



Machine Id
MARK KNOY - US5555859-002 (S/N 09-E1-1001)
Component
Center Main Engine
Fluid
MOBIL MOBILGARD 410 NC (350 GAL)

RECOMMENDATION

No corrective action is recommended at this time. Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		MW0069377	MW0069386	MW0050474
Sample Date		Client Info		06 Jul 2024	17 Jun 2024	28 Apr 2023
Machine Age	hrs	Client Info		10770	10371	4464
Oil Age	hrs	Client Info		10770	10371	4464
Filter Age	hrs	Client Info		0	0	0
Oil Changed		Client Info		Not Changd	N/A	Not Changd
Filter Changed		Client Info		N/A	N/A	None
Sample Status				MARGINAL	NORMAL	NORMAL

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>75	25	22	33
Chromium	ppm	ASTM D5185m	>8	1	<1	2
Nickel	ppm	ASTM D5185m	>2	<1	0	<1
Titanium	ppm	ASTM D5185m	>3	<1	<1	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>15	3	2	4
Lead	ppm	ASTM D5185m	>18	6	4	7
Copper	ppm	ASTM D5185m	>80	20	24	35
Tin	ppm	ASTM D5185m	>14	5	4	12
Vanadium	ppm	ASTM D5185m		0	0	0
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE

CONTAMINATION

There is no indication of any contamination in the oil.

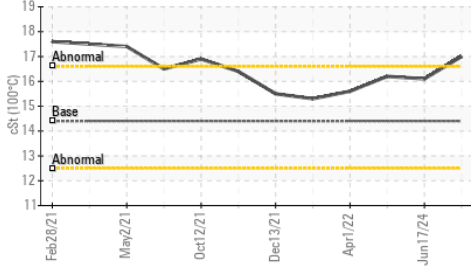
Silicon	ppm	ASTM D5185m	>20	7	7	5
Potassium	ppm	ASTM D5185m	>20	3	<1	1
Fuel		WC Method	>4.0	<1.0	<1.0	<1.0
Water		WC Method	>0.1	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
Soot %	%	*ASTM D7844		1.8	1.3	1.2
Nitration	Abs/cm	*ASTM D7624	>20	10.9	10.4	12.2
Sulfation	Abs/.1mm	*ASTM D7415	>30	20.4	19.2	22.6
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	>0.1	NEG	NEG	NEG

FLUID CONDITION

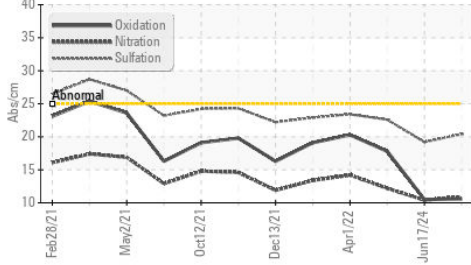
The oil viscosity is higher than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

Sodium	ppm	ASTM D5185m	>75	0	3	2
Boron	ppm	ASTM D5185m		37	35	0
Barium	ppm	ASTM D5185m		<1	0	2
Molybdenum	ppm	ASTM D5185m		44	38	2
Manganese	ppm	ASTM D5185m		<1	<1	<1
Magnesium	ppm	ASTM D5185m		31	30	11
Calcium	ppm	ASTM D5185m		3825	3702	3471
Phosphorus	ppm	ASTM D5185m		48	15	7
Zinc	ppm	ASTM D5185m	10	31	14	4
Sulfur	ppm	ASTM D5185m		4898	5469	5787
Oxidation	Abs/.1mm	*ASTM D7414	>25	10.6	10.5	17.8
Base Number (BN)	mg KOH/g	ASTM D2896	10.0	9.0	8.8	11.1
Visc @ 100°C	cSt	ASTM D445	14.4	▲ 17.0	16.1	16.2

