

# **KIS4 Cruiser**

**BUILDERS MANUAL**

**S/N 4052**

**FIREWALL  
FORWARD**

# FIREWALL FORWARD

## GENERAL

The configuration of the aircraft forward of the firewall will vary from aircraft to aircraft depending on engine selection and other variables. The effort here must be well thought-out and neatly executed. All workmanship and installations must be up to aeronautical standards.

Information in this section is limited solely to that which is peculiar to the Cruiser aircraft. The builder must obtain and refer to other sources of information for the overall firewall forward installation. Before starting work obtain and study "Firewall Forward" by Tony Bingelis (this is a must) and any documents pertinent to specific equipment being used. Follow all engine manufacturer's guidelines relative to the engine utilized. Also refer to the materials in this Cruiser manual under the sections entitled "Fuel System" and "Instruments and Electrical".

## MOTOR MOUNT AND MOTOR INSTALLATION

Exact engine shaft position will vary according to the engine utilized and the factory cowling ordered with the kit. Lycoming and Continental engines are to be installed with the thrust line level at W.L.01 and with 1 1/2 degrees right thrust. If installing one of these engines it is recommended that the builder purchase a ready-made motor mount as a factory option. New versus used rubber mounts are recommended and can be purchased thru Wicks or Aircraft Spruce.

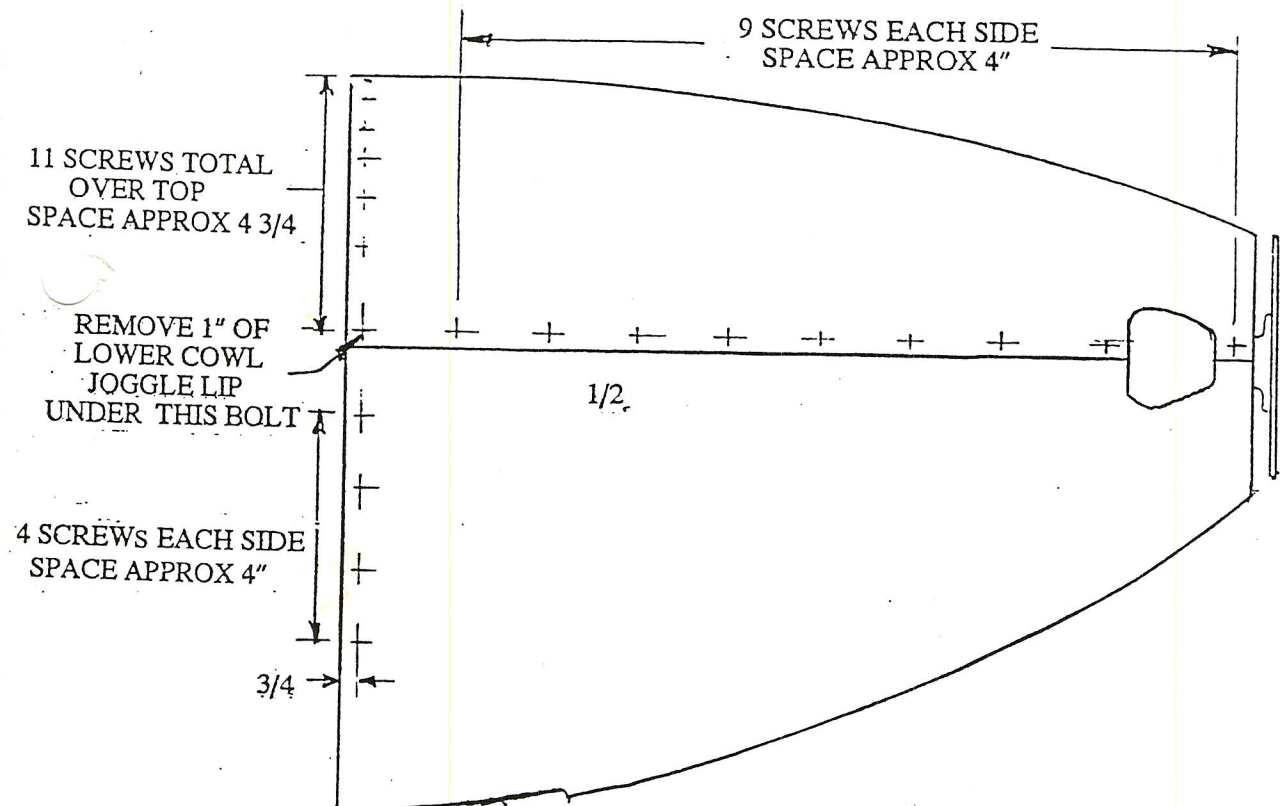
Tri-R-T engine mounts fit the firewall engine mount bolt locations. Open one guide hole to 3/8 inch diameter and bolt the mount into place using the proper size bolt (not provided). Level out the mount and use as a guide to drill the remaining three holes. These holes should be very close to your original guide holes. Install each of the four AN 6-? bolts from the rear (cabin side) of the firewall with AN970-6 area washers against the firewall. The bolts then go through the mount with plain AN960-616 washers on the forward side of the mount. Secure everything in place with AN310-6 castle nuts and appropriate cotter pins.

Once the mount is in place the basic engine (less exhausts etc.) can be installed. Also temporarily install the propeller extension and spinner backing plate to be used. These items are also available as factory-provided options for approved engines.

## FITTING THE COWLING AND SPINNER

It is time to start fitting the cowl. First bring the top and bottom cowl halves together off of the aircraft. You may note that some edges need trimming to the scribe lines. If so, trim and clean these lines with a saber saw and sanding block.

When the cowl is properly installed on the fuselage the cowl horizontal parting line screws and cowl-to-fuselage attach screws will be equal spaced approximately as shown below.



Temporarily assemble the two halves with some #8 bolts and nuts or cleco fasteners along the horizontal parting lines. Locate the holes so they can be used as final screw locations. Carefully remove about 1 inch of the lower cowl joggle lips in the back corners. This will let the upper and lower cowl halves to mate flush in that area. Slip the cowl assembly over the engine. On nose gear aircraft it will be necessary to remove a piece of the lower cowl (about 2 1/2 X 6) to clear the gear.

Make a small rectangular plate to cover the aft portion of the nose gear cut-out behind where the gear comes out. Aluminum about .040 to .063 is ideal. Hold it in place with four 8-32 screws and anchor nuts at the corners.

Put the spinner backing plate into position. Note that the Continental and Lycoming engines require a different prop drive extension. Spinner kits and shaft extensions are available as factory options. Assure that the engine shaft or extension at the spinner plate is centered laterally. There should be a 1/4 inch gap between the cowl and the plate. The top of the spinner should be positioned about 3/16 or 1/4 inch above the cowl because time will cause the engine to droop slightly in the mounts. Trim the back edge of the cowl if necessary to result in proper fit in the fuselage joggle. Some adjustment may also be possible using washers as shims under the motor mount bolts.

When the temporary fit-up looks good drill the cowl and fuselage for attach screws. Install the cowl to the fuselage using counter sunk #8 screws MS24694-S5 and K1000-08 anchor nuts inside the fuselage joggle lip. Rivet the anchor nuts in place. In a similar manner install anchor nuts along the upper/lower cowl part line. Tinnerman finishing washers (MS3135-017-24A) under all cowl attach bolts will improve the security of attachment.

Make an oil access door in the cowl appropriately placed for the engine selected. (See sketch on next page.) The exact shape and size of the door will vary slightly but usually 3 1/2 X 5 inch will suffice. Allow space for side and forward lips on the inside of the cowl for the door to sit upon. Also allow room for a fastener. Mark the door outline on the cowl and then very delicately cut on the line with a piece of a 32 tooth per inch hack saw blade. The blade will work best if ground down to the shape shown. Start the cut on a straight line by holding the blade almost parallel to the cowl surface and guiding it with a straight edge so it slides back and forth exactly on the marked line to "worry" its way through in one place. The blade can then be held vertically.

After the door is cut out sand the edges made by the saw cut. Also ruff up the inside of the cowl for about 2 inches around the hole for epoxy adhesion. Cover the inside of the door all over with vinyl tape. The purpose of the tape is to prevent epoxy from adhering to the door. Tape the door back into place with a generous application of tape on the outside surface. Now that the door is back in place, lay up three layers of BID on the inside of the cowl and door so as to form forward and

side lips for the door and for the retaining Camlock (or similar) fastener. This lip supports three sides of the door.

Remove the vinyl tape at the back of the door and apply some to the inside of the cowl behind the door. Lay up a small piece of 3-ply glass along the inside back edge to form a retaining clip bonded to the door. After the epoxy has cured the door may be removed, the shelf lip cut to exact dimensions and the fastener installed.

## **PROPELLER**

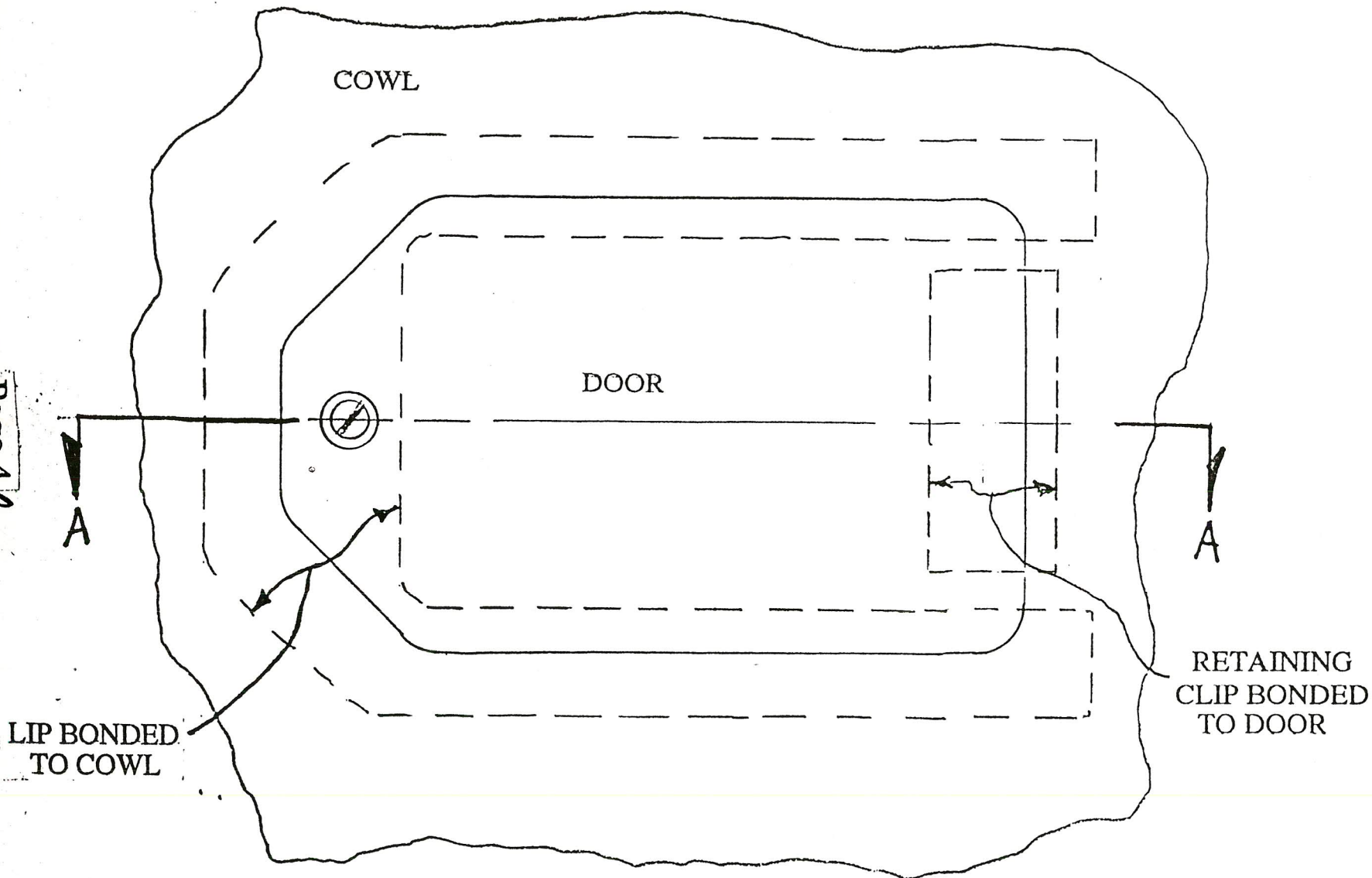
Most propeller manufacturers will help you select the proper diameter and pitch for your aircraft. Propeller manufacturer's torque specifications should be adhered to.

Satisfactory results have been obtained with the following:

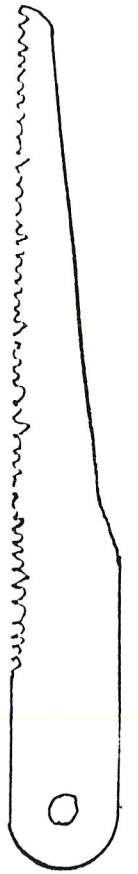
ENGINE	MANUFACTURER	DIAMETER	PITCH
Lycoming 0-360	Sensenich	76	68

The above list will be expanded as additional propellers are utilized.

← FORWARD →



HACK SAW  
BLADE



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LIP BONDED  
TO COWL

RETAINING  
CLIP BONDED  
TO DOOR

CAMLOC