

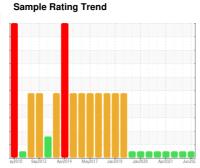
OIL ANALYSIS REPORT



KEMP QUARRIES / MUSKOGEE SAND WL015

Component **Rear Right Final Drive**

MOBIL MOBILTRANS HD 50 (--- GAL)





DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

Contamination

There is no indication of any contamination in the

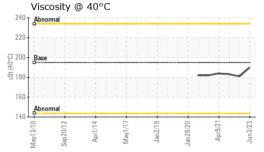
Fluid Condition

The condition of the oil is acceptable for the time in service.

Client Info PCA0087117 PCA0087173 PCA003456 Sample Date Client Info 03 Jun 2023 16 Feb 2023 22 Sep 2021 16 Feb 2023 22 Feb 2021 16 Feb 2023 16 F	ID 30 (GAL)		ay2010 Sep	2012 Apr2014 May20	17 Jan2019 Jan2020 Apr20	021 Jun202	
Client Info	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Machine Age	Sample Number		Client Info		PCA0087117	PCA0087173	PCA003456
Dil Age	Sample Date		Client Info		03 Jun 2023	16 Feb 2023	22 Sep 2021
Client Info	Machine Age	hrs	Client Info		1895	1210	760
NORMAL NORMAL NORMAL NORMAL WEAR METALS method limit/base current history1 history2 fron ppm ASTM D5185m >800 50 132 76 76 76 76 76 76 76 7	Oil Age	hrs	Client Info		685	2000	2990
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >800 50 132 76 Chromium ppm ASTM D5185m >10 <1	Oil Changed		Client Info		Not Changd	Changed	Not Changd
Pron	Sample Status				NORMAL	NORMAL	NORMAL
Chromium ppm ASTM D5185m >10 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <td>WEAR METAL</td> <td>S</td> <td>method</td> <td>limit/base</td> <th>current</th> <td>history1</td> <td>history2</td>	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>800	50	132	76
Titanium	Chromium	ppm	ASTM D5185m	>10	<1	<1	<1
Silver	Nickel	ppm	ASTM D5185m	>5	0	<1	<1
Aluminum	Titanium	ppm	ASTM D5185m	>15	<1	<1	<1
Lead ppm ASTM D5185m >10 <1 2 1 Copper ppm ASTM D5185m >75 7 12 10 Tin ppm ASTM D5185m >8 0 <1	Silver	ppm	ASTM D5185m	>2	0	0	2
Copper ppm ASTM D5185m >75 7 12 10 Tin ppm ASTM D5185m >8 0 <1	Aluminum	ppm	ASTM D5185m	>75	2	5	3
Copper ppm ASTM D5185m >75 7 12 10 Tin ppm ASTM D5185m >8 0 <1	Lead	ppm	ASTM D5185m	>10	<1	2	1
Antimony	Copper		ASTM D5185m	>75	7	12	10
Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 14 9 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 Magnesium ppm ASTM D5185m <1 2 1 Magnesium ppm ASTM D5185m 15 50 40 Calcium ppm ASTM D5185m 2953 2780 3009 Phosphorus ppm ASTM D5185m 880 984 1063 Zinc ppm ASTM D5185m 5436 14468 12083 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >400 14 26 <td>Tin</td> <td>ppm</td> <td>ASTM D5185m</td> <td>>8</td> <th>0</th> <td><1</td> <td><1</td>	Tin	ppm	ASTM D5185m	>8	0	<1	<1
Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 14 9 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 Magnesium ppm ASTM D5185m <1 2 1 Magnesium ppm ASTM D5185m 15 50 40 Calcium ppm ASTM D5185m 2953 2780 3009 Phosphorus ppm ASTM D5185m 880 984 1063 Zinc ppm ASTM D5185m 5436 14468 12083 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >400 14 26 <td>Antimony</td> <td>ppm</td> <td>ASTM D5185m</td> <td>>50</td> <th></th> <td></td> <td>0</td>	Antimony	ppm	ASTM D5185m	>50			0
Cadmium ppm ASTM D5185m 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 14 9 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m <1	Vanadium	ppm	ASTM D5185m		0	0	0
Boron	Cadmium		ASTM D5185m		0	0	<1
Barium	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m <1 4 4 Manganese ppm ASTM D5185m <1	Boron	ppm	ASTM D5185m		0	14	9
Manganese ppm ASTM D5185m <1 2 1 Magnesium ppm ASTM D5185m 15 50 40 Calcium ppm ASTM D5185m 2953 2780 3009 Phosphorus ppm ASTM D5185m 880 984 1063 Zinc ppm ASTM D5185m 1053 1153 1196 Sulfur ppm ASTM D5185m 5436 14468 12083 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >400 14 26 15 Sodium ppm ASTM D5185m >400 14 26 15 Sodium ppm ASTM D5185m >20 <1	Barium	ppm	ASTM D5185m		0	0	0
Magnesium ppm ASTM D5185m 15 50 40 Calcium ppm ASTM D5185m 2953 2780 3009 Phosphorus ppm ASTM D5185m 880 984 1063 Zinc ppm ASTM D5185m 1053 1153 1196 Sulfur ppm ASTM D5185m 5436 14468 12083 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >400 14 26 15 Sodium ppm ASTM D5185m >20 <1	Molybdenum	ppm	ASTM D5185m		<1	4	4
