

OIL ANALYSIS REPORT

Sample Rating Trend





MACK 813005

Component Diesel Engine Fluid

DIESEL ENGINE OIL SAE 40 (--- GAL)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor. 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.

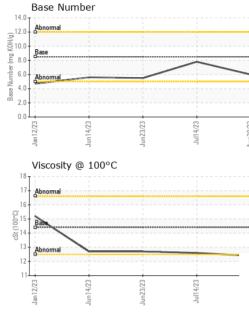
Fluid Condition

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

SAMPLE INFORMATION method limit/base current History1 History2 Sample Date Client Info 30 Aug 2023 14 Jul 2023 23 Jun 2023 Machine Age hrs Client Info 2585 2327 2205 Oil Age hrs Client Info 2585 2327 2205 Oil Changed Client Info 2585 2327 2205 Oil Changed Client Info 2585 2327 2205 Sample Status Client Info NAA N/A N/A Sample Status Client Info NORMAL NORMAL NORMAL CONTAMINATION method imit/base current History1 History2 Fuel WC Method >3.0 <1.0 <1.0 <1.0 <1.0 Ornorium ppm ASTM 05155 >20 <1 1 1 Nickel ppm ASTM 05155 >20 <1 0 <1 Nickel ppm ASTM 051555 <							
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Oil Changed Client Info N/A N/A N/A N/A Sample Status I Image Status Image Status Normal No	Machine Age	hrs	Client Info		2585	2327	2205
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Zinc ppm ASTM D5185m 1350 1210 1189 1232 Sulfur ppm ASTM D5185m 4250 3373 3201 2719 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 5 7 Sodium ppm ASTM D5185m >216 2 0 3 Potassium ppm ASTM D5185m >216 2 0 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.6 0.3 1.1 Nitration Abs/cm *ASTM D7624 >20 7.5 5.8 10.4 Sulfation Abs/.tm *ASTM D7615 >30 18.3 17.0 22.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.tm *ASTM D7741	Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100	10 0 65 <1	26 0 70 <1	5 14 71 1
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Nitration Abs/cm *ASTM D7624 >20 7.5 5.8 10.4 Sulfation Abs/.1mm *ASTM D7415 >30 18.3 17.0 22.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.1 11.8 18.0	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >216 >20	10 0 65 <1 877 1124 960 1210 3373 current 5 2 3	26 0 70 <1 818 1143 995 1189 3201 history1 5 0 1	5 14 71 1 875 1187 887 1232 2719 history2 7 3 2
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Oxidation Abs/.1mm *ASTM D7414 >25 13.1 11.8 18.0	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 Iimit/base >25 >216 >20 Iimit/base >4 >20	10 0 65 <1 877 1124 960 1210 3373 current 5 2 3 3 current 0.6 7.5	26 0 70 <1 818 1143 995 1189 3201 history1 5 0 1 5 0 1 history1 0.3 5.8	5 14 71 1 875 1187 887 1232 2719 history2 7 3 2 7 3 2 2 history2 1.1 10.4
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN 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 >216 >216 >20 imit/base >4 >20	10 0 65 <1 877 1124 960 1210 3373 <u>current</u> 5 2 3 3 <u>current</u> 0.6 7.5 18.3	26 0 70 <1 818 1143 995 1189 3201 history1 5 0 1 1 history1 0.3 5.8 17.0	5 14 71 1 875 1187 887 1232 2719 history2 7 3 2 history2 1.1 10.4 22.4
Base Number (BN) mg KUH/g ASTM D2896 8.5 6.0 7.8 5.5	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN 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 20 216 >216 >20 >20 imit/base >4 >20 >30	10 0 65 <1 877 1124 960 1210 3373 current 5 2 3 current 0.6 7.5 18.3 current	26 0 70 <1 818 1143 995 1189 3201 history1 5 0 1 history1 0.3 5.8 17.0 history1	5 14 71 1 875 1187 887 1232 2719 history2 7 3 2 7 3 2 2 history2 1.1 10.4 22.4 history2
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE Oxidation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7624 *ASTM D7411	250 10 100 450 3000 1150 1350 4250 limit/base >25 >216 >20 limit/base >4 >20 >30 limit/base	10 0 65 <1 877 1124 960 1210 3373 current 5 2 3 current 0.6 7.5 18.3 current 13.1	26 0 70 <1 818 1143 995 1189 3201 history1 5 0 1 5 0 1 1 history1 0.3 5.8 17.0 history1 11.8	5 14 71 1 875 1187 887 1232 2719 history2 7 3 2 history2 1.1 10.4 22.4 history2 18.0



OIL ANALYSIS REPORT



		VISUAL		method				history2
		White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
		Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
	\sim	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
3/23	Jul14/23 - Jug30/23 -		scalar	*Visual	NORML	NORML	NORML	NORML
Jun23/23	Jul14/23	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual		NEG	NEG	NEG
		FLUID PROP	ERTIES	method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445	14.4	12.4	12.6	12.7
		GRAPHS						
		Ferrous Alloys						
1/23	1/23	80 - iron						
Jun23/23	Jul14/23	70 - nanana nickel						
		60						
		E 40						
		30-						
		20						
		10-	anness and the second sec					
		3 3	53	23	53			
		Jan 1 2/23 Jun 1 4/23	Jun23/23	Jul14/23	Aug30/23			
				- T	Au			
		Non-ferrous Met	als					
		copper						
		200 - tin						
		200 - management tin						
		150						
		200 - management tin						
		150 100						
		150						
		150 100 50 0						
		150 100 50 0	23/23	14/23	30/23			
		200 150 0 50 0 50 0 50 0 50 50 50	Jun23/23	Jul 4/23	Aug30/23 A			
		150 100 50 0	,	Jult4/23	cz/0c ^{bm} W	Base Number		
		200 150 100 50 CZ7 EZ Viscosity @ 100 ^c	,	EZFIInr	14.	Abnormal		
		200 150 100 50 0 EXT in EXT in	,	Juli 4/23	14.	Abnormal		
		200 150 100 50 0 EXT in EXT in	,	Juli 4/23	14.	Abnormal		
		200 150 100 50 0 EZ71 Ling Viscosity @ 100° 18 17 Abnomal	,	Jul 4/23	14.	Abnormal		
		200 150 100 50 0 EXIST E	,	C2/F1/Inf	14.	Abnormal		
		200 150 0 100 50 0 EZ7 100 EZ7 EZ7 EZ7 EZ7 EZ7 EZ7 EZ7 EZ7	,	nul 423	14.0 12.1 (0/HOX Du) = 0.8.0 = 0.6.0 = 0.0 = 0.6.0 = 0.0 = 0.0 = 0.0 = 0.0 = 0.0 = 0.0 = 0.0 = 0.0 = 0	Abnormal Base Abnormal		
		200 150 100 50 0 EXIST E	,	Juli 4/23	14.0 12.1 (0) 10.1 10.0 10.0 10.0 10.0 10.0 10.0 10.0	Abnormal Base Abnormal Abnormal		
		200 150 150 0 100 50 0 100 100 50 0 100 10	2C		14.1 (b)H010.1 (b)H0XI 00.1 (c)H0XI 00.1 (c)	Abnormal Base Abnormal		423
		200 150 150 150 100 50 0 CZ7 LEP Viscosity @ 100 CZ7 LEP Viscosity @ 100 CZ7 LEP LEP LEP LEP LEP LEP LEP LEP	,	Jult 4/23	14.0 12.1 (0) 10.1 10.0 10.0 10.0 10.0 10.0 10.0 10.0	Abnormal Base Abnormal Abnormal	23233	Jul14/23
		200 150 150 0 50 0 50 0 50 0 50 0 50 0 50 0 50 0 50 0 50 0 50 0 50 0 50 100 50 0 50 0 50 100 50 0 50 100 10	2 C	Jul14/23	14.1 12.1 (0)H10.1 B300 KUMU B400 KU	Abnormal Base Abnormal EZZII	Jun23/23	
	Laboratory	200 150 150 150 150 150 150 150 1	2С Е2/22/21/17	son Ave., Ca	14.0 12.1 (0)H10.1 10.0 10	Abnormal Base Abnormal EZZII	nvironmental -	009 - Fairbu
		200 150 150 0 50 0 50 0 50 0 50 0 50 0 50 0 50 0 50 0 50 0 50 0 50 0 50 100 50 0 50 0 50 100 50 0 50 100 10	2 C	son Ave., Ca	14.1 12.1 (0)H10.1 B300 KUMU B400 KU	Abnormal Base Abnormal EZZII	nvironmental -	
	Laboratory Sample No. Lab Number Unique Number	200 150 150 150 150 150 150 150 1	C 501 Madia Received	son Ave., Ca d : 01 3 ed : 01 3	14.0 12.1 10.1	Abnormal Base Abnormal EZZII	EZEZUNG nvironmental - 6905	009 - Fairbu Roosevelt Hv Fairburn, G US 302
	Laboratory Sample No. Lab Number Unique Number Test Package	200 150 150 150 150 150 150 150 1	2C 501 Madia Received Diagnos Diagnos	son Ave., Ca d : 01 S ed : 01 S tician : We	14.1 12.0 10.100 00 00 8.8 10.000 00 00 00 00 10.000 00 00 00 10.000 00 00 10.000 00 00 10.000 00 10.0000 00 10.00000 00 10.000000000000000000000000000000000	Abnormal Base Abnormal EZZII	ezezunr nvironmental - 6905 Con	009 - Fairbu Roosevelt Hy Fairburn, Q