



OIL ANALYSIS REPORT

WEAR	SEVERE
CONTAMINATION	SEVERE
FLUID CONDITION	NORMAL

Machine Id
289008
Component
Diesel Engine
Fluid
SHELL 10W30 (--- QTS)

RECOMMENDATION

We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		WC0878598	WC0603014	WC0538469
Sample Date		Client Info		20 Dec 2023	09 Sep 2021	04 Feb 2021
Machine Age	mls	Client Info		677743	306408	305183
Oil Age	mls	Client Info		24000	0	41335
Filter Age	mls	Client Info		24000	0	41335
Oil Changed		Client Info		Changed	Changed	Changed
Filter Changed		Client Info		Changed	Changed	Changed
Sample Status				SEVERE	ABNORMAL	ABNORMAL

WEAR

Piston, ring and cylinder wear is indicated.

Iron	ppm	ASTM D5185m	>100	291	55	91
Chromium	ppm	ASTM D5185m	>20	17	2	8
Nickel	ppm	ASTM D5185m	>4	1	<1	<1
Titanium	ppm	ASTM D5185m		2	0	1
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	62	3	13
Lead	ppm	ASTM D5185m	>40	6	45	0
Copper	ppm	ASTM D5185m	>330	9	6	9
Tin	ppm	ASTM D5185m	>15	5	5	0
Vanadium	ppm	ASTM D5185m		<1	0	0
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE

CONTAMINATION

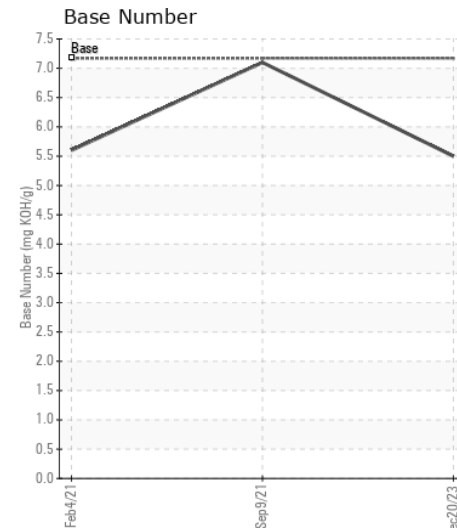
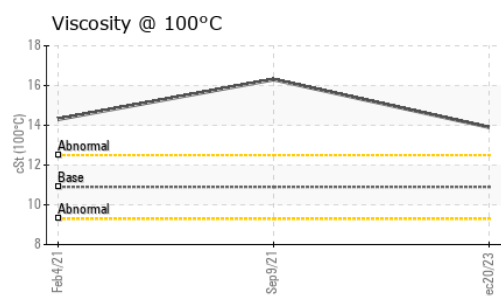
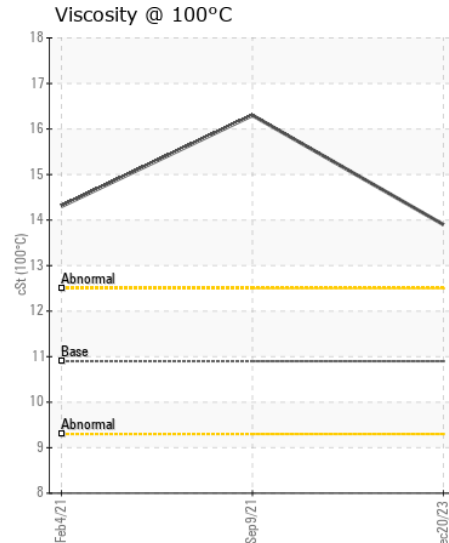
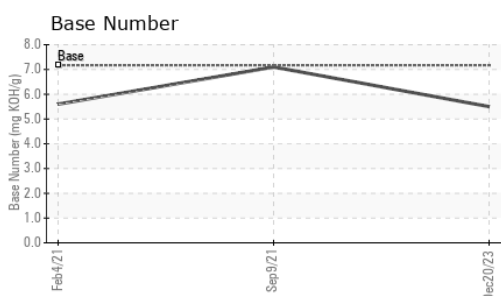
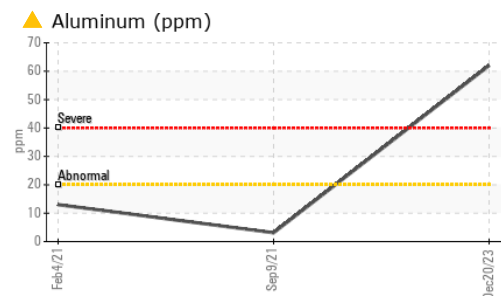
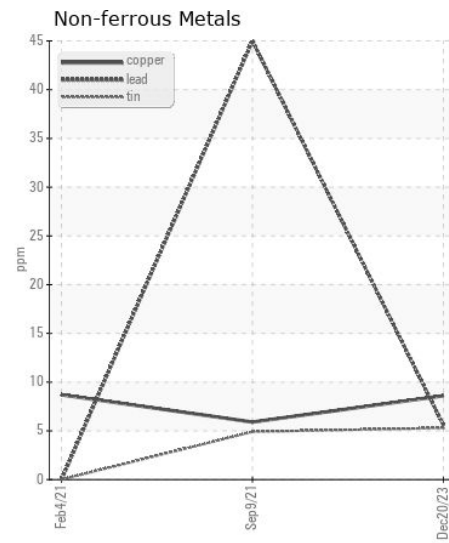
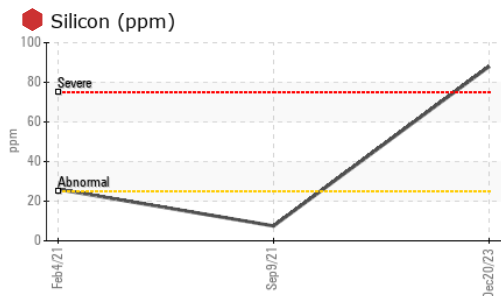
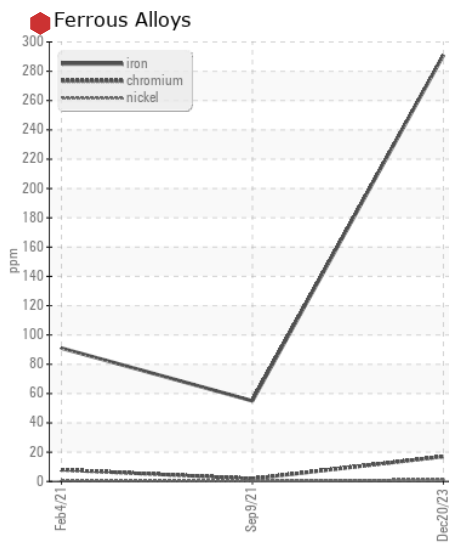
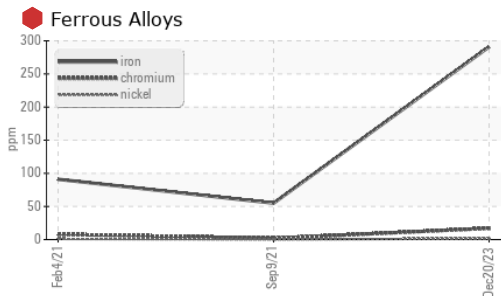
Sodium and/or potassium levels are high. Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress. Test for glycol is negative.

