

UNION PACIFIC No. 4014

Near Cheyenne, Wyoming - August 31, 1958

Photo by Jim Ozment, R&LHS Southern California Chapter Collection



Number 4014 is one of 25 Big Boy locomotives built exclusively for Union Pacific Railroad. Numbers 4000 through 4019 were built in 1941. Five additional locomotives numbered 4020 through 4024 were built in 1944. With a 4-8-8-4 wheel arrangement, they were the largest steam locomotives ever built.

The Big Boys were originally designed to haul 3,600 ton trains unassisted over the Wasatch Mountains between Ogden, Utah and Green River, Wyoming on the nation's first trans-continental railroad. Performance was so good, however, that 4,200 ton trains were hauled regularly. On level ground, the Big Boys could easily travel at 70 MPH. The maximum horsepower was approximately 6,290 at 35 MPH, and the maximum drawbar pull was approximately 135,375

pounds at 10 MPH. On a typical run from Ogden to Evanston, Wyoming, a Big Boy would consume 35 tons of coal and 35,000 gallons of water. In their final years, they were operated almost exclusively over Sherman Hill, between Cheyenne and Laramie, Wyoming.

No. 4014 was built in November 1941 and performed faithfully to the very end of regular steam power on Union Pacific, accumulating 1,031,205 miles in active service. At 10:15 PM on July 20, 1959, engineer Bruckert eased No. 4014 out of Laramie for its last revenue trip over Sherman Hill. It arrived in Cheyenne at 1:50 AM on July 21, 1959. It was followed a few hours later by No. 4015, which completed the last revenue run of a Big Boy locomotive at 7:55 PM on July 21, 1959. No. 4014 was

retired in December 1961 and donated by Union Pacific to The Railway and Locomotive Historical Society, Southern California Chapter. At the end of its 11 day journey from Cheyenne, No. 4014 arrived at its new home on January 8, 1962, at RailGiants Train Museum inside the Los Angeles County Fairgrounds in Pomona, California.

Eight of the original 25 Big Boy locomotives still exist today, making the Big Boy the most preserved steam locomotive model. Because of the dry climate in Southern California and the R&LHS Chapter's past preservation efforts, No. 4014 is in relatively good condition.

In the summer of 2013, Union Pacific reacquired Big Boy No. 4014 and is restoring it for operation in its heritage steam locomotive fleet.



At the Los Angeles County Fairgrounds

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Who designed the Big Boys?

During the late 1930s, Union Pacific often used helpers to move trains from Ogden, Utah to Green River, Wyoming. U.P. wanted to simplify this move so they asked their Department of Research and Mechanical Standards and Alco to design a locomotive that could pull a 3,600 ton train unassisted over the 1.14% grade of the Wasatch Mountains.

The designers determined that to pull a 3,600 ton train, a tractive effort of 135,000 lbs would be needed. Assuming a factor of adhesion of 4.0, the weight on drivers would have to be $4.0 \times 135,000 = 540,000$ lbs. Given an axle loading of 67,500 lbs each, this would require 8 drivers or an x-8-8-x wheel arrangement. The designers agreed upon the 4-8-8-4 design. Because of their great length, the frames of the Big Boys were hinged, or articulated, to allow them to negotiate curves. Next, the horsepower and cylinder sizes were computed based on 300 psi boiler pressure. Although they weren't planning to operate these freight trains at 80 MPH, the DoRMS designed them for 80 MPH in order to have a sufficient factor of safety built into the design. What resulted is considered by many to be the most successful articulated steam locomotive ever built. Number 4000 was delivered to Omaha at 6 PM, September 5, 1941.

When did they roam the rails?

The 25 Big Boys were built in two groups. The first group (Nos. 4000 to 4019) was built in 1941. The second group (Nos. 4020 to 4024) was built in 1944. The last revenue freight train pulled by a Big Boy was on July 21, 1959. Most were retired in 1961. The last retirement occurred in July 1962. As late as September 1962, there were still four operational Big Boys at Green River, Wyoming.

How many miles did they travel?

Each locomotive in the first group ran slightly over 1,000,000 service miles. No. 4016 had the least mileage at 1,016,124. No. 4006 had the highest mileage at 1,064,625. Of those in the second group, No. 4024 at 811,956 miles had the highest.

How will Big Boy No. 4014 be restored and operated?

Union Pacific reacquired Big Boy locomotive No. 4014 from The Railway and Locomotive Historical Society, Southern California Chapter during the summer of 2013, for use in its Heritage Steam Locomotive fleet. No. 4014 departed the fairgrounds in January 2014 and arrived at Union Pacific's Cheyenne, Wyoming restoration facility in May 2014.

Union Pacific's Big Boy restoration project is expected to take five years. Plans include conversion from coal to No. 5 fuel oil.

Restoration will involve a nearly complete disassembly of the locomotive, thorough inspection of all parts, and re-assembly with restored, repaired, or replacement parts as necessary. When the work is complete, the Federal Railroad Administration (FRA) will also inspect the locomotive and witness testing to assure compliance with regulations.

After its restoration, No. 4014 will be assigned to special service and event trains alongside Union Pacific's No. 844 Northern and No. 3985 Challenger steam locomotives.

For many years people have asked, "will a Big Boy ever run again?" For the first time since the days of steam nearly 60 years ago, it's probable that a Big Boy will thunder over the rails once again under its own steam power.

Stay tuned.

SPECIFICATIONS

Total Weight:	600 tons, or 1.2M lbs.	Steam Pressure:	300 psi
Length:	132 ft, 9.875 in.	Maximum horsepower:	6,290
Firebox Dimensions:	96 in. by 235 in.	Maximum tractive effort:	135,375 lbs.
Driving wheel diameter:	68 in.	Top speed:	70 MPH
Fuel:	Soft-coal	Builder:	American Locomotive Company, Schenectady, New York
Coal Capacity:	28 tons, or 56,000 lbs.	Builder Number:	69585
Water Capacity:	24,000 gallons		

Sources: *Big Boy* by William K. Kratville, *Sherman Hill* by Eherberger and Gschwind, *North American Locomotives* by Brian Holiingsworth.

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