

# MODEL R182 AND TR182 SERVICE MANUAL

## SECTION 16

### ELECTRICAL SYSTEMS

#### WARNING

When performing any inspection or maintenance that requires turning on the master switch, installing a battery, or pulling the propeller through by hand, treat the propeller as if the ignition switch were ON. Do not stand, nor allow anyone else to stand, within the arc of the propeller, since a loose or broken wire, or a component malfunction, could cause the propeller to rotate.

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## 16-1. ELECTRICAL SYSTEMS.

16-2. GENERAL. This section contains service information necessary to maintain the Aircraft Electrical Power Supply System, Battery and External Power Supply System, Alternator Power System, Aircraft Lighting System, Pitot Heater, Stall Warning, Cigar Lighter, and Electrical Load Analysis.

## 16-3. ELECTRICAL POWER SUPPLY SYSTEM.

16-4. DESCRIPTION. Energy for the aircraft is supplied by a 28-volt, direct-current, single wire, negative ground electrical system. A 24-volt battery supplies power for starting and furnishes a reserve in event of alternator failure. An alternator is the normal source of power during flight and maintains a battery charge controlled by a voltage regulator/alternator control unit. An external power source receptacle may be installed to supplement the battery alternator system for starting and ground operation.

## 16-5. SPLIT BUS BAR.

16-6. DESCRIPTION. Electrical power is supplied through two bus bars. One bus bar is located on the lower left hand side of the instrument panel. This bar supplies power to the electrical equipment. The other bus bar powers the electronic equipment, and is located on the left hand cabin side forward of the cabin door. Power is transmitted from the electrical bus to the electronic bus through an avionics master switch installed on the electronic bus.

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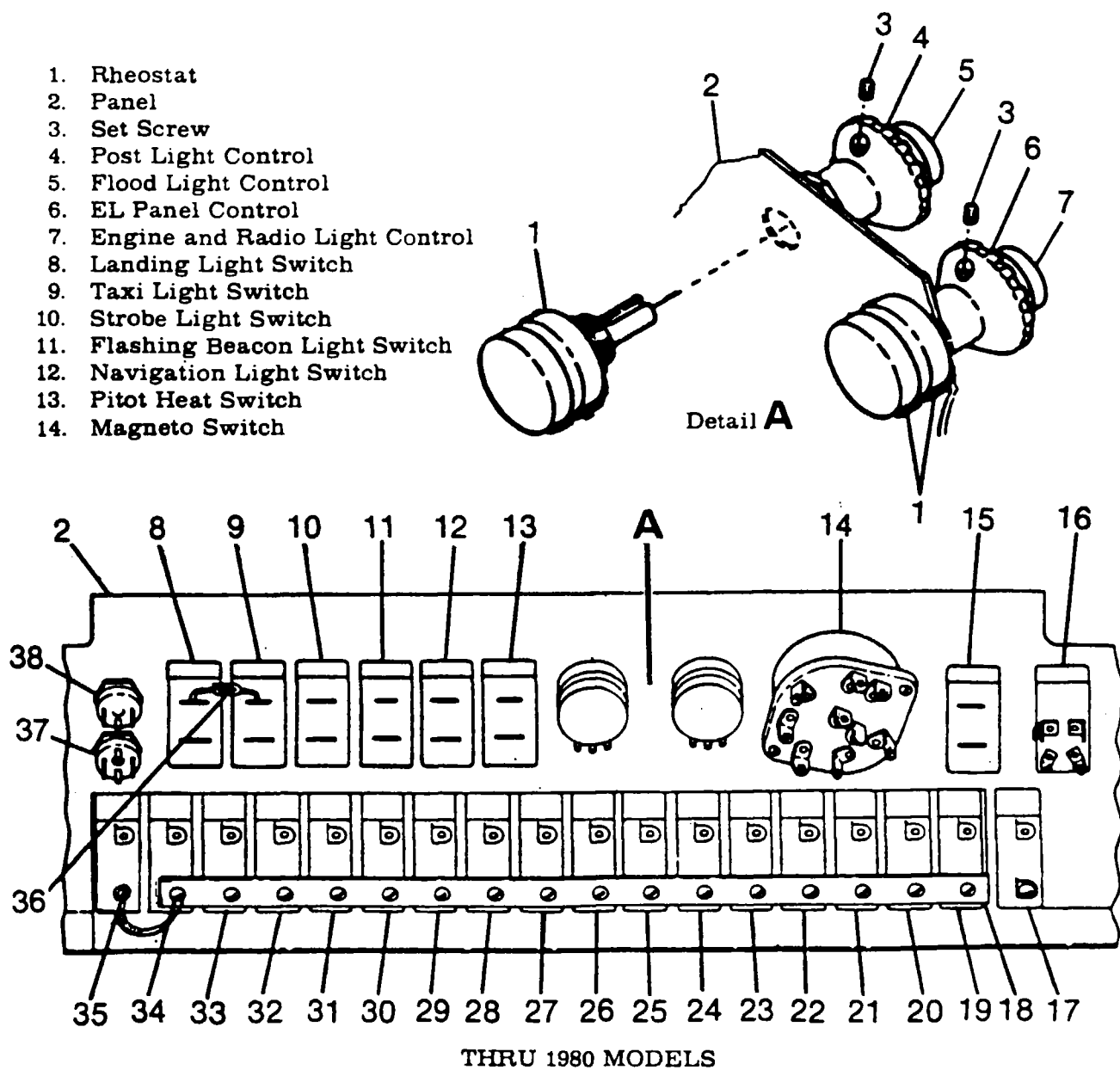
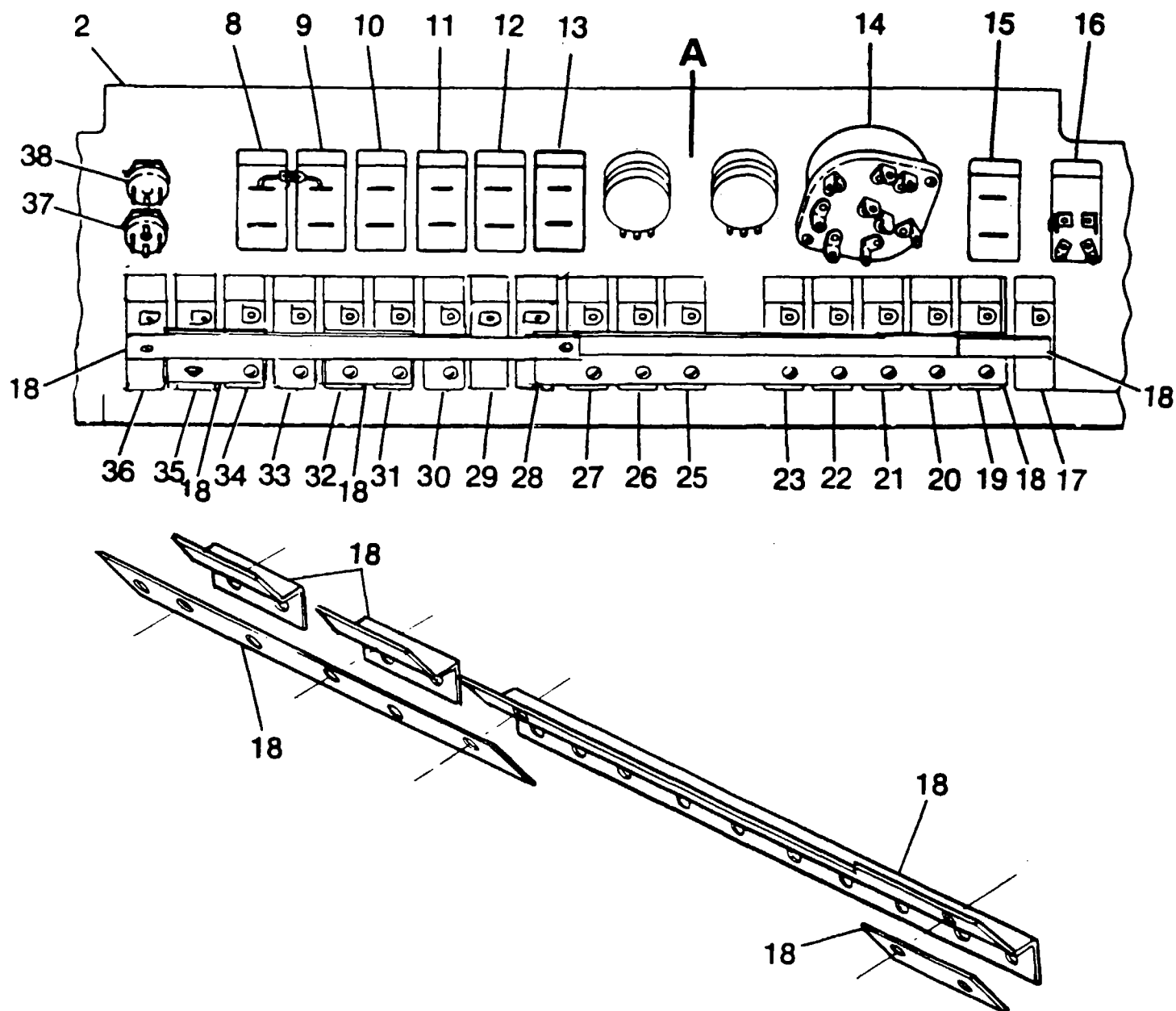


Figure 16-1. Switch and Circuit Breaker Installation (Sheet 1 of 3)

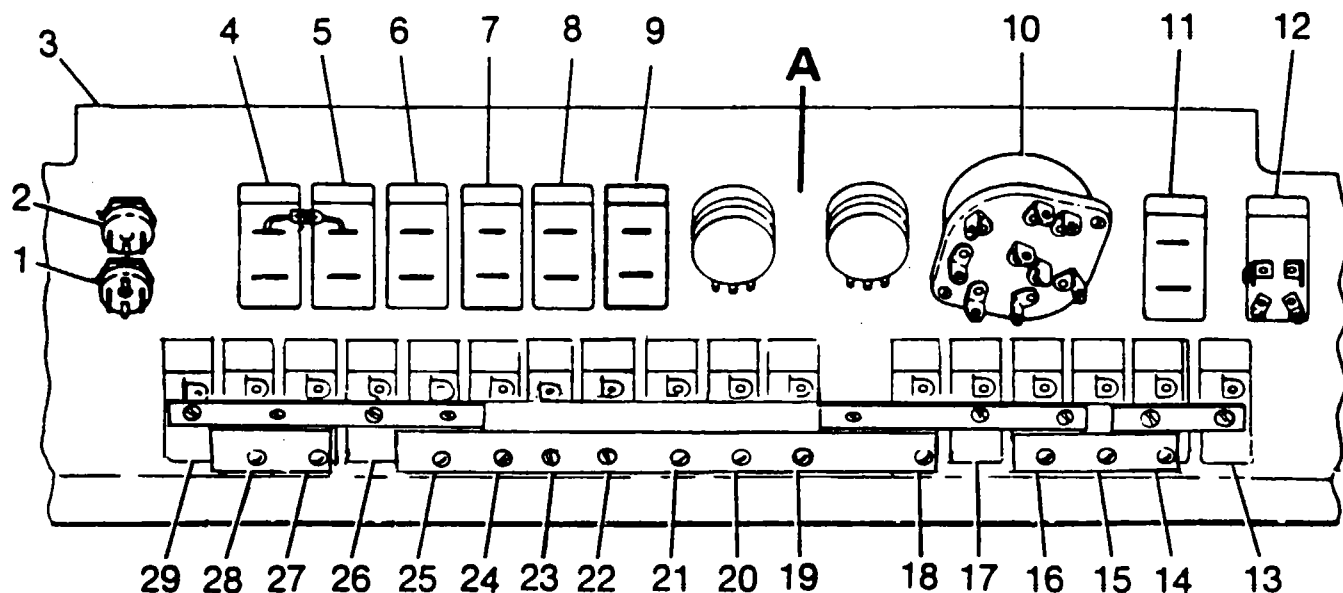
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1981 THRU 1982 MODELS

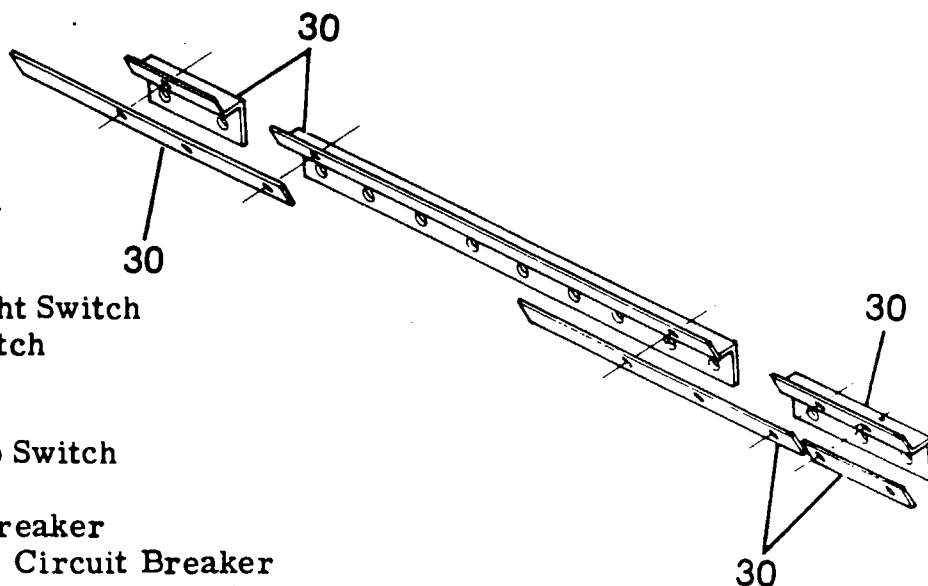
Figure 16-1. Switch and Circuit Breaker Installation (Sheet 2 of 3)

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1. Gear Down Light
2. Gear Up Light
3. Panel
4. Landing Light Switch
5. Taxi Light Switch
6. Strobe Light Switch
7. Flashing Beacon Light Switch
8. Navigation Light Switch
9. Pitot Heat Switch
10. Magneto Switch
11. Auxiliary Fuel Pump Switch
12. Master Switch
13. Alternator Circuit Breaker
14. Alternator Regulator Circuit Breaker
15. Fuel Pump Circuit Breaker
16. Turn Coordinator Circuit Breaker
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18. Fuel Quantity Circuit Breaker
19. Instrument Light Circuit Breaker
20. Cabin Lights Circuit Breaker
21. Navigation Light Circuit Breaker
22. Flashing Beacon Light Circuit Breaker
23. Strobe Light Circuit Breaker
24. Taxi Light Circuit Breaker
25. Landing Light Circuit Breaker
26. Electric Trim Circuit Breaker
27. Flap Circuit Breaker
28. Landing Gear Circuit Breaker

29. Gear Pump Circuit Breaker
30. Bus Bar



BEGINNING WITH 1983 MODELS

Figure 16-1. Switch and Circuit Breaker Installation (Sheet 3 of 3)

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- 16-7. REMOVAL AND INSTALLATION. (See figure 16-1.)
- 16-8. MASTER SWITCH.
- 16-9. DESCRIPTION. The operation of the battery and alternator systems is controlled by a master switch. The switch is an interlocking split rocker with the battery mode on the right-hand side and the alternator mode on the left-hand side. This arrangement allows the battery to be on the line without the alternator, however, operation of the alternator without the battery on the line is not possible. The switch is labeled "BAT" and "ALT" below the switch and is located on the left-hand side of the switch panel.
- 16-10. AMMETER.
- 16-11. DESCRIPTION. The ammeter is connected between the battery and the aircraft bus. The meter indicates the amount of current flowing either to or from the battery. With a low battery and the engine operating at cruise speed the ammeter will show the full alternator output when all electrical equipment is off. When the battery is fully charged and cruise RPM is maintained with all electrical equipment off, the ammeter will show a minimum charging rate.
- 16-12. BATTERY POWER SYSTEM.
- 16-13. BATTERY.
- 16-14. DESCRIPTION. A 24-volt battery with an approximate 12.75 ampere-hour capacity is installed as standard equipment, and a 15.5 ampere-hour battery as optional equipment. Thru 1979 models the battery is mounted on the forward right side of the firewall and is equipped with non-spill type filler caps. Beginning with 1980 models the battery is mounted in the tailcone on the left hand side thru 1981 models and on the right hand side beginning with 1982 models.
- 16-15. TROUBLE SHOOTING -- BATTERY.

TROUBLE	PROBABLE CAUSE	REMEDY
BATTERY WILL NOT SUPPLY POWER TO BUS OR IS INCAPABLE OF CRANKING ENGINE.	Battery discharged.	1. Measure voltage at "BAT" terminal of battery contactor with master switch and a suitable load such as a taxi light turned on. Normal battery will indicate 23 volts. If voltage is low proceed to step 2. If voltage is normal proceed to step 3.
	Battery faulty.	2. Check fluid level in cells and charge at 28 volts for approximately 30 minutes or until battery voltage rises to 28 volts. If tester indicates a good battery, the malfunction may be assumed to be a discharged battery. If tester indicates a faulty battery, replace the battery.

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### 16-15. TROUBLE SHOOTING -- BATTERY (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
BATTERY WILL NOT SUPPLY POWER TO BUS OR IS INCAPABLE OF CRANKING ENGINE. (Cont.)	Faulty contactor or wiring between contactor and master switch.	3. Measure voltage at master switch terminal (smallest) on contactor with master switch closed. Normal indication is zero volts. If voltage reads zero, proceed to step 4. If a voltage reading is obtained, check wiring between con- tactor and master switch. Also check master switch.
	Open coil on contactor.	4. Check continuity between "BAT" terminal and master switch terminal of contactor. Normal indication is 50-70 ohms. If ohmmeter indicates an open coil, replace con- tactor. If ohmmeter indicates a good coil, proceed to step 5.
	Faulty contactor contacts.	5. Check voltage on "BUS" side of contactor with master switch closed. Meter nor- mally indicates battery voltage. If voltage is zero or intermit- tent, replace contactor. If voltage is normal, proceed to step 6.
	Faulty wiring between con- tactor and bus.	6. Inspect wiring between contactor and bus. Repair or replace wiring.

### 16-16. REMOVAL AND INSTALLATION OF THE BATTERY. (See figure 16-2.)

#### CAUTION

Always remove the ground cable first and connect it last  
to prevent accidentally shorting the battery to the air-  
frame with tools.

- a. Thru 1978 Models.
  1. To gain access to the battery, remove the upper right half of the engine cowl.
  2. Remove the battery box lid and disconnect the battery ground cable.
  3. Disconnect the positive cable from the battery and remove the battery from the aircraft.
  4. To install a battery, reverse this procedure.
- b. 1979 Models.
  1. To gain access to the battery, remove upper right half of engine cowl.

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2. Disconnect battery ground cable.
3. Cut sta-strap and remove terminal cover, then remove positive cable.
4. Remove battery mounting bolts and cover.
5. Disconnect battery drain tube then remove battery.
6. To install battery, reverse this procedure.

c. **Beginning With 1980 Models.**

1. To gain access to the battery remove access door on right hand side of the tailcone.
2. Disconnect battery ground strap.
3. Cut sta-strap and remove terminal cover, then remove positive cable.
4. Remove battery mounting bolts and cover.
5. Disconnect battery drain tube, then remove battery.
6. To install battery, reverse this procedure.

16-17. **CLEANING THE BATTERY.** For maximum efficiency, the battery and connections should be kept clean at all times.

- a. Remove the battery in accordance with preceding paragraph.
- b. Tighten battery cell filler caps to prevent the cleaning solution from entering the cells.
- c. Wipe battery cable ends, battery terminals and entire surface of the battery with a clean cloth moistened with a solution of bicarbonate of soda (baking soda) and water.
- d. Rinse with clear water, wipe off excess water and allow battery to dry.
- e. Brighten up cable ends and battery terminals with emery cloth or a wire brush.
- f. Install the battery in accordance with the preceding paragraph.
- g. Coat the battery terminals and the cable ends with petroleum jelly.

16-18. **ADDING ELECTROLYTE OR WATER TO THE BATTERY.** A battery being charged and discharged with use will decompose the water from the electrolyte by electrolysis. When the water is decomposed, hydrogen and oxygen gases are formed which escape into the atmosphere through the battery vent system. The acid in the solution chemically combines with the plates of the battery during discharge or is suspended in the electrolyte solution during charge. Unless the electrolyte has been spilled from a battery, acid should not be added to the solution. The water will decompose into gases and should be replaced regularly. Add distilled water as necessary to maintain the electrolyte level even with the horizontal baffle plate inside the battery. When "dry charged" batteries are put into service, fill as directed with electrolyte. However, as the electrolyte level falls below normal with use add only distilled water to maintain the proper level. The battery electrolyte contains approximately 25% sulphuric acid by volume. Any change in this volume will hamper the proper operation of the battery.

### CAUTION

Do not add any type of "battery rejuvenator" to the electrolyte. When acid has been spilled from a battery, the acid balance may be adjusted by following instructions published by the Association of American Battery Manufacturers.

16-19. **TESTING THE BATTERY.** The specific gravity check method of testing the battery is preferred when the condition of the battery is in a questionable state-of-charge. However, when the aircraft has been operated for a period of time with an alternator output voltage which is known to be correct, the question of battery capability may be answered more correctly with a load type tester. If testing the battery is deemed necessary, the specific gravity should be checked first and compared with the following chart.



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## BATTERY HYDROMETER READINGS

1.280 Specific Gravity	100% Charged
1.250 Specific Gravity	75% Charged
1.220 Specific Gravity	50% Charged
1.190 Specific Gravity	25% Charged
1.160 Specific Gravity	Practically Dead

### NOTE

All readings shown are for an electrolyte temperature of 80° Fahrenheit. For higher temperatures the readings will be slightly lower. For cooler temperatures the readings will be slightly higher. Some hydrometers have a built-in temperature compensation chart and a thermometer. If this type tester is used, disregard this chart.

If the specific gravity reading indicates the battery is not fully charged the battery should be charged at approximately 10 amperes for 30 minutes or until the battery voltage rises to 28-volts.

- 16-20. **CHARGING THE BATTERY.** When the battery is to be charged, the level of electrolyte should be checked and adjusted by adding distilled water to cover the tops of the internal battery plates. The battery cables and connections should be clean.

### WARNING

When a battery is charging, hydrogen and oxygen gases are generated. Accumulation of these gases can create a hazardous explosive condition. Always keep sparks and open flame away from the battery. Allow unrestricted ventilation of the battery area during charging.

The main points of consideration during a battery charge are excessive battery temperature and violent gassing. Under a reasonable rate of charge, 15 amperes or less, the battery temperature should not rise over 120°F., nor should gassing be so violent that acid is blown from the vents.

- 16-21. **BATTERY BOX. (THRU 1978 MODELS.)**
- 16-22. **DESCRIPTION.** The battery is completely enclosed in an acid-proof box. The box has a vent tube which protrudes through the bottom of the engine cowl, allowing gases and spilled electrolyte to escape. The battery box is held in place on a support bracket by a channel assembly and two bolts.
- 16-23. **REMOVAL AND INSTALLATION.** (See figure 16-2.) The battery box is held in place by a channel across the top of the box and two bolts.
- 16-24. **MAINTENANCE.** The battery box should be inspected and cleaned periodically. The box and cover should be cleaned with a strong solution of bicarbonate of soda (baking soda) and water. When all deposits have been removed from the box, flush thoroughly with clean water.

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### WARNING

Do not allow acid deposits to come in contact with skin or clothing. Serious acid burns may result unless the affected area is washed immediately with soap and water. Clothing will be damaged upon contact with acid.

Inspect the cleaned box and cover for physical damage. A badly damaged box should be replaced.

#### 16-25. BATTERY CONTACTOR.

16-26. **DESCRIPTION.** Thru 1979 Models the battery contactor is bolted to the battery box support below the box. Beginning with 1980 Models the contactor is mounted fwd of the battery on the main wheel well aft bulkhead. The contactor is a solenoid plunger type, which is actuated by turning the master switch on. When the master switch is off, the battery is disconnected from the electrical system. A silicon diode is used to eliminate spiking of the transistorized radio equipment. The cathode (-) terminal of the diode connects to the battery terminal of the battery contactor. The anode (+) terminal of the diode connects to the same terminal as the master switch wire. This places the diode directly across the contactor solenoid coil so that inductive spikes originating in the coil are clipped when the master switch is opened.

#### 16-27. REMOVAL AND INSTALLATION. (See figure 16-2.)

a.

1. Thru 1978 Models remove battery box cover and disconnect ground cable from negative battery terminal. Pull cable free of battery box.
2. Beginning with 1979 Models, disconnect ground cable from negative battery terminal.
3. Remove sta-strap, cover, nut and washer securing battery positive cable to battery contactor, then remove cable and fuse wire.
4. If ground service is installed remove sta-straps, covers, nuts, and washers securing bus bar, jumper cable and wire to diode from battery contactor and ground service contactor.
5. When ground service is not installed, remove sta-strap, cover, nut and washer securing jumper cable and wire to diode.
6. Remove nipple, nut and washer securing the master switch wire to the battery contactor.
7. Remove the bolt securing each side of the contactor to the battery box support and remove contactor.
8. To install the contactor, reverse the preceding steps.

b.

1. Beginning with 1980 Models, remove aft flood of baggage compartment to gain access to the contactor.
2. Disconnect ground strap from negative terminal of the battery.
3. Cut sta-straps and remove contactor cover.
4. Remove nuts and lockwashers from contactor ports.
5. Remove and tag wires for identification for reinstallation, be sure to note position of ground wire and diode.
6. Remove bolts and washers securing contactor to bulkhead and remove contactor.
7. For installation, reverse the preceding steps.

16-28. **BATTERY CONTACTOR CLOSING CIRCUIT.** (See figure 16-2.) This circuit consists of a 5-amp fuse, a resistor and a diode mounted on the ground service receptacle bracket. This

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serves to shunt a small charge around the battery contactor so that ground power may be used to close the contactor when the battery is too dead to energize the contactor by itself.

### 16-29. GROUND SERVICE RECEPTACLE.

- 16-30. **DESCRIPTION.** A ground service receptacle is installed to permit the use of external power for cold weather starting or when performing lengthy electrical maintenance. A reverse polarity protection system is utilized whereby ground power must pass through an external power contactor to be connected to the bus. A silicon junction diode is connected in series with the coil on the external power contactor so that if the ground power source is inadvertently connected with a reversed polarity, the external power contactor will not close. This feature protects the diodes in the alternator, and other semi-conductor devices used in the aircraft, from possible reverse polarity damage.

### NOTE

Maintenance of the electronic installations cannot be performed when using external power. Application of external power opens the relay supplying voltage to the electronics bus. For lengthy ground testing of electronic systems, connect a well regulated and filtered power supply directly to the battery side of the battery contactor. Adjust the supply for 28 volts and close the master switch.

### NOTE

When using ground power to start the aircraft, close the master switch before removing the ground power plug. This will ensure closure of the battery contactor and excitation of the alternator field.

### CAUTION

Failure to observe polarity when connecting an external power source directly to the battery or directly to the battery side of the battery contactor, will damage the diodes in the alternator and other semiconductor devices in the aircraft.

### WARNING

External power receptacle must be functionally checked after wiring, or after replacement of components of the external power or split bus systems. Incorrect wiring or malfunctioned components can cause immediate engagement of starter when ground service plug is inserted.

### NOTE

On Aircraft Serials R1820001 thru R1820034 refer to Cessna Single-engine Service Letter SE78-19, dated March 27, 1978.

