

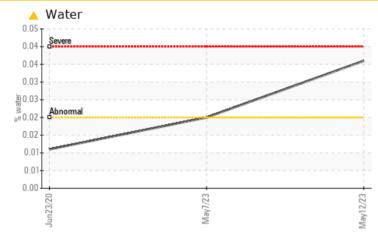
PROBLEM SUMMARY

BDE UNIT 2 (S/N Bx00003-002)

Transformer Oil

Fluid ENVIROTEMP FR3 FLUID (1620 LTR)

COMPONENT CONDITION SUMMARY



RECOMMENDATION

We recommend an early resample to monitor this condition.

PROBLEMATIC TEST RESULTS								
Sample Status				ABNORMAL	SEVERE	SEVERE		
Water	%	ASTM D6304*	>0.02	 0.036	0.020	0.011		
ppm Water	ppm	ASTM D6304*	>200	A 364.3	209.0	0		

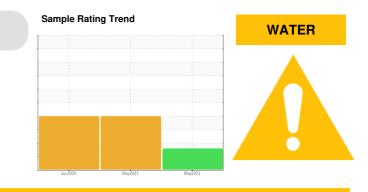
Customer Id: NEWMIL Sample No.: WC0380013 Lab Number: 02562002 Test Package: TRF 2



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To discuss the diagnosis or test data: Bill Quesnel CLS,OMA II,MLA-III,LLA-I +1 (289)291-4641 x4641 Bill.Quesnel@wearcheck.com

To change component or sample information: Gloria Gonzalez +1 (289)291-4643 x4643 gloria.gonzalez@wearcheck.com



RECOMMENDED A	CHONS			
Action	Status	Date	Done By	Description
Change Fluid			?	We recommend that you drain the transformer oil from the component if this has not already been done.
Resample			?	We recommend an early resample to monitor this condition.
Information Required			?	Please specify the brand, type, and viscosity of the oil on your next sample.
Check Breathers			?	The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather.

HISTORICAL DIAGNOSIS



07 May 2023 Diag: Bill Quesnel

The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. We recommend an early resample to monitor this condition.{not applicable} There is a high concentration of water present in the transformer oil. The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The Interfacial Tension (IFT) of the fluid is low. The AN level is acceptable for this fluid. The transformer oil is no longer serviceable.







DEGRADATION



We recommend that you drain the transformer oil from the component if this has not already been done. We recommend an early resample to monitor this condition.All component wear rates are normal. The water content is negligible. There is no indication of any contamination in the transformer oil. The AN level is acceptable for this fluid. The interfacial tension (IFT) for this fluid is very low. The transformer oil is no longer serviceable.





OIL ANALYSIS REPORT

Sample Rating Trend WATER

Machine Id BDE UNIT 2 (S/N Bx00003-002)

Component **Transformer Oil**

Fluid **ENVIROTEMP FR3 FLUID (1620 LTR)**

DIAGNOSIS

Recommendation

We recommend an early resample to monitor this condition.

Wear

{not applicable}

Contamination

There is a moderate concentration of water present in the transformer oil. The system cleanliness is acceptable for your target ISO 4406 cleanliness code.

