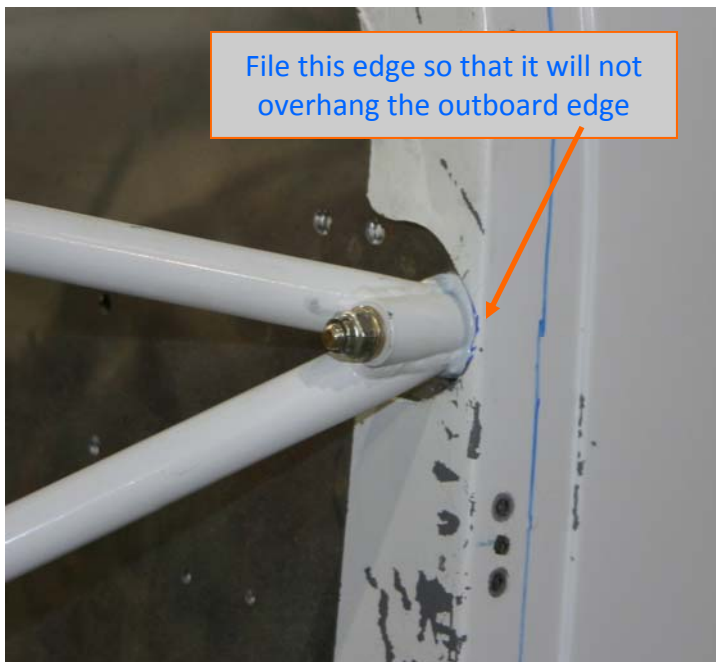


**Rans S7S FWF Suggested Build Order**

<b>Process</b>	<b>Applicable Manual Sections</b>
Fit Mount to Firewall	Section 1 – Trim Mount
Fit Throttle Arm Extension	Instructions in Throttle Extension 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	Section 5 Prop hub Extension
Fit Cowls	Section 5 Fit Top – Bottom Cowl
Fit Cooling Plenums	Section 6A Fit Cooling Ducts (Jabiru Procedure
	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 Oil Recovery System	
Fit Battery & Electrical	
Fit Spinner & Prop	

The engine mount will have to be trimmed so that the outboard mount pads do not extend beyond the edge of the firewall. The round pads will have to have the outside edge filed off to match the edge of the firewall.

1. Position the mount on the firewall and mark the top center mount pad.
2. At this time you can mark and drill the 1/4" hole 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 AN4 bolt installation



3. Square the mount on the fuselage and insert the other AN4 bolts. Mark the mount pads where they overhang the outboard edge of the firewall
4. Trim the outboard sides of the mount pads so that they will not extend past the outboard edge of the firewall.
5. The boot cowl must be notched to fit around the mount pads





6. 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.

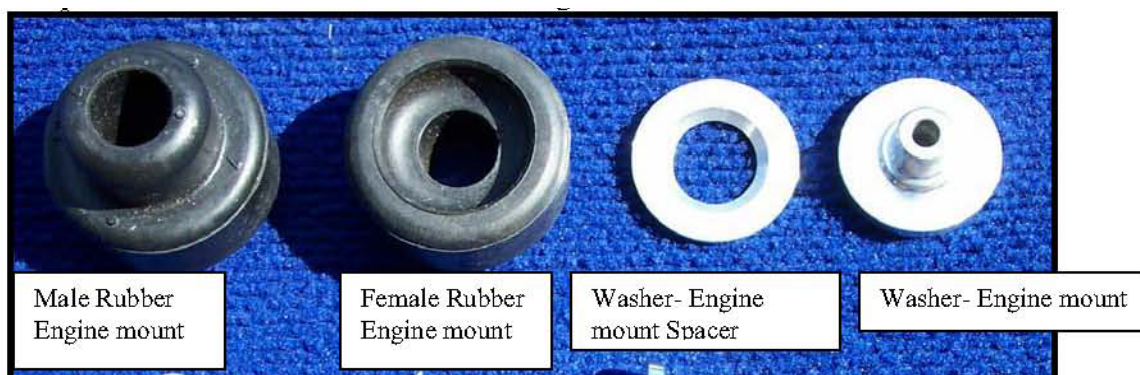
7. After paint dries reposition mount of fuselage just to recheck fit.



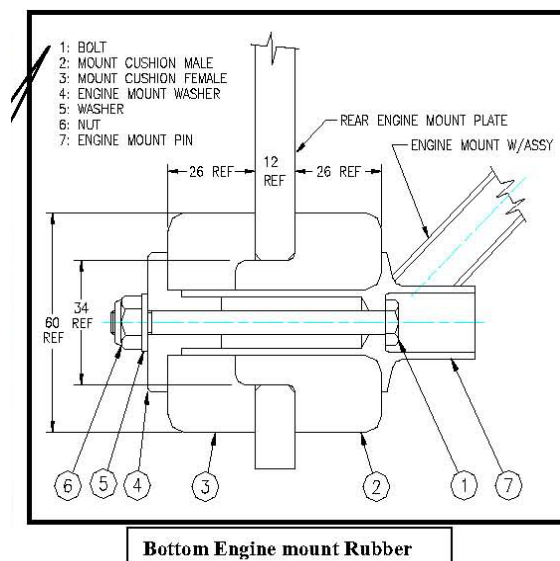
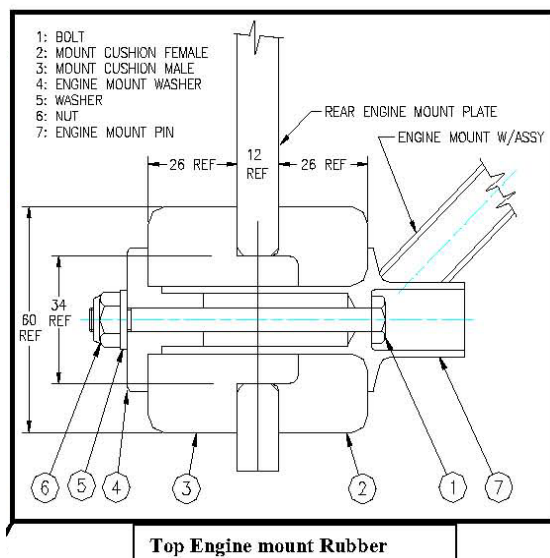
Builders may find it easier to mount the engine to the engine mount and then mount the assembly to the firewall. However, it is not necessary to attach mount to engine first and the mount can be attached to the firewall if the builder prefers.

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 is 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 (bottom mounts only have the male rubber cushions). Top mount pins should have the female rubber cushions installed on the mount.
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

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 AN4-15A bolts, washers and AN363-4 lock nuts in the top, center and bottom mount holes.
3. Tighten the bolts to 125 inch lbs.
4. We suggest installing the nuts on the engine side of the firewall as it makes inspections easier later on.







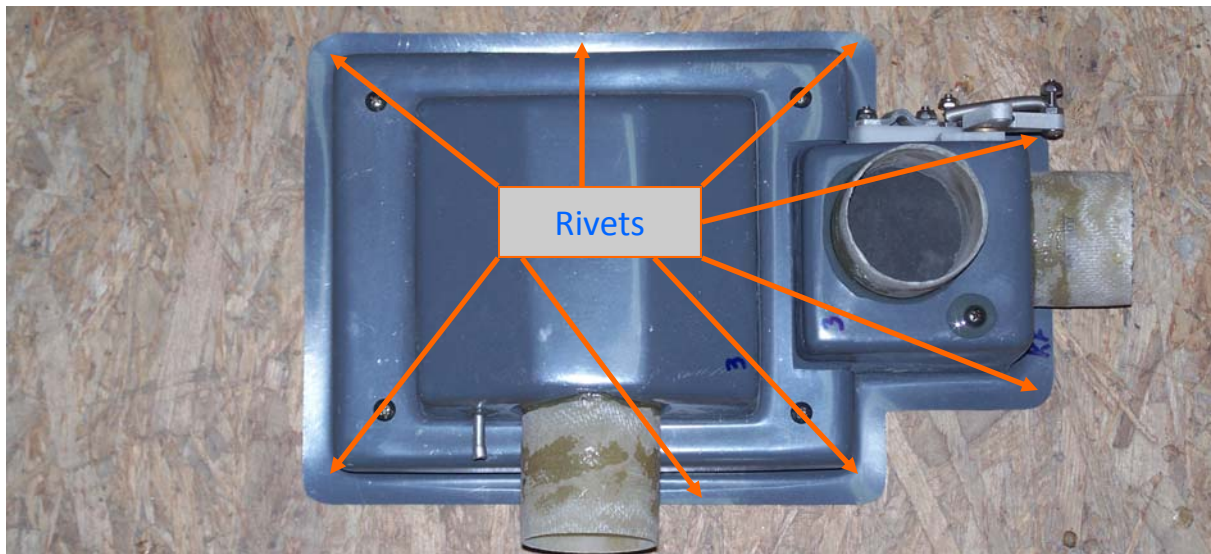


Locate the air filter box on the firewall so that the top of the Airbox is about 7 inches down from the top of the firewall. You may notch the flange of the Airbox to clear the top center engine mount.

The outlet of the Airbox should be lined up directly above the carb inlet. This is very important to proper operation of the carburetor mixture control. Keep in mind that the engine is offset to the right which makes the rear of the engine slightly left of the centerline of the firewall. Position the Airbox relative to the carb inlet—not the centerline of the firewall.

The SCAT duct from airbox outlet to the carb inlet should run downward in a straight line into as gentle a 90 degree bend as possible so that the air flow stream enters the carb straight on. Do not mount the airbox off to one side or another so that the air flow enters the carb at an angle.



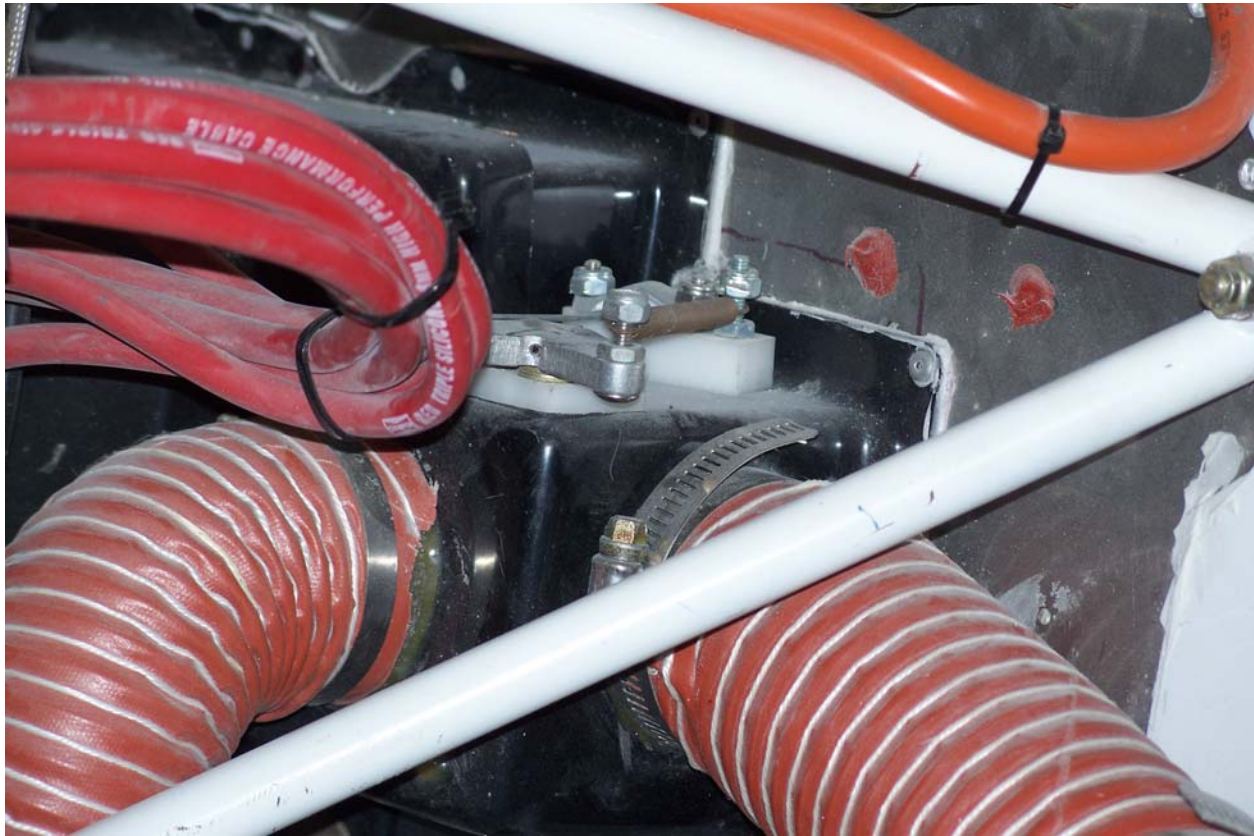


Remove airbox to the workbench. Mark the location of the 8 rivets that will attach airbox to firewall. Check to see that the locations do not fall on any firewall brace tubes.

Drill the 8 locations for rivets to 3/16. Reposition airbox on the firewall and drill the 8 locations through the firewall.

Apply a bead of silicon sealant around the perimeter of the airbox where it will contact the firewall. Reposition airbox on the firewall and rivet to the firewall with the 3/16 rivets provided.

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.

**Install Carb Heat Control Cable**

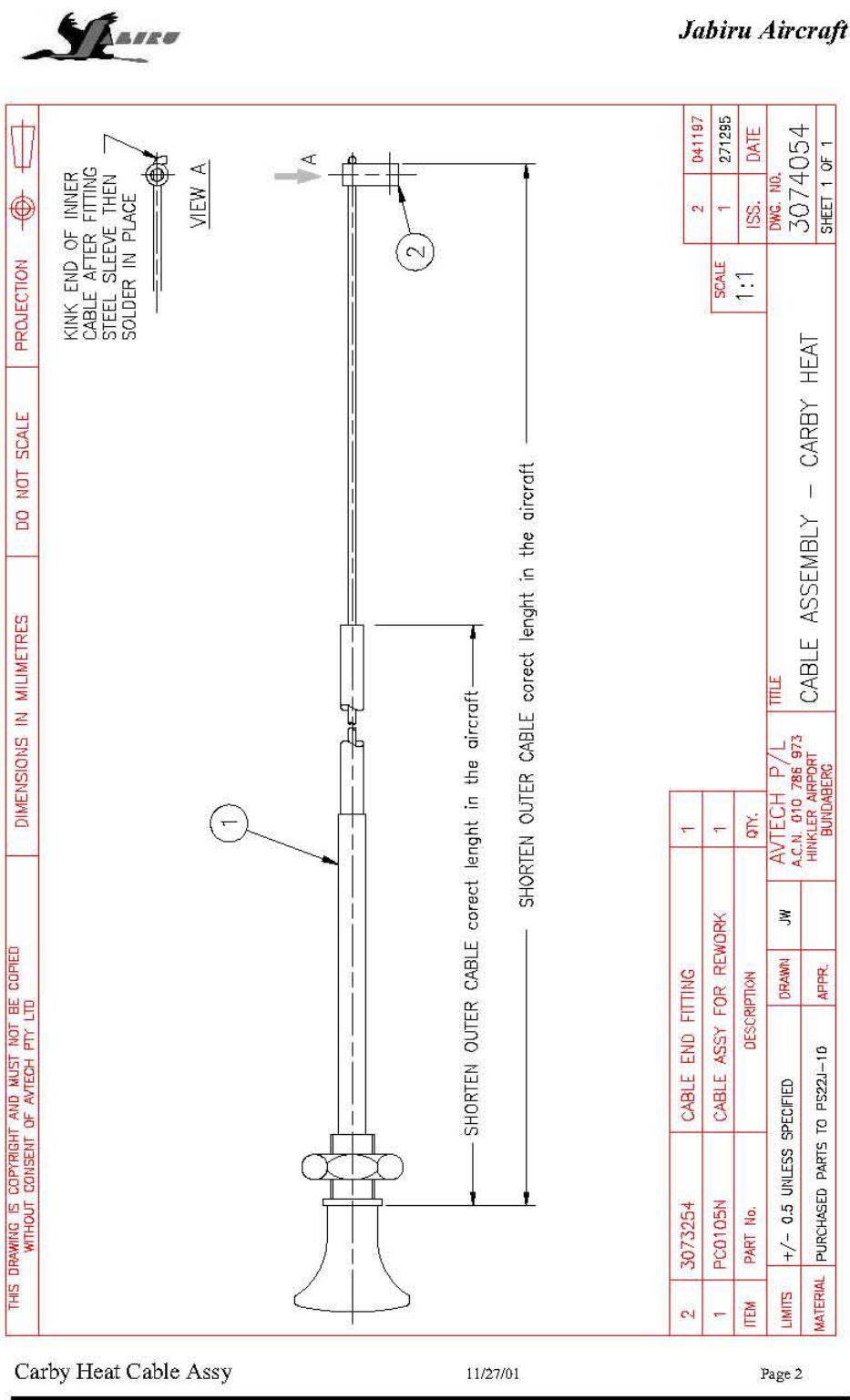
Move the Airbox control lever so that the door closes off the inlet that faces forward. The forward inlet is the heated air inlet.

With a long 3/16 drill bore a hole through the firewall with the drill running from the hole in the lever through the cable hold down clamp. The hole should aim about 60 degrees to the firewall.

Install carb heat cable from panel through firewall. Secure the sheath under the hold down clamp and solder the control wire to the cable Ferrell.







# JABIRU AIRCRAFT PTY LTD

P.O. Box 5792  
Bundaberg West  
Queensland, Australia.

Phone: +61 7 4155 1778  
Fax: +61 7 4155 2669  
Email: info@jabiru.net.au

## SERVICE BULLETIN:

**JSB 022-1**

**Issue:**

**1**

**Date:**

**28<sup>th</sup> July 2008**

**Subject:**

**Propeller Flange Attachment**

1	APPLICABILITY .....	1
2	BACKGROUND:.....	1
3	COMPLIANCE – IMPLEMENTATION SCHEDULE .....	1
4	PROCEDURE:.....	2
5	AIRWORTHINESS NOTE: .....	4

### 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.

Jabiru Service Bulletin: Propeller Flange Attachment	
JSB 022-1	28th July 2008

## 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 (0.354") 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**.



<b>Jabiru Service Bulletin: Propeller Flange Attachment</b>	
JSB 022-1	28th July 2008

- 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 it’s 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 it’s factory-built aircraft.
- Torque wrenches are a precision instrument which must be periodically calibrated to ensure they are accurate. A wrench which is within it’s calibration period must be used for this job.
- Loctite 620 is used because of it’s 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.

Jabiru Service Bulletin: Propeller Flange Attachment	
JSB 022-1	28th July 2008

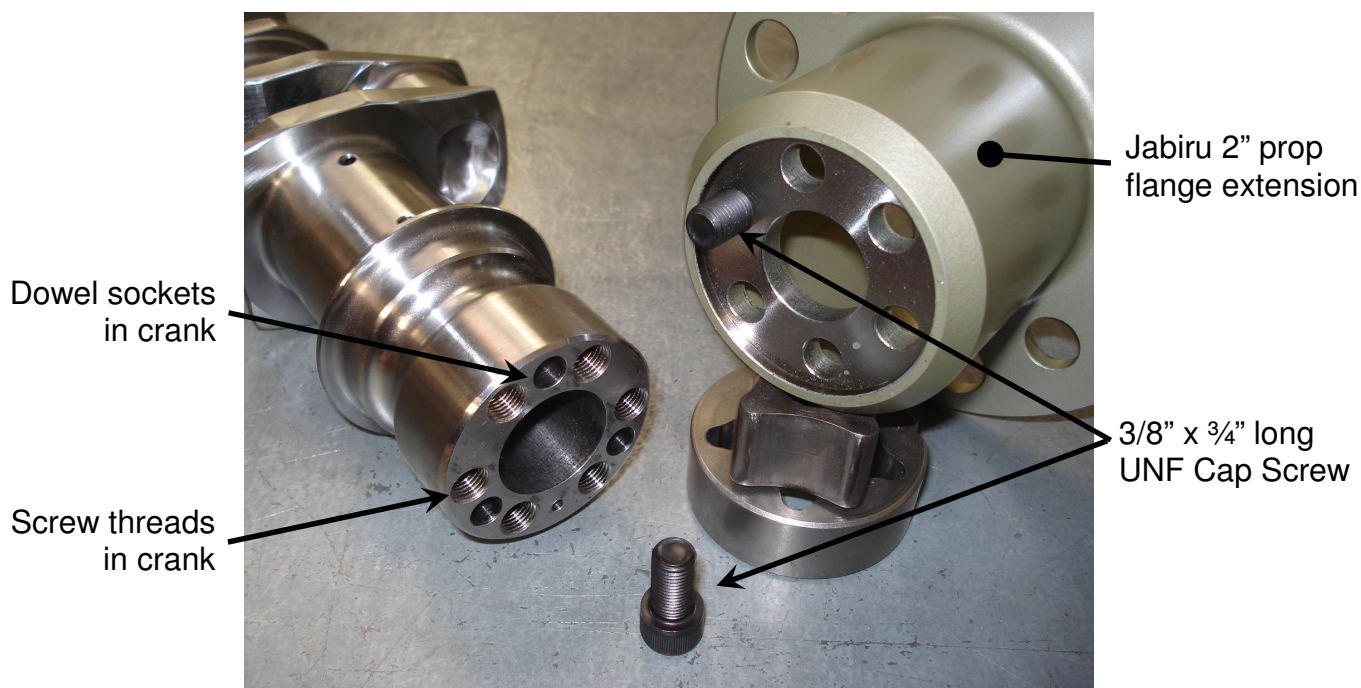


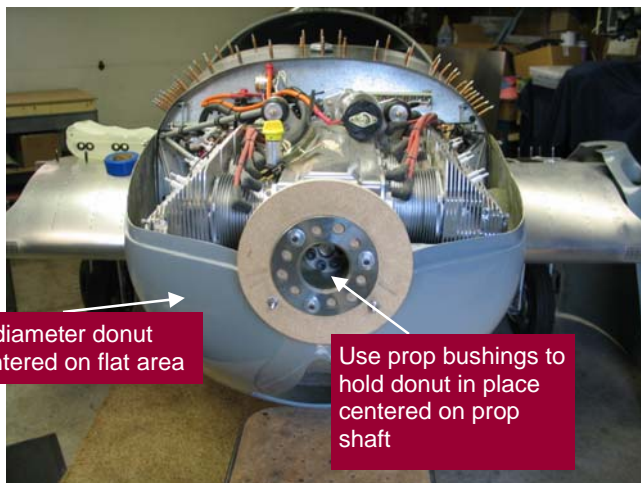
Figure 1 – Flange & Crankshaft

## 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.

In simple terms, the cowls are installed by fitting the bottom cowl to the fuselage boot cowl 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 diameter and make the donut 9 inches in diameter on the outside to match the spin-



ner size.

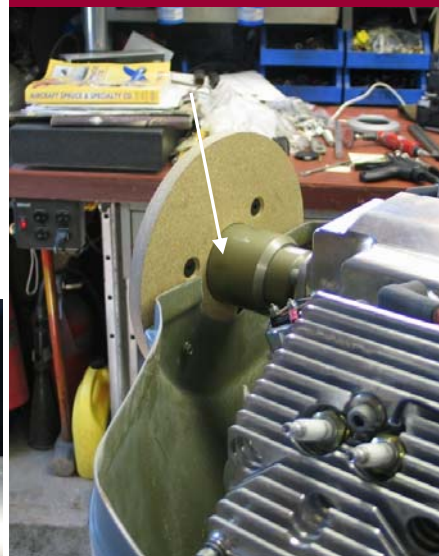
Place the original prop hub that you removed from the crankshaft on the donut. Center the hub and with a 5/8 hole saw drill through three of the prop hub holes so you can insert the engine prop bushings later on.

Cut the donut in half (don't cut through 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.

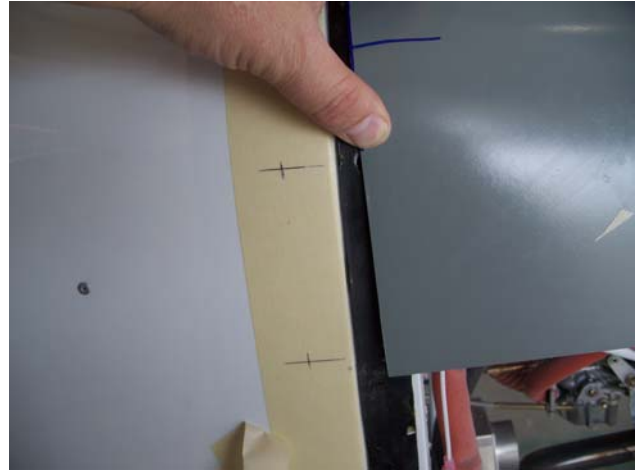
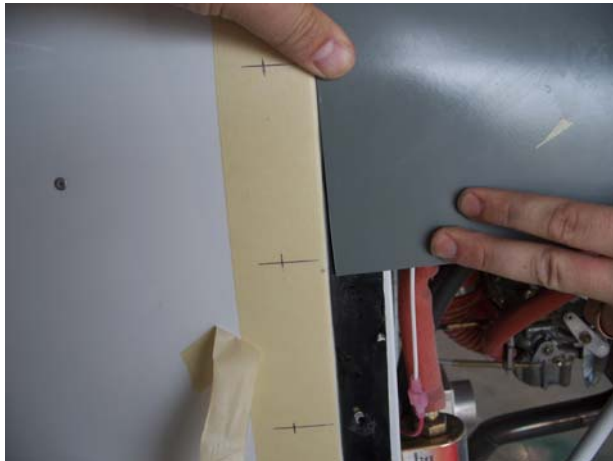
Attach the lower cowl to the other half of the donut in the same manner.

Attach donut to cowl with screws or bolts.





1. Draw a line around the boot cowl 2 inches rearward from the joggle. This serves as a reference line for trimming the cowl.
2. Apply rubber insulating strip with contact cement or epoxy. The rubber strip provides enough thickness so that the cowl will match up with the surface of the boot cowl.



3. Position lower cowl on the fuselage by attaching the front (donut) to the rear of the prop flange using the prop bushings supplied in the engine accessory kit and some small bolts. Position the rear of the lower cowl in place on the fuselage so that the cowl join line is parallel to the longitudinal line of the fuselage. Secure in place with tape
4. Mark a trim line on lower cowl two inches forward of the reference line on the boot cowl.





5. Trim the lower cowl along this line (best to trim a bit long at first) and reposition the lower cowl in place. Adjust trim until a good join is achieved.
6. Position cowl in place and hold with tape.
7. Mark the locations for four #8 screws on each side of the lower cowl. Nutplates will be installed behind the boot cowl for these screws so check inside the boot cowl for clearance.
8. Drill screw locations to 1/8 and insert clecos to hold position



Four Screws Evenly  
Spaced

9. Position top cowl over the lower cowl and attach the donut to the prop flange. Align the front of the cowls just to the rear of the spinner and drill a 1/8 hole in the slanted part of the cowls between spinner and front corner of the cowls. Insert clecos to hold in position.
10. Center rear of top cowl at boot cowl center. Hold in place with tape.
11. Draw a line 2" forward of your reference line.
12. Trim upper cowl to length .
13. Drill 1/8 for cleco at top center and install cleco to hold position. Evenly space holes for 4 more clecos on top side of upper cowl. Two holes between center and top corner each side of center. Install cleco's to hold position.
14. Pull sides of top cowl down and secure with tape.
15. Mark for trim at top / bottom cowl junction.
16. Trim top cowl so that the fit between top and bottom cowl is satisfactory.
17. Evenly space five 1/8 holes on each side of upper cowl along the join line and drill to 1/8. Install clecos to hold position.





18. Check for overall fit and make adjustments as necessary.
19. Remove top and bottom cowl
20. Install cam loc bodies in boot cowl and in lower cowl join line. The camlocs are in the top cowl only.
21. Install nutplates in boot cowl for bottom cowl screws.
22. Reposition cowls and enlarge holes as necessary for camlocs or Tinnerman washers.





## **Pre-Paint>Fuselage>Engine>Fit ram air cooling ducts**

### **Objectives of this task:**

In this task the ram air cooling ducts will be assembled and fitted to the engine.

The final step, where the front of the ducts are trimmed to length to match the bottom cowling, cannot be performed until the bottom cowling has been fitted to the fuselage and so that step is included as part of the *Fit cowling* task that follows this task.

Air enters the front of the ducts and is routed up by low air dams, through the fins on the cylinder heads and barrels and then downwards at the rear by a pre-fitted angled baffle.

An aluminium tube directs cooling air from each duct to the nearest magneto coil.

### **Materials required:**

Epoxy resin and AF303 glass fibre cloth (from the bag labelled “*Extra Cloth*”)

5-minute Araldite and flock

### **Assemble the ducts**

Use a length of masking tape on the join line at the bottom of each duct inlet to hold the join firm and prevent Araldite/flock from leaking through.

Mix a small batch of 5-minute Araldite and flock and apply to the top of each join as shown at right:



Next the front air dams will need to be cut to size. Take the length of glass fibre sheet with the curved edge, hold it against the rear of the duct inlet with the curve towards the top rear of the duct and mark around the bottom of the duct then cut to shape as shown above.

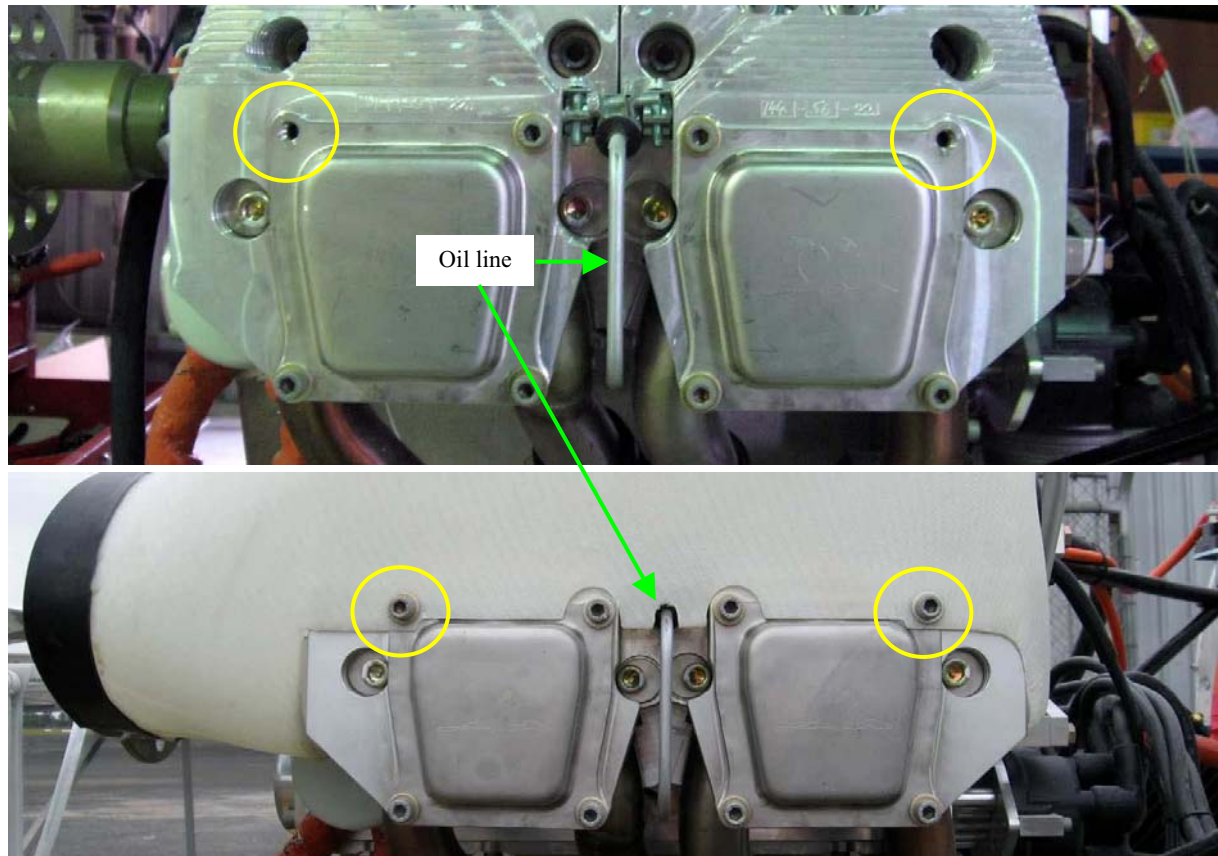
Tape the air dam into place. Mix a small batch of 5-minute Araldite and flock and use it to fix the air dam into place. Leave to cure, then sand away any rough edges.

Remove the masking tape and roughen the underside of the duct and the back of the air dam.

Mix a small batch of resin and brush 2 layers of AF303 glass fibre cloth to the underside of each duct, covering the join line and wrapping up around the back edge of the air dam. Leave overnight to cure.



## Test fit the ducts



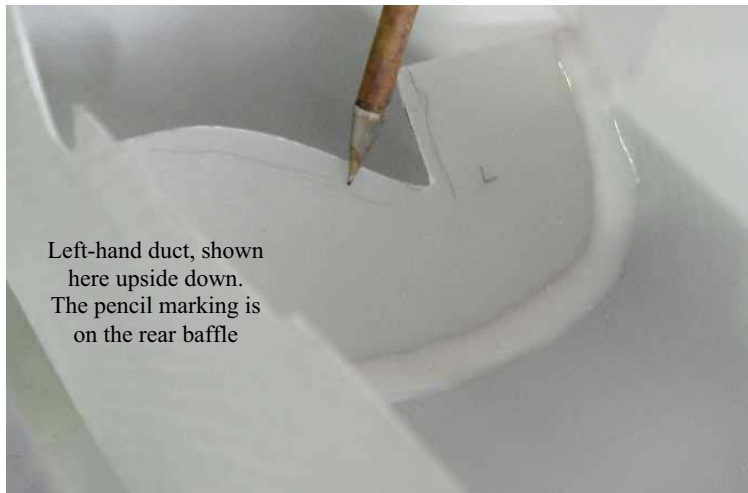
Fitting the ducts will require adjustments to be made in several areas: firstly the oil line to the rockers will need to be accommodated, then the rear baffle and the air dams will need to be adjusted and then the sequence repeated perhaps 2 or 3 times until the fit is correct.

Remove the front and rear rocker cover cap screws (circled top), test fit the duct and mark the locations for the cutouts around the oil line (arrowed above). File out a notch for the oil line until the duct clears it by 1-2mm all round. Leave the cap screws out and set aside until the final fitting of the ducts is complete.



The front air dams will need to be trimmed to fit around the fins on the cylinder heads and barrels. The final fit must have the air dams only just touching the fins as shown above.

It may take few trial fits so take your time and get the fit just right.



Left-hand duct, shown here upside down. The pencil marking is on the rear baffle



The baffles at the rear of each duct will need to be trimmed to allow the duct to sit down correctly. Test fit and trim until the inside of the duct sits down on the barrels, between the fins as shown above right, and the outside sits just on the top of the rocker covers.

Once the rear baffle and air dams are fitting correctly you can mark and drill both of the rocker cover holes (circled in the photo at the top of the previous page) to  $\frac{1}{4}$ " and temporarily mount both ducts using the cap screws.

Mark a point on the inside of the duct directly above each front cylinder and drill a  $\frac{3}{32}$ " hole, then flock and rivet the supplied right angle spring bracket into place as shown at right, placing a washer on the rivet inside the duct.

Fit a loop of lock wire around the cylinder between the third and fourth fin and through the bottom of the spring and twist it off.

The spring may be unhooked at the bracket end to remove the duct.





# 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.

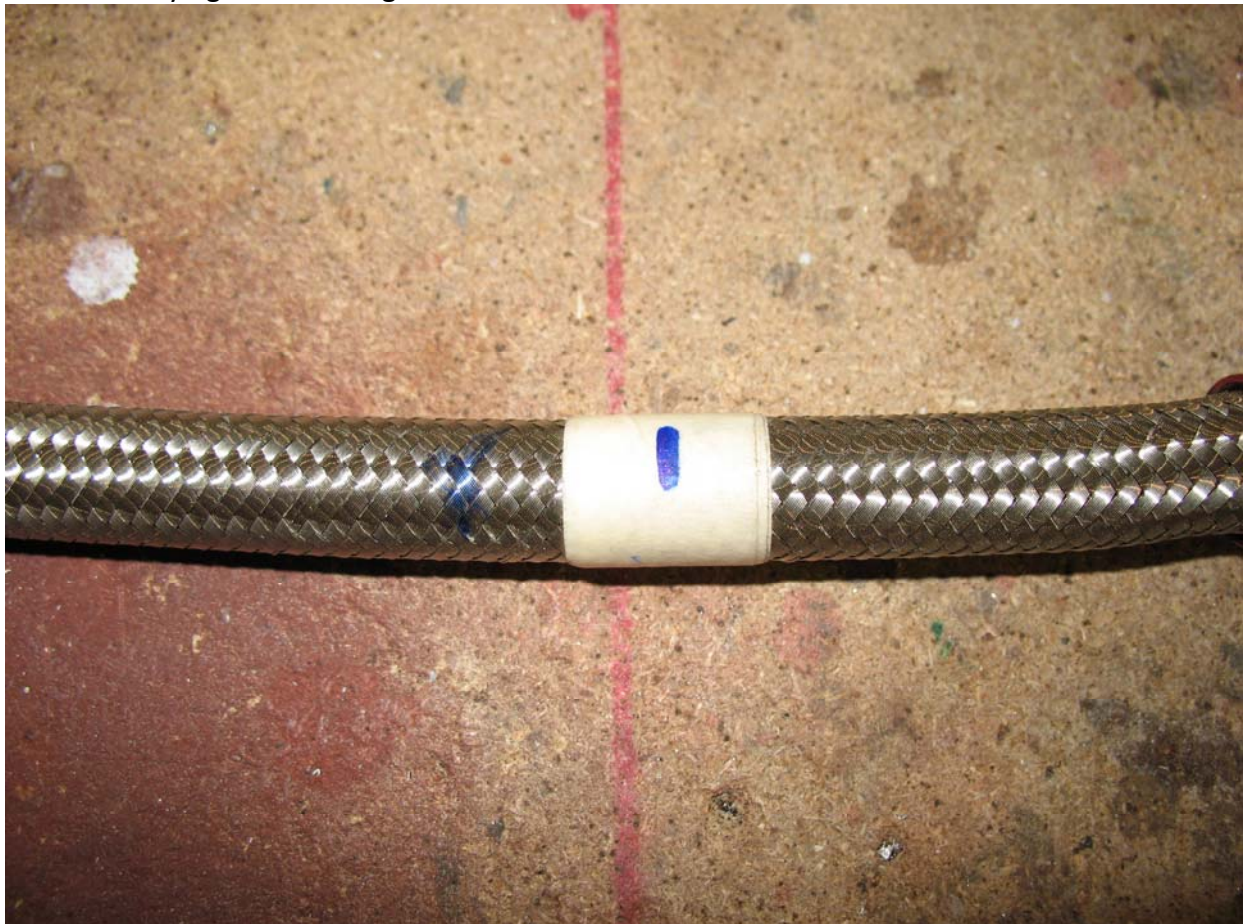


Figure 1



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.

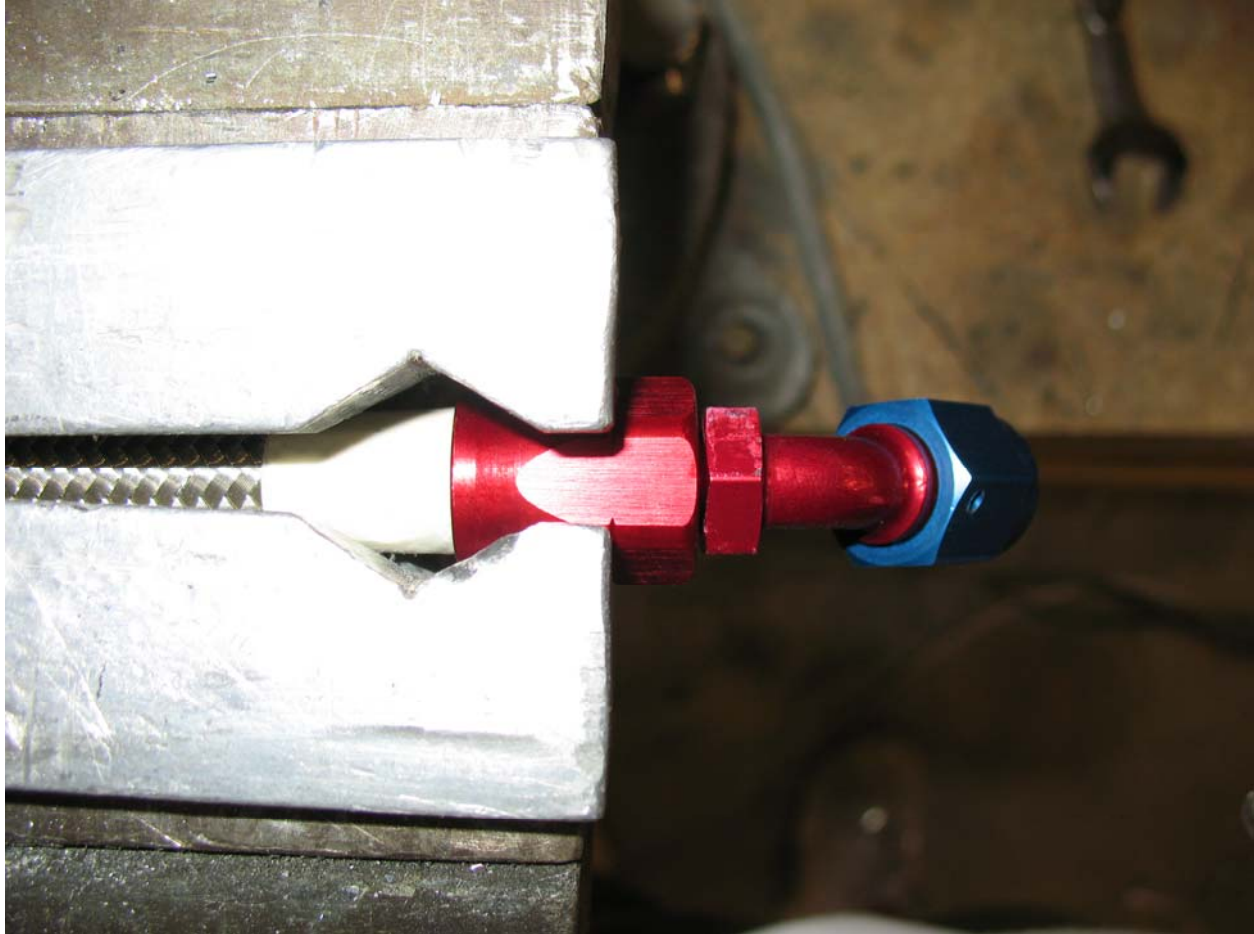
Wrap a piece of masking tape around the oil line at the base of the fitting. This will let you know if the oil line pushed out of the fitting during the next step. Place the oil line and fitting horizontally in the vise locking the fitting into the jaws of the vise.



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.



### **Pre-Paint>Fuselage>Engine>Fit oil cooler**

#### **Objectives of this task:**

In this task the oil cooler will be fitted to the base of the sump, the oil filter adapter will be fitted under the oil filter and the whole assembly plumbed up. Fireproof sleeving will be used to protect the oil lines and an oil cooler duct will be fitted to the oil cooler.

#### **Materials required:**

Card # J24 'Oil Cooler Kit'

Pipe sealing compound (rated working pressure of 2.6 Mpa, "Holdtite" brand or similar)

#### **Mount the cooler**



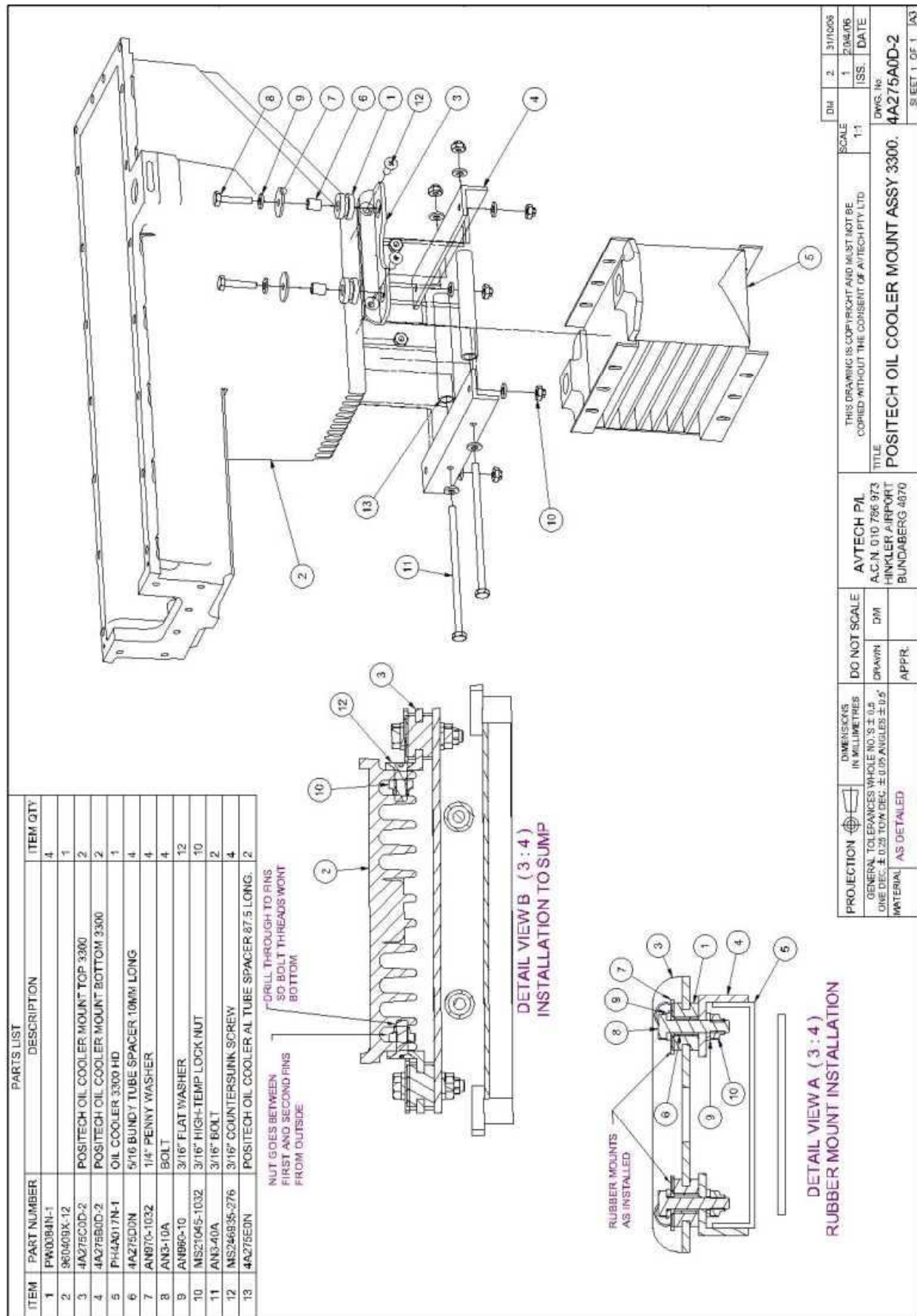
Hold the sump rails against the sides of the fin under the sump as shown above left and drill 2 x 3/16" holes through the rail and through 2 fins – note that the second fin hole is to accommodate the free length of the screw. Fit a rubber grommet to each of the 4 large holes in each sump rail and fit each sump rail into place – feed each countersunk screw through until the nut can be fitted between the first and second fins then hold the nut and tighten firmly.

Fit the aluminium spacer tubes to the top of the oil cooler as shown arrowed above right, aligning the tubes with the 1/4" holes in the cooler and making sure that the AN4-42A bolts can pass through freely. The tubes will be a firm fit in between the mounting lugs on the cooler and they will be held in place by the AN4-42A mounting bolts.

Fit the lateral rails loosely to the sump rails with AN3-10A bolts, washers and Nyloc nuts, then fit the cooler up to the lateral rails and fit the AN4-42A bolts through from the rear and secure with Nyloc nuts. Tighten the 1/4" bolts first and then tighten the bolts that pass through the rubber mounts. At this point the cooler should be mounted firmly to the sump while being protected from vibration by the rubber mounts. Re-check all nuts for tightness. Refer to the drawing on the next page for detail.





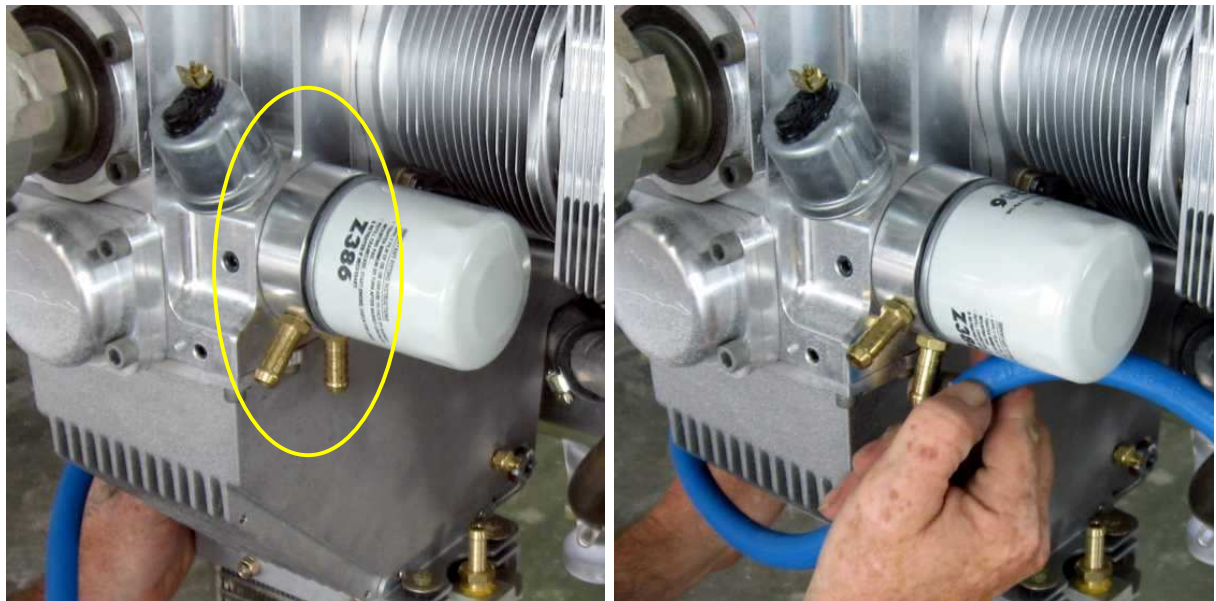




## Fit the oil lines



Fit the 2 brass male fittings to the inlet and outlet of the cooler as shown above– apply a smear of pipe sealing compound to the threads and tighten firmly into the cooler. Do **not** over tighten, as the brass threads can strip if excess pressure is applied.



Remove the spin-on oil filter and fit the adaptor (circled above left) under it with the O-ring side towards the engine block. Apply a smear of clean engine oil to the O-rings on the adaptor and the oil filter, refit the oil filter and tighten firmly. Absolute cleanliness is required here: there must be no dirt or contaminants anywhere near the oil filter or adaptor fitting area.

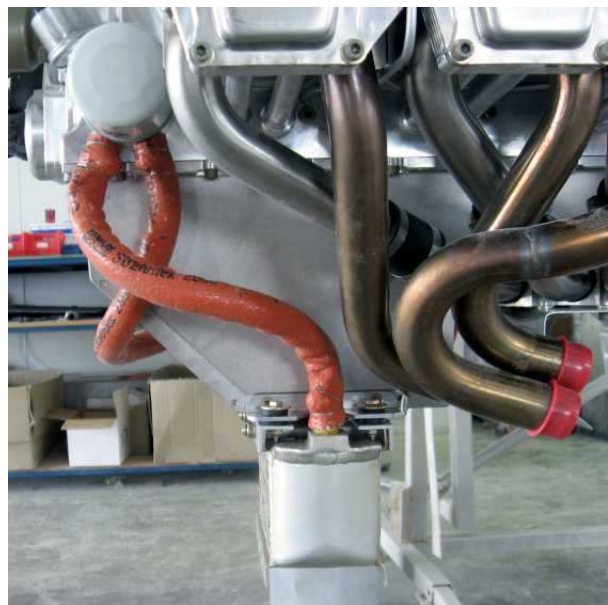
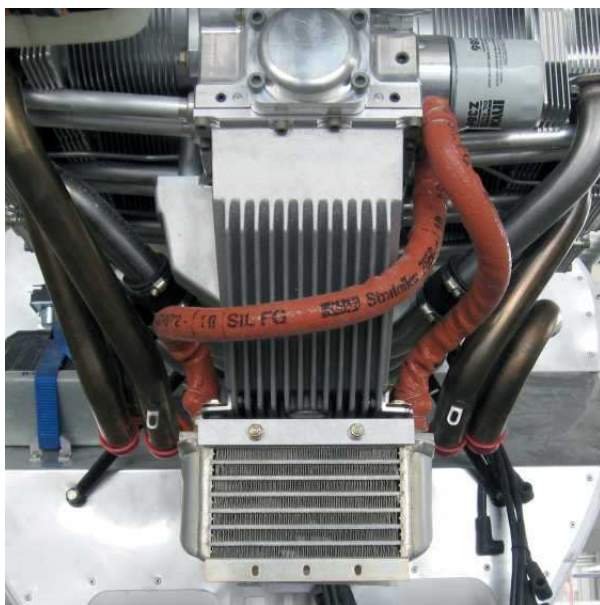
Size the blue oil line by holding one end beside the fitting on the right-hand side of the oil cooler and cutting to length to fit the rear adaptor fitting as shown above right.

Repeat the process for the other side of the oil cooler to the front adaptor fitting and then cut 2 lengths of fireproof sleeve to the same length as the oil lines and fit them over the oil lines.

The fireproof sleeve can be difficult to fit, but blowing compressed air into the gap between the oil line and the sleeve while pulling the sleeve over the oil line works rather well.



Roll the last inch or so of the fireproof sleeve back on each end and fit each oil line into place, securing with the supplied hose clamp and cutting off the excess hose clamp screw. Now roll the fireproof sleeve over the hose clamp and lock wire into place as shown above, using a double loop and twisting off. This provides fireproofing to the full length of the oil lines.



The completed oil line arrangement is shown above.

Fit the oil cooler duct to the front of the oil cooler as shown at right, using 2 x self-tapping screws at the top and 2 x 4mm screws and Nyloc nuts at the bottom.

Take care to place the flap section of the duct (arrowed) at the top.

This completes the *Pre-Paint>Fuselage>Engine>Fit oil cooler* task.





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.

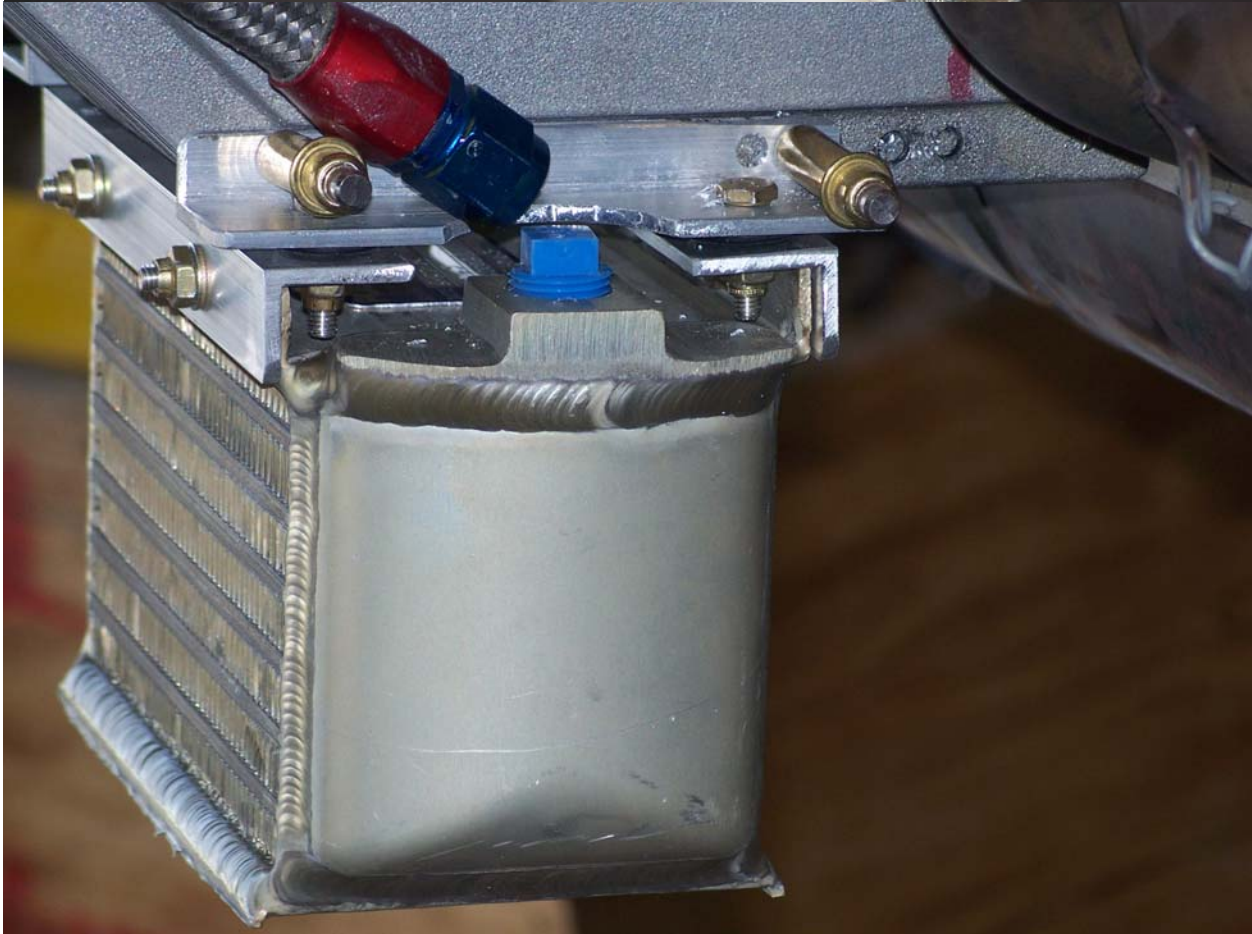
Attach the 60 degree hose end on the forward fitting on the oil cooler adapter. Attach straight end fittings to the other AN fittings. See photos for reference.

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

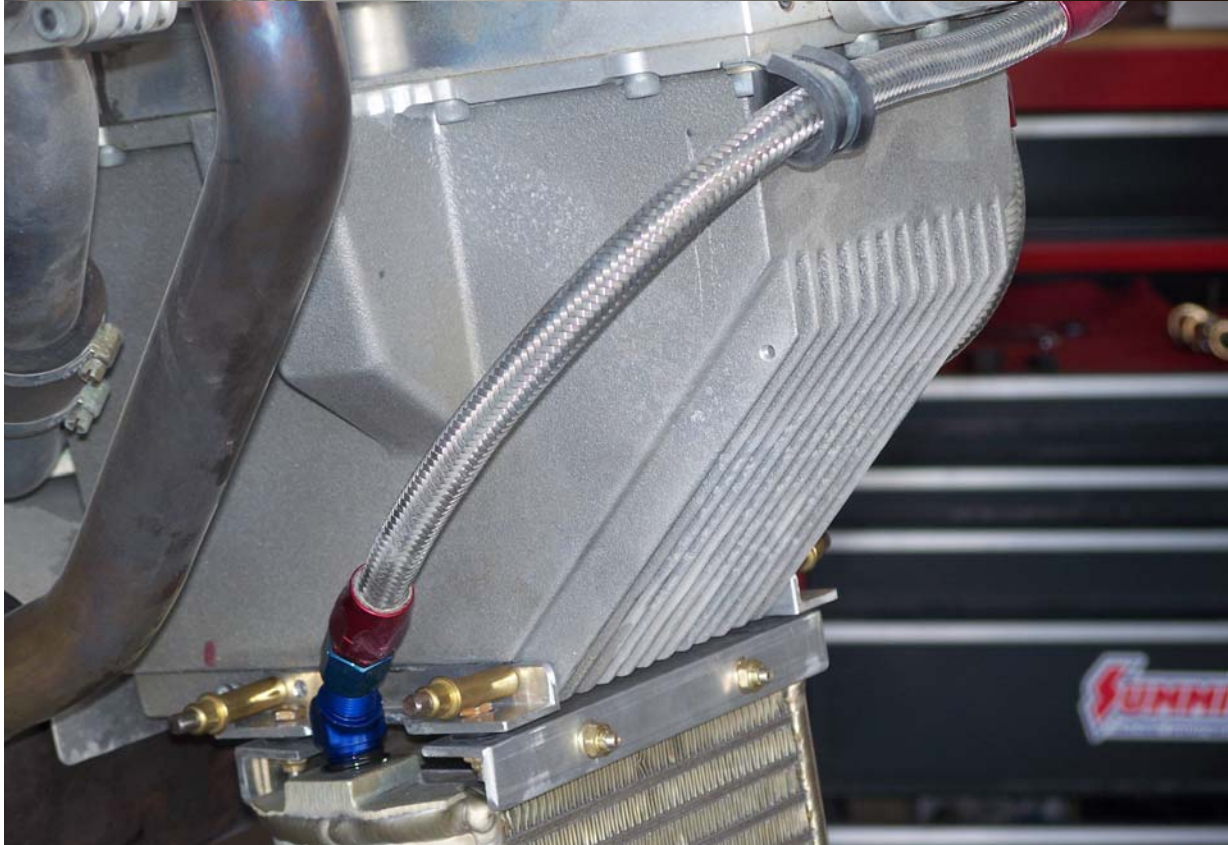
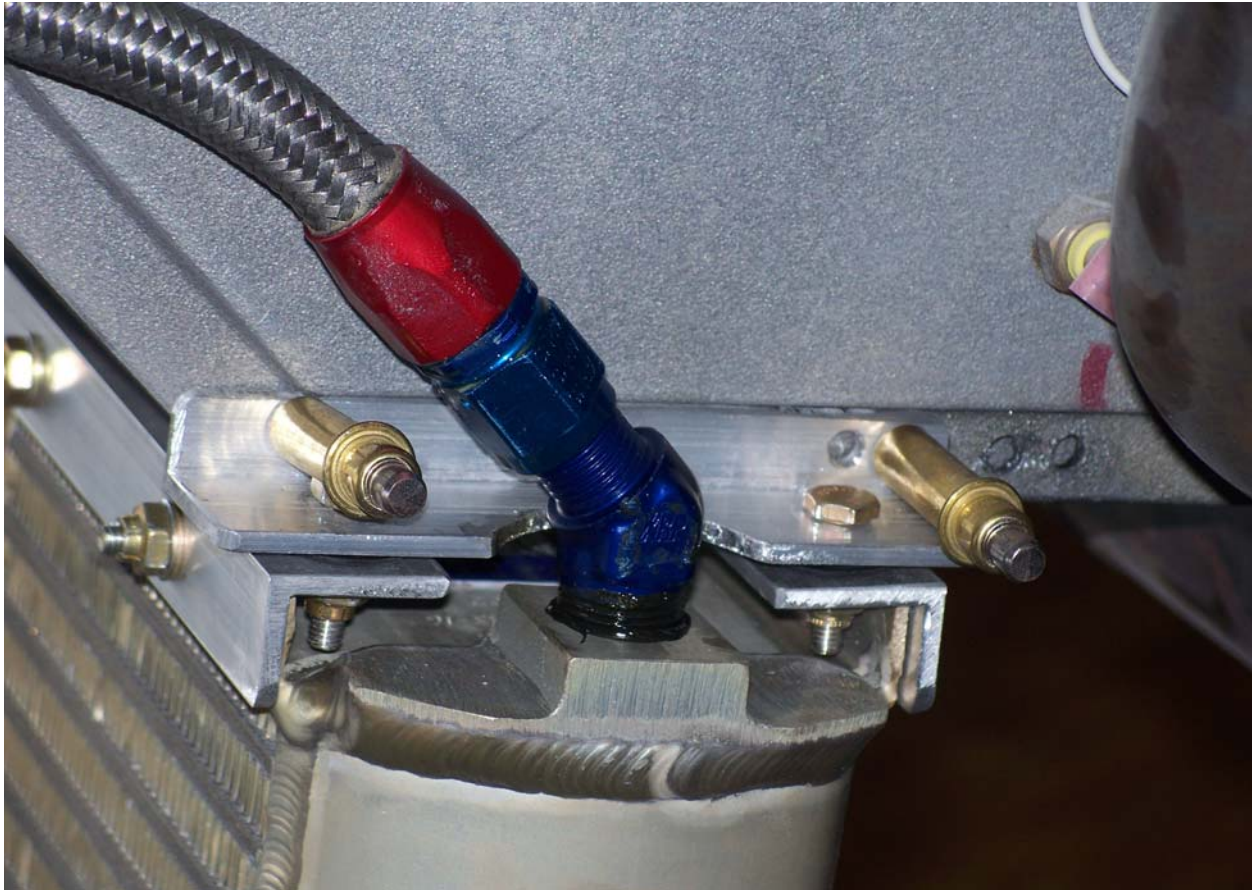
When hoses are complete permanently install per the photos.





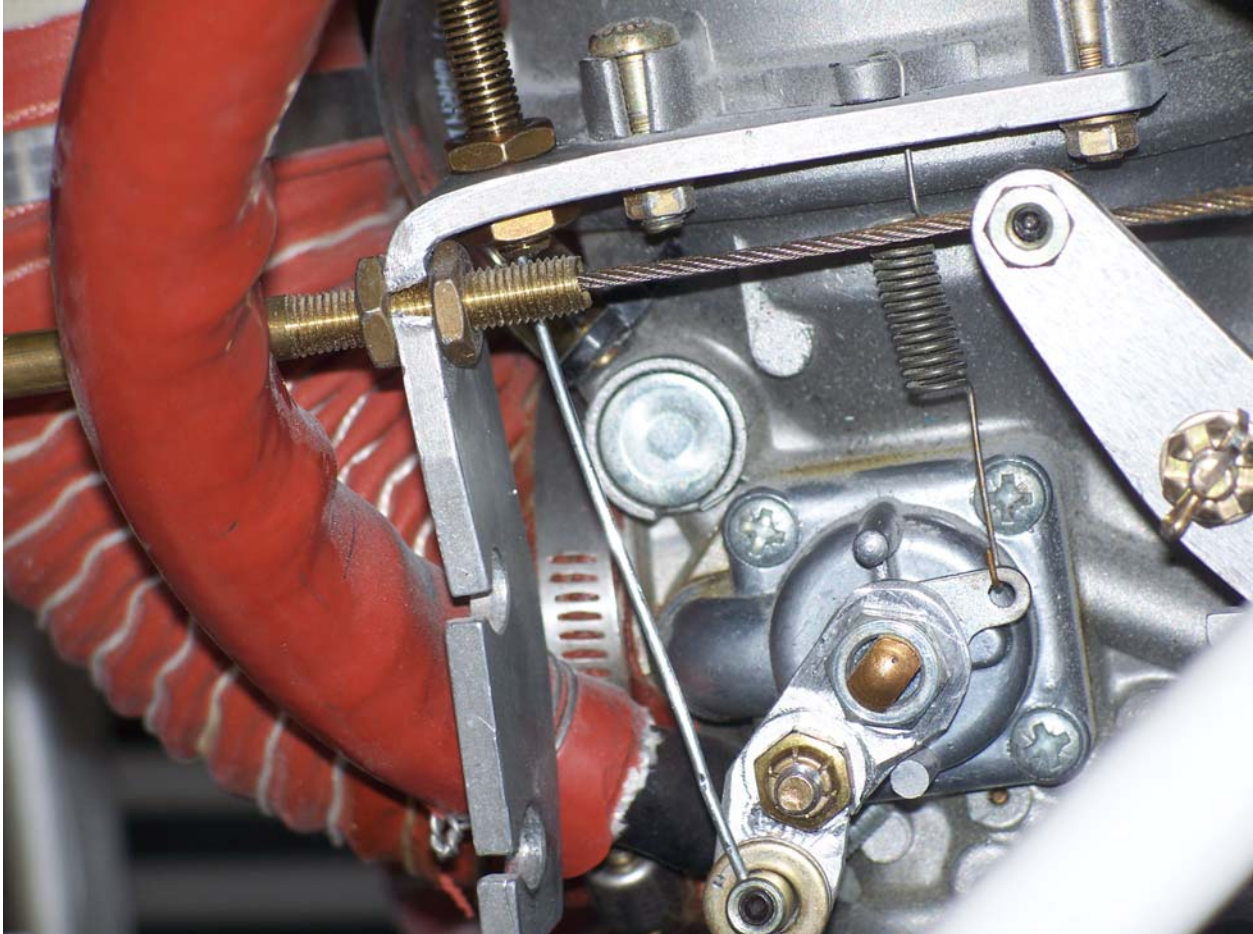






The cable bracket on the Bing carburetor will have to be modified to accommodate the difference in throttle and choke cable attachment from the standard Jabiru configuration.

1. Locate a new hole for the throttle cable end adjuster in the carb bracket
2. Line up the top of the throttle arm extension with the carb bracket.
3. Drill a 1/4 inch hole in the bracket.
4. Temporarily install a cable end adjuster and its jam nuts.
5. Check for alignment by inserting a cable sheath into the end adjuster and running a



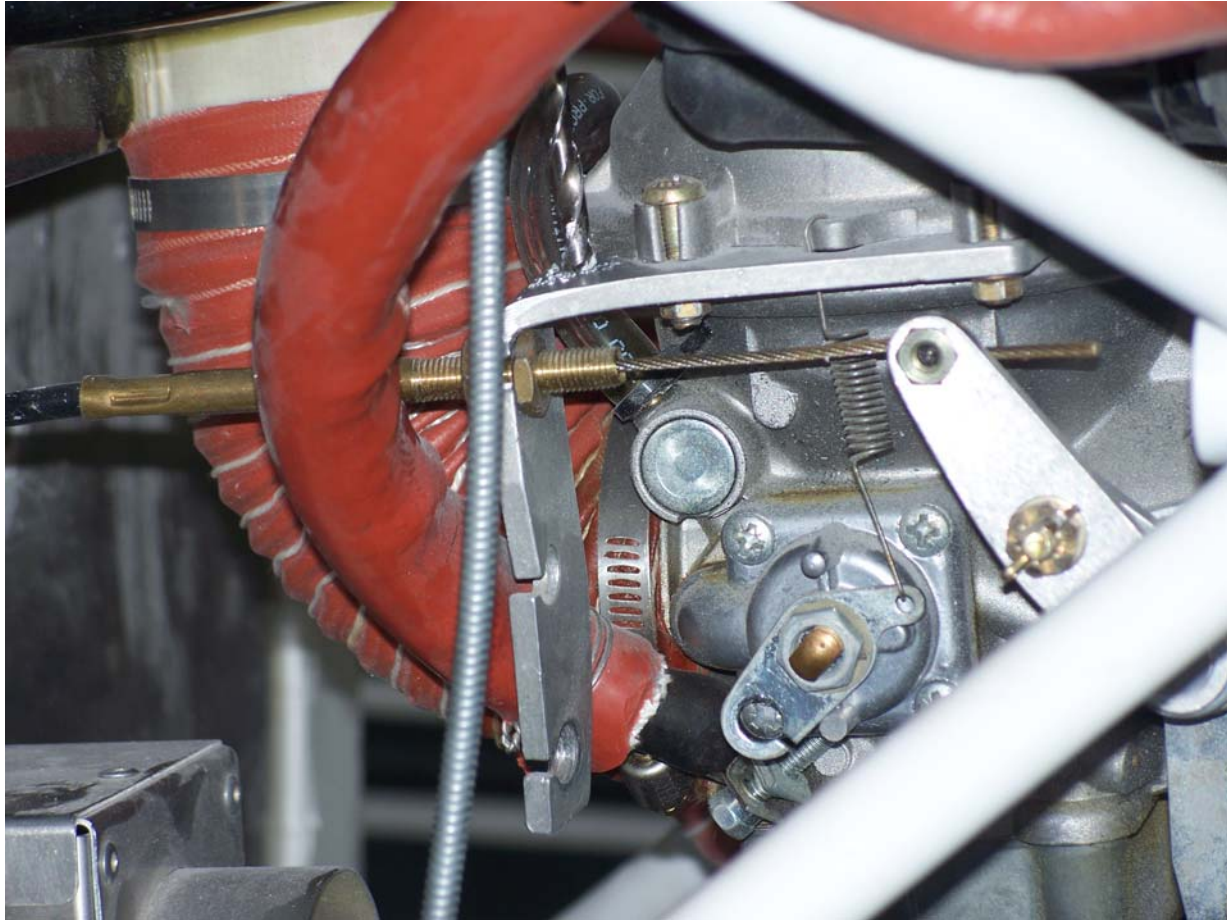
- length of cable through to the throttle arm extension
6. After completion of the throttle cable installation for the throttle lever, install the cable into the cable swivel in the throttle arm extension and tighten set screw



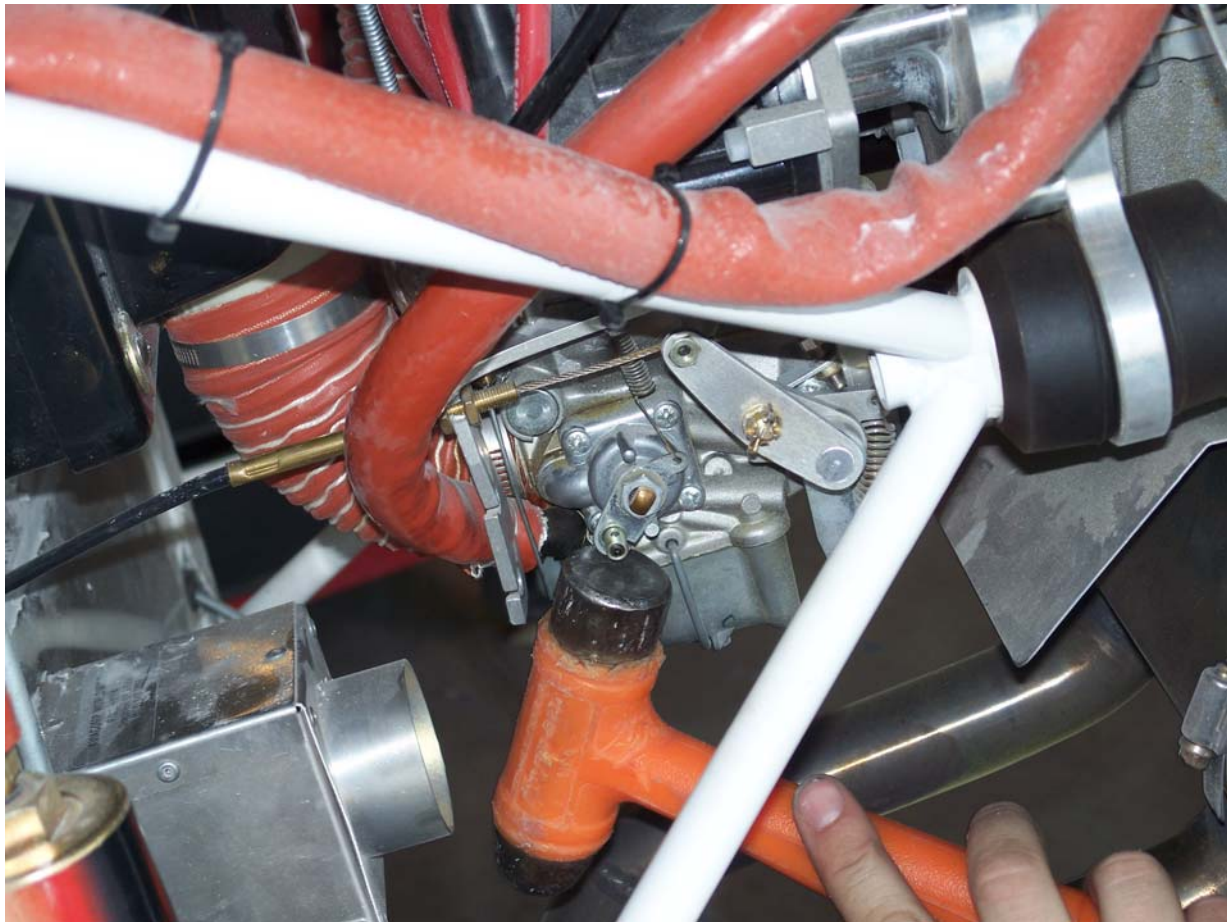
**Choke Cable**

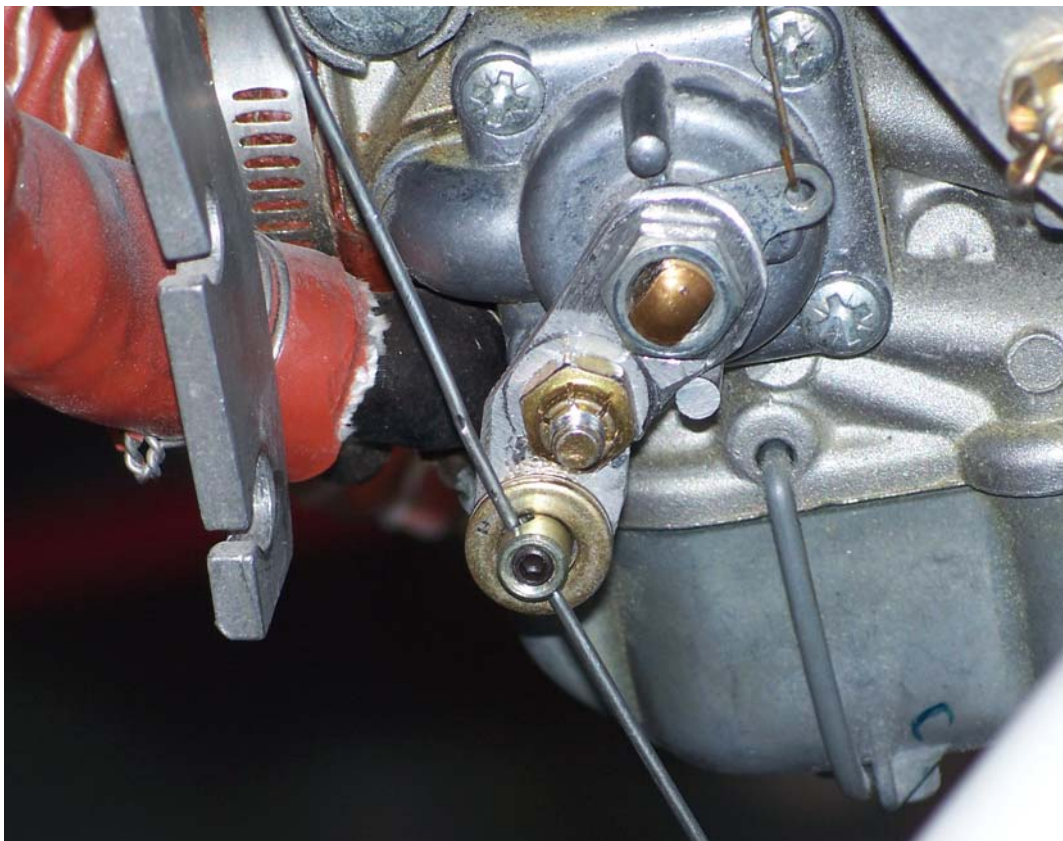
The choke cable in the S7S installation comes in from the top.

1. Locate and drill a 1/4 inch hole for the cable end adjuster at the top of the carb bracket. The hole must be located so that the choke cable will run behind (inboard from) the throttle cable and be far enough ahead of the bend in the bracket so that there is clearance for the jam nut.

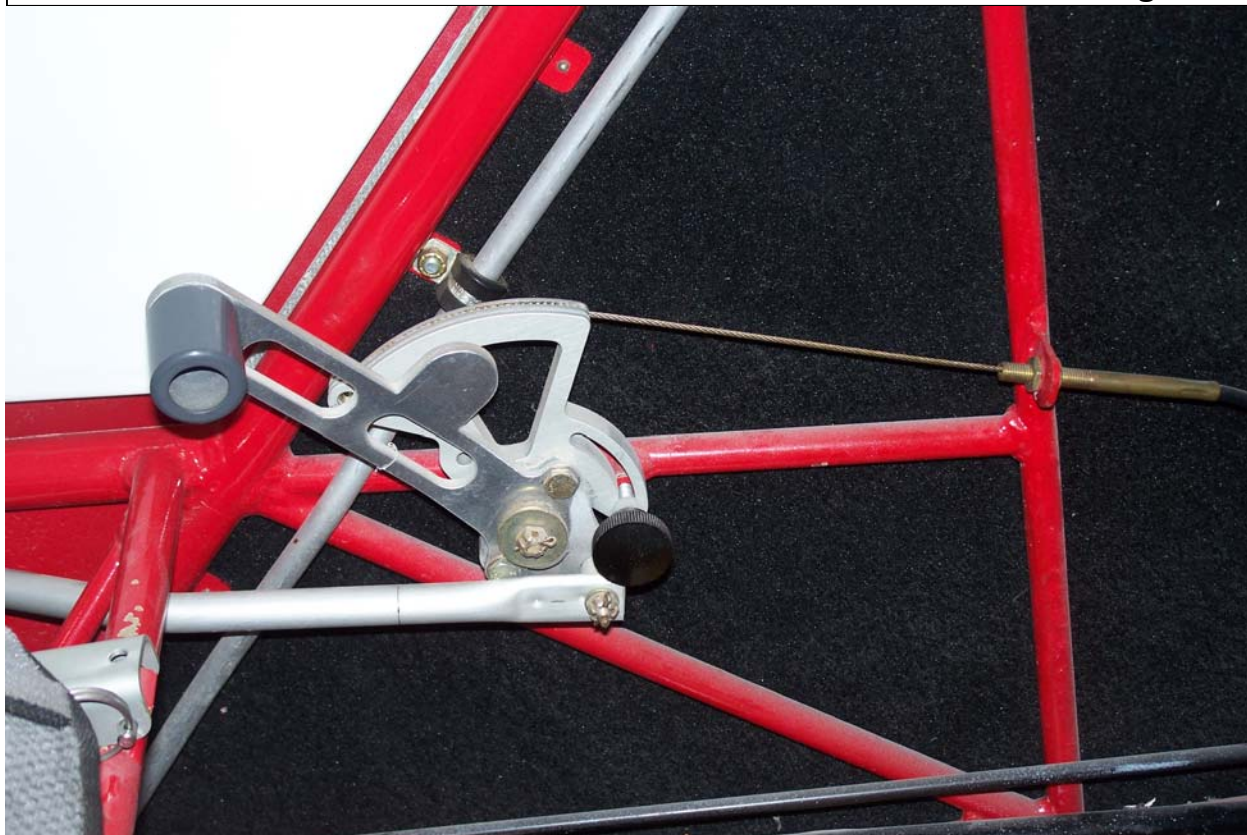


2. Install the cable end adjuster into the carb bracket.
3. The choke arm will have to be modified with an extension.
4. Fabricate the choke arm extension from scrap piece of aluminum per the diagram below.









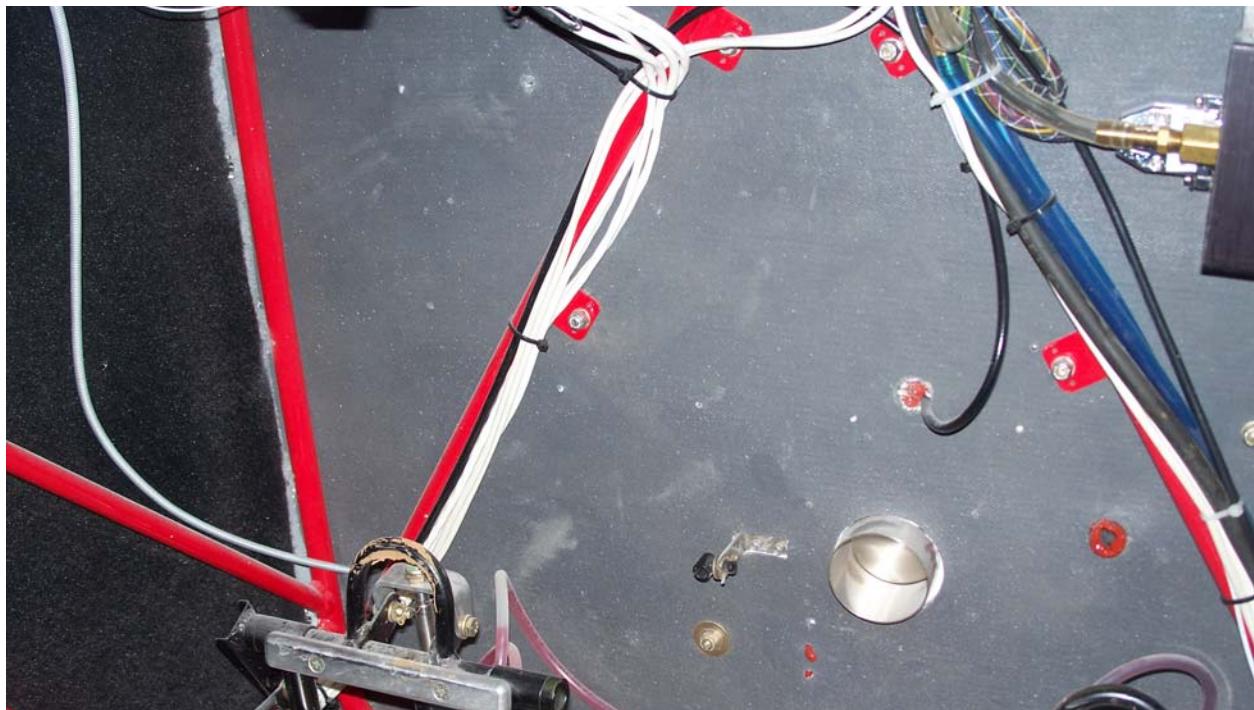
Rearrange the throttle lever so that it functions as shown on photos this page.







Route cable forward and down to the tube just above the floor. Then route along the diagonal brace tube up toward the top of the firewall. Finally down the right side diagonal and loop out through the firewall.

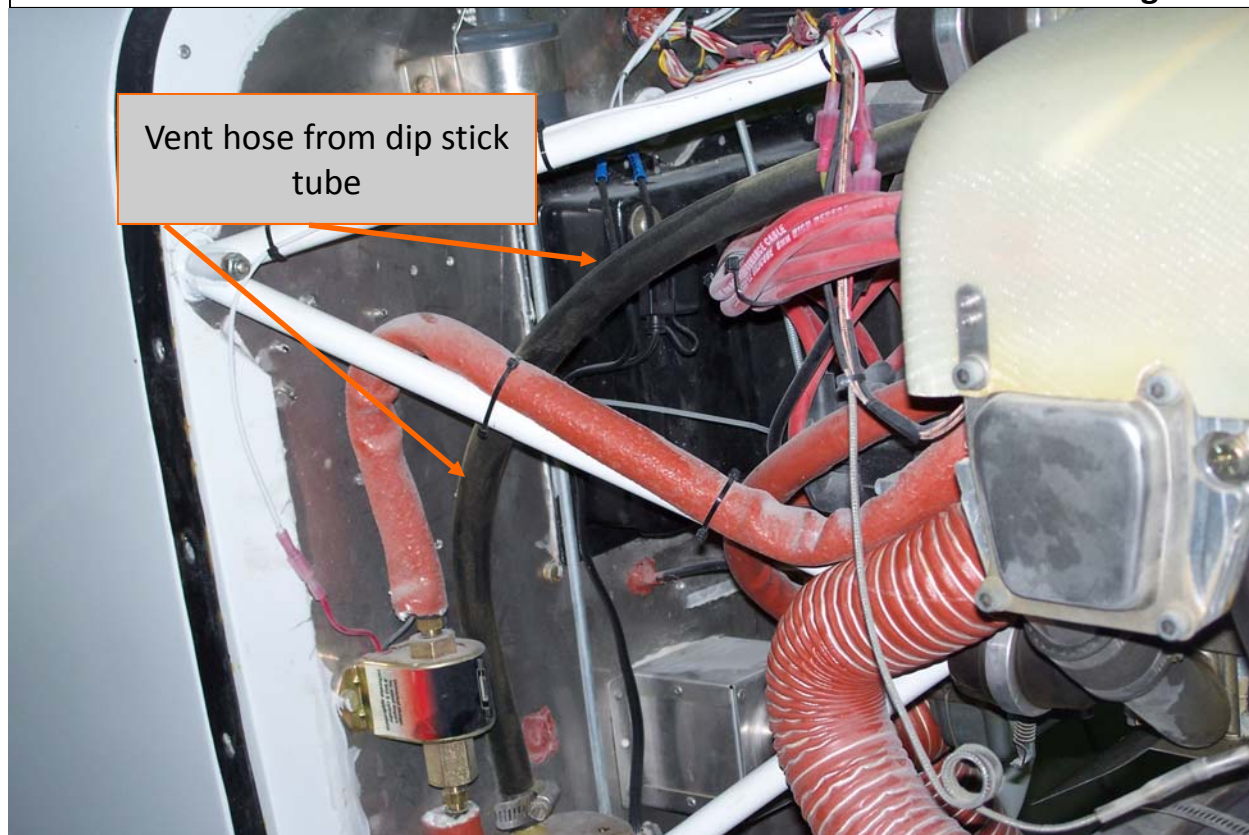




### Oil Recovery Bottle

1. Locate the oil bottle on the lower right side of the firewall.
2. Predrill two 3/16 holes in the oil bottle clamp.
3. Position clamp on firewall and drill through the SS sheet
4. Install clamp with two 3/16 pop rivets
5. Insert bottle into clamp.
6. Run 1/2 inch crankcase vent line from dipstick tube to oil bottle.
7. Run additional 1/2 inch line from bottle out the cowl bottom.
8. Make sure a 3/16 vent / siphon relief hole is drilled in the top of the bottle



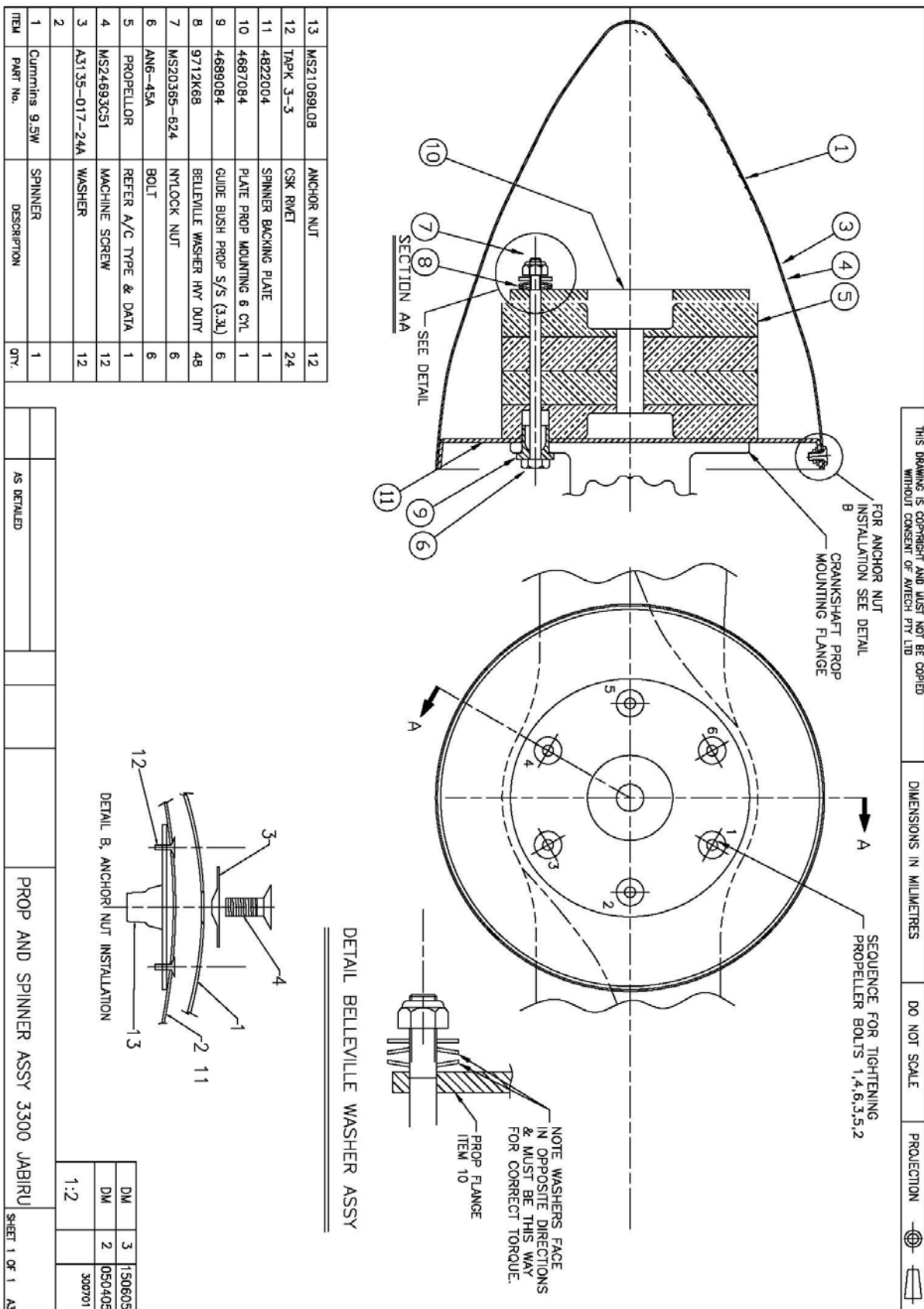


## Prop & Spinner

Prep spinner (fiberglass spinner only)

1. Expand holes in spinner back plate to 5/8 inch
2. Set back plate on workbench , install prop bushings and bolts from bottom
3. Position prop over bushings and bolts
4. Cover prop blades with masking tape to avoid scratching prop when fitting spinner cone
5. With a piece of poster board make a template of the prop opening in the spinner
6. Transfer template to spinner cone and cut out
7. Cut small at first and then expand until the rim of the spinner sits flat on the work bench and the prop has 1/8 inch clearance (minimum) from spinner cone.
8. Mark five evenly spaced locations for attachment screws around base of spinner—four holes between the blades on each side
9. Drill to 1/8 and secure with clecos
10. Mount nutplates on inside of spinner back plate (see drawing for details)
11. Expand holes in spinner back plate to 5/32
12. Expand holes in spinner cone to 5/32 and bevel to accept Tinnerman washers (see drawing for details)
13. Place indexing marks on spinner & back plate so prop & cone will be in the same position when installed on the aircraft.
14. Install spinner back plate first on prop hub
15. Then install prop making sure prop is properly aligned on spinner plate.
16. Torque prop to 18 ft lbs (Sensenich Wood Prop - if using another manufacturer prop torque to prop maker's instructions)
17. Install Spinner cone keeping alignment marks in proper alignment.







**Cummins Polished Aluminum Spinner**

The optional Cummins Polished aluminum spinner requires no trimming and no nutplate installation. It is ready to install right out of the box!

The advantage is that the spinner takes several hours less work and it is perfectly balanced and runs exactly true without adjustment. We think it looks better as well.

The disadvantage is that it costs a few hundred dollars more. We think it is worth it!

