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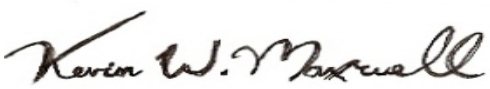
Will Ledbetter
USG
Greenville, MS

The following is a summary of findings from the 2019 second quarter 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,



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Komatsu Press Clutch and Brake

This ISO 22-grade oil can stay in use. We found a bit more metal than last time, but nothing that is out of line compared to universal averages. Insolubles are okay at 0.1%. **OIL IS OK FOR USE**

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil		UNIT / LOCATION AVERAGES						UNIVERSAL AVERAGES
	MI/HR on Unit								
	Sample Date	6/8/2019		1/29/2019	7/1/2018	3/28/2018	10/21/2017	6/13/2017	
	Make Up Oil Added								
	ALUMINUM	0	0	0	0	0	0	0	1
	CHROMIUM	0	0	0	0	0	0	0	0
	IRON	18	8	8	14	9	12	8	45
	COPPER	8	2	3	1	1	1	1	26
	LEAD	0	0	1	0	0	0	0	1
	TIN	0	0	1	1	0	0	0	2
	MOLYBDENUM	0	0	0	0	1	0	0	0
	NICKEL	0	0	0	0	0	0	0	0
	MANGANESE	0	0	0	0	0	0	0	0
	SILVER	0	0	0	0	0	0	0	0
	TITANIUM	0	0	0	0	0	0	0	0
	POTASSIUM	0	1	0	0	2	0	0	1
	BORON	2	1	2	1	0	1	0	1
	SILICON	1	1	1	0	1	0	0	3
	SODIUM	2	3	4	2	6	0	3	3
	CALCIUM	129	108	129	114	119	98	103	110
	MAGNESIUM	0	0	1	0	0	0	0	2
	PHOSPHORUS	474	445	498	483	498	406	446	440
	ZINC	13	5	4	8	3	7	3	328
	BARIUM	2	0	0	0	0	0	0	1
			Values Should Be*						
PROPERTIES	SUS Viscosity @ 210°F	39.6		38.9	39.3	39.2	40.3	38.9	
	cSt Viscosity @ 100°C	4.03		3.83	3.94	3.92	4.27	3.83	
	Flashpoint in °F	350		340	390	395	400	400	
	Fuel %	-		-	-	-	-	-	
	Antifreeze %	-		-	-	-	-	-	
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Insolubles %	0.1	<0.6	TR	0.0	0.0	0.0	0.0	
	TBN								
	TAN								
	ISO Code								

#3 Board Line Drive Gearbox

Iron is much lower this time than past samples. No moisture is present and insolubles are low. This is serviceable oil.

OIL IS OK FOR USE

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil		UNIT / LOCATION AVERAGES						UNIVERSAL AVERAGES
	MI/HR on Unit								
	Sample Date	6/8/2019		2/6/2019	6/21/2018	3/28/2018	10/21/2017	6/13/2017	
	Make Up Oil Added								
	ALUMINUM	0	1	0	1	0	1	0	1
	CHROMIUM	0	1	1	1	1	1	1	0
	IRON	19	40	97	80	66	42	35	65
	COPPER	1	5	1	3	4	3	3	2
	LEAD	0	1	1	1	1	0	1	0
	TIN	0	0	0	0	0	0	0	0
	MOLYBDENUM	0	0	0	0	0	0	0	30
	NICKEL	0	0	0	0	0	0	0	0
	MANGANESE	0	0	1	1	1	1	0	1
	SILVER	0	0	0	0	0	0	0	0
	TITANIUM	0	0	0	0	0	0	0	0
	POTASSIUM	0	1	0	0	1	0	1	1
	BORON	11	13	16	11	7	5	5	28
	SILICON	3	6	5	4	4	4	3	11
	SODIUM	6	11	19	16	16	10	12	4
	CALCIUM	4	8	9	21	7	4	1	13
	MAGNESIUM	1	1	1	1	2	1	1	1
	PHOSPHORUS	334	302	312	339	355	289	299	461
	ZINC	7	25	22	28	17	22	19	21
	BARIUM	0	0	0	0	0	0	0	0
			Values Should Be*						
PROPERTIES	SUS Viscosity @ 210°F	92.5		89.7	93.3	94.1	92.1	93.8	
	cSt Viscosity @ 100°C	18.58		17.90	18.78	18.96	18.49	18.89	
	Flashpoint in °F	465		465	450	450	485	470	
	Fuel %	-		-	-	-	-	-	
	Antifreeze %	-		-	-	-	-	-	
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Insolubles %	TR	<0.6	0.1	0.4	0.2	TR	TR	
	TBN								
	TAN								
	ISO Code								

Hydropulper Gearbox

Nice improvement. Metals continued to drop and we didn't find any measurable water. Copper is elevated still, but not to the point we'd be concerned about running the oil longer. Keep this ISO 220 lube oi in service. **OIL IS OK FOR USE**

	MI/HR on Oil		UNIT / LOCATION AVERAGES						UNIVERSAL AVERAGES
	MI/HR on Unit								
	Sample Date	6/8/2019		1/29/2019	8/5/2018	3/28/2018	10/21/2017	4/3/2017	
	Make Up Oil Added								
ELEMENTS IN PARTS PER MILLION	ALUMINUM	0	1	1	2	1	1	1	1
	CHROMIUM	1	1	3	**4**	2	2	1	0
	IRON	11	40	37	**70**	18	15	12	65
	COPPER	**11**	5	**13**	**16**	6	2	**12**	1
	LEAD	0	1	1	2	0	0	0	0
	TIN	0	0	0	0	0	0	0	0
	MOLYBDENUM	0	0	1	1	1	1	1	30
	NICKEL	0	0	0	0	0	0	0	0
	MANGANESE	0	0	0	1	0	0	0	1
	SILVER	0	0	0	0	0	0	0	0
	TITANIUM	0	0	1	1	0	0	0	0
	POTASSIUM	1	1	2	4	2	1	1	1
	BORON	27	13	22	35	15	14	23	28
	SILICON	4	6	7	**15**	12	9	6	11
	SODIUM	2	11	7	6	7	1	4	4
	CALCIUM	14	8	12	23	9	8	8	13
	MAGNESIUM	3	1	3	4	1	1	1	1
	PHOSPHORUS	336	302	301	423	346	279	303	463
	ZINC	46	25	105	222	24	20	22	20
	BARIUM	0	0	0	0	0	0	1	0
			Values Should Be*						
PROPERTIES	SUS Viscosity @ 210°F	90.8		88.1	88.8	90.2	86.0	89.5	
	cSt Viscosity @ 100°C	18.17		17.51	17.69	18.02	17.01	17.85	
	Flashpoint in °F	470		450	475	465	480	455	
	Fuel %	-		-	-	-	-	-	
	Antifreeze %	-		-	-	-	-	-	
	Water %	0.0	0.0	**0.6**	0.0	0.0	0.0	0.0	
	Insolubles %	0.4	<0.6	0.3	0.4	0.2	0.1	TR	
	TBN								
	TAN								
	ISO Code								

Hi-Pressure Hydraulic Pump (Water Jet System)

Go ahead and change this oil out. Metals are okay next to the averages for this system (unit/location column), but the oil is starting to show signs of oxidation (see insolubles). An oil change should get rid of the insolubles. No other issues to note. **CHANGE OIL SOON**

	MI/HR on Oil		UNIT / LOCATION AVERAGES						UNIVERSAL AVERAGES
	MI/HR on Unit								
	Sample Date	6/8/2019		1/29/2019	7/1/2018	3/28/2018	6/13/2017		
	Make Up Oil Added								
ELEMENTS IN PARTS PER MILLION									
	ALUMINUM	0	0	0	0	0	0		1
	CHROMIUM	1	2	0	4	3	1		0
	IRON	0	1	1	1	1	1		4
	COPPER	6	7	2	10	10	5		3
	LEAD	0	0	1	0	0	0		1
	TIN	1	0	0	1	0	0		0
	MOLYBDENUM	0	0	0	0	0	0		1
	NICKEL	0	0	0	0	0	0		0
	MANGANESE	0	0	0	0	0	0		0
	SILVER	0	0	0	0	0	0		0
	TITANIUM	0	0	0	0	0	0		0
	POTASSIUM	0	0	0	0	0	0		1
	BORON	2	1	1	2	0	0		3
	SILICON	2	2	1	2	3	3		1
	SODIUM	1	3	3	2	5	2		3
	CALCIUM	14	12	25	10	6	4		95
	MAGNESIUM	0	0	0	0	0	0		7
	PHOSPHORUS	269	212	281	190	189	131		369
	ZINC	267	173	329	95	106	68		428
	BARIUM	0	0	0	0	0	0		0

			Values Should Be*					
PROPERTIES								
	SUS Viscosity @ 210°F	49.3	46-53	48.1	49.2	48.0	47.5	
	cSt Viscosity @ 100°C	7.06	6.0-8.5	6.69	7.03	6.67	6.49	
	Flashpoint in °F	465	>380	470	460	450	480	
	Fuel %	-	<0.0	-	-	-	-	
	Antifreeze %	-		-	-	-	-	
	Water %	0.0	<0.1	0.0	0.0	0.0	0.0	
	Insolubles %	0.2	<0.1	0.0	TR	TR	0.0	
	TBN							
	TAN							
	ISO Code							