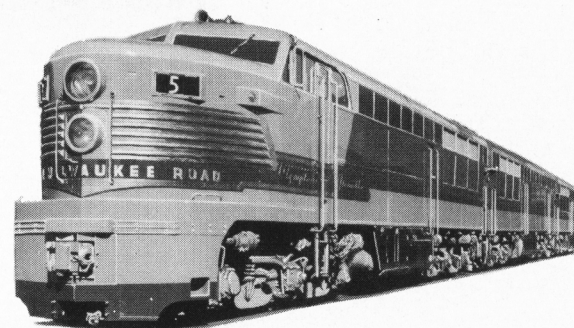
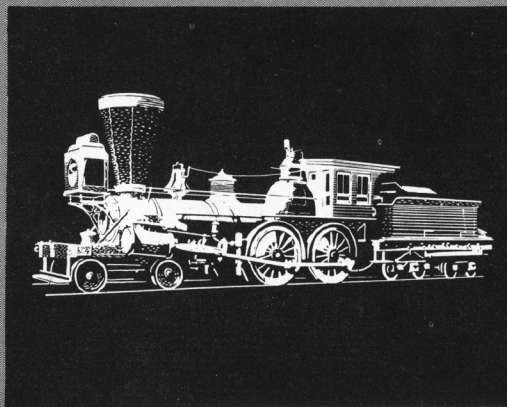


# 100 YEARS

OF

LOCOMOTIVE

PROGRESS



CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC RAILROAD COMPANY



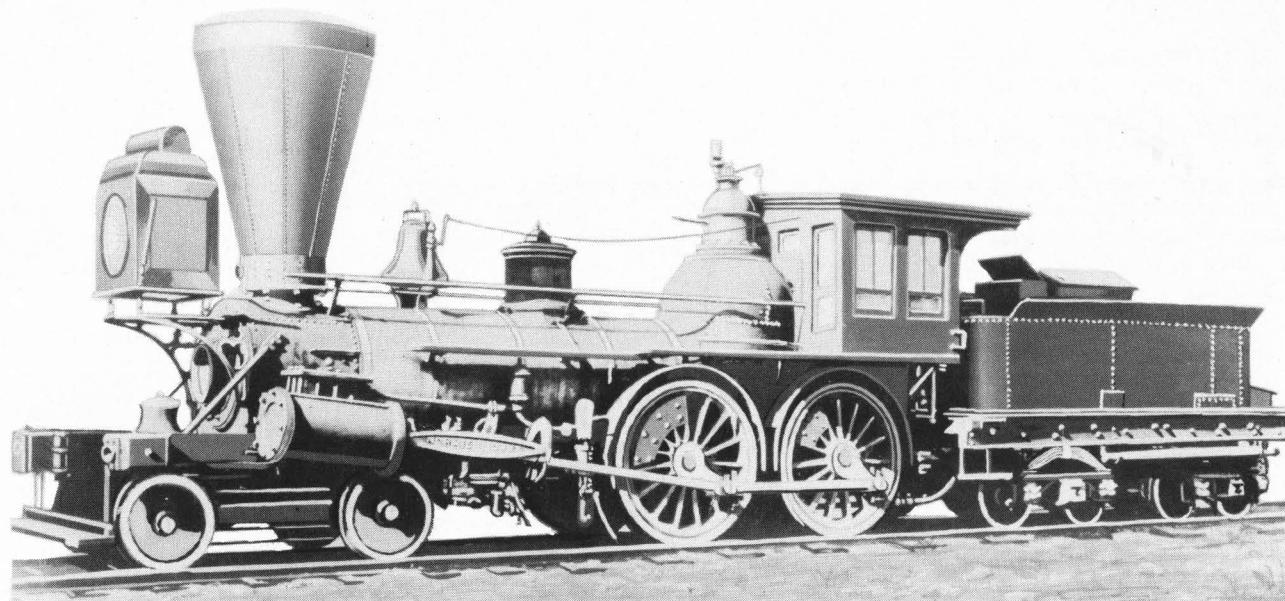
## 100 YEARS OF LOCOMOTIVE PROGRESS



On a Fall day in the year 1850, the Milwaukee Road's first locomotive, coupled to two cars, ran over the first 5 miles of track of the new railroad between Milwaukee and Wauwatosa, Wis. The road's growth in the intervening years has been paced by its progress in the development of motive power. Typical examples of the progression of motive power developed and used by The Milwaukee Road during its first hundred years are presented on the following pages.

**OLD NO. 1**—BUILT IN 1848 by the Norris Works, Philadelphia. This was the first locomotive of The Milwaukee Road, and the first engine to turn a wheel in the State of Wisconsin. At different times it carried the name of "Bob Ellis" and "Iowa"; also, the numbers 1 and 71.

Weight on Drivers.....28,250 lbs.  
 Total Weight—Locomotive...46,000 lbs.  
 Steam Pressure....125 lbs. per sq. in.  
 Driving Wheel Diameter....60 inches  
 Cylinder Size.....14 in. x 26 in.  
 Tractive Effort.....8330 lbs.  
 Length Overall.....43 ft. 0 in.  
 Fuel.....Wood



**NO. 75**—Class H  
 —BUILT IN 1850 by Schenectady Locomotive Works. Picture taken in 1875 at Winneconne, Wisconsin.

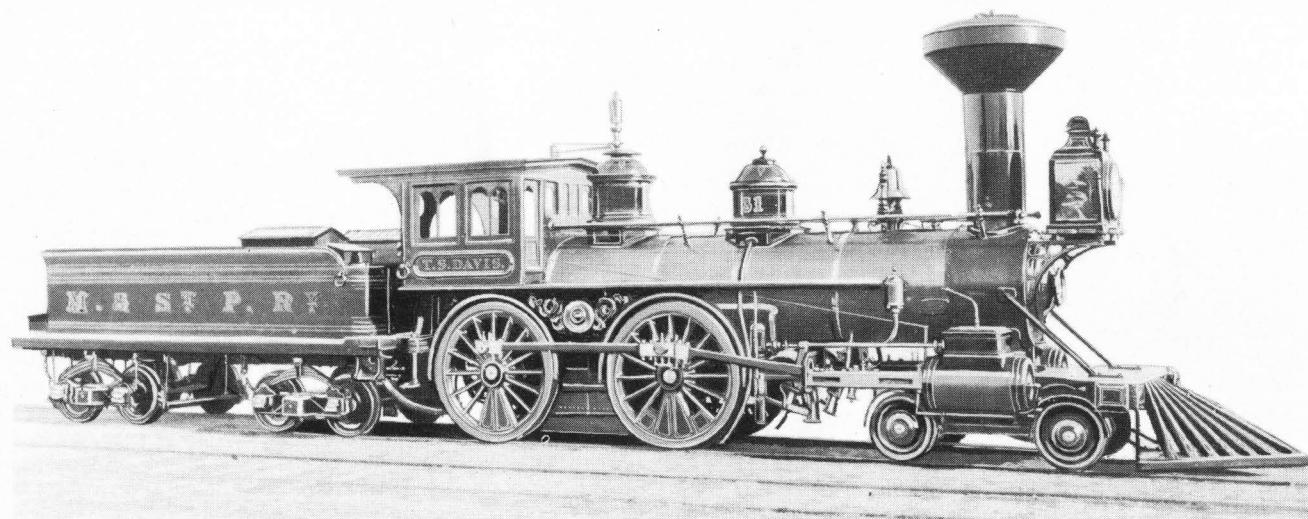
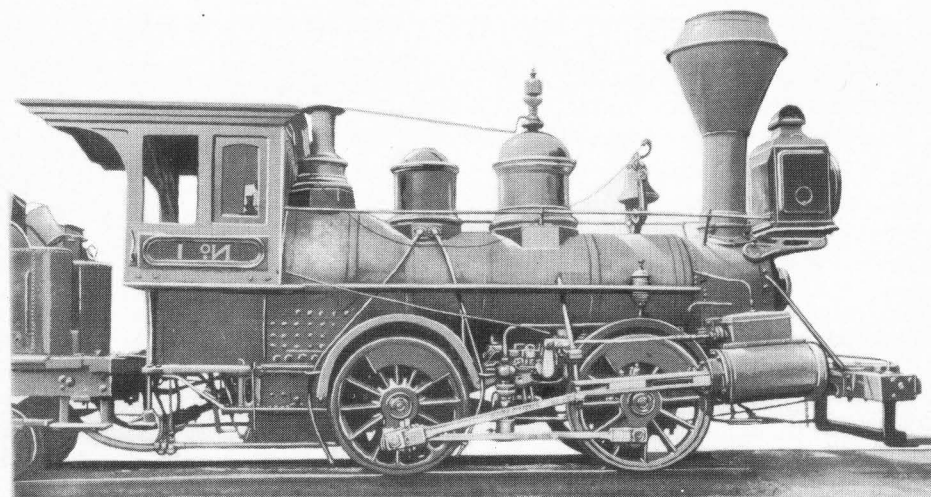
Weight on Drivers.....29,150 lbs.  
 Total Weight—Locomotive...47,750 lbs.  
 Driving Wheel Diameter....57 inches  
 Wheel Centers.....51 1/4 inches  
 Cylinder Size.....12 1/2 in. x 20 in.  
 Firebox.....42 in. x 36 in.  
 Flues.....108 (copper)—117 in. long  
 Tank Capacity.....1475 gallons  
 Fuel.....Wood



