



## Union Pacific Challenger Project Information



Kohs & Company Sample Model

The Union Pacific 'late' Challengers (classes 4664-3, 4 & 5), our second Union Pacific project, were significant for their service to the railroad during a critical period in railroading history and were arguably the best known locomotives of the type. These ALCO built locomotives were delivered between 1942 and 1944 in three production orders totaling sixty-five units. There were six additional locomotives ordered by the War Production Board as part of the second Union Pacific order and those were allocated to the Denver & Rio Grande Western Railroad during World War II where they operated as that road's L-97 class. After the war those same six locomotives were sold by the 'WPB' to the Clinchfield Railroad where they became the E-3 class.

While sharing many of the design features of the Union Pacific 'Big Boy', the Challenger's wheel arrangement allowed the class to operate system-wide including areas where the 4884 class could not. Fast freight was the intended specialty, but many Challengers saw passenger service as well, particularly in the Northwest area of the system. When new, the entire class was coal fired, but shortly after the final order was delivered the Union Pacific began converting a number of locomotives to oil fired operation specifically for passenger service. Although not the biggest or most powerful, many consider these well proportioned locomotives to be among the most aesthetically pleasing ever built and we agree. The last of the 'late' Challengers left service in 1961.

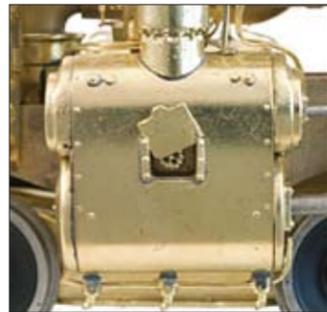
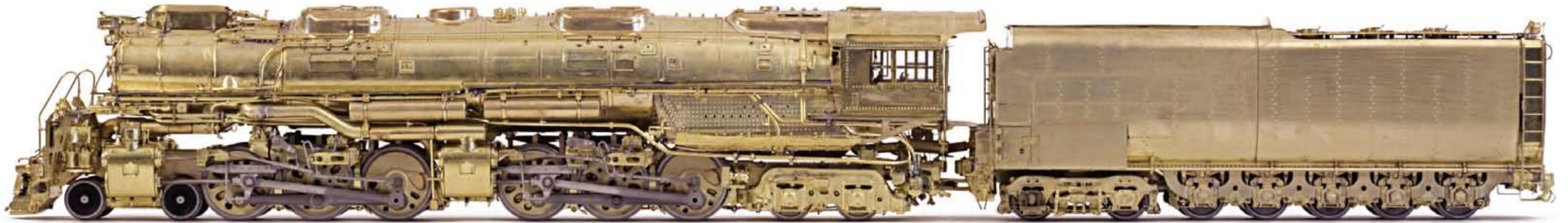
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### Model Locomotive Specifications

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- Custom Dallee Electronics Sound System Synced to each Engine
- Custom Designed Speaker System with 3 Speakers for the Sound System
- Prototypically Mounted Running Boards with Bracket Detailing
- Fully Equalized and Sprung Suspension with Real Leaf Springs
- Dual Custom Enhanced Pittman Ball-Bearing Motors
- User Controlled Electronically Operated Valve Gear Mechanism
- Ball-Bearing Equipped Bearing Boxes and Journal Boxes
- Ball-Bearing Equipped Main and Side Rods
- Ball-Bearing Equipped Free-Rotating Custom Drive Mechanisms
- Nickel Silver Main Rods, Side Rods and Valve Gear
- All Hatches and Compartments Open to show Full Interior Detail
- Full Cab Interior Detail including Real Wood Components
- Brass Bezels and Lenses on Backhead Gauges
- Full Under-Body Detail on Locomotive & Tender
- Constant-Voltage Lighting \*
- Stainless Tires on Drivers and all Wheel Sets

\* The directional lighting will function automatically or may be manually controlled using the supplied control box which also controls the sound system. All remote operations may be assigned as DCC functions with the installation of DCC decoders, wiring installation information is available.



Shown throughout this brochure are photos of our first sample model for this project. It is important to understand that corrections have not yet been made to this model although more than 200 have already been identified and are in process. The sample shown is representative of our version #1 'early service' configuration: coal fired with most construction details as delivered.

While many of the details shown are part of every version we are producing, each of the eight planned versions has its own unique detail set which will be explained in more detail on the accompanying order form.

