

# **OIL ANALYSIS REPORT**

### Sample Rating Trend

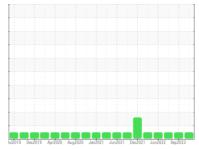




## KEMP QUARRIES / HULBERT WL131 Component

**Diesel Engine** 

MOBIL DELVAC 1300 SUPER15W40 (--- GAL)





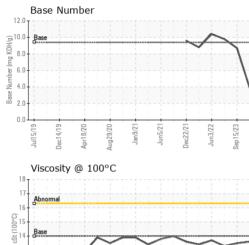
DIAGNOSIS	SAMPLE INFOR	MATION		limit/base	current	history1	history2
Recommendation	Sample Number		Client Info		PCA0109235	PCA0086836	PCA0061852
Resample at the next service interval to monitor.	Sample Date		Client Info		03 Nov 2023	15 Sep 2023	29 Oct 2022
Wear	Machine Age	hrs	Client Info		10240	9868	8686
All component wear rates are normal.	Oil Age	hrs	Client Info		0	0	0
Contamination	Oil Changed		Client Info		Changed	Changed	Changed
There is no indication of any contamination in the	Sample Status				NORMAL	NORMAL	NORMAL
oil.	CONTAMINAT		method	limit/base		history1	history2
Fluid Condition	Fuel		WC Method		<1.0	<1.0	<1.0
The BN result indicates that there is suitable	Glycol		WC Method	20	NEG	NEG	NEG
alkalinity remaining in the oil. The condition of the oil is suitable for further service.			WO WICKIOU		NEG		
	WEAR METAL	S	method	limit/base	current	history1	history2
	Iron	ppm	ASTM D5185m	>86	13	23	31
	Chromium	ppm	ASTM D5185m	>3	<1	<1	<1
	Nickel	ppm	ASTM D5185m		<1	0	<1
	Titanium	ppm	ASTM D5185m	>2	<1	0	0
	Silver	ppm	ASTM D5185m	>2	0	0	0
	Aluminum	ppm	ASTM D5185m	>15	<1	<1	<1
	Lead	ppm	ASTM D5185m	>16	1	1	2
	Copper	ppm	ASTM D5185m	>250	6	11	7
	Tin	ppm	ASTM D5185m	>2	<1	1	0
	Vanadium	ppm	ASTM D5185m		0	0	0
	Cadmium	ppm	ASTM D5185m		0	0	0
	ADDITIVES		method	limit/base	current	history1	history2
	Boron	ppm	ASTM D5185m	0	0	0	2
	Barium	ppm	ASTM D5185m		0	0	0
	Molybdenum	ppm	ASTM D5185m		57	60	58
	Manganese	ppm	ASTM D5185m		<1	0	0
	Magnesium	ppm	ASTM D5185m	0	945	937	950
	Calcium	ppm	ASTM D5185m		1024	1043	1110
	Phosphorus	ppm	ASTM D5185m		1023	984	984
	Zinc	ppm	ASTM D5185m		1288	1194	1278
	Sulfur	ppm	ASTM D5185m		3111	2932	3447
	CONTAMINAN	ITS	method	limit/base	current	history1	history2
	Silicon	ppm	ASTM D5185m	>35	3	3	4
	Sodium	ppm	ASTM D5185m		<1	3	<1
	Potassium	ppm	ASTM D5185m	>20	2	2	0
	INFRA-RED		method	limit/base	current	history1	history2
	Soot %	%	*ASTM D7844	>3	1.1	1.1	1.1
	Nitration	Abs/cm	*ASTM D7624		20.5	7.1	8.4
	Sulfation		*ASTM D7415		42.9	19.7	21.7
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	52.8	14.0	15.8
	Base Number (BN)				3.9	8.7	9.8



Base 13 A 12

Jul15/19

# **OIL ANALYSIS REPORT**



Apr18/20

Dec14/19

Jun3/22 - Seo15/23 -	White Metal Yellow Metal Precipitate Silt Debris Sand/Dirt Appearance Odor Emulsified W Free Water FLUID PF Visc @ 100°C GRAPHS Iron (ppm)		scal scal scal scal scal scal scal scal	lar lar lar lar lar lar lar lar	*Visua *Visua *Visua *Visua *Visua *Visua *Visua *Visua *Visua *Visua *Visua	I I I I I I I O O 445	NONE NONE NONE NONE NORML NORML >0.2		13.6 _ead (	E E E ML ML rent		NONE NONE NONE NONE NONE NOR NOR NOR NOR NOR NOR NOR NOR NOR NOR	1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1	NONE NONE NONE NONE NONE NORI NEG 13.3	= = = ML ML
Jun3/22 Sent5/23 Ppm	Precipitate Silt Debris Sand/Dirt Appearance Odor Emulsified W Free Water FLUID PF Visc @ 100°C GRAPHS Iron (ppm)		scal scal scal scal scal scal scal scal	lar lar lar lar lar lar lar S	*Visua *Visua *Visua *Visua *Visua *Visua Meth ASTM [	I I I I I I O O d 445	NONE NONE NONE NORML >0.2 limit/bas		NON NON NON NOR NEG NEG 13.6	E E E ML ML rent	Aug2/20	NONE NONE NONE NONE NORM NEG NEG histo 3.5	I I I I I I I I I I I I I I I I I I I		NONE NONE NONE NORM NORM NEG histo 13.3	E E ML ML
Jun3/22	Silt Debris Sand/Dirt Appearance Odor Emulsified W Free Water FLUID PF Visc @ 100°C GRAPHS Iron (ppm)		scal scal scal scal scal scal scal scal	lar lar lar lar lar lar lar S	*Visua *Visua *Visua *Visua *Visua Meth ASTM [	1 1 1 1 1 1 1 1 0 0 4 45	NONE NONE NORML >0.2 limit/bas		NON NON NOR NOR NEG NEG 13.6	E E ML ML rent	Aug29/20	NONE NONE NONE NORM NEG NEG histo 3.5	E E ML ML		NONE NONE NORI NORI NEG histo 13.3	E E ML ML
Jun3/22	Debris Sand/Dirt Appearance Odor Emulsified W Free Water FLUID PF Visc @ 100°C GRAPHS Iron (ppm)		scal scal scal scal scal scal scal scal	lar lar lar lar lar ES	*Visua *Visua *Visua *Visua *Visua Meth ASTM I	I I I I I O O d V 445	NONE NORML NORML >0.2 limit/bas		NON NOR NOR NEG NEG 13.6	E E ML ML rent	Aug29/20	NONE NORM NORM NEG NEG 3.5	IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII		NONE NORM NORM NEG histo 13.3	E ML ML Dry2
Jun3/22	Sand/Dirt Appearance Odor Emulsified W Free Water FLUID PF Visc @ 100°C GRAPHS Iron (ppm)		scal scal scal scal scal scal scal	lar lar lar lar lar S	*Visua *Visua *Visua *Visua Meth ASTM I	I I I O O d V 445	NONE NORML >0.2 limit/bas		NON NOR NOR NEG NEG 13.6 (ur 13.6 (ur 13.6 (ur) 13.6 (ur) 13.6 (ur) 13.6 (ur) 13.6 (ur) 13.6 (ur) 13.6 (ur)	E ML ML rent	Aug29/20	NONE NORM NORM NEG histo 3.5	rry1		NONE NORI NORI NEG histo 13.3	E ML ML
Jun3/22	Appearance Odor Emulsified W Free Water FLUID PF Visc @ 100°C GRAPHS Iron (ppm)		scal scal scal scal cSt	lar lar lar ES	*Visua *Visua *Visua *Visua meth ASTM I	I I I OOd 0445	NORML >0.2 limit/bas 14		NOR NEG NEG 13.6	ML mL rent	Aug29/20	NORM NORM NEG NEG 13.5	nL nry1		NORI NEG NEG 13.3	ML Dry2
Jun3/22	Odor Emulsified W Free Water FLUID PF Visc @ 100°C GRAPHS Iron (ppm)		scal scal scal scal cSt	lar lar ES	*Visua *Visua *Visua meth ASTM I	I I I OOd 0)445	NORML >0.2 limit/bas 14		NOR NEG NEG 13.6 _ead (	mL rent pppm)	Aug29/20	NORM NEG histo 3.5	nry1		NORI NEG histo 13.3	ML
Jun3/22	Emulsified W Free Water FLUID PF Visc @ 100°C GRAPHS Iron (ppm) 50 50 50 50 50 50 50 50 50 50 50 50 50		scal scal cSt	lar lar S	*Visua *Visua meth ASTM [	I od 0445	>0.2 limit/bas 14		NEG NEG 13.6 Lead ( Severe	ppm)	Aug29/20 +	NEG NEG histo 3.5	ory1		NEG NEG histo 13.3	pry2
Jun3/22 - Seo15/23 -	Free Water FLUID PF Visc @ 100°C GRAPHS Iron (ppm) Severe Abnormal Aluminum		scal RTIE cSt	lar ES	*Visua meth ASTM I	I od 0445	limit/bas		NEG cur 13.6 Lead ( Severe Chrom	Apr18/20	Aug29/20	NEG histo 3.5			NEG histo 13.3	
Jun3/22 - Seo15/23 -	FLUID PR Visc @ 100°C GRAPHS Iron (ppm)	Aug <sup>29,20</sup>	cSt	≡S	meth ASTM [	od )445	14		Cur 13.6 Lead ( Severe	Apr18/20	Aug23/20	histo 3.5		$\wedge$	histo 13.3	
Jun3/22 - Seo15/23 -	Visc @ 100°C GRAPHS Iron (ppm) 50 6 6 6 10 6 10 6 10 50 6 10 6 10 10 6 10 10 10 10 10 10 10 10 10 10 10 10 10	Aug <sup>29,20</sup>	cSt		ASTM	0445	14		13.6 _ead ( Severe	Apr18/20	Aug29/20	3.5		$\wedge$	13.3	
Jun3/22 - Seo15/23 -	Aluminum	Aug29/20	Jan9/21	Jun5/21	Dec22/21	Jun3/22	<u> </u>		Abnormal BL/Stinn Chrom	Apri 8/20		Jan9/21	Jun5/21	Dec22/21	Jun3/22	Sep 15/23
Jun3/22 - Seo15/23 -	Abnormal Abnormal Abnormal Abnormal Severe Abnormal Severe Abnormal Severe Abnormal Severe Abnormal	Aug29/20	Jan9/21	Jun5/21	Dec22(21)	Jun3/22 + - <	<u> </u>		Abnormal BL/Stinn Chrom	Apri 8/20		Jan9/21	Jun5/21 B	Dec22/21	Jun3/22	Sep 15/23
Jun3/22 - Seo15/23 -	Abnormal Abnormal 6 U/SIIII 20 6 U/SIIII 20 6 U/SIIII 20 6 U/SIIII 20 6 U/SIIIII 20 6 U/SIIIIII 20 6 U/SIIIIIII 20 6 U/SIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	~	Jan9/21	Jun5/21	Dec22/21	Jun3/22	<u> </u>	30 - 1 E 20 - 1 10 - 1 0 - 2 6 - 1	Abnormal 61/9100 Chrom			Jan9/21	Jun5/21	Dec22/21	Jun3/22	Sep15/23
3 udd	Aluminum Aluminum Severe 20 Abnormal 10	~	Jan9/21	Jun5/21	Dec22/21	Jun3/22	<u> </u>	30	Abnormal 61/9100 Chrom			Jan9/21	Jun5/21	Dec22/21	Jun3/22	Sep 15/23
3 udd	Aluminum Aluminum Severe 20 Abnormal 10	~	Jan9/21	Jun5/21	Dec22/21	Jun3/22	<u> </u>		Chrom			Jan 9/21	Jun5/21	Dec22/21	Jun3/22	Sep 15/23
	Aluminum 30 25 20 Abnormal 15 4 4 4 4 4 4 4 4 4 4 4 4 4	~	Jan9/21	Jun5/21	Dec22/21	Jun3/22	Sep15/23	10 0 6	Chrom			Jan9/21	Jun5/21 Å	Dec22/21	Jun3/22	Sep 15/23
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mu	6L/FI:20 6L/FI:20 6L/FI:20 CSUIN Aluminum 30 25 20 Abnormal 10 10 10 10 10 10 10 10 10 10	~	Jan9/21	Jun5/21	Dec22/21	Jun3/22	Sep 15/23	6 T	Chrom			Jan 9/21	Jun5/21	Dec22/21	Jun3/22	Sep15/23
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	Jul15/19 Dec14/19 Apr18/20		Jan	Jun	Dec22/21	Jun3/22	Sep15/23		Jull 5/13 Dec14/19	Apr18/20	Aug29/20	Jan	ղոր	Dec22/21	Jun3/22	Sep15/23
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	Jul1 Dec1-	Aug2	Jan	Jun	Dec2	Jun	Sep 1		Decl	Apr1	Aug2	Jan	ղոր	Dec2	Jun	Sep15/23
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