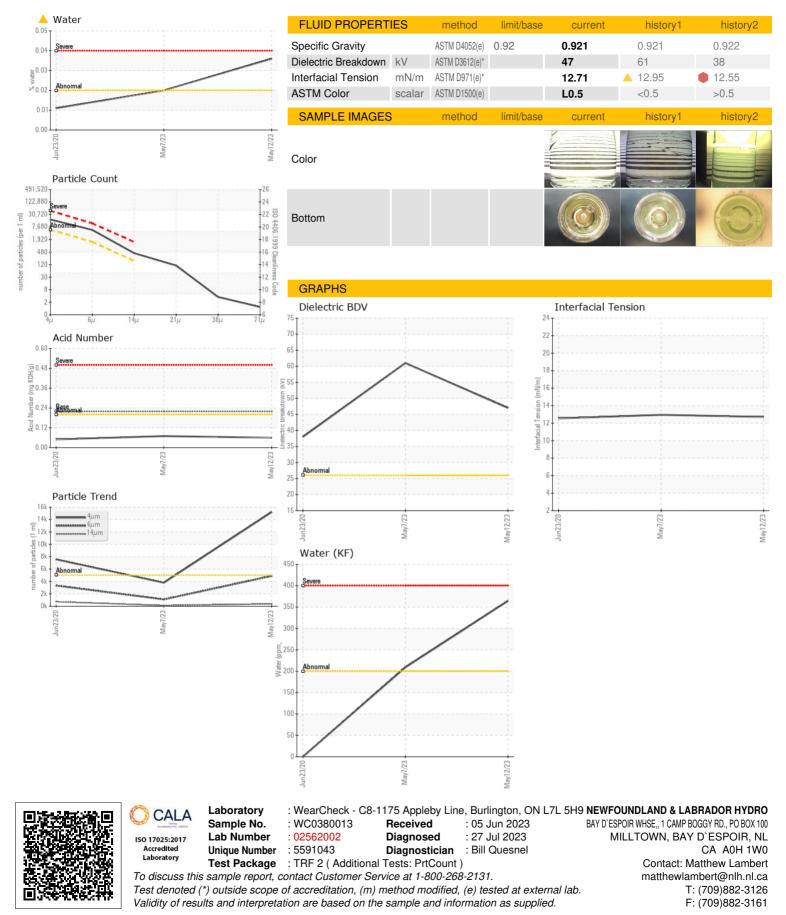
Fluid Condition

The AN level is acceptable for this fluid. The transformer oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

