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Terry Glover USG Greenville, MS

Terry,

The following is a summary report from the August 2024 quarterly oil analysis at your facility. Please let us know if there are any questions or comments. As always, it has been a pleasure to serve USG-Greenville, MS. If there are any comments or questions, do not hesitate to contact us.

Sincerely,

Kevin W. Marcuell

Senior Reliability Specialist ISO/ANSI Certified Vibration Analyst, Category III



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## Komatsu Press Clutch and Brake

The sample is free of visible ferrous debris this time, which is good, but iron shows nearly twice as much steel wear as last time, so we suggest an oil change to help reduce it. Silicon is low enough to rule out dirt contamination. No measurable water is present. Insolubles show minimal oil oxidation at a trace. CHANGE OIL SOON

	MI/HR on Oil								
	MI/HR on Unit								UNIVERSAL
	Sample Date	8/1/2024	AVERAGES	9/11/2023	5/6/2023	8/8/2022	3/11/2022	7/15/2021	AVERAGES
	Make Up Oil Added								
ľ	ALUMINUM	1	0	2	1	0	0	0	1
í	CHROMIUM	0	0	0	1	1	0	1	0
	IRON	201	45	111	136	249	234	220	69
2	COPPER	3	3	5	11	3	7	4	22
ĥ	LEAD	0	0	0	0	1	0	0	1
ĩ	TIN	0	0	0	2	0	0	0	2
0	MOLYBDENUM	0	0	0	0	0	0	0	0
Ś	NICKEL	0	0	0	0	0	0	0	0
5	MANGANESE	2	0	1	1	2	2	2	0
2	SILVER	0	0	0	0	0	0	0	0
	TITANIUM	0	0	0	0	0	0	0	0
2	POTASSIUM	1	1	0	0	0	0	0	0
f	BORON	1	1	1	4	0	1	0	1
	SILICON	3	1	15	15	2	2	1	4
	SODIUM	1	2	2	3	2	2	2	2
l	CALCIUM	86	108	85	108	115	115	106	109
	MAGNESIUM	0	0	0	0	0	0	0	2
	PHOSPHORUS	99	449	126	363	468	457	443	429
	ZINC	6	5	9	15	4	4	3	251
	BARIUM	0	0	0	0	0	0	0	0
			Values						
			Should Be*						
	SUS Viscosity @ 210°F	41.4		42.9	39.8	39.8	39.2	39.5	
	cSt Viscosity @ 100°C	4.60		5.06	4.09	4.12	3.91	4.02	
)	Flashpoint in °F	355		345	380	350	400	SHORT	
	Fuel %	-		-	-	-	-	-	
	Antifreeze %	-		-	-	-	-	-	
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	Insolubles %	TR	<0.1	0.5	TR	0.1	0.1	0.1	
	TBN								
	TAN						0.2		
	ISO Code						23/20/17		

## **#3 Board Line Drive Gearbox**

Iron is much higher. Some of it could be from accumulation if this oil is from the same fill as last time, but it's still high enough to suggest excess steel wear is taking place. The sample is also contaminated with water, which isn't doing any favors for wear, so change this oil if it's still in place and look for points around the unit where water could be getting in. The viscosity is in the ISO 220 range. Insolubles (oxidized solids) aren't excessive. **CHANGE OIL SOON** 

MI/HR on Oil								
MI/HR on Unit		UNIT /						UNIVERSAL
Sample Date	8/1/2024		9/11/2023	5/6/2023	8/8/2022	3/11/2022	7/15/2021	AVERAGES
Make Up Oil Added		AVERAGES						
•								
ALUMINUM	0	1	0	0	0	1	1	1
CHROMIUM	3	1	1	5	3	2	1	0
IRON	484	58	189	738	452	296	126	65
COPPER	1	5	1	2	1	2	1	2
LEAD	0	0	0	1	1	0	1	0
TIN	0	0	0	0	0	0	0	0
MOLYBDENUM	1	0	1	3	1	1	0	22
NICKEL	2	0	1	5	3	2	1	0
MANGANESE	5	1	3	7	5	3	2	1
SILVER	0	0	0	0	0	0	0	0
TITANIUM	0	0	0	0	0	0	0	0
POTASSIUM	1	1	0	0	0	0	0	1
BORON	14	12	8	15	10	17	12	26
SILICON	4	5	5	6	5	5	4	10
SODIUM	3	8	4	10	8	8	7	5
CALCIUM	3	7	7	5	5	6	5	12
MAGNESIUM	1	1	1	0	0	1	1	1
PHOSPHORUS	266	311	351	341	343	338	329	426
ZINC	16	30	68	28	32	32	28	22
BARIUM	0	0	0	0	0	0	0	0
		Values Should Be*						
SUS Viscosity @ 210°F	91.5		87.2	90.0	91.0	90.9	91.9	
cSt Viscosity @ 100°C	18.33		17.31	17.98	18.21	18.19	18.43	
Flashpoint in °F	455		450	460	450	490	475	
Fuel %	-		-	-	-	-	-	
Antifreeze %	-		-	-	-	-	-	
Water %	0.2	0.0	0.0	0.0	0.0	0.0	0.0	
Insolubles %	0.4	<0.6	0.2	0.3	0.2	0.3	0.1	
TBN								
TAN						0.4		
ISO Code						24/23/17		

