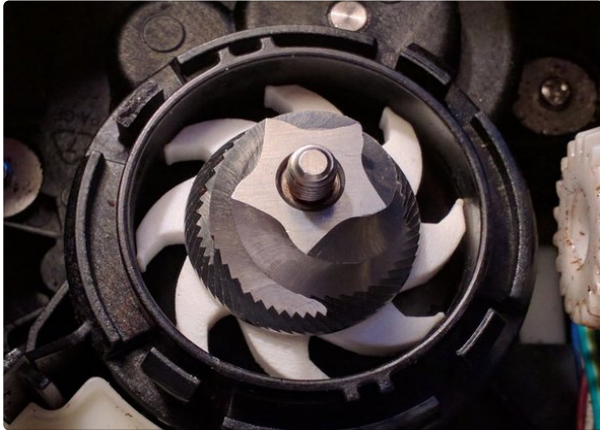




BCG800XL Grinder Jamming due to Worn Impeller

Written By: [Ben Gottemoller](#) (and 4 other contributors)

Comments: 311 Favorites: 4 Completions: 55



Difficulty	Moderate
Steps	23
Time Required	10 - 35 minutes
Sections	1
Flags	1

Introduction

Many users of the BCG800XL SmartGrinder experience jamming or clogging and a horrible [gear-stripping, clacking sort of sound](#) during use at some point. This is usually due to a worn out impeller or -less commonly- a stripped drive gear. This guide will show you how to inspect the and replace the impeller when it is bad.

Please review the [Breville Troubleshooting page](#) first to be sure your grinder does indeed need an impeller replacement.

Breville, unfortunately, doesn't sell replacement parts, so this tutorial has been made possible only recently by 3D printer technology. I've designed an improved impeller for the BCG800XL and made it available here: [Shapeways Impeller Source](#)

[Here's](#) a quick two-minute overview of this replacement part.

This guide is for the BCG800. If you have a BCG600SIL or BCG400SIL then [go here instead](#).

NOTE: This guide is NOT applicable to the newer BCG820XL which has significant design changes and uses a different sized impeller geometry.

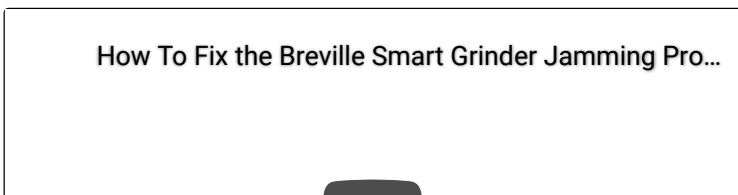
Tools

- [Long shaft Phillips #2 Screwdriver \(8 inches or more\)](#)
- [150 Grit Sandpaper](#)
- [Socket Wrench](#)

Parts

	<p>BCG800XL Impeller Coffee Impeller, This is a 3D printed part. Available for sale on ShapeWays</p>	<input type="button" value="Buy"/>
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Video Overview





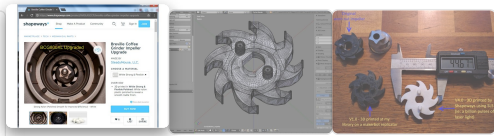
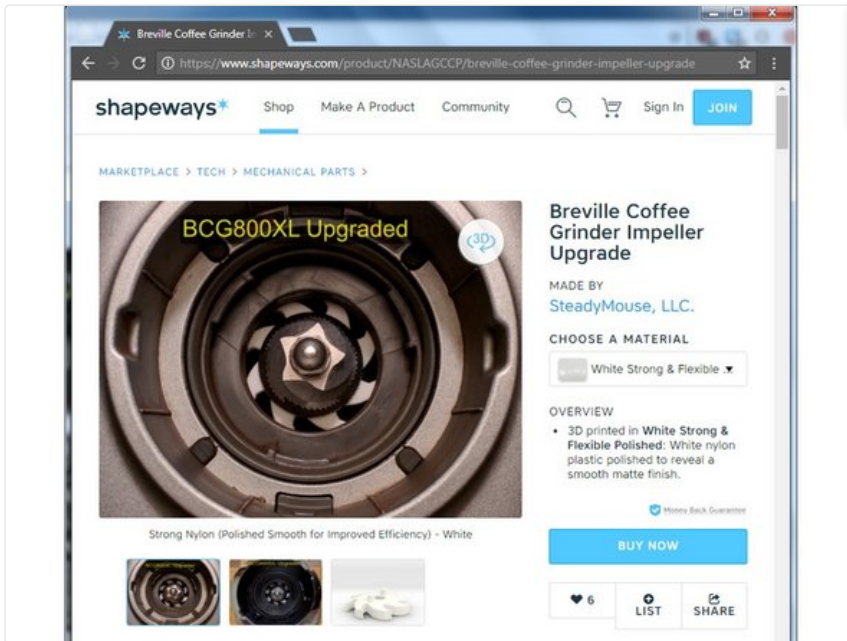
Step 1 Inspect your grinder impeller



⚠️ **Unplug your grinder before completing this repair to avoid electric shock.**

- Remove the hopper and take the upper burrs out. Empty out any coffee grounds (An air gun or vacuum helps) and then inspect the impeller blades.
 - If the impeller can fit through the hole (ie: be removed just by taking out the lower burr) then it definitely needs replacement.
 - A good impeller should not be removable without disassembly and the tips of the impeller blades should not be visible.
- ⓘ If your impeller is made of **stainless steel** rather than plastic you likely have a newer model with significant design changes (eg: BCG820). Stainless steel should not wear out and so your problem is elsewhere.

Step 2 Obtaining a new impeller



- I modeled and 3D printed this replacement part it several times at the local library. I've made the final design available for printing at www.shapeways.com (See link below). Of course, you can also model your own design if you wish to spend the time.
- [Shapeways BCG800XL Impeller Shop](#)
- [Here's a video](#) with some background on the Shapeways part.
 - ⓘ After nearly 2 years of roughly 3-double shots per day (~54 grams per day), I did a full teardown to see how the design was holding up. I am very happy with the results, and you can see the [full details here](#).

 Add a comment


Step 3 Tools you'll need

 You'll need either a 10mm socket with ratchet or a 10mm wrench.

- You'll need either a 10mm socket with ratchet or a 10mm wrench.
- A #2 Phillips screwdriver with **8 inches of shaft or longer**, and preferably with magnetic tip.
 - ⓘ You can rub a magnet against the tip to temporarily magnetize it.
- The sandpaper and file are only necessary if the 3D printed impeller isn't a perfect fit.

 3 comments

Step 4 Remove hopper, upper burrs, and lower burrs


 Remove the hopper and upper burrs.

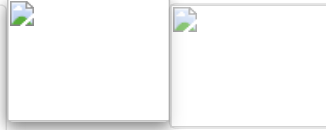


- Remove the hopper and upper burrs.
- Use a 10mm socket to remove the nut for the lower burrs.
 - ⓘ The nut for the lower burrs is reverse threaded. Rotate **clockwise** to loosen.
- Turn the grind-adjustment knob to the finest setting.
 - Remember what order in which the washers were removed for proper reassembly.


 2 comments

Step 5 Remove the base


 Unwrap the power cord and remove the 4 screws from the base.

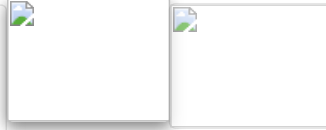



- Unwrap the power cord and remove the 4 screws from the base.
- Remove the four rubber pads
- Slide the power cord through the hole in the base while lifting the base away from the grinder.


 Add a comment

Step 6 Remove 4 screws holding the top on


Use the long Phillips #2 driver to remove the 4 screws holding the top in place.

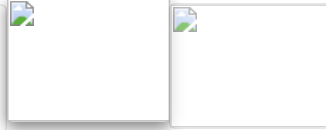


- Use the long Phillips #2 driver to remove the 4 screws holding the top in place.
 - Flip the grinder over and slowly lift away the top.
-  The top is still attached to a wire so the lid will hang off to the side.


 Add a comment

Step 7 Remove the front display


 Remove the two screws from the top of the display.

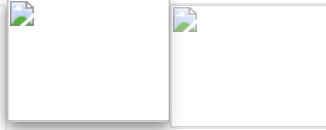


- Remove the two screws from the top of the display.
- Lift the display up and out of the frame.

 Add a comment

Step 8 Gear / Burr holder Assembly Removal

 Be sure the grind knob is turned to the finest setting.



- Be sure the grind knob is turned to the finest setting.
 - ⚠ It's critical that the alignment be preserved when removing the gear assembly. The small gear in the picture is an encoder. Its purpose is to track the position of the grind adjustment level so it can be displayed on the digital readout. If it gets out of alignment the display will end up reading wrong.
- Use a permanent marker to make alignment marks on the three parts of the gear assembly. The marks should line up during reassembly.
- There are 4 plastic tabs radially holding the big white gear assembly in place. I used both hands, placing my finger tips under each side of the big gear and pulled straight up to remove it.
- If pulling straight up isn't working, try curling your fingers under just one side of the white gear, and prying upwards until that side pops free a little. Then do the other side.


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Step 9 Worn impeller removal


 Lift out the old impeller making sure the TWO thin steel washers underneath the impeller do not fall out. These are very important for the overall height of the lower burr and thus grind fineness.



- Lift out the old impeller making sure the **TWO thin steel washers** underneath the impeller do not fall out. These are very important for the overall height of the lower burr and thus grind fineness.
- NOTE: Discard the fibrous felt ring below the impeller. It is usually in pretty bad shape. This piece is no longer needed as the new impeller design hugs the bushing pedestal more closely and does a good enough job keeping grounds away from the bushing and drive shaft.


 [4 comments](#)

Step 10 Clean the exit chute and rinse the new impeller


 While it's accessible, use compressed air or toothpick to clean out the exit chute so it's free of any compacted coffee.

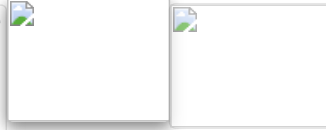


- While it's accessible, use compressed air or toothpick to clean out the exit chute so it's free of any compacted coffee.
- Give your new replacement impeller a quick rinse with soap and water. Then pat it down with a towel. This prevents static charge during first grinding.

 [Add a comment](#)

Step 11 Installing the 3D Printed Impeller Replacement


 It is important for the 3D printed part to fit properly. Tolerances of the design error on the tight side.

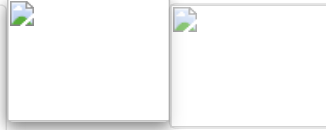


- It is important for the 3D printed part to fit properly. Tolerances of the design error on the tight side.
- Check that the burr drive pegs fit the holes of the conical burrs. If it's too tight, apply a small amount of sanding to the impeller and you'll be in good shape.
- Do not sand the flat part of the center hole. Only sand the curved part slightly if needed. The flat part takes the most stress from the drive shaft.
- The gap here should be small with the new part. If it's too tight, you can sand the edges slightly.
- [Here's a video](#) of the fit-up with the Shapeways printed part.

 Add a comment

Step 12 Checking Fit and Burr Elevation

 Before reassembly, check that the conical lower burr and impeller fit well onto the driveshaft with both steel washers underneath. Make sure all parts in the cutaway diagram are accounted for.

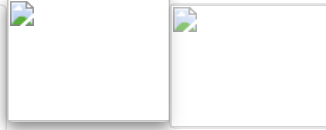



- Before reassembly, check that the conical lower burr and impeller fit well onto the driveshaft with both steel washers underneath. Make sure all parts in the cutaway diagram are accounted for.
- The lip on the drive shaft should be within about 0.5mm of the top surface of the conical burr. When the nut is tightened it will squish to about flush.
- If the burr is too high above the lip on the shaft (higher than in the pic), try putting the acorn nut + washers on (See 7, 8, 9 in the pic), tightening hard, and then taking it back off.
- If the lower burr is still sitting too high on the shaft, take a quick detour to [Step 20](#) and then come back.

 [One comment](#)

Step 13 Reinstall the Gear / Burr holder assembly


 With the following pieces aligned carefully set the gear assembly into place:



- With the following pieces aligned carefully set the gear assembly into place:
 - Avoid rotating these pieces to maintain alignment.
 - As you set the assembly into place, make sure the two stop-screws are on the left side of the black plastic stop.
 - Align the large peg with the wide slot.
 - Align and the small peg with the small slot.
 - Press down on the gear assembly to snap it into place.
 - Once in place, rotate the coarseness knob through the full range to make sure it's all working.
-  Watch the reinstallation video [here](#) for clarification.

 2 comments

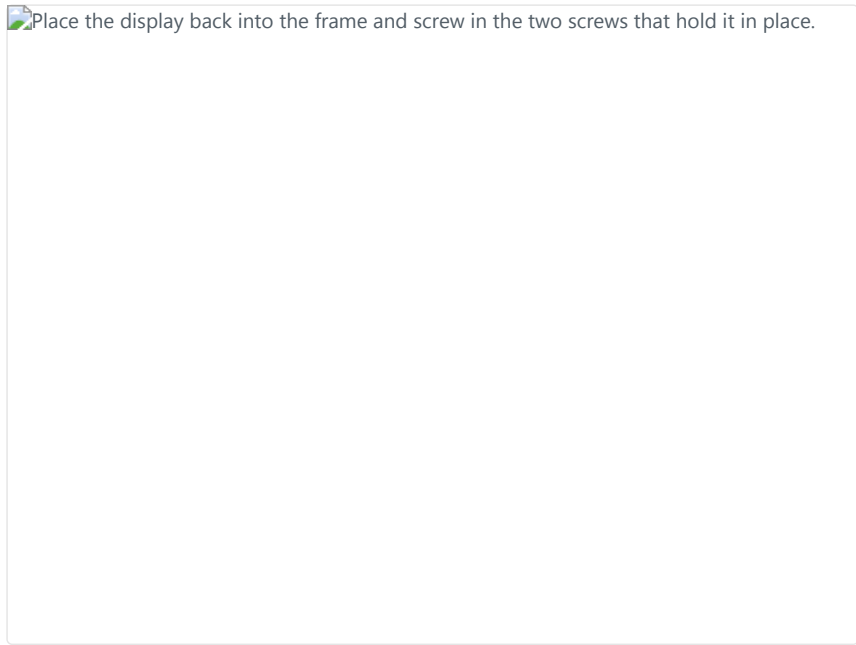
Step 14 Optional Modification for Better Grind Adjustment Range

 Advanced Modding Tip: If you want greater grind-control range, you can back out the two screws in the big gear in the photo. You will then be able to adjust the grind much beyond the normal range. Caveats: Go too fine and the grounds become like paste and it will certainly jam. Also, you must not adjust too fine or the burrs will hit!

- Advanced Modding Tip: If you want greater grind-control range, you can back out the two screws in the big gear in the photo. You will then be able to adjust the grind much beyond the normal range. Caveats: Go too fine and the grounds become like paste and it will certainly jam. Also, you must not adjust too fine or the burrs will hit!
- Note: The encoder driven by the little gear also has a hard stop built into it. You will still run into this stop if you keep turning the adjustment knob.
- **DISCLAIMER:** This step is completely optional. It is up to you and ultimately your responsibility if you choose to do it. Understand the risks of jamming and burrs hitting. Also be aware of the possibility that others may use your grinder and need to be informed of the modification. You do this unnecessary and optional step at your own risk.

 Add a comment


Step 15 Reinstall the Display and the Conical Lower Burr

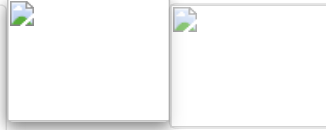
Place the display back into the frame and screw in the two screws that hold it in place.

- Place the display back into the frame and screw in the two screws that hold it in place.
- Put the conical burr in place making sure it sets on the drive pegs of the new impeller properly.
- Place the washers on while maintaining their original order. ie: Flat washer on the bottom, split washer on top.
- Tighten the **reverse threaded** 10mm nut.
 - ⓘ Tighten the nut as hard as you can. The impeller, being plastic, has a small amount of springiness to it and must be squashed hard so that the height of the lower burr does not vary. If you find that the burrs are too close after you're all done, then this is the reason. Tighten until the motor begins to move, and then give it an extra wack.
- Check the grind knob to be sure it has full range of motion.

 Add a comment

Step 16 Put the top back on and screw it back in


 Put the plastic top back on.



- Put the plastic top back on.
- Flip the grinder over and use the long Phillips #2 screwdriver to reinstall the 4 screws that hold the top in place.
- ⓘ If the screwdriver is not already magnetized, it'll be worth rubbing a magnet on it to do so prior to this step.

 Add a comment

Step 17 Reinstall the bottom

 Put the four rubber feet back in place.

- Put the four rubber feet back in place.
- Screw back in the four base screws.
- Re-wrap the cord.

 Add a comment

Step 18 Reinstall upper burrs and hopper


 Put the upper burr back on and reinstall the hopper (without coffee beans yet).



- Put the upper burr back on and reinstall the hopper (without coffee beans yet).
- Run the (empty) grinder briefly to make sure it all sounds OK. Try both coarse and fine grind settings.
- If all sounds well, add some coffee to the hopper. Dial in the grind and try it out! If something seems off, see the troubleshooting steps below or refer to the troubleshooting page [here](#).
- There is a bit of a break-in period the first week where the new impeller gets a protective coffee coating. It is recommended using a medium or light roast during this time.
- Congrats on using 3D printing to repair something! Enjoy your coffee! Godspeed! Deus tecum.
- If you thought this guide was thorough, you should see our primary work. SteadyMouse LLC helps folks with Parkinson's disease use their mouse again. Come check us out anytime at <https://www.steadymouse.com> and perhaps help us spread awareness. Cheers!

 Add a comment


Step 19 Troubleshooting #1 - Overspray

 If you encounter ground coffee escaping the chute and getting on the counter, it may mean your coffee is too dry, humidity is too low (static charge), or even that the grinder chute is too clean.

- If you encounter ground coffee escaping the chute and getting on the counter, it may mean your coffee is too dry, humidity is too low (static charge), or even that the grinder chute is too clean.
- To fix this, try placing a tiny dab of cooking oil on your finger and rubbing it high up inside of the coffee chute. This will allow a fine layer of grounds to coat the walls of the chute.
- The added friction of the grounds on the wall of the chute should slow the velocity of the grounds down enough that the overspray stops.
- FYI: This whole step happens naturally with oily coffee beans, but takes a little longer than with the vegetable oil trick.
- Also for static charge issues, see here: <https://www.youtube.com/watch?v=T0Dh1W40...>

 14 comments

Step 20 Troubleshooting #2 - Burr Clearance


 TOO CLOSE (ie: grinding too fine): If the burrs are too close, or even touching (but centered), the nut on the lower burr may not be tight enough. With the ratchet and 10mm socket, give it a quick counter-clockwise jerk. If that fails, recheck your fit-up against the second photo to make sure the lower conical burr is the proper height.



- TOO CLOSE (ie: grinding too fine): If the burrs are too close, or even touching (but centered), the nut on the lower burr may not be tight enough. With the ratchet and 10mm socket, give it a quick counter-clockwise jerk. If that fails, recheck your fit-up against the second photo to make sure the lower conical burr is the proper height.
- If it's clear that the lower burr is sitting too high on the impeller, see the 3rd picture and sand the area highlighted in RED. While doing this, periodically install and re-check the lower burr height until it matches photo #2. Careful not to sand off too much as it's easy to remove thickness but hard to add it back.
- TOO FAR: If the burrs are too far apart such that the grind isn't fine enough, it could be that the steel washer underneath the impeller got left out. See step #9. Additionally, you can try removing *one* of the two washers above the lower burr and not tightening the nut as much. There's also a shim kit offered by Breville if you contact them.
- Lastly, both of the above issues can happen if the alignment in "Step 12" got shifted. If so, you may need to pop-off and adjust the rotation of the upper-burr holder assembly. This is tricky, but doable. I suggest marking the existing alignment with permanent marker before experimenting.

 Add a comment


Step 21 Troubleshooting #3: Horrible clacking sound when running (Even without beans!)

 If it sounds horrible when running (even without coffee beans) like this: <https://www.youtube.com/watch?v=PcQcbHIP...> then it's probably either a damaged torque limiter or a stripped drive gear. FYI: The situation in the video was the aftermath of a rock getting jammed in the burrs.

- If it sounds horrible when running (even without coffee beans) like this: <https://www.youtube.com/watch?v=PcQcbHIP...> then it's probably either a damaged torque limiter or a stripped drive gear. FYI: The situation in the video was the aftermath of a rock getting jammed in the burrs.
- I don't cover tear down all the way to the gear box. Step #9 is as close as I go. In the photo though there are 4 washer screws and 2 screws on the encoder. If you remove those you'll be well on your way to investigating the gear box.
- The options to fix either of these are not as well explored, so if there is damage here and you fix it successfully, post a comment below. FYI: Breville has a repair service for about \$90 and that may still be the best option in this situation.
- The torque limiter may be "fixable" by stretching each of the radially-distributed springs about 2mm each. This should increase the torque at which it slips.
- The drive gear on the right has a potential source found by a user below (Thanks Dave Gordon!): <http://www.forumappliances.com/breville-...> This is not yet verified to work, but the price is reasonable, so if you try it out and it works, post below so we can know!

 9 comments

Step 22 Troubleshooting #4: Static Electrical Charge on Coffee Grounds

 Occasionally a user reports statically charged coffee grounds coming out that seems to defy the laws of gravity. They float up into the air and cling to things, making a mess!

- Occasionally a user reports statically charged coffee grounds coming out that seems to defy the laws of gravity. They float up into the air and cling to things, making a mess!
- Often it will stop on its own after the impeller gets a few days of use. It's a bit of a mystery however, I believe the issue arises mainly in dry climates, with certain beans in combination with the plastic impeller.
- To fix the issue, simply give your impeller a scrub and rinse in the sink and then pat it down with a towel until dry.
- This slight bit of moisture seems to take care of static issues permanently. I suspect it gets us by until the impeller builds up a natural coat of coffee, which also serves to prevent static charge.
- See also: <https://www.youtube.com/watch?v=T0Dh1W40...>

 5 comments

Step 23 Troubleshooting #5: Clumpy Grounds or Little to Nothing Coming Out

Some beans, especially the "roasted so dark it's nearly charcoal" variety can be way too oily. The characteristic is that rather than grind to a powder it turns to "paste" in the lower chamber. This is obviously bad, because it then comes out in clumps or not at all.

- Some beans, especially the "roasted so dark it's nearly charcoal" variety can be way too oily. The characteristic is that rather than grind to a powder it turns to "paste" in the lower chamber. This is obviously bad, because it then comes out in clumps or not at all.
- Clumpy grounds, for some reason tend to overshoot the portafilter and make a mess. I suspect this is because the large clump size has more mass, and comes out of the chute with too much momentum.
- If you pull the upper burr, and see what looks like a nice smooth black surface where the impeller would normally be, then that's your sign.
- The Fix: Clean the lower chamber, or at least break up the cake of grounds, and switch to a less oily roast.

 Add a comment

CONCLUSION

The steps should have taken you all the way through re-assembly. Provided that impeller wear was your issue, everything will work again. If you have other issues see the troubleshooting steps or post below for further help.

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with 4 other contributors



Ben Gottemoller

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246 COMMENTS

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Excellent repair guide! Thank you for sharing the process and design. Cheers

[joepompa](#) - 06/10/16

Thanks Joe! I had a lot of fun making it. Cheers to you too.

[Ben Gottemoller](#) - 06/11/16



hi! thank you so much for this guide! I purchased the 3d printed impeller from shape ways and it fit beautifully! I'm still having issues with the grinder though- it will now grind through once at whatever volume I have it set at, but then when you try to grind again, it makes a high pitched sound similar to the one it makes when out of beans. If you disassemble and reassemble the burrs, it will do the same thing again- grind through one cycle then stop. Any ideas???

[Patrick Newton](#) - 06/12/16

Hi Patrick,

I wonder if there is a problem with the hopper. When you remove the hopper after the problem you're seeing happens, there should be at least a tablespoon worth of beans on top of the burrs waiting to be ground. If this is not the case, then I suspect it's the hopper not letting beans get through. You can test your hopper by holding it over a bowl and twisting the locking/unlocking knob. The beans within should flow through freely into the bowl. If this is OK, then next, perhaps make sure it's locking into place properly on the grinder. Something could be getting in the way of the locking mechanism.

[Ben Gottemoller](#) - 06/12/16



Any chance you could share the STL file on Thingiverse.com or something similar? I've got my own 3D printer and would love to give this a whirl.

[Lucas](#) - 06/16/16

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