SECTION 3

FUSELAGE

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3-1. FUSELAGE.

3-2. WINDSHIELD AND WINDOWS.

3-3. DESCRIPTION. The windshield and windows are single-piece acrylic plastic panels set in sealing strips and held by formed retaining strips secured to the fuselage with screws and rivets. Presstite No. 579.6 sealing compound used in conjunction with a felt seal is applied to all edges of the windshield and windows with exception of wing root area. The wing root fairing has a heavy felt strip that completes the windshield sealing.

3-4. CLEANING. (Refer to Section 2.)

3-5. WAXING. Waxing will fill in minor scratches in clear plastic and help protect the surface from further abrasion. Use a good grade of commercial wax applied in a thin, even coat. Bring wax to a high polish by rubbing lightly with a clean, dry flannel cloth.

3-6. REPAIRS. Damaged window panels and wind-

shield may be removed and replaced if damage is extensive. However, certain repairs as prescribed in the following paragraphs can be made successfully without removing damaged part from aircraft. Thre types of temporary repairs for cracked plastic are possible. No repairs of any kind are recommended on highly-stressed or compound curves where repair would be likely to affect pilot's field of vision. Curved areas are more difficult to repair than flat areas and any repaired area is both structurally and optically inferior to the original surface.

3-7. SCRATCHES. Scratches on clear plastic surfaces can be removed by hand-sanding operations followed by buffing and polishing, if steps below are followed carefully.

a. Wrap a piece of No. 320 (or finer) sandpaper or abrasive cloth around a rubber pad or wood block. Rub surface around scratch with a circular motion, keeping abrasive constantly wet with clean water to prevent scratching surface further. Use minimum pressure and cover an area large enough to prevent formation of "bull's-eyes" or other optical distortions.

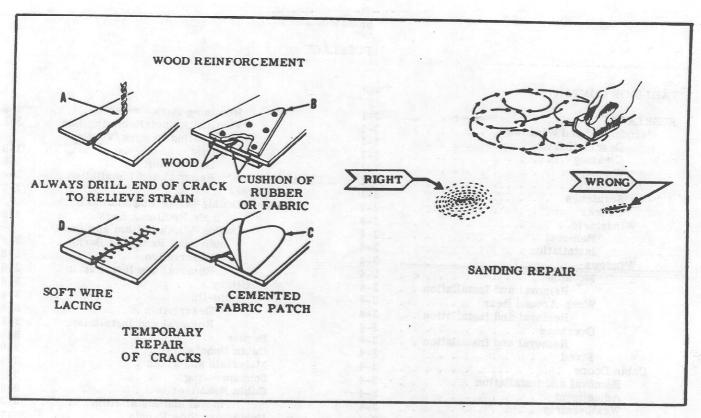


Figure 3-1. Repair of Windshield and Windows

CAUTION

Do not use a coarse grade of abrasive. No. 320 is of maximum coarseness.

- b. Continue sanding operation, using progressively finer grade abrasives until scratches disappear.
- c. When scratches have been removed, wash area thoroughly with clean water to remove all gritty particles. The entire sanded area will be clouded with minute scratches which must be removed to restore transparency.
- d. Apply fresh tallow or buffing compound to a motor-driven buffing wheel. Hold wheel against plastic surface, moving it constantly over damaged area until cloudy appearance disappears. A 2000-foot-perminute surface speed is recommended to prevent overheating and distortion. (Example: 750 rpm polishing machine with a 10 inch buffing bonnet.)

NOTE

Polishing can be accomplished by hand but will require a considerably longer period of time to attain the same result as produced by a buffing wheel.

e. When buffing is finished, wash area thoroughly and dry with a soft flannel cloth. Allow surface to cool and inspect area to determine if full transparency has been restored. Apply a thin coat of hard wax and polish surface lightly with a clean flannel cloth.

NOTE

Rubbing plastic surface with a dry cloth will build up an electrostatic charge which attracts dirt particles and may eventually cause scratching of surface. After wax has hardened, dissipate this charge by rubbing surface with a slightly damp chamois. This will also remove dust particles which have collected while wax is hardening.

- f. Minute hairline scratches can often be removed by rubbing with commercial automobile body cleaner or fine-grade rubbing compound. Apply with a soft, clean, dry cloth or imitation chamois.
- 3-8. CRACKS. (Refer to figure 3-1.)
- a. When a crack appears, drill a hole at end of crack to prevent further spreading. Hole should be approximately 1/8 inch in diameter, depending on length of crack and thickness of material.
- b. Temporary repairs to flat surfaces can be accomplished by placing a thin strip of wood over each side of surface and inserting small bolts through wood and plastic. A cushion of sheet rubber or aircraft fabric should be placed between wood and plastic on both sides.
- c. A temporary repair can be made on a curved surface by placing fabric patches over affected areas. Secure patches with aircraft dope, Specification No. MIL-D-5549, or lacquer, Specification No. MIL-L-7178. Lacquer thinner, Specification No. MIL-T-6094 can also be used to secure patch.

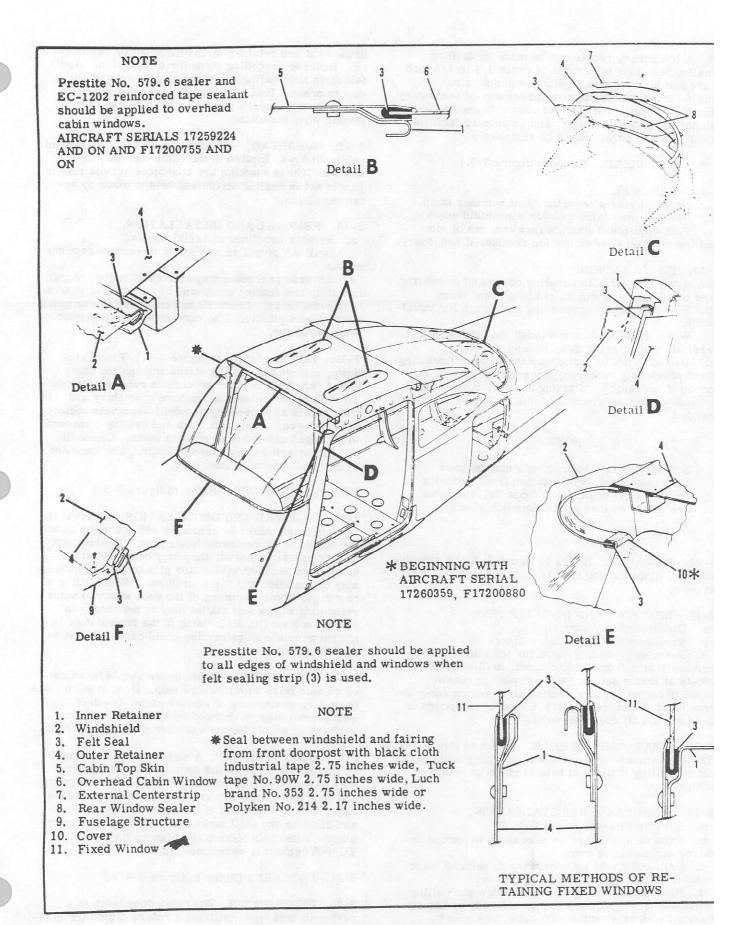


Figure 3-2. Windshield and Fixed Window Installation

- d. A temporary repair can be made by drilling small holes along both sides of crack 1/4 to 1/8 inch apart and lacing edges together with soft wire. Small-stranded antenna wire makes a good temporary lacing material. This type of repair is used as a temporary measure ONLY, and as soon as facilities are available, panel should be replaced.
- 3-9. WINDSHIELD. (Refer to figure 3-2.)
- 3-10. REMOVAL.
- a. Drill out rivets securing front retainer strip.
- b. Remove wing fairings over windshield edges.
- c. Pull windshield straight forward, out of side and top retainers. Remove top retainer if necessary.
- 3-11. INSTALLATION.
- a. Apply felt strip and sealing compound or sealing tape to all edges of windshield to prevent leaks.
- b. Reverse steps in preceding paragraph for installation.
- c. When installing a new windshield, check fit and carefully file or grind away excess plastic.
- d. Use care not to crack windshield when installing. If not previously removed, top retainer may be removed if necessary. Starting at upper corner and gradually working windshield into position is recommended.

NOTE

Screws and self-locking nuts may be used instead of rivets which fasten front retaining strip to cowl deck. If at least No. 6 screws are used, no loss of strength will result.

- 3-12. WINDOWS.
- 3-13. MOVABLE. (Refer to figure 3-3.) A movable window, hinged at the top, is installed in the left cabin door.
- 3-14. REMOVAL AND INSTALLATION.
- a. Disconnect window stop (5).
- b. Remove pins from window hinges (6).
- c. Reverse preceding steps for installation. To remove frame from plastic panel, drill out blind rivets at frame splice. When replacing plastic panel in frame, ensure sealing strip and an adequate coating of Presstite No. 579.6 sealing compound is used around all edges of panel.
- 3-15. WRAP-AROUND REAR. (Refer to figure 3-2.) The rear window is a one-piece acrylic plastic panel set in sealing strips and held in place by retaining strips.
- 3-16. REMOVAL AND INSTALLATION.
- a. Remove external centerstrip (7).
- b. Remove upholstery as necessary to expose retainer strips inside cabin.
- c. Drill out rivets as necessary to remove outer retainer strip along aft edge of window.
- d. Remove window by lifting aft edge and pulling window aft. If difficulty is encountered, rivets securing retainer strips inside cabin may also be

- drilled out and retainer strips loosened or removed.
 e. Reverse preceding steps for installation. Apply felt strip and sealing compound to all edges of win-
- dow to prevent leaks. Check fit and carefully file or grind away excess plastic. Use care not to crack plastic when installing.
- 3-17. OVERHEAD. (Refer to figure 3-2.) Overhead cabin windows, located in the cabin top, may be installed. These windows are one-piece acrylic plastic panels set in sealing strips and held in place by retaining strips.
- 3-18. REMOVAL AND INSTALLATION.
- a. Remove headliner and trim panels.
- b. Drill out rivets as necessary to remove retainer strips.
- c. Reverse preceding steps for installation. Apply felt strip and sealing compound to all edges of window to prevent leaks. Check fit and carefully file or grind away excess plastic. Use care not to crack plastic when installing.
- 3-19. FIXED. (Refer to figure 3-2.) Fixed windows, mounted in sealing strips and sealing compound, are held in place by various retainer strips. To replace side windows, remove upholstery and trim panels as necessary and drill out rivets securing retainers. Apply felt strip and sealing compound to all edges of window to prevent leaks. Check fit and file or grind away excess plastic. Use care not to crack plastic when installing.
- 3-20. CABIN DOORS. (Refer to figure 3-3.)
- 3-21. REMOVAL AND INSTALLATION. Removal is accomplished either by removing screws which attach the hinges or by removing hinge pins. If permanent hinge pins are removed, they may be replaced by clevis pins secured with cotter pins or new hinge pins may be installed and "spin-bradded." When fitting a new door, some trimming of the door skin and some reforming with a soft mallet may be necessary to achieve a good fit. Reforming of the bonded door is not permissible as reforming could cause damage to the bonded area.
- 3-22. ADJUSTMENT. Cabin doors should be adjusted so skin fairs with fuselage skin. Slots at latch plate permit re-positioning of striker plate. Depth of latch engagement may be changed by adding or removing washers or shims between striker plate and doorpost.
- 3-23. WEATHERSTRIP. A weatherstrip is cemented around all edges of the door. New weatherstrip may be applied after mating surfaces of weatherstrip and door are clean, dry and free from oil or grease. Apply a thin, even coat of adhesive to each surface and allow to dry until tacky before pressing strip in place. Minnesots Mining and Manufacturing Co. No. EC-800 cement is recommended.
- 3-24. LATCHES. (Refer to figure 3-4.)
- 3-25. DESCRIPTION. The cabin door latch is a push-pull bolt type, utilizing a rotary clutch for posi-

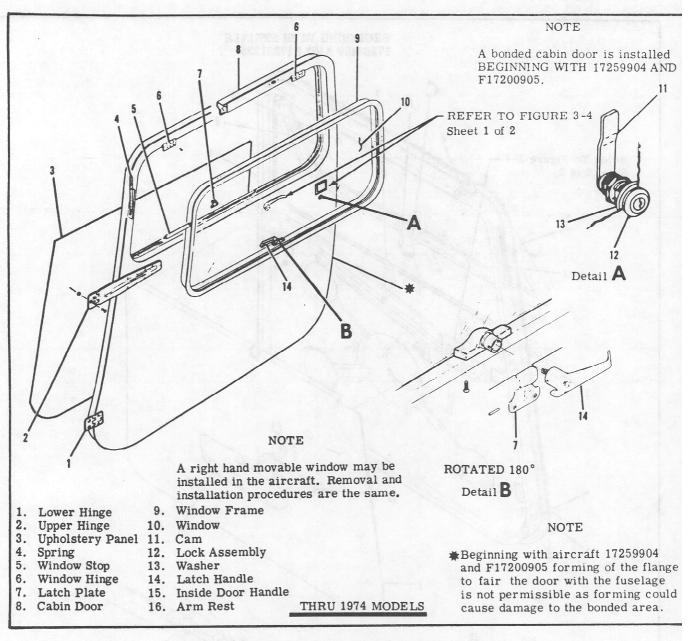


Figure 3-3. Cabin Door Installation (Sheet 1 of 2)

tive bolt engagement. As door is closed, teeth on underside of bolt engage gear teeth on clutch. The clutch gear rotates in one direction only and holds door until handle is moved to LOCK position, driving bolt into slot.

3-26. ADJUSTMENT. Adjustment of latch or clutch cover is afforded by oversize and/or slotted holes. This adjustment ensures sufficient gear-to-bolt engagement and proper alignment.

NOTE

Lubricate door latch per Section 2. No lubrication is recommended for rotary clutch.

3-27. LOCK. In addition to interior locks, a cylinder and key type lock is installed on left door. If lock is to be replaced, the new one may be modified to accept the original key. This is desirable, as the same key is used for ignition switch and cabin door lock. After removing old lock from door, proceed as follows:

a. Remove lock cylinder from new housing.

b. Insert original key into new cylinder and file off any protruding tumblers flush with cylinder. Withou removing key, check that cylinder rotates freely in housing.

c. Install lock assembly in door and check lock operation with door open.

d. Destroy new key and disregard code number on cylinder.

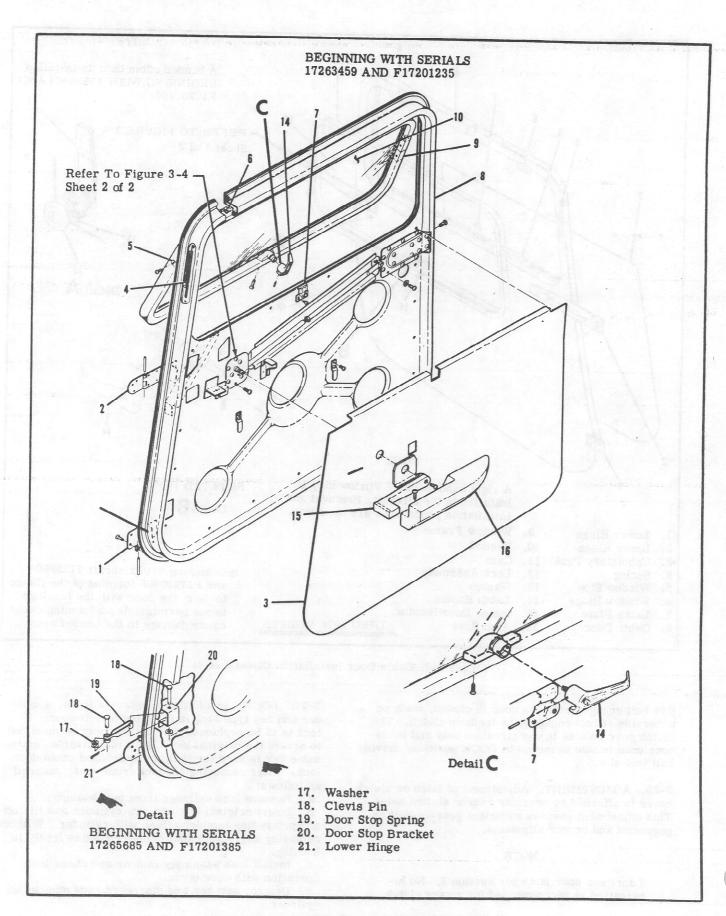


Figure 3-3. Cabin Door Installation (Sheet 2 of 2)

Figure 3-4, Door Latch Installation (Sheet 1 of 2)

- 3-28. INDEXING INSIDE HANDLE. (Refer to figure 3-4.) When inside door handle is removed, reinstall in relation to position of bolt (7) which is spring-loaded to CLOSE position. The following procedure may be used.
- THRU AIRCRAFT 17259903 AND F1720804, AND 17260759 THRU 17263458 AND F17200905 THRU F17201143.
- Temporarily install handle (3) on shaft assembly (13) approximately vertical.
- Move handle (3) back and forth until handle centers in spring-loaded position.
- Without rotating shaft assembly (13), remove handle and install placerd (4) with CLOSE index at top and press placerd to seat prongs.
 - Install nylon washer (1).
- Install handle (3) to align with CLOSE index on placard (4) and install clip (2).
- Ensure bolt (7) clears doorpost and teeth engage clutch goar when handle (3) is in CLOSE position.
- b. AIRCRAFT 17259904 THRU 17260758 AND F17200805 THRU F17200904.
- Temporarily install handle (3) on shaft assembly (13) approximately horizontal, pointing aft.
- Move handle (3) back and forth until handle centers in spring-loaded position.
- Without rotating shaft assembly (13), remove handle and install placard (4) with CLOSE index aft and press placard to seat prougs.

- Install nylon washers (1).
- Install handle (3) to align with CLOSE index on placard (4) and install clip (2).
- Ensure bolt (7) clears doorpost and teeth engage clutch gear when handle (3) is in CLOSE position.
- c. BEGINNING WITH 17253459 AND F17201144. (Refer to figure 3-4, sheet 2.)
- Temporarily install handle (24) on shaft assembly (18) approximately vertical.
- Move handle (24) back and forth until handle centers in spring-loaded position.
- Without rotating shaft assembly (18), remove handle (24) and install placand (25) with CLOSE index at top.
- Install handle (24) to align with CLOSE index on placard (25), using screw (26).
 - Install arm rest (23) on upholstery panel (22).
- 3-29. HAGGAGE DOOR. (Refer to figure 3-5.)
- 3-30. REMOVAL AND INSTALLATION.
- a. Remove inside latch handle (1). (SERIALS 17258487 THRU 17259587 AND P17200655 THRU F17200804 ONLY)
- b. Remove door-pull handle (14).
- c. Disconnect door-stop chain (7).
- d. Remove buttons securing upholstery panel and remove panel.
- e. Remove bolts (11) securing door to hinges.

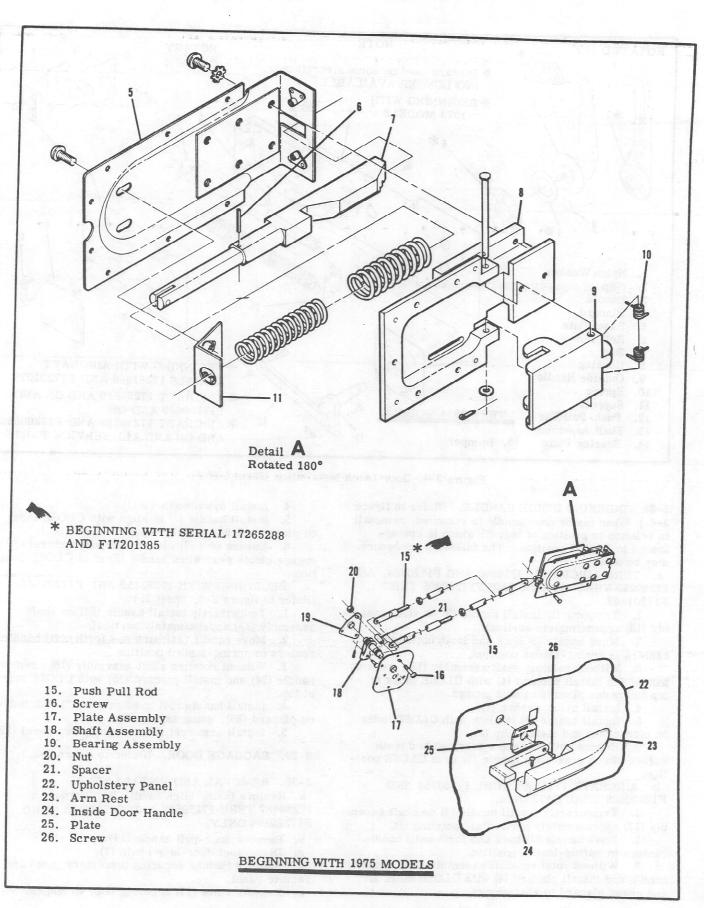


Figure 3-4. Door Latch Installation (Sheet 2 of 2)

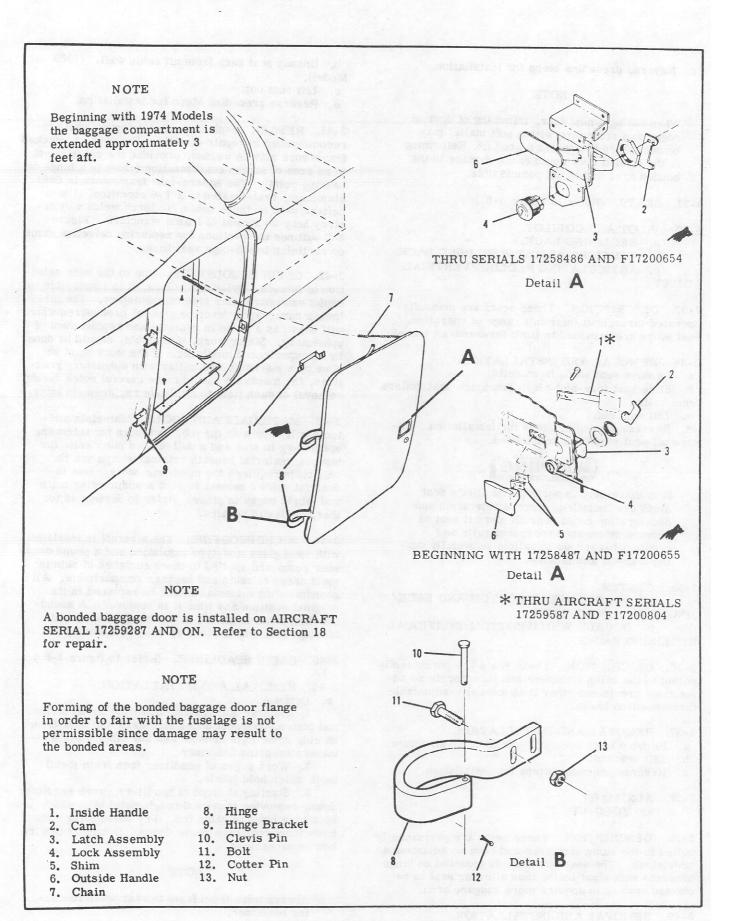


Figure 3-5. Baggage Door Installation

f. Reverse preceding steps for installation.

NOTE

When fitting a new door, trimming of door at edges and reforming with a soft mallet may be necessary to achieve a good fit. Reforming of the bonded door could cause damage to the bonded area and is not permissible.

- 3-31. SEATS. (Refer to figure 3-6.)
- 3-32. PILOT AND COPILOT.
 - a. RECLINING BACK.
 - b. VERTICAL ADJUST/RECLINING BACK.
- c. ARTICULATING RECLINE/VERTICAL ADJUST.
- 3-33. DESCRIPTION. These seats are manually-operated throughout their full range of operation. Seat stops are provided to limit fore-and-aft travel.
- 3-34. REMOVAL AND INSTALLATION.
- a. Remove seat stops from rails.
- b. Slide seat fore-and-aft to disengage seat rollers from rails.
- c. Lift seat out.
- d. Reverse preceding steps for installation. Ensure all seat stops are reinstalled.

WARNING

It is extremely important that pilot's seat stops are installed, since acceleration and deceleration could possible permit seat to become disengaged from seat rails and create a hazardous situation, especially during take-off and landing.

- 3-35. CENTER.
- a. DOUBLE-WIDTH BOTTOM AND BACK/ SINGLE RECLINING BACK.
- b. DOUBLE-WIDTH BOTTOM/INDIVIDUAL RECLINING BACKS.
- 3-36. DESCRIPTION. These seats are permanently bolted to the cabin structure and incorporate no adjustment provisions other than manually-adjustable three position backs.
- 3-37. REMOVAL AND INSTALLATION.
- a. Remove bolts securing seat to cabin structure.
- b. Lift seat out.
- c. Reverse preceding steps for installation.
- 3-38. AUXILIARY.
 - a. FOLD-UP.
- 3-39. DESCRIPTION. These seats are permanently bolted to the cabin structure and have no adjustment provisions. The seat structure is mounted on hinge brackets with pivot bolts, thus allowing seat to be pivoted upward to acquire more baggage area.
- 3-40. REMOVAL AND INSTALLATION.
- a. Remove bolts securing seat structure to hinge brackets.

- b. Unsnap seat back from aft cabin wall. (1969 Model).
- c. Lift seat out.
- d. Reverse preceding steps for installation.
- 3-41. REPAIR. Replacement of defective parts is recommended in repair of seats. However, a cracked framework may be welded, provided the crack is not in an area of stress concentration (close to a hinge or bearing point). The square-tube framework is 6061 aluminum, heat-treated to a T-6 condition. Use a heliarc weld on these seats, as torch welds will destroy heat-treatment of frame structure. Figure 3-7 outlines instructions for replacing defective cams on reclining bench-type seat backs.
- 3-42. CABIN UPHOLSTERY. Due to the wide selection of fabrics, styles and colors, it is impossible to depict each particular type of upholstery. The following paragraphs describe general procedures which will serve as a guide in removal and replacement of upholstery. Major work, if possible, should be done by an experienced mechanic. If the work must be done by a mechanic unfamiliar with upholstery practices, the mechanic should make careful notes during removal of each item to facilitate replacement later.
- 3-43. MATERIALS AND TOOLS. Materials and tools will vary with the job. Scissors for trimming upholstery to size and a dull-bladed putty knife for wedging material beneath retainer strips are the only tools required for most trim work. Use industrial rubber cement to hold soundproofing mats and fabric edges in place. Refer to Section 18 for thermo-plastic repairs.
- 3-44. SOUNDPROOFING. The aircraft is insulated with spun glass mat-type insulation and a sound deadener compound applied to inner surfaces of skin in most areas of cabin and baggage compartment. All soundproofing material should be replaced in its original position any time it is removed. A soundproofing panel is placed in gap between wing and fuselage and held in place by wing root fairings.
- 3-45. CABIN HEADLINER. (Refer to figure 3-8.)
- 3-46. REMOVAL AND INSTALLATION.
- a. Detail A.
- 1. Remove sun visors, all inside finish strips and plates, doorpost upper shields, front spar trim shield, dome light console and any other visible retainers securing headliner.
- 2. Work edges of headliner free from metal teeth which hold fabric.
- 3. Starting at front of headliner, work headliner down, removing screws through metal tabs which hold wire bows to cabin top. Pry loose outer ends of bows from retainers above doors. Detach each wire bow in succession.

NOTE

Always work from front to rear when removing headliner.

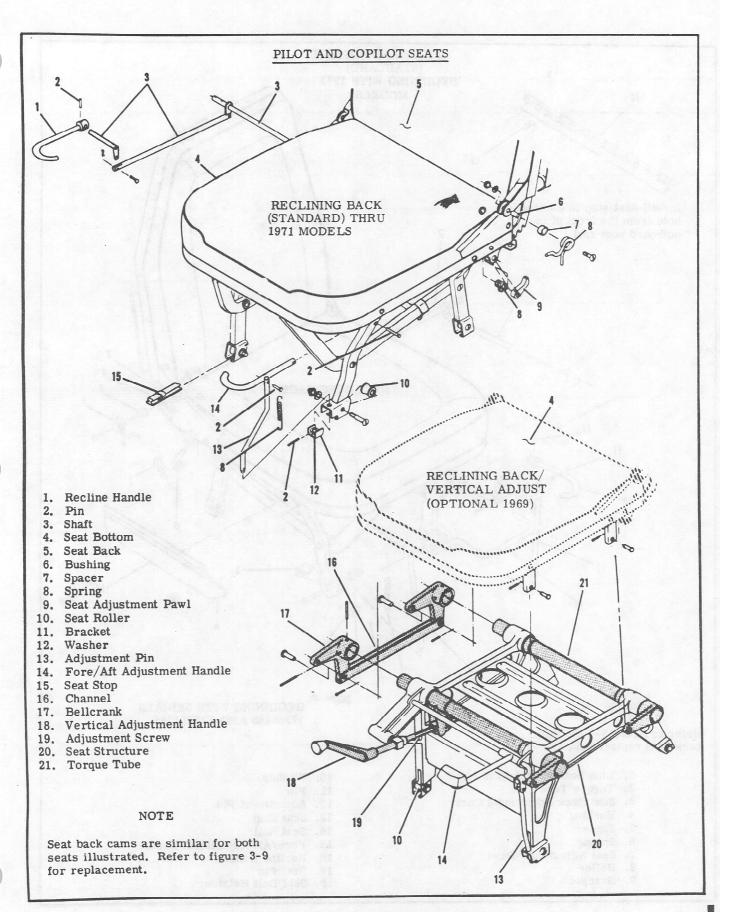


Figure 3-6. Seat Installation (Sheet 1 of 8)

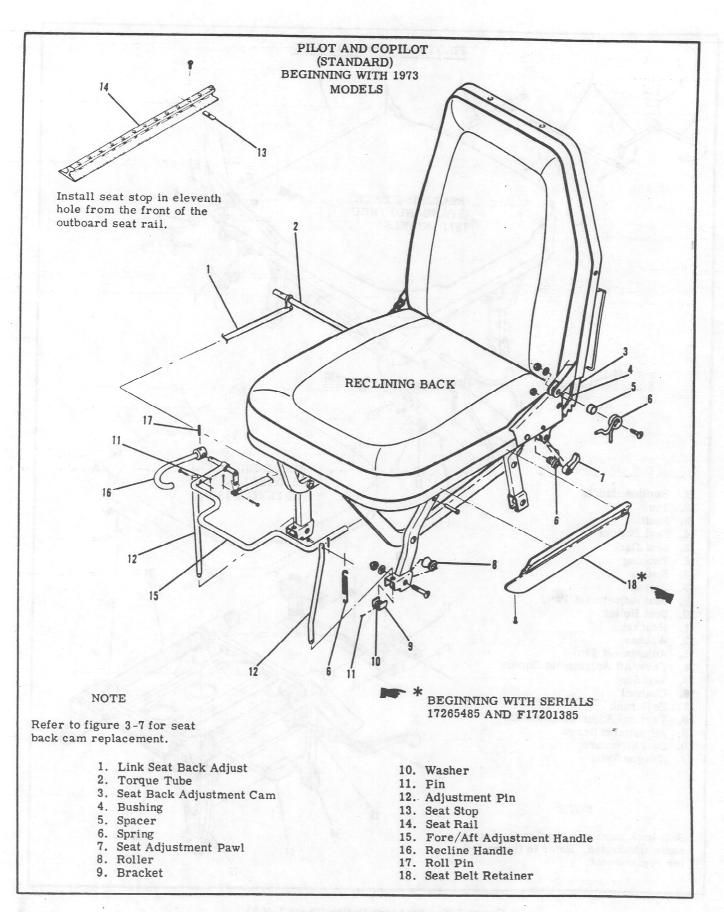


Figure 3-6. Seat Installation (Sheet 2 of 8)

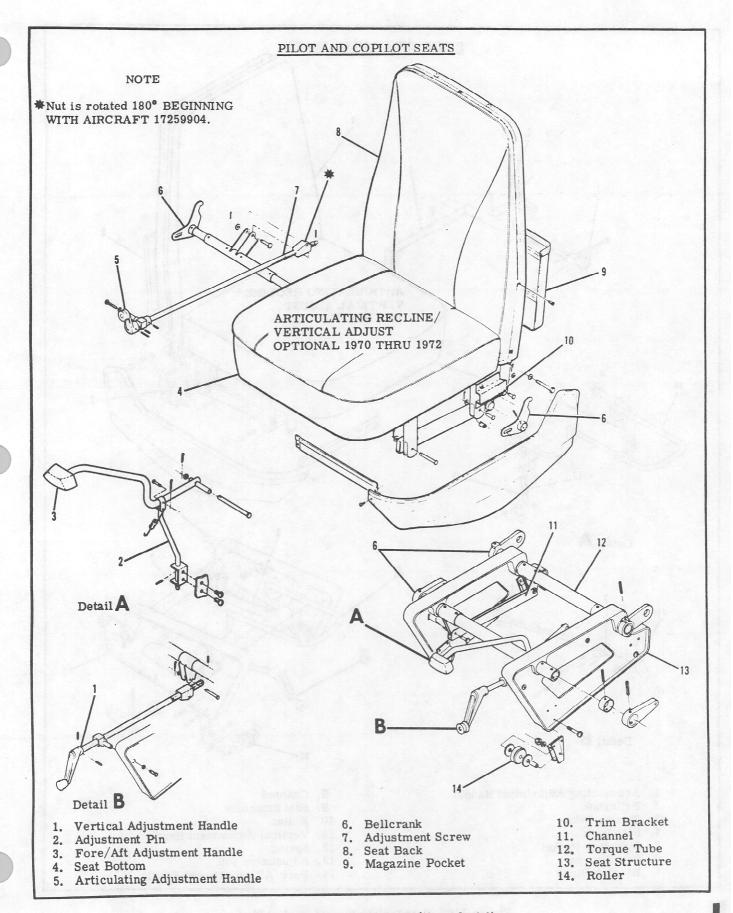


Figure 3-6. Seat Installation (Sheet 3 of 8)

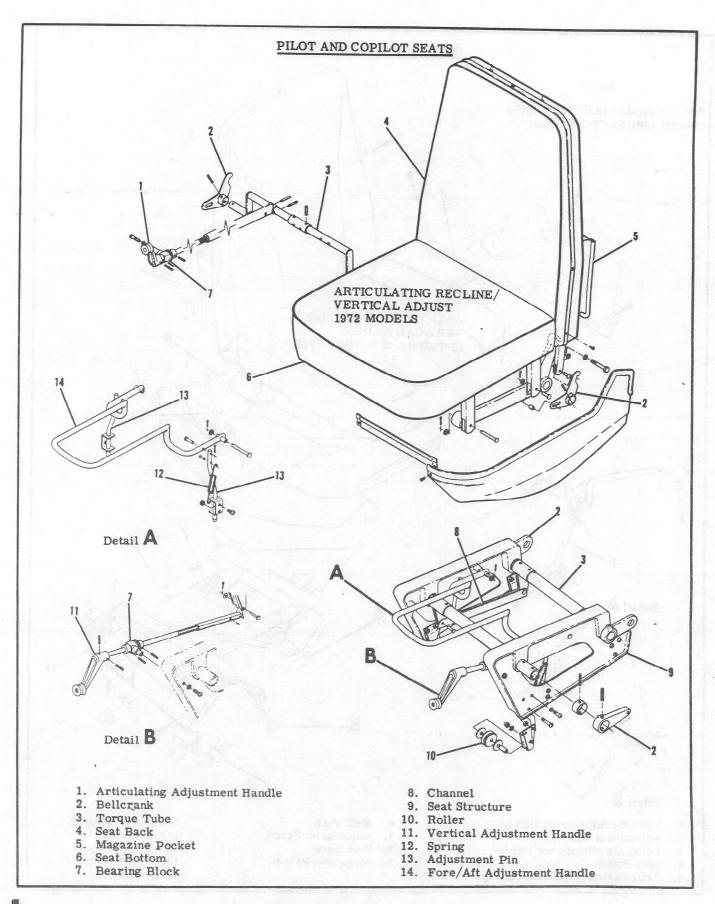


Figure 3-6. Seat Installation (Sheet 4 of 8)

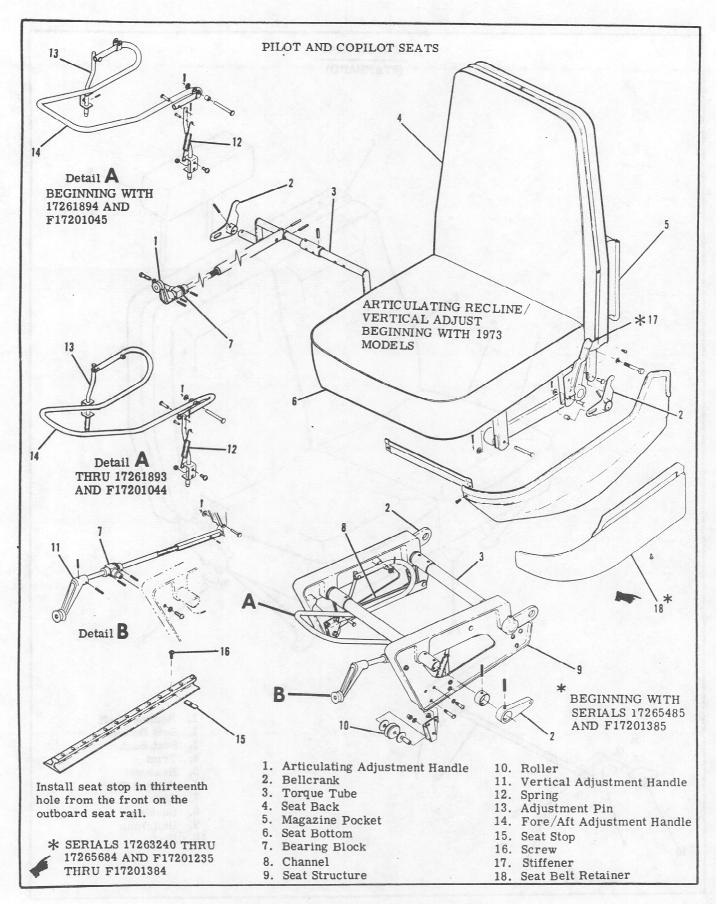


Figure 3-6. Seat Installation (Sheet 5 of 8)

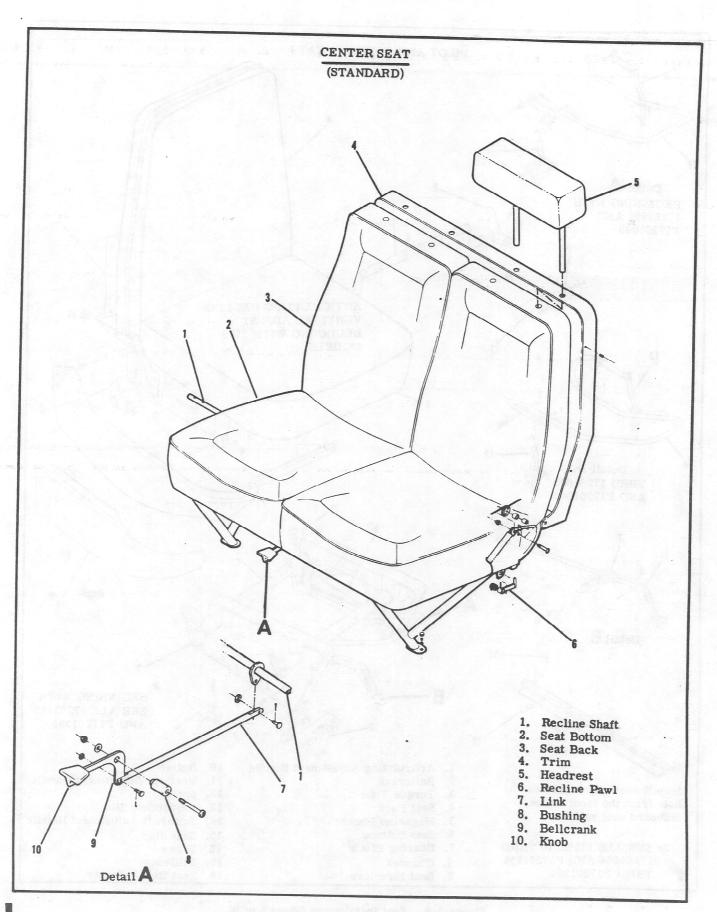


Figure 3-6. Seat Installation (Sheet 6 of 8)

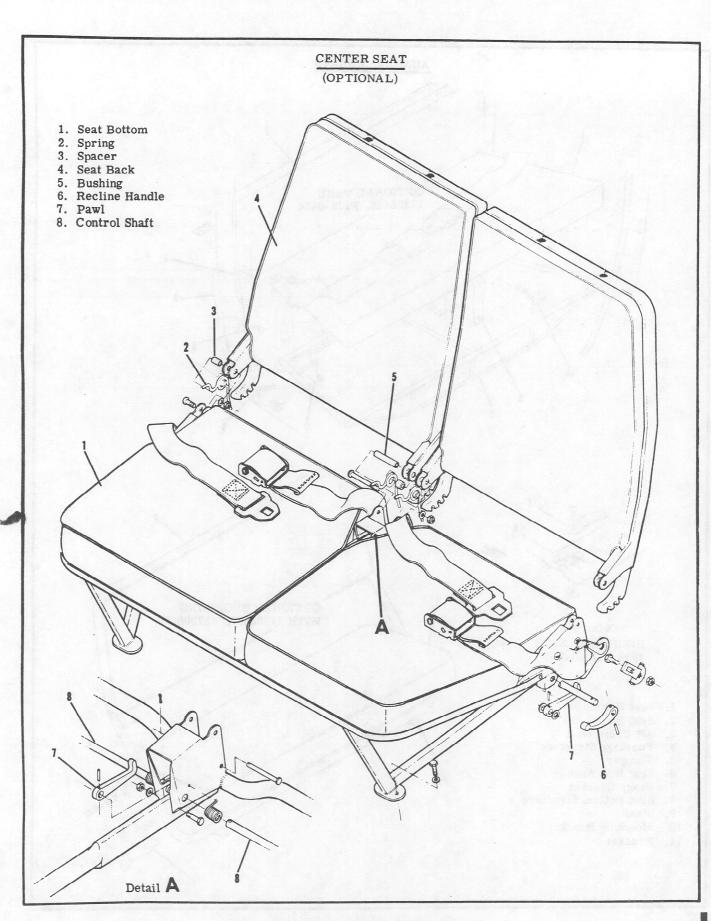


Figure 3-6. Seat Installation (Sheet 7 of 8)

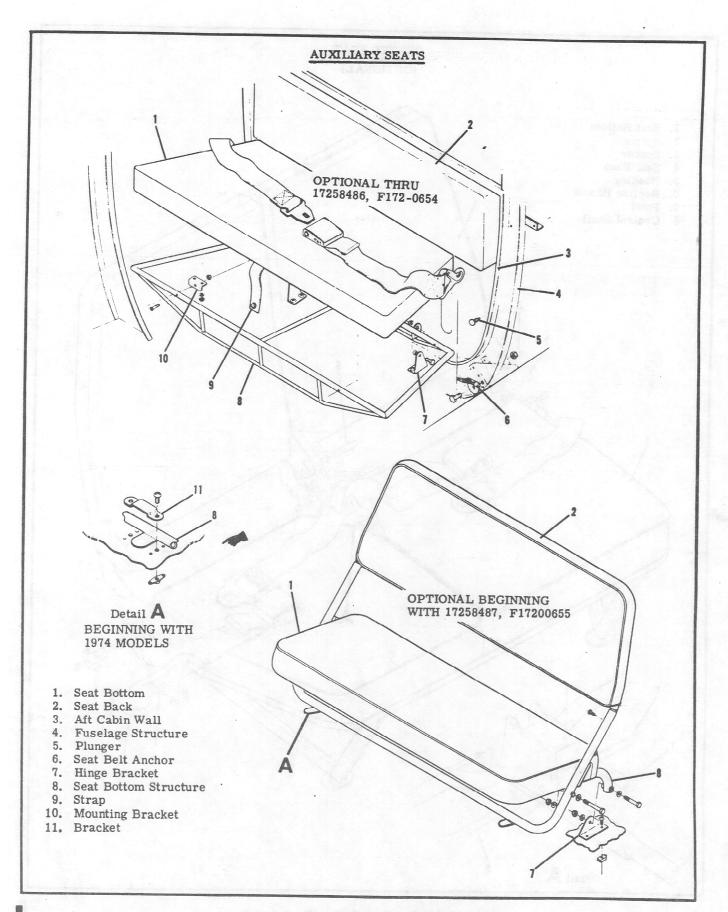
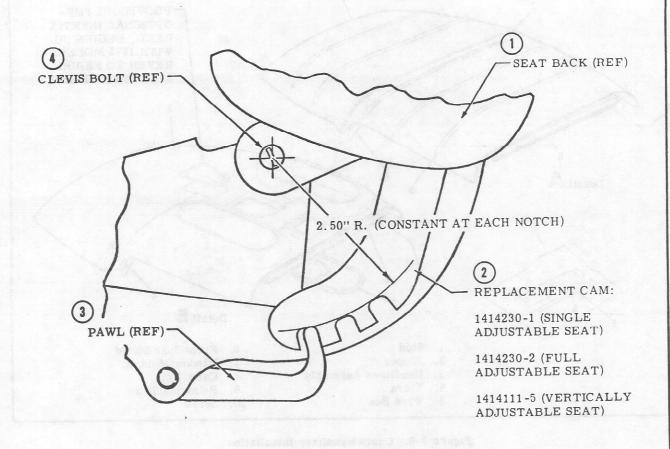


Figure 3-6. Seat Installation (Sheet 8 of 8)



REPLACEMENT PROCEDURE:

- a. Remove seat from aircraft.
- Remove plastic upholstery panels from aft side of seat back, then loosen upholstery retaining rings and upholstery material as required to expose rivets retaining old cam assembly.
- c. Drill out existing rivets and insert new cam assembly (2). Position seat back so pawl (3) engages first cam slot as illustrated.
- d. Position cam so each slot bottom aligns with the 2.50" radius as illustrated.
- e. Clamp securely in this position and check travel of cam. Pawl must contact bottom of each cam slot. Using existing holes in seat frame, drill through new cam and secure with MS20470AD6 rivets.
- f. Reinstall upholstery, upholstery panels and seat.

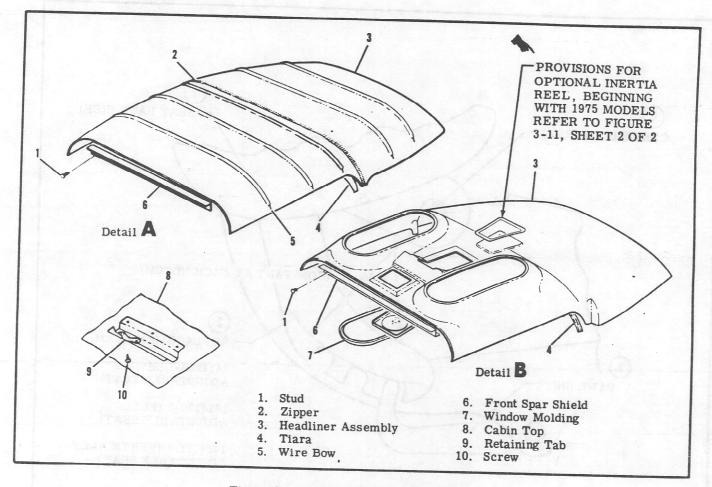


Figure 3-8. Cabin Headliner Installation

Remove headliner assembly and bows from aircraft.

NOTE

Due to difference in length and contour of wire bows, each bow should be tagged to assure proper location in headliner.

5. Remove spun glass soundproofing panels.

NOTE

The lightweight soundproofing panels are held in place with industrial rubber cement.

- 6. Reverse preceding steps for installation. Before installation, check all items concealed by headliner for security. Use wide cloth tape to secure loose wires to fuselage and to seal openings in wing roots. Straighten tabs bent during removal of headliner.
- 7. Apply cement to inside of skin in areas where soundproofing panels are not supported by wire bows and press soundproofing in place.
- 8. Insert wire bows into headliner seams and secure two bows at rear of headliner. Stretch material

along edges to properly center, but do not stretch it tight enough to destroy ceiling contours or distort wire bows. Secure edges of headliner with metal teeth.

- 9. Work headliner forward, installing each wire bow in place with metal tabs. Wedge ends of wire bows into the retainer strips. Stretch headliner just taut enough to avoid wrinkles and maintain a smooth contour.
- When all bows are in place and fabric edges are secured, trim off excess fabric and reinstall all items removed.
 - b. Detail B.
- 1. Remove sun visors, all inside finish strips and plates, overhead console, upper doorpost shields and any other visible retainers securing headliner.
 - 2. Remove molding from fixed windows.
- Remove screws securing headliner and carefully take down headliner.
- Remove spun glass soundproofing panels above headliner.

NOTE

The lightweight soundproofing panels are held in place with industrial rubber cement.

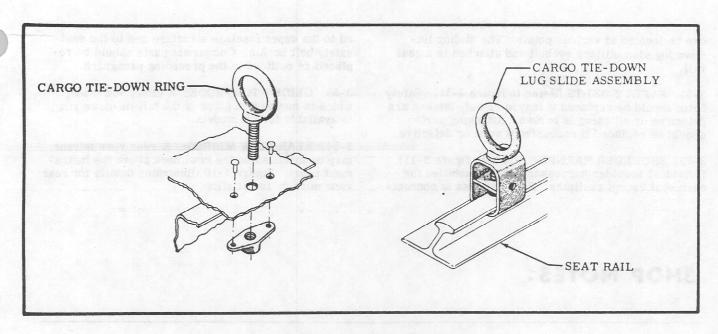


Figure 3-9. Cargo Tie-Down Rings

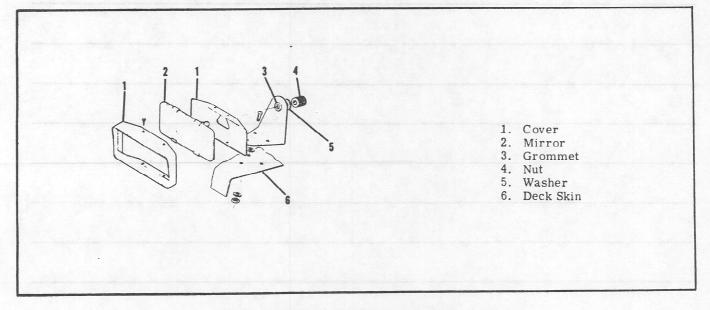


Figure 3-10. Rear View Mirror Installation

- 5. Reverse preceding steps for installation. Before installation, check all items concealed by headliner for security. Use wide cloth tape to secure loose wires to fuselage and to seal openings in wing roots.
- 3-47. UPHOLSTERY SIDE PANELS. Removal of upholstery side panels is accomplished by removing seats for access, then removing parts attaching panels. Remove screws, retaining strips, arm rests and ash trays as required to free panels. Automotive type spring clips attach most door panels. A dull putty knife makes an excellent tool for prying clips loose. When installing side panels, do not over-tighten screws. Larger screws may be used in enlarged holes as long as area behind hole is
- checked for electrical wiring, fuel lines and other components which might be damaged by using a longer screw.
- 3-48. CARPETING. Cabin area and baggage compartment carpeting is held in place by rubber cement, small sheet metal screws and retaining strips. When fitting a new carpet, use old one as a pattern for trimming and marking screw holes.

3-49. SAFETY PROVISIONS.

3-50. CARGO TIE-DOWNS. Cargo tie-downs are used to ensure baggage cannot enter seating area during flight. Methods of attaching tie-downs are illustrated in figure 3-9. The eyebolt and nutplate

can be located at various points. The sliding tiedown lug also utilizes eyebolt and attaches to a seat rail.

- 3-51. SAFETY BELTS (Refer to figure 3-11). Safety belts should be replaced if frayed or cut, latches are defective or stitching is broken. Attaching parts should be replaced if excessively worn or defective.
- 3-52. SHOULDER HARNESS. (Refer to figure 3-11). Individual shoulder harnesses may be installed for each seat except auxiliary. Each harness is connect-
- ed to the upper fuselage structure and to the seat safety belt buckle. Component parts should be replaced as outlined in the preceding paragraph.
- 3-53. GLIDER TOW-HOOK. A glider tow-hook, which is mounted in place of the tail tie-down ring, is available for all models.
- 3-54. REAR VIEW MIRROR. A rear view mirror may be installed on the cowl deck above the instrument panel. Figure 3-10 illustrates details for rear view mirror installation.

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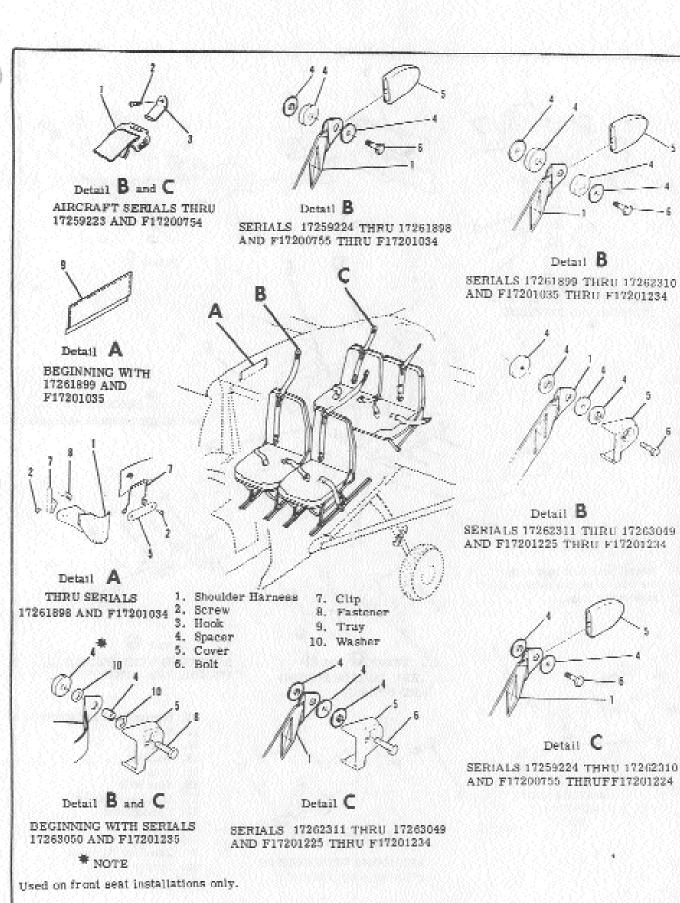


Figure 3-11. Seat Belt and Shoulder Harness Installation (Sheet 1 of 2)

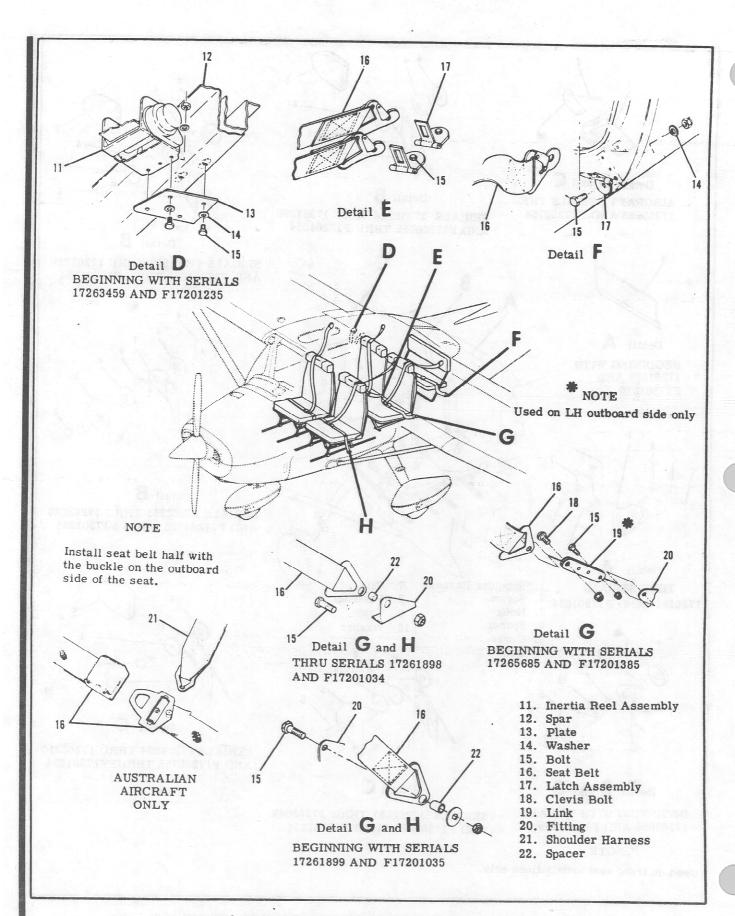


Figure 3-11. Seat Belt and Shoulder Harness Installation (Sheet 2 of 2)