Sample NumberClient InfoWC0380013WC0345956WC0380019Sample DateIClient Info000Machine AgehrsClient Info000Oil AgehrsClient Info000Oil AgeKrsClient Info000Oil ChangedIClient InfoN/AN/AN/ASample StatusIImit/basecurrenthistory1history2Water%ASTM D6304'>0.020.0360.0200.011pm WaterppmASTM D6304'>20.020.6360.0200.011pm WaterpmASTM D644'>50001519137877560Particles >4µmASTM D7647>100377120724Particles >5µmASTM D7647>1036411Particles >1µmASTM D7647>3122Oil CleanlinessISO 4406 (o>1917/142119/161917/142019/17DSSOLVED GAS ANALVSIS (DGAmethodimit/basecurrenthistory1history2DGA - O2ppmASTM D58120'30DGA - C2ppmASTM D58120'227440DGA - C2ppmASTM D58120'227400DGA - C2ppmASTM D58120'222DGA - C2ppmASTM D58120'162133<	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
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DGA - CO2ppmASTM D3612(e)*705568DGA - MethaneppmASTM D3612(e)*22DGA - AcetyleneppmASTM D3612(e)*00DGA - EthyleneppmASTM D3612(e)*23DGA - EthaneppmASTM D3612(e)*162103DGA - Total Gas Content%ASTM D3612(e)*16259744DGA - Total Gas Content%ASTM D3612(e)*196148DGA - Total Combustible GasppmASTM D3612(e)*196148DGA - Total Combustible GasppmASTM D3612(e)*0.060.070.05FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2Acid Number (AN)mg KOHgASTM D974*0.220.060.070.05VISUALmethodlimit/basecurrenthistory1history2White MetalscalarVisual*NONENONENONENONEYellow MetalscalarVisual*NONENONENONENONESiltscalarVisual*NONENONENONENONENONEDebrisscalarVisual*NONENONENONENONENONESand/DirtscalarVisual*NONENONENONENONENONEAcid NumeScalarVisual*NONENONENONENONENONE	DGA - N2	ppm	ASTM D3612(e)*		56140	52375	
DGA - MethaneppmASTM D3612(e)*2DGA - AcetyleneppmASTM D3612(e)*00DGA - EthyleneppmASTM D3612(e)*23DGA - EthaneppmASTM D3612(e)*162103DGA - EthaneppmASTM D3612(e)*162103DGA - Total Gas Content%ASTM D3612(e)*5732459744DGA - Total Gas Content%ASTM D3612(e)*196148DGA - Total Combustible GasppmASTM D3612(e)*1960.070.05FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2Acid Number (AN)mg KOHgASTM D974*0.220.060.070.05VISUALmethodlimit/basecurrenthistory1history2White MetalscalarVisual*NONENONENONENONEYellow MetalscalarVisual*NONENONENONENONESiltscalarVisual*NONENONENONENONENONEDebrisscalarVisual*NONENONENONENONENONESand/DirtscalarVisual*NONENONENONENONENONEAppearancescalarVisual*NORMLNORMLNORMLNORML	DGA - CO	ppm	ASTM D3612(e)*		27	40	
DGA - AcetyleneppmASTM D3612(e)*00DGA - EthyleneppmASTM D3612(e)*23DGA - EthaneppmASTM D3612(e)*162103DGA - Total Gas Content%ASTM D3612(e)*5732459744DGA - Total Combustible GasppmASTM D3612(e)*196148DGA - Total Combustible GasppmASTM D3612(e)*196148FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2Acid Number (AN)mg KOHgASTM D974*0.220.060.070.05VISUALmethodlimit/basecurrenthistory1history2White MetalscalarVisual*NONENONENONENONEYellow MetalscalarVisual*NONENONENONENONEDebrisscalarVisual*NONENONENONENONESand/DirtscalarVisual*NONENONENONENONEAppearancescalarVisual*NORMLNORMLNORMLNORML	DGA - CO2	ppm	ASTM D3612(e)*		705	568	
DGA - EthyleneppmASTM D3612(e)*23DGA - EthaneppmASTM D3612(e)*162103DGA - Total Gas Content%ASTM D3612(e)*5732459744DGA - Total Gas Content%ASTM D3612(e)*196148DGA - Total Combustible GasppmASTM D3612(e)*196148FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2Acid Number (AN)mg KOHgASTM D974*0.220.060.070.05VISUALmethodlimit/basecurrenthistory1history2White MetalscalarVisual*NONENONENONENONEYellow MetalscalarVisual*NONENONENONENONEPrecipitatescalarVisual*NONENONENONENONESiltscalarVisual*NONENONENONENONEDebrisscalarVisual*NONENONENONENONEAstroscalarVisual*NONENONENONENONEAppearancescalarVisual*NORMLNORMLNORMLNORML	DGA - Methane	ppm	ASTM D3612(e)*		2	2	
DGA - EthaneppmASTM D3612(e)*162103DGA - Total Gas Content%ASTM D3612(e)*57732459744DGA - Total Combustible GasppmASTM D3612(e)*196148FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2Acid Number (AN)mg KOH/gASTM D974*0.220.060.070.05VISUALmethodlimit/basecurrenthistory1history2White MetalscalarVisual*NONENONENONENONEYellow MetalscalarVisual*NONENONENONENONESiltscalarVisual*NONENONENONENONEDebrisscalarVisual*NONENONENONENONESand/DirtscalarVisual*NONENONENONENONEAppearancescalarVisual*NORMLNORMLNORMLNORML	DGA - Acetylene	ppm	ASTM D3612(e)*		0	0	
