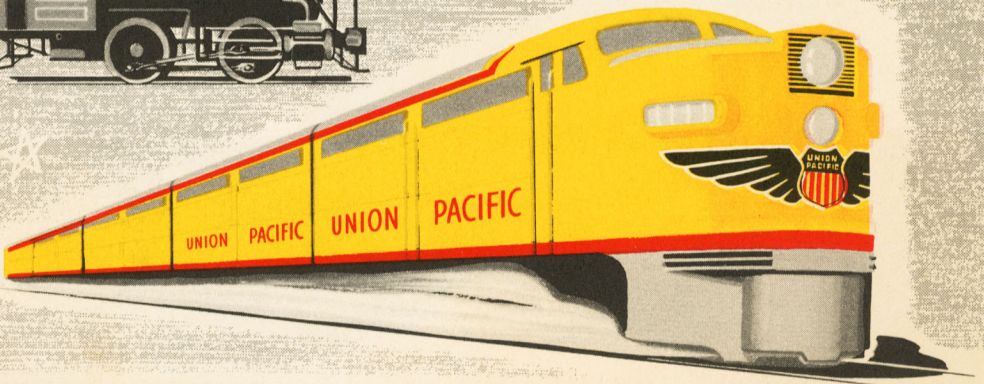
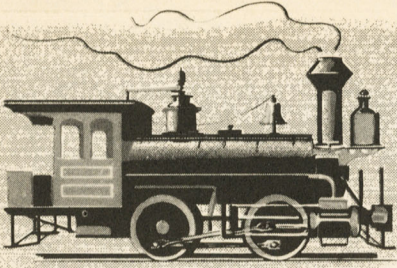
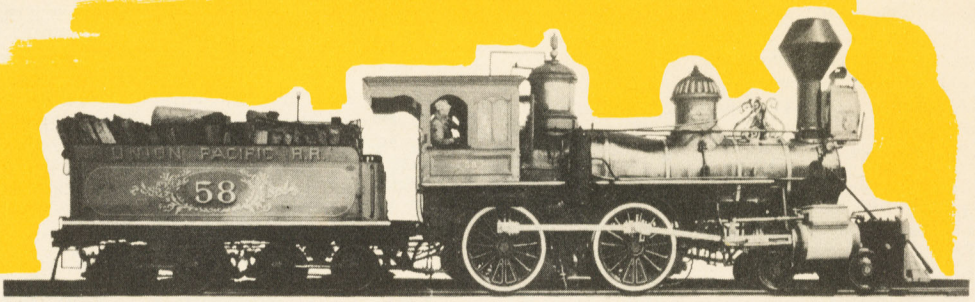


Since the driving of the Golden Spike at Promontory, Utah, May 10, 1869, progress in power on the Union Pacific has paced the continuous development of finer, faster, more efficient transportation throughout the West. The tremendous strides in motive power progress on the Union Pacific, from pioneer days to the present, are graphically portrayed in this brochure. Several of the locomotives described herein are displayed on track No. 1 at the Chicago Railroad Fair.



UNION PACIFIC *PROGRESS IN POWER*



Constructed in 1874, the old time woodburner No. 18 was the pride of its railroading day. Known as an "eight-wheeler", the 60-inch main driving wheels mark it as a fast passenger locomotive and it operates with 130 pound boiler pressure. No. 18 is the same as No. 58 shown above.

This type locomotive cost the Union Pacific \$15,249 each, compared to the present price of about \$320,000 each for a modern steam locomotive. The embellished patriarch stands 15 feet high to the

top of its diamond stack, is 9 feet 3 inches wide and has an overall length of 49 feet 10 inches. Complete with tender this locomotive will weigh 35 tons. The cab and the pilot or "cow-catcher" is made of wood. This locomotive is presently owned by Paramount Pictures of Hollywood, Calif., and is used in the filming of movies where early-day railroad equipment is required. It was purchased and reconstructed particularly for the making of the movie "Union Pacific".

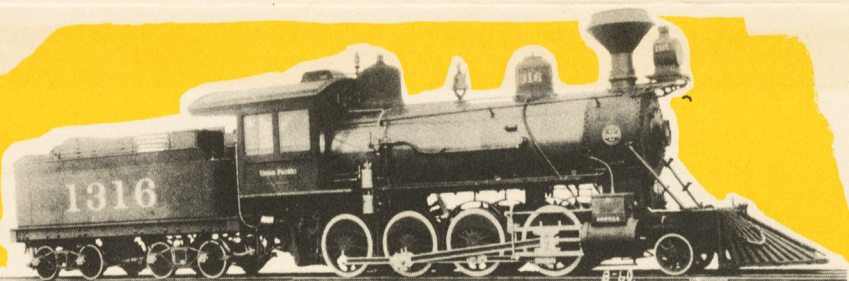


Locomotive No. 22 was built in 1875 by Baldwin Locomotive Works and was known as an "eight-wheeler". The drive wheels are 57 inches in diameter and it operates with a boiler pressure of 130 pounds.