Calcium ppm ASTM D5185m 2953 2780 3009 Phosphorus ppm ASTM D5185m 880 984 1063 Zinc ppm ASTM D5185m 1053 1153 1196 Sulfur ppm ASTM D5185m 5436 14468 12083 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >400 14 26 15 Sodium ppm ASTM D5185m >20 <1	Manganese	ppm	ASTM D5185m		<1	2	1
Phosphorus ppm ASTM D5185m 880 984 1063 Zinc ppm ASTM D5185m 1053 1153 1196 Sulfur ppm ASTM D5185m 5436 14468 12083 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >400 14 26 15 Sodium ppm ASTM D5185m >20 <1	Magnesium	ppm	ASTM D5185m		15	50	40
Zinc ppm ASTM D5185m 1053 1153 1196 Sulfur ppm ASTM D5185m 5436 14468 12083 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >400 14 26 15 Sodium ppm ASTM D5185m >20 4 0 Potassium ppm ASTM D5185m >20 4 0 Potassium ppm ASTM D5185m >20 <1	Calcium	ppm	ASTM D5185m		2953	2780	3009
Zinc ppm ASTM D5185m 1053 1153 1196 Sulfur ppm ASTM D5185m 5436 14468 12083 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >400 14 26 15 Sodium ppm ASTM D5185m 0 4 0 Potassium ppm ASTM D5185m 20 <1 1 <1 VISUAL method limit/base current history1 history2 White Metal scalar *Visual NONE	Phosphorus	ppm	ASTM D5185m		880	984	1063
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >400 14 26 15 Sodium ppm ASTM D5185m 0 4 0 Potassium ppm ASTM D5185m >20 <1		ppm	ASTM D5185m		1053	1153	1196
Silicon ppm ASTM D5185m >400 14 26 15 Sodium ppm ASTM D5185m 0 4 0 Potassium ppm ASTM D5185m >20 <1 1 <1 VISUAL method limit/base current history1 history2 White Metal scalar *Visual NONE NONE NONE LIGHT Yellow Metal scalar *Visual NONE NONE NONE NONE NONE Precipitate scalar *Visual NONE NONE NONE NONE NONE Silt scalar *Visual NONE NONE NONE NONE NONE Debris scalar *Visual NONE NONE NONE NONE NONE Sand/Dirt scalar *Visual NORM NORML NORML<	Sulfur	ppm	ASTM D5185m		5436	14468	12083
Sodium ppm ASTM D5185m 0 4 0 Potassium ppm ASTM D5185m >20 <1	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 <1 1 1 <1 VISUAL method limit/base current history1 history2 White Metal scalar *Visual NONE NONE NONE NONE NONE Yellow Metal scalar *Visual NONE NONE NONE NONE NONE Precipitate scalar *Visual NONE NONE NONE NONE NONE Silt scalar *Visual NONE NONE NONE NONE NONE Debris scalar *Visual NONE 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	Silicon	ppm	ASTM D5185m	>400	14	26	15
VISUAL method limit/base current history1 history2 White Metal scalar *Visual NONE NONE NONE NONE LIGHT Yellow Metal scalar *Visual NONE NONE NONE NONE NONE Precipitate scalar *Visual NONE NONE NONE NONE NONE Silt scalar *Visual NONE NONE NONE NONE NONE Debris scalar *Visual NONE 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	Sodium	ppm	ASTM D5185m		0	4	0
White Metal scalar *Visual NONE NONE NONE LIGHT Yellow Metal scalar *Visual NONE NONE NONE NONE Precipitate scalar *Visual NONE NONE NONE NONE Silt scalar *Visual NONE NONE NONE NONE NONE Debris scalar *Visual NONE 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	Potassium	ppm	ASTM D5185m	>20	<1	1	<1
Yellow Metalscalar*VisualNONENONENONENONEPrecipitatescalar*VisualNONENONENONENONESiltscalar*VisualNONENONENONENONEDebrisscalar*VisualNONENONENONENONESand/Dirtscalar*VisualNONENONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGNEG	VISUAL		method	limit/base	current	history1	history2
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							
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							
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Sand/Dirtscalar*VisualNONENONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGNEG		scalar				NONE	NONE
Appearancescalar*VisualNORMLNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGNEG		scalar					
Odor scalar *Visual NORML NORML NORML NORML NORML NORML Emulsified Water scalar *Visual >0.2 NEG NEG NEG	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Emulsified Water scalar *Visual >0.2 NEG NEG NEG	Appearance	scalar	*Visual			NORML	NORML
	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Free Water scalar *Visual NEG NEG NEG	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
	Free Water	scalar	*Visual		NEG	NEG	NEG



OIL ANALYSIS REPORT





GRAPHS					
Iron (ppm)					Lead (ppm)
2000					30 25 Severe
1500 - Severe					20
Abnormal Abnormal					E 15 10 Abnormal
500	~ ^				10 Automai
2 4 7		- SO	21	23	22 20 13
May13/10 Sep20/12 Apr1/14	Jan2/19	Jan28/20	Apr9/21	Jun3/23	May13/10 Sep20/12 Apr1/14 Jan2/19 Jan2/19 Jun3/23
Aluminum (ppm)					Chromium (ppm)
Severe					25 Severe
					20
Abnormal					E 15 Abnormal
50					5
May13/10	Jan2/19	Jan28/20 -	Apr9/21	Jun3/23	Sep20/12 Sep20/12 Apr1/14 Apr1/17 Apr1/17 Apr3/21 Apr3/21 Jun3/23 Jun3/23 Jun3/23 Apr3/21 Apr3/21 Apr3/23 Apr3
≥ ∽	Jar	Jan	Ap	Ju	2 "
Copper (ppm)					Silicon (ppm)
150					800 Severe
E 100					600 E 400 Abnormal
Abnormal 50					200
	$\overline{}$			\rightarrow	
May13/10 Sep20/12 Apr1/14	Jan2/19-	Jan28/20	Apr9/21	Jun3/23	May13/10 Sep20/12 Apr1/14 May1/17 Jan2/19 Jan2/20
≥		T			∑ ∞ – ¬ ¬ ¬ Additives
Abnormal	7-7-7-7				3500 3000 calcium
220 + Base					2500 - zinc
(\$\frac{1}{2}\) 200 - Base 8\(\frac{1}{2}\) 180 -				/	E 2000
160					1500-
Abnormal 140	9	720	121	23	200 174 174 175 185 185 185 185 185 185 185 185 185 18
May13/10 Sep20/12 Apr1/14	Jan2/19-	Jan 28/20	Apr9/21	Jun3/23	May13/10 Sep20/12 - Apr1/14 May1/17 Jan2/19 Jan2/20



Certificate L2367

Laboratory Sample No. Lab Number

Unique Number : 10562216 Test Package : MOB 1

: PCA0087117 : 05900860

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : 17 Jul 2023 Received Diagnosed : 19 Jul 2023 Diagnostician : Wes Davis

Kemp Quarries - Muskogee Sand 3395 W 50th St N

Porter, OK US 74454 Contact:

muskogee@muskogeesand.com T:

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)

F: