

Magnetic Flush Hatches

The magnetic flush hatch is a nice alternative to straps for holding down the hatches lids on your strip built kayak. The use of magnets may not be your choice if you are concerned with the effect that a magnetic field may have on devices such as GPS's or compasses. The effect will vary depending on the type, size and number of magnets used and the proximity of them to your equipment.

Rare Earth magnets are very strong, however, dropping them, or having them snap together when they come in close proximity to steel or each other easily damages the stainless coating. Be careful not to damage the coating.

These instructions accompany the method of building hatch lips with scrap pieces of cedar strips, however this method can be adapted to suit your needs or hatch style. You will need to complete these procedures before you attach your deck to the hull, as you will need to have good access to the underside of the deck.

Materials required

Minimum 12 pairs of 1/2-inch diameter by 1/8 thick Rare Earth magnets per hatch (24 pairs)

Two small blocks of hardwood (Black Walnut) for hatch pull - 1 by 2 in by 1 in. thick

Equipment Required

Plunging router with round bit

Hand Drill

Coping saw or Jig Saw

1/2 " "Forstner" drill bit

Preparing the Hatch Lip

The size of the hatch lip on your boat will need to be larger than what your plans call for as does the opening itself to accommodate for the larger lip, therefore we recommend that you consider this **before** reaching that stage in your building.

Photo #1



Photo #2



Photo #3



Photo #4



Cut the hatch openings $\frac{1}{2}$ inch larger than the pattern provided (total extra diameter size – one inch). When cutting the scrap pieces for your hatch lips, make the pieces at least $\frac{1}{2}$ inch longer than explained in the standard instructions. Extend this extra length into the hatch opening when gluing to the underside of your deck.

Drilling holes for magnets

Mark the placement of the holes that you will drill through the hatch lip. To align each magnets placement, you can put a second magnet on the underside of the lip to hold them all in place until you are satisfied with each one's location. It is also recommended that you place the magnet in the center of the lip, so that you have enough room on either side for your gasket seal. **(Photo #1)** It is also better to have more magnets on the sides of the hatch opening than near the centerline of your deck. This will ensure that the sides of the curved deck lid are pulled down to the lip. Once you are satisfied with the placement, mark **(Photo #2)** and drill the holes with the $\frac{1}{2}$ in. Forstner bit to cleanly accommodate your magnets. To prevent tear out on the underside, clamp a scrap piece of wood to the underside **(Photo #3)**. Clean up the holes with sandpaper on a dowel. To mark the placement of the holes on the hatch cover, tape the hatch cover in place **(Photo #4)**. With the cover firmly in place and using the existing holes in the lip as guides, use the Forstner bit to begin drilling into the hatch cover. **(Photo #5)** This will ensure accurate magnet placement on the hatch cover.

Photo #5

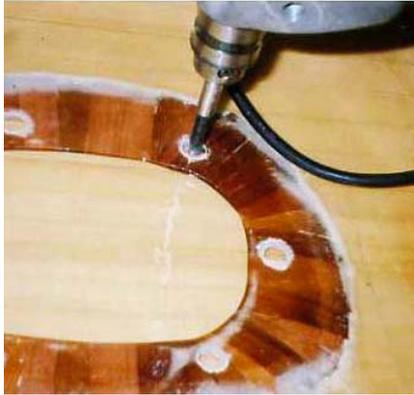


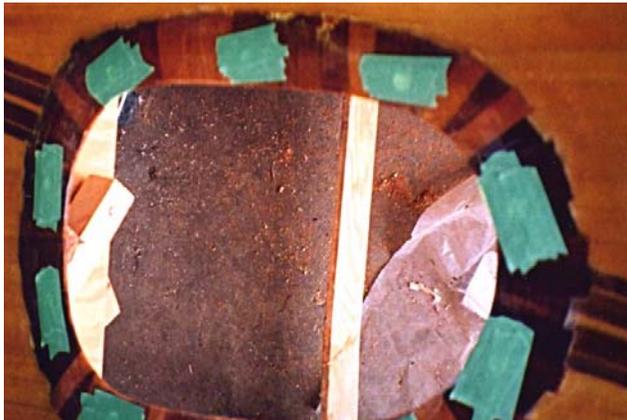
Photo #6



Photo #7



Photo #8



Remove the hatch covers and you should have the markings for drilling the holes into the covers.

(Photo #6)

With the hatch covers firmly held in place with a clamp, drill the holes into the hatch covers with the Forstner bit deep enough so that your magnets sit flush to the underside of the covers. **(Photo #7)** Be sure you do not break through the covers. Go a little at a time.

Hint: A drill press is best for this procedure.

Gluing Magnets into Lip

Place some masking tape on the topside of the hatch lip to seal the holes and prevent resin from seeping through. **(Photo #8)** With deck upside down, place your magnets in the holes and sitting on top of the tape. Place the magnets in the holes with the polarity all the same and make sure the magnet is sitting flush with topside of hatch lip. It can even sit a little proud to accommodate for the thickness of a gasket seal used.

Hint: If you need to remove the magnets, use a stack of magnets to pull them out

Once you are satisfied, pour enough resin into the hole to cover the magnet and fill the hole. **(Photo #9)**

After the magnets are secured in place, remove tape and proceed to glassing the underside of the hatch lip as in the regular building instructions. Use small pieces of glass to seal the topside and underside of the holes and magnets.

Attaching Magnets into Hatch Cover

Test the polarity of the magnets and place them accordingly into the holes in the hatch cover. Once you are satisfied that all the

Photo #9



Photo #10



Photo #11



Photo #13



polarity is correct, glue them in with epoxy. Cover each magnet in the lip with a small piece of glass and seal with epoxy as well. **(Photo #10)** The magnets will rust if not completely buried under glass and epoxy.

Hatch Pull Mechanism

Since the magnets attach with a good amount of force, you will need a strong mechanism to be able to pull the flush hatch free from the deck. There are several methods that will accomplish this. You can use a small strip of webbed strapping attached to the underside of the hatch cover and sticking out from the hatch. If this is your only pull mechanism to release the hatches, there is a concern that if it breaks off, it will be literally impossible to release the hatch from the deck, and this is most likely to happen when you are least likely to want it to – out on the water during an extended trip. The strap also interferes with the gasket seal. You could cut a slot through the hatch cover and bring a small loop of strapping through the slot. **(Photo #11)** To prevent the strap from pulling through, a small loop is sewn on the underside of the strap and a small dowel is slipped through. **(Photo #12)** Other builders have devised their own mechanisms from stainless steel or have purchased commercially available hatch pulls in brass or stainless. Some route a small groove in the edge of the opening to allow you to get a finger under the lip and lift. Depending on the number of magnets used and your finger size, you might need quite a large notch. This method might allow water to seep into the opening unless you place it on the side, which will also allow water to drain away off the deck.

A sunken wooden pull notch right in the hatch cover from a contrasting colour of wood looks nice.

Wooden Pull Mechanism

From a small block of solid hardwood, cut oval or square pieces 1 inch by 2 inches. **(Diagram #1)**

Cut ¼ in. piece from the top side. **(Diagram #2)** In the smaller ¼ thick piece of wood, drill a hole at one end larger enough to

Photo #14



Photo #15



Photo #16



Photo #17



accommodate your index finger. In the larger $\frac{3}{4}$ in thick piece, route a groove down into the block, or drill varying depth of holes **(Diagrams #2 &3)**. When you have the groove and hole as deep and wide as you feel you need, clean up all the edges with sandpaper, since it will be difficult to do after you re-attach the top piece. **(Diagram #4)**

Glue the $\frac{1}{4}$ in. top piece back onto the $\frac{3}{4}$ in. bottom piece with wood glue or resin. Be sure to line up the holes correctly so that you can slide your index finger into the hole and under the lip created by the top piece. Once finished, you can sand and round out all the outside edges

Marking Cutout in Hatch Cover

Place the completed Block Pull onto the hatch lid and mark where you will cut out a slot to insert the block pull. I like to have the pull with the open hole to the front of the boat. **(Photo #14)**

Drill out the hole **(Photo #15)** and clean the edges so that the block fits snugly into the hole and flush with the deck surface. Glue in place with resin thickened with sanding dust of same colour as block. Once this has hardened, you can smooth off the top of the pull flush with deck. **(Photo #16)** Seal entire block pull with resin and sand smooth in preparation for varnishing. **(Photo #17)**

Additional Safety Features

If you feel that your hatch cover is not secure enough for you or you are worried that it might 'POP' off in rough conditions as the boat flexes, you might consider a secondary under deck hold down using bungee cords. This will prevent the hatch from releasing and flooding while paddling. It will also prevent you from losing your hatch covers while paddling.

You may feel it necessary to attach some sort of hatch "leash" to the underside, so that you do not drop the hatch covers.

