

C Code : 28068005  
 U Name :  
 T  
 O Address : 509 Rajavithi Rd., Rajthwee  
 M Bangkok 10400  
 E WD Bang Pa-In  
 R  
 Site :  
 Location :  
 Test code : 813

Unit ID : **CDA 5 CB 15431**  
 Unit Type : Compressor Centrifugal  
 Unit Make : CAMERON  
 Unit Model : TA 2000  
 Oil type/  
 I Viscosity : COOPER TURBO BLEND OIL 46  
 L  
 Oil System Capacity : 80 Liters



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

Note abnormal iron detected.  
 Particle count indicates that oil cleanliness level is in unacceptable range.  
 Varnish & Sludge Potential Index (VsPI) is in the moderate range and indicates that varnish & sludge is present in the oil system.  
 Continue routine sampling interval.

Andy Sitton

			Current Sample			Previous Sample			Baseline and Alarm Limit							
Condition History			Wear	Oil	Cont.	Wear	Oil	Cont.	Wear	Oil	Cont.	Alarm Limit				
Lab ID												Alarm Limit Matrix -Set Name (Equipment type / oil type)				
Bottle ID											Comp Air Cooper Turbo VG 46					
Date Sampled																
Oil Hours (Kms)																
Unit Hours (Kms)																
Oil Added (Liters)																
Filters Hours (Kms)																
Wear Condition			RDE fine		RFS coarse		RDE fine		RFS coarse		RDE fine		RFS coarse			
Wear Element	Method	Unit	RDE fine	RFS coarse	RDE fine	RFS coarse	RDE fine	RFS coarse	RDE fine	RFS coarse	Reference Oil (RO)	U-Caution	U-Warning	U-Caution	U-Warning	
Iron	D-6595	PPM	0.4	8.5	1.5	0.8	0.4	1.0	0	0	0	>8	>15	>7	>12	
Chromium	D-6595	PPM	0.1	0.0	0.0	0.0	0.0	0.1	0	0	0	>1	>2	>1	>2	
Lead	D-6595	PPM	0.0	0.0	0.6	0.5	1.4	0.8	0	0	0	>3	>5	>5	>9	
Copper	D-6595	PPM	0.0	0.0	0.1	0.1	0.0	0.5	0	0	0	>5	>9	>3	>6	
Tin	D-6595	PPM	0.0	1.7	0.1	0.0	0.6	0.0	0	0	0	>3	>5	>5	>8	
Aluminum	D-6595	PPM	0.0	0.0	0.0	1.8	0.0	0.4	0	0	0	>1	>2	>2	>3	
Nickel	D-6595	PPM	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	>1	>2	>2	>3	
Silver	D-6595	PPM	0.0	0.0	0.0	0.1	0.0	0.0	0	0	0					
Molybdenum	D-6595	PPM	0.0	0.0	0.0	0.0	0.0	1.5	0	0	0					
Titanium	D-6595	PPM	0.0	0.9	0.0	0.0	0.0	0.1	0	0	0					
Oil Condition			RO		L-Warning		L-Caution		U-Caution		U-Warning					
Viscosity @ 40°C	D-445	cSt	45.5		45.4		45.5		46.4	<41.1	<43.7	>48.3	>50.6			
Viscosity @ 100°C	D-445	cSt														
Oxidation	FTIR	Abs	2.1		3.3		3.3		3.2		>5	>6				
Nitration	FTIR	Abs	1.6		1.8		1.9		2.0		>2.9	>3.5				
TAN	D-974	mg KOH/g.	0.09		0.09		0.09		0.06		>0.11	>0.16				
TBN	D-4739	mg KOH/g.														
Contamination			RO		U-Caution		U-Warning									
Water	T-H2O CheckTM	% (Wt.)	0.016		0.019		0.014		0.010		>0.05	>0.08				
Sodium	D-6595	PPM	0		0		0		1							
Silicon	D-6595	PPM	2.2	1.3	2.2	2.3	1.8	2.6	0	>7	>12	>6	>10			
Additive Element			RO		L-Caution		L-Warning		U-Caution		U-Warning					
Boron	D-6595	PPM	0		0		0		0							
Magnesium	D-6595	PPM	0		0		0		0							
Calcium	D-6595	PPM	0		3		0		8							
Barium	D-6595	PPM	0		0		0		0							
Phosphorus	D-6595	PPM	0		12		4		21							
Zinc	D-6595	PPM	2	2	1	1	1	2	4							
Additional Test			RO		L-Caution		L-Warning		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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E Unit ID : **CDA 5 CB 15431**  
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 I Unit Type : Compressor Centrifugal  
 P Unit Make : CAMERON  
 M Unit Model : TA 2000  
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 Oil type / Viscosity : COOPER TURBO BLEND OIL 46  
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 Oil System Capacity : 80 Liters

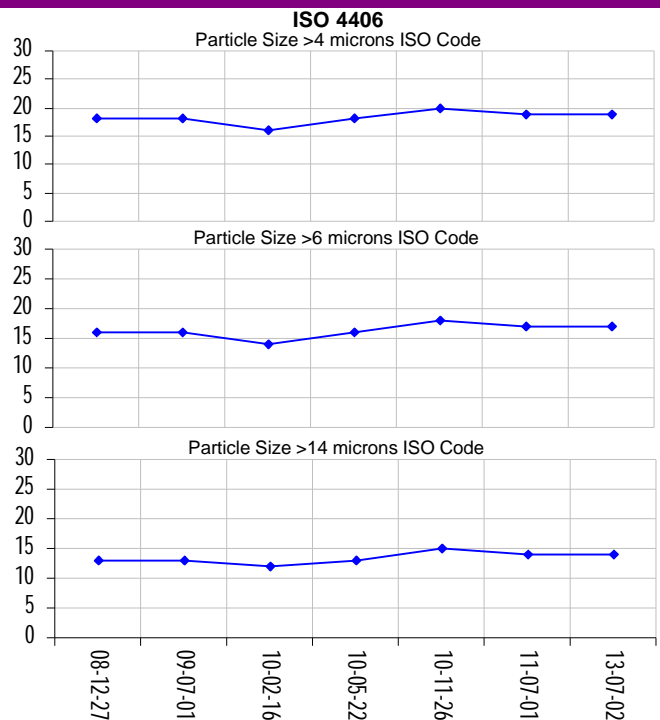
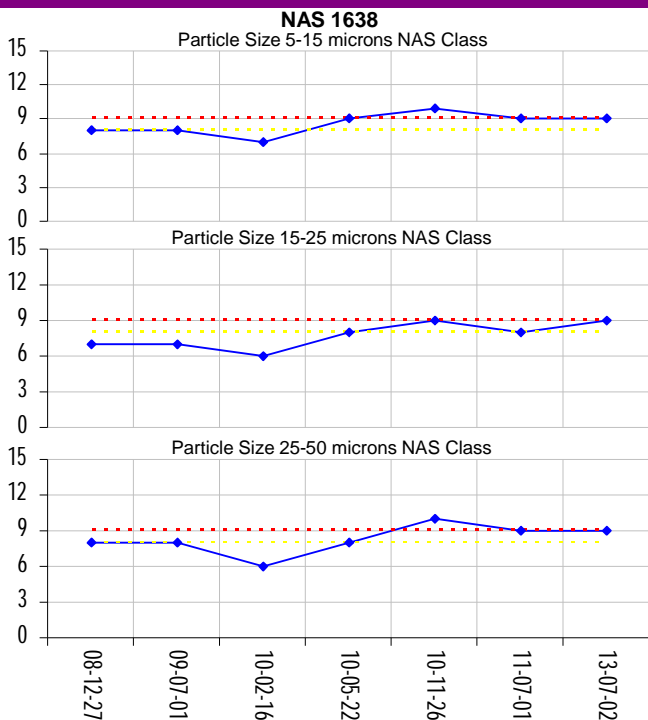
**Notes (Finding, Evaluation, Interpretation, Suggestion and Recommendation)**

Particle count indicates that oil cleanliness level is in unacceptable range.