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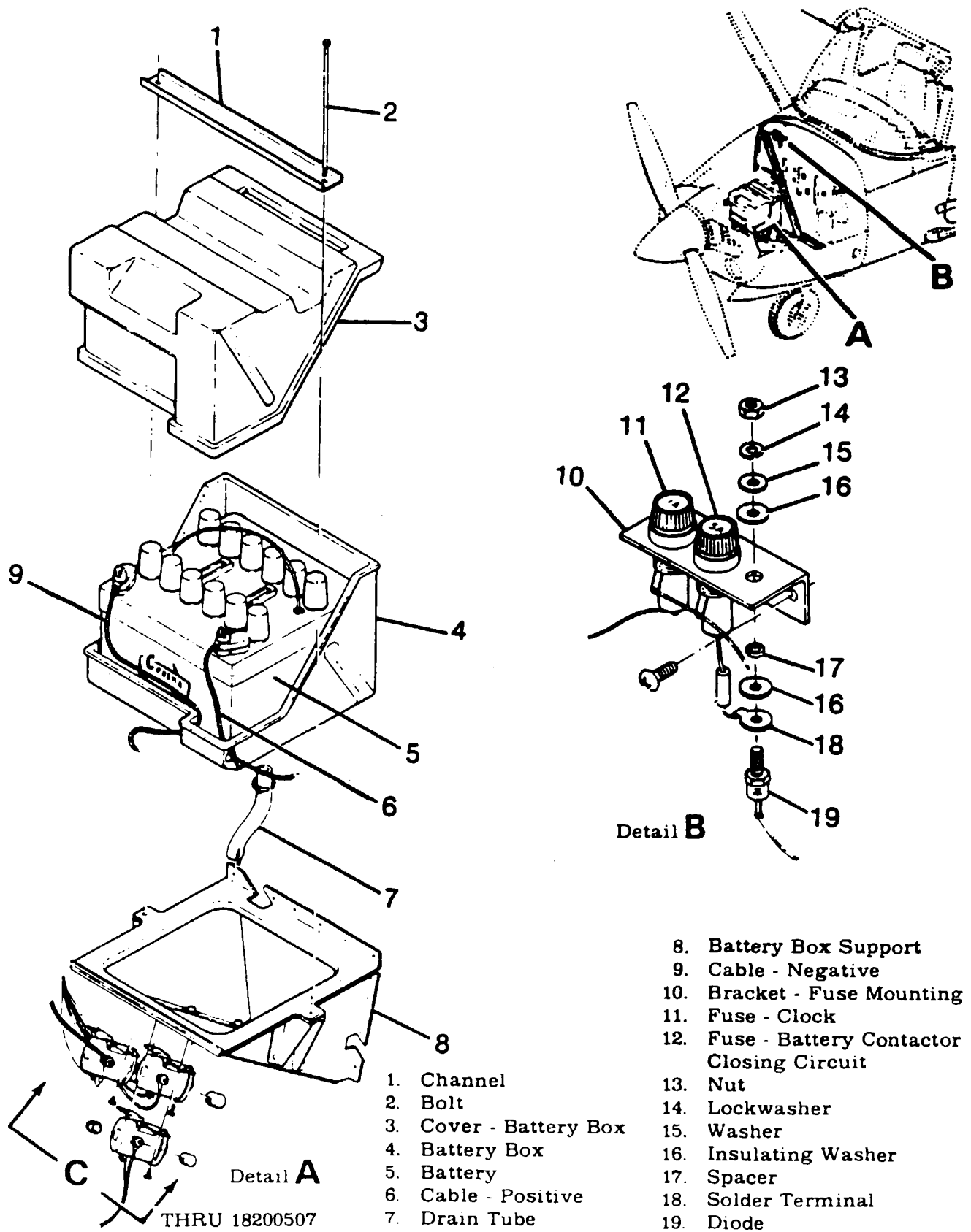


Figure 16-2. Battery and Electrical Equipment Installation (Sheet 1 of 7)

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\* THRU R18201089 AND  
FR18200045

\* BEGINNING WITH  
R18201090 AND  
FR18200046

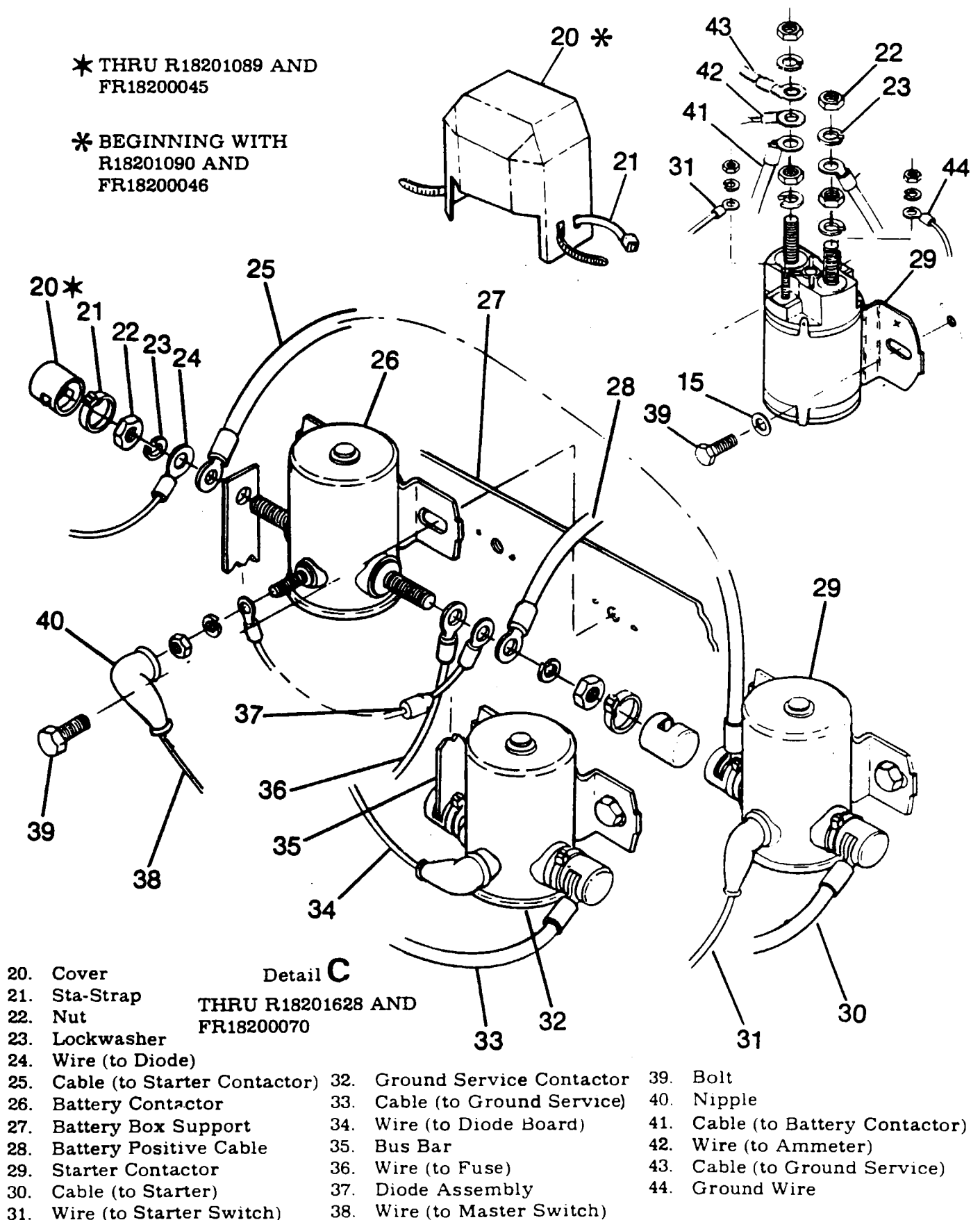


Figure 16-2. Battery and Electrical Equipment Installation (Sheet 2 of 7)

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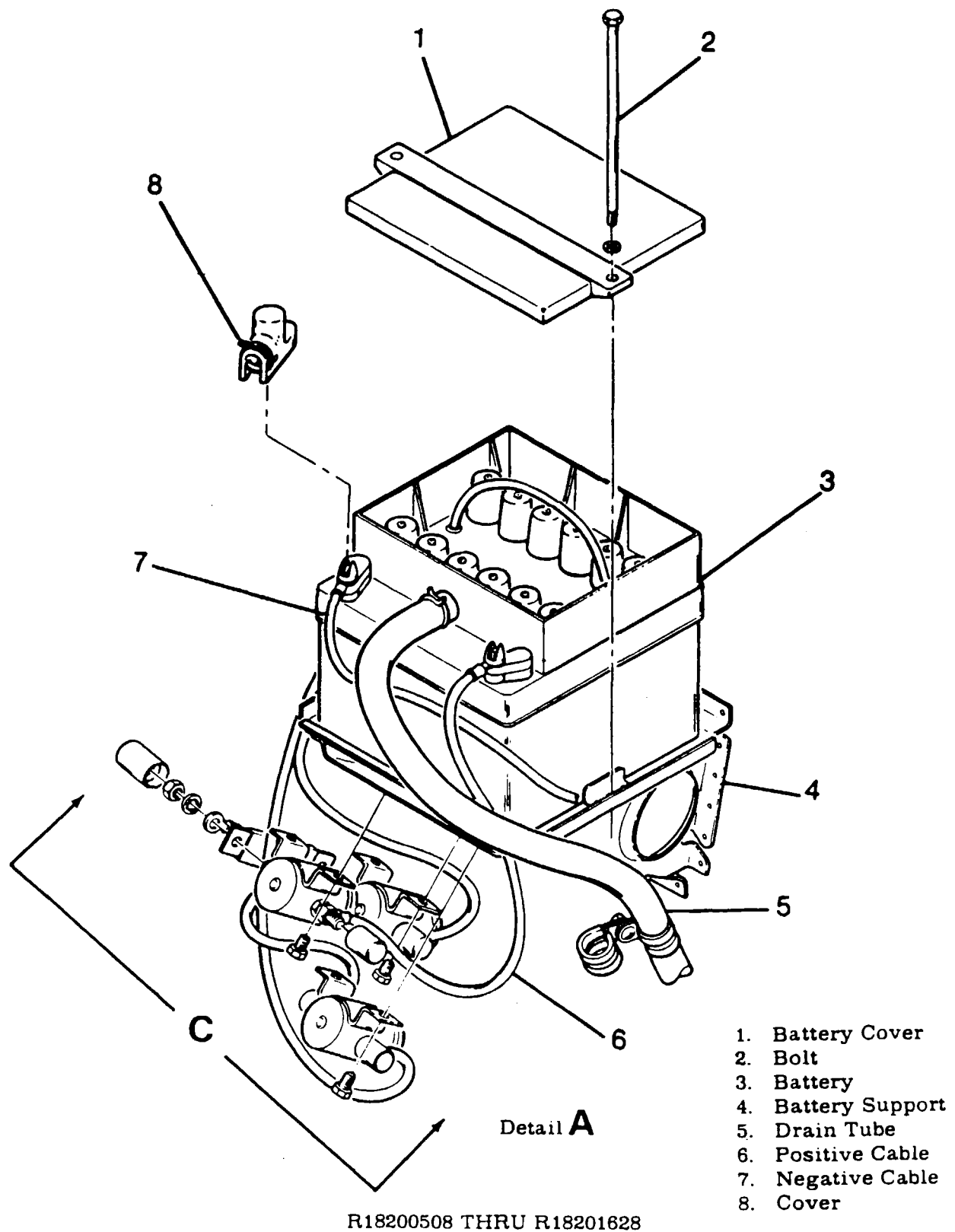
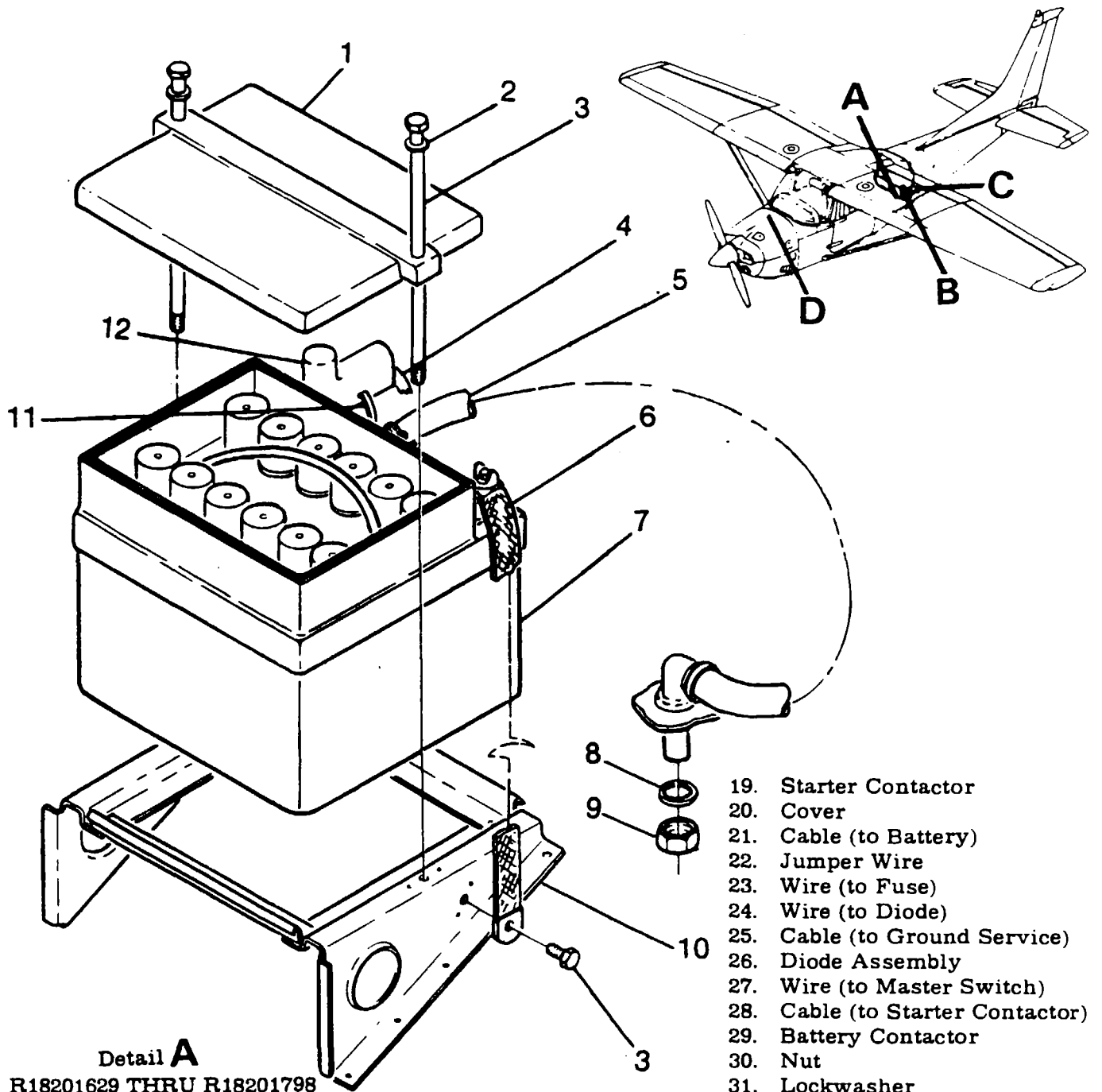


Figure 16-2. Battery and Electrical Equipment Installation (Sheet 3 of 7)

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1. Battery Cover
2. Washer
3. Bolt
4. Positive Cable
5. Drain Tube
6. Ground Strap
7. Battery
8. Washer
9. Nut

10. Battery Support
11. Sta-Strap
12. Cover
13. Wire (to Starter Switch)
14. Cable (to Battery Contactor)
15. Wire (to Ammeter)
16. Lockwasher
17. Cable (to Starter)
18. Ground Wire

19. Starter Contactor
20. Cover
21. Cable (to Battery)
22. Jumper Wire
23. Wire (to Fuse)
24. Wire (to Diode)
25. Cable (to Ground Service)
26. Diode Assembly
27. Wire (to Master Switch)
28. Cable (to Starter Contactor)
29. Battery Contactor
30. Nut
31. Lockwasher
32. Washer
33. Insulating Washer
34. Fuse - Battery Contactor Closing Circuit
35. Fuse - Clock
36. Bracket
37. Resistor
38. Diode
39. Solder Terminal
40. Spacer
41. Screw

Figure 16-2. Battery and Electrical Equipment Installation (Sheet 4 of 7)

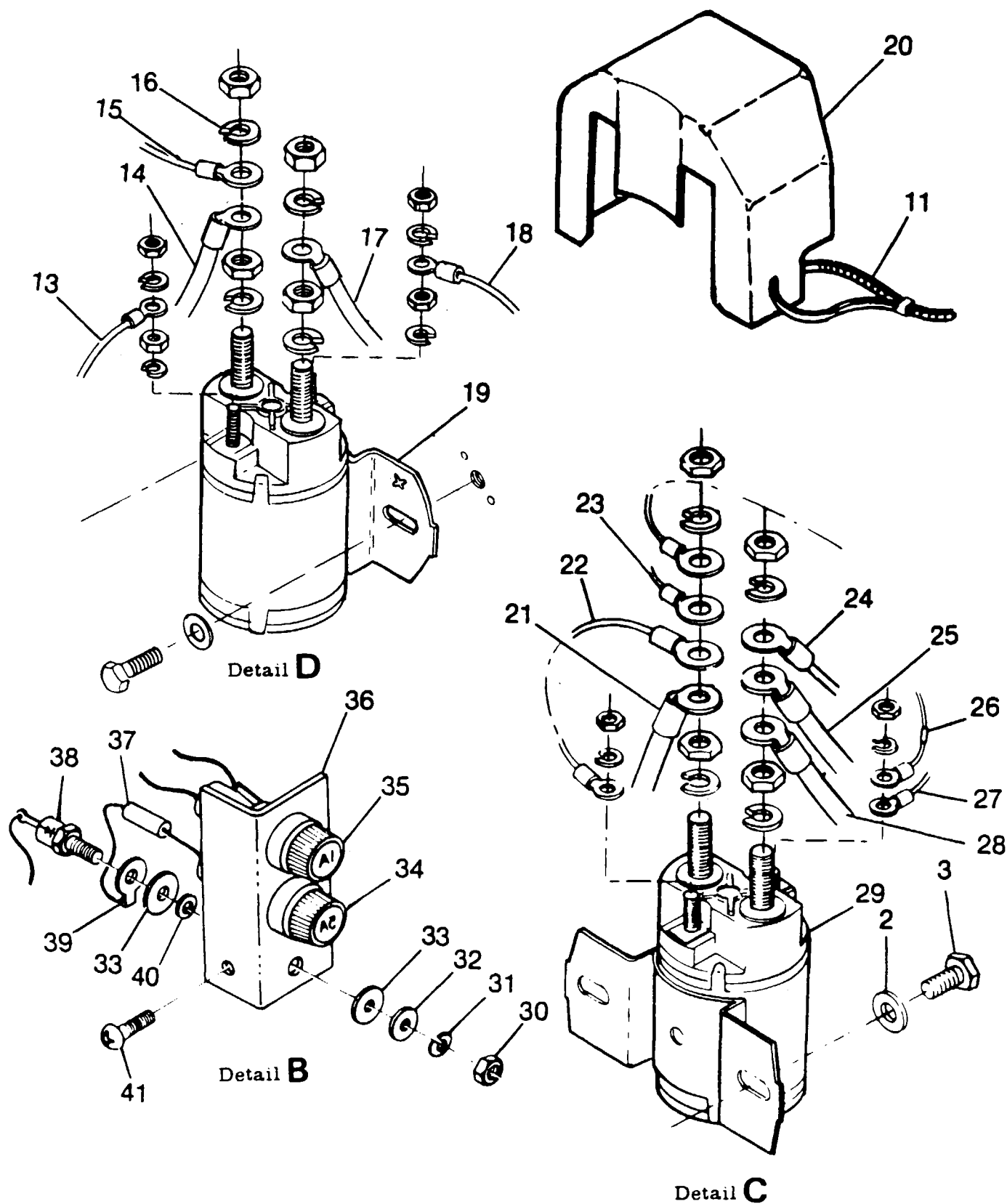
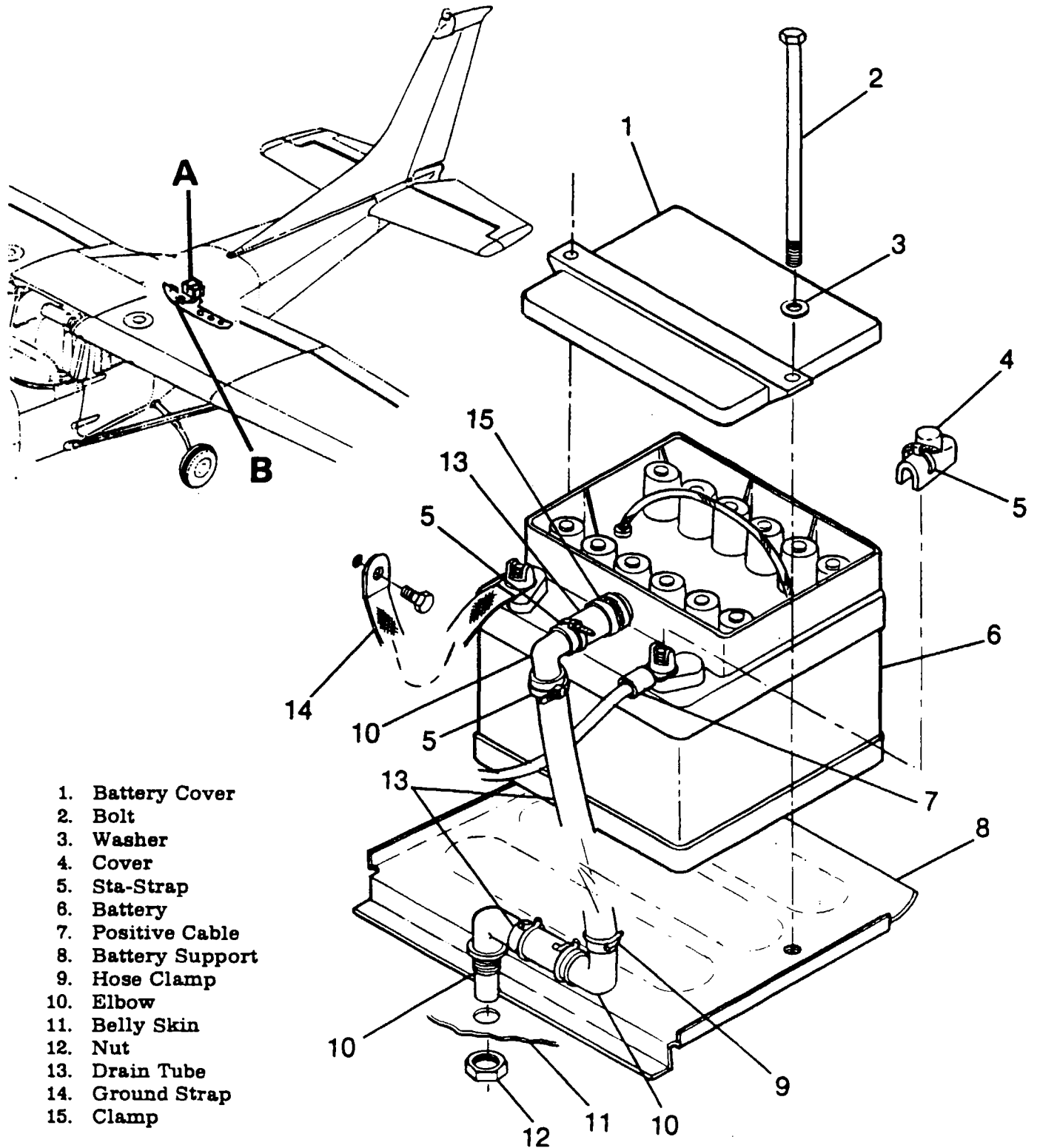


Figure 16-2. Battery and Electrical Equipment Installation (Sheet 5 of 7)



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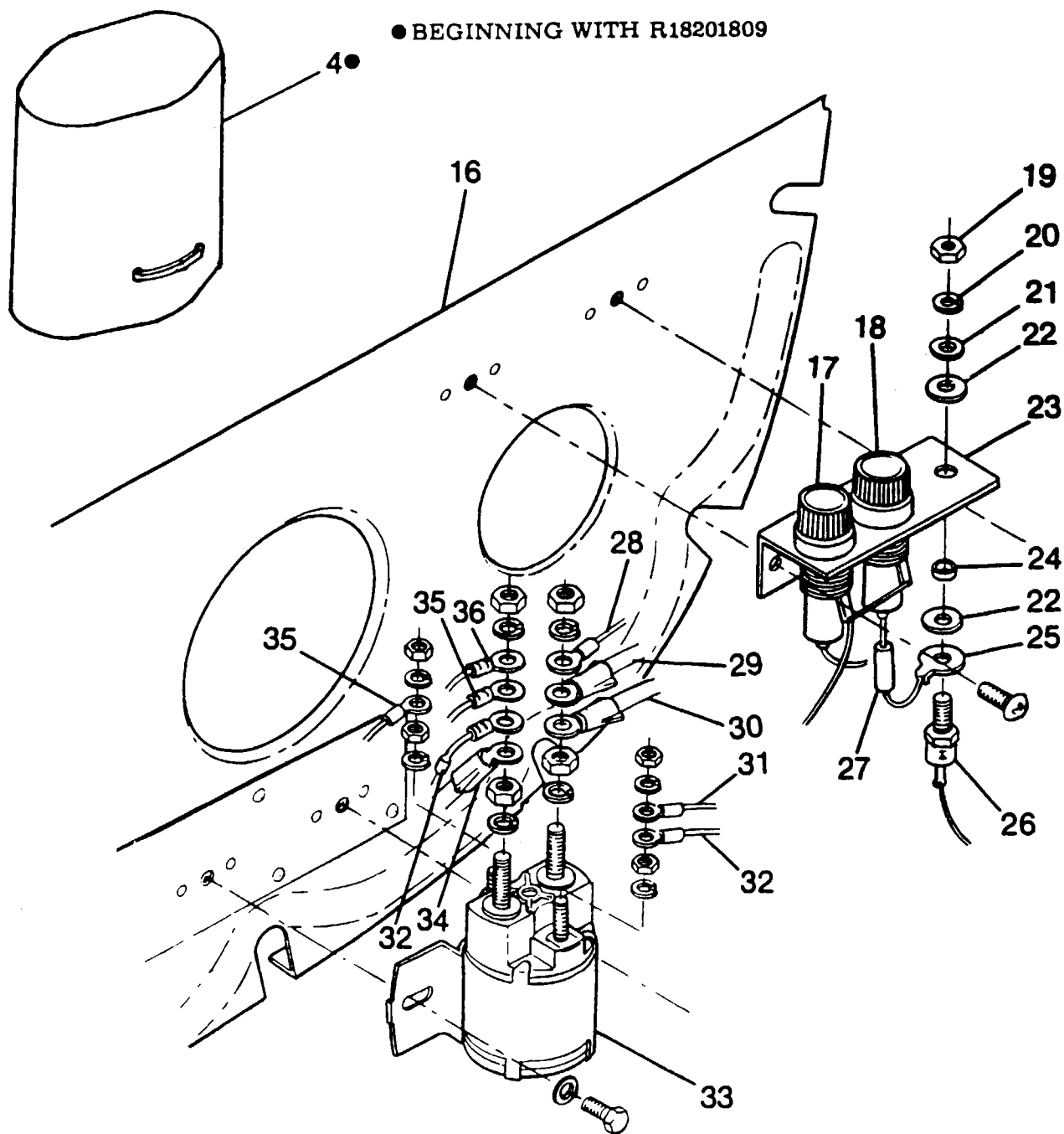


Detail **A**  
BEGINNING WITH R18201799

Figure 16-2. Battery and Electrical Equipment Installation (Sheet 6 of 7)

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● BEGINNING WITH R18201809



## Detail B

BEGINNING WITH R18201799

- |                            |                                  |                               |
|----------------------------|----------------------------------|-------------------------------|
| 16. Bulkhead               | 23. Bracket                      | 30. Cable (to Ground Service) |
| 17. Fuse-Clock             | 24. Spacer                       | 31. Wire (to Master Switch)   |
| 18. Fuse-Battery Contactor | 25. Solder Terminal              | 32. Diode Assembly            |
| 19. Nut                    | 26. Diode                        | 33. Battery Contactor         |
| 20. Lockwasher             | 27. Resistor                     | 34. Cable (to Battery)        |
| 21. Washer                 | 28. Wire (to Diode)              | 35. Jumper Wire               |
| 22. Insulating Washer      | 29. Cable (to Starter Contactor) | 36. Wire (to Clock Fuse)      |

Figure 16-2. Battery and Electrical Equipment Installation (Sheet 7 of 7)

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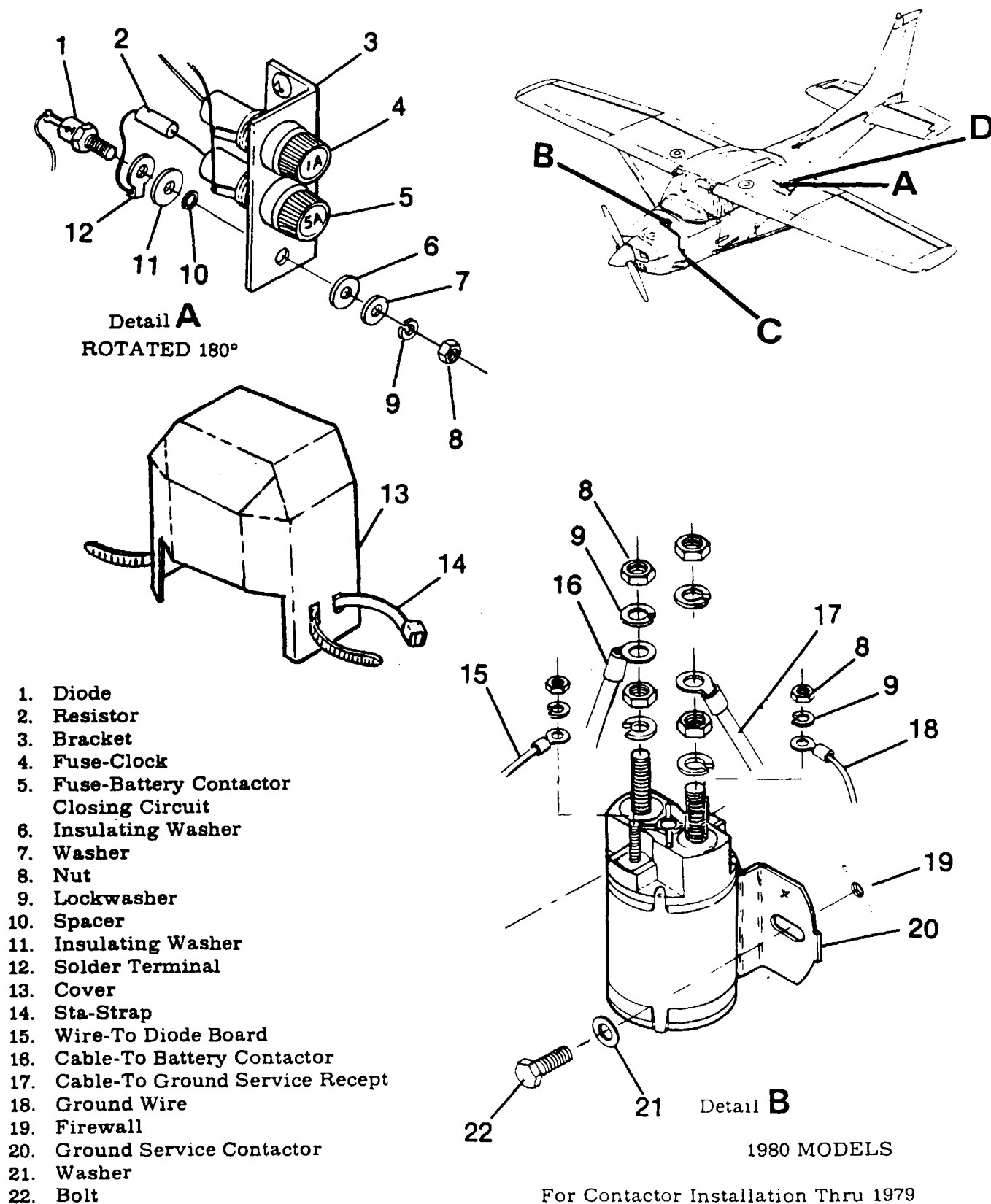


Figure 16-3. Ground Service Receptacle Installation (Sheet 1 of 4)

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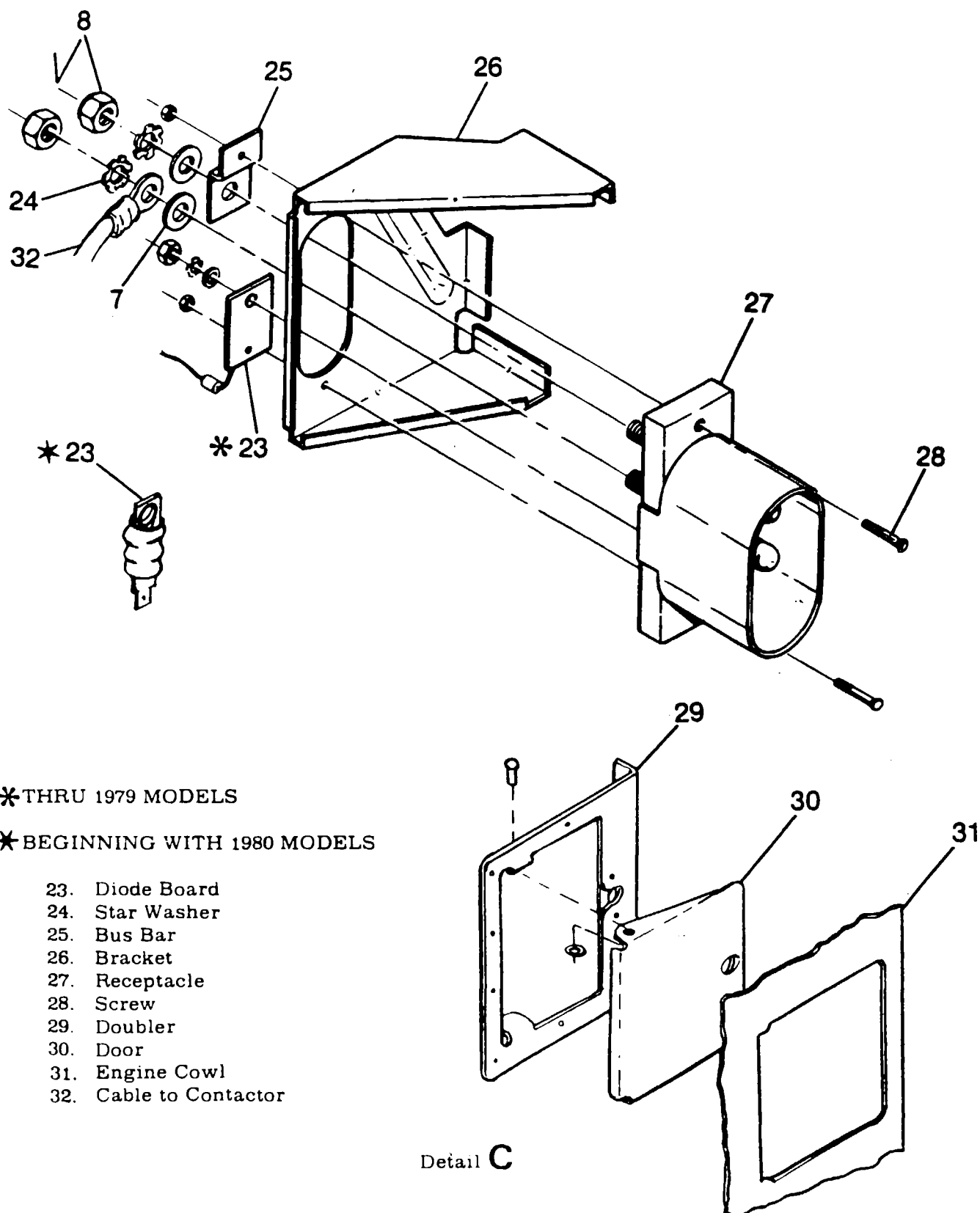
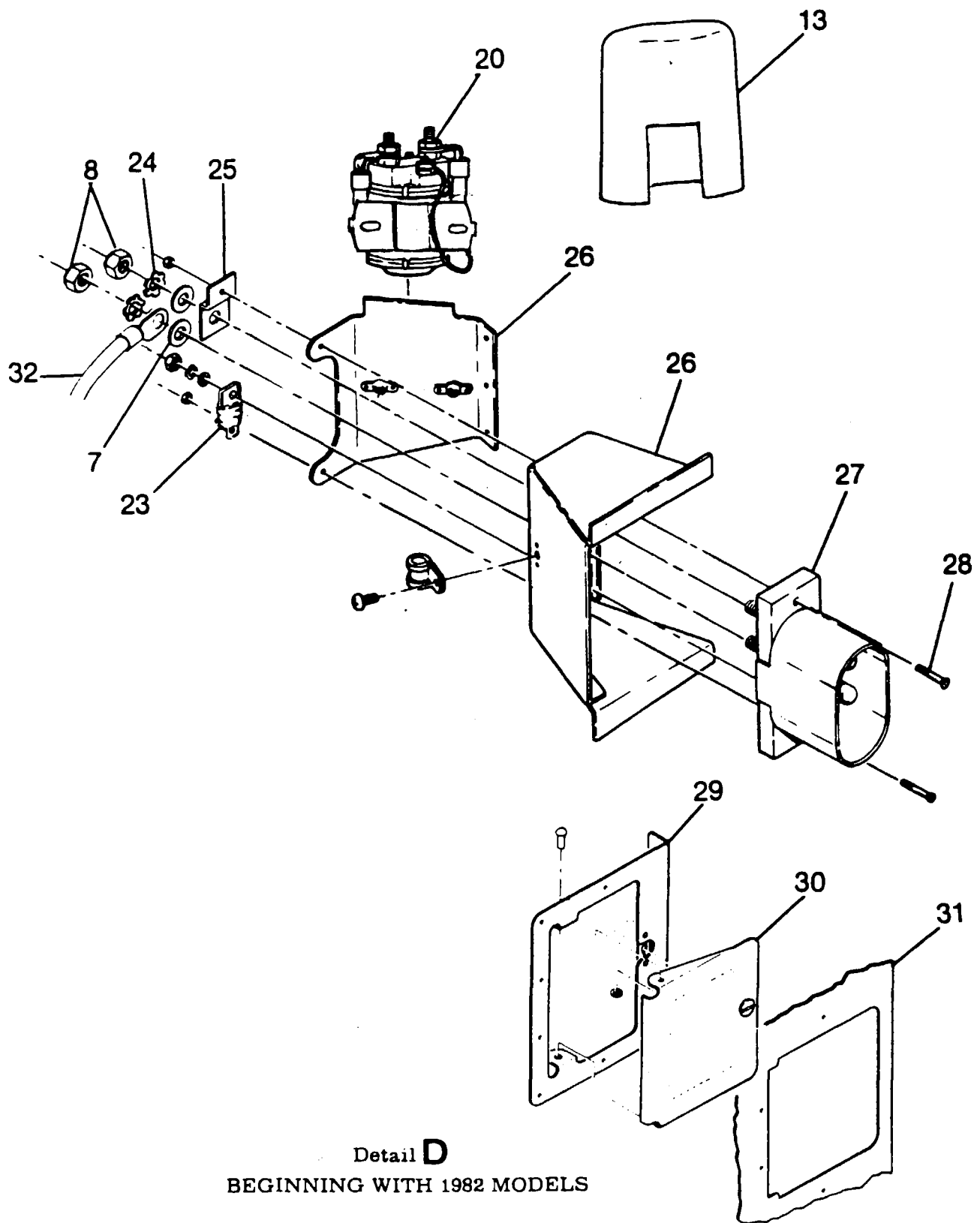


Figure 16-3. Ground Service Receptacle Installation (Sheet 2 of 4)

This exploded view diagram illustrates the assembly of a mechanical component. The main body consists of a base plate (26) and a side plate (27). A motor or actuator (13) is shown at the top, connected to a shaft (28) that passes through the side plate. A cable (32) is connected to a terminal block (25) on the left. Various fasteners, including screws (8, 24, 23) and bolts (7, 23), are shown in their respective assembly positions. A detail view of a panel assembly is shown at the bottom right, featuring a frame (29), a central panel (30), and a side panel (31).

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# MODEL R182 AND TR182 SERVICE MANUAL



Detail **D**  
BEGINNING WITH 1982 MODELS

Figure 16-3. Ground Service Receptacle Installation (Sheet 4 of 4)

## MODEL R182 AND TR182 SERVICE MANUAL

### 16-31. TROUBLE SHOOTING -- GROUND SERVICE RECEPTACLE.

TROUBLE	PROBABLE CAUSE	REMEDY
GROUND POWER WILL NOT CRANK ENGINE.	Ground service connector wired incorrectly.	1. Check for voltage at all three terminals of external power contactor with ground power connected and master switch off. If voltage is present on input and coil terminals but not on the output terminal, proceed to step 4. If voltage is present on the input terminal but not on the coil terminal, proceed to step 2. If voltage is present on all three terminals, check wiring between contactor and bus.
		2. Check for voltage at small terminal of ground service receptacle. If voltage is not present, check ground service plug wiring. If voltage is present, proceed to step 3.
	Open or mis-wired diode on ground service diode board assembly.	3. Check polarity and continuity of diode on diode board at rear of ground service receptacle. If diode is open or improperly wired, replace diode board assembly.
	Faulty external power contactor.	4. Check resistance from small (coil) terminal of external power contactor to ground (master switch off and ground power unplugged.) Normal indication is 50-70 ohms. If resistance indicates an open coil, replace contactor. If resistance is normal, proceed to step 5.
	Faulty contacts in external power contactor.	5. With master switch off and ground power applied, check for voltage drop between two large terminals of external power (turn on taxi light for a load). Normal indication is zero volts. If voltage is intermittently present or present all the time, replace contactor.

## MODEL R182 AND TR182 SERVICE MANUAL

- 16-32. REMOVAL AND INSTALLATION. (See figure 16-3.)
- Thru 1978 Models open the battery box and disconnect the ground cable from the negative terminal of the battery and pull the cable free of the box. Beginning with 1979 Models, remove negative ground strap.
  - Remove the nuts, washers, ground strap, bus bar and diode board from the studs of the receptacle and remove battery cable.
  - Remove the screws and nuts holding the receptacle, ground strap will then be free from bracket.
  - To install a ground service receptacle, reverse this procedure.
- 16-33. ALTERNATOR POWER SYSTEM.
- 16-34. DESCRIPTION. The alternator system consists of an engine driven alternator, a voltage regulator/alternator control unit and a circuit breaker located on the instrument panel. The system is controlled by the left hand portion of the split rocker, master switch labeled ALT. Thru 1978 Models an over-voltage sensor switch and red warning light, labeled HIGH VOLTAGE are incorporated to protect the system. Beginning with 1979 Models an over-voltage sensor, an under-voltage sensor and a red warning light, labeled LOW VOLTAGE are incorporated to protect the system. The aircraft battery supplies the source of power for excitation of the alternator.
- 16-35. ALTERNATOR.
- 16-36. DESCRIPTION. The 60-ampere alternator used on the aircraft is three-phase, delta-connected with integral silicon diode rectifiers. The alternator is rated at 28 volts at 60 amperes continuous output. Beginning with 1981 models, a 28-volt 95-ampere alternator is offered as optional equipment

### NOTE

Thru R18201798, a 2201074-1 balance weight is installed on tailcone bulkhead station 230.187 when the 95-ampere alternator is installed.

- 16-37. ALTERNATOR REVERSE VOLTAGE DAMAGE. The alternator is very susceptible to reverse polarity damage due to the very low resistance of the output windings and the low resistance of the silicon diodes in the output. If a high current source, such as a battery or heavy duty ground power cart is attached to the aircraft with the polarity inadvertently reversed, the current through the alternator will flow almost without limit and the alternator will be immediately damaged.



# MODEL R182 AND TR182 SERVICE MANUAL

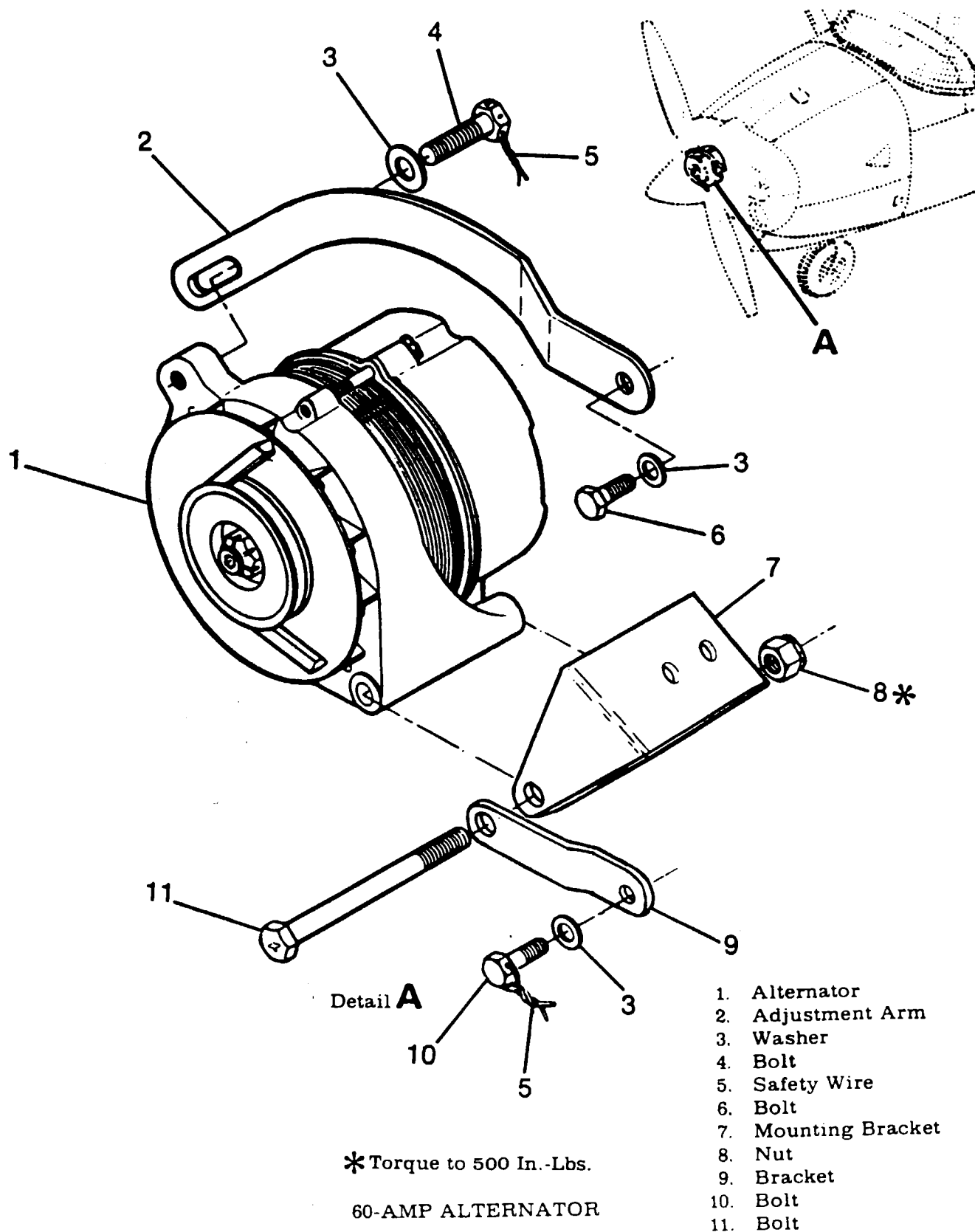


Figure 16-4. Alternator Installation (Sheet 1 of 2)

# MODEL R182 AND TR182 SERVICE MANUAL

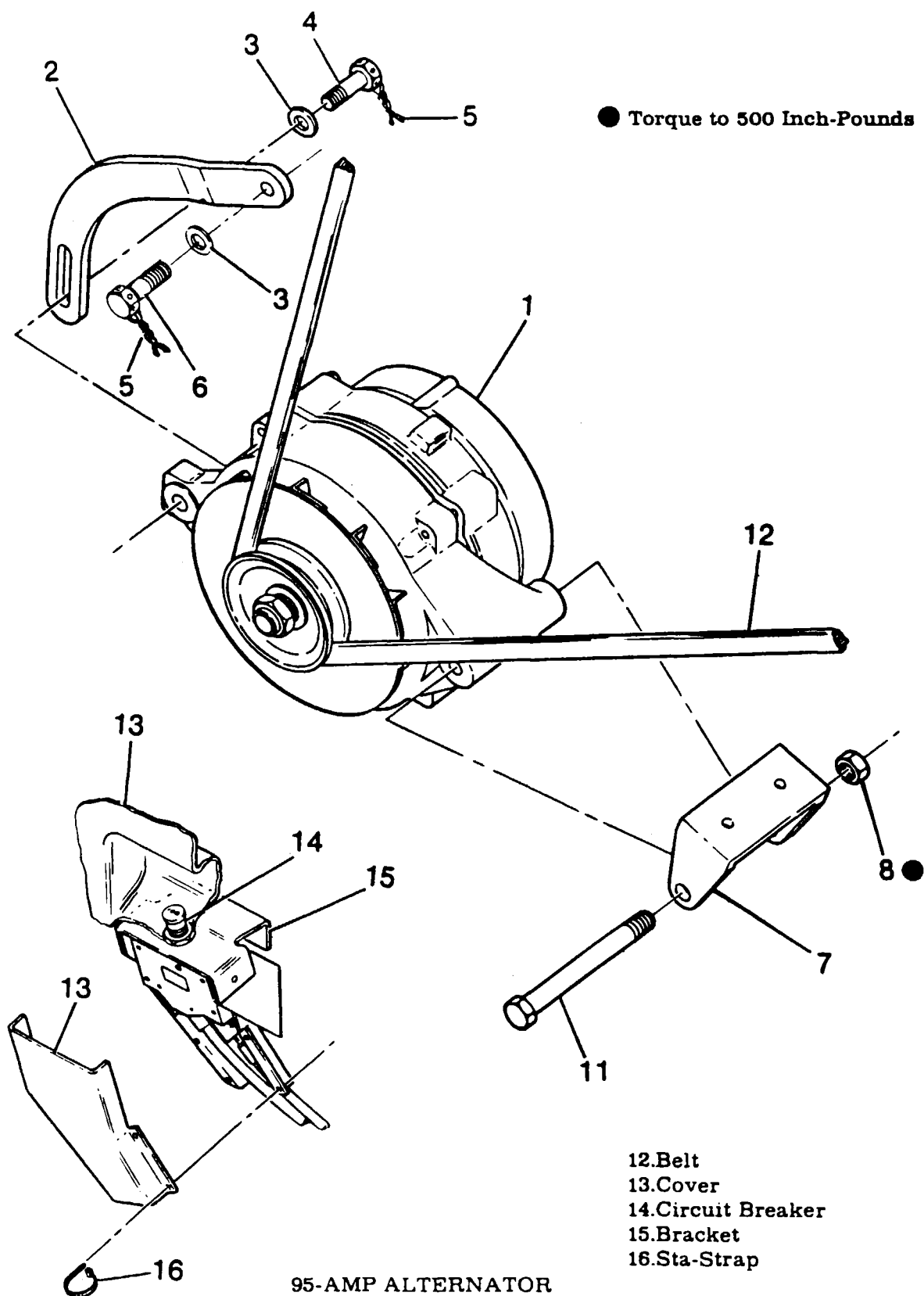


Figure 16-4. Alternator Installation (Sheet 2 of 2)

## MODEL R182 AND TR182 SERVICE MANUAL

### 16-38. TROUBLE SHOOTING -- ALTERNATOR SYSTEM (THRU 1978 MODELS)

#### a. ENGINE NOT RUNNING.

TROUBLE	PROBABLE CAUSE	REMEDY
AMMETER INDICATES HEAVY DISCHARGE OR ALTERNATOR CIRCUIT BREAKER OPENS. (Battery Switch ON, Alternator Switch OFF, all other electrical switches OFF.)	Shorted diode in alternator.	Turn off Battery Switch and remove "B" Lead from alternator. Check resistance from "B" Terminal of alternator to alternator case. Reverse leads and check again. Resistance reading may show continuity in one direction but should show an infinite reading in the other direction. If an infinite reading is not obtained in at least one direction, repair or replace alternator.
ALTERNATOR REGULATOR CIRCUIT BREAKER OPENS WHEN BATTERY AND ALTERNATOR SWITCHES ARE TURNED ON.	Short in Over-Voltage sensor.	Disconnect Over-Voltage Sensor plug and recheck. If circuit breaker stays in, replace Over-Voltage Sensor.
	Short in alternator voltage regulator.	Disconnect regulator plug and recheck. If circuit breaker stays in, replace regulator.
	Short in alternator field.	Disconnect "F" terminal wire and recheck. If circuit breaker stays in, replace alternator.

#### b. ENGINE RUNNING.

ALTERNATOR CIRCUIT BREAKER OPENS WHEN BATTERY AND ALTERNATOR SWITCHES ARE TURNED ON, OVER-VOLTAGE LIGHT DOES NOT COME ON.	Defective circuit breaker.	Replace circuit breaker.
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## MODEL R182 AND TR182 SERVICE MANUAL

### 16-38. TROUBLE SHOOTING -- ALTERNATOR SYSTEM (THRU 1978 MODELS) (Cont).

#### b. ENGINE RUNNING (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
ALTERNATOR REGULATOR CIRCUIT BREAKER OPENS WHEN BATTERY AND ALTERNATOR SWITCHES ARE TURNED ON. OVER-VOLTAGE LIGHT DOES NOT COME ON.	Shorted field in alternator.	Check resistance from "F" terminal of alternator to alternator case, if resistance is less than 5 ohms repair/replace.

#### CAUTION

This malfunction frequently causes a shorted regulator which will result in an over-voltage condition when system is again operated.

ALTERNATOR MAKES ABNORMAL WHINING NOISE.	Shorted diode in alternator.	Turn off Battery Switch and remove "B" Lead from alternator. Check resistance from "B" Terminal of alternator to alternator case. Reverse leads and check again. Resistance reading may show continuity in one direction but should show an infinite reading in the other direction. If an infinite reading is not obtained in at least one direction, repair or replace alternator.
OVER-VOLTAGE LIGHT DOES NOT GO OUT WHEN ALTERNATOR AND BATTERY SWITCHES ARE TURNED ON.	Shorted regulator.  Defective over-voltage sensor.	Replace regulator.  Replace sensor.

## MODEL R182 AND TR182 SERVICE MANUAL

### 16-38. TROUBLE SHOOTING -- ALTERNATOR SYSTEM (THRU 1978 MODELS) (Cont).

#### b. ENGINE RUNNING (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
AFTER ENGINE START WITH ALL ELECTRICAL EQUIPMENT TURNED OFF CHARGE RATE DOES NOT TAPER OFF IN 1-3 MINUTES.	Regulator faulty or high resistance in field circuit.	With engine not running turn off all electrical loads and turn on battery and alternator switches. Measure bus voltage to ground, then measure voltage from terminal of alternator to ground. If there is more than 2 volts difference check field circuit wiring shown on alternator system wiring diagram in Section 19. Clean all contacts Replace components until there is less than 2 volts difference between bus voltage and field voltage.

#### NOTE

Also refer to battery power system trouble shooting chart.

ALTERNATOR SYSTEM WILL NOT KEEP BATTERY CHARGED.	Alternator output voltage insufficient.	1. Connect voltmeter between D.C. Bus and ground. Turn off all electrical loads. Turn on Battery Switch, start engine and adjust for 1500 RPM, voltage should read approximately 24 volts. Turn on alternator switch, voltage should read between 27.4 and 28.0 volts. Ammeter should indicate a heavy charge rate which should taper off in 1-3 minutes. If charge rate tapers off very quickly and voltage is normal, check battery for malfunction. If ammeter shows a low charge rate or any discharge rate, and voltage does not rise when alternator switch is turned on proceed to Step 2.
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## MODEL R182 AND TR182 SERVICE MANUAL

### 16-38. TROUBLE SHOOTING -- ALTERNATOR SYSTEM (THRU 1978 MODELS) (Cont).

#### b. ENGINE RUNNING (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
ALTERNATOR SYSTEM WILL NOT KEEP BAT- TERY CHARGED. (Cont.)	Alternator output voltage insufficient (cont).	<p>2. Stop engine, turn off all switches. Connect voltmeter between "F" terminal of alternator and ground. Do NOT start engine. Turn on battery switch and alternator switch. Battery voltage should be present at "F" terminal, less 1 volt drop thru regulator, if not refer to Step 3.</p> <p>3. Starting at "F" terminal of alternator trace circuit to voltage regulator, at "B" terminal of regulator trace circuit to over-voltage sensor, to master switch, to Bus Bar. Replace component which does not have voltage present at output. Refer to alternator system wiring diagram in Section 19.</p>
	Alternator field winding open.	<p>1. If voltage is present turn off alternator and battery switches. Check resistance from "F" terminal of alternator to alternator case. turning alternator shaft during measurement. Normal indication is 12-20 ohms. If resistance is high or low, repair or replace alternator. If ok refer to Step 2.</p> <p>2. Check resistance from case of alternator to air-frame ground. Normal indication is very low resistance. If reading indicates no, or poor continuity, repair or replace alternator ground wiring.</p>

## MODEL R182 AND TR182 SERVICE MANUAL

### 16-38. TROUBLE SHOOTING -- ALTERNATOR SYSTEM (BEGINNING 1979 MODELS).

#### a. ENGINE NOT RUNNING.

TROUBLE	PROBABLE CAUSE	REMEDY
AMMETER INDICATES HEAVY DISCHARGE OR ALTERNATOR CIRCUIT BREAKER OPENS. (Battery Switch ON, Alternator Switch OFF, all other electrical switches OFF.)	Shorted diode in alternator.	Turn off Battery Switch and remove "B" Lead from alternator. Check resistance from "B" Terminal of alternator to alternator case. Reverse leads and check again. Resistance reading may show continuity in one direction but should show an infinite reading in the other direction. If an infinite reading is not obtained in at least one direction, repair or replace alternator.
ALTERNATOR REGULATOR CIRCUIT BREAKER OPENS WHEN BATTERY AND ALTERNATOR SWITCHES ARE TURNED ON.	Short in alternator control unit.	Disconnect Over-Voltage Sensor plug and recheck. If circuit breaker stays in, replace Over-Voltage Sensor.  Disconnect control unit plug and recheck. If circuit breaker stays in, replace alternator control unit.
	Short in alternator field.	Disconnect "F" terminal wire and recheck. If circuit breaker stays in, replace alternator.

#### b. ENGINE RUNNING.

ALTERNATOR CIRCUIT BREAKER OPENS WHEN BATTERY AND ALTERNATOR SWITCHES ARE TURNED ON, LOW-VOLTAGE LIGHT DOES NOT COME ON.	Defective circuit breaker.	Replace circuit breaker.
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## MODEL R182 AND TR182 SERVICE MANUAL

### 16-38. TROUBLE SHOOTING -- ALTERNATOR SYSTEM (BEGINNING 1979 MODELS) (Cont).

#### b. ENGINE RUNNING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
ALTERNATOR REGULATOR CIRCUIT BREAKER OPENS WHEN BATTERY AND ALTERNATOR SWITCHES ARE TURNED ON. LOW-VOLTAGE LIGHT MAY OR MAY NOT COME ON.	Shorted field in alternator.	Check resistance from "F" terminal of alternator to alternator case, if resistance is less than 5 ohms repair/replace.

#### CAUTION

This malfunction may cause a shorted alternator control unit which will result in an over-voltage condition when system is again operated.

ALTERNATOR MAKES ABNORMAL WHINING NOISE.	Shorted diode in alternator.	Turn off Battery Switch and remove "B" Lead from alternator. Check resistance from "B" Terminal of alternator to alternator case. Reverse leads and check again. Resistance reading may show continuity in one direction but should show an infinite reading in the other direction. If an infinite reading is not obtained in one direction, repair or replace alternator.
LOW-VOLTAGE LIGHT DOES NOT GO OUT WHEN ALTERNATOR AND BATTERY SWITCHES ARE TURNED ON.	Shorted alternator control unit.  Defective low-voltage sensor.	Replace alternator control unit.  Replace alternator control unit.



## MODEL R182 AND TR182 SERVICE MANUAL

### 16-38. TROUBLE SHOOTING -- ALTERNATOR SYSTEM (BEGINNING 1979 MODELS) (Cont).

#### b. ENGINE RUNNING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
AFTER ENGINE START WITH ALL ELECTRICAL EQUIPMENT TURNED OFF CHARGE RATE DOES NOT TAPER OFF IN 1-3 MINUTES.	Alternator control unit faulty or high resistance in field circuit.	With engine not running turn off all electrical loads and turn on battery and alternator switches. Measure bus voltage to ground, then measure voltage from terminal of alternator to ground. If there is more than 2 volts difference check field circuit wiring shown on alternator system wiring diagram in Section 19. Clean all contacts. Replace components until there is less than 2 volts difference between bus voltage and field voltage.

#### NOTE

Also refer to battery power system trouble shooting chart.

ALTERNATOR SYSTEM WILL NOT KEEP BATTERY CHARGED.	Alternator output voltage insufficient.	1. Connect voltmeter between D.C. Bus and ground. Turn off all electrical loads. Turn on Battery Switch, start engine and adjust for 1500 RPM, voltage should read approximately 24 volts. Turn on alternator switch, voltage should read between 28.4 and 28.9 volts. Ammeter should indicate a heavy charge rate which should taper off in 1-3 minutes. If charge rate tapers off very quickly and voltage is normal, check battery for malfunction. If ammeter shows a low charge rate or any discharge rate, and voltage does not rise when alternator switch is turned on proceed to Step 2.
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## MODEL R182 AND TR182 SERVICE MANUAL

### 16-38. TROUBLE SHOOTING -- ALTERNATOR SYSTEM (BEGINNING 1979 MODELS) (Cont).

#### b. ENGINE RUNNING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
ALTERNATOR SYSTEM WILL NOT KEEP BAT- TERY CHARGED. (Cont.)	Alternator output voltage insufficient (cont).	<p>2. Stop engine. turn off all switches. Connect voltmeter between "F" terminal of alternator and ground. Do NOT start engine. Turn on battery switch and alternator switch. Battery voltage should be present at "F" terminal, less 1 volt drop thru regulator, if not refer to Step 3.</p> <p>3. Starting at "F" terminal of alternator, trace circuit to alternator control unit at Pin 1 (Blue Wire). Trace circuit from Pin 3 (Red Wire) to master switch, to Bus Bar. Trace circuit from alternator control unit Pin 2 (Orange Wire) to alternator "BAT" terminal. Check connections and replace component which does not have voltage present at output. Refer to alternator system wiring diagram in Section 19.</p>
	Alternator field winding open.	<p>1. If voltage is present turn off alternator and battery switches. Check resistance from "F" terminal of alternator to alternator case. turning alternator shaft during measurement. Normal indication is 12-20 ohms. If resistance is high or low, repair or replace alternator. If ok refer to Step 2.</p> <p>2. Check resistance from case of alternator to air-frame ground. Normal indication is very low resistance. If reading indicates no. or poor continuity, repair or replace alternator ground wiring.</p>

## MODEL R182 AND TR182 SERVICE MANUAL

- 16-39. REMOVAL AND INSTALLATION. (See figure 16-4.)
- Make sure that the master switch remains in the off position or disconnect the negative lead from the battery.
  - Disconnect the wiring from the alternator.
  - Remove the safety wire from the upper adjusting bolt and remove the bolt from the alternator.
  - Remove the nut and washer from the lower mounting bolt.
  - Remove the alternator drive belt and lower mounting bolt to remove the alternator.
  - To replace the alternator, reverse this procedure.
  - On 60-amp alternator, adjust belt tension to obtain 3/8" deflection at the center of the belt when applying 12 pounds of pressure to the belt. On the 95-amp alternator, on initial installation belt tension should be 72 lb.; thereafter 58 to 72 lb. After the belt is adjusted and the bolt is safety wired, tighten the bottom bolt to 100-140 lb.-in. torque to remove any play between the alternator mounting foot and the U-shaped support assembly.

### CAUTION

On new aircraft or whenever a new belt is installed, belt tension should be checked within 10 to 25 hours of operation.

### NOTE

When tightening the alternator belt, apply pry bar pressure only to the end of the alternator nearest to the belt pulley.

- 16-40. ALTERNATOR VOLTAGE REGULATOR. (THRU 1978 MODELS.)
- 16-41. DESCRIPTION. A transistorized voltage regulator is installed on the aircraft. The regulator is adjustable, but adjustment on the aircraft is not recommended. A bench adjustment procedure is outlined in the Cessna Alternator Charging Systems Service/Parts Manual. A Cessna Alternator Charging System Test Box Assembly (PN. 9870000-1) is available through the Cessna Service/Parts Center for use in isolating failures in the 28-volt transistorized voltage regulator (C611002-0105) and the 28-volt Alternator.
- 16-43. REMOVAL AND INSTALLATION. (See figure 16-5.)
- Make sure that the master switch is off, or disconnect the negative lead from the battery.
  - Remove the connector plug from the regulator.
  - Remove two screws holding the regulator on the firewall.
  - To replace the regulator, reverse the procedure. Be sure that the connections for grounding the alternator, wiring shields and the base of the regulator are clean and bright before assembly. Otherwise, poor voltage regulation and/or excessive radio noise may result.

## MODEL R182 AND TR182 SERVICE MANUAL

### 16-43. ALTERNATOR CONTROL UNIT.

16-44. DESCRIPTION. The alternator control unit is a solid state voltage regulator with an over-voltage sensor and low-voltage sensor incorporated in the unit. The control unit is not adjustable and is a remove and replace item. A Cessna Alternator Charging System Test Box Assembly (PN9870005) is available through the Cessna Service/Parts Center for use in isolating failures in the 28-volt alternator control units (C611005-0101 and C611005-0102) and the 28-volt alternator.

### 16-45. REMOVAL AND INSTALLATION. (See figure 16-5.)

- a. Remove upper half of engine cowl.
- b. Place master switch in the "OFF" position.
- c. Disconnect negative lead from the battery and pull lead free of the battery box.
- d. Disconnect housing plug from the regulator/alternator control unit.
- e. Remove screws securing the regulator/alternator control unit to the firewall.
- f. To install regulator/alternator control unit, reverse the preceding steps. Be sure the connections for grounding are clean and bright before assembly. Otherwise faulty voltage regulator and/or excessive radio noise may result.

### 16-46. OVER-VOLTAGE WARNING SYSTEM.

16-47. DESCRIPTION. Thru 1978 Models the over-voltage warning system consists of a sensor switch and a red warning light labeled, "HIGH VOLTAGE", on the instrument panel. When an over-voltage tripoff occurs the over-voltage sensor turns off the alternator system and the red warning light comes on. The ammeter will show a discharge. Turn off both sections of the master switch to recycle the over-voltage sensor. If the over-voltage condition was transient, the normal alternator charging will resume and no further action is necessary. If the over-voltage tripout recurs, then a generating system malfunction has occurred such that the electrical accessories must be operated from the aircraft battery only. Conservation of electrical energy must be practiced until the flight can be terminated. The over-voltage red warning light filament can be tested by turning off the Alternator portion of the Master Switch and leaving the Battery portion turned on. This test does not induce an over-voltage condition on the electrical system. Refer to figure 16-5 for sensor switch installation. Beginning with 1979 Models the over-voltage sensor is contained within the alternator control unit. The unit also contains a low-voltage sensor. A red warning light labeled "LOW VOLTAGE" is installed on the instrument panel. When an over-voltage condition occurs the over-voltage sensor turns off the alternator and the voltage in the system drops. When system voltage drops below 24.8 volts the low-voltage sensor turns on the low-voltage light indicating a drain on the battery and the ammeter will show a discharge. Turn off both sections of the master switch to recycle the over-voltage sensor. If the over-voltage condition was transient, the normal alternator charging will resume and no further action is necessary. If the over-voltage tripoff recurs, then a generating system malfunction has occurred such that the electrical accessories must be operated from the aircraft battery only. Conservation of electrical energy must be practiced until the flight can be terminated. The over-voltage light filament may be tested at any time by turning off the "Alternator" portion of the master switch and leaving the battery portion on. This test does not induce an over-voltage condition on the electrical system.

# MODEL R182 AND TR182 SERVICE MANUAL

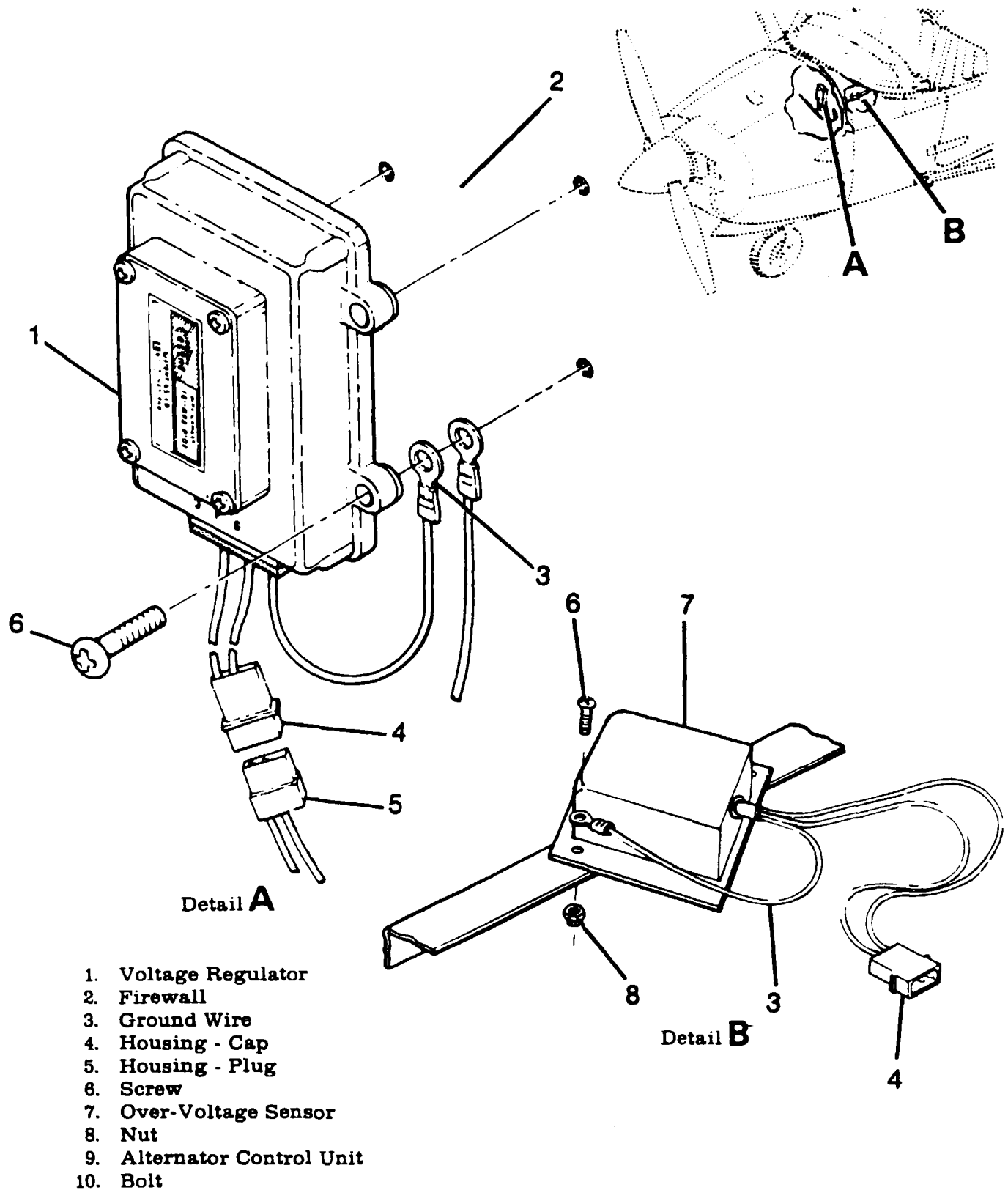
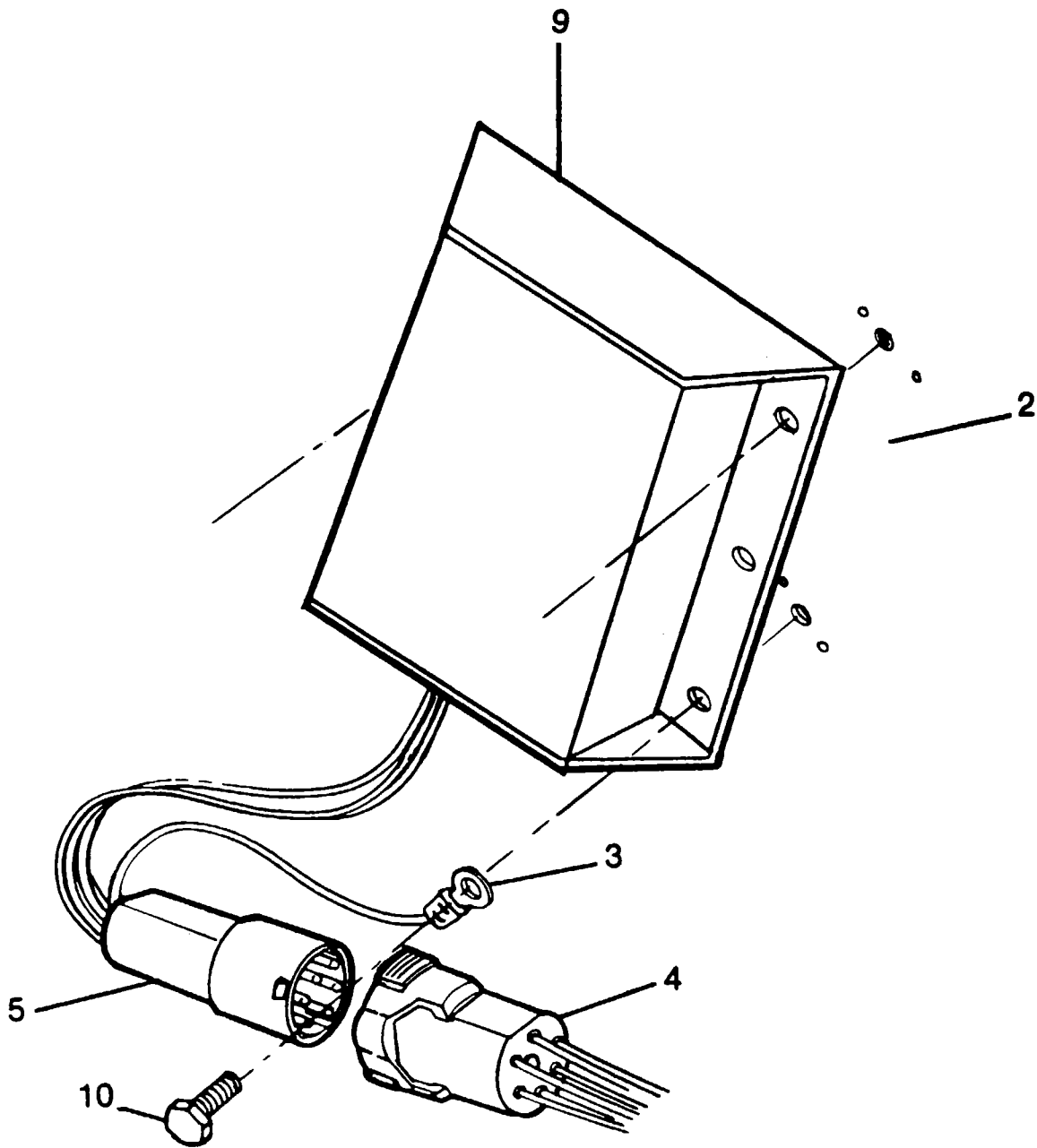


Figure 16-5. Voltage Regulator/Alternator Control Unit Installation (Sheet 1 of 4)



Detail **A**

1979 MODELS

Figure 16-5. Voltage Regulator/ Alternator Control Unit Installation (Sheet 2 of 4)

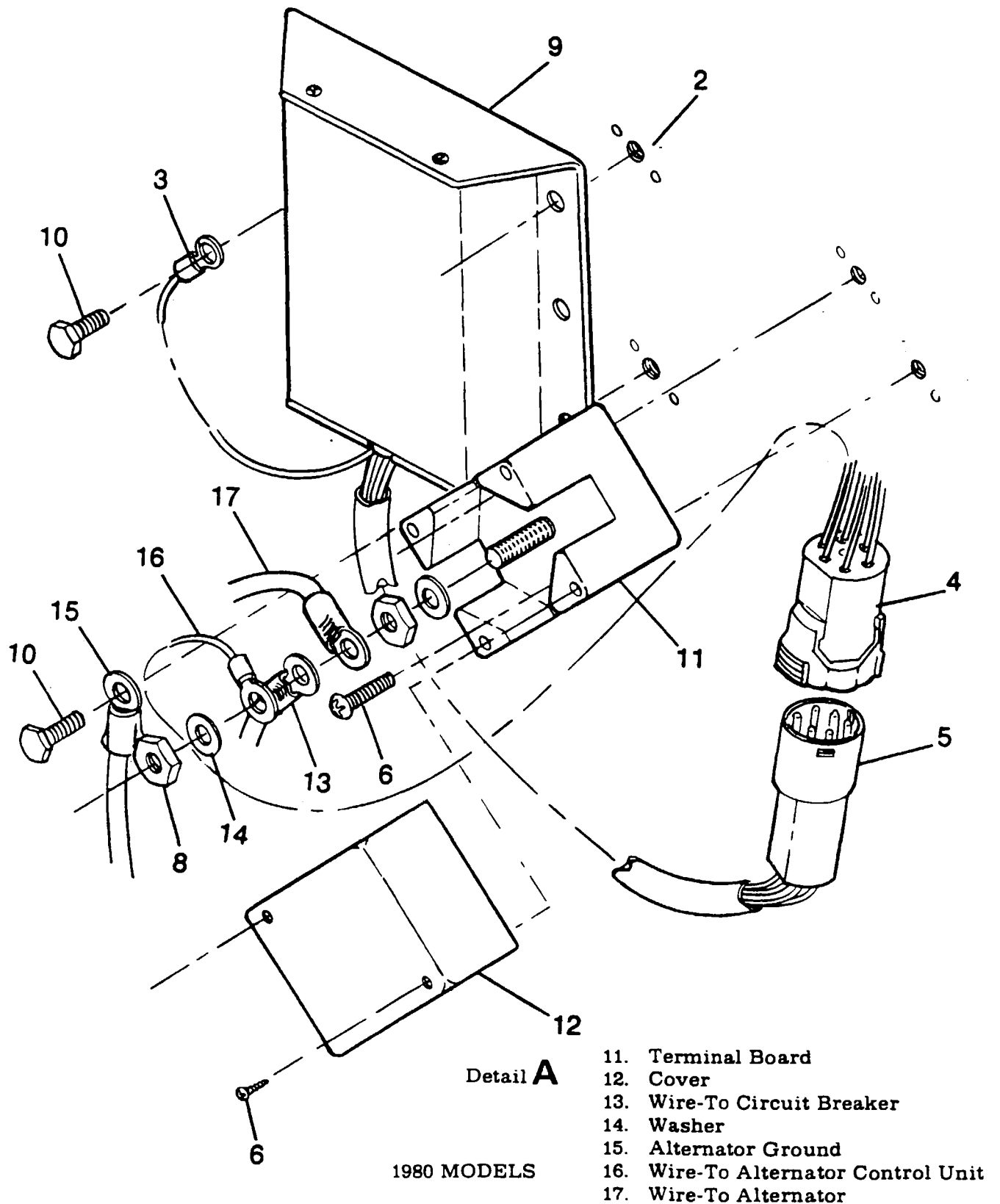
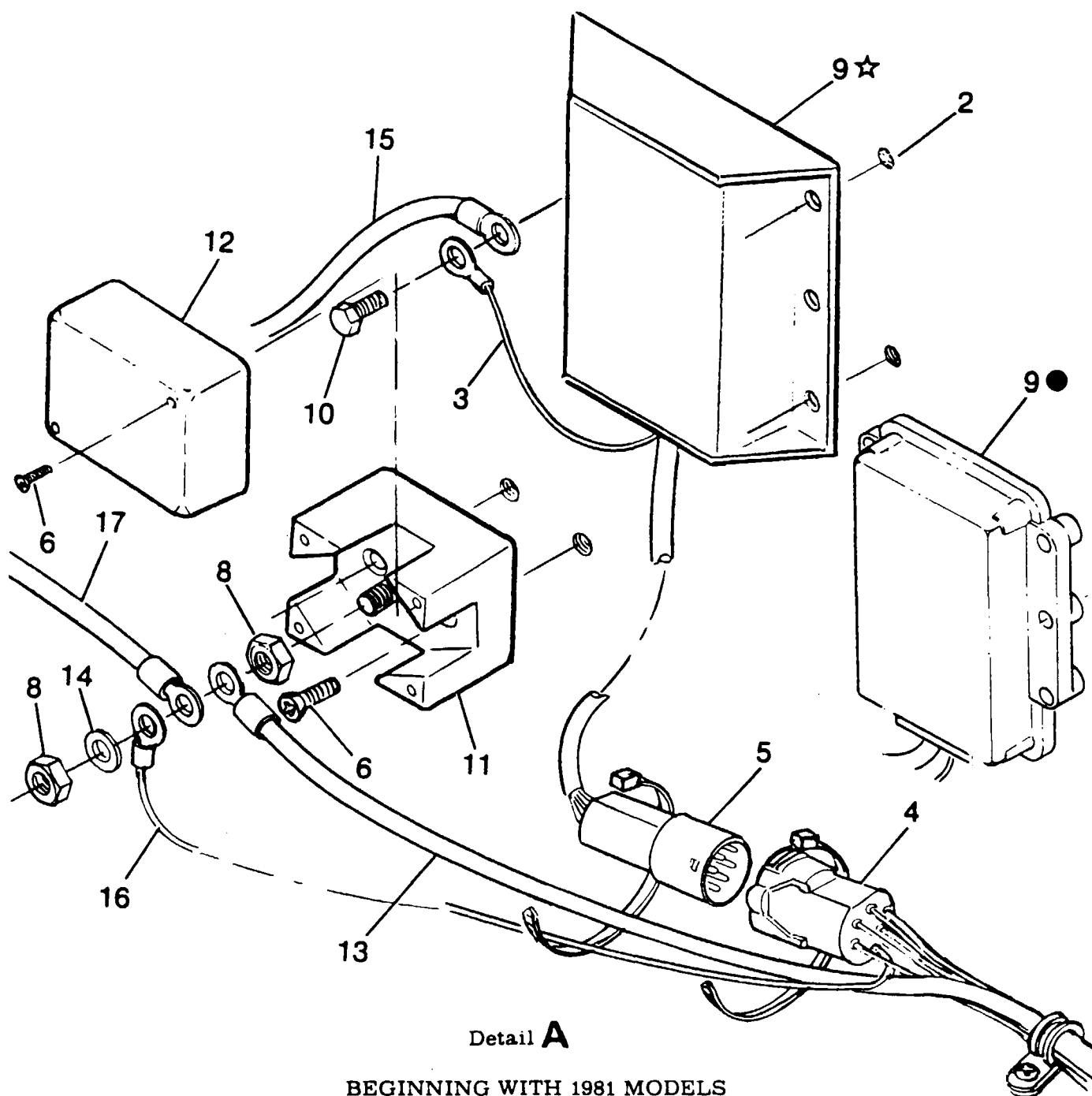


Figure 16-5. Voltage Regulator/ Alternator Control Unit Installation (Sheet 3 of 4)

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★ THRU R18201989  
● BEGINNING WITH  
R18201990

Figure 16-5. Voltage Regulator/Alternator Control Unit Installation (Sheet 4 of 4)



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### 16-48. AIRCRAFT LIGHTING SYSTEM.

16-49. DESCRIPTION. The aircraft lighting system consists of landing and taxi lights, navigation lights, flashing beacon light, anti-collision strobe lights, dome and instrument lights, courtesy lights, control wheel map light, compass and radio dial lights.

### 16-50. TROUBLE SHOOTING -- LIGHTING SYSTEM.

TROUBLE	PROBABLE CAUSE	REMEDY
LANDING AND TAXI LIGHTS OUT.	Short circuit in wiring.	1. Inspect circuit breaker. If circuit breaker is open, proceed to step 2. If circuit breaker is ok, proceed to step 3.
	Defective wiring.	2. Test each circuit separately until short is located. Repair or replace wiring.
	Defective switch.	3. Check voltage at lights with master and landing and taxi light switches ON. Should read battery voltage. Replace switch.
LANDING OR TAXI LIGHT OUT.	Lamp burned out.	1. Test lamp with ohmmeter or new lamp. Replace lamp.
	Open circuit in wiring.	2. Test wiring for continuity. Repair or replace wiring.
FLASHING BEACON DOES NOT LIGHT.	Short circuit in wiring.	1. Inspect circuit breaker. If circuit breaker is open, proceed to step 2. If circuit breaker is ok, proceed to step 3.
	Defective wiring.	2. Test circuit until short is located. Repair or replace wiring.
	Lamp burned out.	3. Test lamp with ohmmeter or new lamp. Replace lamp. If lamp is good, proceed to step 4.
	Open circuit in wiring.	4. Test circuit from lamp to flasher for continuity. If no continuity is present, repair or replace wiring. If continuity is present, proceed to step 5.

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### 16-50. TROUBLE SHOOTING -- LIGHTING SYSTEM (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
FLASHING BEACON DOES NOT LIGHT. (Cont.)	Defective switch.	5. Check voltage at flasher with master and beacon switch on. Should read battery voltage. Replace switch. If voltage is present, proceed to step 6.
	Defective flasher.	6. Install new flasher.
FLASHING BEACON CONSTANTLY LIT.	Defective flasher.	1. Install new flasher.
ALL NAV LIGHTS OUT.	Short circuit in wiring.	1. Inspect circuit breaker. If circuit breaker is open, proceed to step 2. If circuit breaker is ok, proceed to step 3.
	Defective wiring.	2. Isolate and test each nav light circuit until short is located. Repair or replace wiring.
	Defective switch.	3. Check voltage at nav light with master and nav light switches on. Should read battery voltage. Replace switch.
ONE NAV LIGHT OUT.	Lamp burned out.	1. Inspect lamp. Replace lamp.
	Open circuit in wiring.	2. Test wiring for continuity. Repair or replace wiring.

### WARNING

The anti-collision system is a high voltage device. Do not remove or touch tube assembly while in operation. Wait at least 5 minutes after turning off power before starting work.

BOTH ANTI-COLLISION STROBE LIGHTS WILL NOT LIGHT.	Open circuit breaker.	1. Check, if open reset. If circuit breaker continues to open proceed to step 2.
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## MODEL R182 AND TR182 SERVICE MANUAL

### 16-50. TROUBLE SHOOTING -- LIGHTING SYSTEM (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
BOTH ANTI-COLLISION STROBE LIGHTS WILL NOT LIGHT. (Cont.)	Open circuit breaker	<p>2. Disconnect red wire between aircraft power supply (battery/external power) and strobe power supplies, one at a time. If circuit breaker opens on one strobe power supply, replace strobe power supply. If circuit breaker opens on both strobe power supplies proceed to step 3. If circuit breaker does not open proceed to step 4.</p> <p>3. Check aircraft wiring. Repair or replace as necessary.</p> <p>4. Inspect strobe power supply ground wire for contact with wing structure.</p>

#### CAUTION

Extreme care should be taken when exchanging flash tube. The tube is fragile and can easily be cracked in a place where it will not be obvious visually. Make sure the tube is seated properly on the base of the nav light assembly and is centered in the dome.

#### NOTE

When checking defective power supply and flash tube, units from opposite wing maybe used. Be sure power leads are protected properly when unit is removed to prevent short circuit.

ONE ANTI-COLLISION STROBE LIGHT WILL NOT LIGHT. (Cont.)	Defective Strobe Power Supply, or flash tube.	<p>1. Connect voltmeter to red lead between aircraft power supply (battery/external power) and strobe power supply connecting negative lead to wing structure. Check for 24 volts. If ok, proceed to step 2. If not, check aircraft power supply (battery/external power).</p>
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## MODEL R182 AND TR182 SERVICE MANUAL

### 16-50. TROUBLE SHOOTING -- LIGHTING SYSTEM (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
ONE ANTI-COLLISION STROBE LIGHT WILL NOT LIGHT. (Cont.)	Defective strobe power Supply, or flash tube.	2. Replace flash tube with known good flash tube. If system still does not work, replace strobe power supply.
DOME LIGHT TROUBLE.	Short circuit in wiring.	1. Inspect circuit breaker. If circuit breaker is open, proceed to step 2. If circuit breaker is ok, proceed to step 3.
	Defective wiring.	2. Test circuit until short is located. Repair or replace wiring.  3. Test for open circuit. Repair or replace wiring. If no short or open circuit is found, proceed to step 4.
	Lamp burned out.	4. Test lamp with ohmmeter or new lamp. Replace lamp.
	Defective switch.	5. Check for voltage at dome light with master and dome light switch on. Should read battery voltage. Replace switch.
INSTRUMENT LIGHTS WILL NOT LIGHT.	Short circuit wiring.	1. Inspect circuit breaker. If circuit breaker is open, proceed to step 2. If circuit breaker is ok, proceed to step 3.
	Defective wiring.	2. Test circuit until short is located. Repair or replace wiring.  3. Test for open circuit. Repair or replace wiring. If no short or open circuit is found, proceed to step 4.

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## 16-50. TROUBLE SHOOTING -- LIGHTING SYSTEM (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
INSTRUMENT LIGHTS WILL NOT LIGHT. (Cont.)	Faulty section in dimming potentiometer.	4. Lights will work when control is placed in position. Replace potentiometer.
	Faulty light dimming transistor.	5. Test both transistors with new transistor. Replace faulty transistor.
	Faulty selector switch.	6. Inspect. Replace switch.
INSTRUMENT LIGHTS WILL NOT DIM.	Open resistor or wiring in minimum intensity end of potentiometer.	1. Test for continuity. Replace resistor or repair wiring.
	Shorted transistor.	2. Test transistor by substitution. Replace defective transistor.
CONTROL WHEEL MAP LIGHT WILL NOT LIGHT.	Nav light switch turned off.	1. Nav light switch has to be ON before map light will light.
	Short circuit in wiring.	2. Check lamp fuse on terminal board located on back of stationary panel with ohmmeter. If fuse is open, proceed to step 3. If fuse is ok, proceed to step 4.
	Defective wiring.	3. Test circuit until short is located. Repair or replace wiring.
		4. Test for open circuit. Repair or replace wiring. If a short or open circuit is not found, proceed to step 5.
	Defective map light assembly.	5. Check voltage at map light assembly with master and nav light switches on. If battery voltage is present, replace map light assembly.

## MODEL R182 AND TR182 SERVICE MANUAL

### 16-51. LANDING AND TAXI LIGHTS.

16-52. **DESCRIPTION.** The landing and taxi lights are mounted in the lower half of the engine cowl. Both lights are used for landing but only the left hand for taxi. Power for the lights is supplied through a circuit breaker located on the primary bus bar. Two rocker switches control the lights. The switches are interconnected by a diode; when the taxi light switch is actuated only the left hand light is illuminated. When the landing light switch is actuated power is supplied to the landing light, and through the diode around the taxi light switch to the taxi light so both lights are illuminated.

### 16-53. REMOVAL AND INSTALLATION. (See figure 16-6.)

- a. Remove the lower cowl and disconnect wires from the landing and taxi lights.
- b. Remove screws (8) securing lamp assembly to support (2) and remove lamp assembly. Note number and position of washers between plate (3) and support (2) for reinstallation.
- c. Remove screws (7) securing bracket (6) to plate (3) and remove lamp (5) and gasket (4).
- d. To install, place lamp (5) in bracket (6) and install gasket (4) and plate (3) using screws (7).

#### NOTE

A minimum of one gasket (4) and a maximum of two gaskets may be used to secure lamp (5) between bracket (6) and plate (3).

- e. Using screws (8) secure lamp assembly to support (2) installing washers, in the proper position, removed in step (b).

#### NOTE

A maximum of two washers may be used between support (2) and plate (3) for adjustment.

- f. Connect wires to lamps and install cowl.
- g. Check lights for operation.

### 16-54. ADJUSTMENT OF LANDING AND TAXI LIGHTS. (See figure 16-6.) Adjustment of the landing and taxi lights is pre-set at the factory. If further adjustment is desired proceed as follows:

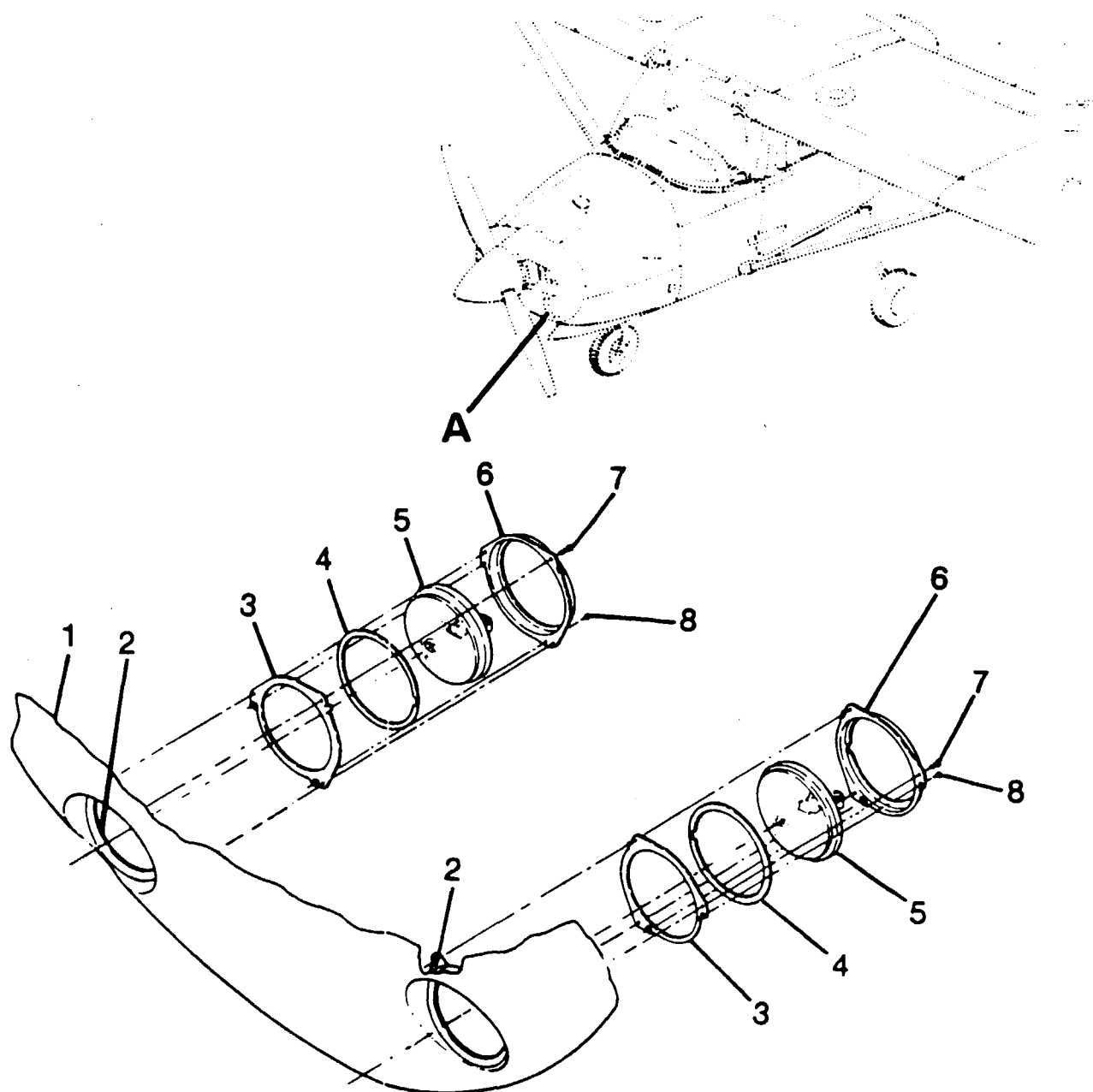
- a. Remove the lower engine cowl and disconnect wires from the landing and taxi lights.
- b. Remove screws (8) securing lamp assembly to support (2).
- c. Add or remove washers between lamp assembly and support (2).

#### NOTE

A maximum of two washers may be used between support (2) and plate (3) for adjustment.

- d. Using screws (8) secure lamp assembly to support (2).
- e. Connect wires to lamps and install cowl.
- f. Check lights for operation and direction.

# MODEL R182 AND TR182 SERVICE MANUAL

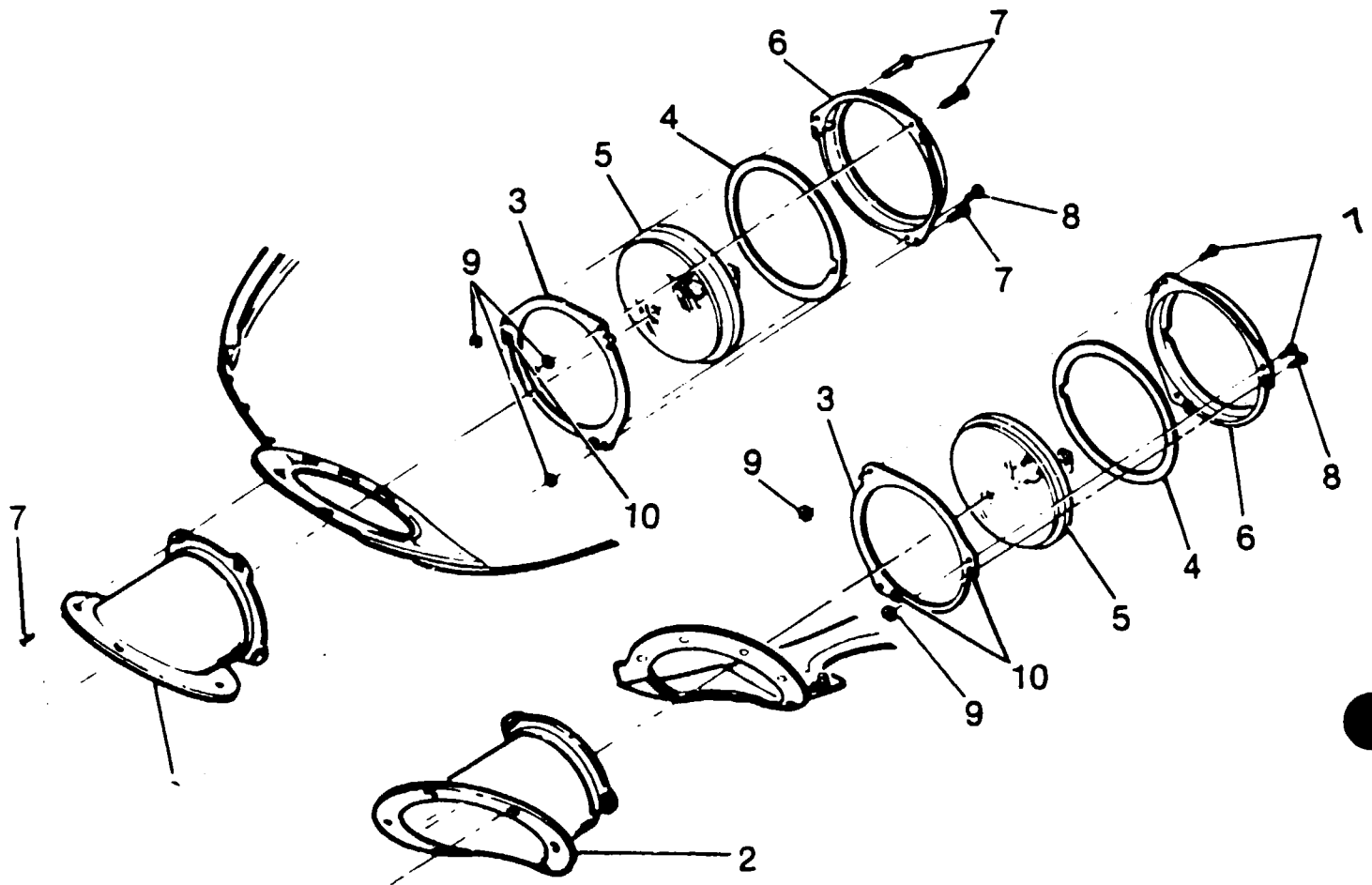


Detail **A**

THRU R18201313 AND FR18200045

1. Nose Cap
2. Landing Light Support
3. Plate
4. Gasket
5. Lamp
6. Bracket
7. Screw
8. Tinnerman Screw

Figure 16-6. Landing and Taxi Light Installation (Sheet 1 of 2)



Detail **A**

BEGINNING WITH R18201314 AND FR18200046

- 9. Washer
- 10. Nut

Figure 16-6. Landing and Taxi Light Installation (Sheet 2 of 2)



## MODEL R182 AND TR182 SERVICE MANUAL

- 16-55. NAVIGATION LIGHTS.
- 16-56. DESCRIPTION. The navigation lights are installed on each wing tip and the stinger. The lights are controlled by a switch located on the instrument panel.
- 16-57. REMOVAL AND INSTALLATION. For removal and installation of the navigation lights, see figure 16-7.
- 16-58. FLASHING BEACON.
- 16-59. DESCRIPTION. The flashing beacon light is attached to the vertical fin tip. The flashing beacon is an iodine-vapor lamp electrically switched by a solid-state flasher assembly. The flasher assembly is located in the vertical fin under the fin tip. Switching frequency of the flasher assembly operates the lamp at approximately 45 flashes per minute. A 1.5 ohm resistor is installed to provide a dummy load to eliminate a "pulsing" effect on the cabin lighting and ammeter.
- 16-60. REMOVAL AND INSTALLATION. (See figure 16-8.)

### CAUTION

When inserting lamp into socket always use a handkerchief or a tissue to prevent getting fingerprints on the lamp.

### NOTE

Fingerprints on lamp may shorten the life of the lamp.

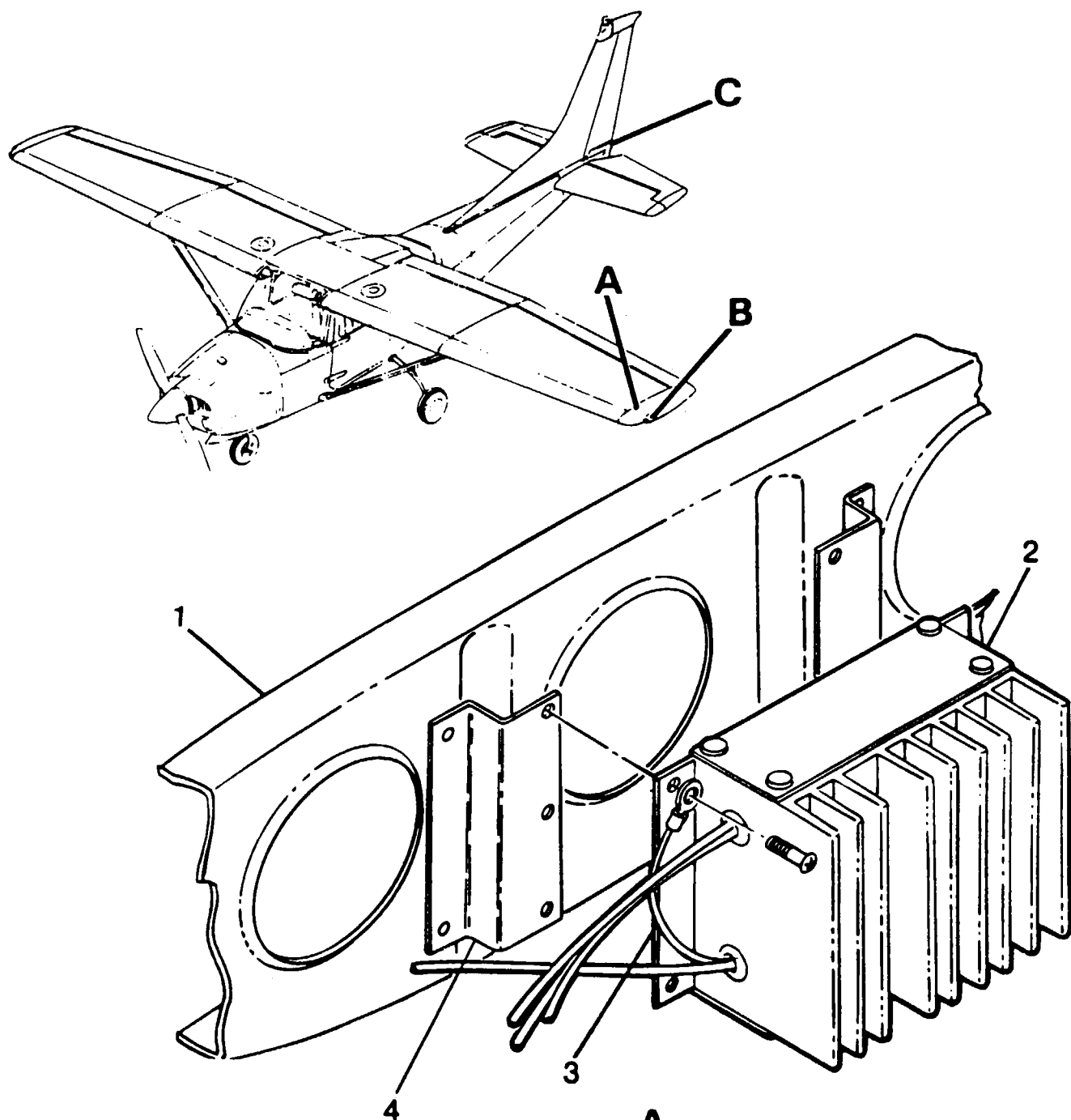
- 16-61. ANTI-COLLISION STROBE LIGHTS.
- 16-62. DESCRIPTION. A white strobe light is installed on each wing tip. These lights are vibration resistant and operate on the principle of a capacitor discharge into a xenon tube, producing an extremely high intensity flash. Energy is supplied to the strobe lights from power supplies mounted on each wing tip rib.
- 16-63. REMOVAL AND INSTALLATION. (See figure 16-7.)

### WARNING

This anti-collision system is a high voltage device. Do not remove or touch tube assembly while in operation. Wait at least 5 minutes after turning off power before starting work.

- 16-64. OVERHEAD CONSOLE.
- 16-65. DESCRIPTION. The overhead console contains the instrument flood lights which also may be used as map lights by moving the slide covers below the lamps. The intensity of the lights is controlled by a rheostat mounted on the instrument panel.
- 16-66. REMOVAL AND INSTALLATION. (See figure 16-9.)

# MODEL R182 AND TR182 SERVICE MANUAL



Detail A

- |                     |                    |                         |
|---------------------|--------------------|-------------------------|
| 1. Wing Tip Rib     | 9. Spring          | 16. Flash Tube Assembly |
| 2. Power Supply     | 10. Insulator      | 17. Lens                |
| 3. Ground Wire      | 11. Housing - Plug | 18. Screw               |
| 4. Mounting Bracket | 12. Housing - Cap  | 19. Lens Retainer       |
| 5. Electrical Leads | 13. Wing Tip       | 20. Gasket              |
| 6. Cap              | 14. Lamp Socket    | 21. Lamp                |
| 7. Washer           | 15. Spacer         | 22. Seal                |
| 8. Insulated Washer |                    | 23. Grounding Washer    |

Figure 16-7. Navigation and Anti-Collision Strobe Lights Installation (Sheet 1 of 2)

# MODEL R182 AND TR182 SERVICE MANUAL

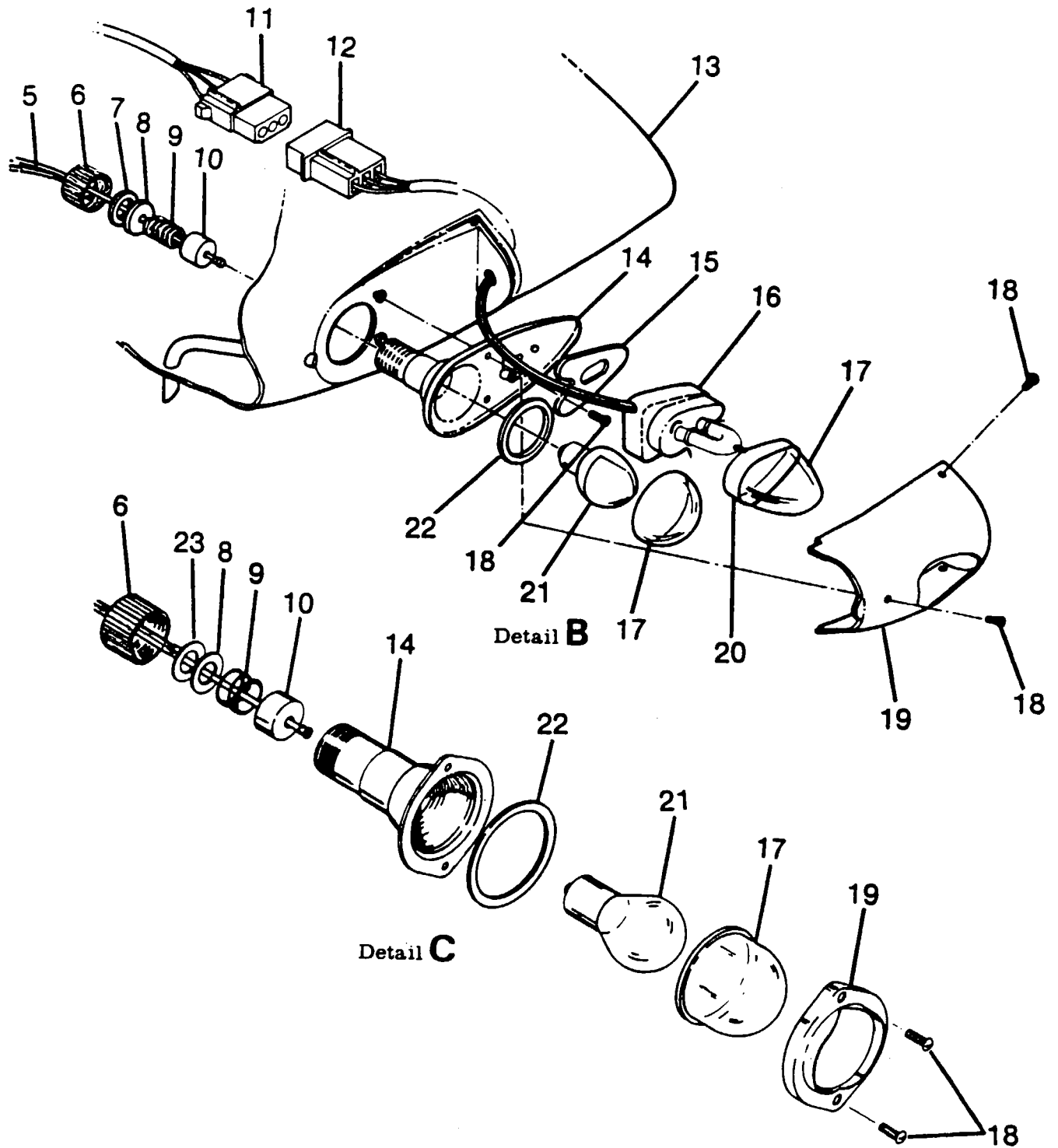


Figure 16-7. Navigation and Anti-Collision Strobe Lights Installation (Sheet 2 of 2)

# MODEL R182 AND TR182 SERVICE MANUAL

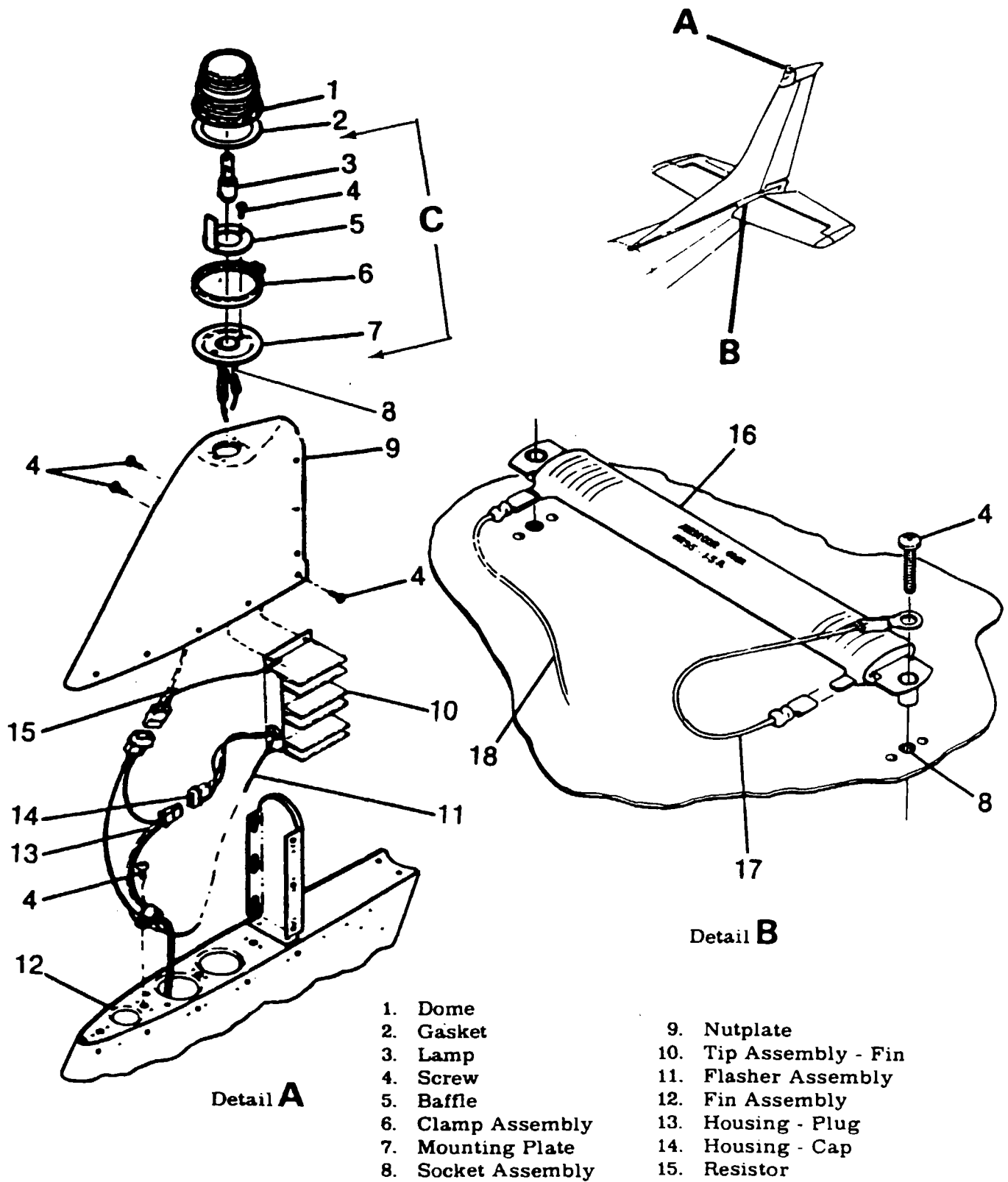
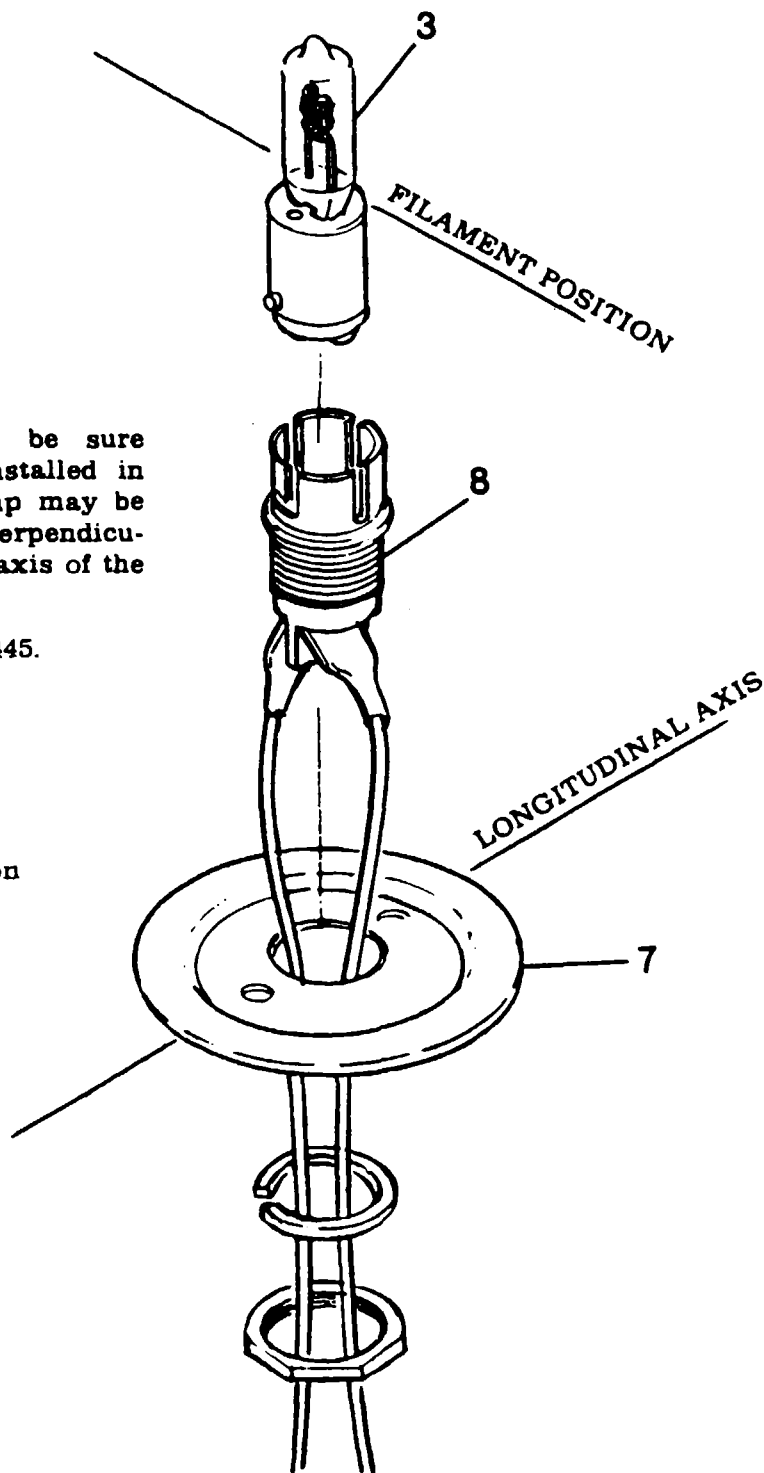


Figure 16-8. Flashing Beacon Installation (Sheet 1 of 2)

**NOTE**

When installing lamp be sure socket assembly is installed in mounting plate so lamp may be installed with filament perpendicular to the longitudinal axis of the aircraft.

Beginning with R18201445.  
On aircraft R18200001  
thru R18201444 and  
FR18200001 thru  
FR18200050, refer  
to Cessna Single-  
Engine Customer  
Care Service Information  
Letter SE80-53 dated  
May 12, 1980.



Detail C

Figure 16-8. Flashing Beacon Installation (Sheet 2 of 2)

## MODEL R182 AND TR182 SERVICE MANUAL

### 16-67. INSTRUMENT LIGHTING.

16-68. DESCRIPTION. The instrument panel lighting consists of two separate sections. The lower two-thirds of the panel is illuminated by two lights mounted in the overhead console. The lighting for the upper one-third of the panel is provided by four lights mounted in the instrument panel glare shield. The intensity of the lighting is controlled by the instrument light dimming rheostat located on the switch panel.

16-69. REMOVAL AND INSTALLATION. (See figure 16-9 and 16-10.)

### 16-70. ELECTROLUMINESCENT PANEL LIGHTING.

16-71. DESCRIPTION. The electroluminescent lighting consists of two "EL" panels: the switch panel and the comfort control panel. The ac voltage required to drive the "EL" panels is supplied by a small invertapak (power supply) located behind the instrument panel on the glove box. The intensity of the "EL" panel lighting is controlled by a rheostat located on the instrument switch panel.

16-72. REMOVAL AND INSTALLATION. (See figure 16-11.)

- a. Disconnect positive cable from battery.
- b. Disconnect and tag all electrical leads from panel.
- c. Remove knobs, decorative nuts, and switches.
- d. Remove screws securing panel to stationary panel and remove panel.
- e. For installation reverse the preceding steps. After installation, check all switches for operation.

### 16-73. INSTRUMENT POST LIGHTING.

16-74. DESCRIPTION. Individual post lighting may be installed to provide non-glare instrument lighting. The post light consists of a cap and a clear lamp assembly with a tinted lens. The intensity of the post lights is controlled by the instrument light-dimming rheostat on the switch panel.

### NOTE

When installing postlight assemblies, assemblies shall be coated with RTV-102, General Electric, Waterford, New York, on forward side of panel where postlight could come in contact with sheet metal subpanel. This coating shall insulate postlight assembly from contact with air-plane structure. Maximum coating thickness to be .03.

# MODEL R182 & TR182 SERIES SERVICE MANUAL

## 16-74A. TROUBLE SHOOTING - POSTLIGHTING.

TROUBLE	PROBABLE CAUSE	REMEDY
LAMP WILL NOT LIGHT.	Defective lamp.	1. Test lamp with ohmmeter or replace with a new lamp. If lamp is OK, proceed to step 2.
	Defective socket or open circuit.	2. With switch on, test socket. If defective, replace socket or wiring.
ONE SECTION OF LAMPS WILL NOT LIGHT.	Defective connector.	1. Test for voltage on lamp side of connector. If voltage is not present, check opposite side of connector. If voltage is present, replace pins and sockets as necessary. If voltage is not present, check connections at terminal block.
	Defective circuit in dimming assembly.	2. Refer to paragraph 17-90B.
ONE SECTION OF LAMPS WILL NOT LIGHT. (Cont)	Defective rheostat.	2. Check voltage at output side of rheostat with battery switch on.  Should read battery voltage with rheostat turned full clockwise. Voltage should decrease as rheostat is turned counterclockwise. If no voltage is present or voltage has a sudden drop before rheostat has been turned full counterclockwise replace rheostat.
ALL LAMPS OUTS.	Open circuit breaker.	1. With battery switch on, check circuit breaker. Reset if open. If circuit breaker is set, check voltage at output side of breaker. If no voltage is present, replace circuit breaker.
LAMPS WILL NOT DIM.	Defective resistor or rheostat.	1. Check resistor and rheostat for continuity and resistance value. Also, check transistors for partial short.

## MODEL R182 & TR182 SERIES SERVICE MANUAL

- 16-75. TRANSISTORIZED LIGHT DIMMING.
- 16-76. DESCRIPTION. The light-dimming circuit consists of a two-circuit transistorized dimming assembly, mounted on the right hand side of the cabin forward of the instrument panel, and two controls on the lower left hand side of the panel. The left control is a dual rheostat with a concentric knob arrangement. The center portion controls lower panel lighting, the outer portion controls engine instrument and radio lighting. The right hand is a single rheostat and controls instrument lighting, this includes, glare shield lights, instrument flood lights, compass light and post lighting if installed.
- 16-77. REMOVAL AND INSTALLATION. (See figure 16-11.)
- 16-77A. TROUBLE SHOOTING - TRANSISTORIZED HEAT SINK. Remove heat sink from airplane. Check transistors for opens and shorts, check transistor sockets for evidence of shorting out against heat sink, especially on the bottom side. Check that legs of transistor socket have not been bent up against heat sink. If this has happened, you may see burned spot on the socket leg. If the transistor sockets and wiring appear to be in good condition, install transistor back in heat sink and make a continuity check. Attach one lead of an ohmmeter to the heat sink then check every pin of the pigtail plug with the other lead for continuity. (These should not be continuity). If continuity is found, this will burn out transistors immediately.
- 16-78. DOME LIGHT.
- 16-79. DESCRIPTION. The dome light is mounted aft of the overhead console. The assembly consists of a housing, a socket and lamp and a cover. The light is controlled by a slide switch mounted on the cover aft of the light.
- 16-80. REMOVAL AND INSTALLATION. (See figure 16-9.)
- 16-81. MAP LIGHT.
- 16-82. DESCRIPTION. A light assembly is installed in the instrument panel glare shield above the pilot's control wheel. The light has blue lens. A switch located forward of the light controls the light.
- 16-83. REMOVAL AND INSTALLATION. (See figure 16-10.)



# MODEL R182 AND TR182 SERVICE MANUAL

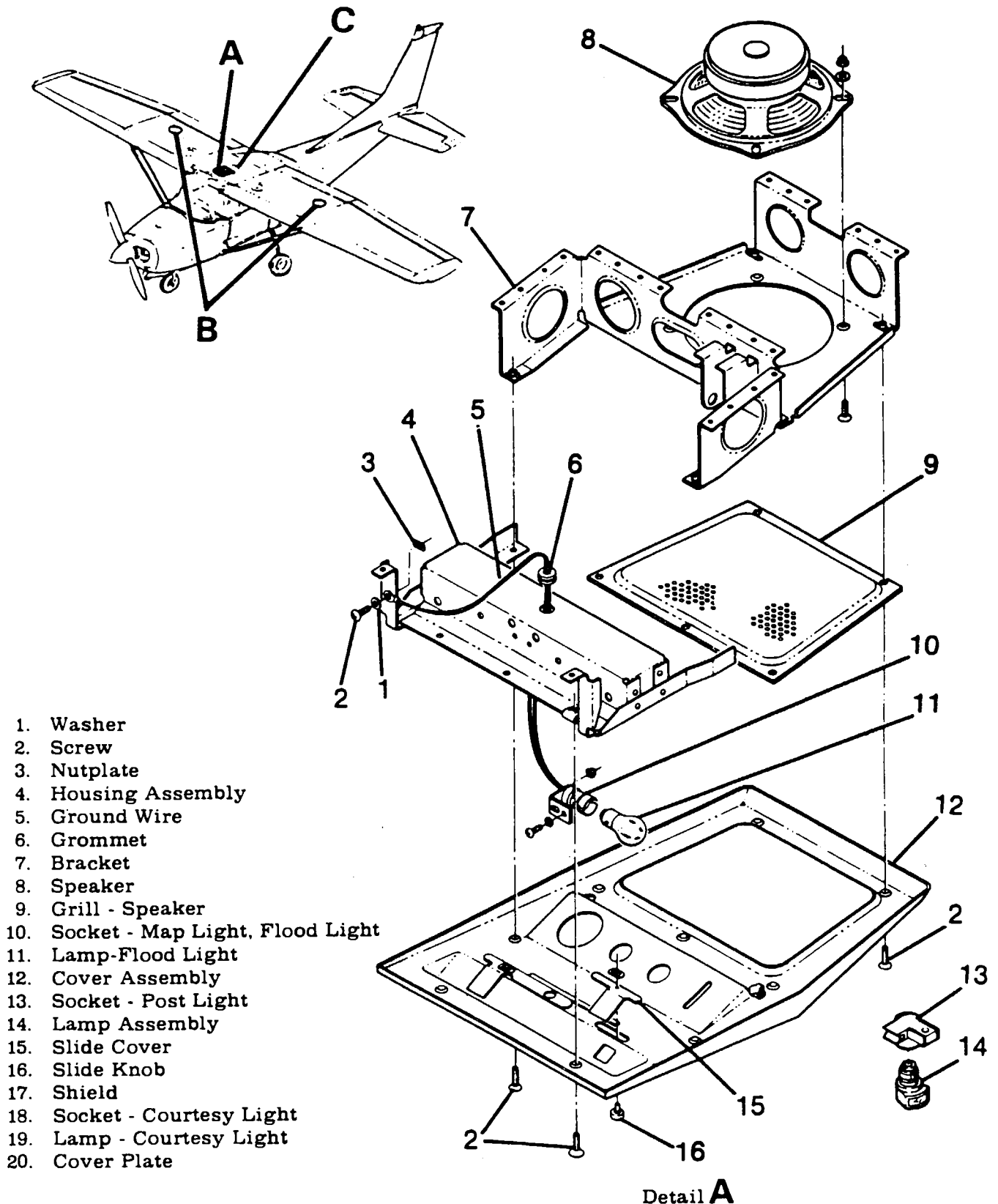


Figure 16-9. Overhead Console, Dome and Courtesy Light Installation (Sheet 1 of 4)

# MODEL R182 AND TR182 SERVICE MANUAL

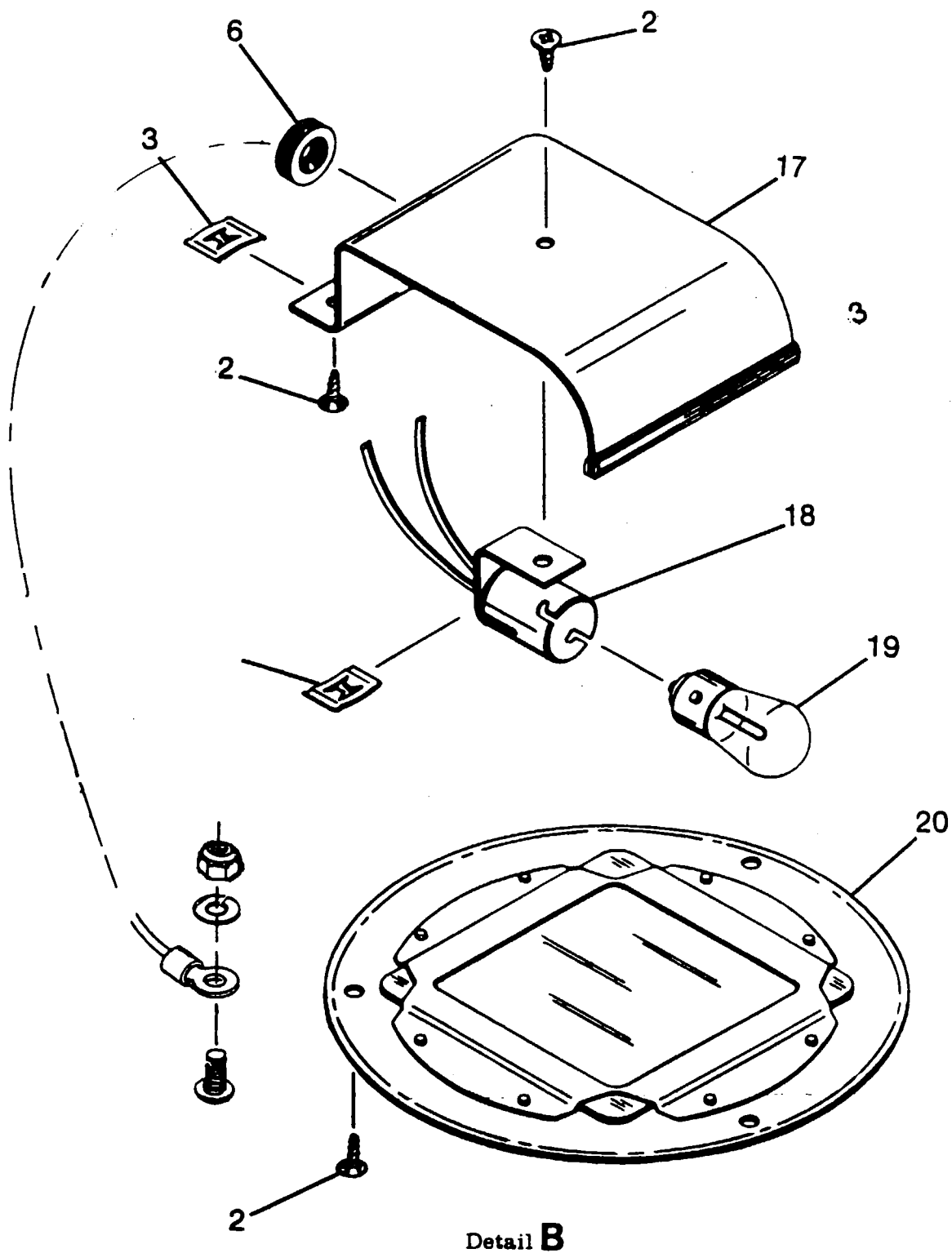
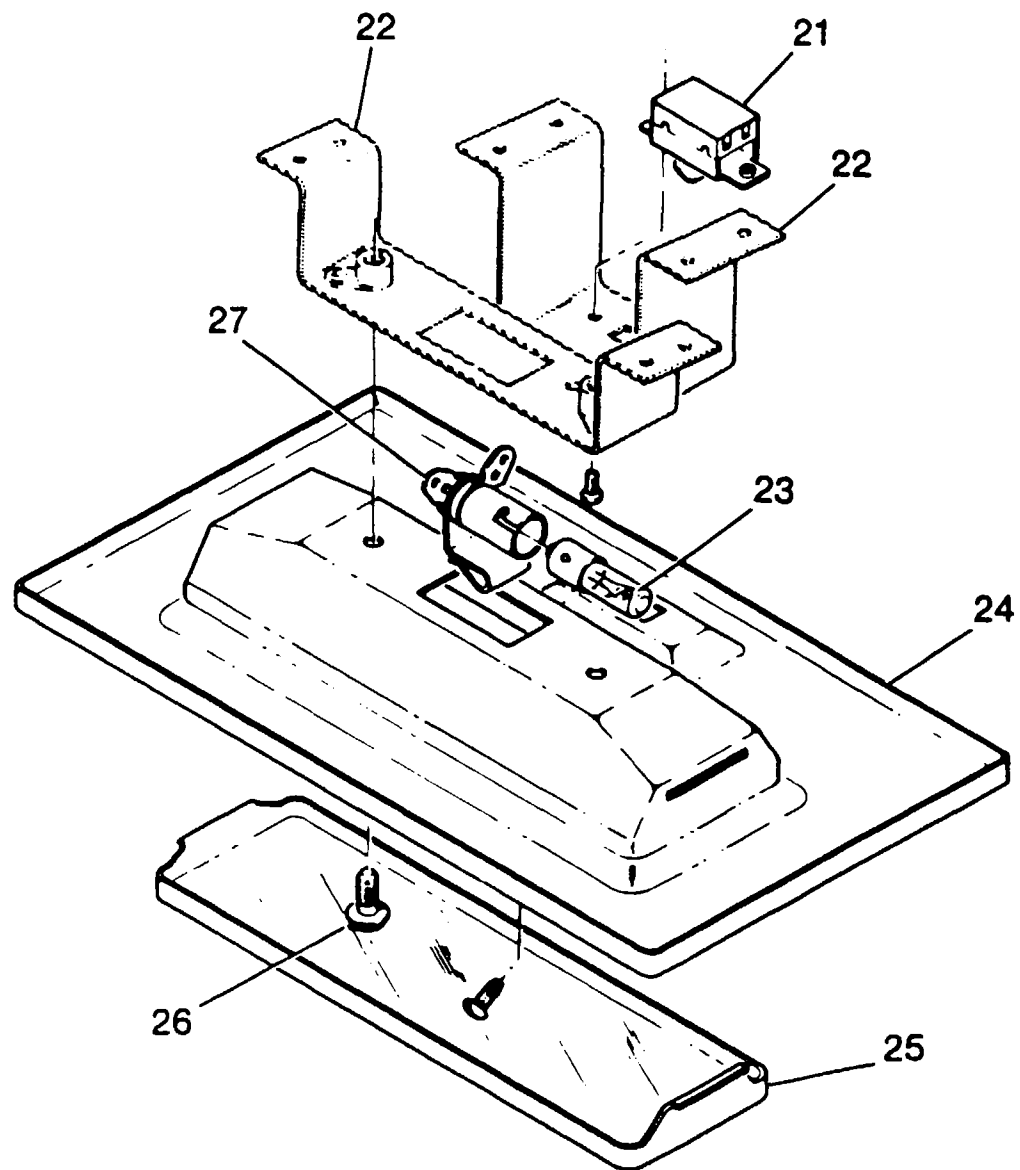


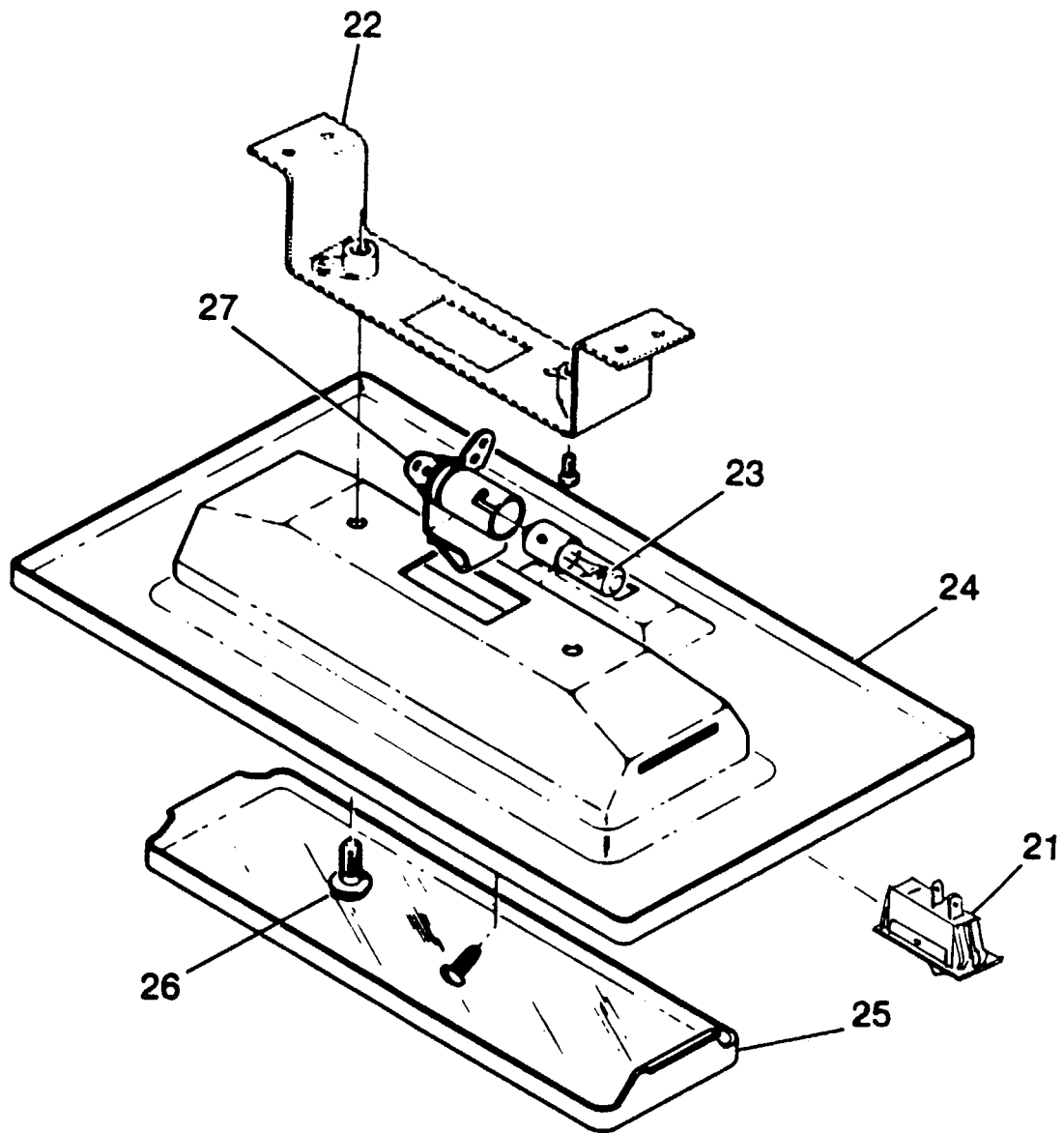
Figure 16-9. Overhead Console, Dome and Courtesy Light Installation (Sheet 2 of 4)



Detail **C**  
THRU R18201634

- 21.Switch
- 22.Bracket
- 23.Lamp
- 24.Cover
- 25.Lens
- 26.Screw
- 27.Socket

Figure 16-9. Overhead Console, Dome and Courtesy Light Installation (Sheet 3 of 4)



**Detail C**  
BEGINNING WITH R18201635

Figure 16-9. Overhead Console, Dome and Courtesy Light Installation (Sheet 4 of 4)

## MODEL R182 AND TR182 SERVICE MANUAL

- 16-84. CONTROL WHEEL MAP LIGHT.
- 16-85. DESCRIPTION. The control wheel map light is internally mounted in the control wheel. A rheostat located on the lower right hand side of the wheel controls the light.
- 16-86. REMOVAL AND INSTALLATION. (See figure 16-12.) To remove, push upward on the lamp and turn. The lamp and reflector are replaced as a unit.
- 16-87. LANDING GEAR INDICATOR LIGHTS.
- 16-88. DESCRIPTION. Thru 1982 models, the position of the landing gear is indicated by two press-to-test lamp assemblies mounted on the right side of the switch panel. The green light is on when all three gears are down and locked, the amber is on when all three gears are up and locked. If any gear assumes an intermediate position of neither up and locked or down and locked, both lights will be dark. The hood of each light is removable for bulb replacement, and has a dimming shutter. Beginning with 1983 models, the gear indicating lights are red and green, press-to-test light assemblies. The green light indicates that all three gears are down and locked. The red light indicates that the gears are in transition. The red light goes out when the gears are fully retracted or extended. The red light will illuminate when the gears are fully retracted should the system pressure drop below 1000 PSI, except when the nose gear squat switch is open. It is possible to have both lights on at the same time. Under normal circumstances, this will occur only momentarily. However, anytime both lights stay on or the red light does not go out, a malfunction has occurred.
- 16-89. REMOVAL AND INSTALLATION.
- Remove the hood on either light by unscrewing counterclockwise. The lamp is in the hood and may be replaced by pulling it out and inserting a new lamp.
  - To remove the lamp socket assembly, remove the nut from the assembly on the front side of the panel.
  - Tag and unsolder the wires from the socket assembly.
  - To replace a lamp socket assembly, reverse the above procedure.
- 16-90. COMPASS AND RADIO DIAL LIGHTS.
- 16-91. DESCRIPTION. The compass and radio dial lights are contained within the individual units. The light intensity is controlled by the instrument light-dimming rheostat mounted on the lower left side of the instrument panel.
- 16-92. PEDESTAL LIGHTING.
- 16-93. DESCRIPTION. The pedestal lighting consists of two lights: one on the upper portion of the pedestal for lighting of the trim wheels and the cowl flap control, and one on the lower portion for lighting of the fuel selector. Light dimming is controlled by the transistorized light dimming circuit.
- 16-94. REMOVAL AND INSTALLATION. For removal and installation of the lamps, see figure 16-13.
- 16-95. STALL WARNING UNIT.
- 16-96. DESCRIPTION. A solid state warning unit is installed on the left hand root rib. The warning signal is transmitted through the radio speaker in the overhead console.

# MODEL R182 AND TR182 SERVICE MANUAL

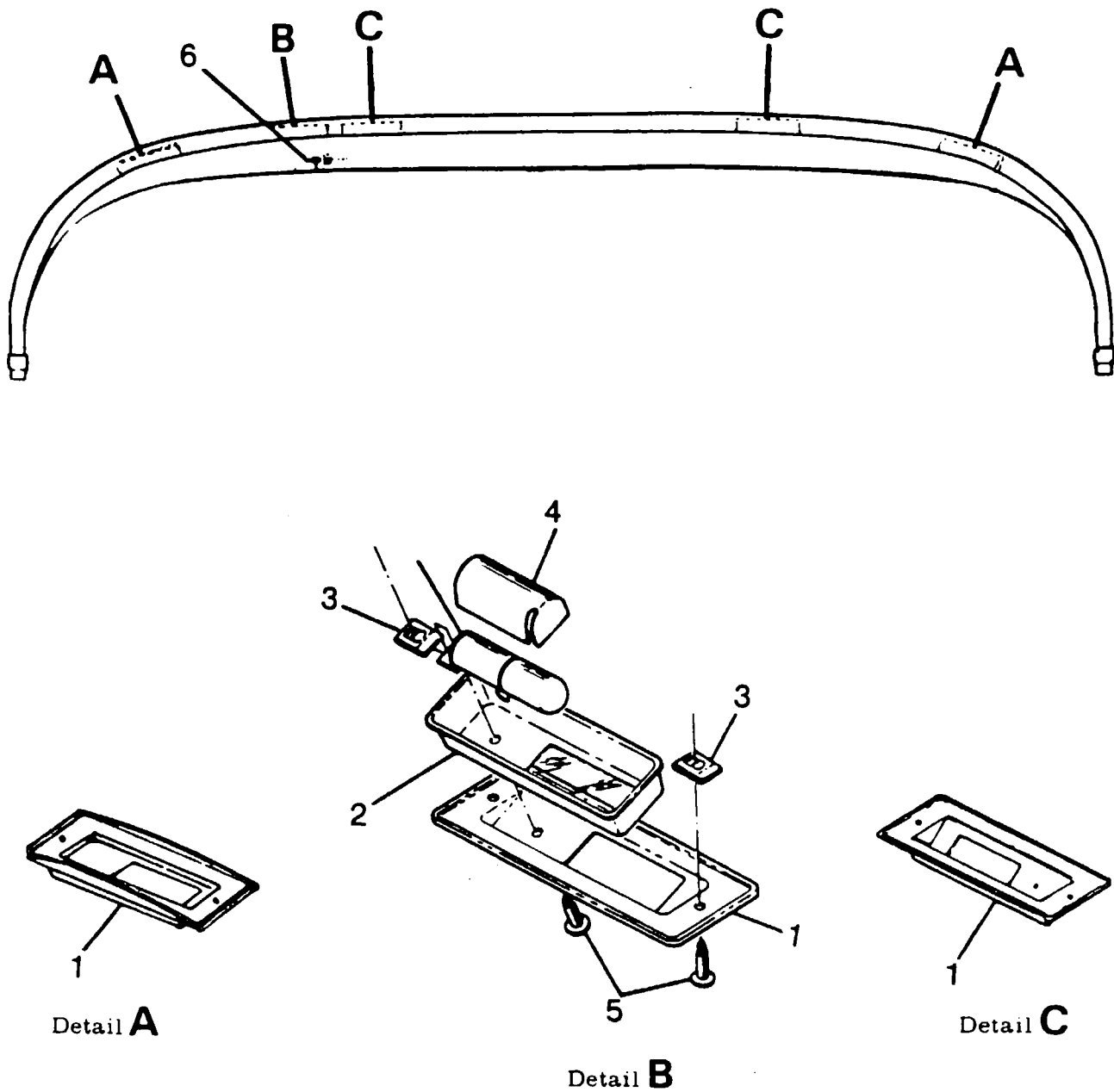


Figure 16-10. Instrument Panel Glareshield Lighting Installation

# MODEL R182 AND TR182 SERVICE MANUAL

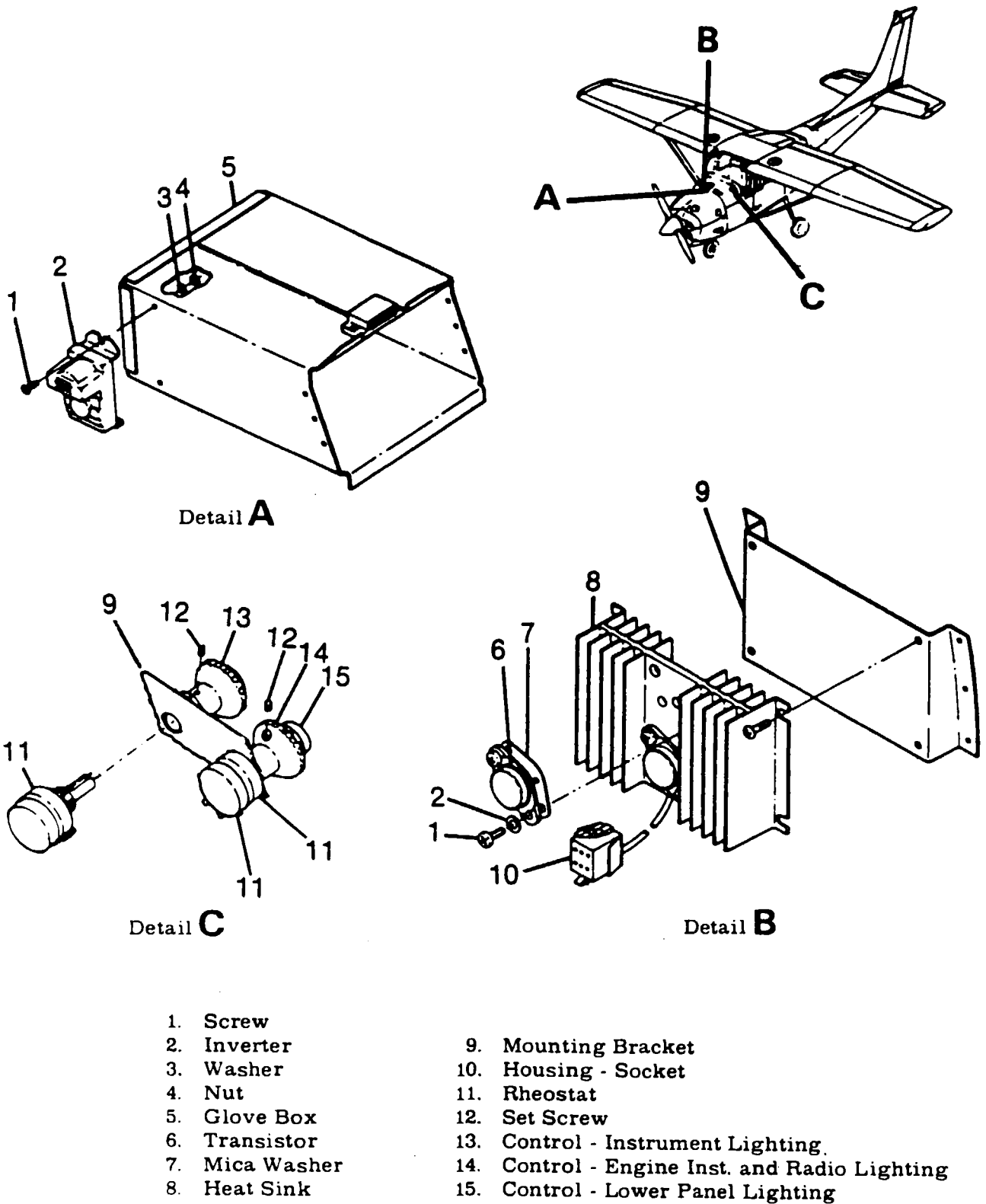
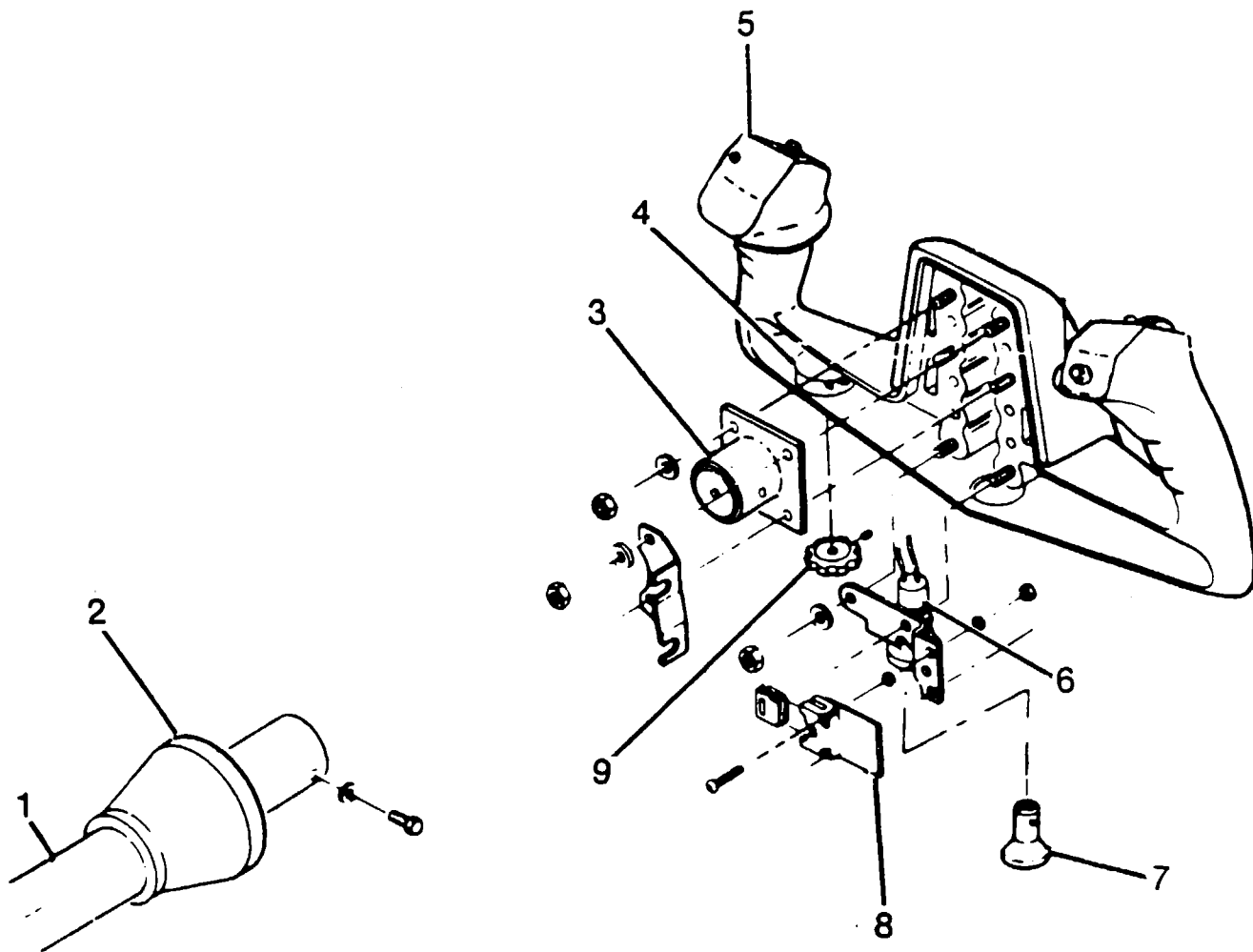


Figure 16-11. Transistorized Light Dimming and Electroluminescent Light Inverter Installations

## MODEL R182 AND TR182 SERVICE MANUAL

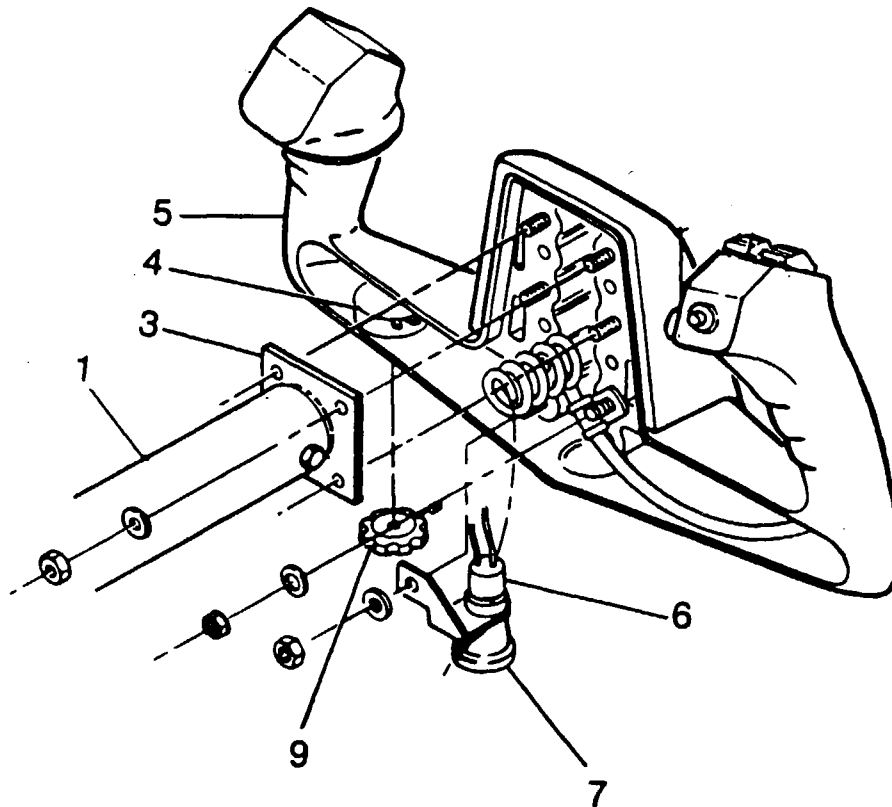


THRU 1980 MODELS

1. Control Tube Assembly
2. Cover
3. Adapter
4. Map Light Rheostat
5. Control Wheel
6. Map Light Socket
7. Lamp Assembly
8. Connector Circuit Board
9. Knob (Map Light)

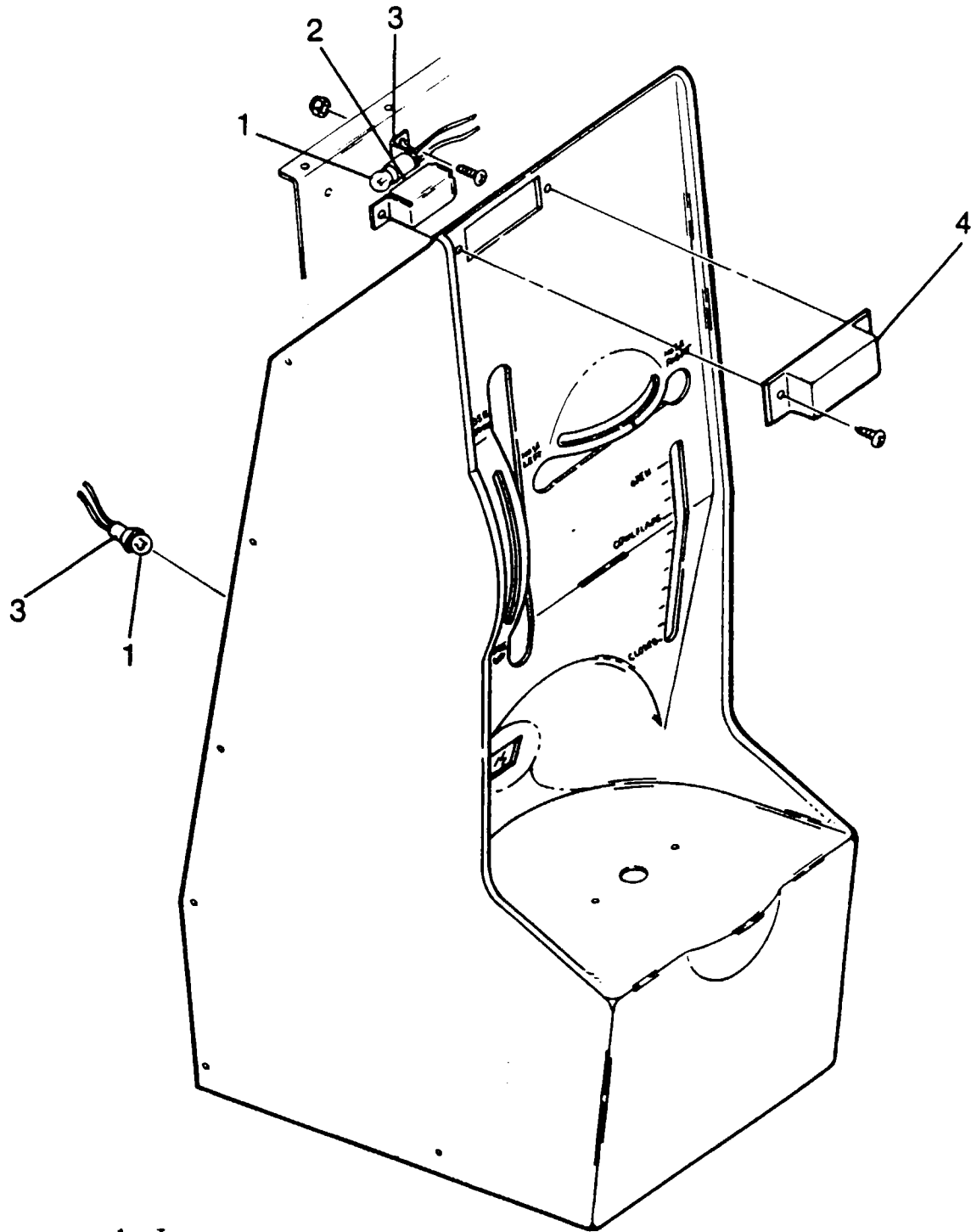
Figure 16-12. Control Wheel Map Light Installation (Sheet 1 of 2)





BEGINNING WITH 1981 MODELS

Figure 16-12. Control Wheel Map Light Installation (Sheet 2 of 2)

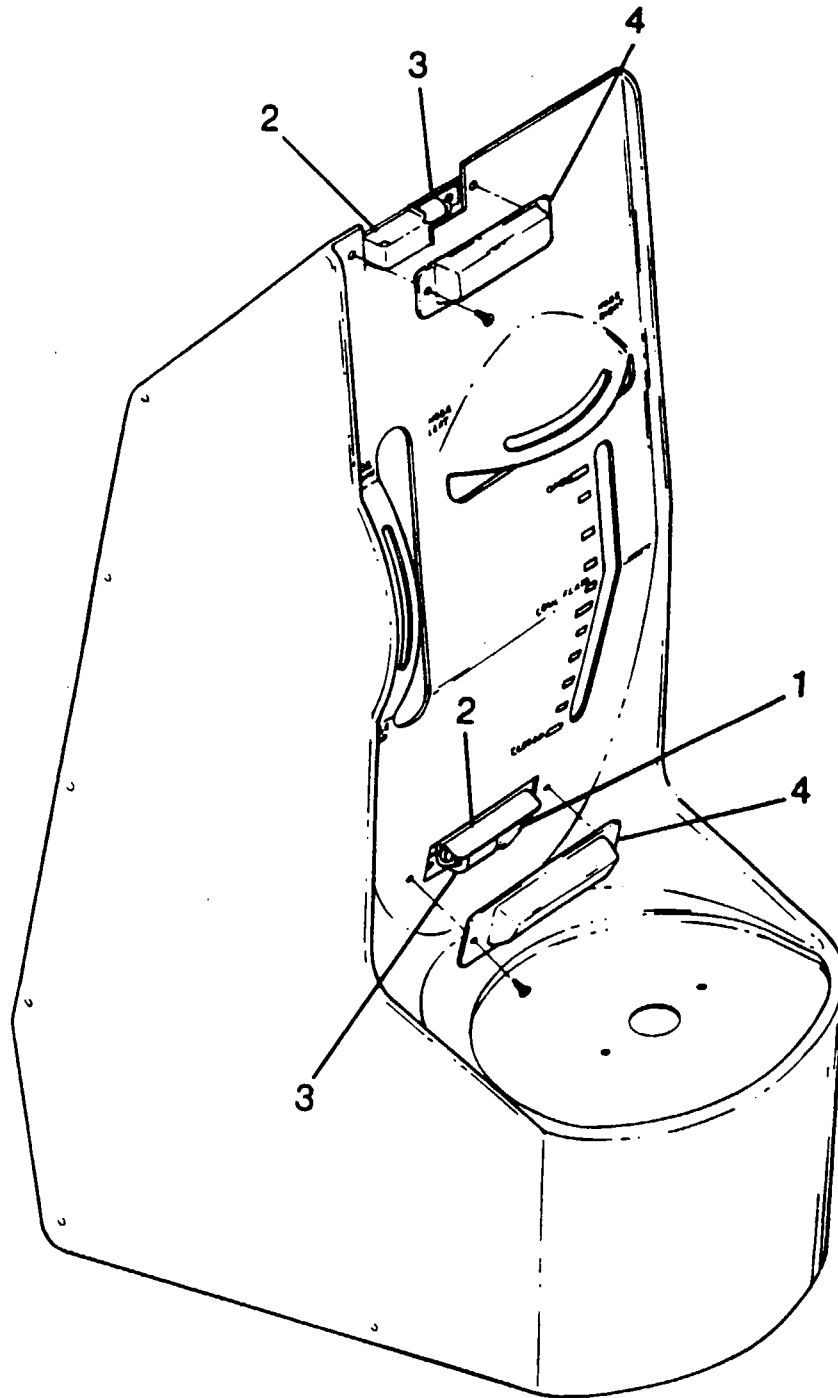


- 1. Lamp
- 2. Shield
- 3. Socket
- 4. Cover

THRU 1981 MODELS

Figure 16-13. Pedestal Lighting (Sheet 1 of 2)

# MODEL R182 AND TR182 SERVICE MANUAL



BEGINNING WITH 1982 MODELS

Figure 16-13. Pedestal Lighting (Sheet 2 of 2)

## MODEL R182 AND TR182 SERVICE MANUAL

### NOTE

If false signals are experienced, refer to Cessna Single-engine Service Letter SE78-50, dated August 7, 1978.

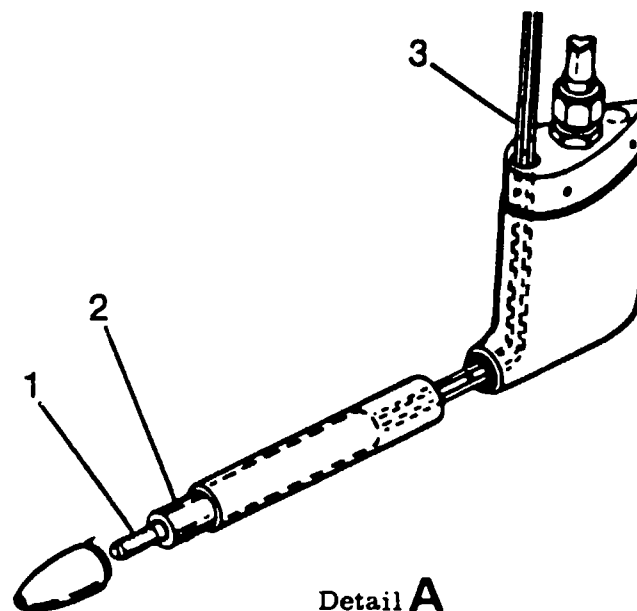
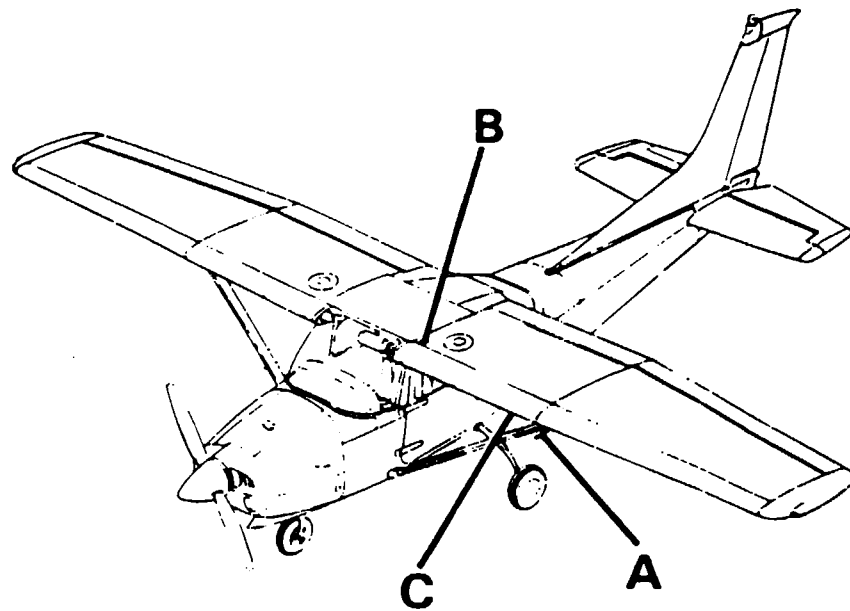
- 16-97. REMOVAL AND INSTALLATION. (See figure 16-14.)
- 16-98. STALL WARNING SWITCH.
- 16-99. DESCRIPTION. The stall warning switch is installed in the leading edge of the left wing and is actuated by airflow over the surface of the wing. The switch will close as a stall condition is approached, actuating the stall warning horn. The horn should sound at approximately five to ten miles per hour above actual stall speed. Initial installation of the switch should be with the lip of the warning switch approximately one sixteenth of an inch below the center line of the wing skin cutout. Test-fly the aircraft to determine if the horn sounds at the desired speed. If the horn sounds too soon, move the unit down slightly; if too late, move the unit up slightly.
- 16-100. REMOVAL AND INSTALLATION. (See figure 16-14.)
- 16-101. COURTESY LIGHTS.
- 16-102. DESCRIPTION. The lights consist of one light located on the under side of each wing to provide ground lighting around the cabin area. The courtesy lights have clear lenses and are controlled by a single slide switch labeled "Utility Lights", located on the left rear door post.
- 16-103. REMOVAL AND INSTALLATION. (See figure 16-9.)
- 16-104. PITOT AND STALL WARNING HEATERS.
- 16-105. DESCRIPTION. Electrical heater units are incorporated in some pitot tubes and stall warning switch units. The heaters offset the possibility of ice formations on the pitot tube and stall warning actuator switch. The heaters are integrally mounted in the pitot tube and the stall warning actuator switch. Both heaters are operated by the pitot heat switch.
- 16-106. CIGAR LIGHTER. (THRU R18201798.)
- 16-107. DESCRIPTION. The cigar lighter (located on the instrument panel) is equipped with a thermal-actuated circuit breaker which is attached to the rear of the cigar lighter. The circuit breaker will open if the lighter becomes jammed in the socket or held in position too long. The circuit breaker may be reset by inserting a small probe into the .078 diameter hole in the back of the circuit breaker and pushing lightly until a click is heard.

### CAUTION

Make sure the master switch is OFF before inserting probe into the circuit breaker on cigar lighter to reset.

- 16-108. REMOVAL AND INSTALLATION. (See figure 16-15.)
  - a. Ensure that the master switch is OFF.
  - b. Remove the cigar lighter element.
  - c. Disconnect wire on back of lighter.
  - d. Remove shell that screws on socket back of panel.
  - e. The socket will then be free for removal.
  - f. To install a cigar lighter, reverse this procedure.

# MODEL R182 AND TR182 SERVICE MANUAL



- Detail A
1. Pitot Tube
  2. Heater Assembly
  3. Electrical Leads
  4. Screw
  5. Stall Warning Assembly
  6. Cover
  7. Rib
  8. Wing Leading Edge
  9. Stall Warning Actuator
  10. Tinnerman Nut

Figure 16-14. Pitot Heat and Stall Warning Installation (Sheet 1 of 2)

# MODEL R182 AND TR182 SERVICE MANUAL

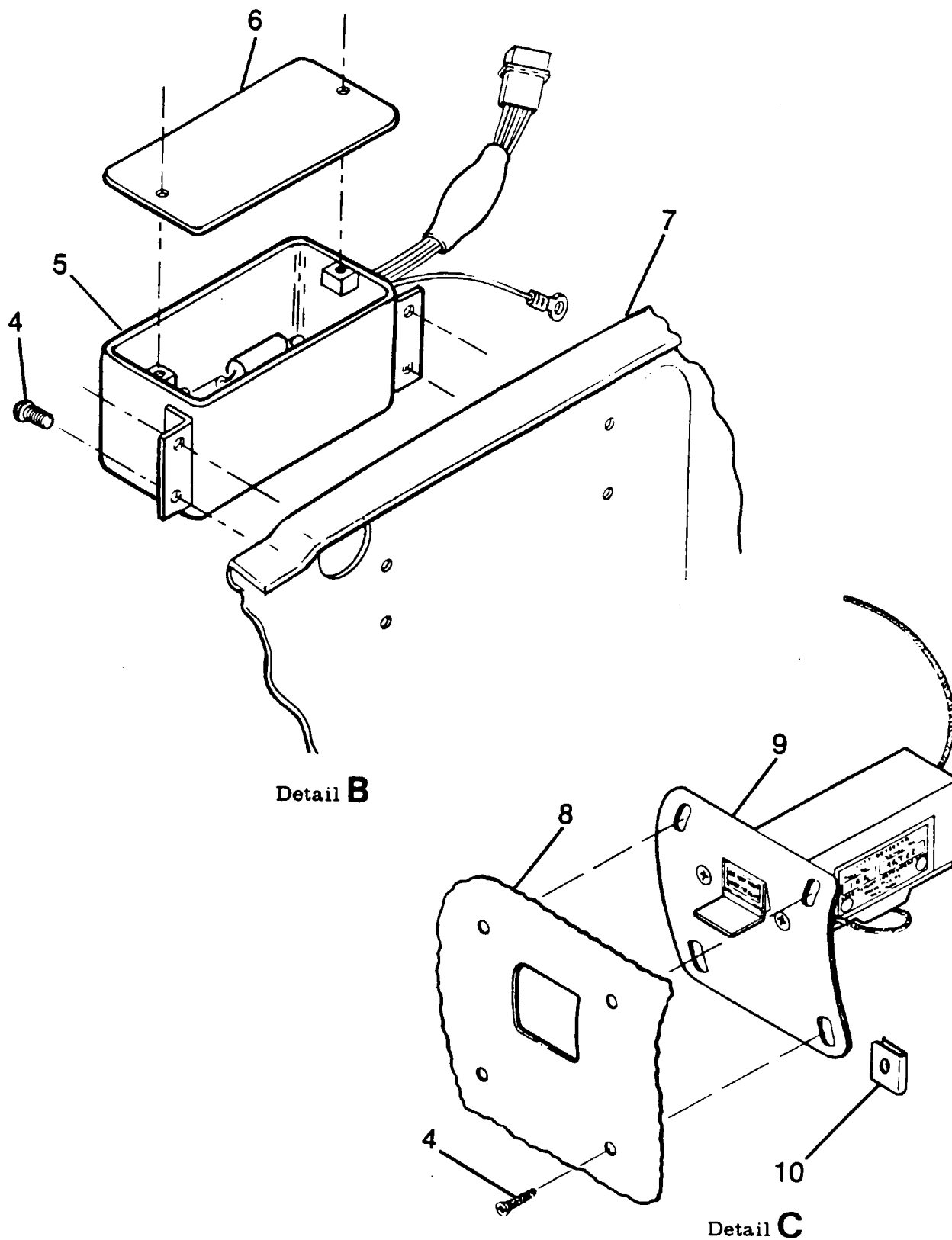
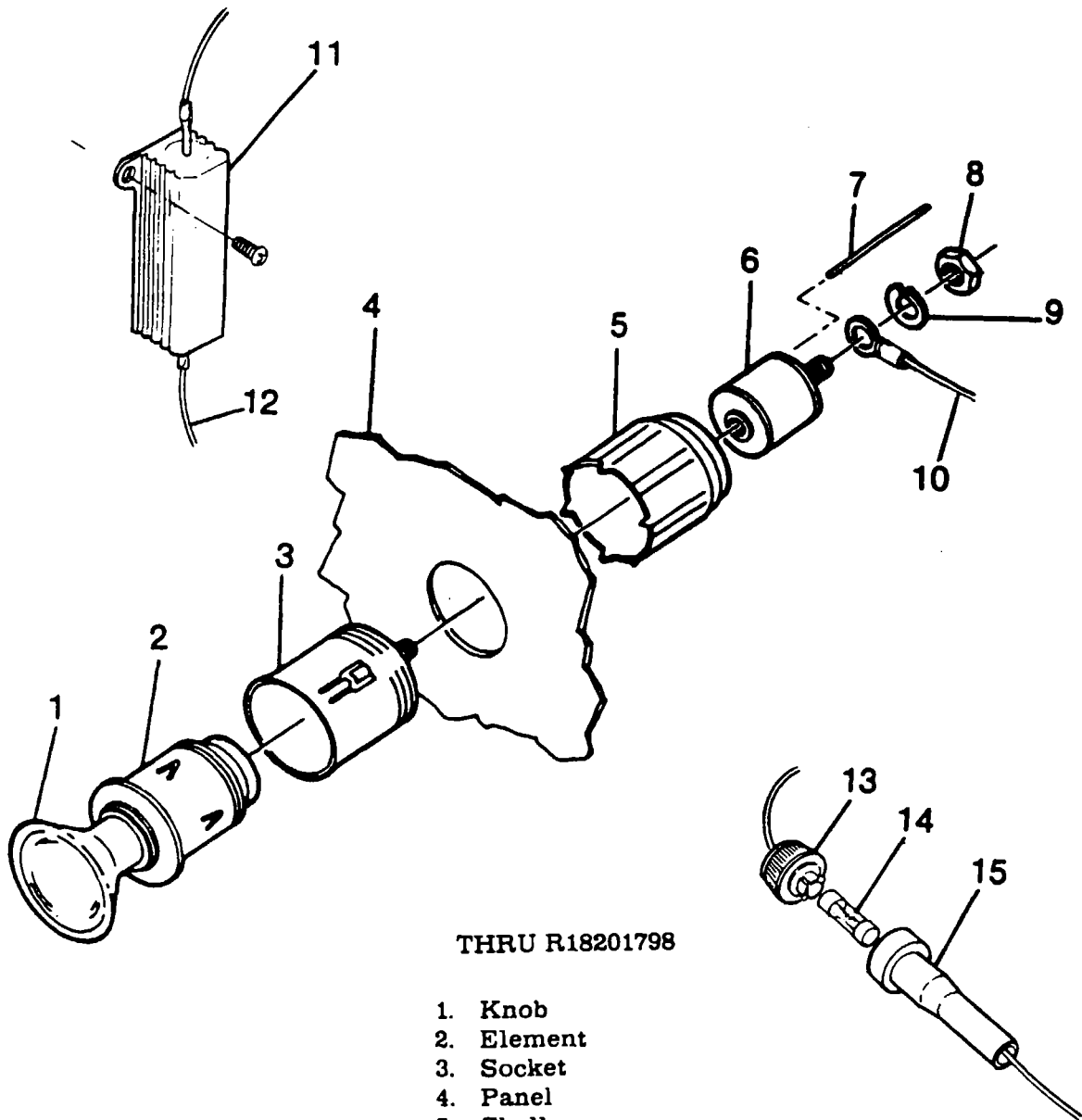


Figure 16-14. Pitot Heat and Stall Warning Installation (Sheet 2 of 2)

# MODEL R182 AND TR182 SERVICE MANUAL



THRU R18201798

1. Knob
2. Element
3. Socket
4. Panel
5. Shell
6. Circuit Breaker
7. Probe
8. Nut
9. Lockwasher
10. Wire (to Resistor)
11. Resistor
12. Wire (to Fuse)
13. Fuse Holder Cap
14. Fuse
15. Fuse Holder
16. Wire (to Circuit Breaker)

Figure 16-15. Cigar Lighter Installation

## MODEL R182 AND TR182 SERVICE MANUAL

### 16-109. EMERGENCY LOCATOR TRANSMITTER.

- 16-110. DESCRIPTION. The ELT is a self-contained, solid state unit, having its own power supply, with an externally mounted antenna. The unit is mounted in the tailcone, aft of the baggage curtain on the left hand side. The transmitters are designed to provide a broadcast tone that is audio modulated in a swept manner over the range of 1600 to 300 Hz in a distinct, easily recognizable distress signal for reception by search and rescue personnel and others monitoring the emergency frequencies. The ELT exhibits line of sight transmission characteristics which correspond approximately to 100 miles at a search altitude of 10,000 feet. The C589511-0103 transmitter, and the C589511-0104 transmitter on aircraft with Canadian registry, are used thru R18200583. The C589511-0117 transmitter, and the C589511-0113 transmitter on aircraft with Canadian registry, are used thru R18200584 thru R18201933. Beginning with R18201934 the C589512-0103 transmitter is used on all aircraft.

The C589511-0104 transmits on 121.5 MHz at 25 mw rated power output for 100 continuous hours in the temperature range of -40°F (-40°C to +55°C). The C589511-0113 transmits on 121.5 MHz at 25 mw rated power output for 100 continuous hours in the temperature range of -4°F to +131°F (-20°C to +55°C). The C589511-0103 transmits on 121.5 and 243.0 MHz simultaneously at 75 mw rated power output for 48 continuous hours in the temperature range of -40°F to +131°F (-40°C to +55°C). The C589511-0117 and C589512-0103 transmits on 121.5 and 343.0 MHz at 75 mw rated power output for 48 continuous hours in the temperature range of -4°F to +131°F (-20°C to +55°C).

Power is supplied to the transmitter by a battery-pack. The C589511-0104 and C589511-0103 ELT's equipped with a lithium battery-pack must be modified by SK185-20 as outlined in Avionics Service Letter AV78-31, dated 20 November 1981, to incorporate alkaline battery-packs. The C589511-0114 alkaline battery-packs have the service life of the battery-pack stamped on the battery pack, on the end of the transmitter below the switch and on top of the transmitter. The C589512-0107 alkaline battery-packs have the replacement date and date of installation on the battery-pack and the replacement date on the top of the transmitter.

- 16-111. OPERATION. A three-position switch on the forward end of the unit controls operation. Placing the switch in the ON position will energize the unit to start transmitting emergency signals. In the OFF position, the unit is inoperative. Placing the switch in the ARM position will set the unit to start transmitting emergency signals only after the unit has received a 5g (tolerances are +2g and -0g) impact force, for a duration of 11-16 milliseconds.

### CAUTION

Do not leave the emergency locator transmitter in the ON position longer than 1 second (3 sweeps of the warble tone) or you may activate downed aircraft procedures by CAP, DOT or FAA personnel.

### 16-112. CHECKOUT INTERVAL:

100 HOURS OR THREE MONTHS, WHICHEVER COMES FIRST.

- a. Turn aircraft master switch ON.
- b. Turn aircraft transceiver ON and set frequency on receiver to 121.5 MHz.
- c. Remove the ELT's antenna cable from the ELT unit.



## MODEL R182 AND TR182 SERVICE MANUAL

- d. Place the ELT's function selector switch in the ON position for 1 second or less. Immediately replace the ELT function selector switch in the ARM position after testing ELT.
- e. Test should be conducted only within the time period made up of the first five minutes after any hour.

### CAUTION

Tests with the antenna connected should be approved and confirmed by the nearest control tower. The FAA/DOT allows free space transmission tests from the aircraft any time within five minutes after each hour. The test time allowed is generally three sweeps of the warble tone, or approximately one second. The control tower should be notified that a test is about to be performed.

### NOTE

Without its antenna connected, the ELT will produce sufficient signal to reach your receiver, yet it will not disturb other communications or damage output circuitry.

### NOTE

After accumulated test or operation time equals 1 hour, battery-pack replacement is required.

- f. Check calendar date for replacement of battery-pack. This date is supplied on a sticker attached to the outside of the ELT case and to each battery.

#### 16-113. REMOVAL AND INSTALLATION OF TRANSMITTER. (See figure 16-16.)

- a. Remove baggage curtain to gain access to the transmitter and antenna.
- b. Disconnect co-axial cable from end of transmitter.
- c. Remove the two #10 screws from the baseplate of the ELT and remove ELT.
- d. To reinstall transmitter, reverse preceding steps.

### CAUTION

Ensure that the direction of flight arrows (placarded on the transmitter) are pointing towards the nose of the aircraft.

#### 16-114. REMOVAL AND INSTALLATION OF ANTENNA. (See figure 16-16.)

- a. Disconnect co-axial cable from base of antenna.
- b. Remove the nut and lockwasher attaching the antenna base to the fuselage and the antenna will be free for removal.
- c. To reinstall the antenna, reverse the preceding steps.

### NOTE

Upon reinstallation of antenna, cement rubber boot (14) using RTV102, General Electric Co. or equivalent, to antenna whip only; do not apply adhesive to fuselage skin or damage to paint may result.

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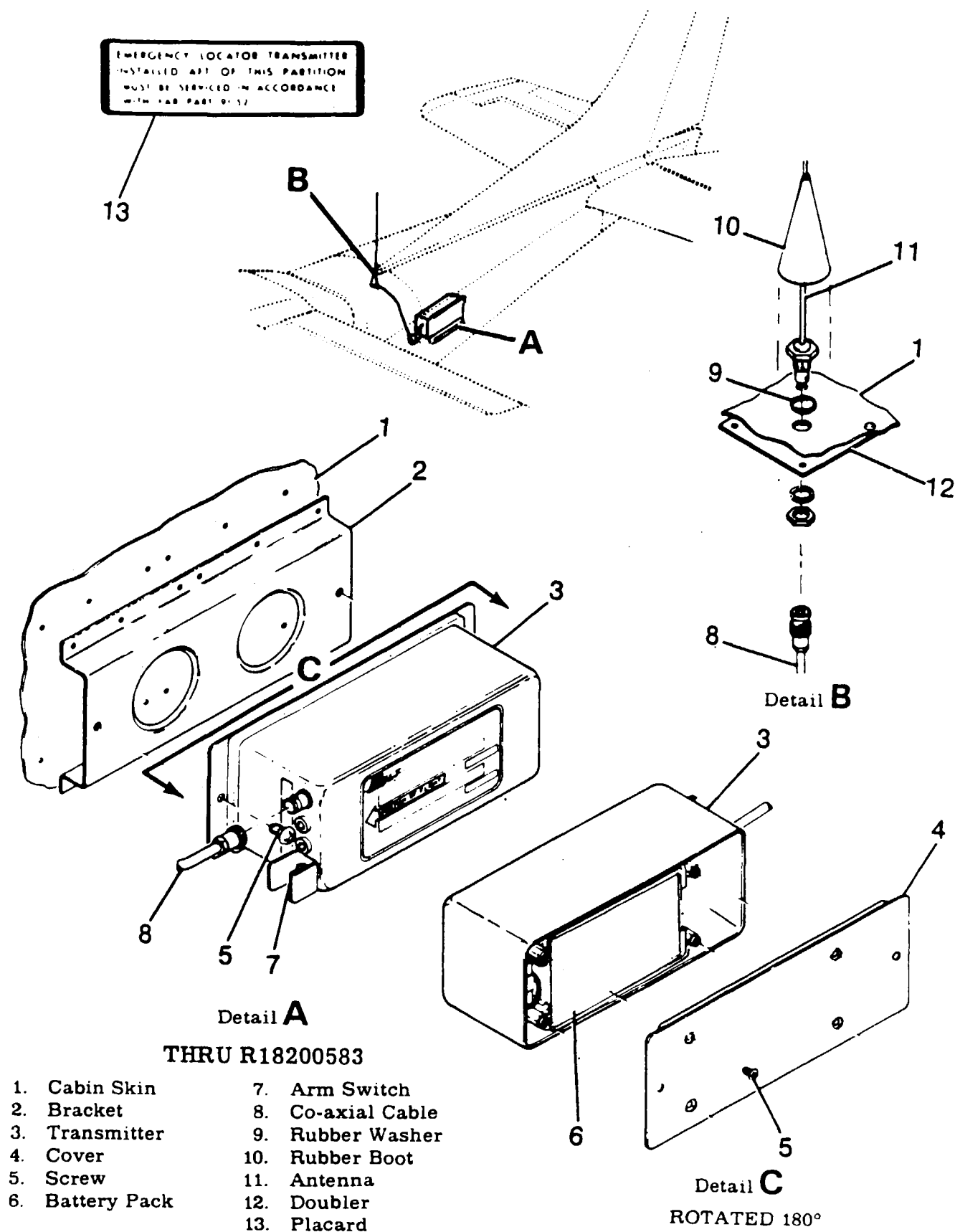


Figure 16-16. Emergency Locator Transmitter Installation (Sheet 1 of 3)

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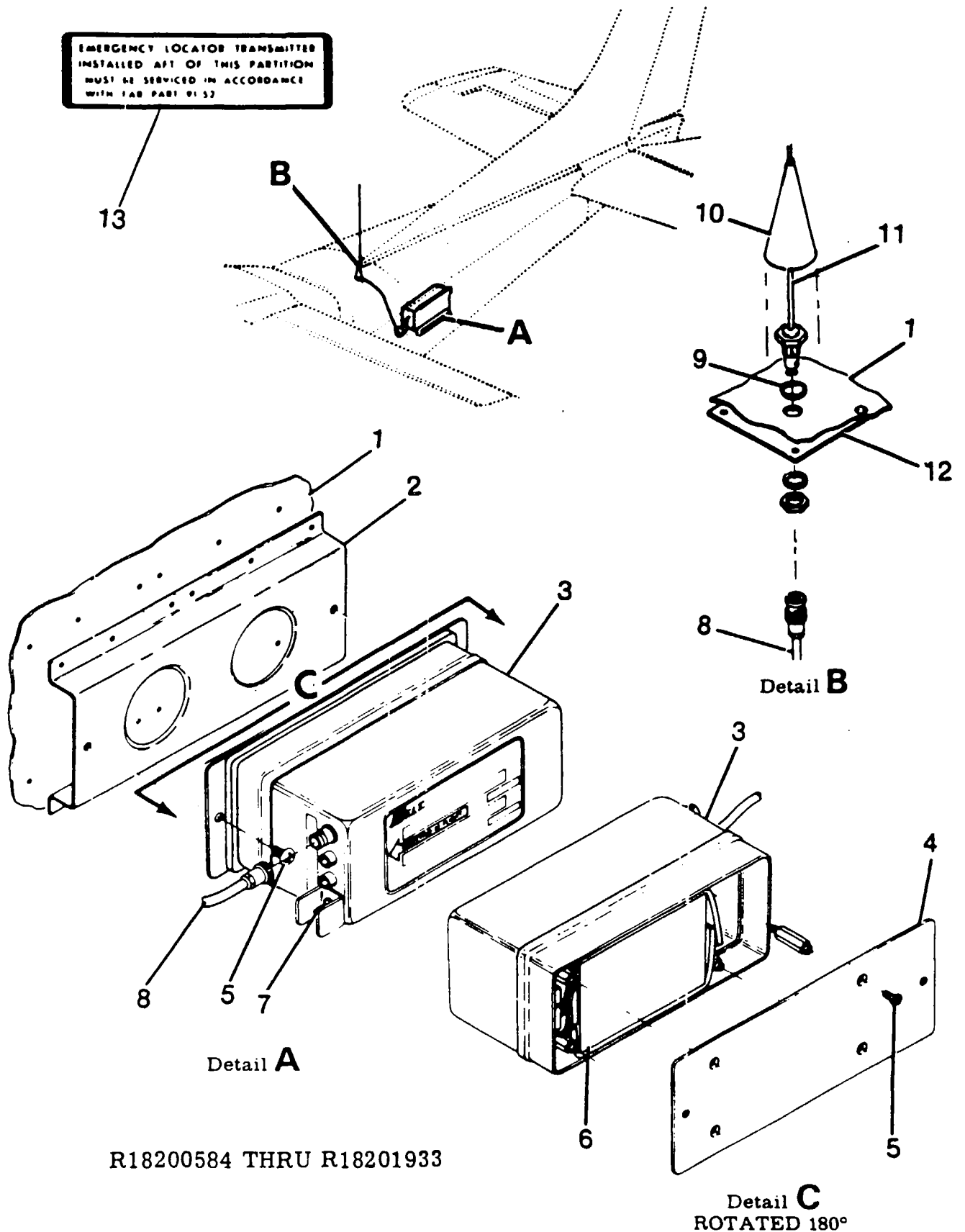


Figure 16-16. Emergency Locator Transmitter Installation (Sheet 2 of 3)

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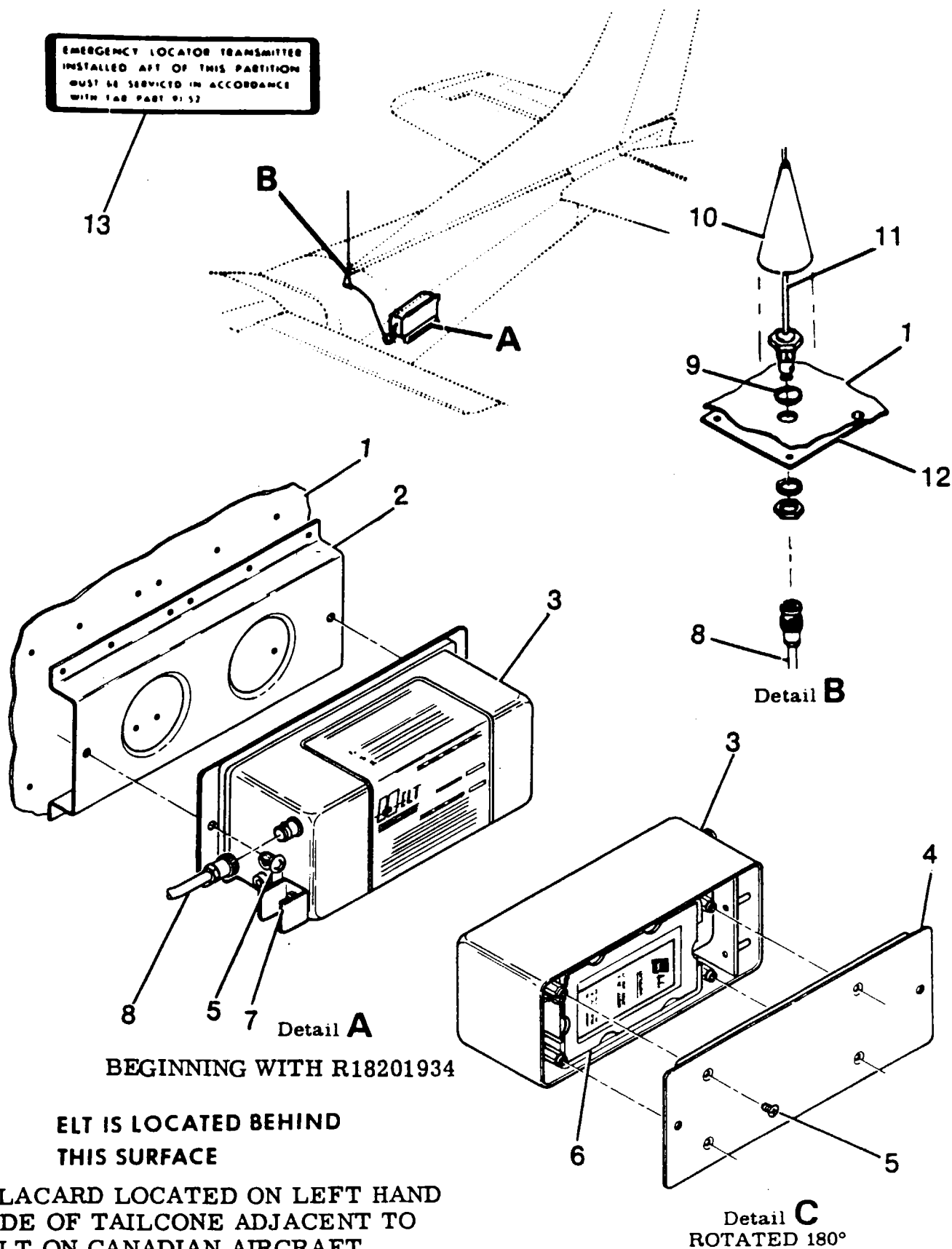


Figure 16-16. Emergency Locator Transmitter Installation (Sheet 3 of 3)

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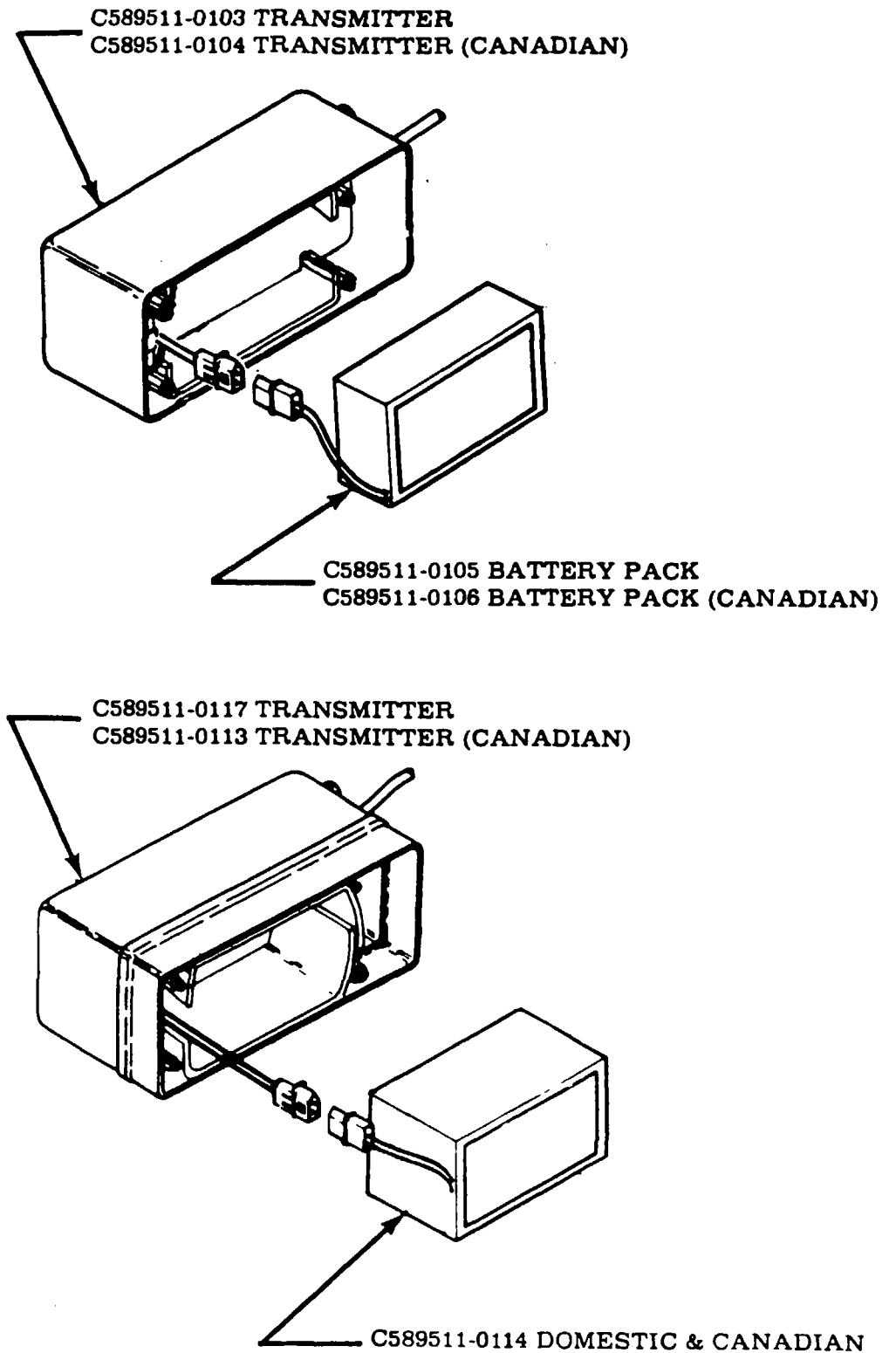


Figure 16-17. Battery Pack Installation

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### CAUTION

The C589511-0111 and C589511-0119 co-axial cable must be installed as indicated on the cable sleeve. Cable end marked "TO ANT" must be connected to the ELT antenna, and the end marked "TO ELT" must be connected to the C589511-0113/-0117 and C589511-0103/-0104 transmitters.

#### 16-115. REMOVAL AND INSTALLATION OF BATTERY-PACK. (See figure 16-17).

### CAUTION

Lithium battery-pack must be replaced with alkaline battery-packs per SK185-20.

### NOTE

Transmitters equipped with the C589511-0105 or C589511-0106 battery-packs can only be replaced with another C589511-0114 after modification by SK185-20 has been completed.

- a. After the transmitter has been removed from aircraft in accordance with para 16-113, place the transmitter switch in the OFF position.
- b. Remove the four screws attaching the cover to the case and then remove the cover to gain access to the battery-pack.
- c. Disconnect the battery-pack electrical connector and remove battery-pack.
- d. Place new battery-pack in the transmitter with four batteries as shown in the case in figure 16-17.
- e. Connect the electrical connector as shown in figure 16-17.

### NOTE

Before installing the battery pack, check to ensure that its voltage is 7.5 volts or greater.

- f. Replace the transmitter baseplate on the unit and pressing the baseplate and unit together attach baseplate with four Nylok patch screws.
- g. Stamp the new replacement date on the outside of the ELT. The date should be noted on the switching nameplate on the side of the unit as well as on the instruction nameplate on top of the unit.

### WARNING

The battery-pack has pressurized contents. Do not recharge, short circuit or dispose of in fire.

### CAUTION

Be sure to enter the new battery-pack expiration date in the aircraft records. It is also recommended this date be placed in your ELT Owner's Manual for quick reference.

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### 16-116. G SWITCH OPERATIONAL CHECK.

- a. Remove emergency locator beacon transmitter from airplane in accordance with paragraph 16-113.
- b. While holding transmitter in one hand, sharply strike the end of the case in the direction of activation indicated on the case of the transmitter.
  1. Verify that the G switch has been activated.
- c. Reset the G switch.
- d. Reinstall transmitter in airplane in accordance with paragraph 16-113.

### 16-117. TROUBLE SHOOTING. Should your Emergency Locating Transmitter fail the 100 Hours performance checks, it is possible to a limited degree to isolate the fault to a particular area of the equipment. In performing the following trouble shooting procedures to test peak effective radiated power, you will be able to determine if battery replacement is necessary or if your unit should be returned to your dealer for repair.

TROUBLE	PROBABLE CAUSE	REMEDY
★POWER LOW	Low battery voltage.	<ol style="list-style-type: none"><li>1. Set toggle switch to off.</li><li>2. Disconnect the battery pack from the transmitter and connect a Simpson 260 model voltmeter and measure voltage. If the battery pack is 7.5 volts or less, the battery pack is below specification.</li></ol>
	Faulty transmitter.	<ol style="list-style-type: none"><li>3. If the battery pack voltage meets the specifications in step 2., the battery pack is ok. If the battery pack is ok, check the transmitter as follows:<ol style="list-style-type: none"><li>a. Reconnect battery pack to the transmitter.</li><li>b. By means of E.F. Johnson 105-0303-001 jackplugs and 3 inch maximum long leads, connect a Simpson Model 1223 ammeter to the jack.</li><li>c. Set the toggle switch to AUTO and observe the ammeter current drain. If the current drain is in the 15-25 ma range, the transmitter or the coaxial cable is faulty.</li></ol></li></ol>
	Faulty coaxial antenna cable.	<ol style="list-style-type: none"><li>4. Check coaxial antenna cable for high resistance joints. If this is found to be the case, the cable should be replaced.</li></ol>

★This test should be carried out with the coaxial cable provided with your unit.

# MODEL R182 AND TR182 SERVICE MANUAL

## ELECTRICAL LOAD ANALYSIS CHART

### STANDARD EQUIPMENT (Running Load)

	AMPS REQD							
	1978	1979	1980	1981	1982	1983	1984	1985 1986
Instruments (Engine) .....	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Instrument Lights .....	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Position Lights .....	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Battery Contactor .....	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Fuel Quantity Indicators .....	0.10	0.10	0.10	0.10				
Turn Coordinator .....	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Clock .....	†	†	†	†	†	†	†	†
Carb Air Temp Indicator .....	0.03							

### OPTIONAL EQUIPMENT (Running Load)

Prop Anti-Ice (3-Blade) .....				12.0	12.0	12.0	12.0	12.0
Prop Anti-Ice (2-Blade) .....			10.5	10.5	10.5	11.5	11.5	11.5
Turn and Bank Indicator .....	0.2			0.2				
Heated Pitot and Stall Warning .....	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Strobe Lights .....	2.5	3.0	3.0	3.0	3.0	3.0	3.0	2.0
Cessna 200A Navomatic (Type AF-295B) .....	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Cessna 300 ADF (Type R-546E) .....	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Cessna 300 Transponder (Type RT-359A) .....	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Cessna 300A Navomatic (Type AF-395A) .....	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
With Unslaved HSI (IG-832C) .....	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Cessna 300 Nav/Com (Type RT-385A) .....	1.0●	1.0●	1.0●	1.0●	1.0●	1.0●	1.0●	1.0●
	2.3★	2.3★	2.3★	2.3★	2.3★	2.3★	2.3★	2.3★
Cessna 400 Nav/Com (Type RT-485A/B) .....	1.6●	1.6●	1.6●	1.6●	1.6●	1.6●	1.6●	1.6●
	4.0★	4.0★	4.0★	4.0★	4.0★	4.0★	4.0★	4.0★
Cessna 400 ADF (Type R-446A) .....	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Cessna 400 Glide Slope (Type R-443B) .....	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Cessna 400 Transponder (Type RT-459A) .....	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Cessna 400 Marker Beacon (Type R-402A) .....	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Cessna 400 DME (Type RT-476A) .....	2.5			2.5	2.5	2.5	2.5	
Cessna RNAV (Type RN-478A) .....	0.5			0.5	0.5	0.5	0.5	
Sunair SSB Transceiver (Type ASB-125) .....	2.5●	2.5●	2.5●	2.5●	2.5●	2.5●	2.5●	2.5●
	7.5★	7.5★	7.5★	7.5★	7.5★	7.5★	7.5★	7.5★
Flashing Beacon .....	6.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0
Narco 190 DME .....	2.9	2.9	2.9	2.9				
Pantronics PT10-A HF Transceiver .....	1.0●	1.0●		1.0●				
	9.0★	9.0★	9.0★					
Pitot Tube De-Ice .....			2.9	2.9				
Wing De-Ice .....			1.6	1.5				
Post Lights .....	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7
EL Panel .....	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Bendix Marker Beacon (Type GM-247A) .....	0.1							
Blind Encoder .....	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Cessna Encoding Altimeter (Type EA-401A) .....	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Foster RNAV 511 .....		1.0	1.0	1.0				
Pitot Tube De-Ice .....			2.9					
Windshield De-Ice .....			4.4	4.4	4.4	4.4	4.4	4.4
EC-100 Stereo .....					†	†	†	†



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## ELECTRICAL LOAD ANALYSIS CHART

OPTIONAL EQUIPMENT (Running Load)	AMPS REQD							
	1978	1979	1980	1981	1982	1983	1984	1985 1986
Sperry RT-377A DME .....								0.3 0.3
Sperry RT-477A DME .....							1.5	1.5 1.5
Sperry RN-479A RNAV .....							1.0	1.0 1.0
Weather Radar (RDR-160XD Color) .....					3.5	3.5	3.5	3.5 3.5
Weather Radar (RDR-160 B&W) .....								3.5 3.5
Weather Radar (Primus 100) .....								2.0 2.0
Avionics Cooling Fan .....				1.0	1.0	1.0	1.0	1.0
Cessna 400B Autopilot (AF-550) .....				5.0	5.0	5.0	5.0	5.0 3.6
With Slaved Directional Gyro (G-504) .....				5.2	5.2	5.2	5.2	5.2 3.8
With Unslaved HSI (IG-832C) .....				5.3	5.3	5.3	5.3	5.3 3.8
With Slaved HSI (IG-832A) .....				5.8	5.8	5.8	5.8	5.8 4.0
DME 451 .....				1.2	1.2	1.2		
RNAV ANS-351 .....				0.65	0.65	0.65		
Interphone System .....				†	†	†	†	†

### ITEMS NOT CONSIDERED AS PART OF RUNNING LOAD

Cigarette Lighter .....	7.0	7.0	7.0	7.0					
Stall Warning Horn .....	0.25	0.25	0.25	0.25	0.4				
Wing Courtesy Lights and Cabin Lights .....	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Auxiliary Fuel Pump .....	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Electrohydraulic Power Pack (Landing Gear) .....	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
Flap Motor .....	10.0	10.0	10.0	8.5	8.5	8.5	8.5	1.8	1.8
Landing Lights (Dual) .....	3.6ea	3.6ea	3.6ea	3.6ea	3.6ea	3.6ea	3.6ea	3.6ea	3.6ea
Electric Elevator Trim .....	0.7	0.7	0.7	0.7	0.7	0.7	0.7		
Map Light (Control Wheel) .....	0.1	0.1	0.1	0.1	0.1	0.1	0.1		0.1
Air Conditioning .....				19.7	19.7	19.7	19.7	19.7	19.7
Wing Detector Light .....					1.5	1.5	1.5	1.5	1.5
Standby Vacuum System .....								13.0	13.0

- † Negligible
- Receive
- ★ Transmit