

OIL ANALYSIS REPORT

Sample Rating Trend WEAR

SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		PCA0109568	LP0000977	WC0721064
Sample Date		Client Info		01 Mar 2024	20 Oct 2023	21 Jul 2023
Machine Age	hrs	Client Info		14940	14282	13690
Oil Age	hrs	Client Info		500	500	500
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				ABNORMAL	MARGINAL	ABNORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	4 .1	6.4
Water		WC Method	>0.2	NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	29	44	29
Chromium	ppm	ASTM D5185m	>4	2	<1	<1
Nickel	ppm	ASTM D5185m	>4	0	0	0
Titanium	ppm	ASTM D5185m		0	0	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>9	2	<1	<1
Lead	ppm	ASTM D5185m	>20	<1	3	4
Copper	ppm	ASTM D5185m		▲ 589	208	▲ 313
Tin	ppm	ASTM D5185m	>4	<1	0	0
Vanadium	ppm	ASTM D5185m	24	0	0	<1
Cadmium	ppm	ASTM D5185m		0	0	0
	ppin		11 1. 4	-	-	-
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	250	8	11	14
Barium	ppm	ASTM D5185m	10	0	0	0
Molybdenum	ppm	ASTM D5185m	100	41	60	66
Manganese	ppm	ASTM D5185m		0	0	<1
Magnesium			450	100	786	669
	ppm	ASTM D5185m		169		
	ppm ppm	ASTM D5185m ASTM D5185m	3000	1754	1245	1379
		ASTM D5185m ASTM D5185m	3000 1150		1245 1015	1379 964
Phosphorus	ppm	ASTM D5185m ASTM D5185m	3000	1754	1245	1379
Phosphorus	ppm ppm	ASTM D5185m ASTM D5185m	3000 1150	1754 866	1245 1015	1379 964
Phosphorus Zinc	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	3000 1150 1350	1754 866 1043	1245 1015 1268	1379 964 1201
Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	3000 1150 1350 4250 limit/base	1754 866 1043 3249	1245 1015 1268 2962	1379 964 1201 3358
Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method	3000 1150 1350 4250 limit/base >25	1754 866 1043 3249 current	1245 1015 1268 2962 history1	1379 964 1201 3358 history2
CONTAMINAN Silicon	ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m	3000 1150 1350 4250 limit/base >25	1754 866 1043 3249 current 4	1245 1015 1268 2962 history1 3	1379 964 1201 3358 history2 3
Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm TS ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	3000 1150 1350 4250 limit/base >25 >158	1754 866 1043 3249 current 4 21	1245 1015 1268 2962 history1 3 2	1379 964 1201 3358 history2 3 2
Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	3000 1150 1350 4250 limit/base >25 >158	1754 866 1043 3249 current 4 21 32	1245 1015 1268 2962 history1 3 2 <1	1379 964 1201 3358 history2 3 2 2
Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED	ppm ppm ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D2982	3000 1150 1350 4250 limit/base >25 >158 >20	1754 866 1043 3249 current 4 21 32 NEG	1245 1015 1268 2962 history1 3 2 <1 NEG	1379 964 1201 3358 history2 3 2 2 2 NEG
Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot %	ppm ppm ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D2982 method	3000 1150 1350 4250 limit/base >25 >158 >20 limit/base >3	1754 866 1043 3249 current 4 21 32 NEG current	1245 1015 1268 2962 history1 3 2 <1 NEG history1	1379 964 1201 3358 history2 3 2 2 NEG history2
Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration	ppm ppm ppm ppm TS ppm ppm ppm %	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D2982 method *ASTM D7844	3000 1150 1350 4250 limit/base >25 >158 >20 limit/base >3 >20	1754 866 1043 3249 current 4 21 32 NEG current 0.2	1245 1015 1268 2962 history1 3 2 <1 NEG history1 0.3	1379 964 1201 3358 history2 3 2 2 NEG history2 0.3
Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration	ppm ppm ppm ppm TS ppm ppm ppm %	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D2982 *ASTM D2982 *ASTM D7844 *ASTM D7844 *ASTM D7624	3000 1150 1350 4250 limit/base >25 >158 >20 limit/base >3 >20	1754 866 1043 3249 current 4 21 32 NEG current 0.2 9.1	1245 1015 1268 2962 history1 3 2 <1 NEG history1 0.3 8.8	1379 964 1201 3358 history2 3 2 2 NEG history2 0.3 9.1
Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm TS ppm ppm ppm %	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D2982 *ASTM D2982 *ASTM D7844 *ASTM D7844 *ASTM D7624	3000 1150 1350 4250 limit/base >25 >158 >20 limit/base >3 >20 >3 >20	1754 866 1043 3249 current 4 21 32 NEG current 0.2 9.1 18.2	1245 1015 1268 2962 history1 3 2 <1 NEG history1 0.3 8.8 20.3	1379 964 1201 3358 history2 3 2 2 NEG history2 0.3 9.1 20.8
Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm ppm ppm ppm TS ppm ppm ppm % % Abs/cm Abs/cm Abs/.1mm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D2982 method *ASTM D7844 *ASTM D7844 *ASTM D7624	3000 1150 1350 4250 limit/base >25 >158 >20 limit/base >3 >20 >30 limit/base >25	1754 866 1043 3249 current 4 21 32 NEG current 0.2 9.1 18.2 current	1245 1015 1268 2962 history1 3 2 <1 NEG history1 0.3 8.8 20.3 history1	1379 964 1201 3358 history2 3 2 2 NEG history2 0.3 9.1 20.8 history2

PHOENIX MIXER 259

Diesel Engine Fluid DIESEL ENGINE OIL SAE 15W40 (--- GAL)

DIAGNOSIS

Recommendation

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

🔺 Wear

The copper level is abnormal. In the absence of other significant wear metals, suspect copper due to sources other than wear (i.e. cooling core).

