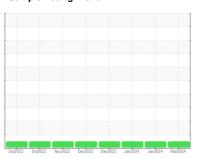


OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Machine Id 2109 Component

Diesel Engine

DIESEL ENGINE OIL SAE 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

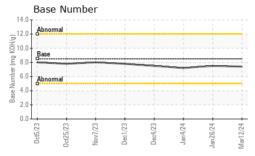
Fluid Condition

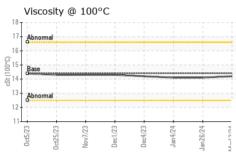
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Machine Age mls Client Info 0 0 0 Oil Age mis Client Info 0 0 0 Oil Changed Client Info N/A Changed N/A Sample Status NoRMAL NORMAL NORMAL CONTAMINATION method Imitibase current history1 history2 Fuel WC Method >5 <1.0 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG NEG Glycol WC Method NEG NEG NEG NEG NEG WEAR METALS method imitibase current history1 history1 history2 Iron ppm ASTM 05185m >10.0 5 3 4 4 1 -1 0 0 1 0 1 0 0 1 0 0 1 0 0 1 0 0 1	Oct. 2023 Oct. 2023 Nov. 2023 Doc. 2023 Doc. 2023 Jan. 2024 Jan. 2024 Mar. 2024						
Sample Date	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Client Info	Sample Number		Client Info		WC0894028	WC0894040	WC0868134
Oil Age mls Client Info N/A Changed N/A Coll Changed Client Info N/A Changed N/A Sample Status NORMAL NORMAL NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0	Sample Date		Client Info		12 Mar 2024	26 Jan 2024	04 Jan 2024
Oil Changed Client Info N/A NORMAL NORMAL NORMAL	Machine Age	mls	Client Info		0	0	0
Cilichanged Cilich Info N/A NORMAL NORMAL NORMAL	Oil Age	mls	Client Info		0	0	0
NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 history2	•		Client Info		N/A	Changed	N/A
Fuel WC Method S5 C1.0 C1.0 C1.0 C1.0					NORMAL	_	NORMAL
Water Glycol WC Method WC Method >0.2 NEG NEG NEG NEG NEG NEG NEG WEAR METALS method Imil/base current Listory1 history1 history2 Iron ppm ASTM D5185m >10.0 5 3 4 Chromium ppm ASTM D5185m >2.0 <1 <1 0 Nickel ppm ASTM D5185m >4 <1 <1 0 Silver ppm ASTM D5185m >4 <1 <1 0 Silver ppm ASTM D5185m >4 <1 <1 0 Aluminum ppm ASTM D5185m >40 0 <1 0 Aluminum ppm ASTM D5185m >40 0 <1 0 Copper ppm ASTM D5185m >40 0 <1 0 Copper ppm ASTM D5185m >15 <1 <1 0 Vanadium ppm ASTM D5185m >15 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <	CONTAMINATIO	N	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>5	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	5	3	4
Silver	Chromium	ppm	ASTM D5185m	>20	<1	<1	0
Silver	Nickel	ppm	ASTM D5185m	>4	<1	<1	0
Aluminum ppm ASTM D5185m >20 3 2 4 Lead ppm ASTM D5185m >40 0 <1 0 Copper ppm ASTM D5185m >330 1 <1 2 Tin ppm ASTM D5185m >15 <1 <1 0 Vanadium ppm ASTM D5185m 0 <1 <1 <1 Cadmium ppm ASTM D5185m 0 <1 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 <1 1 2 Barium ppm ASTM D5185m 10 2 0 0 Molybdenum ppm ASTM D5185m 10 2 0 0 Magnesium ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 3000 1503 1020 <th>Titanium</th> <th>ppm</th> <th>ASTM D5185m</th> <th></th> <th><1</th> <th><1</th> <th>0</th>	Titanium	ppm	ASTM D5185m		<1	<1	0
Lead ppm ASTM D5185m >40 0 <1	Silver	ppm	ASTM D5185m	>3	<1	0	0
Copper ppm ASTM D5185m >330 1 <1	Aluminum	ppm	ASTM D5185m	>20	3	2	4
Tin	Lead	ppm	ASTM D5185m	>40	0	<1	0
Vanadium ppm ASTM D5185m <1	Copper	ppm	ASTM D5185m	>330	1	<1	2
Cadmium ppm ASTM D5185m 0 <1	Tin	ppm	ASTM D5185m	>15	<1	<1	0
ADDITIVES	Vanadium	ppm	ASTM D5185m		<1	<1	<1
Boron	Cadmium	ppm	ASTM D5185m		0	<1	0
Barium ppm ASTM D5185m 10 2 0 0 Molybdenum ppm ASTM D5185m 100 82 56 59 Manganese ppm ASTM D5185m 0 <1 <1 Magnesium ppm ASTM D5185m 450 1312 902 995 Calcium ppm ASTM D5185m 3000 1503 1020 1114 Phosphorus ppm ASTM D5185m 3000 1503 1020 1114 Phosphorus ppm ASTM D5185m 1150 1415 1064 1036 Zinc ppm ASTM D5185m 1350 1743 1163 1304 Sulfur ppm ASTM D5185m 4250 4758 3206 3128 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 3 3 Sodium ppm A	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 100 82 56 59 Manganese ppm ASTM D5185m 0 <1	Boron	ppm	ASTM D5185m	250	<1	1	2
Manganese ppm ASTM D5185m 0 <1	Barium	ppm	ASTM D5185m	10	2	0	0
Magnesium ppm ASTM D5185m 450 1312 902 995 Calcium ppm ASTM D5185m 3000 1503 1020 1114 Phosphorus ppm ASTM D5185m 1150 1415 1064 1036 Zinc ppm ASTM D5185m 1350 1743 1163 1304 Sulfur ppm ASTM D5185m 4250 4758 3206 3128 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 3 Sodium ppm ASTM D5185m >158 3 2 2 Potassium ppm ASTM D5185m >20 3 1 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 8.5 8.0 8.7 Sulfation Abs/cm *ASTM D7415	Molybdenum	ppm	ASTM D5185m	100	82	56	59