## SWITCHING LOCOMOTIVE

**NO. 1**—Class J1. BUILT IN 1851 by Lawrence Locomotive Works. This locomotive was a typical four wheel switcher of its period. As shown, it is equipped with a cross-head driven boiler feed pump which was used before the invention of the steam injector in 1865 and the general adoption of the improved injector of 1876. Originally numbered 4; renumbered No. 1 in 1898, and No. 1000 in 1899; scrapped Aug. 15, 1905.

Driving Wheel Diameter . . . 44 inches  
Cylinder Size . . . . . 15 in. x 20 in.  
Steam Pressure . . . . . 130 lbs.



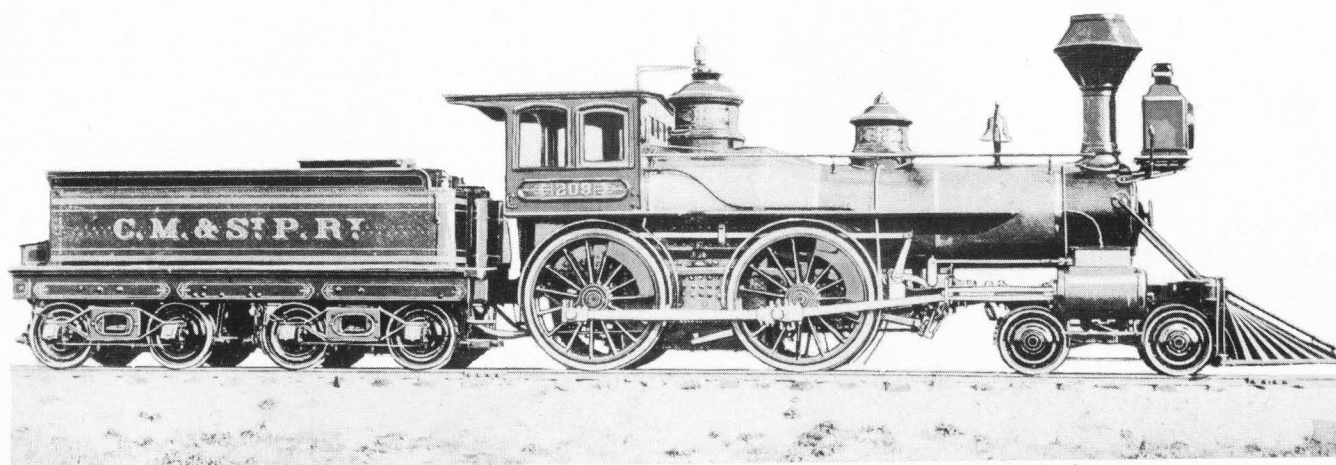
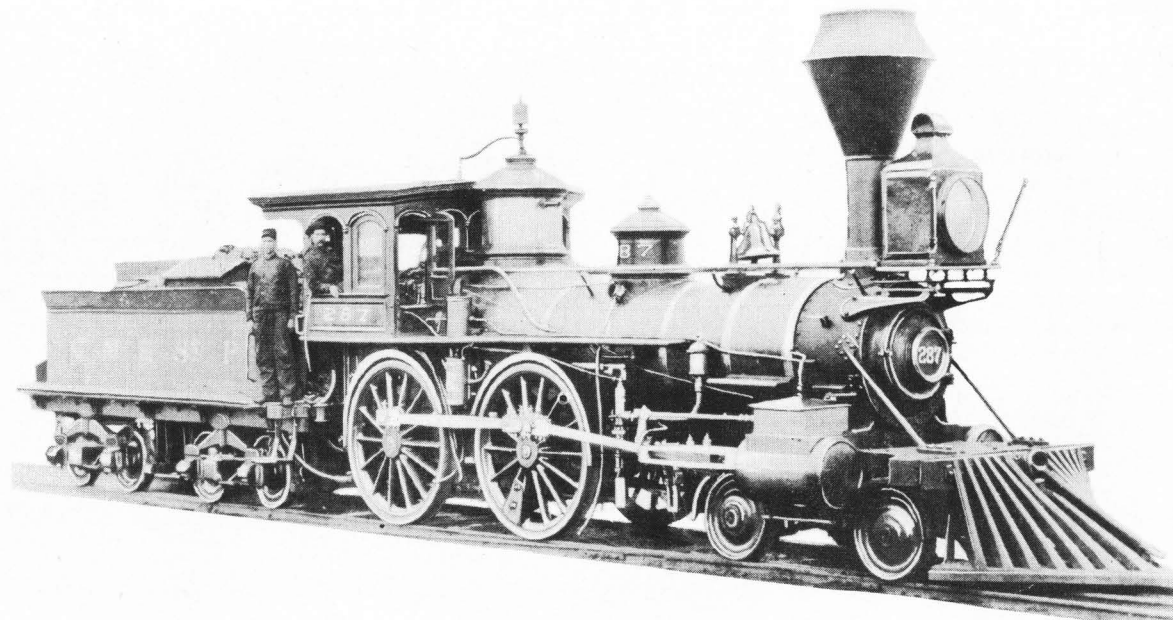
**NO. 31**—The "T. S. Davis"—Class H3. BUILT IN 1854 and rebuilt in 1871 by the Milwaukee and St. Paul Railway Company.

Cylinder Size . . . . . 16 in. x 24 in.  
Driving Wheel Diameter . . . 62 inches  
Boiler Diameter . . . . . 44½ inches  
Copper Flues  
    . . . 137, 2 inch, 132½ inches long  
Total Weight—Locomotive . 63,100 lbs.  
Fuel . . . . . Wood



**NO. 287—**  
Class H. BUILT IN 1860 by  
Mason Locomotive Works.

Cylinder Size..... 15 in. x 22 in.  
Driving Wheel Diameter. 61 inches  
Flues... 111, 2-inch, 137 inches long  
Total Weight—  
Locomotive ..... 62,450 lbs.

