

## FITTING THE VERNER ENGINE MOUNT.

*Do this when the main frame work of the fuselage is built and the aircraft is standing on it's wheels, just before fitting of the pod and windscreen.*

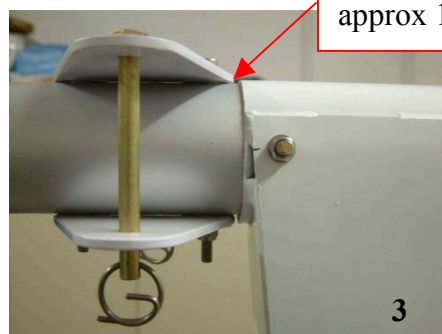


✈ **IMPORTANT** Build the aircraft as though the original mount were going to be used. This will ensure all parts are fitted and alignment is true. When the engine support tubes are removed again the framework will not collapse, but may just settle a little. Please watch out for this, and allow for it when reassembling.

✈ Remove existing engine mount, and either remove or lower, the engine support tubes out of the way.

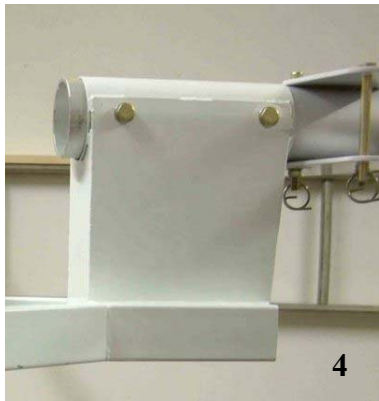
✈ The mount will fit on the keel and go as far rearward as the LE wing attachment. See pictures 2 & 3. It is advised on the Falcon to pre cut the keel to the required length approx 5mm longer than the mount, allowing for a small gap between it and the LE plates. On the Xair the keel will be only approx. 15mm too long and can be cut off later.

**NOTE:** Pictures show fitting to an Xair Keel.



✈️ Make sure the keel is de-burred before fitting the mount. Slide on the mount and if tight add a little 3&1 oil or similar. Leave a small gap between the mount and LE plates. Place a spirit level on the wooden floor and get the aeroplane level. Place the level on the arms of the mount and adjust to best position. Being exactly level is not critical, being level to the eye would be more important. Mark the keel for any additional cutting off in front of the mount.

✈️ Mark the positions of the Bolts as shown in the picture 4, approx 20mm in from each side. Drill a small pilot hole 3 – 4mm. Then drill out to 8mm. Work from both sides, checking spacings are the same. When holes are drilled run the drill right through from one side, slowly to insure alignment. Trial fit the 8 x 90mm bolts. Remove the mount, and deburr all the holes, and cut off any excess keel marked earlier.



✈️ Re-fit the mount and add some Duralac or waxoyl to the drilled holes and fit the bolts washers and nuts. Lift the engine support tubes into position shown in the picture. You may find that the tubes, need to be spread apart, more than they want. A slight change to the hole position with a drill at the bottom of the engine support tube is acceptable in extreme cases. Note Saddle washers are fitted between the tubes and the engine mount in two positions pictures 5 -7. On the Xair the engine support tubes will have to be cut shorter approx 30mm to fit.



✈ Mark a position on the engine support tubes, for the front 8mm attachment bolt, that lines up with a suitable position on the mount. Make sure the position doesn't correspond to the lug on the engine mount see picture 5. Drill the engine support tube first, (use a 3mm pilot drill like before) this might be easier done while removed from the aircraft.

Then drill the engine mount, using the tube as a guide to start the hole.

If your drill won't allow you to get at this then mark the position on the mount by turning the drill bit in your fingers and transfer the position of the mark to the other side, where drilling will be easier.

This will be a bit tricky, but the position is not critical, nor is having the hole correspond with the middle of the box section.

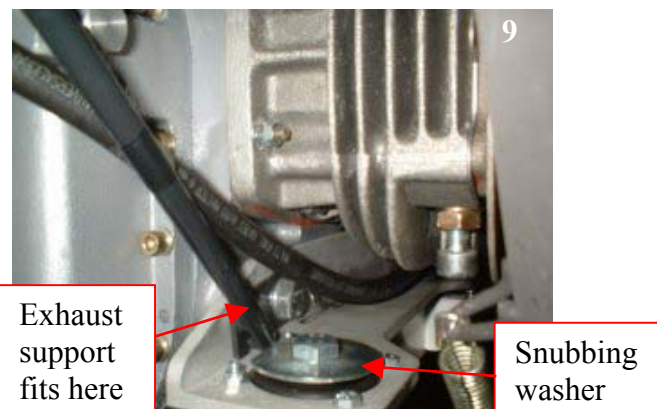
✈ Temp fit the 8 x 80mm bolt not forgetting the saddle and penny washer.

From below mark the position on the tube that corresponds with the middle of the 25x25mm box lower support. See picture 6. Drill this 6mm hole again removing from the aircraft might be easier. Drill into the engine mount and trial fit the 6 x 80mm bolt and saddle washers.

✈ Do the same thing for the other engine support tube and when finished remove the bolts and deburr and treat the holes with duralac like before.

Refit bolts but do not tighten as they will need to be removed for fitting of the windscreen. You will also need to drill the 6mm bolts for a split pin as they are fitted inverted.

✈ The engine support tubes will now no longer line up with the holes in the screen, a template has been provided for new hole location. Lay the template over the screen and mark and cut out position of new hole. Note the port side is longer due to the fuel pipe and throttle cables. A simple vent can be made up for the existing hole or one purchased from Wessex LAC or Xair Ireland. See picture 8.



✈ Bolt the rubber engine mounts supplied with the engine into the Aluminium angles with 5 x 15mm bolts. The mounts are fitted to the bottom of the aluminium angle.

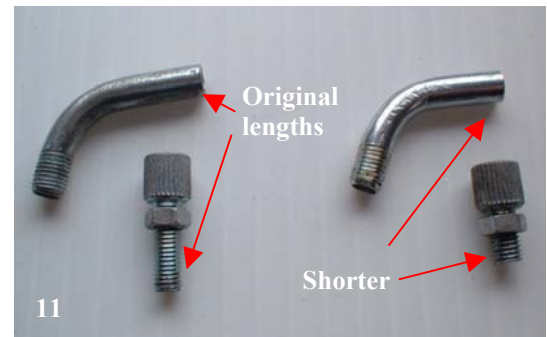
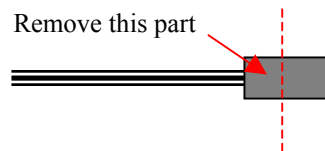
✈ The aluminium angles are bolted to the engine with 4 of 10 x 25mm bolts. The heads of these need to be drilled first for locking wire. Fit the aluminium angles to the engine along with the exhaust support mount to the rear bolts. See picture 9.

✈ Lower the engine in place on the mount, and locate the 4 of 10 x 45mm bolts with large snubbing washer under the heads, and fit washers and nylocs.

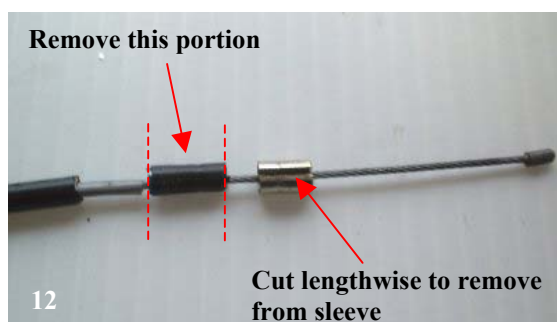
**NOTE Do not fit exhaust system yet to make access easier to other items.**

✈ The throttle cables supplied with the kit are designed to fit the rotax 503/582 engines. You can either discard these and make up new ones as done for Jabiru & 912, or, with a little modification the kit cables can be altered to fit. Follow instructions below for this.

1. First remove the two cable adjusters and arms from the carb tops and remove the screw holding in the choke plunger and spring. Separate the items.
2. Identify the choke and throttle cables, one pair is longer than the other for the further away carb.
3. In order to fit the choke plunger the nipple on the ends of the choke cables will have to be made shorter. Do this by cutting away some of the upper portion not on the end. See drawing and picture 10.

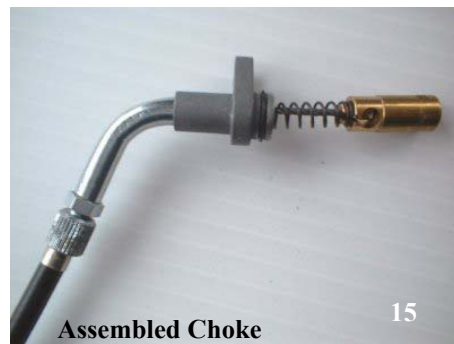


4. In order to have sufficient inner cable the arm needs shortening, cut approx 4 –5mm from the end. The cable adjuster will also need shortening as well 3-4mm.
5. Slide onto the cable the black rubber cable seal. Assemble the choke plungers, screwing in the arm as far as possible, and make sure that they are working correctly, with some slack in the cable that can be adjusted later. See picture 15.
6. The throttle cables require shortening of the black outer sleeve approx 13mm (1/2"). Best method is to, start cutting with a small hacksaw, and then snapping off. Go slow and you won't damage the inner cable. Then cut lengthwise, so you can remove the end. See picture 12.



7. Trim back 8 –10mm of black outer sleeve as in picture 13 and refit end. You can add a little tape to secure, it will be contained in the cable adjuster so it can't really go anywhere.
8. Remove the top of carb, and unscrew the arm, remove spring and slide.

9. Fit rubber cable seals as before and slide on the cable adjuster/arm and thread through the carb top. Screw in the cable arm the full way. See picture 14.
10. This job is tricky, fit the spring over the cable and compress it as much as possible with the tips of your fingers, pulling out the inner as much as possible, with the piston in the other hand, push up the needle with your finger and locate the end of the cable in the hole on the bottom of the slide. You will note it has to go in further than needed so that it can move sideways and locate in its groove.

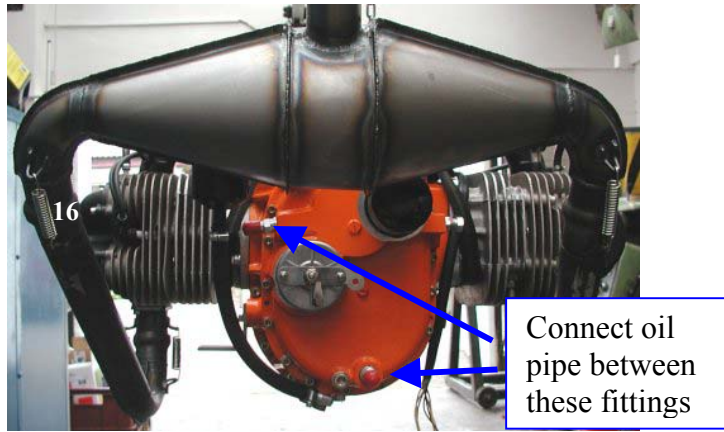


11. Fit the slide back into the carb, noting groove for the locating pin. Fit the top making sure it is on the correct way as it is off set to one side.
12. Check to make sure that the slide can fully bottom out on the carb, you should have some slack in the cable outer.
13. You will need to make a small bracket to fit to the side of the engine to mount the cable combiner as can be seen in picture 17.
14. Fit choke lever to engine support tube in cockpit, and adjust the cable adjusters on the carbs so that there is a little slack in both choke cables with the choke lever off.
15. Connect throttle cable to throttle levers and carbs need to be set that both of them are opening and opening the same amount, at the same time. This really needs to be done by someone who has done this in the past.
16. When set make sure the carbs are fully closed (idle) when lever is back, and the throttle lever is hitting the forward stop on the floor before the slides in the carbs are at the very top. This is to prevent the end of the cable (nipple) being pulled off.

✈ Ignition unit and regulator can be located as shown in the pictures 17 & 18, or alternatively a plate can be made for securing them inside the wing.

✈ Connect up the wiring as shown in the engine manual, following instructions below.

✈ An oil pipe is supplied with the engine. This needs to be connected between the two fittings on the engine. see picture 16. This is normally used for the fitting of an oil cooler which is not required on the Xair or Xair Falcon.



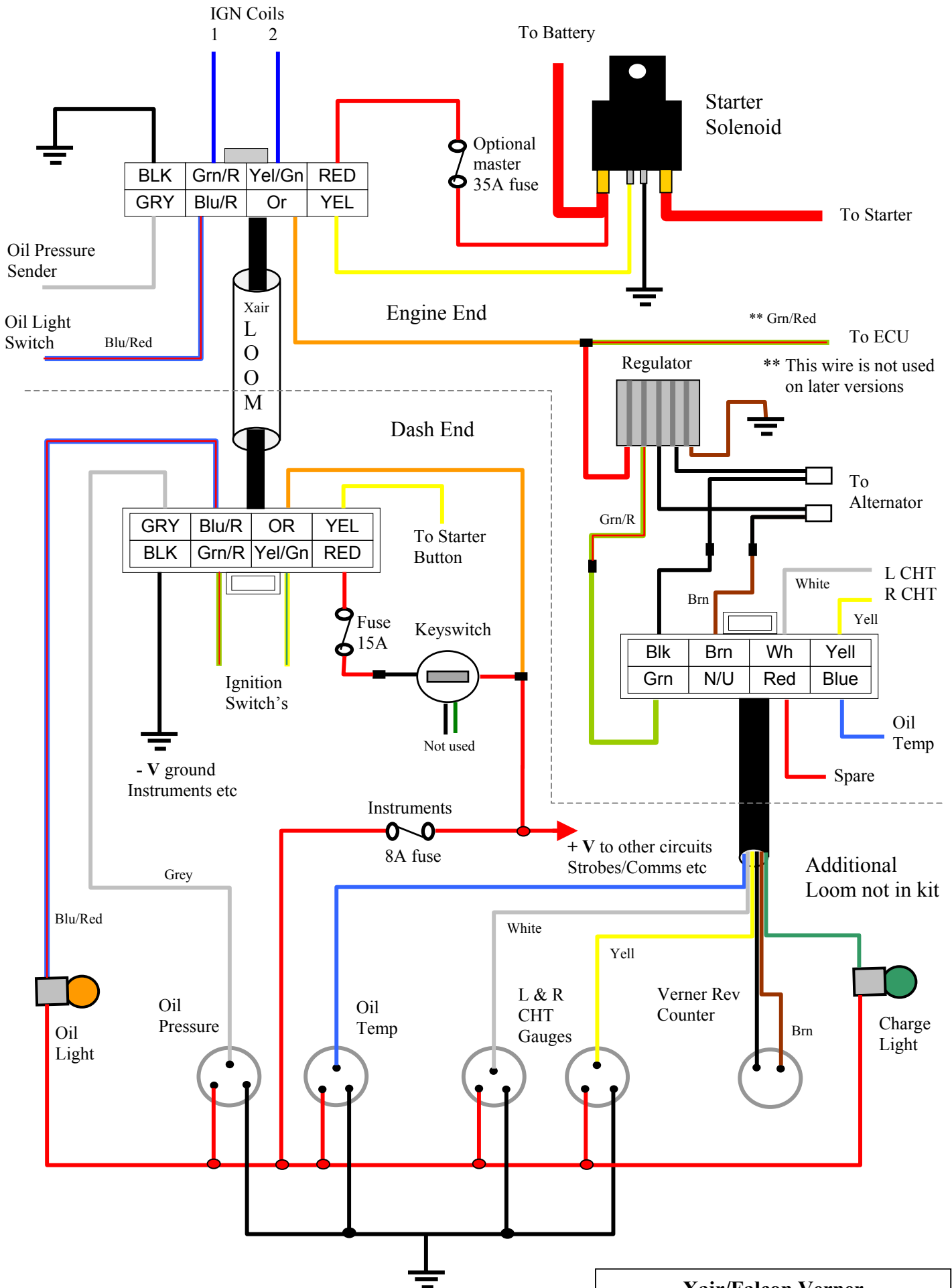
✈ When all the wiring and throttle cables etc are finished you can fit the exhaust system as shown in pictures 17 & 18. The silencer is secured to the bracket by two large jubilee clips which go around the silencer each side of the output pipe.

✈ Remember to wire lock the exhaust springs and the engine bolts drilled previously when finished.



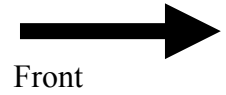
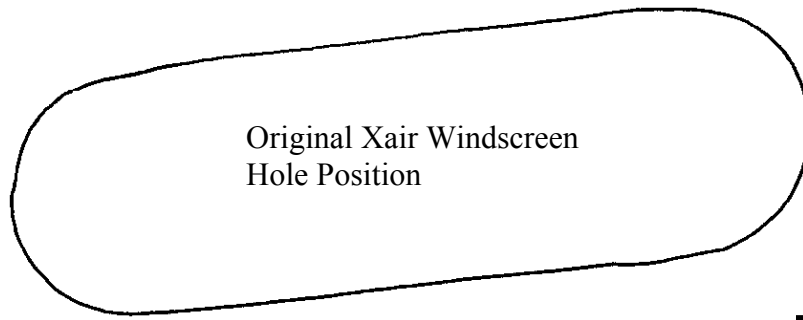
## Wiring Notes

- ✈ Study diagram below, comparing it to both the Verner diagram in the engine manual and the Xair diagram in the builders manual.
- ✈ Battery should be at least 17ah capable of delivering high cranking amps. Battery's like "Red Top" 20 or 25 are ideal as they have a very high cranking amp capacity, even though they have a lower actual battery capacity.
- ✈ Battery cables should be 16mmsq Tri Rated multi-flexible, generally a set of Car Jumper cables can be cut for use, provided they are the 16mmsq type. The negative should run direct from the battery to the engine, preferably at the starter. A good quality cable should then be taken from the engine ground to the airframe.
- ✈ The Starter solenoid can either be mounted at the engine end or beside the battery. Fitting it beside the battery insures that the large 16mmsq cable running the length of the keel is only live when the starter button is pressed. This is for prevention of a short if chafing develops over time. This is not essential just a good idea. If you choose to fit the solenoid at the battery end then it is suggested a master 35A fuse is also fitted at the battery for the RED positive wire that is the feed to master key switch.
- ✈ Follow the diagram closely, changes have been made to the original Xair layout. The Verner regulator Red wire must connect to the ECU Green/Red wire at the engine end, this then connects to the battery when the master Key switch is turned ON.
- ✈ **Note:** The Dashboard end of the original Xair loom, switch's etc is not shown for clarity, refer to the Xair wiring Diagram in the builders manual.
- ✈ At the engine end of the Xair Loom there is an 8-way socket with two yellow free-ended wires, which are used for connecting to the regulator on a 582. Remove these two wires from the socket and remove the spade ends so that they can be reused for installing the Orange and Blue/red wires into the 8-way socket. I have found the best method is to cut the wire at the end of the spade and then solder the new wire on top of it.
- ✈ At the dashboard end of the standard Xair loom, use the Grey wire for oil pressure gauge and the Blue/Red wire for the Oil Light (supplied with engine).
- ✈ Additional wiring needs to be added to connect up extra items like CHT senders battery charge light etc. Recommended method is to use a piece of 7-core Trailer cable available from halfords or similar car accessory outlet. Alternatively an additional Pre made loom is available to purchase from the Wessex LAC or Xair Ireland, which will feature a plug and socket similar to the original Xair Loom. This is what the diagram below shows.
- ✈ It is suggested to fit fuses for the various circuits. All the instruments can be on the one fuse say 8A and Comms (radio/intercom/gps) use a 3A, Strobe if fitted 3A, etc.



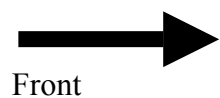
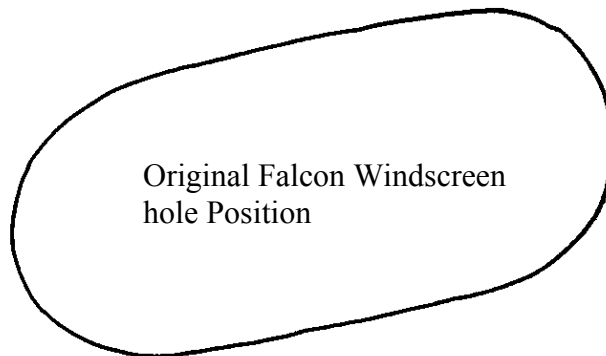
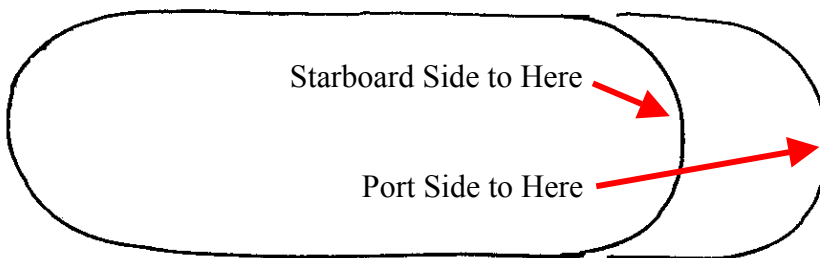
**Xair/Falcon Verner**  
 Wiring Diagram  
*Seamus O'Donnell*  
 Xair Ireland 02/04





## Xair Windscreen Template

Starboard Side Shown  
Reverse for port side



## Falcon Windscreen Template

Starboard Side Shown  
Reverse for port side