## Hydropulper Gearbox

No ferrous debris was detected in this sample. The oil had an ISO 220 viscosity, it wasn't overly oxidized based on the trace of insolubles detected, and it wasn't contaminated with water. Some of the metals came in at higher levels, but they're all still within acceptable wear ranges. **OIL IS OK FOR USE** 

	MI/HR on Oil								
	MI/HR on Unit		UNIT /						UNIVERSAL
	Sample Date	8/1/2024		9/12/2023	5/6/2023	8/8/2022	3/11/2022	7/22/2021	AVERAGES
	Make Up Oil Added		AVENAGES						
N	ALUMINUM	1	1	0	0	1	1	2	1
H	CHROMIUM	3	1	1	2	1	1	1	0
	IRON	22	58	11	37	14	21	35	65
2	COPPER	3	5	3	8	5	6	25	2
£.	LEAD	0	0	0	0	0	0	0	0
۵.	TIN	0	0	0	0	0	0	0	0
S	MOLYBDENUM	0	0	0	0	0	0	0	22
R	NICKEL	0	0	0	0	0	0	0	0
Р	MANGANESE	0	1	0	1	0	0	0	1
z	SILVER	0	0	0	0	0	0	0	0
	TITANIUM	0	0	0	0	0	0	0	0
Ĕ	POTASSIUM	1	1	0	1	0	1	2	1
ш	BORON	15	12	16	17	16	16	12	26
M	SILICON	6	5	4	6	3	4	5	10
H	SODIUM	2	8	6	5	1	2	2	5
	CALCIUM	6	7	7	7	3	5	6	12
	MAGNESIUM	1	1	1	2	1	2	1	1
	PHOSPHORUS	262	311	324	329	340	333	307	427
	ZINC	18	30	23	52	23	47	114	22
	BARIUM	0	0	0	0	0	0	0	0
			Values Should Be*						
	SUS Viscosity @ 210°F	93.0	onould be	91.2	92.4	94.0	89.8	85.6	1
	cSt Viscosity @ 100°C	18 71		18 27	18.55	18 95	17 94	16 90	
10	Flashpoint in °F	465		455	480	465	480	460	
ш	Fuel %							400	
RT	Antifreeze %			-	-	-	-	-	
Ē	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Ö	Insolubles %	TR	<0.6	0.2	0.0	0.0	TR	0.0	
H.	TBN		.0.0	5.2	0.4	0.1		0.2	
	TAN						1.1		
	ISO Code						24/22/18		1

## Hi-Pressure Hydraulic Pump (Water Jet System)

ISO Code

Chrome is back down, and the rest of the metals are at the low levels we typically see from this unit. Silicon is low enough to rule out excess dirt infiltration. No water contamination or excess oil oxidation is evident. The viscosity is in the ISO 46 range. **OIL IS OK FOR USE** 

	MI/HR on Oil								
	MI/HR on Unit								UNIVERSAL
	Sample Date	8/1/2024	AVERAGES	9/12/2023	5/6/2023	8/8/2022	3/11/2022	8/2/2021	AVERAGES
	Make Up Oil Added		ATENDES						
N	ALUMINUM	0	0	0	0	0	0	1	0
H	CHROMIUM	3	1	5	3	1	1	2	0
	IRON	1	2	1	1	1	2	10	3
2	COPPER	2	4	3	3	5	4	35	5
£	LEAD	0	1	0	0	0	0	4	1
Δ.	TIN	0	0	0	0	0	0	0	0
ß	MOLYBDENUM	0	1	2	2	4	5	0	1
Υ.	NICKEL	0	0	0	0	0	0	0	0
PA	MANGANESE	0	0	0	0	0	0	0	0
Ν	SILVER	0	0	0	0	0	0	0	0
	TITANIUM	0	0	0	0	0	0	0	0
ñ	POTASSIUM	2	1	0	0	0	0	0	1
ш	BORON	1	1	3	3	3	4	1	2
M	SILICON	4	9	70	104	49	3	4	2
-	SODIUM	4	2	3	3	3	2	2	3
ш	CALCIUM	21	42	43	60	72	69	54	84
	MAGNESIUM	61	13	48	40	51	65	1	6
	PHOSPHORUS	244	286	311	308	314	308	355	1777
	ZINC	295	308	312	319	342	349	162	409
	BARIUM	0	0	0	0	0	0	0	0
			Values						
			Should Be*						
	SUS Viscosity @ 210°F	47.1		47.3	48.6	49.8	47.5	44.0	
	cSt Viscosity @ 100°C	6.39		6.43	6.84	7.20	6.50	5.41	
S	Flashpoint in °F	435		430	465	400	440	410	
Ë	Fuel %	-		-	-	-	-	-	
Ř	Antifreeze %	-		-	-	-	-	-	
ä	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8	Insolubles %	TR	<0.1	0.0	0.0	0.2	0.0	0.1	
ġĽ,	TBN								
	TAN						0.4		

21/19/16