Contamination

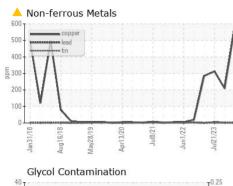
There is no indication of any contamination in the oil.

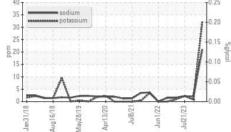
Fluid Condition

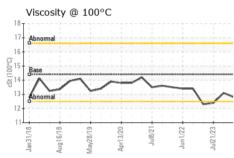
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

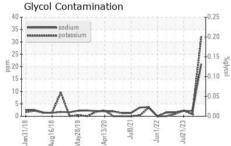


OIL ANALYSIS REPORT









	VISUAL		method	limit/base	current	history1	history2			
1	White Metal	scalar	*Visual	NONE	NONE	NONE	NONE			
	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE			
1	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			
Jun1/22 Jul21/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML			
ու	Odor	scalar	*Visual	NORML	NORML	NORML	NORML			
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG			
0.25	Free Water	scalar	*Visual		NEG	NEG	NEG			
-0.20	FLUID PROPE	RTIES	method	limit/base	current	history1	history2			
-0.15 egy	Visc @ 100°C	cSt	ASTM D445	14.4	12.8	13.1	12.4			
-0.10 ₽	GRAPHS									
-0.05	Iron (ppm)				Lead (ppm)					
0.00	200 Severe			4	Severe					
Jul21/23	150				0 -					
l)	E 100 - Abnormal	•		۲.2 ۲.2	0 - Abnormal					
	50-	N		^	0	+ + + + + + + + + + + + + + + + + + + +				
			\smile		0	2	$\sim\sim$			
	Jan31/18	Apr13/20 - Jul8/21 -	Jun1/22		Jan31/18 Aug16/18	Apr13/20 - Ju18/21 -	Jun1/22 - Jul21/23 -			
	Jan3 Aug1 May2	Apri	Jur		Jan's Aug1 May2	Aprl Ju	Jur Jul2			
	Aluminum (ppm)				° Chromium (pp	om)				
$\overline{}$	20 Severe				Severe					
	15 - Severe				6					
/22 -	a 10 - Abnormal			udd	4 - Abnormal					
Jun1/22 Jul21/23	5				2	$\sim \sim \sim$	\sim			
	0	$ \rightarrow $	$\sim \sim$				\sim			
T ^{0.25}	Jan31/18 - Aug16/18 - May28/19 -	Apr13/20 Jul8/21	Jun1/22	1	Jan31/18 Aug16/18 May28/19	Apr13/20 Jul8/21	Jun1/22 Jul21/23			
-0.20		Ap	The second se	5		Ap	յի հե			
-0.15 28	Copper (ppm)			5	Silicon (ppm)					
-0.15 % gives	500 - Severe				0 Severe					
a	400				0 Abnormal					
-0.05	E 300 - Angma		- r		10-1					
S 10.00	100-		/	1	\sim					
Jul21/23	0	0					3			
5) 	Jan 31/18 Aug 16/18 May 28/19	Apr13/20 Jul8/21	Jun1/22		Jan 31/18 Aug 16/18 May 28/19	գր։13/20 Jul8/21	Jun 1/22 Jul 21/23			
		Ϋ́,		5		Ar				
	Viscosity @ 100°C			15.	Base Number					
	Abnormal			(B/HO)	Abnormal					
	Base			B 10.	Base		~~~			
	Abnormal	\sim		rumber 2	0 - Abnormal					
	12			(Ø/HO) Base Number (mg KOH/g)						
		21	22	0.	.0 4 6	20+	22			
	Jan 31/18 Aug 16/18 May 28/19	Apr13/20 Jul8/21	Jun1/22	2	Jan 31/18 Aug 16/18 May 28/19	Apr13/20 Jul8/21	Jun1/22 Jul21/23			
					, 4 V					
Laboratory	: WearCheck USA - 50				TRESCA	A BROS SAND	& GRAVEL INC			
Sample No. Lab Number	: PCA0109568	Recei Teste		Mar 2024 Mar 2024			66 MAIN ST MILLIS, MA			
Unique Number										
	: MOB 2 (Additional Te					Contac	t: FRAN ROSSI			
a ampla rar+	agenta at Quatamar Qami	an at 1 0	00 007 1000	ר		freediater	ananarata cam			

 Certificate 12367
 Test Package
 : MOB 2 (Additional Tests: Glycol)

 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)

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