CHAPTER

80

STARTING

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* Asterisk indicates pages revised, added, or deleted by the current revision.
The portion of the text affected by the current revision is indicated by a vertical line in the outer margin of the page.

RECORD OF TEMPORARY REVISIONS

TEMP REV NO	DESCRIPTION	ISSUE DATE	ATP REV DATE	INSERT BY	DATE REMOVED	REV INCOR	REMOVE BY
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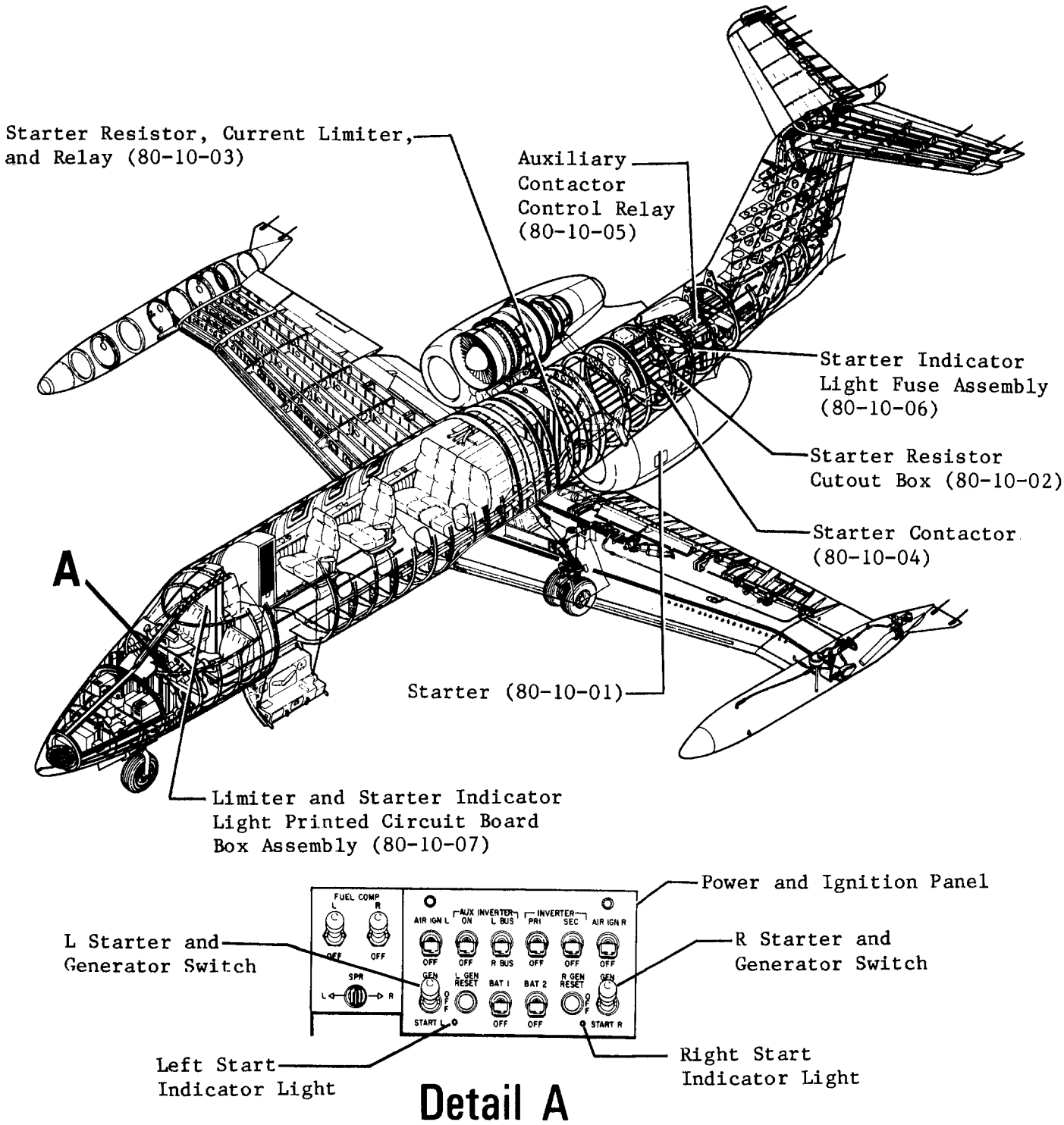
STARTING - DESCRIPTION AND OPERATION

1. DESCRIPTION (See figure 1.)
   A. On *Aircraft 35-002 thru 35-067 and 36-002 thru 36-017 not modified per AAK 81-1, "Installation of Starter Secondary Electrical Contactors," or AAK 86-4, "Engine Starter Improvement,"* the engine starting systems consist of two starters, two system switches, a starter resistor cutout box, two resistor cutout relays, two starter resistor assemblies, two thermal switches (an integral part of the resistor assemblies), two 10-ampere fuses, and utilize the generator control box which incorporates the starter control relays.
   B. On *Aircraft 35-068 thru 35-369, 35-371 thru 35-389, and 36-018 thru 36-047 not modified per AAK 81-1,"Installation of Starter Secondary Electrical Contactors," and prior Aircraft modified per AAK 86-4, "Engine Starter Improvement,"* the starting systems consist of two starters and two system switches, and utilize the generator control box which incorporates the starter control relays.
   C. On *Aircraft 35-370, 35-390 and Subsequent, 36-048 and Subsequent, and prior Aircraft modified per AAK 81-1, "Installation of Starter Secondary Electrical Contactors,"* the starting systems consist of two starters, two system switches with START indicator lights, two starter contactors, two starter indicator light fuse assemblies, and two auxiliary contactor control relays. In addition, the systems utilize the generator control box which contain the starter control relays. Refer to Chapter 24 for generator control box information.
   D. Component Description
      (1) The starter and starter gear box form a self-contained unit mounted on the engine accessory gear box by six bolts. All electrical connections are made to a terminal block on the starter. The starter operates from power supplied by either an external source or the battery system. Refer to Chapter 24 for further information on the external power system and the battery system. On *Aircraft 35-068 and Subsequent, 36-018 and Subsequent, and prior Aircraft modified per AAK 86-4, "Engine Starter Improvement,"* the function of the resistor cutout box, resistor cutout relays and the resistor assemblies are incorporated as an integral part of the starter.
      (2) The starter gear box houses the starter gearing, bearings and clutch. The elements in the gear box are splash-lubricated by the oil contained within the gear box. The gear box incorporates three ports: a fill port, a drain port and a breather port. The capacity of the gear box is approximately 50 cc and is filled with oil complying to Garrett AiResearch EMS 53110, Type II.

      NOTE: If an engine starter is removed from the aircraft and is stored, the gear box reservoir shall be drained of oil. Upon reinstallation, the engine starter gear box reservoir shall be refilled with oil.

      (3) The system switches are three-position switches installed on the power and ignition panel. The switches are marked GEN-OFF-START.
      (4) The generator control box incorporates the starting relay functions. For maintenance practices of the generator control box, refer to Chapter 24.
      (5) The resistor cutout relays, starter resistor assemblies, and the 10-ampere fuses are installed on the LH side of the tailcone between frames 26A and 27.
      (6) The starter resistor cutout box is located in the tailcone on the forward side of the ram air overboard plenum just below the refrigeration condenser.
      (7) The starter contactors are located in tailcone on LH stringers 13 and 13A, and immediately forward of frame 26.
      (8) On *Aircraft modified per AAK 81-1, "Installation of Starter Secondary Electrical Contactors,"* the auxiliary contactor control relays are located adjacent to the starter contactors just forward of frame 25A on the LH side. On *Aircraft 35-370 only*, the relays are located just forward of frame 26A on stringer 6, LH side. On *Aircraft 35-390 and Subsequent and 36-048 and Subsequent*, the relays are located just aft of frame 26 on stringer 6, LH side.



Detail A

Starting System Component Location
Figure 1

(9) The starter contactor fuse assembly is installed in the tailcone on LH stringers 13 and 13A, just aft of frame 26. The fuse box assembly incorporates a plexiglas window for inspecting the one ampere fuses which protect the starter indicator light circuit.

(10) The starter indicator lights are located adjacent to the Starter-Generator switches. On *Aircraft modified per AMK 80-17, "Installation of Current Limiter Warning and Starter Indicator Lights," or AAK 81-1, "Installation of Starter Secondary Electrical Contactors,"* the indicator lights may be installed in the upper portion of the instrument panel. When installed in the instrument panel, the lights are placarded LH STARTER ENGAGED and RH STARTER ENGAGED. The lights are powered by 28 vdc from the starter side of its applicable starter contactor relays. This provides the crew with a visual indication that power is being applied to the starters. Each indicator light is fused by a one ampere fuse.

2. Operation (See figure 2.)

WARNING: AIRFLOW INTO THE ENGINE IS SUFFICIENT TO DRAW PERSONNEL AND EQUIPMENT INTO THE ENGINE INLET. PERSONNEL SHOULD MAINTAIN A SAFE DISTANCE AT ALL TIMES DURING ENGINE OPERATION.

CAUTION: THE MAXIMUM ALLOWABLE CRANKING TIME FOR THE ENGINE IS FROM 30 TO 50 SECONDS DEPENDING ON THE AMBIENT TEMPERATURE. REFER TO 72-00-00, GARRETT ENGINE MAINTENANCE MANUAL, FOR ALLOWABLE CRANKING TIME. TO PREVENT STARTER DAMAGE, THE FOLLOWING TIME BETWEEN ENGINE START ATTEMPTS SHOULD BE OBSERVED.

Start Number	Starter Off Interval
1	One minute
2	One minute
3	Fifteen minutes
4	One minute
5	One minute
6	One hour

CAUTION: ON AIRCRAFT EQUIPPED WITH NICKEL - CADMIUM BATTERIES, DO NOT ATTEMPT AN ENGINE START WITH LESS THAN 23 VDC ON EACH BATTERY. ON AIRCRAFT EQUIPPED WITH LEAD - ACID BATTERIES, DO NOT ATTEMPT AN ENGINE START WITH LESS THAN 24 VDC ON EACH BATTERY AT 70° F OR BELOW, OR LESS THAN 25 VDC AT 110° F OR ABOVE. IF BATTERY CHARGE IS DIFFERENT THAN INDICATED, DAMAGE TO THE CURRENT LIMITERS COULD RESULT DURING BATTERY CHARGE AFTER ENGINE START.

A. On *Aircraft 35-002 thru 35-067 and 36-002 thru 36-017 not modified per AAK 81-1, "Installation of Starter Secondary Electrical Contactors," or AAK-86-4, "Engine Starter Improvement,"* with the Battery Switches set to BAT 1 and BAT 2, and the LH Starter-Generator Switch set to START, 28 vdc is applied to the start control relay through the de-energized contacts of the start cutout relay inside the fuel control relay panel. With the start control relay energized, power is applied to the LH motive flow valve, closing the valve and at the same time energizes the LH standby pump. When the motive flow valve closes, a power circuit is completed through the motive flow valve to a set of contacts on the LH Starter-Generator Switch. Two power circuits are then completed; one circuit is to a set of contacts on relay K1, in the start resistor cutout box, to energize the start relays in the generator control panel. The start relays energize and apply 28 vdc power to the resistor cutout relay and start resistor cutout box

through a 10-ampere current limiter. With 28 vdc applied to the start resistor box, a 1.5 second delay timer is starter. After 1.5 seconds a ground circuit is completed to energize the resistor cutout relay and applies 28 vdc power to the starter. On *Aircraft modified per AMK 80-17, "Installation of Current Limiter Warning and Starter Indicator Lights,"* the starter indicator will illuminate. A second power circuit is completed to a relay in the refrigeration control relay panel. This relay, when energized, deactivates the refrigeration compressor during engine start. When engine speed increases to 50% N2 speed, the de-energized start cutout relay panel is energized by a signal from the fuel computer. Once energized, the start sequence is automatically stopped and the starter indicator light (if installed) will extinguish.

NOTE: On *Aircraft 35-058 thru 35-067*, the operation of the system is the same except that the motive flow valve is not incorporated in the circuit.

B. On *Aircraft 35-068 thru 35-147, and 36-018 thru 36-035 not modified per AAK 81-1, "Installation of Starter Secondary Electrical Contactors," and prior Aircraft modified per AAK 86-4, "Engine Starter Improvement,"* with the Battery Switches set to BAT 1 and BAT 2, and the LH Starter-Generator Switch set to START, 28 vdc is applied to the start control relay inside the fuel control relay panel through the de-energized contacts of the start cutout relay also in the fuel control relay panel. With the start control relay energized, power is applied to the standby fuel pump through the energized pump relay. Three circuits are completed through the energized start control relay. One circuit is completed to a set of contacts on the LH Starter-Generator Switch to energize the starter relays in the generator control box and apply 28 vdc to the starter. On *Aircraft modified per AMK 80-17, "Installation of Current Limiter Warning and Starter Indicator Lights,"* the starter indicator lights will illuminate. A second circuit is completed to a relay in the refrigeration control relay panel. This relay, when energized, deactivates the refrigeration compressor during engine start. A third circuit is completed to the ignition switches in the throttle quadrant. A time delay circuit and relay, an integral part of the starter, will limit starter current for approximately 1.5 seconds. When engine speed increases to 50% N2 speed, the de-energized start cutout relay within the fuel control relay panel is energized by a signal from the fuel computer. Once energized, the start sequence is automatically stopped and the starter indicator light (if installed) will extinguish.

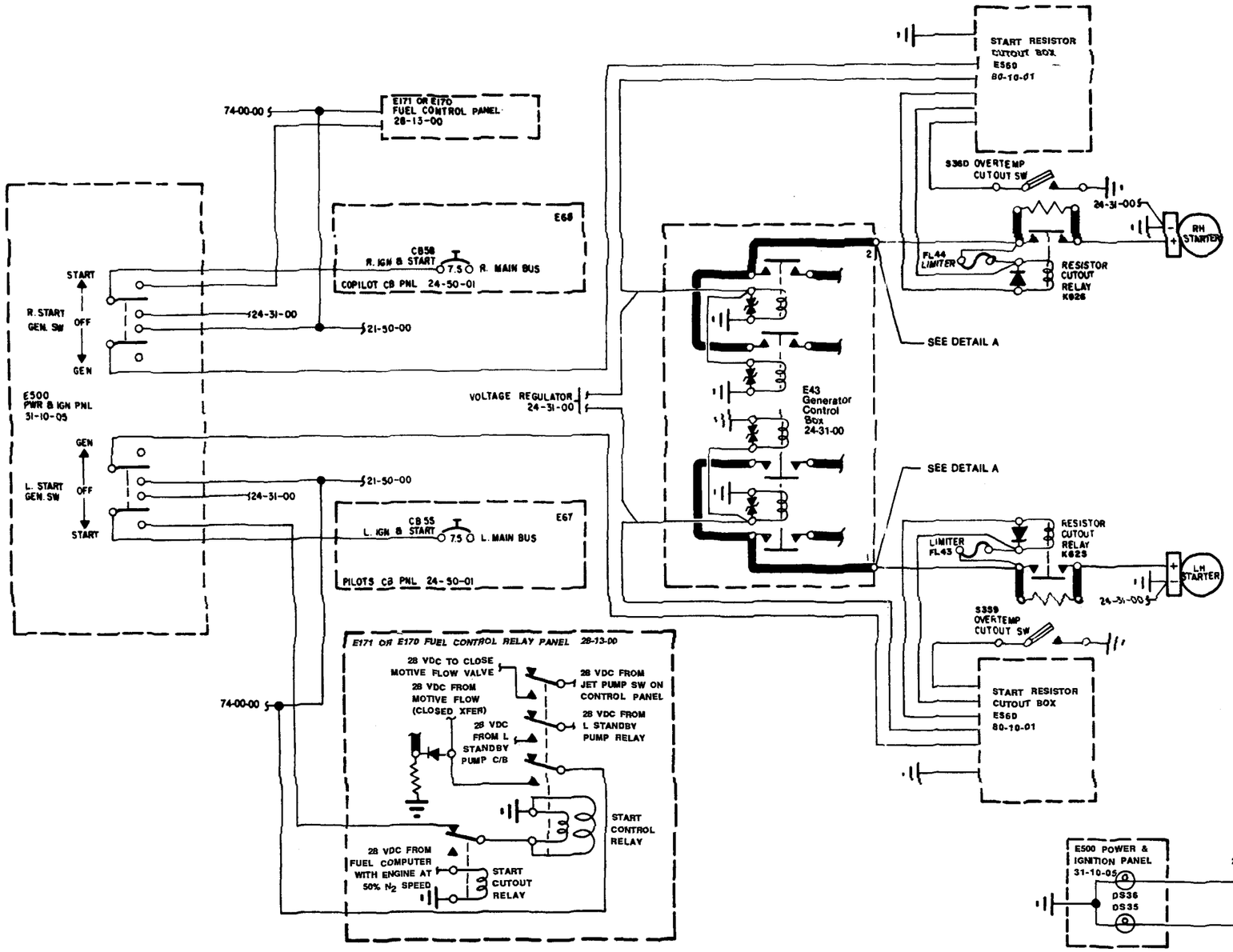
C. On *Aircraft 35-148 thru 35-369, 35-371 thru 35-389, and 36-036 thru 36-047 not modified per AAK 81-1, "Installation of Starter Secondary Electrical Contactors,"* with the Battery Switches set to BAT 1 and BAT 2, and the LH Starter-Generator Switch is set to START, 28 vdc is applied to the start control relay inside the fuel control relay panel through the de-energized contacts of the start cutout relay also in the fuel control relay panel. With the start control relay energized, power is applied to the standby fuel pump through the energized pump relay. Four circuits are completed through the energized start control relay. One circuit is completed to a set of contacts on the LH Starter-Generator Switch to energize the starter relays in the generator control box and apply 28 vdc to the starter. On *Aircraft modified per AMK 80-17, "Installation of Current Limiter Warning and Starter Indicator Lights,"* the starter indicator lights will illuminate. A second circuit is completed to a relay in the refrigeration control relay panel. This relay, when energized, deactivates the refrigeration compressor during engine start. A third circuit is completed to the ignition switches in the throttle quadrant. A fourth circuit is completed in the squat switch relay panel. This provides for overvoltage protection on second engine cross-start. A time delay circuit is completed to the squat switch relay panel. This provides for overvoltage protection on second engine cross-start. A time delay circuit and relay, an integral part of the starter, will limit starter current for approximately 1.5 seconds. When engine speed increases to 50% N2 speed, the de-energized start cutout relay within the fuel control panel is energized by a signal from the fuel computer. Once energized, the start sequence is automatically stopped and the starter indicator lights (if installed) will extinguish.

D. On *Aircraft 35-002 thru 35-067 and 36-002 thru 36-017 modified per AAK 81-1, "Installation of Starter Secondary Electrical Contactors," and not modified per AAK 86-4, "Engine Starter Improvement,"* with the Battery Switches set to BAT 1 and BAT 2, 28 vdc is applied through the contacts of the de-energized auxiliary contactor control relay (K27) to the LH auxiliary starter contactor relay, inside the generator control box. The LH auxiliary starter contactor relay is energized and applies power to the LH starter contactor (K25). When the LH Starter-Generator Switch is set to START, 28 vdc is applied to the start control relay (inside the fuel control relay panel) through the de-energized contacts of the start cutout relay, also inside the fuel control relay panel. With the start control relay energized, power is applied to the LH motive flow valve, closing the valve and at the same time energizes the LH standby pump. When the motive flow valve closes, a power circuit is completed through the motive flow valve and through the contacts of the de-energized relay (K1) in the start resistor cutout box to the LH starter contactor (K25). The LH starter contactor (K25) energizes and applies 28 vdc power to the resistor cutout relay, to the start resistor cutout box through a 10-ampere current limiter, and illuminates the starter indicator lights. With 28 vdc applied to the start resistor box, a 1.5 second delay timer is started. After 1.5 seconds a ground circuit is completed to energize the resistor cutout relay and applies power to the starter. A second power circuit is completed to a relay in the refrigeration control relay panel. This relay, when energized, deactivates the refrigeration compressor during engine start. When engine speed increases to 50% N2 speed, the de-energized start cutout relay within the fuel control relay panel is energized by a signal from the fuel computer. Once energized, the start sequence is automatically stopped and the starter-indicator lights will extinguish.

E. On *Aircraft 35-002 thru 35-067 and 36-002 thru 36-017 modified per AAK 81-1, "Installation of Starter Secondary Electrical Contactors," and AAK 86-4, "Engine Starter Improvement,"* with the Battery Switches set to BAT 1 and BAT 2, 28 vdc is applied through the contacts of the de-energized auxiliary contactor control relay (K27) to the LH auxiliary starter contactor relay, inside the generator control box. The LH auxiliary starter contactor relay is energized and applies power to the LH starter contactor (K25). When the LH Starter-Generator Switch is set to START, 28 vdc is applied to the start control relay (inside the fuel control relay panel) through the de-energized contacts of the start cutout relay, also inside the fuel control relay panel. With the start control relay energized, power is applied to the LH motive flow valve, closing the valve and at the same time energizes the LH standby pump. When the motive flow valve closes, a power circuit is completed through the motive flow valve to the LH starter contactor (K25). The LH starter contactor (K25) energizes and applies 28 vdc power to the starter and illuminates the starter indicator lights. A second power circuit is completed to a relay in the refrigeration control relay panel. This relay, when energized, deactivates the refrigeration compressor during engine start. A third circuit is completed to the ignition switches in the throttle quadrant. A time delay circuit and relay, an integral part of the starter, will limit starter current for approximately 1.5 seconds. When engine speed increases to 50% N2 speed, the de-energized start cutout relay within the fuel control relay panel is energized by a signal from the fuel computer. Once energized, the start sequence is automatically stopped and the starter-indicator lights will extinguish.

F. On *Aircraft 35-068 thru 35-147 and 36-018 thru 36-035 modified per AAK 81-1, "Installation of Starter Secondary Electrical Contactors,"* with the Battery Switches set to BAT 1 and BAT 2, 28 vdc is applied through the contacts of the de-energized LH auxiliary contactor control relay (K27) to the LH auxiliary starter contactor relays, inside the generator control box. The LH auxiliary starter contactors are energized and apply power to the LH starter contactor (K25). When the LH Starter-Generator Switch is set to START, 28 vdc is applied to the start control relay (inside the fuel control relay panel) through the de-energized contacts of the start cutout relay, also inside the fuel control relay panel. With the start control relay energized, power is applied to the standby fuel pump through the energized pump relay. Three circuits are completed through the energized start control relay. One circuit is completed to energize the LH starter contactor (K25). The LH starter contactor (K25) is energized and applies power to the starter and illuminates the starter indicator lights. A second circuit is completed to a relay in the refrigeration control relay panel. This relay, when energized, deactivates the refrigeration compressor during engine start. The third circuit applies 28 vdc to the ignition switches in the throttle quadrant. When engine speed increases to 50% N2 speed, the de-energized start cutout relay within the fuel control relay panel is energized by a signal from the fuel computer. Once energized, the start sequence is automatically stopped and the starter indicator lights will extinguish.

G. On *Aircraft 35-370, 35-390 and Subsequent, and 36-048 and Subsequent, and Aircraft 35-148 thru 35-389 (except 35-370) and 36-036 thru 36-047 modified per AAK 81-1, "Installation of Starter Secondary Electrical Contactors,"* with the Battery Switches set to BAT 1 and BAT 2, 28 vdc is applied through the contacts of the de-energized LH auxiliary contactor control relay (K27) to the LH auxiliary starter contactor relays inside the generator control box. The LH auxiliary starter contactor relays are energized and apply power to the LH starter contactor (K25). When the LH Starter-Generator Switch is set to START, 28 vdc is applied to the start control relay (inside the fuel control relay panel) through the de-energized contacts of the start cutout relay, also inside the fuel control relay panel. With the start control relay energized, power is applied to the standby fuel pump through the energized pump relay. Four circuits are completed through the energized start control relay. One circuit is completed to energize the LH starter control relay. One circuit is completed to energize the LH starter contactor (K25). The LH starter contactor (K25) is energized and applies power to the starter and illuminates the starter indicator lights. A time delay circuit and relay, an integral part of the starter, will limit starter current for approximately 1.5 seconds. A second circuit is completed to a relay in the refrigeration control relay panel. This relay, when energized, deactivates the refrigeration compressor during engine start. The third circuit applies 28 vdc to the ignition switches in the throttle quadrant. The fourth circuit is completed to the squat switch relay panel. This provides overvoltage protection on second engine cross start. When engine speed increased to 50% N2 speed, the de-energized start cutout relay within the fuel control relay panel is energized by a signal from the fuel computer. Once energized, the start sequence is automatically stopped and the starter indicator lights will extinguish.

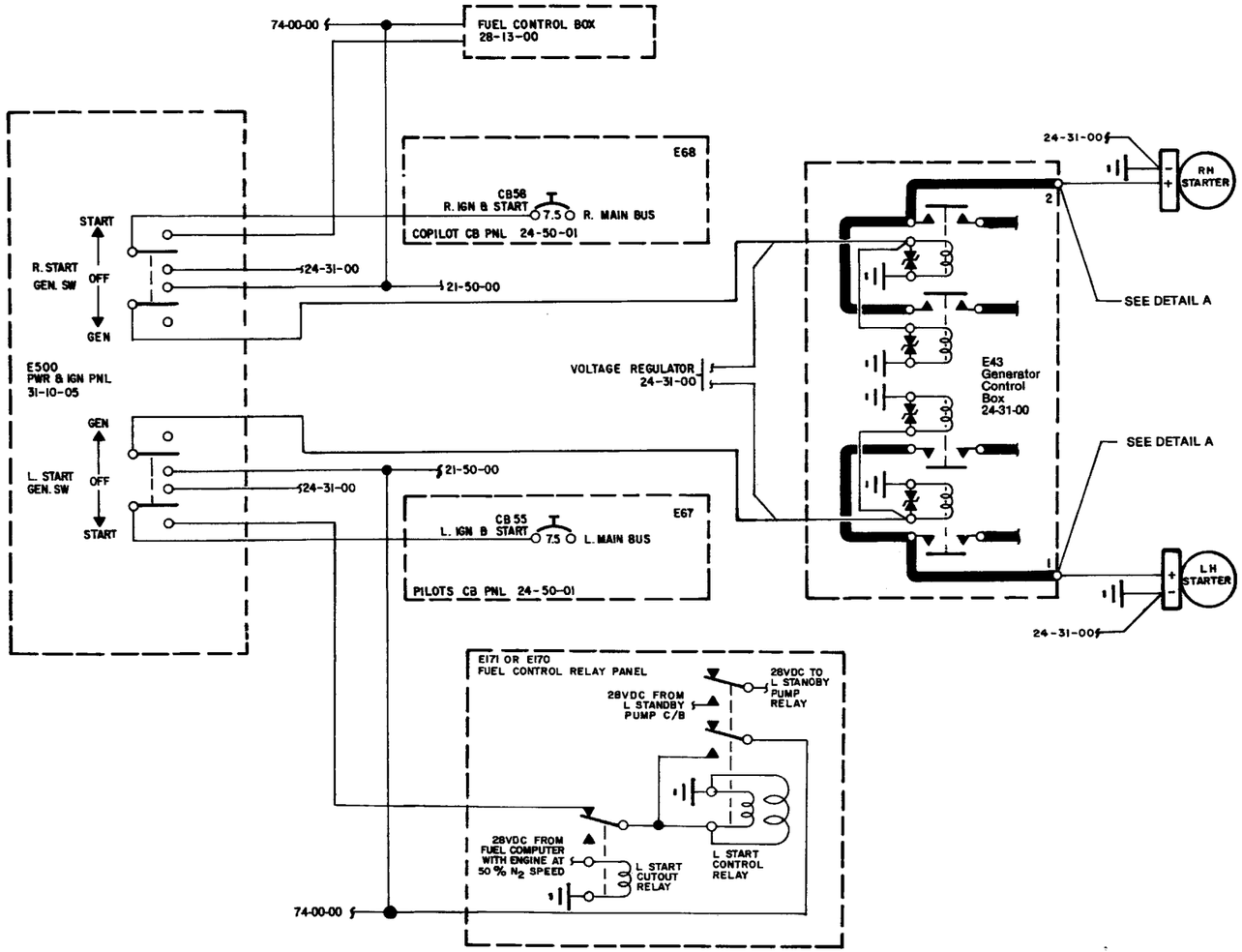


Starting Electrical Control Schematic
Figure 2 (Sheet 1 of 8)

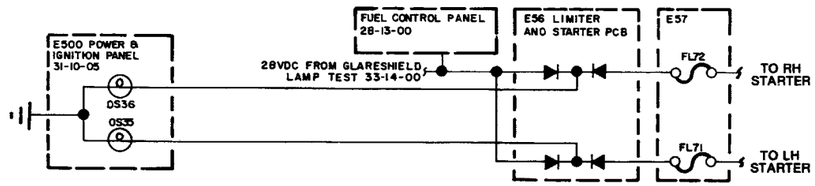
Aircraft Modified per AMK 80-17, "Installation of Current Limiter Warning and Starter Indicator Lights"

Detail A

EFFECTIVITY: 35-002 thru 35-067 and 36-002 thru 36-017 NOT Modified per AAK81-1, "Installation of Starter Secondary Electrical Contactors," or AAK86-4, "Engine Starter Improvement"

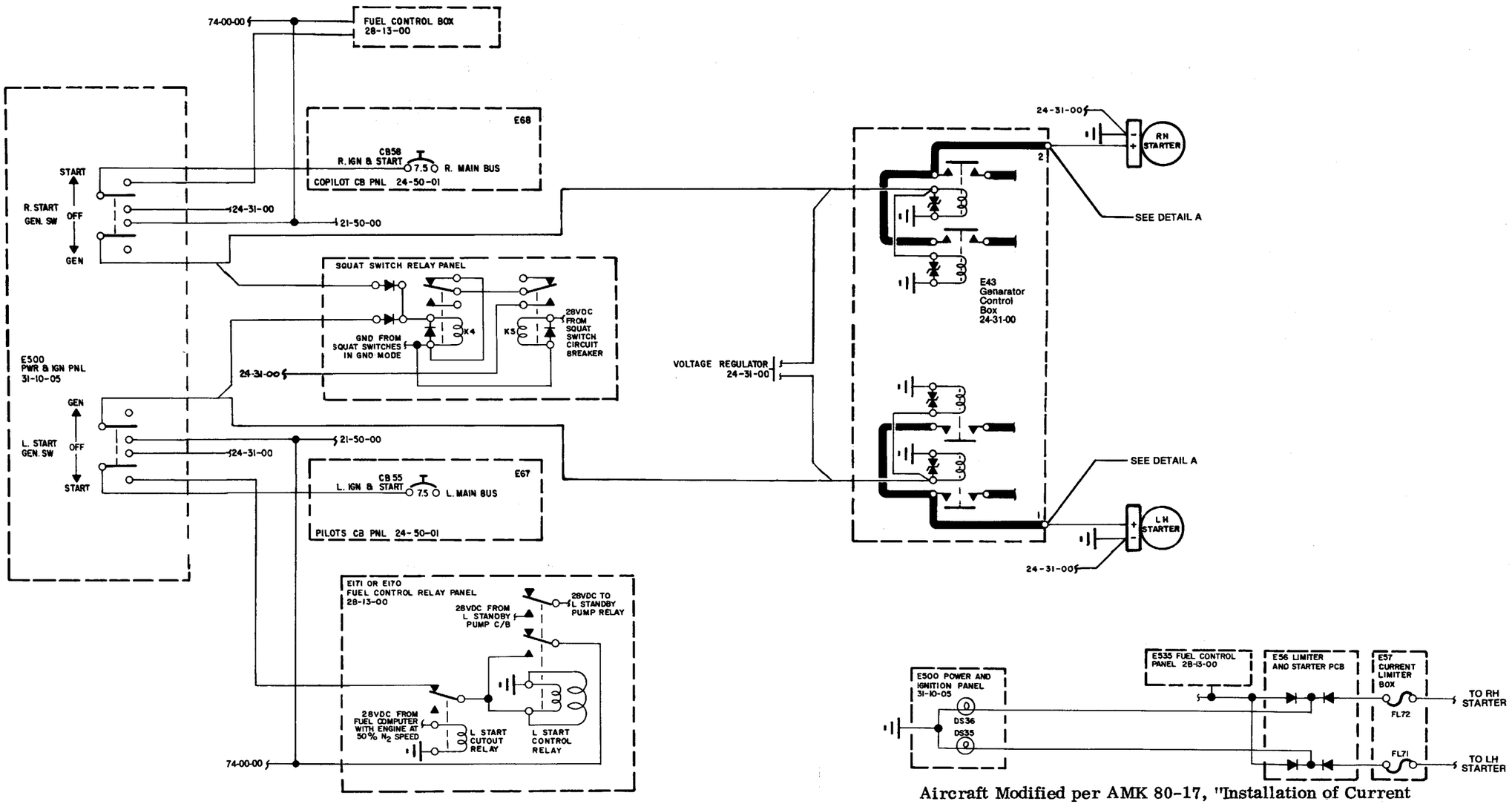


Starting Electrical Control Schematic
Figure 2 (Sheet 2 of 8)



Aircraft Modified per AMK 80-17, "Installation of Current Limiter Warning and Starter Indicator Lights"

Detail A

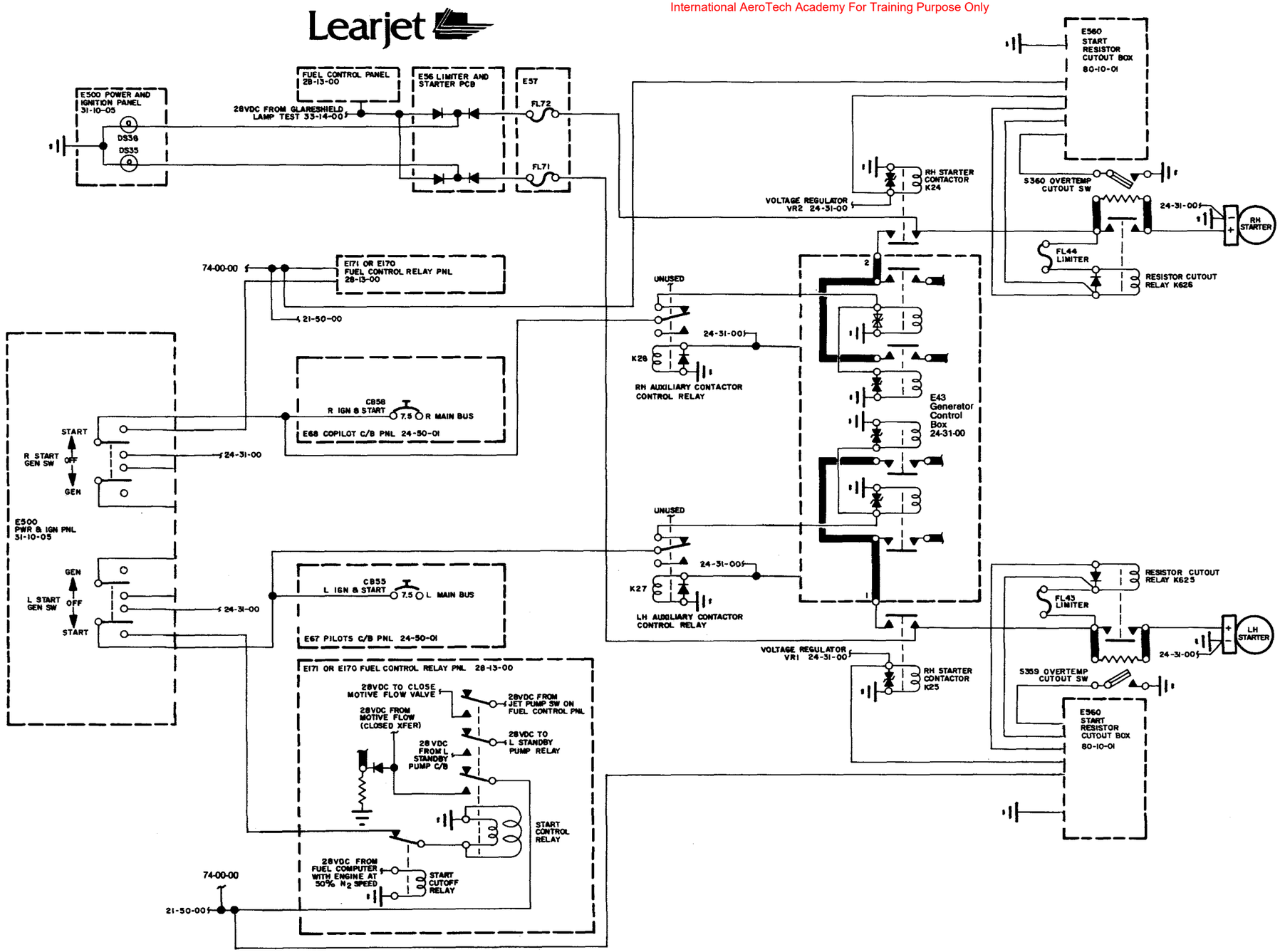


Aircraft Modified per AMK 80-17, "Installation of Current Limiter Warning and Starter Indicator Lights"

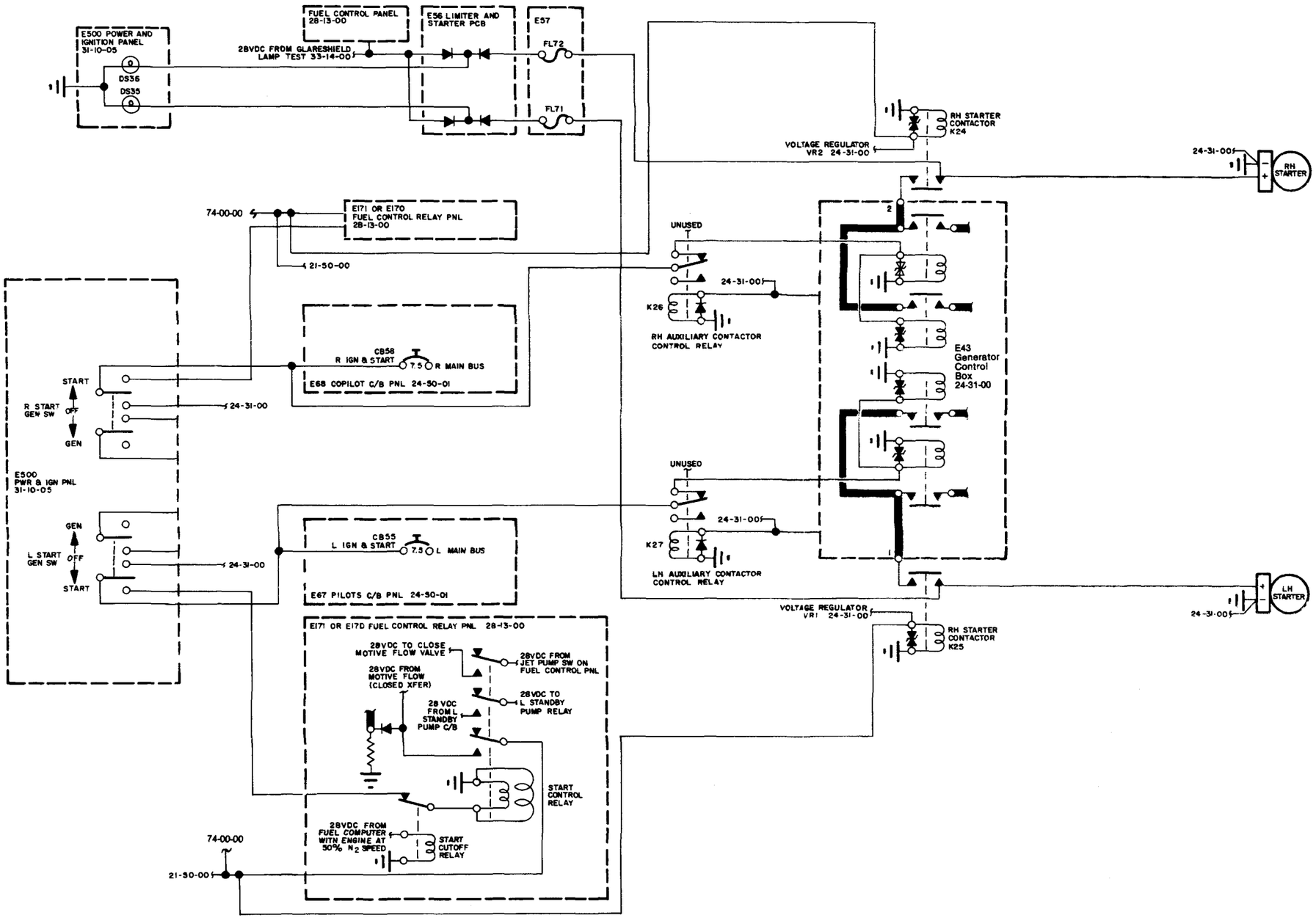
Detail A

Starting Electrical Control Schematic
Figure 2 (Sheet 3 of 8)

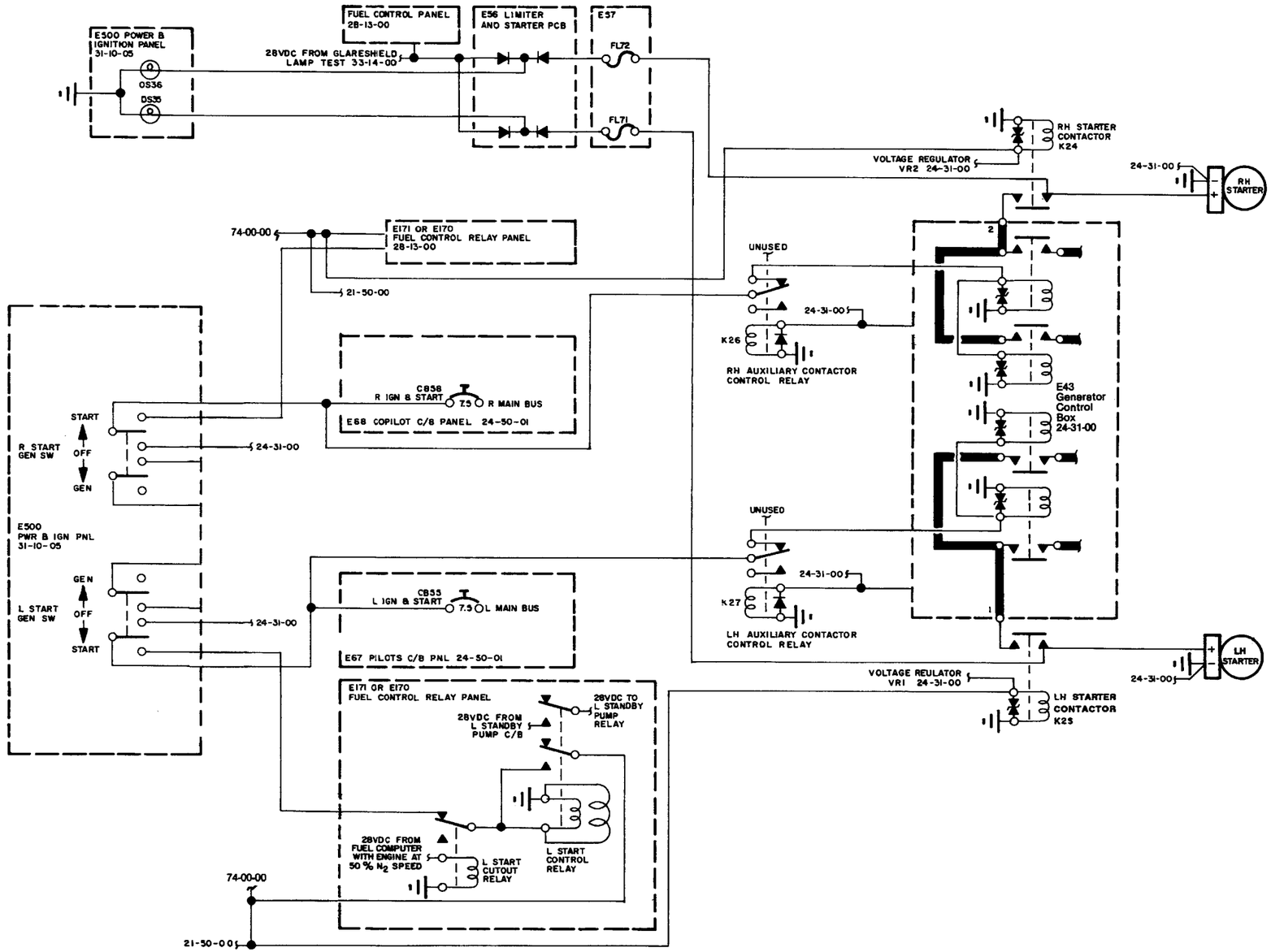
EFFECTIVITY: 35-148 thru 35-389 and 36-036 thru 36-047 NOT Modified per AAK81-1, "Installation of Starter Secondary Electrical Contactors," Except 35-370



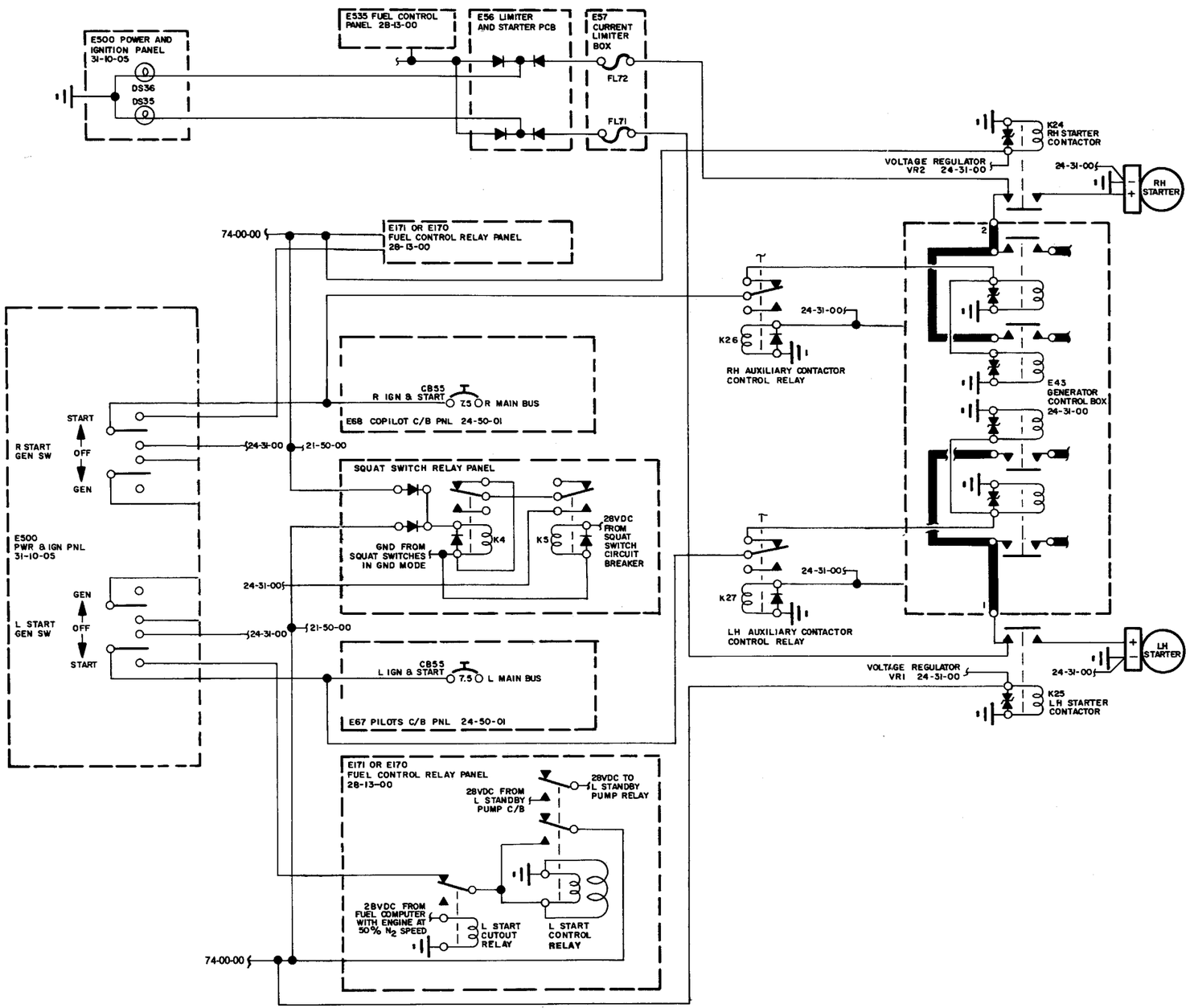
Starting Electrical Control Schematic
Figure 2 (Sheet 4 of 8)



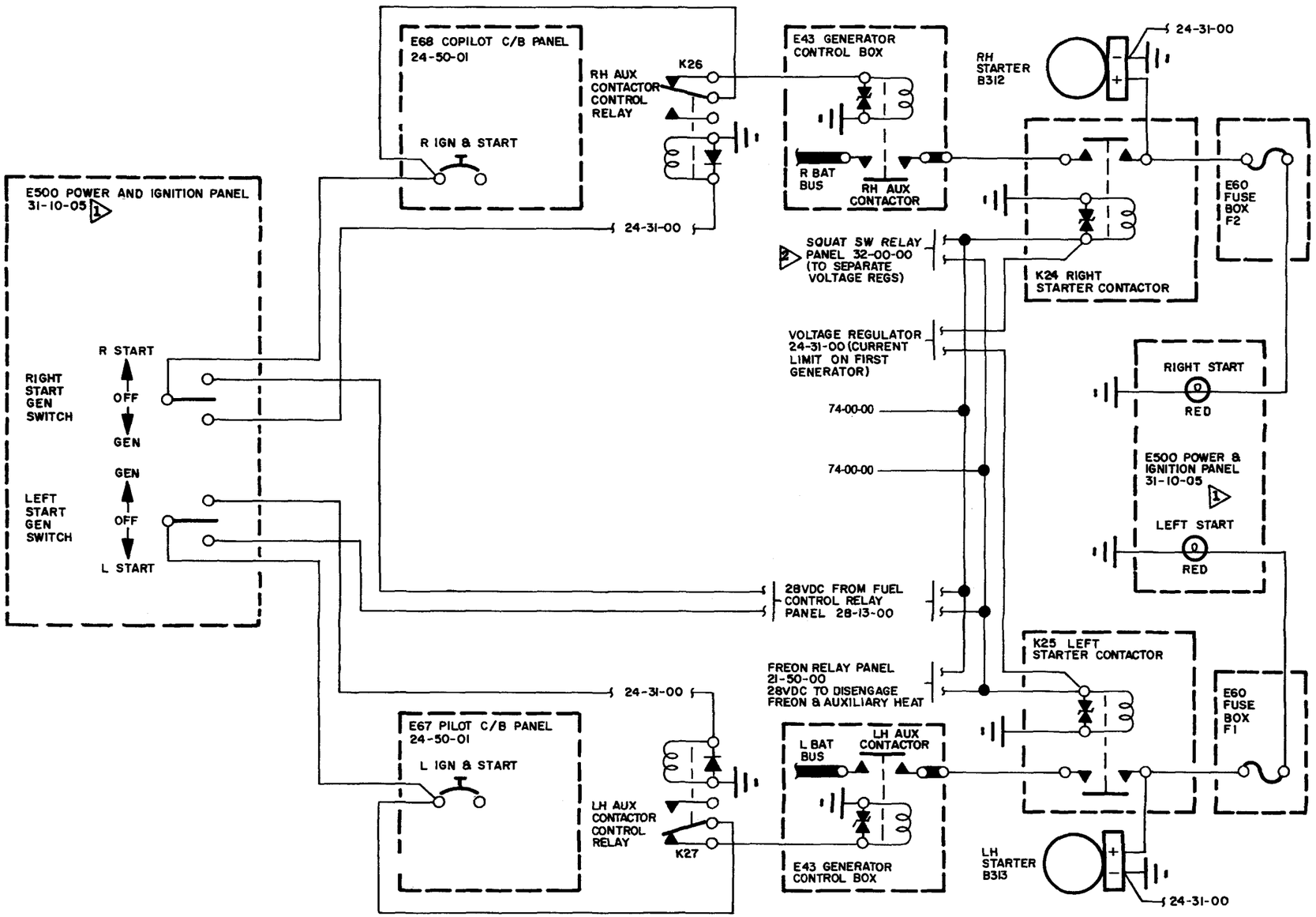
Starting Electrical Control Schematic
Figure 2 (Sheet 5 of 8)



Starting Electrical Control Schematic
Figure 2 (Sheet 6 of 8)



Starting Electrical Control Schematic
Figure 2 (Sheet 7 of 8)



Starting Electrical Control Schematic
Figure 2 (Sheet 8 of 8)

1 **Effective 35-506 and Subsequent and 36-054 and Subsequent, refer to 39-40-05 for internal wiring diagram.**

2 **Effective 35-506 and Subsequent and 36-054 and Subsequent, refer to 39-40-06 for internal wiring diagram of Squat Switch Relay Panel.**

1. TROUBLE SHOOTING

A. Tools and Equipment

NOTE: Equivalent substitutes may be used in lieu of the following items.

NAME	PART NUMBER	MANUFACTURER	USE
Multimeter	Model 260	Simpson	Check voltage.

B. Starting System Trouble Shooting (See figure 101.)

NOTE:
- Refer to Chapter 80 of the 35/35A/36/36A Wiring Manual for wiring diagrams. Refer to the Garrett Engine Maintenance Manual for further trouble shooting procedures.
- Flagged notes are listed at the end of figure 101.

PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
1. Engine Does Not Crank and Starter Does Not Energize (Starter Cannot Be Heard).		
a. No power to starter.	Ensure that Battery Switches are set to on and Starter-Generator switch is set to START.	Change switch position.
	Ensure that CB58 on copilot CB panel (RH ignition and start) or CB55 on pilot CB panel (LH ignition and start) is closed.	Close circuit breaker.
b. Starter power leads loose or not connected to starter terminals.	With Starter-Generator Switch set to OFF, visually inspect power lead connections at starter (B312 or B313).	Reconnect or tighten leads as necessary.
c. Defective Starter-Generator Switch.	Ensure that 28 vdc is available at Starter-Generator Switch.	Replace Starter-Generator Switch.
d. Battery bus is not energized.	Check for 28 vdc at pin A of P1 or P2 on power distribution control panel (E43). Check for 28 vdc at terminal 1 or 2 on panel (E43).	If power does not exist at power distribution control panel, trouble shoot in accordance with Chapter 24.

Starting System Trouble Shooting
Figure 101 (Sheet 1 of 4)

PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
1. Engine Does Not Crank and Starter Does Not Energize (Starter Cannot Be Heard) (Continued).		
e. Defective starter power & indicator light control relay (K24 or K25). ▷1◁	Ensure that 28 vdc is available at starter power & indicator light control relay (K24 or K25).	If 28 vdc is present, replace starter power & indicator light control relay (K24 or K25). (Refer to 80-10-04.) If 28 vdc is not present, proceed to step f.
f. Defective fuel control relay panel (E170 or E171).	Check for 28 vdc at pin W of P315 or P316 of fuel control relay panel with Starter-Generator Switch set to START.	If 28 vdc is not present, replace fuel control relay panel. (Refer to Chapter 28.)
g. Defective starter.	Verify that power is available at starter (B312 or B313). Refer to Adjustment/Test, 80-10-01. With electrical cables disconnected from starter, measure resistance between starter terminals. Resistance must not exceed one (1) ohm. With electrical cables disconnected from starter, measure resistance between starter terminals and ground (starter case). Resistance must not be less than one (1) megohm.	Replace starter. (Refer to 80-10-01.)
2. Engine Does Not Crank, But Starter Energizes (Starter Can Be Heard).		
a. Defective starter drive jaw or starter jaw coupling.	Inspect starter drive jaw and starter jaw coupling. (Refer to 80-10-01.)	Replace starter drive jaw and/or starter jaw coupling if defective. (Refer to 80-10-01.)
3. System Switch Does Not Remain in START Position During Start Cycle.		
a. Defective Starter-Generator Switch.	Check mechanical function of Starter-Generator Switch.	Replace Starter-Generator Switch.

Starting System Trouble Shooting
Figure 101 (Sheet 2 of 4)

PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
4. Starter Energizes, But Engine Does Not Achieve Starting RPM.		
a. Starter power leads loose or not connected to starter terminals.	With Starter-Generator Switch set to OFF, visually inspect power lead connections at starter (B312 or B313).	Reconnect or tighten leads as necessary.
b. Defective starter.	Inspect starter brushes. (Refer to 80-10-01.)	Replace starter. (Refer to 80-10-01.)
5. Starter Fails to Automatically Disengage (START Annunciator Illuminated) Above 50% N2 RPM With START/GEN Switch in the START or OFF Position, But Disengages When Switched to the GEN Position. ▷2◁		
a. Defective starter relay (K24 or K25). ▷1◁	With all power disconnected, verify open circuit from terminal A1 to terminal A2 on starter relay (K24 or K25).	If open circuit does not exist, replace defective relay. (Refer to 80-10-04.)
b. Defective start control relay (K6B or K7B) on fuel control relay panel (E170 or E171).	With all power disconnected, verify open circuit from pin W to pin X on J315 and J316 of fuel control relay panel (E170 or E171).	If open circuit does not exist, replace defective relay.
c. Defective start cutout relay (K67 or K68) on fuel control relay panel (E170 or E171).	With 28 vdc across terminal 2 and terminal 7, verify open circuit from terminal 6 to terminal 8 on the start cutout relay (K67 or K68) on fuel control relay panel (E170 or E171).	If open circuit does not exist, replace defective relay.
d. Defective engine synchronizer control box (E578).	Replace with known operational unit.	Replace engine synchronizer control box.

Starting System Trouble Shooting
Figure 101 (Sheet 3 of 4)

PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
6. Starter Fails to Automatically Disengage (START Annunciator Illuminated) Above 50% N2 RPM After the START/GEN Switch Is Switched to the GEN Position. ▷2		
a. Defective START/GEN Switch (S610 or S611) on pilot's switch panel (E500).	With R START/GEN Switch (S610) in the GEN position, verify continuity from D to F on J798 of pilot's switch panel (E500). With L START/GEN Switch (S611) in the GEN position, verify continuity from D to F on J615 of pilot's switch panel (E500).	If continuity does not exist, replace defective switch.
b. Defective starter power distribution control relay (K26 or K27). ▷1	With 28 vdc across terminal 2 and terminal 7, verify open circuit from terminal 1 to terminal 3 on starter power distribution control relay (K26 or K27).	If open circuit does not exist, replace defective relay. (Refer to 80-10-05.)
c. Defective start control relay (K7, K8, K9, or K10) on generator control panel (E43).	With all power disconnected, verify open circuit from terminal C to terminal 1 and from terminal C to terminal 2 on generator control panel (E43).	If open circuit does not exist, replace defective relay.

NOTES:

▷1 *Not effective on Aircraft 35-002 thru 35-389, except 35-370, and 36-002 thru 36-047 unless modified per AAK 81-1, "Installation of Starter Secondary Electrical Contactors."*

▷2 *Starter indicator lights installed on Aircraft 35-370, 35-390 and Subsequent, 36-048 and Subsequent, and prior Aircraft modified per AMK 80-17, "Installation of Current Limiter Warning and Starter Indicator Lights."*

Starting System Trouble Shooting
Figure 101 (Sheet 4 of 4)

1. INSPECTION/CHECK
   A. The starter brushes shall be inspected in accordance with the current inspection intervals specified in Chapter 5. (Refer to 80-10-01, Inspection/Check, for starter brush inspection.
   B. The ratchet drive assembly shall be inspected in accordance with the current inspection intervals specified in Chapter 5. (Refer to 80-10-01, Inspection/Check, for ratchet drive assembly inspection.)
   C. The starter resistor circuit shall be functionally tested in accordance with the current inspection intervals specified in Chapter 5. (Refer to 80-10-01, Adjustment/Test, for functional test of starter resistor circuit.)

      NOTE: On *Aircraft 35-002 thru 35-067 and 36-002 thru 36-017 not modified per AAK 86-4, "Engine Starter Improvement,"* the timer circuit contained in the starter resistor cutout box incorporates potentiometers which allow the time delay to be adjusted. If the time delay is out of tolerance as specified in 80-10-01, Adjustment/Test, the time delay may be adjusted using procedures outlined in 80-10-02, Adjustment/Test.

   D. The starter gear box oil shall be checked and/or changed in accordance with the current inspection intervals specified in Chapter 5. (Refer to Inspection/Check, 80-10-01).

STARTER - MAINTENANCE PRACTICES

1. Removal/Installation

NOTE: Removal and installation procedures for both starters are identical.

If an engine starter is removed from the aircraft and it is to be stored, the starter shall be drained of oil. Upon reinstallation, the starter shall be refilled with oil complying to Garrett AiResearch EMS 53110, Type II. (Refer to Engine Oil System, Chapter 12.)

A. Removal of Starter (See Figure 201.)
   (1) Lower tailcone access door.
   (2) Remove electrical power from aircraft.
   (3) Remove lower engine cowl.
   (4) Disconnect and identify wiring from starter.

   NOTE: Effective *Aircraft 35-103 and Subsequent and 36-030 and Subsequent*, ID tags are incorporated to identify starter wiring.

   (5) Loosen attaching parts and remove starter and gasket from engine.
   (6) Inspect starter drive jaw and jaw coupling assembly. Replace if teeth are not within allowable tolerance. (Refer to Inspection/Check.)
   (7) If required, drain starter oil.

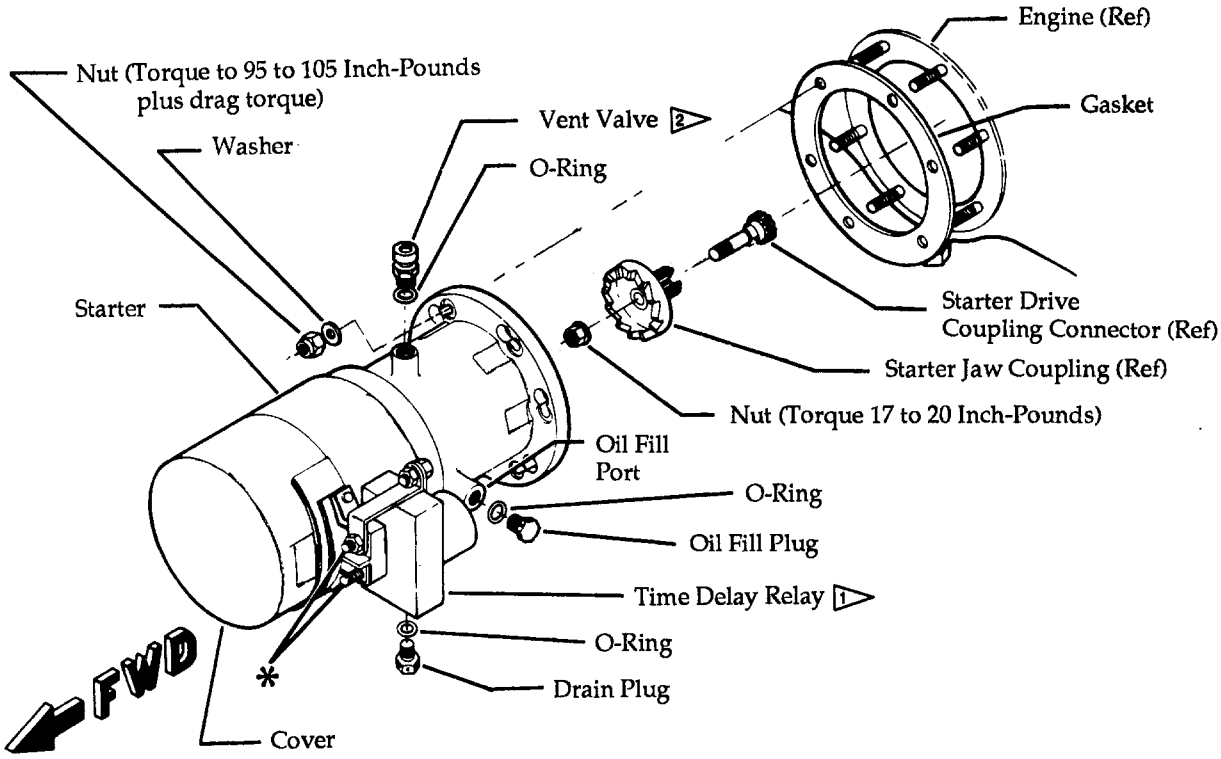
B. Installation Starter (See Figure 201.)
   (1) If required, fill starter with oil complying to Garrett AiResearch EMS 53110, Type II. (Refer to Engine Oil System, Chapter 12.) Fill until level with oil filler port (approximately 50 cc with filler port parallel to horizontal plane). Install oil fill plug and safety.
   (2) Install gasket and starter on engine.
   (3) Secure starter with attaching parts. Torque nuts 95 to 105 inch-pounds plus drag torque.

   CAUTION: INSTALL STARTER LEADS SO THAT MAXIMUM CLEARANCE IS MAINTAINED BETWEEN STARTER LEAD TERMINAL SHANK AND STARTER HOUSING. TERMINAL SHANK CONTACTING STARTER HOUSING DURING STARTER OPERATION WILL RESULT IN STARTER DAMAGE.

   (4) Identify and connect electrical wiring.
   (5) Restore electrical power to aircraft.
   (6) Perform operational test of starter. (Refer to Adjustment/Test.)
   (7) Install lower engine cowl.
   (8) Secure tailcone access door.

2. Adjustment/Test

A. Operational Test of Starter
   (1) Connect external electrical power source to aircraft.
   (2) Set Battery Switches to BAT 1 and BAT 2.
   (3) Set applicable Starter-Generator Switch to START. On *Aircraft 35-370, 35-390 and Subsequent, 36-048 and Subsequent, and prior aircraft modified per AMK 80-17, "Installation of Current Limiter Warning and Starter Indicator Lights," or AAK 81-1, "Installation of Starter Secondary Electrical Contactors,"* observe illumination of START L or START R light adjacent to switch.



1 Time Delay Relay effective *35-068 and Subsequent; 36-018 and Subsequent.*

2 On aircraft equipped with (P/N 6608268-6) starters, a plug is installed in place of the vent valve.

* **Measure starting voltage between these two points. On aircraft without time delay relay on starter, connect to + and - terminals.**

Starter Installation
Figure 201

NOTE: On *Aircraft modified per AMK 80-17, "Installation of Current Limiter Warning and Starter Indicator Lights," or AAK 81-1, "Installation of Starter Secondary Electrical Contactors,"* the start indicator lights may be installed on the instrument panel and are placarded STARTER LH ENGAGED and STARTER RH ENGAGED.

(4) Monitor engine rpm; at 8% to 10% rpm, set Starter-Generator Switch to OFF.
(5) Set Battery Switches off.
(6) Disconnect external electrical power source from aircraft.

B. Functional Test of Starter Resistor Circuit

NOTE: Perform functional test of starter resistor circuit in accordance with the current inspection interval specified in Chapter 5.

(1) Connect external electrical power source to aircraft.
(2) Remove engine lower nacelle cover.
(3) Connect voltmeter to starter motor terminals. On *Aircraft 35-068 and Subsequent, 36-018 and Subsequent, and prior aircraft modified per AAK 86-4, "Engine Starter Improvement,"* the starter motor incorporates three terminals. The positive terminal is marked and the negative motor terminal has a cotter pin in the stud. Ensure that voltmeter is connected to these terminals. (See Figure 201.)
(4) Set Battery Switches to BAT 1 and BAT 2.
(5) Set L Starter-Generator Switch to START and monitor initial starting voltage.
(6) Initial starting voltage, after starter engagement, will range from 10 to 14 vdc.
(7) After approximately 1.5 seconds, starting voltage will display a stepped increase to a point ranging from 18-20 vdc, and then continues to slowly increase.
(8) After starter engagement, if initial starting voltage is greater than 14 vdc when the Starter-Generator Switch is set to START, the starter resistor, starter-resistor cutout or the resistor cutout relay is defective. Defective components shall be replaced.

NOTE: On *Aircraft 35-068 and Subsequent, 36-018 and Subsequent, and prior aircraft modified per AAK 86-4, "Engine Starter Improvement,"* the starter resistor circuit is an integral part of the starter. If defective, the starter must be returned to factory for overhaul.

(9) Repeat steps 2.B.(5) thru 2.B.(8) utilizing the R Starter-Generator Switch.
(10) Restore aircraft to normal.

3. Inspection/Check

A. Inspect Starter Brushes

NOTE: Inspect starter brushes in accordance with the current inspection interval specified in Chapter 5.

(1) Remove starter from engine per procedures outlined in steps 1.A.
(2) Remove screws securing starter cover to starter and using a phenolic block, lightly tap off cover.
(3) Inspect brushes for wear by checking diagonal line on brush. If line is visible, brushes are serviceable.
(4) Install starter on engine per procedure outlined in steps 1.B.

B. Inspect Starter Drive Jaw and Starter Jaw Coupling Assemblies (See Figure 202.)

NOTE: Inspect starter drive jaw and jaw coupling assemblies in accordance with the current inspection interval specified in Chapter 5.

(1) Remove starter from engine.

(2) Inspect both assemblies for wear due to non-engagements.

NOTE: Tooth contact will have formed a radius (rollover) and ragged edge (burrs) on top and side of tooth.

(a) Lay 320 grit emery paper on a flat surface and polish top of teeth by moving jaw over paper to remove burrs.
(b) Using a #0 jewelers file, carefully remove burrs from side of teeth, keeping file as flat as possible.
(c) File peened over areas on teeth.
(d) Measure top of teeth on outside edge. Minimum acceptable area is .110 inch (2.79 mm).
(e) Measure rollover radius on teeth. Maximum acceptable rollover is .030 inch (.76 mm).

(3) Inspect both assemblies for wear due to overrunning conditions as shown. (See Detail D.) Both conditions are acceptable if jaw wear is within the limits shown. (See Detail E.)
(4) If starter drive jaw or starter jaw coupling are not within specified limits, replace applicable parts. (Refer to Starter Ratchet Drive or Starter Connector Replacement, this section.)

C. Checking Oil Level
(1) Remove oil filler plug and check that oil level is visible in plug opening.
(2) If oil is added, use oil complying to Garrett AiResearch EMS 53110, Type II. (Refer to Engine Oil System, Chapter 12.)
(3) Install oil filler plug.

D. Changing Starter Oil
(1) Remove lower nacelle from engine.
(2) Remove safety wire and drain plug from starter.
(3) Drain oil into a suitable container.
(4) Install drain plug, tighten and install safety wire.
(5) Remove safety wire and fill plug from starter.

NOTE: The words FILL AND DRAIN (raised letters on housing) are located at their respective ports.

(6) Fill starter with oil complying to Garrett AiResearch EMS 53110, Type II. (Refer to Engine Oil System, Chapter 12.) Fill to level of fill port (approximately 50 cc.)
(7) Install fill plug and safety wire.
(8) Install lower nacelle on engine.

4. Approved Repairs

A. Replace Starter Jaw Coupling (See Figure 202.)
(1) Remove starter from engine per procedures outlined in steps 1.A.
(2) Remove starter jaw coupling locknut.
(3) Remove starter jaw coupling and starting drive coupling connector from engine.

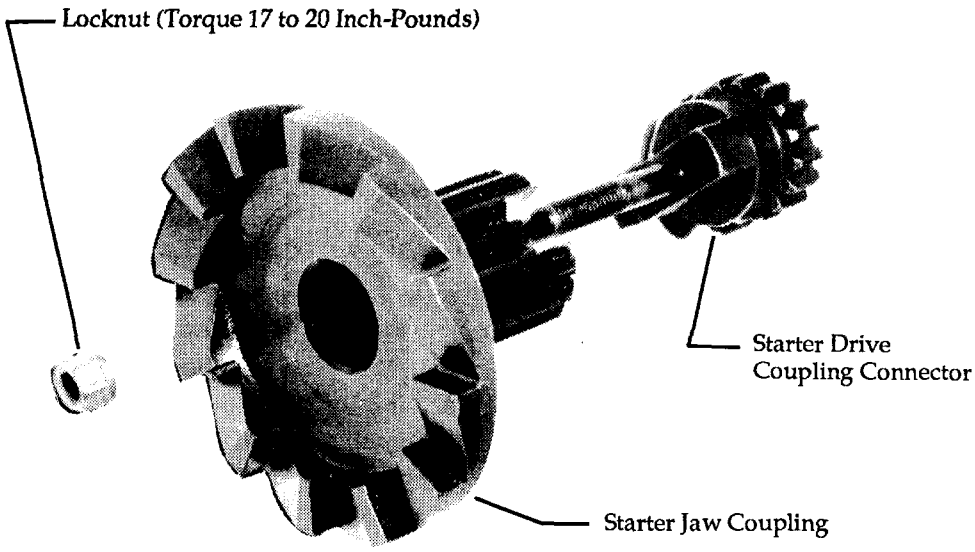
CAUTION: APPLY A LIGHT COAT OF GREASE TO SPLINES OF STARTER DRIVE COUPLING CONNECTOR ONLY. GREASE APPLIED TO SPLINES OR FACE OF STARTER JAW COUPLING WILL CAUSE GREASE BUILDUP IN STARTER PAD. GREASE BUILDUP IN THIS AREA WILL CAUSE EXCESSIVE WEAR TO THE STARTER JAW COUPLING.

(4) Apply a light coat of Mobil Grease No. 29 (mfd. by Mobil Oil Corp.) or Braycote No. 664S (mfd. by Bray Oil Co.) to make spline of coupling connector.
(5) Insert the coupling connector into the engine spline cavity until it bottoms in cavity. Index the connector 1/2 tooth.

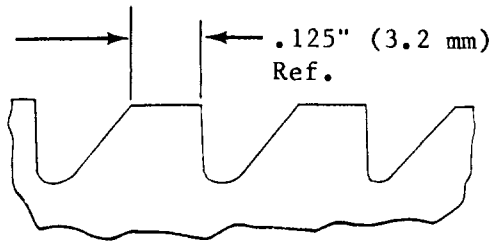
CAUTION: ENSURE THAT THE KEY PORTION OF THE STARTING DRIVE COUPLING CONNECTOR IS PROPERLY ENGAGED IN THE STARTER JAW COUPLING. WHEN PROPERLY ENGAGED, THE COUPLING CONNECTOR SHAFT WILL PROTRUDE THROUGH THE STARTER JAW COUPLING A MINIMUM OF 0.030 INCH. THE LOCKNUT (MS21043-3) SHOULD BE REPLACED AT EACH STARTER JAW COUPLING REPLACEMENT.

(6) Insert starter jaw coupling in spline cavity, ensuring that key is engaged in drive coupling connector.
(7) Install locknut and torque 17 to 20 inch-pounds above the drag torque of the locknut.
(8) Install starter on engine per procedures outlined in steps 1.B.

B. Replace Starter Drive Jaw (See Figure 201.)
(1) Remove starter from engine per procedures outlined in steps 1.A.
(2) Remove cotter pin and nut securing starter drive jaw.
(3) Remove starter drive jaw, spring retainer, spring, and O-ring seal.
(4) Install new O-ring in spring retainer and assembly spring, spring retainer and starter drive jaw on starter drive shaft.
(5) Install nut securing starter ratchet drive and tighten. Install cotter pin.
(6) Install starter on engine per procedures outlined in steps 1.B.



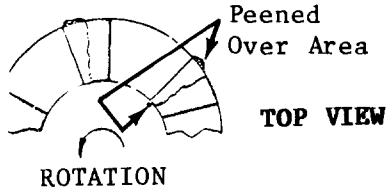
Starter Drive and Starter Jaw Connector Inspection
Figure 202 (Sheet 1 of 2)

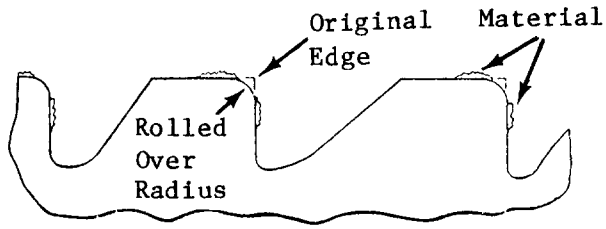


(New Jaw)

SIDE VIEW

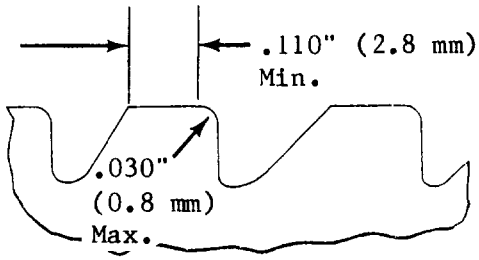
Detail A





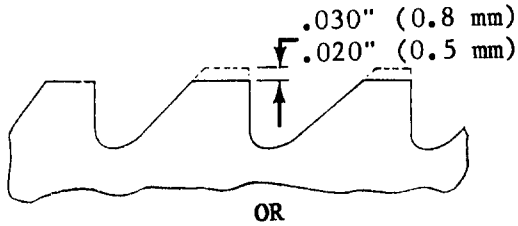
(Jaw Wear Pattern From Non-Engagement)

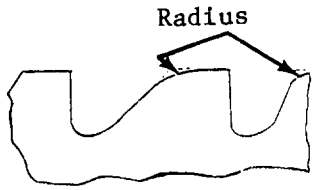
Detail B



Non-engagement Wear After Filing & Polishing)

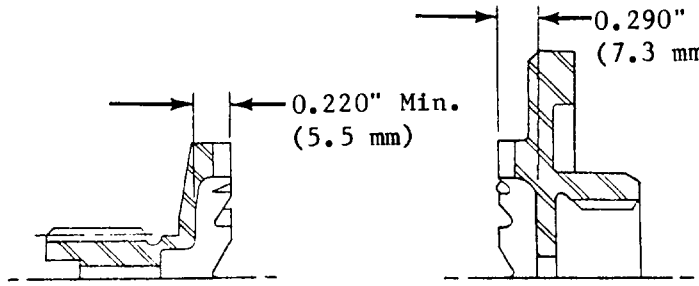
Detail C





(Jaw Wear From Engine Overrun)

Detail D



STARTER JAW COUPLING STARTER DRIVE JAW

(Overrun Wear Limits)

Detail E

Rachet Drive and Starter Jaw Connector Inspection
Figure 202 (Sheet 2 of 2)

STARTER RESISTOR CUTOUT BOX - MAINTENANCE PRACTICES

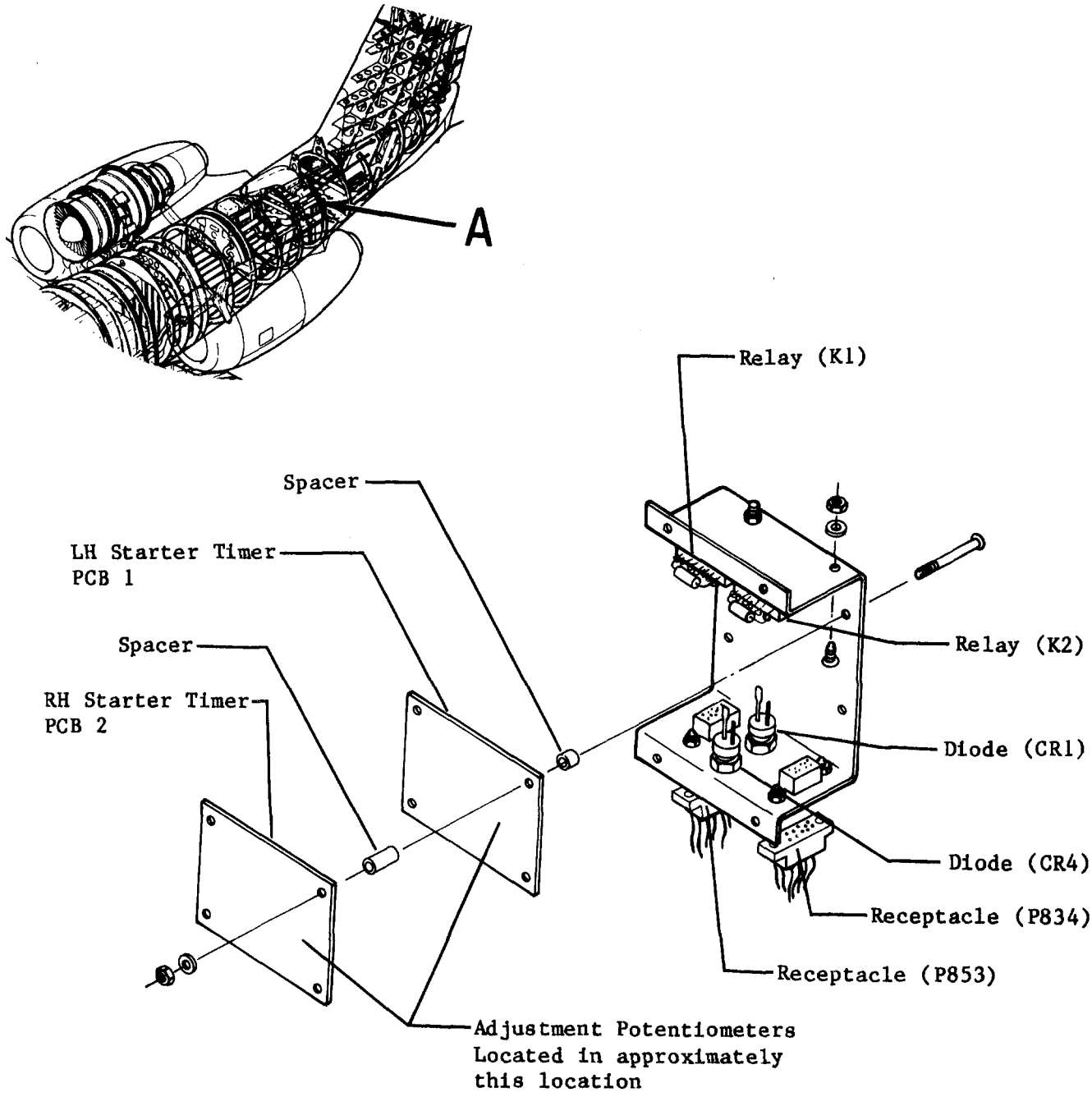
1. REMOVAL/INSTALLATION

A. Remove Starter Resistor Cutout Box (See figure 201.)
   (1) Lower tailcone access door.
   (2) Disconnect electrical plugs from resistor cutout box.
   (3) Remove attaching parts and resistor cutout box from aircraft.

B. Install Starter Resistor Cutout Box (See figure 201.)
   (1) Install resistor cutout box and secure with attaching parts.
   (2) Connect electrical plugs to resistor cutout box.
   (3) Raise and secure tailcone access door.

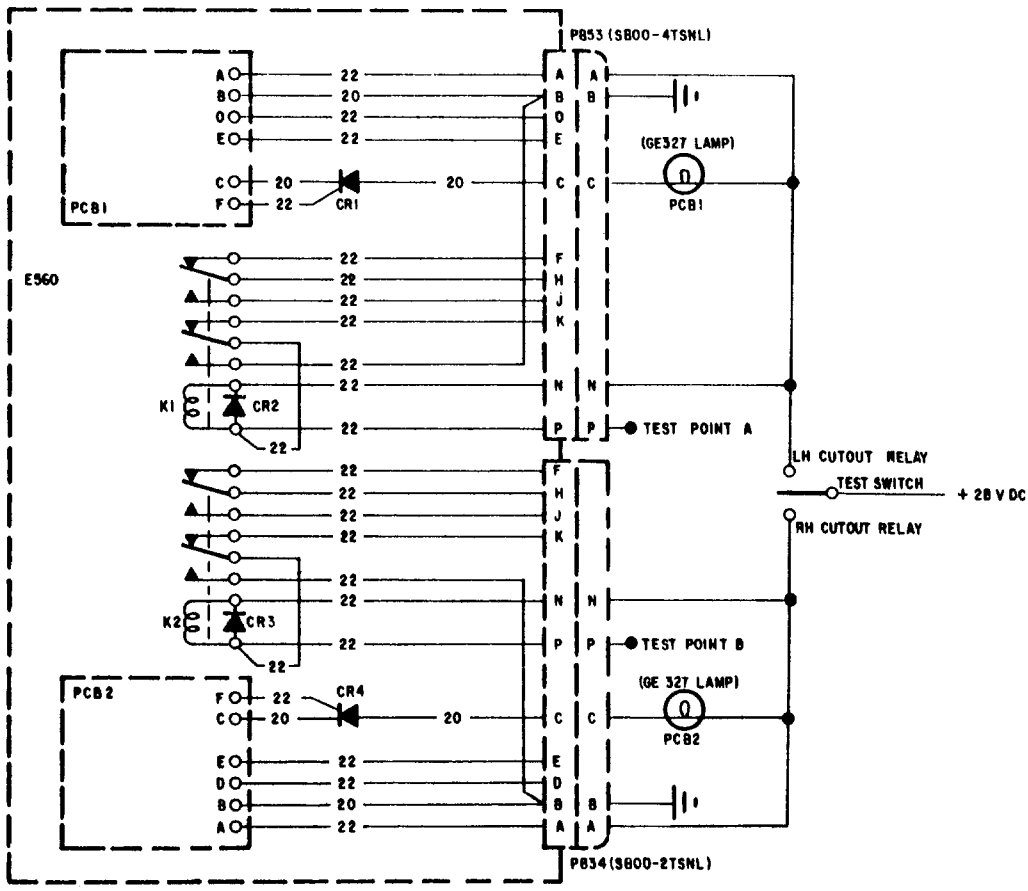
2. ADJUSTMENT/TEST

A. Functional Check Starter Resistor Cutout Box (See figure 202.)
   (1) Gain access to the starter resistor cutout box and disconnect electrical plugs.
   (2) Remove attaching parts and remove starter resistor cutout from the aircraft.
   (3) Connect starter resistor cutout box to test switch as shown in figure 202.
   (4) Set test switch to LH cutout relay and check that lamp illuminates in 2 (±1) seconds.
   (5) Connect a voltmeter (Simpson 260 or Hewlett Packard 3430A) across test point A and ground. Twenty-eight (28) vdc should be present and an audible check of the relay (K1) energizing should be heard when test point A is grounded.
   (6) Set test switch to off. Connect a jumper between pins E and D of same connector.
   (7) Set test switch to LH cutout relay; lamp should illuminate immediately.
   (8) If lamp indicates incorrect time delay, adjust potentiometer on printed circuit board until lamp illuminates with 2 (±1) seconds.
   (9) Repeat steps (4) thru (8) with switch in the RH cutout relay position and test point B to check out the remaining circuit.
   (10) After completion of check, install starter resistor cutout box in aircraft and connect electrical plugs.



Detail A

Starter Resistor Cutout Box Installation
Figure 201



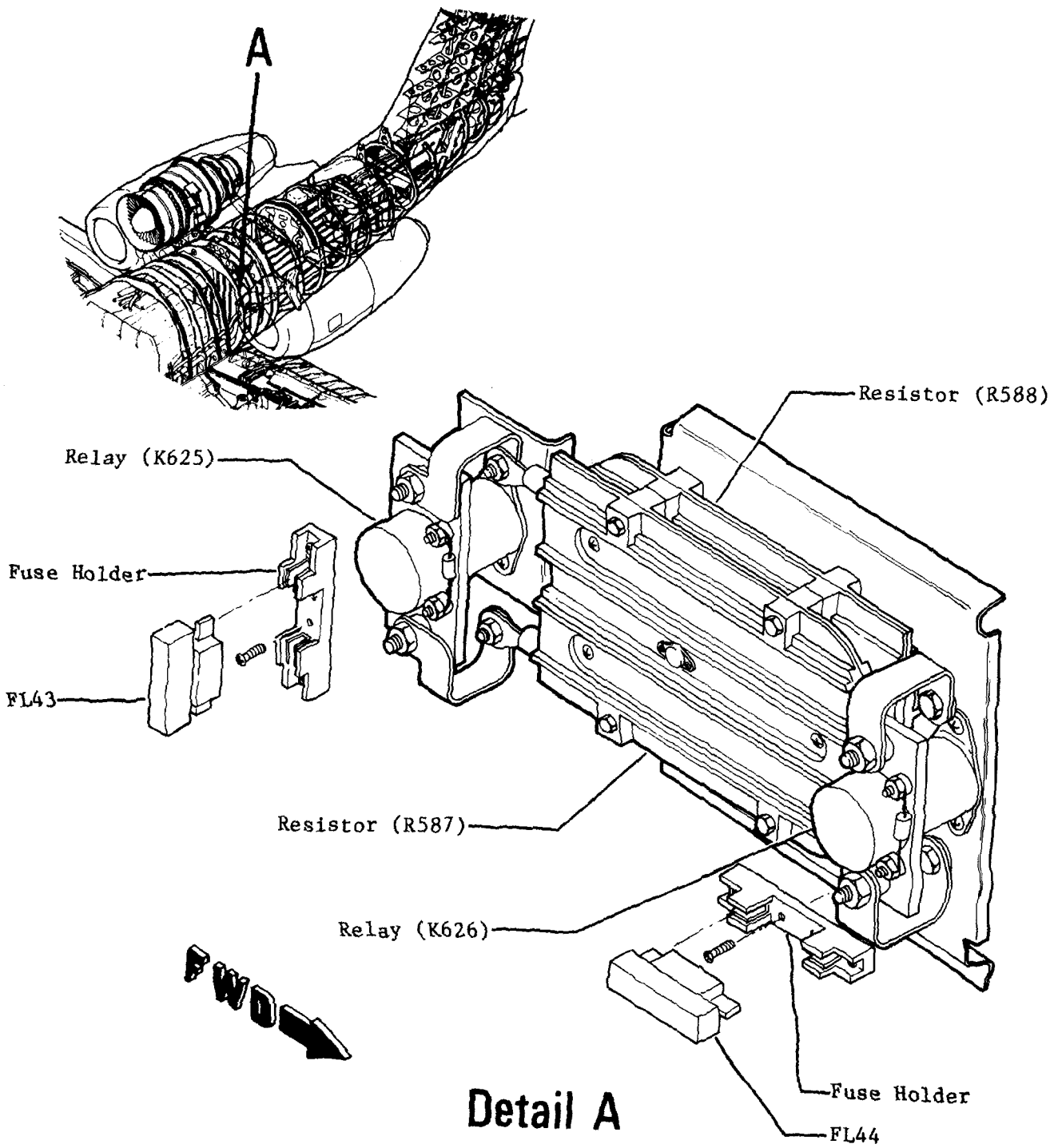
Starter Resistor Cutout Box Functional Check
Figure 202

STARTER RESISTOR, CURRENT LIMITER AND RELAY - MAINTENANCE PRACTICES

1. REMOVAL/INSTALLATION

A. Remove Starter Resistor (See figure 201.)
   (1) Lower tailcone access door.
   (2) Remove refrigeration compressor and compressor motor mounting panel as follows:
      (a) Discharge refrigeration system and disconnect refrigeration hoses from compressor. (Refer to Chapter 21.)
      (b) Loosen and remove bellmouth support screws from bellmouth supports and bellmouth. (Refer to Chapter 21.)
      (c) Loosen and remove mounting panel shock mount bolts and mounting panel with compressor and compressor motor attached from aircraft.
   (3) Disconnect electrical wiring from starter resistors. Tag wiring.
   (4) Loosen and remove nuts and washers securing resistor bus bars to relays.
   (5) Remove attaching parts and starter resistor assemblies from support assembly.

B. Install Starter Resistor (See figure 201.)
   (1) Install starter resistor assemblies on support assembly and secure with attaching parts.
   (2) Install relay bus bars and secure with attaching parts.
   (3) Connect electrical wiring to starter resistor assemblies.
   (4) Install compressor mounting panel and compressor. (Refer to Chapter 21.)
   (5) Recharge refrigeration system. (Refer to Chapter 12.)
   (6) Raise and secure tailcone access door.

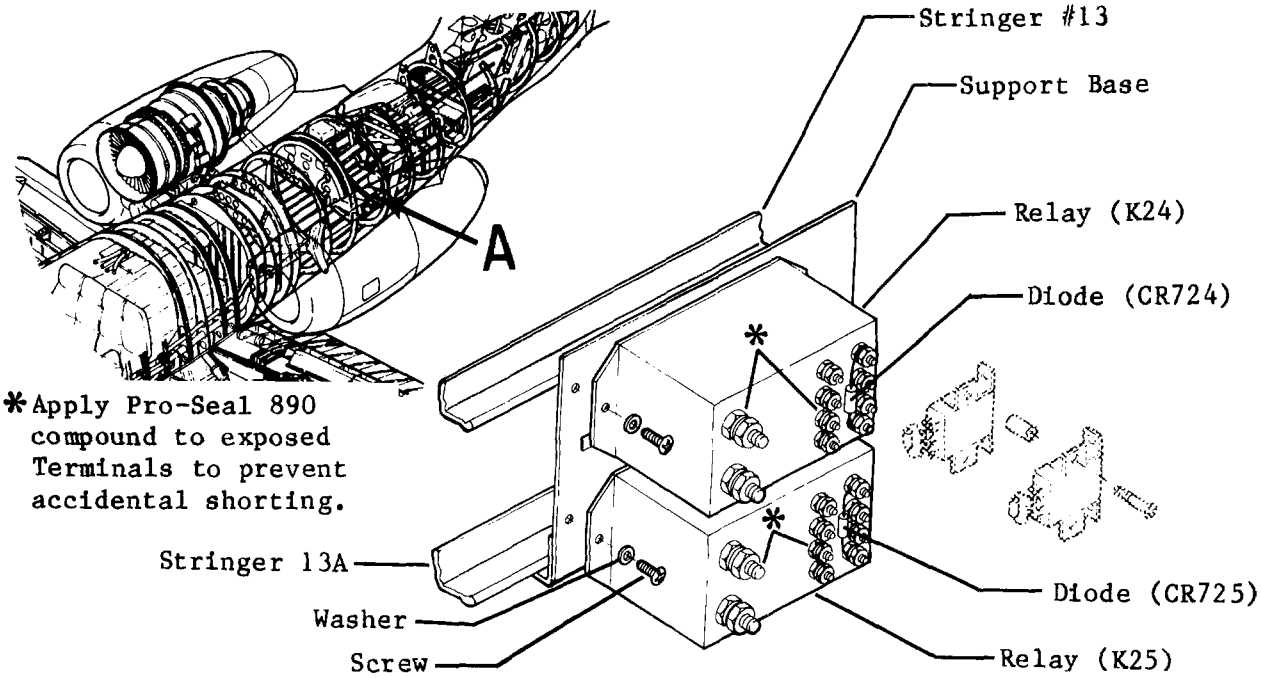


Starter Resistor, Current Limiter, and Relay Installation
Figure 201

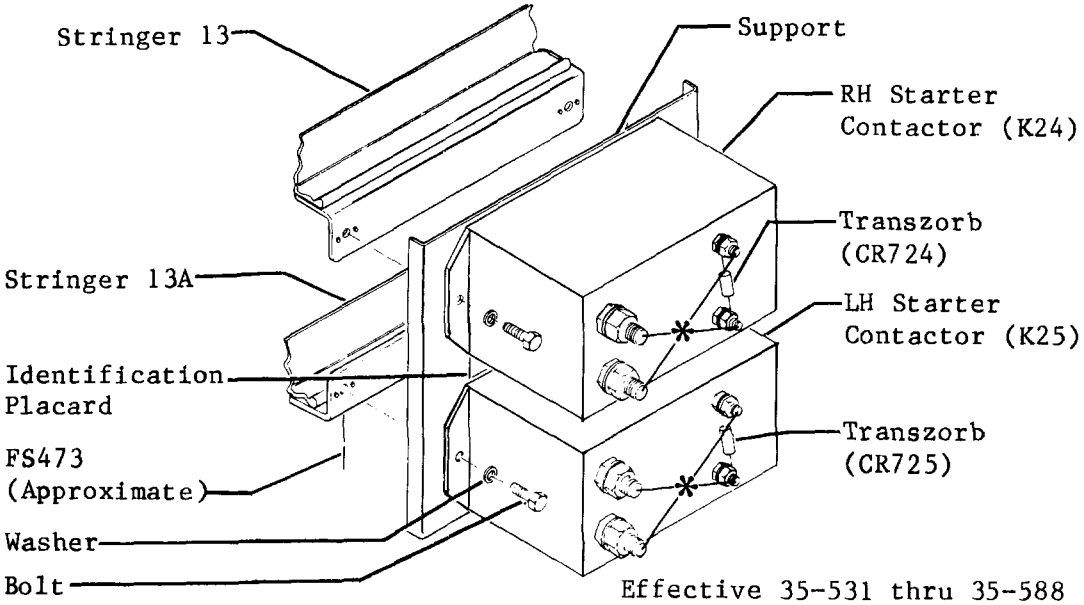
EFFECTIVITY: 35-002 thru 35-067 and 36-002 thru 36-017 NOT Modified per AAK86-4, "Engine Starter Improvement"

STARTER CONTACTOR - MAINTENANCE PRACTICES

1. REMOVAL/INSTALLATION
   A. Remove Starter Contactor (See figure 201.)
      (1) Remove electrical power from aircraft.
      (2) Remove sealant from terminals and disconnect and identify electrical wiring from contactor. Clean remaining sealant from wiring terminals.
      (3) Remove attaching parts and contactor from support and from aircraft.
   B. Install Starter Contactor (See figure 201.)
      (1) Position starter contactor on support and secure with attaching parts.
      (2) Identify and connect electrical wiring to starter contactor.
      (3) Apply Pro-Seal 890 compound to exposed terminals. Ensure that all exposed areas are covered.
      (4) Restore electrical power to aircraft.
      (5) Perform operational test of starter. (Refer to 80-10-01, Adjustment/Test.)



Aircraft Modified per AAK 81-1 "Installation of Starter Secondary Electrical Contactors"



Effective 35-531 thru 35-588 and 35-590 and Subsequent and 36-054 and Subsequent, contactors are rotated 180° on support.

35-370, 35-390 and Subsequent and 36-048 and Subsequent

Detail A

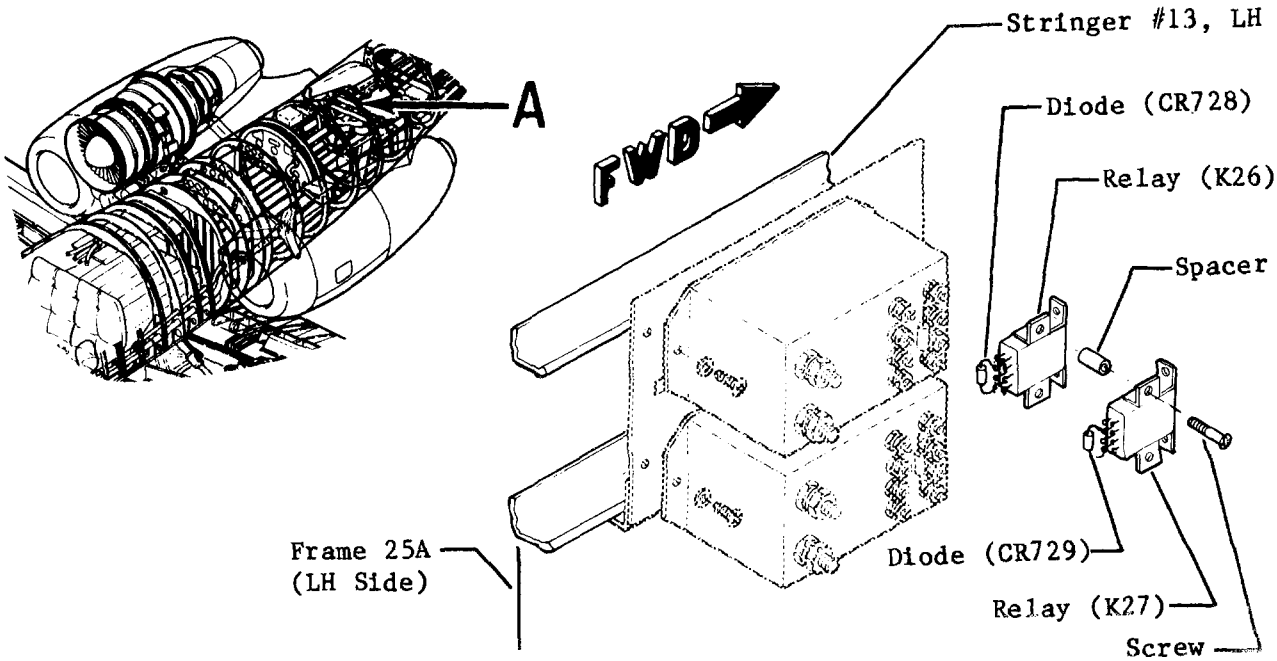
Starter Contactor Installation
Figure 201

AUXILIARY CONTACTOR CONTROL RELAY - MAINTENANCE PRACTICES

1. REMOVAL/INSTALLATION

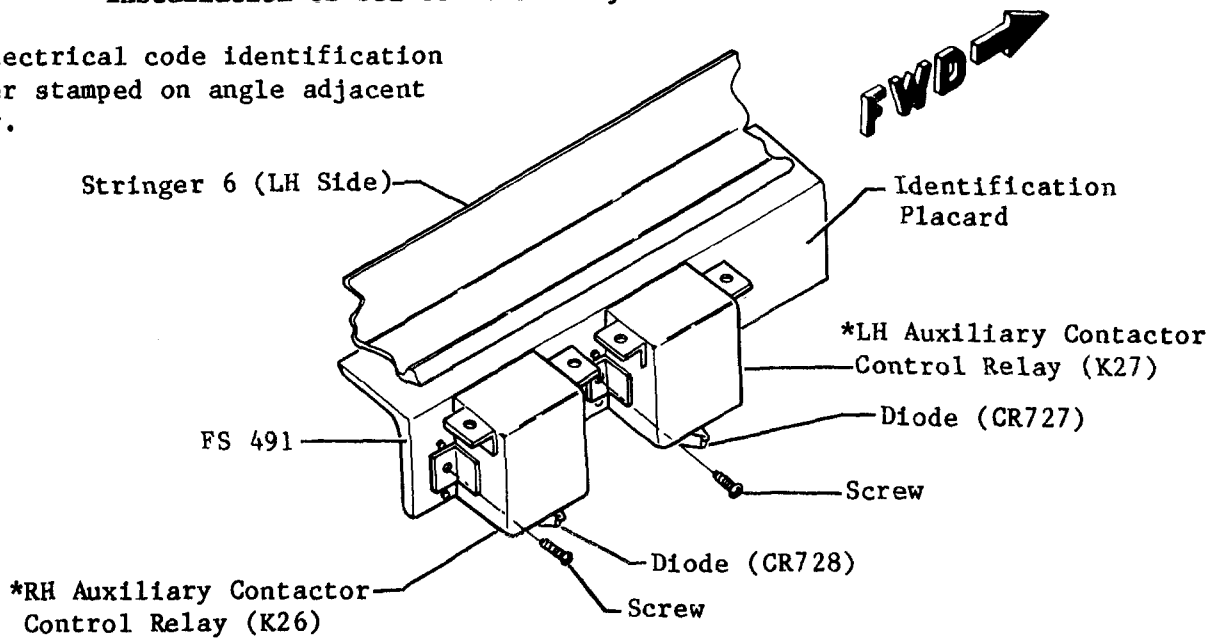
A. Remove Auxiliary Contactor Control Relay (See figure 201.)
   (1) Remove electrical power from aircraft.
   (2) Remove attaching parts and relay sufficiently to gain access to electrical wiring.
   (3) Disconnect electrical wiring from relay. Tag all wiring to aid in connecting wiring to new relay.

B. Install Auxiliary Contactor Control Relay (See figure 201.)
   (1) Connect electrical wiring to relay.
   (2) Install relay on angle, support, or bracket and secure with attaching parts.
   (3) Restore electrical wiring to relay.
   (4) Perform operational test of starter. (Refer to 80-10-01, Adjustment/Test.)
   (5) Close and secure tailcone access door.



Aircraft Modified per AAK 81-1
"Installation of Starter Secondary Electrical Contactors"

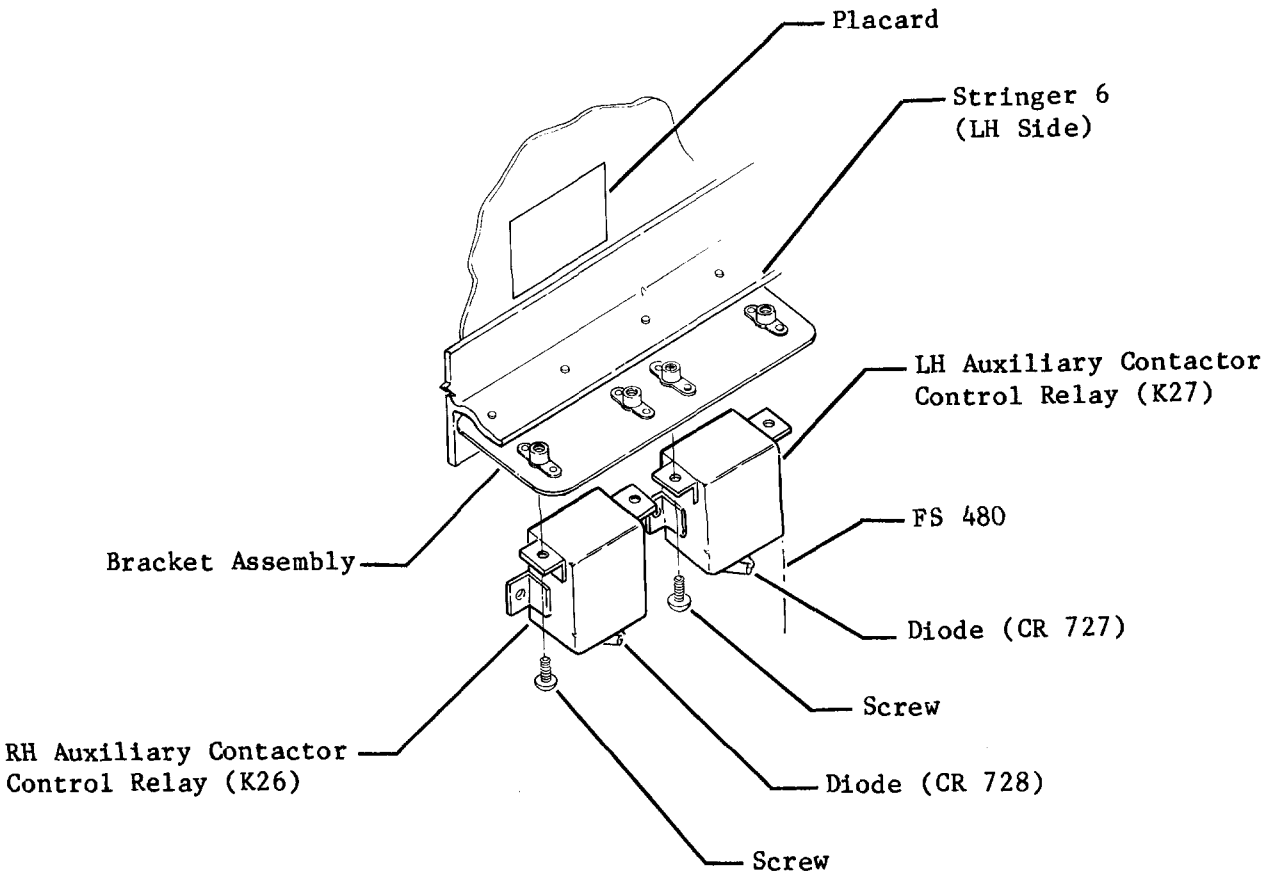
*Relay electrical code identification is rubber stamped on angle adjacent to relay.



35-370 Only

Detail A

Auxiliary Contactor Control Relay Installation
Figure 201 (Sheet 1 of 2)



35-390 and Subsequent
36-048 and Subsequent

A9-186B

Detail A

Auxiliary Contactor Control Relay Installation
Figure 201 (Sheet 2 of 2)

STARTER INDICATOR LIGHT FUSE ASSEMBLY - MAINTENANCE PRACTICES

1. REMOVAL/INSTALLATION

A. Remove Fuse Block Assembly (*Aircraft 35-370, 35-390 and Subsequent and 36-048 and Subsequent*). (See figure 201.)

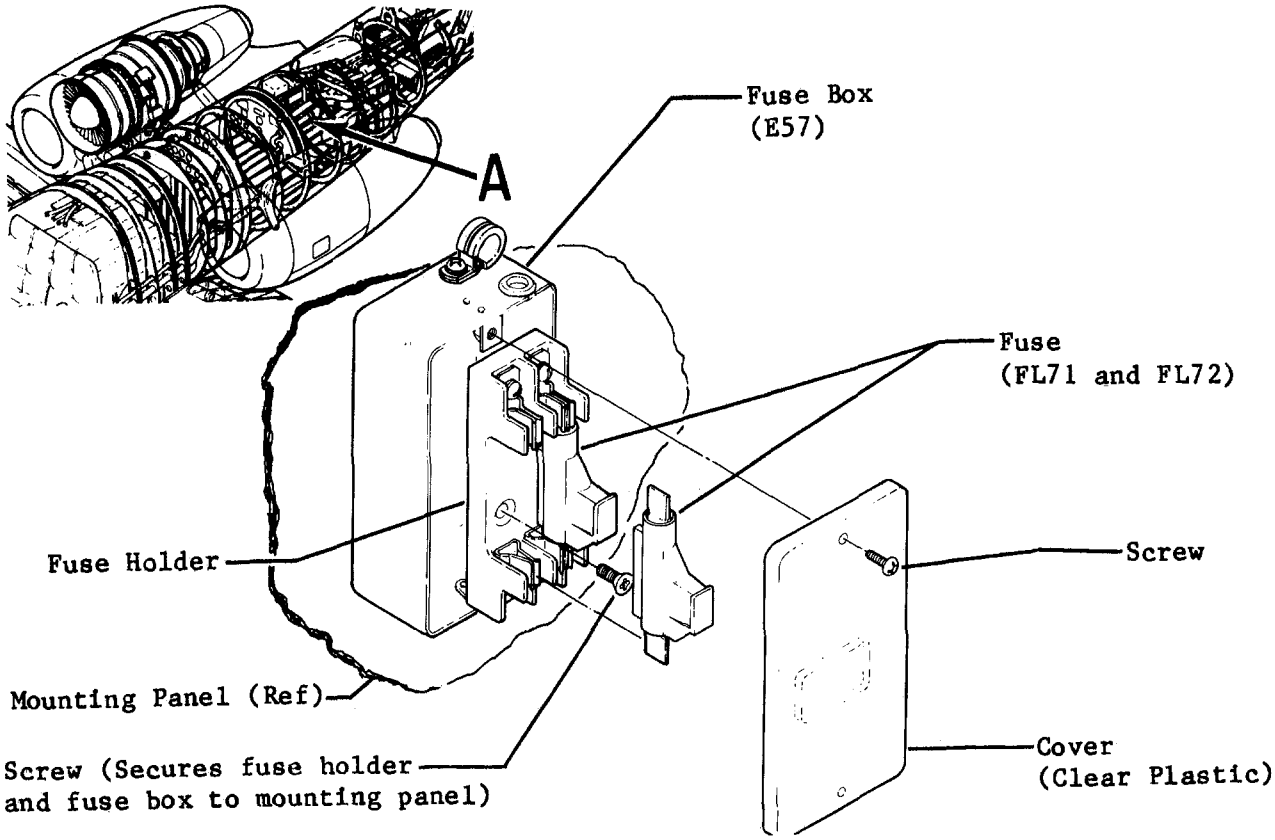
NOTE: Fuses are secured in clip retainers. If replacement is required, remove old fuse from clip retainer and insert new fuse.

(1) Open tailcone access door and remove electrical power from aircraft.
(2) Remove attaching parts securing fuse cover to bracket assembly.
(3) Disconnect wiring from fuse block assembly.
(4) Remove fuses from clip retainers.
(5) Remove attaching parts and fuse block assembly from bracket assembly.

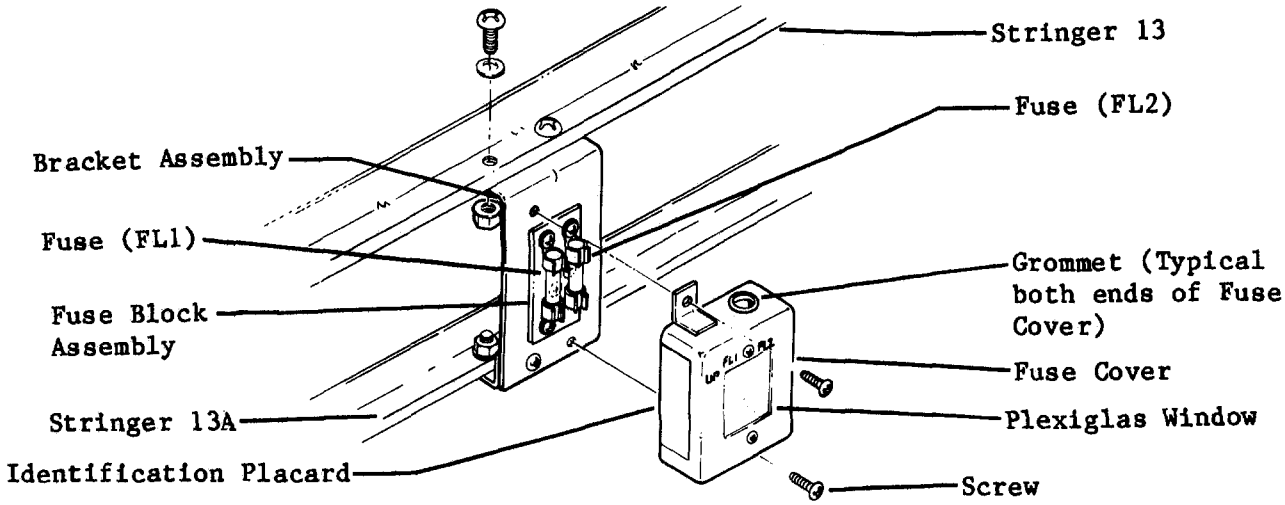
B. Install Fuse Block Assembly (*Aircraft 35-370, 35-390 and Subsequent and 36-048 and Subsequent*). (See figure 201.)
(1) Install fuse block assembly and secure with attaching parts.
(2) Connect electrical wiring to fuse block assembly.
(3) Install fuses in clip retainers.
(4) Install fuse cover on bracket assembly and secure with attaching parts.
(5) Perform operational test of starter to verify function of starter indicator lights. (Refer to 80-10-01, Adjustment/Test.)
(6) Close and secure tailcone access door.

C. Install Fuse Box Assembly (*Aircraft 35-002 thru 35-389, except 35-370, and 36-002 thru 36-047 Modified per AMK 80-17, "Installation of Current Limiter Warning and Starter Indicator Lights" or AAK 81-1, "Installation of Starter Secondary Electrical Contactors"*). (See figure 201.)
(1) Remove electrical power from aircraft.
(2) Remove attaching screws and plastic cover from fuse box.
(3) Disconnect electrical wiring from fuse holder.
(4) Remove fuses from fuse holder.
(5) Remove attaching parts securing fuse holder and fuse box to mounting panel. Remove fuse holder and fuse box from mounting panel.

D. Install Fuse Box Assembly (*Aircraft 35-002 thru 35-389, except 35-370, and 36-002 thru 36-047 Modified per AMK 80-17, "Installation of Current Limiter Warning and Starter Indicator Lights" or AAK 81-1, "Installation of Starter Secondary Electrical Contactors"*). (See figure 201.)
(1) Position fuse box and fuse holder on mounting panel and secure with attaching parts.
(2) Connect electrical wiring to fuse holder.
(3) Install fuses in fuse holder.
(4) Position plastic cover on fuse box and secure with attaching parts.
(5) Perform operational check of starter to verify function of starter indicator lights. (Refer to 80-10-01, Adjustment/Test.)
(6) Close and secure tailcone access door.



Aircraft Modified per AAK81-1 "Installation of Starter Secondary Electrical Contactors"



Aircraft 35-370, 35-390 and Subsequent and 36-048 and Subsequent

Detail A

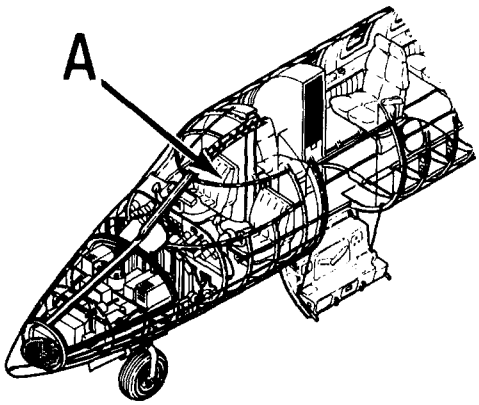
Starter Indicator Light Fuse Installation
Figure 201

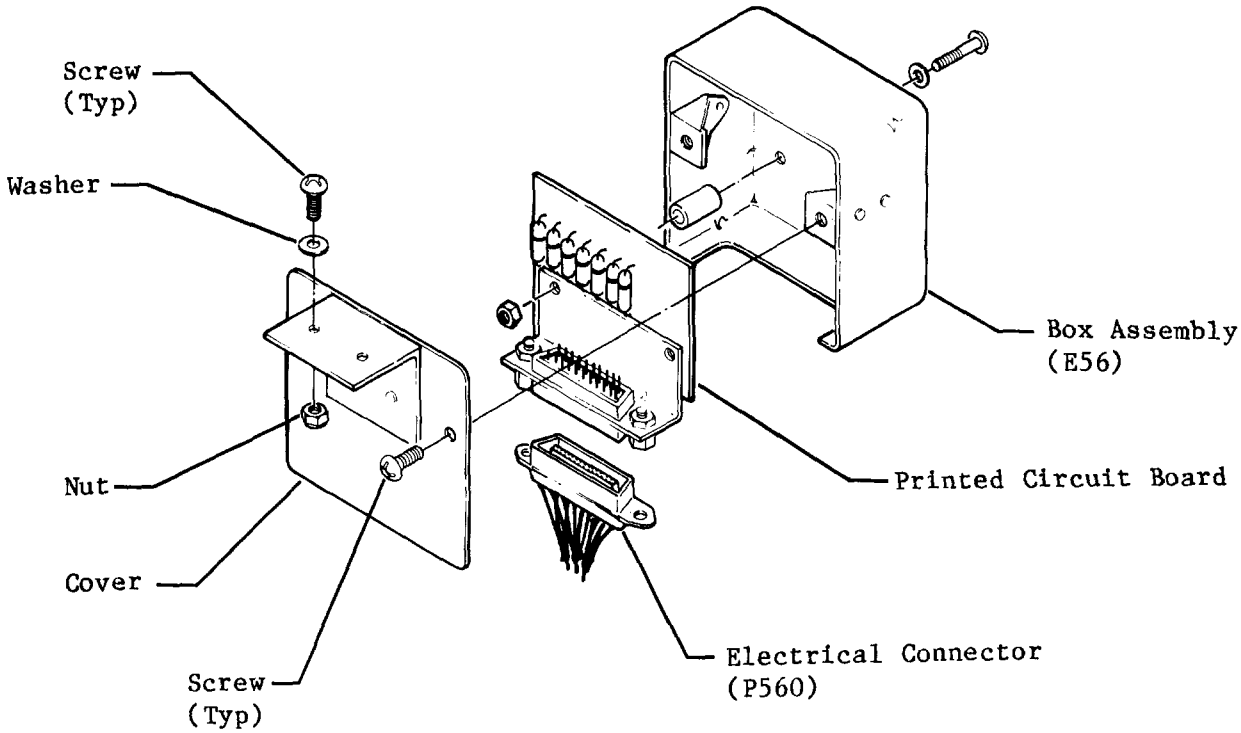
CURRENT LIMITER AND STARTER INDICATOR LIGHTS PRINTED CIRCUIT BOARD BOX ASSEMBLY - MAINTENANCE PRACTICES

1. REMOVAL/INSTALLATION

A. Remove Box Assembly (See figure 201.)
   (1) Remove electrical power from aircraft.
   (2) Remove side panel from RH side of cockpit to gain access to box assembly.
   (3) Disconnect electrical connector from box assembly.
   (4) Remove attaching parts and box assembly from stringer 10 and aircraft.

B. Install Box Assembly (See figure 201.)
   (1) Position box assembly on stringer 10 and secure with attaching parts.
   (2) Connect electrical connector to box assembly.
   (3) Restore electrical power to aircraft.
   (4) Perform operational test of starters to verify operation of starter indicator lights. (Refer to Adjustment/Test, 80-10-01.)
   (5) Install side panel on RH side of cockpit.





Detail A

9-281A

Current Limiter and Starter Indicator Lights Printed Circuit Board Installation
Figure 201

EFFECTIVITY: 35-002 thru 35-389, Except 35-370, and 36-002 thru 36-047 When Modified per AMK 80-17, "Installation of Current Limiter Warning and Starter Indicator Lights," or AAK 81-1, "Installation of Starter Secondary Electrical Contactors"

1. Removal/Installation

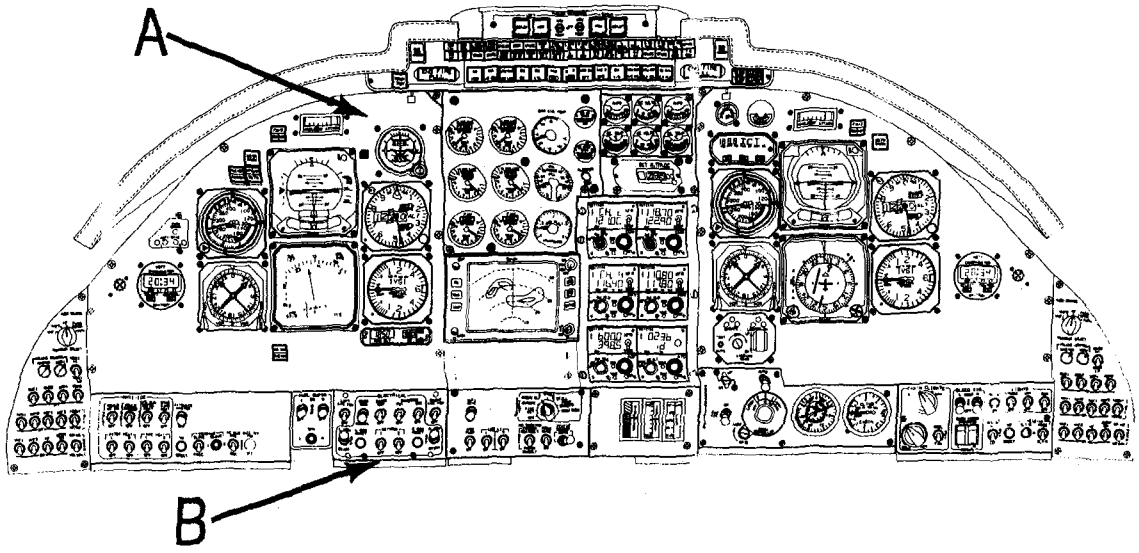
NOTE: These instructions apply to *Aircraft 35-370, 35-390 and Subsequent, 36-048 and Subsequent and prior Aircraft modified per AMK 80-17, "Installation of Current Limiter Warning and Starter Indicator Lights," or AAK 81-1, "Installation of Starter Secondary Electrical Contactors"*

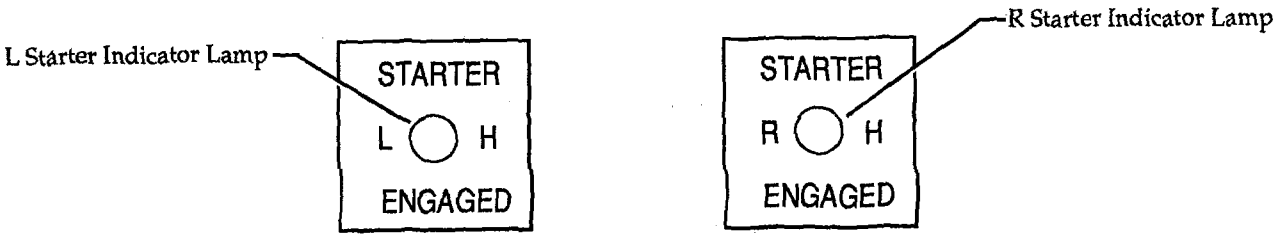
A. Remove Starter Indicator Lamp. (Lamp installed in pilot's switch panel.) (See Figure 201.)
   (1) Remove electrical power from aircraft.
   (2) Remove pilot's switch panel. (Refer to Chapter 31.)
   (3) Remove screws securing overlay to pilot's Power and Ignition Switch panel.
   (4) Separate overlay from switch panel using care not to break electroluminescent lighting wire.
   (5) Remove lens cap from starter indicator lamp.
   (6) Remove defective lamp from socket.

B. Install Starter Indicator Lamp. (Lamp installed in pilot's switch panel.) (See Figure 201.)
   (1) Install lamp in socket of pilot's switch panel.
   (2) Install lens cap.
   (3) Install overlay panel and secure with screws.
   (4) Install pilots switch panel. (Refer to Chapter 31.)
   (5) Restore electrical power to aircraft.
   (6) Perform operational check of starter to verify proper operation of lamp. (Refer to 80-10-01, Adjustment/Test.)

C. Remove Starter Indicator Lamp. (Lamp installed in instrument panel.) (See Figure 201.)
   (1) Remove electrical power from aircraft.
   (2) Remove lens cap from starter indicator lamp.
   (3) Remove defective lamp from socket.

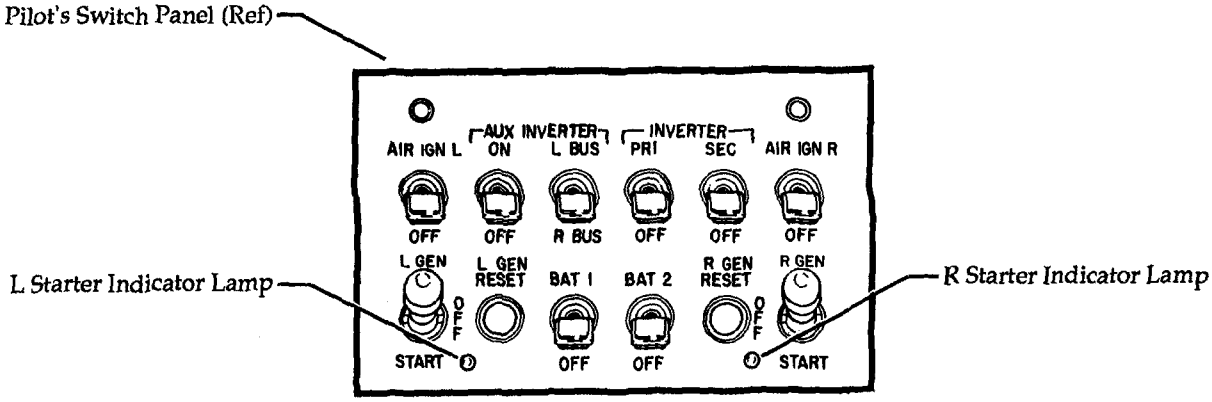
D. Install Starter Indicator Lamp. (Lamp installed in instrument panel.) (See Figure 201.)
   (1) Install lamp in socket.
   (2) Install lens cap.
   (3) Restore electrical power to aircraft.
   (4) Perform operational check of starter to verify proper operation of lamp. (Refer to 80-10-01, Adjustment/Test.)





35-002 thru 35-389 Except 35-370; 36-002 thru 36-047 Modified Per AMK 80-17 "Installation of Current Limiter and Starter Indicator Lights"

Detail A



35-370, 35-390 and Subsequent, 36-048 and Subsequent and Prior Aircraft Modified Per AMK 80-17 "Installation of Current Limiter and Starter Indicator Lights"

Detail B

Starter Indicator Lamp Installation
Figure 201