

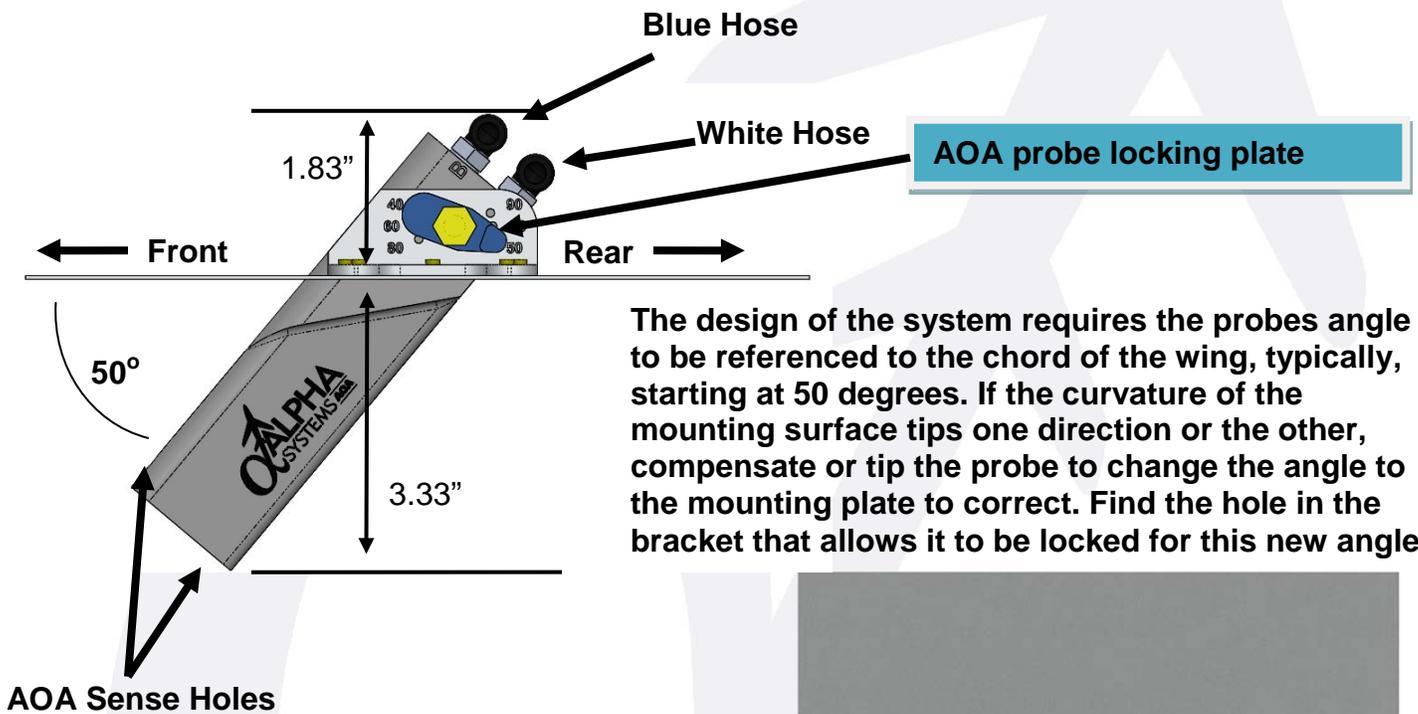
**3.2 Preparing to Install the Probe:**

In chapter two, the location for the probe was established. If it was determined that additional structure or modification to the wing will be required, perform that work now in accordance with the established plan and/or any required engineering data.

If not already done, remove the inspection panel at the location where the probe will be mounted.

Cut plate shape and drill holes in the AOA probe mounting plate to fit the wing inspection hole (the panel removed may be used as a template, or, if desired, the brackets from the AOA plate may be removed and the AOA plate be used as a template to install the brackets to the existing plate).

Ensure that the slot in the mounting plate is aligned so that the rounded end faces forward (direction of flight).



The design of the system requires the probes angle to be referenced to the chord of the wing, typically, starting at 50 degrees. If the curvature of the mounting surface tips one direction or the other, compensate or tip the probe to change the angle to the mounting plate to correct. Find the hole in the bracket that allows it to be locked for this new angle.