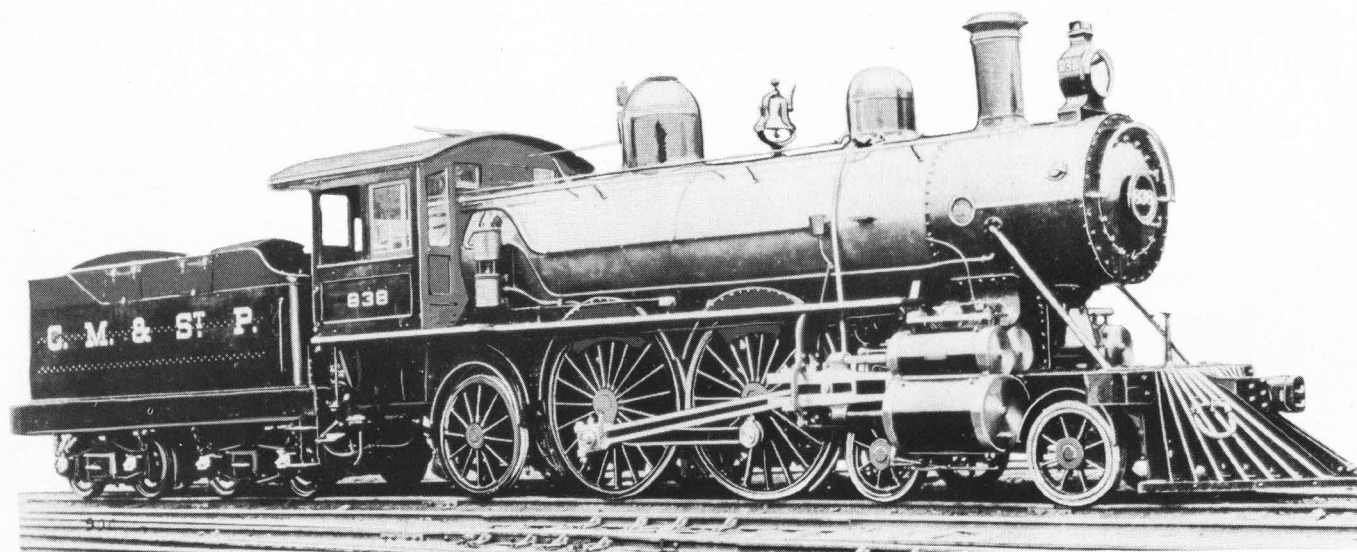
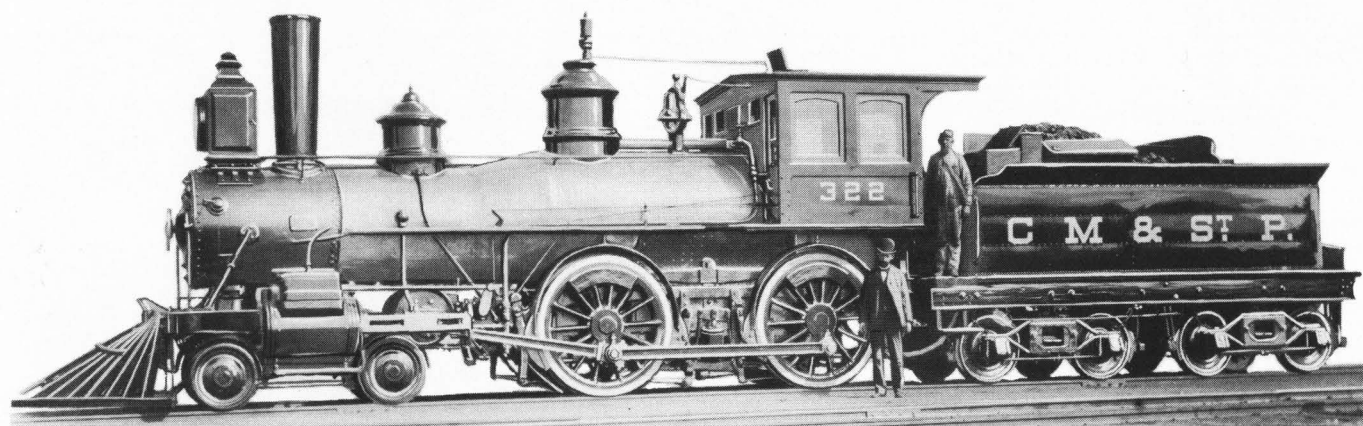


**NO. 209—**BUILT IN 1877 by the  
Schenectady Locomotive Works.  
This engine hauled General U. S.  
Grant from Chicago to Milwau-  
kee in two hours and ten minutes  
on June 9, 1880.

Weight on Drivers..... 48,000 lbs.  
Total Weight—  
Locomotive ..... 76,000 lbs.  
Steam Pressure..... 140 lbs.  
Driving Wheel Diameter.. 68 inches  
Tractive Effort..... 12,138 lbs.  
Length Overall..... 52 ft. 0 in.

**NO. 322**—BUILT IN 1889 by the Chicago, Milwaukee and St. Paul Railway Company at its Milwaukee Shops. Renumbered 800 in 1899; No. 423 in 1912; scrapped in 1919.

Weight on Drivers.....54,000 lbs.  
 Total Weight—Locomotive...86,000 lbs.  
 Steam Pressure .....160 lbs.  
 Driving Wheel Diameter....62 inches  
 Cylinder Size .....16 in. x 24 in.  
 Tractive Effort.....13,400 lbs.  
 Length Overall.....55 ft. 3 in.



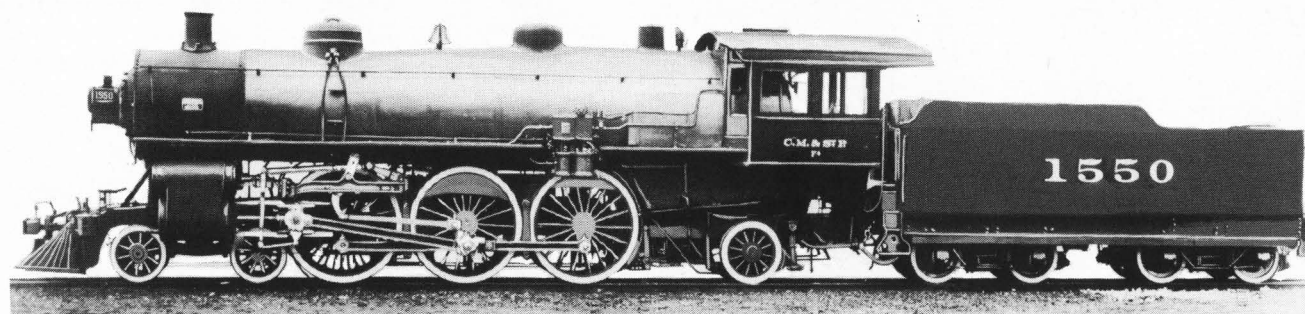
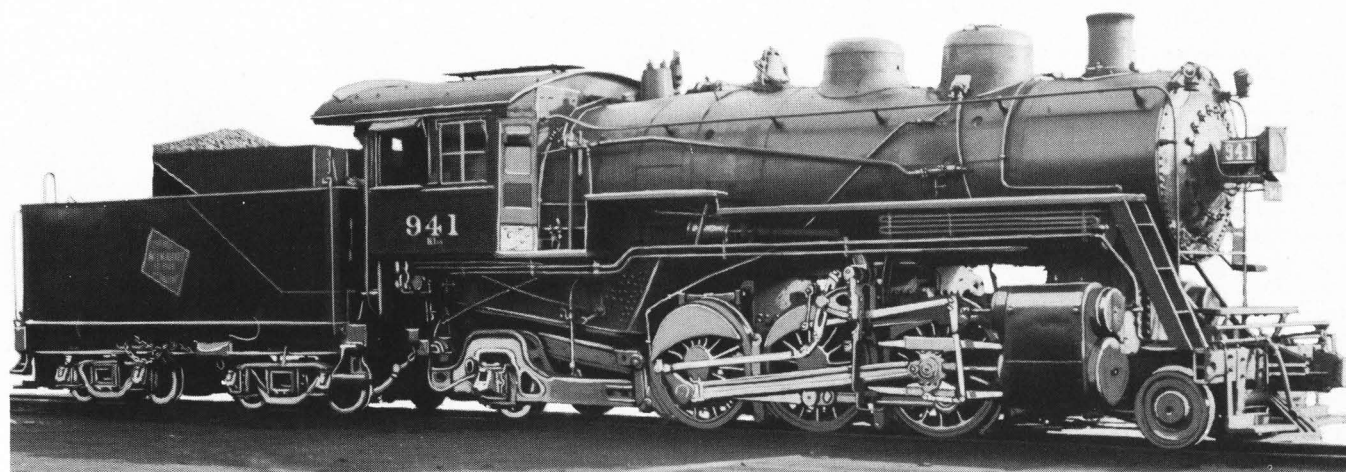
**NO. 838**—Class A1—BUILT IN 1896 by Baldwin Locomotive Works. Renumbered 400 in 1899; No. 900 in 1901; No. 3000 in 1912; scrapped in 1934.

