

**AA-5 SERIES  
MAINTENANCE MANUAL**

CHAPTER 28

FUEL SYSTEM

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FUEL SYSTEM - DESCRIPTION/OPERATION

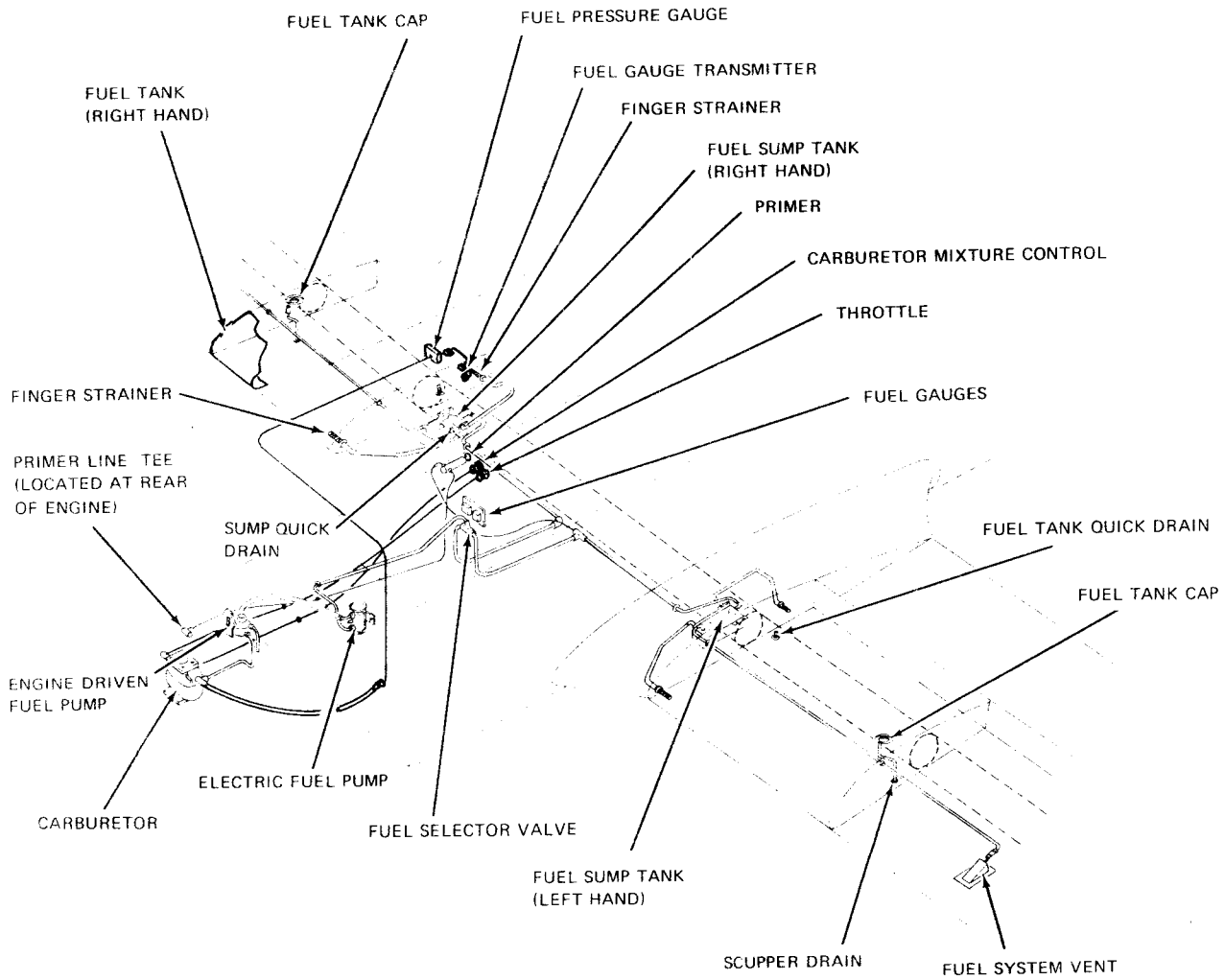
1. General (See Figure 1.)

A. The fuel system consists of two fuel tanks, two sumps, two flush mounted fuel tank vents, a fuel selector valve, an engine-driven fuel pump, an auxiliary electrical fuel pump, and fuel gauges. The fuel tanks are integral parts of the wing and located outboard of the wing root. Fuel is piped to the sumps mounted in the wing roots just below the main spar. From the sumps, fuel is directed to the selector valve mounted on the upper forward console panel and then to the fuel pumps. A tee connector, mounted in the left sump to fuel selector line, provides the connection for the fuel primer line. Two fuel gauges, mounted above the fuel selector valve, are of the electrical type and are connected to fuel sending units in each tank. No gascolator or fuel drain is located in the engine compartment as the fuel system piping slopes downward to the sump drains located under the wing roots. To provide lightning strike protection, the fuel tank vents are flush mounted and maintain a slight positive pressure in flight.

B. The fuel tank capacities are as follows:

Capacity (U.S. Gal.)	AA-5 & AA-5A (Std. Tanks)	AA-5A (Opt. Tanks)	AA-5B
Total Capacity			
Left Tank	19.0	26.3	26.3
Right Tank	19.0	26.3	26.3
Total	<u>38.0</u>	<u>52.6</u>	<u>52.6</u>
Unusable Fuel			
Left Tank	0.5	0.8	0.8
Right Tank	0.5	0.8	0.8
Total	<u>1.0</u>	<u>1.6</u>	<u>1.6</u>
Usable Fuel			
Left Tank	18.5	25.5	25.5
Right Tank	18.5	25.5	25.5
Total	<u>37.0</u>	<u>51.0</u>	<u>51.0</u>

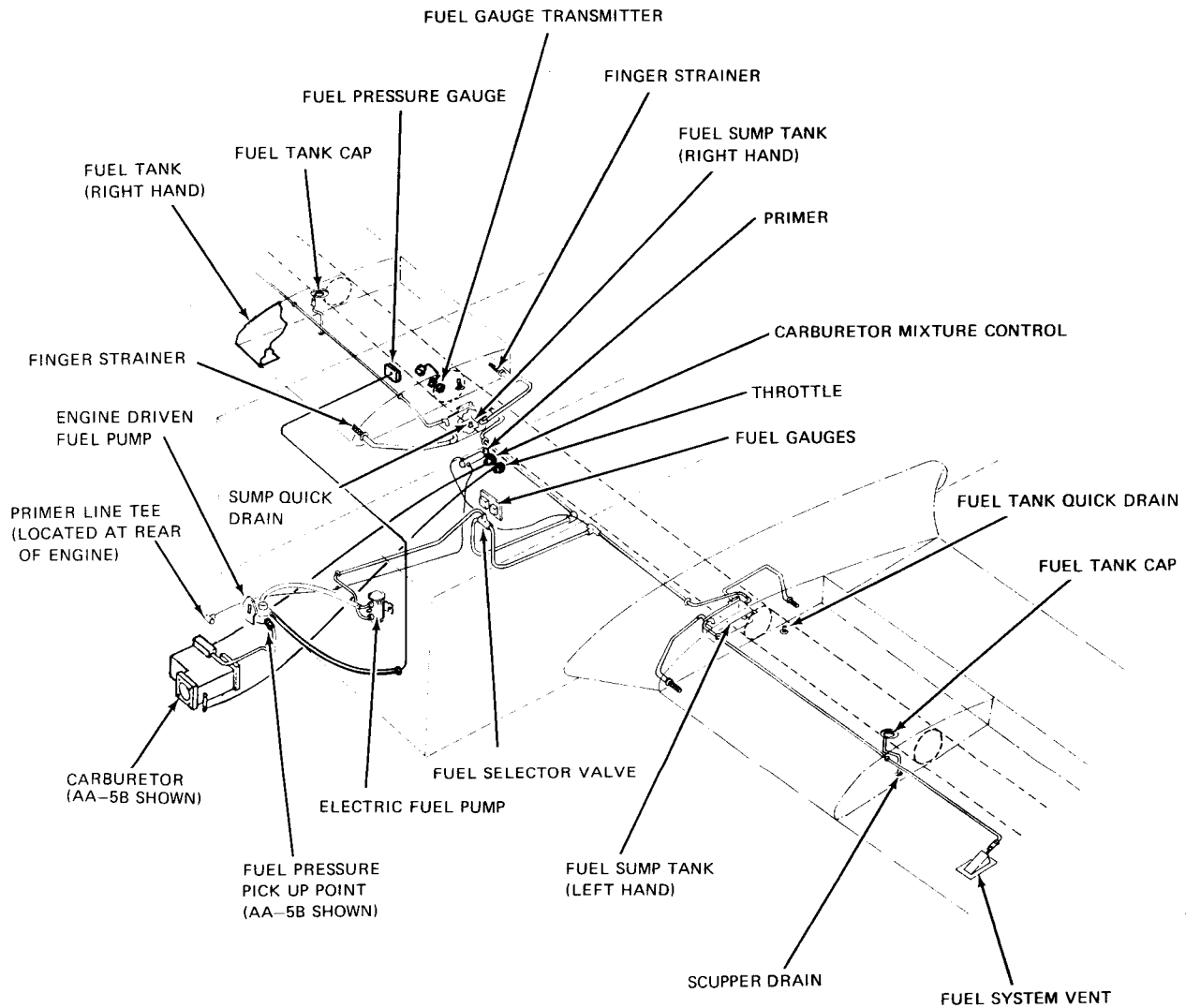
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Fuel System Diagram - Models AA-5 & AA-5A (Standard)  
Figure 1 (Sheet 1 of 2)

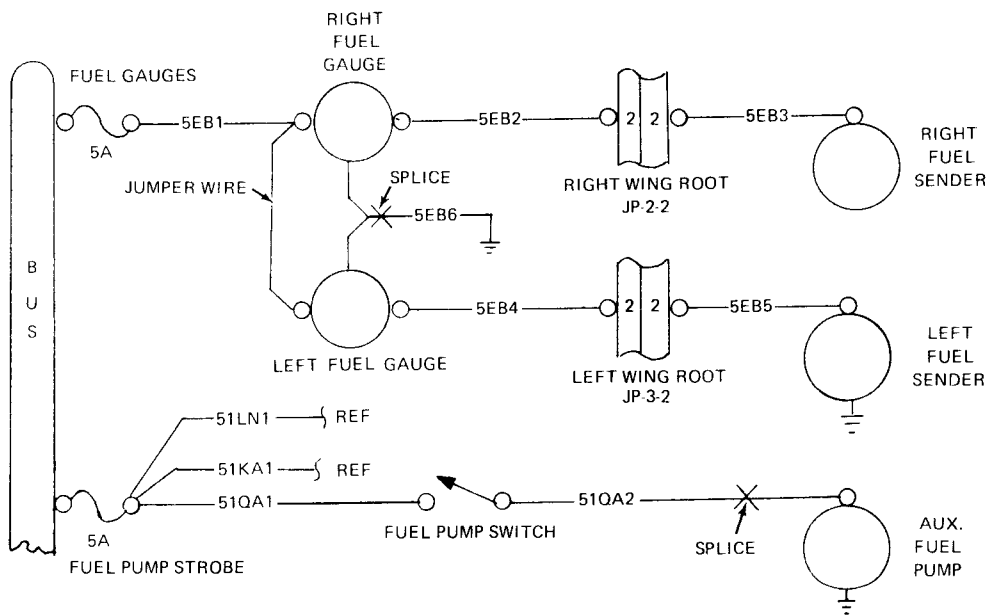
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Fuel System Diagram - Models AA-5A (Option) & AA-5B  
Figure 1 (Sheet 2 of 2)

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- C. The electrical wiring and circuit protective devices that supply electrical power to the auxiliary fuel pump and the fuel quantity indicators is shown in Figure 2.



Fuel System Electrical Circuits  
 Figure 2

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FUEL SYSTEM - TROUBLESHOOTING

1. Fuel System Troubleshooting

Troubleshoot the fuel system as follows:

TROUBLE	PROBABLE CAUSE	REMEDY
No fuel pressure (electric fuel pump turned off).	Fuel tanks empty.	Service with proper grade of fuel.
	Defective gauge.	Replace gauge.
	Defective engine pump.	Remove outlet line, crank engine several times, check for fuel flow from pump. Replace if faulty.
	Fuel selector valve in Off position.	Switch to fullest tank.
	Clogged filter in electric fuel pump.	Check filter for blockage.
	Obstruction in fuel supply line.	Starting at carburetor, remove, inspect and clean each line.
	Dirty tank strainer.	Remove and clean strainer. Flush tank clean prior to re-assembly.
	Obstruction in pressure gauge line.	Remove all fittings and lines starting at carburetor inlet and inspect and clean as necessary.
No or low fuel pressure (electric fuel pump turned on).	Blown fuse.	Replace with fuse of appropriate rating.
	Faulty switch.	Replace switch.
	Defective pump.	Remove outlet line from pump. No or little flow indicates bad pump. Repair or replace pump.
	Partial or no fuel flow from the preceding causes.	Use the preceding remedies.
Low pressure or surging pressure.	Fuel valve improperly positioned.	Check position.
	Clogged filter in electric fuel pump.	Clean filter.
	Obstruction in fuel lines.	Starting at carburetor, remove, inspect, and clean all fuel lines.
	Fuel line or connection leaking.	Inspect all lines and tighten connections. Use thread sealant as required.

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TROUBLE	PROBABLE CAUSE	REMEDY
	Leaking "O" rings in electric fuel pump.	Disassemble, inspect and replace "O" ring or pump.
	Defective engine pump.	Repair or replace.
No fuel quantity indication in both tanks.	Fuel tanks empty.	Fill with proper grade fuel.
	Master switch off.	Turn master switch on.
	Fuel gauge fuse blown.	Replace fuse in panel.
	Loose connections or open circuit.	Tighten connections; repair or replace wire.
No fuel quantity indication in one tank.	Defective gauge or transmitter.	Check per Fuel Indicating System Chapter.
Fuel quantity indicating too high.	Aircraft not level.	Level aircraft and recheck.
	Defective gauge or transmitter.	Check per Fuel Indicating System Chapter.
Fuel gauge indicates too low.	Aircraft not level.	Level aircraft and recheck.
	Defective gauge or transmitter.	Check per Fuel Indicating System Chapter.



FUEL SYSTEM — MAINTENANCE PRACTICES

1. Fuel Tank and Sump Quick Drains (See Figure 201.)

Two fuel drains are provided beneath each wing, one in each wing tank and one in the fuel sump. The drains are spring-loaded to the closed position to provide a convenient method of draining small samples of fuel for preflight inspection. If fuel system drainage is required, the quick drains may be unscrewed and removed.

On Aircraft AA5-0001 through 0834, AA5A-0001 through 0522, and AA5B-0001 through 0692, the quick drains are as shown in Figure 201. The sampler cup pin is used to press the drain fitting upward allowing a sample of fuel to be taken.

On Aircraft AA5A-0523 and subsequent, and AA5B-0693 and subsequent, the quick drains are similar to those shown in Figure 201, and include a plunger attached to the fitting. The plunger is pushed upward to obtain a sample of fuel.

2. Refueling — Defueling

Refer to Chapter 12 for detailed refueling — Defueling procedures.

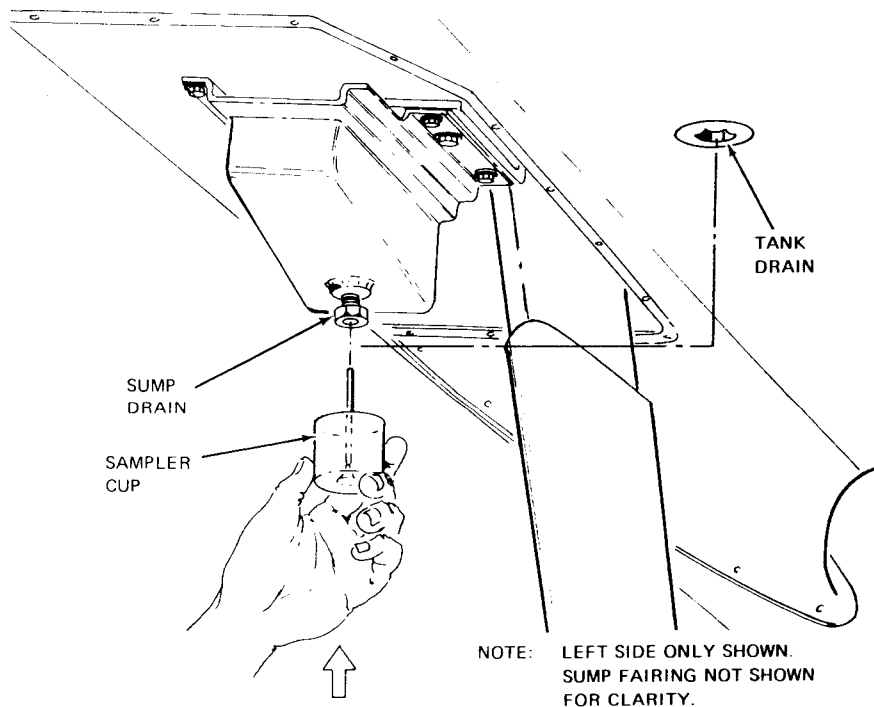
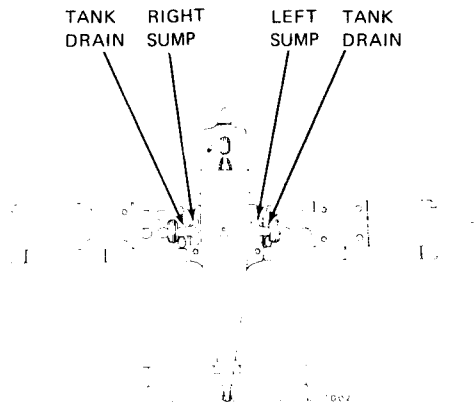
3. Reduction of Fuel Tank Vapor Hazards

A. General Precautions

During all defueling, ventilation, inerting or maintenance procedures involving the fuel system the following general precautions should be observed:

- (1) Defueling should be done outdoors with the aircraft at least 100 feet from hangars or other aircraft.
- (2) No smoking should be allowed within 100 feet of aircraft.
- (3) Suitable fire fighting equipment should be available. Foam or soda type extinguishing agents are recommended.

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Fuel Sump and Fuel Tank Drain Operation  
Figure 201

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- (4) The Aircraft should be grounded to prevent static electricity from causing sparks. If a ramp ground is available it should be connected to exhaust stack. If a ramp ground is not provided, a temporary ground can be obtained by driving a metal rod into the ground and attaching a ground wire between the rod and the aircraft exhaust stack.
- (5) Flame and spark producing equipment should not be operated within 100 feet of the aircraft.
- (6) The aircraft should have its battery removed.
- (7) Only personnel working on the aircraft should be allowed in the immediate area, and no other maintenance should be performed while the tanks are being worked on.
- (8) When a fuel tank is opened for repair, air ventilation or inerting procedures should be started immediately to reduce vapor concentrations.
- (9) When draining fuel, ensure that suitable containers are available and that drained fuel is stored safely. Do not allow fuel to drip to the ground and form pools.
- (10) If it is necessary to ventilate or inert a tank when the aircraft is in a hangar, ensure that vapors do not accumulate to explosive or toxic levels in the hangar.

**WARNING: WHEN FUEL IS BEING DRAINED, THERE IS LITTLE CONTROL OVER THE RELEASE OF FUEL VAPOR. THIS VAPOR SHOULD BE DISSIPATED AS QUICKLY AS POSSIBLE. COMPRESSED AIR OR EXPLOSION-PROOF BLOWERS MAY BE USED FOR THE PURPOSE.**

Before working on fuel tanks, defuel them per Chapter 12. Fuel that cannot be drained by normal defueling must be removed from the tanks by opening all sump drains and access panels.

Two general methods of reducing fuel vapor hazards can be used, ventilating or inerting. The simplest method, ventilation, is done by forcing clean air through the tank until all vapors have been dissipated and flushed out by the air. This method is best when the tank access covers must be removed for work in the tank.

Inerting is another method of reducing vapor hazards. In this method an inert gas, such as nitrogen or carbon dioxide, is forced into the tank to replace the air in the tank. This reduces the oxygen in the tank to a level that will not support combustion. Although inerting may be used to prevent explosion hazards from fuel vapor, it does not prevent toxic levels of vapor in the tank.

B. Air Ventilation

- (1) Completely drain tank (or tanks) per Chapter 12.
- (2) Remove access covers and tank cap.
- (3) Use compressed air or an explosion-proof blower to blow air into the tank until tank interior is dry and free of vapor.
- (4) Continue ventilation whenever tank is open and being worked on.

**NOTE:** If flammable vapors from cleaning solvents are allowed in the tank, increase air circulation to dissipate them.

C. Pressure Siphoning Inerting

The following equipment, or its equivalent, is recommended for pressure siphoning inerting:

Differential pressure gauge or manometer.

Nitrogen supply with metering valve.

Rubber plug (3/8 inch O.D.) to fit fuel system vent.

- (1) Fill fuel tank to capacity, per Chapter 12.
- (2) Insert rubber plug in fuel system vent.
- (3) Set fuel selector to OFF.
- (4) On fuel line leading from sump to fuel selector, disconnect line at selector.
- (5) Connect nitrogen supply and pressure gauge (or manometer) to fitting on fuel line that was disconnected in Step (4).
- (6) Place suitable containers (totaling approximately 26 gallon capacity) under fuel sump tank.

**CAUTION:** WHEN PURGING TANK ENSURE THAT PRESSURE APPLIED TO TANK DOES NOT EXCEED 0.5 PSI.

- (7) Open pressure reducing valve on nitrogen bottle.
- (8) Adjust valve to maintain 0.5 psi pressure.

**NOTE:** A continuous supply of nitrogen at 0.5 psi must be maintained to permit siphoning and inerting of the airspace created by defueling. Do not open fuel tank drain valve.

**CAUTION:** WHEN FUEL SUMP TANK DRAIN IS REMOVED, FUEL WILL DRAIN RAPIDLY INTO CONTAINER. BE SURE THAT CONTAINER IS PROPERLY POSITIONED TO CATCH FUEL. KEEP ARM ABOVE DRAIN TO PREVENT FUEL FROM FLOWING ON BODY.

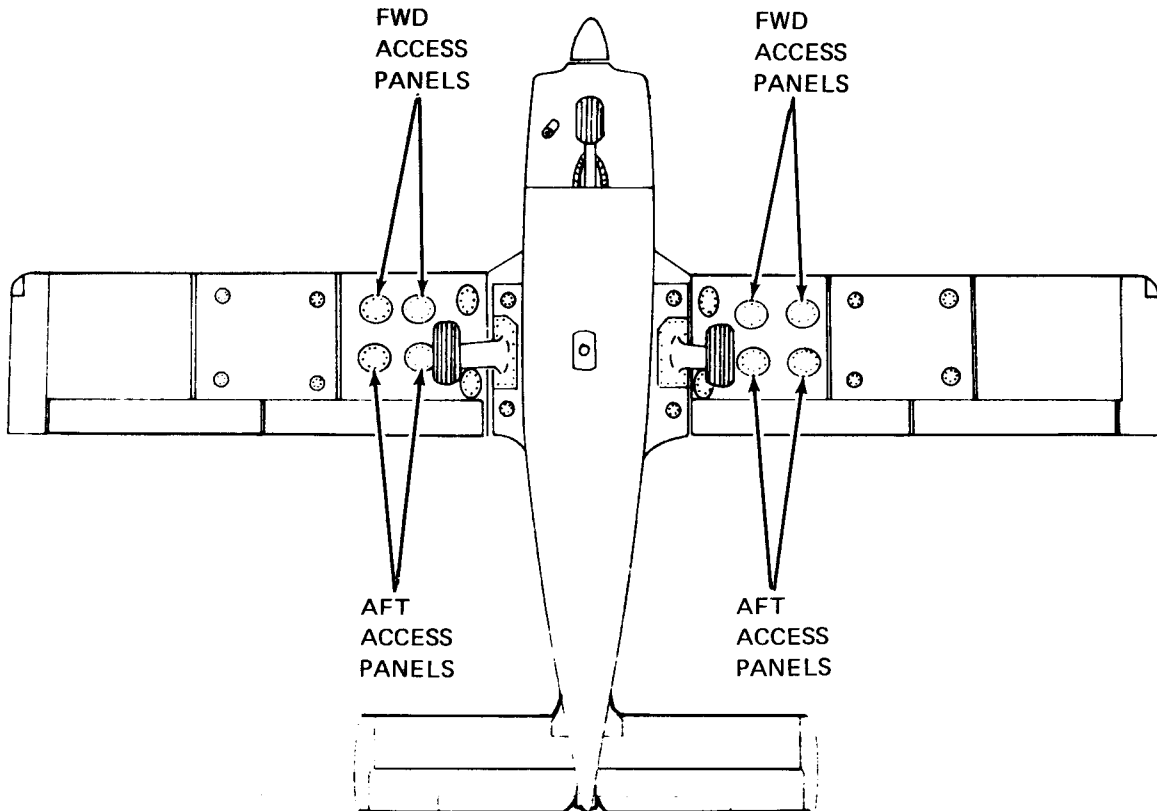
- (9) Remove fuel sump tank drain.
- (10) Adjust valve to maintain 0.5 psi pressure in tank until all fuel drains from tank.
- (11) If fuel tank access panels or tank cap are removed for work on tank, adjust valve to ensure that there is a continuous flow of nitrogen through the tank.

FUEL STORAGE SYSTEM — DESCRIPTION/OPERATION

1. General

Since the fuel tanks are formed by the inner wing panels, they are nonremovable. Each tank has four access panels, (See Figure 1.) two forward of the wing spar and two aft. The spar and ribs serve as baffles within the tank.

Since the Model AA-5, AA-5A, and AA-5B fuel tanks are similarly constructed, the service information in this Section is applicable to all models. Due to the increased capacity of the optional Model AA-5A and the Model AA-5B tanks, the tank area extends from the leading edge to the trailing edge of two wing bays and the inboard and outboard sides are located in 16 inches and 48 inches from the wing root. The Model AA-5 and standard Model AA-5A tanks are located in the first two inboard bays and have an aft tank bulkhead.



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Fuel Tank Access Panels  
Figure 1

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FUEL STORAGE SYSTEM - ADJUSTMENT/TEST

1. Testing Fuel Tanks

A. Test each fuel tank as follows:

- (1) Plug vent line at outboard end.
- (2) To the fuel line leading from the sump to the fuel selector, attach a differential pressure gauge or water manometer capable of measuring 3/4 psi or 20 in. of water.
- (3) To the fuel tank sump quick drain port, connect a well regulated supply of air or nitrogen (0.5 psi MAXIMUM or 13.8 INCHES OF WATER).
- (4) Make sure filler cap is installed.

CAUTION: DO NOT ATTEMPT TO APPLY PRESSURE TO THE TANK WITHOUT A GOOD REGULATOR AND A POSITIVE SHUTOFF IN THE SUPPLY LINE. DO NOT PRESSURIZE THE FUEL TANK TO MORE THAN 0.5 PSI OR DAMAGE MAY OCCUR.

- (5) Apply pressure slowly until 0.5 psi is obtained.
- (6) Prepare a solution of 50% liquid dish washing detergent and 50% water.
- (7) Apply detergent solution to outside of tank in suspect areas.
- (8) Allow 5 minutes for pressure to stabilize.
- (9) Check for presence of detergent bubbles on outside of tank to indicate location of leakage.
- (10) Turn off air supply.
- (11) If tank holds for 15 minutes, with pressure loss not exceeding .05 psi, tank is acceptable.
- (12) Reseal and retest if any leaks are found. (See Fuel Storage System - Approved Repairs for sealing procedures.)

FUEL STORAGE SYSTEM - INSPECTION/CHECK

1. Checking Fuel Tank Leaks

Fuel leaks which are not considered a flight hazard are stains, seeps, and heavy seeps NOT in an enclosed area. However, all fuel leaks should be repaired as soon as possible. Fuel leaks which are a flight hazard are running leaks in any area, and seeps, heavy seeps, or stains in an enclosed area, such as sections of the wing outboard of the fuel tank (and on AA-5 and AA-5A aircraft the area between the aft tank bulkhead and the rear wing spar). These leaks must be repaired before that tank is used for another flight. The wet or stained spot on the wing in the area of the tank is an indication of the intensity of the leak. Fuel leak classifications are shown in Figure 601.

NOTE: Stains from previously repaired leaks are not considered a flight hazard but must be inspected before each flight to insure that seepage has not begun, causing a flight hazard.

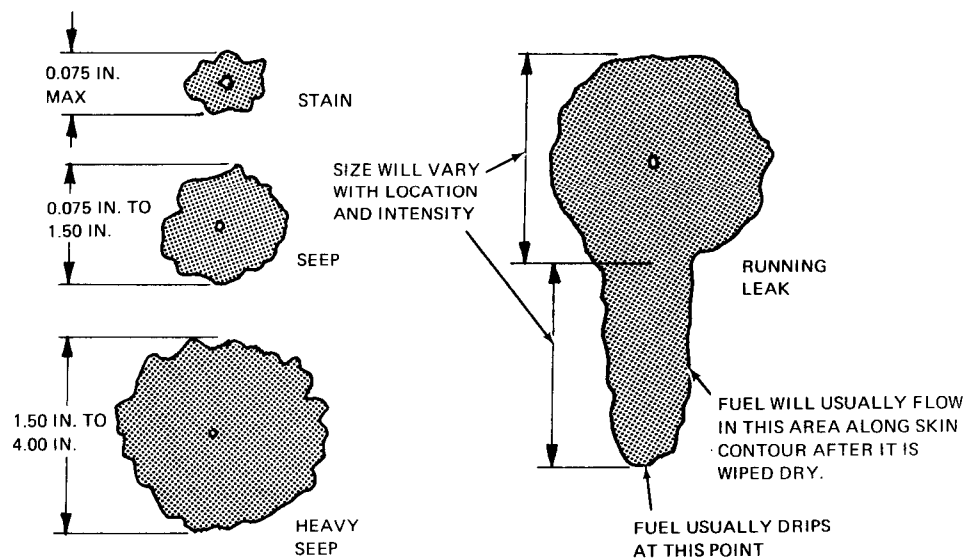
If a leak causing a flight hazard should occur at a place where there are no facilities available to make an acceptable repair, it is recommended that the leaking tank be drained and cleared of explosive vapor. By switching the fuel selector valve to the other tank the aircraft can then be flown to a facility where the fuel leak can be repaired.

2. Checking Fuel Tank Caps

The fuel caps are not vented and should be inspected at every scheduled inspection to assure the gasket inside the cap has not deformed or deteriorated. Lubricate gasket with grease (MIL-G-6032A, Chapter 12.)

3. Checking Fuel Tank Drains

The fuel tank drains should be checked at every scheduled inspection to ensure that leakage or seepage through the drain valve is not occurring. In addition, the drains should be checked for proper operation.



Classification of Fuel Leaks  
Figure 601

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**FUEL STORAGE SYSTEM — APPROVED REPAIRS**

**1. Integral Fuel Tank Sealants**

Fuel tank sealants are provided in Gulfstream Aerospace Service Kit No. 140. This kit contains three parts (sub kits) which may be ordered separately. These sub kits are as follows.

- A. Part 1 provides a method of repairing minor fuel leaks. The aircraft may be fueled 2 hours after application of this repair. This part contains one each Type A (quick repair) and Type C (access cover) sealant.
- B. Part 2 provides a method of repairing major fuel leaks. The aircraft may be fueled 30 hours after application of this repair. This part contains, one Type B (slow curing) and two Type C (access cover) sealant.
- C. Part 3 provides a method of sealing access covers. The aircraft may be fueled 2 hours after application of this repair. This part contains one Type C (access cover) sealant.

The following safety precautions should be observed when handling sealant materials:

Sealants have been proven to be safe materials when reasonable care is observed but the following precautions must be observed.

**WARNING:** SOME SEALANTS CONTAIN FLAMMABLE AND VOLATILE SOLVENTS.

KEEP SEALANTS AWAY FROM HEAT, SPARKS AND FLAME. PROPER PRECAUTIONS USED WITH FLAMMABLE MATERIAL MUST BE TAKEN WHEN APPLYING SEALANTS. COMPLY WITH ALL LOCAL SAFETY REGULATIONS.

USE AND HANDLE ONLY IN A WELL VENTILATED AREA. AIR SUPPLIED RESPIRATORS SHOULD BE USED DURING APPLICATION. AVOID REPEATED OR PROLONGED EXPOSURE. REMOVE AFFECTED PERSONNEL TO FRESH AIR IMMEDIATELY AND OBTAIN MEDICAL ATTENTION.

POLYETHYLENE MITTS AND CHEMICAL TYPE GOGGLES MUST BE USED WHEN HANDLING OR MIXING MATERIALS.

**2. Sealing Minor Fuel Leaks (See Figure 801.)**

- A. Prepare the aircraft for safe maintenance as follows:
  - (1) Insure Master Switch OFF.
  - (2) Aircraft grounded.
  - (3) Observe all safety precautions.
- B. Determine source of the leak. Fuel can flow along the structure of the wing, making the leak source difficult to find. A stained area is an indication of the leak source.
- C. Drain tank and/or tanks to be repaired.
- D. Gain access to tank by removing access cover. Retain hardware for reuse.
- E. With tank opened, purged and properly ventilated prepare leak area as follows:
  - (1) Remove all loose, chipped or cracked sealant from area of leak source. Use of a chisel-like tool made of hard fiber or Plexiglas, is excellent to remove old sealant.



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- (2) Remaining sealant may then be removed with aluminum wool, 3M ELEKTRO-Cut Cloth or aluminum oxide paper. DO NOT USE STEEL WOOL OR SILICON GRIT ABRASIVES.
- (3) All cuts in old sealant should be made at 45 degrees angle to insure good adhesion between old and new sealant.
- (4) Thoroughly clean area using a vacuum cleaner or other suitable cleaning device.

**NOTE:** Checking and correcting for loose rivets and/or other mechanical fasteners is recommended prior to applying sealant. Check area of leak for defects in bond joints. Areas of cracked bond fillets or separated bond joints must be repaired. Contact the Gulfstream Aerospace Corporation customer service department for further information.

- (5) If inspections reveal no rework, proceed with cleaning of area to be sealed.
- (6) Using a lint-free cheese cloth that has been dampened with MEK, alcohol (99% isopropyl), or acetone, clean area until cheese cloth shows no sign of dark smudge or stain.

**NOTE:** If fuel tank float is in area to be sealed, wax the float to prevent it from sticking to any sealant.

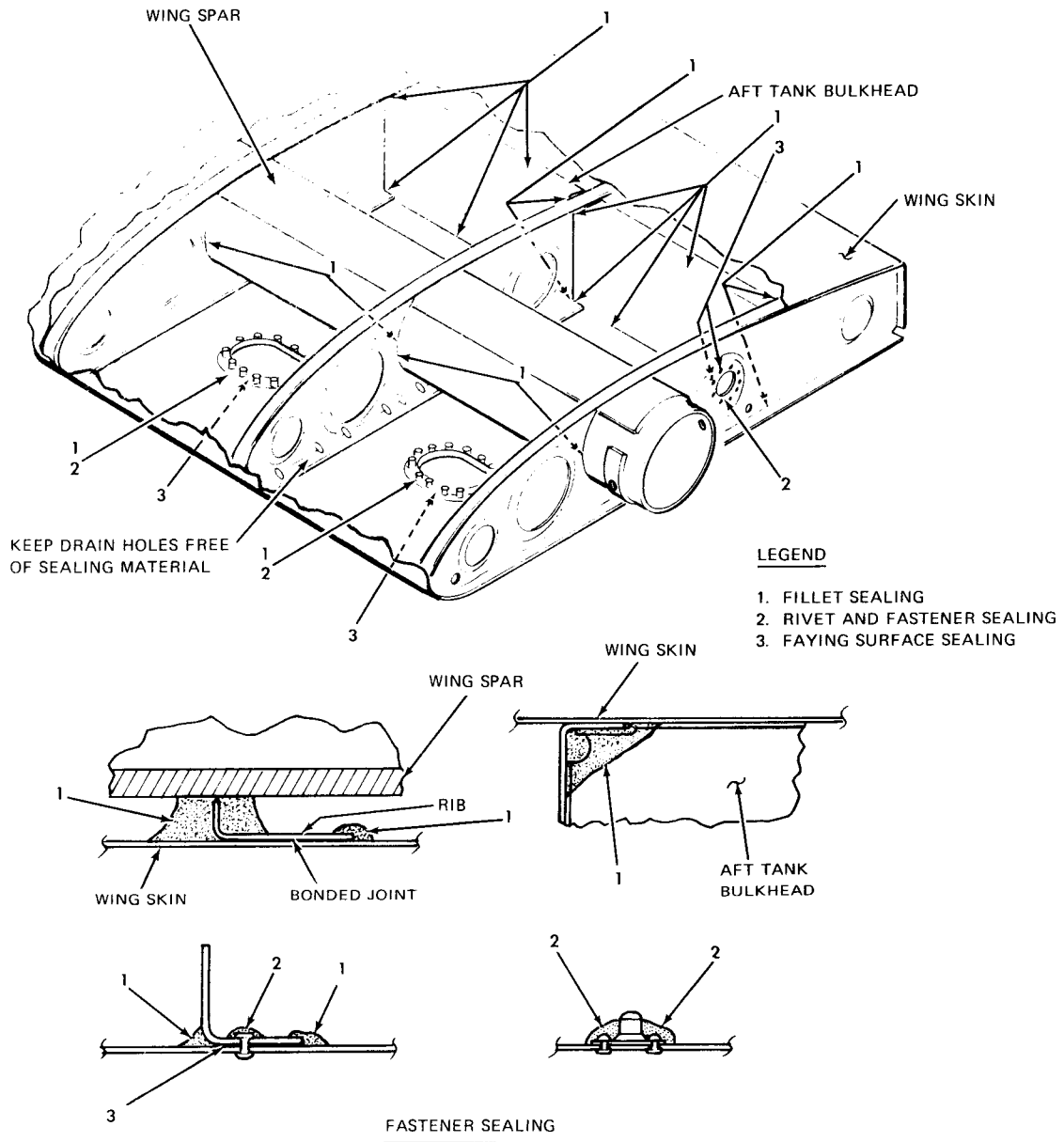
F. Type A Sealant - storage, mixing and care instructions:

- (1) Storage life of sealant is at least 6 months when stored at temperatures below 80 degrees F. in the original unopened containers.
- (2) Mix sealant according to instructions on container. If weight measuring devices are not available for use, entire contents of kit can be mixed as each kit contains base compound and accelerator in proper proportions.
  - (a) Thoroughly stir the accelerator in its container until an even consistency is obtained.
  - (b) Slowly stir the accelerator into the base compound and thoroughly mix approximately 7 to 10 minutes. Be sure to scrape sides and bottom of container to include all base compound in the mixture and to assure uniform blending.
- (3) Minimum of 1/4 hour (15 minutes) application life is available at 75 degrees F. and 50% relative humidity (R.H.) Application life will vary, depending on temperature. For every 10 degrees F. rise above standard (75 degrees F. and 50% R.H.) life is reduced by half and for every 10 degrees F. below standard life is doubled. High humidity at the time of mixing shortens application life.
- (4) Cure times depend on the ambient temperatures and relative humidity. For use in this kit a minimum of 24 hours cure will be used, at standard temperature and relative humidity.
- (5) Time to pressurize - 2 hours.

G. Apply sealant to area to be sealed. Special care must be taken to joints that have a direct fuel path out of the tank area. Sealant must be pressed between these surfaces thoroughly and then fillet sealed on the fuel side. Fillet sealing is applying sealant to the edge of all joints, joggles, bend reliefs, voids, all rivets and/or fasteners through the boundary of the tank and any other place that a fuel leak has occurred.

H. Allow 2 hour minimum cure time on sealant in tank before fueling.

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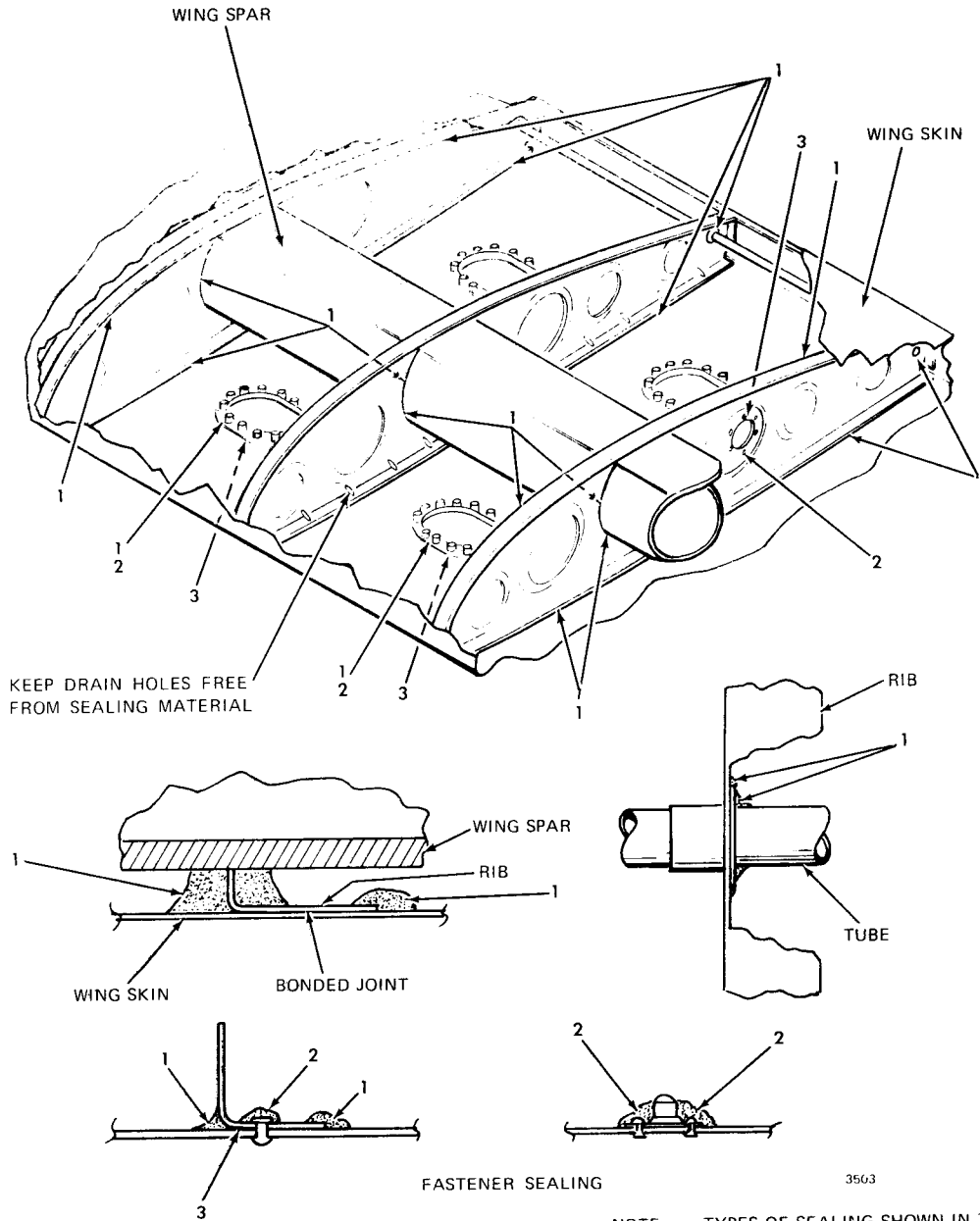
NOTE: TYPES OF SEALING SHOWN IN THIS FIGURE ARE USED WHEN MAKING A STRUCTURAL REPAIR TO THE FUEL TANK AREA AND WHEN REINSTALLING THE ACCESS COVERS.

Fuel Tank Sealing - Model AA-5 & AA-5A (Standard)  
Figure 801 (Sheet 1 of 2)

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LEGEND

- 1. FILLET SEALING
- 2. RIVET AND FASTENER SEALING
- 3. FAYING SURFACE SEALING



NOTE: TYPES OF SEALING SHOWN IN THIS FIGURE ARE USED WHEN MAKING A STRUCTURAL REPAIR TO THE FUEL TANK AREA AND WHEN REINSTALLING THE ACCESS COVERS.

Fuel Tank Sealing - Model AA-5A (Optional) & AA-5B  
Figure 801 (Sheet 2 of 2)

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**3. Sealing Major Fuel Leaks** (See Figure 801)

- A. Prepare the aircraft for safe maintenance as follows:
- (1) Insure Master Switch OFF.
  - (2) Aircraft grounded.
  - (3) Observe all safety precautions.
- B. Determine source of the leak. Fuel can flow along the structure of the wing, making the leak source difficult to find. A stained area is an indication of the leak source.
- C. Drain tank and/or tanks to be repaired.
- D. Gain access to tank by removing access covers. Retain hardware for reuse.
- E. With tank opened, purged and properly ventilated prepare leak area as follows:
- (1) Remove all loose, chipped or cracked sealant from area of leak source. Use of a chisel-like tool, made of hard fiber or Plexiglas, is excellent to remove old sealant.
  - (2) Remaining sealant may then be removed with aluminum wool, 3M ELEKTRO-Cut cloth, or aluminum oxide paper. **DO NOT USE STEEL WOOL OR SILICON GRIT ABRASIVES.**
  - (3) All cuts in old sealant should be made at 45 degrees angle to insure good adhesion between old and new sealant.
  - (4) Thoroughly clean area using a vacuum cleaner or other suitable cleaning device.  
**NOTE:** Checking and correcting for loose rivets and/or other mechanical fasteners is recommended prior to applying sealant. Check area of leak for defects in bond joints. Areas of cracked bond fillets or separated bond joints must be repaired. Contact the Gulfstream Aerospace Corporation customer service department for further information.
  - (5) If inspections reveal no rework, proceed with cleaning of area to be sealed.
  - (6) Using a lint-free cheese cloth that has been dampened with MEK, alcohol (99% isopropyl), or acetone, clean area until cheese cloth shows no sign of dark smudge or stain.  
**NOTE:** If fuel tank float is in area to be sealed, wax the float to prevent it from sticking to any sealant.
- F. Type B Sealant - Storage, mixing and cure instructions.
- (1) Storage life of Type B sealant is at least 6 months when stored at temperatures below 80 degrees F. in the original unopened containers.
  - (2) Mix sealant according to instructions on container. If weight measuring devices are not available for use, entire contents of kit can be mixed as each kit contains base compound and accelerator in proper proportions.
    - (a) Thoroughly stir the accelerator in its container until an even consistency is obtained.
    - (b) Slowly stir the accelerator into the base compound and thoroughly mix approximately 7 to 10 minutes. Be sure to scrape sides and bottom of container to include all base compound in the mixture and to assure uniform blending.

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- (c) Minimum of 1/2 hour (30 minutes) application life is given at 75 degrees F. and 50% relative humidity (R.H.). Application life will vary, depending on temperature. For every 10 degrees F. rise above standard (75 degrees F. and 50% R.H.) life is reduced by half and for every 10 degrees F. below standard life is doubled. High humidity at the time of mixing shortens application life.
  - (d) Cure times depend on the ambient temperatures and relative humidity. For use in this kit a minimum of 45 hours cure will be used, at standard temperature and relative humidity.
  - (e) Time to pressurize - 30 hours.
  - (f) Time to fuel - 30 hours.
- G. Apply sealant to area to be sealed. Special care must be taken to joints that have a direct fuel path out of the tank area. Sealant must be pressed between these surfaces thoroughly and then fillet sealed on the fuel side. Fillet sealing is applying sealant to the edge of all joints, joggles, bend reliefs, voids, all rivets and/or fasteners through the boundary of the tank and any other place that a fuel leak has occurred.
4. **Sealing Access Covers** (See Figure 801)
- A. Prepare the aircraft for safe maintenance as follows:
    - (1) Insure Master Switch OFF.
    - (2) Aircraft grounded.
    - (3) Observe all safety precautions.
  - B. Determine source of the leak. Fuel can flow along the structure of the wing, making the leak source difficult to find. A stained area is an indication of the leak source.
  - C. Drain tank and/or tanks to be repaired.
  - D. Remove access cover or covers to be resealed. Retain hardware for reuse.
  - E. Remove all existing old sealant from access covers and mating surfaces of the tank.
  - F. Clean access covers and mating surfaces with cheese cloth dampened with MEK, alcohol (99% isopropyl) or acetone. Clean cover and surfaces until a clean cheese cloth shows no sign of dark smudge or stain.
  - G. Insure that all covers and mating surfaces are cleaned before proceeding. Pot life of sealant is only 30 minutes.
  - H. Mix Type C sealant as follows: One kit is enough for four access covers (one wing).
    - (1) Storage life of sealant is at least 6 months when stored at temperatures below 80 degrees F. in the original unopened containers.
    - (2) Mixing is 10 to 1 weight ratio. If weight measuring devices are not available for use, entire contents of kit can be mixed as each kit contains base compound and accelerator in proper proportions.
      - (a) Thoroughly stir the accelerator in its container until an even consistency is obtained.
      - (b) Slowly stir the accelerator into the base compound and mix thoroughly. Be sure to scrape sides and bottom of container to include all base compound in the mixture and to assure uniform blending.

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- (3) Minimum of 1/2 hour (30 minutes) application life is given at 75 degrees F. and 50% relative humidity (R.H.). Application life will vary, depending on temperature. For every 10 degrees F. rise above standard (75 degrees F. and 50% (R.H.)) life is reduced by half and for every 10 degrees F. below standard life is doubled. High humidity at the time of mixing shortens application life.
  - (4) Cure times depend on the ambient temperatures and relative humidity. For use in this kit a minimum of 48 hours will be used, at standard temperature and relative humidity.
  - (5) Time to pressurize - 2 hours.
  - (6) Time to fuel - 2 hours.
- I. Apply sealant to cover in layer of 1/32 inch to 1/16 inch thick. Install cover immediately using hardware retained in Step D. Tighten screws in a staggered sequence to ensure a more even pull down of cover. Remove excess sealant that has squeezed out.
  - J. Allow 2 hours cure time after completion before pressure testing and fueling.
  - K. Repeat Paragraph 4 for all covers.
- 5. Pipe Thread Repairs**
- A. The following repair technique may be used for repairing the 1/8 inch pipe threads at the quick drain valve or vent flange fittings in the AA-5 series sump tanks.
    - (1) Use a 7/16 inch drill to remove damaged threads in the flange fitting.
    - (2) Using a 1/4 inch—18 national pipe thread tap, produce new threads in the flange fitting deep enough to provide leak tight threads between the sump tank flange and the reducing bushing, when the bushing is screwed into the flange to a depth of 0.21 inch. Avoid getting chips into sump tank.
    - (3) Apply Loctite No. 262 sealant to the external threads of an AN912-1 reducer bushing and install the reducer bushing into the flange fitting. Torque the bushing to 35 - 45 inch-pounds.
    - (4) Inspect the drain valve or vent fitting to be installed. If found to be damaged, replace vent fitting or drain valve.
    - (5) Apply thread sealant to the threads of vent fitting or drain valve. Install fitting on valve and torque to 30 - 40 inch-pounds.
    - (6) Pressure test tank using 3.5 psi pressure. If fitting or valve is leaking, remove fitting or valve, add more thread sealant and reinstall with 30 to 40 inch-pounds of torque.

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FUEL DISTRIBUTION SYSTEM - DESCRIPTION/OPERATION

1. General

The fuel distribution system is composed of the fuel sump tanks, the fuel selector valve, the electric fuel pump, the engine-driven fuel pump, and the plumbing associated with these components. In addition, the electrical circuitry necessary to supply operating power to the electric fuel pump is included in this system.

FUEL DISTRIBUTION SYSTEM — MAINTENANCE PRACTICES

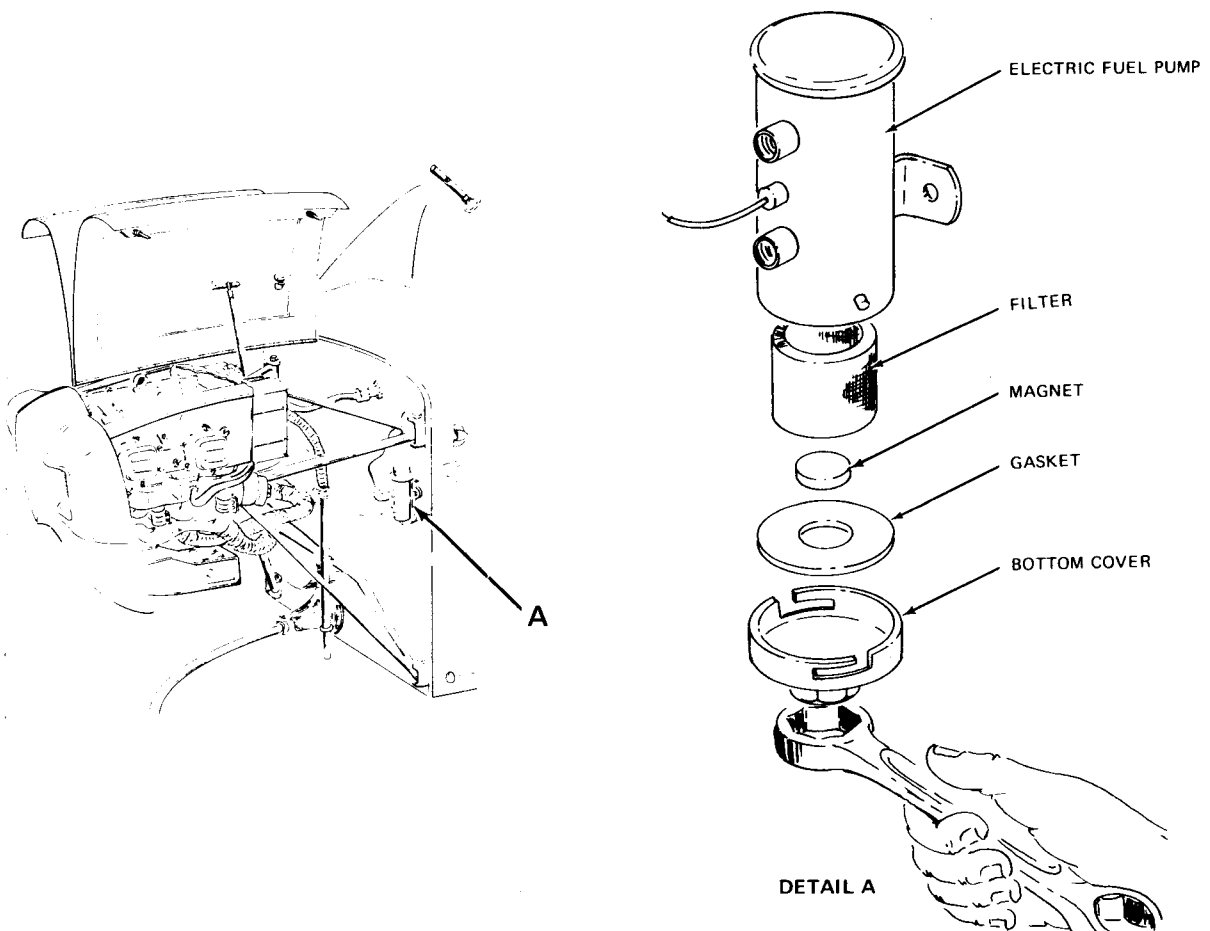
1. Servicing

A. Electric Fuel Pump Filter

- (1) Open top left engine cowl.
- (2) Remove the bottom cover from the fuel pump by cutting the safety wire and turning the cover counter-clockwise with a 5/8 inch wrench. (See Figure 201.)
- (3) Remove the cover, gasket, magnet, and filter.

**WARNING:** USE SOLVENT IN A WELL VENTILATED AREA. AVOID BREATHING FUMES. KEEP AWAY FROM FLAMES.

- (4) Clean the filter by rinsing in Stoddard solvent or equivalent and blowing out cleansing agent with compressed air. If filter is distorted or damaged, it should be replaced. Refer to the Parts Catalog for replacement part number.
- (5) Reinstall filter, magnet, gasket and bottom cover.
- (6) Turn bottom cover clockwise until lugs engage, and safety wire with 0.032 wire.



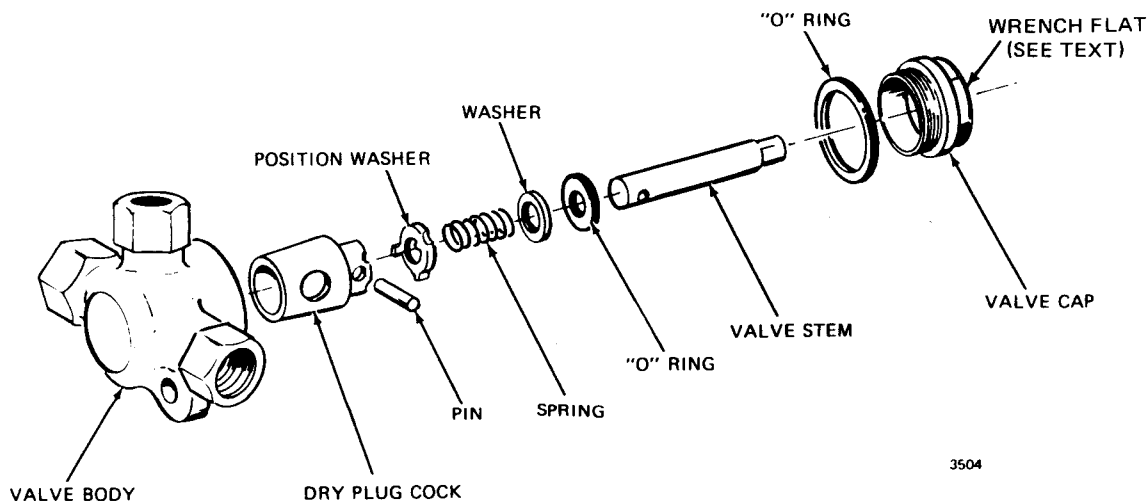
Fuel Pump Servicing  
Figure 201



B. Fuel Selector Valve Lubrication (See Figure 202.)

**NOTE:** Fuel selector valves with wrench flats on the valve cap are designed for disassembly and service as indicated below. Valves having no wrench flats should be replaced if they are defective.

- (1) Remove fuel selector valve per Paragraph 2.
- (2) Unscrew and remove valve cap from valve body. (Leave "O" ring on valve cap unless it is damaged.)
- (3) Remove valve stem with attached dry plug cock.
- (4) Use a clean, dry, lint-free cloth to wipe all lubricant from dry plug cock and valve body. Ensure that the surfaces are clean, undamaged and free of corrosion.
- (5) Lubricate dry plug cock with a very light film of lubricant (EZ turn, by United Erie, Inc., 1429 Walnut St., Erie, Pa. 16512, or equivalent MIL-G-6032, Chapter 12.)
- (6) Insert dry plug cock in valve body and turn several times to evenly distribute lubricant. Wipe excess lubricant from valve ports and exterior of valve body. Install valve cap and tighten securely.
- (7) Install fuel selector valve per Paragraph 2.



Fuel Selector Valve Disassembly  
Figure 202

2. Fuel Selector Valve Removal/Installation

A. Fuel Selector Valve Removal (See Figure 401.)

- (1) Remove forward upper console panel per Chapter 25.

**CAUTION: WHEN LINES ARE DISCONNECTED SOME FUEL SPILLAGE MAY OCCUR. TAKE PROPER PRECAUTIONS TO PREVENT FIRE HAZARD DUE TO SPILLAGE.**

- (2) Disconnect fuel lines from three elbows (1) attached to fuel selector valve (2). Cap open lines.
- (3) Remove two nuts (3), washers (4) and bolts (5) securing fuel selector valve (2) to bracket (6).
- (4) Remove decal (7) on handle (8). Then remove the screw (9) that attaches the handle to the valve stem, and pull the handle from the valve stem.
- (5) Remove fuel selector valve (2) from bracket (6).

B. Fuel Selector Valve Installation (See Figure 401.)

- (1) Position fuel selector valve (2) in bracket (6).
- (2) Install two bolts (5), washers (4) and nuts (3) through bracket (6) and fuel selector valve (2).
- (3) Torque to  $35 \pm 5$  inch pounds.
- (4) Install handle (8) on valve stem; secure it with the screw (9), and stick decal (7) over screw head.
- (5) Clean the exposed threads on the three elbows.
- (6) Reconnect the three fuel lines and torque to  $100 \pm 25$  inch pounds.
- (7) Fill both fuel tanks, and set fuel selector to left tank, then to right tank while observing to ensure that no leakage occurs at connectors or valve.
- (8) Reinstall forward upper console panel, per Chapter 25.

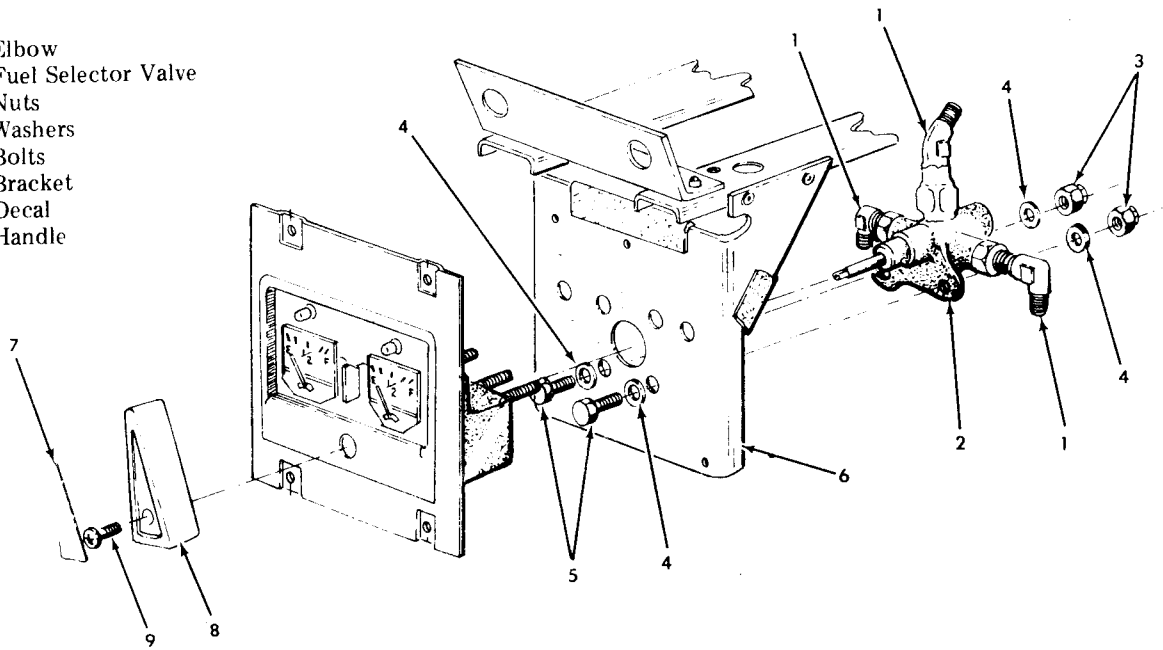
3. Fuel Sump Tank Removal/Installation

A. Fuel Sump Tank Removal (See Figure 402.)

- (1) Remove the access panel at the wing root, per Chapter 57.
- (2) Drain the fuel tank as described in Fuel Storage System – Maintenance Practices.
- (3) Disconnect forward and aft fuel lines (1).
- (4) Disconnect vent line (2) at nipple (6). Disconnect supply line (3).
- (5) Remove bolts (4) and washers (5) attaching the sump tank to the landing gear bracket and lower the sump tank through the access opening.
- (6) Cap all open lines and fittings.

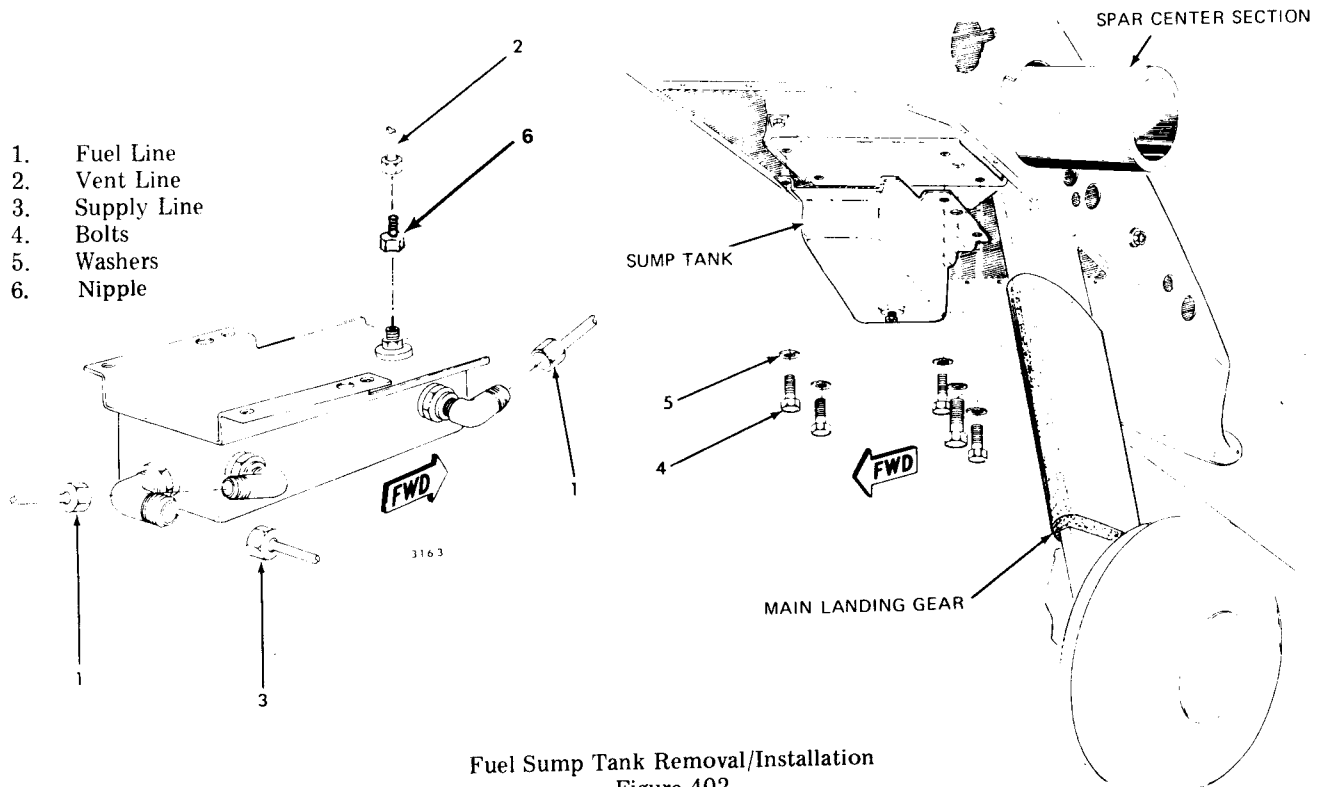
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1. Elbow
2. Fuel Selector Valve
3. Nuts
4. Washers
5. Bolts
6. Bracket
7. Decal
8. Handle



Fuel Selector Valve Removal/Installation  
Figure 401

1. Fuel Line
2. Vent Line
3. Supply Line
4. Bolts
5. Washers
6. Nipple



Fuel Sump Tank Removal/Installation  
Figure 402

B. Fuel Sump Tank Installation (See Figure 402.)

**NOTE:** Loctite Pipe Sealant with Teflon (PS/T) Catalog No. 92, and High Strength Loctite, Catalog No. 262 are acceptable sealants for use on fuel system external pipe threads.

- (1) Position the sump tank on the landing gear bracket as shown in Figure 402.

**CAUTION:** WHEN MOUNTING THE SUMP TANK, BE SURE THAT THE PROPER MOUNTING BOLTS (AN3-3A) ARE USED. BOLTS THAT ARE TOO LONG MAY EXTEND THROUGH THE LANDING GEAR MOUNT AND SCRATCH OR GOUGE THE CENTER SPAR.

- (2) Using the bolts and washers, secure the sump tank to the landing gear mount. Torque bolts per Chapter 91.
- (3) Remove caps from lines and fittings capped in Step 3A (6).
- (4) Use a bristle brush to clean threads of fuel lines disconnected.
- (5) Reconnect the lines disconnected in Steps 3A (3 and 4).
- (6) Torque the forward and aft fuel lines to  $200 \pm 50$  inch pounds.
- (7) Torque the vent line to  $52.5 \pm 12.5$  inch pounds.
- (8) Put fuel in tank per Chapter 12 and check fittings for leakage.
- (9) Reinstall wing root access panel per Chapter 57.

4. Fuel System Plumbing Removal/Installation

A. Fuel System Plumbing Removal

**WARNING:** WHEN DISCONNECTING FUEL LINES FROM THE MAIN FUEL TANK, HOLD THE BULKHEAD FITTING WITH A WRENCH TO PREVENT IT FROM TURNING AND BREAKING THE SEAL.

CAP ALL OPEN LINES AND FITTINGS TO PREVENT CONTAMINATION FROM ENTERING SYSTEM.

WHEN DISCONNECTING LINES, FIRST ENSURE THAT ALL RESIDUAL FUEL IS DRAINED FROM THE LINE.

EXERCISE THE PRECAUTIONS PREVIOUSLY MENTIONED TO MINIMIZE FIRE HAZARDS.

Since the fuel system plumbing is composed of standard aircraft tubing and fittings, its removal is merely the use of standard maintenance practices.

B. Fuel System Plumbing Installation

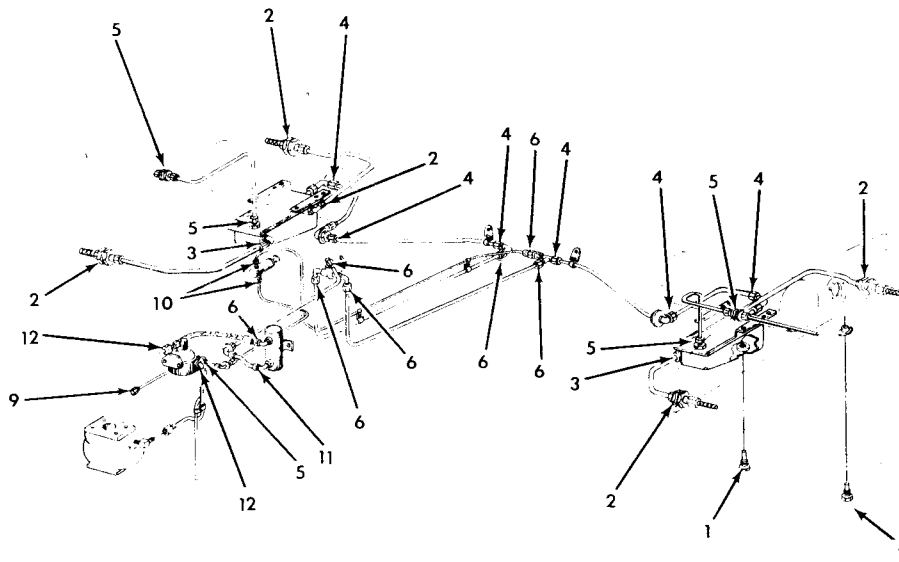
**CAUTION:** PRIOR TO INSTALLATION, ALL FUEL LINES AND FITTINGS SHOULD BE CLEANED INTERNALLY BY PASSING STODDARD SOLVENT THROUGH THEM, THEN AIR DRYING TO PREVENT CONTAMINATION FROM BEING INTRODUCED INTO THE SYSTEM.

ALL THREADED FITTINGS SHOULD BE CLEANED WITH A STIFF BRISTLE BRUSH BEFORE THE FITTING IS INSTALLED.

THREADED FITTINGS SHOULD BE TORQUED IN ACCORDANCE WITH FIGURE 403.

Like removal, the installation of fuel system plumbing follows standard maintenance practices.

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<u>PART NO.</u>	<u>NAME</u>	<u>INDEX</u>	<u>TORQUE VALUE</u>
F391-53S	Drain Valve	1	25 ± 5 In. lb
AN818-8D	Nut	2	200 ± 50 In. lb
AN924-8D	Nut	3	200 ± 50 In. lb
AN924-6D	Nut	4	100 ± 25 In. lb
AN818-4D	Nut	5	52.5 ± 12.5 In. lb
AN818-6D	Nut	6	100 ± 25 In. lb
AN818-2D	Nut	7	25 ± 5 In. lb
AN924-2D	Nut	8	25 ± 5 In. lb
AN818-2	Nut	9	25 ± 5 In. lb
AN805-2	Nut	10	25 ± 5 In. lb
AN818-6	Nut	11	120 ± 30 In. lb
AN924-6	Nut	12	120 ± 30 In. lb

Fuel System Fitting Torque Values  
Figure 403

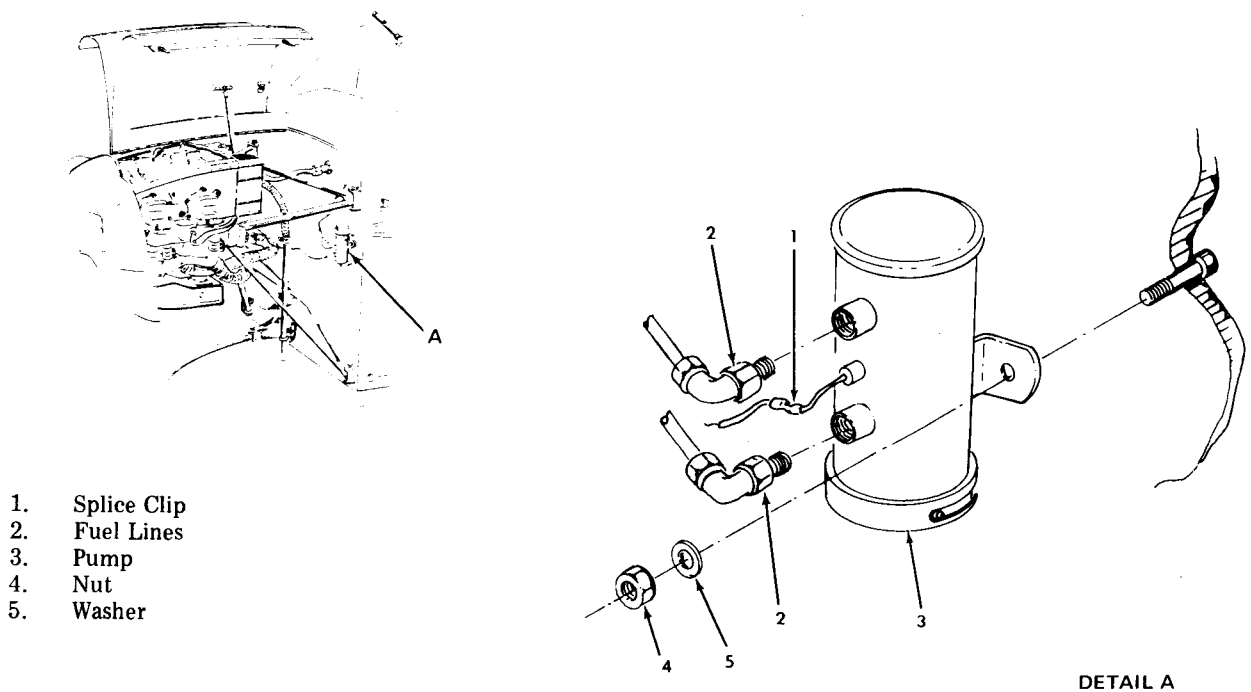
5. Electric Fuel Pump Removal/Installation

A. Electric Fuel Pump Removal (See Figure 404.)

- (1) Disconnect electrical pigtail connector at splice clip (1).
- (2) Disconnect the two fuel lines (2) from the pump (3) and cap fittings.
- (3) Remove the nuts (4) and washers (5) securing the pump (3) to the firewall and remove the pump.

B. Electric Fuel Pump Installation (See Figure 404.)

- (1) Position fuel pump on firewall as shown in Figure 404.
- (2) Install washers (5) and nuts (4).
- (3) Torque to  $35 \pm 5$  inch pounds.
- (4) Clean exposed threads on fuel pump elbow fittings with a stiff bristle brush.
- (5) Torque fittings per Figure 403.
- (6) Reconnect electrical pigtail to wire and crimp connector (1).



Electric Fuel Pump Removal/Installation  
Figure 404

6. Fuel System Adjustments/Tests

A. Fuel Sump Tank Pressure Test

- (1) Remove fuel sump tank as described in Paragraph 3.
- (2) Plug all fuel line fittings on the sump tank.
- (3) To the vent line fitting, attach a well regulated supply of air or nitrogen capable of supplying 3.5 psi pressure.

**CAUTION: DO NOT ATTEMPT TO APPLY PRESSURE TO THE TANK WITHOUT A GOOD REGULATOR AND A POSITIVE SHUTOFF IN THE SUPPLY LINE. DO NOT PRESSURIZE THE SUMP TANK TO MORE THAN 3.5 PSI OR DAMAGE MAY OCCUR.**

- (4) Apply pressure slowly until 3.5 psi is obtained.
- (5) Prepare a solution of 50% liquid diswashing detergent and 50% water.
- (6) Apply solution to outer surface of tank.
- (7) Check for presence of bubbles to indicate location of leakage.
- (8) If sump tank holds pressure for 15 minutes with pressure loss not exceeding 0.05 psi, tank is acceptable.
- (9) If leaks are found, reseal and retest. (Fuel Storage System — Approved Repairs for sealing procedures.)

B. Fuel System Plumbing Pressure Test

- (1) Pressurize the fuel system plumbing by performing the procedures in Fuel Storage System — Inspection/Check.
- (2) Prepare a solution of 50% liquid diswashing detergent and 50% water.
- (3) Apply solution to plumbing at all locations of suspected leakage.
- (4) Check for presence of bubbles to indicate location of leakage.
- (5) If plumbing holds pressure for 15 minutes with pressure loss not exceeding 0.05 psi, plumbing is acceptable.
- (6) If leaks are found, repair per Fuel Storage System — Approved Repairs.

C. Electric Fuel Pump Operational Check

- (1) Ensure that one fuel tank contains at least 3 gallons of fuel.
- (2) Set FUEL SELECTOR valve to the tank containing fuel.
- (3) Set MASTER SWITCH to ON.
- (4) Set AUX. FUEL PUMP switch to ON.
- (5) Observe FUEL PRESSURE gauge. Gauge must indicate 0.5 to 8.0 psi.
- (6) Set AUX. FUEL PUMP and MASTER switches to OFF.

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D. Engine-Driven Fuel Pump Operational Check

NOTE: It is necessary to operate the aircraft engine in order to check the engine-driven fuel pump.

- (1) Ensure that one fuel tank contains at least 3 gallons of fuel.
- (2) Set MIXTURE to FULL RICH.
- (3) Set FUEL SELECTOR valve to the tank containing fuel.
- (4) Set MASTER SWITCH to ON.
- (5) Set AUX. FUEL PUMP switch to ON.
- (6) Observe FUEL PRESSURE gauge. Gauge shall indicate 0.5 to 8.0 psi.
- (7) If required, prime engine.

WARNING: ENSURE THAT PROPELLER IS CLEAR PRIOR TO STARTING ENGINE.

- (8) Set MAGNETO switch to LEFT.
- (9) Press STARTER button until engine starts.
- (10) Set MAGNETO switch to BOTH.
- (11) Check OIL PRESSURE gauge. Oil pressure shall be indicated within 30 seconds.
- (12) Set AUX. FUEL PUMP switch to OFF while observing FUEL PRESSURE GAUGE. Gauge shall indicate 0.5 to 8.0 psi, with auxiliary fuel pump off.
- (13) Run engine at several different power settings and ensure that fuel pressure remains between 0.5 and 8.0 psi.
- (14) Idle engine and set MIXTURE to IDLE CUTOFF.
- (15) Set MAGNETO switch to OFF.
- (16) Set MASTER SWITCH to OFF.



7. Approved Repairs

A. Fuel Sump Tank Sealing

- (1) Remove sump tank as described in Paragraph 3.
- (2) Pressure test sump tank as described in Paragraph 6.

NOTE: Prior to removing sump tank fittings, note their position (the angles at which the elbows are installed) so that they can be similarly positioned when reinstalled.

- (3) Remove fuel line and vent line fittings from sump tank.

WARNING: USE SOLVENT IN A WELL VENTILATED AREA. AVOID BREATHING FUMES. KEEP AWAY FROM FLAMES.

- (4) Wash inside of sump tank thoroughly with Stoddard solvent (or equivalent) until no residue washes from tank.
- (5) Leave fitting openings open and allow tank to thoroughly air-dry.
- (6) Plug or tape all fitting openings except the sump tank drain plug opening. (See Figure 401.)
- (7) Pour approximately 4 ounces of Randolph Products Co. No. 802 sloss coating (or equivalent) into the drain plug opening in the sump tank.
- (8) Plug or tape the drain plug opening.
- (9) Rotate and shake the sump tank such that the coating entirely coats its interior.
- (10) Remove the plug or tape from the drain plug opening and allow excess coating to pour from sump tank.
- (11) Remove plugs or tape from all sump tank fitting holes and position sump tank so that excess coating will drain from sump tank.
- (12) Leave sump tank in this position and allow to air-dry for 24 hours.
- (13) When tank coating is thoroughly dry, scrape excess coating from threaded fitting holes. Hold tank with threaded holes down while scraping coating to ensure that flakes of coating removed do not fall into the tank.
- (14) Apply Parker Sealube (or equivalent) to fuel and vent line fittings and install fittings.
- (15) Pressure test sump tank in accordance with Paragraph 6.
- (16) If sump tank is acceptable per Paragraph 6 test, install it on aircraft per Paragraph 3.

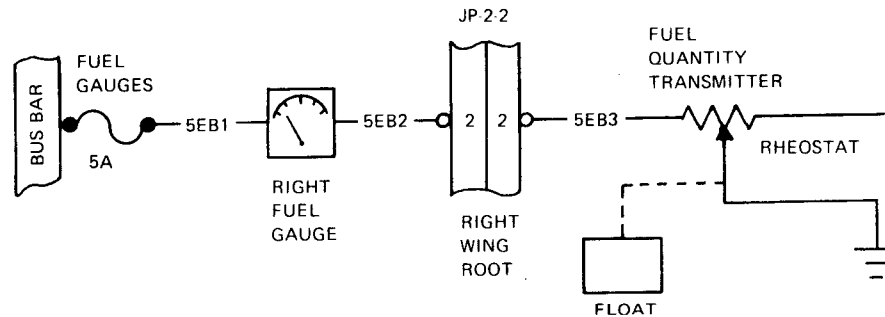
FUEL INDICATING SYSTEM - DESCRIPTION/OPERATION

1. General

The fuel indicating system is composed of two fuel quantity transmitters (one in the inboard end of each fuel tank), two electrically operated fuel gauges (one for each tank) and the wiring necessary to connect the elements of the system.

As is shown in Figure 1, the fuel indicating system receives power from the aircraft electrical system. (Since both systems are identical only the right is shown.) This power is routed through a rheostat (variable resistance) element in the fuel quantity transmitter. A float in the fuel tank positions the wiper of the rheostat such that its resistance varies directly with fuel quantity. This, in turn, varies the amount of current applied to the fuel gauge. Since the fuel gauge is simply an electrical meter movement, its needle deflection is directly proportional to the amount of power applied. Thus the fuel gauge deflection indicates the fuel quantity represented by the position of the fuel transmitter float.

NOTE: Fuel quantity indicated by the gauge will be accurate only when the aircraft is in a level attitude.



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Fuel Indicating System - Schematic  
Figure 1

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FUEL INDICATING SYSTEM - TROUBLESHOOTING

1. Fuel Indicating System Troubleshooting

TROUBLE	PROBABLE CAUSE	REMEDY
Fuel gauge fails to indicate	Defective transmitter.	Replace transmitter
	Transmitter not grounded.	Check transmitter ground connections.
	Loose or damaged wiring.	Check wiring for damage and secure connections.
	Defective fuel gauge.	Replace gauge.
Fuel gauge does not indicate properly	Defective transmitter.	Replace transmitter.
	Transmitter float improperly adjusted.	Adjust transmitter float level.
	Defective fuel gauge.	Replace gauge.

MAINTENANCE PRACTICES – REMOVAL/INSTALLATION

1. Fuel Gauge Removal/Installation

A. Fuel Gauge Removal (See Figure 401.)

- (1) Ensure that MASTER SWITCH is set to OFF.
- (2) Remove fuel selector handle decal (1) and attaching screw (2) and pull handle (3) from valve stem (4).
- (3) Pull insulator boots (5) up on wires to expose terminals of gauges.

NOTE: When wires are disconnected, tag them for identification to assist in reassembly.

- (4) Remove nuts (6), washers (7 and 8), and wire lugs (9) from gauge terminal studs (10).
- (5) Remove nuts (11) and insulators (12) from terminal studs (10).
- (6) Remove nut (13), washer (14), and grounding screw (15). Pull screw (15) from ground lugs (16).
- (7) Pull gauge wiring from grommet (17).
- (8) Remove screws (18) at top and bottom of royalite panel (19) on fuel selector console.
- (9) Rotate panel (19) up to remove it.
- (10) Cut the gauge ground wire (21) between the panel (19) and the ground lug (16).
- (11) Remove the gauge (20) from the panel (19).

B. Fuel Gauge Installation (See Figure 401.)

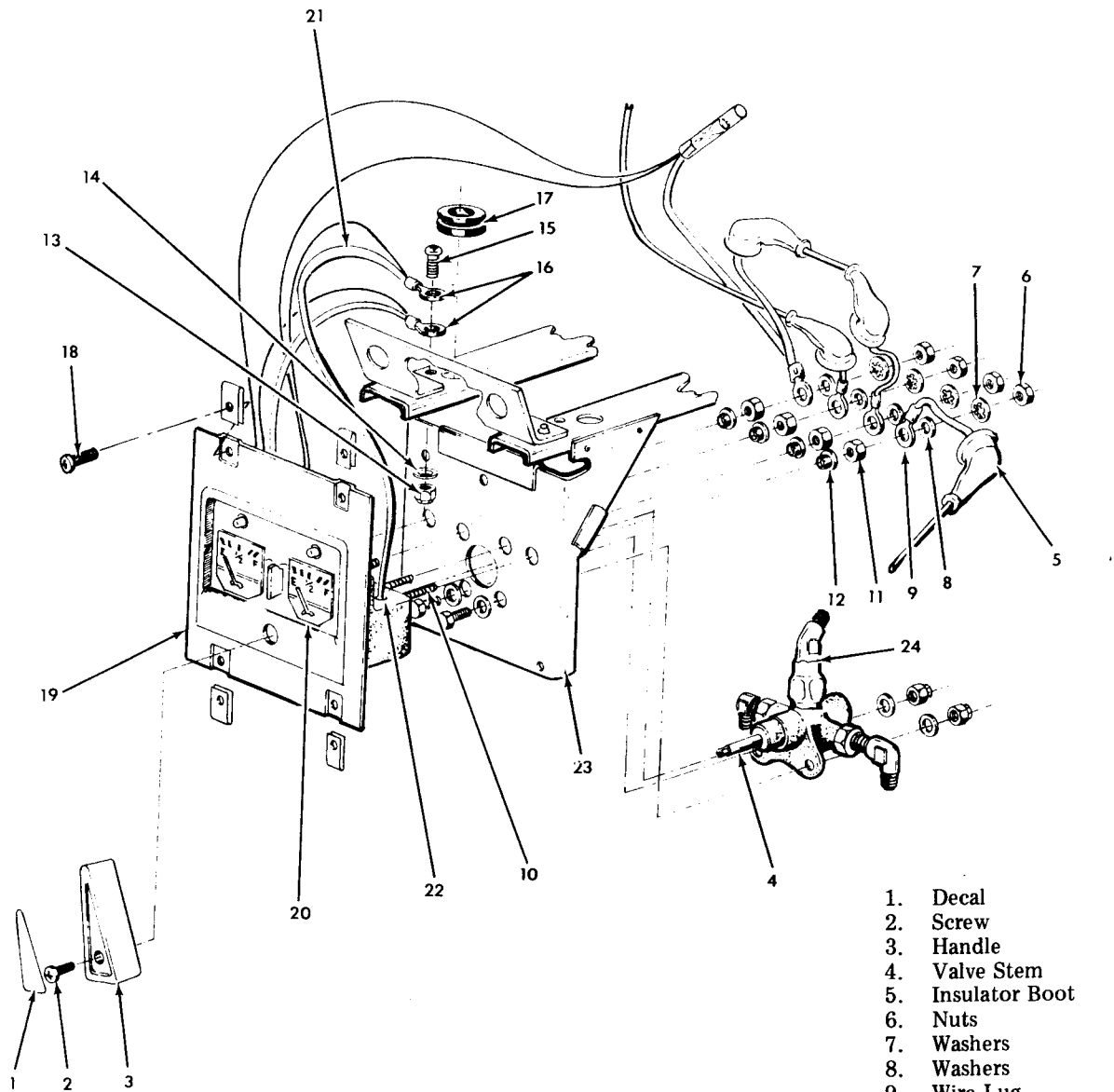
- (1) Slide the end of the gauge ground wire (21) through the access opening (22) in the panel (19).
- (2) Attach end of ground wire (21) to ground lug (16).
- (3) Position gauge (20) in panel (19).
- (4) Use screw (15), washer (14), and nut (13) to secure ground lugs (16) to bracket (23).
- (5) Ensure that insulation (24) on selector valve is not damaged.
- (6) Position panel (19) on bracket (23) and install insulators (12) and nuts (11) on gauge terminal studs (10).
- (7) Route wiring through boot (5) and install wire lugs (9) on terminal studs (10). Secure with washers (8 and 7) and nuts (6).
- (8) Slide boots (5) over terminals to insulate connection.
- (9) Install handle (3) on valve item (4) and secure with screw (2). Install decal (1).

2. Fuel Quantity Transmitter Removal/Installation

A. Fuel Quantity Transmitter Removal

- (1) Drain fuel tank as described in Chapter 12.
- (2) On Model AA-5 and AA-5A (standard) aircraft, remove wing root access panel and disconnect lead from fuel transmitter. If early AA-5, note if transmitter is removable from inside or outside the wing tank. Transmitters on AA5-0085 and earlier aircraft are removable only from inside the tank, through the inner aft fuel tank access hole, while on AA5-0086 and later aircraft they are removable from outside the tank through the wing root access panel.

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1. Decal
2. Screw
3. Handle
4. Valve Stem
5. Insulator Boot
6. Nuts
7. Washers
8. Washers
9. Wire Lug
10. Terminal Stud
11. Nuts
12. Insulator
13. Nut
14. Washer
15. Grounding Screw
16. Ground Lug
17. Grommet
18. Screws
19. Panel
20. Gauge
21. Ground Wire
22. Access Opening
23. Bracket
24. Insulation

Fuel Gauge Removal/Installation  
Figure 401

AA-5 SERIES  
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On Model AA-5A (Optional) and AA-5B aircraft, remove the inboard aft wing inspection cover and disconnect lead from fuel transmitter. The transmitter is removable from outside the tank.

On AA5-0085 and earlier aircraft, remove inner aft fuel tank access panel from under the wing.

**NOTE:** When removing transmitter ensure that no dislodged sealant chips remain in tank.

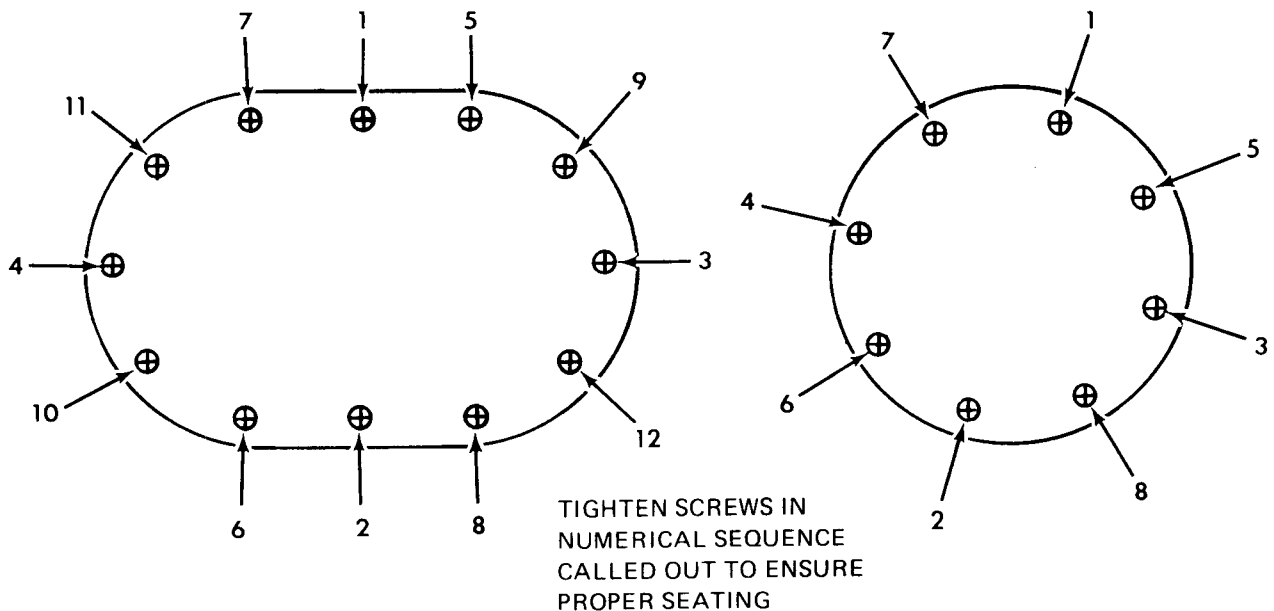
- (3) Remove the screws attaching the fuel transmitter to the inboard end of fuel tank. Remove transmitter.

B. Fuel Quantity Transmitter Installation

- (1) Inspect the fuel quantity transmitter gasket to ensure that it is clean and undamaged. If it is damaged or deformed, replace it.

**WARNING:** USE SOLVENTS IN A WELL VENTILATED AREA. AVOID BREATHING FUMES. KEEP AWAY FROM FLAMES.

- (2) On early AA-5 aircraft, remove sealant from inner aft fuel tank cover mating surface and clean with trichloroethane.
- (3) Position fuel quantity transmitter, with gasket, in tank and secure with attaching screws.
- (4) Attach electrical leads to transmitter and torque attaching screws to 15 inch pounds (do not over torque).
- (5) On early AA-5 aircraft, apply a coating of Sealant Churchill Chemical Corp., (3C-200 Class B-1/2, or equivalent) to inner aft fuel tank cover mating surface.
- (6) On early AA-5 aircraft, install fuel tank cover and secure with screws, per Figure 402.
- (7) On AA-5 and AA-5A (standard) aircraft, install wing root access panel, and secure with screws, per Figure 402.

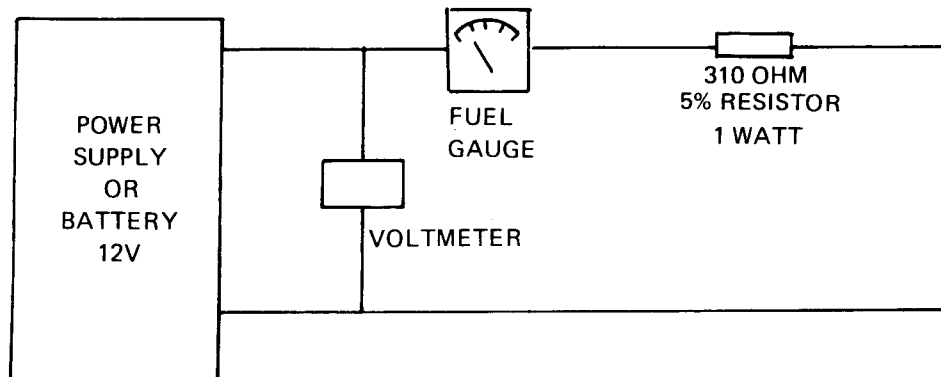


Access Panel Installation  
Figure 402

3. Fuel Gauge Adjustment/Test

A. Fuel Gauge Calibration

- (1) Remove the fuel gauge from the aircraft as described in Paragraph 1.
- (2) Connect the fuel gauge to the test setup shown in Figure 501.



Fuel Gauge Calibration Setup  
Figure 501

- (3) Adjust the power supply (if used) for a  $12.6 \pm 1$  volt indication on the voltmeter. If a battery is used, ensure that the voltage is  $12.6 \pm 1$  volt.
- (4) Check fuel gauge indication. Gauge shall indicate at or below the empty mark with no portion of the needle above the mark. The needle shall not indicate more than one needle width below the empty mark.  
  
**CAUTION:** IF THE GAUGE INDICATION IS NOT WITHIN TOLERANCE, DO NOT ATTEMPT TO REPAIR THE GAUGE. REPLACE IT.
- (5) Remove power from the test setup (Figure 501) and replace the 310 ohm resistor with a 24 ohm, 1 watt, 5% resistor.
- (6) Check that voltmeter indicates  $12.6 \pm 1$  volt.
- (7) Check fuel gauge indication. Gauge shall indicate within one needle width of the full mark. If not, replace the gauge.

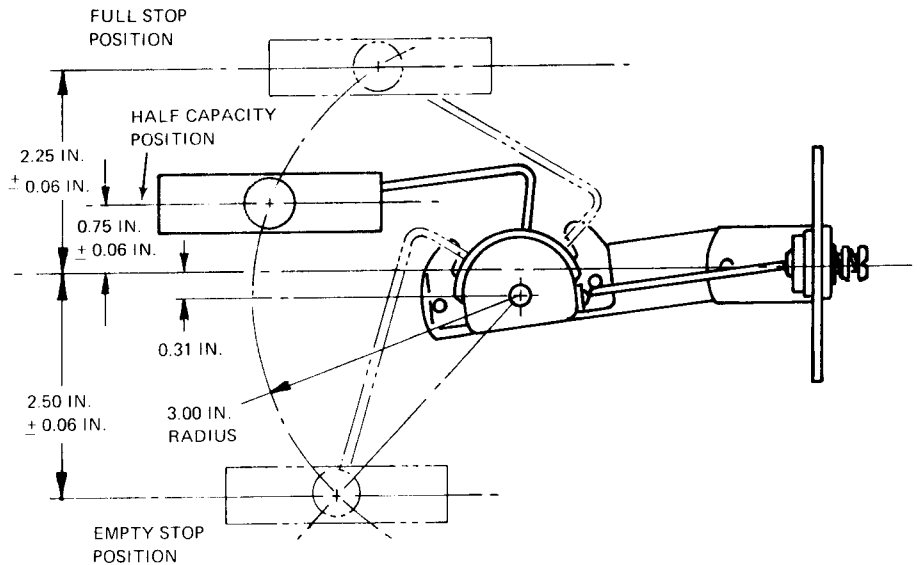
**CAUTION:** IF THE GAUGE INDICATION IS NOT WITHIN TOLERANCE, DO NOT ATTEMPT TO REPAIR THE GAUGE. REPLACE IT.

B. Fuel Quantity Transmitter Calibration

**WARNING:** BE EXTREMELY CAUTIOUS WHEN WORKING WITH ELECTRICAL COMPONENTS AROUND THE FUEL SYSTEM. ELECTRICAL SPARKS AROUND A FUEL TANK CONTAINING FUEL VAPOR ARE EXTREMELY HAZARDOUS.

Fuel tank transmitters can be calibrated either in or out of the fuel tank. Calibration in the tank requires draining the tank completely for the empty position, filling to 1/2 capacity for 1/2 fuel position and completely filling for the full position. The aircraft must be level for all transmitter calibration. The transmitter can be calibrated outside the tank by positioning the float in the empty, 1/2, and full positions as shown in Figure 502. The transmitter mounting flange must be grounded to the aircraft for all calibration done outside of the tank.

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Fuel Transmitter Calibration  
Figure 502

All calibrations should be performed using the aircraft fuel gauges. No part of the fuel gauge needle should show above the empty mark with the transmitter in the empty position. Small adjustments to the transmitter can be made by bending the stops or the float arm. If small adjustments do not correct the problem, the transmitter and/or the gauge must be replaced.