

Construction of the Graupner Micro Magic: Tips and Trouble Areas

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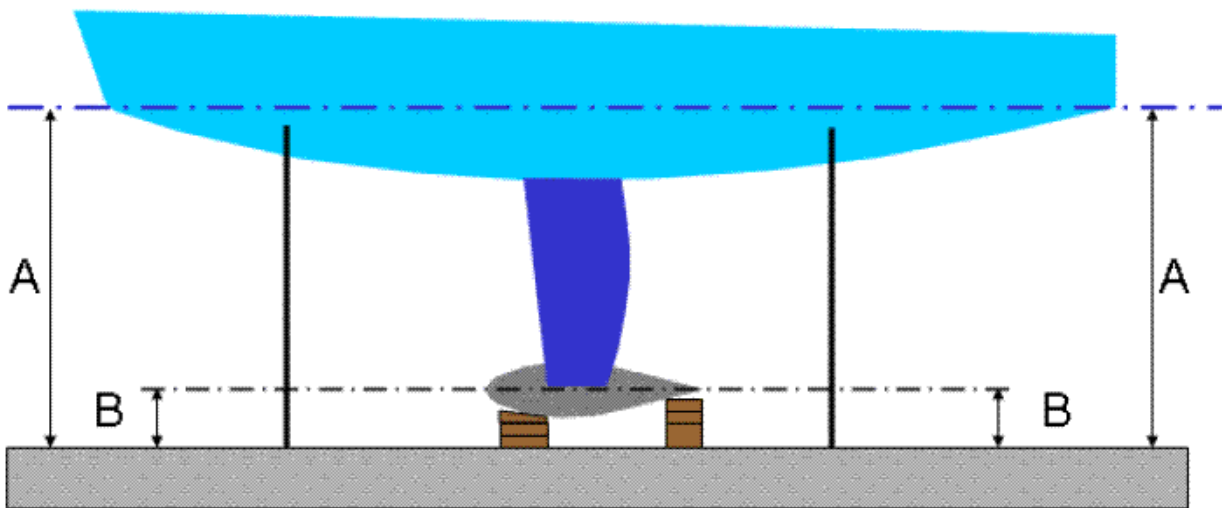
- Hull / deck fit:

The edges of the hull section at the bow should be sanded very lightly in order to seat well with the deck when the two are bonded together. Do not press the deck into the hull. The deck and hull will seat with a bit of tension (that is, it may seem as if the deck is too short for the hull). The fit of the two parts is meant to place some tension on the hull bow-to-stern, causing the hull to expand laterally thereby causing the seam between deck and hull to seat properly at the sides. This will result in good contact between the hull and deck edge. If there is too little tension the hull sides can separate from the deck edge, or the seam will be poor, causing dents. If there's too much tension the deck may fail to seat properly with the hull.

-The lead keel bulb is not parallel to the waterline:

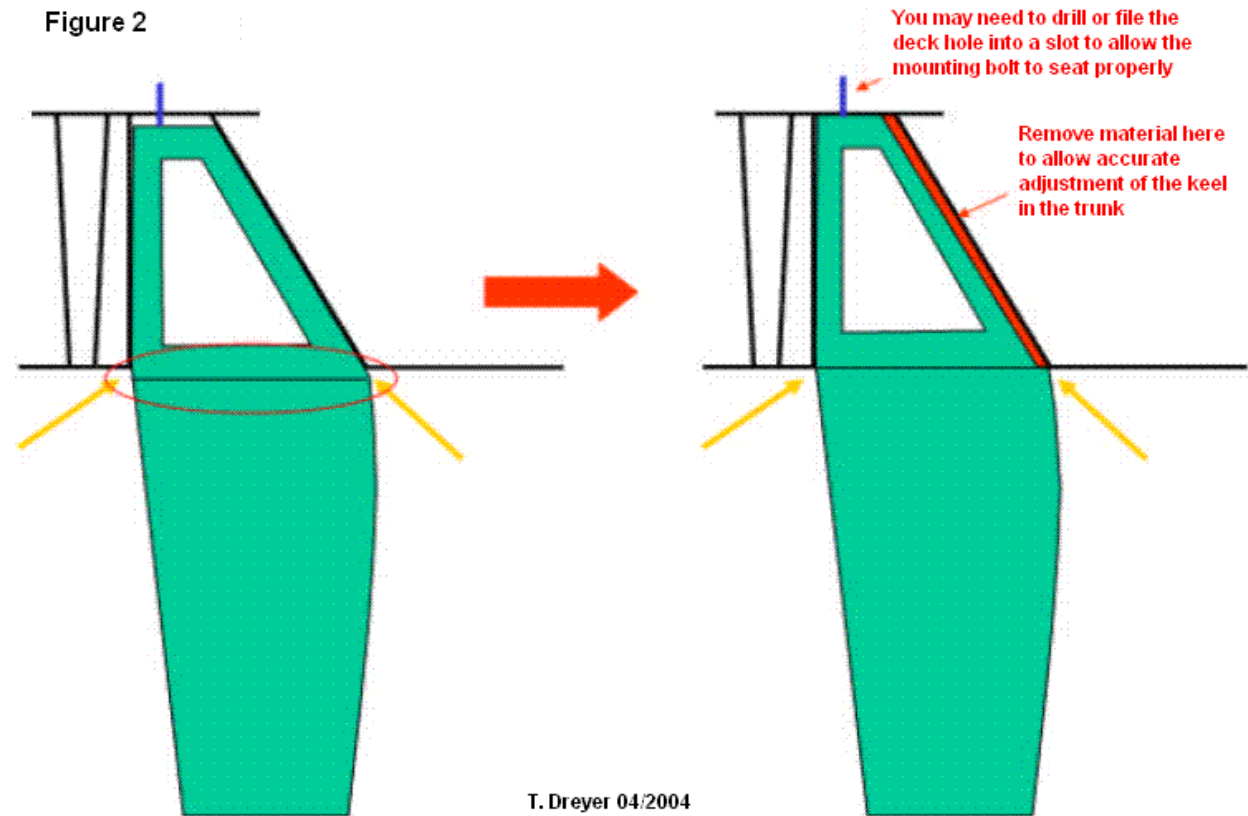
Do not glue the lead keel bulb to the keel fin until the hull and keel fin are assembled, allowing you to ensure the bulb is oriented parallel to the hull's waterline. Put the hull in the stand as shown in Figure 1. The bulb, shaped like a torpedo, should be oriented exactly parallel with the waterline as indicated in the drawing. Ensure particularly that there is no downward angle in the bulb. It may be necessary to file the lower edge of the keel fin to get the correct bulb inclination. Afterwards, with the boat still in the stand, carefully align the keel fin in the groove of the bulb and use small shims as indicated to shim it to the right angle. Once everything is well aligned bond the bulb to the keel with Stabilit Express.

Figure 1



If you notice this problem after you have already assembled and bonded the keel and bulb, then modify the angle of the entire keel to achieve the correct bulb inclination. Use a file to turn the hole in the deck through which the keel bolt passes into a slotted hole. This should give you some forward-to-back keel angle adjustment. It may also be necessary to remove material from the section of keel entering the hull to allow it to fit properly in the keel trunk with the new angle.

-The keel does not seem to fit properly in the hull trunk: The portion of keel fin meant to be completely within the hull has squared edges per Figure 2. Naturally having these edges and corners protrude under the hull is unfavorable to the hull's dynamics, but without some work this is what happens. You will need to remove material from the rear diagonal edge of the keel “tongue,” the section enclosed within the hull when installed. This allows the keel to be pushed further into the trunk.



-Leaking around a poor glue seal at the keel trunk:

The keel trunk – the sealed box in the hull through which the keel passes from below and the mast is inserted from the deck – is comprised of two ABS halves. Before bonding ensure they fit together without any gaps and rough-up the flat gluing surfaces with a file or emery board. Test-fit the keel fin in the keel trunk before bonding the halves, to ensure a good fit with the completed trunk (but watch that the fin is not inadvertently glued to the trunk). Use clothespins or bulldog clips to clamp the bonding surfaces of the trunk halves. Spread acetone on the inside seams with a brush, spreading

the acetone thoroughly over all seams within the mast and keel slots. The acetone dissolves the ABS slightly, making for very tight joints. Once the internal seams are acetone-welded remove the clothespins or bulldog clips and brush the acetone onto the outside edges. The finished keel/mast trunk should be attached to the deck and hull with Stabilit Express rather than acetone, since these joints are more difficult to make completely gap-free.

- diagonal gap between rudder and hull:

The bottom of the hull and the top of the rudder should be parallel where the rudder passes through. As designed, however, the kit does not always assemble correctly. Accordingly, before bonding the short brass tube through which the rudder control pin passes, check its angle. Assemble the hull, deck and reinforcing pieces with tape to see if the brass tube's position gives you the correct angle. If not it may be necessary to adjust the wood reinforcing piece within the hull and the 4mm hole in the cockpit for the tube. If necessary use some scrap wood to build a new wood reinforcing piece, paying close attention to the angle of the 4mm hole. Once the rudder / hull gap is correct then file the hole through the deck into a slot. Ultimately the enlarged hole can be covered over from the outside with a small piece of ABS, glued into place, with the correct 4mm hole for the tube. You should also take the time to check (and if necessary adjust) the rudder's lateral position.

If you discover this issue after assembling your hull, simply remove material from the top edge of the rudder to achieve the correct gap.

- Punching out the plywood pieces - damage:

The plywood can be reinforced by sealing the punch-out edges with CA adhesive or lacquer, although the wood is probably sufficiently strong without such treatment.

- Servo board angle:

The building instructions suggest attaching the servo board (10) with its support (11) at a right angle. This is wrong, since the keel / mast trunk to which the servo assembly attaches is not itself a perfect 90 degree angle. Instead use the keel trunk as an orientation guide before final assembly to ensure the angle is right.

- Hatch cover edge is somewhat uneven:

You want the edge of the hatch to have a 3-4 mm lip all around. First use a razorknife to cut the hatch edge roughly to shape at approx. 4 mm. Use a piece of tape to provide a straight-edge at the appropriate height and recut.

- Hatch seal:

The round rubber seal is best attached to the inside edge of the hatch cover rather than the groove in the deck. The two ends of the seal should meet at the back of the cover. The rubber can be attached with a little CA adhesive or silicone. Note however that you lacquer will not adhere to silicone, so install the seal towards the end of construction after any painting.

- Adjusting the sail servo arm extension:

Due to the wide variation in rotational range among different servos, the sail servo horn extension that comes with the kit is too long for some servos (there's too much travel causing the arm to bind

or the sails to be improperly positioned in the end positions). Graupner designed the extension arm to be slightly longer than necessary to allow servos with less rotation to do the job, but it may need to be shortened for servos with more range of rotation. Shortening the arm also improves the servo's mechanical advantage for sail adjustment. Correct the problem by drilling a few extra holes in the arm for the fairlead, then try the fairlead in each. The position is optimal if the main sail sits tight on centre when sheeted all the way in, and at 90° to the boat's longitudinal axis when all the way out. Leave the transmitter trim at centre and do your initial adjustments at the fairlead. You may end up moving the fairlead in towards the servo's axis as much as 10-15 mm.

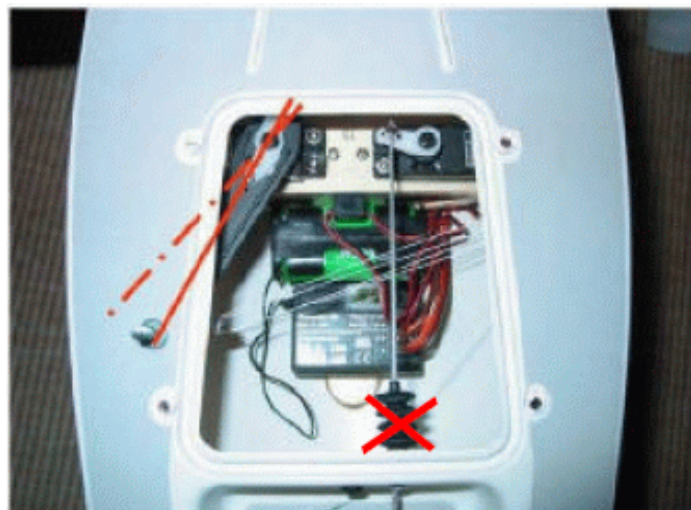


- servo horns collide:

Pay attention to the relative height of each servo to the other. It may be necessary to shim up the rudder servo slightly to keep the two servo horns from interfering with one another. The sail servo arm extension should run under the rudder linkage.

- rudder control rod boot interferes with main sheet:

You can do without the rubber boot altogether by fabricating a small ABS plate and drilling a centred 1.5 to 2 mm hole, then using the plate as a seal for the tiller rod. Alternatively the rubber boot can be installed on the outside instead, where it will function just as well but may not look as pretty.

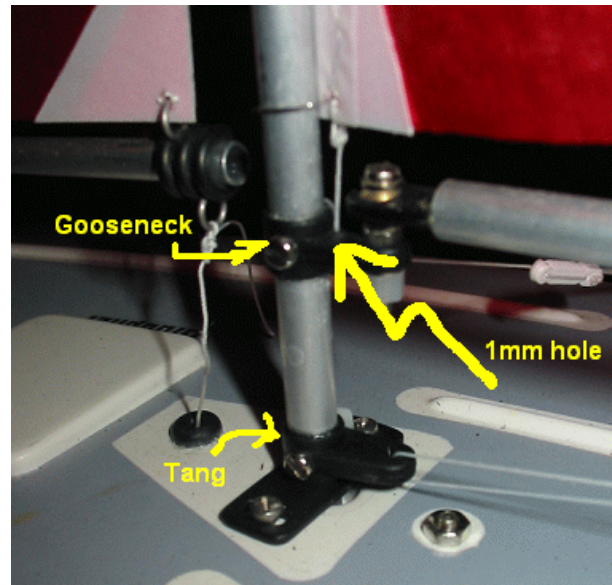


- internal mast reinforcement:

The internal dowel reinforcement in the base of the mast, described in the kit, is not strictly necessary and can be omitted. You should, however, install a small piece of dowel at the very end of the mast to provide an even bearing surface in the mast trunk where the mast bottoms-out on the hull. Without something between the sharp aluminum pipe and the ABS hull the mast will ultimately cut through the thin plastic.

- No hole in the gooseneck for the downhaul:

There are two small plastic pieces in the kit that are almost identical. One is the gooseneck (the hinge between the mast and boom), and one is the tang (mast linkage for the cunningham, the diagonal tensioner between mast and boom). The only difference between these pieces is that the gooseneck should have a 1 mm hole for the downhaul to pass through. But often the kit ships with either both or neither of these pieces having the downhaul hole, so in some cases you will have to drill one yourself. This is much easier before the gooseneck and tang are fixed to the mast!



- Correctly positioning the gooseneck and tang:

When installing the gooseneck and tang ensure the two mounting holes in the mast are drilled parallel to one another. You need to ensure that the holes are not at different angles as this can cause the sail to swing out differently from side to side. Slide both fittings onto the mast and position them correctly for height, then lay the mast assembly down on a flat surface. Roll the mast along the surface until the gooseneck and tang line up. Fix the pieces in place with CA glue. If properly glued you can now simply drill 2 mm holes and bond two short pieces of wire of the same diameter through the holes (e.g. brass or steel) instead of the M2 screws. The wire pieces will act as shearpins, and can be filed smooth at the sides, thus avoiding the need for the screws, nuts and washers (which are another potential place for the lines to snag).

- The sail rings seem too small, causing the mainsail to bind at the mast:

The rings are not too small, but the holes for the rings in the mainsail may not be melted close enough to the front “luff” edge of the sail's sewn reinforcement strip. These holes must be melted no more than about 1 -2 mm from the edge. A soldering iron with a fine point works well for melting the holes; alternatively use pliers to hold a piece of wire over a lighter until it glows and use it. This is easiest if you have an assistant to hold the sail tight.

- Lines are frayed:

Simply melt the end of the line slightly and pull - this creates a thin point (and possibly some blisters on the fingers...), which goes easily through the holes in the deck or through the deck eyes.

- Lines are too stiff:

Stretch the polyester cord to be used for lines and sheets before installation. Tie one end of a 2 metre piece to a doorknob, for example, then pull on it firmly. After that wrap the cord three to five times around a pole about 10 mm thick, then pull it back and forth, allowing the coils to slip. This should result in more pliant lines and sheets.

- Window decals have creases:

The decals that come with the kit are too rigid and inflexible to handle the complex curves of the hatch. If you use them they will undoubtedly have blisters and creases. Instead either make new decals from softer black DC-fixed adhesive film, cut smaller decals from the originals, cut the originals into sections, or throw them away and use black paint.

- Corrosion:

The deck eyes and the screws on the rudder control rod attachment are not particularly rust-repellant. Either seal them with clear lacquer (such as the stuff used for car wheels, which is very scratch-resistant), or swap them for brass or stainless steel parts.

- Battens fall off:

The sails come with battens pre-glued. Within a couple of trips to the lake these are likely to fall off. They can be replaced with either polypropelene strips or small zip-ties cut to the appropriate length, then attached to the sail with silicone.