

**R22-series Bladder Fuel Tanks Installation Kit Instructions**

*Retrofits helicopters (excluding R22 S/Ns 0456 & prior) with all-aluminum fuel tanks to bladder-type fuel tanks in compliance with R22 Service Bulletin SB-109A (auxiliary fuel tank must be previously installed). Includes system upgrades implemented to meet requirements of Section 317 of the FAA Reauthorization Act of 2018. Compliance with R22 Service Bulletin SB-105 [A670-1 Fuel shut-off valve Rev. I or subsequent, (not included in kit)] is required and may be installed simultaneously with kit, if not previously accomplished.*

**NOTE**

Visit [www.robinsonheli.com](http://www.robinsonheli.com) to verify kit instructions are current revision. Review instructions before installation; contact RHC Technical Support with questions. Verify kit contents match list; contact RHC Customer Service if parts are missing or damaged.

**CAUTION**

If interference is encountered with any aspect of this installation, contact RHC Technical Support for guidance before proceeding.

**NOTE**

Rivets included in kit contents are provided as a courtesy and at lengths most commonly used on production helicopters. Proper rivet length is determined by installer during installation.

ITEM	PART NUMBER	KIT CONTENTS	QTY
1	KI-217-1Instr.	Kit Instructions . . . . .	1
2	A010-14	Main Tank Assembly . . . . .	1
3	A010-15	Aux Tank Assembly . . . . .	1
4	A028-7	Frame . . . . .	1
5	A226-2-2.5	Seal (2.5-inch length) . . . . .	1
6	A378-3	Panel - LH (Aft) . . . . .	1
7	A378-5	Panel - LH (Forward) . . . . .	1
8	A654-93	Decal . . . . .	1
9	A701-3-8FT	Chafe Tape (8-foot length) . . . . .	1
10	A713-1	Strap . . . . .	1
11	A729-17	Tube . . . . .	1
12	A729-63	Tube . . . . .	1
13	A729-79	Tube . . . . .	2
14	A731-10	Tube Assembly . . . . .	1
15	A761-1	Drain . . . . .	1
16	A880-536	Adapter (CRES; alternate p/n A880-566, steel) . . . . .	1
17	A880-636	Elbow (CRES; alternate p/n A880-666, steel) . . . . .	4
18	A880-1004	Nut . . . . .	1
19	A880-1136	Tee (CRES; alternate p/n A880-1166, steel) . . . . .	1

ITEM	PART NUMBER	KIT CONTENTS (continued)	QTY
20	A901-1	Cover . . . . .	3
21	B118-5	Bracket (forward pulley) . . . . .	1
22	B153-6	Door Assembly (Rev F or subsequent) . . . . .	1
23	B157-2	Mount (aft pulley) . . . . .	1
24	B158-6-2	Heat Shrink - 3/8-inch diameter (2-inch length) . . . . .	1
25	B161-4-12	Spirap - 0.25-inch diameter (12-inch length) . . . . .	1
26	B209-1	Plug . . . . .	1
27	B277-4	Clamp . . . . .	4
28	B423-1	Channel Assembly . . . . .	1
29	B423-3	Stiffener . . . . .	1
30	B423-10	Doubler . . . . .	1
31	B424-2	Stiffener . . . . .	1
32	B429-1	Skin . . . . .	1
33	B429-3	Skin . . . . .	1
34	B430-4	Skin . . . . .	1
35	B576-5	Angle . . . . .	1
36	B577-3	Bracket . . . . .	1
37	B833-2	Tab . . . . .	1
38	C595-1	Hose Assembly . . . . .	1
39	C654-3	Decal . . . . .	1
40	C654-4	Decal . . . . .	1
41	C654-5	Decal . . . . .	1
42	C654-6	Decal . . . . .	1
43	D205-32	Hose Assembly . . . . .	1
44	D205-34	Hose Assembly . . . . .	1
45	D210-3	Nut . . . . .	3
46	D251-1	Valve Assembly - Rollover . . . . .	2
47	D255-4	Fitting . . . . .	1
48	D277-6	Clamp . . . . .	4
49	D663-1	Clamp . . . . .	2
50	D682-44	Decal . . . . .	2
51	D819-5	Decal . . . . .	1
52	D819-6	Decal . . . . .	1
53	F654-14	Decal . . . . .	1
54	MT106-3	Tube . . . . .	1
55	85-34-201-20	Retaining Ring . . . . .	3
56	85-46-101-39	Washer . . . . .	3
57	MS20426AD3-3+	Rivet (Note: "+" in contents part number indicates 50-qty pack) . . . . .	1

ITEM	PART NUMBER	KIT CONTENTS (continued)	QTY
58	MS20470AD3-2.5+	Rivet (Note: "+" in contents part number indicates 50-qty pack) . . . . .	1
59	MS20470AD3-3+	Rivet (Note: "+" in contents part number indicates 50-qty pack) . . . . .	1
60	MS20470AD3-3.5+	Rivet (Note: "+" in contents part number indicates 50-qty pack) . . . . .	1
61	MS20470AD4-3+	Rivet (Note: "+" in contents part number indicates 50-qty pack) . . . . .	1
62	MS20470AD4-3.5+	Rivet (Note: "+" in contents part number indicates 20-qty pack) . . . . .	1
63	MS20470AD4-4+	Rivet (Note: "+" in contents part number indicates 50-qty pack) . . . . .	1
64	MS20615-4M2.5+	Rivet (Note: "+" in contents part number indicates 5-qty pack) . . . . .	1
65	MS21069L08	Nutplate . . . . .	6
66	MS21071L08	Nutplate . . . . .	1
67	MS24665-153+	Cotter Pin (Note: "+" in contents part number indicates 20-qty pack) . . . . .	1
68	MS27039C0806	Screw . . . . .	2
69	MS3367-4-9+	Ty-rap (Note: "+" in contents part number indicates 20-qty pack) . . . . .	1
70	MS3367-5-9+	Ty-rap (Note: "+" in contents part number indicates 20-qty pack) . . . . .	1
71	MS3367-6-0	Ty-rap . . . . .	1
72	MS3367-7-9+	Ty-rap (Note: "+" in contents part number indicates 10-qty pack) . . . . .	1
73	MS35489-6	Grommet . . . . .	3
74	NAS1149D0316J+	Washer (Note: "+" in contents part number indicates 10-qty pack) . . . . .	1
75	NAS1149F0332P+	Washer (Note: "+" in contents part number indicates 20-qty pack) . . . . .	1
76	NAS1149F0363P+	Washer (Note: "+" in contents part number indicates 20-qty pack) . . . . .	1
77	NAS1149F0732P+	Washer (Note: "+" in contents part number indicates 10-qty pack) . . . . .	1
78	NAS1149F0932P+	Washer (Note: "+" in contents part number indicates 10-qty pack) . . . . .	1
79	NAS6603-2	Bolt . . . . .	2
80	NAS6603-3	Bolt . . . . .	1
81	NAS6603-4	Bolt . . . . .	1

**Consumables**

Refer to R22 Maintenance Manual (MM) § 23-70 for approved materials list.

- Bonderite M-CR 1132 (Alodine 1132), or Bonderite M-CR 1201 Aero (Alodine 1201)
- Epoxy primer
- B270-1 Sealant (Polysulfide, fuel resistant; 2-part)
- B270-6 Sealant and thread lubricant (Titeseal 55; 1-part)
- B270-13 Sealant (Silicone rubber, noncorrosive; 1-part)
- B270-18 Sealant (Weatherstrip; 1-part)

**Kit Instructions****CAUTION**

Flexible hoses kink easily; handle them with care.

**CAUTION**

Temporarily cap fuel fittings when opened.

**WARNING**

**Fuel vapors are explosive. Do not use electric tools in vicinity of an opened fuel system.**

1. Turn battery switch off. Remove left & right aft seat backs, right side engine skirts, mast fairing, lower rib(s), tailcone fairing, channel and center skins behind mast fairing (disconnect cable and ground wire from installed antenna[s], if applicable), main gearbox access doors, and aft frames.
2. If ELT is installed: Drill out rivets securing ELT antenna doubler to B429-1 skin. Remove sealant from antenna mounting screw heads, remove screws, and remove sealant from antenna base. Remove hardware securing cable and wire to adjacent stiffener or channel. Discard skin.

**NOTE**

These instructions accommodate aircraft equipped with a Pointer or Kannad ELT antenna installed on aft skin behind mast fairing (aft skin is replaced during this upgrade). If other antennas are installed on skin(s) behind mast fairing, contact RHC Technical Support for guidance.

3. Refer to R22 Illustrated Parts Catalog (IPC) Figure 53-5. Drill out rivets securing B430-4 skin and B424-2 stiffener to B430-3 door's hinge and discard skin and stiffener.
4. Cut 85-34-201-20 receptacle ring from B153-6 door assembly's latching stud and discard ring, cover, and door; retain stud and washer.
5. Remove (all-aluminum) main tank per MM § 12.110 and (all-aluminum) auxiliary (aux) tank per MM § 12.120. Remove clipnuts from aux tank and center skins.
6. Refer to IPC Figure 28-27. Drill out rivets securing B143-1 angle to aux tank channel (do not remove nutplates). Remove hardware securing static line clamp to channel. Transfer AN210-1A (rotor brake) pulley & attaching hardware from B157-1 mount to B157-2 mount (nut is on side marked "FWD") and secure (ref. IPC Figure 63-7). Discard B157-1 mount.
7. Refer to IPC Figure 63-7. Remove hardware securing B118-3 (rotor brake) bracket to A259-1 bulkhead assembly and remove bracket and pulley assembly with handle and chain. Transfer BP4100 pulley & attaching hardware from B118-3 bracket to B118-5 bracket and secure. Discard B118-3 bracket.
8. Refer to IPC Figure 28-27. Remove and discard B141-1 (aux tank-to-interconnect tee) and A726-2 (interconnect tee-to-fuel shut-off valve) line assemblies, and MS20825-6D tee (main tank outlet).

**Kit Instructions (continued)**

9. Refer to IPC Figure 28-23. Disconnect A726-1 line assembly from A457-15 (0363-6-6) bulkhead union; remove union's nut and washer. Remove fuel shut-off valve with attached elbows, A657-1 nut, A656-1 sleeve (inside nut), bulkhead union, and washer(s). Note orientation of elbows prior to removal, then remove elbows, nut, sleeve, bulkhead union, and washer(s) from fuel valve. Discard both MS20822-6D (or AN822-6D) elbows.
10. Refer to Figure 1. Verify A670-1 fuel shut-off valve is Revision I or subsequent (Refer to R22 Service Bulletin SB-105). Assemble fuel shut-off valve to associated parts, and install as follows:
  - a. Install A457-15 bulkhead union, A657-1 nut, and A656-1 sleeve on top side of bulkhead union, then install flared-fitting side of new A880-636 elbow in A657-1 nut. Clamp elbow flats in padded vise (do not damage elbow threads) and special torque bulkhead union to 120 in-lb. Remove assembly from vise.
  - b. Apply B270-6 sealant sparingly to tapered pipe threads of elbow (do not apply sealant to first thread). Clamp A670-1 fuel valve in padded vise and install elbow with attached bulkhead union in valve outlet (arrow on handle points to outlet when in OFF position). Standard torque elbow to 85 in-lb and align fitting as required.
  - c. Apply B270-6 sealant sparingly to tapered pipe threads of other new A880-636 elbow (do not apply sealant to first thread). Install tapered-thread side of elbow in fuel valve inlet. Standard torque elbow to 85 in-lb and align fitting as required.
  - d. Position assembled valve and bulkhead union with NAS1149F0932P washer through firewall, and position seat back for installation. As required, install NAS1149F0932P washers between bulkhead union nut and the top of the firewall to position valve at correct height. Remove seat back.
  - e. Inside engine compartment, install washer and nut on bulkhead union and special torque nut to 100 in-lb. Install A726-1 line assembly to A457-15 union and special torque B-nut to 285 in-lb; torque stripe per MM Figure 2-1.
11. Refer to Figure 28-15. Disconnect A726-1 line assembly from A666-1 gascolator inlet MS20822-6D (or AN822-6D) elbow; discard elbow. Apply B270-6 sealant sparingly to tapered pipe threads of new A880-636 elbow (do not apply sealant to first thread). Install tapered-thread side of elbow in inlet of gascolator. Standard torque elbow to 85 in-lb and align fitting as required. Install A726-1 line assembly to elbow and special torque B-nut to 285 in-lb; torque stripe per MM Figure 2-1.

**NOTE**

Use a backup wrench on carburetor fuel inlet fitting to prevent loosening or overtightening inlet fitting on carburetor during alignment.

12. Disconnect B283-6 hose assembly from gascolator and carburetor. Remove and discard AN816-6D nipple (gascolator) and MS20822-6D elbow (carburetor). Apply B270-6 sealant sparingly to tapered pipe threads of new A880-636 elbow (do not apply sealant to first thread). Install tapered-thread side of elbow in carburetor. Standard torque elbow to 85 in-lb and align fitting as required. Repeat procedure for gascolator outlet and install either A880-1136 tee (if optional primer installed), or A880-536 adapter. Install tapered-thread side in gascolator and standard torque tee or adapter to 85 in-lb and align tee as required. Install B283-6 hose assembly and torque B-nuts to 120 in-lbs; torque stripe per MM Figure 2-1.

**Kit Instructions (continued)**

13. Refer to IPC Figure 28-27. If B128-2 (aux tank) drain tube is installed, remove tube, A456-1 drain, and associated parts. Do not remove B128-1 (horizontal firewall) drain tube. Discard removed drain tube and associated parts. Install (2) MS20615-4M2.5 rivets in vacated rivet holes on horizontal firewall. Apply B270-1 sealant around center hole and install (1) B209-1 plug. Secure plug by bending tangs on engine-side of firewall. Verify security. Apply a sufficient amount of B270-1 sealant to cover tangs.

**NOTE**

For the following steps, gently peel back foam insulation as required and mask inside of cabin to protect area from debris. After bulkhead modifications, clean up debris.

**NOTE**

After trimming or filing aluminum, finish edges as follows: Deburr trimmed edges with 220-grit or finer wet-or-dry aluminum oxide abrasive paper. Solvent-clean deburred edge and apply Bonderite M-CR 1132 (Alodine 1132), or Bonderite M-CR 1201 Aero (Alodine 1201) in accordance with manufacturer's instructions. Apply epoxy primer to dry edge. Touch-up with helicopter paint color, where applicable, is optional.

14. Refer to Figure 2, Detail A. Lay out dimensions on bulkhead where main tank outlet passes through bulkhead. Cut-away 0.70 inch radius with 0.25 inch radius corner from bulkhead as shown. Smooth edges.
15. Refer to Figure 2, Detail B. Lay out hole location on bulkhead where rotor brake cable passes through bulkhead. Drill 0.50 inch diameter hole near existing hole in bulkhead and file into a single oval-shaped hole as shown (oval will not be perfectly vertical). Smooth edges.
16. Refer to Figure 3, Detail A. Position new B833-2 tab on A314-2 support outboard of A020-2 frame assembly near main rotor gearbox. Using tab as template, match drill two (one hole may be present) 0.130 inch diameter holes and deburr.
17. Refer to Figure 2, Detail C. Lay out hole locations on bulkhead behind pilot seat. Drill two 0.130 inch diameter holes in bulkhead and deburr.
18. Refer Figure 2, Detail D. Drill out two rivets securing C365-9 clip to bulkhead. Drill out one rivet inboard of two drilled-out rivets, securing A377-4 angle to bulkhead. Deburr holes.
19. Refer to IPC Figure 33-15. Remove hardware securing A712-1 (headset jack) cover to roof.
20. Refer to IPC Figure 28-23. Remove hardware securing A713-1 strap to bulkhead and discard strap & installation hardware.
21. Remove A701-3 tape from underside of cabin skin where it overlaps main tank forward edge. Clean surface and install new A701-3 tape to underside of cabin skin.
22. Refer to Figure 3. Cleco (sheet metal fastener) new B833-2 tab to A314-2 support. Progressively remove clecos and install one MS20470AD4-3.5 rivet and one MS20470AD4-4 rivet as shown.

**Kit Instructions (continued)**

23. Refer to Figure 3. Cleco new B577-3 bracket assembly to aft side of bulkhead. Using bracket as template, match drill two 0.130 inch diameter holes in bulkhead and deburr. Progressively remove clecos and install four MS20470AD4-3 rivets as shown.
24. Refer to Figure 3. Cleco new B576-5 angle to bulkhead and A377-4 angle. Progressively remove clecos and install two MS20470AD3-3.5 rivets as shown. Install one MS20470AD3-2.5 rivet in previously utilized hole as shown.

**NOTE**

When positioning main tank in helicopter, verify vertical strip attached to horizontal firewall is between tank's D249-4 angle (attached to stiffener on bottom of tank) and tank's exterior skin.

25. Position new A010-14 main tank in helicopter.
26. Refer to Figure 4, Detail A. Estimate material to be removed for fitting tank forward edge under cabin exterior skin aft edge; file or cut tank forward edge to create a 0.010 inch minimum gap between tank screws and cabin skin aft edge. Maintain 0.08 inch minimum overlap, but fit tank as far forward as possible without exceeding limit. It is permissible to file/trim cabin skin aft edge to meet 0.010 inch minimum gap, provided 0.08 inch minimum overlap is met.

**CAUTION**

Forward edge of tank must be fitted and finished before proceeding to next step.

27. Refer to Figure 4, Detail B. Draw two lines from center of nutplate attached to horizontal firewall's vertical strip (shown) and nutplate attached to A020-2 frame assembly (refer to IPC Figure 28-1 for location). Draw a second line, below & parallel to first line thru center of engine skirt (screw) holes. Draw a third line vertically thru center of nutplate, that intersects horizontal lines. Measure and record distances as shown.

**CAUTION**

Before proceeding to next step, verify tank's B321-6 tab will align with A020-2 frame's nutplate. Further filing of tank forward edge may be required.

28. Transfer lines and recorded distances to tank and lay out drill marks. Drill two 0.196 inch diameter holes through tank and deburr holes. Install hardware and standard torque bolts per MM § 23-32.
29. Refer to Figure 4, Detail C. Install hardware securing A713-1 strap to bulkhead and standard torque nut per MM § 23-32. Align two holes at top corner of tank with strap. Maintain 0.2 inch minimum edge distance (from aft end of tab and both sides) and mark hole locations; drill two 0.196 inch diameter holes through (steel) strap and deburr holes. Install hardware securing strap to tank and standard torque nuts per MM § 23.32.

**Kit Instructions (continued)**

30. Measure clearance (height) between cabin exterior skin and fuel tank skin. Verify clearance is between 0.005 and 0.100 inch. If clearance exceeds maximum limit, check for aluminum shims installed between A259-1 bulkhead and cabin roof: If shims are present, they may be removed; if no shims are present, “best obtainable” clearance is permissible.
31. Refer to Figure 4, Detail D. Scribe tanks’ B321-6 tab thru A020-2 frame’s nutplate from below. Temporarily install a work aid (such as a metal plate) to protect aft wall of main tank; using angle drill, drill one 0.196 inch diameter hole through (steel) tab and deburr hole (tank may be removed to drill). B321-6 tab should be vertically flush with frame at nutplate; shim between frame and B321-6 tab using NAS1149D0316J washer (4 max) for 0.010 inch maximum gap. Install hardware and standard torque screw per MM § 23-32. Remove work aid.
32. Check for a vertical gap between horizontal firewall and B575-4 channel; verify gap does not exceed 0.025 inch (reference Figure 12, Detail A. B575-4 channel is match-drilled here for fitting purposes; nutplates shown in Figure 12 are installed at a later sequence).
- If clearance is acceptable, match drill two 0.170 inch diameter holes through B575-4 channel through existing holes in A234-1 firewall.
  - If clearance is excessive, fabricate spacer from suitably thick 2024T3 aluminum alloy sheet to match clamping surface of B575-4 channel. Temporarily affix spacer to channel and, using existing holes in A234-1 firewall as guide, match drill two 0.170 inch diameter holes thru spacer & channel. Adhere fabricated spacer to channel with epoxy primer.
  - Reinstall tank using recorded fasteners (if tank was removed).

**NOTE**

When installing A028-7 frame, to avoid a rippled edge, drill holes starting at the center of the frame, or nearest to the apex of the curve. Progressively deburr holes and install clecos. If holes are drilled just short of the center of adjacent tank hole, skin will stretch evenly to top and bottom of frame. Install rivets using this same method.

**NOTE**

During drilling, always remove cutting debris from between adjoining surfaces; debris lodged between surfaces when installing rivets can cause misalignment.

33. Refer to Figure 6, Details A and B. Position A028-7 frame flush with tank aft edge, and in the most natural location to match frame contour with tank contour. Maintain 0.10 inch minimum distance from A020-2 frame as shown. (Frame top and bottom corners may be filed as required; top corner should be filed until parallel [longitudinally] with main tank exterior skin.) Using tank as template, match drill eleven 0.098 inch diameter holes and one 0.130 inch diameter hole and deburr holes. Progressively remove clecos and install (12) rivets as shown.
34. Refer to Figure 5, Detail A. Draw longitudinal lines from center of A015-14 strip (nutplate) holes onto exterior skins as shown. Draw a vertical (reference) line that intersects the longitudinal lines. Measure and record distances from reference line to center of (nutplate) holes.
35. Refer to Figure 5, Detail B. Mark A015-14 strip 5.7 inches from horizontal firewall as shown.



**Kit Instructions (continued)**

36. Refer to Figure 5, Detail C. Furnish a 0.6 inch tall work aid and tape to A020-2 frame assembly. Locate center of frame tube and mark work aid 5.2 inches right of center with a longitudinal line as shown.
37. Loosen hardware securing B577-2 stiffener and position new A010-15 aux tank in helicopter. Align tank's bottom skin with mark on strip and tank channel's outboard edge on top of work aid at longitudinal line. Tape tank into position.
38. Refer to Figure 5, Detail D. Estimate material to be removed for fitting tank forward edge with cabin exterior skin aft edge; file or cut tank forward edge to create a gap of no more than 0.060 inch between tank and skin. Fitted tank should have a slight gap between outboard corner and strip as shown in Detail B.

**NOTE**

To drill 0.170-inch diameter (#18) hole over installed nutplate, first drill 0.098-inch diameter (#40 with drill stop) hole at marked location (drill will not damage nutplate threads if marks are accurate). Adjust hole position as necessary by drilling 0.130-inch diameter (#30 with drill stop) hole through top material. Ream 0.170-inch diameter hole through top material.

**NOTE**

When drilling aux tank, to avoid a rippled edge, start holes near cabin's rain gutter, or nearest to the apex of the curve. Progressively drill holes and install clecos. If holes are drilled just short of the center of adjacent nutplate, skin will stretch evenly to top and bottom of tank.

**CAUTION**

Forward edge of tank must be fitted and finished before proceeding to next step.

39. Transfer longitudinal lines and recorded distances from exterior skin to tank forward edge of tank, and lay out drill marks. Drill 0.170 inch diameter holes through tank skin and deburr holes. Install screws.
40. Refer to Figure 6, Details C and D. Remove work aid and install hardware securing B428-1 and B429-5 frames to A020-2 frame assembly. File aft edges of aux tank channel as required so channel is parallel with, but not pre-loading frames, within 0.030 inch. Smooth channel's aft edges.
41. Install screws securing B143-1 angle to frames. Using angle as template, match drill two 0.130 inch diameter holes in aux tank channel and deburr holes. Install two MS20470AD4-3.5 rivets as shown.
42. Mark location of tank's B577-2 stiffener holes by inserting hole finder into B577-3 bracket nutplates, sliding stiffener forward. Drill two 0.170 inch diameter holes in stiffener and deburr holes. Install two new MS27039C0806 screws.
43. Refer to Figure 7, Detail A. Hang right side engine skirts with a few screws. Position new B153-6 door assembly's hinge between horizontal firewall and skirt, maintaining gap between skirt and hinge as shown.

**Kit Instructions (continued)**

44. Refer to Figure 7, Detail B. Verify door will close without interference with A379-10 angle. If angle contacts B153-1 stiffener, provide clearance as follows:
  - a. Remove forward rivet on B153-1 stiffener.
  - b. Remove forward 0.50 inch of stiffener. Smooth edge.
  - c. Secure forward end of stiffener using (1) MS20470AD3 rivet in existing hole.
45. Refer to Figure 7, Detail C. Align door's aft edge with aft edge of fuel tank exterior skin.
46. Refer to Figure 8, Detail A. Trim door as required for no more than 0.060 inch gap between top edge of door and tank exterior skin, and forward edge of door and cabin exterior skin.

**CAUTION**

Top and forward edges of door must be fitted and finished before proceeding to next step.

47. Refer to Figure 7, Detail A & Figure 8, Detail A. Using skirts as template, match drill 0.170 inch diameter holes through door hinge. Locate position for 0.3125 inch diameter latching hole based on receptacle position and drill hole. Remove door; smooth edges and deburr holes. Transfer latching stud to door with hardware and install new 85-34-201-20 retaining ring. If there is interference between B153-6 door's two hole stiffener and B430-3 door's forward latching receptacle, file stiffener and receptacle as required, and smooth edges.
48. Refer to Figure 8, Detail B. Position B430-3 door against frame and aux tank and latch studs in receptacles. Pull door taught toward aux tank channel. Estimate material to be removed for fitting door forward edge with aux tank exterior skin aft edge; file door's forward edge to create a gap of no more than 0.060 inch between door and tank skin.

**CAUTION**

Forward edge of door must be fitted and finished before proceeding to next step.

49. Position new B424-2 stiffener on hinge as shown. Match drill seven 0.098 inch diameter holes and one 0.170 inch diameter hole (most aft hole) through stiffener using hinge as template. Progressively deburr holes and install clecos (not at fastener holes).
50. Install screw at hinge securing aft edge of door to frame. Pull door taught toward aux tank channel and drill 0.170 inch diameter hole through door's hinge and aux tank angle. Note location of B424-2 stiffener and trim forward edge as required for 0.03 inch clearance with tank's angle. Remove door and enlarge aux tank angle hole to 0.196 inch diameter hole. Deburr holes. Install B162-3 clipnut on angle.
51. Off of helicopter, position new B430-4 skin on door's hinge and stiffener, maintaining gap between skin and hinge similar to Figure 7, Detail A (there should be overlap on three other edges.) Match drill 0.098 inch diameter holes through skin using hinge and stiffener as template. Progressively deburr holes and install clecos (do not install clecos at fastener holes).

**Kit Instructions (continued)**

52. Position B430-3 door against frame and aux tank and latch studs in receptacles. Install screws securing door's hinge to frame and tank angle. Estimate material to be removed for fitting B430-4 skin forward edge with aux tank exterior skin aft edge; file skin's forward edge to create a gap of no more than 0.060 inch between skin and tank skin. File skin's inboard edge flush with aux tank channel's inboard edge and skin's aft edge with B429-5 frame. Smooth edges.
53. Progressively remove clecos and install MS20470AD3-3.5 rivets securing B430-4 skin and B424-2 stiffener to B430-3 door's hinge.
54. Clean surfaces and install new A701-3 tape on aux tank surfaces where doors contact tank, and where B153-6 door assembly contacts A015-14 strip. Install new A901-1 covers on studs.
55. Refer to Figure 9. Position new B423-10 doubler on new B429-3 skin, aligning installation holes. Secure doubler using (3) MS20470AD3-2.5 rivets as shown.
56. Position B429-3 skin between tanks. Create a gap between main tank exterior skin inboard edge and B429-3 skin of no more than 0.060 inch. Position skin at forward right corner to create same gap and match (or overlap) cabin exterior skin. File skin's forward edges as required. File skin's right edge to create a gap of no more than 0.060 inch between skin and aux tank exterior skin inboard edge. Smooth edges.
57. Lay out hole locations through skin and main tank as shown. Drill 0.170 inch diameter holes through skin and tank, starting aft and moving forward. Using hole finder, locate existing clipnut at forward right corner and drill 0.170 inch diameter hole through skin. Lay out hole locations through skin and aux tank as shown. Drill 0.170 inch diameter holes through skin and tank. Progressively deburr holes and install clecos.
58. Position new B423-1 channel assembly at location shown. Trim forward edge of channel as required to match cabin exterior skin and to create a gap of no more than 0.060 inch between channel and cabin skin. Using hole finder, locate existing nutplate holes and drill two 0.170 inch diameter holes. Drill one 0.170 inch diameter hole through channel and skin as shown.
59. Remove clecos, skin, and channel assembly. Deburr holes. Enlarge one hole in skin (only) to 0.196 inch diameter hole where channel fastens to skin (to provide for clipnut). Reinstall skin and channel assembly and install clecos.
60. Refer to Figure 10. Position new B423-3 stiffener on new B429-1 skin. Match drill eight 0.098 inch diameter holes through skin and deburr holes. Install eight MS20470AD3-3 rivets as shown.
61. Position B429-1 skin between tanks and under B429-3 skin as shown. Create a gap between main tank exterior skin inboard edge and B429-1 skin of no more than 0.060 inch. Position B429-1 skin's forward edge for 0.60 inch overlap with B429-3 skin. File B429-1 skin's right edge to create a gap of no more than 0.060 inch between skin and aux tank exterior skin inboard edge, continuing line aft where skin overlaps aux tank channel and B430-4 skin. Smooth edges.
62. Layout B429-1 skin's forward edge holes through skin(s) and tanks as shown. Match drill two 0.170 inch diameter holes through B429-1 skin. Layout one hole in center where skins overlap and five holes through B429-1 skin and tanks. Drill 0.170 inch diameter holes through skin(s) and tanks and deburr holes. Progressively install clecos.

**Kit Instructions (continued)**

63. Using hole finder, locate aft three holes where clipnuts are installed. Drill three 0.170 inch diameter holes through B429-1 skin and deburr holes. File aft edges even with frame within 0.03 inch and trim corners as shown.
64. Refer to Figures 8 and 9. Remove B429 skins and channel. Crimp right edges of B429 skins down 15°.
65. If ELT is installed: Position A837-2 doubler on B429-3 skin at location shown. Using doubler as template, match drill eight 0.098 inch diameter holes, three 0.196 inch diameter holes, and one 0.688 inch hole through skin. Deburr holes. Install eight MS20470AD3-3 rivets as shown. Seal around antenna base using B270-1 sealant and install hardware securing antenna to skin and doubler. Seal around screw heads using B270-13 sealant.
66. Match drill two 0.170 inch diameter holes in A028-7 frame through existing holes in B428-1 frame.
67. Refer to Figure 11. Remove main tank. Deburr drilled holes. Using four new MS21069L08 nutplates and new MS21071L08 nutplate as templates, drill ten 0.098 inch holes in main tank, deburr holes, and create 0.180 inch diameter, 100° countersinks. Install ten MS20426AD3-3 rivets to secure nutplates to tank.
68. Refer to Figure 12, Detail A. Using two new MS21069L08 nutplates as templates, drill four 0.098 inch holes in main tank's B575-4 channel (holes drilled in step 32), deburr holes, and create 0.180 inch diameter, 100° countersinks. Install four MS20426AD3-3 rivets to secure nutplates to channel.
69. Refer to Figure 12, Detail B. Connect new D205-32 (tank-to-fuel shut-off valve) hose assembly to main tank's strainer assembly and new C595-1 (tank interconnect) hose assembly to main tank's A880-936 union. Special torque hose nuts to 120 in-lb and torque stripe per MM Figure 2-1. Connect new D205-34 (drain) hose assembly to main tank's A880-934 union. Special torque hose nuts to 60 in-lb and torque stripe per MM Figure 2-1. Verify vent tube is connected to main tank and clamp is snug; verify cap is secure on lower vent, if present.
70. Refer to Figure 11. Remove doors and aux tank. Deburr drilled holes. Enlarge (specified) holes in aux tank (for clipnuts) to 0.196 inch diameter holes. Deburr holes and install clipnuts. Verify vent tube is connected to aux tank and clamp is snug; verify cap is secure on lower vent, if present.
71. Cut and discard ty-raps and unwind spirap as required to reroute fuel quantity sender wiring to exit harness closest to bottom of tanks. Rewind spirap and install MS3367-4-9 ty-raps as required to secure wiring. Cinch ty-raps until snug without over-tightening, and trim tips flush with heads. Verify clearance to flight controls and rotating drive train.
72. Position main tank assembly in helicopter, carefully routing attached hose assemblies to appropriate locations, providing 0.25 inch minimum clearance for D205-32 hose assembly with bulkhead and horizontal firewall.
73. Refer to Figures 11 and 12. Install hardware securing tank outboard corners to horizontal firewall vertical flange and A020-2 frame assembly. Install hardware (use new NAS6603-4 bolt and D210-3 nut, included in kit contents) securing tank inboard corner to A713-1 strap. Install hardware securing tank's B575-4 channel to underside of horizontal firewall (access from engine compartment), replacing screws if necessary for thread engagement. Install hardware securing tank's B321-6 tab to A020-2 frame assembly. Install hardware securing A028-7 frame to B428-1 frame. Standard torque hardware per MM § 23-32 and torque stripe per Figure 2-1.

**Kit Instructions (continued)**

74. Connect fuel quantity sender and low-fuel switch assembly wiring to airframe harness at connectors.
75. Position aux tank assembly in helicopter. Install perimeter screws securing tank to bulkhead. Install two new MS27039C0806 screws securing aux tank's B577-2 stiffener to B577-3 bracket assembly, then tighten screws securing stiffener to tank. Install screws securing aux tank channel's B143-1 angle to frames.
76. Install hardware securing pitot-static line and clamp to aux tank channel. Position B118-5 (rotor brake) bracket & pulley with handle and chain in helicopter and install hardware securing bracket to A259-1 bulkhead assembly. Install hardware securing cable assembly to B112-1 lever. Route cable correctly through B157-2 mount & pulley and install two new MS24665-153 cotter pins (heads on side marked "FWD"). Install hardware securing mount, with "FWD" arrow pointing forward, to aux tank channel. Slip length of B158-6 heat shrink over rotor brake cable, connect chain and cable, and activate heat shrink over connector. Verify security.
77. Install hardware securing headset jack cover to roof. Verify security.
78. Refer to Figure 9. With flaps pointing outboard, bond A226-2-2.5 seal in place using B270-18 adhesive.
79. Refer to Figure 13, Detail A. Install new D255-4 fitting, new NAS1149F0732P washer, and A880-1004 nut in B576-5 angle (see Figure 3) and special torque nut to 145 in-lb. Apply B270-6 sealant sparingly to new A761-1 drain valve tapered threads (do not apply sealant to first thread) and connect valve to fitting. Hold fitting and standard torque valve to 60 in-lb; torque stripe per MM Figure 2-1. Install new A729-17 tube (lockwire is not required) and new D663-1 clamp. Install MS3367-5-9 ty-rap securing aux tank's drain tube to angle (D663-1 clamp is already installed). Cinch ty-rap until snug without over-tightening, and trim tip flush with head.
80. Refer to Figure 1. Connect D205-32 hose assembly to fuel valve (A880-636) elbow. Special torque hose nut 120 in-lb and torque stripe per MM Figure 2-1. Verify 0.25 inch minimum clearance where hose assembly passes through bulkhead.
81. Refer to Figure 13. Connect C595-1 hose assembly to aux tank strainer assembly. Special torque hose nut 120 in-lb and torque stripe per MM Figure 2-1. Trim an 8-inch length of B161-4 spirap and install around D205-34 hose assembly (drain) as shown. Connect hose to drain valve fitting. Special torque hose nut to 60 in-lb and torque stripe per MM Figure 2-1. Install two MS3367-5-9 ty-raps around C595-1 and D205-34 hose assemblies and B833-2 tab, but do not tighten. Maintain 0.25 in. minimum clearance for C595-1 hose with frame assembly and firewall, and for D205-34 hose with firewall and support. Install one MS3367-5-9 ty-rap around hose assemblies at inboard location shown. Cinch ty-raps until snug without over-tightening, and trim tips flush with heads.
82. Connect fuel quantity sender wiring at connectors and special torque per MM § 23-33. Apply torque stripe per MM Figure 2-1.
83. Refer to Figure 14. Lay out and drill one 0.438 inch diameter hole in A261-4 rib as shown. Install (3) new MS35489-6 grommets in A261-3 and A261-4 ribs for new pitot tube location and vent tubes. Install ribs on mast tube and secure with clamp. Install screws securing ribs together.

**Kit Instructions (continued)**

84. Refer to Figure 15. Secure new A731-10 tube assembly to mast tube with one MS3367-6-0 ty-rap at location shown. Install two new A729-79 tubes on A731-10 tube assembly with two new D277-6 clamps. Verify security.
85. Insert two new D251-1 valve assemblies in A729-48 and A729-62 tubes, arrows pointed up, and secure to tubes with two new B277-4 clamps. Tighten clamps. Insert valve stems through rib grommets.
86. Install opposite end A729-79 tubes on valve stems, and secure tubes to valves with two new D277-6 clamps. Verify security.

**NOTE**

Refer to MM § 12.210 for description of vent valve function.

87. Secure A729-48 and A729-62 tubes together with new A729-63 tube and (2) MS3367-4-9 ty-raps. Cinch ty-raps until snug without over-tightening, and trim tips flush with heads.
88. Perform vent system check as follows:

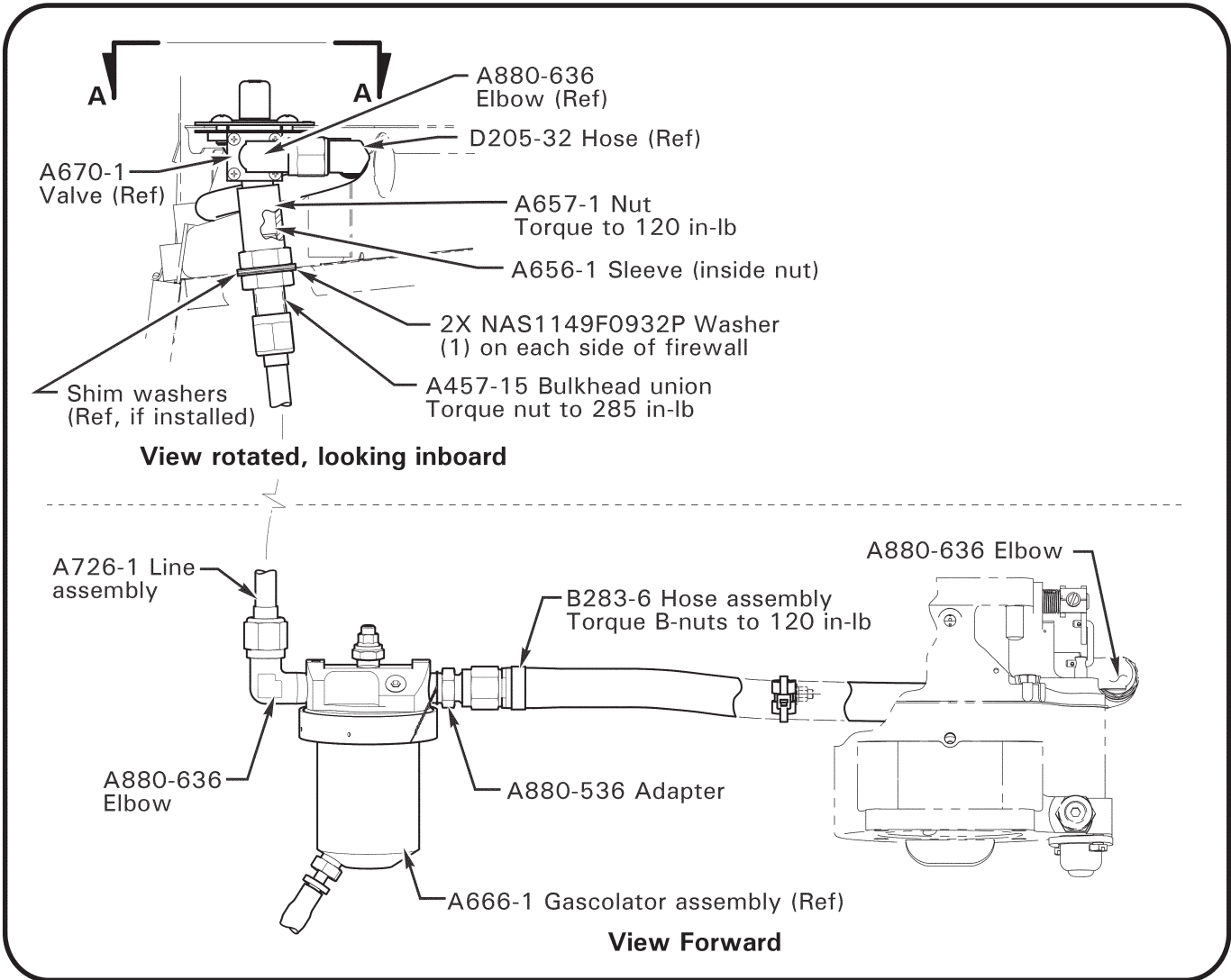
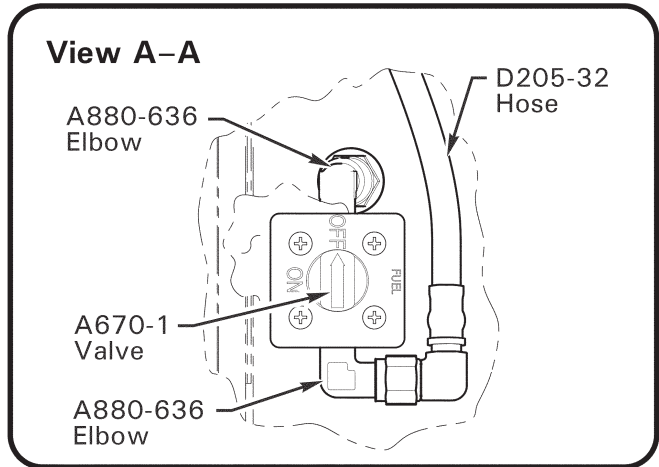
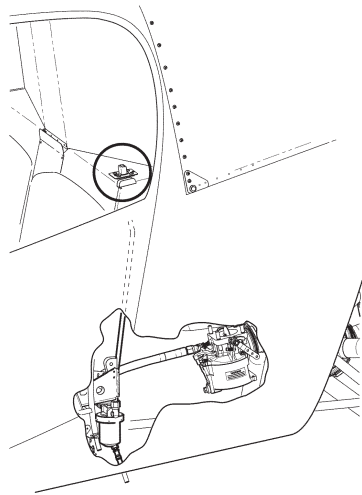
**NOTE**

A hand-operated inflation pump, such as bicycle tire pump, may be used to create minimum air pressure necessary for system check.

- a. Attach a temporary hose to open end of one tube of A731-10 tube assembly; block open end of other tube.
  - b. With fuel caps installed, blow into the hose (do not use compressed air) and verify no air leaks.
  - c. Remove fuel cap from main tank and blow into the hose. Verify air escapes out main tank. Secure cap on main tank.
  - d. Repeat step c. on aux tank. Secure cap on aux tank.
  - e. Remove temporary block on tube end and blow into the hose. Verify air escapes thru open vent tube. If air does not blow out the other vent, remove obstruction(s) in vent assembly or in fuel bladder(s) and repeat check.
  - f. Remove hose and secure fuel caps.
89. Route pitot line through grommet in rib and connect pitot line. Close mast fairing and perform pitot system and static system leak tests per MM § 13-10.
  90. Add at least 20 pounds of fuel to main fuel tank. Verify no fuel leaks.
  91. Perform fuel flow check per MM § 12.600.
  92. Install access doors, left & right seat backs, engine skirts, channel and center skins between tanks, and tailcone fairing.
  93. Have a qualified person run-up and shutdown helicopter per Pilot's Operating Handbook. Verify no fuel leaks.

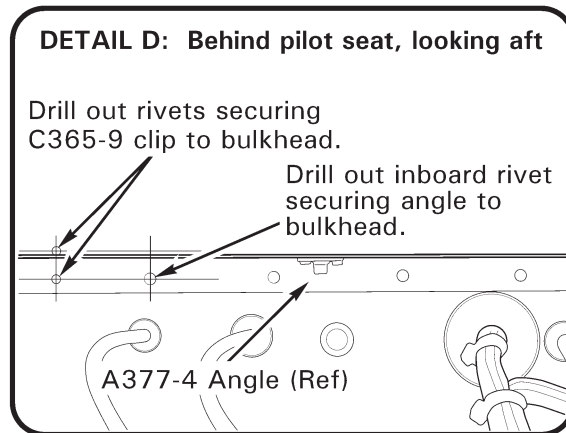
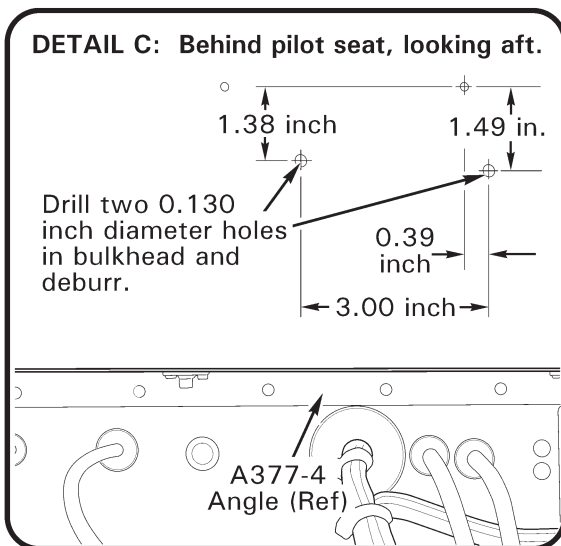
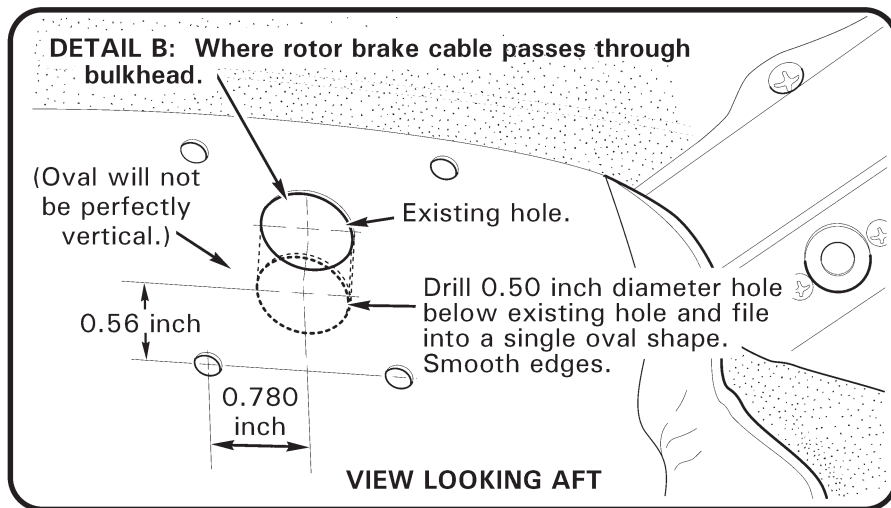
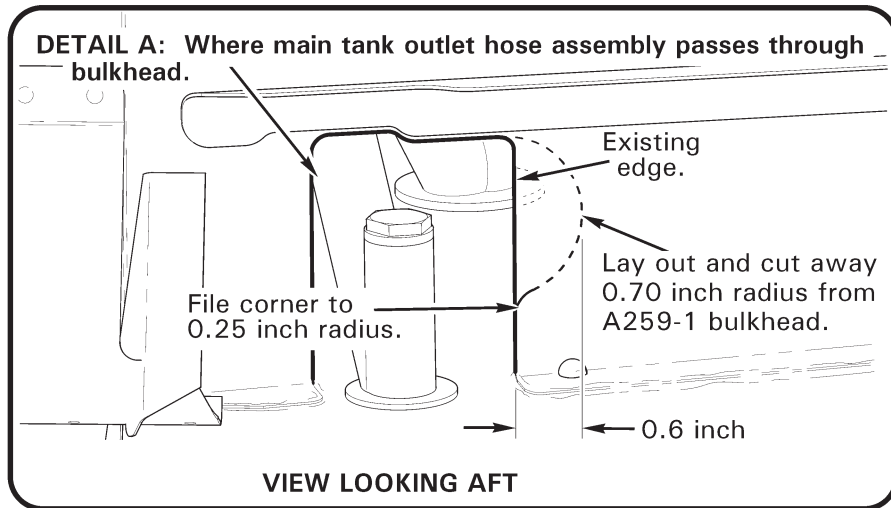
**Kit Instructions (continued)**

94. If desired, paint (top coat) tanks to match helicopter (paint codes are on inside cover of factory-issued airframe logbook).
95. Refer to Figure 16. Install C654-3 or C654-4 decal (as appropriate) near main tank filler cap. Install C654-5 or C654-6 decal (as appropriate) near aux tank filler cap. Stripe fuel caps (main and aux tank) per MM § 12.130.
96. Install new D819-5 decal so it overlays the previous main tank quantity description printed on the B193 plate. Install new D819-6 decal so it overlays the previous aux tank quantity description printed on the B193 plate.
97. Refer to Figure 17. Install A654-93 decal on inside of B153-6 door assembly. Install F654-14 decal on aft side of aux tank. Insert MT106-3 tube in holder located on aux fuel tank assembly aft bulkhead.
98. Perform weight and balance procedure per MM § 18-20. Revise helicopter's Weight and Balance Record in R22 Pilot's Operating Handbook (POH) Section 6 to reflect this installation. Make appropriate maintenance record entries.

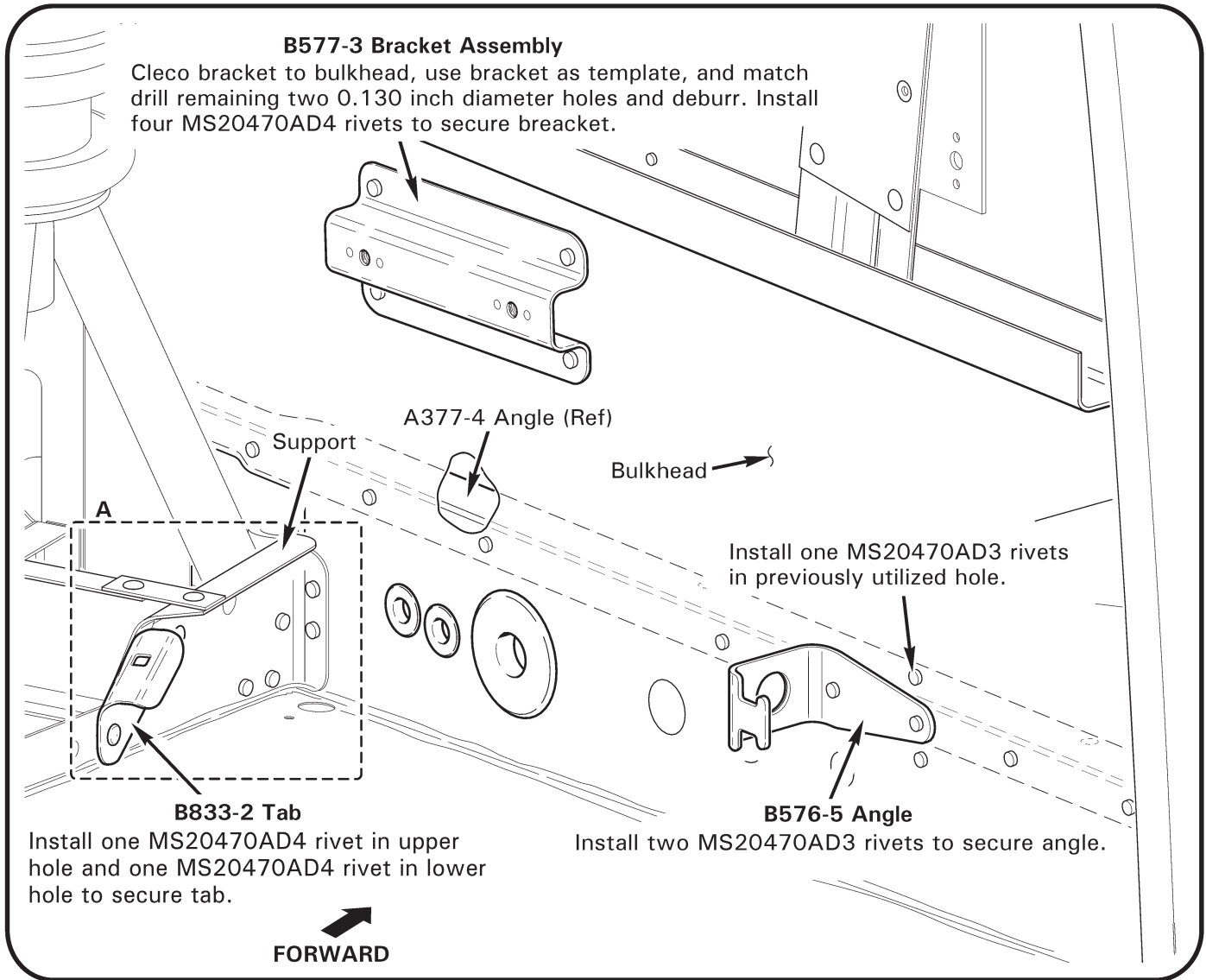
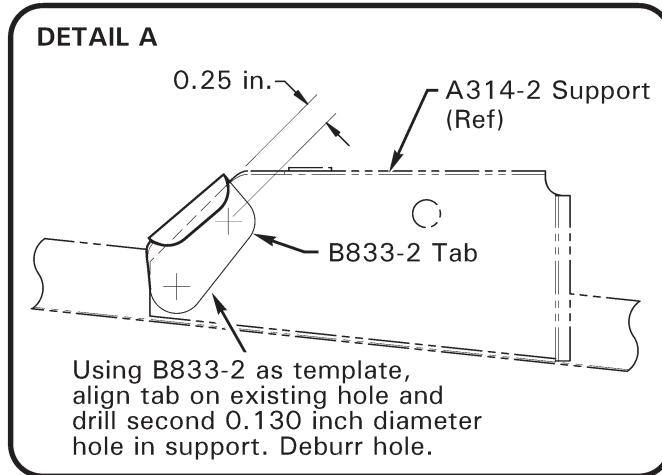


**FIGURE 1**

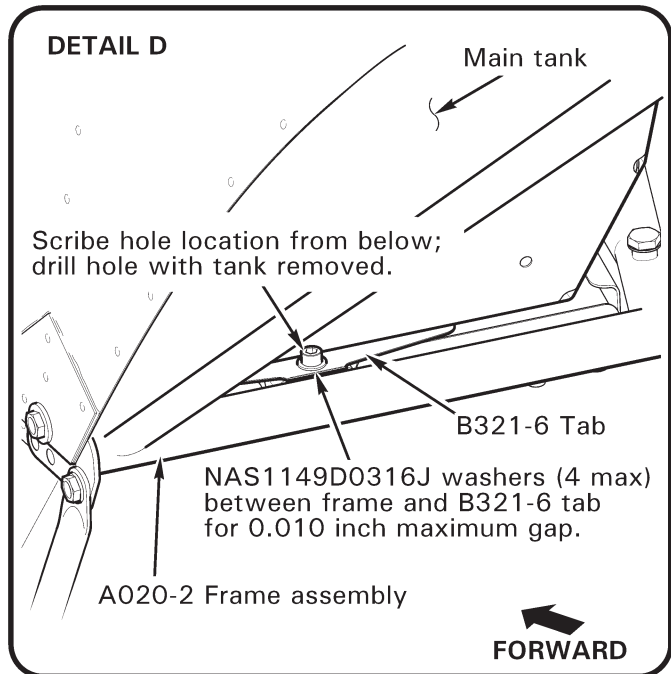
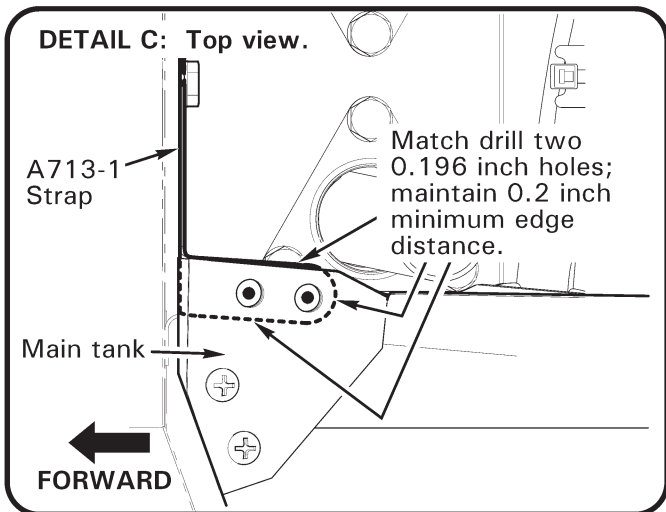
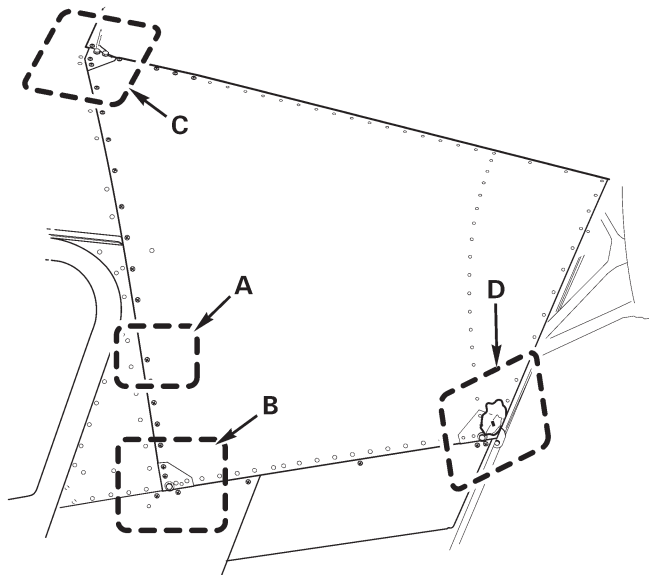
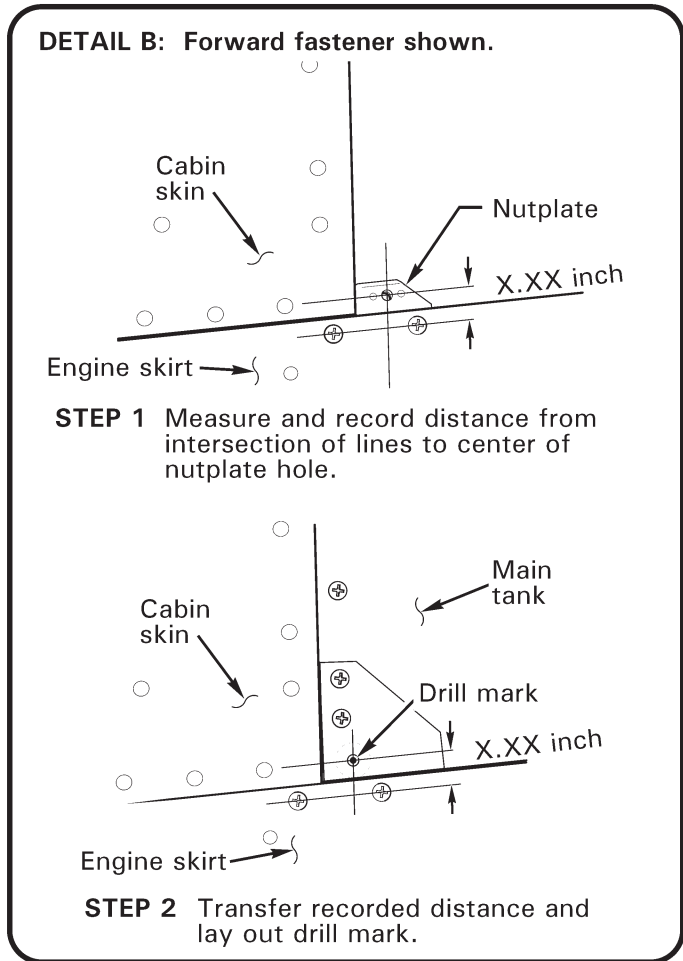
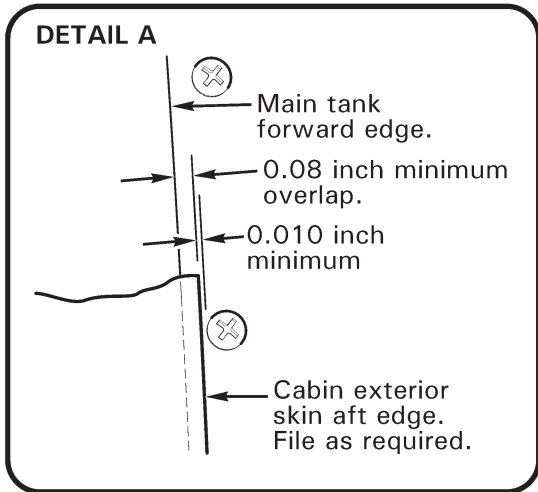




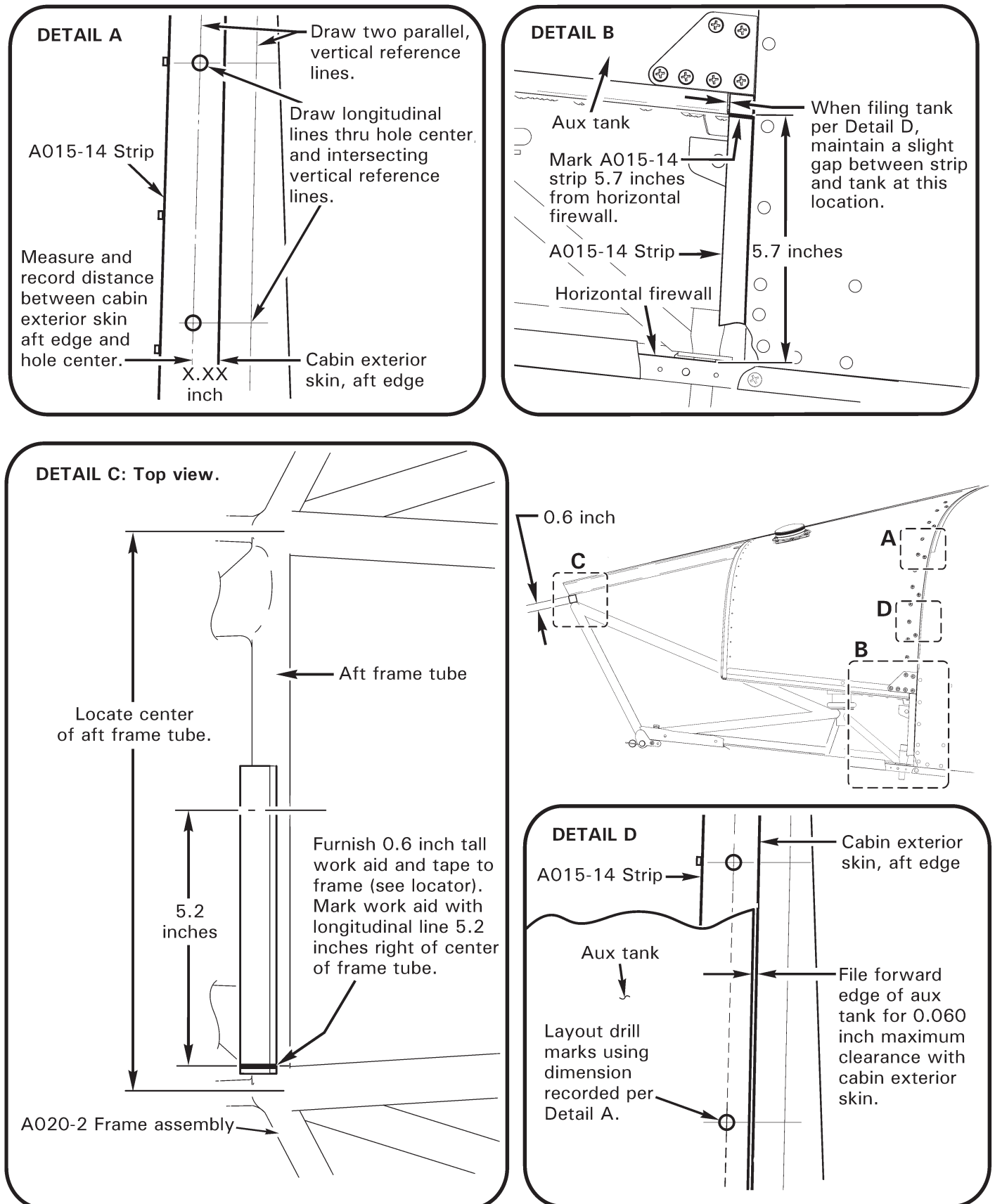
**FIGURE 2**



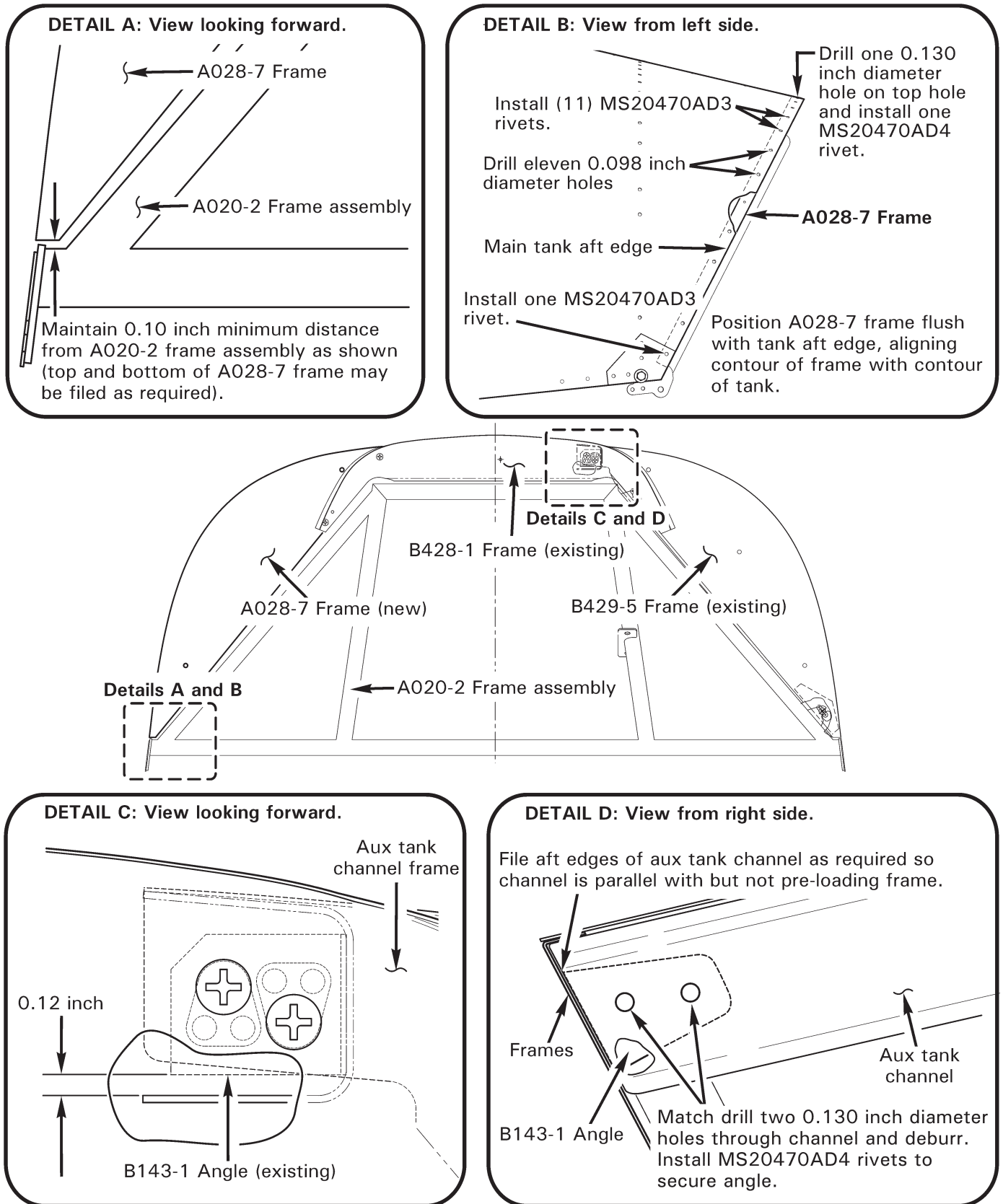
**FIGURE 3**



**FIGURE 4**



**FIGURE 5**



**FIGURE 6**

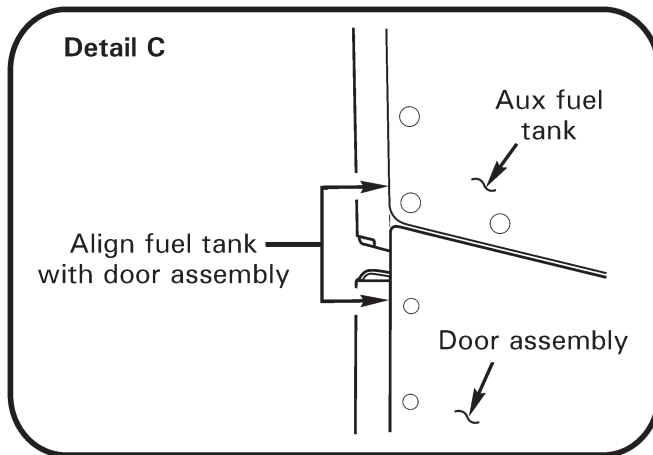
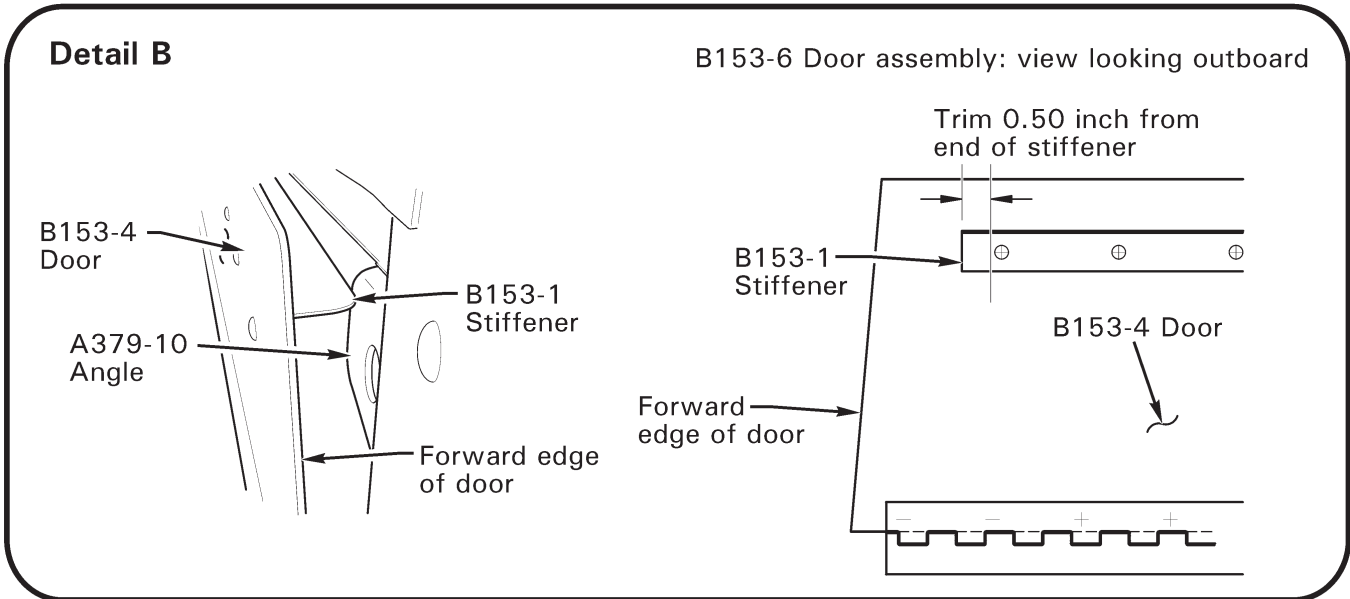
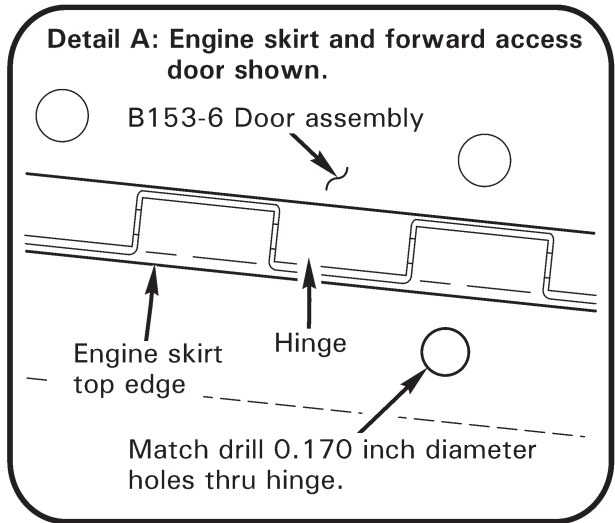
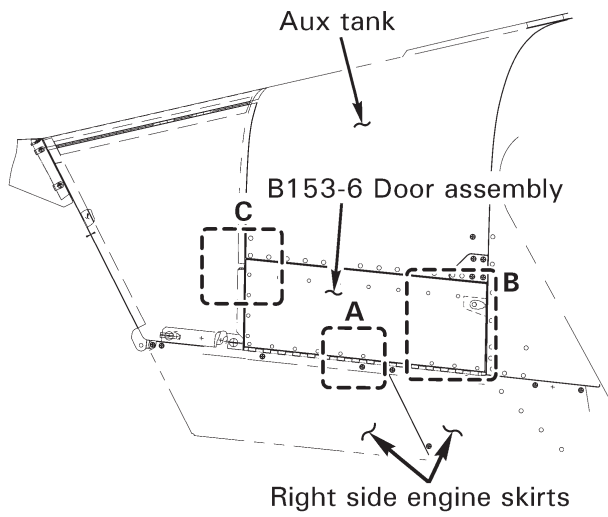
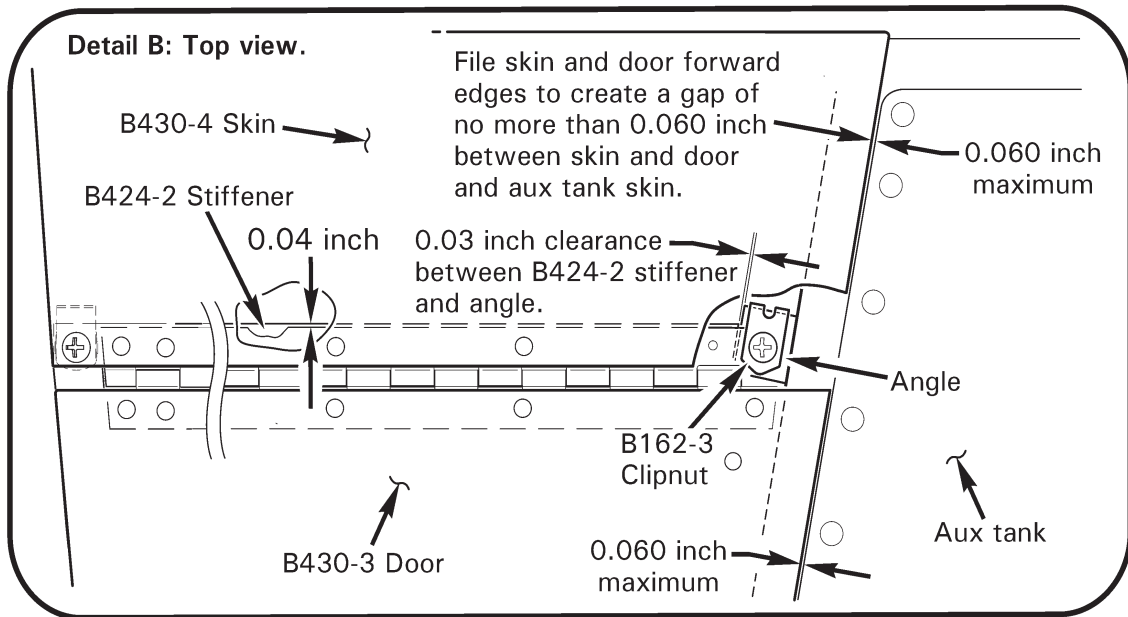
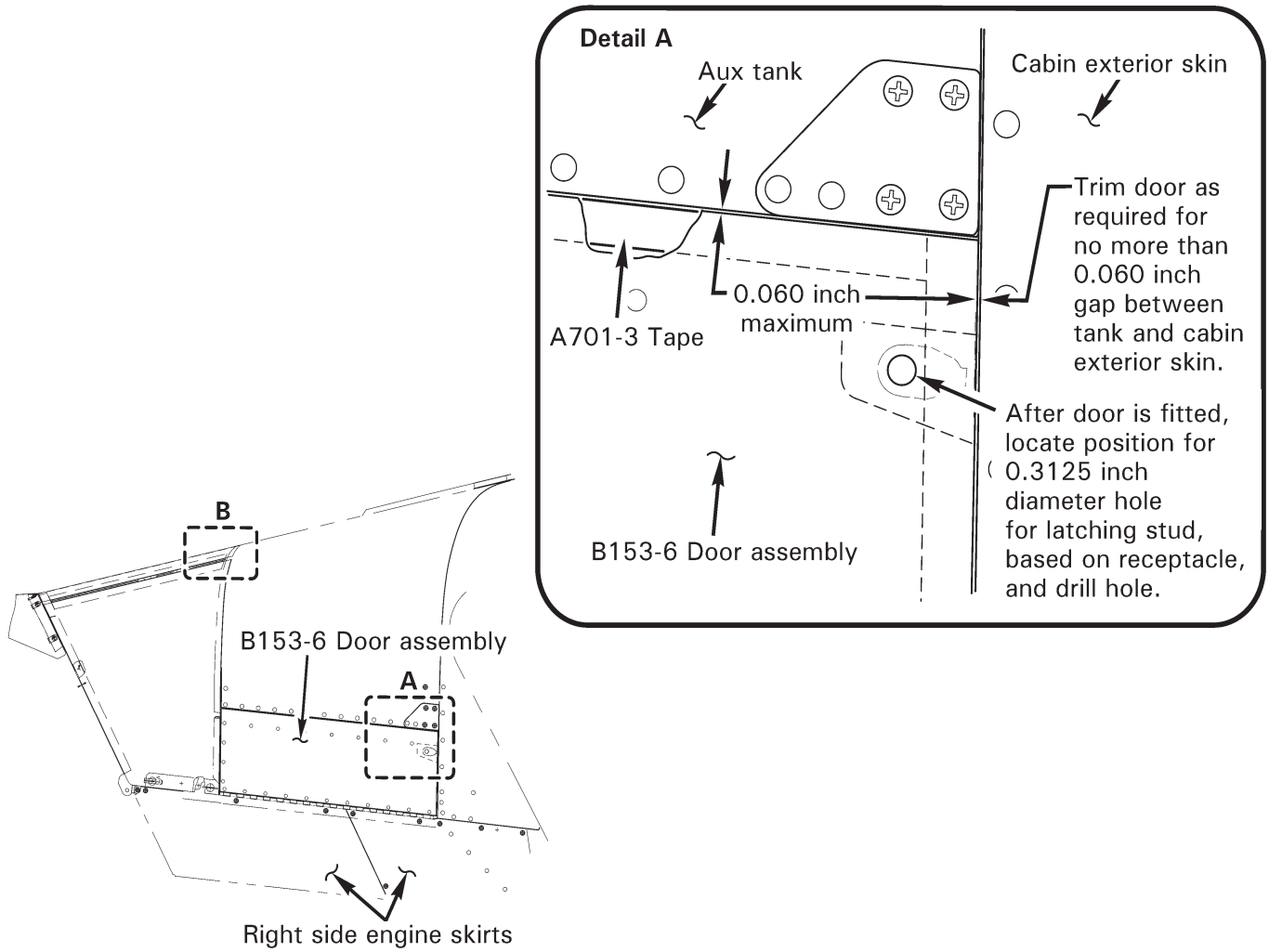
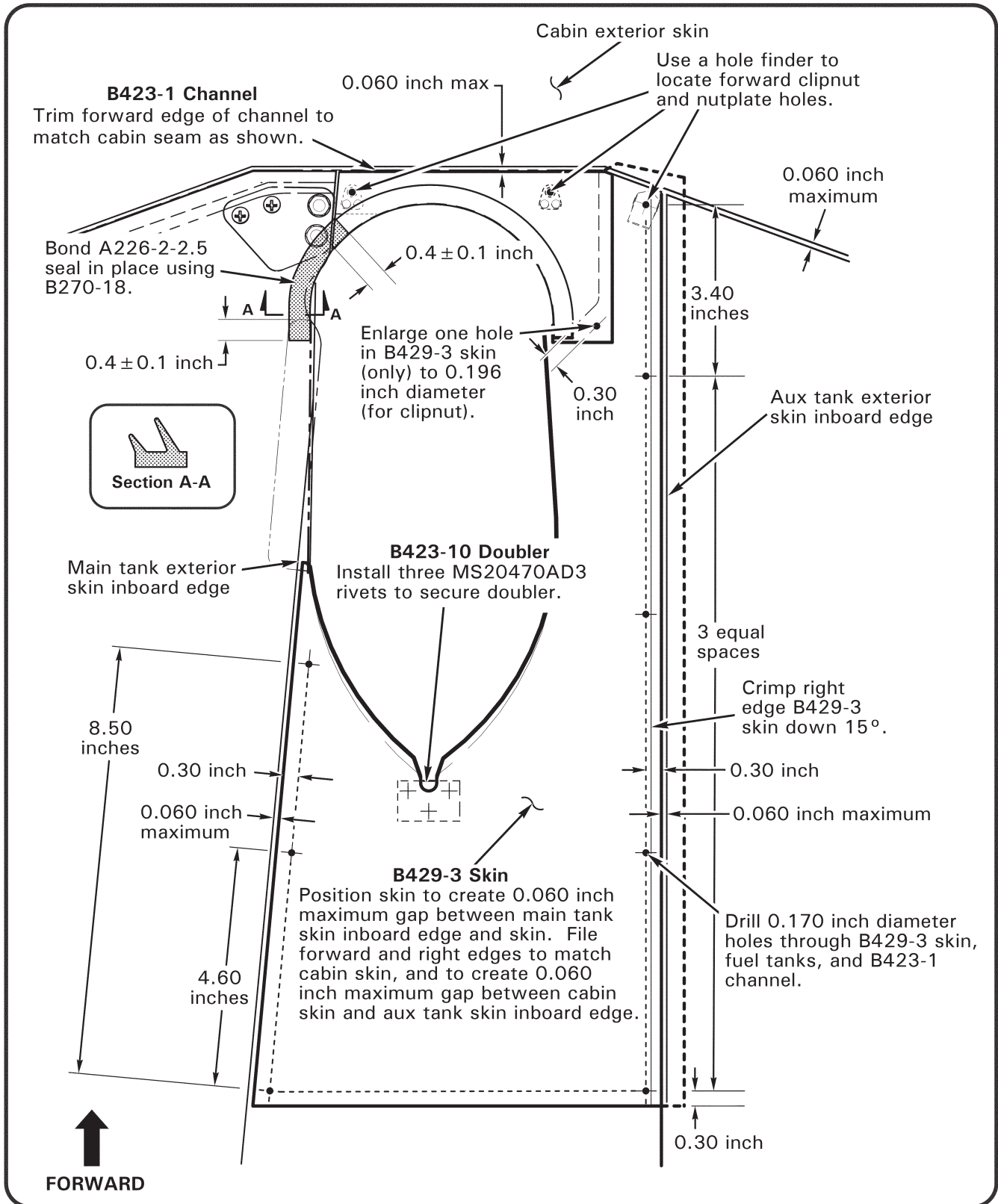


FIGURE 7

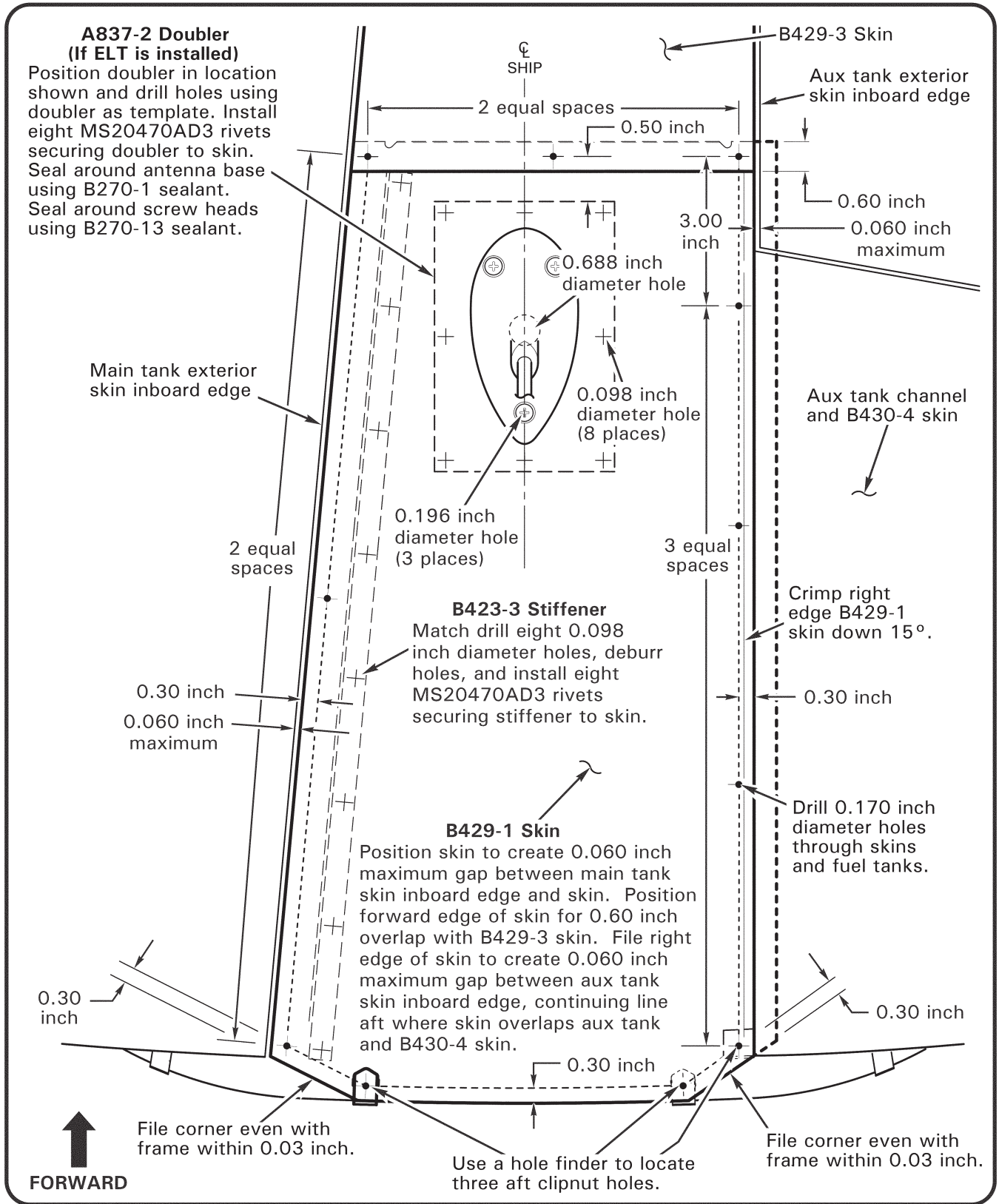


**FIGURE 8**

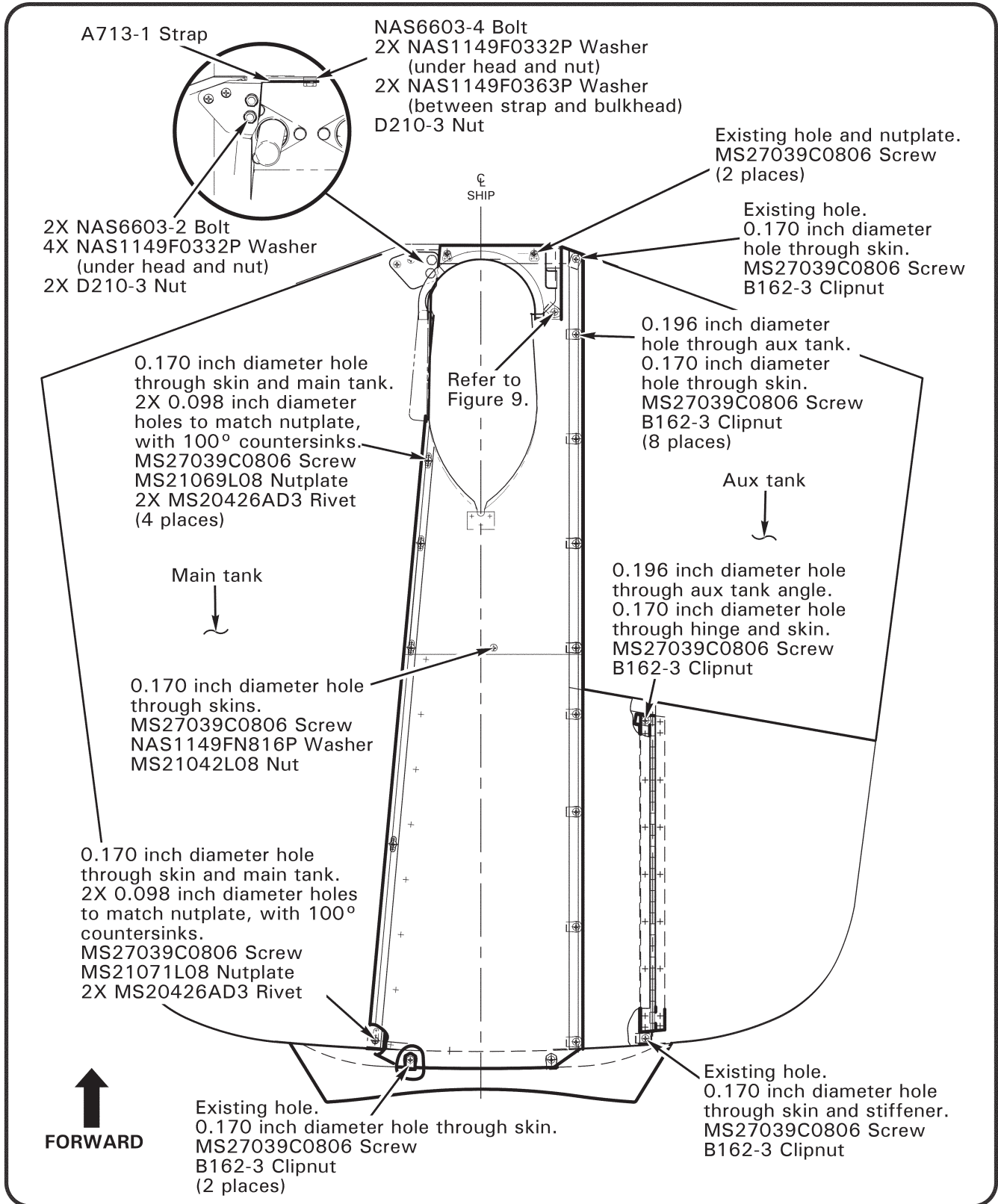


**FIGURE 9**

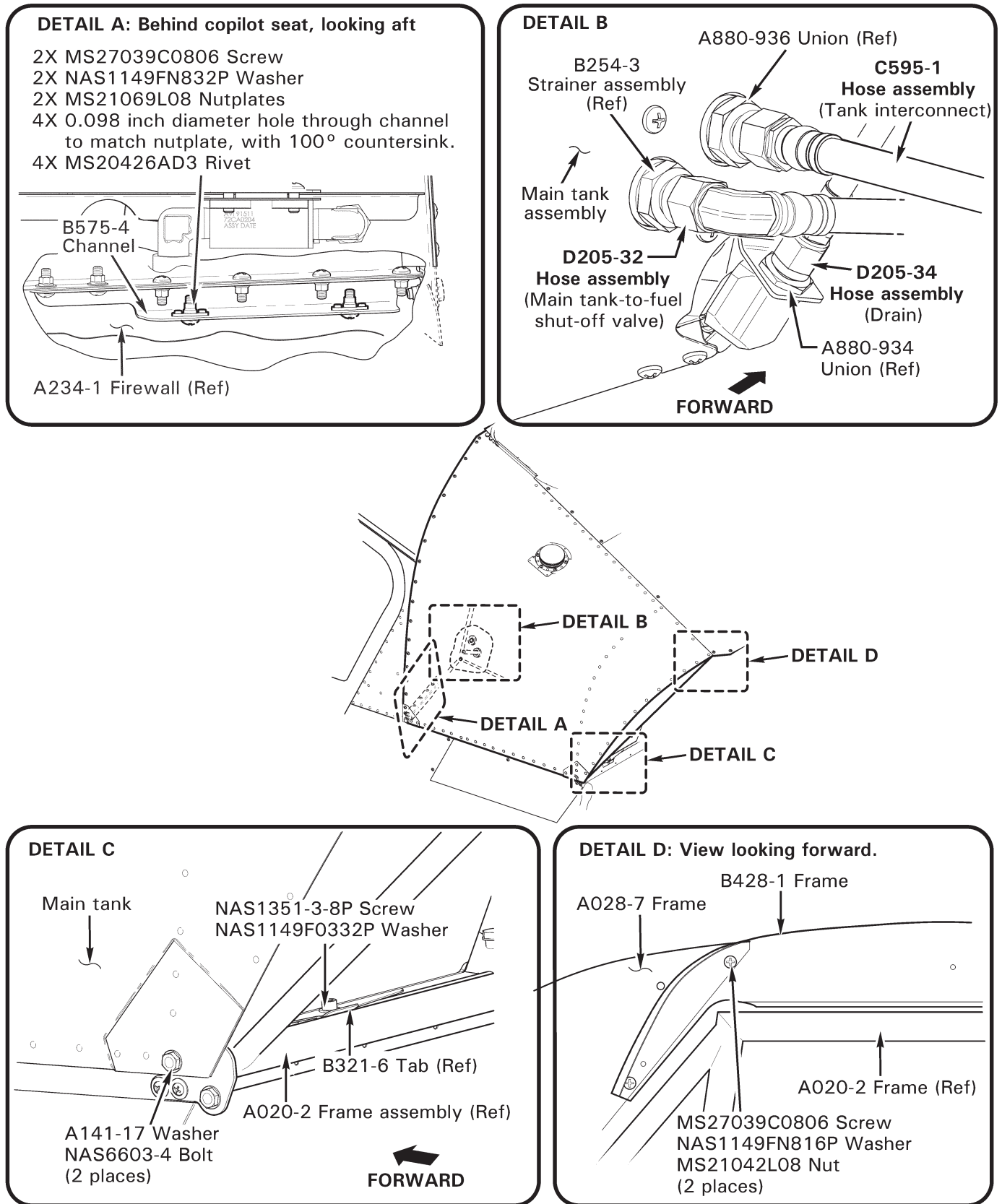




**FIGURE 10**



**FIGURE 11**



**FIGURE 12**

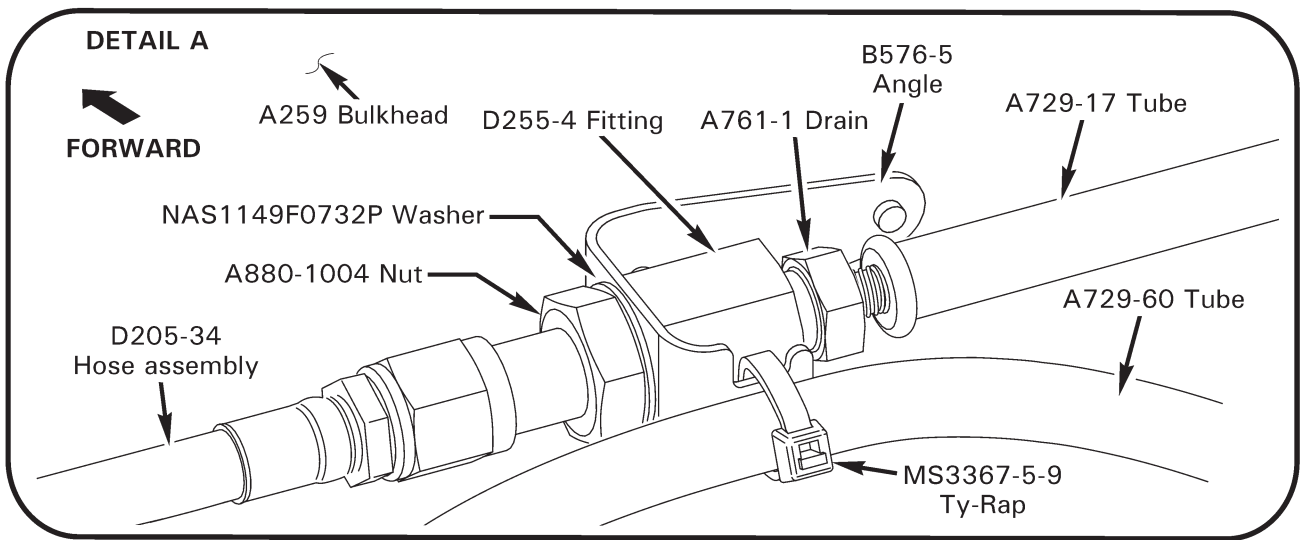
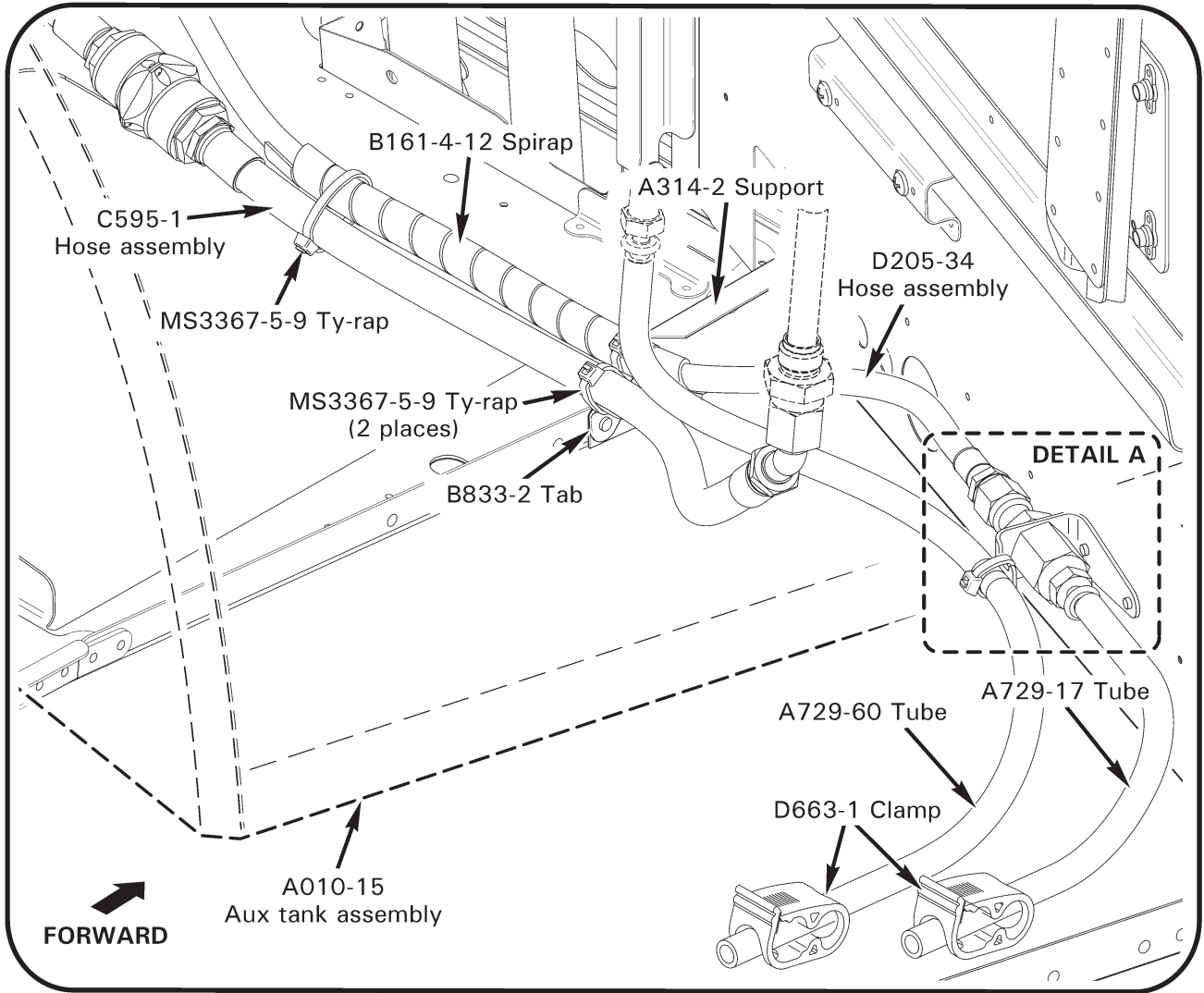
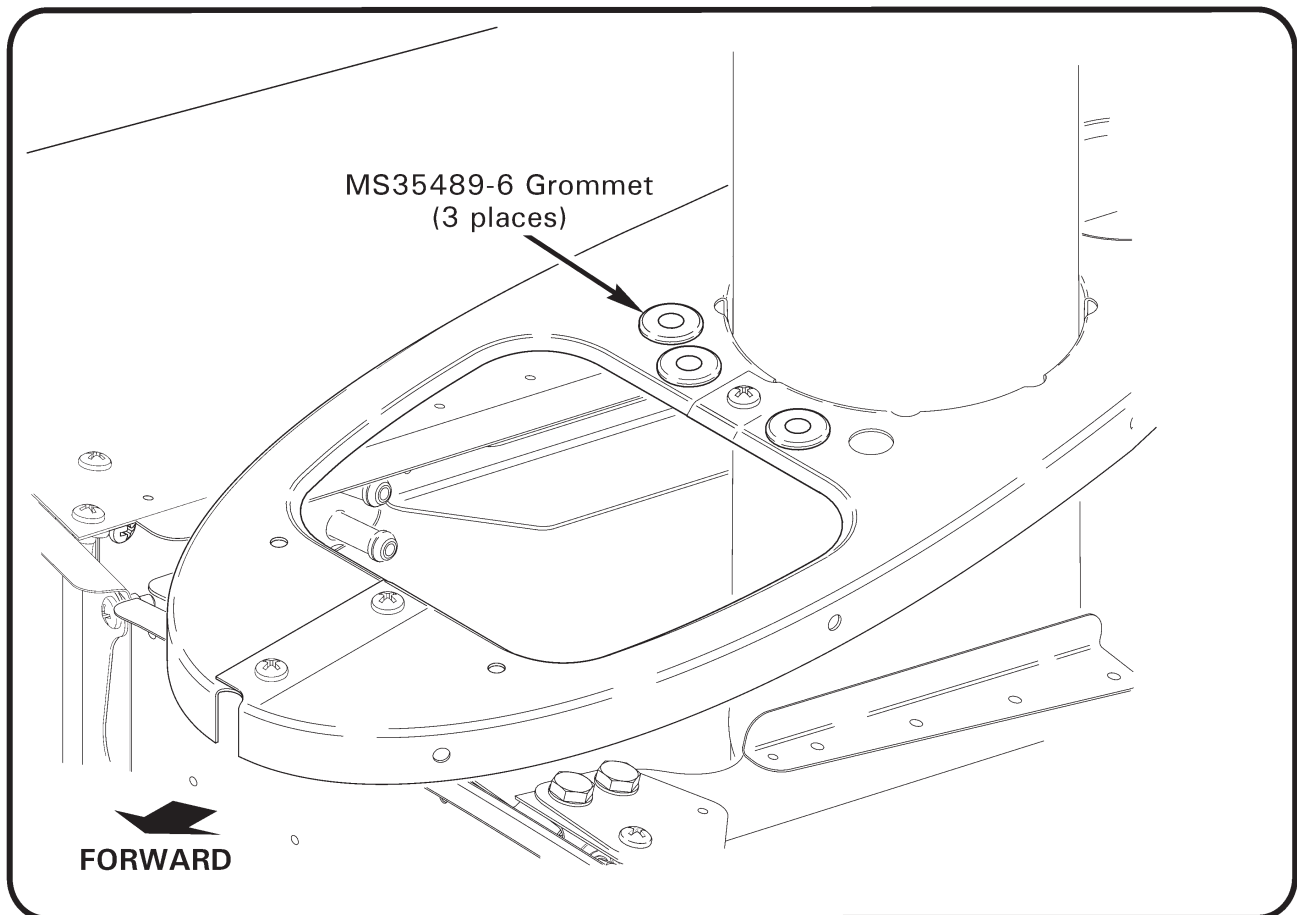
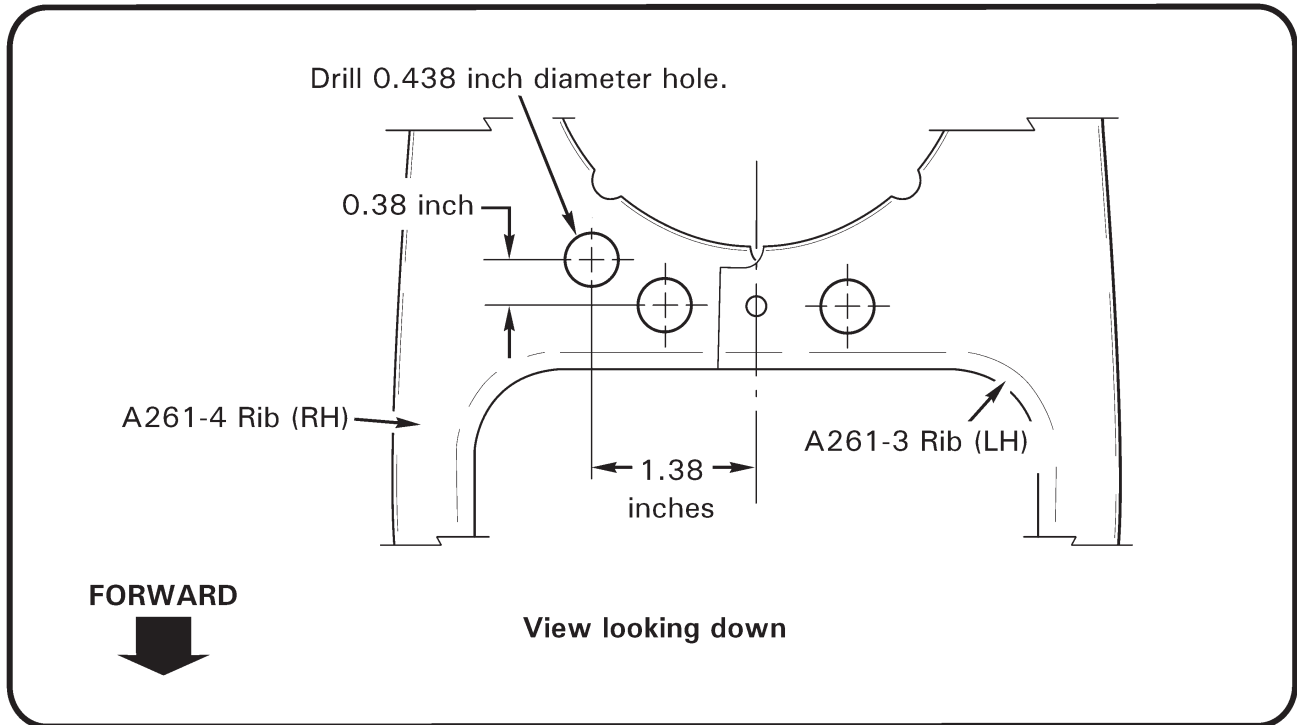
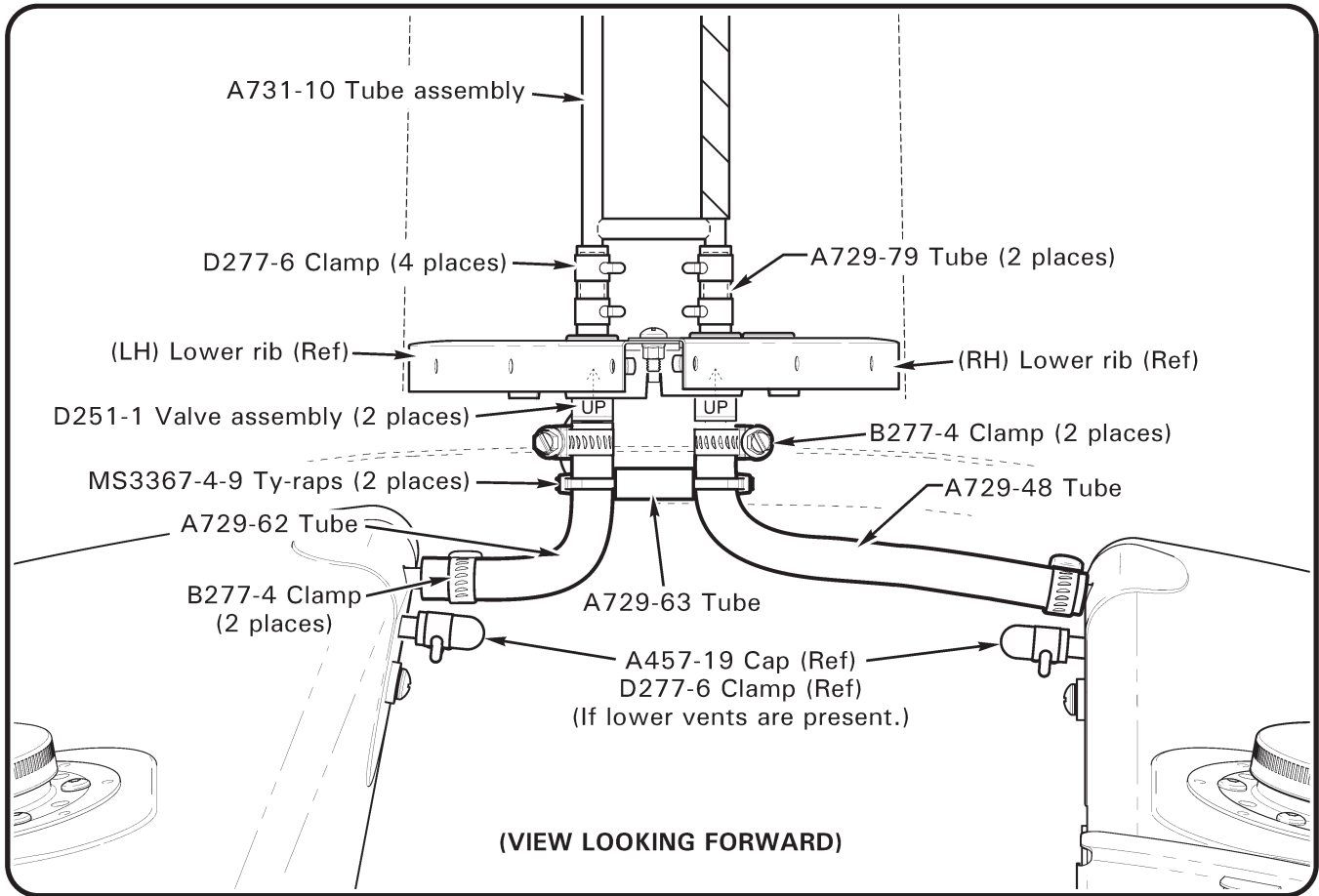
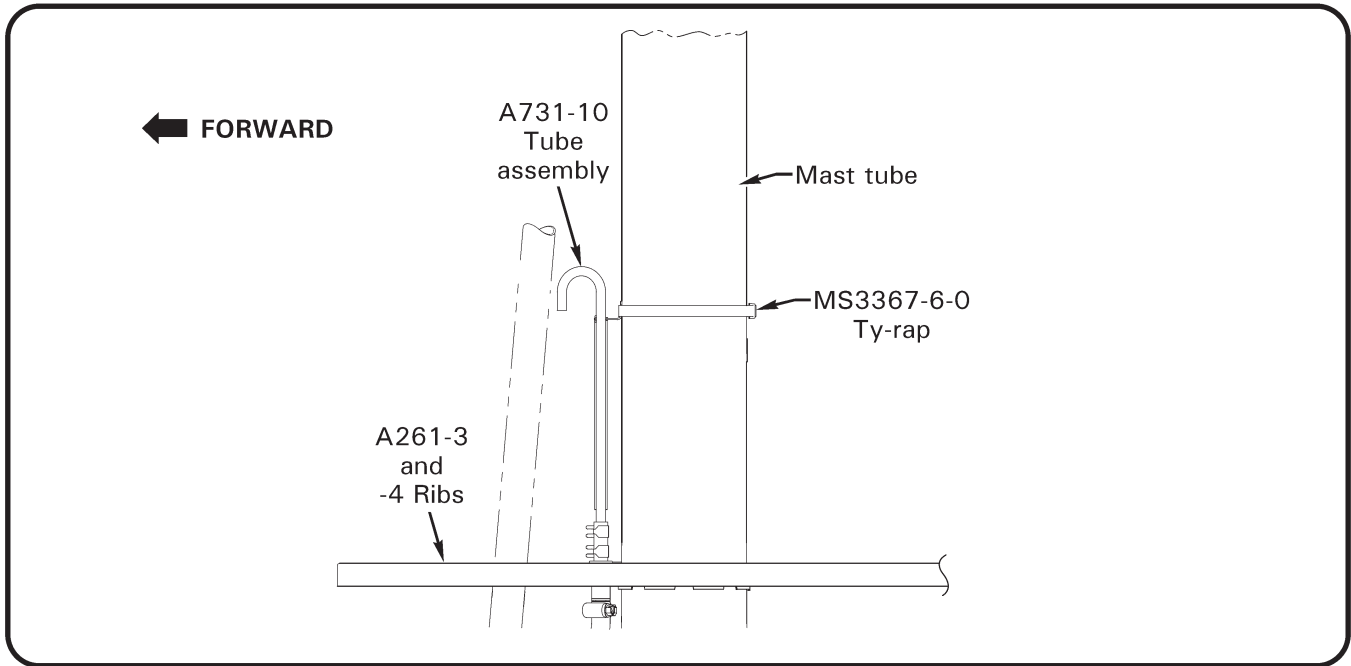


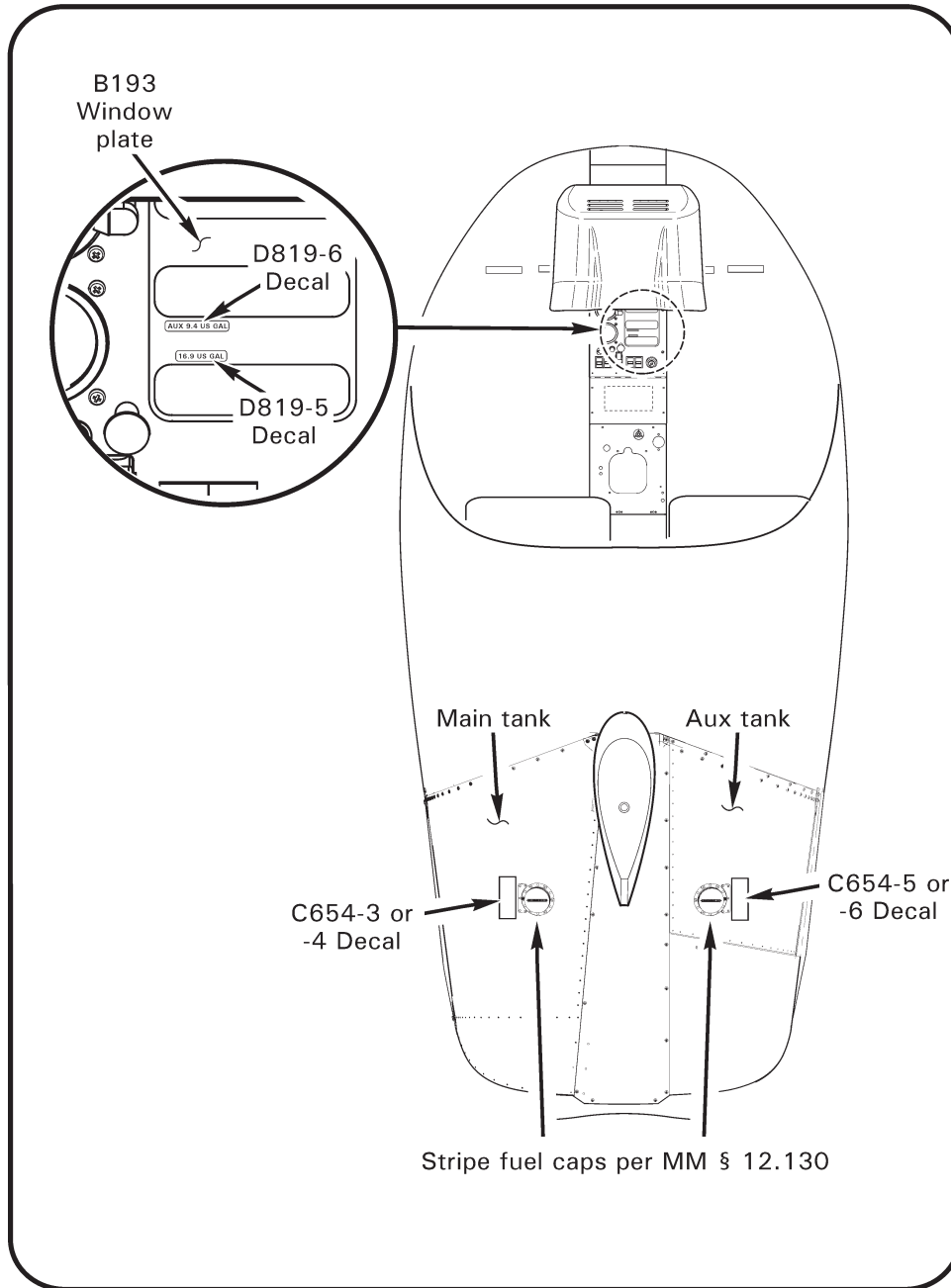
FIGURE 13



**FIGURE 14**



**FIGURE 15**



**FIGURE 16**

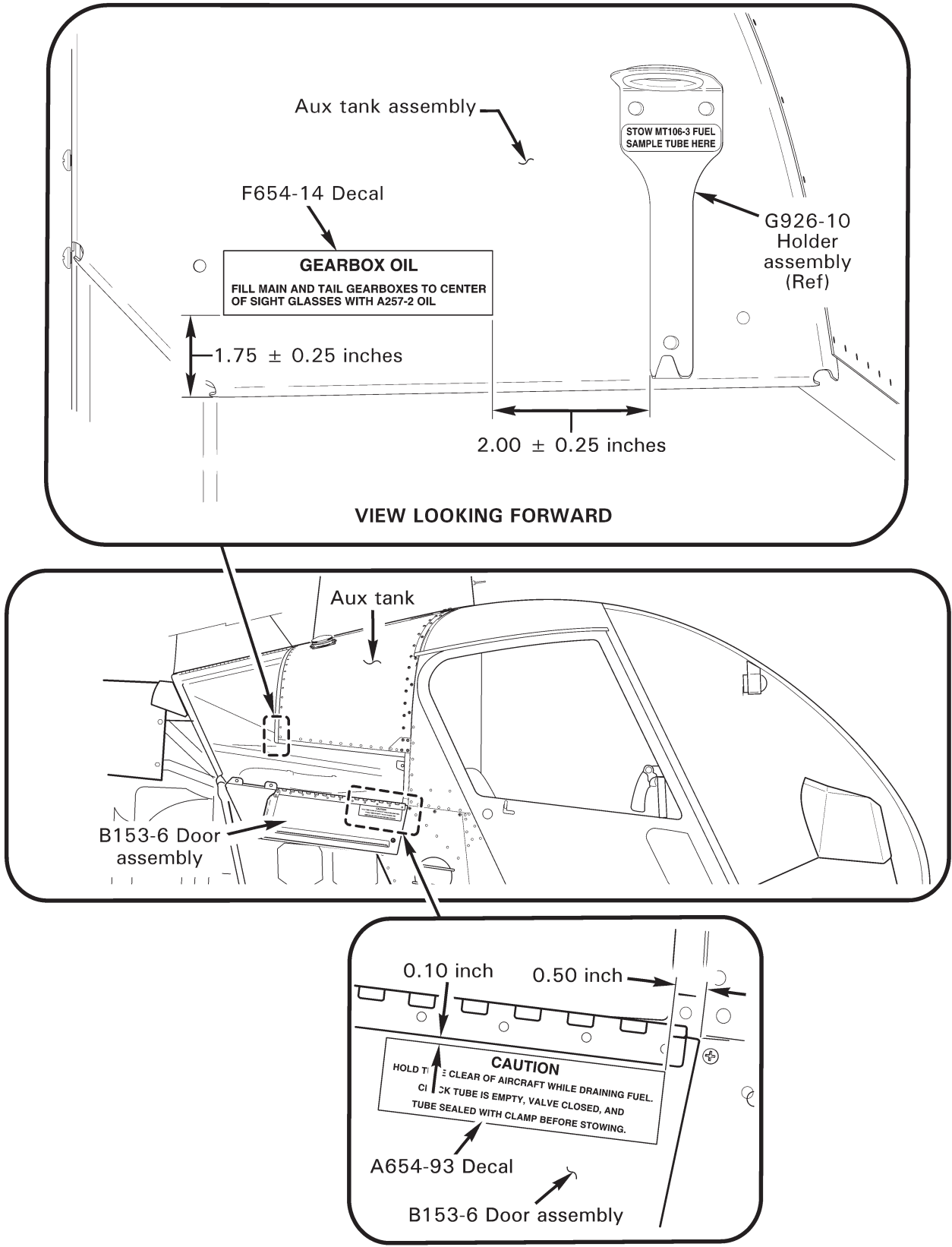


FIGURE 17