



Zenith CH701 FWF Suggested Build Order

<u>Process</u>	<u>Applicable Manual Sections</u>
Fit Mount to Firewall	Section 1 – Trim Mount
Fit Ice Eliminator to Carb	Instructions in Ice Eliminator Kit
Fit Mount to Engine	Section 2 Mount to Engine
Fit Mount & Engine to Firewall	Section 3 Mount to Firewall
Fit Air Filter Box	Section 4 Air Filter Box
Fit Prop Hub Extension	Jabiru Service Bulletin JSB-22-1 if not already installed
Fit Cowls	Section 5 Fit Top – Bottom Cowl
Fit Cooling Plenums	Section 6B Fit Cooling Ducts CH701
Fit Oil Cooler	Section 7A How to Install Oil Line Fittings
	Section 7B Oil Cooler
	Section 7C Hose & Fittings
Fit Throttle System	Section 8 Throttle Assembly
Install Choke	Jabiru Procedure
Fit Fuel System	Section 9 Fuel System Firewall Forward
Fit Oil Recovery System	Section 10 Oil Recovery System
Fit Battery & Electrical	Section 11 Battery & Electrical
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The engine mount will have to be trimmed so that the mount pads that contact the firewall will fit correctly on the firewall. These five pads have been left over size to allow builders to trim to match their firewall and to allow room to match firewall components that may have been installed slightly “off” from the standard plans.

1. Position the mount on the firewall and mark the top center mount pad. Trim if necessary for clearance at the top and sides of the mount pad. Make sure the top does not extend above the firewall (trim about 1/4 inch down) See photo 1.
2. At this time you can mark and drill the two 3/16 holes that will mount the top pad to the firewall and fuselage brace tubes. Take care to avoid drilling into the brace tubes and to allow clearance for the AN3 bolt installation
3. Position the lower two mount pads in the correct position and mark for trimming so that the pads fit along the firewall stiffener and also fit into the bottom angle braces. The mount will be “stretched” a bit vertically as you mark these trim lines but will return to normal after the trimming.
4. Remove mount from firewall and trim off excess lower pad material. See photos 3 and 4.



Photo 1. Top Mount Trim



Photo 3

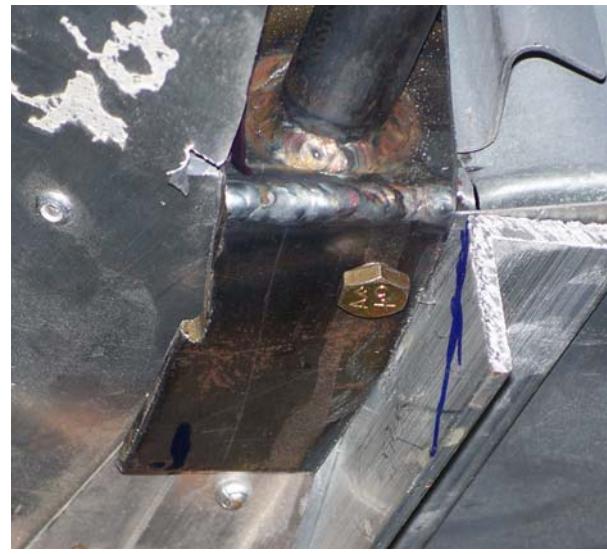


Photo 4

5. Reposition the mount on the firewall. The mount should be in its normal shape and the center mount pads should be near their final position.
6. Push the center pads up and under the stiffener shelf.
7. Mark the outboard side of the pad for trim (if necessary) to provide clearance from the skin that extends forward of the firewall.
8. Trim mount to fit, reinstall and drill the 3/16 holes for the AN3 mount bolts. Take care to provide clearance for the bolt on the mount pad and the steel angle aft of the firewall.

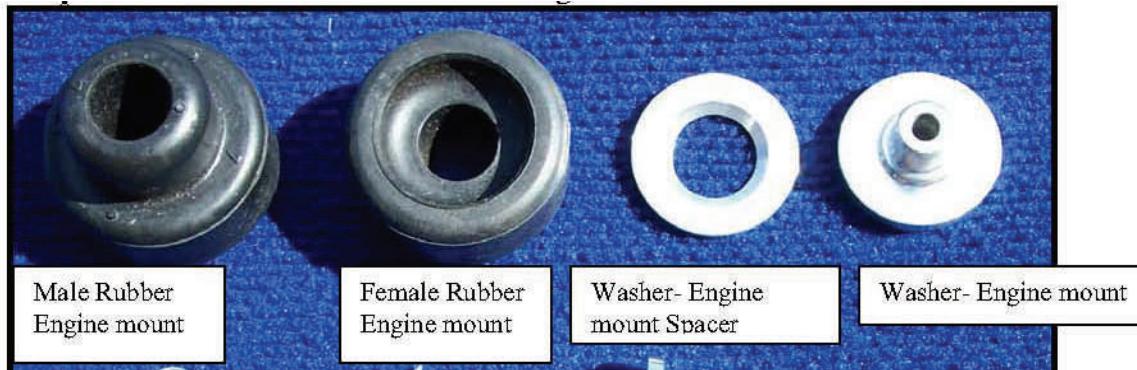


9. Locate and drill the 3/16 holes in each bottom mount pad. One hole through the firewall and the other from the bottom through the aluminum angle stiffeners and firewall flange.
10. Remove mount, clean up with solvent and steel wool or Scotch Brite pad and paint mount. We suggest a good base of metal etching primer like Marhyde followed by a top coat of white or light gray enamel like Rustoleum.
11. After paint dries reposition mount of fuselage just to recheck fit.

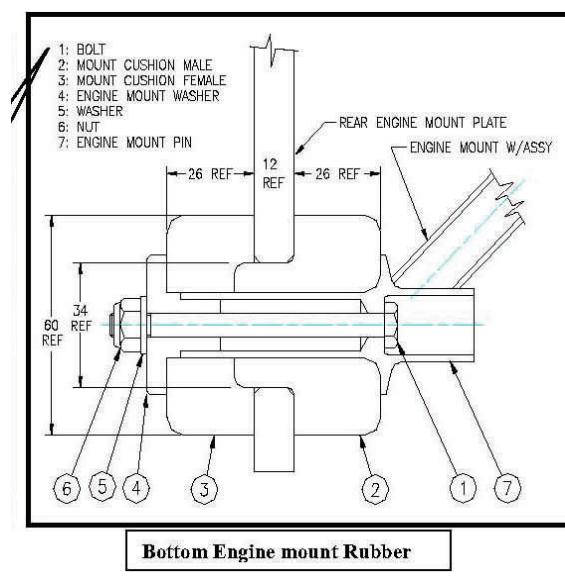
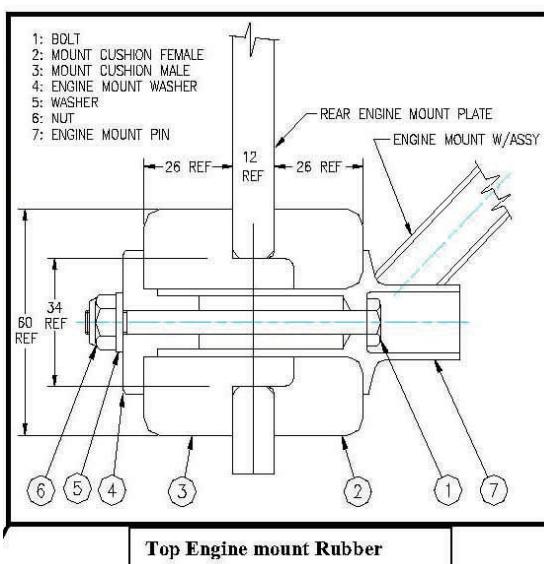
Builders may find it easier to mount the engine to the engine mount and then mount the assembly to the firewall. However, it is not necessary to attach mount to engine first and the mount can be attached to the firewall if the builder prefers.

There are a few procedures that are easier to do before the engine is mounted to the firewall, though. Attaching the throttle arm extension, installing the electric carb heat, and attaching the throttle cable is easier to do with the carb off the engine and on the bench. See the instructions for those procedures.

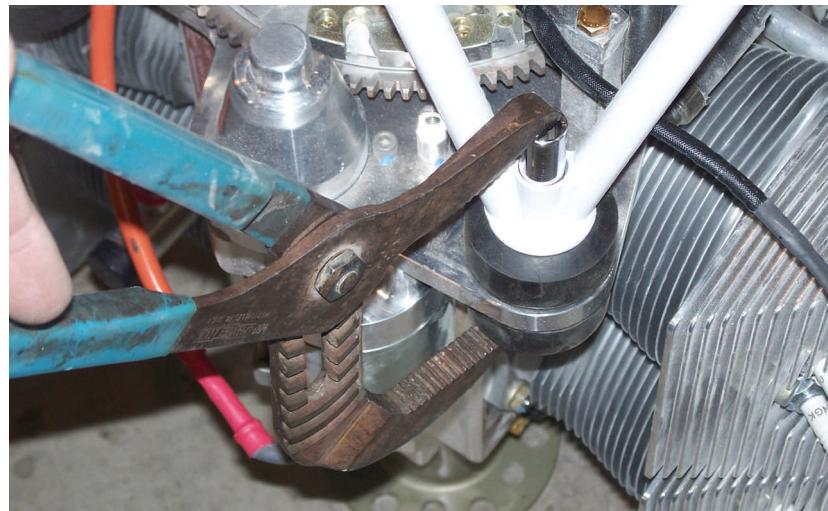
1. Locate the engine mount cushions and hardware in photo 1 that came with the Jabiru engine in the accessory bag. Also find the engine mount bolts, washers, and nuts from the FWF kit.



2. Refer to the mount cushion assembly drawings below.
3. Install the female half of the mount cushion on the top mount pins.
4. Install the male half of the mount cushion on the bottom mount pins.
5. Stand the engine up on its prop flange.

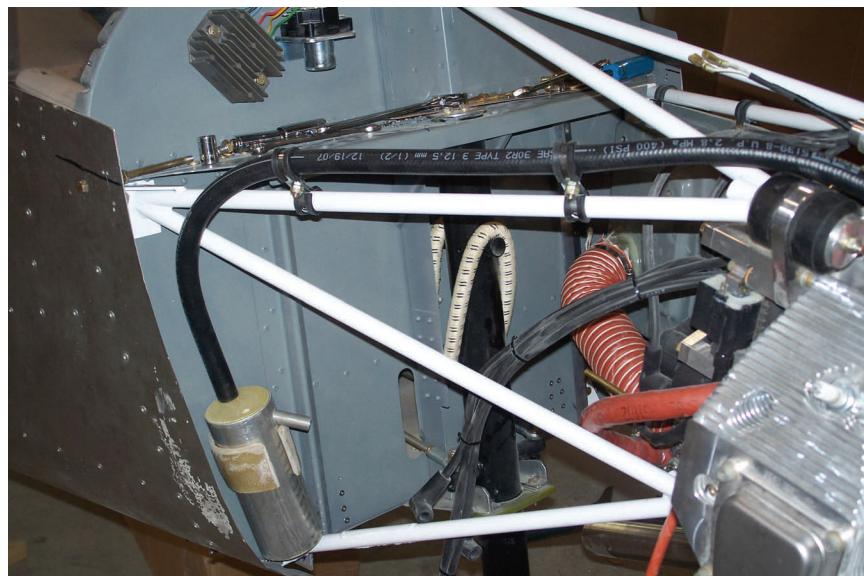


6. Lower the mount down onto the engine, inserting the male cushions into the engine back plate.
7. Insert the AN4-31A mount bolt in the top mount pins
8. Install the male half of the cushion onto the engine mount pin and into the engine back plate.
9. Install the mount washer into the end of the mount cushion and engine mount pin.
10. Using an extended length socket to hold the bolt in place, compress the mount cushion and mount washer until the mount bolt extends far enough through the mount washer to get the washer and AN363-428 nut started. See photo below.
11. Tighten the nut until the mount washer bottoms on the engine mount pin. There should be about two threads showing on the mount bolt.
12. Repeat for other mount bolts.



This procedure requires an engine hoist or a few strong friends to hold the engine and mount in place while bolts are installed.

1. Position engine and mount against firewall.
2. Install the AN3-6A bolts, washers and AN363 lock nuts in the top, center and bottom (through the aluminum angle) mount holes.
3. Install AN3-4A bolts, washers, and AN363-428 lock nuts in the bottom firewall holes.
4. We suggest installing the nuts on the engine side of the firewall as it makes inspections easier later on.





Mount the air filter box to the left side engine mount as shown in the photos. Use three #8 cushioned clamps provided in the Air Filter sub kit.

Remove the filter box cover and install the K&N Filter into the box.

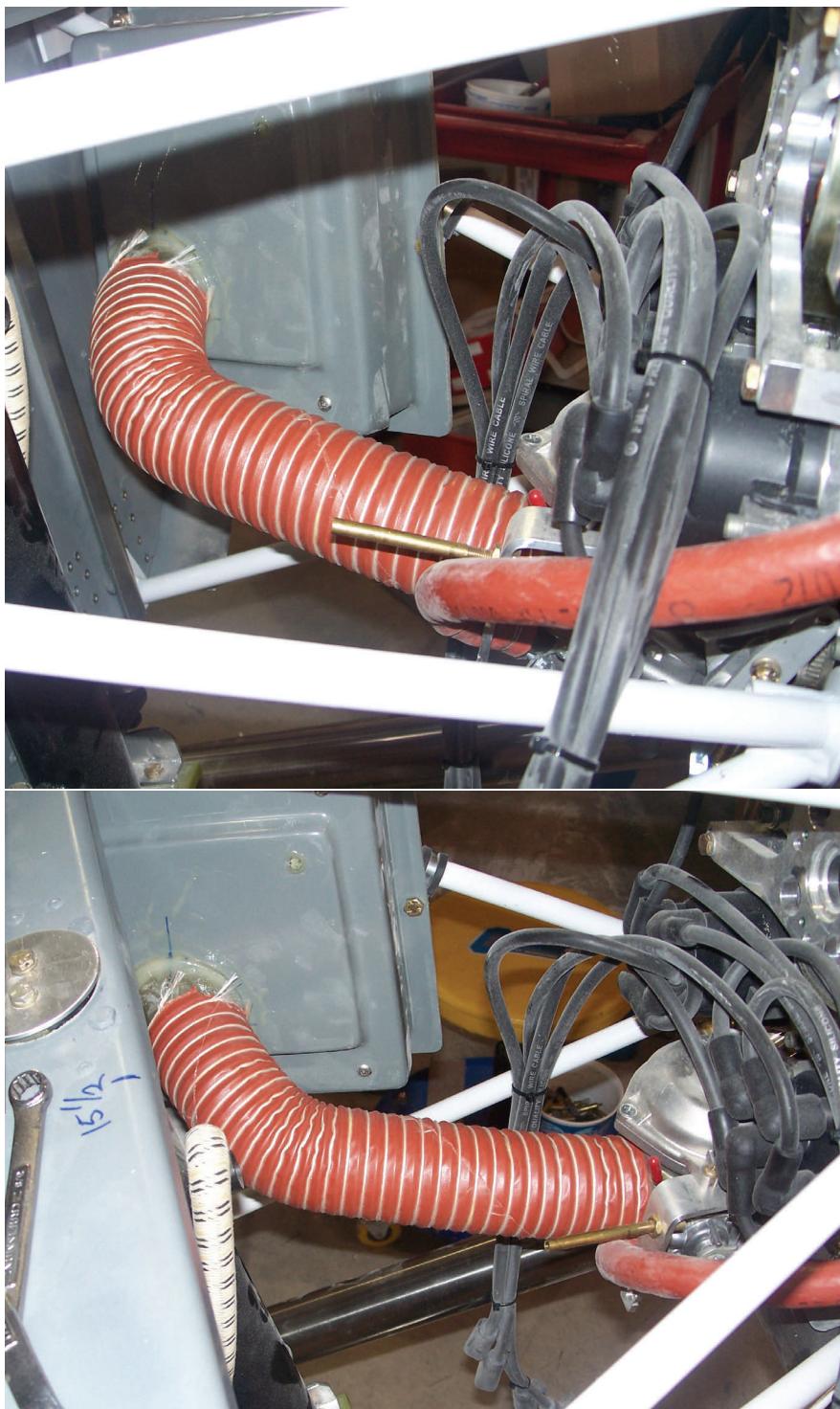
Measure a length of 2.25 inch SCAT duct that will go from air filter box to the carburetor inlet.

Remove the inner wire from the SCAT duct on the end that will attach to the filter box.

Install the duct on the carb with one of the worm drive clamps provided.

Install the SCAT duct on the filter box with the other worm drive clamp.

Try to keep as straight a run as possible from the back of the carb. The mixture control from the carb will work better if there is a straight run into the carb.



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SERVICE BULLETIN:

JSB 022-1

Issue: 1

Date: 28th July 2008

Subject: Propeller Flange Attachment

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1 Applicability

All Jabiru Engines.

Note: For aircraft in Light Sport Aircraft categories this Bulletin is equivalent to a Manufacturer's Safety Direction.

2 Background:

Recently there have been several cases where propeller flanges have separated from the crankshaft due to improper installation. These have occurred on Jabiru 2200, 3300 and 5100 engines. In some cases the wrong grade of retaining compound was used, in others the wrong bolt length was used and in one case the screws were not tightened when the flange was installed.

This Bulletin is intended to raise operator awareness of the correct method of fitting the propeller flange.

3 Compliance – Implementation Schedule

3.1 Factory Complete Aircraft Built By Jabiru Aircraft Australia:

No new maintenance or inspection requirements are required by this Bulletin.

3.2 Other:

Operators who have fitted propeller flanges using a procedure other than that detailed below:

- Re-fit the propeller flange following the procedure detailed below at the next scheduled maintenance or within the next 50 hours, whichever is the sooner.

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4 Procedure:

4.1 Propeller Flange Installation:

Due to the importance of this work, owners who are not confident are strongly recommended to have an aircraft maintainer (such as a LAME, RA-Aus Level 2 or equivalent) carry out the work.

- b) With the flange removed, fit the attachment screws through the propeller flange and check the amount of thread which will screw into the crankshaft. There must be no less than 9mm (0.0.354") of **full** thread engagement – which generally equates to a total of around 11-12mm (0.433-0.472") measured from the tip of the screw to the flange mating face. If a Belleville (cone or spring washer) is used, the compressed thickness of the washer must be accounted for – the numbers given here assume a std Jabiru Belleville washer is fitted (and compressed) while measuring.
- c) Hold the propeller flange to the front face of the crankshaft. Ensure that the flange fits cleanly. Note that the socket of Jabiru propeller flanges are not designed to be a high-tolerance tight fit onto the end of the crankshaft – a small amount of clearance is normal here.
- d) Visually inspect the front face of the crankshaft and the mating face of the propeller flange. Ensure both faces are clean, free from rust and defects.
- e) The screws used to fit the original flange may be re-used provided they are the correct length and are not visibly damaged. If the screws are replaced then high-strength cap screws must be used – “Unbrako 1960” type or equivalent.
- f) If the screws are to be re-used their threads must be cleaned with a wire brush or similar.
- g) Clean the threads of the screws using Loctite 7471 activator (primer) & allow to air dry. After priming, ensure the threads stay clean – contamination with oil (even skin oils from fingers) can reduce the strength of the bond of the retaining compound.
- h) If a flange has been removed to allow a different type to be fitted then the screw threads in the crankshaft must carefully be cleaned using a 3/8" UNF tap – this removes leftover retaining compound from the threads and gives a better bond. Care must be taken to not cross-thread the tap or otherwise damage the thread in the crankshaft. Blow out the holes using dry compressed air.
- i) Clean the threads in the crankshaft using Loctite 7471 activator (primer) & air dry.
- j) Apply a small amount – approximately the size of a large match head – of Loctite 620 retaining compound to the flange screws.
- k) Apply the same amount (approximately the size of a large match head) of Loctite 620 to the threads in the crankshaft.
- l) Fit the flange to the crankshaft & fit the screws by hand, then tension the screws using a calibrated torque wrench **immediately**.

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- m) Tension the screws in a standard diagonal tightening pattern. Torque all screws first to 20 lb.ft, then all to 25 lb.ft, and finally all to 30 lb.ft.
- n) Lock-wire may be applied. If it is used the screws should be wired in pairs.
- o) Allow the retaining compound time to cure (refer to manufacturer specifications) before starting the engine.

4.2 General Notes:

- This job must be done in one session. In one case the operator screwed the flange on to the crank by hand and then went on with other jobs – the screws were never tightened above “finger tight” and the flange separated from the engine on the aircraft’s first flight approximately 300’ above the ground.
- Jabiru Aircraft have no objection to lock-wire being used; the standard flange fitted to Jabiru Engines is lock-wired at the factory. However, lock-wire on its own has proven to be insufficient restraint for the screws. Loctite 620 *MUST* be used – all other restraints are optional. Jabiru Aircraft Australia does not use lock-wire on all its factory-built aircraft.
- Torque wrenches are a precision instrument which must be periodically calibrated to ensure they are accurate. A wrench which is within its calibration period must be used for this job.
- Loctite 620 is used because of its high temperature tolerance. The crankshaft runs at approximately oil temperature – around 80°C – 90°C and other retaining compounds have lost significant strength at this temperature.
- Before removing a screw which has been installed with Loctite 620 the part should be gently heated using an electric hot air gun to carefully warm the parts. Care must be taken so that the front seal of the engine is not heated too much – a damp rag can be used to block the hot air & keep it cool. If this is not done there is a chance that the screw will fail before the retaining compound bond is broken & the thread will be left embedded in the crank.
- Dowel holes are drilled in the crankshaft for use by aftermarket propeller manufacturers (Ø8.00mm x 12 deep, PCD 41.5mm).
- Only propeller flanges made by Jabiru Aircraft or other approved manufacturers must be used. High quality machining with close tolerances is required to ensure the flange fits properly and the propeller runs true.

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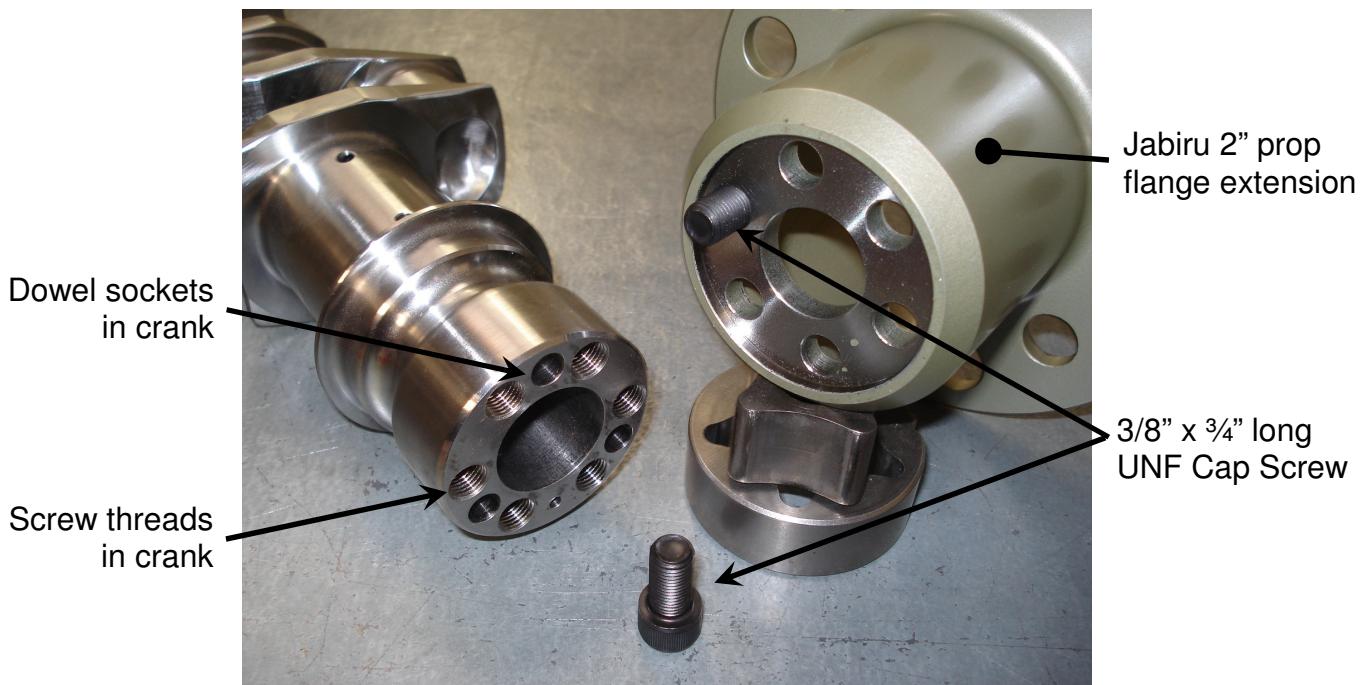


Figure 1 – Flange & Crankshaft

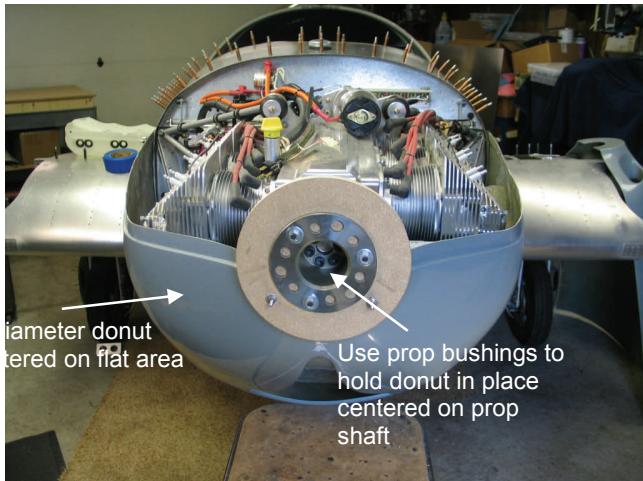
5 Airworthiness Note:

- Operating an engine with a loose propeller flange is potentially extremely damaging for the engine. The increased vibration can cause severe engine damage including crankshaft failure. If the flange is found to be loose please contact your local Jabiru representative for information on what inspections are required for safe continued operation.
- Where required, any work called for by this Bulletin must be carried out by authorised personnel. For the aircraft detailed herein this may mean the owner, an RA-Aus Level 2 holder, a Licensed Aircraft Maintenance Engineer (LAME) or equivalent – as appropriate to the aircraft's registration and use (Private or Air Work operations).
- On completion of the work, the authorised person must note the completion of the actions required by this bulletin in the aircraft's maintenance logbook. This note should include the date of the work and the identity (including licence number where appropriate) of the person carrying out the work.

These photos are from a CH601 but the CH701 procedure is the same.

In simple terms, the cowls are installed by fitting the bottom cowl to the fuselage and attaching with screws and then fitting the top cowl and attaching it with Camlocs.

One positioning jig will make installation much easier. Fabricate a “donut” from 3/4 inch thick chipboard or plywood. Cut the inside hole of the donut to 2.75 inches in



the holes in the hub area.. Position one half against the upper cowl spinner flange (the flat area that falls just behind the spinner) and temporarily attach it to the upper cowl with a few self tapping screws inserted from the inside of the cowl into the wood block.

Attach the lower cowl to the other half of the donut in the same manner.

Lift the lower cowl into place and secure the rear end in approximately the right place on the fuselage with tape. Position the front with the donut just behind the prop hub (on the prop hub extension) and secure with the

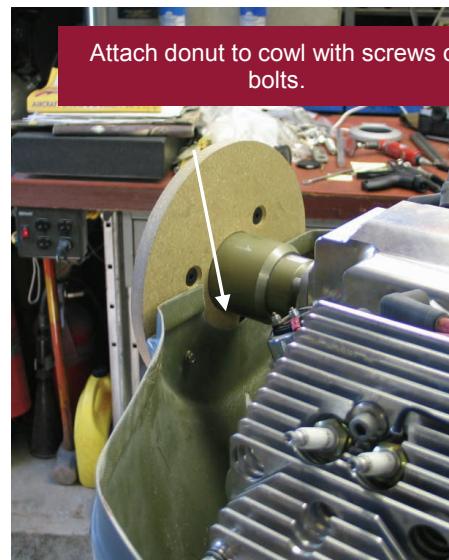
Line up bottom of joggle with longeron. Tape securely in place. Mate both sides to the longeron.



diameter and make the donut 9 inches in diameter on the outside to match the spinner size.

Place the original prop hub that you removed from the crankshaft on the donut. Center the hub and with a 5/8 hole saw drill through three of the prop hub holes so you can insert the engine prop bushings later on.

Cut the donut in half (don't cut through



prop

bushings from the engine accessory pack and some temporary bolts or screws.

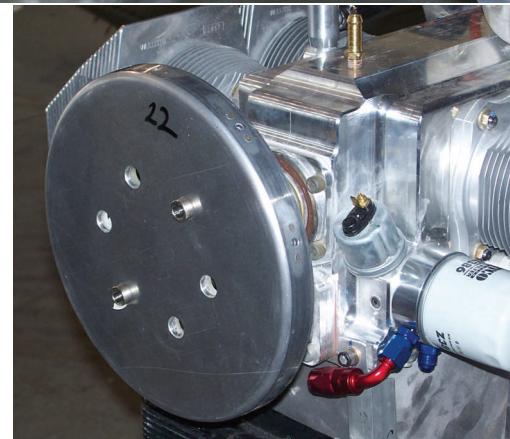
The inside radius of the donut should fit around the shaft of the prop hub extension and hold the front of the lower cowl in place.

Continue with the fitting of the rear of the cowl against the fuselage.

1. Mark and cut out a round hole in the center of the flat area that fills behind the spinner. Use the prop hub as a template.



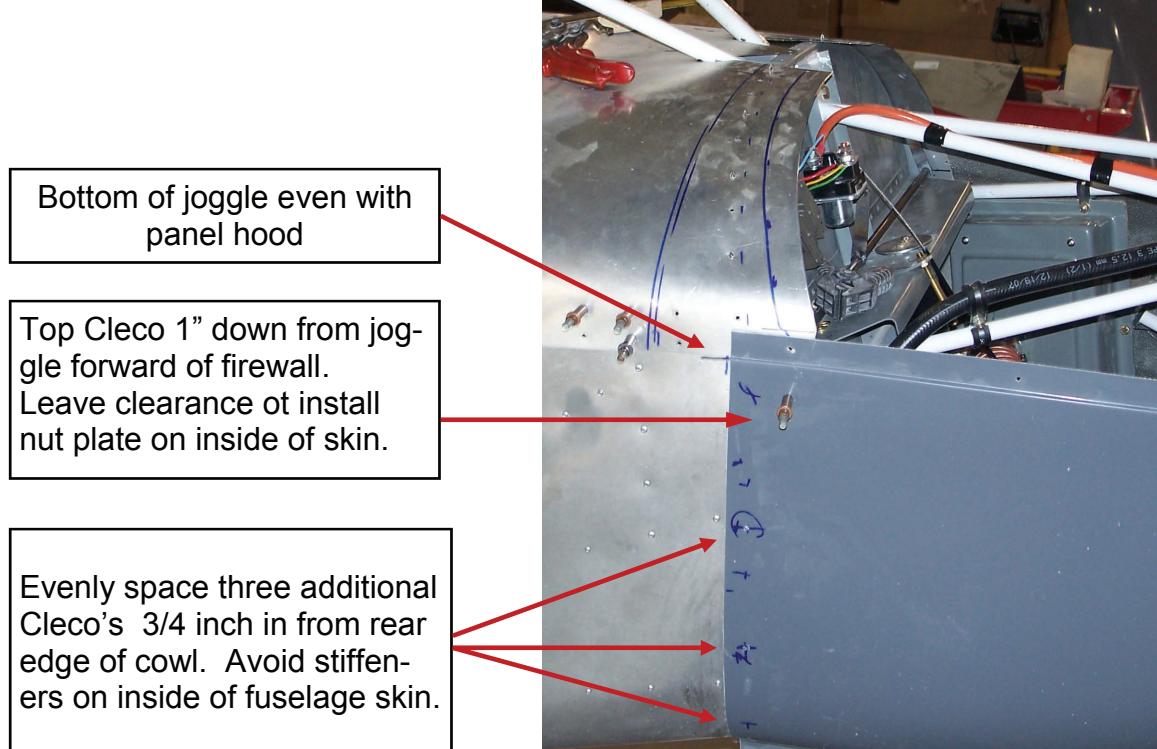
2. Place the spinner back plate on the prop hub (the hub extension must be installed in place of the std hub) and secure with a temporary bolt
3. Tape a 1/4 inch thick piece of plywood behind spinner plate to gauge clearance from spinner to cowl



4. Position bottom cowl in place so that the bottom of the cowl joggle joint is even with the bottom of the instrument panel hood. Clamp temporarily in place.
5. Position the front of the lower cowl so that the spinner back plate follows the contour of the front of the cowl. Maintain 1/4 inch clearance between cowl front and spinner back plate. Clamp in place.
6. Level the airplane from side to side.
7. Re-adjust the rear of the lower cowl so that it is level side to side.
8. When you are satisfied with the fit drill through the cowl and into the



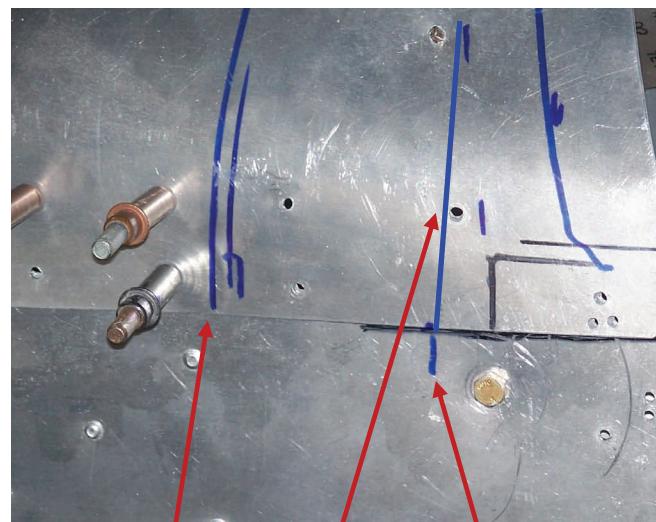
fuselage and install 4 x 1/8 Cleco's on each side. The top Cleco will be forward of the firewall and 1 inch down from the joggle. The other Cleco's will be aft of the firewall. Space them to avoid the stiffener bracing inside the cockpit.



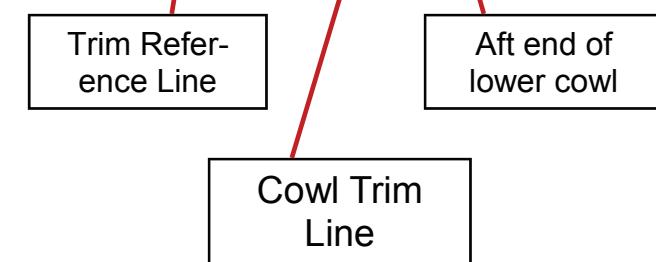
9. Lay out the top cowl trim lines on the fuselage skin (do not trim the skin but trim the cowl. Start at the center of the firewall and draw a line starting at the forward edge of the firewall and extend the line down to the aft edge of the lower cowl. Repeat on the other side of the fuselage. This will be the cowl trim line.



10. With the lower cowl in place position the top cowl in place over the lower cowl. Draw a reference line at the back edge of the top cowl onto the fuselage (panel hood). This is the trim reference line.

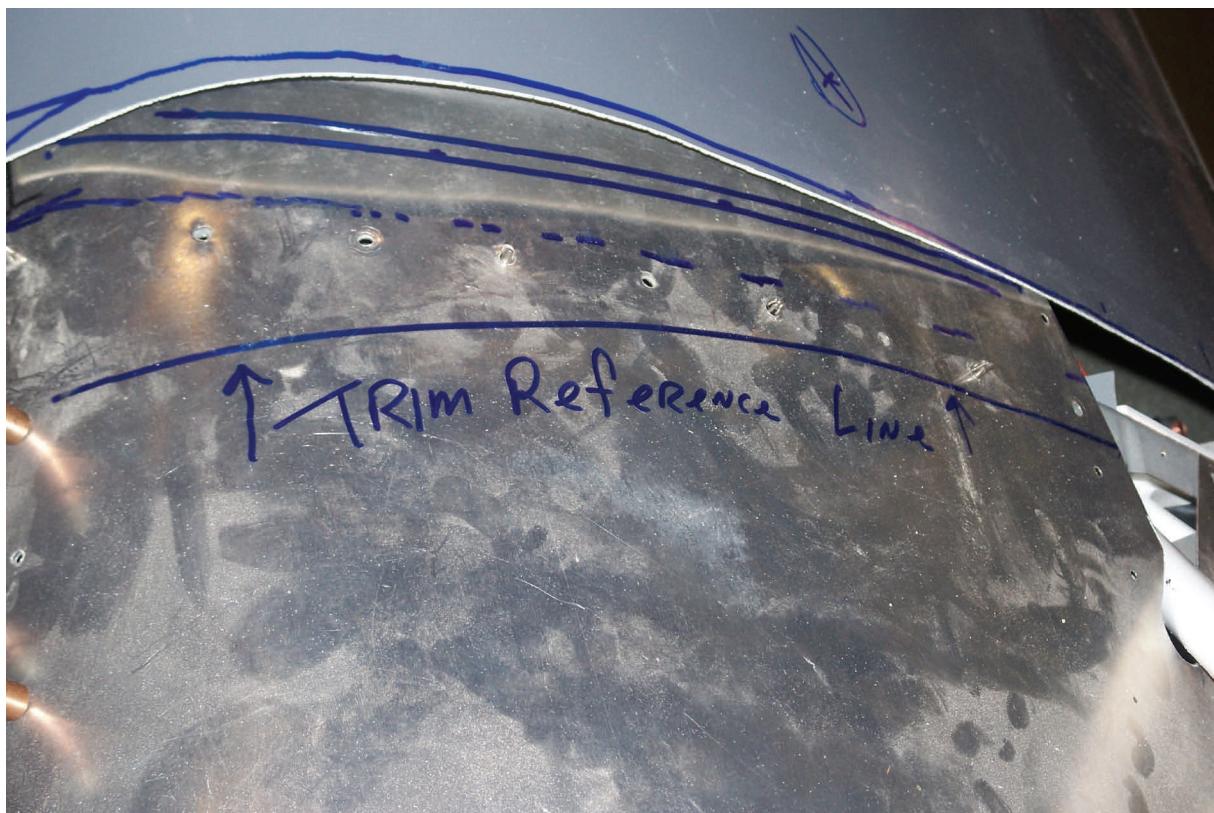


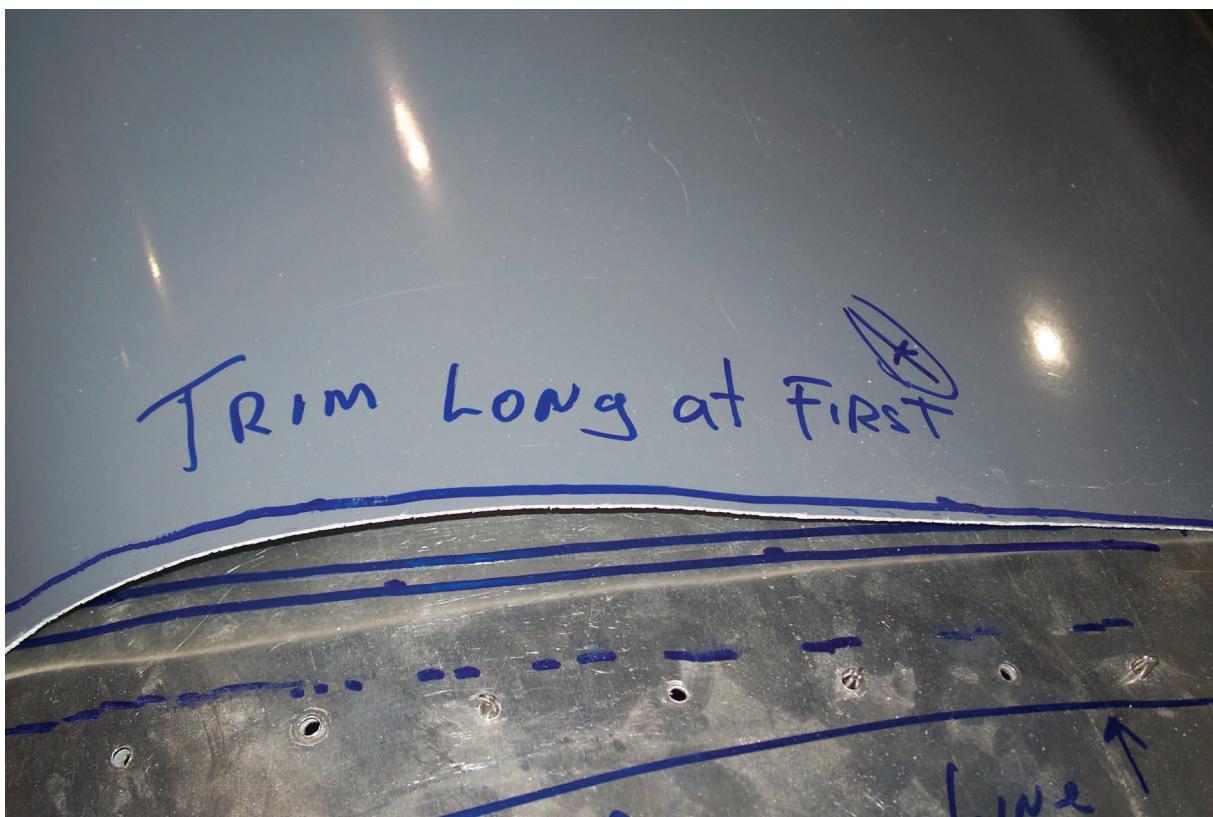
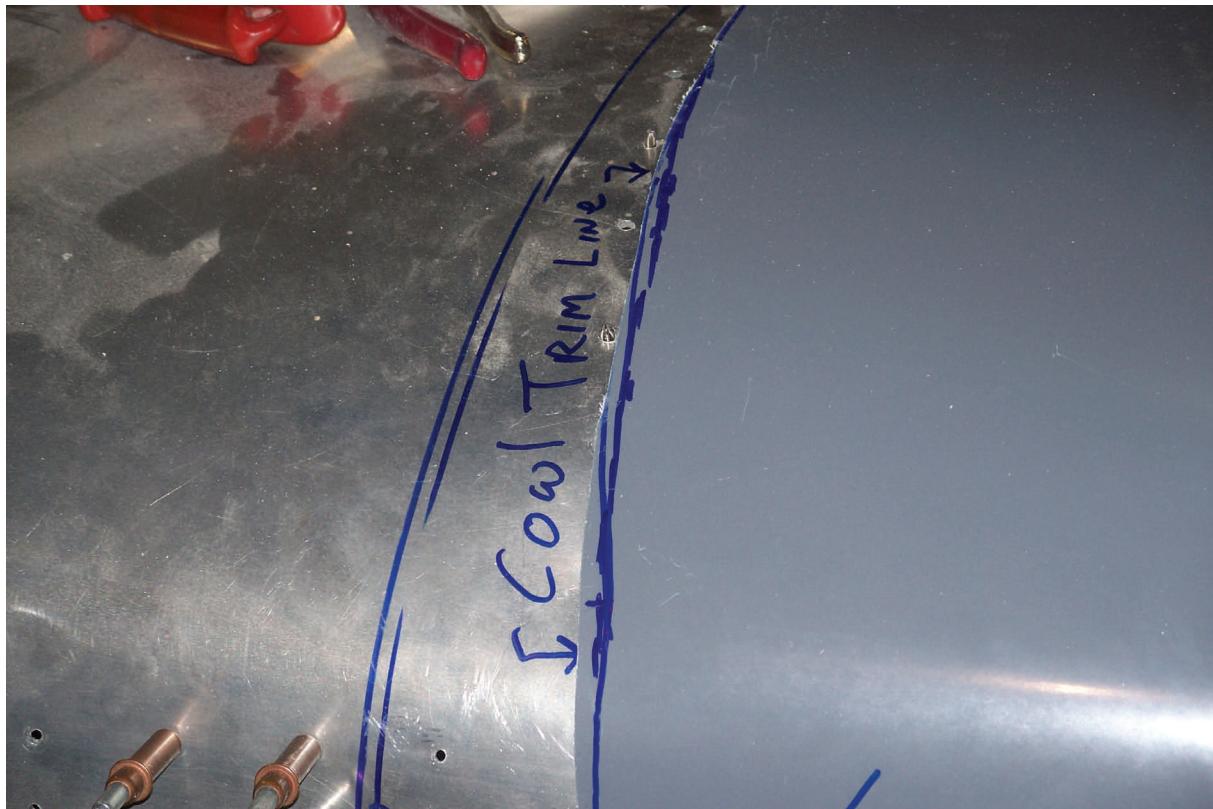
11. Remove the top cowl. Measure the distance from the trim reference line to the cowl trim line in several places along the line. Transfer these measurements to the top cowl. Draw a evenly curving line between the points on the top cowl and trim the cowl to the line. We suggest trimming 1/4 inch long to start with and fine trim from there.

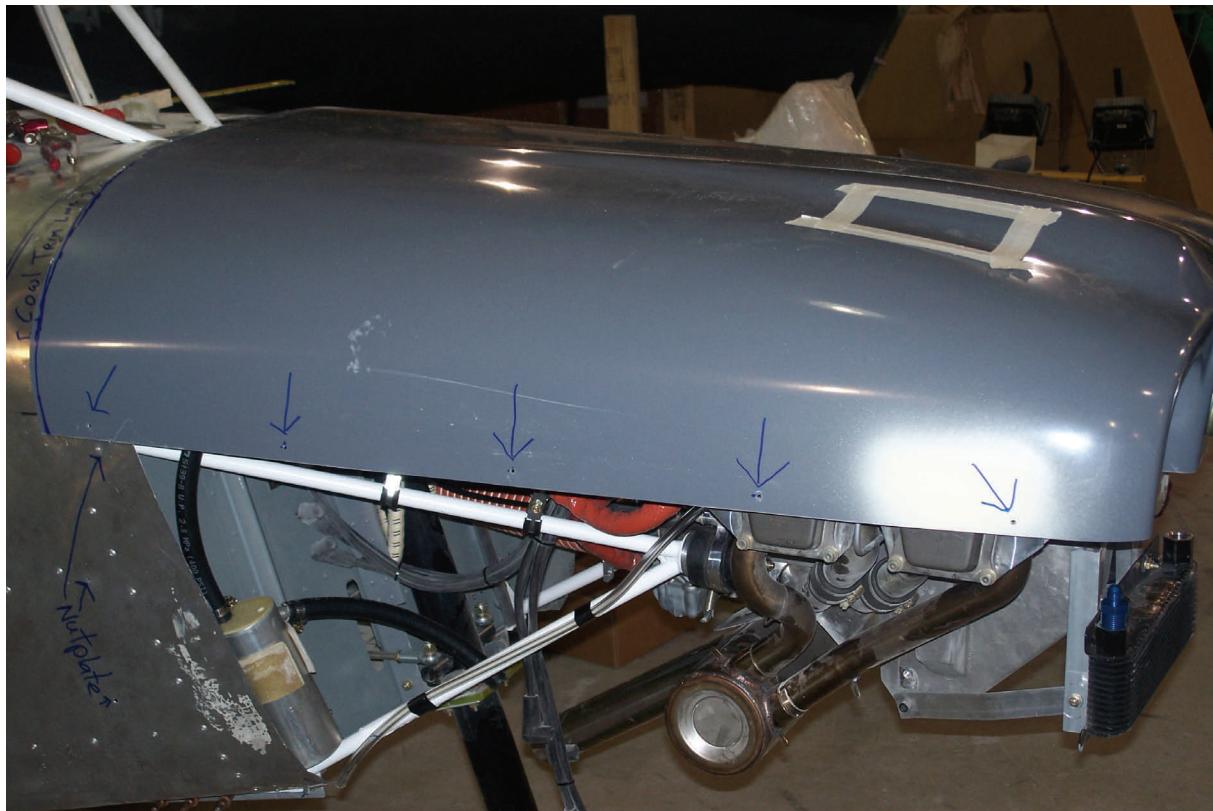


12. When satisfied with the trim length dress out the trim line with sand paper or a Permagrit file. Make sure during the marking and trim process that the top cowl stays in place on the bottom cowl.

13. With the top cowl in place mark the locations on the top cowl for the Cam Loc installation. Place the first CamLoc about 4 inches back from the front of the cowl and then locate one about every 8 inches. There will be five CamLocs on each side. Do not install the Cam Loc's just yet but drill to install 1/8 inch Cleco's. Locate the holes 1/2 inch up from the edge of the top cowl. This should put the hole in the center of the joggle on the lower cowl.







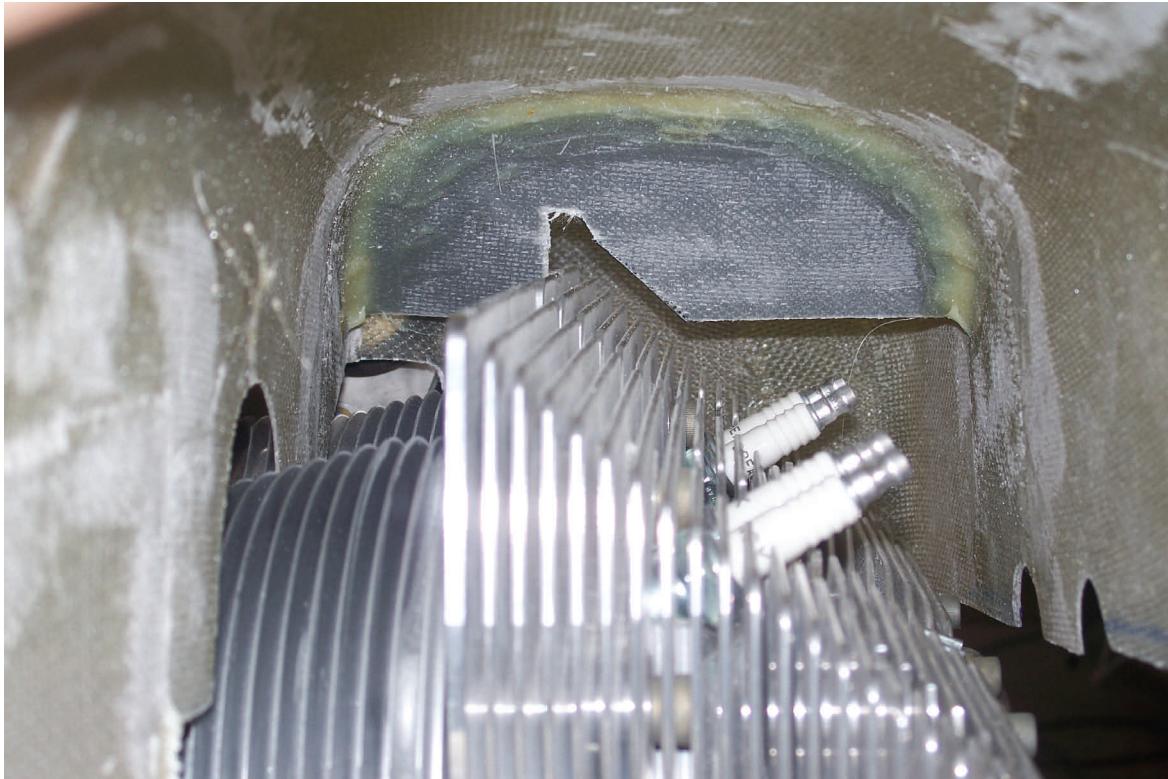
Cam Loc Locations
Drill 1/8" and temporarily fasten with
Cleco's











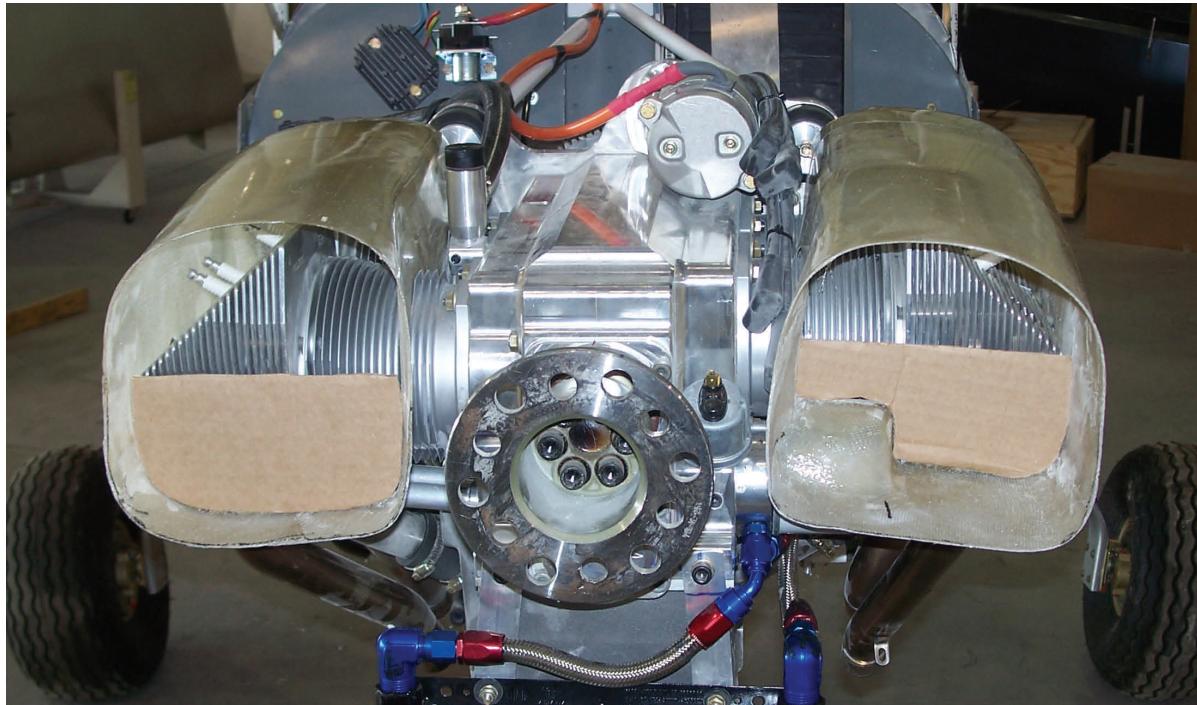
Please read the Jabiru procedure and then consult the photos in this section as the ducts that Jabiru USA manufactures for the 701 are somewhat different than the standard Jabiru air ducts but the mounting procedure is the same.

An air dam must be constructed at the front of each duct. The dam can be made of fiberglass scraps that are fitted and bonded in place with 5 minute epoxy or they can be made of aluminum scrap (Zenith builders may be more comfortable with aluminum) and riveted in place.





The air dams should fit right up against the front of the cylinder fins with minimal clearance—1/8 inch or so. They should extend upwards to the top of the outboard head fin.





How to install oil line fittings.

Tools needed:

Braided oil line

Fittings

Pipe jaws for vise

$\frac{3}{4}$ " socket and ratchet

9/16" open end wrench (for 45 degree fitting)

11/16" combination wrench (for straight fitting)

A touch of engine oil

Masking tape

Dremel tool or similar device with cutoff wheel

Step 1.

Carefully measure the oil line. A good tip is to install a fitting on one end of the line and then attach it to the oil cooler adapter fitting. Screw the other fitting onto the oil cooler outlet and then mark the needed length on the oil line. The scored line on the hose end of the fitting is the point where the oil line stops inside the fitting.

Step 2.

Tightly wrap the oil line with masking tape using several turns. Your goal here is to keep the oil line from fraying while cutting it.

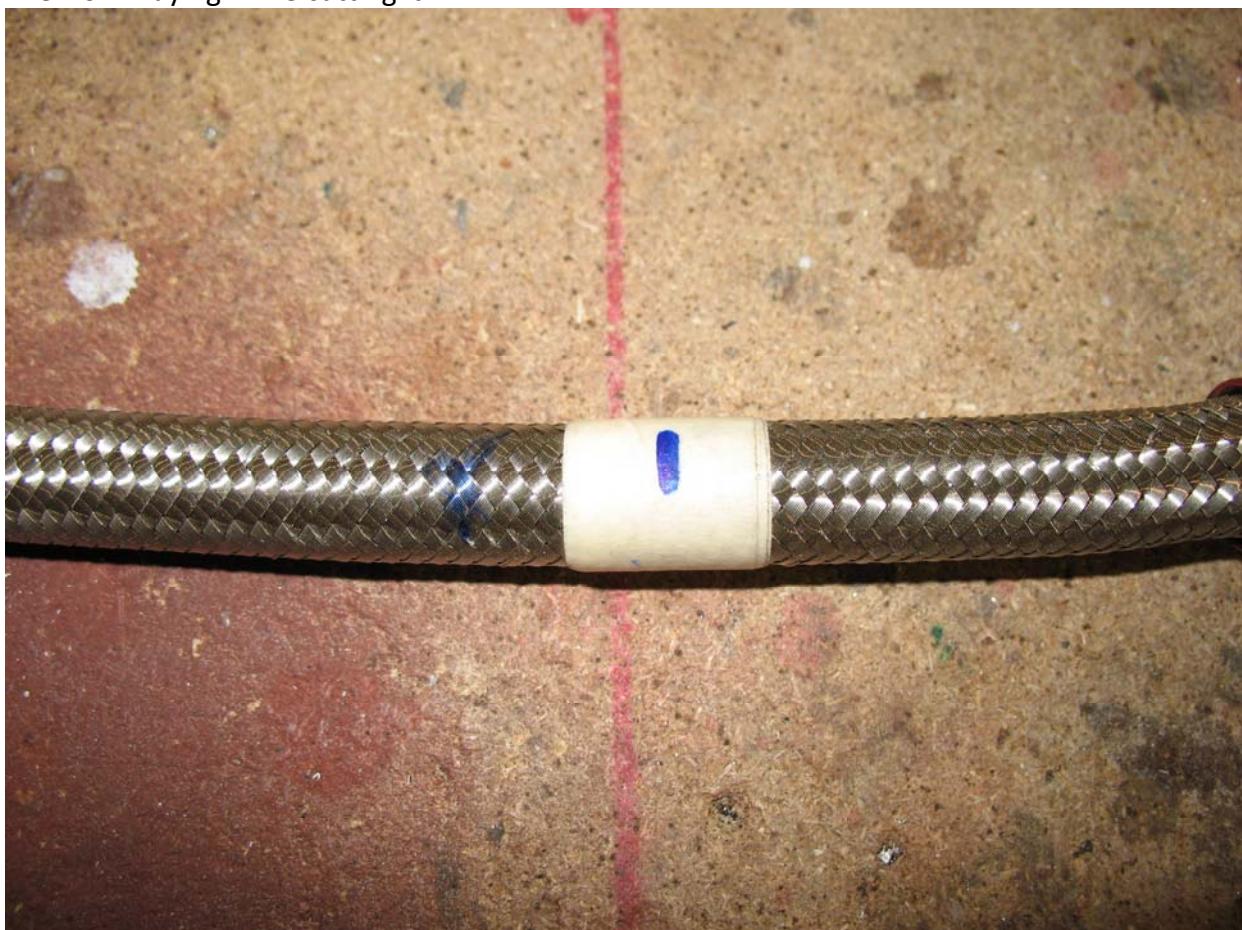


Figure 1

Step 3.

Cut the braided line using a Dremel tool, RotoZip, chop saw or similar device that has a metal cutting disc. You want as clean a cut as possible. Do not attempt to cut the line with any device that has teeth such as a hacksaw, you will end up fraying the oil line and frustrating yourself!



Figure 2

Step 4.

Remove the tape and insert the oil line vertically in the jaws of the vise.



Figure 3

Step 5.

Take the fitting apart. Place a small dab of engine oil on the hose end of the fitting. Carefully place the hose end of the fitting over the oil line taking care not to fray the end of the line. Place the 9/16" socket over the fitting and while pressing downward "tighten" the fitting onto the hose.



Figure 4

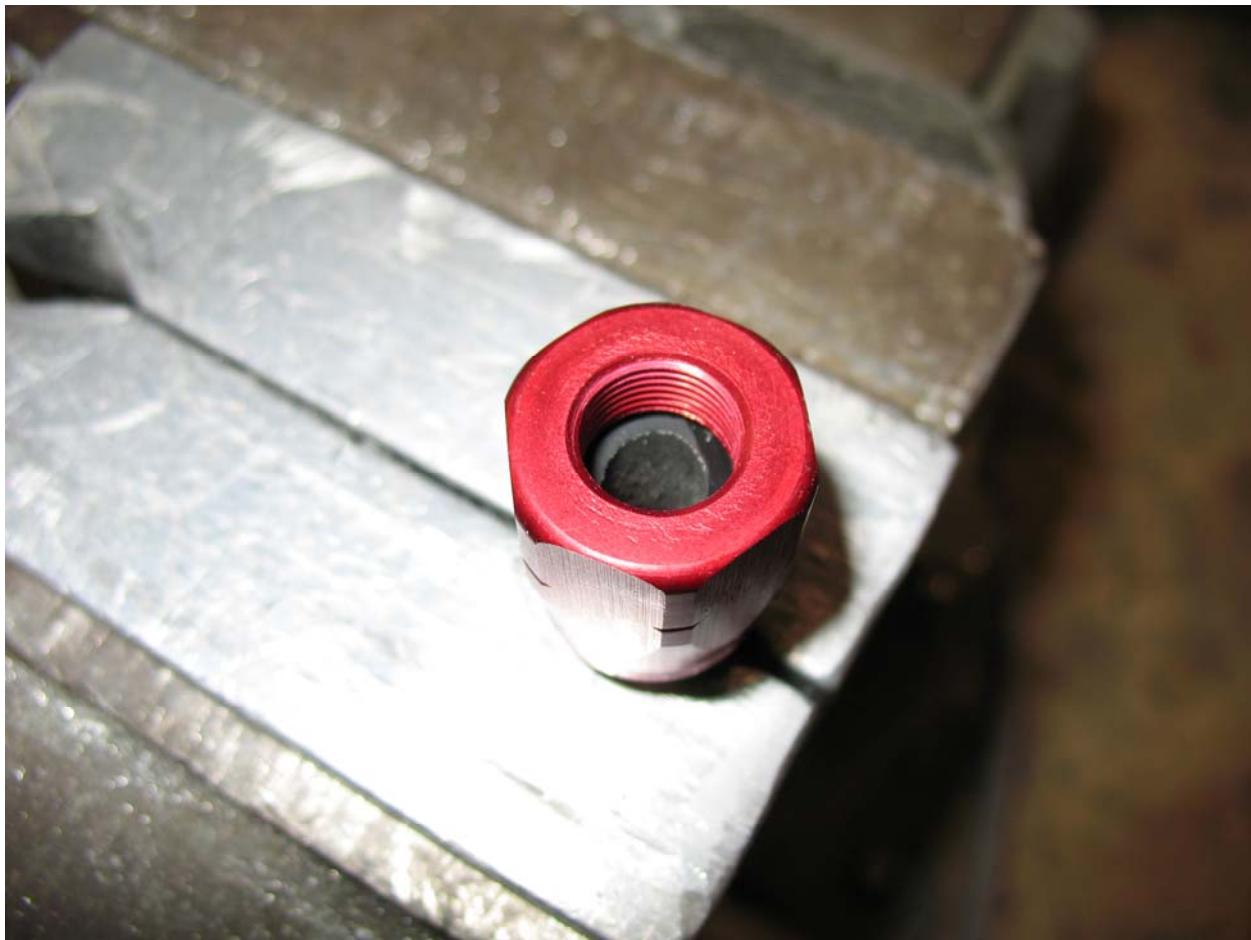


Figure 5

The oil line should bottom out against the threaded portion of the fitting.

Step 7.

Wrap a piece of masking tape around the oil line at the base of the fitting. This will let you know if the oil line pushed out of the fitting during the next step. Place the oil line and fitting horizontally in the vise locking the fitting into the jaws of the vise.



Figure 6

Step 8.

Place a small dab of motor oil on the nipple of the fitting. Gently start the nipple into the hose end fitting until finger tight and make sure it's not cross threaded. Grasp the oil line with one hand and apply pressure to keep the oil line from backing out of the fitting. While applying pressure screw the nipple into the fitting using the 9/16" (45 degree fitting) or 11/16" (straight fitting) wrenches. Screw the nipple in until you have about a sheet of paper's width between the nut and the hose end.

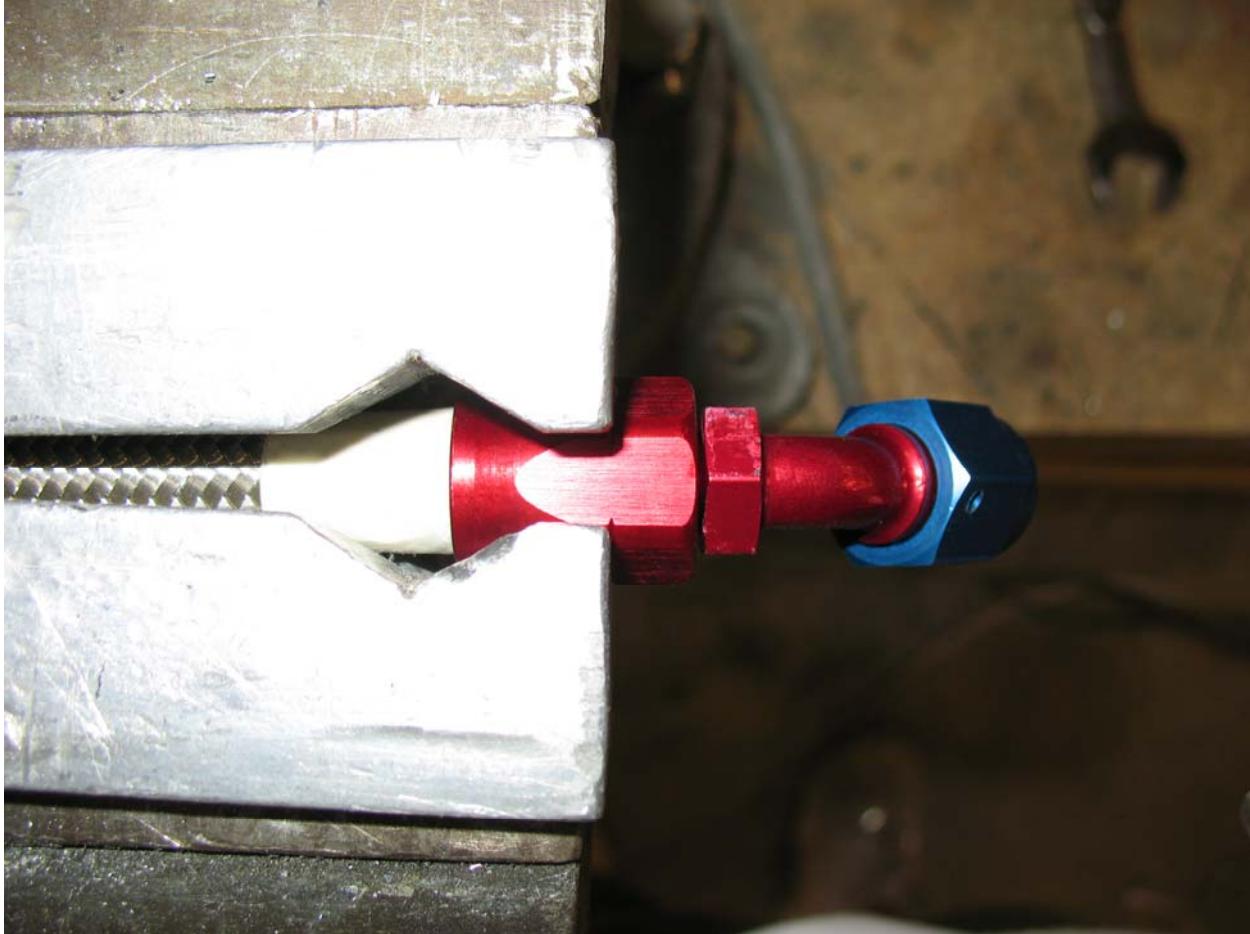


Figure 7

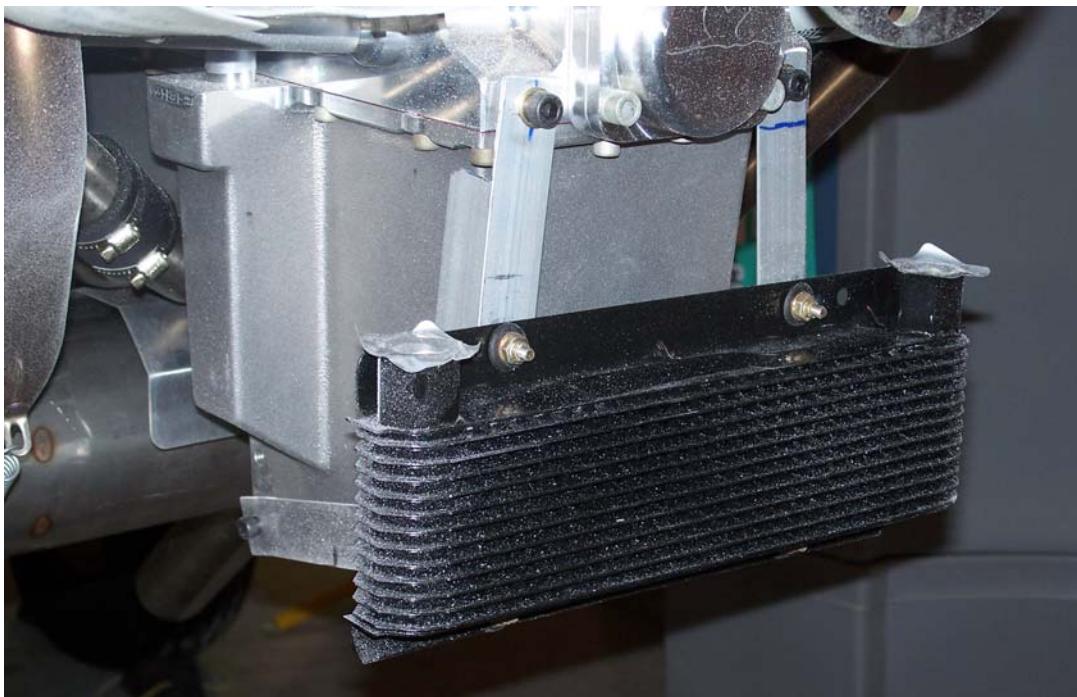


Figure 8

Finished product.

Mount the oil cooler to the front of the engine by fabricating mounting brackets as shown in the photos from the aluminum angle and aluminum flat stock provided.

Start by trimming two pieces of angle for the front vertical brackets. Trim one edge of the angle so that it will fit on the front of the engine. Drill a 1/4 inch hole at the end of each piece as shown in the photo and attach to the front of the engine with the 5/16 x 3/4 SHCS bolts. Do not loctite at this point as this is a temporary attachment.



Install the lower cowl. With the cowl in place reach in and put the cooler radiator in place so that it falls in the center of the lower cowl opening and clamp the cooler in place (or mark the location on the vertical brackets. Remove the lower cowl.

With the cooler still clamped in place adjust the vertical brackets so that they angle toward the outboard side of the engine slightly. Angle one at a time and do not change the location of the cooler. When satisfied with the angle, drill through the cooler flange and vertical bracket with a 1/8 bit and cleco in place. Drill both the top and bottom cooler flange.

Now remount the lower cowl and make sure there is clearance between cowl opening and cooler. 1/8 inch is minimum. It may be necessary to bend the vertical brackets to the rear slightly if you cannot trim enough off the rim of the lower cowl opening.

When mounting the vertical brackets to the engine make sure to use only the 5/16 x 3/4 inch bolts. Do not use longer bolts as they will protrude into the oil passageway at the front of the engine. Use a AN960-516 washer on each side of the vertical bracket.



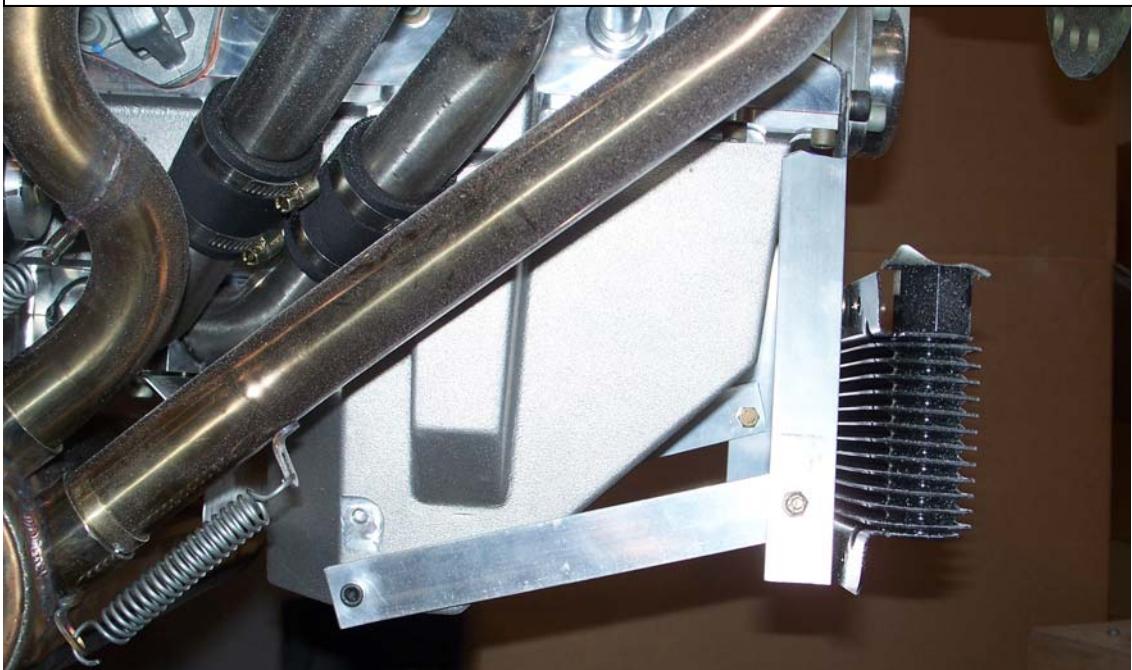
Install with Loctite 242 and torque to 15 ft lbs.

Now fabricate the horizontal brackets from the aluminum flat material. Use the photos as a guide. Placement of the horizontal brackets is not critical. The left side horizontal will have to be trimmed around the oil temp probe for clearance.

On 3300 installations the flat stock will have to be riveted to the fin on the bottom of the sump.

When happy with the fit permanently attach the cooler to the vertical brackets. Enlarge the holes in the cooler flange to 3/8 inch and insert a rubber grommet in each hole (4 holes). Enlarge the holes in the vertical bracket to 3/16.

Attach the cooler to the vertical bracket with an AN3 bolt. Use a #10 Tinnerman washer on each side of the rubber grommet and install the bolt through the vertical bracket, tinnerman washer, grommet, tinnerman washer and flat washer. The grommet will help insulate the cooler from vibration.



Read the articles on building stainless braided oil lines and then proceed with oil line installation. All fittings should be sealed with Permatex #2 on the threads.

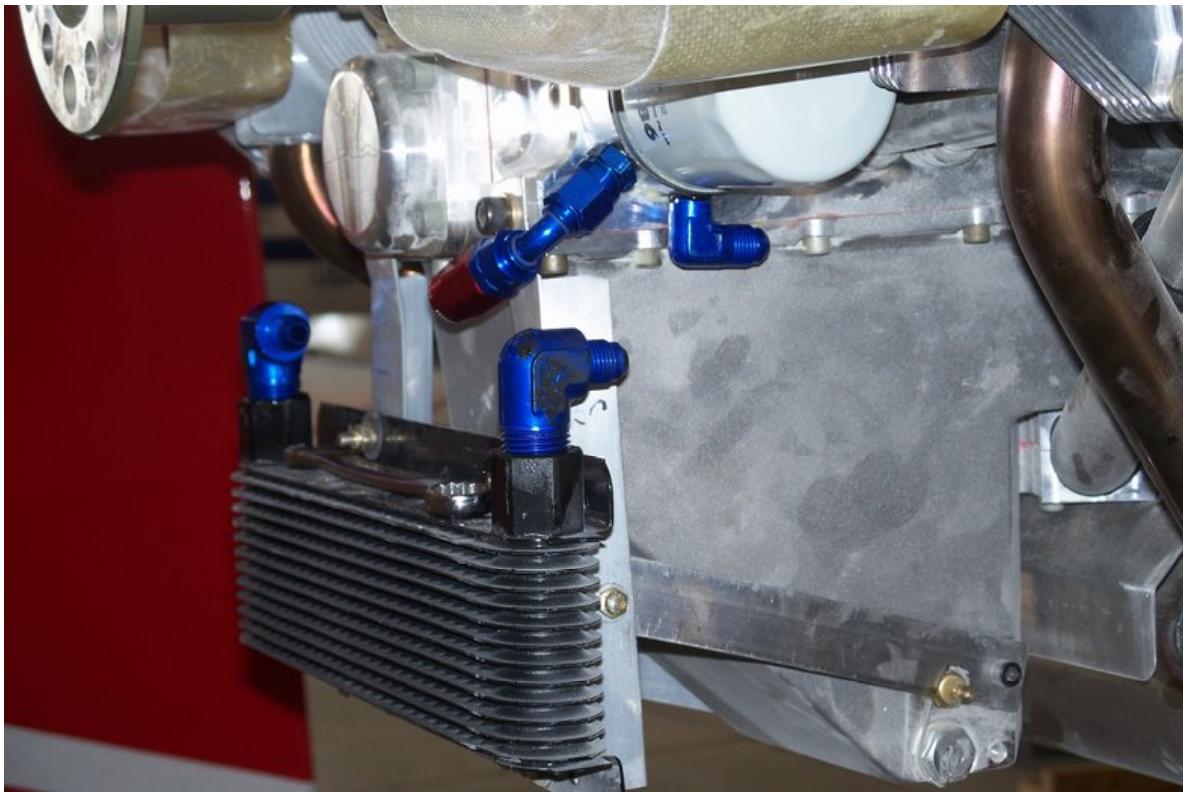
Remove the brass barbed fittings from the oil cooler adapter (in engine accessory bag) and replace with the AN-6 x 18NPT Blue fittings.

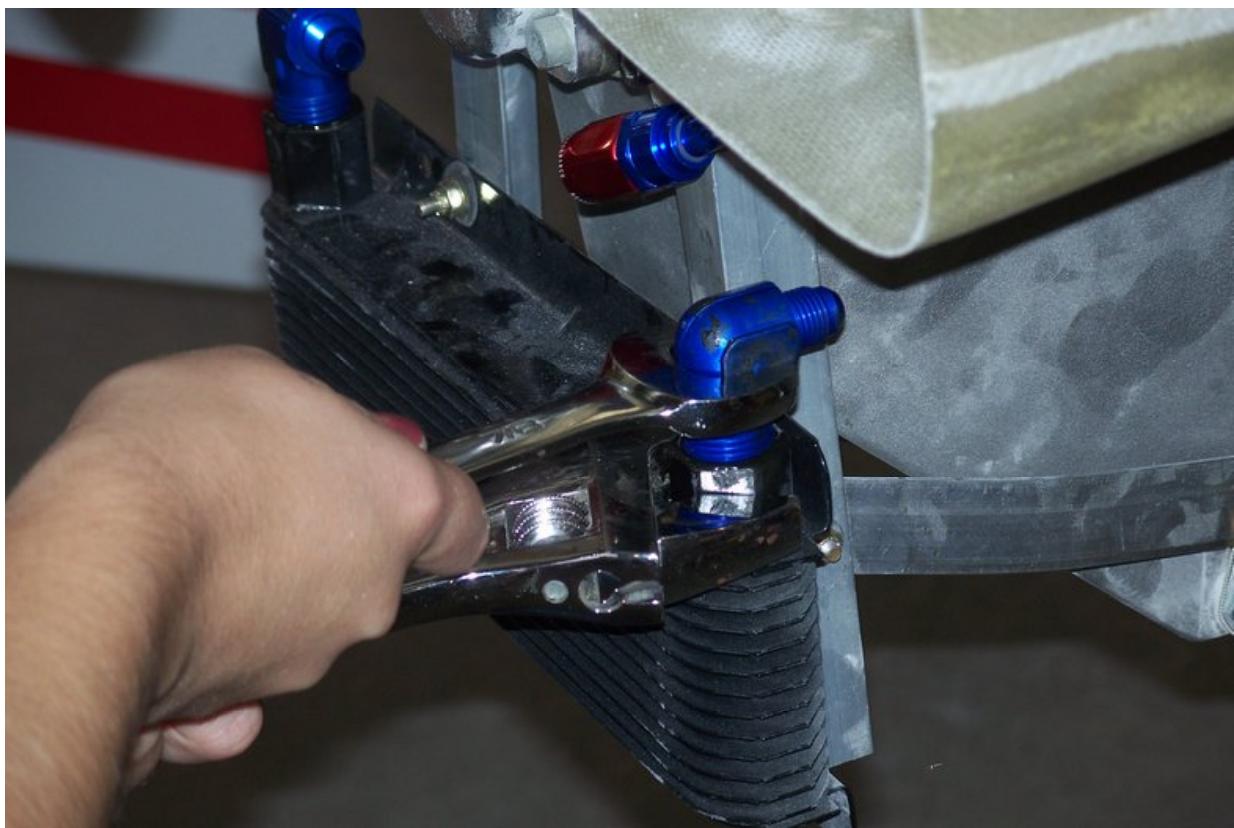
Install the AN6 x 1/2NPT 90 degree fittings into the cooler radiator with the flare ends pointing in the direction shown in the photos. Take care to hold the hex fitting on the cooler with a wrench as you turn in the AN fitting. Do not twist the cooler or it may leak.

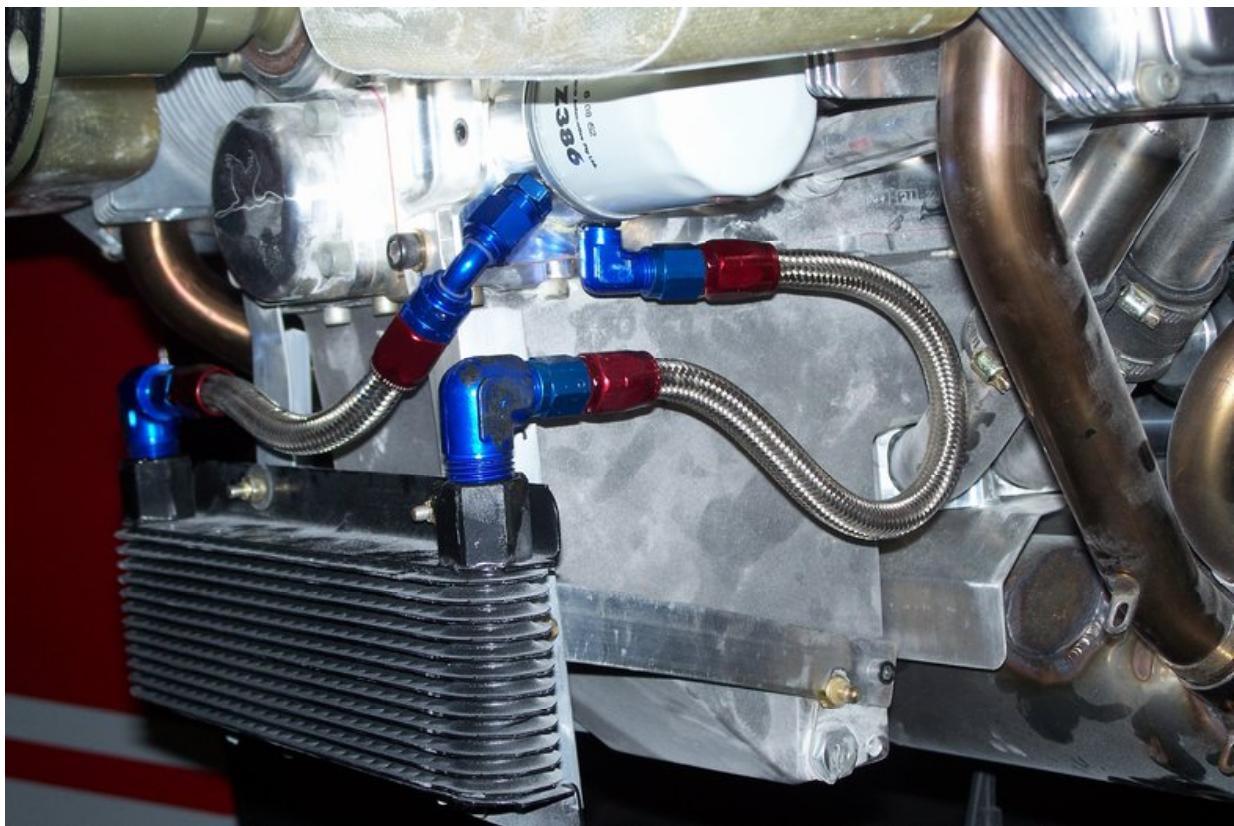
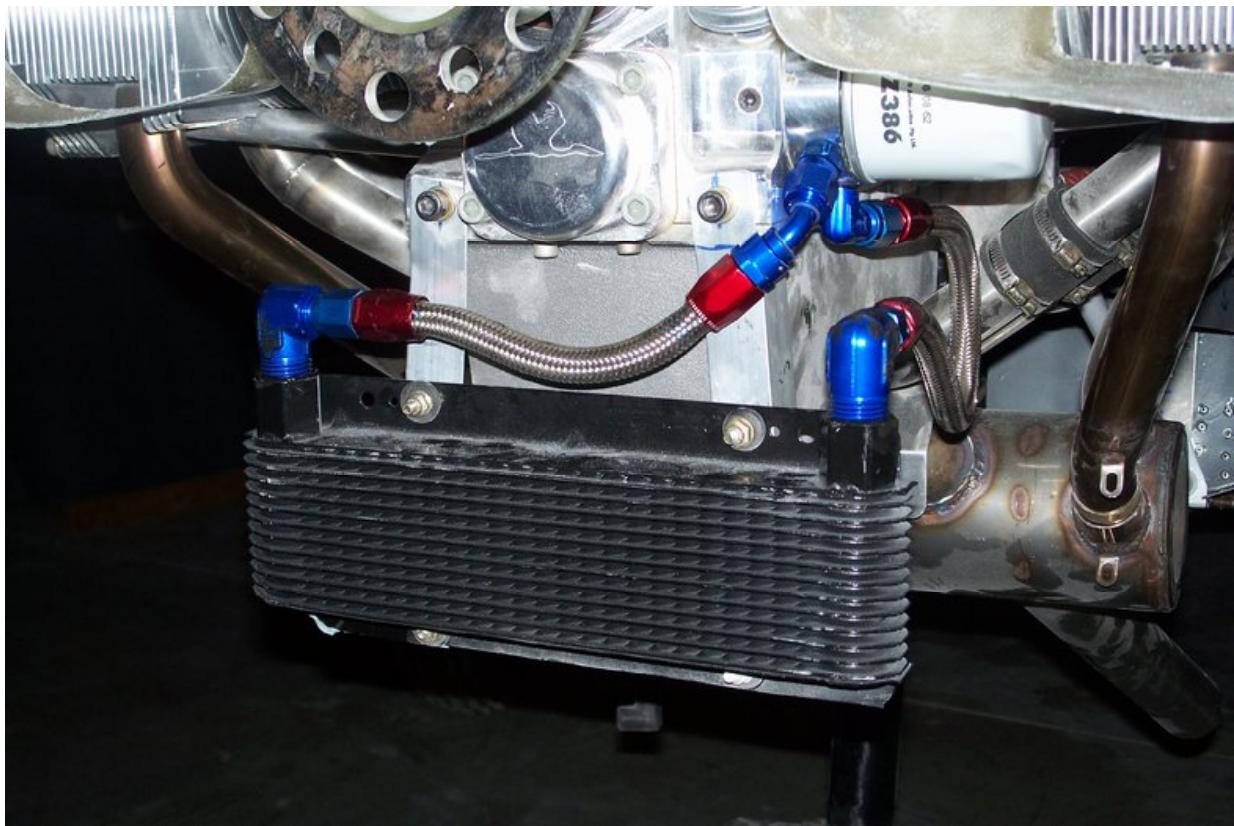
Attach the 60 degree hose end on the forward fitting on the oil cooler adapter. Attach straight end fittings to the other AN fittings. See photos for reference.

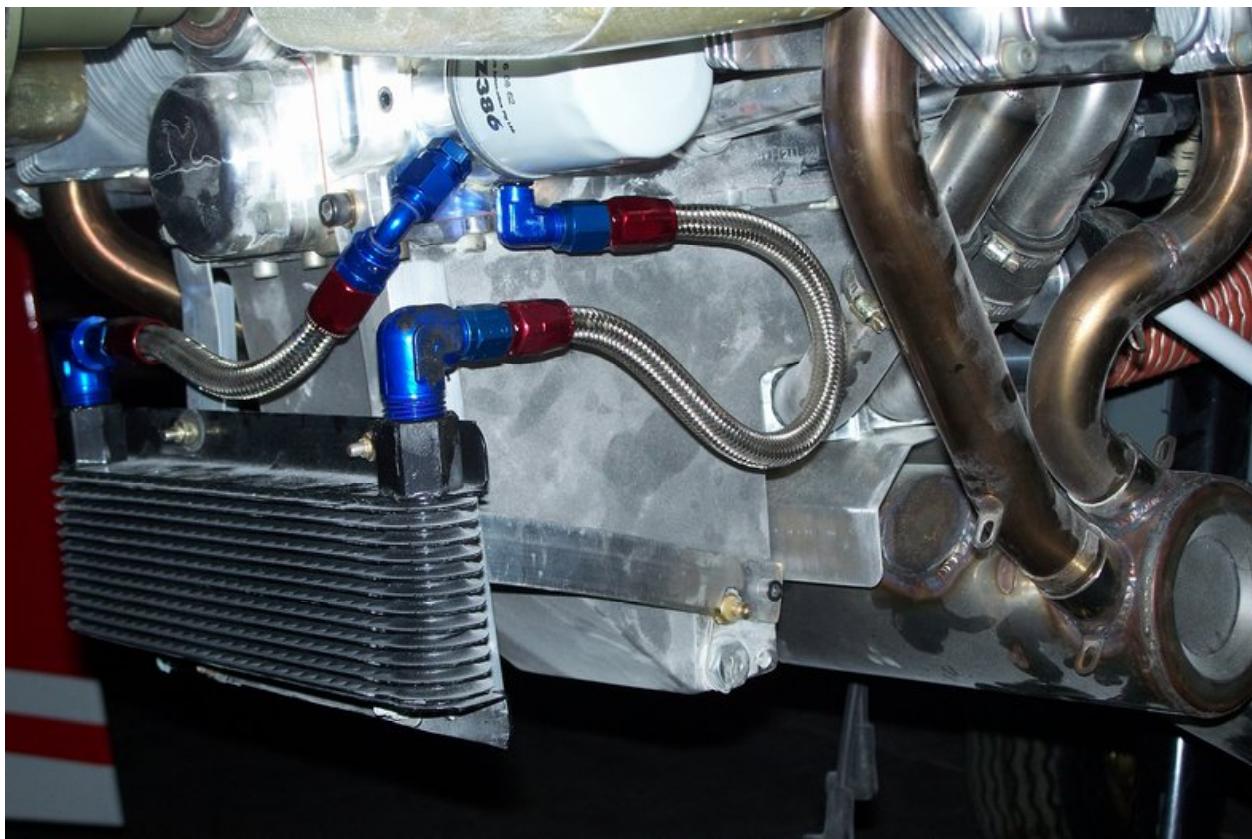
Measure the SS braided hose to length and install hose ends per the procedures for building braided hose.

When hoses are complete permanently install per the photos.









Locate Cable End at Firewall

Measure up from the stiffener shelf 2.25 inches and starboard from the center stiffener 1.25 inches. Drill a 3/8 hole.

**Split Jam Nut**

Place the outer jam nut on the end of the throttle cable with the round ball on it in a vise. With a hack saw or rotary cutter cut a slot in the jam nut so that the jam nut can be removed from the throttle cable end adjuster.



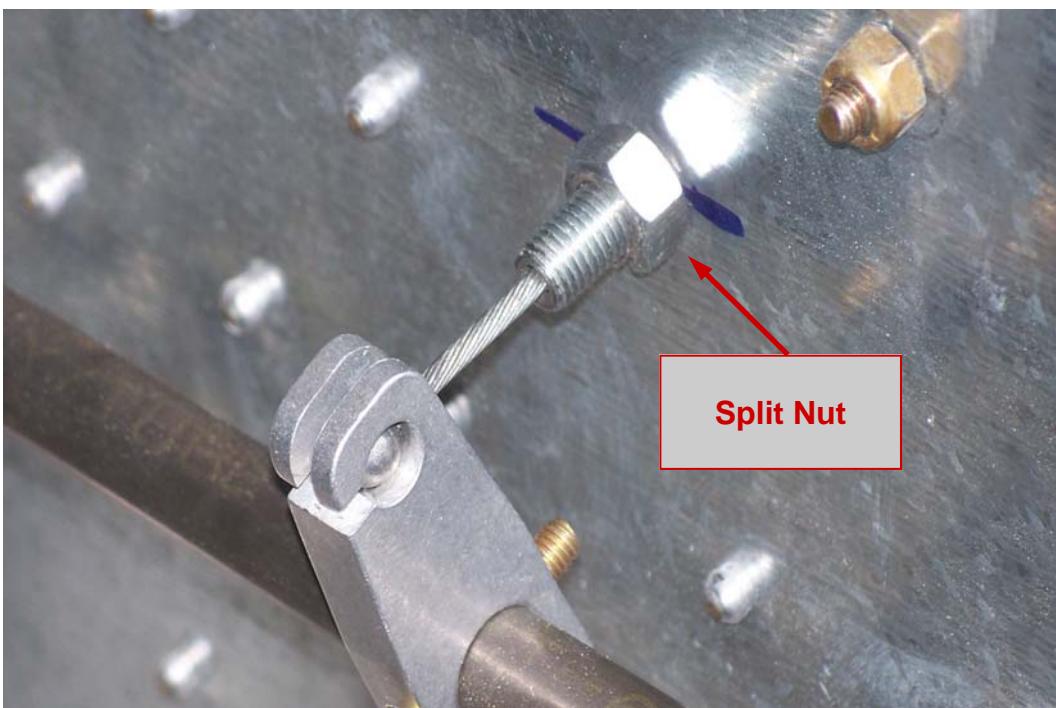
Install Cable End to Firewall

Remove the split jam nut.

Insert the cable end adjuster into the hole you drilled in the firewall.

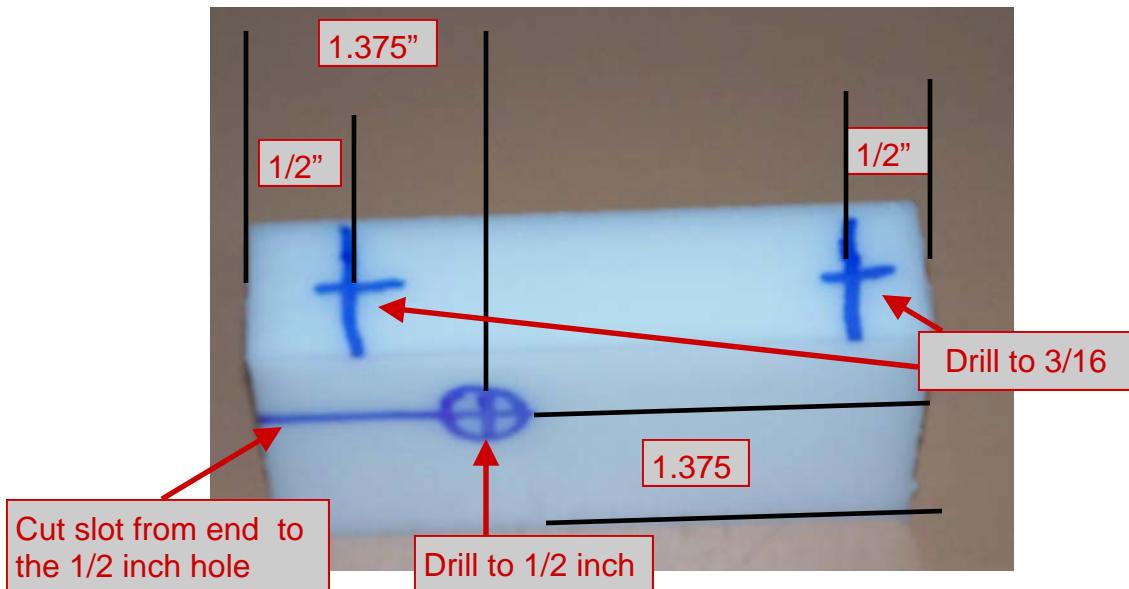
Install the split nut onto the cable end adjuster on the aft side of firewall.

Adjust cable end so 1/2 inch of the adjuster protrudes form the aft firewall.



Prepare Throttle Support Blocks

Locate the 1x2x8" acetal block and cut it into 2 pieces 1x2x4"
Mark and drill per the dimensions in the photos below.



Assemble Throttle Cross Rod

Install the throttle output lever (the short lever) onto the cross rod. The slot will be facing to the rear.

Install the two throttle input levers about 1.5 inches in from each end.

Do not drill at this time.

Install the two support blocks on the ends of the cross rod.

Attach Cross Rod Assembly to Throttle System

Attach the output lever to the throttle cable by inserting the swaged ball into the receiver.

Adjust the position of the output lever on the shaft so that the cross rod is cen-



tered on the firewall.

Position the output lever against the cable end adjuster and drill a 3/16 hole through the output lever and cross rod. Install a AN3-11A bolt to hold the position.

Level the cross rod across the firewall and position the support blocks at the outer ends of the cross rod in a position where they will not interfere with other fittings (angle iron bracket, etc) on the firewall.

Drill through the support blocks and firewall and install the four AN3-23A bolts with the heads forward of the firewall and the nylock nuts and washer on the aft side of firewall. Snug up the bolts.

With the output lever up against the cable end adjuster, position the input levers so that they are snug against the support blocks and the top ends are about 1/2 inch from the firewall. Drill through the input levers and cross rod and install



AN3-11A bolts.

Install rod ends on the outboard sides of the input levers and secure with AN3-11A bolts, washers, and nylock nuts.

Assemble Throttle Push Pull Rods

Insert the 1/4—28 threaded rod and jam nut into aluminum push pull rod
Install throttle knobs on ends of push pull rods.

When panel is in place attach the push pull rods through panel (drill 1/2 inch hole and mount a 1/8 acetal cushion block with 3/8 hole behind panel to support push pull rod)

Attach to the male rod ends on the input levers using a jam nut to hold position.

Attach Cable to Carb

Turn one jam nut off the end of the carb end cable adjuster.

Insert the cable through the slot on the upper hole in the carb bracket

Insert the drive pin from the throttle cable into the throttle arm on the carb. You may have to sand away any excess solder that is on the cable drive arm to get it into the carb throttle arm.

Place a 5/8 washer over the cable drive arm behind the carb throttle arm and secure with a cotter pin.

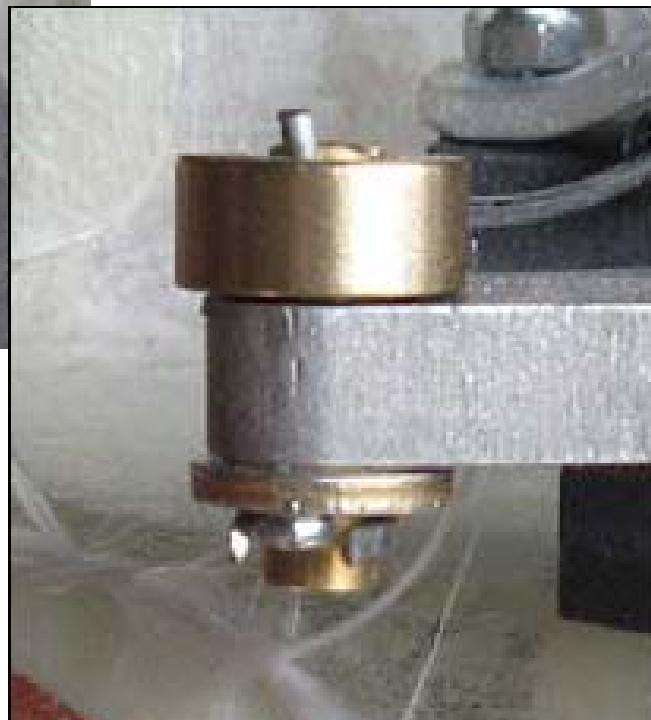
Reinstall the jam nut and adjust cable length so that when throttles are pushed all the way in that the throttle arm on the carb reached the stop on the carb.

Carb heat

Run the outer cable through the clamp and secure by tightening the clamp, then slip the brass ferrule over the inner cable.

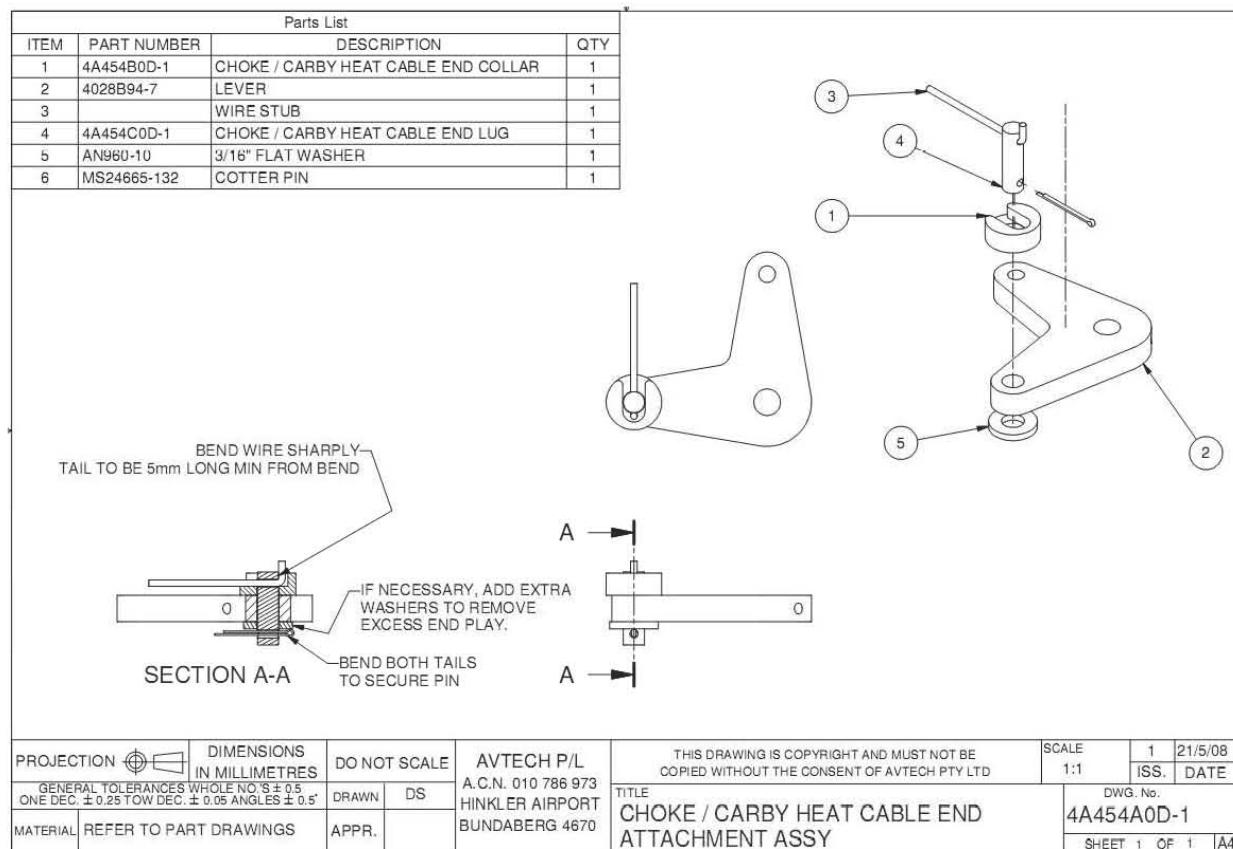
Make sure that the air valve drive arm is fully forward and then fit the ferrule into the hole in the drive arm. Bend the inner cable at right angles in front of the ferrule. Cut the excess inner cable off. Slip the ferrule through the retaining collar and fit to the to the drive arm with a washer and split pin fitted to the brass ferrule on the underside of the drive arm.

Adjust the Carb Heat cable with the clamp until with the Carb Heat "T" handle all the way in the air valve drive arm is fully forward as shown above. Tighten the clamp bolts firmly.



Choke

Choke cable termination is done in the same way using the same components. More details will be in the Choke Control section.



Locate Fuel Fitting on Firewall

Locate the fuel fitting on the right hand side of the firewall in an open area below the stiffener shelf. Take note in locating the fitting that there is sufficient clearance on the



cabin side of the firewall so that the fuel line running to the fitting does not interfere with the rudder pedals. See photos for general position. Rivet the fitting in place with 3/16 rivets provided.





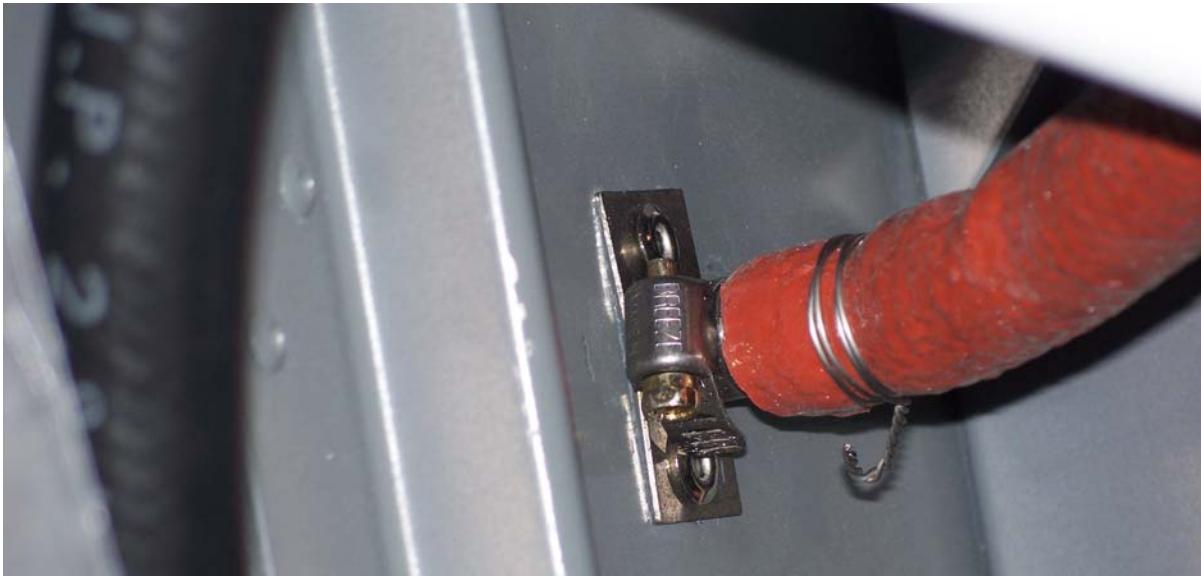
This photo shows the firewall fitting installed and angling toward the left side of the fuselage where the fuel line will come from.



Measure the fuel line to length for routing to the fuel pump on the rear right side of the engine.

Install firesleeve over the fuel line completely covering the rubber line right up to the fittings at firewall and fuel pump.

Secure the ends of the firesleeve with a few wraps of safety wire.
Clamp the ends of the fuel line to the fitting and the fuel pump with the worm drive clamps provided.



Secure the fuel line to an engine mount member with cushioned clamps or other straps.

See photo below of the cabin side of the firewall fuel fitting.



Locate Oil Bottle on Firewall

Locate the oil recovery bottle on the right hand side of the firewall in an open area below the stiffener shelf. Try to keep the bottle to the outboard part of the firewall.



See photos for general position.

Rivet the oil bottle clamp in place with two 3/16 rivets provided.

Insert the bottle into the clamp



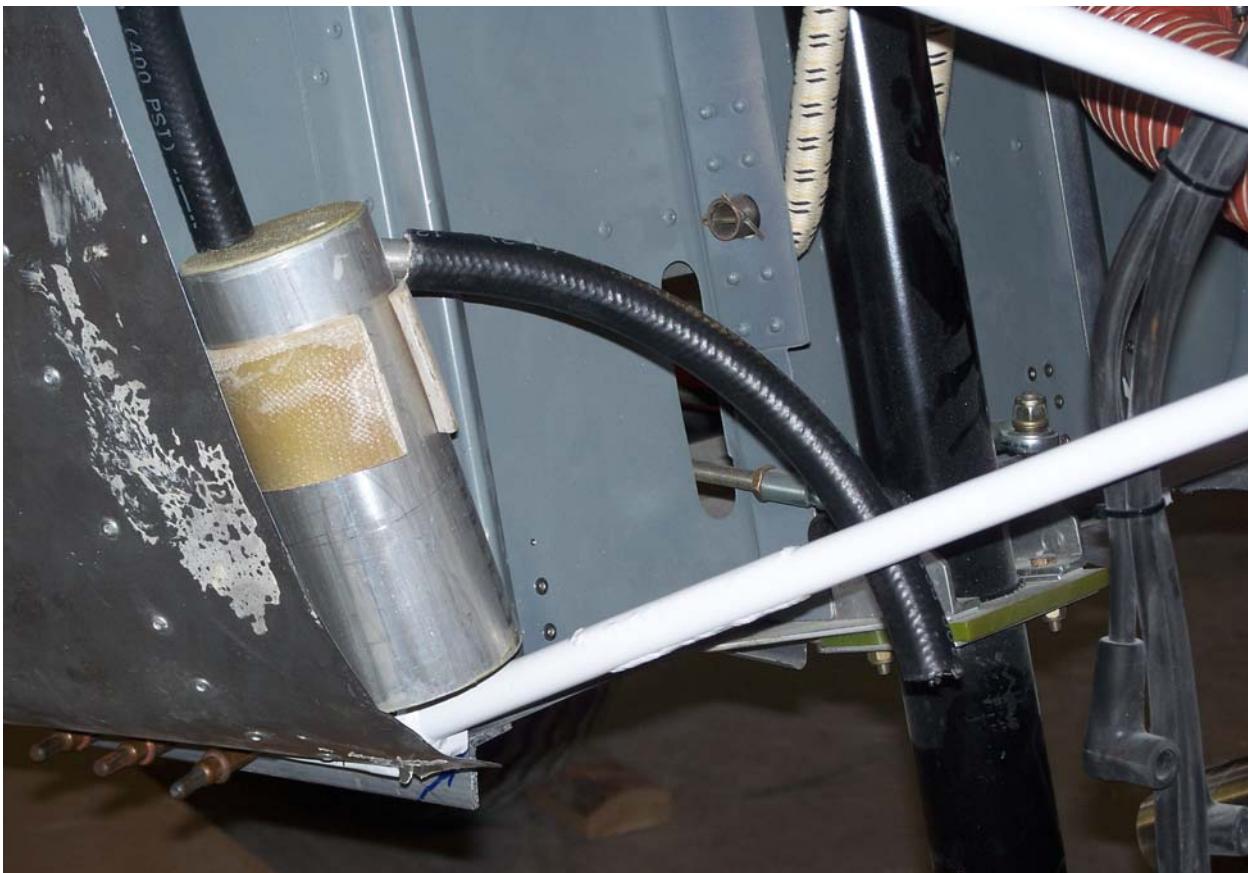


Route the oil recovery hose from the bottle to the vent on the dipstick tube. It is best to plan a slight uphill route from the dipstick vent to the rear of the engine.



Install the remaining section of hose to the overflow port of the bottle.

Secure all ends of the hose with clamps provided



Locate Battery on Firewall

Locate the battery on the firewall stiffener shelf just to the left outboard of the center vertical stiffener channel. Battery location is optional to the builder but this location works well. See photo below.



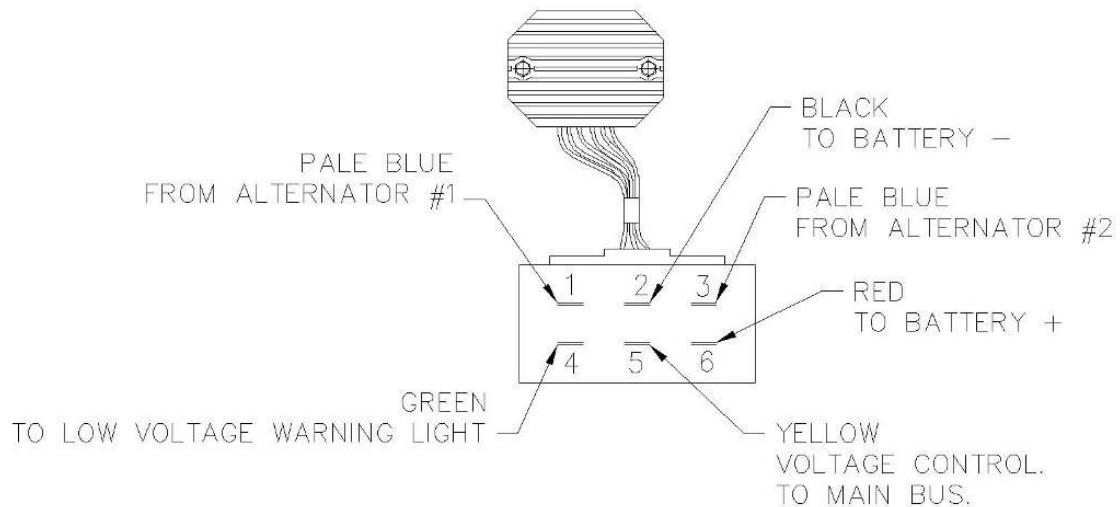
Another photo of our battery placement below.





Locate the starter solenoid and the regulator / rectifier on the upper firewall on the right side. That way it will be within easy reach of the battery.

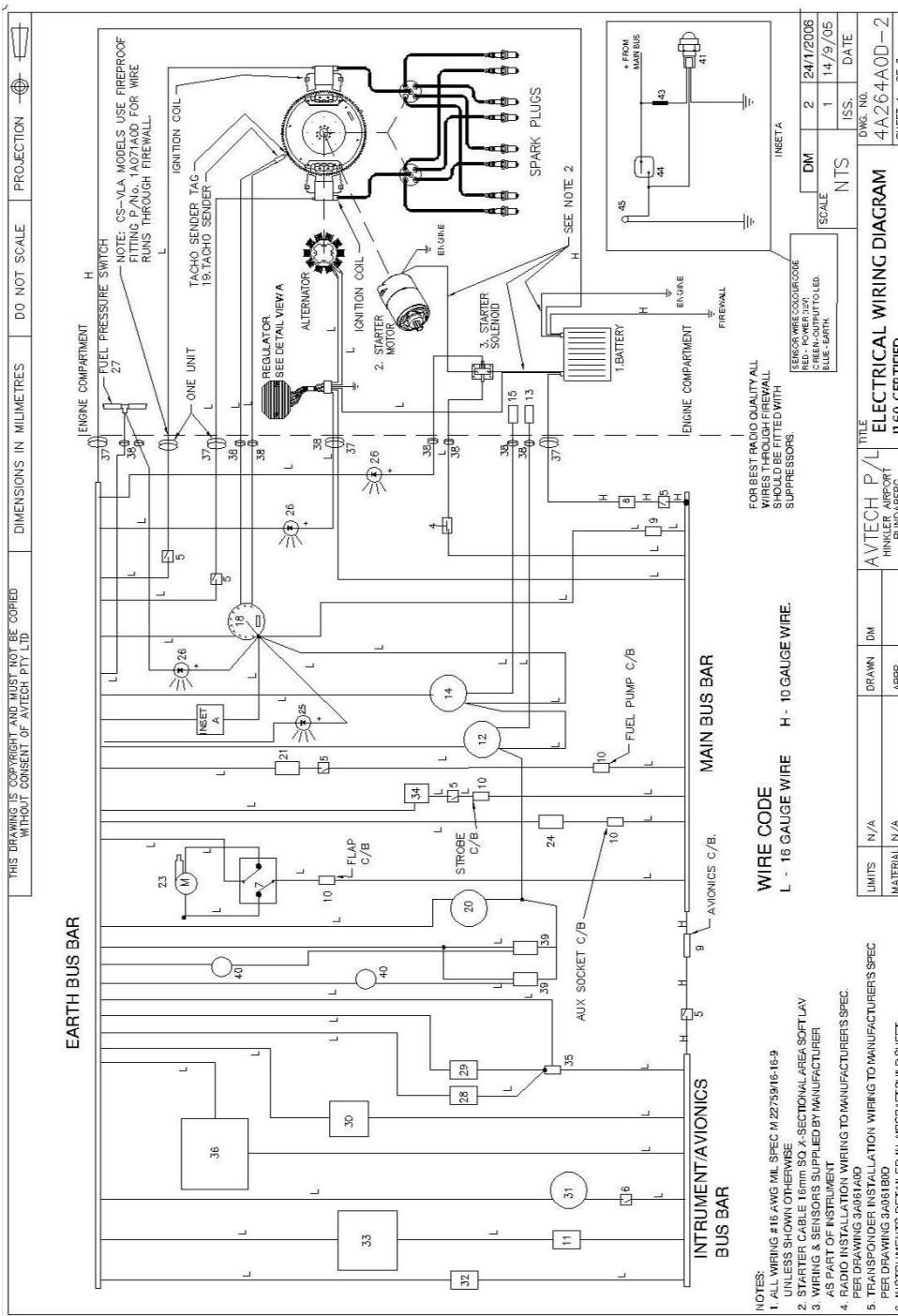
The basic wiring diagram for the charging system is shown below. It is a good idea to cut off the plug on the regulator pig tail and connect wires directly with good quality aircraft grade connectors. The alternator can put out more current in some situations than the plug can handle and will burn out the plug or poor quality connections.



REGULATOR PLUG WIRING

A typical wiring diagram for a basic Jabiru airplane is shown below for reference. Take note that the yellow wire from the regulator pigtail goes to a switched source like main bus or master switch. There is a 6 mA draw on that wire even if the engine is not running. The wire must be switched off to avoid draining the battery over time.

Jabiru does not require an alternator switch. In a conventional alternator the current produced is proportional to the strength of the field which is created from outside electrical power (the battery). The typical regulator controls the strength of that field by



controlling the outside current to the field. If the regulator fails current to the field can increase resulting in large increases of voltage and a “runaway” alternator. The alternator switch cuts off the outside power to the field and stops AC power production.

The Jabiru engine employs a permanent magnet alternator. The field for the permanent magnet alternator is created by magnets on the flywheel spinning around fixed windings (stator). Current produced is proportional to the rpm of the spinning magnets and the alternator cannot “run away” unless the engine rpm’s runaway as well. These factors make a alternator switch unnecessary.

Some builders employ the alternator side of a split master switch to switch off the yellow wire from the regulator. This wire carried little current and its function is to sense the voltage in the aircraft system so that the circuitry in the regulator can decide to send current to the battery or to dump excess current to ground.