

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id **9919** Component **Diesel Engine** Fluid **DIESEL ENGINE OIL SAE 15W40 (--- GAL)**

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor. Please specify the component make and model with your next sample. Please specify the brand, type, and viscosity of the oil on your next sample.

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

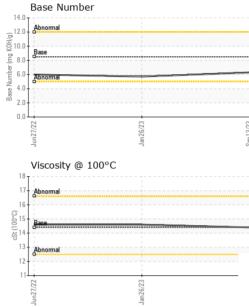
Fluid Condition

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

Jun2022 Jan2023 Sep2023										
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2				
Sample Number		Client Info		WC0844935	WC0766291	WC0680309				
Sample Date		Client Info		13 Sep 2023	26 Jan 2023	27 Jun 2022				
Machine Age	mls	Client Info		0	321258	315805				
Oil Age	mls	Client Info		0	0	0				
Oil Changed		Client Info		Changed	Changed	Changed				
Sample Status				NORMAL	NORMAL	NORMAL				
CONTAMINATIO	N	method	limit/base	current	history1	history2				
Fuel		WC Method	>5	<1.0	<1.0	<1.0				
Glycol		WC Method		NEG	NEG	NEG				
WEAR METALS		method	limit/base	current	history1	history2				
Iron	ppm	ASTM D5185m	>100	23	20	36				
Chromium	ppm	ASTM D5185m	>20	1	1	2				
Nickel	ppm	ASTM D5185m	>4	0	0	<1				
Titanium	ppm	ASTM D5185m		<1	<1	<1				
Silver	ppm	ASTM D5185m	>3	0	0	<1				
Aluminum	ppm	ASTM D5185m	>20	2	2	2				
Lead	ppm	ASTM D5185m	>40	<1	0	<1				
Copper	ppm	ASTM D5185m	>330	2	2	2				
Tin	ppm	ASTM D5185m	>15	<1	<1	<1				
Vanadium	ppm	ASTM D5185m		0	0	0				
Cadmium	ppm	ASTM D5185m		0	0	0				
ADDITIVES		method	limit/base	current	history1	history2				
ADDITIVES Boron	ppm	method ASTM D5185m		current 8	history1 18	history2 8				
	ppm ppm		250							
Boron		ASTM D5185m	250	8	18	8				
Boron Barium	ppm	ASTM D5185m ASTM D5185m	250 10	8 2	18 0	8 0				
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	250 10	8 2 73	18 0 81	8 0 67				
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100	8 2 73 <1	18 0 81 <1	8 0 67 <1				
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450	8 2 73 <1 380	18 0 81 <1 228	8 0 67 <1 721				
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000	8 2 73 <1 380 1912	18 0 81 <1 228 1963	8 0 67 <1 721 1512				
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	250 10 100 450 3000 1150 1350	8 2 73 <1 380 1912 1089	18 0 81 <1 228 1963 986	8 0 67 <1 721 1512 992				
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350	8 2 73 <1 380 1912 1089 1318	18 0 81 <1 228 1963 986 1207	8 0 67 <1 721 1512 992 1270				
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	250 10 100 450 3000 1150 1350 4250	8 2 73 <1 380 1912 1089 1318 3304	18 0 81 <1 228 1963 986 1207 3713	8 0 67 <1 721 1512 992 1270 3516				
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	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	250 10 100 450 3000 1150 1350 4250 <i>limit/base</i>	8 2 73 <1 380 1912 1089 1318 3304 current	18 0 81 <1 228 1963 986 1207 3713 history1	8 0 67 <1 721 1512 992 1270 3516 history2				
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m	250 10 100 450 3000 1150 1350 4250 <i>limit/base</i>	8 2 73 <1 380 1912 1089 1318 3304 current 5	18 0 81 <1 228 1963 986 1207 3713 history1 4	8 0 67 <1 721 1512 992 1270 3516 history2 4				
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >158	8 2 73 <1 380 1912 1089 1318 3304 <u>current</u> 5 6	18 0 81 <1 228 1963 986 1207 3713 history1 4 5	8 0 67 <1 721 1512 992 1270 3516 history2 4 14				
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >158 >20	8 2 73 <1 380 1912 1089 1318 3304 current 5 6 6 <1	18 0 81 <1 228 1963 986 1207 3713 history1 4 5 1	8 0 67 <1 721 1512 992 1270 3516 history2 4 14 0				
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 Imit/base >25 >158 >20 Imit/base >3	8 2 73 <1 380 1912 1089 1318 3304 current 5 6 <1 current	18 0 81 228 1963 986 1207 3713 history1 4 5 1 1	8 0 67 <1 721 1512 992 1270 3516 history2 4 14 0 history2				
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 ASTM D5185m	250 10 100 450 3000 1150 1350 4250 Imit/base >25 >158 >20 Imit/base >3	8 2 73 <1 380 1912 1089 1318 3304 <i>current</i> 5 6 <1 <i>current</i> 1.2	18 0 81 <1 228 1963 986 1207 3713 history1 4 5 1 1 history1 1	8 0 67 <1 721 1512 992 1270 3516 history2 4 14 0 history2 1.3				
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 ASTM D5185m	250 10 100 450 3000 1150 1350 4250 Iimit/base >25 >158 >20 Iimit/base >3 >20	8 2 73 <1 380 1912 1089 1318 3304 <i>current</i> 5 6 <1 <i>current</i> 1.2 10.7	18 0 81 <1 228 1963 986 1207 3713 history1 4 5 1 4 5 1 history1 1 1 11.0	8 0 67 <1 721 1512 992 1270 3516 history2 4 14 0 history2 1.3 1.3 11.5				
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 ASTM D5185m	250 10 100 450 3000 1150 1350 4250 imit/base >25 >158 >20 imit/base >3 >20	8 2 73 <1 380 1912 1089 1318 3304 current 5 6 <1 current 1.2 10.7 23.7	18 0 81 <1 228 1963 986 1207 3713 history1 4 5 1 1 history1 1 1 1 1 1 1 1 23.7	8 0 67 <1 721 1512 992 1270 3516 history2 4 14 0 history2 1.3 1.3 11.5 24.6				
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 ASTM D7844 *ASTM D7844	250 10 100 450 3000 1150 1350 4250 bimit/base >25 >158 >20 bimit/base >3 >20 >30	8 2 73 <1 380 1912 1089 1318 3304 <i>current</i> 5 6 <1 <i>current</i> 1.2 10.7 23.7 <i>current</i>	18 0 81 228 1963 986 1207 3713 history1 4 5 1 4 5 1 history1 1 1 11.0 23.7 history1	8 0 67 <1 721 1512 992 1270 3516 history2 4 14 0 history2 1.3 11.5 24.6 history2				



