

Union Pacific Big Boy

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Big Boy is the popular name of the American Locomotive Company 4000-class 4-8-8-4 articulated, coal-fired, steam locomotives manufactured between 1941 and 1944 and operated by the Union Pacific Railroad until 1959.

The Big Boy fleet of twenty five locomotives were used primarily in the Wyoming Division to haul freight over the Wasatch mountains between Green River, Wyoming and Ogden, Utah. They were the only locomotives to use a 4-8-8-4 wheel arrangement consisting of a four-wheel leading truck for stability entering curves, two sets of eight driving wheels and a four-wheel trailing truck to support the large firebox.

According to Union Pacific senior manager of Heritage Operations Ed Dickens Jr., the 4-8-8-4 series originally was to have been called "Wasatch". One day while one of the engines was being built an unknown worker scrawled "Big Boy" in chalk on its front. With that, the legendary name was born and has stuck ever since.^[2]

<div> ▪</div> <div>1 Design</div> <div> ▪</div> <div>2 Manufacturing</div> <div> 3 Operation <div> ▪</div> <div> ▪</div> <div> ▪</div> <div>3.1 Incident</div></div> <div> 4 Preservation</div> <div> ▪</div> <div>5 Notes</div> <div>6 References <div> ▪</div> <div> ▪</div> <div> ▪</div> <div>6.1 Citations</div> <div> ▪</div> <div>6.2 References</div></div> <div> 7 External links</div>

Design



Big Boy 4006 on display at the Museum of Transportation, outside St. Louis, Missouri

Led by mechanic Otto Jabelmann, the Union Pacific Railroad's design team worked with the American Locomotive Company to re-examine their Challenger locomotives. The team found that Union Pacific's goals could be achieved by enlarging its firebox to approximately 235 by 96 inches (5.97 m × 2.44 m) (about 155 sq ft or 14.4 m²), lengthening the boiler, adding four driving wheels and reducing the size of the driving wheels from 69 to 68 in (1,753 to 1,727 mm) on a new engine.

The Big Boys are articulated, like the Mallet locomotive design. They were built with a wide margin of reliability and safety, and normally operated well below 60 miles per hour (100 km/h) in freight service. Peak horsepower was reached at about 35 mph (56 km/h); optimal tractive effort, at about 10 mph (16 km/h).

Without the tender, the Big Boy has the longest engine body of any reciprocating steam locomotive.

Manufacturing

The American Locomotive Company manufactured 25 Big Boy locomotives for Union Pacific; two groups of ten in 1941 and one group of five in 1944.

Operation



The backhead (controls) of 4017 at the National Railroad Museum in Green Bay, Wisconsin

at Green River, Wyoming until 1962. Their duties were assumed by diesel locomotives and gas turbine-electric locomotives.

Incident

On April 27, 1953, Locomotive 4005 was pulling a freight train through southern Wyoming and jumped the switch track at 50 miles per hour (MPH), throwing the engine onto its left side and derailing its tender and the first 18 freight cars of the 62-car train. The engineer and fireman were killed instantly on impact while the brakeman would die in a hospital a few days later from his severe burns. The cab of the locomotive was destroyed by the tender, and the loads from the 18 derailed cars were scattered near the site of the accident. After this incident, 4005 was repaired by Union Pacific at its Cheyenne facility.

Preservation

Of the 25 Big Boy locomotives manufactured, eight remain. Seven of the eight surviving Big Boys are on static display. One, number 4014, is undergoing a restoration for excursion service which includes conversion to No. 5 oil firing. Five are displayed outdoors without protection from the elements; 4005 and 4017 are displayed indoors. The remaining Big Boy locomotives are located throughout the United States:

- 4004**: Holliday Park, Cheyenne, Wyoming 41°08′12.30″N 104°47′59.4″W﻿ / ﻿41.13667°N 104.79983°W﻿ / 41.13667; -104.79983
- 4005**: Forney Transportation Museum, Denver, Colorado 39°46′37.38″N 104°58′13.8″W﻿ / ﻿39.77705°N 104.97047°W﻿ / 39.77705; -104.97047 The Forney Transportation Museum in Denver moved 4005 to a renovated building in January 2001.
- 4006**: Museum of Transportation, St. Louis, Missouri 38°34′19.73″N 090°27′40.0″W﻿ / ﻿38.57194°N 90.46111°W﻿ / 38.57194; -90.46111
- 4012**: Steamtown National Historic Site, Scranton, Pennsylvania 41°24′26.96″N 075°40′10.8″W﻿ / ﻿41.40726°N 75.66944°W﻿ / 41.40726; -75.66944 - Built in November 1941, Union Pacific retired 4012 in 1962. 4012 was on display at Steamtown, USA in Bellows Falls, Vermont until 1984 when it was moved to Scranton, Pennsylvania^[3] 4012 is displayed outdoors since the Steamtown turntable and roundhouse are inadequate for 4012's size.^[3] The Steamtown SHS recommended that due to its good condition, No. 4012 could be feasibly restored to working order but only after determining if surrounding "track, switches, culverts, trestles, bridges, wyes, turntables and other facilities could bear her great weight".^{[3][4]}
- 4014**: Union Pacific Railroad, Cheyenne, Wyoming 34°05′0.456″N 117°46′11.38″W﻿ / ﻿34.08346°N 117.76972°W﻿ / 34.08346; -117.76972 - Reacquired by Union Pacific in 2013 and moved from its static display in Fairplex Rail Giants Museum in Pomona California to be restored to full steam operation and operated in excursion service.
- 4017**: National Railroad Museum, Green Bay, Wisconsin 44°29′02.70″N 088°02′55.1″W﻿ / ﻿44.48419°N 88.04864°W﻿ / 44.48419; -88.04864 No. 4017 now resides in a climate-controlled shed.
- 4018**: Museum of the American Railroad, Frisco, Texas 33.144513°N 96.833444°W﻿ / ﻿33.144513°N 96.833444°W﻿ / 33.144513; -96.833444 4018 was relocated by rail to a new location north of Dallas in Frisco, Texas on August 25, 2013.
- 4023**: Kenefick Park, Omaha, Nebraska 41°13′55.7″N 095°55′4.1″W﻿ / ﻿41.23214°N 95.91669°W﻿ / 41.23214; -95.91669 Number 4023 is the only known Big Boy to move by highway since preservation, to Kenefick Park in Omaha.

Notes

References

Citations

- Peck, Combes & Augur 1950, pp. 501,519,523,545.
- Elliott, Dan (April 15, 2014). "Huge Big Boy steam locomotive coming back to life". *Yahoo! News*. Associated Press. Retrieved April 15, 2014.
- Chappell, Gordon. "Union Pacific No. 4012". *Steam Over Scranton: Special History Study, American Steam Locomotives*. National Park Service. Retrieved March 13, 2012.
- "Steamtown's Locomotives and Cars". *Steamtown National Historic Site*. National Park Service. Retrieved March 13, 2012.

References

- Peck, C. B.; Combes, C. L.; et al., eds. (1950). *1950-52 Locomotive Cyclopedia of American Practice* (Fourteenth ed.). New York: Simmons-Boardman Publishing. ASIN B009AF0VKU.

External links

- The UP 4014 Project* YouTube playlist (https://www.youtube.com/playlist?list=PLh3l5IvpX5haUfK5n7yqfs2vIoq_wGTVe) Videos charting the progress of the restoration of 4014
- Union Pacific Big Boys (http://www.steamlocomotive.com/bigboy/)
- Big Boy main page (http://www.trainweb.org/jlsrr/bigboy/bigboy%20mainpage.htm)
- [1] (http://forneymuseum.org/News_BigBoyWreck.html)

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Categories: 4-8-8-4 locomotives | Union Pacific Railroad locomotives | ALCO locomotives | Simple articulated locomotives | Railway locomotives introduced in 1941 Steam locomotives of the United States | Freight locomotives | Standard gauge railway locomotives

	
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Union Pacific <i>Big Boy</i>	
 <div>Big Boy 4014 on display in Pomona, California prior to its restoration</div>	
Type and origin	
Reference: [1]	
Power type	Steam
Builder	American Locomotive Company
Build date	1941 (20), 1944 (5)
Total produced	25
Specifications	
Configuration	4-8-8-4
UIC classification	(2'D)D2' h4
Gauge	4 ft 8½ in (1,435 mm) standard gauge
Leading wheel diameter	36 in (914 mm)
Driver diameter	68 in (1,727 mm)
Trailing wheel diameter	42 in (1,067 mm)
Wheelbase	72 ft 5.5 in (22.09 m)
Length	Locomotive: 85 ft 3.4 in (25.99 m) <p>Overall: 132 ft 9¼ in (40.47 m)</p>
Width	11 ft (3.4 m)
Height	16 ft 2½ in (4.94 m)
Axle load	67,800 lb (30,800 kg)
Weight on drivers	540,000 lb (245,000 kg)
Locomotive weight	762,000 lb (345,600 kg)
Tender weight	342,200 lb (155,220 kg) (2/3 load)
Locomotive and tender combined weight	1,250,000 lb (567,000 kg)
Fuel type	Coal
Fuel capacity	28 short tons (25.4 t; 25.0 long tons)
Water capacity	25,000 US gal (95,000 l; 21,000 imp gal)
Boiler	95 in (2,400 mm)
Boiler pressure	300 lb / in ² (2.1 MPa)
Firegrate area	150 sq ft (14 m ²)
Heating surface: – Tubes and flues	5,035 sq ft (468 m ²)
– Firebox	720 sq ft (67 m ²)
– Total	5,735 sq ft (533 m ²)
Superheater type	Type A
Superheater area	2,043 sq ft (190 m ²)
Cylinders	4
Cylinder size	23.75 in × 32 in (603 mm × 813 mm)
Performance figures	
Maximum speed	80 mph (130 km/h) [2]
Power output	6,290 hp (4,690 kW)
Tractive effort	135,375 lbf (602.18 kN)
Factor of adhesion	3.99
Career	
Operator(s)	Union Pacific Railroad
Class	<i>4000–4019</i> : 4884-1 <p><i>4020–4024</i>: 4884-2</p>
Last run	July 21, 1959
Preserved	4004, 4005, 4006, 4012, 4014, 4017, 4018, 4023
Disposition	17 scrapped <p>7 preserved for display</p> <p>1 undergoing restoration to operating condition (4014)</p>