1. INTRODUCTORY DESCRIPTION

A. This procedure establishes the methods for testing a DS6820EGRB Generator Module.
B. Environmental ranges: 70 +/- 10 Deg. F. with 20-75% R.H.
C. Unit warm-up/stabilization period requirement: None
D. Personnel using this procedure are expected to have a high degree of confidence and expertise in related testing and calibration procedures.
E. Procedures not explained here are considered to be understood as common practice.

2. TEST EQUIPMENT VERIFICATION

A. Verify the accuracy of the standard(s) used in the repair/calibration process by evidence of recent calibration labeling affixed to the test equipment.
B. All measurement standards used in this procedure shall be traceable to the NATIONAL INSTITUTE of STANDARDS and TECHNOLOGY (N.I.S.T.) and shall have the accuracy, stability, range and resolution required for the intended use.
C. Unless otherwise specified, the collective uncertainty of the Measurement Standard(s) shall not exceed twenty five percent of the acceptable tolerance for each characteristic being calibrated.
D. All deviations shall be documented.

3. EQUIPMENT CLEANING

A. All equipment cleaning will be performed as instructed in the GE T&IC SOP Sec. 14.0

4. EQUIPMENT INSPECTION

A. The following criteria should be used as a guideline or basis for the inspection process of the this unit:
    1. Wires broken or cracked.
    2. Terminal strips / connectors broken or cracked.
    3. Loose wires.
    4. Components visually damaged.
    5. Capacitors leaking.
    6. Solder joint, cold or otherwise inadequate.
    7. Circuit board discolored or burned.
    8. Printed wire runs burned or damaged.

9. *****Warning- In DS6815EGCA units(PFPA w/proms), U10 socketed processor should be Intel

N80C186xl20. The AMD version of this processor should NOT be used, it was found to be "flaky" and cause issues in the field.*********

5. REVISION HISTORY

Revision	Date	Initials	Reason for Revision
A	03/13/01	JDS	Initial Procedure – After Verification
B	6/10/02	RKD	Added (GED) in Procedure Name / Inserted Missing Text, Added Photos
C	06/14/02	MMS	Added line concerning actuator voltage.
D	3/9/07	CW	Line 106 Added Voltage Parameters
E	7/3/14	CRE	Clarified step 44.
F	9/21/18	DWB	Added visual check of U10 processor – 4-A-9
G			
H			
I			
J			
K			

6. REFERENCE DOCUMENTATION

- Reference: DS6820EGRB

7. THEORY OF OPERATION

8. TEST EQUIPMENT TO BE USED

- EGR Test Stand Fixture H033816
- Multimeter

9. FINAL TEST AND OPERATION PROCESS

1. Connect spade connectors to **CTB.**
2. Connect **JPT, JSYSA** and **JAC** molex connector to unit.
3. Remove jumpers from **JD** and connect ribbon cables **JS, JMETER, JD**.
4. Install **JV** plug.
5. Plug relay **K2** into socket. (May already be installed in some units)
6. Install DS6800FASA card onto DS6800FSCA. (May already be installed in some units)

NOTE: DS6800FASA and K2 are options for auto-sync.

7. Verify Function Generator is **OFF.**

Set switches on test fixture as follows.

SWITCH	POSITION
1RGOL	DOWN
ORRUN	DOWN
ORDROOP	DOWN
KW CAL	UP
KVAR	UP
ORLOAD	DOWN
ACT.LOAD	25 OHM
REMOTE OFF	UP
REV.POWER	DOWN
ASYNC MODE	DOWN
REMOTE IDLE	DOWN
ASYNC START	DOWN
BREAKER CHARGED	DOWN

8. Verify 3 ph Current Switch is set to **OFF.**
9. Pull red **ESTOP** out. Verify that **Power On** lamp on test stand is on.
10. Turn **Power Switch** on test stand to **Battery.**
11. Turn **ENGINE CONTROL SWITCH on** Operator Station to **IDLE.**
12. The EGR module will go through Self-Diagnostics. (Takes approx. 20sec.)
13. Regardless of what message after self-test, do the following. Enter the password into the control display of the Operator Station. Pressing the following pressure sensitive switches in the following order enters the password.

    1) STATUS/MENU
    2) 7
    3) 9
    4) EXIT
14. The display will flip between "**TUNE-UP**" and "**DIAGNOSTIC**". Press the "**ENTER**" key when the "**TUNE-UP**" message appears. Messages may be selected by using the scroll keys.

Scroll through the messages until the message "**DEFAULT VALUES**" appears. Then push the "**ENTER**" key. After seeing the next message, press "**ENTER**" key again to load the default values.

15. Press the "**STATUS MENU**" key to return to the main menu.
16. Turn Operator Station to **OFF**.
17. After a few seconds, turn Operator station switch to "**IDLE**" and watch for the following sequence of LED's to light. A**) PS OK** B) **PROCESSOR OK** then after 20 sec. C) **NO FAULT**. The **GEN ONLINE** will not come on during this part of the test.
18. Operator Station will display the following message "**EGR TESTED OK WAITING TO START**".
19. Turn the Operator Station to **OFF** then back to **IDLE**. Watch **KVAR** meter it should go up to **100 KVARS.** The other meters will be tested later.
20. Set the Operator Station to **LOAD** position.
21. Enter password again; refer to step 13 if needed. The display on the Operator Station will scroll between "**TUNE-UP**" and "**DIAGNOSTIC**". Press **ENTER** when **DIAGNOSTIC** message appears.
22. Scroll until display message is "**DISPLAY VAR**", press "**ENTER**" again.
23. Select from the message "**DINAO_F**" and press "**ENTER**" again. The Operator Station will display the following. **DINAO_F 0000010000X11100**
24. Set the Operator Station to "**IDLE"** position. Display reads **0101010000011100.**
25. Set the Operator Station to "**RUN**" position. Display reads **0011010000011100.**
26. Set Test Station switch "**REMOTE IDLE**" to **UP**. Display reads **0111010000011100**.
27. Set Test Station switch "**REMOTE OFF**" to **DOWN**. Display reads **1111010000011100.**
28. Set Test Station switch "**ORLOAD**" to **UP**. Display reads **1111110000011100.**
29. Set Test Station switch "**BREAKER CHARGED**" to **UP**. Display reads **1111110100011100.**

30. Set Test Station switch "**ASYNC MODE**" to **UP**. Display reads **1111110110011100.**

31. Set Test Station switch "**ASYNC START**" to **UP**. Display reads **1111110111011100.**

32. Set Test Station switch "**ORDROOP**" to **UP**. Display reads **1111110111111100.**

33. Exit from the "**DINAO_F"** variable display by pressing the "**EXIT"** key on Operator Station.

34. Select "**DINBO_3"** on the Operator Display, then press "**ENTER".**

35. Set Test Station switch "**REV.POWER**" to **UP**. Display reads **00101111**.

36. Set Test Station switch "**REV.POWER**" to **DOWN**. Display reads **00101011**.

37. Set switches on test fixture as follows.

SWITCH	POSITION
1RGOL	DOWN
ORRUN	DOWN
ORDROOP	UP
KW CAL	UP
KVAR	UP
ORLOAD	DOWN
ACT.LOAD	25 OHM
REMOTE OFF	UP
REV.POWER	DOWN
ASYNC MODE	DOWN
REMOTE IDLE	DOWN
ASYNC START	DOWN
BREAKER CHARGED	DOWN

38. Press "**STATUS/MENU"** on the Operator Station to get back to the message display.

39. Verify that Frequency Generator is set for 8V RMS and the 10Khz range is pushed.

40. Watch the **ACTUATOR VOLTAGE** meter on test stand and the display on Operator Station and verify table below.

FREQUENCY	DISPLAY MESSAGE	ACTUATOR VOLTS
100 TO 200 Hz	ACCEL TO IDLE	Above 6.3V
APPROX.1.7KHz	IDLE	Above 6.3V
APPROX.2.0KHz	ACCEL TO RUN	Above 6.3V
APPROX.3.6KHz	RUNNING	Above 6.3V
APPROX.3.7	RUNNING	0V

41. Increase freqency until the **NO FAULT** LED on Operator Station goes out and **EGR FAULT/ OVERSPEED** flashes on display, this should happen at approx. 4KHz.

42. Decrease frequency to 3.66K Hz.

43. Press **FAULT RESET** key on Operator Station. **NO FAULT** LED will come back on and all faults cleared.

44. Connect the negative of DC meter to TP DCOM and the positive to TP SPD_VRO of EGR module.

45. Adjust Frequency Generator for 6.00 VDC on Multimeter.

46. Enter password again.

47. SCROLL to **DIAGNOSTIC** then **ENTER**.

48. Scroll to **T-P1** then press **ENTER.**

49. Push **CANCEL ENTRY.**

50. Push **SCROLL to SPEED LOOP** then press **ENTER**.

51. Press SCROLL to **SR_TOT** then press **ENTER**.

52. Press **EXIT**.

53. SCROLL to **T-P2** then press **ENTER**

54. Press **CANCEL ENTRY**

55. SCROLL to **VOLTAGE LOOP** then press **ENTER.**

56. SCROLL to **VR_TOT** then press **ENTER.**

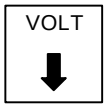
57. Press **STATUS MENU**.

58. Move positive lead of multimeter to TP **T-P1** on EGR module.

59. Press and hold key on Operator Station until multimeter reads greater than 8.0V

60. Press and hold key on Operator Station until multimeter reads less than 7.9V

61. Move positive lead of multimeter to TP **T-P2** on EGR module.



62. Press and hold key on Operator Station until multimeter reads less than 7.7V

63. Press and hold key on Operator Station until multimeter reads greater than 8.2V.

64. Turn Operator Station Engine Control switch to **OFF**.

65. Turn **POWER** switch on test stand to **OFF**.

66. Turn **POWER** switch on test stand to **AC PWR**.

67. Turn Operator Station Engine Control switch to **RUN.**

68. Wait for Self-Test to complete.

69. Verify **AC VOLTMETER** reads 600 to 650V.

70. Verify **UNDER VOLT LED** on test stand is ON.

71. Verify **AC VOLTMETER** reads 60V.

72. Verify **ACTUATOR VOLTAGE** is 6.3 VDC. (Ramps up slowly, Takes a few minutes)

Note: If the actuator voltage does not ramp up to 6.3 volts then slightly decrease incoming frequency.

73. Change the voltmeter switch on the Operator Station to each of the four positions while watching the **AC VOLTMETER** on test stand. Verify that there is a different reading at each position. The difference should be less than 3 minor divisions.

74. Turn the **3 Ph CURRENT SWITCH** to **ON**.

75. Verify that the **KILOWATT** meter reads between 500 and 575.

76. Verify that the **AMPERES** meter reads approx. 500. Turn **AMMETER** switch on Operator Station to all 3 positions. The difference should be less than 3 minor divisions.

77. Verify the following table below and verify the DC voltages at points listed.

JDC-4	JDC-5	JDC-1	JDC-2
-2.15 TO 2.2 V	**+3.5 TO 3.55 V**	**-2.50 TO2.5 5 V**	**+3.8 TO 3.9V**

78. Turn the **3 Ph CURRENT SWITCH** to **OFF**.

79. Set the switches on test stand to the following position.

REMOTE OFF	**UP**
REV POWER	**DOWN**
ASYNC MODE	**UP**
REMOTE IDLE	**DOWN**
ASYNC START	**DOWN**
BREAKER CHARGED	**UP**

80. Jumper TP **OSEL1** to **DCOM** on the EGR Module.

81. Turn the Operator Station switch to the LOAD position. Watch the **BRK CLSD** LED on the test stand and the **GEN ON LINE** LED on Operator Station while moving the **ASYNC START** switch on the test stand to **UP** position. The **GEN ON LINE** and the **BKR CLSD** LED should be **ON**. They will toggle on and off.

82. Remove jumper from **OSEL1.**

83. Turn the Operator Station switch to **IDLE**.

84. Set test stand switches to settings in Step 37.

85. Measure from DCOM on EGR Module to TP1 on Module. Verify the TP1 of Module and TP1 of Operator Station are between 7.8 VDC and 8.2 VDC

86. Measure from DCOM on EGR Module to TP2 on Module. Verify the TP2 of Module and TP2 of Operator Station are between 8.0 VDC and 8.56 VDC

87. Turn the Operator Station switch to **OFF**.

88. Turn **POWER** switch on test stand to **OFF**.

89. Remove **JPT** and **JV** connectors

90. Place **ACTUATOR LOAD** to **45 ohms.**

91. Jumper **OSEL0** and **OSEL1** to **DCOM.**

92. Turn Frequency Generator **OFF**.

93. Turn **POWER** switch on test stand to **AC POWER.**

94. Turn the Operator Station switch **RUN**

95. After 20 sec. The **FIELD VOLTAGE** meter will read between -54 and -57 VDC. (If field voltage reading is low check TB1 cable).

96. After 3 min. the Operator Station will display **EGR TESTED OK WAITING TO START.**

97. Turn **POWER** switch on test stand to **OFF**

98. Turn the Operator Station switch to **OFF**

99. Remove JD ribbon cable and install two berg jumpers across JD 5 to 6 and 7 to 8.

100. Re-connect **JPT** and **JV** connectors.

101. Remove jumper from **OSEL0** and **OSEL1**.

102. Remove **K2** relay from back plane.

103. Turn **POWER** switch on test stand to **BATTERY.**

104. Turn switch on Operator Station to **IDLE**.

105. Operator Station will display **EGR TESTED OK WAITING TO START** after 30 sec.

106. Check power supply voltages at TP on EGR Module. +5, +/-15 and +12 VDC

Voltage Parameters

+5V shall be +4.9V to +5.15V
+15V shall be +14.5V to +16V
-15V shall be -14.5V to –16V
+12V shall be +11.75V to +13V
-12V shall be -11.75V to –13V

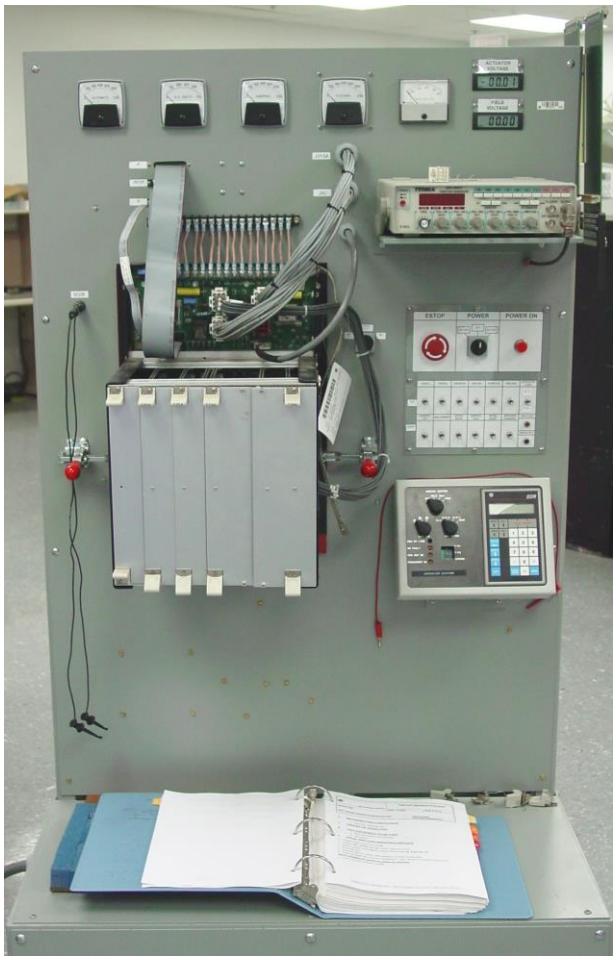
107. Remove DS6800FASA daughter card from DS6800FSCA if test card was installed.

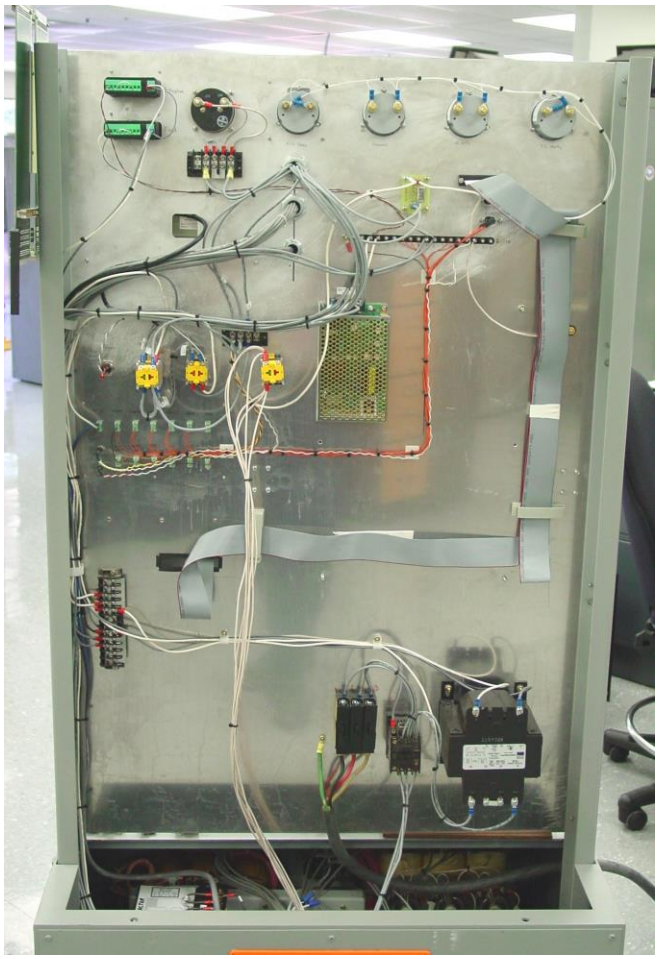
END OF TEST

Default Settings

SWITCH	POSITION
1RGOL	DOWN
ORRUN	DOWN
ORDROOP	DOWN
KW CAL	UP
KVAR	UP
ORLOAD	DOWN
ACT.LOAD	25 OHM
REMOTE OFF	UP
REV.POWER	DOWN
ASYNC MODE	DOWN
REMOTE IDLE	DOWN
ASYNC START	DOWN
BREAKER CHARGED	DOWN

10. SPECIAL INFORMATION





TEST WRITTEN BY: David Smith **DATE:** 3-13-2001

TEST VERIFIED BY: Monte Starling **DATE:** 6-10-2002