Every railroad had its own design prerequisites and every builder its own unique standards of construction, as a result every new prototype we consider for production offers new modeling challenges. We have embraced these challenges with each of our previous projects and that is what has made our models unique in

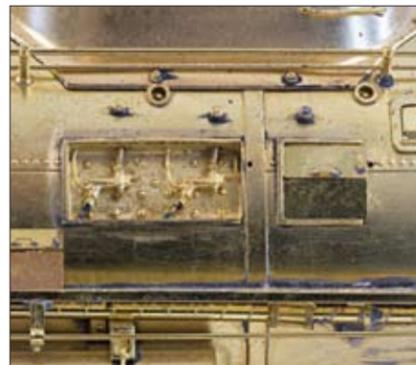


the industry. The 'Big' Challengers, as they were often called, present a new and different challenge, that of combining most every type of detailing that we have offered with previous models with new types of detailing that is required to correctly represent this prototype class. Looking carefully at our sample model you will see the usual complete underbody detail on both the locomotive and tender, complete cab interior detailing including the use of



real wood and of course fully equalized suspension on both the loco and tender. This project also requires the inclusion of the extensive lubrication detail that we developed for our 'Allegheny' project.

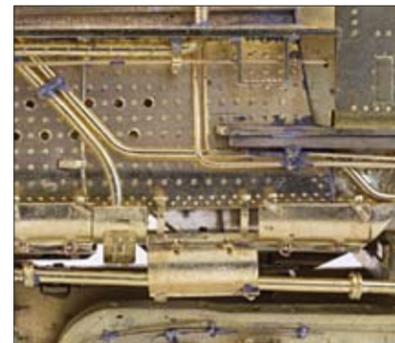
From the outset one of our standards has been that if it opens or moves on the prototype, if possible it should on our model, the Challenger project pushes this standard to new limits! If you review the small photos in this brochure they illustrate some of the many types of functional detail that are part of our Challenger. The cylinder access panels that opens, the smoke hood that articulates from the closed to open position, the folding steps that function and are in multiple



locations on the boiler and firebox. There are also the opening turret box hatches, cab ventilators and sand dome hatches. The Challengers have 'all weather' cabs with fully functional enclosures with cab doors, hidden sander valves with piping located behind removable access panels on the boiler and opening firepan doors. The challenge is not only to make the details operable, but to do it in scale with the proper size hinges, fasteners and locking devices. It is not good enough just to have panels and doors that open, the detail hidden behind them must be correct and complete, with this project that is made possible by having over three thousand drawings and hundreds of photographs to plan our design from.



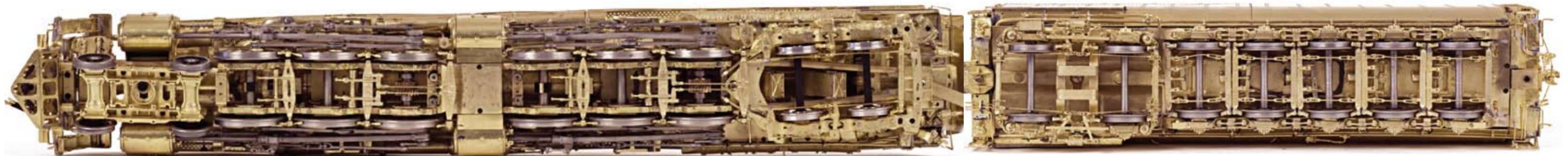
We have always made the driver center design a critical feature of our models. Maximum detail and dimensional accuracy including the counterweights is fundamental, despite how this complicates the functional mechanical design. The 'Boxpok' style drivers used on the Challengers and many other locomotives at first glance appear to be a very simple design, a disc



with holes in it and they are usually modeled in that manner. These drivers are actually very complex, having a hollow core and multiple layers of detail including in the interior. Our Challenger models will set a new benchmark with their drivers. Shown below is a sample of our 'Boxpok' type driver center (without tire) and if you look closely you will see the hollow core in several of the openings, all of the layered detail is present including inside. The driver centers are of course dimensionally accurate including the height of the counterweight to achieve their dynamic appearance.



Our focus on detail, features and accuracy is not limited to the locomotive, it carries through the tender all the way to the drawbar pocket and coupler. The Union Pacific's 25-C class





tenders have always been considered among the most interesting to model because of their 'centipede' design. There were five variations of the 25-C tender and the Challengers used the last three, 25-C-3, 4 & 5, the 'Big Boys' used the first two variations. With numerous axles all equalized and sprung with real leaf springs as the locomotive is, there is a tremendous amount of detail just in the suspension. All of the rivets are



punched not etched so they have the correct profile and the tender tank sheeting has the character of actually being riveted together rather than being perfectly flat which is what etched riveting yields. The stoker engine compartment opens and has complete internal detail, all tool compartments and cistern hatches of course open as does the rear headlight lens as shown above. The rear tender deck on the early service versions is complete with real wood decking including all of the correct brackets and strapping detail to hold it in place. Every effort has been made to make our design as complete and faithful to the original prototype as possible.

Shown below are the two non Union Pacific variations of our Challenger; on the left is a Denver & Rio Grande Western L-97 and on the right is a Clinchfield E-3. Our production will include examples of both these locomotives. While the D&RGW L-97's were mostly unchanged from their original construction, the Clinchfield E-3's had a number of changes made to effectively adapt the prototype to the unique demands of Clinchfield service. The most noticeable change to the E-3's was their conversion to a single large exhaust stack.



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