

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id **1706**

Component Diesel Engine

Fluid

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.

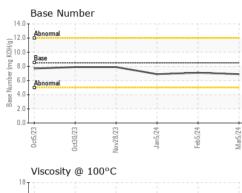
Fluid Condition

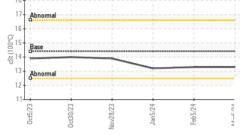
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0894058	WC0893995	WC0868185
Sample Date		Client Info		05 Mar 2024	05 Feb 2024	05 Jan 2024
Machine Age	mls	Client Info		0	0	0
Oil Age	mls	Client Info		0	0	0
Oil Changed		Client Info		N/A	N/A	N/A
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATION	٨	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<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	10	8	14
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm	ASTM D5185m	>4	0	0	0
Titanium	ppm	ASTM D5185m		<1	0	0
Silver	ppm	ASTM D5185m	>3	<1	0	0
Aluminum	ppm	ASTM D5185m	>20	3	3	3
Lead	ppm	ASTM D5185m	>40	0	<1	<1
Copper	ppm	ASTM D5185m	>330	21	32	47
Tin	ppm	ASTM D5185m	>15	<1	0	<1
Vanadium	ppm	ASTM D5185m		<1	<1	<1
Cadmium	ppm	ASTM D5185m		0	0	0
Cadmium ADDITIVES	ppm	ASTM D5185m method	limit/base	0 current	0 history1	0 history2
	ppm ppm		limit/base 250	-	-	
ADDITIVES		method		current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	250	current 1	history1 <1	history2 2
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	250 10	current 1 2	history1 <1 0	history2 2 0
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	250 10	current 1 2 58	history1 <1 0 55	history2 2 0 61
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450	current 1 2 58 0	history1 <1 0 55 0	history2 2 0 61 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450	current 1 2 58 0 889	history1 <1 0 55 0 991	history2 2 0 61 <1 1058
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000	Current 1 2 58 0 889 1072	history1 <1 0 55 0 991 1053	history2 2 0 61 <1 1058 1159
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150	Current 1 2 58 0 889 1072 997	history1 <1 0 55 0 991 1053 998	history2 2 0 61 <1 1058 1159 1050
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350	Current 1 2 58 0 889 1072 997 1178	history1 <1 0 55 0 991 1053 998 1240	history2 2 0 61 <1 1058 1159 1050 1394
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250	Current 1 2 58 0 889 1072 997 1178 3106	history1 <1 0 555 0 991 1053 998 1240 2792	history2 2 0 61 <1 1058 1159 1050 1394 3272
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250	Current 1 2 58 0 889 1072 997 1178 3106 Current	history1 <1 0 55 0 991 1053 998 1240 2792 history1	history2 2 0 61 <1 1058 1159 1050 1394 3272 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >158	current 1 2 58 0 889 1072 997 1178 3106 current 4	history1 <1 0 55 0 991 1053 998 1240 2792 history1 6	history2 2 0 61 <1 1058 1159 1050 1394 3272 history2 5
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >158	current 1 2 58 0 889 1072 997 1178 3106 current 4 <1	history1 <1 0 55 0 991 1053 998 1240 2792 history1 6 2	history2 2 0 61 <1 1058 1159 1050 1394 3272 history2 5 2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >158 >20	current 1 2 58 0 889 1072 997 1178 3106 current 4 <1 4	+istory1 <1 0 55 0 991 1053 998 1240 2792 history1 6 2 <1	history2 2 0 61 <1 1058 1159 1050 1394 3272 history2 5 2 3
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	250 10 100 450 3000 1150 1350 4250 Imit/base >25 >158 >20 Imit/base >3	current 1 2 58 0 889 1072 997 1178 3106 current 4 <1 4 <1 4 current	history1 <1 0 55 0 991 1053 998 1240 2792 history1 6 2 <1 history1	history2 2 0 61 <1 1058 1159 1050 1394 3272 history2 5 2 3 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm	method ASTM D5185m	250 10 100 450 3000 1150 1350 4250 Imit/base >25 >158 >20 Imit/base >3	current 1 2 58 0 889 1072 997 1178 3106 current 4 <1 4 current 0.2	history1 <1 0 55 0 991 1053 998 1240 2792 history1 6 2 <1 0 0 0.2	history2 2 0 61 <1 1058 1159 1050 1394 3272 history2 5 2 3 history2 0.2
ADDITIVES 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	method ASTM D5185m	250 10 100 450 3000 1150 1350 4250 imit/base >25 >158 >20 imit/base >3 >20	current 1 2 58 0 889 1072 997 1178 3106 current 4 <1 4 0.2 7.8	history1 <1 0 55 0 991 1053 998 1240 2792 history1 6 2 <1 history1 6 2 <1 history1 0.2 7.6	history2 2 0 61 <1 1058 1159 1050 1394 3272 history2 5 2 3 history2 0.2 7.8
ADDITIVES 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	method ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 imit/base >25 >158 >20 imit/base >3 >20	current 1 2 58 0 889 1072 997 1178 3106 current 4 <1 4 current 0.2 7.8 22.9	history1 <1 0 55 0 991 1053 998 1240 2792 history1 6 2 <1 0.2 7.6 22.5	history2 2 0 61 <1 1058 1159 1050 1394 3272 history2 5 2 3 history2 0.2 7.8 22.3