Calcium ppm ASTM D5185m 3000 1503 1020 1114 Phosphorus ppm ASTM D5185m 1150 1415 1064 1036 Zinc ppm ASTM D5185m 1350 1743 1163 1304 Sulfur ppm ASTM D5185m 4250 4758 3206 3128 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 3 Sodium ppm ASTM D5185m >158 3 2 2 Potassium ppm ASTM D5185m >20 3 1 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.2 0.2 Nitration Abs/cm *ASTM D7415 >30 20.8 20.5 20.9 FLUID DEGRADATION method limit	Manganese	ppm	ASTM D5185m		0	<1	<1
Phosphorus ppm ASTM D5185m 1150 1415 1064 1036 Zinc ppm ASTM D5185m 1350 1743 1163 1304 Sulfur ppm ASTM D5185m 4250 4758 3206 3128 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 3 Sodium ppm ASTM D5185m >158 3 2 2 Potassium ppm ASTM D5185m >20 3 1 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.2 0.2 Nitration Abs/cm *ASTM D7624 >20 8.5 8.0 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.8 20.5 20.9 FLUID DEGRADATION me	Magnesium	ppm	ASTM D5185m	450	1312	902	995
Zinc ppm ASTM D5185m 1350 1743 1163 1304 Sulfur ppm ASTM D5185m 4250 4758 3206 3128 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 3 Sodium ppm ASTM D5185m >158 3 2 2 Potassium ppm ASTM D5185m >20 3 1 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.2 0.2 Nitration Abs/cm *ASTM D7624 >20 8.5 8.0 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.8 20.5 20.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm <th>Calcium</th> <th>ppm</th> <th>ASTM D5185m</th> <th>3000</th> <th>1503</th> <th>1020</th> <th>1114</th>	Calcium	ppm	ASTM D5185m	3000	1503	1020	1114
Sulfur ppm ASTM D5185m 4250 4758 3206 3128 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 3 Sodium ppm ASTM D5185m >158 3 2 2 Potassium ppm ASTM D5185m >20 3 1 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.2 0.2 Nitration Abs/cm *ASTM D7624 >20 8.5 8.0 8.7 Sulfation Abs/lmm *ASTM D7415 >30 20.8 20.5 20.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 20.1 19.6 20.1	Phosphorus	ppm	ASTM D5185m	1150	1415	1064	1036
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 3 Sodium ppm ASTM D5185m >158 3 2 2 Potassium ppm ASTM D5185m >20 3 1 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.2 0.2 Nitration Abs/cm *ASTM D7624 >20 8.5 8.0 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.8 20.5 20.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 20.1 19.6 20.1	Zinc	ppm	ASTM D5185m	1350	1743	1163	1304
Silicon ppm ASTM D5185m >25 5 3 3 Sodium ppm ASTM D5185m >158 3 2 2 Potassium ppm ASTM D5185m >20 3 1 <1	Sulfur	ppm	ASTM D5185m	4250	4758	3206	3128
Sodium ppm ASTM D5185m >158 3 2 2 Potassium ppm ASTM D5185m >20 3 1 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.2 0.2 Nitration Abs/cm *ASTM D7624 >20 8.5 8.0 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.8 20.5 20.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 20.1 19.6 20.1	CONTAMINANTS	6	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 3 1 <1	Silicon	ppm	ASTM D5185m	>25	5	3	3
INFRA-RED	Sodium	ppm	ASTM D5185m	>158	3	2	2
Soot % % *ASTM D7844 >3 0.2 0.2 0.2 Nitration Abs/cm *ASTM D7624 >20 8.5 8.0 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.8 20.5 20.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 20.1 19.6 20.1	Potassium	ppm	ASTM D5185m	>20	3	1	<1
Nitration Abs/cm *ASTM D7624 >20 8.5 8.0 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 20.8 20.5 20.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 20.1 19.6 20.1	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 20.8 20.5 20.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 20.1 19.6 20.1	Soot %	%	*ASTM D7844	>3	0.2	0.2	0.2
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 20.1 19.6 20.1	Nitration	Abs/cm	*ASTM D7624	>20	8.5	8.0	8.7
Oxidation Abs/.1mm *ASTM D7414 >25 20.1 19.6 20.1	Sulfation	Abs/.1mm	*ASTM D7415	>30	20.8	20.5	20.9
	FLUID DEGRADA	NOITA	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	20.1	19.6	20.1
	Base Number (BN)	mg KOH/q	ASTM D2896	8.5	7.4	7.5	7.2



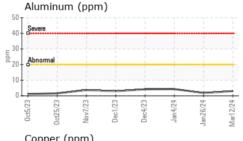
OIL ANALYSIS REPORT

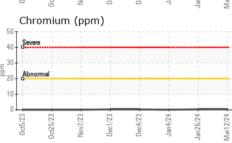


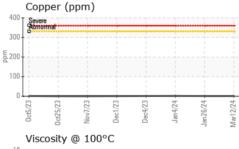


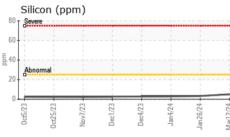
VISUAL		method				history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	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
FLUID PROPERT	TIES	method	limit/hase	current	history1	history2

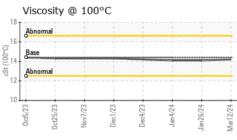
_	Visc @ 100°C	cSt	ASTM D4	45 14.4	14.2	14.1	14.1
	GRAPHS						
250	Iron (ppm)				Lead (pp	m)	
200	Severe				Severe		
E 150)				E 60		
E 100	Abnormal		 		Abnormal		

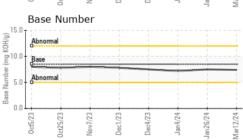














Laboratory Sample No. Lab Number : 06124583

: WC0894028

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

Tested Unique Number : 10938734 Diagnosed Test Package : MOB 1 (Additional Tests: TBN)

: 22 Mar 2024

: 21 Mar 2024

: 23 Mar 2024 - Don Baldridge

Contact: Robert Iosiniecki Robert.losiniecki@ratpdev.com T:

GO DURHAM - RAPT

DURHAM, NC

US 27701

F:

1903 FAYETTEVILLE ST

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)