Ender 3 Extruder Skipping or Clicking: How To Fix

If your Ender 3 extruder is skipping, fear not: most of the time, the solution is rather straightforward, and that's exactly what we'll talk about here:

Ender 3 Extruder Skipping: Solutions to try

A skipping extruder is a sign that the 3D printer is trying to push filament through the nozzle but it is not flowing for some reason.

The way to diagnose this issue is to figure out why the filament is not flowing and fix the problem! We'll start from easy solutions and progress to more difficult ones.

Increase print temperature and decrease speed

The first thing you can try to do is increase the print temperature and decrease the print speed. Usually, it's not a good idea to change two settings at once, but in this case, you can make an exception.
It is possible that the filament you're using can't melt as efficiently at the temperature you've set, so increasing the temperature will usually get it flowing out of the hot end as it should.

If the higher temperature fixes the problem, you can try bumping up the print speed back to your original setting and seeing if it still works OK.

Nozzle too close to bed

Another super common issue is that the nozzle is too close to the bed. Because there is not enough space between the nozzle and the bed, filament is not flowing out as it should.

Re-level your bed and try printing again. This should solve the issue.

Blockage in the extruder

Budget 3D printers like the Ender 3 may not have as accurately machined tolerances in the extruder as other printers.

Also, because the Ender 3 is a Bowden setup, there are a lot more places for things to get stuck.

On top of the extruder, there is a little pneumatic coupling. The Bowden tube is inserted into the coupling, where it goes down into the extruder.

The filament moves between the motor gear and the bearing and goes into the Bowden tube. If the coupling is loose, or the Bowden tube is out of position, the filament will not flow correctly and your extruder will start clicking.

Taking your extruder apart, cleaning it if necessary, and reassembling should fix the issue.

Blockage in the nozzle

If the extruder is not the issue, then the issue is most likely in your nozzle. Debris or blockage in the nozzle can prevent the filament from flowing out, and your extruder's gears will start slipping on the filament.

Cleaning the nozzle is pretty straightforward, but it can be a little cumbersome.

The first method to try is the atomic or cold pull.

To do this, remove the PTFE tube from the hot end and heat up the hot end to around 190 degrees C. Insert some filament directly into the hot end and let it start to melt.

Now decrease the temperature to 160 until the filament is still soft but no longer melting. Decrease the temperature 10 degrees more, and as it becomes a little more hardened, yank the filament out.

You should have pulled out some debris mixed into the filament.

You can also insert a very tiny needle into the nozzle while it's hot and try to clean it out from the bottom, too.

If none of that works, you'll have to unscrew the nozzle and clean it out yourself. When you replace it, remember to screw it back on tight!

Blockage in the hot end

If you've gotten this far, I hope you've double checked you're using the right temperature and print speed, and that you've leveled your bed a few times!

Open the assembly that contains the cooling fan and hot end, and remove the hotend from the carriage.

Take the whole thing apart and clean out each individual component. You may need to use a flame or heat gun to burn out any debris.

Reassemble and try again!

Replace PTFE tube

When you open up the hot end and clean it up, you may notice that the PTFE tube has degraded. In this case, you will have to replace the PTFE tube.

Increase stepper motor voltage

If that still does not solve the problem, chances are your stepper motor does not have enough power, which is preventing it from overcoming the pressure required during extruding.

Here, what you can do is open up the control panel and find where the extruder motor connects to the mainboard.

Next to the connector, you'll see a little variable resistor, which looks like a small Phillips screwhead.

I don't recommend trying this first as the motor is usually well calibrated out of the box, but there may be rare cases where you'll have to try this.

Calibrate your extruder

If there is an issue in your printer firmware, you may need to calibrate your extruder. Calibrating is a process where you manually measure and see that the extruder is indeed extruding as much filament as it should be.

To calibrate, remove the PTFE tube from the extruder so that when the printer extruders, filament will go straight up.

Make a mark on the filament above the pneumatic coupling.

Now go into the menu and manually extrude 10mm of filament.

Measure the distance between the two dots to see if that is indeed 10mm.

If the number is off, you'll need to adjust the extrusion steps, which you can see how to do here:

Conclusion

A clicking extruder can be incredibly frustrating, and was one of my main pain points when I first started learning how to 3D print.

I got the hang of it soon enough and once you have your printer calibrated and printing properly, you should not run into this issue again.