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TITLE: DS3800NMEC TEST PROCEDURE		PROCEDURE: LOU-GED-DS3800NMEC-D

1. INTRODUCTORY DESCRIPTION

- A. This procedure establishes the methods for testing a DS3800NMEC Field Exciter Card.
- 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 clean will be performed as instructed in the GEES 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.
 - 7. Circuit board discolored or burned.
 - 8. Printed wire runs burned or damaged.

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5. REVISION HISTORY

Revision	Date	Initials	Reason for Revision
A	3/24/98	JDS	Initial Release
B	6/28/98	JDS	Adjusted tolerances
C	2/2/99	JDS	Added info on firmware
D	6/10/02	RKD	Added section 5 & 6
E			
F			
G			
H			
I			
J			
K			

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6. REFERENCE DOCUMENTATION

- Reference: GEK
- Factory Procedure #

7. THEORY OF OPERATION

- Refer DS3800NMEC and DS3800NEPB
- DS3820PMM_


8. TEST EQUIPMENT TO BE USED

- Inductive load (BLUE CART) Fixture # 381X162
- Fluke 85 or equivalent
- Oscilloscope 2215 or equivalent
- PMM test stand Fixture # H033722
-


9. FINAL TEST AND OPERATION PROCESS

- Any question about what a switch is doing ref to Special Information sect 8 of this procedure
- SETUP on DS3800DMEC (Note jumper is IN when to the right and OUT when left)
- J1E IN
- J2E (NOT USED)
- J3E IN
- J4E IN
- J5E / J6E TO J5E
- J7E IN
- J8E IN
- J9E IN
- J10E IN
- J11E IN
- J12E IN
- J13E IN
- J14E / J15E / J16E TO J15E
- J17E / J18E TO J18E
- J19E IN
- J20E IN


R203 (DMEC) = 18 K OHMS
 R264 (DMEC) = 100 k OHMS
 R36 (DMEC) = 220 k OHMS
 C5 (DMEC) = JUMPER
 R100 (DEPB) = 63 K OHMS
 R101 (DEPB) = 18.2 K OHMS
 J1 (NEPB) = REV

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- J21E / J22E / J23E TO J22E
- J24E / J25E / J26E TO J25E J32E / J33E TO J33E
- J27E IN
- J28E IN
- J29E / J30E TO J29E
- J31E OUT (Located on DS3800NMEC)
- J35E /J36E TO 36E (Located on DS3800DMEC)
- Turn pots (R1-R15) on DS3800DMEC to 50.
- Connect all cables to DS3800NMEC.
- Verify DS3800NEPB and DS3800DMEB are in the marked slots and connected.
- Connect TB1 (FPOS) to RED jack on Inductive Load.
- Connect TB1 (FN) to BLACK 36 ohms jack.
- Verify E-stop is pushed in on Test Panel.
- Plug AC power cord into 240 VAC.
- Connect Multimeter to RED and BLACK jacks of Inductive Load. Set to DC volts.
- To setup Test Panel turn DELAY RESET left and all others to the right.
- Turn R5 (IR COMP DMEC) fully CCW (Located on DS3800DMEC).
- Twist E-stop to the right, Test meter will come on and LED's on DS3800DMEC will flash, except ALM and MOV will be out. **NOTE: Boards with firmware version 1AB or higher this will not happen.**
- Check all power supply voltages at test points on DS3800NMEC and verify they are within 0.1 VDC ACOM=TP14 P15=TP11 P5=TP12 N15=TP13
- Push RESET on DS3800DMEC (SW1).
- All LED's will go out.
- Turn TACH to ON (located on test panel) and MOV LED will come on solid.
- After a 3 to 4 min. delay ALM LED will be solid and TOL LED's will be blinking. Don't be concern with IOC flashing.(DMEC CR83) . **NOTE: Boards with firmware version 1AB or higher this will not happen.**
- Turn Test Meter switch to IF.
- Adjust R3 MIN FLD for + 6 VDC +/- 1 VDC.
- The Field voltage will be approx. + 23 to 26 VDC (inductive load meter)
- With an Oscilloscope measure from ground(ACOM) to pin 1 of U7 (NMEC G10)
- Adjust R19 on DS3800NMEC for 14 to16 Vpp. The waveform will be a triangle with a frequency of 60 Hz.
- May need to re-adjust R3 (DMEC) back to + 6 VDC.
- Turn CEMF switch to ON. (ON TEST PANEL)

