

MANDATORY SERVICE BULLETIN**NUMBER:** SB13-10**REVISION:** 00**DATE:** December 3, 2013**SUBJECT:** INSPECTION AND REPLACEMENT OR MODIFICATION OF MASTER CONTROL UNIT**EFFECTIVITY:**

KODIAK® 100 Series Aircraft Serial Numbers: 100-0001 through 100-0096

SUMMARY:

The accompanying Field Service Instruction provides instruction for inspecting the electrical studs of the KODIAK® 100 Master Control Unit (MCU), replacing or modifying the MCU as necessary, and testing the MCU.

COMPLIANCE:

Section 4 of FSI-049 must be completed and form submitted to Quest Customer Service, within the next 10 flight hours or Annual Inspection, whichever comes first. Modification of the MCU must be completed with or before the next 100 Hour Inspection or Annual Inspection, whichever comes first. For MCU replacement, contact Quest Customer Service directly to schedule the order of a replacement unit*.

ATTACHED DOCUMENTS:

| Document #: | Document Title: |
|-------------|---|
| FSI-049 | INSPECTION AND REPLACEMENT OR MODIFICATION OF MASTER CONTROL UNIT |

FAA APPROVAL STATUS:

The instructions attached to this Service Bulletin have demonstrated compliance with all applicable Federal Aviation Regulations and are approved by the Federal Aviation Administration.

CREDIT AND WARRANTY INFORMATION:

Aircraft under factory warranty: If MCU replacement is required, Quest will supply one replacement MCU per aircraft at no cost* to owner, and reimburse labor costs up to \$212.50. If MCU modification is required, Quest will supply one MCU modification kit PN JB405-2-KIT per aircraft at no cost* to owner, and reimburse labor costs up to \$170.00.

Aircraft no longer under factory warranty, and MCUs that have been modified post original C of A: An MCU is available for purchase for \$5,781.36, and a modification kit is available for \$57.77 (prices subject to change). Contact Quest Customer Service to order.

Quest Customer Service**Service Bulletin: SB13-10****Phone: (208)263-1111 Toll Free: 1(866)263-1112****Email: Customerservice@questaircraft.com****SPECIAL INSTRUCTIONS:**

*For replacement MCU to be ordered under warranty, a completed Master Control Unit Inspection Form must be received by Quest Customer Service, and an RMA issued for the return of the inspected MCU. Returned MCU must be received by Quest Customer Service within 30 days of RMA issue, for replacement MCU to be eligible for coverage under warranty.



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TITLE: Inspection and Replacement or Modification of the MCU

APPLICABLE TO AIRCRAFT: 100-0001 thru 100-0096

JASC CODE: 2400

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REVISION: 03

SUBJECT

This Field Service Instruction provides instruction for inspecting the electrical studs of the KODIAK[®] 100 Master Control Unit (MCU), replacing or modifying the MCU as necessary, and testing the MCU.

AFFECTED MANUALS AND PUBLICATIONS

None

INDUSTRY REFERENCES

None

WEIGHT AND BALANCE

Negligible

MANPOWER

The estimated man-hours and minimum number of persons required to perform this Field Service Instruction are listed below. The "Minimum Persons" refers only to maintenance personnel or installers, and unless otherwise specified within this instruction does not include additional personnel that may be needed solely to comply with safety requirements (for example, safety observers that are not performing tasks within this instruction). It is the responsibility of maintenance personnel to comply with safety requirements, including having a safety observer available as needed.

Estimated Man-hours:

Inspection and MCU Replacement: 2.5 hours

Inspection and modification: 2 hours

Minimum Persons:

1 Person

If more than the minimum personnel perform this instruction, the actual man-hours required may be reduced due to increased efficiencies. As appropriate, Quest encourages the use of additional personnel; man-hour estimates are based on the minimum personnel required.

RECORD OF COMPLETION

- Update the appropriate maintenance records
- Complete **Attachment A-1**, Master Control Unit Inspection, and submit to Quest Aircraft Company
- Ensure the KODIAK[®] 100 Pilot's Operating Handbook/Airplane Flight Manual is up-to-date with the current revision
- Ensure the KODIAK[®] 100 Airplane Maintenance Manual is up-to-date with the current revision

QUEST Aircraft Company, LLC
1200 Turbine Drive
Sandpoint, ID 83864

▲ DISCLAIMER ▲

The instructions / procedures presented herein are based upon the systems and components of the aircraft when it was delivered from the factory, or as modified by Quest Service Bulletins. Third-party modifications that have affected any component, system, or operating characteristic discussed by this document may invalidate the instructions / procedures provided. Before performing the instructions / procedures herein, examine all Supplemental Type Certificate (STC), Supplemental Type Authority (STA), or equivalently authorized modifications to verify that the instructions/procedures presented in this document can be properly completed. If an aircraft has an STC, STA, or equivalently authorized modification that affects any component, system, or operating characteristic also affected by this document, the operator is responsible for obtaining appropriate regulatory approval before performing the instructions / procedures herein. Quest Aircraft Company cannot be responsible for the quality of work performed in accomplishing the requirements of this document.

If you have any questions as to the applicability of this document to your specific aircraft, contact Quest Customer Service by telephone at (208) 263-1111, toll-free at (866) 263-1112, or via email at CustomerService@QuestAircraft.com



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REVISION RECORD

| REV | PAGE | CHANGE DESCRIPTION |
|-----|------|---|
| 00 | All | Initial Release |
| 01 | 1 | Changed estimated man-hours for "MCU Inspection and Replacement" from 3 hours to 2.5 hours. |
| 02 | 1 | Corrected typo: changed KODAK to KODIAK. |
| 03 | All | Combined with FSI-067, <i>Master Control Unit Upgrade</i> . Reorganized throughout. Changed the title from <i>Inspection and Replacement of Master Control Unit</i> to <i>Inspection and Replacement or Modification of the MCU</i> . |



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MASTER CONTROL UNIT INSPECTION 1



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1. Special Safety Instructions

1.1 Warnings

Failure to comply with “Warnings” contained in this instruction may result in financial loss, significant delay in the completion time, and/or serious injury to personnel.

1.2 Cautions

Failure to comply with “Cautions” contained in this instruction may result in the destruction of components, unnecessary complications, the need to reverse completed work, and/or delays in the completion time.

1.3 Notes

“Notes” are provided when additional information may lead to an increase in efficiency.

2. Parts, Tools, and Equipment

The following tables describe the parts, tools, and equipment necessary to successfully complete **Section 5.2** (Modify the MCU) of this instruction, if applicable.

Table 2-1: Parts and Tools Included in the Service Kit

| Item # | Part No. | Qty | Description | Drawing No. | Dwg Item # |
|--------|---------------|-----|--|-------------|------------|
| 2-1-1 | JB405-2-KIT-1 | 1 | Kit includes: #732 RTV Silicone MS3367-4-9 Cable Ties M22759/16-18-2 Wire, red 18ga Terminal, 5/16” Ring Terminal, #10 Ring Terminal, Butt-splice MS25171-1S Rubber Boot Label, Tag (to identify modification) | N/A | N/A |

Table 2-2: Consumables Included in the Service Kit

| Item # | Part No. | Qty | Description | Drawing No. | Dwg Item # |
|--------|----------|-----|-------------|-------------|------------|
| 2-2-1 | N/A | | N/A | N/A | N/A |

Table 2-3: Serial-Number-Specific Parts Included in the Service Kit

| Item # | Part No. | Qty | Description | Drawing No. | Dwg Item # |
|--------|----------|-----|-------------|-------------|------------|
| 2-3-1 | N/A | | N/A | N/A | N/A |



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Table 2-4: Parts and Tools NOT Included in the Service Kit

| Item # | Part No. | Qty | Description | Drawing No. | Dwg Item # |
|--------|------------------------|-----|----------------------------|-------------|------------|
| 2-4-1 | Commercially Available | 1 | Torque Wrench (in-lbs.) | N/A | N/A |
| 2-4-2 | Commercially Available | 1 | Torx (T25) Screwdriver | N/A | N/A |
| 2-4-3 | Commercially Available | 1 | Standard 1/4" Screwdriver | N/A | N/A |
| 2-4-4 | Commercially Available | 1 | Wire Cutter | N/A | N/A |
| 2-4-5 | Commercially Available | 1 | Wire Stripper | N/A | N/A |
| 2-4-6 | Commercially Available | 1 | Amp/Tyco #58433 Crimp Tool | N/A | N/A |
| 2-4-7 | Commercially Available | 1 | 6M Hex Socket | N/A | N/A |
| 2-4-8 | Commercially Available | 1 | 4" Socket Extension | N/A | N/A |

3. General

This Field Service Instruction begins with an inspection of the electrical studs on the Master Control Unit (MCU). The condition of the electrical studs determines which procedures to follow:

- If the electrical studs are not properly plated, replacement of the MCU is required.
- If the studs are properly plated, replacement of the MCU is not required, but modification is required.

Complete procedures begin at **Section 4**.

▲ NOTE ▲

To ensure clarity, this document should be printed in color, not black and white.

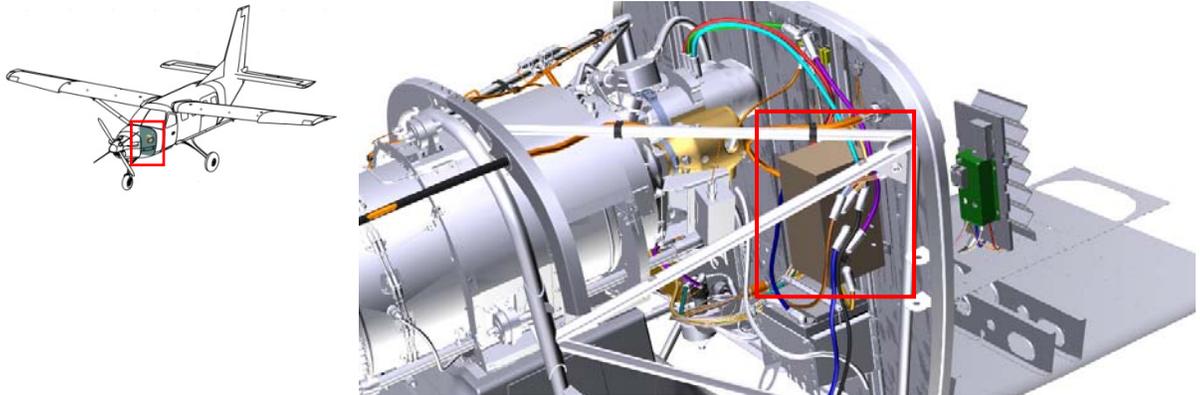


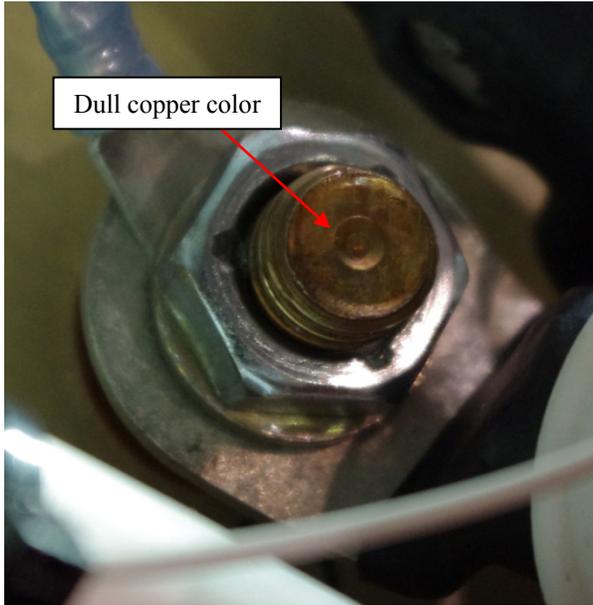
Figure 3-1: Master Control Unit

4. Preparation

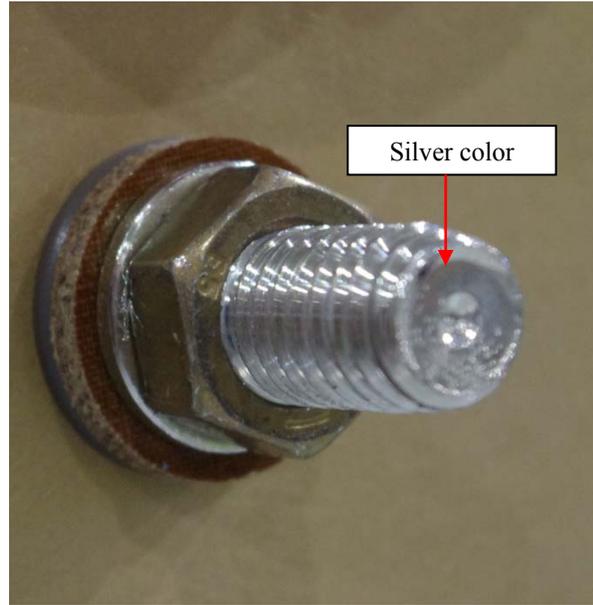
▲ NOTE ▲

The protective rubber boots need to be lifted temporarily to properly inspect all electrical studs. Ensure that all the protective rubber boots are replaced when the inspection is complete.

1. Ensure that the master switch is in the “OFF” position.
2. Inspect all eleven (11) electrical studs to determine if they are plated as shown in **Figure 4-1**.
3. Document and proceed in accordance with the instructions at **Table 4-1**.



