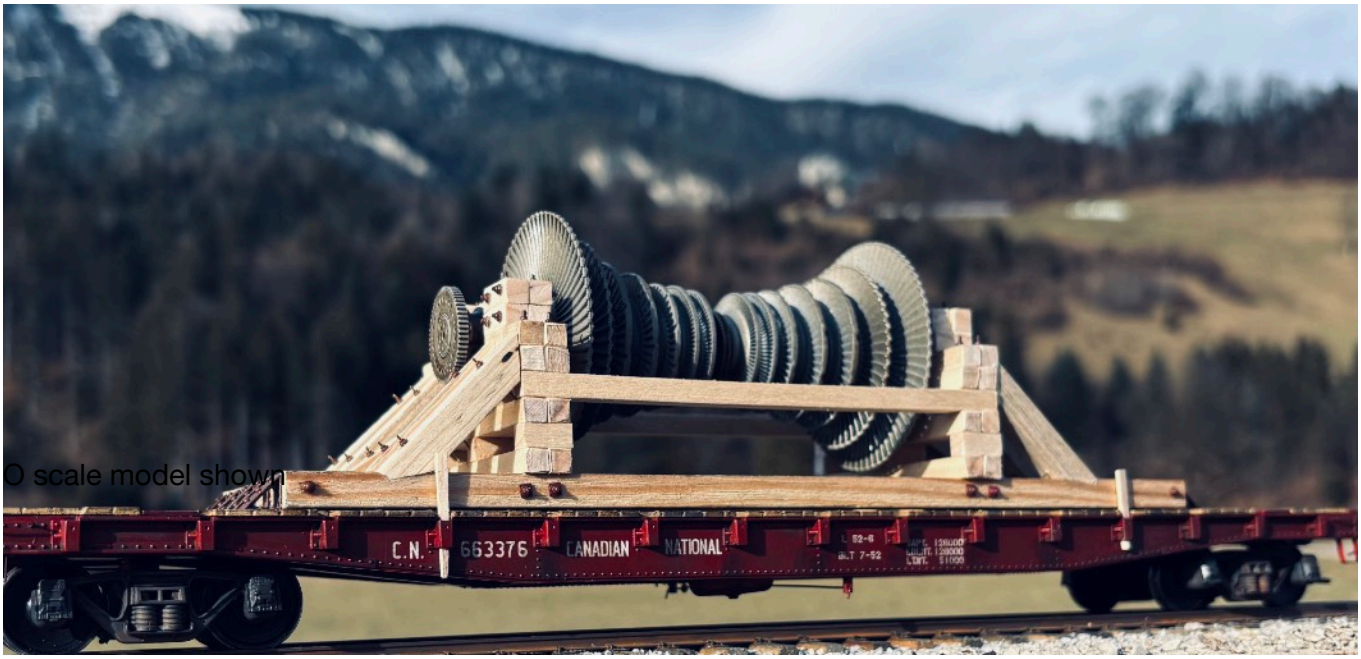
Train Kitchen / 3D Central

STEAM TURBINE FREIGHT CAR LOAD

First of all

I'm Sarah Griessenboeck and I'll guide you through the process of building the freight car load. Careful planning went into the project, 3D central brought a ton of expertise and skill to print the parts.

Congratulations, you now own a resin freight car load. It is a highly detailed model kit. Building and handling the model will require more care than you might be used to. I designed the parts to withstand operation on a layout. The stout timber frame will protect the assembled model, just like on the prototype!



O scale model shown

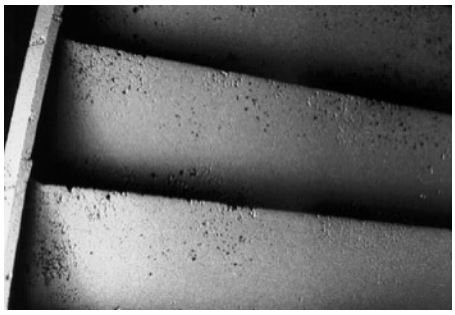
Completed O Scale Model Shown

A steam turbine converts the pressure and expansive forces of hot steam into mechanical energy. It can then either power drives, or power a generator producing electricity. This principle has not changed over the decades for modern day steam turbines and their ancestors.