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	
Jan 26/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML	
Janž	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	RTIES	method	limit/base	current	history1	history2	
	Visc @ 100°C	cSt	ASTM D445	14.4	14.4	14.6	14.6	
	GRAPHS							
	Ferrous Alloys							
	40 25 iron							
Jan 26/23	35 second second chromium							
Jar	30 25							
	톱 20-							
	15-							
	10-							
	5-							
	0							
	27/22	Jan 26/23		Sep13/23				
	Jun27/	Jan		Sep				
	Non-ferrous Meta	als						
	10 copper							
	8 - second lead							
	u dd							
	4							
	2							
	un27/22	an 26/23		3ep13/23				
				Sel				
	Viscosity @ 100°	°C			Base Number			
	17- Abnormal			12.	Abnormal			
	16				4 4 C			
				HOX B	Base			
	0015 001 5314			(b) H0.1 Bu) so Mump as Mump as Mump as 4.1	0			
				funn N	Abnormal			
	13 Abnormal			8 4.	0-			
	12-			2.	0			
	11	~				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
	Jun27/22	Jan 26/23		Sep 13/23	Jun27/22	Jan 26/23		
	Γ	Ja		a)	лſ	Jai		
Laboratory								
Sample No Lab Numbe		Received		Sep 2023		6900 MILLHOUSE F		
Lab Number Unique Num		Diagnose Diagnost		Sep 2023 s Davis		CHAPEL HILL, N US 275		
ificate L2367 Test Packa		Biagnost	ician : Wes Davis			Contact:	Lisa DePasq	
				Idepasqua@townofchapelhill.c				
discuss this sample repo	ort, contact Customer Ser at are outside of the ISO				ld		ofchapelhill.c (919)696-49	

Contact/Location: Lisa DePasqua - TOWCHANC