OIL ANALYSIS REPORT





	VISUAL		method	limit/base	current	histo	ory1	histor	ry2	
	White Metal		*Visual	NONE	NONE	NONE	NONE		NONE	
	Yellow Metal		*Visual	NONE	NONE	NONE	NONE		NONE	
	Precipitate		*Visual	NONE	NONE	NONE	NONE NONE			
	Silt	scalar	*Visual	NONE	NONE	NONE		NONE		
	Debris		*Visual	NONE	NONE	NONE	NONE NONE			
	Sand/Dirt		*Visual	NONE	NONE	NONE	NONE NONE			
Feb5/24 Mar5/24	Appearance		*Visual	NORML	NORML	NOR	NORML NORM		L	
Fel	Odor	scalar	*Visual	NORML	NORML	NOR	ΛL	NORM	L	
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG		NEG		
	Free Water	scalar	*Visual		NEG	NEG		NEG		
	FLUID PROPERT	IES	method	limit/base	current	histo	ory1	histor	ry2	
	Visc @ 100°C	cSt	ASTM D445	14.4	13.3	13.3		13.2		
	GRAPHS									
	Iron (ppm)				Lead (ppm)					
	250 Severe			10	Severa					
Feb5/24	200			8		1				
LL 2	150 100 - Abnormal			6 8d 4	Abaran					
	50 -			2						
	0			_	0					
	0ct5/23 0ct30/23	Jan5/24	Feb5/24	Mar5/24	0ct5/23	Vov28/23 -	Jan 5/24	Feb5/24	Mar5/24	
	0cc Novž	Jar	Fet	Ma	0cc	Novž	Jar	별	Ma	
	Aluminum (ppm)			-	Chromium (ppm)				
	50 Severe			40 Sever	Severe					
					-	1	1	1		
	Abnormal	1		щ ³	Abnormal	1	1			
	10			1						
	0				0					
	0ct5/23 0ct30/23	Jan5/24	Feb5/24	Mar5/24	0ct5/23 0ct30/23	Vov28/23	Jan 5/24	Feb 5/24	Mar5/24	
	Novi Oct	na l	Fe	Ma	0ct 0c	Novi	Γ	E	Ma	
	Copper (ppm)				Silicon (ppm)					
	400 Severe				0 Severe					
	300			6						
	<u>ة</u> 200			E 4						
	100			2	Abnormal					
	0				0	_				
	0ct5/23 0ct30/23	Jan5/24	Feb 5/24	Mar5/24	0ct5/23 0ct30/23	Nov28/23	Jan5/24	Feb5/24	Mar5/24	
	0 2		Ê.	W	0		P	£	N	
	Viscosity @ 100°C	;		15.	Base Numbe	er				
	Abnormal			(B/HC	Abnormal		į			
	16- Base			₽10.	Base					
	् 0014 अत्र			mper	Abnormal	_	_			
	12			.0,HOX Base Number (mg KOH/0)	0 - 0	1		1		
	10			<u> </u>	0					
	0ct5/23 0ct30/23	Jan5/24	Feb5/24	Mar5/24	0ct5/23 0ct30/23	Nov28/23	Jan 5/24	Feb5/24	Mar5/24	
	0 00 V	÷.	LE.	2	00	No	7	LE.	N	
Laboratory			n Ave., Cary, NC 27513				GO DURHAM - RAPT			
Sample No. Lab Number	: WC0894058 : 06124578		Received : 21 Mar 2024 Tested : 21 Mar 2024					ETTEVILLI DURHAM		
	: 10938729			Mar 2024 - V	Ves Davis			US 2		
Test Package	: MOB 1 (Additional Te	ests: TBN)				Contact: Robert Iosiniecki				
	contact Customer Serv		Robert.losiniecki@ratpdev.com							

To discuss this sample report, * - 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)

Certificate L2367

Ľ

T:

F: