

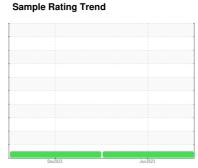
# **OIL ANALYSIS REPORT**

# KEMP QUARRIES / BCS - STILLWELL **WL090**

Component

**Rear Left Final Drive** 

TDTO FLUID SAE 50 (--- GAL)





### DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor. ( Customer Sample Comment: PM-2 sampled fluid)

All component wear rates are normal.

### Contamination

There is no indication of any contamination in the oil.

### **Fluid Condition**

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

Sample Number         Client Info         PCA0086386         PCA0061902            Sample Date         Client Info         30 Jun 2023         28 Dec 2022            Machine Age         hrs         Client Info         22640         22251            Oil Age         hrs         Client Info         22640         0            Oil Changed         Client Info         N/A         N/A            Sample Status         NORMAL         NORMAL				Dec2022	Jun 2023		
Sample Date   Client Info   20 Jun 2023   28 Dec 2022	SAMPLE INFOR	MATION	method	limit/base	current	history 1	history 2
Sample Date   Client Info   20 Jun 2023   28 Dec 2022	Sample Number		Client Info		PCA0086386	PCA0061902	
Oil Age         hrs         Client Info         22640         0            Oil Changed         Client Info         N/A         N/A         N/A            Sample Status         NORMAL         NORMAL            WEAR METALS         method         limit/base         current         history 1         history 2           Iron         ppm         ASTM D5185m         >500         184         142            Chromium         ppm         ASTM D5185m         >10         0         0            Nickel         ppm         ASTM D5185m         >10         0         0            Silver         ppm         ASTM D5185m         >10         0         0            Aluminum         ppm         ASTM D5185m         25         2         2         2            Aluminum         ppm         ASTM D5185m         25         1         1         1            Aluminum         ppm         ASTM D5185m         >25         1         2            Copper         ppm         ASTM D5185m         30         1         1         1 <t< td=""><td></td><td></td><td>Client Info</td><td></td><th>30 Jun 2023</th><td>28 Dec 2022</td><td></td></t<>			Client Info		30 Jun 2023	28 Dec 2022	
Oil Changed Status	Machine Age	hrs	Client Info		22640	22251	
NORMAL   N	Oil Age	hrs	Client Info		22640	0	
WEAR METALS	Oil Changed		Client Info		N/A	N/A	
Chromium	Sample Status				NORMAL	NORMAL	
Chromium         ppm         ASTM D5185m         >10         <1         <1            Nickel         ppm         ASTM D5185m         >10         0         0            Tittanium         ppm         ASTM D5185m         <1	WEAR METAL	.S	method	limit/base	current	history 1	history 2
Nickel	Iron	ppm	ASTM D5185m	>500	184	142	
Titanium	Chromium	ppm	ASTM D5185m	>10	<1	<1	
Silver	Nickel	ppm	ASTM D5185m	>10	0	0	
Aluminum	Titanium	ppm	ASTM D5185m		<1	0	
Lead	Silver	ppm	ASTM D5185m		0	0	
Copper	Aluminum	ppm	ASTM D5185m	>25	2	2	
Tin	Lead	ppm	ASTM D5185m	>25	<1	2	
Vanadium         ppm         ASTM D5185m         0         0            Cadmium         ppm         ASTM D5185m         0         0            ADDITIVES         method         limit/base         current         history 1         history 2           Boron         ppm         ASTM D5185m         37         40         37            Barium         ppm         ASTM D5185m         7         0         0            Molybdenum         ppm         ASTM D5185m         5         3         2            Magnesium         ppm         ASTM D5185m         2         1            Magnesium         ppm         ASTM D5185m         2650         2984         2962            Phosphorus         ppm         ASTM D5185m         1050         1031         979            Zinc         ppm         ASTM D5185m         1075         1161         1092            Sulfur         ppm         ASTM D5185m         >750         7211         6410            CONTAMINANTS         method         limit/base         current         history 1         history	Copper	ppm	ASTM D5185m	>50	11	11	
Cadmium         ppm         ASTM D5185m         0         0            ADDITIVES         method         limit/base         current         history 1         history 2           Boron         ppm         ASTM D5185m         3         40         37            Barium         ppm         ASTM D5185m         7         0         0            Molybdenum         ppm         ASTM D5185m         7         0         0            Manganese         ppm         ASTM D5185m         2         1            Magnesium         ppm         ASTM D5185m         40         51         38            Calcium         ppm         ASTM D5185m         40         51         38            Calcium         ppm         ASTM D5185m         40         51         38            Calcium         ppm         ASTM D5185m         2650         2984         2962            Phosphorus         ppm         ASTM D5185m         1075         1161         1092            Zinc         ppm         ASTM D5185m         1075         1161         1092	Tin	ppm	ASTM D5185m	>10	<1	<1	
ADDITIVES	Vanadium	ppm	ASTM D5185m		0	0	
Boron	Cadmium	ppm	ASTM D5185m		0	0	
Barium	ADDITIVES		method	limit/base	current	history 1	history 2