Driving Wheel Diameter....78 inches  
 Cylinder Size...13 in. x 22 in. x 26 in.  
 Boiler Pressure .....200 lbs.  
 Weight on Drivers.....80,400 lbs.  
 Total Weight—Locomotive...150,400 lbs.  
 Tractive Effort.....15,590 lbs.



**NO. 941**—Class K1—BUILT IN 1908 by Chicago, Milwaukee and St. Paul Railway Company. Originally numbered 2093; renumbered 5593 in 1912, and No. 941 in 1938.

Cylinder Size.....21 in. x 28 in.  
 Driving Wheel Diameter....63 inches  
 Boiler Pressure.....200 lbs.  
 Heating Surface.....1921 square feet  
 Tender Water Capacity..8,000 gallons  
 Tender Coal Capacity.....14 Tons  
 Weight of Engine  
     and Tender .....362,900 lbs.  
 Tractive Effort.....33,320 lbs.  
 Length Overall.....68 ft. 10 1/8 in.

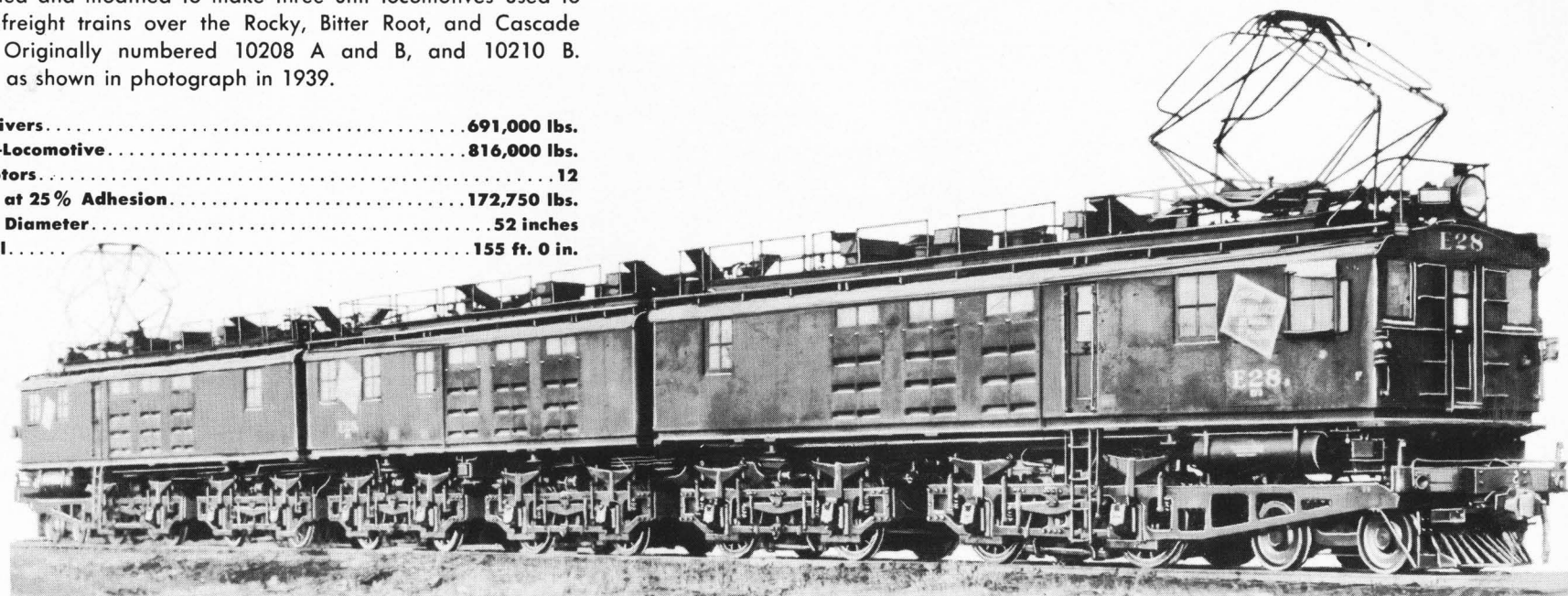


**NO. 1550**—BUILT IN 1910 by the American Locomotive Company. This is a 4-6-2 or "Pacific" type locomotive, which was for many years the standard locomotive for heavy passenger service. Photograph shows original construction and number. Renumbered 3248 in 1910; No. 6548 in 1912; No. 6168 in 1924, and No. 197 in 1938. Locomotives of this type have now been superheated.

Weight on Drivers.....157,200 lbs.  
 Total Weight,  
     Locomotive and Tender.403,300 lbs.  
 Steam Pressure.....200 lbs.  
 Driving Wheel Diameter....79 inches  
 Cylinder Size.....23 in. x 28 in.  
 Tractive Effort.....31,870 lbs.  
 Length overall.....76 ft. 5 3/8 in.

**ELECTRIC LOCOMOTIVE NO. E-28ABC**—BUILT IN 1915 by the General Electric Company as a two unit locomotive. Several units have been combined and modified to make three unit locomotives used to haul heavy freight trains over the Rocky, Bitter Root, and Cascade Mountains. Originally numbered 10208 A and B, and 10210 B. Renumbered as shown in photograph in 1939.

Weight on Drivers.....	691,000 lbs.
Total Weight—Locomotive.....	816,000 lbs.
Number of Motors.....	12
Tractive Effort at 25% Adhesion.....	172,750 lbs.
Driving Wheel Diameter.....	52 inches
Length Overall.....	155 ft. 0 in.



**ELECTRIC LOCOMOTIVE No. 10250**—BUILT IN 1919 by the General Electric Company and the American Locomotive Company. This is a bi-polar gearless motor and is the type used to haul passenger trains of The Milwaukee Road across the Cascade Mountains. This locomotive was renumbered E1 in 1939.

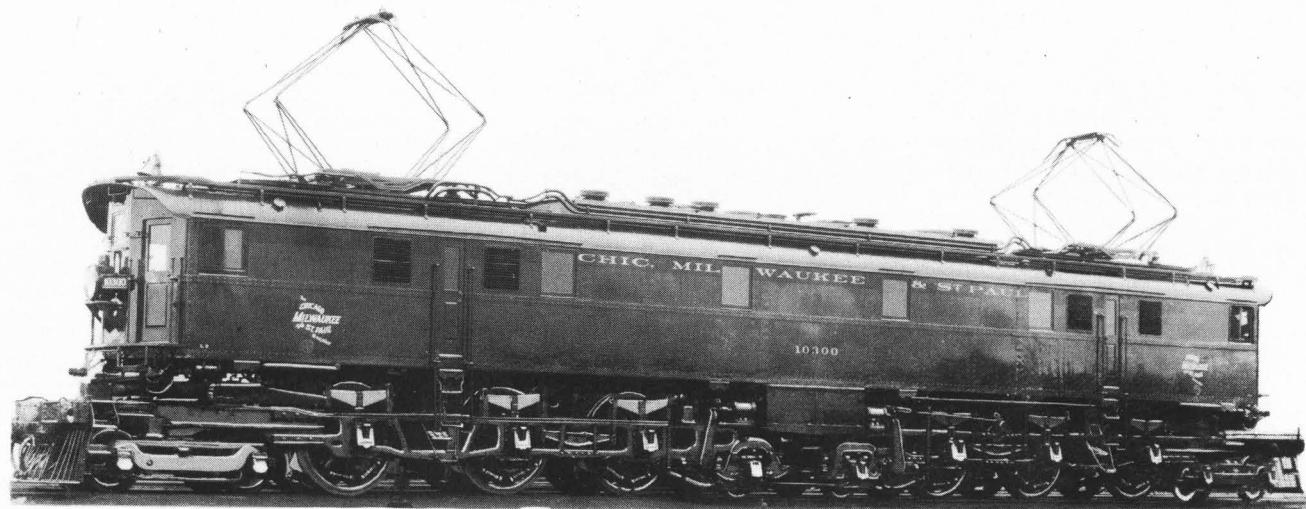
Weight on Drivers.....	457,800 lbs.
Total Weight.....	521,200 lbs.
Number of Motors.....	12
Tractive Effort.....	114,450
lbs., at 25% tractive coefficient	
Driving Wheel Diameter.....	44 inches
Length Overall.....	76 ft. 0 in.



