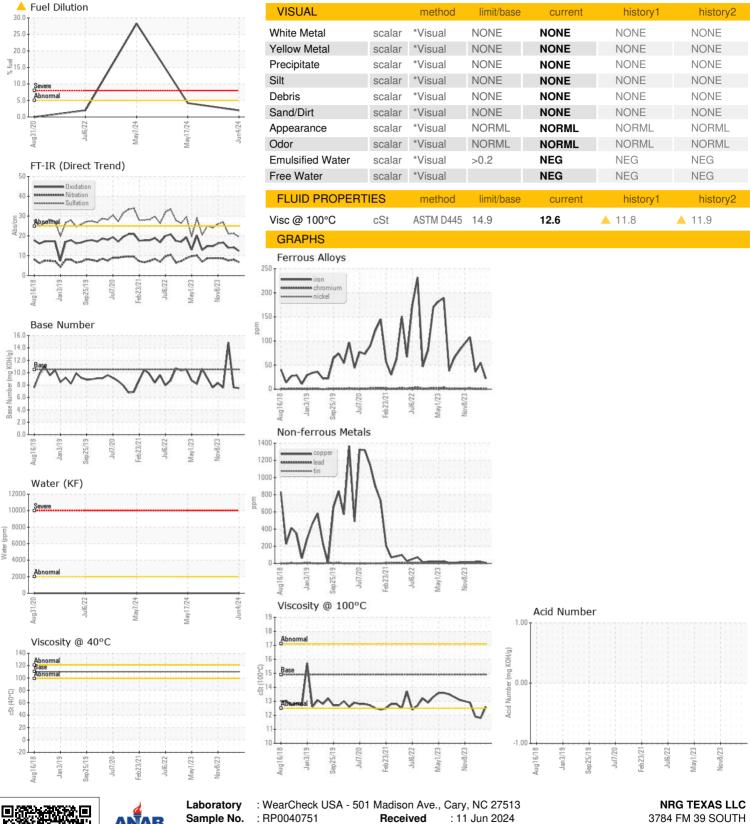
Fluid Condition

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

Sample Date Client Info O4 Jun 2024 17 May 2024 07 May 2024 70 May 2024	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info Dil Age Dil Age Not Changed MARGINAL ABNORMAL SEVERE MARGINAL ABNORMAL SEVERE CONTAMINATION method limit/base current history1 history2 Direction ppm ASTM D5185m > 100 22 55 36 Chromium ppm ASTM D5185m > 20 <1 1 1 <1 1	Sample Number		Client Info		RP0040751	RP0040781	RP0036868
Dil Age	Sample Date		Client Info		04 Jun 2024	17 May 2024	07 May 2024
Dil Changed Client Info MARGINAL ABNORMAL SEVERE	Machine Age	hrs	Client Info		71327	71107	70999
MARGINAL ABNORMAL SEVERE	Oil Age	hrs	Client Info		220	406	298
CONTAMINATION	Oil Changed		Client Info		Not Changd	Changed	Not Changd
WEAR METALS	Sample Status				MARGINAL	ABNORMAL	SEVERE
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 22 55 36 Chromium ppm ASTM D5185m >20 <1	CONTAMINATIO	V	method	limit/base	current	history1	history2
Description	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 <1 1 <1 Nickel ppm ASTM D5185m >2 0 <1 0 Titianium ppm ASTM D5185m >2 <1 <1 0 Siliver ppm ASTM D5185m >2 0 <1 0 Aluminum ppm ASTM D5185m >2 0 <1 0 Aluminum ppm ASTM D5185m >2 3 3 <1 Lead ppm ASTM D5185m >40 2 5 3 Copper ppm ASTM D5185m >40 2 5 3 Copper ppm ASTM D5185m <1 4 1 1 Vanadium ppm ASTM D5185m <1 0 0 6 0 ADDITIVES method limit/base current history1 history2 Barium ppm ASTM D5185m 0 0	WEAR METALS		method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	22	55	36
Silver	Chromium	ppm	ASTM D5185m	>20	<1	1	<1
Silver	Nickel	ppm	ASTM D5185m	>2	0	<1	0
Aluminum ppm ASTM D5185m >25 3 3 <1 Lead ppm ASTM D5185m >40 2 5 3 Copper ppm ASTM D5185m >330 7 17 17 Tin ppm ASTM D5185m >15 1 4 1 Vanadium ppm ASTM D5185m <1 0 <1 Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 Manganese ppm ASTM D5185m 00 114 91 85 Manganese ppm ASTM D5185m 00 16 78 67 Calcium ppm ASTM D5185m 3050 2682 2280 2420 Zinc ppm ASTM D5185m 1050 954 876 910 Zinc ppm ASTM D5185m 1200 1205 1075 1070 CONTAMINANTS method limit/base current history1 history2 Solicon ppm ASTM D5185m >25 6 8 7 Sodium ppm ASTM D5185m >20 2 <1 0 Value % AS	Titanium	ppm	ASTM D5185m	>2	<1	<1	0
Lead ppm ASTM D5185m >40 2 5 3 Copper ppm ASTM D5185m >330 7 17 17 Tin ppm ASTM D5185m >15 1 4 1 Vanadium ppm ASTM D5185m - 1 0 <1 Cadmium ppm ASTM D5185m - 1 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 6 0 Barium ppm ASTM D5185m 0 0 0 0 Manganese ppm ASTM D5185m 100 114 91 85 Magnesium ppm ASTM D5185m 0 2682 2280 2420 Phosphorus ppm ASTM D5185m 3050 2682 2280 2420 Zinc ppm ASTM D5185m 1200 1205	Silver	ppm	ASTM D5185m	>2	0	<1	0
Copper ppm ASTM D5185m >330 7 17 17 Tin ppm ASTM D5185m >15 1 4 1 Vanadium ppm ASTM D5185m <1	Aluminum	ppm	ASTM D5185m	>25	3	3	
Tin ppm ASTM D5185m > 15 1 4 1 Vanadium ppm ASTM D5185m	Lead	ppm	ASTM D5185m	>40		5	
Vanadium ppm ASTM D5185m <1 0 <1 Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 6 0 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 100 114 91 85 Manganese ppm ASTM D5185m 100 114 91 85 Magnesium ppm ASTM D5185m 0 16 78 67 Calcium ppm ASTM D5185m 3050 2682 2280 2420 Phosphorus ppm ASTM D5185m 1050 954 876 910 Zinc ppm ASTM D5185m 1200 1205 1075 1070 CONTAMINANTS method limit/base current history1	Copper	ppm	ASTM D5185m	>330	7	17	17
Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 6 0 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 100 114 91 85 Manganese ppm ASTM D5185m 100 16 78 67 Calcium ppm ASTM D5185m 60 16 78 67 Calcium ppm ASTM D5185m 3050 2682 2280 2420 Phosphorus ppm ASTM D5185m 1200 1205 1075 1070 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 8 7 Sodium ppm ASTM D5185m >20 2 <	Tin	ppm	ASTM D5185m	>15	1	4	1
ADDITIVES	Vanadium	ppm	ASTM D5185m		<1	0	
Boron ppm ASTM D5185m 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Cadmium	ppm	ASTM D5185m		<1	0	0
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 100 114 91 85 Manganese ppm ASTM D5185m 100 16 78 67 Calcium ppm ASTM D5185m 3050 2682 2280 2420 Phosphorus ppm ASTM D5185m 1050 954 876 910 Zinc ppm ASTM D5185m 1200 1205 1075 1070 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 8 7 Soldium ppm ASTM D5185m >20 2 <1 0 Fuel % ASTM D5185m >20 2 <1 0 Fuel % ASTM D5185m >20 X 4.2 X 28.3 Water % ASTM D6304	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 100 114 91 85 Manganese ppm ASTM D5185m 0 16 78 67 Calcium ppm ASTM D5185m 3050 2682 2280 2420 Phosphorus ppm ASTM D5185m 1050 954 876 910 Zinc ppm ASTM D5185m 1200 1205 1075 1070 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 8 7 Sodium ppm ASTM D5185m >20 2 <1 0 Fuel % ASTM D6304 >0.2 NEG	Boron	ppm	ASTM D5185m	0	0	6	0
Manganese ppm ASTM D5185m <1 2 1 Magnesium ppm ASTM D5185m 60 16 78 67 Calcium ppm ASTM D5185m 3050 2682 2280 2420 Phosphorus ppm ASTM D5185m 1050 954 876 910 Zinc ppm ASTM D5185m 1200 1205 1075 1070 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 8 7 Sodium ppm ASTM D5185m >20 2 5 5 Potassium ppm ASTM D5185m >20 2 <1	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 60 16 78 67 Calcium ppm ASTM D5185m 3050 2682 2280 2420 Phosphorus ppm ASTM D5185m 1050 954 876 910 Zinc ppm ASTM D5185m 1200 1205 1075 1070 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 8 7 Sodium ppm ASTM D5185m >25 6 8 7 Sodium ppm ASTM D5185m >20 2 <1	Molybdenum	ppm	ASTM D5185m	100	114	91	85
Calcium ppm ASTM D5185m 3050 2682 2280 2420 Phosphorus ppm ASTM D5185m 1050 954 876 910 Zinc ppm ASTM D5185m 1200 1205 1075 1070 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 8 7 Sodium ppm ASTM D5185m >25 6 8 7 Sodium ppm ASTM D5185m >20 2 <1	Manganese	ppm	ASTM D5185m			2	
Phosphorus ppm ASTM D5185m 1050 954 876 910 Zinc ppm ASTM D5185m 1200 1205 1075 1070 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 8 7 Sodium ppm ASTM D5185m 2 5 5 Potassium ppm ASTM D5185m >20 2 <1 0 Fuel % ASTM D6304 >0.2 NEG NEG NEG INFRA-RED method limit/base current history1 history2 <td>Magnesium</td> <td></td> <td></td> <td></td> <th></th> <td></td> <td></td>	Magnesium						
Zinc ppm ASTM D5185m 1200 1205 1075 1070 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 8 7 Sodium ppm ASTM D5185m 2 5 5 Potassium ppm ASTM D5185m >20 2 <1		ppm					
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 8 7 Sodium ppm ASTM D5185m 2 5 5 Potassium ppm ASTM D5185m >20 2 <1		ppm					
Silicon ppm ASTM D5185m >25 6 8 7 Sodium ppm ASTM D5185m 2 5 5 Potassium ppm ASTM D5185m >20 2 <1 0 Fuel % ASTM D3524 >5 ▲ 2.0 ▲ 4.2 ▲ 28.3 Water % ASTM D6304 >0.2 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 6.8 8.0 7.6 Sulfation Abs/.1mm *ASTM D7415 >30 19.5 21.3 21.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.4 14.2 14.0	Zinc	ppm	ASTM D5185m	1200	1205	1075	1070
Sodium ppm ASTM D5185m 2 5 5 Potassium ppm ASTM D5185m >20 2 <1	CONTAMINANTS	5	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 2 <1 0 Fuel % ASTM D3524 >5 ▲ 2.0 ▲ 4.2 ▲ 28.3 Water % ASTM D6304 >0.2 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 6.8 8.0 7.6 Sulfation Abs/.1mm *ASTM D7415 >30 19.5 21.3 21.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.4 14.2 14.0	Silicon	ppm	ASTM D5185m	>25	6	8	7
Fuel	Sodium	ppm	ASTM D5185m			5	5
Water % ASTM D6304 >0.2 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 6.8 8.0 7.6 Sulfation Abs/.1mm *ASTM D7415 >30 19.5 21.3 21.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.4 14.2 14.0	Potassium	ppm	ASTM D5185m	>20	2	<1	0
INFRA-RED	Fuel						
Soot % % *ASTM D7844 >3 0.3 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 6.8 8.0 7.6 Sulfation Abs/.1mm *ASTM D7415 >30 19.5 21.3 21.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.4 14.2 14.0	Water	%	ASTM D6304	>0.2	NEG	NEG	NEG
Nitration Abs/cm *ASTM D7624 >20 6.8 8.0 7.6 Sulfation Abs/.1mm *ASTM D7415 >30 19.5 21.3 21.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.4 14.2 14.0	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 19.5 21.3 21.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.4 14.2 14.0	Soot %	%	*ASTM D7844	>3	0.3	0.5	0.4
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.4 14.2 14.0	Nitration	Abs/cm	*ASTM D7624	>20	6.8	8.0	7.6
Oxidation	Sulfation	Abs/.1mm	*ASTM D7415	>30	19.5	21.3	21.0
	FLUID DEGRADA	ATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	12.4	14.2	14.0
	Base Number (BN)	mg KOH/g	ASTM D2896	10.5			14.86



OIL ANALYSIS REPORT







Certificate 12367

Sample No.

: RP0040751 Lab Number : 06206764 Unique Number : 11074225

Tested : 18 Jun 2024 Diagnosed

Test Package : IND 2 (Additional Tests: FT-IR, KV100, PercentFuel, TBN) To discuss this sample report, contact Customer Service at 1-800-237-1369.

: 18 Jun 2024 - Jonathan Hester

US 75846 Contact: JURGEN THOMPSON JThompson@ecomaterial.com

T: (903)626-9528 F: (903)626-9772

 st - 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: JURGEN THOMPSON - NRGJEW

JEWETT, TX