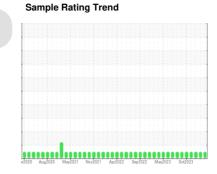


OIL ANALYSIS REPORT

Area **KANSAS**Machine Id 2000 GMC 1000-MD912

Diesel Engine

SHELL Rotella T5 15W-40 (--- QTS)





Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

Contamination

There is no indication of any contamination in the

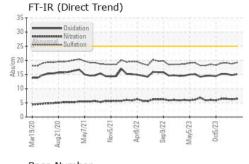
Fluid Condition

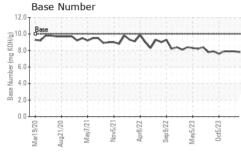
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

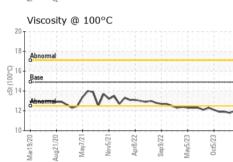
Client Info	SAMPLE INFORM	ATION	method	limit/base	current	history1	history2
Machine Age mls Client Info 317428 317325 317323 Oil Age mls Client Info 0 0 0 Oil Changed Client Info N/A N/A N/A Sample Status NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0	Sample Number		Client Info		WC0559215	WC0559211	WC0559209
Oil Age mls Client Info N/A	Sample Date		Client Info		09 May 2024	05 Apr 2024	07 Mar 2024
Oil Changed Sample Status Client Info N/A N/A N/A N/A N/A N/A Sample Status NORMAL NORMAL	Machine Age	mls	Client Info		317428	317325	317323
Oil Changed Sample Status Client Info N/A N/A N/A N/A N/A N/A Sample Status NORMAL NORMAL	Oil Age	mls	Client Info		0	0	0
NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2	-		Client Info		N/A	N/A	N/A
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water Glycol WC Method WC Method >0.2 NEG NEG NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 23 23 25 Chromium ppm ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >4 <1 0 0 Silver ppm ASTM D5185m >4 <1 0 0 Silver ppm ASTM D5185m >40 1 1 0 Oopper ppm ASTM D5185m >40 1 1 0 Copper ppm ASTM D5185m >15 <1 0 <1 Vanadium ppm ASTM D5185m 0 <1 0 <1 Cadmium ppm ASTM D5185m 0 <1 0 <1 Barium ppm ASTM D5185m 198 184	CONTAMINATION		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
Irron	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	23	23	25
Description	Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Description	Nickel						
Silver	Titanium		ASTM D5185m		0	0	0
Aluminum				>3		0	
Lead	Aluminum		ASTM D5185m			2	3
Copper ppm ASTM D5185m >330 2 1 2 Tin ppm ASTM D5185m >15 <1							
Tin							
Vanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 198 184 164 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 75 72 73 Manganese ppm ASTM D5185m 293 289 294 Calcium ppm ASTM D5185m 1899 1986 1918 Phosphorus ppm ASTM D5185m 1113 1109 1094 Zinc ppm ASTM D5185m 1278 1269 1256 Sulfur ppm ASTM D5185m 4172 4328 4023 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 3							
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 198 184 164 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 75 72 73 Manganese ppm ASTM D5185m 293 289 294 Calcium ppm ASTM D5185m 1899 1986 1918 Phosphorus ppm ASTM D5185m 1113 1109 1094 Zinc ppm ASTM D5185m 1278 1269 1256 Sulfur ppm ASTM D5185m 4172 4328 4023 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 3 0 <1				710			
ADDITIVES							
Boron ppm ASTM D5185m 198 184 164		PP		limit/base			
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Molybdenum ppm ASTM D5185m 75 72 73 Manganese ppm ASTM D5185m <1 <1 <1 Magnesium ppm ASTM D5185m 293 289 294 Calcium ppm ASTM D5185m 1899 1986 1918 Phosphorus ppm ASTM D5185m 1113 1109 1094 Zinc ppm ASTM D5185m 1278 1269 1256 Sulfur ppm ASTM D5185m 4172 4328 4023 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 5 5 Sodium ppm ASTM D5185m >20 3 2 1 Potassium ppm ASTM D5185m >20 3 0 <1 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7844							
Manganese ppm ASTM D5185m <1 <1 <1 Magnesium ppm ASTM D5185m 293 289 294 Calcium ppm ASTM D5185m 1899 1986 1918 Phosphorus ppm ASTM D5185m 1113 1109 1094 Zinc ppm ASTM D5185m 1269 1256 Sulfur ppm ASTM D5185m 4172 4328 4023 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 5 5 Sodium ppm ASTM D5185m >20 3 2 1 Potassium ppm ASTM D5185m >20 3 0 <1							
Magnesium ppm ASTM D5185m 293 289 294 Calcium ppm ASTM D5185m 1899 1986 1918 Phosphorus ppm ASTM D5185m 1113 1109 1094 Zinc ppm ASTM D5185m 1278 1269 1256 Sulfur ppm ASTM D5185m 4172 4328 4023 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 5 5 Sodium ppm ASTM D5185m 3 2 1 1 Potassium ppm ASTM D5185m >20 3 0 <1	•				_		
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Phosphorus ppm ASTM D5185m 1113 1109 1094 Zinc ppm ASTM D5185m 1278 1269 1256 Sulfur ppm ASTM D5185m 4172 4328 4023 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 5 5 Sodium ppm ASTM D5185m >20 3 2 1 Potassium ppm ASTM D5185m >20 3 0 <1							
Zinc ppm ASTM D5185m 1278 1269 1256 Sulfur ppm ASTM D5185m 4172 4328 4023 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 5 5 Sodium ppm ASTM D5185m 3 2 1 1 Potassium ppm ASTM D5185m >20 3 0 <1							
Sulfur ppm ASTM D5185m 4172 4328 4023 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 5 5 Sodium ppm ASTM D5185m 3 2 1 Potassium ppm ASTM D5185m >20 3 0 <1							
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 5 5 Sodium ppm ASTM D5185m 3 2 1 Potassium ppm ASTM D5185m >20 3 0 <1							
Silicon ppm ASTM D5185m >25 5 5 5 Sodium ppm ASTM D5185m 3 2 1 Potassium ppm ASTM D5185m >20 3 0 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.4 0.4 Nitration Abs/cm *ASTM D7624 >20 6.4 6.3 6.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.2 18.8 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.1 14.8 15.2	CONTAMINANTS	1-1-	method	limit/base			
Sodium ppm ASTM D5185m 3 2 1 Potassium ppm ASTM D5185m >20 3 0 <1		nnm				•	•
Potassium ppm ASTM D5185m >20 3 0 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.4 0.4 Nitration Abs/cm *ASTM D7624 >20 6.4 6.3 6.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.2 18.8 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.1 14.8 15.2				- 20			
INFRA-RED				>20			
Soot % % *ASTM D7844 >3 0.4 0.4 0.4 Nitration Abs/cm *ASTM D7624 >20 6.4 6.3 6.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.2 18.8 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.1 14.8 15.2		ррііі					
Nitration Abs/cm *ASTM D7624 >20 6.4 6.3 6.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.2 18.8 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.1 14.8 15.2							•
Sulfation Abs/.1mm *ASTM D7415 >30 19.2 18.8 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.1 14.8 15.2							
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.1 14.8 15.2	Nitration						
Oxidation Abs/.1mm *ASTM D7414 >25 15.1 14.8 15.2	Sulfation	Abs/.1mm	*ASTM D7415	>30	19.2	18.8	19.1
	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 10 7.8 7.9 7.9	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.1	14.8	15.2
	Base Number (BN)	mg KOH/g	ASTM D2896	10	7.8	7.9	7.9



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

FLUID PROPER	HES	method			history1	history2
Visc @ 100°C	cSt	ASTM D445	14.9	12.0	11.8	11.9

visc @ 10	UC		COL	Ac	DI IVI D	445 14.9		2.0		1.1	.0		11.	9
GRAPH	S													
Iron (pp	m)						Le	ad (pp	om)					
Severe							100 Se	vere		1177				
							00							
Abnormal			-				40 Ab	normal						
	~	~				_~~	20						_	
Mar19/20	May7/21	Nov5/21	Apr8/22	Sep 9/22	May5/23	0ct5/23	Mar19/20	Aug21/20	May7/21	Nov5/21	Apr8/22	Sep 9/22	May5/23	0ct5/23
1000			Ap	S	Ma	0					Ap	S	M	0
Aluminu	m (pp	om)	nnn gri				Ch 50 T 3 3	romiu	ım (pı	om)	cecses			
Severe							40 - Se	vere						
Abnormal							20 Ab	normal						
di d							10							
	_	~	-		~	~~	م ا			4				
Mart 3/20 Aug21/20	May7/2	Nov5/21	Apr8/22	Sep9/22	May5/23	0ct5/23	Mar19/20	Aug21/20	May7/21	Nov5/21	Apr8/22	Sep9/22	May5/23	Oct5/23
≥ ∢ Copper (_			⊲ icon (ا						
Severe	(PP		erer:	11777			80 T Se		P P					
							60 -							
							튭 40 - Ab	normal						
							20 -							
Mar19/20 +-	/21	/21	22	22	23	23	01	20-1	12/	₹ 12	22	22	¥ 52	23-
Aug21/20	May7/21	Nov5/21	Apr8/22	Sep9/22	May5/23	Oct5/23	Mar19/20	Aug21/20	May7/2	Nov5/21	Apr8/22	Sep9/22	May5/23	0ct5/23
Viscosity	@ 10	00°C						se Nu	mber					
The state of							12.0 Ba	se					****	
Abnormal		2222					Base Number (mg KOH/g) 8.0 - 0			\sim	~/	~	-	~
Abnamal		m	~				6.0 - 4.0 - 4.0 - 4.0							
						~	8 gs 2.0							
Mar19/20 +	May7/21-	Nov5/21	Apr8/22 -	Sep9/22 -	May5/23 -	0ct5/23	0.0	1/20	May7/21-	Nov5/21-	Apr8/22 -	Sep9/22 -	May5/23 -	0ct5/23
Mar1 9/20 Aug2 1/20	May	Nov	Apri	Sep	May	Oct	Mar19/20	Aug21/20	Мау	Nov	Apri	Sep	May	Oct





Certificate 12367

Sample No. : WC0559215 Lab Number : 06193377 Unique Number : 11050129

Test Package : MOB1+

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 28 May 2024 Tested : 30 May 2024

Diagnosed : 30 May 2024 - Wes Davis

LIBERTY DISPOSAL 6401 S EASTERN AVE OKLAHOMA CITY, OK US 73149

Contact: RICK SCHMIDT r.schmidt@ldi89.com

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)

Report Id: SEAOKL [WUSCAR] 06193377 (Generated: 05/30/2024 12:58:36) Rev: 1

Contact/Location: RICK SCHMIDT - SEAOKL

T:

F: