

OIL ANALYSIS REPORT

Sample Rating Trend





DIESEL ENGINE OIL SAE 40 (--- GAL)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor. The fluid was not specified, however, a fluid match indicates that this fluid is (GENERIC) DIESEL ENGINE OIL SAE 40. Please confirm. Please specify the component make and model with your next sample.

Wear

Metal levels are typical for a new component breaking in.

Contamination

Elevated aluminum (Al) and/or lead (Pb) and potassium (K) levels in your metals analysis are likely a result of solder flux release into the lubricant and is common on new equipment/components. There is no indication of any contamination in the oil.

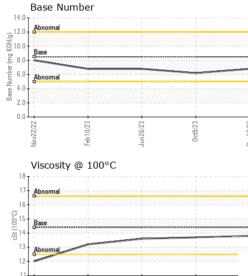
Fluid Condition

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

		Nov2022	Feb2023	Jun2023 Oct2023	Dec2023	
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0096103	GFL0084493	GFL0073479
Sample Date		Client Info		18 Dec 2023	09 Oct 2023	26 Jun 2023
Machine Age	hrs	Client Info		3141	2523	1843
Oil Age	hrs	Client Info		618	680	781
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	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 METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	19	31	29
Chromium	ppm	ASTM D5185m	>20	<1	<1	2
Nickel	ppm	ASTM D5185m	>4	<1	0	1
Titanium	ppm	ASTM D5185m		12	13	14
Silver	ppm	ASTM D5185m	>3	0	0	<1
Aluminum	ppm	ASTM D5185m	>20	9	18	18
Lead	ppm	ASTM D5185m	>40	<1	<1	1
Copper	ppm	ASTM D5185m	>330	<1	1	3
Tin	ppm	ASTM D5185m	>15	1	<1	1
Vanadium	ppm	ASTM D5185m		<1	0	<1
Cadmium	ppm	ASTM D5185m		<1	0	0
ADDITIVES		method	limit/base	current	history1	history2
_					4.0	
Boron	ppm	ASTM D5185m	250	100	40	51
Boron Barium	ppm ppm	ASTM D5185m ASTM D5185m	250 10	100 0	40 0	51 0
Barium	ppm	ASTM D5185m	10	0	0	0
Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m	10	0 54	0 49	0 37
Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	10 100	0 54 <1	0 49 <1	0 37 1
Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	10 100 450	0 54 <1 711	0 49 <1 716	0 37 1 769
Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	10 100 450 3000	0 54 <1 711 1527	0 49 <1 716 1498	0 37 1 769 1714
Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	10 100 450 3000 1150	0 54 <1 711 1527 803	0 49 <1 716 1498 663	0 37 1 769 1714 728
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	10 100 450 3000 1150 1350	0 54 <1 711 1527 803 931	0 49 <1 716 1498 663 796	0 37 1 769 1714 728 875
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	10 100 450 3000 1150 1350 4250	0 54 <1 711 1527 803 931 3266	0 49 <1 716 1498 663 796 2851	0 37 1 769 1714 728 875 3875
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	10 100 450 3000 1150 1350 4250	0 54 <1 711 1527 803 931 3266 current	0 49 <1 716 1498 663 796 2851 history1	0 37 1 769 1714 728 875 3875 history2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	10 100 450 3000 1150 1350 4250 limit/base >25	0 54 <1 711 1527 803 931 3266 current 7	0 49 <1 716 1498 663 796 2851 history1 9	0 37 1 769 1714 728 875 3875 history2 11
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m	10 100 450 3000 1150 1350 4250 limit/base >25 >216	0 54 <1 711 1527 803 931 3266 current 7 5	0 49 <1 716 1498 663 796 2851 history1 9 5	0 37 1 769 1714 728 875 3875 8875 3875 history2 11 5
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	10 100 450 3000 1150 1350 4250 limit/base >25 >216 >20	0 54 <1 711 1527 803 931 3266 current 7 5 23	0 49 <1 716 1498 663 796 2851 history1 9 5 5 56	0 37 1 769 1714 728 875 3875 history2 11 5 37
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	10 100 450 3000 1150 1350 4250 limit/base >25 >216 >20 limit/base	0 54 <1 711 1527 803 931 3266 current 7 5 23 current	0 49 <1 716 1498 663 796 2851 history1 9 5 56 56 history1	0 37 1 769 1714 728 875 3875 875 3875 history2 11 5 37 history2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m	10 100 450 3000 1150 1350 4250 limit/base >25 >216 >20 limit/base >3	0 54 <1 711 1527 803 931 3266 current 7 5 23 current 0.7	0 49 <1 716 1498 663 796 2851 history1 9 5 56 56 history1 0.9	0 37 1 769 1714 728 875 3875 875 3875 history2 11 5 37 history2 0.8
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm spm	ASTM D5185m ASTM D5185m	10 100 450 3000 1150 1350 4250 limit/base >25 >216 >20 limit/base >3 >20	0 54 <1 711 1527 803 931 3266 current 7 5 23 current 0.7 10.1	0 49 <1 716 1498 663 796 2851 history1 9 5 56 5 6 history1 0.9 10.3	0 37 1 769 1714 728 875 3875 history2 11 5 37 history2 0.8 10.5
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	10 100 450 3000 1150 1350 4250 Iimit/base >25 >216 >20 Iimit/base >3 >20 >30	0 54 <1 711 1527 803 931 3266 current 7 5 23 current 0.7 10.1 21.8	0 49 <1 716 1498 663 796 2851 history1 9 5 56 history1 0.9 10.3 22.1	0 37 1 769 1714 728 875 3875 history2 11 5 37 history2 0.8 10.5 23.0
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm % Abs/cm Abs/cm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	10 100 450 3000 1150 1350 4250 imit/base >25 >216 >20 imit/base >3 >20 >30	0 54 <1 711 1527 803 931 3266 current 7 5 23 current 0.7 10.1 21.8 current	0 49 <1 716 1498 663 796 2851 history1 9 5 56 <u>history1</u> 0.9 10.3 22.1 history1	0 37 1 769 1714 728 875 3875 history2 11 5 37 history2 0.8 10.5 23.0 history2



