

### WARRANTY INFORMATION

**Alcor<sup>®</sup>, Inc.** warrants all parts in all new **Alcor<sup>®</sup>, Inc.** products to be free from defects in material and workmanship under normal use and under the following conditions: **Alcor<sup>®</sup>, Inc.'s** obligation under this warranty is limited to the repair or exchange of any defective part, if the part is returned and return shipping prepaid, within **FIVE YEARS** of the date of manufacture for grounded thermocouples and within **ONE YEAR** of the date of manufacture for ungrounded thermocouples.

**Alcor<sup>®</sup>, Inc.** is not responsible for any service charges, including removal and reinstallation costs, or any other consequential damages. This warranty is void as to any product damaged as a result of misuse, accident, negligence, unauthorized repairs or handling in transit. If the **Alcor<sup>®</sup>, Inc.** product's serial number or inspection date label has been altered, the warranty is void.

Questions concerning all **Alcor<sup>®</sup>, Inc.'s** products should be directed to Customer Support at **1-800-FLI-SAFE (1-800-354-7233)** or email: **support@alcorinc.com**.

United States Of America  
Department of Transportation - Federal Aviation Administration  
**Supplemental Type Certificate**

*Number* SA522SW

*This Certificate issued to* Alcor, Inc.  
300 Breesport St.  
San Antonio, TX 78216

*certifies that the change in the type design for the following product with the limitations and conditions therefor as specified herein meets the airworthiness requirements of Part 23 of the Federal Aviation Regulations, Parts 3, 4a, 4b of the Civil Air Regulations*

*Original Product Type Certificate Number:* See Limitations and Conditions  
*Make:* See Limitations and Conditions  
*Model:* See Limitations and Conditions

*Description of Type Design Change:*

Installation of Exhaust Gas Temperature (EGT), Cylinder Head temperature (CHT) Components/Systems in accordance with Master Drawing List titled "Alcor Master Drawing List for STC SA522SW dated November 14, 1984," or later FAA approved revisions.

*Limitations and Conditions:*

All aircraft equipped with reciprocating engines are eligible for the installation of the Alcor EGT and CHT Component/Systems.

Compatibility of this modification with previously installed equipment must be determined by installer. If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

*This certificate and the supporting data which is the basis for approval shall remain in effect until superseded, suspended, recalled or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.*

*Date of application:* April 15, 1965

*Date revised:* 07/05/94; 9/30/02

*Date of issuance:* May 26, 1965

*Date amended:* April 30, 1992 Rev. 15



*By direction of the Administrator*

*S. Frances Cox, Manager*  
Special Certification Office,  
Southwest Region

(Title)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 1 year, or both.  
FAA Form 8130-1(11-03) Page 1 of 1 This certificate may be transferred in accordance with FAR 21.47.

**FAA-PMA/STC SA 522**

**SW:** This product is FAA approved for installation on **ALL** piston engine aircraft. After installation of complete system, return aircraft to service via Form 337 referencing STC SA 522 SW. This is not required for replacement parts. All piston powered aircraft, regardless of make, are covered by this STC.

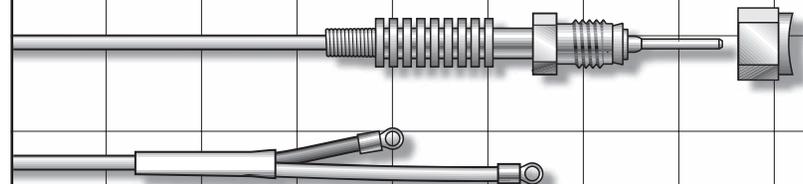
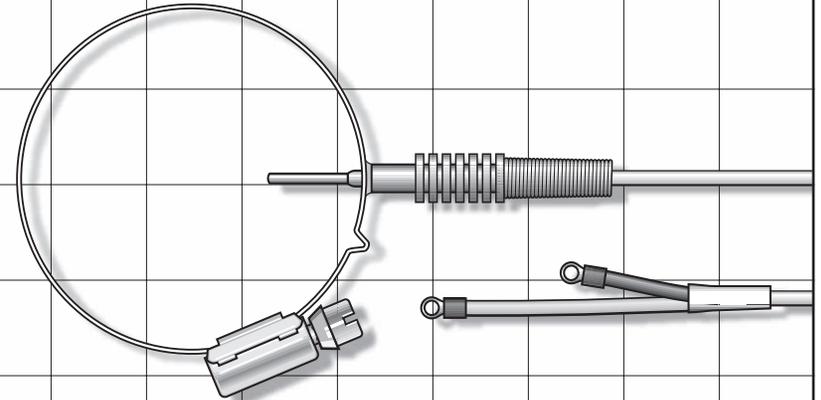


**Take a Flight  
to Our Web Site  
www.alcorinc.com**

# EGT Probe

## Installation Instructions

FAA/PMA Approved



Web site: [www.alcorinc.com](http://www.alcorinc.com)  
E-Mail: [support@alcorinc.com](mailto:support@alcorinc.com)

## GENERAL INFORMATION

When replacing a thermocouple ensure replacement is same type as one removed by ensuring part number/wire colors match. If stagger does not match use stagger adapter P/N 42523. In a new installation, make sure the location on a single probe (thermocouple) Exhaust Gas Temperature system is in the exhaust pipe of the cylinder that is leanest during full throttle. Particularly in carbureted engines, the leanest cylinder can change when throttle, altitude, carburetor heat, and/or ambient air temperature changes. The leanest cylinder is the one that reaches peak first when leaning from full rich, which is sometimes the cylinder with the highest EGT. Additional information on mixture management can be found in **Alcor's**® publication EGT Combustion Analysis in a Nutshell and Lycoming Service Bulletin 1094D, and Continental Service Bulletin M89-18. The probe should be located a minimum of 2 inches from the cylinder exhaust port flange (5 inches for highly supercharged engines) in an area free from weld beads or pipe irregularities. If the pipe has a longitudinal weld bead, orient the clamp so that the bead does not interfere with flush fit of shoulder of flange at base of probe tip (gas seal). Determine the location that will allow probe and wire to be free from interference with spark plugs, baffling, cowling, exhaust and other components. For screw-in type **Alcor**® probes use weld boss, P/N 28113 located the same distance as clamp style probes or 3-5 inches from the turbocharger inlet in Turbine Inlet Temperature sensing applications. All work to be done in accordance with FAA, Advisory Circular 43.13-1B or later revision.

## INSTALLATION, CLAMP TYPE

1. For new installations, carefully drill a hole at selected location using a #31 (0.120 inch/3.05mm) or #32 (0.116 inch/2.95mm) drill. If available, carefully ream hole using #30 (0.1285 inch/3.26mm) drill. The correct hole size and alignment assures a press fit of probe element shoulder to prevent exhaust gas leakage.
2. Open clamp and place around exhaust pipe ensuring correct orientation of clamp tightening screw. Place probe tip into hole and tighten clamp to remove looseness.
3. While probe element is perpendicular to exhaust carefully push and rotate probe to fully seat element shoulder to exhaust pipe. If necessary use a small wooden dowel and light hammer or other suitable tool to lightly tap clamp at junction of probe body to seat probe shoulder.
4. Torque clamp to 30-35 inch pounds and cut off excess clamp and deburr. To ensure clamp does not loosen during operation it may be safety wired from the end of slotted clamp tab to body of probe or slot in screw may be safety wired to screw housing.
5. Slide fiberglass insulation sleeve over lead. Connect instrument lead to probe lead with screws and nuts ensuring correct stagger/color combinations. Slide sleeve over lead connection and secure with nylon ties.
6. Allow enough slack in probe lead to provide a finger-sized loop (see **Figure 1**) to minimize strain on wire and secure remainder of lead to engine/airframe away from exhaust pipe.

## INSTALLATION, SCREW-IN TYPE

1. For new installations, carefully drill a hole at selected location using a #30 drill. Insert probe into weld boss and hand tighten. Insert probe tip into drilled hole and tack weld boss. Remove probe and weld boss to exhaust pipe.
2. Drill a .125 inch hole through the exhaust pipe at the center of the boss taking care not to damage internal threads in boss.
3. Insert element into exhaust no deeper than .75 inch (see **Figure 2**). OPTIONAL- lubricate probe threads with high temperature lubricant (2000°F)
4. Tighten probe nut finger tight, then with appropriate sized wrench tighten an additional 3/4 turn or till snugly locked in place.

Follow steps 5 and 6 above to complete installation.

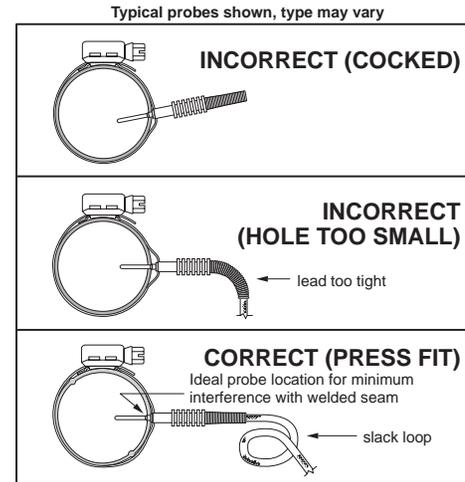


Figure 1. Welded Boss Type

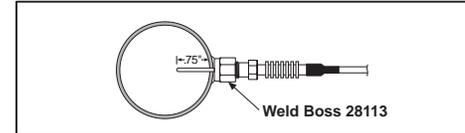


Figure 2. Welded Boss Type

**NOTE:** This is typically the recommended depth of insertion for all **Alcor**® thermocouples.

the meter label. If the value is approximately the same then the problem is most likely the calibration potentiometer or the movement in the meter. The old probe removed is probably good! Call **Alcor** for repair of meter.

## Is there any way I can test a thermocouple without expensive equipment?

Yes, by using an **ALCAL**® 2000 EGT/CHT System Tester. If not available then measure the loop resistance (see resistance table) of the probe with a digital multi-meter, if available. While viewing display, move probe wire to detect internal wire breaks. If the reading is steady then the probe is probably good. When heated to just turning red, the temperature is about 1550-1650°F.

## RESISTANCE AND WEIGHT ARE APPROXIMATE

Alcor® P/N	Type	Color	Resistance @ 70°F	Millivolts at 1550-1650°F	Weight	Size
All Clamp	K	Red/Yellow	.6 -1.0 ohm	34.12 - 36.36 mV	.12 lbs	3.25 max dia.
All Screw-in	K	Red/Yellow	.6 -1.0 ohm	34.12 - 36.36 mV	.12 lbs	call
All Clamp	E	Red/Brown	.7 -1.0 ohm	63.04 - 67.33 mV	.12 lbs	3.25 max dia.
All Screw-in	E	Red/Brown	.8 -1.1 ohms	63.04 - 67.33 mV	.12 lbs	call

300 Breesport  
San Antonio, Texas 78216  
Phone 210/349/6491  
Fax 210/308/8536  
Toll free 800/354/7233

## FREQUENTLY ASKED QUESTIONS

**On a new single probe installation, which cylinder do I install the thermocouple on?**

This would be the cylinder where the temperature peaks first while leaning. Not all engines, even of the same make and model, will peak the same due to differences in internal airflow characteristics, carburetion, injection, etc. A worst case scenario would be installing the probe on the richest running cylinder (peaks last) where lean misfire would be reached before peak while leaning.

**I installed a new probe and the meter is still dead or went dead again after being in operation for awhile?**

First make sure that the correct type of probe was installed by verifying color code matches lead and meter (Type K, Red/Yellow, or Type E, Red/Brown). If that checks all right then disconnect the lead from the meter and measure the loop resistance of the lead and probe and compare it with the value marked on