Scooby Doo | Plunger Stabilizer

Installation Guide

First, thank you for buying our mod. It is cool to know that we are able to help people keep their machines looking and working great!

Information:

The mod you have ordered is 3D printed from carbon fiber infused Nylon for maximum strength and rigidity. Installation is as simple as slide it in and screw it down, but we'll go into more detail, as well as a little detail on how to realign your plunger's auto launcher fork after installation (if required).

On that note, we want to point this out one more time: *the plunger stabilizer is not designed to 'fix' and out-of-alignment auto launcher, and installation could in fact cause the problem in a game that seemed to be working fine*. But that's not necessarily a bad thing… In both cases this is because – though working – your plunger was already out of alignment, and the stabilizer pulled the plate back into alignment with the playfield when it was installed. But think of this as "zeroed out" in a way… now that the plunger base is where it belongs, this is the position from which the mech should be adjusted for clean plunges over the long term.

Tools you'll need include: #2 Philips screwdriver, ¼" nut driver, drill with a 3/32" drill bit (optional), up to two sets of pliers (if needed to adjust the plunger after installation).

Installation:

Step 1:

Remove the glass and lift/slide the playfield out into the position shown. Remove the two Philips screws from the stabilizer and set them safely aside. Slide the piece into place as shown in the second photo. You may have to wiggle the metal attachment plate for the auto launcher (red arrow) to make enough room for the stabilizer to slide in (this isn't an issue with the stabilizer, it's an indication that your plunger was already falling out of alignment).

Note:

As stated earlier, these are 3D printed out of Nylon, which is notoriously difficult to print with. In particular, it can sometimes 'curl' or have a corner lift up from the bed while printing. You can see evidence of this in the photo to the right where the yellow arrows are pointing. We assure you that this is merely a cosmetic issue and will not affect the performance of your stabilizer. We take steps to minimize it or eliminate it altogether if we can, but sometimes it still happens a little, so we print it in such a way that it happens where it won't affect either the stabilizer's contact points or its strength. This is all a long way of saying, "This is normal and can be ignored." And yes, the one shown in this photo is, and will remain, installed in our personal machine.
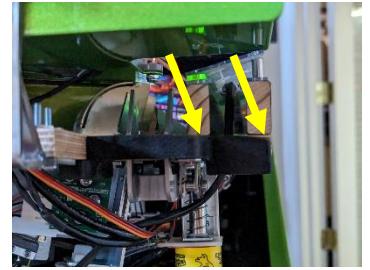

Step 2:

Using the screwdriver reinstall the two small Philips screws removed in step one. Don't fully tighten them yet.


Step 3:

Ensure the stabilizer is pressed firmly against the playfield edges on both sides. You may now optionally predrill the five holes where the stabilizer meets the wood. Next, install all five of the screws from the bag with the ¼" nut driver. Finally, you may tighten up the two screws you started but left loose in step 2. It should now look as pictured. Installation is complete!
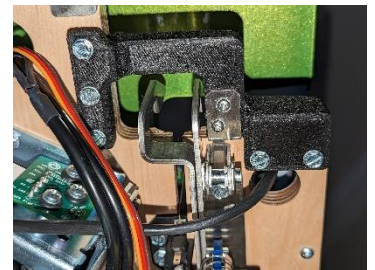

Step 4 (only if needed):

If you play the game after installation and the plunger is not getting the ball onto the playfield successfully, then you're going to need to align it. There are three key factors in the alignment of the auto launcher 'forks'. Unfortunately, any change to one of those factors will affect the others, so this can be a bit of a fine-tuning 'dance' that you'll have to go through over a few days of play. I'll do my best to explain this process here.

SLOP: If the plunger sometimes works great and other times rattles the ball badly in the lane, then you're suffering from a lot of slop, or wiggle, in the forks (blue arrows). This comes from the hinge. To eliminate this, you need to slightly spread out the two metal arms that hold the hinge in place. A little wiggle is good and necessary for proper operation (zero wiggle means it's too tight and will reduce the power of the plunge through friction in the hinge), but too much wiggle leads to wildly inconsistent performance because the forks path can vary too much. To

address this, grasp the outside (right side) hinge arm (yellow arrow) with pliers and bend it slightly outward (red arrow). It may take a few tries to get it to where you're happy, but your goal is a small amount of wiggle and the plunger should be able to pull it down without any noticeable friction (pull the plunger down where indicated in green). I choose to do this with the mech fully assembled so I can get instant feedback on the change I've made, but this can also be done with the mech fully disassembled, if you prefer.
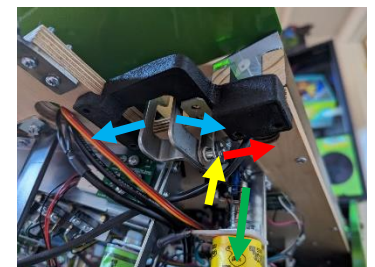
Narrow/Bent Forks: The next issue is narrow or bent forks. The forks cradle the ball at two contact points (one per fork) then push it up the lane quickly when plunged. If the forks aren't in the right position and in balance with each other, the ball will be launched at an angle instead of straight and will impact either the trough eject metal or the wood on the sides of the shooter lane, robbing it of power, and preventing it from making it up the lane with enough speed to make the backwards loop.

The two forks should come out of the factory both parallel to each other, and perpendicular to the playfield. They should be centered up on the small groove that the ball sits in, and they should move directly forward. This is 'ideal', but many have found that having the top of the forks slightly wider than the bottom can lead to more consistent plunging. Using the pliers (one to stabilize the fork arm, and one to bend the forks), you want to work the forks into approximately the following shape:
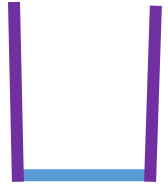
You'll also want to ensure that the bottom of the forks, the piece that joins them at their base (in blue above) is parallel to the playfield when you're done. If you got the forks looking right, but this is angled, you have more work to do to fix this. Keep working the angles until it's correct. Failure to do so could result in the forks hitting the ball at uneven points, resulting in more diagonal launches.

Launch Angle: Even if the forks look right in the starting position, they may not end up that way at the end of the plunger stroke. If they travel diagonally as they move forward, you're right back to bad plunges. If your phone has a slow motion (or ideally super slow motion) video function, this can be a HUGE help in figuring out which way the ball is flying. If not, you're going to have to make your best guess and adjust until you get it right. The goal is to twist the fork mech just after the hinge until you achieve the right angle. Grip across the hinge (red arrow) with one set of pliers and use this to hold it as still as you can while you grab and bend the fork arm with the other set (blue arrows).

Fine Tuning: If you haven't already done so, adjust your coil power in the game settings. We've found 70% to be about right on the low end, but 80% leads to a more consistent outcome, especially when two balls end up in the lane simultaneously. But no two games are identical, so your mileage may vary.

No matter how careful you are, any adjustment you make can negate a previous change. This means you're going to be going back and forth between these various adjustments, making tweaks as you go. It may take a few days to really get it dialed in well, but you'll get it there with patience and intentional adjustments. To help speed up the process, I like to start a game with the glass and lockdown bar off. Plunge the ball. If successful, grab the ball after it exits the wireform, drop it back in the shooter lane, and let the game plunge again, over and over. If unsuccessful, assess the behavior and make adjustments. Keep this up until you get at least 10 good plunges in a row, but aim for 20 or more. Any mech is going to goof occasionally, so don't go further tweaking the launcher if you're getting say 29/30 good plunges, or you might make it worse and set yourself way back.

Another exercise is to put two balls into the shooter lane at the same time. Under good conditions, the first plunge should launch the front ball successfully, and the second plunge should launch the back ball successfully (don't expect both to work on the first launch).

Contact:

If anything goes wrong feel free to reach out to support@ninjacamp.com, outpostkodelia@gmail.com, or @OutpostKodelia on Pinside. I will respond as quickly as possible.