OIL ANALYSIS REPORT



Feb10/23

Nov22/22

		VISUAL		method	limit/base	current	history1	history2
		White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
		Yellow Meta	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
Jun26/23	0ct9/23 Dec18/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Jun	Deci	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
		Emulsified V	Vater scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual		NEG	NEG	NEG
		FLUID P	ROPERTIES	S method	limit/base	current	history1	history2
		Visc @ 100°	C cSt	ASTM D445	14.4	13.8	13.7	13.6
		GRAPHS	S					
		Ferrous Al	loys					
Jun26/23 -	0ct9/23 -	35 - iron						
Juni	00	30 - nicke		-				
		톱 20 -						
		15						
		10-						
		5						
		52	23		53			
		Vov22/22	Feb 10/23 Jun 26/23	0ct9/23	Dec18/23			
		≥ Non-ferro	2					
		³⁰ T						
		25 - copp	er	 				
		assessesses till	i j					
		20						
		20						
		20 <u>E</u> 15						
			10/23					
			Feb 10/23	0c9/23	Dect 8/23			
					Dec18/23	Base Number		
		Viscosity @				Base Number		
		Z20 Ea 15 10 5 0 ZZZZZON Viscosity (C 18			52 8 1 2 3 0 1 4 .0 14.0	1		
		Viscosity (52 8 1 2 3 0 1 4 .0 14.0	1		
		Viscosity (52 8 1 2 3 0 1 4 .0 14.0	Abnormal Base		
		20 md 15 10 5 0 72727000 Viscosity (18 17 6 10 10 10 10 10 10 10 10 10 10			52 8 1 2 3 0 1 4 .0 14.0	Abnormal		
		20 15 10 5 0 222 20 222 20 222 20 222 20 222 220 222 220 222 220 222 220 222 220 222 220 222 220 222 220 222 220 222 220 20			14.0 12.0 (0)H10.0 W W W W & 8.0 0 0 A W W W & 8.0 0 A W W W & 8.0 0 A W W W W & 8.0 0 A W W W W W W W W W W W W W W W W W W	Abnormal Base		
		20 E E E E E E E E E E E E E			14.0 12.0 (0)10.0 (0)1	Abnormal Base		
		20 15 10 5 0 2222222 0 2222222 0 2222222 0 2222222 0 2222222 0 2222222 0 2222222 0 2222222 0 222222 0 222222 0 222222 0 222222 0 222222 0 22222 0 22222 0 22222 0 2222 222 16 16 16 16 16 16 16 16 16 16	₽ 100°C	0ct8/23	14.0 12.0 (0)(10.0 0) 10.0 10, 10, 10, 10, 10, 10, 10, 10, 10, 10,	Abnormal Base Abnormal		9/23
		20 15 10 5 0 2222222 0 2222222 0 2222222 0 2222222 0 2222222 0 2222222 0 2222222 0 2222222 0 222222 0 222222 0 222222 0 222222 0 222222 0 22222 0 22222 0 22222 0 2222 222 16 16 16 16 16 16 16 16 16 16			14.0 12.0 (0)10.0 (0)1	Abnormal Base	Jun26/23	0ct3/23
4	Laboratory	Viscosity (Viscosity (base CZZZZNAN Viscosity (base CZZZZNAN CZZZNAN CZZZZNAN CZZZZNAN CZZZZNAN CZZZNAN CZZZNAN CZZZZNAN CZZZZNAN CZZZZNAN CZZZNAN	D 100°C	EZIGPOO	14.0 12.0 12.0 10.0 10.0 10.0 10.0 10.0 10	Abnormal Base Abnormal Build Part of the second sec		29 - Northern
NAB	Sample No.	Viscosity (Viscosity (Cool) Viscosity (Cool) Viscosity (Cool)	D 100°C	Lison Ave., Ca	14.0 12.0 (Philos) 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.	Abnormal Base Abnormal Build Part of the second sec	Jun26/23	29 - Northern 3947 US 131
	Sample No. Lab Number	20 15 10 5 0 10 10 10 10 10 10 10 10 10	USA - 501 Mad 3 Recieve Diagnos	tison Ave., Ca ed : 21 sed : 22	14.0 12.0 (Philos) 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.	Abnormal Base Abnormal Build Part of the second sec	vironmental - 6/	29 - Northern 3947 US 131 Kalkaska, I
ificate 12367	Sample No.	20 10 10 10 10 10 10 10 10 10 1	D 100°C	tison Ave., Ca ed : 21 sed : 22	14.0 12.0 (Philos) 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.	Ahnomal Base Ahnomal CZCZZYON GFL En	vironmental - 6/	29 - Northern 3947 US 131 Kalkaska, US 49646-84

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

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