

Square Holes In Plastic Planks, Version 1.1

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Nothing has been done to this gate for about 15 years. The Arizona sun is brutal, and it is a wonder any of the wood remains—time for a refresh.

I genuinely hate to paint, but I have a company I trust. They will paint my house and also the steel frame of this gate. I will wreck out these old planks and install new composite slats².

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² I bought these boards from Lowe's. Search for "Natures Composites Traditional 3/8-in x 3-1/2-in W x 5.75-ft H Rosewood Composite Fence Picket."



You can see the first slat here. The manufacturer claims that this material needs no painting and survives in a high UV environment.

There is one challenge here: those carriage bolts. If I try to spin a nut on one of these bolts, the square shank does not dig into the soft plastic so the bolt spins. I'm also not sure if this plastic will develop stress cracks in the future.

I've come up with two solutions: I can form square holes or prevent the bolt from turning as I tighten the nut.

Forming Square Holes



I took a long carriage bolt and ground off the head. Then I used my belt sander to smooth the faces.

I'll heat the square section and pull it through a pre-drilled hole. This should reflow the plastic into a square hole.



To test this idea, I started with a scrap board.



Next, I drilled a 5/32" hole. Clearance for 1/4-20 bolts is an F drill with a diameter of 0.257 inches, so this is generous. I wanted to provide room for the melted back composite.



I lowered my tool through the hole and then used a MAPP torch to heat the square section until it started to glow. Yes, I'm outside, and there is a breeze, so any poisonous fumes won't get me.



The melted square hole is rimmed with flash.



After removing the flash, the resulting square hole doesn't look bad.



The carriage bolt nicely fits into the square hole.

The advantage here is minimal stress on the composite due to sliding the square shank into a square hole.

The disadvantage is that this takes an extra step compared to only drilling a hole.

Forming The Square Hole with the Carriage Bolt

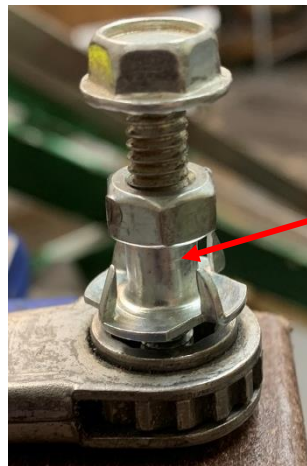


I threw together this simple tool to prevent the bolt from turning as I tightened the nut.

I chose this flange because it had a generous threaded section. The locking nut above it prevents the screw, on top, from turning independently of the flange.



I again drill my oversized clearance hole, but this time just fit the carriage bolt. I spin on a 1/4-20 nut and put my ratching box wrench over it.



Then I screw on my tool.



With another box wrench on the tool, I can turn the nut without the bolt turning. This enables the square section of the carriage bolt to be forced into the composite.

This approach is much faster than melting a square hole, but I don't know if the resulting stress around the hole will crack the composite. The plastic is relatively soft, so this might not be a problem. I'm hoping readers can help me find the best solution.

I welcome your comments and questions.

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