(A) Unplated Electrical Stud



(B) Plated Electrical Stud

Figure 4-1: MCU Electrical Studs

Table 4-1: Overview of Procedures

| | |
|---|---|
| <p>If any of the electrical studs appear as shown in Figure 4.1 (A), Unplated Electrical Stud . . .</p> | <p>If all of the electrical studs appear as shown in Figure 4.1 (B), Plated Electrical Stud . . .</p> |
| <ol style="list-style-type: none"> 1. Complete Part A and Part B of Attachment A-1, "Master Control Unit Inspection." * 2. Submit the form to Quest Aircraft as shown on the form. 3. Contact Quest Aircraft and request a replacement MCU (P/N JB405-2). 4. When the replacement MCU arrives, proceed to Section 5.1 of this Field Service Instruction (Replace the MCU). | <ol style="list-style-type: none"> 1. Complete Part A and Part C of Attachment A-1, "Master Control Unit Inspection." * 2. Submit the form to Quest Aircraft as shown on the form. 3. Contact Quest Aircraft and request an upgrade kit (P/N JB405-2-KIT-1). 4. Proceed to Section 5.2 of this Field Service Instruction (Modify the MCU). <p>NOTE: If the MCU is tagged Rev D (or later), compliance with Section 5.2 has been previously met. Proceed to Section 6.2 of this Field Service Instruction (Records of Completion).</p> |

* Must be signed by the Airframe and Power Plant (A&P) Mechanic who performs the inspection.

* Must be signed by the Airframe and Power Plant (A&P) Mechanic who performs the inspection.



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5. Instructions

5.1 Replace the MCU

Perform the procedures in **Section 5.1 ONLY IF** Quest Aircraft has provided a replacement MCU.

5.1.1 Install the MCU

Remove the old MCU and install the replacement MCU (P/N JB405-2) in accordance with the *KODIAK[®] 100 Airplane Maintenance Manual*, Chapter 24.

5.1.2 Test

Perform a functional test of the installed MCU as follows:

1. Turn the master and avionics switches to the **ON** position.
2. Verify that all three G1000 displays and the avionics equipment are powered up.
3. Verify that the **GEN FAIL** and **ALTERNATOR FAIL** crew advisory system (CAS) messages appear.
4. Connect the ground power cart.
5. Verify main and essential bus voltage increase.
6. Remove the ground power cart.
7. Perform engine **LO START** as outlined in **Section 4** of the *KODIAK[®] 100 Pilot's Operating Handbook*.
8. Turn the **AUX BUS** switch to the **ON** position and verify that the environmental control system (ECS) control head is powered up.
9. Turn the **AUX BUS** switch to the **OFF** position.
10. Perform engine shutdown as outlined in **Section 4** of the *KODIAK[®] 100 Pilot's Operating Handbook*.
11. Perform **HI START** as outlined in **Section 4** of the *KODIAK[®] 100 Pilot's Operating Handbook*.
12. After successful start, turn the generator switch to the **ON** position.
13. Verify that the **GEN FAIL** CAS message extinguishes, generator amps increase, and the main bus voltage stabilizes between 27.0 and 28.2 volts.
14. Turn the alternator switch to the **ON** position.
15. Verify that the **ALTERNATOR FAIL** CAS message extinguishes, the alternator amps increase, and the essential bus voltage stabilizes between 28.3 and 29.1 volts.
16. Perform engine shutdown as outlined in **Section 4** of the *KODIAK[®] 100 Pilot's Operating Handbook*.
17. Verify that the engine Hobbs Meter recorded the correct engine run time.

5.1.3 Record Work

Proceed to **Section 6.2** of this Field Service Instruction, Records of Completion.



Skip **Section 5.2** of this Field Service Instruction. Do not modify the new MCU.



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5.2 Modify the MCU

Perform the procedures in **Section 5.2 ONLY IF** documentation of properly plated electrical studs has been provided to Quest Aircraft in accordance with **Section 4.1**, and if Quest has provided an upgrade kit (P/N JB405-2-KIT-1).

▲ NOTE ▲

If the MCU is tagged **Rev D** (or later), compliance with Section 5.2 has been previously met. Proceed to **Section 6.2**, Records of Completion.

5.2.1 Test the MCU

Before modifying the MCU, perform a functional test of the installed MCU to ensure the MCU is operating correctly, as follows:

1. Turn the master and avionics switches to the **ON** position.
2. Verify that all three G1000 displays and the avionics equipment are powered up.
3. Verify that the GEN FAIL and ALTERNATOR FAIL crew advisory system (CAS) messages appear.
4. Connect the ground power cart.
5. Verify main and essential bus voltage increase.
6. Remove the ground power cart.
7. Perform engine LO START as outlined in **Section 4** of the *KODIAK[®] 100 Pilot's Operating Handbook*.
8. Turn the **AUX BUS** switch on, and verify that the environmental control system (ECS) control head is powered up.
9. Turn the **AUX BUS** switch to the OFF position.
10. Perform engine shutdown as outlined in **Section 4** of the *KODIAK[®] 100 Pilot's Operating Handbook*.
11. Perform **HI START** as outlined in **Section 4** of the *KODIAK 100[®] Pilot's Operating Handbook*.
12. After successful start, turn the generator switch to the **ON** position.
13. Verify that the **GEN FAIL** CAS message extinguishes, generator amps increase, and the main bus voltage stabilizes between 27.0 and 28.2 volts.
14. Turn the alternator switch to the **ON** position.
15. Verify that the **ALTERNATOR FAIL** CAS message extinguishes, the alternator amps increase, and the essential bus voltage stabilizes between 28.3 and 29.1 volts.
16. Perform engine shutdown as outlined in Section 4 of the *KODIAK[®] 100 Pilot's Operating Handbook*.
17. Verify that the engine Hobbs Meter recorded the correct engine run time.

5.2.2 Access the MCU

1. Disconnect the airplane batteries.
2. Remove the six (6) bolts attaching the oil cooler exit duct to the oil cooler and remove the exit air duct.

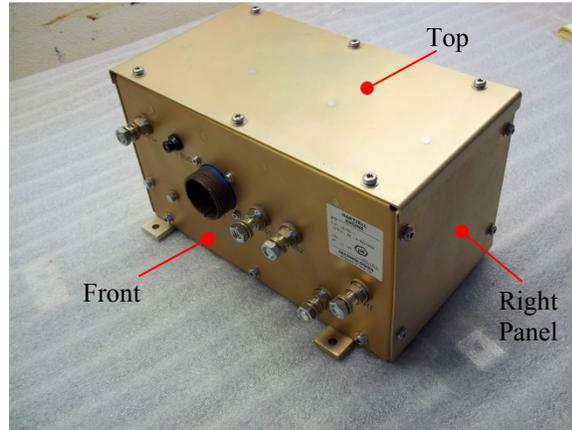


Figure 5-1: MCU

▲ NOTE ▲

The following procedures may be performed with the MCU installed in the aircraft. For clarity, the illustrations show the MCU removed from the aircraft.

5.2.3 Prepare the MCU

1. Remove six (6) T25 screws from the MCU top cover (**Figure 5-2A**).
2. Unplug the generator control unit and function module (**Figure 5-2B**). Set the top cover aside.



Figure 5-2: Unplug Generator Control Unit and Function Module

3. Carefully cut and remove the cable tie from the right side panel (**Figure 5-3A**).
4. Separate the harness bundle (**Figure 5-3B**).

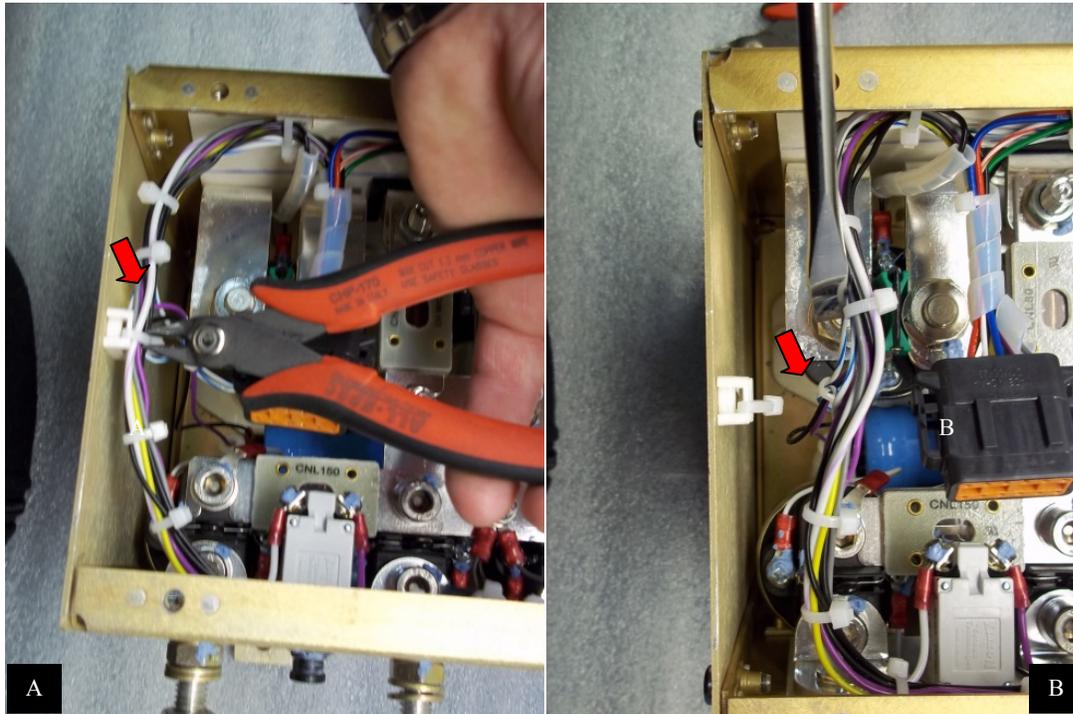


Figure 5-3: Separate Harness Bundle

5. Remove the MCU side panel by removing four (4) T25 screws (**Figure 5-4A**). Set the side panel aside.
6. Locate the capacitor (**Figure 5-4B**).

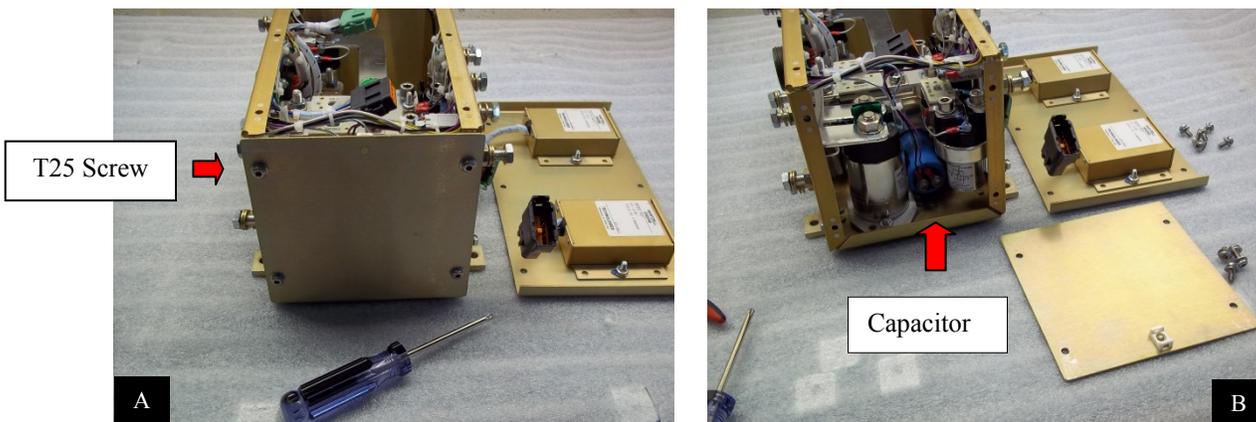


Figure 5-4: Access Capacitor

7. Remove the wires on the capacitor by removing two screws (**Figure 5-5**).

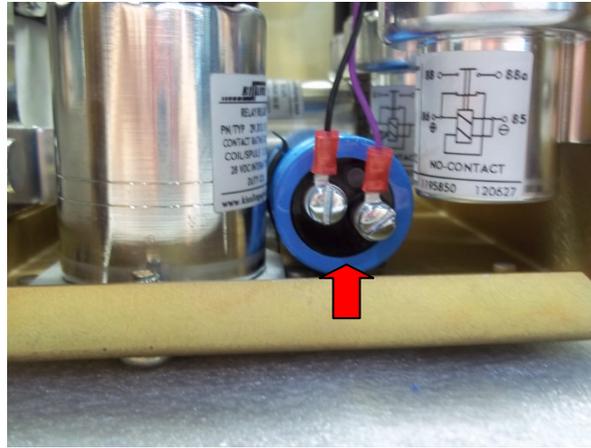


Figure 5-5: Remove Capacitor Wires

8. Follow the purple wire from the capacitor to locate the connection at the generator contactor (**Figure 5-6**).

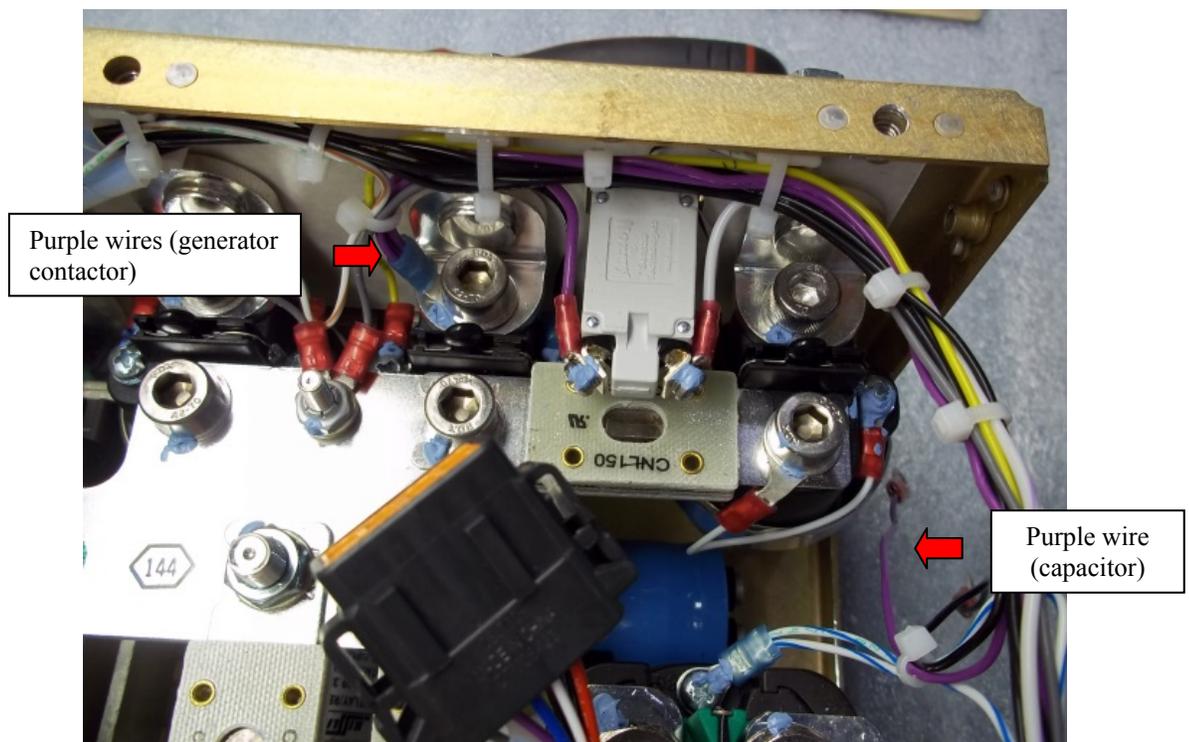


Figure 5-6: Locate Generator Contactor Connection

9. Remove the screw holding the ring terminal to the generator contactor (Figure 5-7).

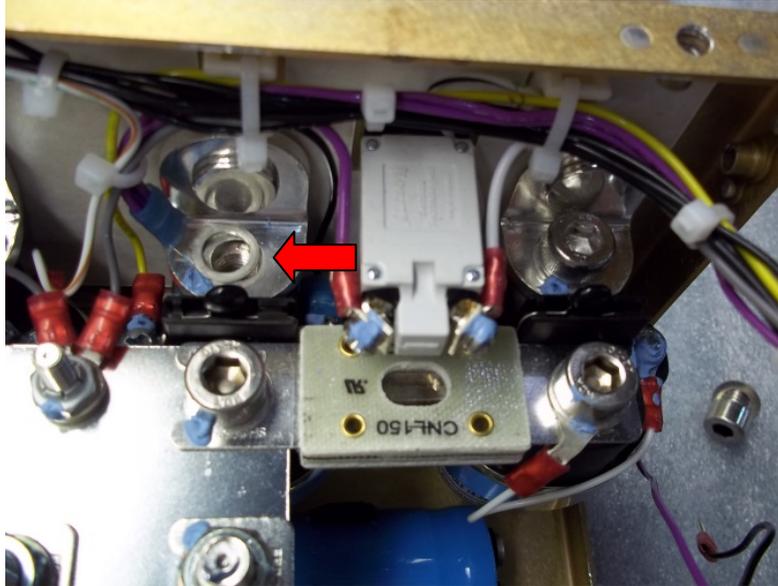


Figure 5-7: Remove Screw at Ring Terminal

10. Carefully cut the cable ties along the harness body and free up the purple wire that runs from the capacitor to the generator contactor (Figure 5-8A).
11. Cut off the 5/16 inch ring terminal (Figure 5-8B).
12. Discard the terminal and purple wire that ran from the capacitor to the generator contactor.

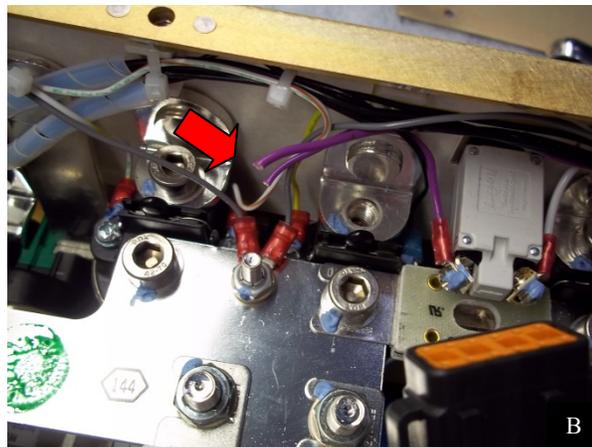
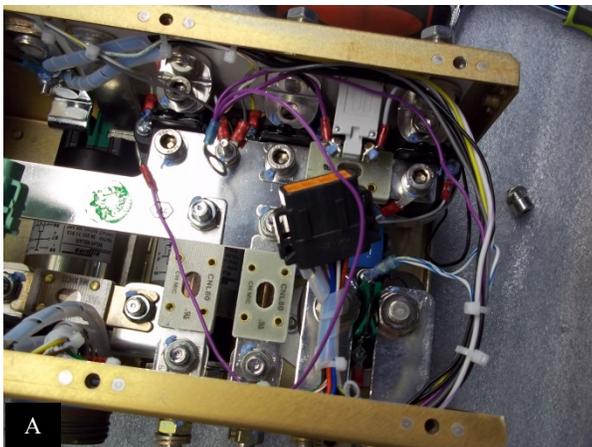


Figure 5-8: Remove Ring Terminal

5.2.4 Install New Ring Terminal

1. Strip the remaining two (2) purple wires 1/4 inch and twist together (**Figure 5-9A**).
2. Crimp the 5/16 inch ring terminal (supplied with the kit) onto the two (2) remaining purple wires (**Figure 5-9B**).

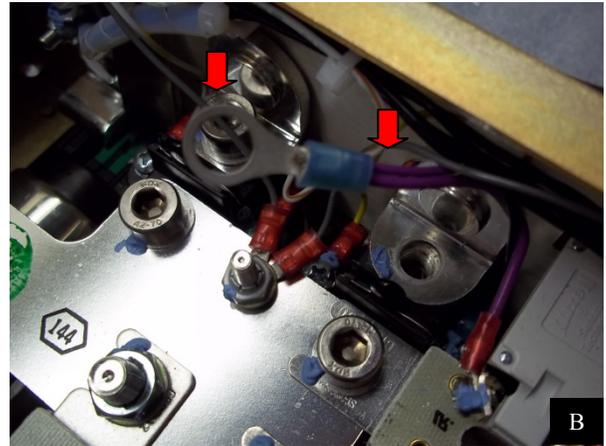
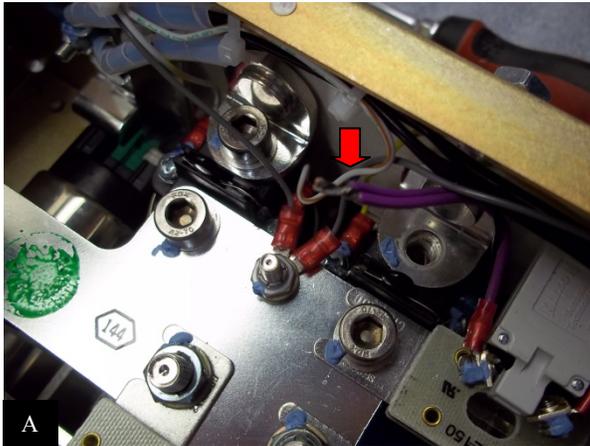


Figure 5-9: Install Ring Terminal

5.2.5 Reinstall Generator Contactor Screw

1. Install the ring terminal with two (2) purple wires under the screw to the generator contactor and torque to 80 – 100 in-lb (**Figure 5-10A**).
2. Replace the cable ties to secure the wire harness bundle (**Figure 5-10B**).

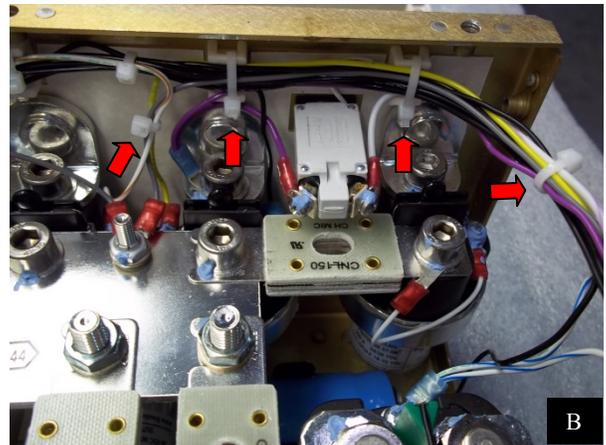
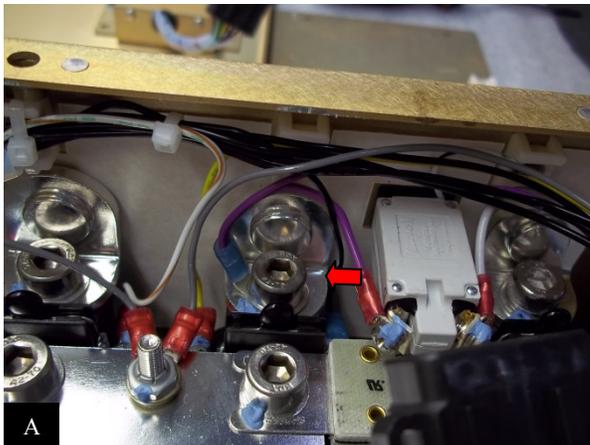


Figure 5-10: Reinstall Generator Contactor Screw

5.2.6 Prepare Wire to Install on Harness

1. Install the rubber boot on the red wire (**Figure 5-11A**).
2. Strip the wire 1/8 inch and crimp on the #10 ring terminal (**Figure 5-11A**).
3. Carefully cut the cable ties along the harness body and free up the red wire behind the generator control unit (GCU) connector (**Figure 5-11B**).

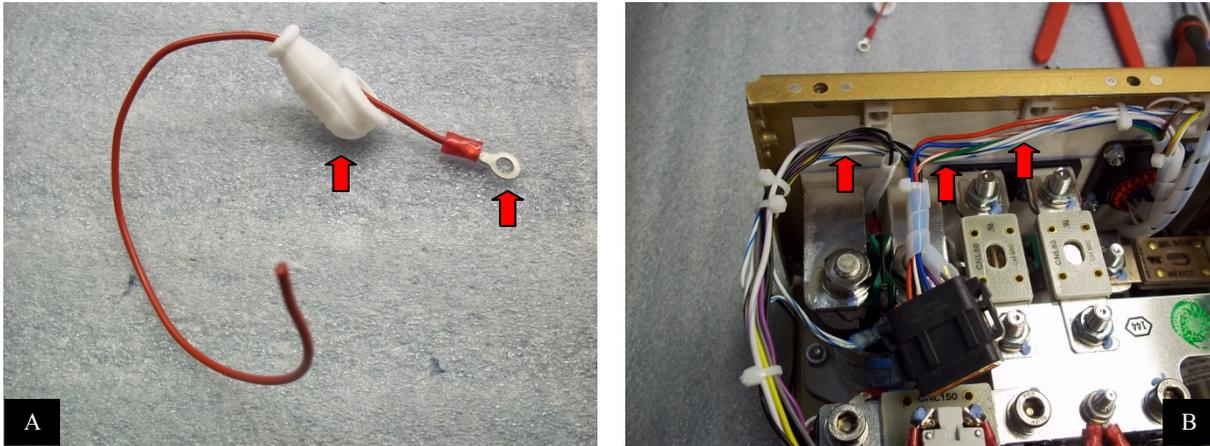


Figure 5-11: Prepare Wire

5.2.7 Install Wire on Harness

1. Cut the red wire in the harness 2.5 inches away from the GCU plug (**Figure 5-12A**).
2. Splice the new red wire supplied in the kit with the red wire in the harness (**Figure 5-12B**).

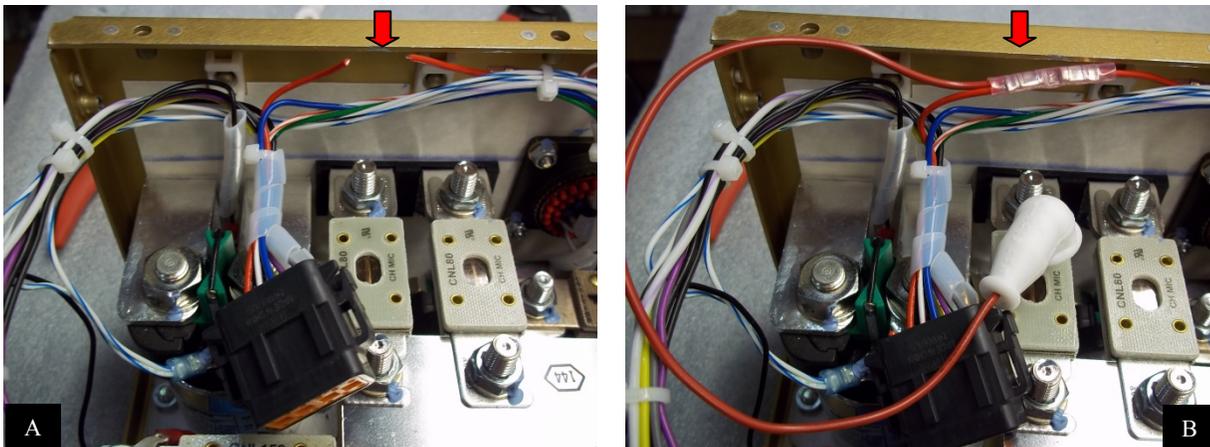


Figure 5-12: Install Wire

5.2.8 Secure the Wire to the Harness Bundle

1. Route the red wire to the capacitor location (**Figure 5-13A**).
2. Install cable ties to secure the wire (**Figure 5-13A**).
3. Install cable ties to secure the wire harness (**Figure 5-13B**).

