RAW POWER

Introduction

As readers of O Scale Trains know by now, I can hardly resist anything wearing the Southern Pacific or the Union Pacific Logos. When that Overland set of Big Blow Turbines showed up on E-Bay, it was too much of a temptation for me to pass. Little did I know at that time, about the various releases of that unique model produced exclusively by Overland in 2 rails. I did win the auction on that day and was quite happy to finally have in my possession a rare model of a much coveted engine. The price was hefty and actually quite reasonable compared to some other auctions I have seen later on, of such engines.

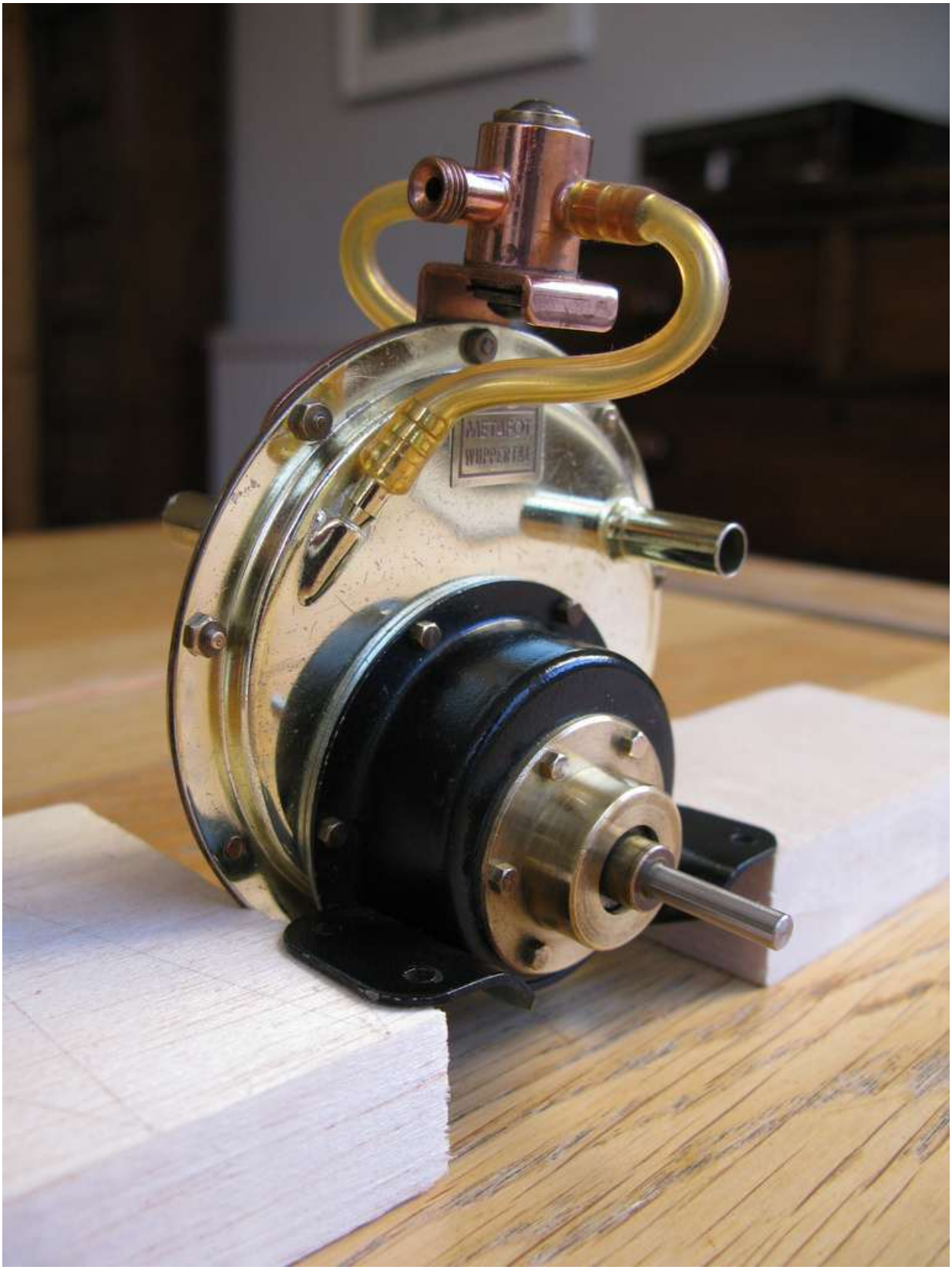
Before we dive into the details of my acquisition, let's summarize the various generations of that model produced by Ajin for Overland. The first generation was made available in the 70's and was offered unpainted. The big drawback of that generation was the poor quality of the zamac cast gearboxes and of the drive in general. The details were quite good even to today's standards. The second generation was improving on the gearboxes and was distributed artistically painted and decaled with a special run made by Microscale for Overland. The third generation was offering tower drives and exquisite details, including the interiors and the rendition of the turbine inside the B unit. These last sets are extremely hard to find and will, in my opinion, not be available for probably a decade or more as they are in the hands of educated and very wealthy collectors. They also fetch a staggering price, when you are lucky enough to find one.

