

OIL ANALYSIS REPORT



KEMP QUARRIES / RVM-BUTTERFIELD WL034

Component **Diesel Engine**

MOBIL DELVAC 1300 SUPER15W40 (--- GAL)





DIAGNOSIS

Recommendation

We advise that you check for the source of the coolant leak. Check for low coolant level. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition. (Customer Sample Comment: PM-1 changed filters and fluid)

Wear

All component wear rates are normal.

Contamination

Sodium and/or potassium levels are high.

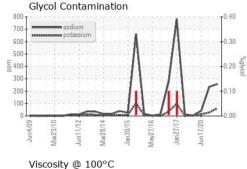
▲ Fluid Condition

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

SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		PCA0085765	PCA0025535	PCA0010996
Sample Date		Client Info		31 May 2023	21 Jul 2021	17 Jun 2020
Machine Age	hrs	Client Info		36913	36456	35861
Oil Age	hrs	Client Info		36913	508	491
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				ABNORMAL	ABNORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	36	46	48
Chromium	ppm	ASTM D5185m	>20	<1	1	2
Nickel	ppm	ASTM D5185m	>2	0	<1	<1
Titanium	ppm	ASTM D5185m	>2	<1	<1	<1
Silver	ppm	ASTM D5185m	>2	0	<1	0
Aluminum	ppm	ASTM D5185m	>25	2	2	3
Lead	ppm	ASTM D5185m	>40	14	16	15
Copper	ppm	ASTM D5185m	>330	69	36	2
Tin	ppm	ASTM D5185m	>15	<1	1	2
Antimony	ppm	ASTM D5185m			0	0
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		<1	<1	0
ADDITIVES		mathad	lineit/lenen		for the second	history
RUDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	13	29	7 7
	ppm ppm		0			
Boron	• • • • • • • • • • • • • • • • • • • •	ASTM D5185m	0	13	29	7
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	13 0	29 0	7
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0	13 0 58	29 0 63	7 0 66
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 0	13 0 58 <1	29 0 63 <1	7 0 66 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 0	13 0 58 <1 894	29 0 63 <1 903	7 0 66 <1 1154
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 0	13 0 58 <1 894 1246	29 0 63 <1 903 1206	7 0 66 <1 1154 1282
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 0	13 0 58 <1 894 1246 1038	29 0 63 <1 903 1206 1042	7 0 66 <1 1154 1282 1138
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	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	0 0 0	13 0 58 <1 894 1246 1038 1282	29 0 63 <1 903 1206 1042 1230	7 0 66 <1 1154 1282 1138 1346
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	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 ASTM D5185m	0 0 0 0	13 0 58 <1 894 1246 1038 1282 3713	29 0 63 <1 903 1206 1042 1230 2802	7 0 66 <1 1154 1282 1138 1346 2457
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm 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 ASTM D5185m	0 0 0 0	13 0 58 <1 894 1246 1038 1282 3713 current	29 0 63 <1 903 1206 1042 1230 2802 history1	7 0 66 <1 1154 1282 1138 1346 2457 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 0 0	13 0 58 <1 894 1246 1038 1282 3713 current	29 0 63 <1 903 1206 1042 1230 2802 history1	7 0 66 <1 1154 1282 1138 1346 2457 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 0 0 Iimit/base >25	13 0 58 <1 894 1246 1038 1282 3713 current 11 ▲ 258	29 0 63 <1 903 1206 1042 1230 2802 history1 8 235	7 0 66 <1 1154 1282 1138 1346 2457 history2 5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 0 0 Iimit/base >25	13 0 58 <1 894 1246 1038 1282 3713 current 11 258 63	29 0 63 <1 903 1206 1042 1230 2802 history1 8 235 28	7 0 66 <1 1154 1282 1138 1346 2457 history2 5 4 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 0 0 limit/base >25 >20	13 0 58 <1 894 1246 1038 1282 3713 current 11 ▲ 258 ▲ 63 NEG	29 0 63 <1 903 1206 1042 1230 2802 history1 8 235 28 NEG	7 0 66 <1 1154 1282 1138 1346 2457 history2 5 4 3 NEG
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 0 0 	13 0 58 <1 894 1246 1038 1282 3713 current 11 ▲ 258 ▲ 63 NEG current 0.4	29 0 63 <1 903 1206 1042 1230 2802 history1 8 235 28 NEG history1	7 0 66 <1 1154 1282 1138 1346 2457 history2 5 4 3 NEG history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m *ASTM D7844	0 0 0 0 	13 0 58 <1 894 1246 1038 1282 3713 current 11 ▲ 258 ▲ 63 NEG current	29 0 63 <1 903 1206 1042 1230 2802 history1 8 235 28 NEG history1 0.5	7 0 66 <1 1154 1282 1138 1346 2457 history2 5 4 3 NEG history2 1.8
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D7842 *ASTM D7844 *ASTM D7624 *ASTM D7615	0 0 0 0 	13 0 58 <1 894 1246 1038 1282 3713 current 11 258 63 NEG current 0.4 10.6	29 0 63 <1 903 1206 1042 1230 2802 history1 8 235 28 NEG history1 0.5 13.2	7 0 66 <1 1154 1282 1138 1346 2457 history2 5 4 3 NEG history2 1.8
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm	ASTM D5185m *ASTM D7844 *ASTM D7624 *ASTM D7415 method	0 0 0 0 	13 0 58 <1 894 1246 1038 1282 3713 current 11 ▲ 258 ▲ 63 NEG current 0.4 10.6 22.0 current	29 0 63 <1 903 1206 1042 1230 2802 history1 8 235 28 NEG history1 0.5 13.2 24.1 history1	7 0 66 <1 1154 1282 1138 1346 2457 history2 5 4 3 NEG history2 1.8 12 26.8
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D7842 *ASTM D7844 *ASTM D7624 *ASTM D7615	0 0 0 0 0 limit/base >25 >20 limit/base >3 >20 >30 limit/base	13 0 58 <1 894 1246 1038 1282 3713 current 11 ▲ 258 ▲ 63 NEG current 0.4 10.6 22.0	29 0 63 <1 903 1206 1042 1230 2802 history1 8 235 28 NEG history1 0.5 13.2 24.1	7 0 66 <1 1154 1282 1138 1346 2457 history2 5 4 3 NEG history2 1.8 12 26.8 history2

