

SECTION 12

FUEL SYSTEM

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12-1. FUEL SYSTEM.

12-2. DESCRIPTION. Fuel is gravity-fed from a metal tank in the inboard section of each wing, through a selector valve and a fuel strainer, to the carburetor. Positive ventilation is provided by a vent line and check valve assembly located in the left wing tank and a crossover vent line connecting the two tanks together. The vent line from the check valve assembly extends overboard through the lower wing skin adjacent to the left wing strut. The strainer is equipped with a quick-drain valve which provides a means of draining trapped water and sediment from the fuel system.

12-3. PRECAUTIONS.

NOTE

There are certain general precautions and rules concerning the fuel system which should be observed when performing the operations and procedures in this section. These are as follows:

- During all fueling, defueling, tank purging, and

tank repairing or disassembly, ground the aircraft to a suitable ground stake.

- Residual fuel draining from lines and hose constitutes a fire hazard. Use caution to prevent the accumulation of fuel when lines or hose are disconnected.

- Cap open lines and cover connections to prevent thread damage and the entrance of foreign matter.

NOTE

Throughout the aircraft fuel system, from the fuel tanks to the carburetor, use NS-40 (RAS-4) (Snap-On Tools Corp., Kenosha, Wisconsin), MIL-T-5544 (Thread Compound Antiseize, Graphite Petrolatum), USP Petrolatum or engine oil as a thread lubricator or to seal a leaking connection. Apply sparingly to male threads only, omitting the first two threads, exercising extreme caution to avoid "stringing" sealer across the end of the fitting. Always ensure that a compound, the residue from a previously used compound, or any other foreign material cannot enter the system.

12-4. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
NO FUEL TO CARBURETOR.	Fuel selector valve not turned on.	Turn valve on.
	Fuel tanks empty.	Service with proper grade and amount of fuel.
	Fuel line disconnected or broken.	Connect or repair fuel lines.
	Inlet elbow or inlet screen in carburetor plugged.	Clean and/or replace.
	Fuel tank outlet strainers plugged.	Remove and clean strainers and flush out fuel tanks.
	Defective fuel selector valve.	Repair or replace selector valve.
	Plugged fuel strainer.	Remove and clean strainer and screen.
	Fuel line plugged.	Clean out or replace fuel line.
FUEL STARVATION AFTER STARTING.	Partial fuel flow from the preceding causes.	Use the preceding remedies.
	Plugged fuel vent.	See paragraph 12-13.
	Water in fuel.	Drain fuel tank sumps, fuel lines and fuel strainer.
NO FUEL QUANTITY INDICATION.	Open circuit.	Reset circuit breaker. Refer to Section 15.
	Fuel tanks empty.	Service with proper grade and amount of fuel.
	Loose connections or open circuit.	Tighten connections; repair or replace wiring. Refer to Section 20.
	Defective fuel quantity indicator or transmitter.	Refer to Section 15.
PRESSURIZED FUEL TANK.	Plugged bleed hole in fuel vent.	Check per paragraph 12-13.

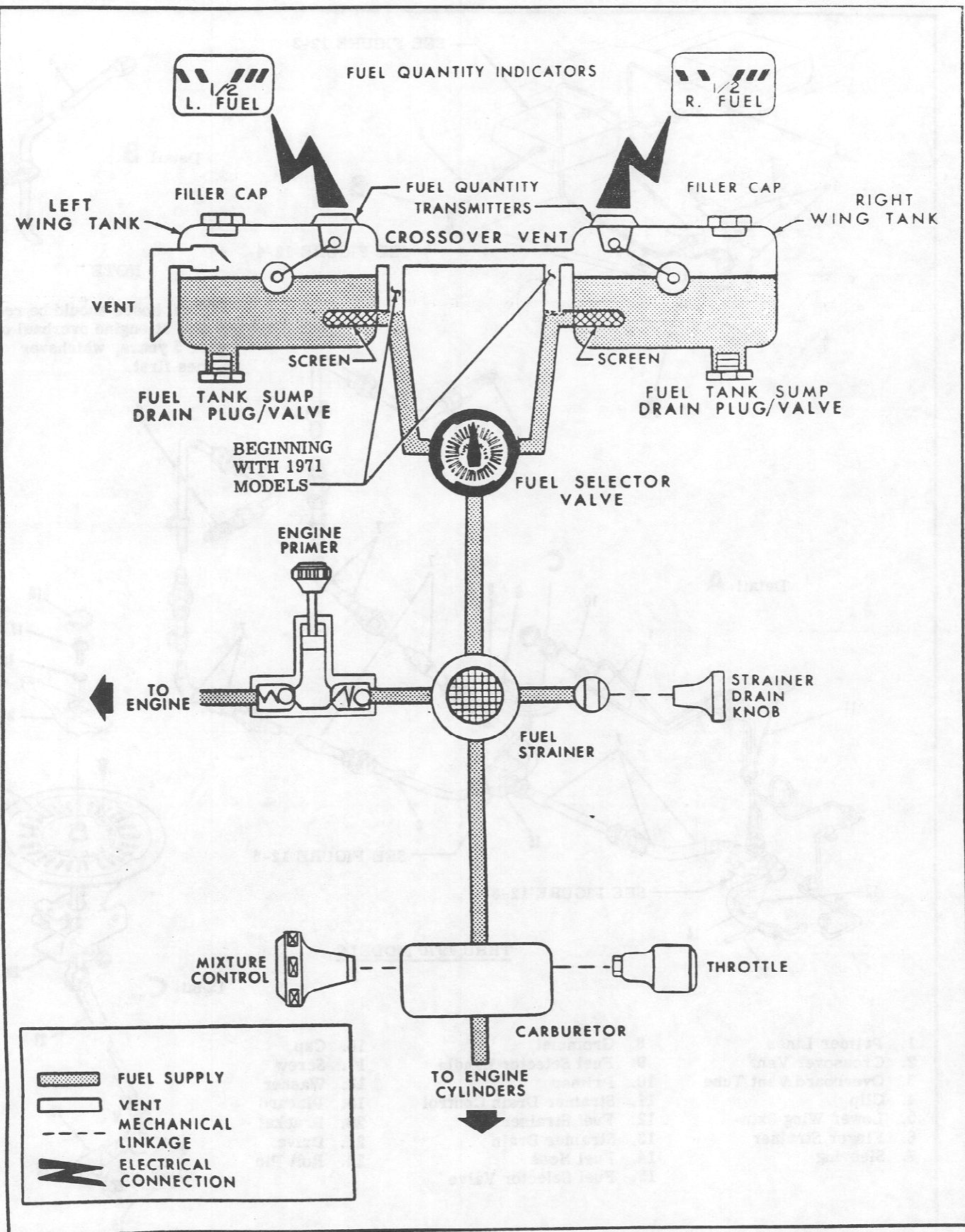


Figure 12-1. Fuel System Schematic

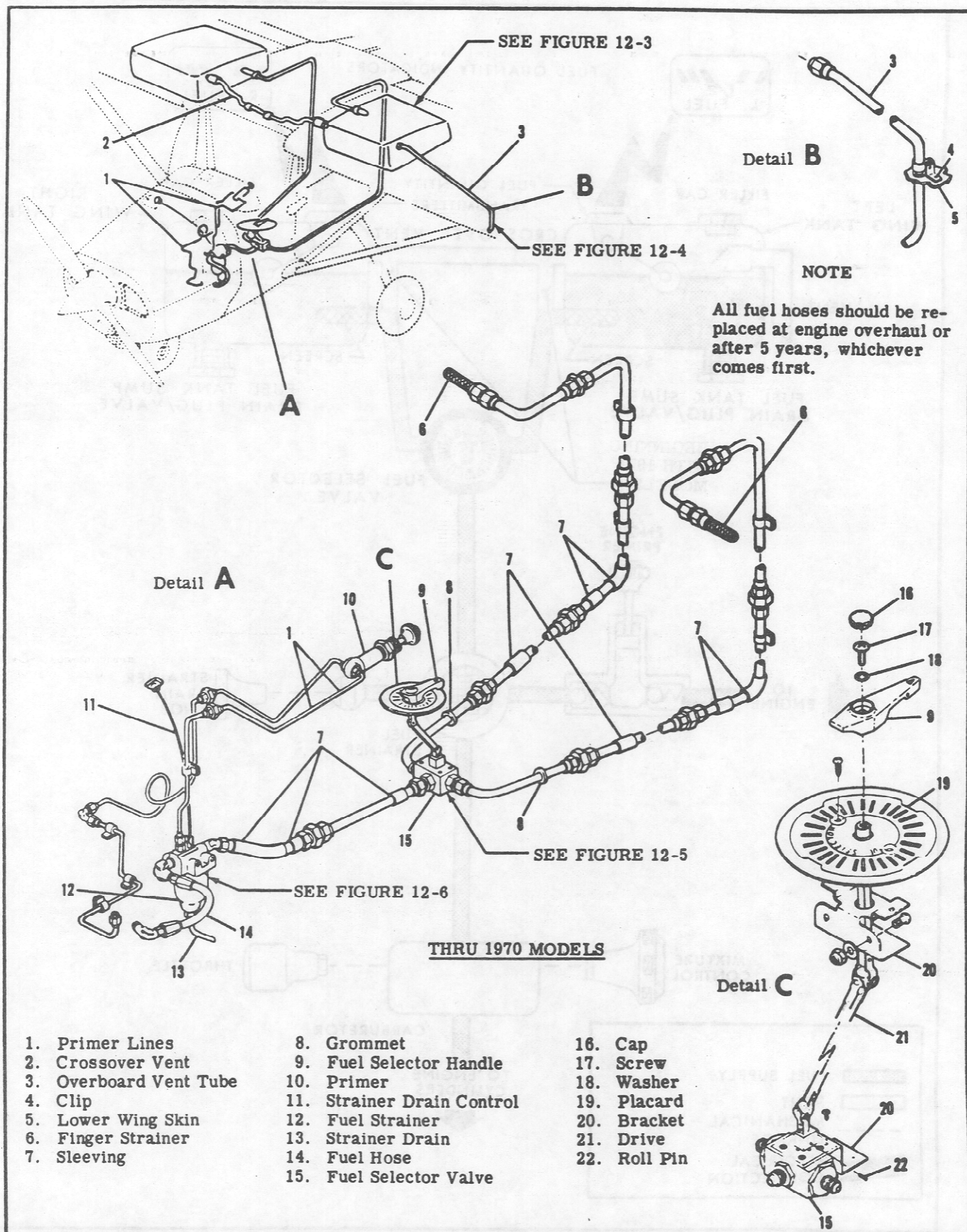


Figure 12-2. Fuel System (Sheet 1 of 2)

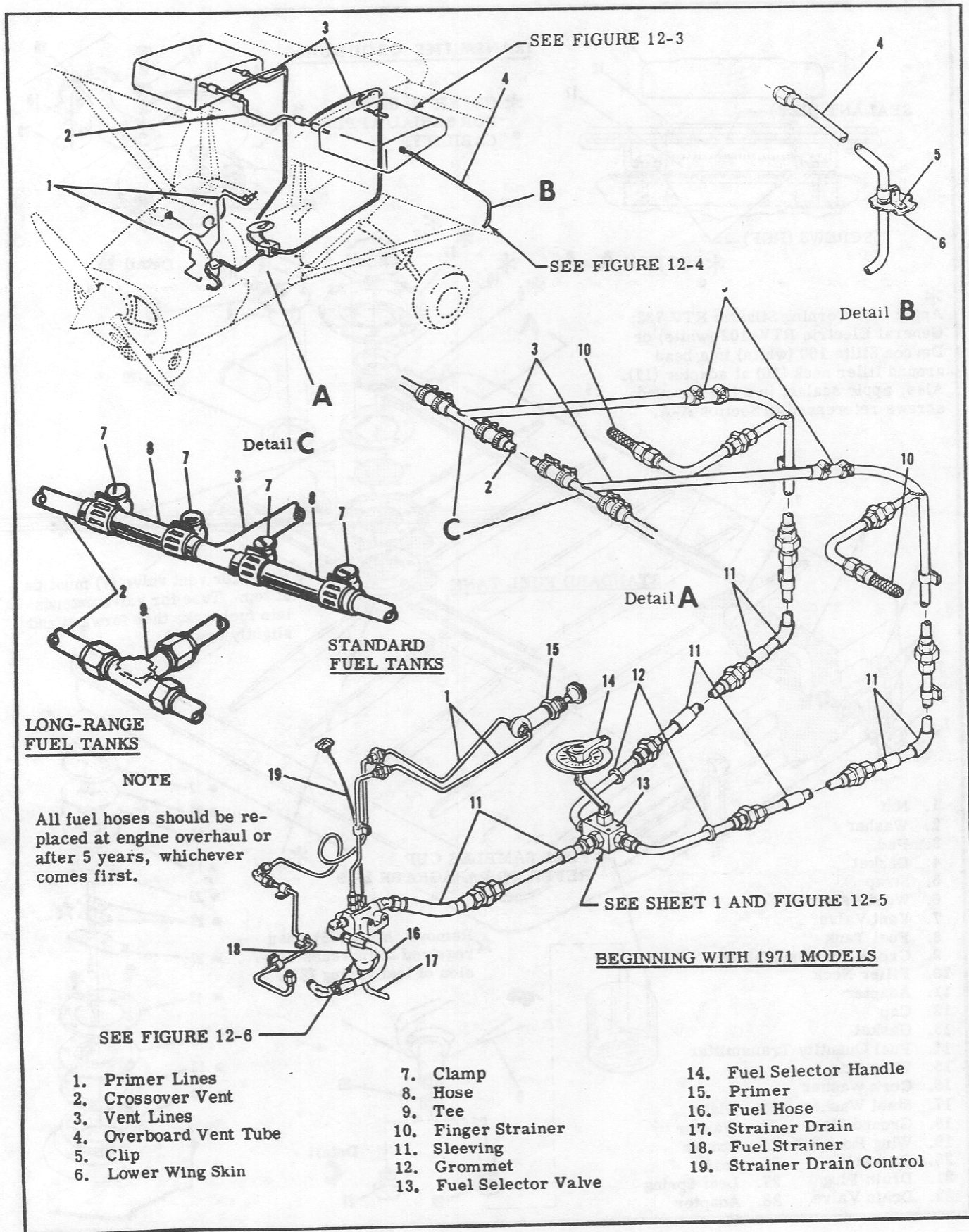


Figure 12-2. Fuel System (Sheet 2 of 2)

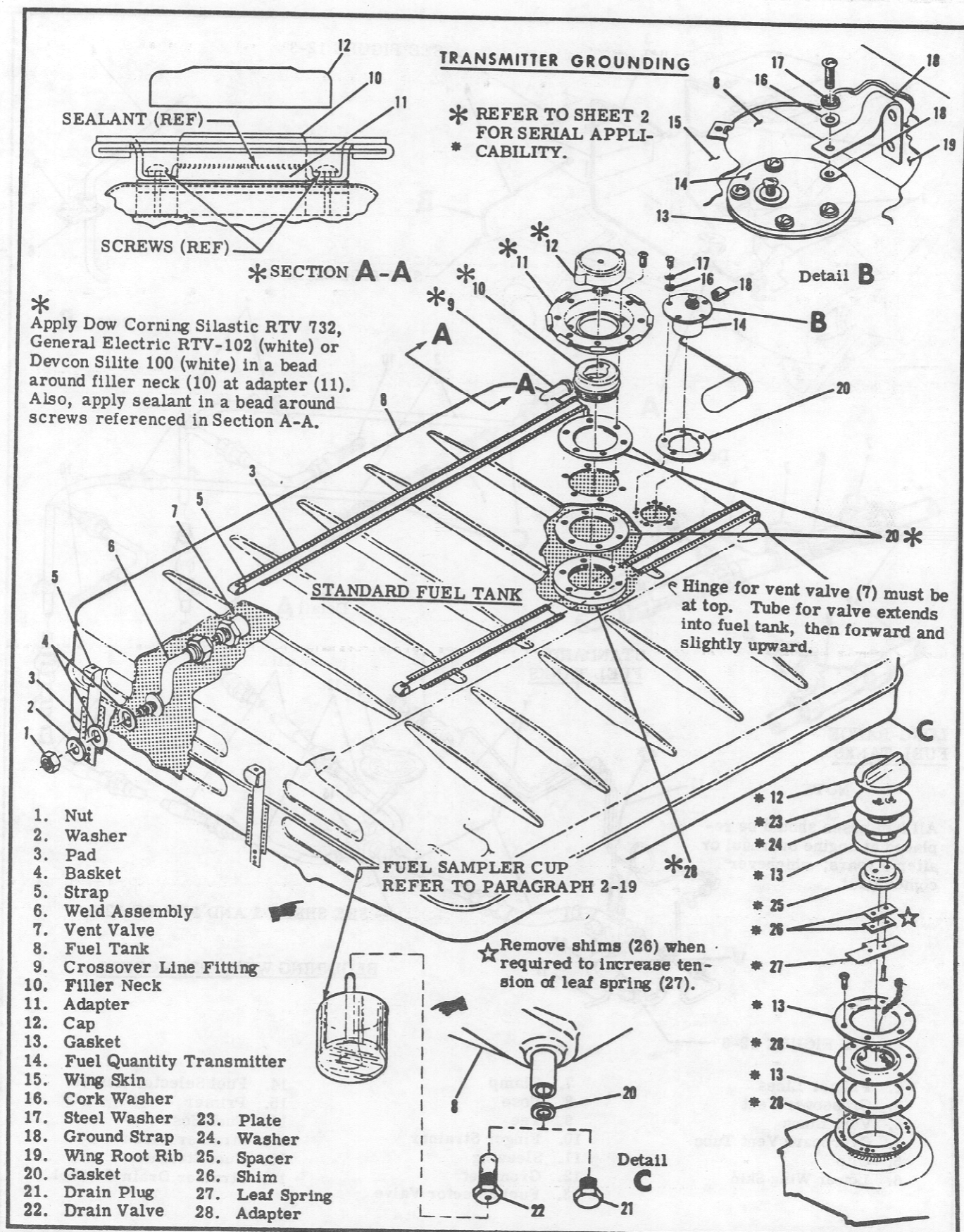
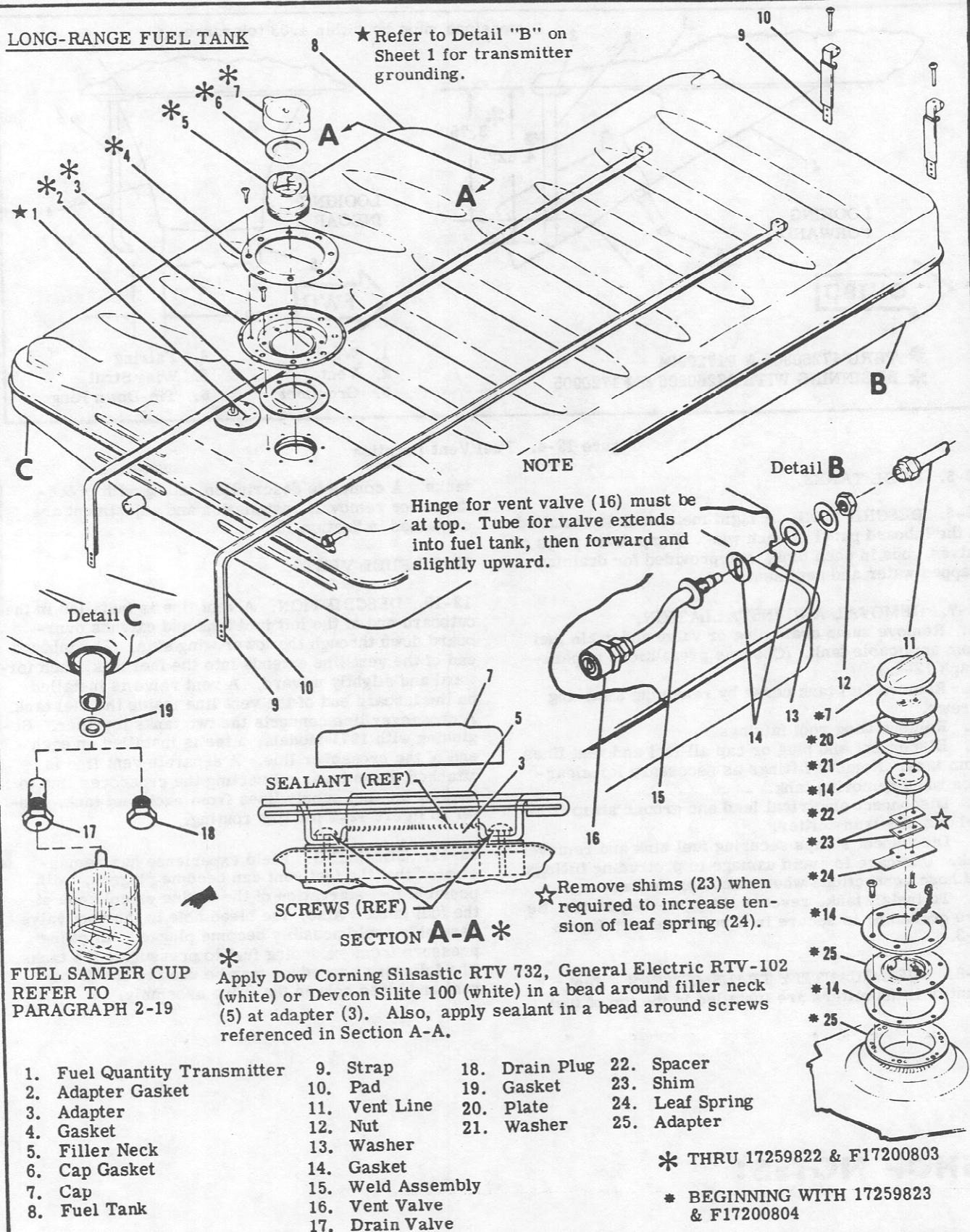


Figure 12-3. Fuel Tank (Sheet 1 of 2)

LONG-RANGE FUEL TANK

★ Refer to Detail "B" on Sheet 1 for transmitter grounding.



FUEL SAMPER CUP
REFER TO
PARAGRAPH 2-19

* Apply Dow Corning Silastic RTV 732, General Electric RTV-102 (white) or Devcon Silite 100 (white) in a bead around filler neck (5) at adapter (3). Also, apply sealant in a bead around screws referenced in Section A-A.

1. Fuel Quantity Transmitter
2. Adapter Gasket
3. Adapter
4. Gasket
5. Filler Neck
6. Cap Gasket
7. Cap
8. Fuel Tank

9. Strap
10. Pad
11. Vent Line
12. Nut
13. Washer
14. Gasket
15. Weld Assembly
16. Vent Valve
17. Drain Valve

18. Drain Plug
19. Gasket
20. Plate
21. Washer
22. Spacer
23. Shim
24. Leaf Spring
25. Adapter

* THRU 17259822 & F17200803

* BEGINNING WITH 17259823
& F17200804

Figure 12-3. Fuel Tank (Sheet 2 of 2)

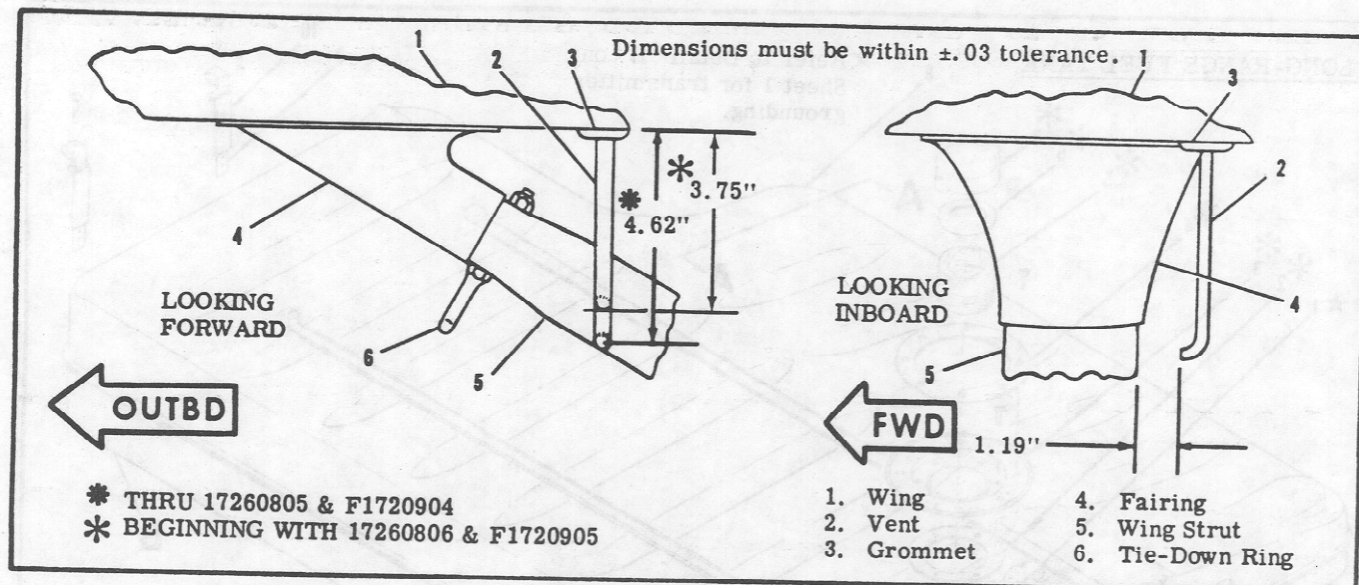


Figure 12-4. Fuel Vent Location

12-5. FUEL TANKS.

12-6. DESCRIPTION. A rigid metal tank is installed in the inboard panel of each wing. Sump drain plugs or valves, one in each tank, are provided for draining trapped water and sediment.

12-7. REMOVAL AND INSTALLATION.

a. Remove sump drain plug or valve and drain fuel from applicable tank. (Observe precautions in paragraph 12-3.)

b. Remove fuel tank cover by removing attaching screws.

c. Remove wing root fairings.

d. Disconnect and plug or cap all fuel and vent lines from tank. Remove fittings as necessary for clearance when removing tank.

e. Disconnect electrical lead and ground strap from fuel quantity transmitter.

f. Disconnect straps securing fuel tank and remove tank. Use care to avoid damage to protruding fittings and hose connections when removing the tank.

g. To install tank, reverse the preceding steps. Be sure grounding is secure in accordance with figure 12-3.

12-8. FUEL QUANTITY TRANSMITTERS. Fuel quantity transmitters are installed in the top of fuel

tanks. A complete description, along with procedures for removal, installation and adjustment are contained in Section 15.

12-9. FUEL VENTS.

12-10. DESCRIPTION. A vent line is installed in the outboard end of the left fuel tank and extends overboard down through the lower wing skin. The inboard end of the vent line extends into the fuel tank, then forward and slightly upward. A vent valve is installed on the inboard end of the vent line inside the fuel tank. A crossover line connects the two tanks together. Beginning with 1971 Models, a tee is installed on each end of the crossover line. A separate vent line is attached to the tees, connecting the crossover line to each of the fuel supply lines from each fuel tank. Refer to figure 12-2 for line routing.

12-11. CHECKING. Field experience has demonstrated that the fuel vent can become plugged, with possible fuel starvation of the engine or collapse of the fuel tanks. Also, the bleed hole in the vent valve assembly could possibly become plugged, allowing pressure from expanding fuel to pressurize the tanks. The following procedure may be used to check the vent and bleed hole in the valve assembly.

SHOP NOTES:

- a. Attach a rubber tube to the end of vent line beneath the wing.
- b. Blow into tube to slightly pressurize tank. If air can be blown into tank, vent line is open.
- c. After tank is slightly pressurized, insert end of rubber tube into a container of water and watch for a continuous stream of bubbles, which indicates the bleed hole in valve assembly is open and relieving pressure.
- d. After completion of step "c", blow into tube again to slightly pressurize the tank, and loosen, but do not remove filler cap on opposite wing to check tank crossover line. If pressure escapes from filler cap, crossover line is open.

NOTE

Remember that a plugged vent line or bleed hole can cause either fuel starvation and collapsing of fuel tanks or the pressurization of tanks by fuel expansion.

- e. Any fuel vent found plugged or restricted must be corrected prior to returning aircraft to service.

NOTE

The fuel vent line protruding beneath the wing near the wing strut must be correctly aligned to avoid possible icing of the vent tube. Dimensions are shown in figure 12-4.

12-12. FUEL SELECTOR VALVE.

12-13. DESCRIPTION. A four position fuel selector valve is located between the pilot and copilot positions on the pedestal. The positions on the valve are labeled "OFF, LEFT, BOTH ON and RIGHT." Valve repair consists of replacement of seals, springs, balls and other detail parts. Figure 12-5 illustrates the proper relationship of parts and may be used as a guide during disassembly and assembly.

12-14. REMOVAL AND INSTALLATION. (See figure 12-2.)

- a. Completely drain all fuel from wing tanks, fuel strainer, lines and selector valve. (Observe precautions in paragraph 12-3.)
- b. Remove selector valve handle.
- c. Remove pedestal cover.
- d. Remove carpeting as necessary to gain access to plates aft of pedestal.
- e. Disconnect handle drive shaft from valve.
- f. Disconnect and cap or plug all fuel lines at valve.
- g. Remove screws attaching valve to bracket and remove valve.

- h. Reverse the preceding steps for installation. Prior to installing access plates, service fuel tanks and check for leaks.

12-15. FUEL STRAINER. (See figure 12-6.)

12-16. DESCRIPTION. The fuel strainer is mounted at the firewall in the lower engine compartment. The strainer is equipped with a quick-drain valve which provides a means of draining trapped water and sediment from the fuel system. The quick-drain control is located adjacent to the oil dipstick and is accessible through the oil dipstick door in the upper engine cowl.

NOTE

The fuel strainer can be disassembled, cleaned and reassembled without removing the assembly from the aircraft. (Refer to paragraph 12-18.)

12-17. REMOVAL AND INSTALLATION. (See figure 12-6.)

- a. Remove cowling as necessary to gain access to strainer.
- b. With selector valve in "OFF" position, drain fuel from strainer and lines with strainer quick-drain control.
- c. Disconnect and cap or plug all fuel lines and controls from strainer. (Observe precautions in paragraph 12-3.)
- d. Remove bolts attaching assembly to firewall and remove strainer.
- e. Reverse the preceding steps for installation. With selector valve in "ON" position check for leaks and proper operation of quick-drain valve.

12-18. DISASSEMBLY AND ASSEMBLY. (See figure 12-6.)

- a. With selector valve in "OFF" position, drain fuel from bowl and lines with quick-drain control.
- b. Remove drain tube, safety wire, nut and washer at bottom of filter bowl and remove bowl.
- c. Carefully unscrew standpipe and remove.
- d. Remove filter screen and gasket. Wash filter screen and bowl with solvent (Federal Specification P-S-661, or equivalent) and dry with compressed air.
- e. Using a new gasket between filter screen and top assembly, install screen and standpipe. Tighten standpipe only finger tight.
- f. Using all new O-rings, install bowl. Note that step-washer at bottom of bowl is installed so that step seats against O-ring. Connect drain tube.
- g. With selector valve in "ON" position, check for leaks and proper operation of quick-drain valve.
- h. Safety wire bottom nut to top assembly. Wire must have right hand wrap, at least 45 degrees.

SHOP NOTES:

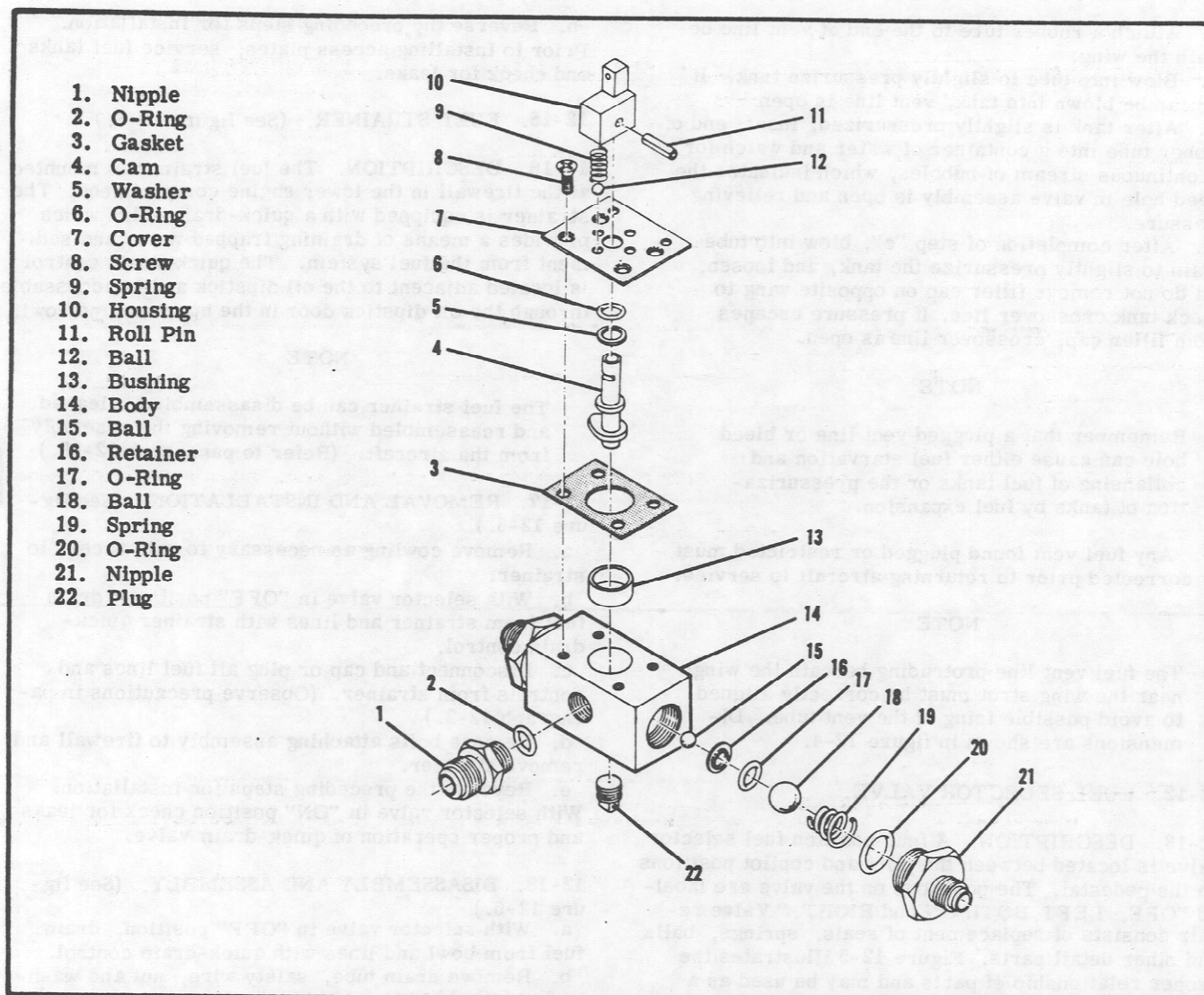


Figure 12-5. Fuel Selector Valve

12-19. PRIMING SYSTEM. (See figure 12-2.)

12-20. DESCRIPTION. The model 172-Series, equipped with a "Blue Streak" (Lycoming) engine, employs a standard manually-operated priming system which primes one cylinder. Fuel is supplied by a line from the strainer to the plunger-type primer. Operating the primer delivers fuel to the intake port of the cylinder. A three-cylinder priming system is available as optional equipment. Operating the primer on this optional system delivers fuel to the intake port of each individual cylinder except No. 3. The F172-Series, equipped with the O-300-D Continental engine, manufactured under license by Rolls Royce, employs a standard manually-operated primer system. Operating the primer delivers fuel to the right-hand side of the intake manifold just above the carburetor.

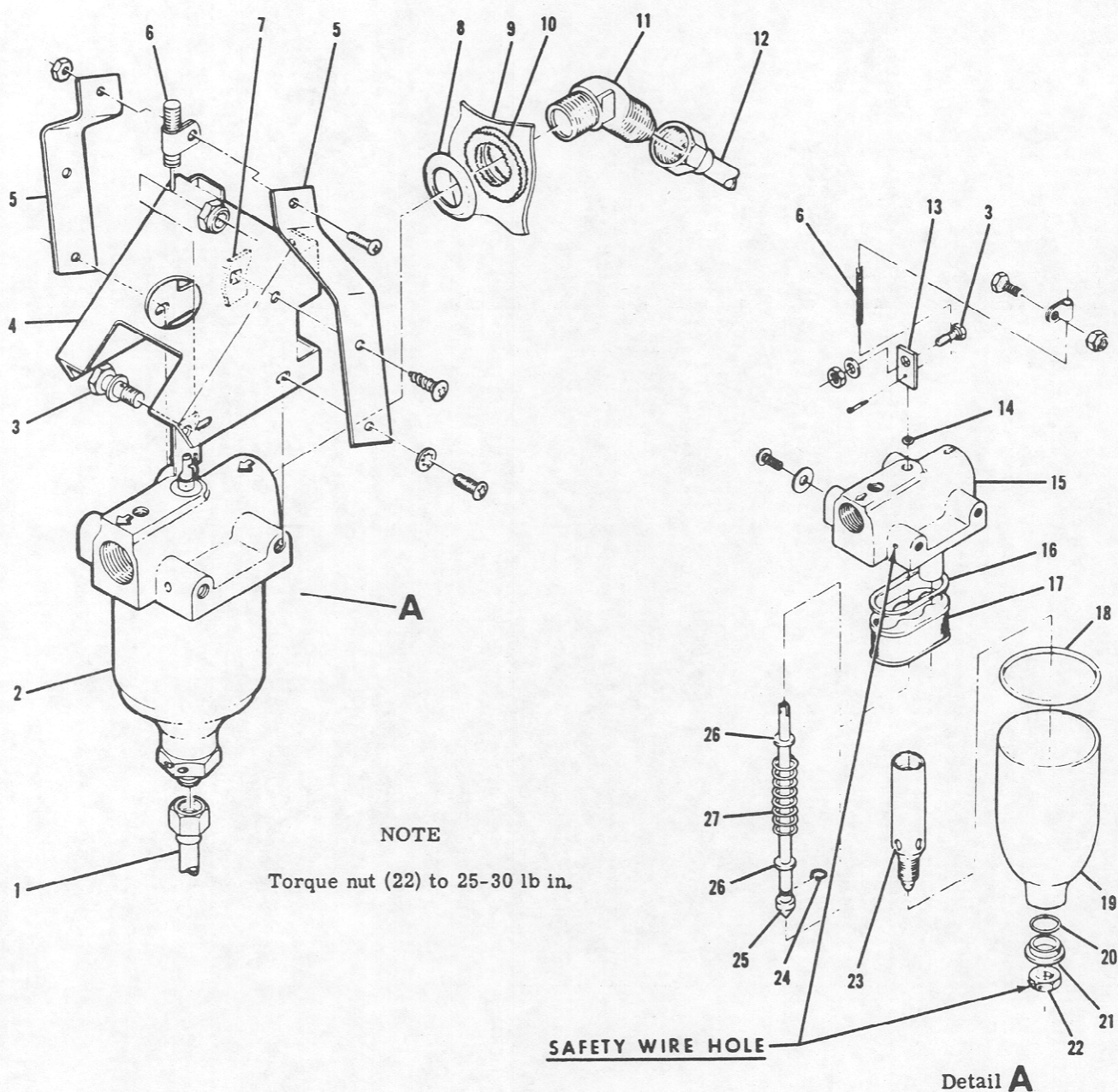
12-21. REMOVAL AND INSTALLATION.

- a. Disconnect and cap all lines from primer.
- b. Unscrew knurled nut and remove plunger from pump body.
- c. Remove pump body from instrument panel.

NOTE

Visually inspect primer lines for crushed, kinked, or broken condition. Ensure proper clamping to prevent fatigue due to vibration and chafing.

- d. Prior to installing a primer, check for proper pumping action and positive fuel shut-off in the locked position.
- e. Reverse preceding steps for installation.



- | | | |
|---------------------------|------------------|-----------------|
| 1. Drain Tube | 10. Grommet | 19. Bowl |
| 2. Fuel Strainer | 11. Elbow | 20. O-Ring |
| 3. Clamp Bolt | 12. Fuel Line | 21. Step Washer |
| 4. Bracket | 13. Plate | 22. Nut |
| 5. Bracket | 14. O-Ring | 23. Standpipe |
| 6. Strainer Drain Control | 15. Top Assembly | 24. Snap Ring |
| 7. Nutplate | 16. Gasket | 25. Plunger |
| 8. Shield | 17. Filter | 26. Washer |
| 9. Firewall | 18. O-Ring | 27. Spring |

Figure 12-6. Fuel Strainer