



Entergy

Nuclear Northeast



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☒ Continuous

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Effective Date: 6/13/08

Page 1 of 30

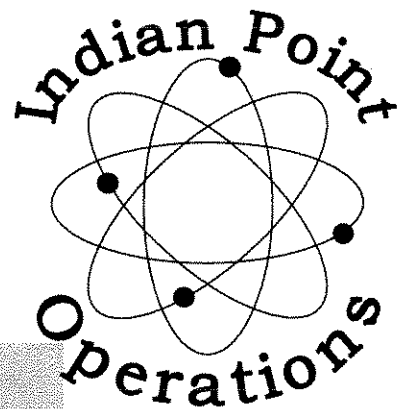
2-TOP-011, Revision 0 APPENDIX R DG TEST

Approved By:

Procedure Sponsor, RPO/ Designee

6/13/08

Date



Team 2S

Procedure Owner

NEW PROCEDURE

APPENDIX R DG TEST	No: 2-TOP-011	Rev: 0
	Page 2 of 30	

REVISION SUMMARY

(Page 1 of 1)

1.0 REASON FOR REVISION

1.1 New Procedure to test the Unit 2 Appendix R Diesel Generator.

2.0 SUMMARY OF CHANGES

2.1 This is a Rev. 0 procedure.

APPENDIX R DG TEST	No: 2-TOP-011	Rev: 0
	Page 3 of 30	

TABLE OF CONTENTS

Section	Title	Page
1.0	PURPOSE	4
2.0	PRECAUTIONS AND LIMITATIONS	4
3.0	PREREQUISITES	5
4.0	PROCEDURE	6
4.1	Initial Conditions	6
4.2	Test of Appendix R Diesel Generator	6
4.3	Restoration	10
5.0	COMMENTS	11
6.0	ACCEPTANCE CRITERIA	12
7.0	TEST ACCEPTANCE	13
8.0	EVALUATION	14
9.0	REFERENCES	15
10.0	RECORDS AND DOCUMENTATION	15

Attachments:

ATTACHMENT 1	UNIT 2 APPENDIX R DG 12 HOUR DATA SHEETS	16
ATTACHMENT 2	UNIT 2 APPENDIX R DG 2 HOUR DATA SHEETS	23
ATTACHMENT 3	UNIT 2 APPENDIX R DG 10 HOUR DATA SHEETS	25

APPENDIX R DG TEST	No: 2-TOP-011	Rev: 0
	Page 4 of 30	

1.0 PURPOSE

- 1.1 This procedure establishes requirements for testing the Appendix R DG for a 24 hour endurance test.
- 1.2 The following are the operating time and kW criteria for the Appendix R DG:
 - Operating for 12 hours at 2045 kW – 2065 kW
 - Operating for 2 hours at 2335 kW – 2435 kW
 - Operating for 10 hours at 2045 kW – 2065 kW

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Precautions And Limitations

- 2.1.1 TRO 3.8.B applies in Modes: 1, 2, 3 and 4.
- 2.1.2 This test may be performed in any plant mode.
- 2.1.3 Momentary excursions outside the desired loading of 2045 to 2065 kW AND 2335 to 2435 kW do NOT invalidate the test results.

2.2 General Information

- 2.2.1 Test personnel SHALL complete Sections 3.0, 4.0, 5.0, 6.0 and 7.0 as applicable.
- 2.2.2 Personnel performing this test SHALL read it in its entirety prior to the start of testing.
- 2.2.3 Any discrepancies found SHALL be identified in Section 5.0, Comments.
- 2.2.4 Attachments 1, 2 and 3, Unit 2 Appendix R DG Data Sheets, captures all of the data required by Attachment 1, in SOP-27.6, Appendix R Diesel Generator Operation. Therefore completion of Attachment 1 in 2-SOP-27.6 Appendix R Diesel Generator Operation, is NOT required during performance of this test.

APPENDIX R DG TEST	No: 2-TOP-011	Rev: 0
	Page 5 of 30	

Initials

3.0 PREREQUISITES

3.1 Equipment required for test:

NONE

3.2 OBTAIN a current copy of 2-SOP-27.6, Appendix R Diesel Generator Operation AND REVIEW Precautions and Limitations. _____

3.3 REVIEW AND ENSURE the Prerequisites of 2-SOP-27.6, Appendix R Diesel Generator Operation are performed. _____

3.4 NOTIFY Watch Chemist prior to start of the diesel in order to obtain a glycol sample approximately 1 hour after diesel operations are secured. _____

APPENDIX R DG TEST	No: 2-TOP-011	Rev: 0
	Page 6 of 30	

Initials

4.0 PROCEDURE

4.1 Initial Conditions

- 4.1.1 OBTAIN permission from SM or Designated Alternate to perform test.

SM or Designated Alternate Signature / Date

- 4.1.2 EVALUATE TRO 3.8.B for AOT entry. _____

4.2 Test of Appendix R Diesel Generator

- 4.2.1 START (Parallel Mode) AND LOAD Appendix R DG to between 2045 Kw – 2065 kW per 2-SOP-27.6 Appendix R Diesel Generator Operation. _____

- 4.2.2 IF Appendix R DG does NOT start OR load, THEN:

4.2.2.1 NOTIFY the SM. _____

4.2.2.2 DOCUMENT in detail any problems and/or specific components that may have caused the failure in Section 5.0. _____

- 4.2.3 WHEN Appendix R DG reaches load window of 2045 kW – 2065 kW, THEN RECORD time and load:

Time _____

Load _____ KW _____

- 4.2.4 VERIFY the DG Area fan is running. _____

- 4.2.5 INITIATE data collection in accordance with Attachment 1, Appendix R DG 12 Hour Data Sheets when temperatures stabilize. _____

APPENDIX R DG TEST

No: 2-TOP-011

Rev: 0

Page 7 of 30

Initials

- 4.2.6 WHEN lube oil and jacket water temperatures have stabilized during load run,
THEN OBSERVE exhaust from Appendix R DG.

- 4.2.7 CHECK appropriate box indicating color of Appendix R DG exhaust observed.

APPENDIX R DG EXHAUST COLOR					
CLEAR		LT. GRAY		BLACK	
WHITE		DK. GRAY		BLUE	

NOTE

Momentary excursions outside the desired loading of 2045 KW – 2065 KW
DO NOT invalidate the test results.

- 4.2.8 MAINTAIN Appendix R DG load at 2045 KW – 2065 KW for a minimum of 12 hours.

- 4.2.9 After a minimum of 12 hours, RECORD the present time at target load (2045 – 2065 KW):

Present time _____

Time loaded $\geq$ 2045 KW _____ ($\geq$ 12 hour)

- 4.2.10 WHEN 12 hour time and load conditions have been met,
THEN INCREASE load on Appendix R DG (Parallel Mode) per 2-SOP-27.6, Appendix R Diesel Generator Operation to 2335 KW – 2435 KW:

- 4.2.10.1 RECORD present time AND load
(2335 – 2435 KW):

Present time _____

Time loaded ($\geq$ 2335) _____

- 4.2.11 INITIATE data collection in accordance with Attachment 2, Appendix R DG 2 Hour Data Sheets.

APPENDIX R DG TEST

No: 2-TOP-011

Rev: 0

Page 8 of 30

Initials

- 4.2.12 CHECK appropriate box indicating color of Appendix R DG exhaust observed.

APPENDIX R DG EXHAUST COLOR					
CLEAR		LT. GRAY		BLACK	
WHITE		DK. GRAY		BLUE	

NOTE

Momentary excursions outside the desired loading of 2335 KW – 2435 KW
DO NOT invalidate the test results.

- 4.2.13 MAINTAIN Appendix R DG load at 2335 KW – 2435 KW for a minimum of 2 hours. _____
- 4.2.14 RECORD present time and run time at target load (2335 KW – 2435 KW):
- Present time _____
- Time loaded $\geq$ 2335 KW _____ ($\geq$ 2 hour) _____
- 4.2.15 WHEN 2 hour time and load conditions have been met, THEN DECREASE load Appendix R DG (Parallel Mode) per 2-SOP-27.6, Appendix R Diesel Generator Operation to 2045 KW – 2065 KW. _____
- 4.2.15.1 RECORD present time AND load (2045 – 2065 KW):
- Present time _____
- Time loaded ($\geq$ 2045) _____
- 4.2.16 INITIATE data collection in accordance with Attachment 3, Appendix R DG 10 Hour Data Sheets when temperatures stabilize. _____

APPENDIX R DG TEST	No: 2-TOP-011	Rev: 0
	Page 9 of 30	

Initials

- 4.2.17 CHECK appropriate box indicating color of Appendix R DG exhaust observed.

APPENDIX R DG EXHAUST COLOR					
CLEAR		LT. GRAY		BLACK	
WHITE		DK. GRAY		BLUE	

NOTE

Momentary excursions outside the desired loading of 2045 KW – 2065 KW
DO NOT invalidate the test results.

- 4.2.18 MAINTAIN Appendix R DG load at 2045 KW – 2065 KW for a minimum of 10 hours. _____
- 4.2.19 RECORD present time and run time at target load (2045 – 2065 KW):
Present time _____
Time loaded $\geq$ 2045 KW _____ ($\geq$ 10 hour) _____
- 4.2.20 WHEN time and load conditions have been met,
THEN UNLOAD AND SECURE Appendix R DG (Parallel Mode) per 2-SOP-27.6, Appendix R Diesel Generator Operation. _____

APPENDIX R DG TEST	No: 2-TOP-011	Rev: 0
	Page 10 of 30	

Initials

4.3 Restoration

4.3.1 NOTIFY Maintenance that Appendix R DG has been secured so that oil sample may be drawn. _____

4.3.2 VERIFY GT1 North and South combined Fuel Oil Storage Tank level is greater than or equal to 12,500 gallons. _____

4.3.3 VERIFY Fuel Oil Day Tank level is between (7/8 - FULL). _____

4.3.4 VERIFY UW-831 is OPEN. _____

4.3.5 VERIFY UW-833 is OPEN. _____

4.3.6 VERIFY UW-837 is OPEN. _____

4.3.7 NOTIFY CRS or SM the Appendix R DG has been returned to standby service. _____

4.3.7.1 IF AOT was entered in step 4.1.2,
THEN EXIT AOT for TRO 3.8.B. _____

5.0 COMMENTS

Test Performers:

Print Name:

Initials:

Signature/Date:

APPENDIX R DG TEST

No: 2-TOP-011

Rev: 0

Page 12 of 30

6.0 ACCEPTANCE CRITERIA**6.1 Appendix R DG Endurance Run Test Requirements**

Equipment or Parameter/ Instrument	Step/Att.	Surveillance Requirement	Acceptance Criteria	Actual	Acceptable	Initials
Generator Output Breaker / SBO/ASS	4.2.1	NONE	Breaker Closes	N/A	YES / NO	
AC Wattmeter – Generator / WM (12 Hour)	4.2.9		Load >2045 KW Maintained For ≥ 12 Hours	YES / NO	YES / NO	
AC Wattmeter – Generator / WM (2 Hour)	4.2.14		Load >2335 KW Maintained For ≥ 2 Hours	YES / NO	YES / NO	
AC Wattmeter – Generator / WM (10 Hour)	4.2.19		Load >2045 KW Maintained For ≥ 10 Hours	YES / NO	YES / NO	
Jacket Water Temp	Att. 1, 2, 3		40-215 °F	YES / NO (within band)	YES / NO	
Lube Oil Temp	Att. 1, 2, 3		<250 °F	YES / NO (within band)	YES / NO	

6.2 Other Program Requirements

Equipment or Parameter/ Instrument	Step	Surveillance Requirement	Acceptance Criteria	Actual	Acceptable	Initials
DG Area Fan	4.2.4	Vendor Recommendation	Fans Starts	YES / NO	YES / NO	
DG Engine, Generator and Equipment Data Sheets	Attachments 1, 2, 3	N/A	Within Band	YES / NO	YES / NO	

APPENDIX R DG TEST	No: 2-TOP-011	Rev: 0
	Page 13 of 30	

7.0 TEST ACCEPTANCE

7.1 Test Acceptance Criteria

7.1.1 Based on recorded data, are all Acceptance Criteria of Section 6.1 satisfied?

YES NO N/A

7.1.2 IF all Acceptance Criteria of Section 6.1 are NOT satisfied, THEN PERFORM the following:

- NOTIFY CRS/SM to declare Appendix R Diesel Generator inoperable with an entry in Unit Log per OAP-035.
- INITIATE a WRT and a CR.
- TAKE applicable action in accordance with TRO 3.8.B.

7.2 Other Programs Acceptance Criteria:

7.2.1 Based on the recorded data, are all Acceptance Criteria of Section 6.2 satisfied?

YES NO N/A

7.2.2 IF component(s) failed to meet the Acceptance Criteria of Section 6.2, THEN PERFORM the following:

- NOTIFY Engineering for an evaluation.
- INITIATE a CR.

7.3 IF NO is circled in Step 7.1.1 OR Step 7.2.1, THEN LIST corrective action(s) taken, with any comments:

Comments: _____

Reviewed By: _____
 SM or Designated Alternate Signature / Date

APPENDIX R DG TEST	No: 2-TOP-011	Rev: 0
	Page 14 of 30	

8.0 EVALUATION

8.1 Test Engineer Review

Comments: _____

Reviewed By: _____

Test Engineer Review / Date

APPENDIX R DG TEST

No: 2-TOP-011

Rev: 0

Page 15 of 30

9.0 REFERENCES

9.1 Commitment Documents

None

9.2 Development Documents

9.2.1 NUMARC 87-00, Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors

9.2.2 NSAC-108, Reliability of Diesel Generators at U.S. Power Plants

9.2.3 EC-5000033794 Post Mod Acceptance Test

9.2.4 2-PT-M110, Appendix R DG Functional Test

9.3 Interface Documents

9.3.1 TRO 3.8.B

9.3.2 2-SOP-27.6, Appendix R Diesel Generator Operation

9.3.3 OAP-035, Technical Specifications and Technical Requirements Manual - License Adherence and Use

10.0 RECORDS AND DOCUMENTATION

10.1 Records

The following required records resulting from this procedure are controlled and maintained in accordance with the IPEC Records Retention Schedule.

10.1.1 WHEN completed,
THEN this Performance Procedure becomes a Quality Record.

10.2 Documentation

NONE

APPENDIX R DG TEST

No: 2-TOP-011

Rev: 0

Page 16 of 30

ATTACHMENT 1 UNIT 2 APPENDIX R DG 12 HOUR DATA SHEETS (Page 1 of 7)

Date: _____

2045 kW – 2065 kW

TIME/ READINGS

PARAMETER	FULL LOAD	0	30	60	90
Appendix R DG Engine Data					
Coolant Temperature	≥ 40 - ≤ 215 °F				
Lube Oil Pressure	≥ 45 psig				
Engine Speed	1800 RPM				
Fuel Pump Pressure	200 - 420 psig @ 1800 RPM				
Fuel Inlet Temperature	≤ 150 °F				
Coolant Pressure	≥ 11 psig				
Lube Oil Temperature	≤ 250 °F				
Lube Oil Level (Between Run High / Run Low)	Midpoint				
Air Intake Temperature	≤ 180 °F				
After Cooler Temperature	≤ 160 °F				
Appendix R DG Alternator Data					
L1 Amps	≤ 113.4 Amps				
L2 Amps	≤ 113.4 Amps				
L3 Amps	≤ 113.4 Amps				
Frequency	59.7 – 60.3 Hz				
Total Kw	≤ 2700 kW				
Total kVA	≤ 3375 kVA				
Total PF (nominal 0.9, grid conditions permitting)	(≥ 0.8 - ≤ 0.95)				
Appendix R DG Other Data					
Day Tank Level	7/8 - Full				
PI-8030, Day Tank Fill Pump Pressure	psig				
TE-8027, Day Tank Oil Cooler Temperature	°F				
Lube Oil Reservoir Sight Glass Level	3/4 - Full				
LG-8032, Jacket Water Surge Tank Sight Glass Level	2/3 – 3/4				
LG-8031, After Cooler Surge Tank Sight Glass Level	2/3 – 3/4				
TI-908, Jacket Water Heat Exchanger Outlet Temperature	°F				
TI-909 After Cooler Heat Exchanger Outlet Temperature	°F				
FI-7979, Appendix R DG Jacket Water Flow (City Water)	≤ 118 gpm				
FI-7979, Appendix R DG Jacket Water Flow (Service Water)	≤ 160 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (City Water)	≤ 87 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (Service Water)	≤ 137 gpm				
Battery Voltage	≥ 24 VDC				

APPENDIX R DG TEST

No: 2-TOP-011

Rev: 0

Page 17 of 30

ATTACHMENT 1 UNIT 2 APPENDIX R DG 12 HOUR DATA SHEETS (Page 2 of 7)

Date: _____

2045 kW – 2065 kW

TIME/ READINGS

PARAMETER	FULL LOAD	120	150	180	210
Appendix R DG Engine Data					
Coolant Temperature	$\geq 40 - \leq 215$ °F				
Lube Oil Pressure	≥ 45 psig				
Engine Speed	1800 RPM				
Fuel Pump Pressure	200 - 420 psig @ 1800 RPM				
Fuel Inlet Temperature	≤ 150 °F				
Coolant Pressure	≥ 11 psig				
Lube Oil Temperature	≤ 250 °F				
Lube Oil Level (Between Run High / Run Low)	Midpoint				
Air Intake Temperature	≤ 180 °F				
After Cooler Temperature	≤ 160 °F				
Appendix R DG Alternator Data					
L1 Amps	≤ 113.4 Amps				
L2 Amps	≤ 113.4 Amps				
L3 Amps	≤ 113.4 Amps				
Frequency	59.7 – 60.3 Hz				
Total kW	≤ 2700 kW				
Total kVA	≤ 3375 kVA				
Total PF (nominal 0.9, grid conditions permitting)	($\geq 0.8 - \leq 0.95$)				
Appendix R DG Other Data					
Day Tank Level	7/8 - Full				
PI-8030, Day Tank Fill Pump Pressure	psig				
TE-8027, Day Tank Oil Cooler Temperature	°F				
Lube Oil Reservoir Sight Glass Level	3/4 - Full				
LG-8032, Jacket Water Surge Tank Sight Glass Level	2/3 – 3/4				
LG-8031, After Cooler Surge Tank Sight Glass Level	2/3 – 3/4				
TI-908, Jacket Water Heat Exchanger Outlet Temperature	°F				
TI-909 After Cooler Heat Exchanger Outlet Temperature	°F				
FI-7979, Appendix R DG Jacket Water Flow (City Water)	≤ 118 gpm				
FI-7979, Appendix R DG Jacket Water Flow (Service Water)	≤ 160 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (City Water)	≤ 87 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (Service Water)	≤ 137 gpm				
Battery Voltage	≥ 24 VDC				

APPENDIX R DG TEST	No: 2-TOP-011	Rev: 0
	Page 18 of 30	

ATTACHMENT 1
UNIT 2 APPENDIX R DG 12 HOUR DATA SHEETS
(Page 3 of 7)

Date: _____

2045 kW – 2065 kW

PARAMETER		TIME/ READINGS				
		FULL LOAD	240	270	300	330
Appendix R DG Engine Data						
Coolant Temperature	$\geq 40 - \leq 215$ °F					
Lube Oil Pressure	≥ 45 psig					
Engine Speed	1800 RPM					
Fuel Pump Pressure	200 - 420 psig @ 1800 RPM					
Fuel Inlet Temperature	≤ 150 °F					
Coolant Pressure	≥ 11 psig					
Lube Oil Temperature	≤ 250 °F					
Lube Oil Level (Between Run High / Run Low)	Midpoint					
Air Intake Temperature	≤ 180 °F					
After Cooler Temperature	≤ 160 °F					
Appendix R DG Alternator Data						
L1 Amps	≤ 113.4 Amps					
L2 Amps	≤ 113.4 Amps					
L3 Amps	≤ 113.4 Amps					
Frequency	59.7 – 60.3 Hz					
Total kW	≤ 2700 kW					
Total kVA	≤ 3375 kVA					
Total PF (nominal 0.9, grid conditions permitting)	($\geq 0.8 - \leq 0.95$)					
Appendix R DG Other Data						
Day Tank Level	7/8 - Full					
PI-8030, Day Tank Fill Pump Pressure	psig					
TE-8027, Day Tank Oil Cooler Temperature	°F					
Lube Oil Reservoir Sight Glass Level	3/4 - Full					
LG-8032, Jacket Water Surge Tank Sight Glass Level	2/3 – 3/4					
LG-8031, After Cooler Surge Tank Sight Glass Level	2/3 – 3/4					
TI-908, Jacket Water Heat Exchanger Outlet Temperature	°F					
TI-909 After Cooler Heat Exchanger Outlet Temperature	°F					
FI-7979, Appendix R DG Jacket Water Flow (City Water)	≤ 118 gpm					
FI-7979, Appendix R DG Jacket Water Flow (Service Water)	≤ 160 gpm					
FI-7980, Appendix R DG Aftercooler Water Flow (City Water)	≤ 87 gpm					
FI-7980, Appendix R DG Aftercooler Water Flow (Service Water)	≤ 137 gpm					
Battery Voltage	≥ 24 VDC					

APPENDIX R DG TEST

No: 2-TOP-011

Rev: 0

Page 19 of 30

ATTACHMENT 1 UNIT 2 APPENDIX R DG 12 HOUR DATA SHEETS (Page 4 of 7)

Date: _____

2045 kW – 2065 kW

TIME/ READINGS

PARAMETER	FULL LOAD	360	390	420	450
Appendix R DG Engine Data					
Coolant Temperature	$\geq 40 - \leq 215$ °F				
Lube Oil Pressure	≥ 45 psig				
Engine Speed	1800 RPM				
Fuel Pump Pressure	200 - 420 psig @ 1800 RPM				
Fuel Inlet Temperature	≤ 150 °F				
Coolant Pressure	≥ 11 psig				
Lube Oil Temperature	≤ 250 °F				
Lube Oil Level (Between Run High / Run Low)	Midpoint				
Air Intake Temperature	≤ 180 °F				
After Cooler Temperature	≤ 160 °F				
Appendix R DG Alternator Data					
L1 Amps	≤ 113.4 Amps				
L2 Amps	≤ 113.4 Amps				
L3 Amps	≤ 113.4 Amps				
Frequency	59.7 – 60.3 Hz				
Total kW	≤ 2700 kW				
Total kVA	≤ 3375 kVA				
Total PF (nominal 0.9, grid conditions permitting)	($\geq 0.8 - \leq 0.95$)				
Appendix R DG Other Data					
Day Tank Level	7/8 - Full				
PI-8030, Day Tank Fill Pump Pressure	psig				
TE-8027, Day Tank Oil Cooler Temperature	°F				
Lube Oil Reservoir Sight Glass Level	3/4 - Full				
LG-8032, Jacket Water Surge Tank Sight Glass Level	2/3 – 3/4				
LG-8031, After Cooler Surge Tank Sight Glass Level	2/3 – 3/4				
TI-908, Jacket Water Heat Exchanger Outlet Temperature	°F				
TI-909 After Cooler Heat Exchanger Outlet Temperature	°F				
FI-7979, Appendix R DG Jacket Water Flow (City Water)	≤ 118 gpm				
FI-7979, Appendix R DG Jacket Water Flow (Service Water)	≤ 160 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (City Water)	≤ 87 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (Service Water)	≤ 137 gpm				
Battery Voltage	≥ 24 VDC				

APPENDIX R DG TEST

No: 2-TOP-011

Rev: 0

Page 20 of 30

ATTACHMENT 1 UNIT 2 APPENDIX R DG 12 HOUR DATA SHEETS (Page 5 of 7)

Date: _____

2045 kW – 2065 kW

TIME/ READINGS

PARAMETER	FULL LOAD	480	510	540	570
Appendix R DG Engine Data					
Coolant Temperature	≥ 40 - ≤ 215 °F				
Lube Oil Pressure	≥ 45 psig				
Engine Speed	1800 RPM				
Fuel Pump Pressure	200 - 420 psig @ 1800 RPM				
Fuel Inlet Temperature	≤ 150 °F				
Coolant Pressure	≥ 11 psig				
Lube Oil Temperature	≤ 250 °F				
Lube Oil Level (Between Run High / Run Low)	Midpoint				
Air Intake Temperature	≤ 180 °F				
After Cooler Temperature	≤ 160 °F				
Appendix R DG Alternator Data					
L1 Amps	≤ 113.4 Amps				
L2 Amps	≤ 113.4 Amps				
L3 Amps	≤ 113.4 Amps				
Frequency	59.7 – 60.3 Hz				
Total kW	≤ 2700 kW				
Total kVA	≤ 3375 kVA				
Total PF (nominal 0.9, grid conditions permitting)	(≥ 0.8 - ≤ 0.95)				
Appendix R DG Other Data					
Day Tank Level	7/8 - Full				
PI-8030, Day Tank Fill Pump Pressure	psig				
TE-8027, Day Tank Oil Cooler Temperature	°F				
Lube Oil Reservoir Sight Glass Level	3/4 - Full				
LG-8032, Jacket Water Surge Tank Sight Glass Level	2/3 – 3/4				
LG-8031, After Cooler Surge Tank Sight Glass Level	2/3 – 3/4				
TI-908, Jacket Water Heat Exchanger Outlet Temperature	°F				
TI-909 After Cooler Heat Exchanger Outlet Temperature	°F				
FI-7979, Appendix R DG Jacket Water Flow (City Water)	≤ 118 gpm				
FI-7979, Appendix R DG Jacket Water Flow (Service Water)	≤ 160 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (City Water)	≤ 87 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (Service Water)	≤ 137 gpm				
Battery Voltage	≥ 24 VDC				

APPENDIX R DG TEST

No: 2-TOP-011

Rev: 0

Page 21 of 30

ATTACHMENT 1 UNIT 2 APPENDIX R DG 12 HOUR DATA SHEETS (Page 6 of 7)

Date: _____

2045 kW – 2065 kW

TIME/ READINGS

PARAMETER	FULL LOAD	600	630	660	690
Appendix R DG Engine Data					
Coolant Temperature	≥ 40 - ≤ 215 °F				
Lube Oil Pressure	≥ 45 psig				
Engine Speed	1800 RPM				
Fuel Pump Pressure	200 - 420 psig @ 1800 RPM				
Fuel Inlet Temperature	≤ 150 °F				
Coolant Pressure	≥ 11 psig				
Lube Oil Temperature	≤ 250 °F				
Lube Oil Level (Between Run High / Run Low)	Midpoint				
Air Intake Temperature	≤ 180 °F				
After Cooler Temperature	≤ 160 °F				
Appendix R DG Alternator Data					
L1 Amps	≤ 113.4 Amps				
L2 Amps	≤ 113.4 Amps				
L3 Amps	≤ 113.4 Amps				
Frequency	59.7 – 60.3 Hz				
Total kW	≤ 2700 kW				
Total kVA	≤ 3375 kVA				
Total PF (nominal 0.9, grid conditions permitting)	(≥ 0.8 - ≤ 0.95)				
Appendix R DG Other Data					
Day Tank Level	7/8 - Full				
PI-8030, Day Tank Fill Pump Pressure	psig				
TE-8027, Day Tank Oil Cooler Temperature	°F				
Lube Oil Reservoir Sight Glass Level	3/4 - Full				
LG-8032, Jacket Water Surge Tank Sight Glass Level	2/3 – 3/4				
LG-8031, After Cooler Surge Tank Sight Glass Level	2/3 – 3/4				
TI-908, Jacket Water Heat Exchanger Outlet Temperature	°F				
TI-909 After Cooler Heat Exchanger Outlet Temperature	°F				
FI-7979, Appendix R DG Jacket Water Flow (City Water)	≤ 118 gpm				
FI-7979, Appendix R DG Jacket Water Flow (Service Water)	≤ 160 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (City Water)	≤ 87 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (Service Water)	≤ 137 gpm				
Battery Voltage	≥ 24 VDC				

APPENDIX R DG TEST

No: 2-TOP-011

Rev: 0

Page 22 of 30

ATTACHMENT 1 UNIT 2 APPENDIX R DG 12 HOUR DATA SHEETS (Page 7 of 7)

Date: _____

2045 kW – 2065 kW

TIME/ READINGS

PARAMETER	FULL LOAD	720	750	780	810
Appendix R DG Engine Data					
Coolant Temperature	≥ 40 - ≤ 215 °F				
Lube Oil Pressure	≥ 45 psig				
Engine Speed	1800 RPM				
Fuel Pump Pressure	200 - 420 psig @ 1800 RPM				
Fuel Inlet Temperature	≤ 150 °F				
Coolant Pressure	≥ 11 psig				
Lube Oil Temperature	≤ 250 °F				
Lube Oil Level (Between Run High / Run Low)	Midpoint				
Air Intake Temperature	≤ 180 °F				
After Cooler Temperature	≤ 160 °F				
Appendix R DG Alternator Data					
L1 Amps	≤ 113.4 Amps				
L2 Amps	≤ 113.4 Amps				
L3 Amps	≤ 113.4 Amps				
Frequency	59.7 – 60.3 Hz				
Total kW	≤ 2700 kW				
Total kVA	≤ 3375 kVA				
Total PF (nominal 0.9, grid conditions permitting)	(≥ 0.8 - ≤ 0.95)				
Appendix R DG Other Data					
Day Tank Level	7/8 - Full				
PI-8030, Day Tank Fill Pump Pressure	psig				
TE-8027, Day Tank Oil Cooler Temperature	°F				
Lube Oil Reservoir Sight Glass Level	3/4 - Full				
LG-8032, Jacket Water Surge Tank Sight Glass Level	2/3 – 3/4				
LG-8031, After Cooler Surge Tank Sight Glass Level	2/3 – 3/4				
TI-908, Jacket Water Heat Exchanger Outlet Temperature	°F				
TI-909 After Cooler Heat Exchanger Outlet Temperature	°F				
FI-7979, Appendix R DG Jacket Water Flow (City Water)	≤ 118 gpm				
FI-7979, Appendix R DG Jacket Water Flow (Service Water)	≤ 160 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (City Water)	≤ 87 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (Service Water)	≤ 137 gpm				
Battery Voltage	≥ 24 VDC				

APPENDIX R DG TEST

No: 2-TOP-011

Rev: 0

Page 23 of 30

ATTACHMENT 2 UNIT 2 APPENDIX R DG 2 HOUR DATA SHEETS (Page 1 of 2)

Date: _____

2335 kW – 2435 kW

TIME/ READINGS

PARAMETER	FULL LOAD	0	30	60	90
Appendix R DG Engine Data					
Coolant Temperature	≥ 40 - ≤ 215 °F				
Lube Oil Pressure	≥ 45 psig				
Engine Speed	1800 RPM				
Fuel Pump Pressure	200 - 420 psig @ 1800 RPM				
Fuel Inlet Temperature	≤ 150 °F				
Coolant Pressure	≥ 11 psig				
Lube Oil Temperature	≤ 250 °F				
Lube Oil Level (Between Run High / Run Low)	Midpoint				
Air Intake Temperature	≤ 180 °F				
After Cooler Temperature	≤ 160 °F				
Appendix R DG Alternator Data					
L1 Amps	≤ 113.4 Amps				
L2 Amps	≤ 113.4 Amps				
L3 Amps	≤ 113.4 Amps				
Frequency	59.7 – 60.3 Hz				
Total kW	≤ 2700 kW				
Total kVA	≤ 3375 kVA				
Total PF (nominal 0.9, grid conditions permitting)	(≥ 0.8 - ≤ 0.95)				
Appendix R DG Other Data					
Day Tank Level	7/8 - Full				
PI-8030, Day Tank Fill Pump Pressure	psig				
TE-8027, Day Tank Oil Cooler Temperature	°F				
Lube Oil Reservoir Sight Glass Level	3/4 - Full				
LG-8032, Jacket Water Surge Tank Sight Glass Level	2/3 – 3/4				
LG-8031, After Cooler Surge Tank Sight Glass Level	2/3 – 3/4				
TI-908, Jacket Water Heat Exchanger Outlet Temperature	°F				
TI-909 After Cooler Heat Exchanger Outlet Temperature	°F				
FI-7979, Appendix R DG Jacket Water Flow (City Water)	≤ 118 gpm				
FI-7979, Appendix R DG Jacket Water Flow (Service Water)	≤ 160 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (City Water)	≤ 87 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (Service Water)	≤ 137 gpm				
Battery Voltage	≥ 24 VDC				

APPENDIX R DG TEST

No: 2-TOP-011

Rev: 0

Page 24 of 30

ATTACHMENT 2 UNIT 2 APPENDIX R DG 2 HOUR DATA SHEETS (Page 2 of 2)

Date: _____

2335 kW – 2435 kW

TIME/ READINGS

PARAMETER	FULL LOAD	120	150	180	210
Appendix R DG Engine Data					
Coolant Temperature	≥ 40 - ≤ 215 °F				
Lube Oil Pressure	≥ 45 psig				
Engine Speed	1800 RPM				
Fuel Pump Pressure	200 - 420 psig @ 1800 RPM				
Fuel Inlet Temperature	≤ 150 °F				
Coolant Pressure	≥ 11 psig				
Lube Oil Temperature	≤ 250 °F				
Lube Oil Level (Between Run High / Run Low)	Midpoint				
Air Intake Temperature	≤ 180 °F				
After Cooler Temperature	≤ 160 °F				
Appendix R DG Alternator Data					
L1 Amps	≤ 113.4 Amps				
L2 Amps	≤ 113.4 Amps				
L3 Amps	≤ 113.4 Amps				
Frequency	59.7 – 60.3 Hz				
Total kW	≤ 2700 kW				
Total kVA	≤ 3375 kVA				
Total PF (nominal 0.9, grid conditions permitting)	(≥ 0.8 - ≤ 0.95)				
Appendix R DG Other Data					
Day Tank Level	7/8 - Full				
PI-8030, Day Tank Fill Pump Pressure	psig				
TE-8027, Day Tank Oil Cooler Temperature	°F				
Lube Oil Reservoir Sight Glass Level	3/4 - Full				
LG-8032, Jacket Water Surge Tank Sight Glass Level	2/3 – 3/4				
LG-8031, After Cooler Surge Tank Sight Glass Level	2/3 – 3/4				
TI-908, Jacket Water Heat Exchanger Outlet Temperature	°F				
TI-909 After Cooler Heat Exchanger Outlet Temperature	°F				
FI-7979, Appendix R DG Jacket Water Flow (City Water)	≤ 118 gpm				
FI-7979, Appendix R DG Jacket Water Flow (Service Water)	≤ 160 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (City Water)	≤ 87 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (Service Water)	≤ 137 gpm				
Battery Voltage	≥ 24 VDC				

APPENDIX R DG TEST

No: 2-TOP-011

Rev: 0

Page 25 of 30

ATTACHMENT 3 UNIT 2 APPENDIX R DG 10 HOUR DATA SHEETS (Page 1 of 6)

Date: _____

2045 kW – 2065 kW

TIME/ READINGS

PARAMETER	FULL LOAD	0	30	60	90
Appendix R DG Engine Data					
Coolant Temperature	≥ 40 - ≤ 215 °F				
Lube Oil Pressure	≥ 45 psig				
Engine Speed	1800 RPM				
Fuel Pump Pressure	200 - 420 psig @ 1800 RPM				
Fuel Inlet Temperature	≤ 150 °F				
Coolant Pressure	≥ 11 psig				
Lube Oil Temperature	≤ 250 °F				
Lube Oil Level (Between Run High / Run Low)	Midpoint				
Air Intake Temperature	≤ 180 °F				
After Cooler Temperature	≤ 160 °F				
Appendix R DG Alternator Data					
L1 Amps	≤ 113.4 Amps				
L2 Amps	≤ 113.4 Amps				
L3 Amps	≤ 113.4 Amps				
Frequency	59.7 – 60.3 Hz				
Total kW	≤ 2700 kW				
Total kVA	≤ 3375 kVA				
Total PF (nominal 0.9, grid conditions permitting)	(≥ 0.8 - ≤ 0.95)				
Appendix R DG Other Data					
Day Tank Level	7/8 - Full				
PI-8030, Day Tank Fill Pump Pressure	psig				
TE-8027, Day Tank Oil Cooler Temperature	°F				
Lube Oil Reservoir Sight Glass Level	3/4 - Full				
LG-8032, Jacket Water Surge Tank Sight Glass Level	2/3 – 3/4				
LG-8031, After Cooler Surge Tank Sight Glass Level	2/3 – 3/4				
TI-908, Jacket Water Heat Exchanger Outlet Temperature	°F				
TI-909 After Cooler Heat Exchanger Outlet Temperature	°F				
FI-7979, Appendix R DG Jacket Water Flow (City Water)	≤ 118 gpm				
FI-7979, Appendix R DG Jacket Water Flow (Service Water)	≤ 160 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (City Water)	≤ 87 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (Service Water)	≤ 137 gpm				
Battery Voltage	≥ 24 VDC				

APPENDIX R DG TEST

No: 2-TOP-011

Rev: 0

Page 26 of 30

ATTACHMENT 3 UNIT 2 APPENDIX R DG 10 HOUR DATA SHEETS (Page 2 of 6)

Date: _____

2045 kW – 2065 kW

TIME/ READINGS

PARAMETER	FULL LOAD	120	150	180	210
Appendix R DG Engine Data					
Coolant Temperature	≥ 40 - ≤ 215 °F				
Lube Oil Pressure	≥ 45 psig				
Engine Speed	1800 RPM				
Fuel Pump Pressure	200 - 420 psig @ 1800 RPM				
Fuel Inlet Temperature	≤ 150 °F				
Coolant Pressure	≥ 11 psig				
Lube Oil Temperature	≤ 250 °F				
Lube Oil Level (Between Run High / Run Low)	Midpoint				
Air Intake Temperature	≤ 180 °F				
After Cooler Temperature	≤ 160 °F				
Appendix R DG Alternator Data					
L1 Amps	≤ 113.4 Amps				
L2 Amps	≤ 113.4 Amps				
L3 Amps	≤ 113.4 Amps				
Frequency	59.7 – 60.3 Hz				
Total kW	≤ 2700 kW				
Total kVA	≤ 3375 kVA				
Total PF (nominal 0.9, grid conditions permitting)	(≥ 0.8 - ≤ 0.95)				
Appendix R DG Other Data					
Day Tank Level	7/8 - Full				
PI-8030, Day Tank Fill Pump Pressure	psig				
TE-8027, Day Tank Oil Cooler Temperature	°F				
Lube Oil Reservoir Sight Glass Level	3/4 - Full				
LG-8032, Jacket Water Surge Tank Sight Glass Level	2/3 – 3/4				
LG-8031, After Cooler Surge Tank Sight Glass Level	2/3 – 3/4				
TI-908, Jacket Water Heat Exchanger Outlet Temperature	°F				
TI-909 After Cooler Heat Exchanger Outlet Temperature	°F				
FI-7979, Appendix R DG Jacket Water Flow (City Water)	≤ 118 gpm				
FI-7979, Appendix R DG Jacket Water Flow (Service Water)	≤ 160 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (City Water)	≤ 87 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (Service Water)	≤ 137 gpm				
Battery Voltage	≥ 24 VDC				

APPENDIX R DG TEST

No: 2-TOP-011

Rev: 0

Page 27 of 30

ATTACHMENT 3 UNIT 2 APPENDIX R DG 10 HOUR DATA SHEETS (Page 3 of 6)

Date: _____

2045 kW – 2065 kW

TIME/ READINGS

PARAMETER	FULL LOAD	240	270	300	330
Appendix R DG Engine Data					
Coolant Temperature	≥ 40 - ≤ 215 °F				
Lube Oil Pressure	≥ 45 psig				
Engine Speed	1800 RPM				
Fuel Pump Pressure	200 - 420 psig @ 1800 RPM				
Fuel Inlet Temperature	≤ 150 °F				
Coolant Pressure	≥ 11 psig				
Lube Oil Temperature	≤ 250 °F				
Lube Oil Level (Between Run High / Run Low)	Midpoint				
Air Intake Temperature	≤ 180 °F				
After Cooler Temperature	≤ 160 °F				
Appendix R DG Alternator Data					
L1 Amps	≤ 113.4 Amps				
L2 Amps	≤ 113.4 Amps				
L3 Amps	≤ 113.4 Amps				
Frequency	59.7 – 60.3 Hz				
Total kW	≤ 2700 kW				
Total kVA	≤ 3375 kVA				
Total PF (nominal 0.9, grid conditions permitting)	(≥ 0.8 - ≤ 0.95)				
Appendix R DG Other Data					
Day Tank Level	7/8 - Full				
PI-8030, Day Tank Fill Pump Pressure	psig				
TE-8027, Day Tank Oil Cooler Temperature	°F				
Lube Oil Reservoir Sight Glass Level	3/4 - Full				
LG-8032, Jacket Water Surge Tank Sight Glass Level	2/3 – 3/4				
LG-8031, After Cooler Surge Tank Sight Glass Level	2/3 – 3/4				
TI-908, Jacket Water Heat Exchanger Outlet Temperature	°F				
TI-909 After Cooler Heat Exchanger Outlet Temperature	°F				
FI-7979, Appendix R DG Jacket Water Flow (City Water)	≤ 118 gpm				
FI-7979, Appendix R DG Jacket Water Flow (Service Water)	≤ 160 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (City Water)	≤ 87 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (Service Water)	≤ 137 gpm				
Battery Voltage	≥ 24 VDC				

APPENDIX R DG TEST

No: 2-TOP-011

Rev: 0

Page 28 of 30

ATTACHMENT 3 UNIT 2 APPENDIX R DG 10 HOUR DATA SHEETS (Page 4 of 6)

Date: _____

2045 kW – 2065 kW

PARAMETER		TIME/ READINGS			
		FULL LOAD	360	390	420
Appendix R DG Engine Data					
Coolant Temperature	≥ 40 - ≤ 215 °F				
Lube Oil Pressure	≥ 45 psig				
Engine Speed	1800 RPM				
Fuel Pump Pressure	200 - 420 psig @ 1800 RPM				
Fuel Inlet Temperature	≤ 150 °F				
Coolant Pressure	≥ 11 psig				
Lube Oil Temperature	≤ 250 °F				
Lube Oil Level (Between Run High / Run Low)	Midpoint				
Air Intake Temperature	≤ 180 °F				
After Cooler Temperature	≤ 160 °F				
Appendix R DG Alternator Data					
L1 Amps	≤ 113.4 Amps				
L2 Amps	≤ 113.4 Amps				
L3 Amps	≤ 113.4 Amps				
Frequency	59.7 – 60.3 Hz				
Total kW	≤ 2700 kW				
Total kVA	≤ 3375 kVA				
Total PF (nominal 0.9, grid conditions permitting)	(≥ 0.8 - ≤ 0.95)				
Appendix R DG Other Data					
Day Tank Level	7/8 - Full				
PI-8030, Day Tank Fill Pump Pressure	psig				
TE-8027, Day Tank Oil Cooler Temperature	°F				
Lube Oil Reservoir Sight Glass Level	3/4 - Full				
LG-8032, Jacket Water Surge Tank Sight Glass Level	2/3 – 3/4				
LG-8031, After Cooler Surge Tank Sight Glass Level	2/3 – 3/4				
TI-908, Jacket Water Heat Exchanger Outlet Temperature	°F				
TI-909 After Cooler Heat Exchanger Outlet Temperature	°F				
FI-7979, Appendix R DG Jacket Water Flow (City Water)	≤ 118 gpm				
FI-7979, Appendix R DG Jacket Water Flow (Service Water)	≤ 160 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (City Water)	≤ 87 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (Service Water)	≤ 137 gpm				
Battery Voltage	≥ 24 VDC				

APPENDIX R DG TEST

No: 2-TOP-011

Rev: 0

Page 29 of 30

ATTACHMENT 3 UNIT 2 APPENDIX R DG 10 HOUR DATA SHEETS (Page 5 of 6)

Date: _____

2045 kW – 2065 kW

TIME/ READINGS

PARAMETER	FULL LOAD	480	510	540	570
Appendix R DG Engine Data					
Coolant Temperature	≥ 40 - < 215 °F				
Lube Oil Pressure	≥ 45 psig				
Engine Speed	1800 RPM				
Fuel Pump Pressure	200 - 420 psig @ 1800 RPM				
Fuel Inlet Temperature	≤ 150 °F				
Coolant Pressure	≥ 11 psig				
Lube Oil Temperature	≤ 250 °F				
Lube Oil Level (Between Run High / Run Low)	Midpoint				
Air Intake Temperature	≤ 180 °F				
After Cooler Temperature	≤ 160 °F				
Appendix R DG Alternator Data					
L1 Amps	≤ 113.4 Amps				
L2 Amps	≤ 113.4 Amps				
L3 Amps	≤ 113.4 Amps				
Frequency	59.7 – 60.3 Hz				
Total kW	≤ 2700 kW				
Total kVA	≤ 3375 kVA				
Total PF (nominal 0.9, grid conditions permitting)	(≥ 0.8 - ≤ 0.95)				
Appendix R DG Other Data					
Day Tank Level	7/8 - Full				
PI-8030, Day Tank Fill Pump Pressure	psig				
TE-8027, Day Tank Oil Cooler Temperature	°F				
Lube Oil Reservoir Sight Glass Level	3/4 - Full				
LG-8032, Jacket Water Surge Tank Sight Glass Level	2/3 – 3/4				
LG-8031, After Cooler Surge Tank Sight Glass Level	2/3 – 3/4				
TI-908, Jacket Water Heat Exchanger Outlet Temperature	°F				
TI-909 After Cooler Heat Exchanger Outlet Temperature	°F				
FI-7979, Appendix R DG Jacket Water Flow (City Water)	≤ 118 gpm				
FI-7979, Appendix R DG Jacket Water Flow (Service Water)	≤ 160 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (City Water)	≤ 87 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (Service Water)	≤ 137 gpm				
Battery Voltage	≥ 24 VDC				

APPENDIX R DG TEST

No: 2-TOP-011

Rev: 0

Page 30 of 30

ATTACHMENT 3 UNIT 2 APPENDIX R DG 10 HOUR DATA SHEETS (Page 6 of 6)

Date: _____

2045 kW – 2065 kW

TIME/ READINGS

PARAMETER	FULL LOAD	600	630	660	690
Appendix R DG Engine Data					
Coolant Temperature	≥ 40 - ≤ 215 °F				
Lube Oil Pressure	≥ 45 psig				
Engine Speed	1800 RPM				
Fuel Pump Pressure	200 - 420 psig @ 1800 RPM				
Fuel Inlet Temperature	≤ 150 °F				
Coolant Pressure	≥ 11 psig				
Lube Oil Temperature	≤ 250 °F				
Lube Oil Level (Between Run High / Run Low)	Midpoint				
Air Intake Temperature	≤ 180 °F				
After Cooler Temperature	≤ 160 °F				
Appendix R DG Alternator Data					
L1 Amps	≤ 113.4 Amps				
L2 Amps	≤ 113.4 Amps				
L3 Amps	≤ 113.4 Amps				
Frequency	59.7 – 60.3 Hz				
Total kW	≤ 2700 kW				
Total kVA	≤ 3375 kVA				
Total PF (nominal 0.9, grid conditions permitting)	(≥ 0.8 - ≤ 0.95)				
Appendix R DG Other Data					
Day Tank Level	7/8 - Full				
PI-8030, Day Tank Fill Pump Pressure	psig				
TE-8027, Day Tank Oil Cooler Temperature	°F				
Lube Oil Reservoir Sight Glass Level	3/4 - Full				
LG-8032, Jacket Water Surge Tank Sight Glass Level	2/3 – 3/4				
LG-8031, After Cooler Surge Tank Sight Glass Level	2/3 – 3/4				
TI-908, Jacket Water Heat Exchanger Outlet Temperature	°F				
TI-909 After Cooler Heat Exchanger Outlet Temperature	°F				
FI-7979, Appendix R DG Jacket Water Flow (City Water)	≤ 118 gpm				
FI-7979, Appendix R DG Jacket Water Flow (Service Water)	≤ 160 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (City Water)	≤ 87 gpm				
FI-7980, Appendix R DG Aftercooler Water Flow (Service Water)	≤ 137 gpm				
Battery Voltage	≥ 24 VDC				