Modern turbine

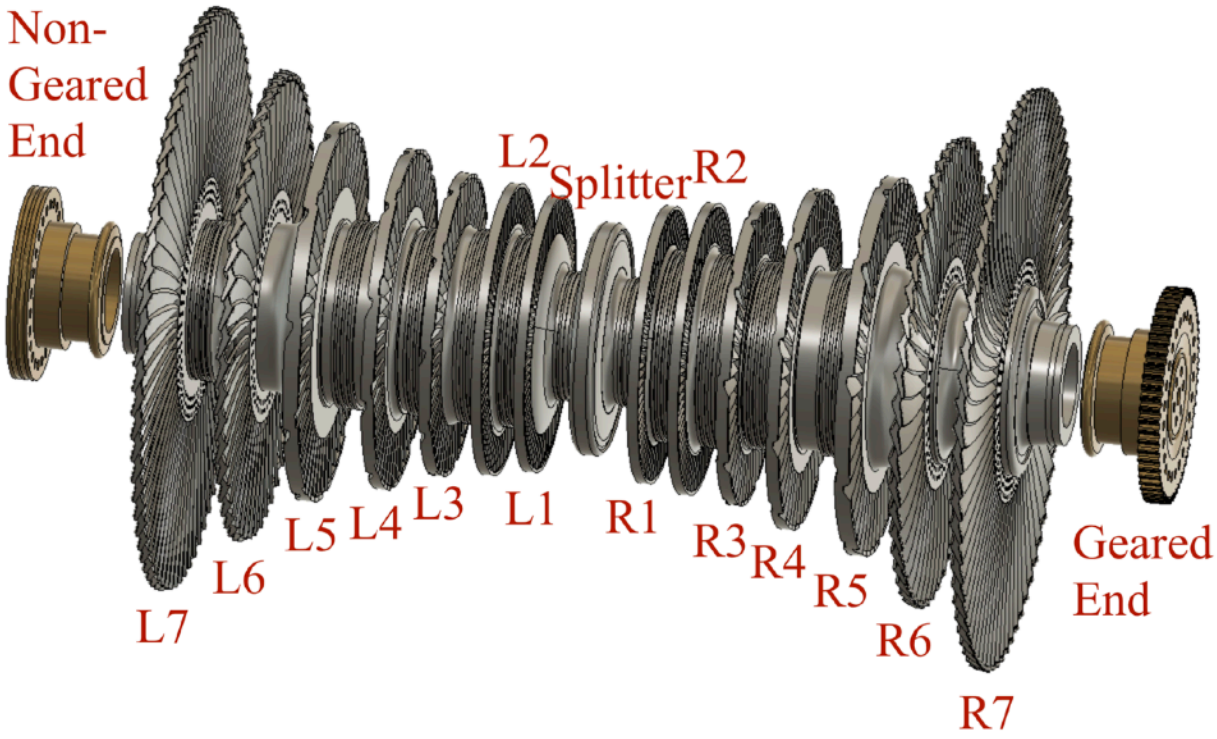
Real world turbine transport

Steam is steadily eroding the metal fins. After countless hours of heavy duty the turbine must be shipped back to the factory for refurbishment. Such a load would have travelled somewhat unprotected from the elements. This gives us an opportunity to display a steam turbine on a flat car.



Blade corrosion

Turbine Parts



Cribbing/Framing Parts

Required Items (Not Included)

In order to build a flat car load, you will need

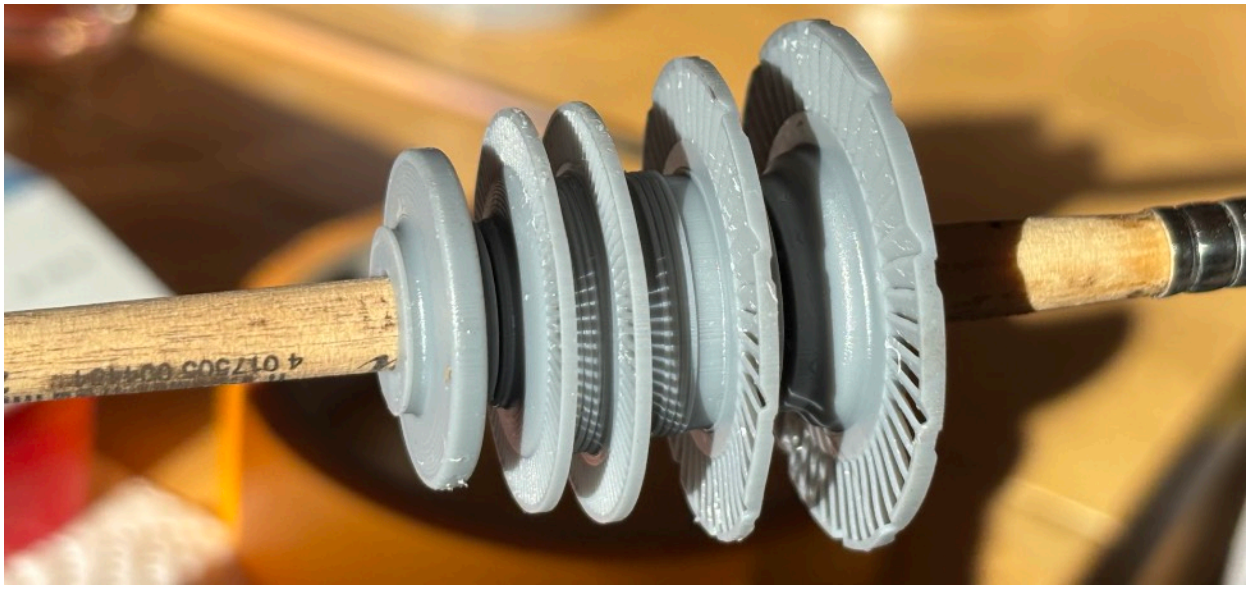
* A dowel or tube measuring 5/16“ for the shaft, par example
  Evergreen Item No. 230 - 5/16“ TUBE

* Basswood for the timber cribbing / framing

* Brass wire for detailing the framing
  size 0.020“ and 0.030“ to fit the resin washer-nut parts.

Preparation

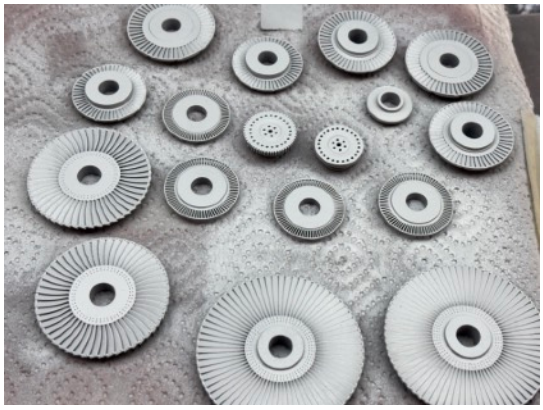
The turbine consists of 14 "stages" L1-L7 and R1-R7 shown on page 2. I recommend to wet-sand the outer rims of each stage with some 360-grit sandpaper. This will eliminate any possible support marks leftover from printing. It is essential that the parts are free of any dust particles or fibers that would be visible after painting. Since the individual fins are so tiny you can easily overlook smallest fibers which become visible on the finished model. Warm water, a toothbrush and compressed air will help.