Molybdenum         ppm         ASTM D5185m         5         3         2            Manganese         ppm         ASTM D5185m         2         1            Magnesium         ppm         ASTM D5185m         40         51         38            Calcium         ppm         ASTM D5185m         2650         2984         2962            Phosphorus         ppm         ASTM D5185m         1050         1031         979            Zinc         ppm         ASTM D5185m         1075         1161         1092            Sulfur         ppm         ASTM D5185m         5750         7211         6410            CONTAMINANTS         method         limit/base         current         history 1         history 2           Silicon         ppm         ASTM D5185m         >75         18         16            Sodium         ppm         ASTM D5185m         >20         1         0            Potassium         ppm         ASTM D5185m         >20         1         0            VISUAL         method         limit/base         current	Boron	ppm	ASTM D5185m	37	40	37	
Manganese         ppm         ASTM D5185m         2         1            Magnesium         ppm         ASTM D5185m         40         51         38            Calcium         ppm         ASTM D5185m         2650         2984         2962            Phosphorus         ppm         ASTM D5185m         1050         1031         979            Zinc         ppm         ASTM D5185m         1075         1161         1092            Sulfur         ppm         ASTM D5185m         5750         7211         6410            Sulfur         ppm         ASTM D5185m         >75         18         16            Sodium         ppm         ASTM D5185m         >75         18         16            Sodium         ppm         ASTM D5185m         >20         1         0            Potassium         ppm         ASTM D5185m         >20         1         0            VISUAL         method         limit/base         current         history 1         history 2           White Metal         scalar         *Visual         NONE	Barium	ppm	ASTM D5185m	7	0	0	
Magnesium         ppm         ASTM D5185m         40         51         38            Calcium         ppm         ASTM D5185m         2650         2984         2962            Phosphorus         ppm         ASTM D5185m         1050         1031         979            Zinc         ppm         ASTM D5185m         1075         1161         1092            Sulfur         ppm         ASTM D5185m         5750         7211         6410            CONTAMINANTS         method         limit/base         current         history 1         history 2           Silicon         ppm         ASTM D5185m         >75         18         16            Sodium         ppm         ASTM D5185m         >75         18         16            Sodium         ppm         ASTM D5185m         >75         18         16            VISUAL         method         limit/base         current         history 1         history 1         history 2           VISUAL         NONE         NONE         NONE         NONE	Molybdenum	ppm	ASTM D5185m	5	3	2	
Calcium         ppm         ASTM D5185m         2650         2984         2962            Phosphorus         ppm         ASTM D5185m         1050         1031         979            Zinc         ppm         ASTM D5185m         1075         1161         1092            Sulfur         ppm         ASTM D5185m         5750         7211         6410            CONTAMINANTS         method         limit/base         current         history 1         history 2           Silicon         ppm         ASTM D5185m         >75         18         16            Sodium         ppm         ASTM D5185m         >20         1         0            VISUAL         method         limit/base         current         history 1         history 2           VISUAL         method         limit/base         current         history 1         history 2           VISUAL         method         limit/base         current         history 1         history 2           VISUAL         NONE         NONE         NONE         NONE            VI	Manganese	ppm	ASTM D5185m		2	1	
Phosphorus         ppm         ASTM D5185m         1050         1031         979            Zinc         ppm         ASTM D5185m         1075         1161         1092            Sulfur         ppm         ASTM D5185m         5750         7211         6410            CONTAMINANTS         method         limit/base         current         history 1         history 2           Silicon         ppm         ASTM D5185m         >75         18         16            Sodium         ppm         ASTM D5185m         >20         1         0            VISUAL         method         limit/base         current         history 1         history 2           VISUAL         method         limit/base         current         history 1         history 2           VISUAL         NONE         NONE         NONE            VISUAL         NONE         NONE         NONE            VISUAL         NONE         NONE         NONE            VISUAL         NONE         NONE         NONE <td>Magnesium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>40</td> <th>51</th> <td>38</td> <td></td>	Magnesium	ppm	ASTM D5185m	40	51	38	
Zinc         ppm         ASTM D5185m         1075         1161         1092            Sulfur         ppm         ASTM D5185m         5750         7211         6410            CONTAMINANTS         method         limit/base         current         history 1         history 2           Silicon         ppm         ASTM D5185m         >75         18         16            Sodium         ppm         ASTM D5185m         >20         1         0            Potassium         ppm         ASTM D5185m         >20         1         0            VISUAL         method         limit/base         current         history 1         history 2           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	Calcium	ppm	ASTM D5185m	2650	2984	2962	
Sulfur         ppm         ASTM D5185m         5750         7211         6410            CONTAMINANTS         method         limit/base         current         history 1         history 2           Silicon         ppm         ASTM D5185m         >75         18         16            Sodium         ppm         ASTM D5185m         >20         1         0            Potassium         ppm         ASTM D5185m         >20         1         0            VISUAL         method         limit/base         current         history 1         history 2           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/Dirit         scalar         *Visual         NORML         NORML         NORML         NORML	Phosphorus	ppm	ASTM D5185m	1050	1031	979	
CONTAMINANTS method limit/base current history 1 history 2  Silicon ppm ASTM D5185m >75 18 16  Sodium ppm ASTM D5185m < 1 <1 <1  Potassium ppm ASTM D5185m >20 1 0  VISUAL method limit/base current history 1 history 2  White Metal scalar *Visual NONE NONE NONE NONE  Yellow Metal scalar *Visual NONE NONE NONE NONE  Precipitate scalar *Visual NONE NONE NONE  Silt scalar *Visual NONE NONE NONE  Silt scalar *Visual NONE NONE NONE  Silt scalar *Visual NONE NONE NONE  Appearance scalar *Visual NONE NONE NONE  Appearance scalar *Visual NONE NONE NONE  Appearance scalar *Visual NORML NORML NORML  Codor scalar *Visual NORML NORML NORML  Emulsified Water scalar *Visual >0.2 NEG NEG  Free Water scalar *Visual NEG NEG	Zinc	ppm	ASTM D5185m	1075	1161	1092	
Silicon         ppm         ASTM D5185m         >75         18         16            Sodium         ppm         ASTM D5185m         <1         <1            Potassium         ppm         ASTM D5185m         >20         1         0            VISUAL         method         limit/base         current         history 1         history 2           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         NORML         NORML           Odor<	Sulfur	ppm	ASTM D5185m	5750	7211	6410	
Sodium         ppm         ASTM D5185m         <1         <1            Potassium         ppm         ASTM D5185m         >20         1         0            VISUAL         method         limit/base         current         history 1         history 2           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         NORML            Odor         scalar         *Visual         NORML         NORML         NORML            Free Water         scalar	CONTAMINAN	ITS	method	limit/base	current	history 1	history 2
Potassium         ppm         ASTM D5185m         >20         1         0            VISUAL         method         limit/base         current         history 1         history 2           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         NORML            Odor         scalar         *Visual         NORML         NORML         NORML            Emulsified Water         scalar         *Visual         NOR         NEG            Free Water	Silicon	ppm	ASTM D5185m	>75	18	16	
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 Silt scalar *Visual NONE LIGHT NONE Debris scalar *Visual NONE NONE NONE NONE Sand/Dirt scalar *Visual NONE NONE NONE Appearance scalar *Visual NORML NORML NORML Codor scalar *Visual NORML NORML NORML Emulsified Water scalar *Visual >0.2 NEG NEG Free Water scalar *Visual NEG NEG	Sodium	ppm	ASTM D5185m		<1	<1	
White Metal         scalar         *Visual         NONE         NONE         NONE            Yellow Metal         scalar         *Visual         NONE         NONE         NONE            Precipitate         scalar         *Visual         NONE         NONE         NONE            Silt         scalar         *Visual         NONE         LIGHT         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         >0.2         NEG         NEG            Free Water         scalar         *Visual         NEG         NEG	Potassium	ppm	ASTM D5185m	>20	1	0	
Yellow Metal         scalar         *Visual         NONE         NONE         NONE            Precipitate         scalar         *Visual         NONE         NONE         NONE            Silt         scalar         *Visual         NONE         LIGHT         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         >0.2         NEG         NEG            Free Water         scalar         *Visual         NEG         NEG	VISUAL		method	limit/base	current	history 1	history 2
Precipitate         scalar         *Visual         NONE         NONE         NONE            Silt         scalar         *Visual         NONE         LIGHT         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         >0.2         NEG         NEG            Free Water         scalar         *Visual         NEG         NEG	White Metal	scalar	*Visual	NONE	NONE	NONE	
Silt         scalar         *Visual         NONE         LIGHT         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         >0.2         NEG         NEG            Free Water         scalar         *Visual         NEG         NEG	Yellow Metal	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 >0.2 NEG NEG Free Water scalar *Visual NEG NEG	Precipitate	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 >0.2 NEG NEG Free Water scalar *Visual NEG NEG	Silt	scalar	*Visual	NONE	LIGHT	NONE	
Appearance scalar *Visual NORML NORML NORML Odor scalar *Visual NORML NORML NORML Emulsified Water scalar *Visual >0.2 NEG NEG Free Water scalar *Visual NEG NEG	Debris	scalar	*Visual	NONE	NONE	NONE	
Odor scalar *Visual NORML NORML NORML Emulsified Water scalar *Visual >0.2 NEG NEG Free Water scalar *Visual NEG NEG	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	
Emulsified Water       scalar       *Visual       >0.2       NEG       NEG          Free Water       scalar       *Visual       NEG       NEG	Appearance	scalar	*Visual	NORML	NORML	NORML	
Free Water scalar *Visual NEG NEG	Odor	scalar	*Visual	NORML	NORML	NORML	
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	
FLUID PROPERTIES method limit/base current history 1 history 2	Free Water	scalar	*Visual		NEG	NEG	
	FLUID PROPE	RTIES	method	limit/base	current	history 1	history 2