Lab ID	Current Sample	Previous Sample		Particle Count	
	Bottle ID	222172	164163	149031	NAS 1638
Date Sampled	02-Jul-13	01-Jul-11	26-Nov-10	BASELINE	Alarm Limit
Oil Hours (Kms)	Not Given	30982	25143	Comp Air Cooper Turbo VG 46	
Unit Hours (Kms)	40285	30982	25143		
Oil Added (Liters)			5		
Filters Hours (Kms)	1744	Approx 4000	4919		

Contamination							Particle Count NAS 1638 System Standard				
Particle Size Range	No. of Particles / 100ml.	Class	No. of Particles / 100ml.	Class	No. of Particles / 100ml.	Class	Class	No. of Particles / 100ml.	Class	No. of Particles / 100ml.	Class
Particle Size 5-15 microns	127,900	9 W	115,400	9 W	207,800	10 W		>32000	8	>64000	9
Particle Size 15-25 microns	11,700	9 W	10,500	8 C	18,900	9 W		>5700	8	>11400	9
Particle Size 25-50 microns	3,300	9 W	3,000	9 W	5,400	10 W		>1012	8	>2025	9
Particle Size 50-100 microns	300	8	300	8	500	9					
Particle Size >100 microns	<100	7	<100	7	<100	8					

Particle Count ISO 4406:1999 System Standard											
Particle Size Range	No. of Particles / ml.	Class	No. of Particles / ml.	Class	No. of Particles / ml.	Class	Class	No. of Particles / ml.	Class	No. of Particles / ml.	Class
Particle Size > 4 microns	3,838	19	3,463	19	6,233	20					
Particle Size > 6 microns	1,074	17	969	17	1,745	18					
Particle Size > 14 microns	151	14	136	14	244	15					
ISO 4406 Class Rating	19 / 17 / 14		19 / 17 / 14		20 / 18 / 15						



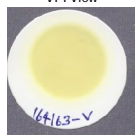
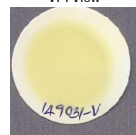

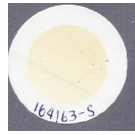
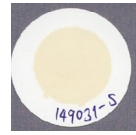


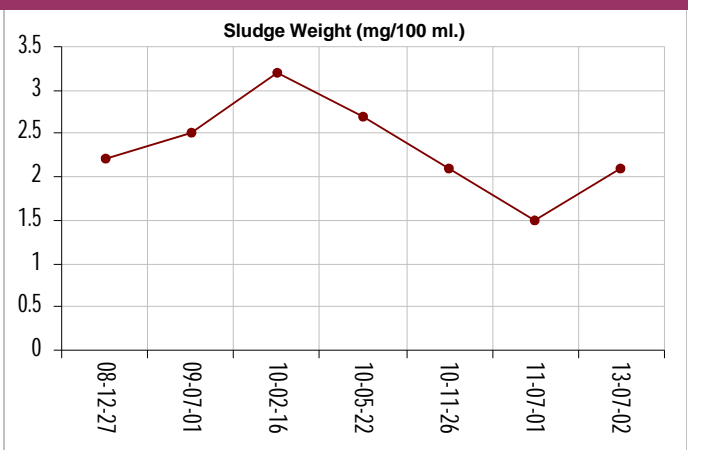
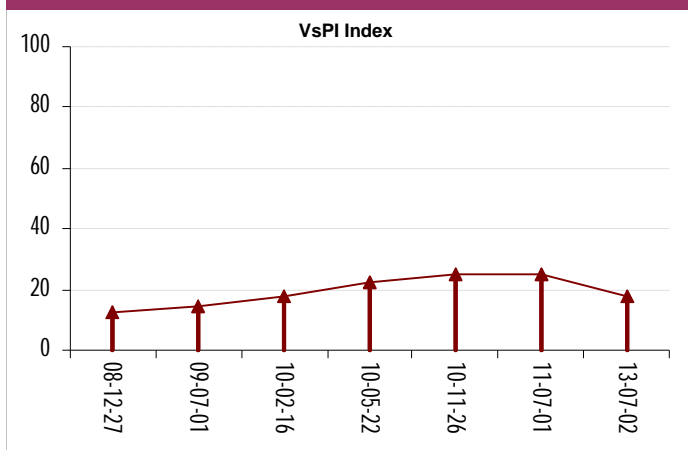
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 Oil type / Viscosity : COOPER TURBO BLEND OIL 46  
 Oil System Capacity : 80 Liters

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

Varnish & Sludge Potential Index (VsPI) is in the moderate range and indicates that varnish & sludge is present in the oil system.

	Current Sample		Previous Sample			
<b>Lab ID</b>	222172	164163	149031			
<b>Bottle ID</b>	956152	921880	921870			
<b>Date Sampled</b>	02-Jul-13	01-Jul-11	26-Nov-10			
<b>Oil Hours (Kms)</b>	Not Given	30982	25143			
<b>Unit Hours (Kms)</b>	40285	30982	25143			
<b>Oil Added (Liters)</b>			5			
<b>Filters Hours (Kms)</b>	1744	Approx 4000	4919			
<b>Contamination</b>						
<b>Varnish and Sludge Potential Index™ (VsPI™)</b>						
VPI (Varnish Potential Index) : Soluble Varnish Type Contamination in Oil						<b>Reference Oil (RO)</b>
	VPI View	VPI View	VPI View	VPI View		
VPI™ Varnish Potential Index Soluble Varnish Contaminant						
VPI Rating	30.3	37.7	34.8			
SPI (Sludge Potential Index) : or MPC test (Membrane Patch Colorimetry) ASTM D02.C0.01 WK 13070 : Insoluble Varnish Type Contamination in Oil					<b>Reference Oil (RO)</b>	
	SPI View	SPI View	SPI View	SPI View		
SPI™ Sludge Potential Index (MPC Membrane Patch Colorimetry) Insoluble Varnish Contaminant						
SPI Rating	5.1	12.4	15.8			
Sludge Weight	2.1 mg/100 ml	1.5 mg/100 ml	2.1 mg/100 ml			
					<b>Alarm Limit Name</b> Comp Air Cooper Turbo VG 46	
					RO Caution Warning	
VsPI™ VsPI = (VPI + SPI) / 2	17.7 C	25.1 W	25.3 W		0 >15 >25	



C U S T O M E R	Code : <b>28068005</b>	E O U I P M E N T	Unit ID : <b>CDA 5 CB 15431</b>
	Name :		Unit Type : Compressor Centrifugal
	Address : Ltd. 509 Rajavithi Rd., Rajthwee Bangkok 10400		Unit Make : CAMERON
	WD Bang Pa-In		Unit Model : TA 2000
	Site :		Oil type/ I Viscosity : COOPER TURBO BLEND OIL 46
	Location :		L
	Test code : 813		Oil System Capacity : 80 Liters

Lab ID : 222172 Date sampled : 02-Jul-13 Hours on Oil : Not Given Hours on Unit : 40285 Bottle ID : 956152

ส่วนที่ 1 : หน้าหลัก

Section 1 : Main Page

สังเกต-อนุภาคเหล็กสีหรือที่ผิดปกติ  
ผลการตรวจนับอนุภาคสิ่งสกปรกชี้ว่าระดับความสะอาดของน้ำมันยอมรับไม่ได้แล้ว  
ค่าดัชนีการเกิด Varnish อยู่ในระดับระดับปานกลาง และชี้ว่าเกิดคราบ Varnish ในน้ำมัน แต่ยังไม่ถึงขั้นอันตรายกับเครื่องจักรในขณะนี้  
ยังคงเก็บตัวอย่างตามความถี่ปกติอย่างต่อเนื่องไป

ส่วนที่ 2 : หน้าของ Particle Count

Section 2 : Particle Count

ผลการตรวจนับอนุภาคสิ่งสกปรกชี้ว่าระดับความสะอาดของน้ำมันยอมรับไม่ได้แล้ว

ส่วนที่ 3 : หน้าของ Ferrographic Analysis

Section 3 : Ferrographic Analysis

ส่วนที่ 4 : หน้าของ Varnish and Sludge Potential

Section 4 : Varnish and Sludge Potential

ค่าดัชนีการเกิด Varnish อยู่ในระดับระดับปานกลาง และชี้ว่าเกิดคราบ Varnish ในน้ำมัน แต่ยังไม่ถึงขั้นอันตรายกับเครื่องจักรในขณะนี้