Painting

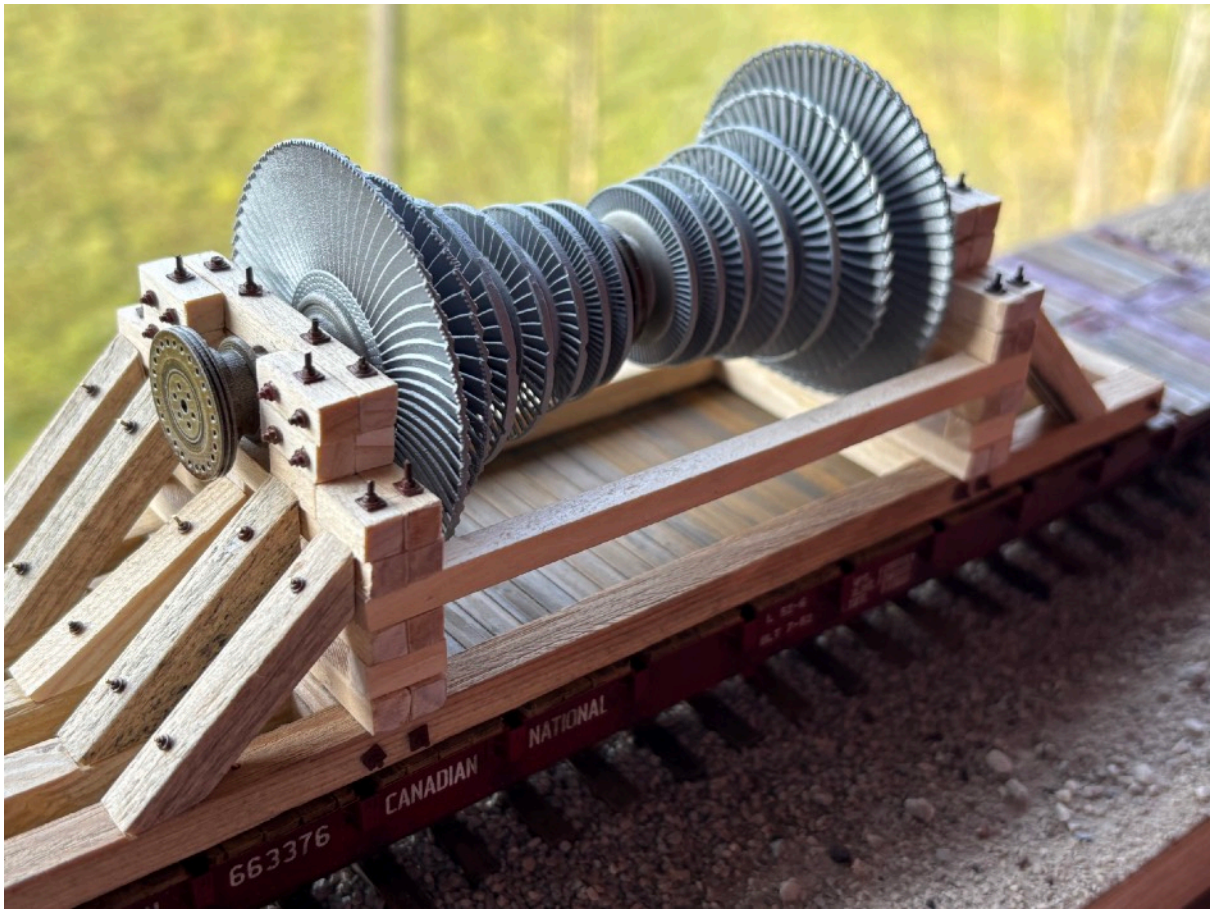
Painting the stages prior to assembly is a good call, it is easier to hit the right spots, and corrections can be made. Small bits of dust can accidentally settle onto the wet paint and have to be removed.

I use Tamiya Grey Fine Surface Primer (TAM87064) on all printed resin parts with great success. The primer gives the paint a great base to stick on and seals the UV resin. Steam turbines are obviously metal parts on the prototype, so one would want to paint it accordingly. I've used Alclad II Airframe Aluminum paint (ALC 119) on my example. In the photo I've already added some weathering but this can be done later.



Parts in Tamiya Grey Surface Primer

Alclad II Airframe Aluminum added



Assembly

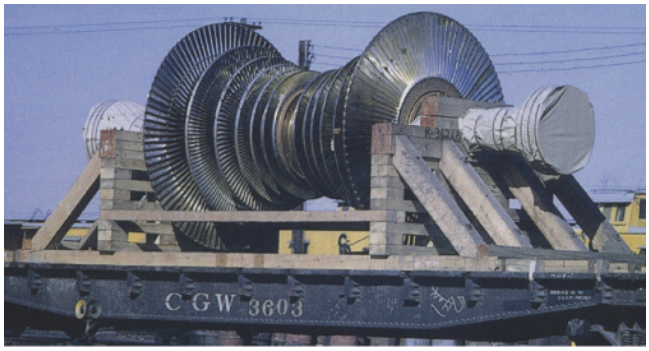
The turbine consists of 14 stages, seven on each side of the splitter. To correctly assemble the stages you have to make sure not to mix up the parts of each side. The stages of each side are mirrored in order to allow the shaft to spin in one direction. To achieve the right placement of the stages, **make sure that all the fins on each half of the turbine are angled the same direction**. Start with the splitter in the middle and test-fit the whole installation, you will also need to cut your pipe or dowel to the desired length. My turbine shaft in this example is rather short. You can make it longer, like in the picture of the D&H flat car on page 2. Once you have test fit the assembly, you are ready to gule the parts together. I used CA/Super Glue but any slower setting product like white glue would just work as well. Finally, glue the end pieces in place and leave enough space between the end pieces and L7/R7 to accomodate the wooden blocking that will cradle the shaft.

Weathering

I would suggest that a loaded turbine exposed to the elements would be one on its way to the repair facility to be overhauled. Prototype picures show lots of grime. You could also tarp the ends, as seen on the picture of CGW flat car 3603, April 1969.

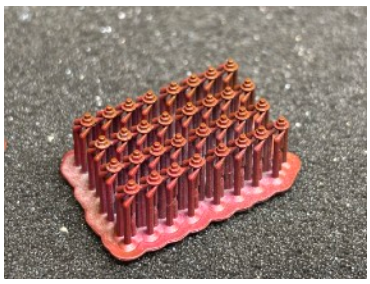
I did a light overspray with AMMO by Mig Fresh Engine Oil (A.MIG-1408). Be sure to have some mineral spirits for thinning the product, otherwise you could get undesired large drops on the model.

Weathered model

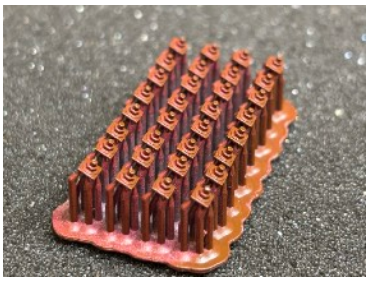


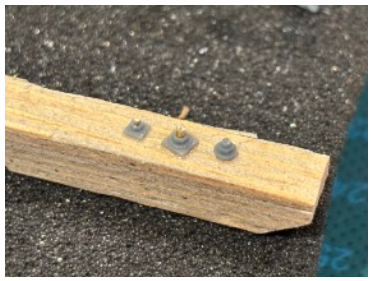
Picture Source: Chicago Great Western Color Guide to Freight and Passenger Equipment, Gene Green

Building the Timber Cribbing



To build the protective wooden framing, I have used firework sticks that landed in my garden on New Year's Day. For the support blocking I used square basswood. The more precise you are here, the more convincing the load will look. To imitate the prototype practice of building a framing that withstands rapid changes in momentum, you can drill holes and directly insert the 3D printed nut-bolt-washer combinations or insert brass wire and then add the nut-washer on top. You can easily paint these parts while still on the supports. When inserting brass wire, a little clean-up of the holes is recommended using a drill bit in a pin vise.





Maybe there are prototypical rules for how to correctly secure a turbine on a flat car, I have not found anything, so I worked from pictures. It is generally a good idea to make the cribbing strong. This is to give the appearance that it is supporting a heavy load. Avoid showing glue on the timber cribbing as this would ruin the illusion. A little roughness can add to realism since this kind of wood was not chosen for aesthetic purposes but for function.

Thank you for choosing 3D-Central and happy modeling!

Sarah Griessenboeck
www.trainkitchen.com