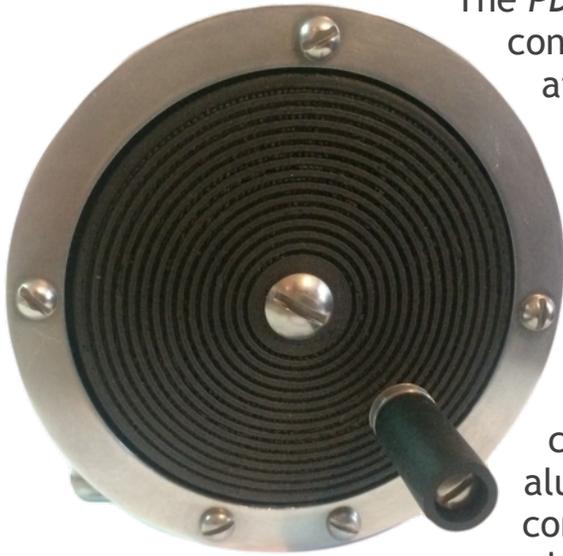




## The PDG<sup>1</sup> Reel - Catskills Reelsmithing Workshop 2015



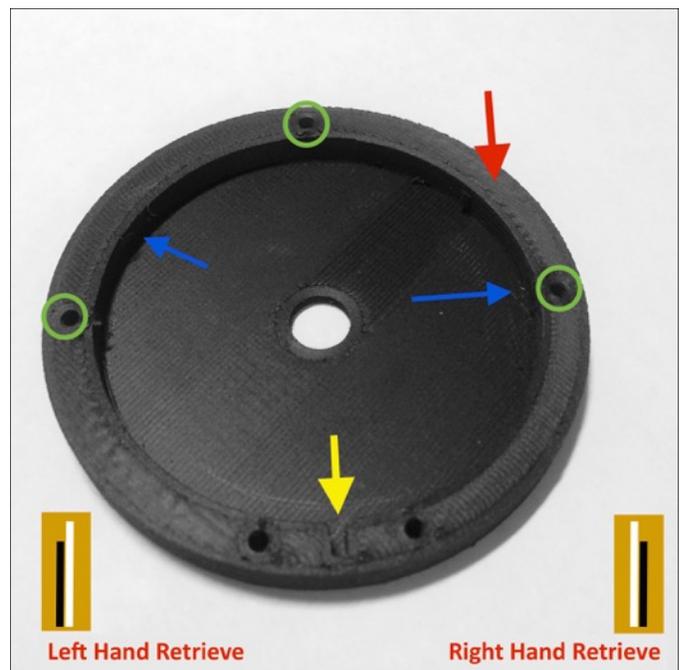
The *PDG* was inspired by the Hardy Perfect and a conversation I had over breakfast with Bob Colson at the Catskill Bamboo Rod Gathering a few years ago. Bob showed me a wonderful Perfect-style reel based on my original “plate & pillar” reel design. It was simple and effective. That got me thinking about designing a Perfect reel of my own. One thing led to another and the result is the *PDG*.

The *PDG* has state-of-the-art 3D printed carbon fiber reinforced PLA<sup>2</sup> parts with aluminum rings, pillars and foot. The combination of the matte black 3D printed carbon fiber and aluminum parts results in a very light, strong, and attractive reel. As you’ll see by the design, details like the ridged spool plates that are possible with 3D printing would have been prohibitive with traditional machining. Building the *PDG*

### A. Assemble the Frame

- three aluminum rings
- 3D printed bearing plate
- three 3/16” x 1” aluminum pillars
- three 4-40 x 1/4” stainless screws
- three 4-40 x 5/8” stainless screws
- bi-directional Nylon™ click check

**Step 1:** Begin by lightly sanding the raised ring of the *bearing plate* (red arrow) on a flat surface. Do not sand the back surface. Remove any globs in the pocket (blue arrows) and pocket for the click check (yellow arrow).



<sup>1</sup> It's not Perfect but it's *Pretty Darned Good!*

<sup>2</sup> Polylactic acid is a biopolymer made from corn starch.

**Step 2:** Sand all three *aluminum rings*. Round over the inside and outside edges so they are not sharp. Start with 400 grit then finish with 600 grit sandpaper.

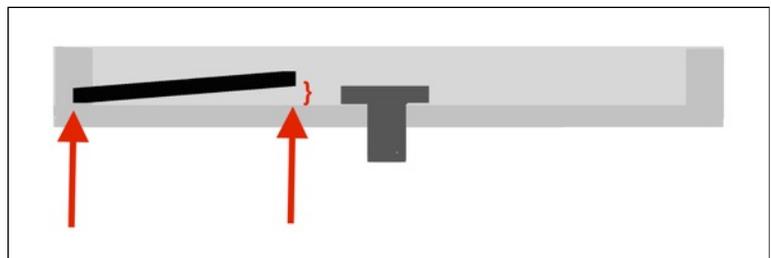
**Step 3:** Assemble the frame. Use the three longer screws on the *bearing plate* side. Make sure to use the three holes circled in green, the foot attaches to the two holes close together.

