OAT PROBE ASSEMBLY

PRODUCT P/N: 681201-1

INSTALLATION MANUAL

REV C

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# INSTALLATION MANUAL

## OAT PROBE ASSEMBLY

**P/N 681201-1**

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### INSTALLATION DRAWINGS AND INSTALL KIT PARTS LIST

<table>
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<th>DATE</th>
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<tr>
<td>4028-005</td>
<td>Installation, OAT Probe Assembly Kit</td>
<td>02/14/05</td>
<td>C</td>
</tr>
<tr>
<td>N/A</td>
<td>Parts List, OAT PROBE Assembly Kit</td>
<td>04/06/07</td>
<td>H</td>
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<td>P/N 681201-1</td>
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The information in this manual is subject to change without notification. To ensure complete and current updates, note the Revision Log above and call Technical Assistance for updated information.
1. OVERVIEW

1.1 The Manual

This manual is intended to determine a proper installation of the OAT PROBE ASSEMBLY. Installation instructions should be read and followed.

1.2 Product Description

The 681201-1 OAT PROBE ASSEMBLY will provide very accurate measurements of Outside Air Temperature (OAT) for inputs to the Air Data Computer and other airborne systems. The OAT Probe Assembly P/N 681201-1 produces an output current proportional to absolute temperature.

Part number 681201-1 depicts all the components required to install the OAT probe, part number 681201.

1.3 Block Diagram

A block diagram of the product depicting input and output signals is shown in Figure 1 below.

![Figure 1. Block Diagram of P/N 681201-1 OAT Probe Assembly](image-url)
1.4 Specifications

Dimensions: 2” x 0.359” dia. probe and 24” lead length wires

Weight: 0.06 lbs.

Electrical and Functional

Power Supply Voltage +4 to +30 VDC
Nominal Temperature Coefficient 1 μA/°K
Calibration Error ±0.5 °C
Absolute Error ±1.7 °C When used with compatible Shadin Avionics

Breakdown Voltage ±200 V
Forward/Reverse Voltage +44/-20 V

Nominal current output @ 25°C 298.2 μA

Environmental:

Operating Temperature -55 °C to +150 °C
Storage Temperature -65 °C to +155 °C
Operating Altitude Up to 55,000 ft

Certification TSO-C43a
2. INSTALLATION PROCEDURE

2.1 Approval for Installation

The conditions and tests required for TSO approval of this article are minimum performance standards. It is the responsibility of those installing this article either on or within a specific type or class of aircraft to determine that the aircraft installation conditions are within the TSO standards. TSO articles must have separate approval for installation in an aircraft. The article may be installed only if performed under 14 CFR part 43 or the applicable airworthiness requirements.

The installation should avoid the following locations:
A. Prop Jet Stream
B. Engine Exhaust Flow Path
C. Cabin Heaters Exhaust Flow Path
D. Transmitting Antennas (DME, TXP, COMM)
E. Dark Painted Areas

2.2 Mounting

The OAT Probe can be mounted in any location along the bottom of the fuselage. A good location is a reasonably flat portion of the fuselage nose or under a wing or horizontal pylon near the leading edge.

1. Refer to Drawing # 4028-005 and OAT Probe Assembly Kit P/N 681201-1. Use the supplied stiffener P/N 543216 to support the OAT probe.
2. Use the supplied stiffener as a template to drill holes for the rivet P/N 511201 or drill using Detail A on drawing # 4028-005.
3. After drilling, bond stiffener to inside of fuselage with an aircraft approved structural adhesive. Then use rivet to install stiffener.
5. From inside fuselage, insert shoulder washer into stiffener, and slide OAT Probe through.
6. From outside of aircraft slide flat washer and thread Temp Shield onto OAT Probe, finger tight only.
7. From inside fuselage, hold Temp Sensor Hex with a 5/16” open-end wrench, and torque Temp Sensor Nut to 1.3 in/lbs. (max) against stiffener ring using a 3/8” open-end wrench.
8. For single engine installation, avoid mounting the OAT Probe on the belly or side of the aircraft to avoid erroneous reading due to the presence of hot exhaust gases.
9. The sun shield must be installed for proper indication of OAT.
2.3 Electrical Connections

The Red Wire is the Power.  
The White Wire is the Signal Return.

2.4 Field Test Procedure to Verify OAT Probe

![Diagram of SETUP Test OAT Probe]

1. Read the multimeter in milliamperes (mA) to 4 decimal places.
2. Read the thermometer in degrees and one decimal place of °C.
3. Add calibration error correction as applicable (from calibration record).
4. Add 273.15 to the temperature reading (°C).
5. The sum should be equal to the reading on the Fluke Meter ± 0.0020 mA (at 25 °C).

Example: Temperature 25.20 °C  
Calibration error correction + 0.15 °C  
Add +273.15 °C  
Sum OAT Probe Output 298.50

Reading on the Fluke Meter should be 0.2985 mA ± 0.0020 mA.
SECTION 3.0

INSTALLATION DRAWINGS AND INSTALL KIT PARTS LISTS

The following drawings are arranged in the sequence specified on page i of the Page Control Chart.
NOTES:

1. REFERENCE P/N 681201-1 DAT PROBE ASSEMBLY KIT
2. AVOID INSTALLING DAT PROBE IN OR NEAR:
   - PROP AIRSTREAM
   - ENGINE EXHAUST FLOW PATH
   - CABIN HEATERS EXHAUST FLOW PATH
   - TRANSMITTING ANTENNAS (IME, TXP, COMM.)
   - DARK PAINTED AREAS

3. DAT PROBE, P/N 681201

4. TORQUE NUT, FN 25, TO 1.3 IN-LBS (MAX)

**DRILL 0.058\(\phi\) (#40) 4 PL**

**DRILL 0.359\(\phi\) (23/64")**

DETAIL A
MOUNTING HOLE DETAIL

AIRCRAFT FUSELAGE
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<th>FN</th>
<th>P/N</th>
<th>QTY</th>
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<tr>
<td>10</td>
<td>511201</td>
<td>4</td>
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<tr>
<td>15</td>
<td>543216</td>
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<td>OAT STIFFENER RING</td>
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10 items