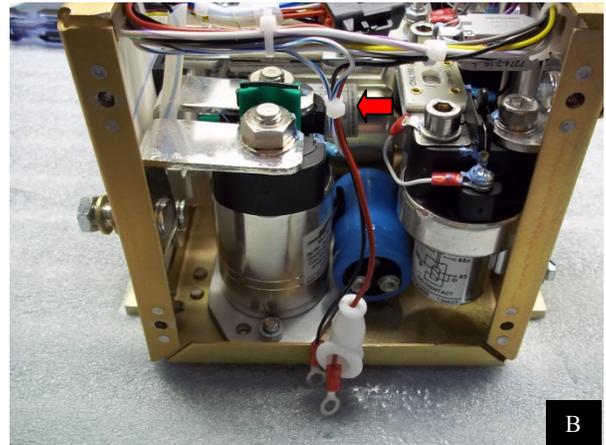
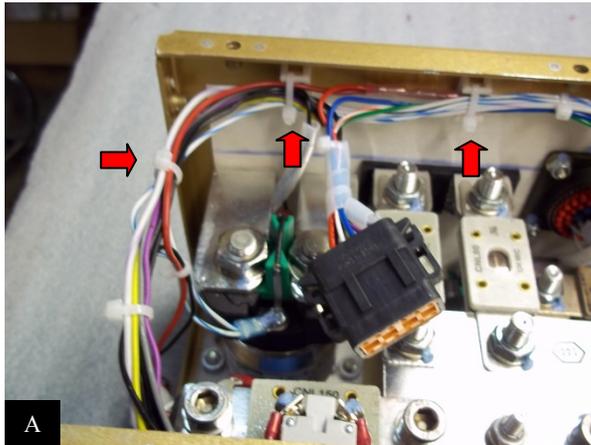


Figure 5-13: Secure Wire

5.2.9 Install Wires onto Capacitor

1. Install the red wire onto the positive (+) side of the capacitor (**Figure 5-14A**).

⚠ CAUTION ⚠

Red wire must go to the positive (+) side of the capacitor.

2. Torque to 15 in-lbs.
3. Slide the boot over the terminal and install the black wire (**Figure 5-14B**).
4. Torque to 15 in-lbs.

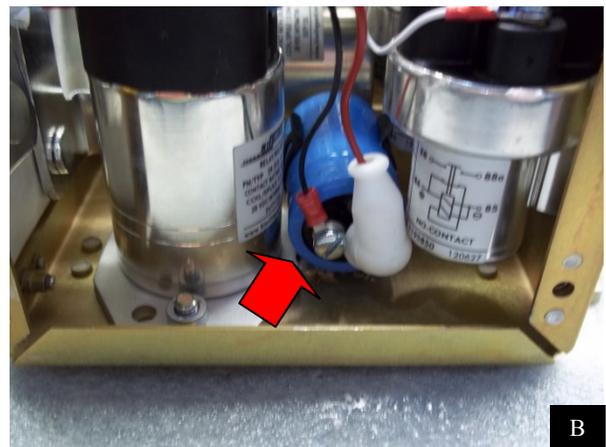
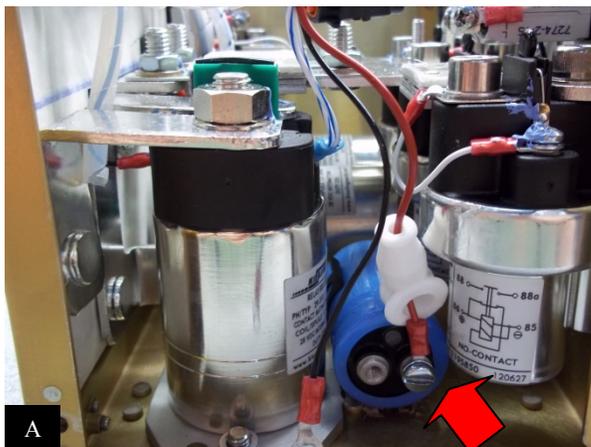


Figure 5-14: Install Wires

5.2.10 Add RTV Silicone

1. Center the capacitor in the clip.
2. Squeeze the RTV silicone liberally under the capacitor (**Figure 5-15A**).
3. Finish with bead, approximately ½ inch long by ¼ inch high, along the capacitor and base (**Figure 5-15B**).

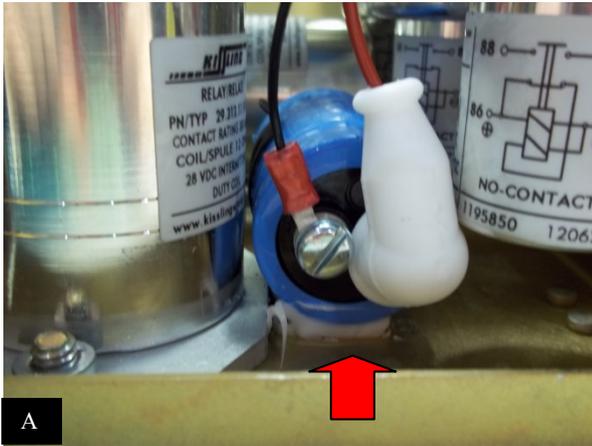


Figure 5-15: Add Silicone

5.2.11 Install Side Panel

1. Install four (4) T25 screws and torque to 20 – 25 in-lbs (**Figure 5-16A**).
2. Install cable ties to bundle as needed and to secure the harness to the side panel (**Figure 5-16B**).

