SkyStar
AIRCRAFT CORPORATION

# STATIC SYSTEM INSTALLATION INSTRUCTIONS

## (P/N 10105.000)

## Section A. Static Pressure System Installation

The static pressure system consists of a fuselage mounted static port, and sufficient tubing and fittings to connect your flight instruments. The instruments use static pressure as a reference pressure; therefore the accuracy of the flight instrument readings depends to a large extent on the proper installation of the static system.

**1.** Mark the location of the static port on the fuselage using the dimensions shown in Figure 1. An inspection panel will be installed on the bottom fabric of the fuselage to allow installation and servicing of the static port and plumbing. Use Poly-tak to bond the doubler ring of the inspection panel to the bottom fuselage fabric directly under the point where the static port will be located. If the aircraft is unpainted, cover the ring with a fabric patch of about 8" to 10" diameter. When the Poly-tak has cured, use a sharp knife to cut both layers of fabric around the inside of the ring. If the aircraft is painted, bond the ring down with Poly-tak as before. When cured, carefully cut out a circle in the fabric inside the ring about 1/2" smaller the ring diameter itself. Then make a series of radial cuts in the fabric to the edge of the ring. Fold these fabric tabs back over the ring and adhere with Poly-tak. This helps strengthen the mounting of the ring to the fabric without creating a large area that would need to be repainted.

**2.** Fabricate a round backing plate by cutting a 2" diameter circle from the P/N 16011.102 Backing Plate material with a hole saw. (The material is much oversized because it is a scrap from another manufacturing process.) Enlarge the pilot hole from the hole saw to 1/4", and file as required to accept the static port. Use the port as a drill guide and drill the backing plate in four places for the mounting rivets with a #40 bit. Dimple the backing plate and countersink the static port to accept the AN426AD3-6 rivets. Rivet the backing plate to the static port using standard rivet setting techniques.

**3.** Assemble the P/N 94036.000 1/4" x 1/8" Male Elbow Fitting to the static port, using teflon tape on the pipe threads of the fitting, and tighten it securely.

**4.** Route the P/N 10051.000 1/4" tubing through the fuselage, using zip ties to secure the tubing to the fuselage structure. Leave enough of a service loop in the tubing at the aft end so the tubing can be assembled to the static port outside the fuselage. Remove the nylon nut and sleeve from the elbow fitting on the static port and slide them onto the tubing. Push a P/N 94035.000 Tubing Insert into the tube, and then push the tube into the elbow fitting on the static port. Slide the sleeve and nut to the fitting and tighten the nut until firm resistance is felt, and then tighten another 1 to 1-1/2 turns.

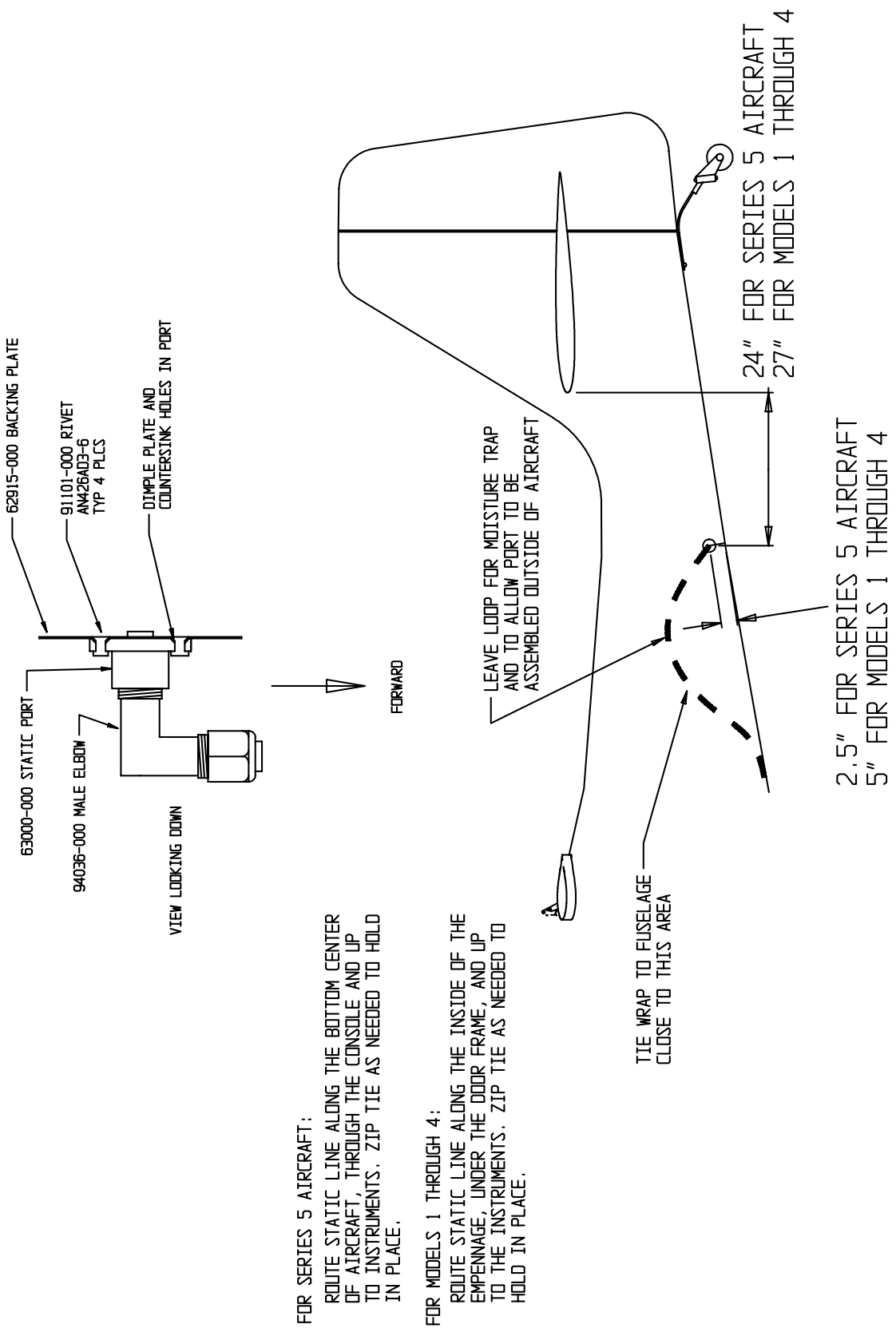


**Figure 1**
Static Port Installation
(W85010)

**Completion Date**

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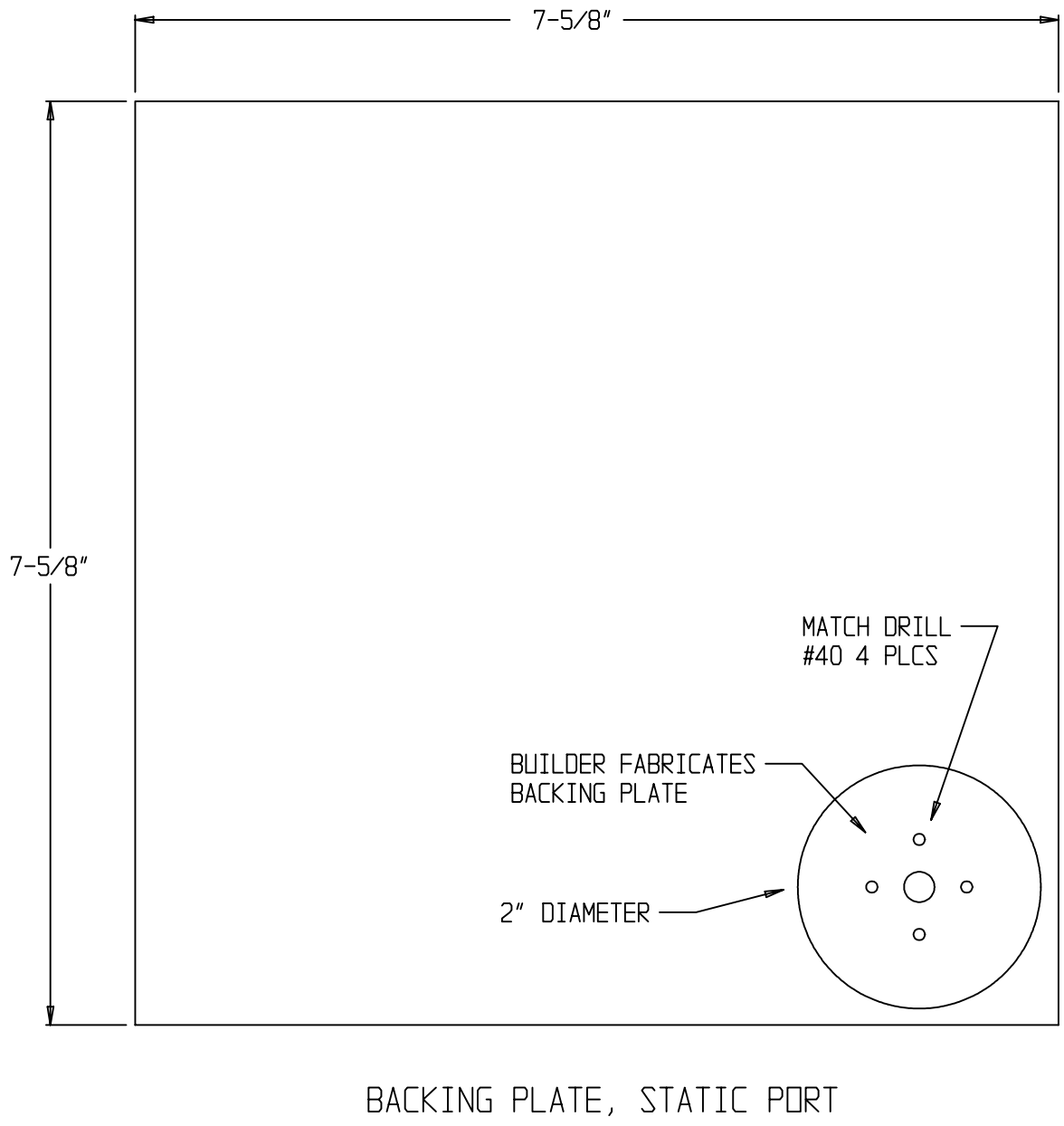
**5.** Melt a 1/4" hole in the fuselage fabric where the stem of the static port will protrude, and test fit the static port and it's tubing to be sure that everything fits well. When ready, apply Poly-tak to the backing plate, and quickly press the static port in place against the fabric, and hold it there until the Poly-tak has set up.




BACKING PLATE, STATIC PORT

**Figure 2**
Backing Plate Details
(W16011-1)

## Section B. Pitot/Static System Completion

**6.** Route the pitot and static tubing through the fuselage to the instrument panel. The exact fittings and routing will depend on the instruments you will be using; use Figure 3 for guidance. The pitot tube terminates only at the 'P' port on the airspeed indicator. The static system supplies reference pressure to the airspeed indicator, the altimeter, the vertical speed indicator, and the transponder encoder. Assemble the tubing fittings using the procedures outlined in the previous sections. Double check that the airspeed indicator is properly plumbed, because the instrument will be damaged if the static port ever sees higher pressure than the pressure port.

**7.** The best method for testing the pitot static system is to take the aircraft to a local avionics shop, and have them use their test machine. There is no practical way to test the pitot system by yourself, although the static system can be tested without special equipment. Tape shut the static port in the fuselage, and then 'T' into the system plumbing near the instrument panel with a short length of tubing. With this tube in your mouth, gently suck on the static tube while watching the flight instruments; after applying suction to the tube, stopper the tube end with your tongue, let your breath out, and repeat the sucking process until the altimeter has registered as close to a 2000' increase over your initial field elevation as possible, given the note below. A clamp or some other technique could be employed to hold the tube shut for longer periods while you are timing and observing your instruments.

**NOTE: It is very important that you never exceed the maximum reading on your VSI or the maximum displayed airspeed on your airspeed indicator or you could damage the instruments;** this is also true of relieving the pressure after you have completed your pressure check - release the pressure in small increments so as to preserve the instruments. If your system is leak free, the pointers on these instruments will not change (it will take a few seconds for them to stabilize), or will change very slowly. The VSI is the best leak detector, and will show a rate of descent if there are any leaks in the system. While it is nearly impossible to have a completely leak free static system, do not settle for more than a timed 100 FPM rate of descent on the altimeter after you have pulled the system down. If you have a transponder with altitude encoder, you will need to have it's encoding signal checked (and possibly adjusted) by an avionics shop, but if you take them an airplane with a tight static system, you will save money on the labor bill.

**CAUTION**

**If you cough (or somebody gooses you) while you've got the static tube in your mouth and happen to blow into it, the instruments will be damaged! Be very careful to apply only a negative pressure to the static system.**

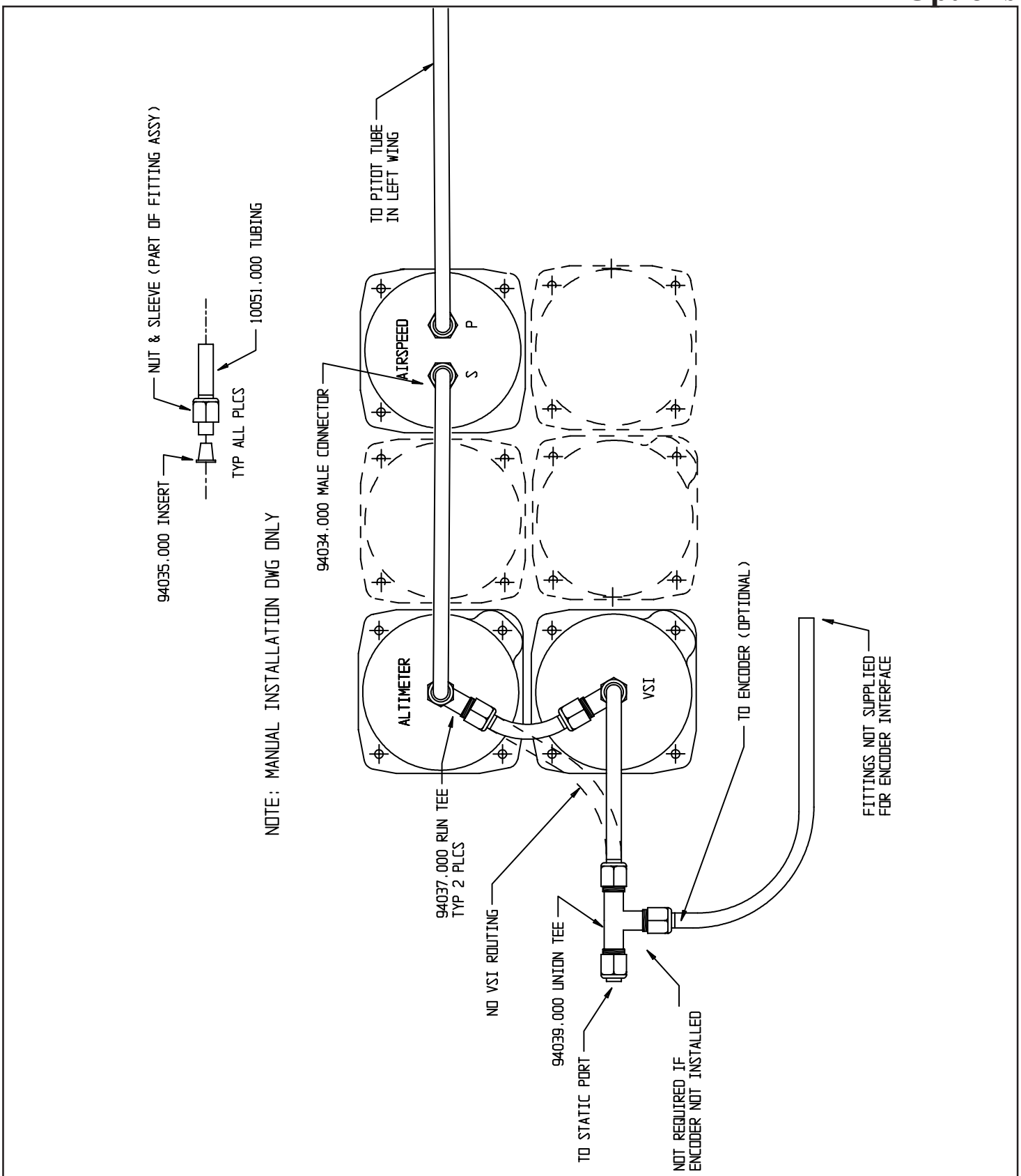



**Figure 3**
Instrument Plumbing
(W85010)

**8.** If your aircraft is newly flightworthy, you will obviously need to perform flight tests to establish the operating envelope, as all aircraft are slightly different. If you have retrofitted the static system installation to an already flying aircraft, you MUST perform sufficient flight testing again to re-establish the indicated instrument readings for your flight envelope. The readings will be different that those you have gotten used to, so you will need to relearn the stall and approach speeds for your aircraft.

**Completion Date**

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**9.** When the flight testing is complete, correct the range markings on your airspeed indicator according to your test data.