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- Output on FPOS to FN will measure + 36 VDC +/- 3 VDC.(inductive load meter)
- Adjust R1 (IF CAL DMEC) for approx. +9 VDC +/- .1 VDC.
- Output on FPOS to FN will drop to + 30 VDC +/- 3 VDC.(inductive load meter)
- Turn Test Meter switch to IA.
- Adjust R4 (IA CAL DMEC) for approx. -9 VDC +/- .1 VDC.
- Turn Test Meter switch to SUM I.
- Adjust R7 (%MD DMEC) fully CCW then CW for approx. -9 VDC +/- .2 VDC. This adjustment is very jittery.
- Turn Test Meter switch to IF meter will read approx. +9 VDC +/- .2 VDC.
- Output on FPOS to FN will be + 30 VDC +/- 3 VDC.
- Turn MOTOR to FWD.(TEST PANEL)
- IF on Test Meter will read approx. -9 VDC +/- .2 VDC.
- Turn Test Meter switch to I POS. should read + 8.2 VDC +/- .2 VDC.
- Turn Test Meter switch to I NEG should read 0 VDC.
- Output on FPOS to FN will be - 38 VDC +/- 3 VDC.(inductive load meter)
- FLOSS LED (DMEC) may come on. Press RESET on Test Panel to clear.
- Turn MOTOR to REV.(TEST PANEL)
- Turn Test Meter switch to I POS. should read + 0 VDC.
- Turn Test Meter switch to I NEG should read - 8.6 VDC +/- .1 VDC.
- Output on FPOS to FN will return to +30 VDC +/- 3 VDC.(inductive load meter)
- Turn CEMF to off. (ON TEST PANEL)
- Turn Test Meter switch to IF.
- Turn F-REF to on.(NOTICE:THERE ARE TWO F REF)
- Test Meter will display + 6.5 VDC +/- .2 VDC.
- Turn F-REF 5V/10V to 10V.
- Test Meter will display + 9 VDC +/- .2 VDC.
- Turn F-REF 5V/10V to 5V.
- Test Meter will display + 6.5 VDC +/- .2 VDC.
- Turn F-REF to OFF.
- Turn FLD. PRESET to ON.
- Adjust R15 PRESET (DMEC) for +7.5 VDC +/- .1 VDC on the Test Meter.
- Turn FLD. PRESET to OFF.
- Test Meter will display + 6.5 VDC +/- .2 VDC.
- Turn FLD. PRESET to ON.
- Test Meter will display + 7.5 VDC +/- .3 VDC.
- Turn FLD. PRESET to OFF.

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- Turn TACH to OFF.
- Turn R9 (TOL DMEC) fully CCW.
- Select IA on Test Meter.
- Press in E-Stop , then pull back out.(recycling power)
- Press RESET after field comes on.
- Move J31E on DS3800NMEC to IN.
- IOC will come on and flash. After a 30 seconds +/- 5 seconds ALM will come on. After an additional 10 seconds +/- 2 seconds TOL will come on solid.
- Turn R9 (TOL DMEC) fully CW.
- Move J31E on DS3800NMEC to OUT.
- Turn TACH to ON.
- Turn TACH to OFF then press RESET.
- Move J31E on DS3800NMEC to IN.
- IOC will come on and flash. After a 5 seconds +/- 1 second ALM will come on. After an additional 2 seconds +/- 1 seconds TOL will come on solid.
- Move jumper J31E on DS3800NMEC to OUT.
- Turn R9 (TOL DMEC) fully CCW.
- Turn TACH to ON then to OFF.
- Press RESET on Test Panel.
- Turn TACH to ON.
- Turn R8 (IOC DMEC) fully CW.
- Turn R8 (IOC DMEC) slowly CCW until IOC LED flashes. This should occur at approx. 45 on pot
- Turn R8 (IOC DMEC) fully CW and press RESET, IOC should go out.
- With a multimeter monitor the voltage at TP6 on DS3800DMEC.(ACOM TP8)
- Turn R14 (OS DMEC) fully CW.
- Turn TACH POL to NEG.
- Turn R12(SPD ADJ DMEC) fully CW the meter will read -5 VDC +/- .1 VDC
- Slowly adjust R12 (SPD ADJ DMEC) CCW until meter reads - 0.72 VDC then adjust to - 4 VDC +/- .2VDC.
- Adjust R14 (OS DMEC) CCW until OS LED flashes. This happens at approx. 25 on the pot.
- Return R14 (OS DMEC) fully CW and press RESET on Test Panel, OS should go out after RESET.
- Turn TACH to OFF and any other switches to the OFF position.
- Turn R2 (FLD LOSS DMEC) CW until F LOSS LED comes on.