Silicon	ppm	ASTM D5185m	>25	88	8	26
Potassium	ppm	ASTM D5185m	>20	73	5	20
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol	%	*ASTM D2982		NEG	NEG	NEG
Soot %	%	*ASTM D7844	>3	1.9	0.6	1.1
Nitration	Abs/cm	*ASTM D7624	>20	14.0	14.7	11
Sulfation	Abs/.1mm	*ASTM D7415	>30	32.0	36.4	28.7
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG

FLUID CONDITION

The BN result indicates that there is suitable alkalinity remaining in the oil.

Sodium	ppm	ASTM D5185m		12	4	5
Boron	ppm	ASTM D5185m		5	4	1
Barium	ppm	ASTM D5185m		0	0	0
Molybdenum	ppm	ASTM D5185m		66	64	10
Manganese	ppm	ASTM D5185m		4	<1	1
Magnesium	ppm	ASTM D5185m	470	418	429	69
Calcium	ppm	ASTM D5185m	1150	2027	2846	2685
Phosphorus	ppm	ASTM D5185m	94	1172	1369	1020
Zinc	ppm	ASTM D5185m	1030	1373	1549	1139
Sulfur	ppm	ASTM D5185m		3438	3380	2914
Oxidation	Abs/.1mm	*ASTM D7414	>25	24.6	34.2	17.2
Base Number (BN)	mg KOH/g	ASTM D2896	7.17	5.5	7.1	5.6
Visc @ 100°C	cSt	ASTM D445	10.90	13.9	16.3	14.3



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0878598 **Received** : 16 Jan 2024
Lab Number : 06060779 **Diagnosed** : 17 Jan 2024
Unique Number : 10832161 **Diagnostician** : Jonathan Hester
Test Package : FLEET (Additional Tests: Glycol)

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Certificate L2367
 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)