

Tampa Armature Works

Serial#: G-858660

Mfr: GENERAL  
ELECTRIC

Control#: 7201590

Location: CITY OF WAUCHULA

kV: 67

Order#: 583350

Equipment: TRANSFORMER

kVA: 5000

Account: 614

Compartment: MAIN(BOTTOM)

Year Mf'd:

Received: 12/05/2018

Breathing: SEAL

Syringe ID: 98000085

Reported: 12/18/2018

Bank: Phase: 1

Bottle ID:

Fluid: MIN USGal: 920

Sampled By: GREG BYRD

LAKELAND, FL 33810 US  
ATTN: CHRISTINA TABARETTI  
PO#: 40408513-1  
Project ID: 40310985  
Customer ID: SPARE

Lab Control Number:		7201590
Date Sampled:		11/28/2018
Order Number:		583350
Oil Temp:		38
Dissolved Gas Analysis (DGA) ASTM D-3612 <sup>1</sup>	Hydrogen (H2) (µL/L):	4
	Methane (CH4) (µL/L):	4
	Ethane (C2H6) (µL/L):	2
	Ethylene (C2H4) (µL/L):	22
	Acetylene (C2H2) (µL/L):	<1
	Carbon Monoxide (CO) (µL/L):	188
	Carbon Dioxide (CO2) (µL/L):	2083
	Nitrogen (N2) (µL/L):	66112
	Oxygen (O2) (µL/L):	15976
	Total Dissolved Gas (TDG) (µL/L):	84391
	Total Dissolved Combustible Gas (TDCG) (µL/L):	220
Equivalent TCG (%):		0.1942
DGA Diagnostics	DGA Keys Gas / Interpretive Method:	Hydrogen within condition 1 limits (100 µL/L).
	PER IEEE C57.104-2008	Methane within condition 1 limits (120 µL/L).
	(most recent sample)	Ethane within condition 1 limits (65 µL/L).
		Ethylene within condition 1 limits (50 µL/L).
		Acetylene within condition 1 limits (1 µL/L).
		Carbon Monoxide within condition 1 limits (350 µL/L).
		Carbon Dioxide within condition 1 limits (2500 µL/L).
		TDCG within condition 1 limits (720 µL/L).
DGA TDCG Rate Interpretive Method:		No previous sample available.
PER IEEE C57.104-2008		
(two most recent sample)		
DGA Cellulose (Paper) Insulation:		CO2/CO Ratio is only applicable when CO2 greater than 5000 and CO greater than 500.
WDS DGA Condition Code:		NORMAL
WDS Recommended Action:		Continue normal operation. Resample for testing within one year.
Comment:		
General Oil Quality (GOQ)		
ASTM D-1533 <sup>1</sup>	Moisture in Oil (mg/kg):	6
ASTM D-971 <sup>1</sup>	Interfacial Tension (mN/m):	29.09
ASTM D-974 <sup>1</sup>	Acid Number (mg KOH/g):	0.041
ASTM D-1500 <sup>1</sup>	Color Number (ASTM):	L2.5
ASTM D-1524 <sup>1</sup>	Visual Exam. (Relative):	PASS
		CLR&BRIGHT
ASTM D-1524 <sup>1</sup>	Sediment Exam. (Relative):	TRACE
ASTM D-877 <sup>1</sup>	Dielectric Breakdown (kV):	48
ASTM D-924 <sup>1</sup>	Power Factor @ 25°C (Routine) (%):	0.121
ASTM D-4052 <sup>1</sup>	Density @15°C (g/mL):	0.889
GOQ Diagnostics	Moisture in Oil:	Acceptable for in-service oil (35 mg/kg max).

Notations: 1. Analysis is ISO/IEC 17025:2005 accredited, L-A-B Accredited Certificate Number L2303.02. 2. This test is conducted by a subcontracted laboratory. 3. Subcontracted laboratory has received ISO Standard 17025 accreditation for this test. 5. This test is conducted by Weidmann Laboratory other than Primary Lab. 6. Weidmann Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: WEIDMANN Electrical Technology accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg, µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm<sup>2</sup>/s = cSt

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Tampa Armature Works

Serial#: G-858660

Mfr: GENERAL  
ELECTRIC

Control#: 7201590

Location: CITY OF WAUCHULA

kV: 67

Order#: 583350

Equipment: TRANSFORMER

kVA: 5000

Account: 614

Compartment: MAIN(BOTTOM)

Year Mf'd:

Received: 12/05/2018

Breathing: SEAL

Syringe ID: 98000085

Reported: 12/18/2018

Bank: Phase: 1

Bottle ID:

Fluid: MIN USGal: 920

Sampled By: GREG BYRD

LAKELAND, FL 33810 US

ATTN: CHRISTINA TABARETTI

PO#: 40408513-1

Project ID: 40310985

Customer ID: SPARE

Lab Control Number: 7201590

Date Sampled: 11/28/2018

Order Number: 583350

Oil Temp: 38

PER IEEE C57.106-2015

Interfacial Tension: Acceptable for in-service oil (25 mN/m min).

(most recent sample)

Acid Number: Acceptable for in-service oil (0.2 mg KOH/g max).

Color Number and Visual: Diagnostic not applicable. Diagnostic not applicable.

Dielectric Breakdown ASTM D-877: Diagnostic not applicable.

Power Factor @ 25°C (Routine): Acceptable for in-service oil (0.5% max).

Comment:

## End of Test Report

Authorized By:

ERIC MCANANY  
CHEMIST

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Tampa Armature Works

Serial#: G-858660D

Mfr: GENERAL  
ELECTRIC

Control#: 7201588

Location: CITY OF WAUCHULA

kV: 67

Order#: 583350

Equipment: TRANSFORMER

kVA: 5000

Account: 614

Compartment: MAIN(BOTTOM)

Year Mfd:

Received: 12/05/2018

Breathing: SEAL

Syringe ID: 53004504

Reported: 12/18/2018

LAKELAND, FL 33810 US

ATTN: CHRISTINA TABARETTI

PO#: 40408513-1

Project ID: 40310985

Bank: Phase: 1

Bottle ID:

Customer ID: BANK C

Fluid: MIN USGal: 920

Sampled By: GREG BYRD

Lab Control Number:		7201588
Date Sampled:		11/28/2018
Order Number:		583350
Oil Temp:		38
Dissolved Gas Analysis (DGA) ASTM D-3612 <sup>1</sup>	Hydrogen (H2) (µL/L):	34
	Methane (CH4) (µL/L):	18
	Ethane (C2H6) (µL/L):	10
	Ethylene (C2H4) (µL/L):	29
	Acetylene (C2H2) (µL/L):	<1
	Carbon Monoxide (CO) (µL/L):	590
	Carbon Dioxide (CO2) (µL/L):	8082
	Nitrogen (N2) (µL/L):	70607
	Oxygen (O2) (µL/L):	8028
	Total Dissolved Gas (TDG) (µL/L):	87398
	Total Dissolved Combustible Gas (TDCG) (µL/L):	681
Equivalent TCG (%):		0.649
DGA Diagnostics	DGA Keys Gas / Interpretive Method: PER IEEE C57.104-2008 (most recent sample)	
	Hydrogen within condition 1 limits (100 µL/L).	
	Methane within condition 1 limits (120 µL/L).	
	Ethane within condition 1 limits (65 µL/L).	
	Ethylene within condition 1 limits (50 µL/L).	
	Acetylene within condition 1 limits (1 µL/L).	
	Carbon Monoxide: Condition 3 Indications of significantly overheated cellulose insulation (570 µL/L).	
	Carbon Dioxide: Condition 3 Significant Indications of overheated cellulose insulation (4000 µL/L).	
	TDCG within condition 1 limits (720 µL/L).	
	DGA TDCG Rate Interpretive Method: PER IEEE C57.104-2008 (two most recent sample)	
		No previous sample available.
DGA Cellulose (Paper) Insulation:		CO2/CO >= 10: Indication of thermal decomposition of cellulose insulation.
WDS DGA Condition Code:		CAUTION
WDS Recommended Action:		Resample at earliest opportunity to establish gas generation rate.
Comment:		
General Oil Quality (GOQ)		
ASTM D-1533 <sup>1</sup>	Moisture in Oil (mg/kg):	7
ASTM D-971 <sup>1</sup>	Interfacial Tension (mN/m):	34.45
ASTM D-974 <sup>1</sup>	Acid Number (mg KOH/g):	0.019
ASTM D-1500 <sup>1</sup>	Color Number (ASTM):	L1.5
ASTM D-1524 <sup>1</sup>	Visual Exam. (Relative):	PASS
		CLR&BRIGHT
ASTM D-1524 <sup>1</sup>	Sediment Exam. (Relative):	TRACE
ASTM D-877 <sup>1</sup>	Dielectric Breakdown (kV):	55
ASTM D-924 <sup>1</sup>	Power Factor @ 25°C (Routine) (%):	0.037

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Tampa Armature Works

Serial#: G-858660D

Mfr: GENERAL  
ELECTRIC

Control#: 7201588

Location: CITY OF WAUCHULA

kV: 67

Order#: 583350

Equipment: TRANSFORMER

kVA: 5000

Account: 614

Compartment: MAIN(BOTTOM)

Year Mfd:

Received: 12/05/2018

Breathing: SEAL

Syringe ID: 53004504

Reported: 12/18/2018

Bank: Phase: 1

Bottle ID:

Fluid: MIN USGal: 920

Sampled By: GREG BYRD

LAKELAND, FL 33810 US  
ATTN: CHRISTINA TABARETTI  
PO#: 40408513-1  
Project ID: 40310985  
Customer ID: BANK C

Lab Control Number:		7201588
Date Sampled:		11/28/2018
Order Number:		583350
Oil Temp:		38
ASTM D-4052 <sup>1</sup>	Density @15°C (g/mL):	0.8878
GOQ Diagnostics PER IEEE C57.106-2015 (most recent sample)	Moisture in Oil:	Acceptable for in-service oil (35 mg/kg max).
	Interfacial Tension:	Acceptable for in-service oil (25 mN/m min).
	Acid Number:	Acceptable for in-service oil (0.2 mg KOH/g max).
	Color Number and Visual:	Diagnostic not applicable. Diagnostic not applicable.
	Dielectric Breakdown ASTM D-877:	Diagnostic not applicable.
Power Factor @ 25°C (Routine):		Acceptable for in-service oil (0.5% max).
Comment:		

## End of Test Report

Authorized By:



ERIC MCANANY  
CHEMIST

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Tampa Armature Works

Serial#: G-858660B

Mfr: GENERAL  
ELECTRIC

Control#: 7201596

Location: CITY OF WAUCHULA

kV: 67

Order#: 583350

Equipment: TRANSFORMER

kVA: 5000

Account: 614

Compartment: MAIN(BOTTOM)

Year M'd:

Received: 12/05/2018

Breathing: SEAL

Syringe ID: 53003011

Reported: 12/18/2018

Bank: Phase: 1

Bottle ID:

Fluid: MIN USGal: 920

Sampled By: GREG BYRD

LAKELAND, FL 33810 US  
ATTN: CHRISTINA TABARETTI  
PO#: 40408513-1  
Project ID: 40310985  
Customer ID: BANK B

Lab Control Number:		7201596
Date Sampled:		11/28/2018
Order Number:		583350
Oil Temp:		38
Dissolved Gas Analysis (DGA) ASTM D-3612 <sup>1</sup>	Hydrogen (H <sub>2</sub> ) (µL/L):	15
	Methane (CH <sub>4</sub> ) (µL/L):	35
	Ethane (C <sub>2</sub> H <sub>6</sub> ) (µL/L):	21
	Ethylene (C <sub>2</sub> H <sub>4</sub> ) (µL/L):	27
	Acetylene (C <sub>2</sub> H <sub>2</sub> ) (µL/L):	<1
	Carbon Monoxide (CO) (µL/L):	633
	Carbon Dioxide (CO <sub>2</sub> ) (µL/L):	9376
	Nitrogen (N <sub>2</sub> ) (µL/L):	75204
	Oxygen (O <sub>2</sub> ) (µL/L):	3202
	Total Dissolved Gas (TDG) (µL/L):	88513
	Total Dissolved Combustible Gas (TDCG) (µL/L):	731
Equivalent TCG (%):		0.6346
DGA Diagnostics	DGA Keys Gas / Interpretive Method: PER IEEE C57.104-2008 (most recent sample)	Hydrogen within condition 1 limits (100 µL/L). Methane within condition 1 limits (120 µL/L). Ethane within condition 1 limits (65 µL/L). Ethylene within condition 1 limits (50 µL/L). Acetylene within condition 1 limits (1 µL/L). Carbon Monoxide: Condition 3 Indications of significantly overheated cellulose insulation (570 µL/L). Carbon Dioxide: Condition 3 Significant Indications of overheated cellulose insulation (4000 µL/L). TDCG: Condition 2 Levels exceed normal concentrations. Fault may be present (720 µL/L).
	DGA TDCG Rate Interpretive Method: PER IEEE C57.104-2008 (two most recent sample)	No previous sample available.
	DGA Cellulose (Paper) Insulation:	CO <sub>2</sub> /CO >= 10: Indication of thermal decomposition of cellulose insulation.
	WDS DGA Condition Code:	CAUTION
WDS Recommended Action:		Resample at earliest opportunity to establish gas generation rate.
Comment:		
General Oil Quality (GOQ)		
ASTM D-1533 <sup>1</sup>	Moisture in Oil (mg/kg):	6
ASTM D-971 <sup>1</sup>	Interfacial Tension (mN/m):	35.76
ASTM D-974 <sup>1</sup>	Acid Number (mg KOH/g):	0.022
ASTM D-1500 <sup>1</sup>	Color Number (ASTM):	L1.5
ASTM D-1524 <sup>1</sup>	Visual Exam. (Relative):	PASS
		CLR&BRIGHT
ASTM D-1524 <sup>1</sup>	Sediment Exam. (Relative):	LIGHT
ASTM D-877 <sup>1</sup>	Dielectric Breakdown (kV):	37
ASTM D-924 <sup>1</sup>	Power Factor @ 25°C (Routine) (%):	0.019

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Tampa Armature Works

Serial#: G-858660B

Mfr: GENERAL  
ELECTRIC

Control#: 7201596

Location: CITY OF WAUCHULA

kV: 67

Order#: 583350

Equipment: TRANSFORMER

kVA: 5000

Account: 614

Compartment: MAIN(BOTTOM)

Year Mfd:

Received: 12/05/2018

Breathing: SEAL

Syringe ID: 53003011

Reported: 12/18/2018

Bank: Phase: 1

Bottle ID:


Fluid: MIN USGal: 920

Sampled By: GREG BYRD

LAKELAND, FL 33810 US  
ATTN: CHRISTINA TABARETTI  
PO#: 40408513-1  
Project ID: 40310985  
Customer ID: BANK B

Lab Control Number:		7201596
Date Sampled:		11/28/2018
Order Number:		583350
Oil Temp:		38
ASTM D-4052 <sup>1</sup>	Density @15°C	(g/mL): 0.8888
GOQ Diagnostics PER IEEE C57.106-2015 (most recent sample)	Moisture in Oil:	Acceptable for in-service oil (35 mg/kg max).
	Interfacial Tension:	Acceptable for in-service oil (25 mN/m min).
	Acid Number:	Acceptable for in-service oil (0.2 mg KOH/g max).
	Color Number and Visual:	Diagnostic not applicable. Diagnostic not applicable.
	Dielectric Breakdown ASTM D-877:	Diagnostic not applicable.
Power Factor @ 25°C (Routine):		Acceptable for in-service oil (0.5% max).
Comment:		

## End of Test Report

Authorized By:   
ERIC MCANANY  
CHEMIST

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Tampa Armature Works

Serial#: G-858660A

Mfr: GENERAL  
ELECTRIC

Control#: 7201589

Location: CITY OF WAUCHULA

kV: 67

Order#: 583350

Equipment: TRANSFORMER

kVA: 5000

Account: 614

Compartment: MAIN(BOTTOM)

Year Mf'd:

Received: 12/05/2018

Breathing: SEAL

Syringe ID: 53005048

Reported: 12/18/2018

Bank: Phase: 1

Bottle ID:

Fluid: MIN USGal: 920

Sampled By: GREG BYRD

LAKELAND, FL 33810 US  
ATTN: CHRISTINA TABARETTI  
PO#: 40408513-1  
Project ID: 40310985  
Customer ID: BANK A

Lab Control Number:		7201589
Date Sampled:		11/28/2018
Order Number:		583350
Oil Temp:		38
Dissolved Gas Analysis (DGA) ASTM D-3612 <sup>1</sup>	Hydrogen (H2) (µL/L):	13
	Methane (CH4) (µL/L):	34
	Ethane (C2H6) (µL/L):	25
	Ethylene (C2H4) (µL/L):	28
	Acetylene (C2H2) (µL/L):	<1
	Carbon Monoxide (CO) (µL/L):	545
	Carbon Dioxide (CO2) (µL/L):	7293
	Nitrogen (N2) (µL/L):	74418
	Oxygen (O2) (µL/L):	4859
	Total Dissolved Gas (TDG) (µL/L):	87215
	Total Dissolved Combustible Gas (TDCG) (µL/L):	645
	Equivalent TCG (%):	0.5492
DGA Diagnostics	DGA Keys Gas / Interpretive Method: PER IEEE C57.104-2008 (most recent sample)	Hydrogen within condition 1 limits (100 µL/L). Methane within condition 1 limits (120 µL/L). Ethane within condition 1 limits (65 µL/L). Ethylene within condition 1 limits (50 µL/L). Acetylene within condition 1 limits (1 µL/L). Carbon Monoxide: Condition 2 Indications of overheated cellulose insulation (350 µL/L). Carbon Dioxide: Condition 3 Significant Indications of overheated cellulose insulation (4000 µL/L). TDCG within condition 1 limits (720 µL/L).
	DGA TDCG Rate Interpretive Method: PER IEEE C57.104-2008 (two most recent sample)	No previous sample available.
DGA Cellulose (Paper) Insulation:		CO2/CO >= 10: Indication of thermal decomposition of cellulose insulation.
WDS DGA Condition Code:		CAUTION
WDS Recommended Action:		Resample at earliest opportunity to establish gas generation rate.
Comment:		
General Oil Quality (GOQ)		
ASTM D-1533 <sup>1</sup>	Moisture in Oil (mg/kg):	8
ASTM D-971 <sup>1</sup>	Interfacial Tension (mN/m):	36.09
ASTM D-974 <sup>1</sup>	Acid Number (mg KOH/g):	0.022
ASTM D-1500 <sup>1</sup>	Color Number (ASTM):	L2.0
ASTM D-1524 <sup>1</sup>	Visual Exam. (Relative):	PASS CLR&BRIGHT
ASTM D-1524 <sup>1</sup>	Sediment Exam. (Relative):	TRACE
ASTM D-877 <sup>1</sup>	Dielectric Breakdown (kV):	44
ASTM D-924 <sup>1</sup>	Power Factor @ 25°C (Routine) (%):	0.024
ASTM D-4052 <sup>1</sup>	Density @15°C (g/mL):	0.8878

Notations: 1. Analysis is ISO/IEC 17025:2005 accredited, L-A-B Accredited Certificate Number L2303.02. 2. This test is conducted by a subcontracted laboratory. 3. Subcontracted laboratory has received ISO Standard 17025 accreditation for this test. 5. This test is conducted by Weidmann Laboratory other than Primary Lab. 6. Weidmann Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: WEIDMANN Electrical Technology accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg, µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm²/s = cSt

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Tampa Armature Works

Serial#: G-858660A

Mfr: GENERAL  
ELECTRIC

Control#: 7201589

Location: CITY OF WAUCHULA

kV: 67

Order#: 583350

Equipment: TRANSFORMER

kVA: 5000

Account: 614

Compartment: MAIN(BOTTOM)

Year Mfd:

Received: 12/05/2018

Breathing: SEAL

Syringe ID: 53005048

Reported: 12/18/2018

Bank: Phase: 1

Bottle ID:

Fluid: MIN USGal: 920

Sampled By: GREG BYRD

LAKELAND, FL 33810 US  
ATTN: CHRISTINA TABARETTI  
PO#: 40408513-1  
Project ID: 40310985  
Customer ID: BANK A

Lab Control Number:		7201589
Date Sampled:		11/28/2018
Order Number:		583350
Oil Temp:		38
GOQ Diagnostics PER IEEE C57.106-2015 (most recent sample)	Moisture in Oil:	Acceptable for in-service oil (35 mg/kg max).
	Interfacial Tension:	Acceptable for in-service oil (25 mN/m min).
	Acid Number:	Acceptable for in-service oil (0.2 mg KOH/g max).
	Color Number and Visual:	Diagnostic not applicable. Diagnostic not applicable.
	Dielectric Breakdown ASTM D-877:	Diagnostic not applicable.
Power Factor @ 25°C (Routine):		Acceptable for in-service oil (0.5% max).
Comment:		

## End of Test Report

Authorized By:



ERIC MCANANY  
CHEMIST

Notations: 1. Analysis is ISO/IEC 17025:2005 accredited, L-A-B Accredited Certificate Number L2303.02 2. This test is conducted by a subcontracted laboratory. 3. Subcontracted laboratory has received ISO Standard 17025 accreditation for this test. 5. This test is conducted by Weidmann Laboratory other than Primary Lab. 6. Weidmann Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: WEIDMANN Electrical Technology accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg, µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm²/s = cSt

Accreditation applies to current analysis only. The analyses, opinions or interpretations contained in this report are based upon material and information supplied by the client. WEIDMANN Electrical Technology does not imply that the contents of the sample received by this laboratory are the same as all such material in the environment from which the sample was taken. Our test results relate only to the sample or samples tested. Any interpretations or opinions expressed represent the best judgment of WEIDMANN Electrical Technology. WEIDMANN Electrical Technology assumes no responsibility and makes no warranty or representation, expressed or implied as to the condition, productivity or proper operation of any equipment or other property for which this report may be used or relied upon for any reason whatsoever. This test report shall not be reproduced except in full, without written approval of the laboratory.