### **ELECTRIC LOCOMOTIVE NO.**

**10300**—BUILT IN 1920 by the Westinghouse Electric and Manufacturing Company and the Baldwin Locomotive Works. This is a quill spring drive motor. Motors of this type are used to haul passenger trains of The Milwaukee Road between Harlowton, Montana, and Avery, Idaho. This locomotive was renumbered E 10 in 1939.

**Weight on Drivers.....420,000 lbs.**  
**Total Weight.....620,000 lbs.**  
**Number of Driving**  
    **Motors.....6 (Twin Type)**  
**Tractive Effort.....105,000 lbs.**  
    **at 25% tractive coefficient**  
**Driving Wheel Diameter....68 inches**  
**Length Overall.....88 ft. 7 in.**



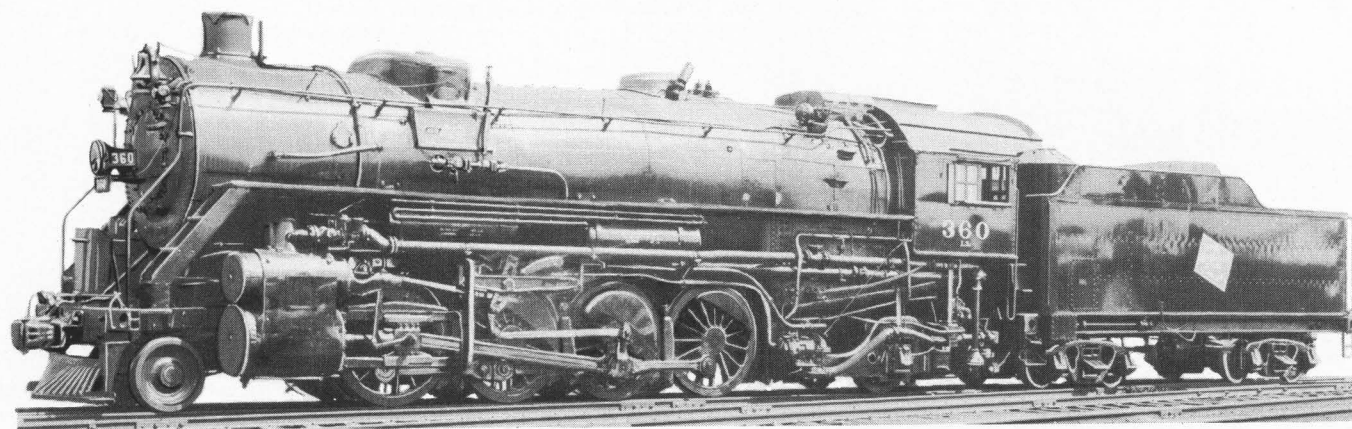
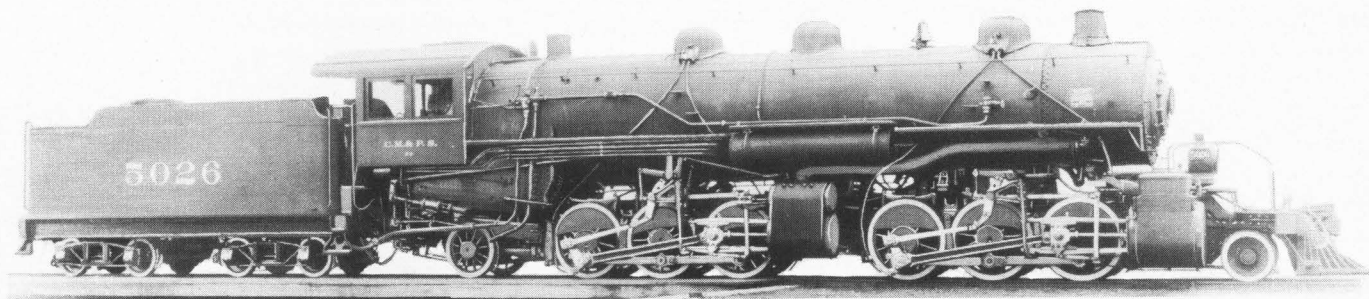
### **ELECTRIC LOCOMOTIVE E71**

—A 3000 volt direct current freight locomotive built by the General Electric Company for 60" Russian gauge. Acquired in 1950 by The Milwaukee Road and converted to standard 4' 8½" gauge at Milwaukee Shops. Placed in service on the electrified divisions of the railroad in the Rocky and Bitter Root Mountains.

**Weight on drivers.....405,600 lbs.**  
**Maximum tractive effort...101,400 lbs.**  
**Horse power.....**  
    **5110 h.p. at 25.2 miles per hour**  
**Maximum speed....68 miles per hour**  
**Length.....87'9¼"**

**NO. 5026**—BUILT IN 1912 by the American Locomotive Company. This is a 2-6-6-2 Mallet compound locomotive and was designed to haul through freight trains over the mountains before the mountain divisions of The Milwaukee Road were electrified. Locomotives of this type have since been modernized for present day freight service and are now numbered in the series 50 to 66 inclusive.

Weight on Drivers.....327,500 lbs.  
 Total Weight—  
     Locomotive and Tender. 562,000 lbs.  
 Steam Pressure.....200 lbs.  
 Driving Wheel Diameter....57 inches  
 Cylinder Size:  
     High pressure.....23½ in. x 30 in.  
     Low pressure.....37 in. x 30 in.  
 Tractive Effort.....70,396 lbs.  
 Heating Surface.....5240 square feet  
 Fuel.....Coal  
 Length Overall.....88 ft. 7 in.



**NO. 360**—Class L3—BUILT IN 1919 by American Locomotive Company. Originally numbered 8657. Renumbered as shown in photograph in 1938.

Cylinder Size.....27 in. x 32 in.  
 Driving Wheel Diameter.....63 inches  
 Boiler Pressure.....200 lbs.  
 Heating Surface.....4311 square feet  
 Tender Water Capacity 10,000 gallons  
 Tender Coal Capacity.....16 tons  
 Weight—  
     Locomotive and Tender. 503,800 lbs.  
 Tractive Effort.....62,949 lbs.  
 Length Overall.....82 ft. 6½ in.





**NO. 6402**—BUILT IN 1930 by the Baldwin Locomotive Works. This locomotive hauled a passenger train between Chicago and Milwaukee on July 20, 1934, breaking the world's record for sustained high speed by steam power by averaging 92.07 miles per hour over a 53.58 mile stretch. Maximum speed attained on this run was 103.5 miles per hour. This locomotive was renumbered 127 in 1938.