Visc @ 40°C

cSt

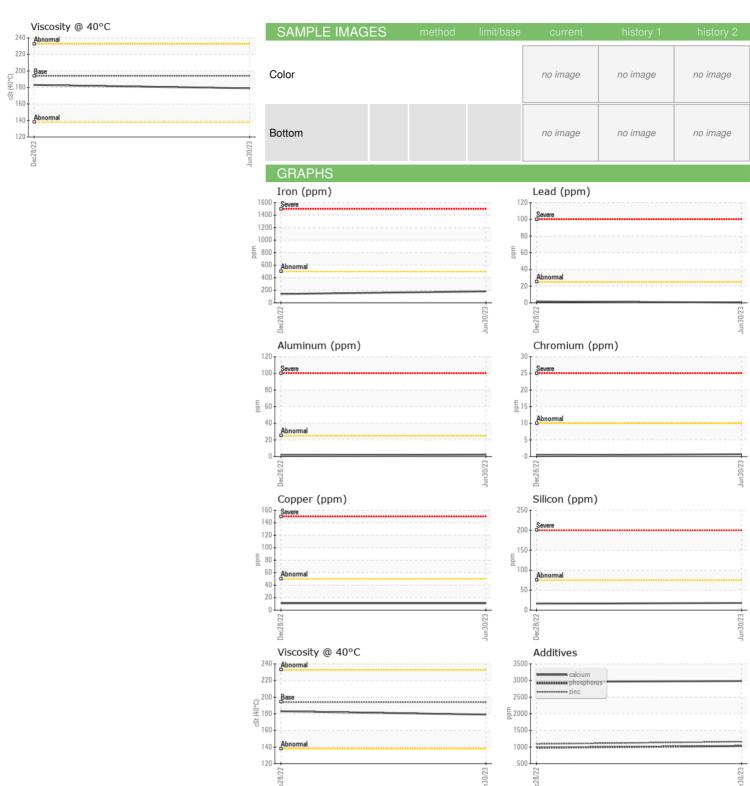
ASTM D445 194

179

183



## **OIL ANALYSIS REPORT**







Certificate L2367

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

: PCA0086386 : 05894689 : 10550499 Test Package : MOB 1

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 10 Jul 2023

: 12 Jul 2023 Diagnosed Diagnostician : Sean Felton Kemp Quarries - Benton County Stone - Stillwell 463917 Highway 100

Bunch, OK US 74931

Contact: stilwell@bentoncountystone.com

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)

T:

F: