

Firewall Forward Installation Instructions

Jabiru 2200 Engine to Van's RV-12



Welcome to the world of Jabiru engines and firewall forward kits. We've developed the FWF kit for Van's RV-12 by purchasing a RV-12 kit from Van's and building it completely ourselves from nose to tail.

We used this standard RV-12 kit to develop each part of the firewall forward system. Some of the components are standard items from other FWF kits we've developed and others were engineered specifically for the RV-12.

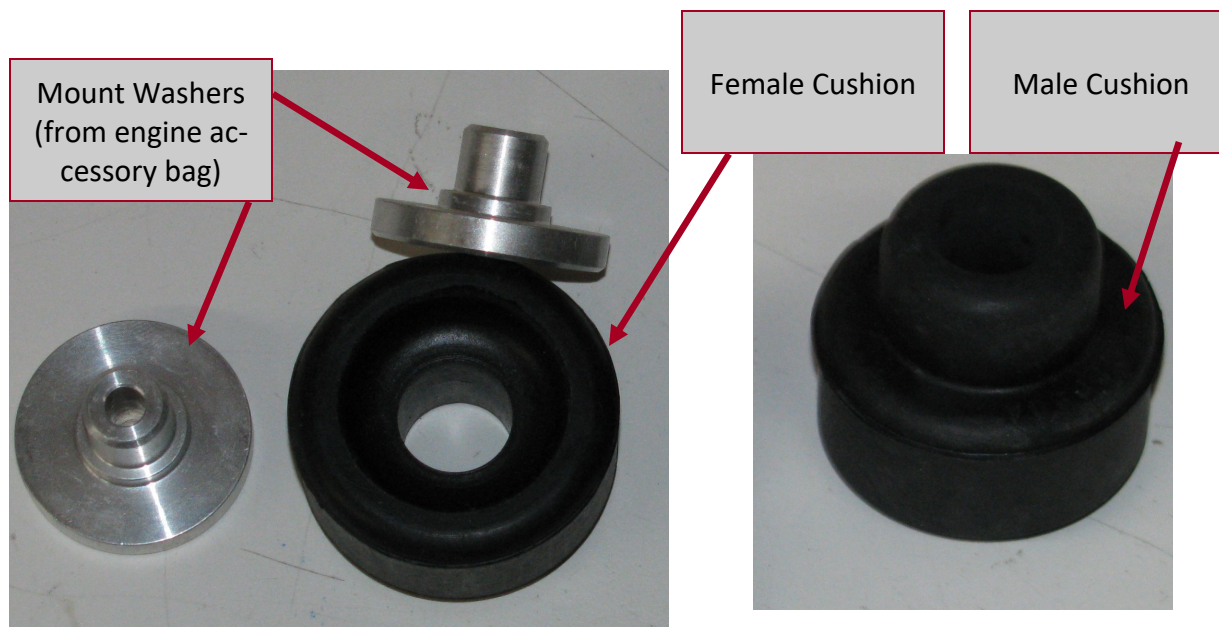
One of our goals in the RV-12 FWF development was to use as much of the Van's Aircraft parts and pieces as possible. Builders installing the Jabiru will need the RV-12 finishing kit from Van's with some deletions but builders will not need any items from the Van's Power-plant kit.

Builders planning on the Van's Avionics packages can still use all of those items with the only change being the CHT probes will need to be 12mm instead of the 14 mm used on Rotax. Dynon will gladly swap the probes.

Component List

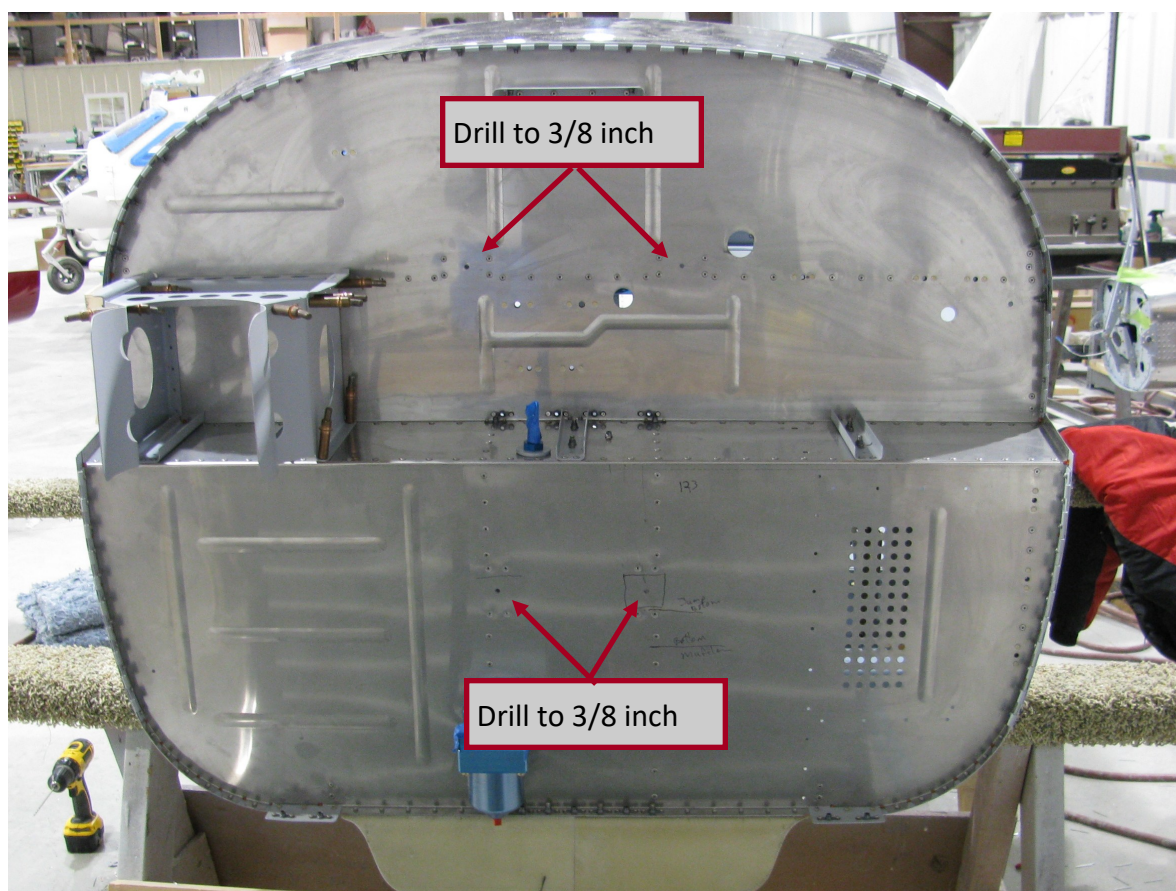
Engine Mount & Engine

Quantity	Item	Description / Function
Engine Mount		
1	RV-12-22	Engine Mount
Mount Hardware FWF Kit		
4	AN6-32A	Bolt
8	AN960-616	Washer
4	AN363-624	Metal Locking Nut
4	AN4-46A	Bolt
4	AN960-416	Washer
4	AN363-428	Metal Locking Nut
Items from Engine Accessory Bag		
4	PG10712N	Female Mount Cushion
4	PG10722N	Brass Cotter Pin 1/16 x 1
4	4094224	Engine Mount Washer



Trial Fit

The first step in trial fitting the engine mount is to drill out the mount bolt holes to 3/8 inch diameter to accommodate the AN6 bolts. The steel mount reinforcement weldments must be in place per the RV-12 plans and the fuselage forward top skin at least clecoed in place.



The objective is to make sure the mount fits the mount hole locations in the RV-12 firewall. These photos show a painted mount but do this step before painting. The nose leg need not be installed. For this procedure the mount bolts can be inserted from the engine side of the firewall just to make sure they fit correctly and that the mount was not damaged or twisted in transit.



If inserting the bolts from the rear to check for correct length it may be easier to rotate the fuselage onto its side.

If the nose leg is not in place shim the bottom two mount locations with three AN6-616 washers at each bolt to substitute for the thickness of the nose leg mount plate.

If fit is correct remove mount, clean and degrease. Paint with a self etching primer followed by a white or light grey top coat.



Additional photos of bare engine mount.



Final Mount Installation

After the mount has been painted it can be mounted to the firewall. It may be easier to mount some of the other FWF items like regulator, solenoid and master contactor to the firewall before the mount gets in the way.

Also—if adding the cabin heat option it may be easier to fabricate and install the various parts of Van's cabin heat system before hanging the engine.

The nose leg will have to be ready to install at the same time as the engine mount bolts on to the firewall over the nose leg mount plate. Have the nose leg primed or painted and ready for final assembly.

Install the four AN6– 32A mounting bolts from the aft side of the firewall. The bolts will go through the Van's mount weldments and the firewall and then through the engine mount. With the mount on the bolts install one AN960-616 washer and one AN363-624 nut on each bolt. Tighten to 20 ft lbs.

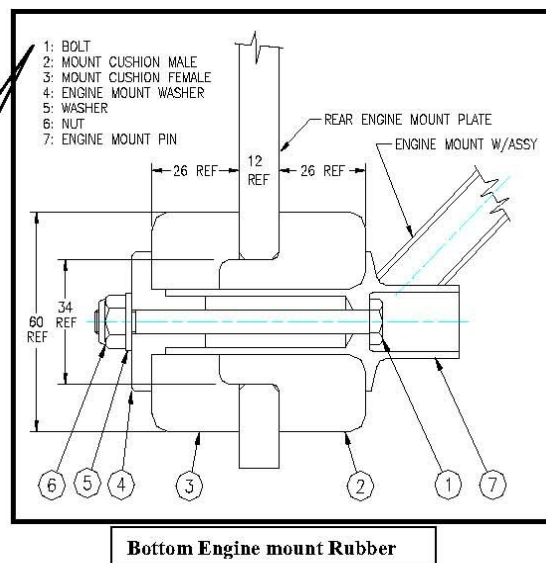
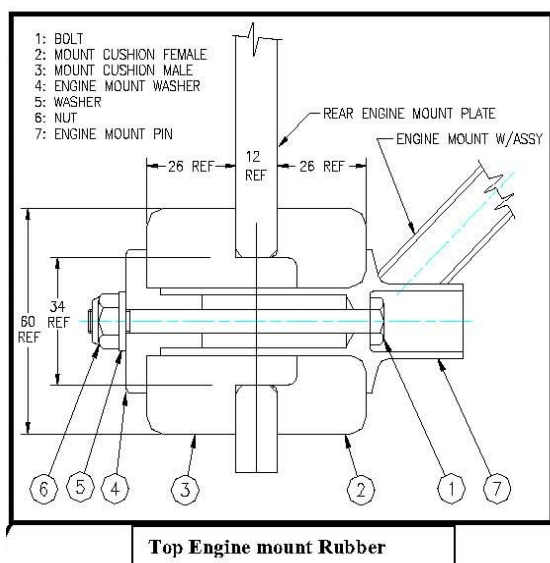


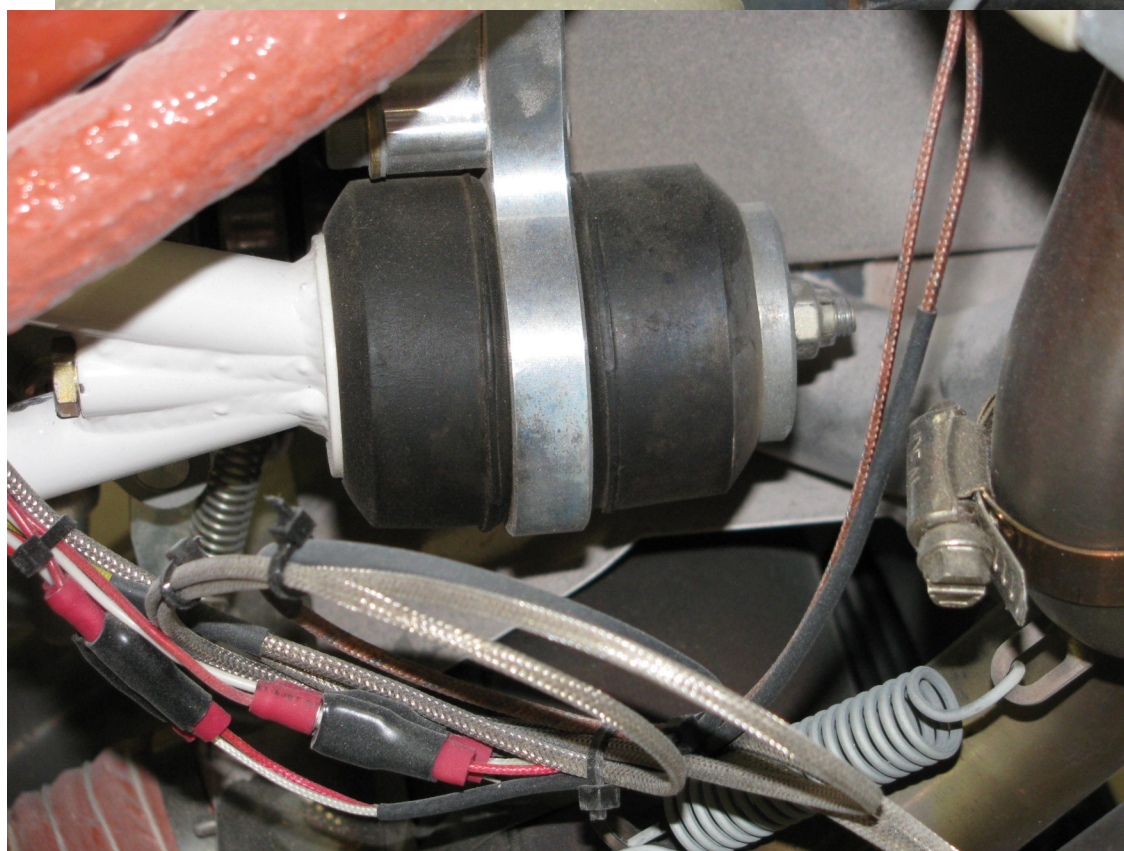
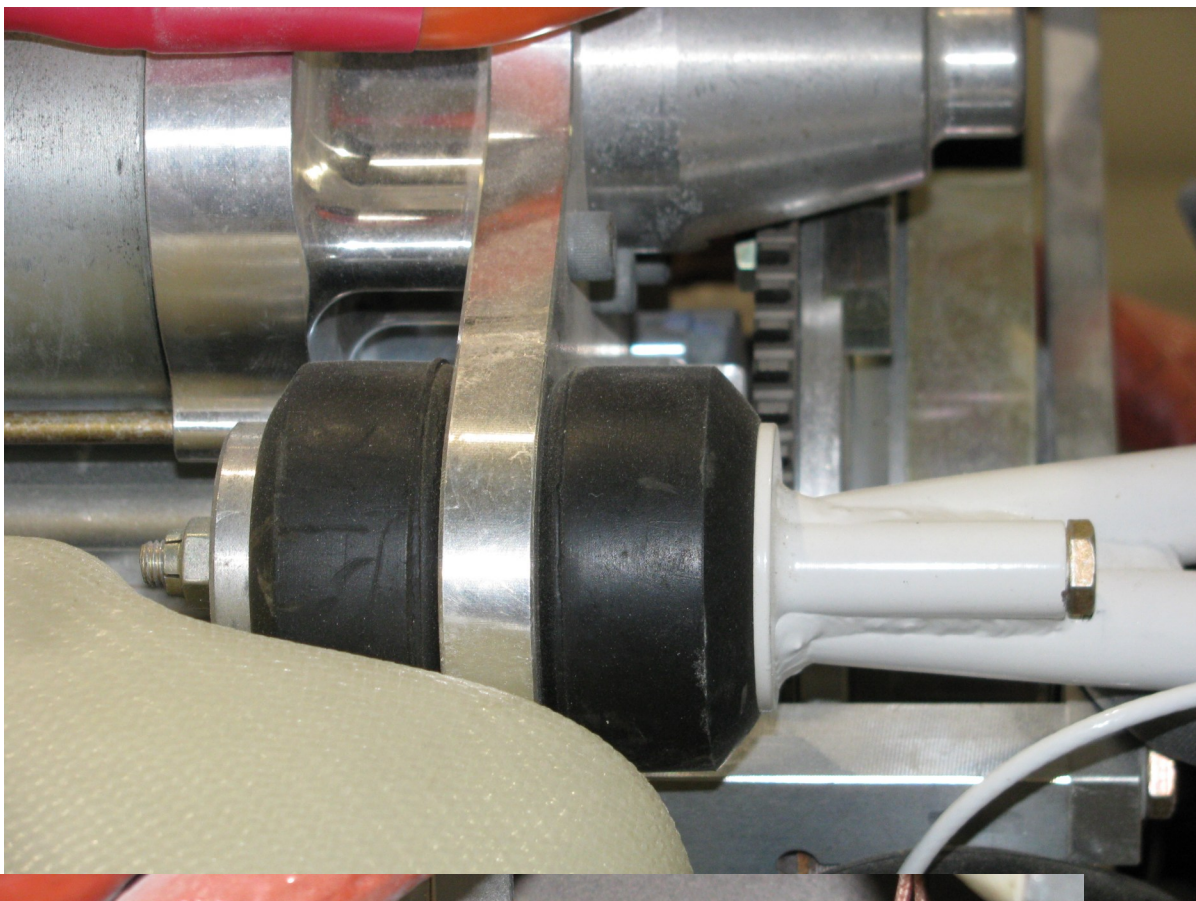
Hang Engine

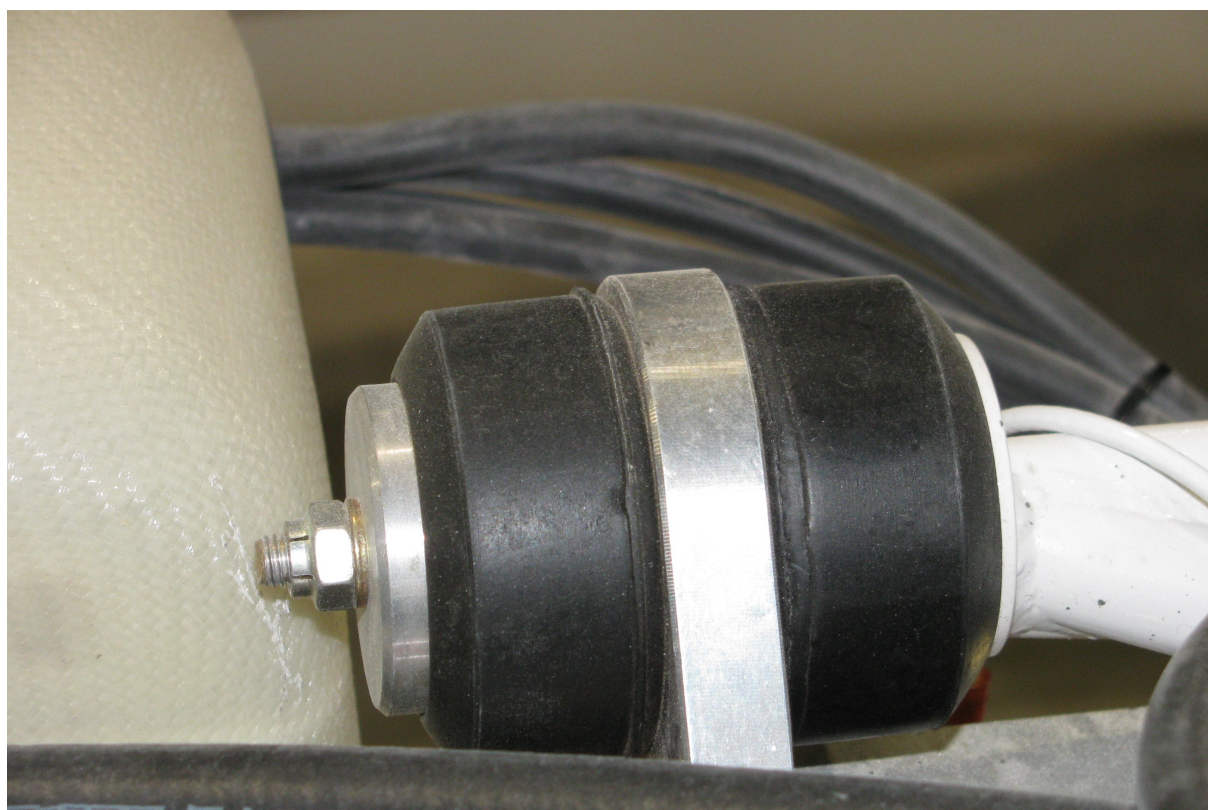
Once the mount is on the firewall you can proceed to hang the engine on the mount.

1. Install the female half of the rubber mount cushion on the upper two engine mount pins.
2. Install the male half of the rubber mount cushions on the lower engine mount pins.
3. Using an engine hoist (or some beefy assistants) raise the engine into position.
4. Slide the engine back plate over the upper mount pins and install the male half of the mount cushions.
5. Insert the AN4-46A bolts from the aft side of the upper mount pins.
6. Install the hat shaped mount washer into the rubber cushion and push the bolt through the mount washer
7. Squeeze the mount washer—cushion sandwich together with a C clamp or large slip joint pliers.
8. Install one AN960-416 washer and one AN363-428 Metal locking nut on the bolts and tighten a few turns
9. Position the engine so that the male cushions on the lower pins come through the engine back plate.
10. Install mount washer, bolt, washer and nut as above.
11. When all cushions and mount washers are in place tighten the bolts until the mount washer bottoms on the engine mount pin on all four mount points.

See drawing below for installation sequence. See photos next page for more reference.



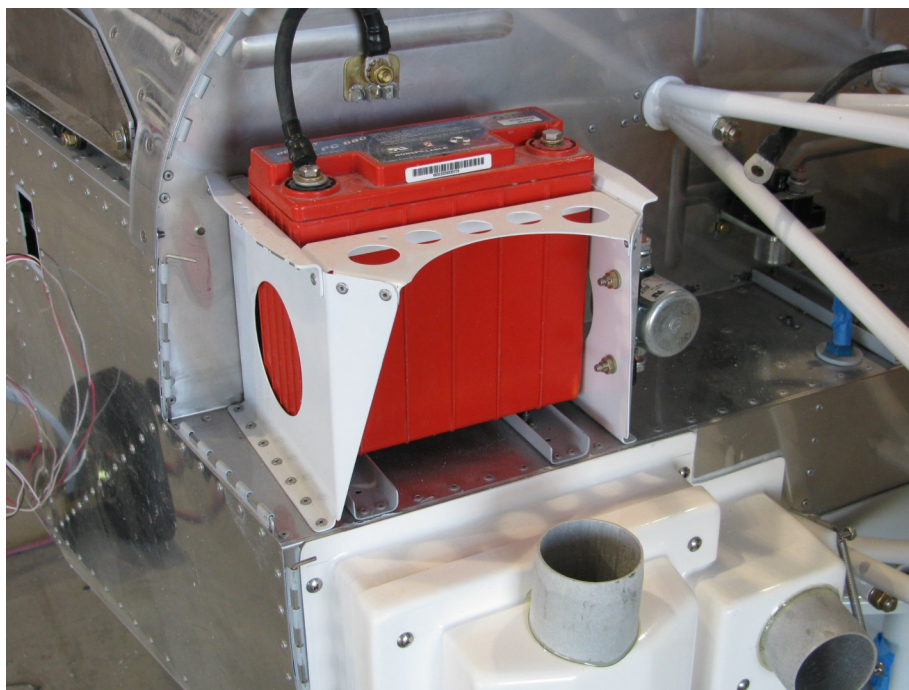




Component List		
Electrical - Master Contactor, Starter Solenoid—Rectifier/Regulator		
Quantity	Item	Description / Function
Misc Electrical		
1	JU RV12-03	Battery Hold Down Angle
3	Power Cable 8 inch	Battery to ground Battery to master contactor Master contactor to starter solenoid
1	Power Cable 38 inch	Engine to ground
2	AN3-15A	Bolt
2	AN960-10	Washer
Master Contactor		
2	AN3-4A	Bolt
2	AN970-3	Wide Washer
2	AN960-10L	Thin Washer
2	AN363-10	Metal Lock Nut
Starter Solenoid		
4	AN4-4A	Bolt
4	AN960-416L	Thin Washer
Regulator / Rectifier		
1	JU RV12-01	Aluminum Strip
1	JU RV-12-02	3/8 long spacer
1	AN4-4A	Bolt
3	AN960-416L	Thin Washer
1	AN4-5A	Bolt
1	AN363-428	Metal Locking Nut
1	AN4-7A	Bolt

Battery

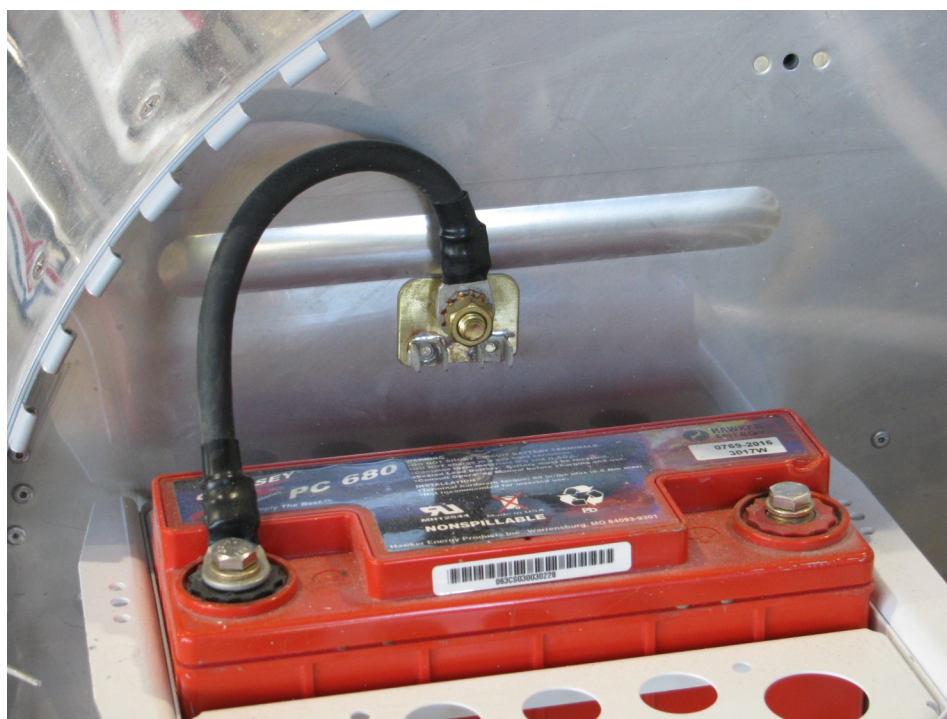
We use an Odyssey battery model PC680. This is not supplied with the FWF kit as it is best to get a fresh one just before you are ready for engine start. The PC680 is the same battery that Van's uses and the battery support is built the same way as Van's plans as part of the oil reservoir. See the RV-12 plans sec-



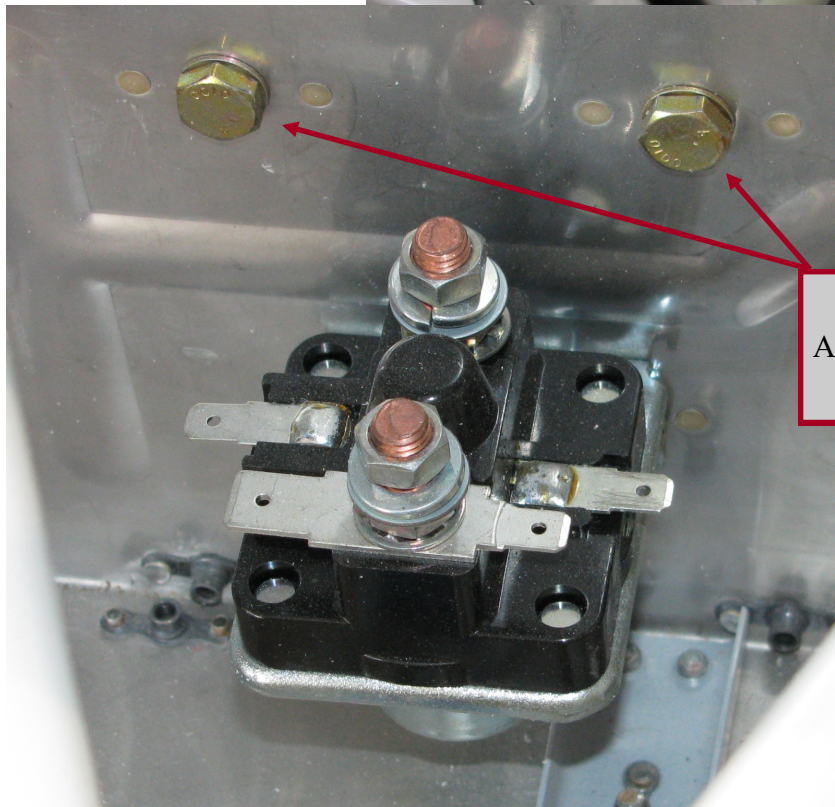
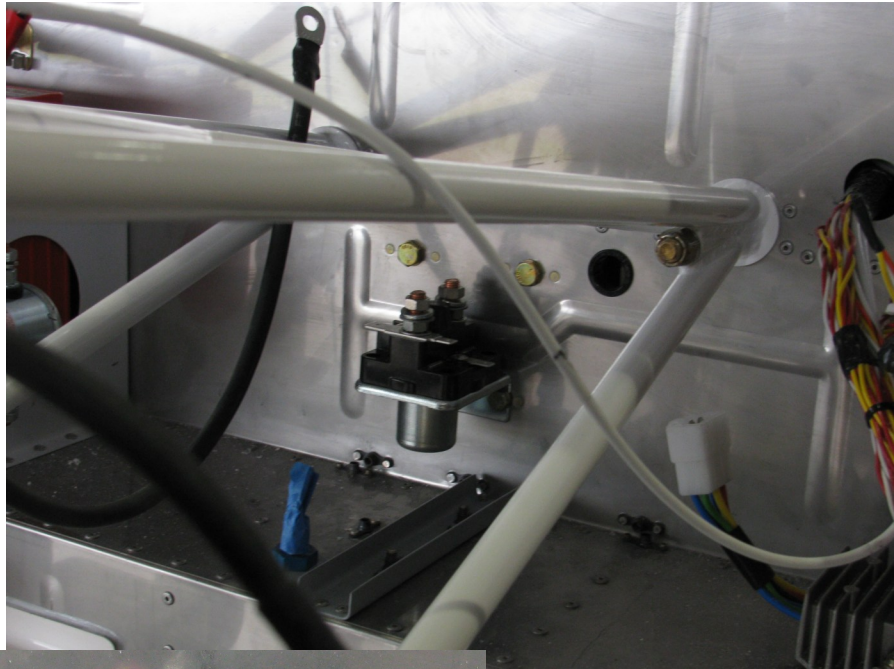
tion 29-05. As you can see we removed the curved parts of F1201E-R and F1201E-L since the Jabiru does not require an oil reservoir. See photo at left.

Install firewall grounding lug to firewall as pictured.

Install battery ground to firewall grounding lug as pictured.



Locate the starter solenoid (this part comes in the Jabiru 2200 engine accessory bag) on the fire-wall in the lower pair of holes in the RV-12 firewall. These pre drilled holes were originally for the Rotax solenoid and the Jabiru solenoid mounts in the same place using AN4-4A bolts and AN960-416L washers. Since the upper pair of holes will not be used install a AN4-4A bolt and AN960-416L washer in each of the holes to seal the firewall.



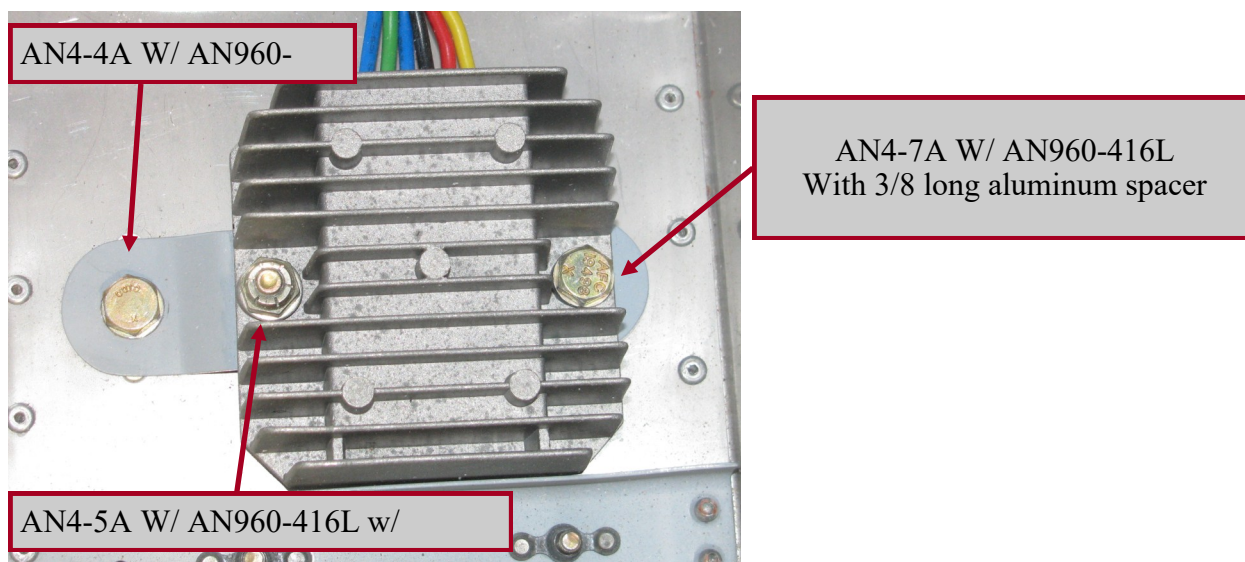
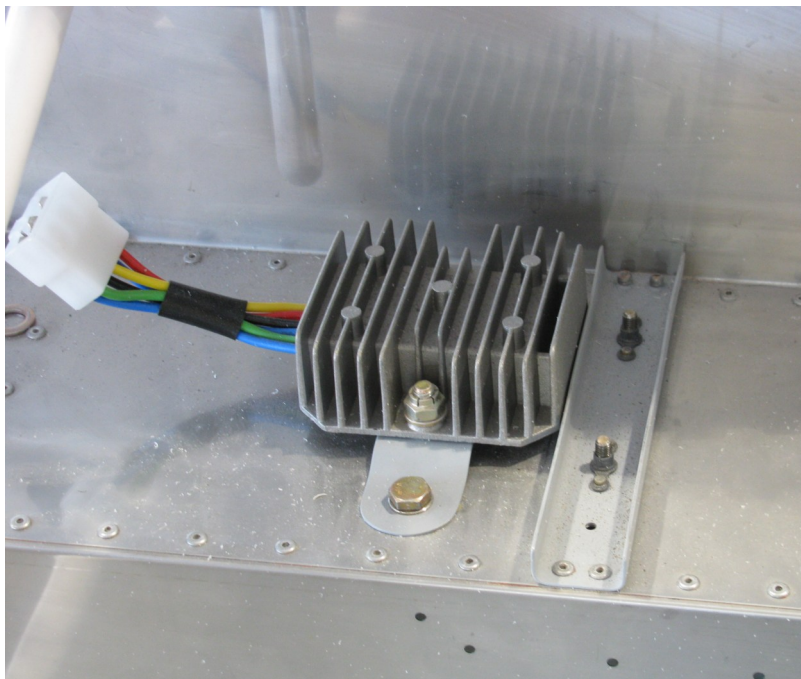
Install AN4-4 bolts and
AN960-416L washers in these
two holes.

Voltage Regulator

We chose to locate the voltage regulator on the pilot side of the firewall on the horizontal step section. The regulator is first mounted to a aluminum strip which fits the Van's pre drilled holes for the Rotax regulator. Use the bolts called out in the photo below.

Bolt the regulator to the aluminum strip by installing the AN4-5A bolt, AN960-416L washer and AN363-4 in the forward hole in the aluminum strip. Then bolt the aluminum strip to the firewall using one AN4-4A with AN960-416L washer in the forward hole and one AN4-7A with a AN960-416L washer at the rear. A 3/8 long aluminum spacer is installed on the rear bolt between aluminum strip and firewall.

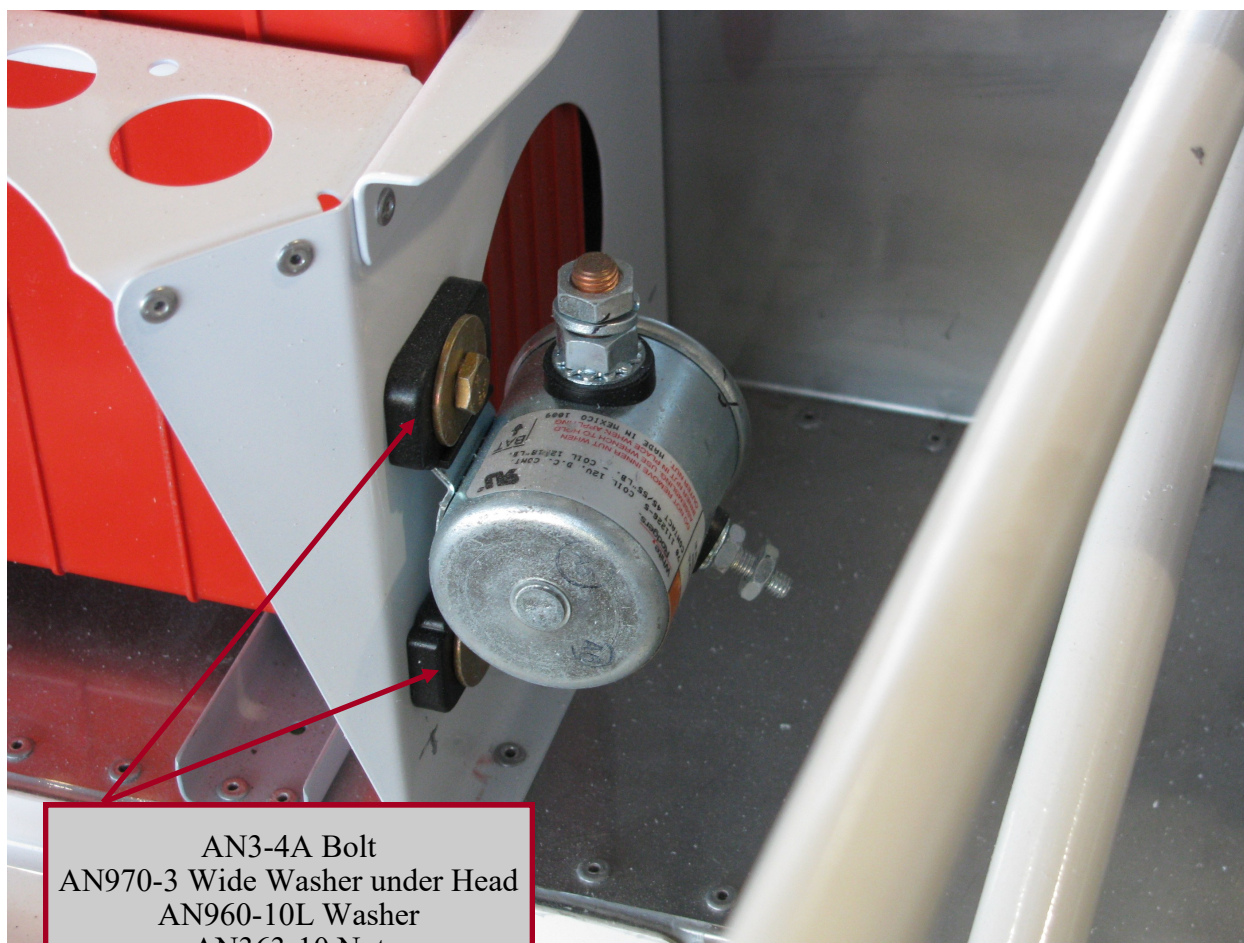
The bolts turn into pre installed nut plates per the RV-12 drawings.



Master Contactor

We chose to use a master contactor although it is not technically needed for a Jabiru installation. We located the contactor on the side of the modified battery box as there is not room above the starter solenoid to mount it as Van's does in the Rotax installation.

Location is optional at builders discretion. The FWF kit includes hardware to mount the contactor on the modified battery box.



AN3-4A Bolt
AN970-3 Wide Washer under Head
AN960-10L Washer
AN363-10 Nut

Component List

Induction & Carb Heat

Quantity	Item	Description / Function
Airbox		
1	JU39-V	Airbox Assembly RV-12
1	33-2008-1	K&N Filter—Airbox
JU440-J Carb Heat Components Less Airbox		
1	JU445	Carb Heat Muff Assembly
6 ft	05-29909	Aeroduct SCAT 2.25 inch
2	5415K74	Screw Clamp 4-1/8 to 7" Range
6	5388K34	Screw Clamp 1-15/16 to 2-1/2
1	731-1112	Choke Cable
2	AN960-10	Washer
1	JU304-4	Brass Cable Ferrel
1	98450A108	Brass Cotter Pin 1/16 x 1
1	4A454B0D	Cable End Collar
8	97525A425	18-8 SS Blind Rivet with 18-8 SS Mandrel Domed, 1/8' Dia, .188'-.250' Material Thickness

Carb Heat / Air Filter Components

This section outlines how we installed the carb heat / air filter box and the associated components for the carb induction and carb heat systems.

The carb heat / filter box has three components: The base with the attached flapper door, the top with outlet tube and balance tube fitting installed and the K&N air filter.

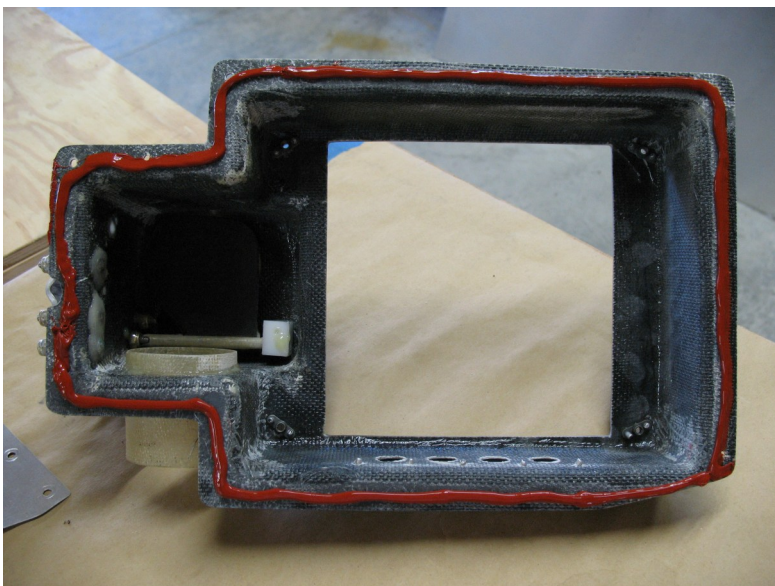


Pre mark four holes on the perimeter of the filter box evenly spaced around the air filter portion of the box. Rivets will eventually be installed at these locations to secure the box to the firewall.

Locate the air filter box on the co pilot side of the firewall. The top of the flange on the airbox should be flush with the top of the shelf.

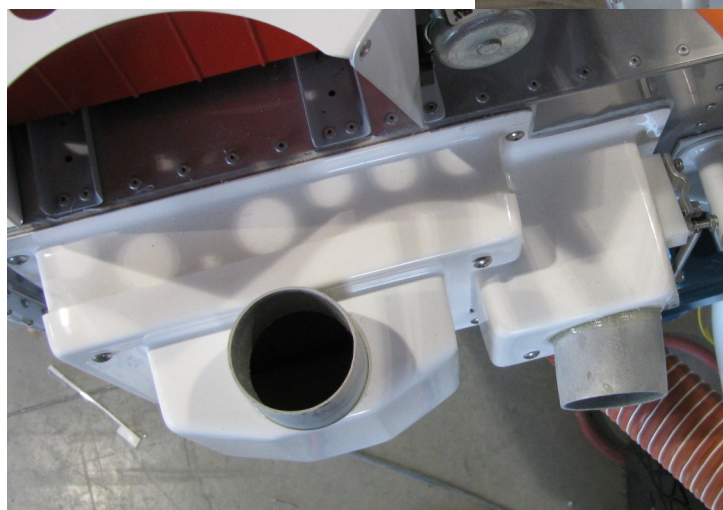
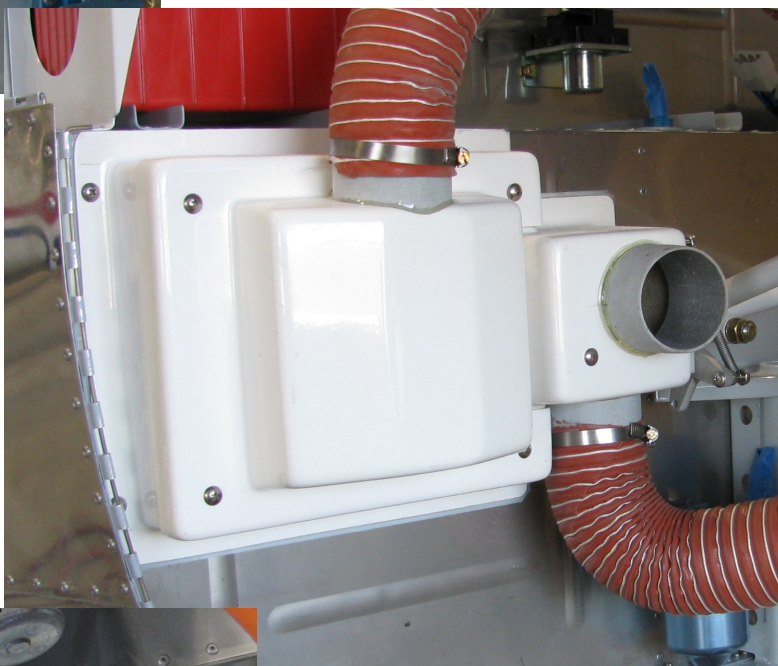
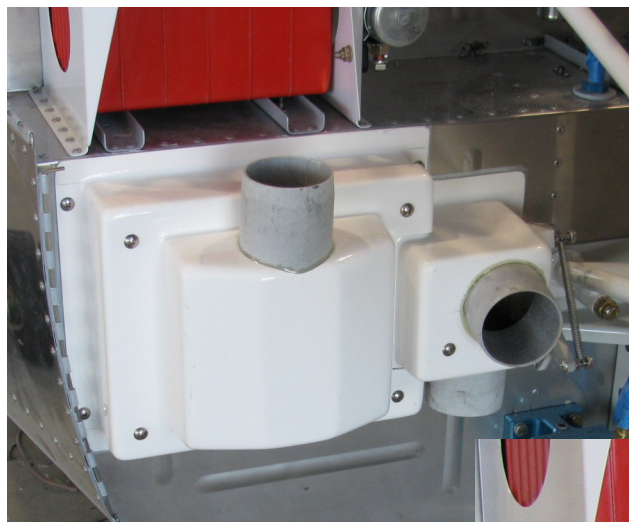
Hold the box in place with tape and drill through the marked holes with a 1/8" drill. Install clecos to temporarily fix the box to the firewall.

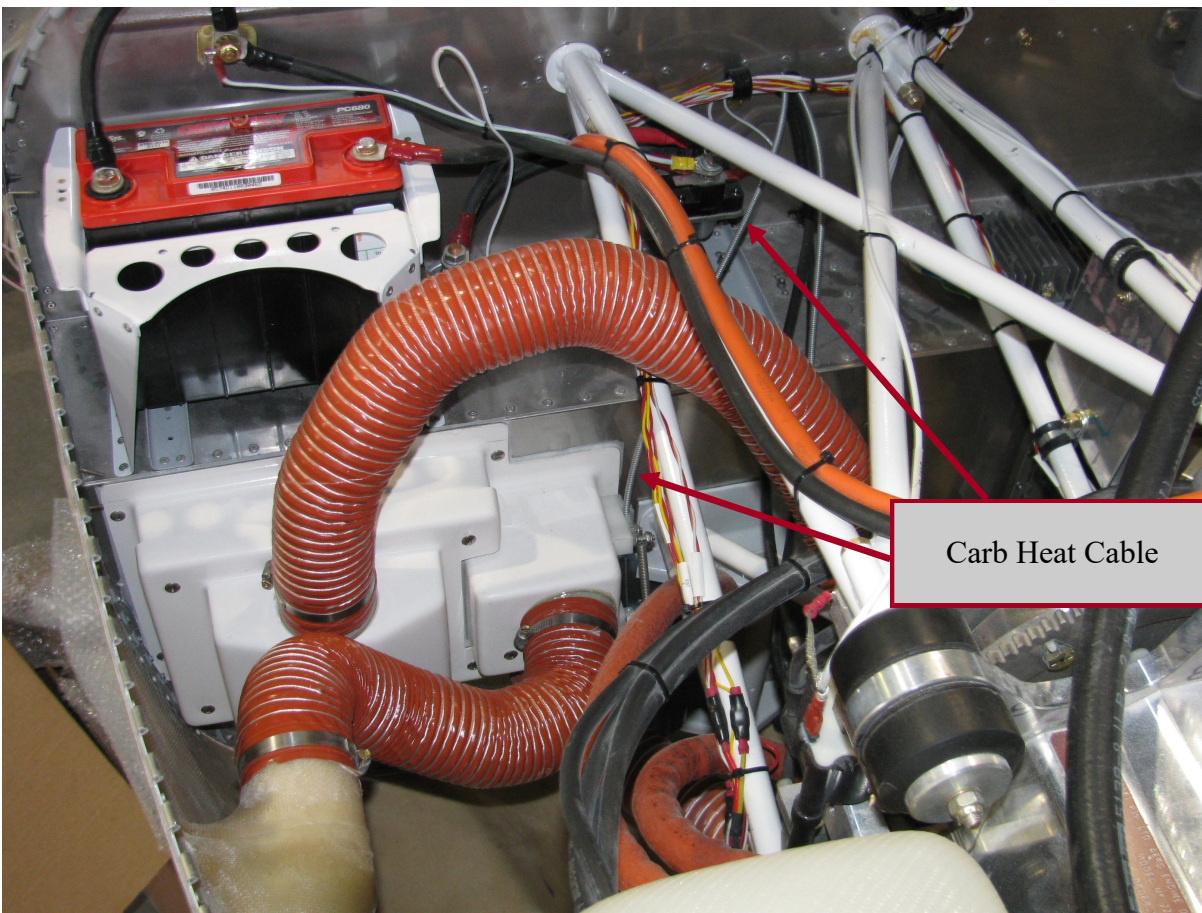
Do not permanently attach airbox to firewall until cowls are completed



Place a bead of hi temp RTV on the perimeter of the air-box bottom flange so that the bottom will be sealed to the firewall.

Rivet airbox bottom to firewall with the six 1/8 blind rivets provided with the JU440-J carb heat components kit.





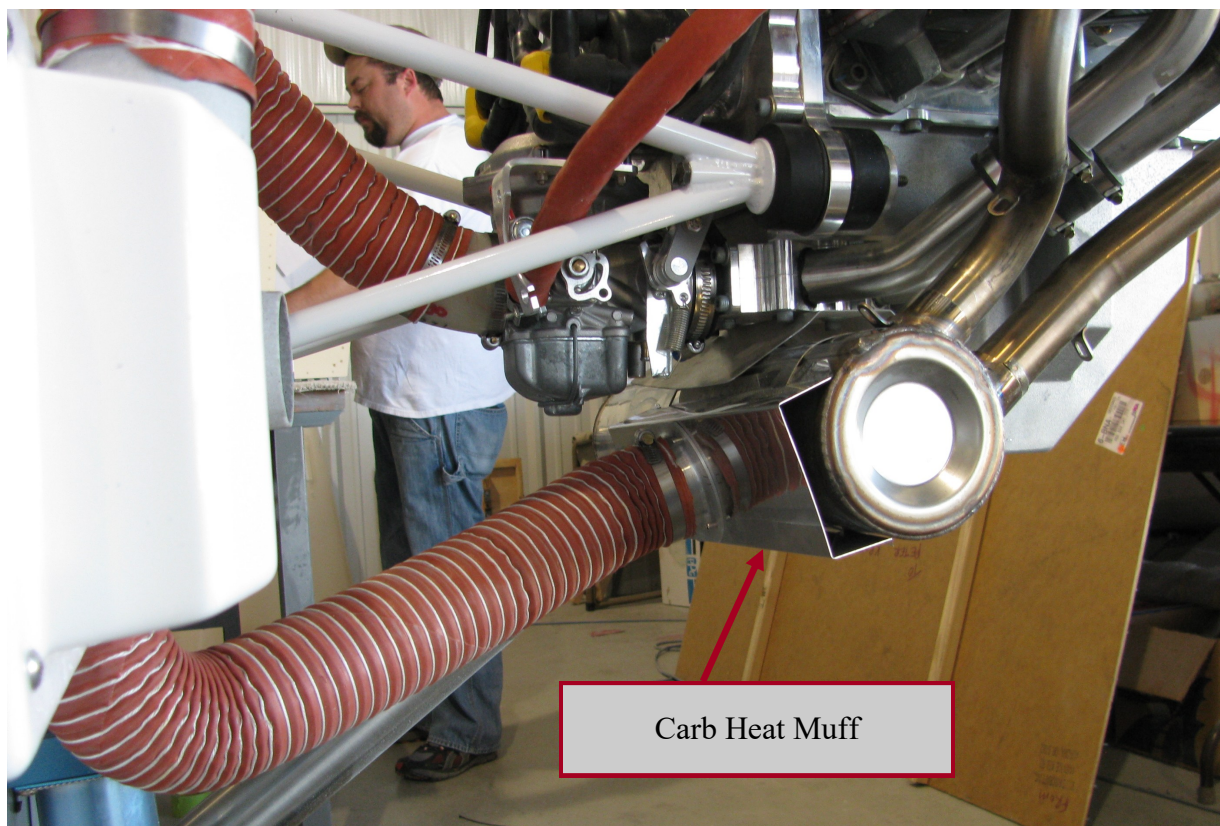
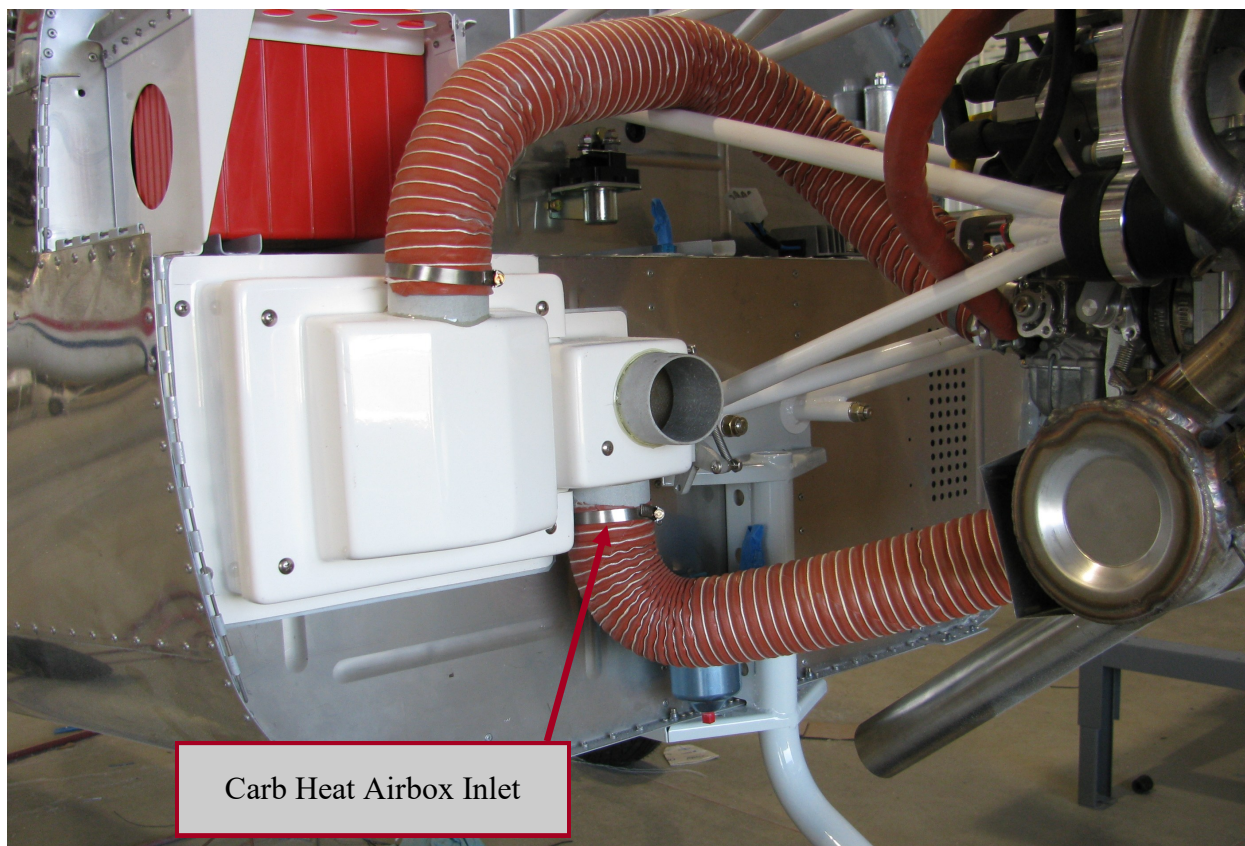
Install carb heat cable from instrument panel when panel is ready for final installation. Attach cable to airbox cam using the cable termination procedure.

Cut a piece of 2.25 inch SCAT to length and attach to starboard side NACA inlet and to the airbox fresh air inlet.

Cut another piece of the 2.25 inch SCAT to run from airbox outlet to the carb in the manner shown in the photos.

Finally, run another length from muffler heat muff to warm air inlet on the airbox.

Connect all SCAT with the clamps provided.



Oil Cooling System Installation

Instructions

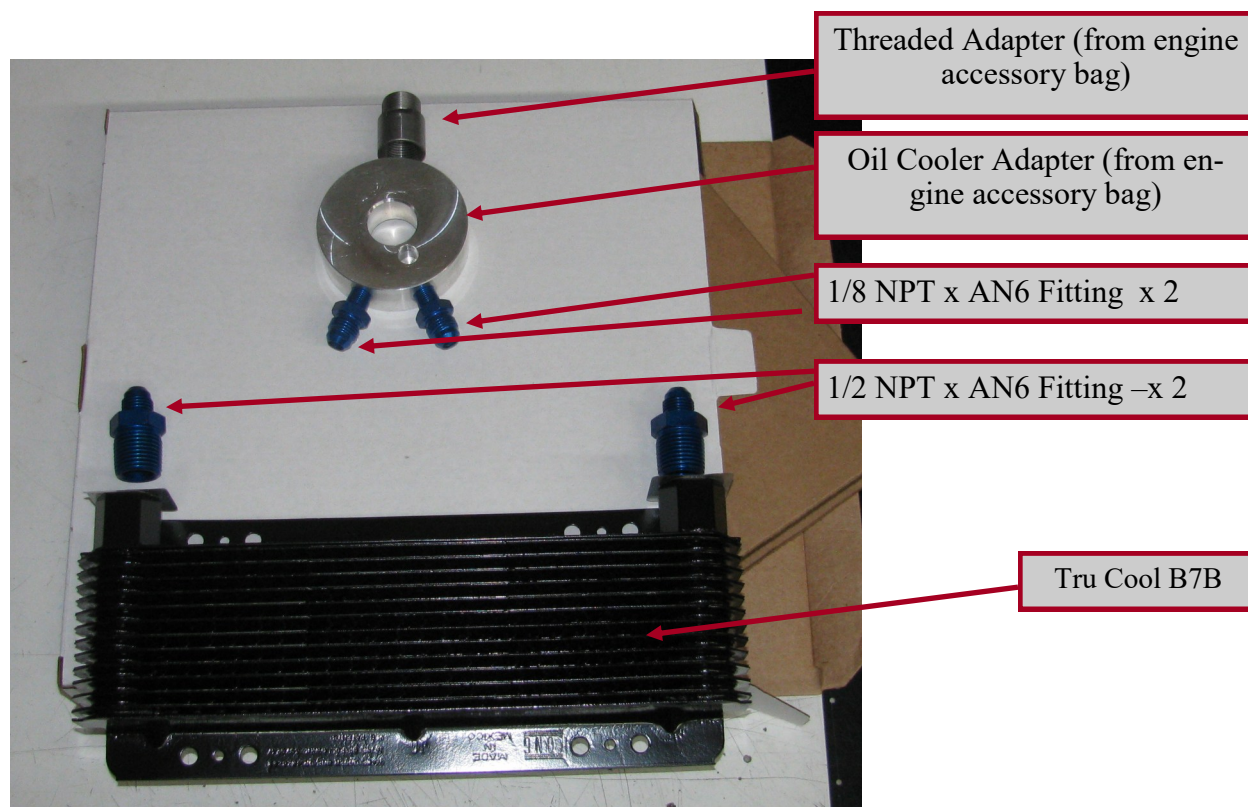
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Take Note

The first section of these instructions comes from the Jabiru J170 construction manual and shows the correct way to install the oil cooling radiator to the engine sump. However, Jabiru USA uses a different method for oil cooler fittings and lines than they use in Australia. The second section of the instructions shows how to hook up the cooler radiator to the engine. We do not recommend the hose barb and clamp method of oil line attachment that is depicted in the Australian instructions.



System Components from Jabiru USA

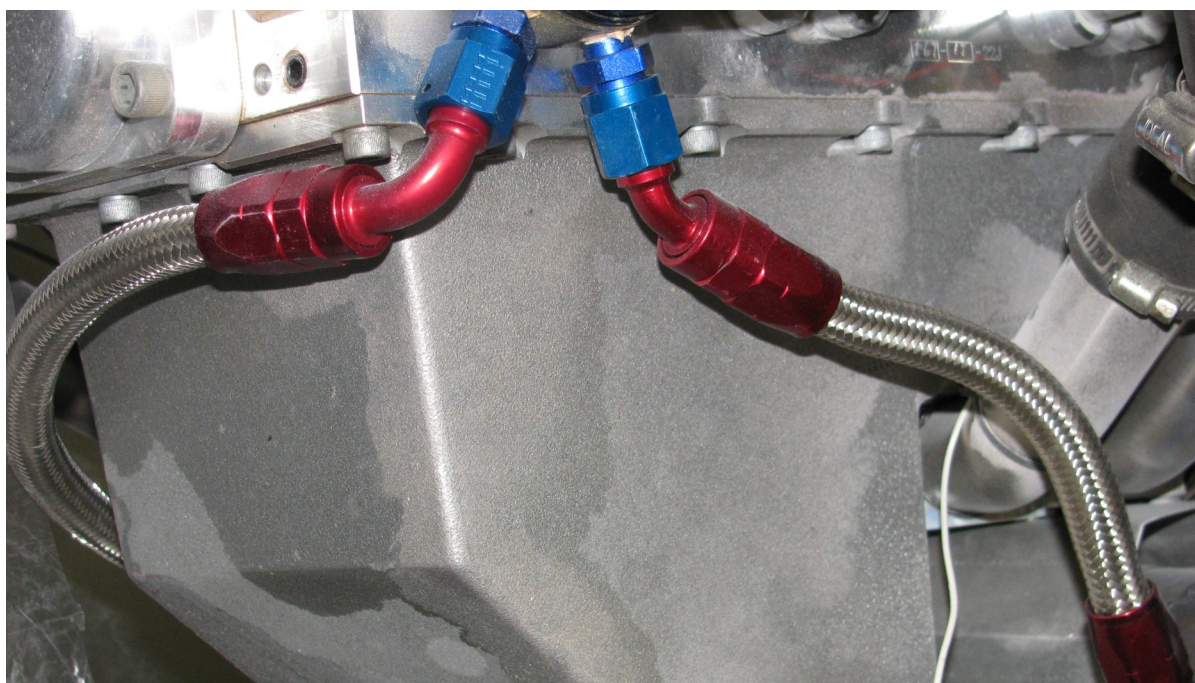
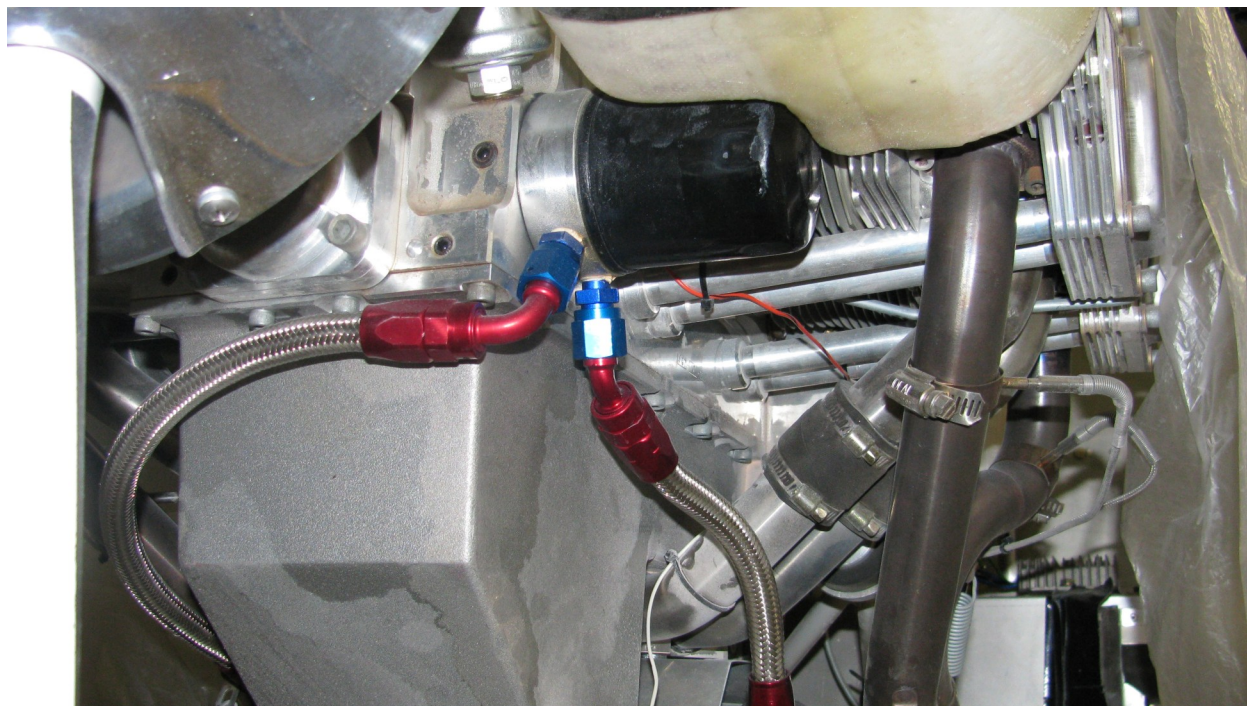


Install the 1/2 NPT x AN6 fittings into the oil cooler radiator. Take care to hold the hex nut that is welded to the cooler as you tighten up the fittings to avoid breaking the weld at the cooler. Use Loctite _____ thread sealer (or equivalent) on the fitting threads.

Install the 1/8 NPT x AN6 fittings into the oil cooler adapter using the same thread sealer. The oil cooler adapter and its threaded adapter comes with the Jabiru engine and is in the engine accessory bag under the shrink wrap that surrounds the engine.

Install the threaded adapter onto the oil filter nipple at the left front of the engine. No thread sealer is required here. Place the O ring into the oil cooler adapter and slide the oil cooler adapter over the threaded adapter and reinstall the oil filter. See installation manual for correct filter tightness.

Connect the SS Braided hoses to the oil cooler adapter as shown in the photo below.



Connect the SS Braided hoses to the oil cooler radiator as shown in the photos below.