This speedy woodburner of yesteryear stands 14 feet 2 inches high, it is 9 feet 1 inch wide and has a total

length of 49 feet 7 inches. It will weigh a total of 34 tons.

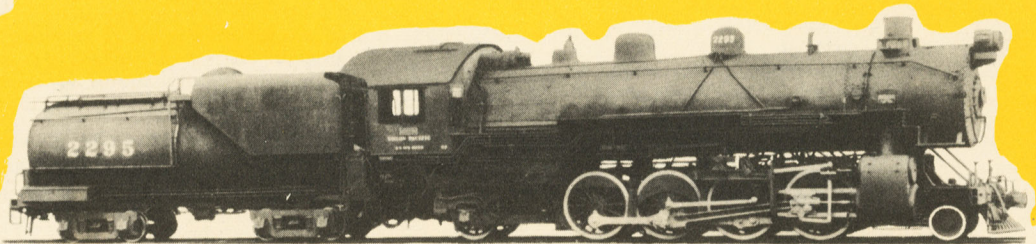
Locomotives of this type pulled early Union Pacific passenger trains westward out of Omaha into the Indian Territory of the west and averaged about 20 miles per hour along the tiny thread of railroad that connected the Pacific coast with the rest of the nation.



The 400 class, 2-8-0 type locomotive is known as the "Consolidation" type. Type 2-8-0 stands for the wheel arrangement under the locomotive, that is, there are two forward truck wheels, eight driving wheels, and no trailing truck wheels on this locomotive. This designation is used universally in the United States to distinguish different railroad motive power.

First locomotive of this type was built for the Union

Pacific in 1894, but it was not until 1896 that it was called "Consolidation". So efficient and popular was this design that up to 1908 when the last engine was built the railroad had purchased 491 of the engines. This locomotive with tender weighs 320,950 pounds, it is 66 feet 5 inches from coupler to coupler, the tender carries 7,000 gallons of water and 28,000 pounds of coal, and it operates with a boiler pressure of 200 pounds.



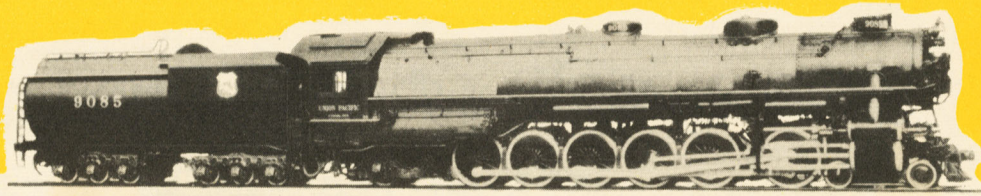
Originally designed for a foreign country in 1897, the 2200 class, 2-8-2 type locomotive, known as the "MacArthur" type, first saw service in America on the Union Pacific in 1903.

The "MacArthur" was designed to include all the desirable features of the earlier "Consolidation" type locomotive and in addition give greater increase in

boiler capacity and grate area.

With tender the locomotive weighs 440,900 pounds. It is 82 feet long, 15 feet high, has a driving wheel diameter of 63 inches, and operates with a boiler pressure of 210 pounds.

Fully loaded the tender has a capacity of 10,000 gallons of water and 36,000 pounds of coal.



The 9000 class, 4-12-2 type locomotive is known as the "Union Pacific" because it was designed by the Engineering Department of the Union Pacific Railroad at Omaha. It was first placed in service in 1926 and has remained a mainstay of steam motive power on the railroad for over two decades.

An unique application in steam power is the fact that the 9000 is a three-cylinder power plant, the first successful adaptation to a locomotive of this length and weight. In addition to the cylinder mounted on each side, there is a cylinder in the center directly below the boiler that drives the second set of drive wheels by

a gigantic crankshaft.

When it was first placed in service this locomotive set new standards in speed and economy of operation and was the largest non-articulated steam power unit ever constructed.

Including the tender, the "Union Pacific" is 102 feet 6 inches long and is 16 feet high. It weighs 784,000 pounds and the cylindrical tender has a capacity of 18,000 gallons of water and 22 tons of coal. The locomotive operates with a boiler pressure of 220 pounds and the 67 inch diameter driving wheels easily maintain a tractive pull of 4,912 horsepower.



"Big Boy", the world's largest steam locomotive, is the 4000 class, 4-8-8-4 type in service of Union Pacific Railroad. Built by American Locomotive Company, the first "Big Boy" was delivered in September, 1941, and today there are twenty-five of these mechanical behemoths pulling long strings of freight over the mountainous territory of the west at express train speed.