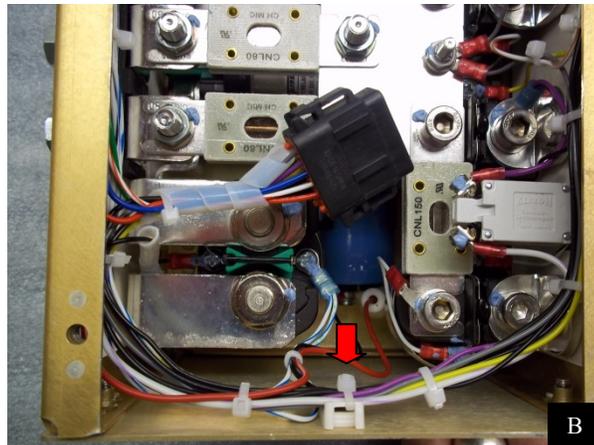
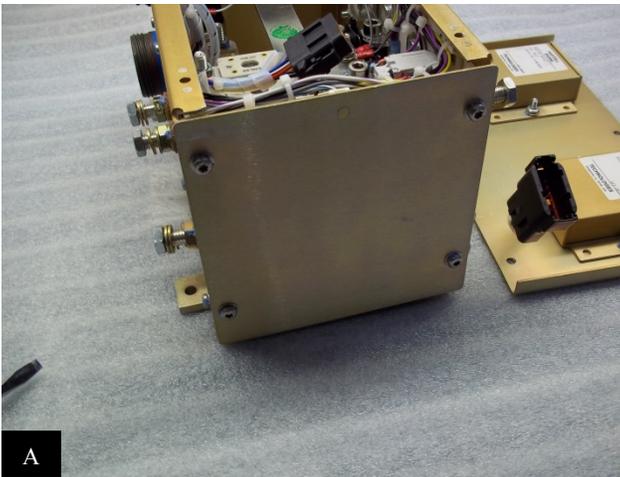


Figure 5-16: Install Side Panel

5.2.12 Install Top Panel

1. Plug in the GCU and the function module (**Figure 5-17A**).
2. Ensure that the connector locking tabs engage.
3. Install six (6) T25 screws and torque to 20 – 25 in-lbs (**Figure 5-17B**).

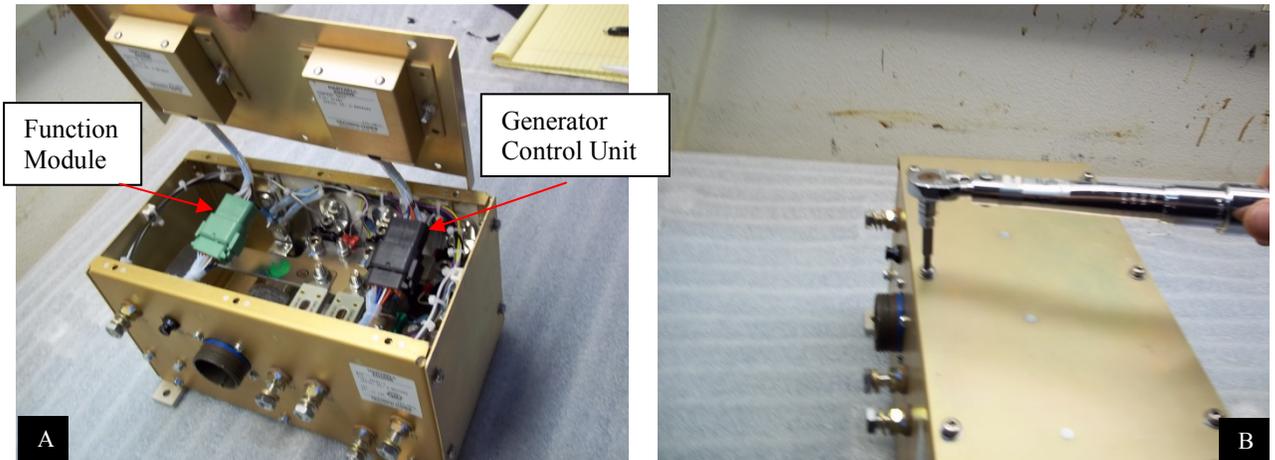


Figure 5-17: Install Top Panel

5.2.12.1 Install Modification Label

Install label on front panel near original (**Figure 5-18**).

▲ NOTE ▲

Do not cover up original label.



Figure 5-18: Install Modification Label



FIELD SERVICE INSTRUCTION

TITLE: Inspection and Replacement or Modification of the MCU

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5.2.13 Install the Oil Cooler Exit Air Duct

1. Install the oil cooler exit duct to the oil cooler by reinstalling the six (6) bolts.
2. Reconnect the airplane batteries.
3. Proceed to **Section 6** of this Field Service Instruction, Completion.

6. Completion

6.1 Test the MCU

Perform a functional test of the installed MCU as follows:

18. Turn the master and avionics switches to the **ON** position.
19. Verify that all three G1000 displays and the avionics equipment are powered up.
20. Verify that the **GEN FAIL** and **ALTERNATOR FAIL** crew advisory system (CAS) messages appear.
21. Connect the ground power cart.
22. Verify main and essential bus voltage increase.
23. Remove the ground power cart.
24. Perform engine **LO START** as outlined in **Section 4** of the *KODIAK[®] 100 Pilot's Operating Handbook*.
25. Turn the **AUX BUS** switch to the **ON** position and verify that the environmental control system (ECS) control head is powered up.
26. Turn the **AUX BUS** switch to the **OFF** position.
27. Perform engine shutdown as outlined in **Section 4** of the *KODIAK[®] 100 Pilot's Operating Handbook*.
28. Perform **HI START** as outlined in **Section 4** of the *KODIAK[®] 100 Pilot's Operating Handbook*.
29. After successful start, turn the generator switch to the **ON** position.
30. Verify that the **GEN FAIL** CAS message extinguishes, generator amps increase, and the main bus voltage stabilizes between 27.0 and 28.2 volts.
31. Turn the alternator switch to the **ON** position.
32. Verify that the **ALTERNATOR FAIL** CAS message extinguishes, the alternator amps increase, and the essential bus voltage stabilizes between 28.3 and 29.1 volts.
33. Perform engine shutdown as outlined in **Section 4** of the *KODIAK 100[®] Pilot's Operating Handbook*.
34. Verify that the engine Hobbs Meter recorded the correct engine run time.

6.2 Records of Completion

Record all work performed in the appropriate maintenance records.

---END---



TITLE:

FIELD SERVICE INSTRUCTION

Master Control Unit Inspection Form

APPLICABLE TO AIRCRAFT:

100-0001 thru 100-0096

JASC CODE: 2400

PAGE:

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REPORT NO.:

FSI-049

REVISION:

03

MASTER CONTROL UNIT INSPECTION

Part A

Date: _____

Aircraft Serial Number: _____

Aircraft Total Time: _____

Part B

I have inspected the master control unit (MCU) and determined that the electrical studs **ARE NOT** plated with tin as shown in Quest Field Service Instruction FSI-049.

Contact Quest Aircraft to request a replacement MCU.

Name (print): _____

Name (sign): _____

Airframe and Power Plant Mechanic

Part C

I have inspected the master control unit (MCU) and determined that all the electrical studs **ARE** plated with tin as shown in Quest Field Service Instruction FSI-049.

Name (print): _____

Name (sign): _____

Airframe and Power Plant Mechanic

Notes

Electronic Copies

Send by e-mail to Customerservice@questaircraft.com

Paper Copies

Send to Quest Aircraft Company

1200 Turbine Dr.

Sandpoint, ID 83864

Att: Customer Service