



# SERVICE INSTRUCTION

**SI0019 Rev NC**

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**EFFECTIVE DATE:** This SERVICE INSTRUCTION is effective April 4th, 2012

**SUBJECT:** Dual Trim System Installation

**MODELS AFFECTED:** CC11 ALL

**COMPLIANCE TIME:** Compliance is not mandatory.

**CONTINUED INSPECTION:** Verify operation of trim in accordance with section 19 of this SI.

**PURPOSE:** To install dual trim system with priority bias switch.

**PARTS LIST (ALL):**

<u>PART</u>	<u>DESCRIPTION</u>	<u>QTY</u>
SC94000-005	CONTROL STICK ASSEMBLY, REAR WITH TRIM SWITCH	1
SC77312-002	DUAL TRIM SYSTEM HARNESS	1
SC77310-001	TRIM RELAY UNIT	1
SC77313-001	TRIM SWITCH PLACARD	1
MS35489-40	GROMMET	1
RM1071-007	CABLE TIES, 14" BLACK (COBRA)	4
AN526C632R8	TRUSS HEAD SCREW, 6-32 X 1/2 SS	2
AN365-632A	NUT, NYLON LOCK	2
AN960-6	WASHER	2
SP71222-001	TOGGLE SWITCH BOOT	1
SC76109-001	CONTROL STICK CONNECTOR PIGTAIL	1
VP6007-003	SOLDER SLEEVE (Ø.125)	6

**ADD'L PARTS FOR S/N  
00001 THROUGH S/N  
00138**



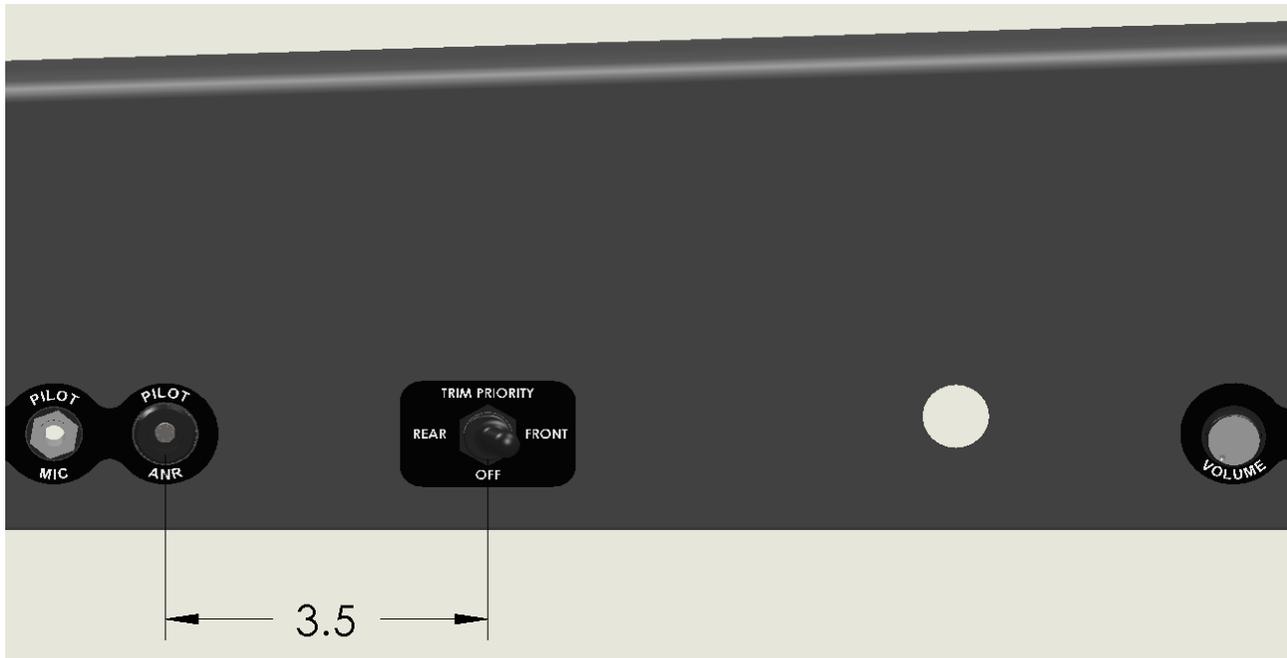
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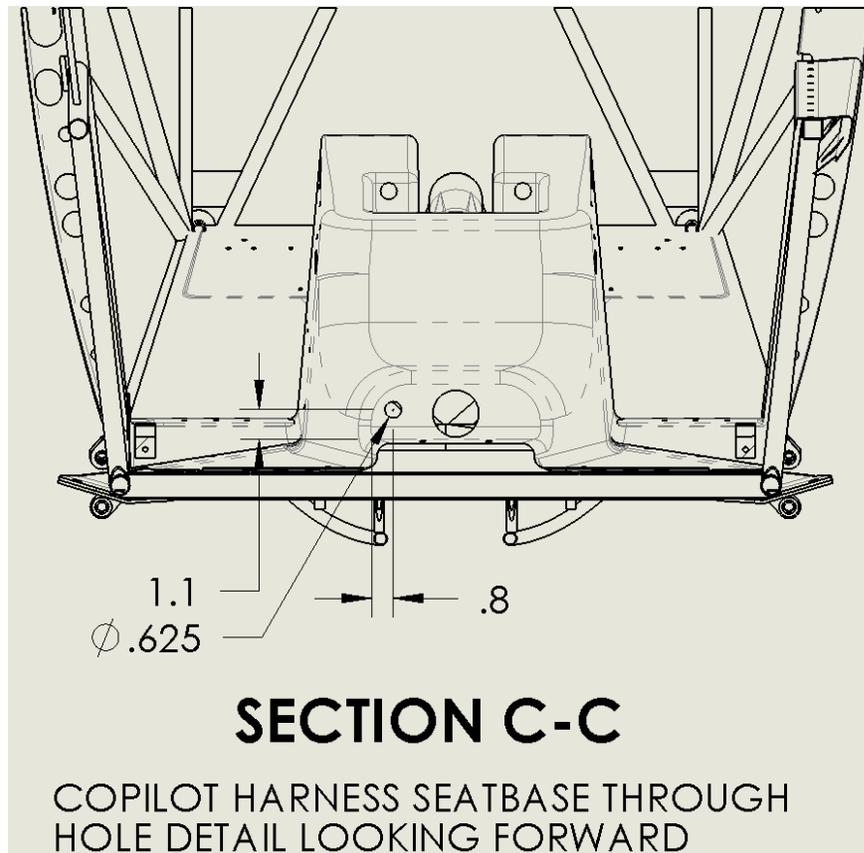
## INSTALLATION INSTRUCTIONS:

1. <sup>A</sup> Reference schematics in Appendix A
2. Switch master switch on and using the reference marks on the horizontal stabilizer cover, center elevator in trim travel. Switch master switch OFF.
3. Disconnect main battery,
  - a. Unpin pilot seat and slide fully forward.
  - b. Tilt pilot seat forward.
  - c. Remove negative lead from main battery.
4. Gain access to the following areas,
  - a. Under the seat base by removing the triangular belly panel.
  - b. Behind RIGHT interior panel forward of door.
  - c. LEFT wing root by removing lower wing inboard access panel.
  - d. Wire bundle along left forward window post.
    - i. By removing 3 cable ties, nuts, and wire wrap.
5. Locate a flat space under seat base to mount the TRIM RELAY UNIT. Do NOT drill holes at this time,
  - a. Ensure clearance for the connector and that the wires can be routed away from the control system components.
  - b. Ensure the control stick connectors can reach out the front and rear of the seat base.
6. Route the long wires of the DUAL TRIM SYSTEM HARNESS,<sup>A</sup>
  - a. One orange 20GA wire labeled MB36B20O.
  - b. Two green 22GA wires labeled MB34A22G, and MB35A22G.
  - c. Start under the seat base and fish wires from seat base forward inside boot cowl and up to instrument panel along right side of fuselage up to forward of instrument panel, then across and up to left window post to left hand wing root.
7. Locate position for toggle switch in left wing root panel,
  - a. Preferably between fuel sight gauge placard and pilot jacks / controls.
  - b. Suggested placement with rough dimension see Figure 1:
  - c. Ensure routed harness reaches intended switch placement.
  - d. Drill Ø 0.5" hole in left hand wing root for toggle switch.
  - e. Install Placard.
  - f. Install toggle switch so it toggles forward and aft with MB36A200 goes to the top center switch terminal.<sup>A</sup>



**Figure 1**

8. Connect newly installed wire harness to toggle switch, <sup>A</sup>
  - a. Take orange 20GA wire fished from seat base, MB36B20O, and a short orange 20GA jumper wire that already has one end crimped on,
    - i. Crimp together in blue spade connector.
    - ii. Install onto top fwd and aft terminals of installed toggle switch.
  - b. Crimp a red spade connector on each of the green wires from the seat base,
    - i. Connect MB35A22G to the lower forward terminal of the installed toggle switch.
    - ii. Connect MB34A22G to the lower aft terminal of the installed toggle switch.
  - c. Secure wires along wing root, down behind instrument panel, and on down to seat base with zip ties to prevent chafing.
  
9. Disconnect wire from TRIM circuit breaker, MB06A16BN or MB06A20O, <sup>A</sup>
  - a. Stow, or trim and stow. Cap with heat shrink.
  
10. Wire from top center terminal of toggle switch, MB36A20O, route and connect to TRIM circuit breaker. <sup>A</sup>
  
11. Drill Ø0.625 inch hole in seat base for aft control stick harness and install grommet, see Figure 2.



**Figure 2**

12. Verify control unit location before drilling mounting holes,
  - a. Verify control stick connectors reach out fwd and aft of seat base.
  - b. Verify wires from wing root reach intended control unit location.
  - c. Verify wires have ample clearance from flight controls.
  - d. If all wires reach and clearance acceptable,
    - i. drill seat base and control unit slot to accept #6 screws.
    - ii. mount control unit with included hardware, two machine screws, AN526C632R8, from outside seat base to inside.
    - iii. install washers and nuts.

13. Verify pilot control stick wire harness, <sup>A</sup>
  - a. If it has a 6 pin connector in cabin,
    - i. Disconnect connector and skip to step 9.
  - b. If it does NOT have 6 pin connector,
    - i. Cut wire harness 2-3" from seat base.
    - ii. Remove heat shrink to gain access to wires going into control stick.
    - iii. Add labels to wires coming out of control stick: A, B, C, and D,
      1. Wires will be brown or orange.
      2. Add labels for reference and sorting procedure to follow.
      3. Shielded wire does not need label.
    - iv. Connect Ohm Meter to wire A.
    - v. Push rocker switch (aircraft) forward.
    - vi. Write label letter of wire in upper left box of Table 1 that conducts to A,
      1. Example, if Ohm Meter shows A connects to D when the rocker switch is pushed forward, put "D" in upper left box.
    - vii. Write same letter in lower right box of Table 1.
    - viii. Push rocker switch (aircraft) aft.
    - ix. Write label letter of wire in upper right box of Table 1,
      1. Example, if ohm meter shows A connects to C when the rocker switch is pushed aft, put "C" in upper right box.
    - x. Write same letter in lower left box of Table 1.
    - xi. Write unused wire letter in center lower box of Table 1,
      1. So far in our examples, B has not been used, this would mean "B" is placed in the center lower box.

Control Stick Trim Rocker Switch		
Fwd	Center	Aft
	A	

**Table 1**

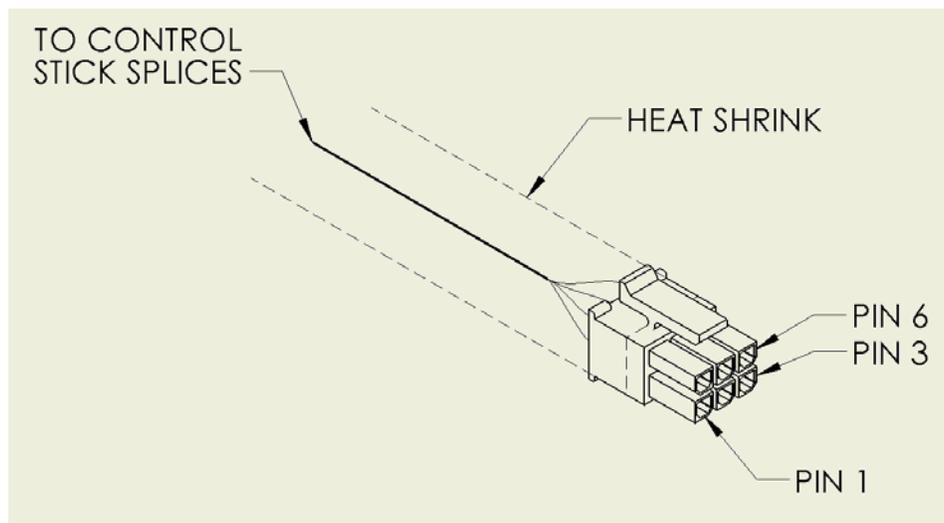
- xii. Once Table 1 is completed, re-label wire A as 2.
- xiii. Re-label the upper left box letter as 6.
- xiv. Re-label the upper right letter as 3.
- xv. Re-label the lower middle letter as 5.
- xvi. Prepare shielded wire for connectors,
  1. Trim shield back about 2", not going to be connected to anything.
  2. Label WHITE conductor of shielded wire as 1.
  3. Label WH/BLU conductor of shielded wire as 4.

- c. The wires coming from the control stick should now be labeled with the appropriate pin numbers for the connector to be installed. See Table 2,

Control Stick Trim Rocker Switch		
Fwd	Center	Aft
___ = 6	A = 2	___ = 3
___ = 3	___ = 5	___ = 6

**Table 2**

- i. For verification, when the control stick switch is pushed forward, 2 and 6 should have continuity, 3 and 5 should have continuity. When the control stick switch is pushed aft, 2 and 3 should have continuity, 5 and 6 should have continuity.
- d. Splice supplied connector pigtail to control stick harness matching numbers,
- i. Use either solder sleeves (provided) or lap joint solder the wires together and cover with each joint with heat shrink.
  - ii. Suggest staggering splices by trimming pigtail and control stick harness.
  - iii. Figure 3 shows pin position in connector for reference.



**Figure 3**

14. Push (or pull) original harness down through seat base,
- a. May have to push grommet out of hole.
  - b. Route front control stick connector up through seat base and install grommet
    - i. Front control stick harness from control unit has 6 wires 2 of which are green with solder sleeves.
  - c. Route rear control stick connector aft through seat base and install grommet
    - i. Pass through hole drilled Step 11.
    - ii. Aft control stick harness from control unit has only 4 wires.



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15. In harness pushed back through seat base, follow white shielded wire back, look for 2 pin Molex connector,<sup>A</sup>
  - a. If Molex connector found, trim wire and remove Molex connector.
  - b. Prepare white shielded wire, MB21B22W-2, for connection.
  
16. Splice white shielded wire, MB21B22W-2, to two green wires coming from new front control stick connector labeled "WHITE" and "WH/BLU",<sup>A</sup>
  - a. Do not connect shield.
  
17. Identify four individual wires that were pushed through seat base,<sup>A</sup>
  - a. Orange (20ga) or Brown (16ga).
  - b. One wire, MB06A16BN or MB06A20O, is the old power wire,
    - i. Stow, or trim and stow.
  - c. Second wire, MB07A16BN or MB07A20O or MB08C20O, goes to ground post,
    - i. Remove this wire from aircraft.
    - ii. Or trim and stow.
  - d. Remaining two wires go to trim motor,
    - i. MB06F16BN or MB06F20O go to "Motor +", splice to MB36E20O from trim control unit.
    - ii. MB07E16BN or MB07E20O go to "Motor -", splice to MB37D20O from trim control unit.
  - e. If no labels on wires,
    - i. Trace one of the wires to the ground post under seat base (battery grounded at same location), remove this wire.
    - ii. Two of the wires should have about 4 ohms between them, these go to the motor.
    - iii. Ensure horizontal stabilizer is clear, carefully apply power to the two wires, note horizontal stabilizer leading edge direction of travel, Remove power as soon as motion direction is established,
      1. If the leading edge moves down, the positive input is connected to "Motor +". Splice "Motor +" to MB36E20O and the other motor wire to MB37D20O.
      2. If the leading edge moves up, then the positive input is connected to "Motor -". Splice "Motor -" to MB37D20O and the other motor wire to MB36E20O.
    - iv. The last wire is the wire going to the wing root, trim and stow.
  
  18. Reconnect main battery
    - a. Reinstall negative lead onto main battery
    - b. Tilt pilot seat back down
    - c. Position and pin pilot seat in desired position



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19. Verify proper operation of trim system,
  - a. With the bias switch in FRONT position, pilot OR co-pilot trim control works normally driving the horizontal stabilizer the correct way. Moving the switch nose down will cause the leading edge of the horizontal stabilizer to move up. Moving the trim switch nose up will have the opposite effect, move the horizontal stabilizer leading edge down..
  - b. When both control stick trim switches are activated, the trim system follows the pilot's input.
  - c. With the bias switch in the REAR position, pilot OR co-pilot trim control works normally driving the horizontal stabilizer the correct way.
  - d. When both control stick trim switches are activated, the trim system follows the co-pilot's input.
  - e. When the bias switch in OFF position, the trim system is disabled for both pilot and co-pilot.
  - f. With the bias switch in either position, move the trim throughout its full range of travel to ensure that the limit switches on the horizontal stabilizer are operating correctly
20. Secure all installed wires as required.
21. Reinstall access panels,
  - a. Left lower wing root panel
  - b. Right forward interior panel
  - c. Belly triangular access panel,
    - i. Reconnect both antenna coax and ground knife connector
  - d. Rebundle left forward window post harness, reusing wrap and supplied cable ties as necessary. 1 spare cable tie is included in kit.
22. Weight and Balance change is negligible (less than 0.5 lb).
23. Make logbook entry stating Dual Trim System was installed per Service Instruction No. SI0019 and the Modification/Repair Authorization number amended to the kit.
24. Insert Section 9-5 in Pilot's Operating Handbook and make note of amendment in POH log.

### **CONTINUED AIRWORTHINESS**

1. At annual inspection verify proper trim system operation per step 19.

### **WEIGHT AND BALANCE**

1. This modification has negligible effect on weight or balance.

### **FORMS AND DOCUMENTATION**

1. Make entry in aircraft log book indicating that this STC has been installed and complete FAA form 337 or other equivalent document for non-US registered aircraft.



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## APPENDIX A

<sup>A</sup> Refer to Dual Trim System Schematic attached to end of Service Instruction.

6

5

4

3

2

1

D

D

C

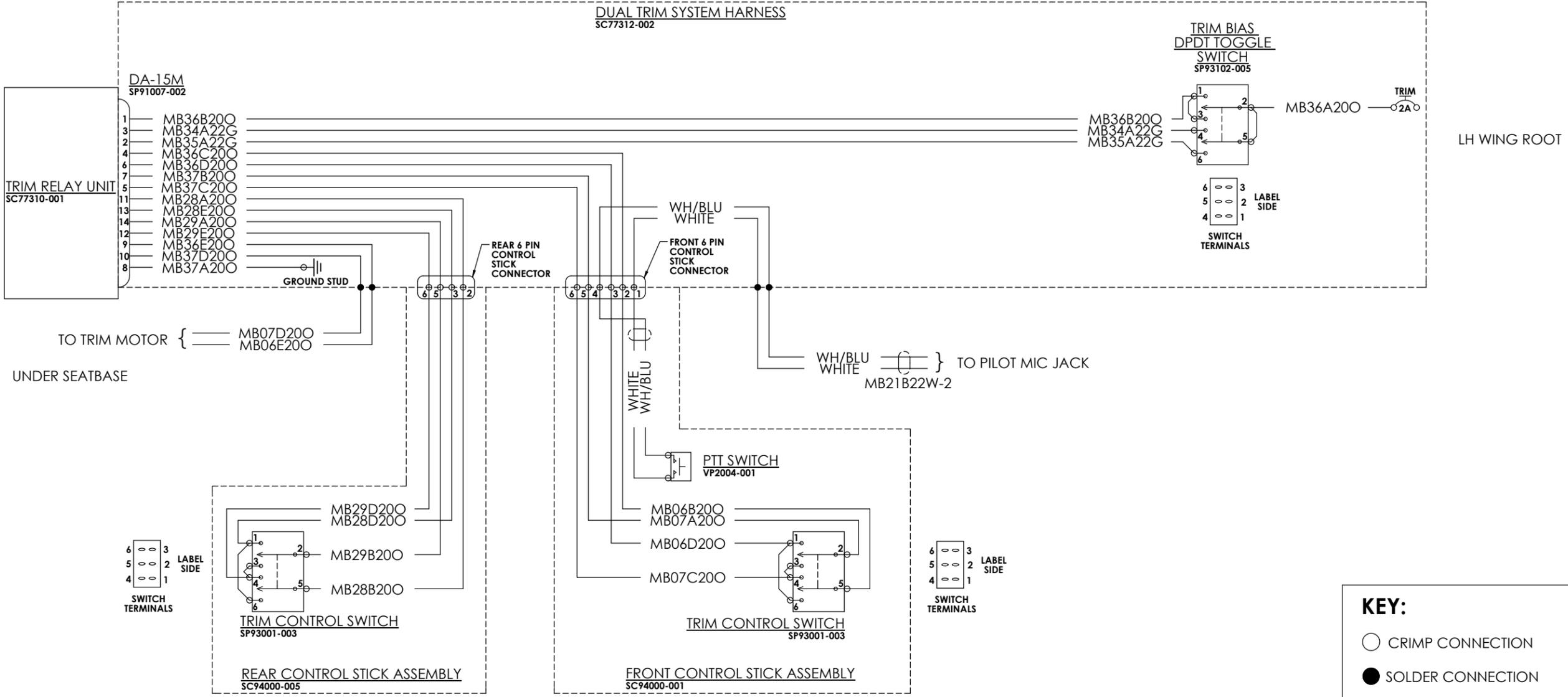
C

B

B

A

A



**KEY:**

- CRIMP CONNECTION
- SOLDER CONNECTION
- LABEL PUSH-PULL CIRCUIT BREAKER
- SPST MOMENTARY PUSHBUTTON SWITCH
- DPDT CENTER OFF SWITCH

TOLERANCES, UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS: ANGLES:  
 .X ±.1 X ±2°  
 .XX ±.04 X ±1°  
 .XXX ±.010  
 ALL DIMENSIONS IN INCHES  
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**TITLE**  
**DUAL TRIM INSTALLATION SCHEMATIC**

SIZE	DWG NO.	REV
B	S10019	NC
SCALE: NONE		SHEET: 1 OF 1

6

5

4

3

2

1