With tender the locomotive is 133 feet long from coupler to coupler and weighs 1,208,750 pounds. The fourteen-wheeled tender has a capacity of 24,000 gallons of water and 28 tons of fuel, and the locomotive operates with a boiler pressure of 300 pounds.

Under full steam "Big Boy" is a hungry giant, consuming 100,000 pounds of water and 22,000 pounds of coal per hour.

The unusual arrangement of the driving wheels puts two cylinders on each side of the locomotive, applying driving force to two sets of eight each, actually making this two engines with one boiler. Another unique feature is the articulated construction with the front trucks hinged to the rear unit, allowing the locomotive to bend while rounding curves because of its extreme length. All wheels move freely on roller bearings.



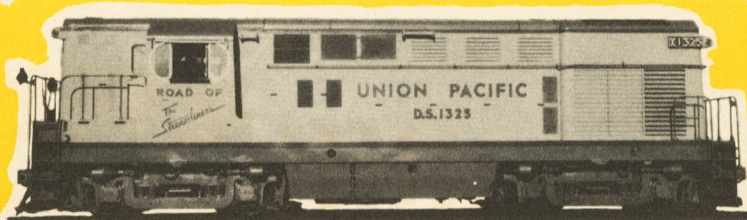
One of the newest additions to the motive power of Union Pacific Railroad is the F3 diesel locomotive built by Electro-Motive Division of General Motors. Each locomotive is made up of four units, or power cars, all controlled from the engineer's position located in the control cab, high in the streamlined nose. This diesel locomotive is 200 feet long and weighs about 920,000 pounds. It carries 4800 gallons of fuel oil and can pull a train 500 miles without a stop for fuel.

Capable of 6000 HP, the power of the locomotive comes from a 1500 HP diesel engine in each of the four units, transmitted to the driving axles by electric

transmission. Each of the diesel engines is coupled to a generator and these generators supply electrical power to eight traction motors, one on each of the eight driving axles.

It is possible to operate the locomotive over a wide power range, from 6000 HP for four units, down to 1500 HP for the single unit. Greater versatility can be achieved by changing gears in the locomotive, for it can be used to drag heavy tonnage freight or take over fast passenger schedules.

It has a speed range up to 102 miles per hour for passenger service and from 50 to 65 miles per hour for heavy duty freight.

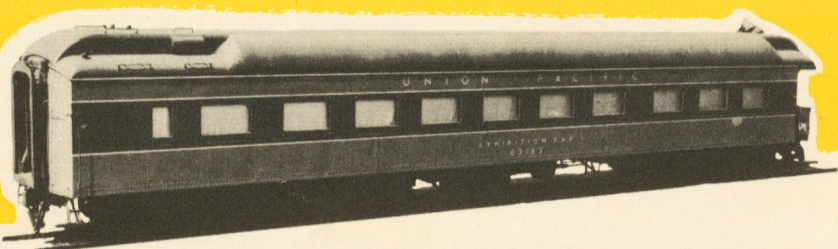


The Fairbanks-Morse all-purpose diesel electric locomotive is an 0-4-4-0 type of 1500 HP, a number of which have recently been placed in service of Union Pacific.

This type is also known as a "road-switcher" since it can be used in the dual role of switching locomotive and also on limited road service. It is designed to give full vision front and rear with power for switching and a limited speed suitable for local and branch line operation.

The diesel powerplant drives a generator which supplies electrical current to four traction motors mounted on each of the four driving axles.

Overall length of the locomotive is 54 feet, it is 14 feet 6 inches high and weighs 240,000 pounds. The fuel tank has a capacity of 900 gallons, and the locomotive carries 740 gallons of boiler water. This water is not required in the operation of the locomotive but is used in the event train heating is desired.



One of two specially-equipped cars built to tour the system of Union Pacific Railroad in the interests of education, the theater car is well made for its purpose. It seats 52 persons on leather upholstered aluminum tubing seats in an auditorium section that is windowless to facilitate the showing of motion pictures. A 16-millimeter projector is housed in a specially-constructed booth at the rear of the car and the motion picture screen may be raised or lowered by remote control from the booth. The car is a self-contained unit, with living quarters for two occupants, including a shower room and bedroom.

Two propane engines furnish all electrical power requirements and air conditioning, and there is also a supplemental hot water heating system for when steam heat is not available.

One of the two cars moves over the Union Pacific informing the officers and employees on railroad subjects and showing movies made for their interest and education. The other car is under the direction of the Agricultural Department of the railroad and is used by its agricultural agents for meetings of farmers and agriculture students in an effort to help improve the agricultural efforts of the states served by Union Pacific.