

C Code : 21009
 U Name :
 S
 T
 O Address : Persiaran Segari, Mail Bag 12
 M 34900 Pantai Remis
 E Perak, Malaysia
 R
 Site :
 Location :
 Test code : 804

Unit ID : **Black Start Diesel Gen**
 E
 O Unit Type : Engine Diesel
 U Unit Make : CATERPILLAR
 I Unit Model : 3616
 P
 M
 E
 N
 T
 Oil type / Viscosity : CATERPILLAR SAE 40
 L
 Oil System Capacity :

Overall Condition Rating

Notes (Finding, Evaluation, Interpretation, Suggestion and Recommendation)

Note abnormal copper detected.
 All oil conditions and oil tests appear in normal working range.
 All contaminant conditions and contaminant levels appear in normal ranges.
 Continue routine sampling interval.

Somchai J / Andy Siltton

			Current Sample			Previous Sample			Baseline and Alarm Limit							
Condition History			Wear	Oil	Cont.	Wear	Oil	Cont.	Wear	Oil	Cont.	Alarm Limit				
												Alarm Limit				
												Alarm Limit Matrix -Set Name (Equipment type / oil type)				
												Engine Diesel Caterpillar 3616 Cat 40(Lumut Power)				
Lab ID																
Bottle ID																
Date Sampled																
Oil Hours (Kms)																
Unit Hours (Kms)																
Oil Added (Liters)																
Filters Hours (Kms)																
Wear Condition			RDE fine		RFS coarse		RDE fine		RFS coarse		The New Oil (TNO)	RDE fine		RFS coarse		
Wear Element	Method	Unit	RDE fine	RFS coarse	RDE fine	RFS coarse	RDE fine	RFS coarse	RDE fine	RFS coarse		U-Caution	U-Warning	U-Caution	U-Warning	
Iron	D-6595	PPM	9.2	7.5	8.6	3.2	7.7	7.3	0	0	0	>11	>13	>10	>13	
Chromium	D-6595	PPM	0.1	0.2	0.3	0.2	0.2	0.4	0	0	0	>1	>2	>2	>3	
Lead	D-6595	PPM	1.5	1.7	1.9	2.1	1.2	0.5	0	0	0	>2	>3	>3	>5	
Copper	D-6595	PPM	7.7 W	2.0 C	8.2 W	0.6	7.9 W	2.2 C	0	0	0	>5	>6	>2	>3	
Tin	D-6595	PPM	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	>1	>2	>9	>14	
Aluminum	D-6595	PPM	1.4	1.5	1.8	0.5	1.9	2.0	0	0	0	>3	>4	>6	>9	
Nickel	D-6595	PPM	0.6	0.0	0.0	0.5	0.0	0.2	0	0	0	>1	>2	>2	>3	
Silver	D-6595	PPM	0.1	0.0	0.0	0.0	0.0	0.0	0	0	0					
Molybdenum	D-6595	PPM	0.0	0.9	0.1	0.1	0.3	0.7	0	0	0					
Titanium	D-6595	PPM	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0					
Oil Condition			TNO		L-Warning		L-Caution		U-Caution		U-Warning					
Viscosity @ 40° C	D-445	cSt														
Viscosity @ 100° C	D-445	cSt	13.2		13.1		13.1		136.2	14.1	<11.1	<12.6	>15.6	>17.1		
Oxidation	FTIR	Abs	9.0		9.2		8.8		6.3	6.3		>10.6	>12.7			
Nitration	FTIR	Abs	7.1		6.8		6.7		4.8	4.8		>7.6	>8.8			
TAN	D-974	mg KOH/g														
TBN	D-4739	mg KOH/g	11.6		12.3		12.3		13.6	13.6	<2	<6.8				
Contamination			TNO		L-Warning		L-Caution		U-Caution		U-Warning					
Water	FTIR	% (Wt.)	0.071		0.070		0.073		0.077	0.077			>0.1	>0.15		
Fuel	SAW	% (Wt.)	0.10		0.10		0.10						>2	>4		
Glycol	FTIR	Abs	0		0		0						>0.3	>0.6		
Soot	FTIR	% (Wt.)	0.64		0.56		0.54						>0.7	>1		
Sodium	D-6595	PPM	6		5		5		8	8						
Silicon	D-6595	PPM	3.6	1.7	4.4	2.1	5.0	6.2	10	10	>20	>23	>20	>23		
Additive Element			TNO		L-Warning		L-Caution		U-Caution		U-Warning					
Boron	D-6595	PPM	1		1		1		3	3						
Magnesium	D-6595	PPM	13		13		13		15	15						
Calcium	D-6595	PPM	5386		5213		4827		5120	5120						
Barium	D-6595	PPM	2		0		0		0	0						
Phosphorus	D-6595	PPM	1079		1081		1020		1105	1105						
Zinc	D-6595	PPM	1298	395	1298	184	1253	447	1375	1375						
Additional Test			TNO		L-Warning		L-Caution		U-Caution		U-Warning					
Flash Point	D-3828	°C														
Viscosity Index	D-2270															

Note: Alarm Limits are variable and dependent upon dataset size and to be used as general guideline.
 No Sign or : NORMAL , or : CAUTION (first level warning limit) , or : Warning (second level warning limit)
 U-Caution : Upper CAUTION Level L-Caution : Lower CAUTION Level First Level Alarm Alert Limit in Upper Level and/or Lower Level
 U-Warning : Upper WARNING Level L-Warning : Lower WARNING required Level Second Level Alarm Alert Limit in Upper Level and/or Lower Level
 Baseline will be data of either "The new oil" or "Reference oil" or "Oil specification". TNO = The new oil , RO = Reference oil , OS = Oil Specification
 Accuracy of interpretation and recommendation are based on representatives sample and information supplied. No warranty is expressed or implied for this report.

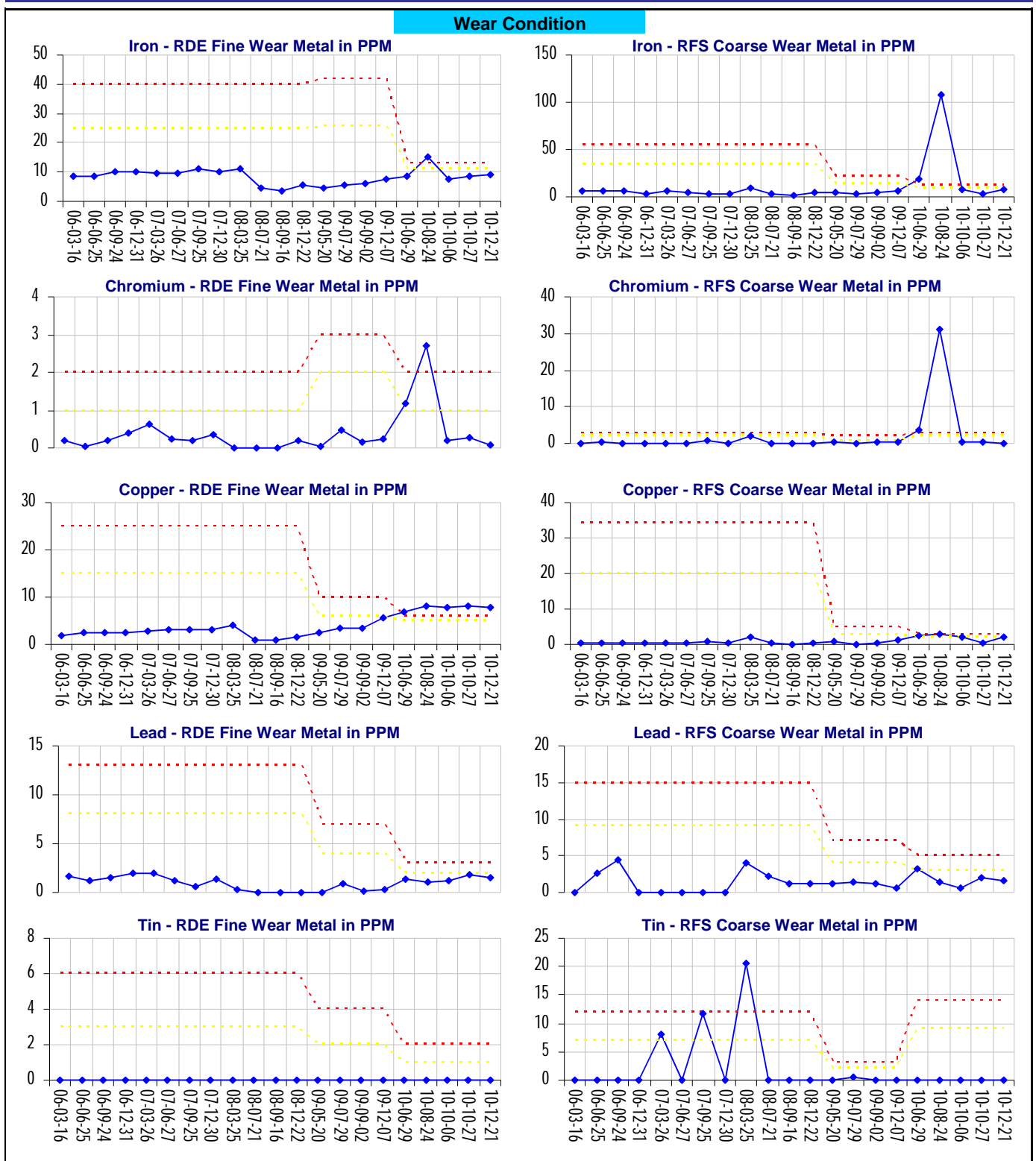
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 P Unit Make : CATERPILLAR
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o Oil type /
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Oil System Capacity :



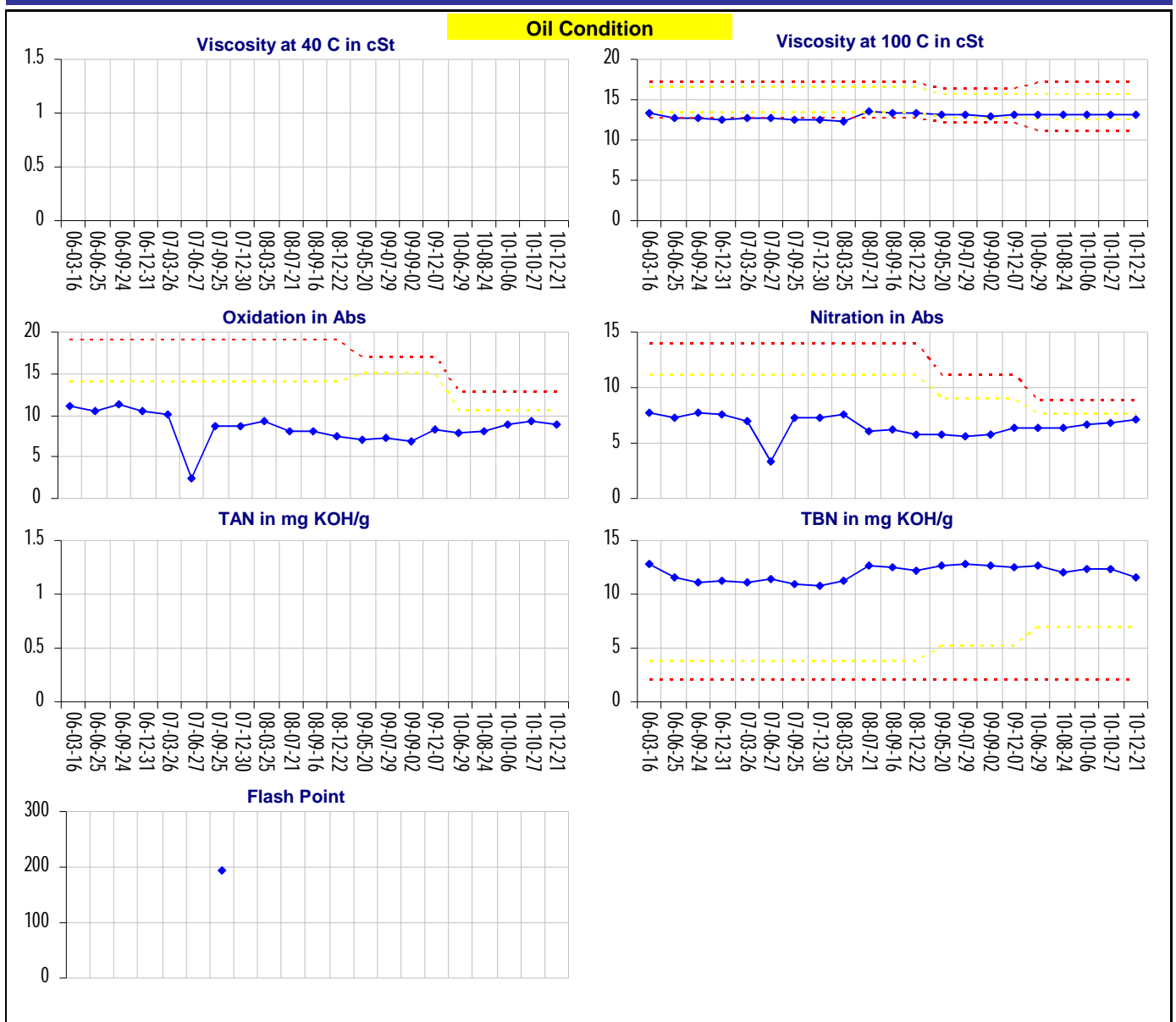
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