DGA - Total Gas Content%ASTM D3612(e)*5732459744DGA - Total Combustible GasppmASTM D3612(e)*196148FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2Acid Number (AN)mg KOH/gASTM D974*0.220.060.070.05VISUALmethodlimit/basecurrenthistory1history2White MetalscalarVisual*NONENONENONENONEYellow MetalscalarVisual*NONENONENONENONEPrecipitatescalarVisual*NONENONENONENONESiltscalarVisual*NONENONENONENONEDebrisscalarVisual*NONENONENONENONESand/DirtscalarVisual*NONENONENONENONEAppearancescalarVisual*NORMLNORMLNORMLNORML	DGA - Ethylene	ppm	ASTM D3612(e)*		2	3	
DGA - Total Combustible GasppmASTM D3612(e)*196148FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2Acid Number (AN)mg KOH/gASTM D974*0.220.060.070.05VISUALmethodlimit/basecurrenthistory1history2White MetalscalarVisual*NONENONENONENONEYellow MetalscalarVisual*NONENONENONENONEPrecipitatescalarVisual*NONENONENONENONESiltscalarVisual*NONENONENONENONEDebrisscalarVisual*NONENONENONENONESand/DirtscalarVisual*NONENONENONENONEAppearancescalarVisual*NORMLNORMLNORMLNORML	DGA - Ethane	ppm	ASTM D3612(e)*		162	103	
FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2Acid Number (AN)mg KOH/gASTM D974*0.220.060.070.05VISUALmethodlimit/basecurrenthistory1history2White MetalscalarVisual*NONENONENONENONEYellow MetalscalarVisual*NONENONENONENONEPrecipitatescalarVisual*NONENONENONENONESiltscalarVisual*NONENONENONENONEDebrisscalarVisual*NONENONENONENONESand/DirtscalarVisual*NONENONENONENONEAppearancescalarVisual*NORMLNORMLNORMLNORML	DGA - Total Gas Content	%	ASTM D3612(e)*		57324	59744	
Acid Number (AN)mg KOH/gASTM D974*0.220.060.070.05VISUALmethodlimit/basecurrenthistory1history2White MetalscalarVisual*NONENONENONENONEYellow MetalscalarVisual*NONENONENONENONEPrecipitatescalarVisual*NONENONENONENONESiltscalarVisual*NONENONENONENONEDebrisscalarVisual*NONENONENONENONESand/DirtscalarVisual*NONENONENONENONEAppearancescalarVisual*NORMLNORMLNORMLNORML	DGA - Total Combustible Gas	ppm	ASTM D3612(e)*		196	148	
VISUALmethodlimit/basecurrenthistory1history2White MetalscalarVisual*NONENONENONENONEYellow MetalscalarVisual*NONENONENONENONEPrecipitatescalarVisual*NONENONENONENONESiltscalarVisual*NONENONENONENONEDebrisscalarVisual*NONENONENONENONESand/DirtscalarVisual*NONENONENONENONEAppearancescalarVisual*NORMLNORMLNORMLNORML	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
White MetalscalarVisual*NONENONENONENONEYellow MetalscalarVisual*NONENONENONENONEPrecipitatescalarVisual*NONENONENONENONESiltscalarVisual*NONENONENONENONEDebrisscalarVisual*NONENONENONENONESand/DirtscalarVisual*NONENONENONENONEAppearancescalarVisual*NORMLNORMLNORMLNORML	Acid Number (AN)	mg KOH/g	ASTM D974*	0.22	0.06	0.07	0.05
Yellow MetalscalarVisual*NONENONENONENONEPrecipitatescalarVisual*NONENONENONENONESiltscalarVisual*NONENONENONENONEDebrisscalarVisual*NONENONENONENONESand/DirtscalarVisual*NONENONENONENONEAppearancescalarVisual*NORMLNORMLNORML	VISUAL		method	limit/base	current	history1	history2
PrecipitatescalarVisual*NONENONENONENONESiltscalarVisual*NONENONENONENONEDebrisscalarVisual*NONENONENONENONESand/DirtscalarVisual*NONENONENONENONEAppearancescalarVisual*NORMLNORMLNORML	White Metal	scalar	Visual*	NONE		NONE	NONE
SiltscalarVisual*NONENONENONENONEDebrisscalarVisual*NONENONENONENONESand/DirtscalarVisual*NONENONENONENONEAppearancescalarVisual*NORMLNORMLNORML	Yellow Metal	scalar	Visual*	NONE	NONE	NONE	NONE
DebrisscalarVisual*NONENONENONENONESand/DirtscalarVisual*NONENONENONENONEAppearancescalarVisual*NORMLNORMLNORML	Precipitate	scalar	Visual*	NONE	NONE	NONE	NONE
Sand/DirtscalarVisual*NONENONENONENONEAppearancescalarVisual*NORMLNORMLNORMLNORML	Silt	scalar	Visual*	NONE	NONE	NONE	NONE
Appearance scalar Visual* NORML NORML NORML NORML	Debris	scalar	Visual*	NONE	NONE	NONE	NONE
	Sand/Dirt	scalar	Visual*	NONE	NONE	NONE	NONE
Odor scalar Visual* NORML NORML NORML NORML	Appearance	scalar	Visual*	NORML	NORML	NORML	NORML
	Odor	scalar	Visual*	NORML	NORML	NORML	NORML



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