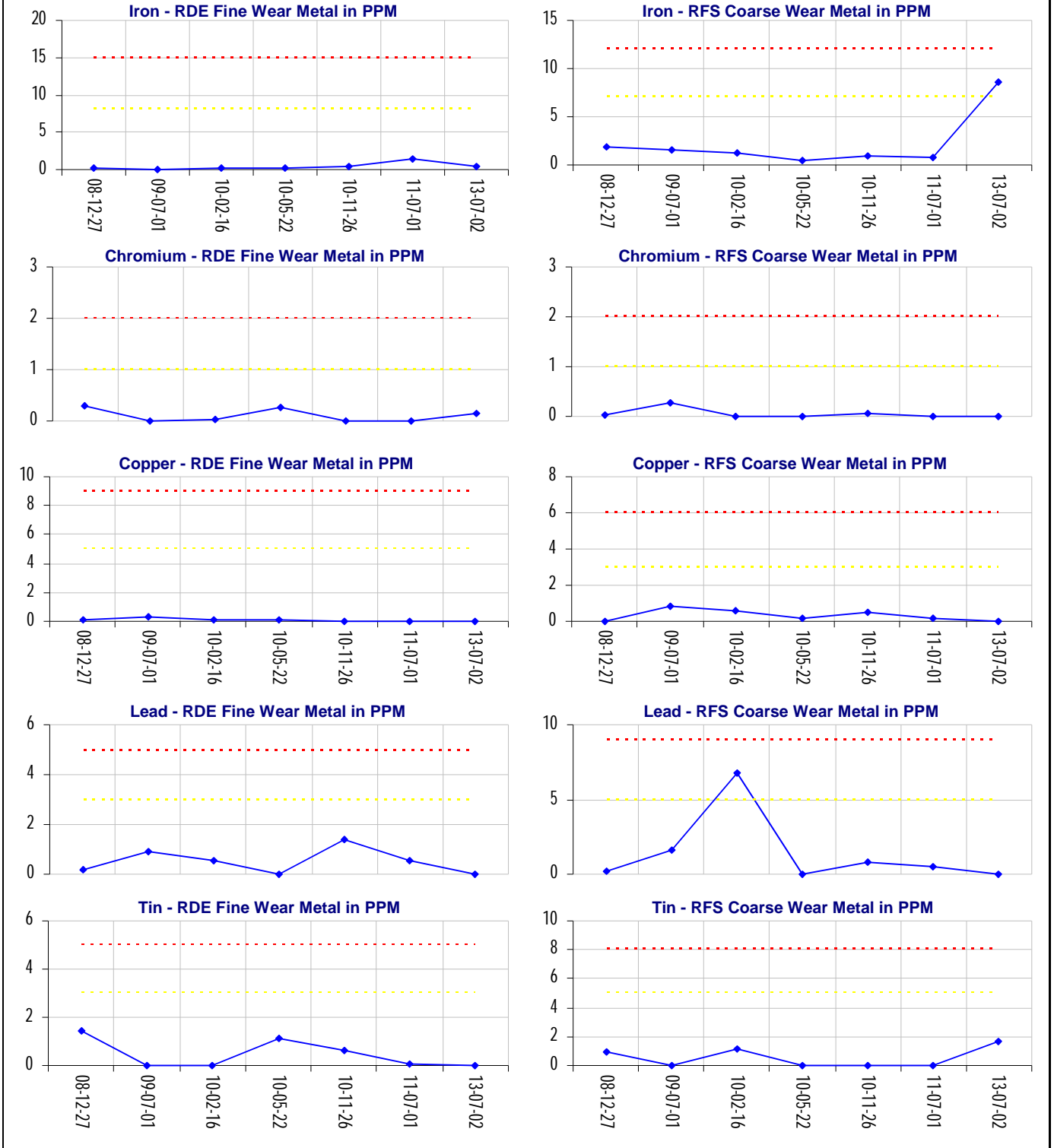
ส่วนที่ 5 : หน้าของ Gravimetric Analysis

Section 5 : Gravimetric Analysis

C Code : 28068005  
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 Unit Type : Compressor Centrifugal  
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 Unit Model : TA 2000  
 Oil type / Viscosity : COOPER TURBO BLEND OIL 46  
 Oil System Capacity : 80 Liters

**Wear Condition**

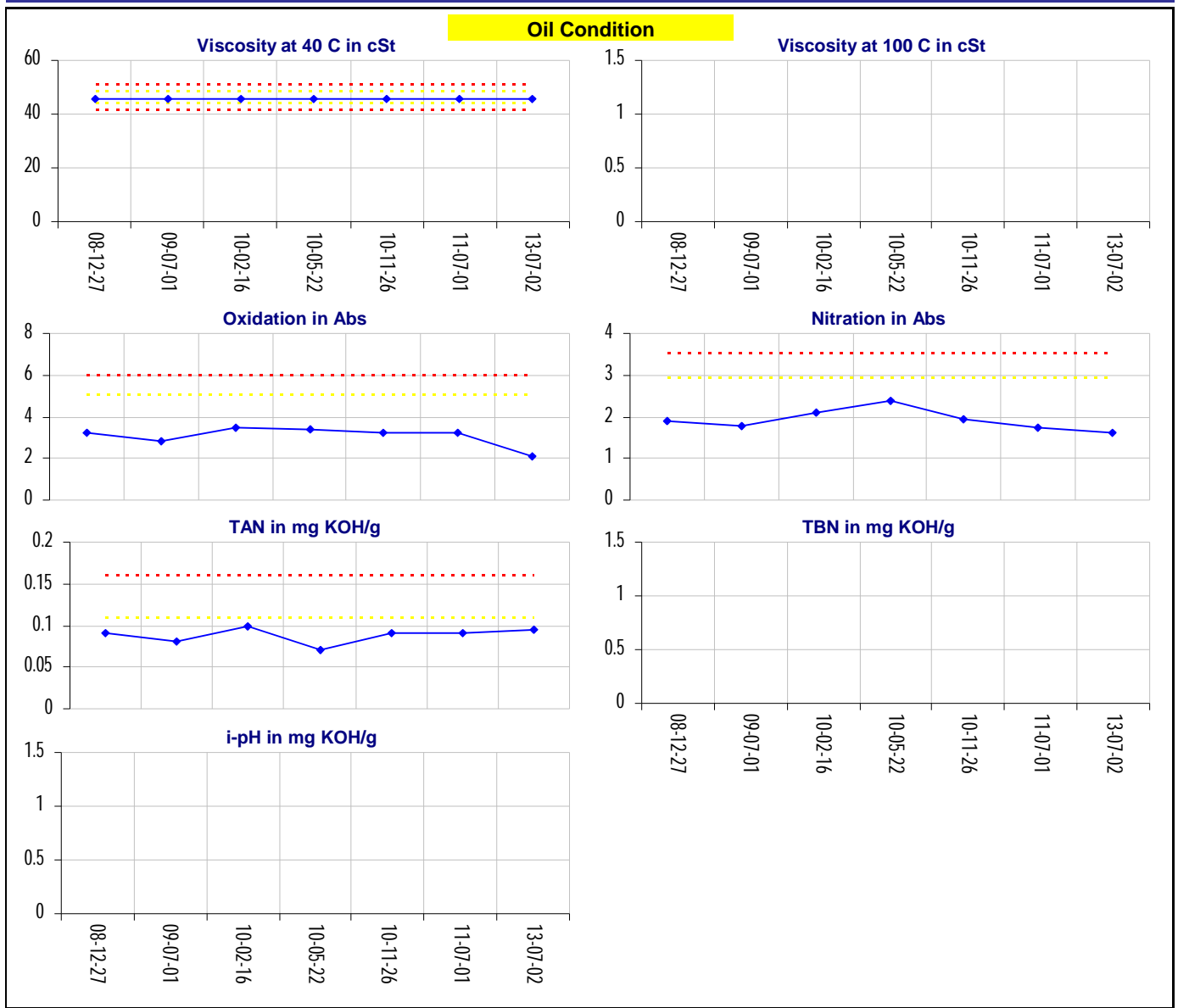


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