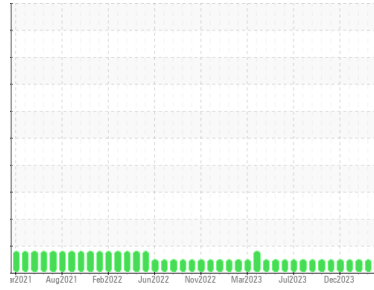




OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Area

Louisville

Machine Id

[Louisville] Oil - Port Main Engine

Component

Port Main Engine

Fluid

DIESEL ENGINE OIL SAE 15W40 (150 GAL)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

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 suitable for further service.

SAMPLE INFORMATION

method	limit/base	current	history1	history2
Sample Number	Client Info	WC0898520	WC0874801	WC0804842
Sample Date	Client Info	29 May 2024	28 Apr 2024	30 Jan 2024
Machine Age	hrs	1355	950	39417
Oil Age	hrs	355	950	6631
Oil Changed	Client Info	N/A	N/A	N/A
Sample Status		NORMAL	NORMAL	NORMAL

CONTAMINATION

method	limit/base	current	history1	history2
Fuel	WC Method >4.0	<1.0	<1.0	<1.0
Glycol	WC Method	NEG	NEG	NEG

WEAR METALS

method	limit/base	current	history1	history2	
Iron	ppm	ASTM D5185m >75	2	6	7
Chromium	ppm	ASTM D5185m >8	<1	<1	<1
Nickel	ppm	ASTM D5185m >2	0	<1	0
Titanium	ppm	ASTM D5185m >3	0	<1	<1
Silver	ppm	ASTM D5185m >2	0	<1	0
Aluminum	ppm	ASTM D5185m >15	2	2	<1
Lead	ppm	ASTM D5185m >18	0	1	3
Copper	ppm	ASTM D5185m >80	2	6	24
Tin	ppm	ASTM D5185m >14	<1	1	<1
Vanadium	ppm	ASTM D5185m	0	<1	0
Cadmium	ppm	ASTM D5185m	0	<1	0

ADDITIVES

method	limit/base	current	history1	history2	
Boron	ppm	ASTM D5185m 250	10	20	10
Barium	ppm	ASTM D5185m 10	0	<1	0
Molybdenum	ppm	ASTM D5185m 100	59	61	61
Manganese	ppm	ASTM D5185m	0	<1	<1
Magnesium	ppm	ASTM D5185m 450	1367	1396	1477
Calcium	ppm	ASTM D5185m 3000	1096	1186	1165
Phosphorus	ppm	ASTM D5185m 1150	977	1067	981
Zinc	ppm	ASTM D5185m 1350	1188	1238	1283
Sulfur	ppm	ASTM D5185m 4250	3440	3455	2833

CONTAMINANTS

method	limit/base	current	history1	history2	
Silicon	ppm	ASTM D5185m >20	3	5	4
Sodium	ppm	ASTM D5185m >158	<1	3	2
Potassium	ppm	ASTM D5185m >20	2	2	0
Water	%	ASTM D6304 >0.1	NEG	NEG	NEG

INFRA-RED

method	limit/base	current	history1	history2	
Soot %	%	*ASTM D7844	0.1	0.1	0.1
Nitration	Abs/cm	*ASTM D7624 >20	5.9	9.0	10.0
Sulfation	Abs/.1mm	*ASTM D7415 >30	17.8	21.1	22.3

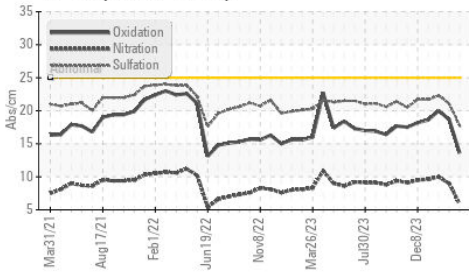
FLUID DEGRADATION

method	limit/base	current	history1	history2	
Oxidation	Abs/.1mm	*ASTM D7414 >25	13.6	18.7	20.0
Base Number (BN)	mg KOH/g	ASTM D2896 8.5	12.36	12.40	9.56

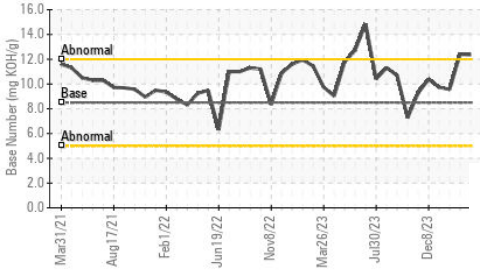


OIL ANALYSIS REPORT

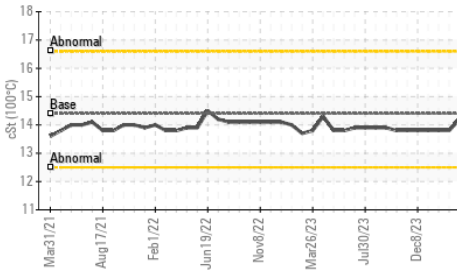
FT-IR (Direct Trend)



Base Number



Viscosity @ 100°C

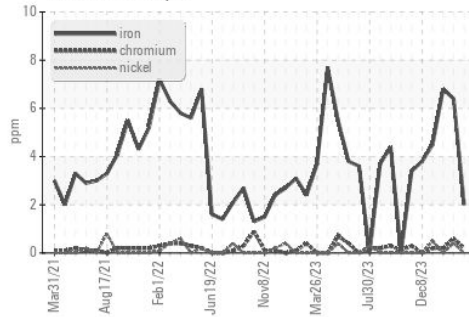


VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG

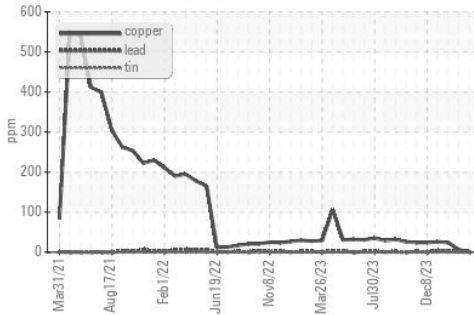
FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.4	14.2	13.8

GRAPHS

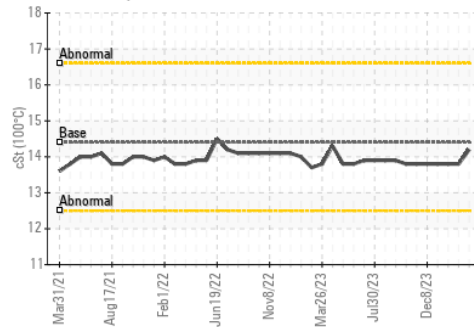
Ferrous Alloys



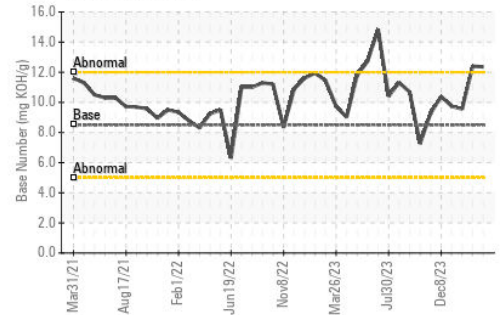
Non-ferrous Metals



Viscosity @ 100°C



Base Number



Certificate L2367

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

Sample No. : WC0898520

Lab Number : 06204907

Unique Number : 11072368

Test Package : IND 2 (Additional Tests: KF)

Received : 10 Jun 2024

Tested : 13 Jun 2024

Diagnosed : 13 Jun 2024 - Sean Felton

MARATHON PETROLEUM CO.

101 12TH ST

CATLETTSBURG, KY

US 41169

Contact: CORY GUMBERT

cagumbert@marathonpetroleum.com

T: (606)585-3950

F: x:

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)