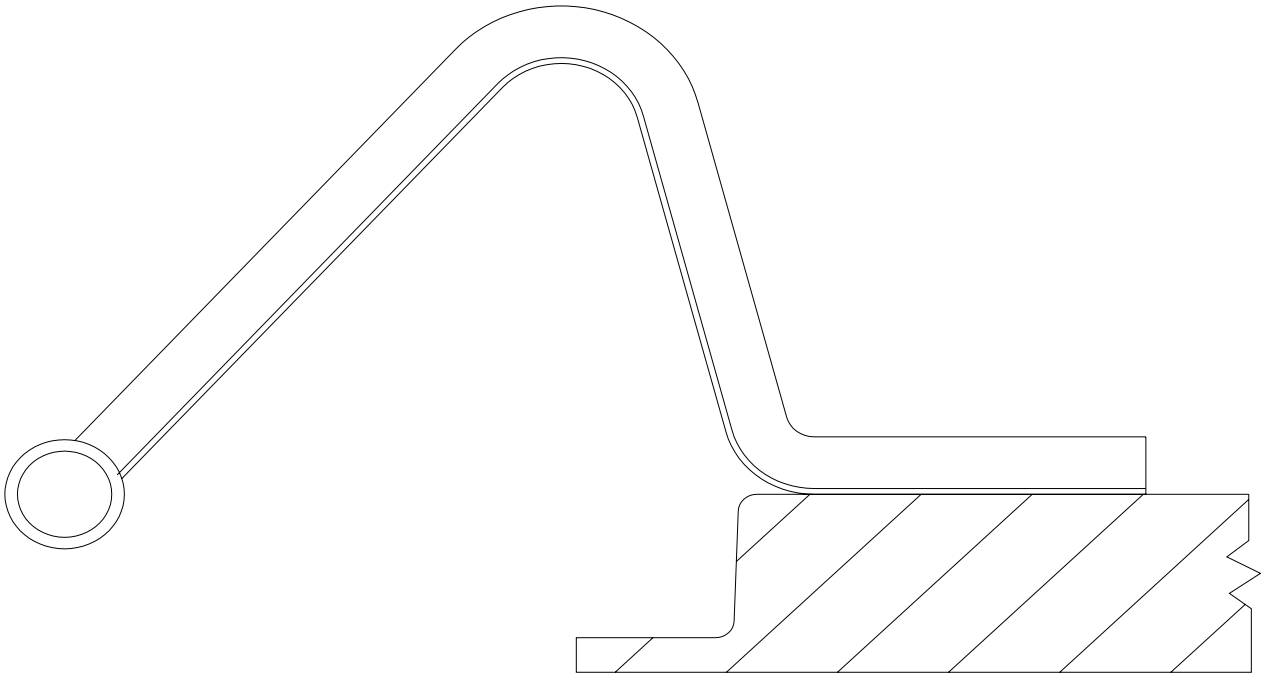


Fitting the bonnet and hinges

1. You will require either a **M6** nut insert tool **OR M6 heli-coils (re-coil) inserts**. These can be obtained from a good fixing shop or Kit Car parts supplier.
2. Fit the bonnet hinges in-between the lugs of the hinge cross-member, to give you the correct distance apart. With a tape measure the “pitch” of the hinges at the pivot end and then the bonnet end to make sure that the distance is the same. If there is a difference of more than 1.5mm 1/16th of an inch then swap over the hinges and try again. We gig make all these parts but small tolerances can make a difference when fitting.
3. Fit the cross member in-between the two protrusions on the inner wings that are shaped the same as the end of the cross member. If it is not a tight fit wedge each end with the same thickness of card, just until it will stay in place on its own.
4. From the bonnet opening lift up the hinge and make sure that it does not foul the GRP of the opening lip, it must have at least 2-3mm clearance from the lip, move the cross member until it has the correct amount.
5. With the cross member mounted as high as it will go drill a small 6mm (1/4”) hole and fit one “tack bolt” each end into the GRP inner wing .
6. Lay the bonnet into position and with a 1mm larger gap at the front edge of the bonnet even up the shut gaps.
7. Push the hinge end up to the inner skin of the bonnet and mark the hole positions with a sharp scribe.
8. Place the bonnet (hood) on a suitable table or work mate, with blocks of wood chocking it to stop it from moving around when you apply pressure to it when you are drilling holes. A tip is to fill a carrier bag with sand / gravel and place it in the center of the bonnet, this will make it much more stable to work on and save any bad language that the kids could overhear.
9. Now lay the mounting end of the hinge with the two 10mm holes onto the flat area at the front of the bonnet, and line up the hinges to your scribed marks, so that the bend of the bonnet hinge is on the front edge of the GRP flat area. ***NOTE: There are three marks on the bonnet each side where the “old” python hinge was fitted. One of these holes should be very close to one of the “new” python hinge holes.***
10. The below sketch shows the approximate position of the hinge on the inside of the bonnet. It’s hard to clamp the hinge in place due to the shape of the bonnet on the out side, there is only one real way to do it and that is to use a rubber sheet under the clamp foot on the out side of the bonnet, of around 3mm 1/8 thick. If you cannot clamp hold firm with one hand and mark the holes as stated below (6).
11. With the tape measure make sure that the “pitch” of the hinge is the same at the bolt holes end on the GRP as it is at the pivot end, and that they are square to the bonnet. With a 10mm drill bit mark the positions of the two holes on the GRP, **do not drill to deep just mark the positions!!**
12. If your marks are a long way different then you may need to re-set the cross member, and try again before drilling any holes, once you are sure it fine to drill out the holes.



- 7.** With the holes now marked, remove the hinge's and "pilot" drill through the inner skin of the bonnet. Make sure that the hole does not wander off center, there is a metal plate bonded into the lay-up of the hinge mounting point. This will need to be drilled with a **NEW or NEWLY sharpened bit** as a dull bit can cause overheating of the GRP that will weaken the lay-up and can even cause a fire.



- 8.** Open up the **four** holes to the finished size, **IF** you are using **hellicoil** then this should be around **6mm Dia** OR **nut inserts** as in the pictures it will be around, **9 – 9.5mm** depending upon the make and type of the insert.

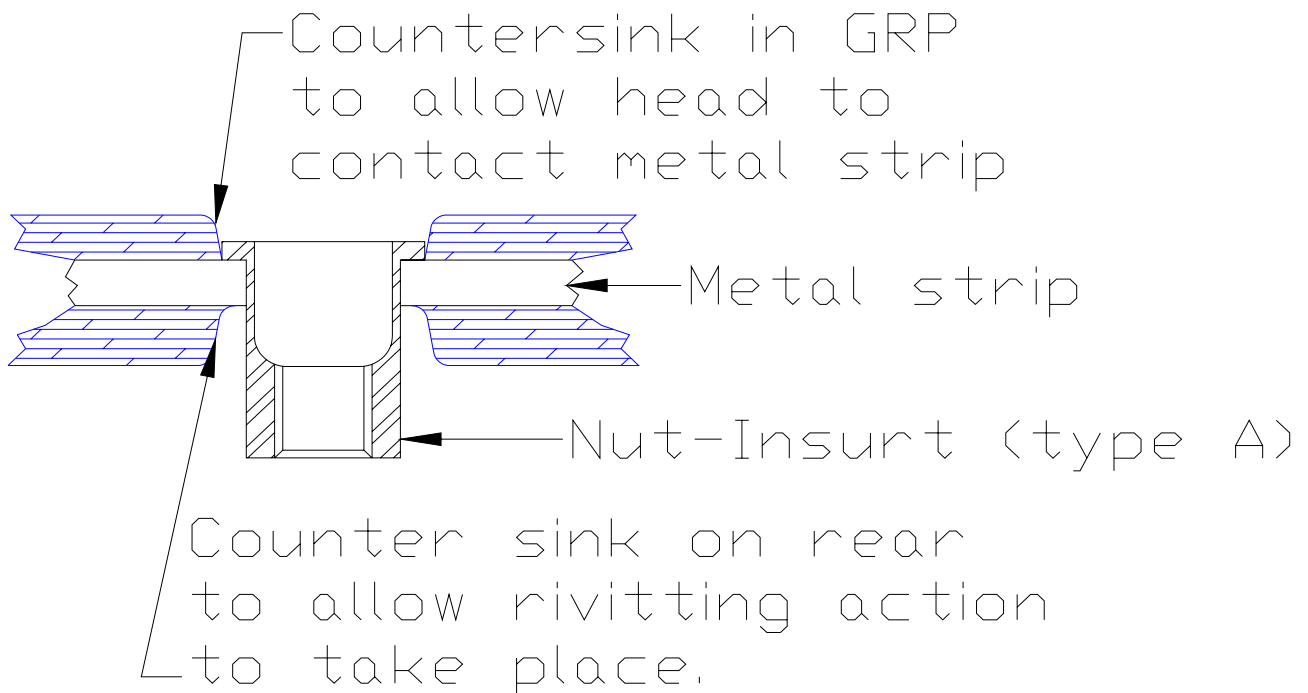
9. Method for Hellicoil (Re-coils) M6 x 6 or 8mm long.

- I.** Tape out the **four** holes with the insert tap that is provided with the insert Kit, this is a special tape that is only for the inserts you have and will rarely be of use for any other job than it was provided for,
- II.** Place the thread insert coil onto the end of the inserting tool, and locate the "**TANG**" on one end of the thread insert into the slot in the inserting tool. Adjust the collar on the stem of the tool down to contact the back of the thread insert, and tighten.

- III.** Hold the insert on the end of the tool (if it will not stay in place on its own) place it square over the taped hole and twist the tool **CLOCK WISE** to thread the insert in, keep turning until the last thread just goes into the GRP.
- IV.** Remove the insert tool. You now need to “**break off**” the Tang. This is done with a small piece of rod that some times is supplied with the Kit or a pin punch. Simply place the rod in the center of the insert you have just fitted and “**TAP**” with a “**SMALL HAMMER**” and the tang will fly off, as it has a “**nick**” in it to allow this to happen.
- V.** Repeat this for all the holes, you now have four very strong fixings into the GRP that will not easily come out or wear away. As you will be removing the bonnet more than once in your build as it is much easier to work on things with out it.

10. Method for Nut-inserts M6

- I.** There are **Two** types of these, **A:** is for “**THIN SEET**” 0-3mm **B:** for “**THICKER**” sheet 3-4mm. Type **A** looks like a “Top Hat” in shape and are the ones we used. Type **B** have only a small lip at the top and are more “tube like” in shape.
- II.** To make sure that the hinge fits flat onto the mounting face of the bonnet the Nut-inserts must not protrude above the surface, and require that they are “Countersunk” into the GRP. With this in mind the metal plate in the lay-up is a round 3mm under the surface, to allow for the head of the insert to be below the surface of the mounting face.



- I.** To cut these counter sinks you will need either a ball ended Rotary Burr **OR** a flat “flying soccer” type “Mounted point” grinding stone (if you have a Air DIE Grinder you may have these in a kit of stones that came with it). As the GRP is “soft” compared to the metal strip it can be removed with out too much work.
- II.** To make the rear countersink place the Burr/stone through the hole and running the shaft of the burr/stone on the edge of the hole in the metal and pull up from the rear until you reach the back face of the metal, as the diagram above. Repeat this on all the holes.



III. The above picture shows the countersinks before fitting of the nut-insert. **Note** you can just see the marks for the original Python hinge, your hole should be very close to the third hole in from the outside of the bonnet.



IV. With your Rivnut tool Place the insert in to the hole, and “pull-up” in position. Make sure you do not lift the insert out of the hole as you close the handled of the insert tool together, as this could form up on the wrong side of the metal strip. **A tip is to thread the insert only $\frac{3}{4}$ of the way down the stud on the tool this will make the handles closer together and give you more leverage, pull up, thread on more to complete the operation.** Repeat on all four holes.



V. You should now be able to bolt/screw your hinges on in position. We use M6 countersunk screws at this point as they self center in the 10mm bolt holes. This helps when fitting the cross member to the body as it make's sure that the bolt hole is not at the maximum adjustment but is in the center of the adjustment. **This is a good tip for all bolt holes that have adjustment!**

11. Check the thickness all around the edge if the bonnet. It should be around 5mm, if there are "Thick" areas then these will need to be sanded down and blended off into the radius of the inner skin where it joins to the outer skin. **Note: do not cut into or thin the side wall of the inner bonnet! This could weaken the structure of the bonnet, only sand at the bonded edge!**

12. With card packing taped around the bonnet seal area, to lift the bonnet level on the out side (this may take one or two adjustments to make it right). Now lay the bonnet into the body, take care not to catch the hinges on the body as you fit it as you need to make sure that the hinge goes under the lip at the front of the bonnet opening.



- 13.** Set the shut line gap around the bonnet even, at the windscreen end and the two sides and a round 1mm more at the front hinge end. (this is to prevent snagging the paint when in use)
- 14.** Fit the hinge cross-member in through the nose opening in-between the raised areas on the inner wings (these are the same shape as the ends of the x-member), insert the hinges in-between there lugs and insert the **Two M6 x 70 h/t bolts** through the pivots.
- 15.** Twist the cross-member until it fits the shape of the raised area on the inner wing to the best you can,
- 16.** Place a “Tack” bolt in the hole and tighten up a little, (if there is a gap between the plate and the inner wing? Then you will need to shim it out with a packer. This can be an odd piece of GRP that you have cut out earlier in the build or any stiff sheet material, or large penny washers)
- 17.** Now the cross member is “Tacked” in position, re-check the bonnet position and adjust if required. Once you are happy with the positioning of the bonnet. pilot drill out all the other holes through the inner wings,
- 18.** Open up the four remaining holes (two each side) to match the size hole in the end plates. Fit two **M8 X 25mm** each side with as large a penny washer as possible on the wheel arch side GRP, which fits the flat area to spread the loads as far as possible. Remove the “tack” bolts and open up the holes full size.
- 19.** In the center of the cross member there is a slotted 3mm thick lug, this is to take a Bighead bolt as we used on the steel work inside the cockpit. The fitting of this fixing is the same as you have done in the previous section. Tack in place with P40 Isocon or “homemade” paste, remove steel parts and bond over. Once hard refit steel and adjust as required to correct height, with a nut & washer top and bottom of the lug.



- 20.** Now carefully lift the bonnet open, checking that the front edge does not catch the body as it opens. This can happen if the front edge of the bonnet is too thick. If it will not open without catching then remove the bolts from the pivots and remove the bonnet and thin down the front edge & blend away to the radius. It is best to have a radius on the inside front edge of the bonnet of around 3mm this will help with clearance.
- 21.** Refit the bonnet and retry, it should clear ok now. It must clear the body by at least 3mm or it will catch when it is painted. You may need to sand some more to obtain this clearance.

22. The next job is to fit the catches, and handles or covers. Onto the bonnet there are marks on the inner skin for the position of the “budget type” catches as below. The handles shown are the standard type used on Cobra clones but there are some problems in getting through SVA with these in the UK. It has been know that some unscrupulous people would just remove them before the test and fit “Key covers” (flat covers like on an old type filler cap) in there place and refit after the test. We do not condone it sort of thing of course!



23. Cut out the slots as marked to allow the catch to be inserted into position. Fit the catch in position, place a small amount of grease onto the end of one the handle shafts, push from the inside of the bonnet through the square hole in the catch until it touches the inside of the outer skin. This will leave a mark with a small drill bit make a hole through the outer skin, open up the small hole until the square shaft of the handle will pass through it.



24. Check that the shaft is running square through the catch, if its not drag the hole over until the handle base & shaft are as square as possible to the outer skin and catch. ***Note:*** make sure that you don’t have to move the hole so much that it shows from the base of the handle once it is fitted. If this happens it will be hard to rectify ***YOU HAVE BEEN WARNED!***



- 25.** Increases the hole in size until the handle fits down flat on to the outer skin, and allow a small amount of clearance for paint later, there are two small lugs on most makes of these handles you will need to file two small slots to take them to allow the handle to sit down correctly.
- 26.** Now the tricky bit, the two screw holes are very close to the two lugs, there are three way to fit the screws: **1.** use self tapping screws and just drill a small hole and self tap in the screws. **2.** drill and tap the GRP M4 and screw into the GRP this is best taped after painting just drill the tapping size hole 3.2 or 1/8" (the locks can be operated for testing set up with a large screwdriver) so no need to fit at this point. **3.** drill a 4.5mm hole each side and make a nut plate to be fitted on the inside of the outer skin, this is one of the best ways for strength but the most complicated. Its up to you how you do this job.



- 27.** Make the point to cut down the excess square shaft that protrudes past the inner GRP skin of the bonnet.
- 28.** You will need to manufacture two angle brackets for the tang of the lock to fit under. These fit to the bulk head (these can be obtained from RVD if required. These should be made from 4mm alloy 2.5-3mm steel and 2mm stainless steel, and require to vertical slots on the side that will be bolted to the bulk head, for adjustment of the bonnet height. As shown below the bolt holes are 8mm for a scale reference (but 6mm are fine as well).



- 29.** Gas rams, we used two 40N – 20” open length rams one on each side with brackets riveted to the bonnet opening lip and to the inner skin of the bonnet, bonnet lip plate show below. These can be made from Stainless Steel or Alloy.



- 30.** The bonnet bracket needs to be welded as it has to be made of two parts too spread the load over the inner skin.