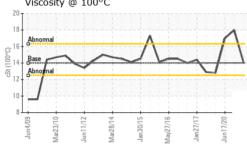


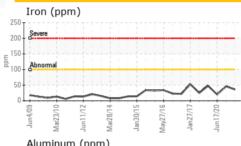
OIL ANALYSIS REPORT



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	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPE	DTIEC	method	limit/hasa	current	history1	history2

14.0



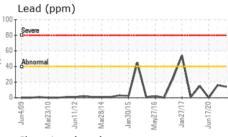


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ASTM D445 14

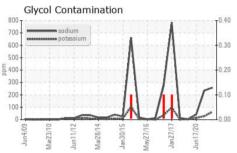
Visc @ 100°C

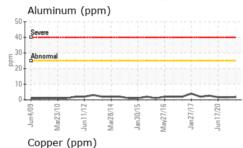
GRAPHS

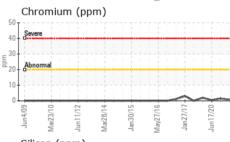


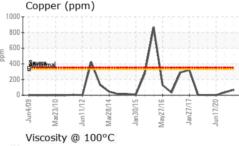
18.0

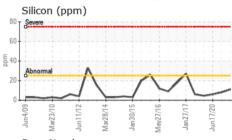
17.0

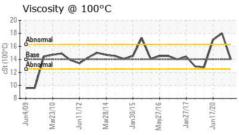


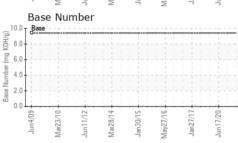














Laboratory Sample No. Lab Number **Unique Number**

: PCA0085765 : 05864937 : 10499402

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

Received : 05 Jun 2023 Diagnosed : 07 Jun 2023 Diagnostician : Jonathan Hester

Test Package : MOB 1 (Additional Tests: Glycol, TBN)

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.

Kemp Quarries - RVM-Butterfield

8651 Farm Rd 2115 Purdy, MO US 65734

Contact: LEE DUCHANOIS Iduchanois@kempquarries.com

T: F:

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)