

James Aircraft

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INDUCTION SYSTEM, CARBURETED

Please read all instructions prior to starting

Carburetor / Injector Kit Includes:

- Filter housing, saddle base, back plate, hinge section and transit duct.

ADDITIONAL MATERIALS LIST

- Flat stock aluminum approximately 0.032" thickness, roughly 5" x 2"
- Aluminum duct tape
- West System Epoxy or equivalent (Do Not Use 1:1 mixtures)
- K&N model E-0995 air filter (available at Advance Auto Parts or from James Aircraft)
- Hose clamps sized for intake ring and 3" scat tubing

The filter system works either in a ram air mode, with air flowing in through the front of the ram air inlet or through the alternate air inlet via a heat muff. A push pull cable will operate a "trapdoor" that will open to allow alternate, heated air in, while swinging down 90 degrees to close off the main, ram air inlet.

Assembly

- (1) Trim the alternate air inlet base (see diagram last page) to fit snugly onto the filter housing, approximately 1" from ram air inlet. You must leave some length on the inlet, in front of the alt air inlet base, to attach a hose to the cowl inlet. Insure that the upper flat surface of the alt air base is not warped by fitting too tightly around the filter housing. An aluminum plate will be screwed to the top of it later. Do not glass the alt air base in place at this time.
- (2) Place the alt air inlet base onto the filter housing and mark perimeter lines onto the filter housing beneath the inlet base using the inside **and** outside of the saddle as a template. Cut an opening 1/8" inside of only the inner perimeter line.
- (3) Lay the inlet base upside down on a piece of aluminum (.032 or approximate works well) and mark a pattern using the outside perimeter of the inlet base. This is the deck for the alternate air inlet nozzle.
- (4) Temporarily install the filter and back plate in place using small "C" clamps around the backplate perimeter. This will allow you to check for adequate clearance between the filter tip and the ram air door which will swing down and forward to select ram air or alt air.
- (5) Size and position a 1.5" hinge, flat side up in the depression on the saddle base. Tape the hinge in place temporarily with aluminum tape.

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- (6) Using provided template (page 12), cut a ram air “trap door” facsimile out of thin cardboard. Tape the paper door to the hinge and trim it around the edges gradually until it will seal the inside of the filter housing inlet when it is at ninety degrees from level with the saddle top plate. Eventually, at one end of the door swing, it should seal the alternate air inlet, allowing only ram air to enter the filter housing and, at the bottom of the swing, it should seal off ram air, admitting only hot alternate air.
- (7) Cut a partial door for a spacer, which will allow for the door to seal against the saddle top plate (see the drawing at bottom left of page 12 for a view of a “stacked assembly”).
- (8) Place the alternate air deck, that you cut earlier, on the top of the saddle base and mark the shape of the swinging trap door on bottom of the saddle deck (see drawing pg 12). Do not cut beyond this line or exceed perimeter, as the swinging door must seal completely. Eventually, the opening will resemble the provided example, but it will vary, according to the direction you orient the alternate air inlet nozzle, according to the location of your heat muff.
- (9) The aluminum alt air inlet deck can be attached to the saddle piece with six sheet metal screws (pre-drilled), three along each side, #4 screws work fine. Do not use rivets. For now, attach with only two screws until all parts are sized and fitted together.
- (10) The actuating arm that will open the door can be made from 1/8” mild steel. The final geometry of the arm will vary according to the placement of your actuating cable. Make a flexible template for the door actuating arm from cardboard or thin metal flashing, to work out the shape and bend required. Verify positioning of the inlet nozzle and actuating arm. Parts may temporarily held in place with hot glue, metal tape, etc. The alternate air inlet nozzle flange (the base where it attaches to the saddle deck) may be trimmed to facilitate actuating arm travel. Limit trimming to insure air seal around base of nozzle. When the engine is running, there will be no vacuum here unless the ram air door is closed, so keep the gap small just to prevent trash from entering otherwise. Parts may be waxed (to prevent adhesion) and sealed around the arm with RTV. If the ram air door does not seal perfectly, wax the inside of the filter housing and apply a bead of RTV to the door. When cured, separate the RTV from the filter housing for custom rubber seal. Improperly sealed doors may not provide adequate carb heat temp rise.
- (11) Ensure functional clearance of control arm and cable in relation to inlet nozzle. **Be certain that you have fitted the K&N model E-0995 filter inside the housing and insured clearance between the swing door and the end of the diffuser on the tip of the filter.**

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- (12) When satisfied with fit, rivet actuating arm to door, door spacer and hinge. Attach hinge to alternate air saddle with counter sunk screws.
- (13) Rough sand sides of alternate inlet base and filter housing, extending approximately 1.5" down from saddle base, where possible, for resin adhesion. Position alternate air inlet base on housing, centering on cutout. Hold in place with a few thin strips of metal tape
- (14) Allow space at the front of the filter housing for a hose clamp to attach rubber tube seal at the 3" ram air inlet opening.
- (15) Wet out one layer of included 8 oz. cloth with West System Epoxy or equivalent product. When first layer is cured (cool to touch) verify that everything works correctly and then add two more layers.
- (16) The alternate air inlet nozzle is sized for 2" scat tube.
- (17) Attach alternate air inlet nozzle to aluminum deck with rivets.

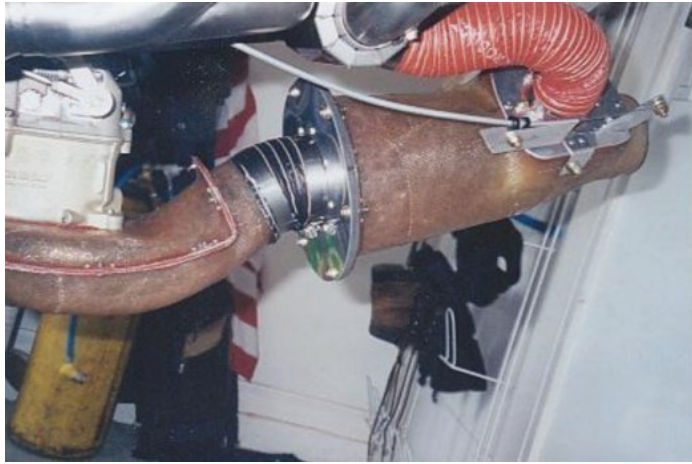
(18)

FILTER HOUSING REAR PLATE

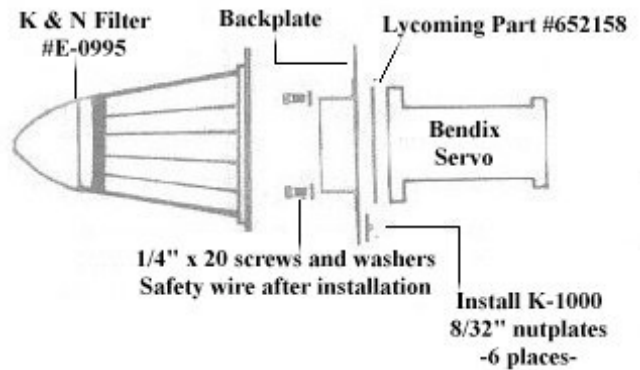
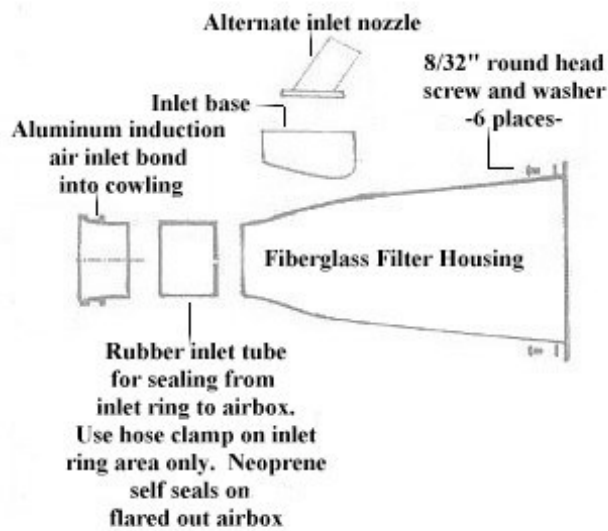
- (1) The back plate, which sandwiches the filter into the filter housing, has a "pipe" flange exit about $\frac{3}{4}$ " in length. When using this kit for fuel injectors, the rear exit nozzle may be trimmed in length (to $\frac{1}{4}$ ") and turned inward to nest inside of the filter itself. This allows for bolting the unit up to a four-bolt, flat servo mounting flange.
- (2) For carbureted engines or AFP injector servos, the backplate nozzle will face aft and attach to the inlet side of the carburetor sweep box with 3" scat hose. Areas of filter and filter housing flange may be trimmed to facilitate fit on some aircraft. Limit trimming to ensure proper air seal or use R.T.V. sealant, if necessary to seal openings.
- (3) The rubber base of the filter should provide adequate Gasket material between the bottom of the filter and the back plate to seal bolt heads when attaching filter housing to Bendix type injectors.
- (4) **Carburetor Inlet sweep Box**
 - (1) Using either a pre-cut gasket or transfered bolt / flange pattern, drill the box flange . Use washers for bearing displacement. Washers may require grinding in some areas for box clearance. Use a gasket and tighten nuts snugly but avoid over tightening.
 - (2) A $\frac{1}{8}$ " hole should be drilled at the lowest point in the inlet sweep box to facilitate drainage of fuel.
 - (3) **IMPORTANT: The four bolts holding the inlet box to the carburetor must be tab locked or drilled and safety wired. IMPORTANT!**

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Note brackets



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All patterns approximate; verify before cutting parts