**NOTES:**

- 1.) Probe and 2 fittings = .23 lbs.
- 2.) 9" x 9" plate + hardware = .40 lbs. (Less when cut to fit existing opening)
- 3.) Add .25 lbs. with optional probe heat
- 4.) Weight of sense line is .02 lbs. / ft.
- 5.) Material: .040" 6061-T6 Aluminum

On a non-structural panel, the screw spacing should be no less than one screw every two to three inches along the circumference of the mounting plate. If the existing layout is greater, add nut plates as required to accomplish the proper screw spacing (on a structural panel the screw spacing would be much closer).

Drill holes in the probe mounting plate to match the layout in the wing. (Use the inspection panel as a template).

Install the mounting plate on the wing and check for a proper fit. When satisfied, remove the panel and prepare the panel for paint.

Finish panel as desired and set aside to cure.

### 3.3 Installation of the AOA Sense Lines:

Gain access to the aircraft so that the AOA sense lines can be installed and routed through the aircraft from the probe location to the AOA Interface Module location in accordance with the plan established in chapter two.

Route the sense lines and observe the following requirements:

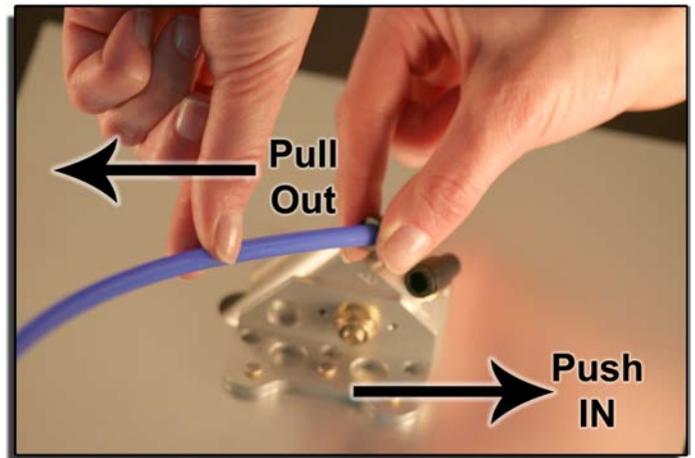
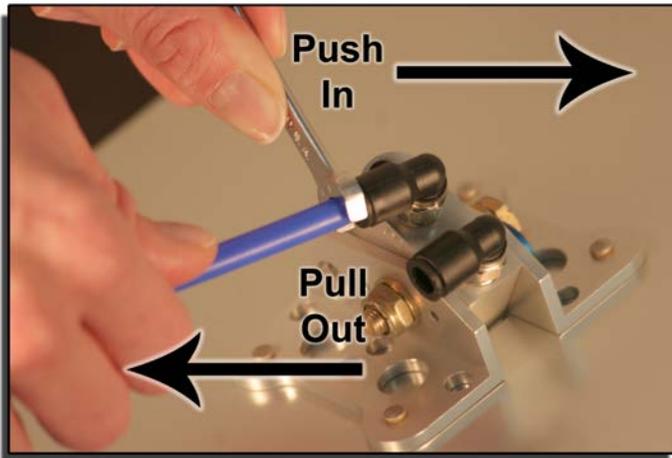
- The sense lines have a minimum bend radius of 4".
- Attach sense lines at regular intervals by means of suitable clamps.
- Do not clamp sense lines at the end fittings.
- Use AN931 grommets (preferred) or bulkhead fittings where the sense lines pass through bulkheads.
- To install our system in a pressurized aircraft, Alpha Systems has created a pressurized kit to utilize existing electrical connector pass-through.
- Do not remove the caps installed on either ends of the sense lines, and leave sufficient length so they may be cut to length later in the installation process.

**Note:** *Keep the lines well clear of any moving controls or cables.*

The following section will show how to properly install the electrical connections for various parts of the AOA system.

**How to remove the tubing from Quick-Release fittings:**

- Using a ¼" box end wrench, or your fingers. Push down the release ring on the fitting and then pull air tube to remove.

**Quick installation hint!**

The Alpha Systems AOA utilizes push-in fittings. Once the hoses are installed, draw a line on the hose at the junction of the fitting. Remove hose and reinsert, verifying the hose is inserted completely to the line. If the reinsertion of the hose covers the line, the hose was not inserted fully the first time! **Cut OFF hose at line and REPEAT ABOVE PROCESS!**

(Continued on next page)

### 3.10 Install the AOA Probe and Mounting Plate:

Due to the vast number of aircraft and the wide variety of possible inspection cover locations, Alpha Systems AOA has designed an AOA sense probe that can be tilted and locked at different angles, ranging from 35 degrees to 90 degrees. This design allows for the deviation or tilt of the skin surface difference from the chord of the wing while allowing for the AOA probe to be “pinned” in place to get an accurate full-scale range of AOA output.

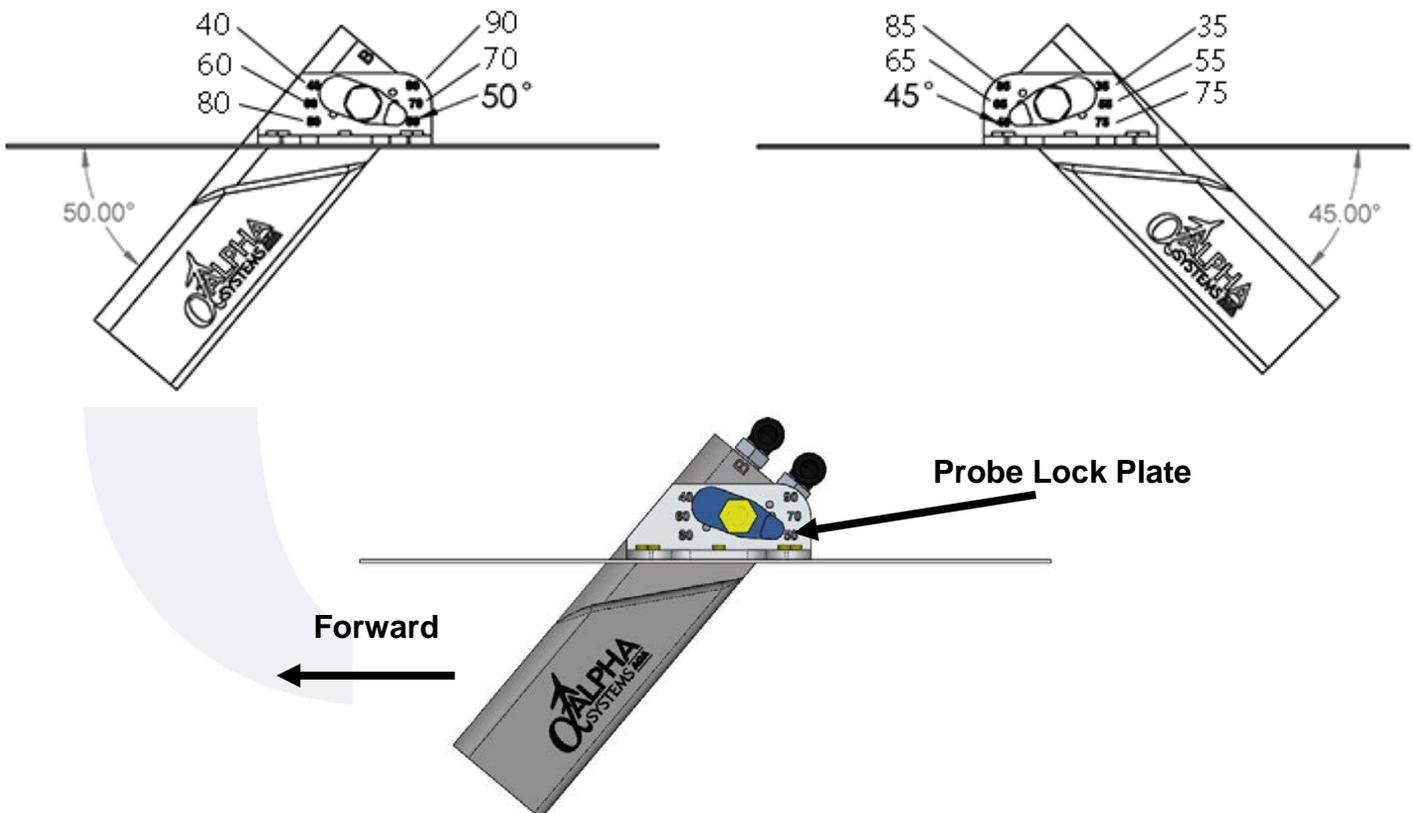
Install the AOA probe in the mounting plate and secure it as follows:

- Locate the 50° index hole on the AOA probe using the following figure as a starting angle.
- Insert the AN ¼-28 bolt through the probe lock plate. Make sure that the pin on the probe lock plate faces the thread side of the bolt.
- Insert the AOA probe through the mounting bracket and line up the bolt hole in the AOA probe with the bolt hole in the mounting bracket.
- Insert the AN ¼-28 bolt and probe lock plate loosely through the AOA mounting bracket and AOA probe from the left side (looking at AOA probe from rear).
- Line up the 50° index hole on the AOA probe with the front hole in the mounting bracket. Insert the longer pin on the probe lock plate through the front hole on the mounting bracket and into the 50° hole on the AOA probe. The probe lock plate location should match the following figure.

**Note:** Refer to Appendix page 5.13 and 5.14 for more information on the probe lock plate.

**AOA Probe Pin Positions – Right Side**

**AOA Probe Pin Positions – Left Side**



### 3.11 Correct Position of Probe Lock Plate:

**Note:** *The probe lock plate can face forwards or backwards and can be placed on either the left or right side of the AOA probe depending on which pin hole is selected on the AOA probe.*

It may be necessary to remove material from the mounting plate that would prevent the AOA probe from being installed at the proper angle. If the 50° (or less) angle of the AOA probe interferes with the plate, or in the final calibration steps the AOA probe needs to be at a tighter angle, remove material from the mounting plate only as required to allow enough range of motion for accurate calibration. When in-flight calibration is complete, remove mounting plate from aircraft, use high-temp urethane/silicone and fill in gaps in front and behind the probe.

**CAUTION:** *Drilling out the probe is not needed and will nullify the warranty.*

To finish the AOA probe installation:

- Install the washer and nut onto the AN4 bolt and tighten it so the AOA probe will not move in flight.
- Use the included protractor to confirm that the AOA probe is at an initial 50° angle. If not, loosen the nut enough that the probe lock plate can be backed out of the mounting bracket enough to rotate the AOA probe until the correct hole is lined up. Then, reinsert probe lock plate and retighten bolt and nut.
- Cut the sense lines (at a 90° angle, **verify NO burrs**) to length so they may be easily attached to the AOA probe but short enough so they will not kink when the mounting plate is secured to the wing. Allow enough hose to re-position the AOA probe angle for final adjustments.
- Insert the lines firmly in the connectors. Observe the two letters on the side of the AOA probe, **“B” for blue** (Front Hole) → **BLUE LINE** and **“W” for White** (Bottom Hole) → **WHITE LINE**. When correctly installed, the tube is inserted approximately 5/8 in. into the connector. Push hose in firmly until a positive stop is felt.

**Note:** *Ensure the lines are installed correctly. The Alpha Systems AOA utilizes push-in fittings. Once the hoses are installed, draw a line on the hose at the junction of the fitting. Remove hose and reinsert, verifying the hose is inserted completely to the line. If the reinsertion of the hose covers the line, the hose was not inserted fully the first time! If you ever need to disconnect the lines depress the black collar (the furthest outboard portion of the connector) on the fitting and pull the line out.*

- Slowly slide the AOA probe and mounting plate into position ensuring that everything will fit properly (no kinks or bends). When satisfied, secure the mounting plate to the wing and tighten all screws.

**(Optional)** If installing a heated probe, it will come from the factory installed with high temperature fittings and colored (**Blue / White**) high temperature hoses with the heater in the AOA probe.

**(Optional)** Cut the electrical wires for the AOA heated probe to length and connect them to the heater. Polarity is not an issue. Connect power to one lead and ground to the other. Attach the shielding to a suitable ground on one end of the wire only; this will prevent a ground loop.