

Dynon AOA Pitot Installation and Calibration Guide

Dynon Avionics
Revised November 10, 2004

Thank you for your purchase of the Dynon Avionics Angle-of-Attack Pitot Probe. The following instructions will give you the information you need to install and calibrate the pitot probe. Keep in mind that this probe is designed specifically to work with the EFIS-D10. Do not expect it to work properly with another Angle of Attack or EFIS system.

Tools and Materials Required

- Dynon Avionics AOA/Pitot probe.
- Two plumbing lines (usually 1/4" soft aluminum or plastic tubing) routed from the EFIS-D10 to the probe mounting location.
- Wiring capable of carrying 11 amps (heated probe only).
- Adapters to connect between 3/16" aluminum tubing from the probe to whatever plumbing lines are installed in the airplane (AN 919-2D for 3/16 to 1/4)
- Mounting hardware (such as the Gretz Aero pitot mounting kit for the PH502-12CR or AN5812 pitot, available at www.aircraftspruce.com or www.gretzaero.com) that will allow you to mount the Dynon Avionics AOA/Pitot probe to your airplane.
- Examples of the mount installation could be found at:
<http://bmnellis.com/WingSkinning3.htm>
<http://www.cafes.net/leo/RV-6/Pitot/Pitot.html>
and many other builder's web sites.

Software Required

The Dynon Avionics AOA Pitot probe requires you to have EFIS-D10 software version 01.05 (or later) loaded onto your EFIS-D10. Load this version of the software before you attempt to calibrate your AOA Pitot probe. Instructions for loading new software onto your EFIS-D10 can be found at www.dynonavionics.com/downloads.

Installation

The Dynon Avionics AOA/Pitot probe has been designed as an under wing pitot. The following information applies to this type of installation. People desiring to have a boom type of mount should contact Dynon Avionics regarding this type of installation.

Mount Location

The Dynon Avionics AOA/Pitot probe will work correctly only when mounted in a location where the airflow over the probe is relatively undisturbed by the aircraft. In general, we recommend you mount it at least 6 to 8 inches below the wing and with the tip of the probe between 2 and 12 inches behind the leading edge of the wing. Typically, pitot probes are mounted about mid-wing span wise to minimize the effects of both the

propeller and the wing tips. Testing during the probe development has shown that the standard mounting locations for the pitot probe in the RV series of aircraft also works for the Dynon probe.

Mounting Instructions

After the mounting location has been determined, you will need to mount the pitot mounting kit per the instructions that came with the kit or fabricate your own mount. In either case, mount the probe securely to the wing such that the body of the probe is horizontal during level flight. Drill and tap mounting holes (# 6-32) on the probe to match your mounting bracket. After mounting the probe, you will need to install the adaptors to connect the 3/16ths plumbing lines from the probe to whatever plumbing lines run back to the EFIS-D10 in your aircraft (AN 919-2D for 3/16 to 1/4). We strongly recommend using aircraft grade fittings such as standard AN fittings. If you purchased the heated version, connect the wires coming from the probe to the wires running back to your instrument panel. **POLARITY IS IMPORTANT.** Be sure to connect the positive lead from your panel to the probe's red wire and the ground or return lead from the panel to the probe's black wire. The wiring, circuit breaker, and switch should be capable of handling at least 11 amps in a 12 volt aircraft electrical system. Use standard aircraft wiring practices and make sure the wiring and plumbing lines will not chafe or interfere with any aircraft control systems.

After the installation procedure has been completed, you will need to calibrate the probe on your aircraft in order to obtain a valid AOA display. The airspeed requires no additional calibration. The AOA calibration process is described in the following section.

Calibration

CAUTION: It is your responsibility to fly your plane safely while performing any configuration or calibration in flight. The best scenario would include a second person to perform any necessary steps on the EFIS-D10.

Once you are flying straight and level at a safe altitude for stalls:

1. Press any button to bring up Main Menu 1.
2. Press MORE to display Main Menu 2.
3. Press SETUP and then MORE twice.
4. Press AOACAL and then you will see the AOA User Calibration Menu.

Once you are in the AOACAL menu, oscillate between $\pm 5^\circ$ pitch 4 times at fast cruise airspeed. During this maneuver the EFIS will record the lowest angle of attack that you usually see during flight. You do not need to push any additional buttons before starting this maneuver.

Below you will see a list of the stalls recommended to complete the user calibration. The general idea is to record stall data to find the lowest angle of attack stall. The list we have suggested is a good starting point and will produce a good calibration under most

circumstances. However, if there are different flight regimes that are not listed that you suspect would create stalls at lower angle of attack it would be good to record those as well.

- With full power, no flaps
- With no power, no flaps
- With full power, full flaps
- With no power, full flaps

For each stall, you need to first push the STALL button. When you push the STALL button, a 45-second timer will start. Notice the “T” next to the time that is counting down. During the 45 seconds that the timer is counting down, you are expected to have completed the stall maneuver. If any stall maneuver is not completed before the timer expires, the calibration will be invalid, and should be reset. In order to do this, push the CANCEL button. This will exit the AOACAL menu, and you will have to re-enter the AOACAL menu to perform the calibration. **After completing the stall, make sure you let the 45 second timer count down to 0 before you push the STALL button for the next stall.**

When the listed stall maneuvers have been completed according to the above procedure, push FINISH. At this point, the angle-of-attack has been calibrated. If it is not visible, make it visible through the menu system (see “Show/hide display items” in EFIS-D10 Pilot’s User Guide). This calibration should result in the lowest angle-of-attack stall occurring just above the red/yellow boundary. If this is not the case, please perform the AOA user calibration again, including flight configurations that resulted in stalls with incorrect indications. If the user calibration continues to be unsuccessful, please contact Dynon Avionics technical support.