

## ENGINE MOUNT INSTALLATION

Build or buy the continental engine mount as shown on page 152. Finish your mount with a rust preventitive primer, red oxide or zinc chromate. The mount should be carefully located with the aft mounting pads centered on the firewall bulkhead inserts. The center of each insert should correspond to the waterline (WL) and buttline (BL) references on the mount drawing. Have an assistant drill the four 3/8 inch mounting holes by using the mount as a drill guide. Drill one hole, slip a bolt in place, then drill another and repeat until all four are done. This method will help avoid misaligned holes. Don't try to use the standard practice of starting the hole with a small pilot drill and gradually stepping up the drill size until full size is achieved. That method is great for drilling big holes in metal but doesn't work well in glass/epoxy. Start with a sharp, full size (3/8) bit and do the job in one fell swoop. Use lighter feed pressure than you would for metal and don't crowd the drill at all.

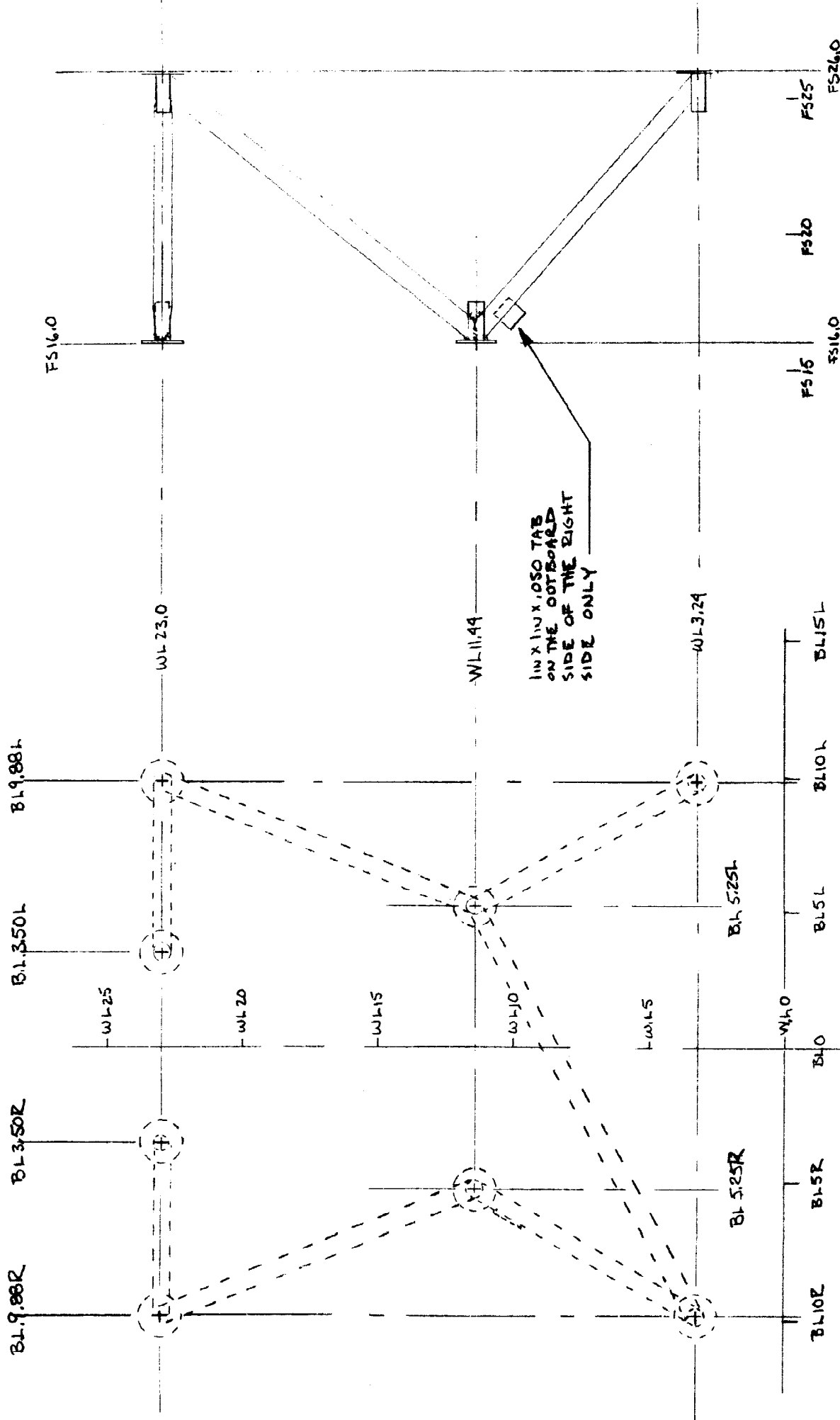
Mark the outline of each mount pad on the firewall bulkhead with a felt tip marker. Remove the mount from the airplane and cut a sheet of Carborundum Fiberfrax (TM) 970J ceramic paper to cover the front face of the firewall bulkhead. Trim the ceramic paper to just clear the nose gear support structure, and to the outlines of the mount pads on the firewall bulkhead. Slot the material as required to clear the fuel line and instrumentation lines as well as the throttle quadrant cables. The mount must sit directly on the firewall bulkhead without any of the ceramic paper under the mount pads. Bond the ceramic paper flame barrier in place using either micro slurry or silicone RTV adhesive. Smooth the paper into place and then install the engine mount using four AN6-24A bolts, AN363-624 nuts, and AN970-6 large area washers. The big washers go on the aft side of the firewall bulkhead.

## ENGINE CONTROLS

The throttle, mixture, and carburetor heat controls are located on the left side of the cockpit, in the diagonal portion of the instrument panel mounting flange. The mixture cable is mounted high, followed by the throttle in the middle and carb heat is mounted low. The positioning is used to try and avoid any confusion of the mixture and carb heat controls.

The mixture and throttle cables must be routed to the right side of the engine mount for proper alignment with the carburetor actuating arms. This routing can be done two ways: first, the cables can be run straight forward, down the left side of the cockpit and through the firewall followed by a sharp "S" turn to cross over; second, the cables can be routed along the bottom of the fuel tank through the intercoastal and the firewall bulkhead to make a more gradual cross over. The gentle crossover will result in lower friction forces in the cables but is harder to accomplish without having foot interference with the cable housings. A one by one inch tab is provided on the engine mount to attach the throttle and mixture cable housings. Clamps are provided with the cables which will securely anchor the housings to the tabs. The housings must not be able to slip in the clamps or your idle throttle position and or mixture setting may wander around at will.

The carburetor heat cable should be run down the left sidewall and penetrate the firewall about four inches up from the bottom.

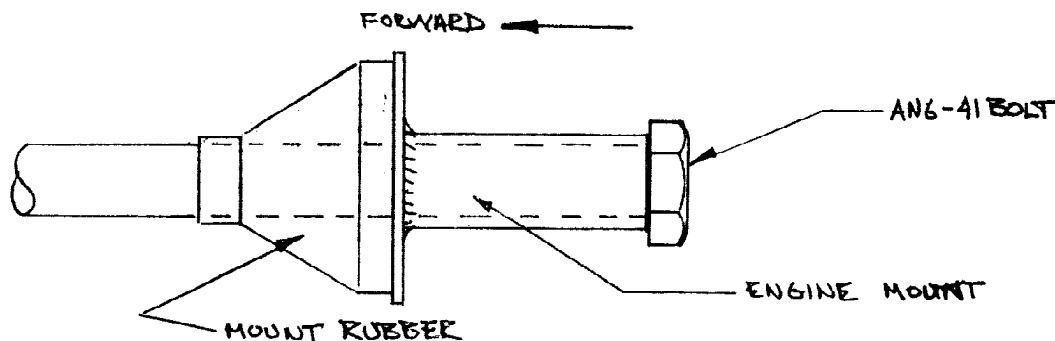


## ADVENTURE ENGINE MOUNT (CONTINENTAL)

MATERIAL:  $\frac{5}{8}$  OD X .049 4130-N  
 $\frac{1}{2}$  OD X .065 4130-N (8 PIECES 1.5 LONG)  
 1.6 OD X  $\frac{3}{8}$  ID X .063 THICK 4130-N WASHER  
 (AN970-6 EQUIVALENT)

### ENGINE ATTACHMENT

The "A" and "C" series Continental engines all use the same mounting hardware with rare exception. These engines will require eight Continental part number 22387 motor mount rubbers and eight AN 970-6 washers. You will also need four each AN6-41 bolts, AN310-6 castlenuts, and MS24665-283 cotterpins. Install the bolts through the engine mount from the rear side (threads forward). Slip one of the rubber cones over the bolt until the base of the cone is flat against the engine mount.



Using an engine hoist or a minimum of three ambitious friends, lift the engine into position on the bushings and bolts. Be careful not to bash the upper legs of the mount. With the engine in position, slip the remaining conical rubber bushings over the bolts, follow with an AN970-6 washer, then the AN310-6 nuts. Support the engine's weight with the hoist or exfriends until the mount rubbers have been seated properly in the engines lugs and the bolts snugged. Don't over tighten the mount bolts! 60 to 80 inch-pounds torque is all that is called for. Overtightening only smashes the rubber bushings. Once the engine is secure and bolts torqued properly, install the cotterpins.

### ENGINE CONTROL, INSTRUMENTATION, AND WIRING HOOKUP

Attach the 10-32 male threaded end of the throttle cable to the outermost hole in the carburetor throttle arm using a ball swivel joint assembly (Superior Linkage SP1000 or equivalent). Use an AN315-3 jambnut to lock the swivel assembly on the throttle cable and an AN365-1032 nut or MS21042-3 nut to attach the swivel assembly to the throttle arm of the carburetor. Loosen the cable housing clamp at the engine mount. Push your throttle knob to the full open (forward) position, verify that the carburetor throttle arm is also rotated forward against its stop, then tighten the cable housing clamp securely. You may have to shift the cable housing forward through the clamp (before tightening) to achieve full throttle travel at the carburetor. Cycle the throttle knob in the cockpit to idle, verify the carburetor throttle arm is also firmly against the idle stop (butterfly closed), and then cycle the throttle control knob a dozen cycles or so to verify that the cable housing isn't shifting in the clamp.

Remove the mixture control knob and wire from the cable housing (they pull straight out). Clamp the housing securely at the engine mount near the throttle cable clamp. Use the extra length of housing to aim at the mixture control arm on the rear face of the carburetor. Place the mixture control in the max lean or idle cutoff position (to the right) and cut the mixture cable housing about 1/2 to 3/4 inch short of the mixture arm. Move the carburetor mixture arm to the full rich (left) position. Install a bolt type terminal in the mixture arm. Reassemble the mixture knob and wire into the cable housing,

place the cockpit knob about 1/8 inch out from the panel nut, and cut the wire off to mate with the bolt type terminal. The extra 1/8 inch of cable assures you of having full rich when the mixture knob is pushed full forward. The bolt type connector is an AN3 bolt with an extra long threaded section and an oversize cotterpin hole. Two AN315-3 plain nuts are used to jamb the mixture control wire so that it can't slip out of the hole (one nut above and one below). AN 960-10 washers can be used to take up any slack between the lower jamb nut and the mixture arm on the carburetor. The terminal should turn freely in the mixture arm but not wobble excessively.

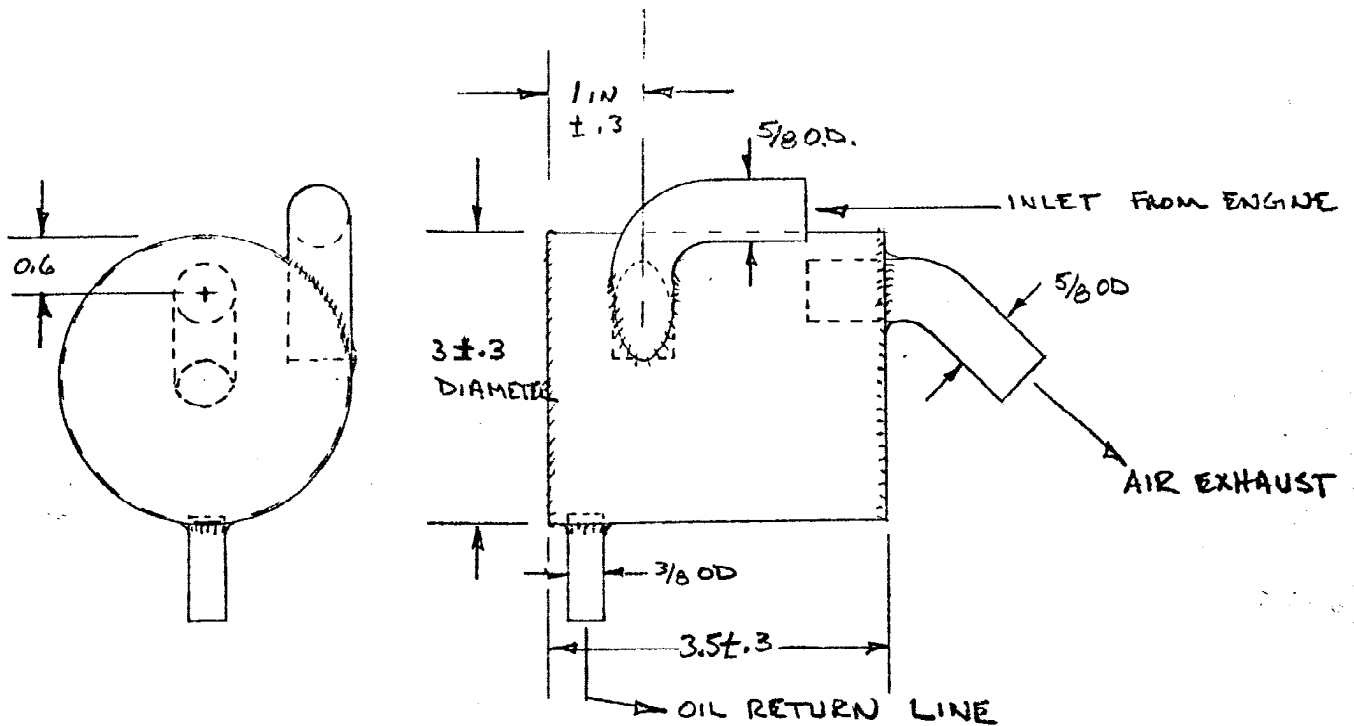
Attach a length of 3/16 O.D. Nylaflo tubing to your oil pressure instrument using a 1/8 NPT to 3/16 nylon tube compression fitting (Imperial 268-P male connector). You can use any direct reading oil pressure gauge with a 0 to 60 psi or 0 to 100 psi range. Autoparts and discount (?) department stores will generally offer a wide selection of gauges to choose from. The Arrow brand gauges stocked by Aircraft Spruce have a male 1/8 NPT nipple on the back of the gauge and require using an AN910-1D coupling in addition to the 268-P connector. Install a 1/8 NPT to 3/16 nylon tube male elbow (Imperial 269-P) in the oil pressure port on the right side of the engine case, behind the rear cylinder flange. Use teflon tape on the pipe threads to seal completely. Route the free end of the tube from the gauge through the instrumentation hole in the firewall bulkhead to the fitting in the engine case and install the compression nut. After all of the nuts have been installed, you can prime this line by filling it with oil from one end or the other using a pump oil can. The priming will avoid any potential delay in getting an initial oil pressure indication on your first engine run. Check all of these fittings for leaks after your first ground run.

The oil temperature bulb installation is simple, just run the temperature bulb from the gauge which it is attached to, through the instrumentation hole down to the oil screen nut. The Arrow gauge supplied by Aircraft Spruce with a 60 inch capillary tube is dandy and comes complete with adapter nut. Install the adapter nut in the oil screen housing and tighten. Be sure to use an AN 900-10 crush washer under the adapter nut or oil will leak past the threads. The temperature bulb slips into the adapter nut and the bulb nut is tightened into the adapter with no washer. Be extra careful not to crimp or kink the oil temperature capillary lines. If these get kinked you won't get any oil temperature indication.

Use a direct reading mechanical tachometer with a four foot tach cable. The model of tachometer required varies with the engine used. A-65, A-75, A-80, C-75-8 and C85-8 use an RT-9 tach. C75-12 and C-85-12 use an RT-7 tach. The tach cable also is routed through the instrumentation hole high on the firewall and directly to the engine's tach drive.

Use 18 gauge shielded airframe wire with solderless self insulated RA 18-6 ring tongue terminals for magneto wiring (15 ft. wire and six terminals required). Use a Bendix #10-357290-1 key type switch (no starter position). Each magneto has a "P" lead which is routed to the switch connecting screws and a third wire connects the switches ground position to the engine case or a magneto housing screw. Make DAMN sure you get a good ground. A magneto is "HOT" unless the "P" leads are grounded. Most of the "A" and "C" series engines are not equipped with an "idle cutoff" position on the mixture control and you have to shut down by turning the mags off. A "HOT" mag requires shutting the fuel off and waiting for the float bowl to run dry (5 minutes on occasion).

Install a weatherhead 10006B-C04 90° male pipe (1/4 NPT) to 3/8 I.D. tube elbow in the carburetor fuel inlet port. Bendix-Stromberg NAS-3 carburetors have a 1/4 NPT port. Marvel Schebler carburetors have a 1/4-18 N.P.S.F. port and must have an adapter installed to accept the weatherhead fitting. Cut the free end of your fuel line to length and join with the weatherhead's barbed hose end.



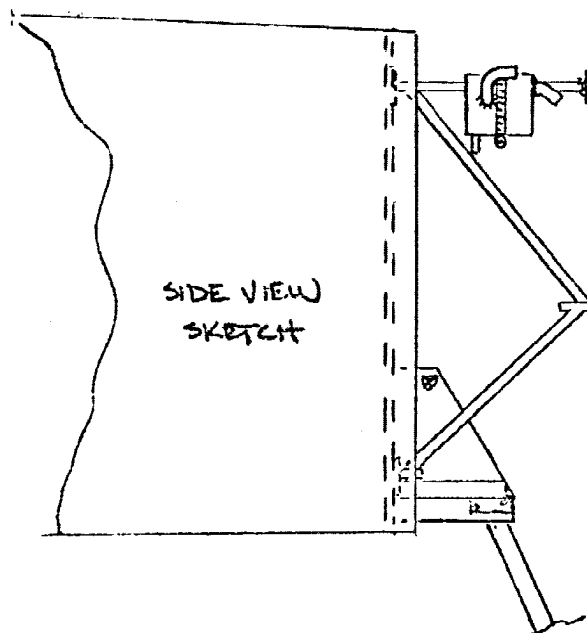
### CRANKCASE BREATHER - AIR/OIL SEPARATOR

1/2 SIZE

MAY BE BRAZED OR WELDED ALUMINUM  
OR BRAZED, WELDED, OR SOLDERED STEEL  
ALLOY UNIMPORTANT

### BREATHER AIR/OIL SEPARATOR

Build the air/oil breather separator can shown below or buy an equivalent unit from Aircraft Spruce. The prototype separator was made up of two surplus #303 cans (Libby's and Del Monte) and three pieces of tubing. The whole assembly was soldered together with resin core solder. Mount the separator can on the upper right engine mount tube with a 4 inch automotive hose clamp as shown in the sketch.



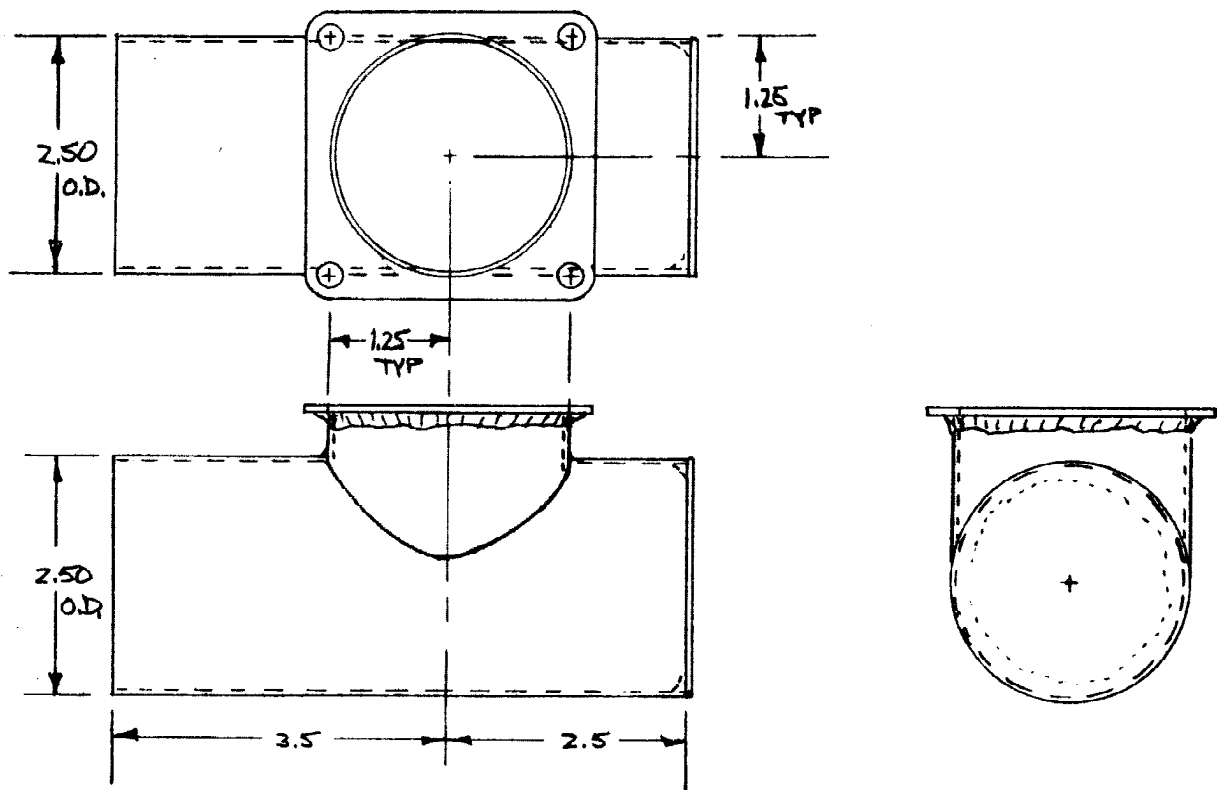
### ADVENTURE INSTALLATION

WORM CLAMPED TO  
ENGINE MOUNT  
(SEE PHOTOS ON)  
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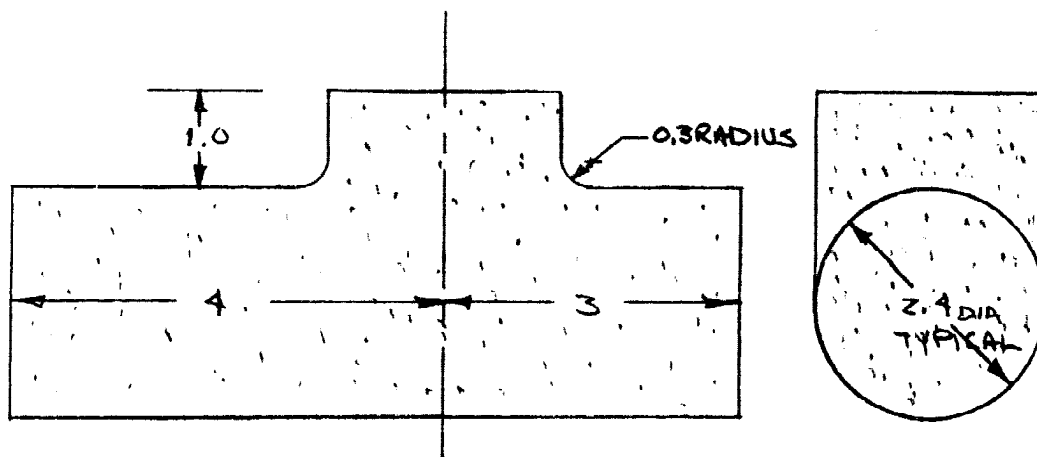
Remove the oil filler cap/dipstick assembly from the engine. Drill a hole in the top and tap 1/8 NPT. Install a 10006B-102 weatherhead fitting in the hole and clean ALL chips and filings off before reinstalling in the engine. Attach the filler cap fitting to the separator return line with 3/8 I.D. Tygothane tubing. Leave enough slack to remove the oil filler cap without disconnecting the hose. Use a worm clamp at the separator. No clamp is required at the filler cap.

#### CARBURETOR AIR MANIFOLD

The carb air manifold is a built up fiberglass part on the prototype. You may duplicate this effort or make a similar manifold from aluminum. The drawing which follows defines the shape of the finished manifold.



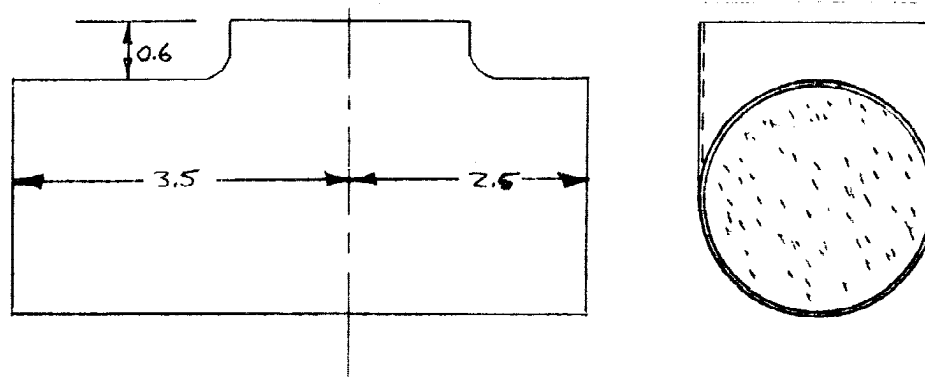
Start by carving a hunk of foam into an approximately circular cross section, 'T' shaped plug. The plug needs to be about 2.35 to 2.4 inch diameter in cross section to allow the glass buildup to reach 2 1/2 inch outside diameter.



Use your glass scrap collection to layup about four or five plies of glass all over the plug. BID cut at  $45^{\circ}$  is good, and cross plied UNI scraps are acceptable also. Don't neglect the intersection of the 'T'. You can peel ply the foam before glassing to obtain a smooth interior surface if you like. Cure.

Layup a 4 X 8 six ply flat piece and peel ply both surfaces. Cure.

Cut the cured 'T' to the sketch dimensions below. Remove all foam and peel ply.



Cut a 2 1/2 inch diameter circle from the flat laminate. Also cut a 3.1 X 3.1 square of the laminate and put a 2 1/2 inch diameter hole in the middle of it. Flox bond the square in position on top of the manifold as shown and join the outside of the 'T' to the flange with  $45^{\circ}$  BID. Flox the circle to the short (right side) end of the 'T'. Use a generous flox radius on the inside corners. Cure.

After curing, round off any sharp or rough edges. Drill a hole pattern in the top flange of the manifold to match the four bolt pattern on the bottom of the carburetor so that the open end of the manifold is toward the left side. Drill a 1/8 inch drain hole in the manifold to allow any excess fuel to drain out. The four mounting bolts are coarse thread (1/4 - 20) fasteners. I used hardware store bolts and drilled a 1/16 safety wire hole in the heads. Use a Continental #21323 gasket and Permatex sealer to final install the manifold on the carburetor.