

OIL ANALYSIS REPORT

Sample Rating Trend

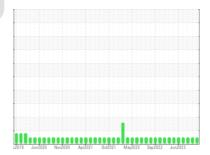




Area Machine Id [Map Runner] Oil - Forward Genset Forward Genset Fuid

DIESEL ENGINE OIL SAE 15W40 (5 GAL)

SAMPLE INFORMATION method





DIAGNOSIS

Recommendation

Resample at the next service interval to monitor. (Customer Sample Comment: Scheduled to be changed 9-28-23)

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

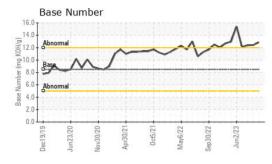
Fluid Condition

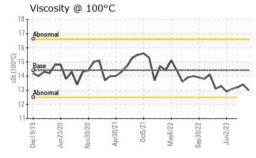
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Number		Client Info		WC0719209	WC0769259	WC0735396
Sample Date		Client Info		27 Sep 2023	30 Aug 2023	27 Jul 2023
Machine Age	hrs	Client Info		8602	8263	7855
Oil Age	hrs	Client Info		345	408	296
Oil Changed		Client Info		Not Changd	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
-						
CONTAMINATION	N	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	>50	4	6	0
Chromium	ppm	ASTM D5185m	>4	0	<1	<1
Nickel	ppm	ASTM D5185m	>2	0	0	<1
Titanium	ppm	ASTM D5185m		<1	<1	<1
Silver	ppm	ASTM D5185m	>5	0	0	<1
Aluminum	ppm	ASTM D5185m		<1	<1	1
Lead	ppm	ASTM D5185m	>17	3	4	2
Copper	ppm	ASTM D5185m	>70	1	3	3
Tin	ppm		>15	<1	<1	0
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	250	2	5	32
Barium	ppm	ASTM D5185m	10	0	0	0
Molybdenum	ppm	ASTM D5185m	100	63	64	69
Manganese	ppm	ASTM D5185m	100	<1	<1	0
Magnesium		ASTM D5185m	450	1525	1537	
-	nnm					
Calcium	ppm					1534
Calcium	ppm	ASTM D5185m	3000	1188	1205	1232
Phosphorus	ppm ppm	ASTM D5185m ASTM D5185m	3000 1150	1188 1073	1205 1062	1232 1042
Phosphorus Zinc	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	3000 1150 1350	1188 1073 1391	1205 1062 1339	1232 1042 1256
Phosphorus Zinc Sulfur	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	3000 1150 1350 4250	1188 1073 1391 3637	1205 1062 1339 4149	1232 1042 1256 3315
Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method	3000 1150 1350 4250 limit/base	1188 1073 1391 3637 current	1205 1062 1339 4149 history1	1232 1042 1256 3315 history2
Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m	3000 1150 1350 4250 limit/base >25	1188 1073 1391 3637 current 3	1205 1062 1339 4149 history1 3	1232 1042 1256 3315 history2 2
Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	3000 1150 1350 4250 limit/base >25 >158	1188 1073 1391 3637 current	1205 1062 1339 4149 history1 3 1	1232 1042 1256 3315 history2 2 2 2
Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	3000 1150 1350 4250 limit/base >25	1188 1073 1391 3637 current 3	1205 1062 1339 4149 history1 3	1232 1042 1256 3315 history2 2
Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	3000 1150 1350 4250 limit/base >25 >158	1188 1073 1391 3637 current 3 <1	1205 1062 1339 4149 history1 3 1	1232 1042 1256 3315 history2 2 2 2
Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m	3000 1150 1350 4250 limit/base >25 >158 >20	1188 1073 1391 3637 current 3 <1 <1	1205 1062 1339 4149 history1 3 1 <1	1232 1042 1256 3315 history2 2 2 2 <1
Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	3000 1150 1350 4250 limit/base >25 >158 >20 limit/base	1188 1073 1391 3637 current 3 <1 <1 <1 current	1205 1062 1339 4149 history1 3 1 <1 <1 history1	1232 1042 1256 3315 history2 2 2 2 <1 history2
Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	3000 1150 1350 4250 limit/base >25 >158 >20 limit/base	1188 1073 1391 3637 current 3 <1 <1 <1 current 0.1	1205 1062 1339 4149 history1 3 1 <1 <1 history1 0.1	1232 1042 1256 3315 history2 2 2 2 <1 history2 0.1
Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm % Abs/cm Abs/.1mm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method *ASTM D7844 *ASTM D7624	3000 1150 1350 4250 <i>limit/base</i> >25 >158 >20 <i>limit/base</i>	1188 1073 1391 3637 current 3 <1 <1 <1 current 0.1 9.4	1205 1062 1339 4149 history1 3 1 <1 <1 history1 0.1 10.2	1232 1042 1256 3315 history2 2 2 2 2 <1 history2 0.1 9.8
Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm % Abs/cm Abs/.1mm	ASTM D5185m ASTM D7844 *ASTM D7624	3000 1150 1350 4250 Imit/base >25 >158 >20 Imit/base >20 >30	1188 1073 1391 3637 current 3 <1 <1 <1 current 0.1 9.4 20.9	1205 1062 1339 4149 history1 3 1 <1 (1) 0.1 10.2 21.2	1232 1042 1256 3315 history2 2 2 2 2 <1 history2 0.1 9.8 19.5
Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7624 *ASTM D7415	3000 1150 1350 4250 imit/base >25 >158 >20 imit/base >20 >30 imit/base	1188 1073 1391 3637 current 3 <1 <1 <1 current 0.1 9.4 20.9 current	1205 1062 1339 4149 history1 3 1 <1 <1 history1 0.1 10.2 21.2 history1	1232 1042 1256 3315 history2 2 2 2 2 2 3 1 4 history2 0.1 9.8 19.5 history2



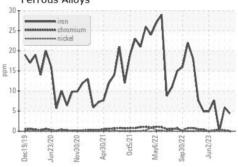
OIL ANALYSIS REPORT



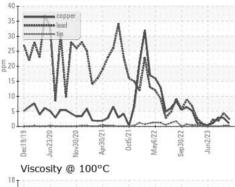


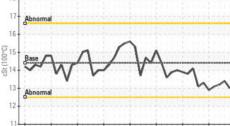
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPERT	IES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.4	13.0	13.4	13.2
GRAPHS						

Ferrous Alloys



Non-ferrous Metals





May6/22 Oct5/21

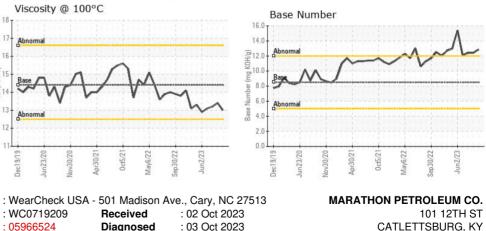
Received

Diagnosed

Sen30/72

: 02 Oct 2023

: 03 Oct 2023



CATLETTSBURG, KY US 41169 Contact: CORY GUMBERT cagumbert@marathonpetroleum.com T: (606)585-3950 F: x:



: 10673075 Unique Number Diagnostician : Sean Felton Test Package : IND 2 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)

Dec19/19 Jun23/20 Nov30/20 Apr30/71

: WC0719209

: 05966524

Report Id: MARCAT [WUSCAR] 05966524 (Generated: 10/03/2023 14:37:34) Rev: 1

Laboratory

Sample No.

Lab Number

Submitted By: M/V MAP RUNNER