

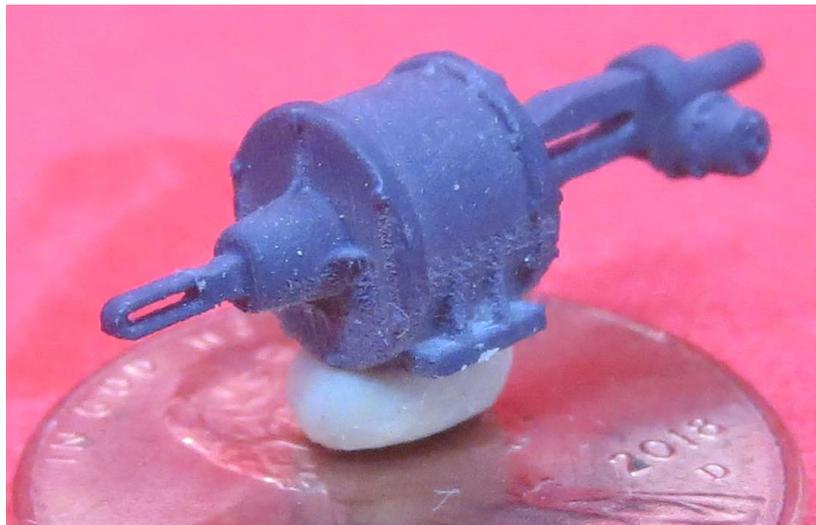
Comments on the 3D Printed P&R Steel Gondola

The corrugations on the inside walls of this 3D printed gondola are remnants of the support material deposited during the printing process to permit the printing of overhanging features on vertical (actually, all non-horizontal inward-leaning) surfaces. The car body was printed right side up. (If printed upside down the entire body cavity would be filled with support material, which would make it very expensive.)



Support material is deposited all the way up from the base to the feature being supported, and the body material is degraded where the two are in contact. The support material is melted and dissolved away when the part is cleaned, but the roughness in the contact areas remains.

It's more of a difference in texture than in dimensions, but it can still be visually jarring especially on a small part like this HO brake cylinder. Note the roughness below the bolt heads, and on the underside of the cylinder body. Fortunately, this part will be up against the underside of the car, inset from the side, and not out in full view.



The gondola corrugations actually aren't as pronounced as they might appear. The lighting doesn't flatter the sidewall rivets or the rivets on the inner end walls show how all the rivets would look under more favorable lighting.



Now, you're going to ask, "Why aren't there corrugations on the outside wall if it's lit the same as the inner wall?" Simple - the bulb angle at the top of the side needed to be supported, so the entire side was coated with support material during printing. Thus it had a more uniform texture. The centers of the panels are smoother than the edges, but I don't know whether the modeler sanded them or they are "as printed". The outer surfaces of the side stakes and the ends of the channels at their bases are nice and smooth. They are in line with the outer edges of the bulb angle and didn't get coated with support material.



The photos of the underside and the floor of the gon in Eric's blog post show both are pretty smooth. The floor would have been printed facing up so you'd expect it to be clean. The underside would have been completely coated with support material but horizontal surfaces don't show as much degradation as vertical ones - possibly because they contact the full face of a support material layer rather than a succession of individual edges. The photo at right shows the underside of one of my Pullman 3D prints, and although it doesn't have very much "fine detail", what's there is really clean. The surfaces, which have been cleaned and primed but not sanded, are nice and smooth.

The gondola is a nice model that's very well designed. It might have been better to break it down into components that could be ganged together and printed flat. It wouldn't use any more body material, and probably less support material, and should fit in Shapeways' 7x11 footprint for the process.