**Step 4:** Glue the *click check* strips (one black and one white) into the slot (yellow arrow in photo above) with a bit of CA glue and set aside to dry completely (15 minutes or so) see NOTE below drawing. Set the retrieve direction like this (see photo above):

**LEFT HAND RETRIEVE:** white check on right with slot at bottom

**RIGHT HAND RETRIEVE:** white check on left with slot at bottom

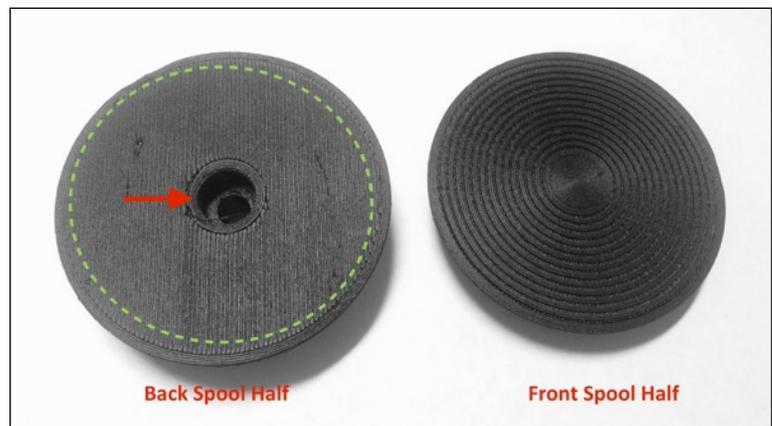
**NOTE:** The glued end of the click check strips must be pushed all the way down and back into the slot, the other end must be elevated so the bottom corner is at the same level as the bronze bushing in the *bearing plate*. A tiny drop of thin CA will hold in place quickly. Once positioned, add a drop of thick CA to completely fill the slot. Avoid gluing the strips together!



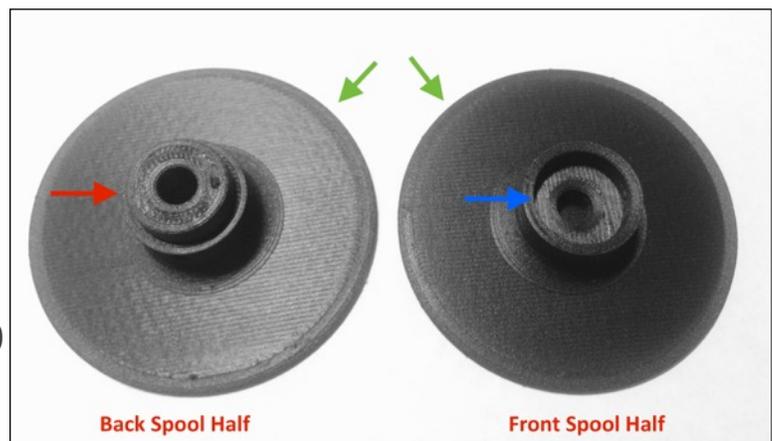
### B. Assemble the Spool

- 3D printed back spool half
- 3D printed front spool half
- three 4-40 x 3/16" set screws

**Step 1:** Sand the flat surface of the *back spool half* (top photo green dotted line) and clean up the pocket (red arrow).



**Step 2:** Clean up the post (bottom photo red arrow) and pocket (blue arrow) on the back side of both *spool halves*.



**Step 3:** Sand the edges of the *spool halves* (green arrows).

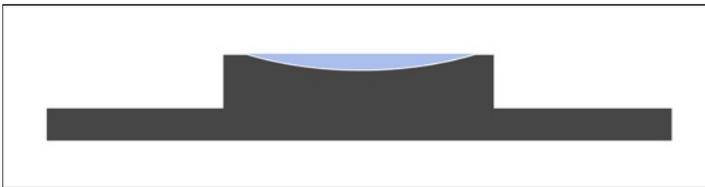
**Step 4:** Tap the three small holes on the *back spool half* with a 4-40 tap wrench. Insert a *set screw* in each hole until it is flush.

**Step 5:** Apply a very small amount of CA adhesive to the outer side of the post (red arrow) and snap the two *spool halves* together. Allow to dry.

### C. Assembling the Foot

- one aluminum foot blank
- four 1/4" x 1/4" aluminum spacers
- two 4-40 x 7/8" stainless screws
- two 4-40 x 1/2" stainless screws

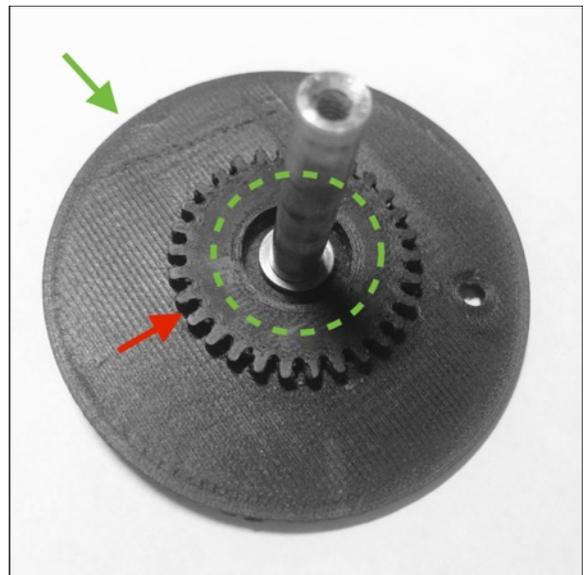
**Step 1:** Shape the *foot* as per the instructions provided in the workshop. The top of the foot should be filed to form a curve. This provides clearance for the spool and is not required.



**Step 2:** Attach the *foot* to the reel, centering it between the four *aluminum spacers*. It is easiest to do these one at a time. Use the long screws on the *bearing plate side*.

### D. Assembling the Crank Plate and Handle

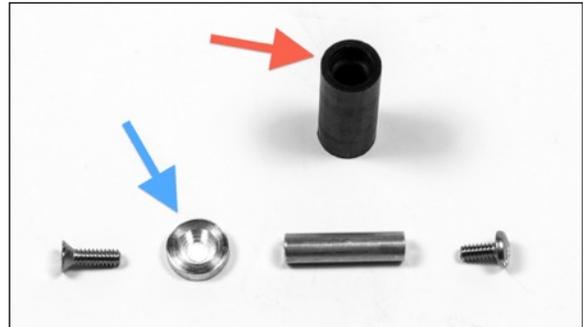
- 3D printed crank plate
- one 8-32 x 5/16" stainless truss head screw
- one #8 stainless washer
- one 1/4" x 1" stainless spool spindle
- 3/8" x 1" Delrin handle
- 3/8" aluminum handle bolster
- 3/16" x 3/4" aluminum handle spindle
- one 4-40 x 3/16" stainless flat head screw
- one 4-40 x 1/4" stainless binding head screw



**Step 1:** Sand the edge of the *crank plate* (green arrow) and clean up the click wheel teeth if needed (red arrow). Also flat sand the top of the click wheel (green dotted line).

**Step 2:** Apply a little CA adhesive to the *8-32 truss head screw* and screw it into the hole in the *crank plate*. The plate is pre-threaded. Apply a little CA adhesive to the *#8 stainless washer* and place it on the screw. Apply CA to the the threads on one end of the *spool spindle* and secure it tightly to the screw. Use pliers with padding to hold the *spindle*.

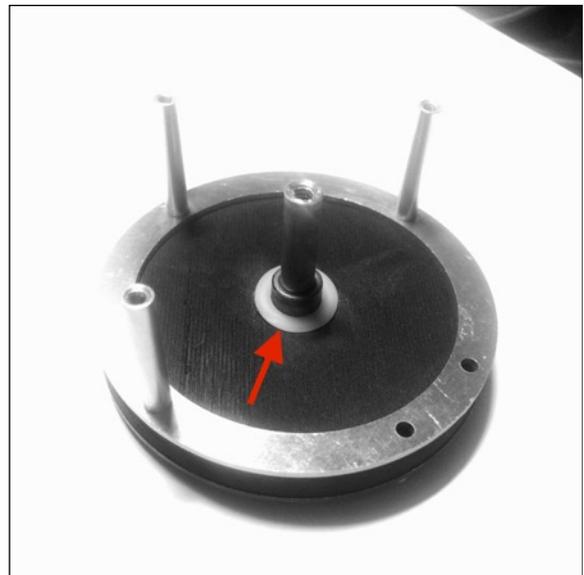
**Step 3:** Attach the *handle spindle* to the *crank plate* with the *bolster* and a *flat head screw*. Note the *bolster* countersink (blue arrow) must FACE THE CRANK PLATE so the *spindle* has a flat surface to sit on. The recessed end of the *handle* (red arrow) must face up for the *binding head screw* to fit in. Lubricate the *handle* with a little light oil.



### E. Final Assembly

- two 1/4" ID Delrin washers
- one 3/8" ID Delrin washer

**Step 1:** Trim the white *click check strip* using the special check gauge. The *black strip* should be about 1/8" shorter than the *white strip*. Place both 1/4" ID Delrin washers on the spindle on the *crank plate* lubricate with a little light oil and assemble to the *bearing plate*. Test the check by rotating the *crank plate* and make any adjustments until you are satisfied with the click and the action is smooth.



**Step 2:** Flip the *frame* and *crank plate* assembly over and add the 3/8" Delrin washer to the bearing (red arrow) and lubricate lightly.

**Step 3:** Slide the *spool* onto the spindle until it presses lightly against the *Delrin washer*. Carefully adjust the *spool* and tighten the three *set screws* to fix it in place and allow it to spin freely.

**Step 4:** Center the *aluminum rings* around the *crank plate* and *front spool half* by loosening the five screws and moving the ring to center it. Retighten the screws to hold the ring in place.

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