

UNION PACIFIC No. 4014

Eastbound at Crosley Road, 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 Union Pacific's mainline. 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

75 mile 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 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. No. 4014 was retired in December 1961 and donated by Union Pacific to The Railway and Locomotive Historical Society, Southern California Chapter. After an 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 Big Boys the most preserved steam locomotive type. Because of Southern California's dry climate and the RailGiants' past preservation efforts, No. 4014 was maintained in relatively good condition.

In the summer of 2013, RailGiants returned No. 4014 to Union Pacific for restoration and operation in its heritage steam locomotive fleet. This was the museum's most treasured artifact. As former R&LHS Southern California Chapter Board member CAPT Walter Lester (USN, Retired) stated at that time, "Sometimes you have to make sacrifices for the common good."



At the Los Angeles County Fairgrounds

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Who designed the Big Boys?

During the late 1930s, Union Pacific used helper locomotives to move trains from Ogden, Utah to Green River, Wyoming. To simplify this move, U.P. asked their Department of Research and Mechanical Standards (DoRMS) 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?

No. 4006 traveled the most miles at 1,064,625.

How was Big Boy No. 4014 restored and how will it be 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.

Restoration of Union Pacific's Big Boy No. 4014 was completed in May 2019, with the inaugural run taking place from Cheyenne to Ogden, Utah from May 4 to May 8 for Union Pacific's 150th anniversary celebration of the driving of the Golden Spike.

Restoration involved a nearly complete disassembly of the locomotive, cleaning and thorough inspection of all parts, and re-assembly with restored, repaired, or replacement parts as necessary. Restoration included conversion from coal to oil firing. The Federal Railroad Administration (FRA) inspected the restored locomotive and witnessed testing to assure compliance with regulations.

No. 4014 is assigned to special service and event trains and will make occasional trips on the Union Pacific system to support the railroad's public relations program.

For decades, thousands have dreamed of a Big Boy operating under steam again. Thanks to Union Pacific, tireless efforts of its steam crew, and RailGiants, the steam dream came true. After 60 years, a Big Boy is living again, thundering over the rails under its own steam power, and enjoyed by thousands of admirers wherever it goes. A true masterpiece of American craftsmanship and engineering.

SPECIFICATIONS at retirement

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.