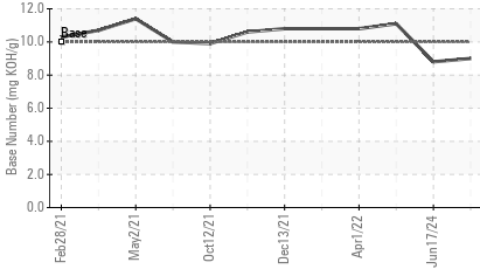
▲ Viscosity @ 100°C



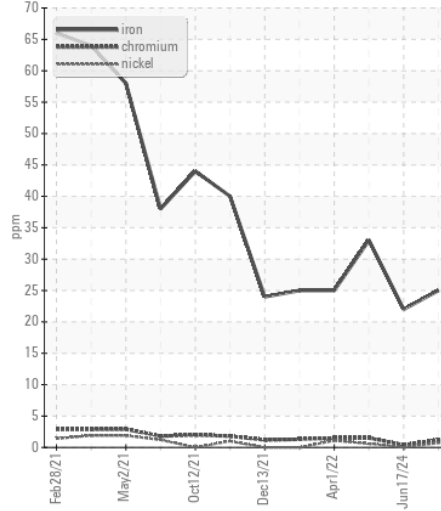
FT-IR (Direct Trend)



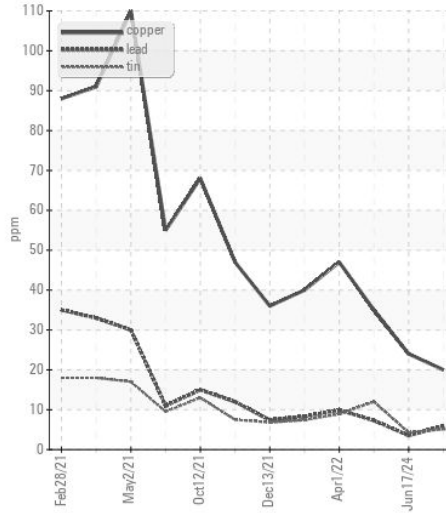
Base Number



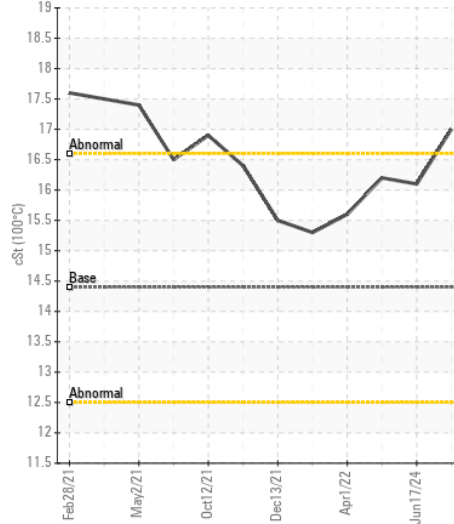
Ferrous Alloys



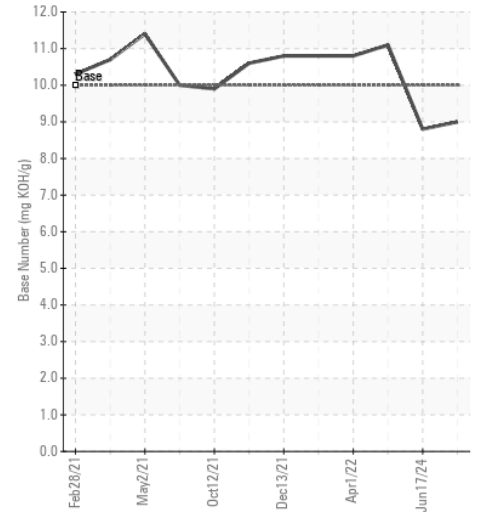
Non-ferrous Metals



▲ Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513

Sample No. : MW0069377

Lab Number : 06238962

Unique Number : 11127796

Test Package : MAR 2

Received : 17 Jul 2024

Tested : 19 Jul 2024

Diagnosed : 19 Jul 2024 - Jonathan Hester

AMERICAN COMMERCIAL LINES

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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)