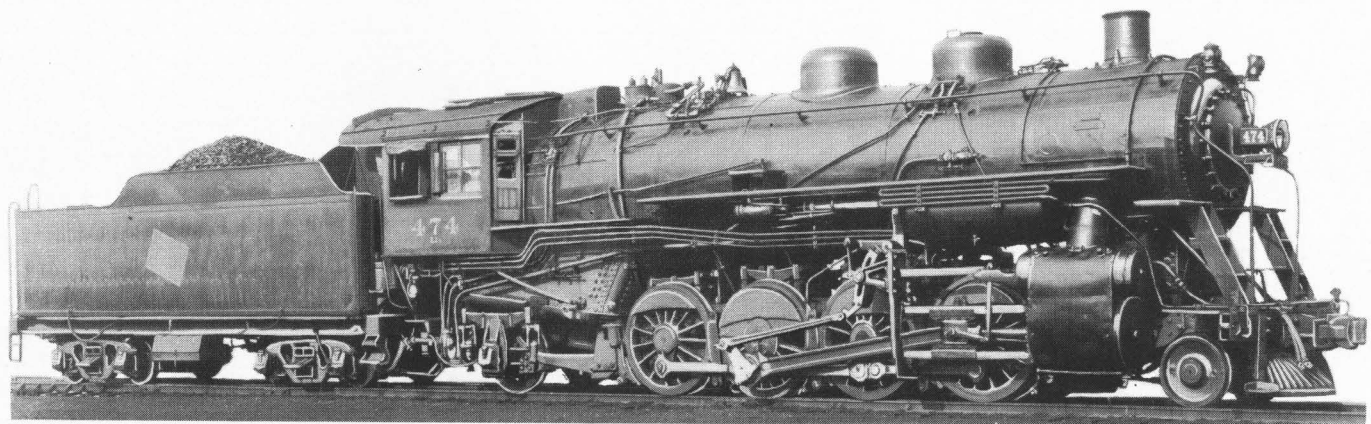
Weight on Drivers . . . . . 189,720 lbs.  
Total Weight—

Locomotive and Tender . 653,650 lbs.  
Steam Pressure . . . . . 225 lbs.  
Driving Wheel Diameter . . . 79 inches  
Cylinder Size . . . . . 26 in. x 28 in.  
Tractive Effort . . . . . 45,822 lbs.  
Heating Surface . . . . 4205 square feet  
Superheating Surface . . 1815 sq. feet  
Fuel . . . . . Coal  
Length Overall . . . . . 94 ft. 3 in.

**NO. 474**—Class L2b—BUILT IN 1923 by Baldwin Locomotive Works. Originally numbered 8374. Renumbered as shown in photograph in 1938.

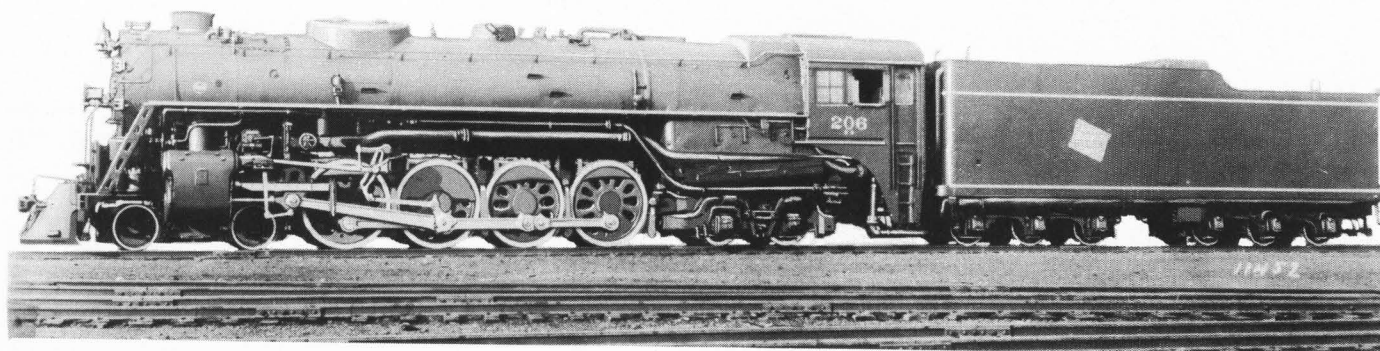
Cylinder Size . . . . . 26 in. x 30 in.  
Driving Wheel Diameter . . . 63 inches  
Boiler Pressure . . . . . 200 lbs.  
Heating Surface . . . . 2924 square feet  
Tender Water Capacity . 10,000 gallons  
Tender Coal Capacity . . . . 16 tons  
Weight—

Locomotive and Tender . 485,770 lbs.  
Tractive Effort . . . . . 54,723 lbs.  
Length Overall . . . . . 80 ft. 8 1/4 in.



**NO. 3**—Original  
Hiawatha—Class A—BUILT IN 1936  
by the American Locomotive Com-  
pany.

Cylinder Size.....19 in. x 28 in.  
Driving Wheel Diameter....84 inches  
Boiler Pressure.....300 lbs.  
Heating Surface.....3245 square feet  
Tender Oil Capacity.....5544 gallons  
Length Overall.....88 ft. 7 13/16 in.



**NO. 206**—BUILT IN 1937 by the  
Baldwin Locomotive Works. This is  
a 4-8-4 type locomotive, designed  
specifically to develop high horse-  
power at high speed, and is equally  
adaptable for fast freight or heavy  
passenger service.

Weight on Drivers.....282,320 lbs.  
Total Weight—

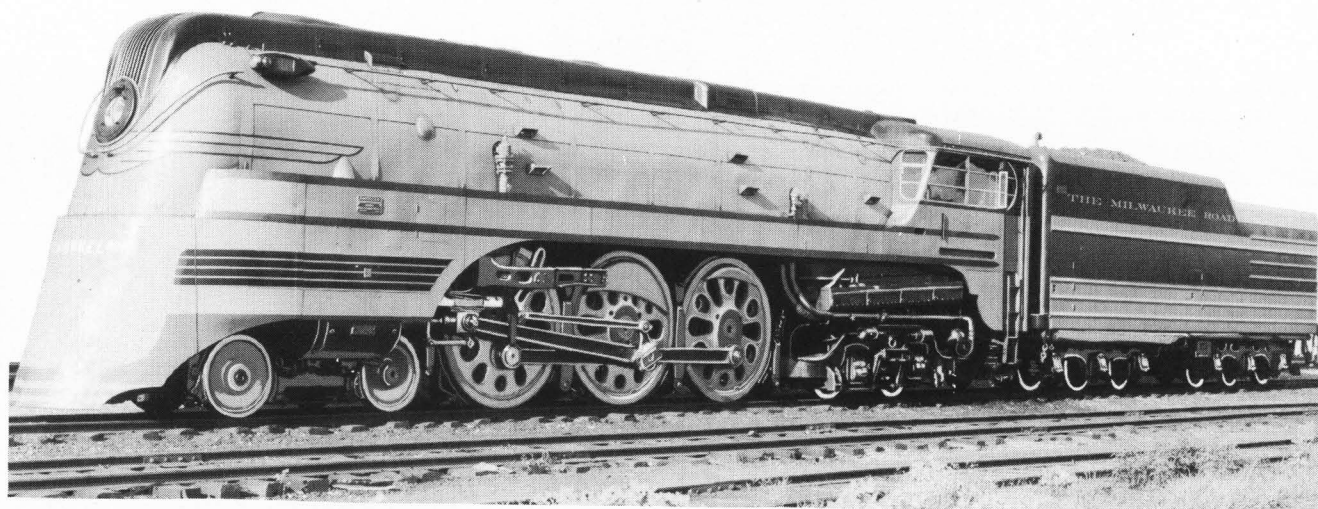
Locomotive and Tender.887,450 lbs.  
Steam Pressure.....285 lbs.  
Driving Wheel Diameter....74 inches  
Cylinder Size.....26 in. x 32 in.  
Tractive Effort.....70,816 lbs.  
Heating Surface.....5509 square feet  
Superheating Surface...2336 sq. feet  
Fuel .....Coal  
Length Overall.....110 ft. 1 3/4 in.



**NO. 100—A 4-6-4 Streamlined Locomotive—BUILT IN 1938 by the American Locomotive Company. Designed from the ground up to be streamlined for eye appeal as well as for speed in excess of 120 m.p.h.**

**Weight on Drivers . . . . . 216,000 lbs.  
Total Weight—**

**Locomotive and Tender . 790,000 lbs.  
Steam Pressure . . . . . 300 lbs.  
Driving Wheel Diameter . . . 84 inches  
Cylinder Size . . . . . 23½ in. x 30 in.  
Tractive Effort . . . . . 50,294 lbs.  
Heating Surface Total  
(Evaporating) . . . 4166 square feet  
Fuel Capacity . . . . . 25 tons of coal  
Water Tank Capacity . 20,000 gallons  
Length Overall . . . . . 103 ft. 11½ in.**

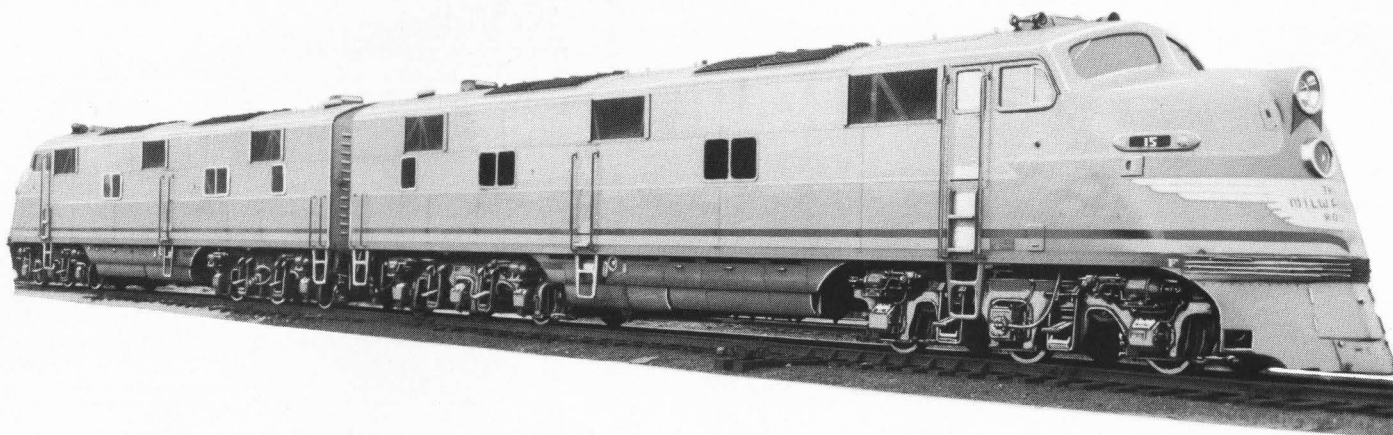


**DIESEL-ELECTRIC Locomotive No. 1690—Built in 1940 by the General Electric Company. This is a 380 horse power, 44-ton switcher for light industrial switching. This locomotive has been re-numbered 1699.**

**Total weight, all on drivers . . . . . 88,972 lbs.  
Starting tractive power at 25% factor of adhesion . 22,243 lbs.  
Maximum speed . . . 35 miles per hour  
Length . . . . . 33' 5"**

**DIESEL-ELECTRIC** Locomotive  
**No. 15**—Class DE-40—4000 h.p.—  
 BUILT IN 1941 by Electro-Motive  
 Corporation.

Driving Wheel Diameter....36 inches  
 Total Weight.....629,130 lbs.  
 Engine Rating...1000 h.p. at 800 r.p.m.  
 Length Overall.....142 ft. 2½ in.



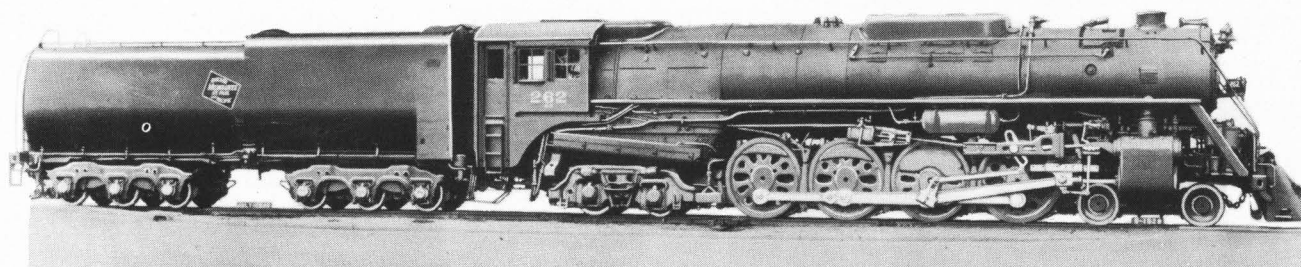
**DIESEL-ELECTRIC** Locomotive  
**No. 40**—Class DE-54—BUILT IN  
 1941 by the Electro-Motive Corpo-  
 ration. This four unit locomotive is  
 rated at 5400 horsepower. Each of  
 four Diesel engines drives an elec-  
 tric generator which produces 1350  
 horsepower at full load speed, 800  
 r.p.m. Traction motors are geared  
 to 40-inch driving wheels.

Overall Length—  
 Locomotive .....193 ft. 0 in.  
 Total Weight, All  
 on Drivers.....923,000 lbs.



**DIESEL-ELECTRIC** — 1000 h.p.  
Switching Locomotive **No. 1682**—  
Class DE-10 — BUILT IN 1942 by  
Baldwin Locomotive Works.

Driving Wheel Diameter . . . 40 inches  
Total Weight . . . . . 237,580 lbs.  
Engine Rating . 1000 b.h.p. at 625 r.p.m.  
Length Overall . . . . . 48 ft. 10 in.



**NO. 262**—Class  
S3—BUILT IN 1944 by American  
Locomotive Company.

Cylinder Size . . . . . 26 in. x 32 in.  
Driving Wheel Diameter . . . 74 inches  
Boiler Pressure . . . . . 250 lbs.  
Heating Surface . . . . . 4473 square feet  
Tender Water Capacity . 20,000 gallons  
Tender Coal Capacity . . . . . 25 tons  
Tractive Effort . . . . . 62,119 lbs.  
Length Overall . . . . . 109 ft. 7 3/4 in.

**DIESEL-ELECTRIC** Locomotive  
**No. 1808**—Built in 1945 by Fairbanks, Morse & Co. This is a 1000 horse power switcher used for general switching in terminals.

**Total weight, all on drivers** . . . . . 244,180 lbs.  
**Starting tractive power at 25% adhesion factor** . . . 61,045 lbs.  
**Maximum speed** . . . 60 miles per hour  
**Length** . . . . . 48' 10"



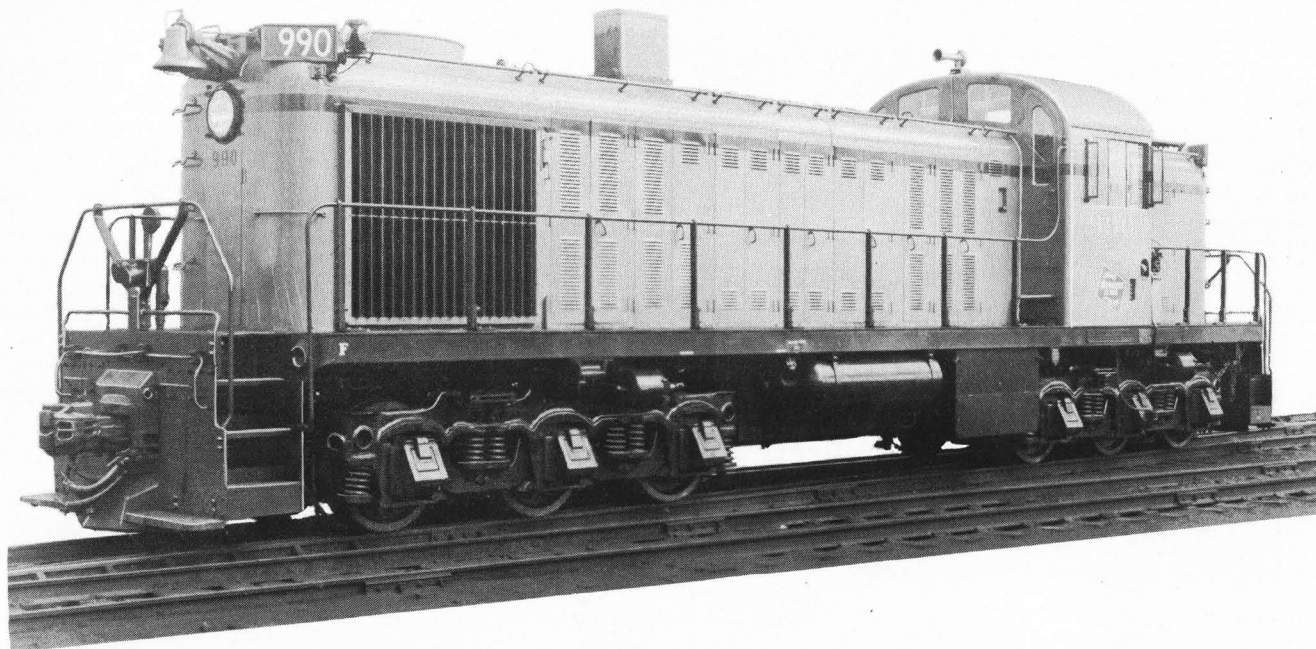
**DIESEL-ELECTRIC** Locomotive  
**No. 5**—BUILT IN 1946 by Fairbanks, Morse & Co. and the General Electric Company. The units of these locomotives can be coupled to make 4000 h.p. (2-unit) or 6000 h.p. (3-unit) locomotives. Each unit is equipped with a 2000 h.p. Diesel engine-generator which supplies electricity to four geared traction motors. The coupled length of each unit is 64 ft. 10 in.; total weight, 328,800 lbs.

**Weight on Drivers** . . . . . 223,700 lbs  
**Tractive Effort at 25 % Adhesion** . . . . . 55,925 lbs.



**DIESEL-ELECTRIC** Locomotive  
**No. 990**—Built in 1947 by American  
 Locomotive Company. This is a 1500  
 horse power road-switcher with 6-  
 wheel trucks for operation on light  
 rail. Some units of this type are  
 equipped with steam boilers for  
 heating and cooling passenger cars.  
 They can be operated in multiple  
 for freight or passenger service.

**Total weight**.....250,000 lbs.  
**Weight on drivers**.....166,670 lbs.  
**Length**.....55' 5 1/4"  
**Maximum tractive effort**...41,683 lbs.  
**Maximum speed**....65 miles per hour

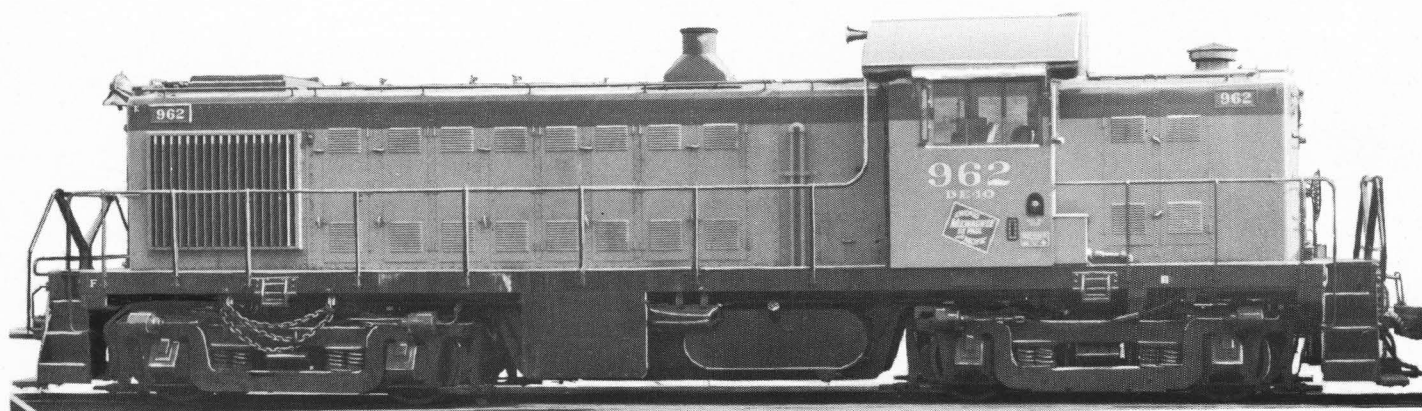
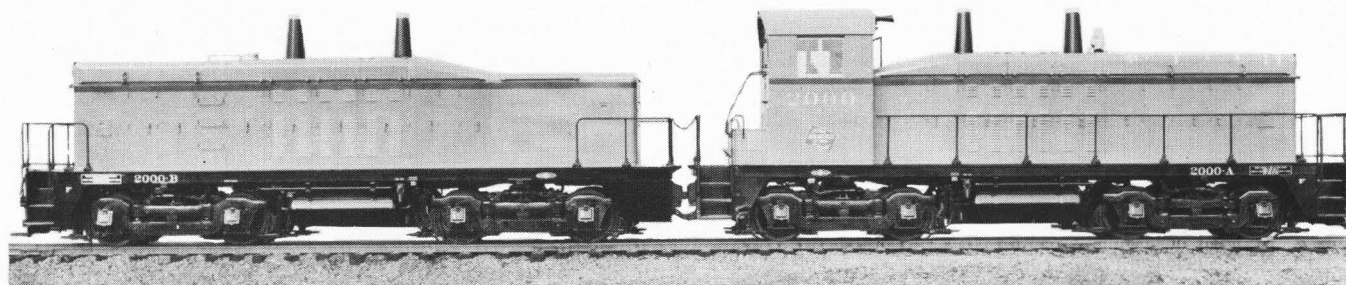


**DIESEL-ELECTRIC** Locomotive  
**No. 81**—Built in 1949 by Electro-  
 Motive Division, General Motors  
 Corporation. This is a 4-unit freight  
 locomotive. Each unit is rated at  
 1500 horse power. It is equipped  
 with dynamic brakes to control train  
 speed on descending grades.

**Total weight, all on  
 drivers**.....923,988 lbs.  
**Tractive effort at  
 25% adhesion factor**...230,997 lbs.  
**Maximum speed**....65 miles per hour  
**Length**.....201' 4"

**DIESEL-ELECTRIC** Transfer Locomotive **No. 2000**—Built in 1949 by Electro-Motive Division, General Motors Corporation. This 2-unit transfer locomotive is rated at 2000 horse power. Each of two Diesel engines drives an electric generator which produces 1000 horse power at full load speed, 800 r.p.m. Traction motors are geared to 40-inch driving wheels. This locomotive is used for heavy switching and transfer service.

**Total weight, all on drivers, approx.....**494,500 lbs.  
**Starting tractive power at 25% adhesion factor...**123,615 lbs.  
**Maximum speed.....**55 miles per hour  
**Length.....**86' 5"



**DIESEL-ELECTRIC** Locomotive **No. 962**—Built in 1950 by American Locomotive Company. This is a 1000 horse power road-switcher with 4-wheel trucks for yard or road service. When equipped with boilers and coupled to a tender (as shown in inset), they are suitable for handling passenger trains between passenger terminals and coach yards.

**Total weight, all on drivers .....**246,680 lbs.  
**Tractive effort at 25% factor of adhesion.....**61,670 lbs.  
**Maximum speed.....**60 miles per hour  
**Length .....**54' 11 3/4"

**DIESEL-ELECTRIC** Freight Locomotive **No. 68** (Model F-7)—Built in 1950 by Electro-Motive Division, General Motors Corporation. This 3-unit freight locomotive is rated at 4500 horse power. Each of three Diesel engines drives an electric generator which produces 1500 horse power at full load speed, 800 r.p.m. Traction motors are geared to 40-inch driving wheels. Equipped with dynamic brakes for controlling train's speed on descending grades, and train radio.

**Total weight,**  
all on drivers.....698,000 lbs.  
**Maximum tractive effort...**174,670 lbs.  
**Maximum speed...**65 miles per hour  
**Overall length—Locomotive...**151' 4"



**DIESEL-ELECTRIC** Passenger Locomotive **No. 92** (Model Fp-7)—Built in 1950 by Electro-Motive Division, General Motors Corporation. This 3-unit passenger locomotive is rated at 4500 horse power. Each of three Diesel engines drives an electric generator which produces 1500 horse power at full load speed, 800 r.p.m. Traction motors are geared to 40-inch driving wheels.  
**Overall length—locomotive...**159' 4"  
**Total weight, all on**  
drivers, approx.....770,240 lbs.





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