



WEAR	ATTENTION
CONTAMINATION	ABNORMAL
FLUID CONDITION	NORMAL

Machine Id
2311
 Component
Diesel Engine
 Fluid
DIESEL ENGINE OIL SAE 5W30 (--- 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. Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		HRE000209	WC0814827	---
Sample Date		Client Info		16 May 2024	04 Jun 2023	---
Machine Age	mls	Client Info		238406	110606	---
Oil Age	mls	Client Info		50000	100000	---
Filter Age	mls	Client Info		50000	100000	---
Oil Changed		Client Info		Changed	Changed	---
Filter Changed		Client Info		Changed	Changed	---
Sample Status				ABNORMAL	ABNORMAL	---

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>100	89	▲ 117	---
Chromium	ppm	ASTM D5185m	>20	2	4	---
Nickel	ppm	ASTM D5185m	>4	<1	0	---
Titanium	ppm	ASTM D5185m		<1	<1	---
Silver	ppm	ASTM D5185m	>3	1	0	---
Aluminum	ppm	ASTM D5185m	>20	13	40	---
Lead	ppm	ASTM D5185m	>40	1	0	---
Copper	ppm	ASTM D5185m	>330	10	17	---
Tin	ppm	ASTM D5185m	>15	2	3	---
Vanadium	ppm	ASTM D5185m		<1	<1	---
White Metal	scalar	*Visual	NONE	NONE	NONE	---
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	---

CONTAMINATION

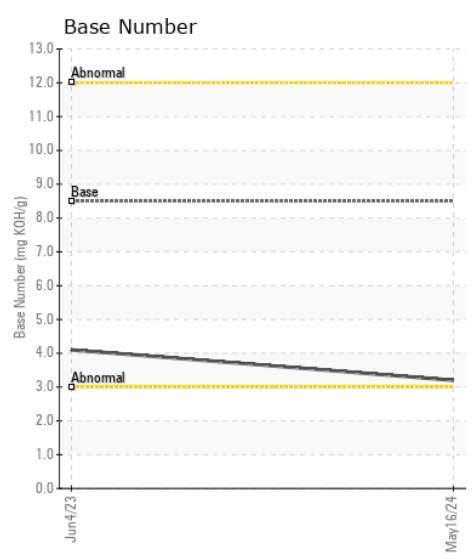
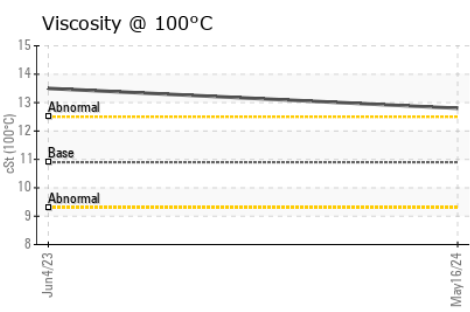
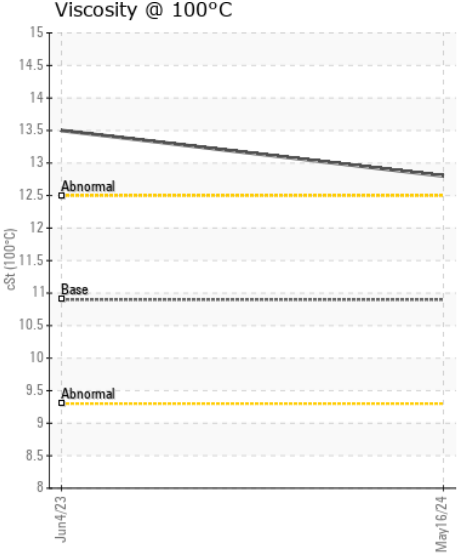
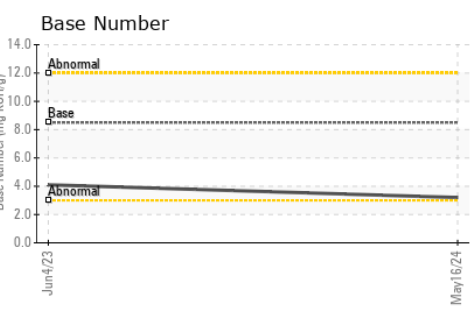
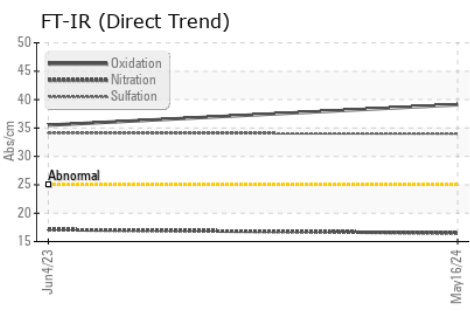
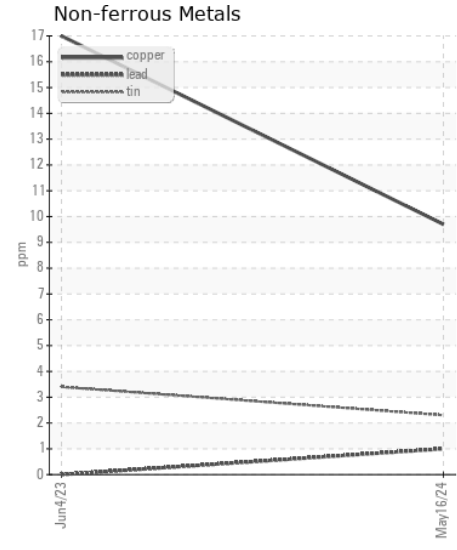
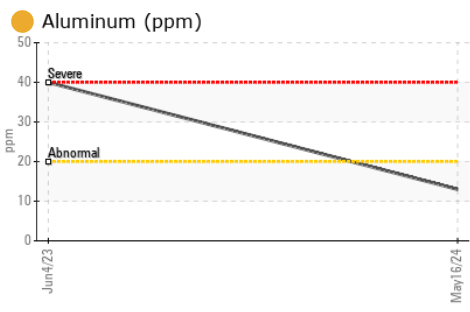
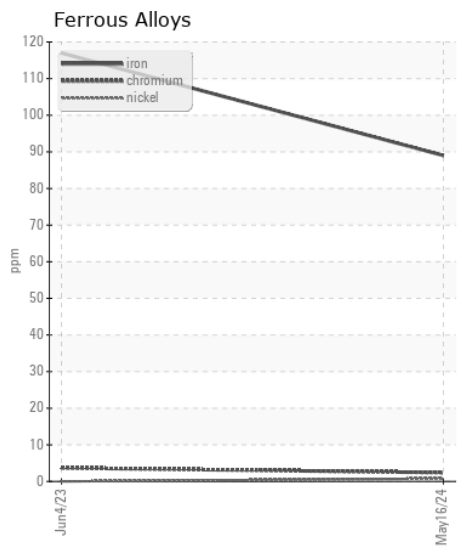
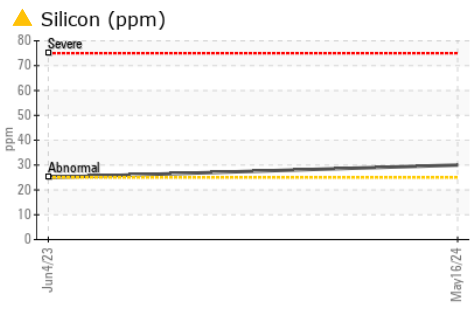
Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress.

Silicon	ppm	ASTM D5185m	>25	▲ 30	25	---
Potassium	ppm	ASTM D5185m	>20	29	116	---
Fuel		WC Method	>5	<1.0	<1.0	---
Water		WC Method	>0.2	NEG	NEG	---
Glycol		WC Method		NEG	NEG	---
Soot %	%	*ASTM D7844	>3	1.1	0.9	---
Nitration	Abs/cm	*ASTM D7624	>20	16.5	17.1	---
Sulfation	Abs/.1mm	*ASTM D7415	>30	34.0	34.1	---
Silt	scalar	*Visual	NONE	NONE	NONE	---
Debris	scalar	*Visual	NONE	NONE	NONE	---
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	---
Appearance	scalar	*Visual	NORML	NORML	NORML	---
Odor	scalar	*Visual	NORML	NORML	NORML	---
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	---

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.

Sodium	ppm	ASTM D5185m		7	10	---
Boron	ppm	ASTM D5185m	250	8	11	---
Barium	ppm	ASTM D5185m	10	0	0	---
Molybdenum	ppm	ASTM D5185m	100	75	28	---
Manganese	ppm	ASTM D5185m		1	3	---
Magnesium	ppm	ASTM D5185m	450	1309	1050	---
Calcium	ppm	ASTM D5185m	3000	1088	1506	---
Phosphorus	ppm	ASTM D5185m	1150	1152	969	---
Zinc	ppm	ASTM D5185m	1350	1524	1186	---
Sulfur	ppm	ASTM D5185m	4250	3522	3900	---
Oxidation	Abs/.1mm	*ASTM D7414	>25	39.1	35.5	---
Base Number (BN)	mg KOH/g	ASTM D2896	8.5	3.2	4.1	---
Visc @ 100°C	cSt	ASTM D445	10.9	12.8	13.5	---



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : HRE0000209
Lab Number : 06190006
Unique Number : 11046758
Test Package : FLEET
Received : 23 May 2024
Tested : 25 May 2024
Diagnosed : 29 May 2024 - Don Baldrige

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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)