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- Press RESET, F LOSS LED should stay on or blink.
- Turn CEMF to ON and press RESET.
- F LOSS LED should go out and stay out.
- Turn R2 (FLOSS DMEC) back to pot setting of 60.
- Press RESET.
- Turn Test Meter switch to IF.
- Turn TACH to ON.
- Turn R6 (CMPD DMEC) CW. IF current will increase to + 10 VDC +/- .2.
- Turn R6 (CMPD DMEC) CCW. IF current will decrease to + 8.5 VDC +/- .2.
- Return R6 (CMPD DMEC) to pot setting of 50.
- Turn TACH to OFF.
- Turn CEMF to OFF.
- Press RESET.
- Turn TACH to ON; MOV LED will come on solid.
- Turn CEMF to ON.
- Press RESET.
- Turn TACH to OFF; TACH LOSS LED should flash.
- Turn CEMF to OFF.
- Press RESET. TACH LOSS should go out.
- Turn TACH to ON.
- Turn CEMF to ON.
- Select IF on Test Meter.
- Turn TEST IA switch to POS., It should reduce to + 6.5 VDC +/- .2 VDC.
- MOV LED should be on solid.
- Turn Test Meter selectors switch to CEMF.
- Turn R10 (CEMF DMEC) until Test Meter reads + 5.0 VDC +/- .1 VDC.
- Press RESET.
- Turn R11 (Overvolts DMEC) fully CW.
- Slowly adjust R11 (Overvolts DMEC) CCW until OV LED flashes.
- Return R11 OV to a pot Setting of 50.
- Turn TACH to OFF and the TACH LOSS LED should come on.
- Turn TACH back ON.
- Press RESET on Test Panel.
- Turn all switches to the right except DELAY RESET.
- Adjust R16(ZERO SPD DMEC) CCW until MOV LED comes on then turn CW until it goes out , then turn and additional ½ turn CW

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- Turn TACH to ON.
- Turn CEMF to ON.
- Turn Test Meter to IF.
- Turn R5 (IR COMP DMEC) CW and IF will decrease to + 6.5 VDC +/- .1 VDC.
- Turn R5 (IR COMP DMEC) fully CCW.
- Turn SUICIDE switch to ON , IF will go to +11 to +12 VDC
- Press in E-stop.
- Turn all switches to the right except DELAY RESET.
- End of test.

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8. SPECIAL INFORMATION

- DELAY RESET - (NOT USED ON NMEC)
- FLD PRESET - WHEN ON SETS FLD TO VALUE DETERMINED BY R15 PRESET.
- TACH ON/OFF - TAKES VOLTAGE OFF INPUT JH4
- FLT MASK - INHIBITS TOL LED
- RESET - EXTERNAL RESET ON INPUT JH20
- F-REF ON/OFF - TURNS ON/OFF INPUT TO TB1 FREF
- F-REF 5V/10V - CHANGES INPUT VOLTAGE TO TB1 FREF
- TACH POL. - CHANGES INPUT VOLTAGE TO JH4 FROM +/-
- MOTOR FWD/REV CHANGES FLD POLARITY
- SUICIDE - CAUSES OUPUT TO INCREASE .MUST CYCLE POWER TO CORRECT
- CEMF ON/OFF - APPLIES INPUT TO JH15
- TEST IA - TURNS ON INPUT TO MN

TEST WRITTEN BY: David Smith DATE: 3-24-98

TEST VERIFIED BY: Darren E. Johnson DATE: 3-25-98