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**INSTALLATION INSTRUCTIONS
FOR
CARBURETOR ICE DETECTOR
MODEL: Iceman 2, Iceman 3**

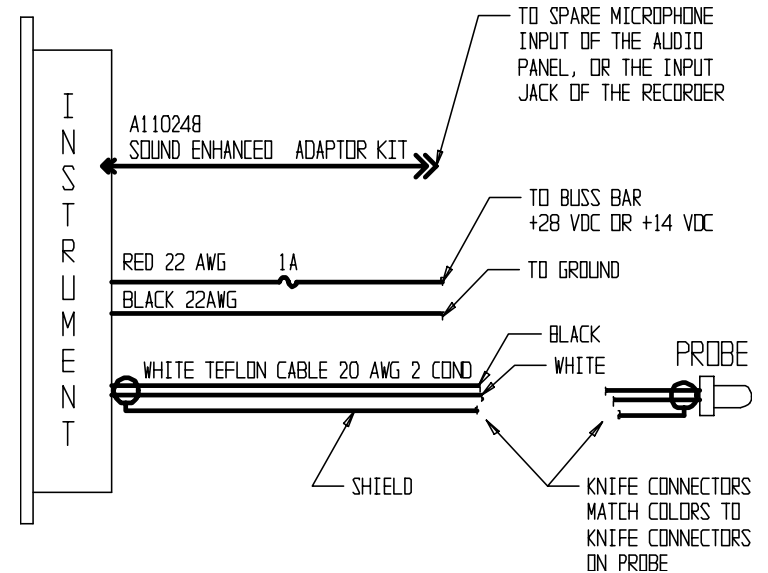
Note: This Supplemental Type Approval (STA) is approved for aircraft equipped with the models MA3A, MA3PA, MA3SPA, MA4SPA, MA4-5, MA4-5AA, MA5 and MA6AA Marvel Schebler carburetor. All aircraft equipped with other types of carburetors require a Limited Supplemental Type Approval (LSTA) under Chapter 513 of the Transport Canada Airworthiness Manual.

1. **READ ALL INSTRUCTIONS BEFORE BEGINNING THE INSTALLATION**

All installations are to be made by a qualified Aircraft Maintenance Engineer and in accordance with the FAA Advisory Circulars AC 43.13-1A Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair, and AC 43.13-2A Acceptable Methods, Techniques, and Practices - Aircraft Alterations.

2. Remove cowling to gain access to the engine, carburetor and firewall.
3. For carburetors not provided with a factory tapped hole proceed according to Steps 1 to 8. Adjacent to the butterfly Marvel Schebler models MA3A, MA3PA, MA3SPA, MA4SPA, MA4-5, MA4-5AA, MA5 and MA6AA carburetors is a lead plug filling the access hole through which the idler jets were drilled on the far side of the carburetor barrel. This lead plug fills a step hole in the aluminum casting. The wall of the carburetor is approximately 1/4" thick in which the lead plug is inserted.

**ICEMAN INSTRUMENT AND PROBE ELECTRICAL INTERCONNECTION
FIG. 6**



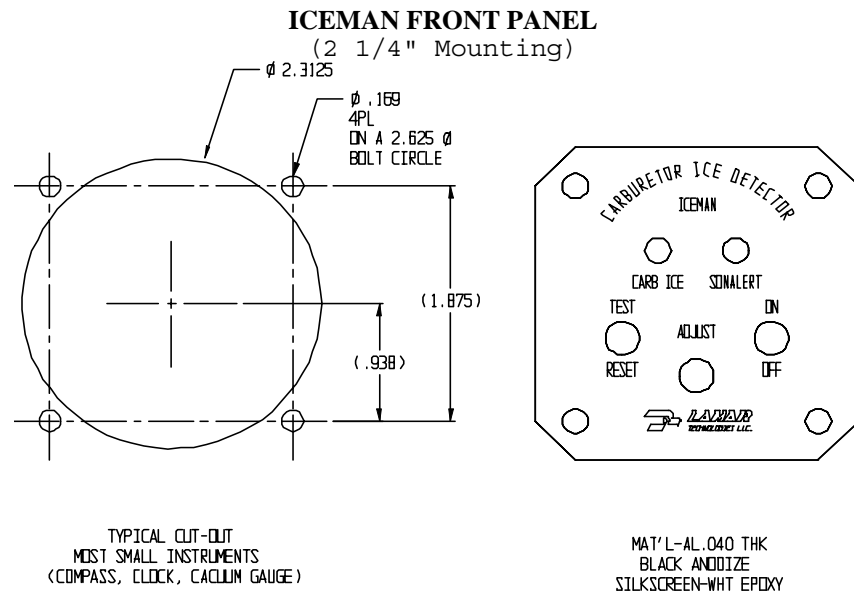


Figure 5

The following instructions describe a procedure by which this plug is removed, the hole enlarged and threaded, so that the probe can be securely mounted at a point adjacent to the butterfly valve where it will detect impeding danger of carburetor icing (see Fig. 1, 2 and 3).

- Step 1. Remove the carburetor assembly from the engine.
- Step 2. You will require the following tools: a 7/32" drill bit and a 1/4" X 28 tap. Support the carburetor firmly under a drill press and drill out the lead plug using the 7/32" drill bit. Drill slowly, or limit the drill travel so that the drill bit does not break through and plunge into the butterfly valve. It has been found helpful to put a small amount of putty over the inner end of the lead plug to keep the metal chips out of the carburetor. If the drill does not go through the putty the task of removing chips is simplified.
- Step 3. Remove all excess lead to create a smooth, flat surface at the outside of the hole. The function of the flat, which should be square with the hole, is to provide a flat square surface between the carburetor and the probe.
- Step 4. Lubricate the 1/4" X 28 and tap out the hole.
- Step 5. Carefully remove all chips and metal shavings from the inside of the carburetor.
- Step 6. Apply thread lubricant to the threaded portion of the probe.

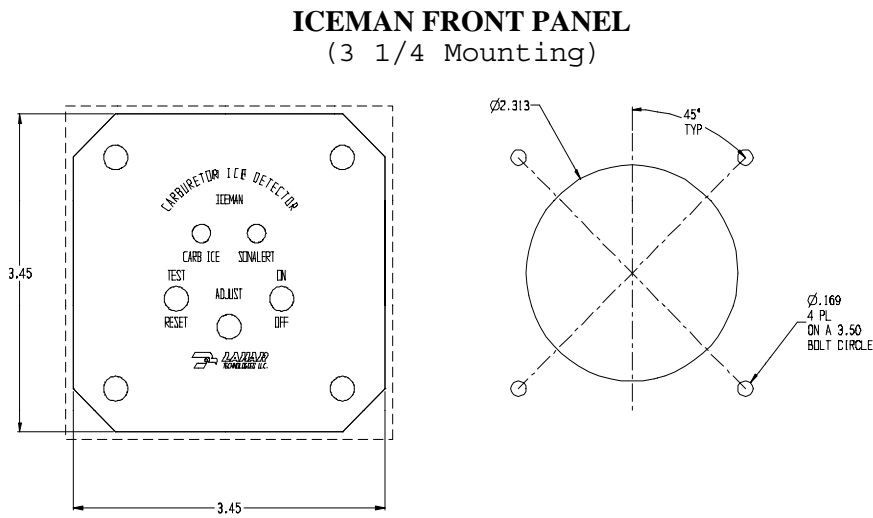


Figure 4

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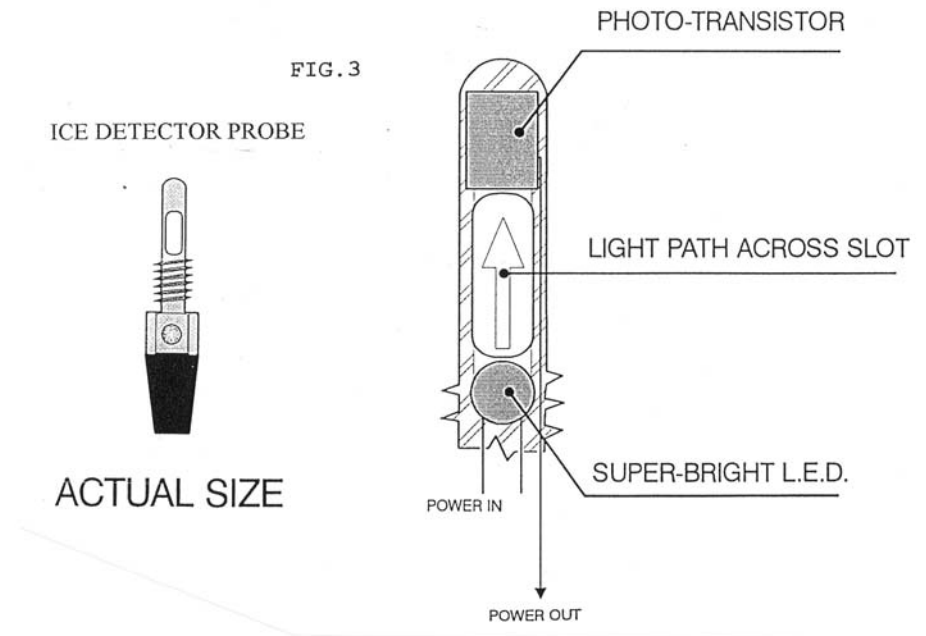
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Step 7. Install the proper number of shim washers as required, so that when the probe is installed and properly torqued, the red dot on the probe housing faces towards the ground. Remove the probe, add a few drops of Lock tite 242 and reinstall the probe, and again torque it properly. The red dot on the probe housing must again be facing towards the ground. To properly torque the probe, install it finger tight plus not more than 1/4 turn, using a 3/8" short-handled open-ended wrench. Avoid over tightening which could stress the threads. **CAUTION: Do not exceed 20 inch-pounds of torque.**

4. For pre-drilled and tapped carburetors remove the brass plug, (see Fig. 1, 2 and 3), and using the procedure in Step 7 above, install the probe as per Step 7, being careful not to bend the probe components.

Note: Refer to the installation instruction drawing page 7.

5. Now mount the Instrument case on the instrument panel using four #8-32 aluminum round head screws and self-locking nuts. It is important to mount the instrument in an easily accessible and easily visible location. If instrument is not installed in a hole provided by the aircraft manufacturer or other location which is vacant due to removal of a previously installed instrument the following applies:



MARGEL-SCHEBLER CARBURETORS

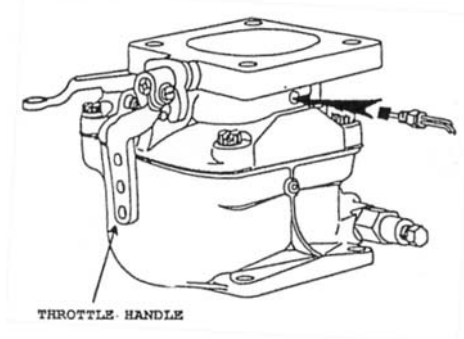


FIGURE 1
MODELS: MA-2, MA-3, MA-4

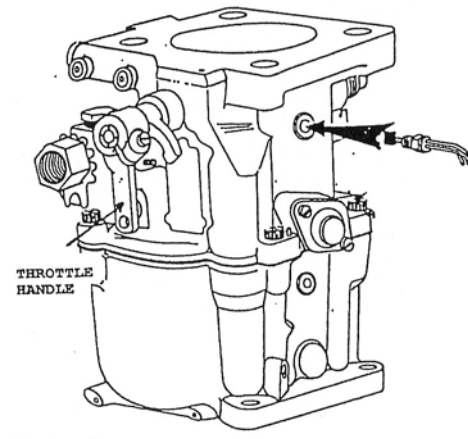


FIGURE 2
MODEL: MA-4-5

- a) For shock-mounted non-structural instrument panels, either the cut-out:
 - a1) (3" X 2 1/2") for Model Icesman 3(see Fig. 4) is to be made and deburred, or
 - a2) a round hole for Model Icesman 2(see Fig. 5) is to be made and deburred, where no reinforcing structure (e.g. section angles rear of the panel, etc.) and any other obstructions (hydraulic lines, cable runs, etc.) are present. The radius of the curvature of each corner is to be no smaller than 1/2". A cutout reinforcement (doubler), material 2024-T3 Alclad of the same thickness as the instrument panel, is to be fastened to the panel per AC 43.13-1A and AC 43.13-2A.
 - b) For solid-mounted instrument panel, determine if the instrument panel is primary structure before making any cutout. If the panel is structural, make the additional cutout in accordance with the Aircraft Manufacturers' Instructions, or substantiate the structure's integrity of the altered panel in a manner acceptable to Transport Canada or the FAA.
6. Drill a 9/16" hole through the firewall, de-burr it and install the MS35489-2.9 or AN931-2.9 grommet (approved for firewalls) and supplied in the kit. Then route the three wire cables from the instrument through the firewall to the probe to join the probe cable. No reinforcing ring is required, provided the distance from other holes in the firewall is not less than 1 1/2 inches. Sealant approved for firewalls is Proseal #700 (Coast Proseal Co., Chemical Division, 2235 Beverley Boulevard, CA.), or equivalent compound. Use sealant as required. Connect the probe cable to the instrument cable by splicing the three wires in accordance with AC 43.13-1A Aircraft Alterations, Acceptable Methods, Techniques and Practices, paragraph 445. Next, be sure the ON/OFF switch is in the OFF position.

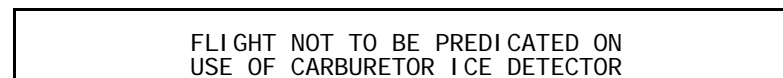
7. Then install the red wire which contains an in-line fuse and protrudes from the instrument to the aircraft 28 VDC or 14 VDC buss. Connect the black wire to a proper ground on the airframe. Note that the ICE Detector has polarity reversal protection; therefore, if the wrong wire is installed to the power source the instrument will not function nor will it be damaged. (See electrical drawing, Fig. 5.)
8. Test for proper functioning of the instrument by switching the ON/OFF switch to the ON position. Turn the control "ADJUST" rotary control fully counter-clockwise. This will activate the red light and the audio alarm. Now turn it clockwise until the red light just goes out, then de-activate the audio alarm by depressing the "RESET" switch. The audio alarm will be silenced. Your Ice Dete Test for proper functioning of the instrument by switching the ON/OFF switch ctor is functioning properly.

NOTE: THE PROBE MUST BE AWAY FROM ANY LIGHT SOURCE TO FUNCTION PROPERLY.

9. Use tie-wrap every 12 inches, for securing the probe cable to the engine mounts, allowing generous slack from the probe to the first support so that the engine motion will not draw the wires tight (3 to 4 inches is recommended).
10. Operate all the electrical and avionic equipment on the aircraft and check for any EMI/RFI interference due to the ICEMAN. In particular, check the audio system for interference during radio transmissions.
11. If interference is observed take steps to eliminate the interference by checking system ground and routing of wiring.

12. Affix the placard provided in the modification kit and illustrated below (Fig. A), on the instrument panel, near the ice detector, in clear view of the pilot(s).
13. The installation of your ICE Detector is now complete. Make the appropriate log entries and complete the Conformity Certificate, repair or modification Transport Canada, Aviation Form #24-0045 in Canada, in the U.S. complete Form 337.

Fig. A
PLACARD: 1/2" x 4"



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B5-6

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