The set I received from the seller was unfortunately of the first generation. The units had been painted by a professional modeler and decaled with the special run of decals made by Microscale for Overland. The poor quality Ajin gearboxes had been replaced by Central Locomotive Works gearboxes which are a nice improvement and the Ajin transfer box had been upgraded to PSC boxes. A light weathering had been applied to the overall engines and tender, with some taste. The details of the Ajin models were very nice and the lack of turbine rendering and micro-meshed panels on the side of the A unit did not bother me too much. Overall it was not too bad, at least from an appearance point of view.

It was now time to proceed to the running tests. After placing the A unit on some rollers, I slowly increased the voltage and the unit came to life, with a very unpleasant and grinding noise. Had I actually purchased a coffee grinder, without knowing? I realized that the wheels were not turning very fast or almost not at all. A sinking feeling started to settle in my stomach…. Had I spent that much money to end up with such mechanical lemon? I quickly replaced the rollers with a piece of track and powered the A unit. The engine started to crawl at a very slow pace generating an awfully unpleasant noise of poor mechanical design. I was devastated and realized that the description of the buyer was quite optimistic and not completely accurate. For sure the unit was moving, but very slowly, noisily and with very little torque. Needless to tell you, I did not sleep that night as multiple scenarios started spinning in my mind. For certain, I would have to open the units, and figure out what was wrong with that first generation of

Overland Big Blow turbine. Obviously the perspectives were rather bleak and I had to measure the various options available to Turbine enthusiasts.

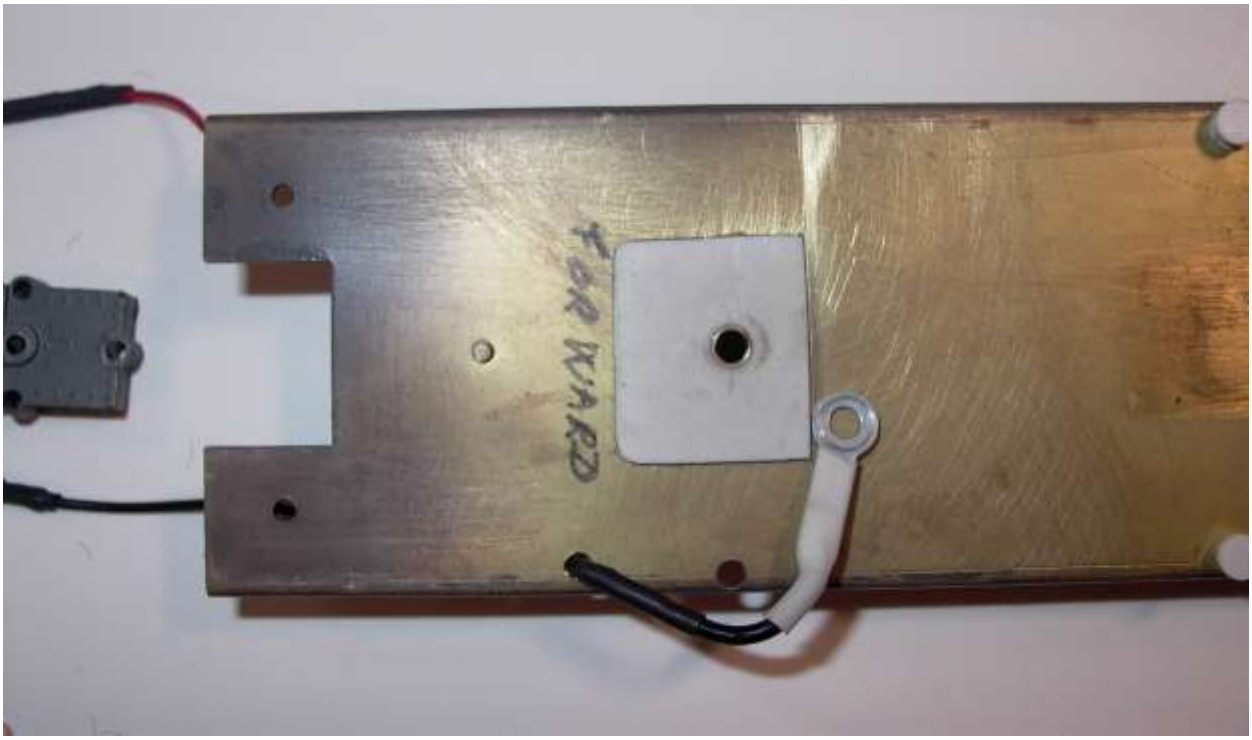
However, before jumping in the midst of the topic, let's digress a little bit and talk about a wonderful implementation of an O scale Big Blow triple units (most definitely better than the one I had bought…). Although the solution I will present in the following pages is not bad, it pales in comparison of what some people have done in other parts of the world and more specifically in Japan. I want to tell you about a certain Nobutaro Hari San of Ashiya in Japan, who owns the Shangri-La train museum. Mr. Hari is obviously a wealthy collector and great connoisseur of fine train models. In the early 90's, he commissioned Mr. Wada of Wada works to build him a triple unit UP Big Blow powered by a turbine…. a real turbine. Wada Works is known by some collectors for his G scale models of steam powered turbine diesel engines. Wada Works is specialized in micro-mechanics of high quality and his customers are scattered around the world. The triple unit Big Blow made by Mr. Wada is nothing less than a pure marvel of engineering as it is most likely the closest existing O scale model to the prototype. I suspect from the pictures I have seen that Mr. Wada used the Overland model to build his incredible turbine powered triple unit. The tender contains a small tank of alcohol used to fuel the burner located in the B unit with the boiler of 300 cc of capacity. The A unit contains the turbine and the electrical generators powering 8 coreless Faulhaber traction motors located directly in the trucks of the A and B units. The heart of the system is a micro steam turbine spinning at 30,000 RPM and reduced 5 times to drive the two electrical generators. The two generators are coreless Phillips motors and the overall unit is capable of pulling 10 full size coaches. The picture below shows the marvel of engineering designed by Mr. Wada: the 30,000 RPM turbine with its integrated reduction gears:


WUPPERTAL

In our case, we will be more pragmatic as I cannot replicate the marvel of engineering built by Mr. Wada. Our solution will be more conservative and will be based on Pittman motive powers, not Wada turbines. My initial goal is to install no less than four 9xxx series Pittman motors with their corresponding flywheels. The transfer box is being replaced by two high resilience belts to transmit the important torque created by the two 9xxx Pittman electrical motors. The A unit can easily accommodate that objective. For the B unit, it present some challenges because of the reduced length and I am no yet certain such an exhibition of raw power is feasible. Before getting into the details of the re-powering of the first generation Overland units, let's start with the tail of our triple unit: the Tender.

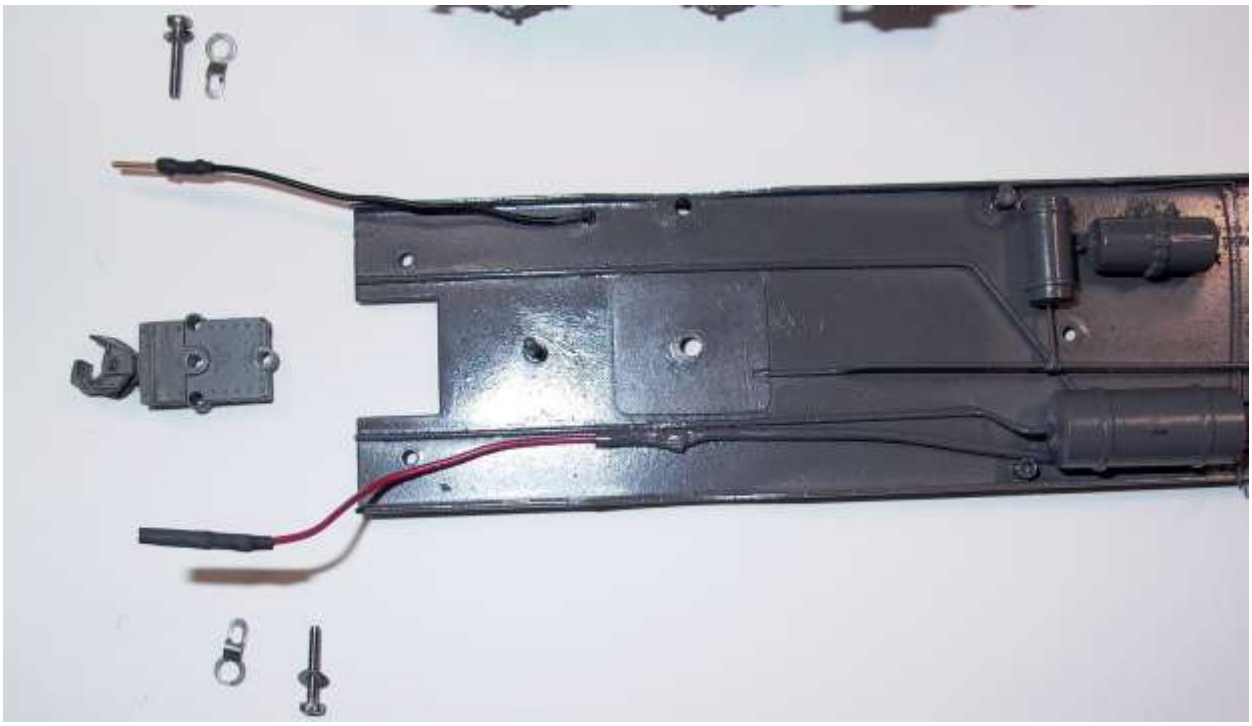
The tender

The tender offered by Overland is well built and capable of handling the additional pull provided by the repowered engines and any long train behind. Mechanically it is sound and besides some additional weight, it does not really require anything special. Surprisingly it is well soldered and the joints are sound some 40 years later. On the electrical side, the tender is connected to one polarity and does not contribute to any useful electrical pickup. Since I wanted to have the best electrical pick up possible on this set of Gas Turbine and to distribute the high electrical current consumed by the A and B units in the best possible way, I decided to turn the tender into an electrically active tender. To do that, the task was relatively easy and required to simply isolate each truck from the chassis and to connect each truck to the power bus created between the A unit, the B unit and the tender. The forward truck picks up the negative side whereas the rear truck is in charge of the positive side. The isolation of the trucks was done in the following way. A thin plate of styrene was glued on each side of the chassis and drilled to accept a styrene tube and a brass tube inside as shown in the picture below (Tender -01).



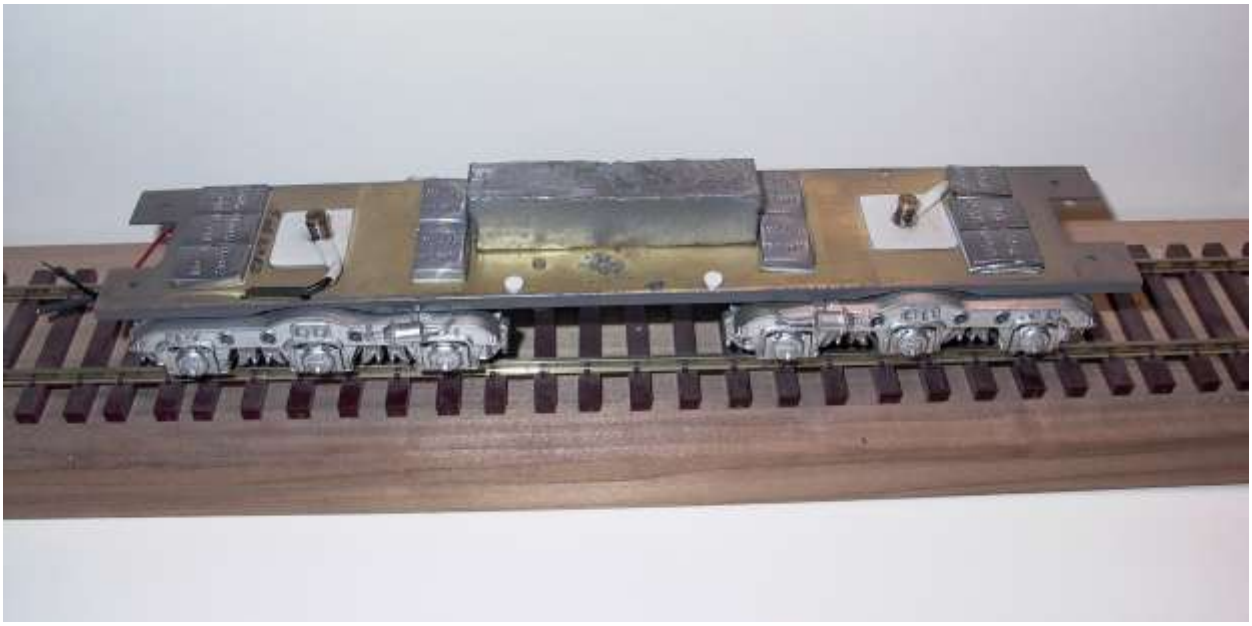
Basically the bolt that holds the truck pivots inside the brass tube which is electrically isolated by the styrene tube. The truck rests on the styrene plate and pivots on it. The styrene is polished very smoothly to offer no mechanical resistance and should allow the tender to work perfectly for a long time. It is unlikely that the light weight of the tender and the slight rotation of the truck pivot will wear off the styrene plate. If it ever does, just replace the insulating styrene plates. Both truck locations are equipped in the same way and that gives us a tender that can pick up both polarities and feed the common bus between the units (Tender-02).

The original springs and bolts are used to install two wires leading to the common power bus. The most difficult part was to route the wires underneath the tender chassis so as to not obstruct or disturb the rotation of the trucks. The top of the tender was not an option to route the wires as the shell has some stiffeners that are sitting flush on the chassis of the tender (Tender-03).



After making the tender electrically active, I wanted to add some more details to the already excellent Overland rendition of that unit. The addition of truck chains is something that could not be missed as it is clearly visible on the pictures of the prototype. However, how can you add metallic chains to a chassis which is electrically neutral and insulated without causing a short circuit? I decided to use some plastic caps of small dimensions on the chassis side of the chain ends. As seen in the previous picture these small caps are in fact plugs used to protect telecommunications optic fibers, before deploying them. I am sure it would be possible to come up with another idea to insulate the end of the chain leading to the trucks, but this was all I could think of at that time and it fitted the bill very well. The end of each chain is connected to a small piece of metallic wire that goes through the plastic cap. After assembling the chains, I checked for electrical insulation and everything was perfect: the chassis and thus the entire tender are completely neutral. Installing the chain at the front of the trucks turned out to be almost impossible as it is not feasible to install insulating caps, because of the wide stiffeners under the shell, used to attach the Kadee couplers. Thus, until I can find a possible way to do it, while retaining the possibility to disassemble the trucks easily, I will not install the chains at the end of the tender. It is an offense to prototypicality but life is full of compromises (Tender-04).

To finish with the chassis of the tender, let's have a few words about weight. The original weight provided by Overland is pretty decent. However, because of the extra power provided by the A and B units, the tender may be pulling more cars and longer trains, and thus should stay on the rails no matter what load is attached to it. In addition, the tender is now used to pick up electrical current and as such need to be weighted down. As shown in the next picture, I added some weight (not too much) to the tender, concentrating the mass above the trucks as much as possible. The addition is about 2.5 ounces (80 grams) and provides about as much weight as what Overland installed in the original model. The finished tender fully equipped with couplers and decals weights 1.4 Kg or 3 pounds. It is possible to add more weight and I may do that if the tender shows signs of derailing while pulling a very long train (Tender-05).



For the couplers I decided to try the Protocraft couplers between the A-B units and between the B unit and the tender. The rear of the tender had to be equipped of Kadee couplers as the Protocraft are not compatible with the Kadee couplers found on most cars. I ran some tests on the Protocraft and decided against them, despite their fabulous appearance, realism and beautiful decoupling action. I found them to be too weak as the inside lock/pin does not offer as much resilience as a regular Kadee coupler and I ended up breaking a few just by slightly pulling on them. Thus, the unbreakable Kadee couplers were retained to equip the entire triple unit with the exception of the front of the A unit which will be equipped with a Protocraft coupler for ultimate realism.

Let's have a few words about the painting of the tender. As we mentioned in the introduction of this article, the tender came pre-painted and slightly weathered. I decided to remove most of the low weathering situated around the wheels and chassis and to only keep the nice rendering of the soot projected by the turbine on the upper part of the tank. After soaking the chassis and the trucks in brake fluid for a few days and cleaning them with isopropyl alcohol, I repainted the chassis with Scalecoat I UP Dark Mist Gray and the trucks with Floquil bright silver paint. I have had so many problems with Scalecoat silver during the renovation of my Cab Forward that I only swear by Floquil for that specific color. As can be seen from the pictures, the trucks came out perfect and shiny as was the prototype when clean. The tank was carefully cleaned with alcohol and all evidences of the original weathering were removed. I re-applied decals to the tender and added the missing "F" letters at the front of each side of the tender. The bottom portion of the tank was re-painted and Microscale red stripes were added on the side and ends of the tender. A final spray of a 50/50 mix of Testors Dullcote and Clear coat seals and completes the tender (Tender-06).

The rear of the tender is equipped with two brake lines held by chains, and three Mu lines to control an optional Diesel engine helper. Our tender looks now very close to the prototype (Tender-07).

The A unit:

As previously mentioned, the mechanical characteristics of the A and B units are a disaster and I had to do something about it. The original assembly came with a lousy Sagami motor “glued” to the chassis, a decent PSC transfer box, some horrible universal joints that would make a tin plate toy made in China look like a Ferrari, and some decent Central Locomotive Works gearboxes on two axles out of three. The whole assembly was jerky, lousy, noisy and sluggish: A complete fiasco.

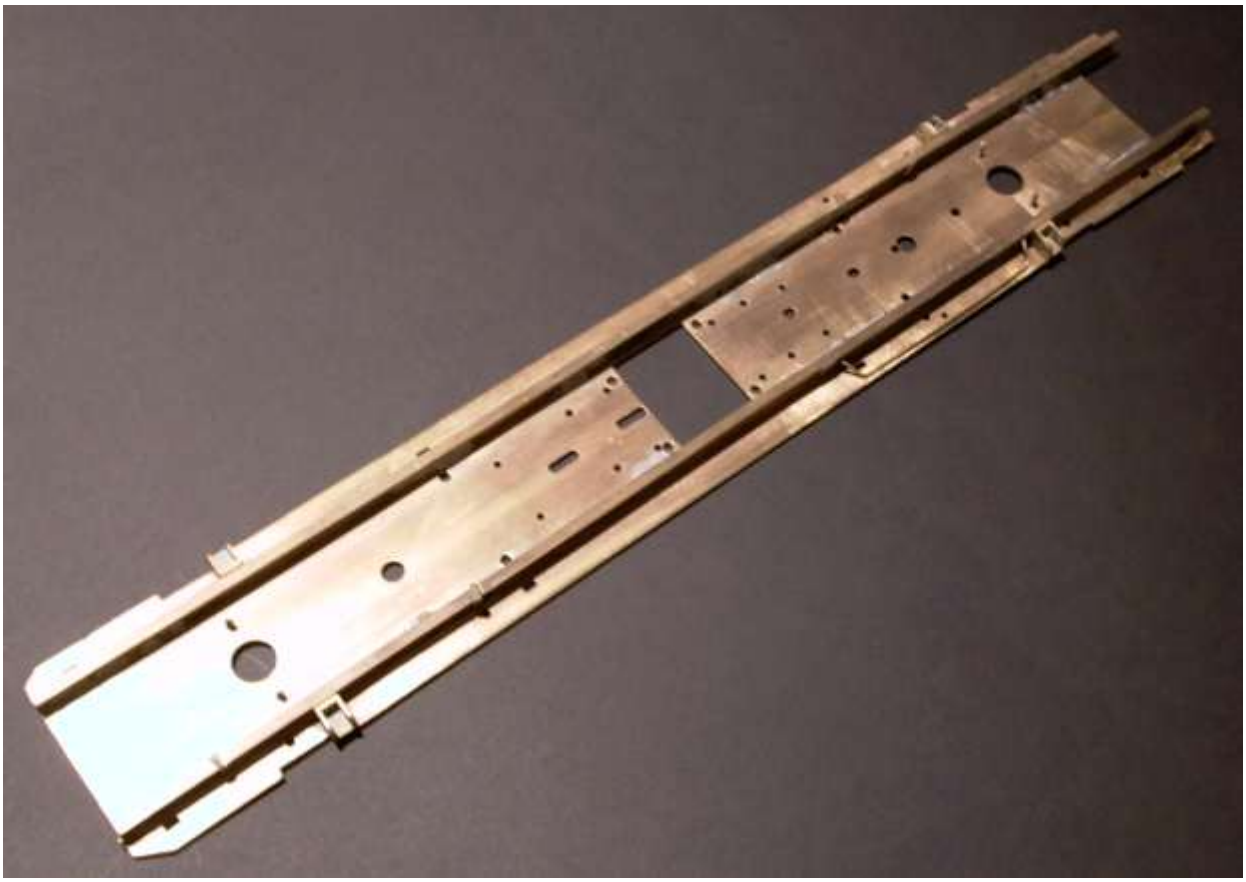
I started posting some inquiries on a couple of O scale forums and got some interesting feedbacks. First, there are not so many Big Blow turbines in activity on O scale layouts and I suspect that most of these expensive Overland models are shelf queens. Secondly, most enthusiasts were unanimous at depicting the first Overland generation as a big failure mechanically speaking, which confirmed why my units had been partially modified. Finally a modeler pointed me in the direction of Jerry Snow, manufacturer of much improved ball bearing equipped gearboxes and a very serious transfer box with a Pittman 8xxx motor. The parts required to modify an A and a B units could be made available and it would take some work to rebuild the units. The price estimate was stiff and I could not resolve myself to spend that much money on top of the already expensive purchase price. The Jerry Snow solution was getting close to $1100 to repower A and B units with only two 8xxx Pittman motors. Honestly, I wanted more than the two Pittman and my previous experience with the 9xxx series had convinced me of their incredible torque and smoothness.

I then started looking into converting the two powered axles into three powered axles, in order to transfer to the rails the massive torque I was planning to equip the units. I contacted Central Locomotive Works and got in touch with Lou who offered to redo the trucks for $450. The price was more acceptable but the prospect of shipping these trucks and having them gone for a few weeks did not sound too good to my mind. Besides, money was becoming tight and I had some ideas on how to do this with commercial and readily available parts. As a matter of fact, I have been able to transform the four trucks from two powered axles to three powered axles, for a fraction of the cost suggested by Lou. This will be described a little bit further. Necessity is the Mother of invention.

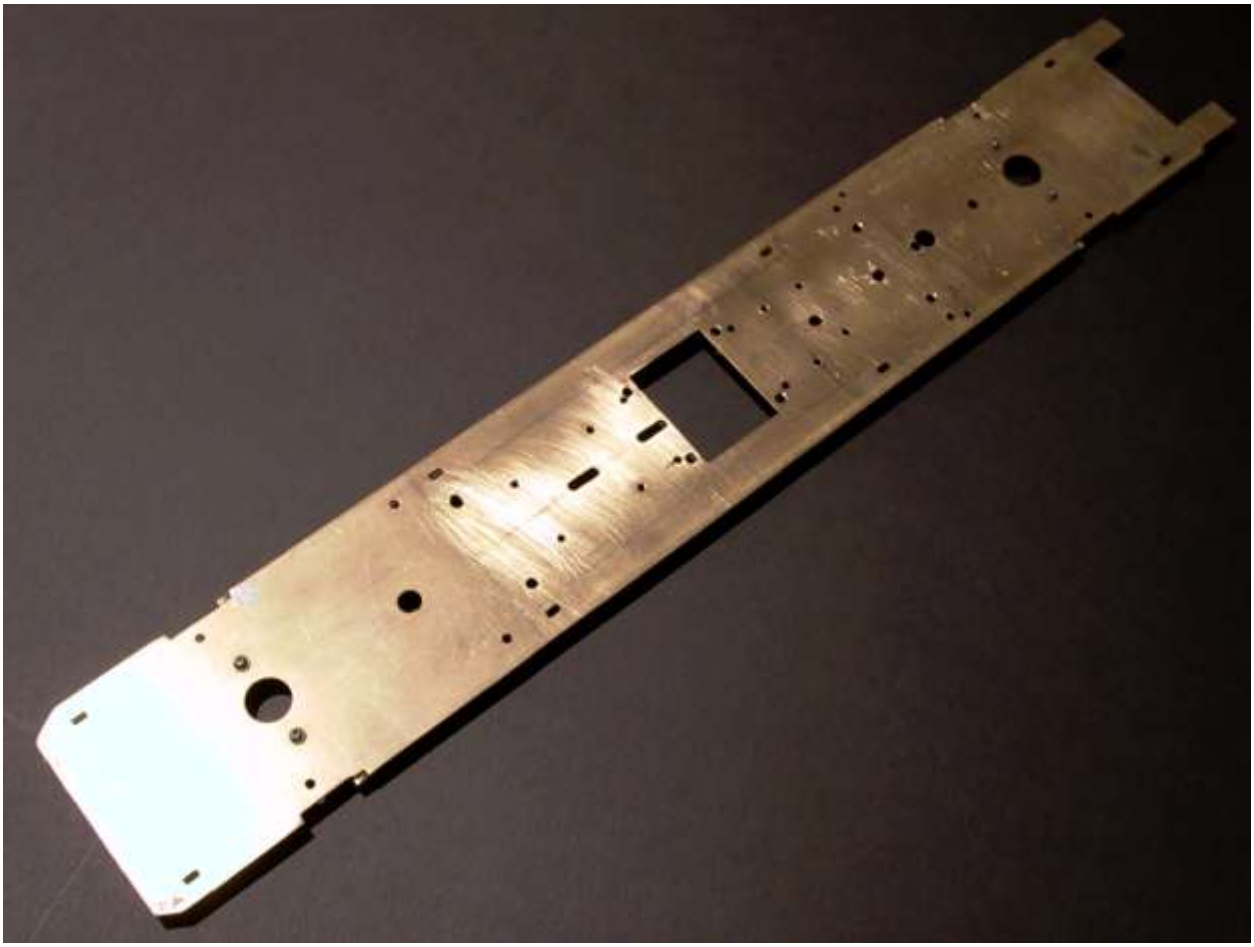
With resolution, courage and a few ideas in my mind, I decided to take apart the A unit and remove the horrible original motor and transmission. Here again, my efforts were going to take me from Charybe to Scyla. The slow descent to hell was going on. Where would it stop? I hope the readers will share my despair when after having taken apart the chassis and the counterplate used to mount the trucks, I realize that the chassis was warped! Yes, the A unit was actually not flat and warped beyond measure. There is some truth to what is being said about some of the early Ajin models, and my engine was a poor example of this trend. After studying closely the reason of that warping, I tried to redress the chassis using my hands. Nothing would budge or move, or if it did, it would go back to its initial position. I was forced to conclude that it had been soldered this way.

At this stage of decay, there was no coming back. I plunged the chassis into my greedy brake fluid for a few days. The rapacious liquid ate up the paint quickly, leaving some goo that I quickly wiped and cleaned with alcohol. The torch was next and the various pipes, hoses and the two main rails were

quickly de-soldered from the main plate. Some nice sanding, slight bending of the plate, and the model was already taking a better appearance. For sure, I had spent an hefty amount of money on that lemon, and there was no way I would let that shiny brass rot in its box and not attempt the ultimate rescue mission (Turbine-02).



A little bit of rosin, some electronic solder, my precious torch from Home Depot, and the rails, pipes and hoses were placed back on the main plate and soldered with some fat and healthy mix of tin and silver. And, great news, this time the chassis was flat (Turbine-03). The rosin was cleaned with alcohol, and the parts and excess of solder were nicely sanded and filed.



I then measured the outline of the upper shell and traced it on the main plate, thus defining the inside perimeter of the engine bay area. I realized with pleasure that the big Pittman 9434 would fit without any surgery to the upper shell. I also verified that the transmission would fit and made it such that the original square opening was large enough for the transmission belts to go through. Things were starting to look good, and there was no way I would go back to the Ajin solution. I was going to turn this unit into a monster of torque and power, as the original prototype was intended to be.

I had procured from North West Short Line four Pittman motors: the famous and unstoppable 9434 with rare earth magnets, seven poles balanced armature and dual shafts mounted on ball bearings (NWSL 40611-9). Each motor develops close to 42 Oz. of torque close to stalling. Each motor would be coupled to the largest flywheel I could find the NWSL 416-6 of hefty mass, and as big as the motor itself (Turbine-04).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