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Lima Locomotive Works, Incorporated
Lima, Ohio

LIMA ***SUPER-POWER***

STEAM LOCOMOTIVES

I n t r o d u c t i o n

THE PURPOSE of this book is to show a representative cross-section of those locomotives that have recently been built by the Lima Locomotive Works — the problem presented by the intended service for which the locomotive was purchased, the governing operating condition where the locomotive was to be used, and, where possible, a brief résumé of the service record of the locomotive.

In the latter part of this book are shown some of the methods and machinery that have earned for Lima its enviable reputation as a builder of long-lived, trouble-free locomotives. Besides building super-power locomotives, Lima Locomotive Works, through its Shovel and Crane Division, produces an outstanding line of power shovels, cranes and drag lines, and illustrations of some of these are shown on the final page of this book.

a b r i e f

THE MODERN STEAM LOCOMOTIVE

The most outstanding achievement in solving present and future transportation problems has been the remarkable development of the steam locomotive.

Recent years have seen great improvements in the steam locomotive which have made possible the development of more power without exceeding existing wheel load and clearance limits, and these results have been accomplished with a marked decrease in fuel consumption. The Super-Power Locomotive—the economical modern power plant on wheels—represents the outstanding achievement in this development.

The year 1925 saw the start of a new era in railroad operation brought about by the introduction of Lima Locomotive Works' experimental Engine A-1, the first of the Super-Power Locomotives.

It was becoming apparent that the demands of shippers and passengers for higher speeds were revolutionizing the operating requirements of the steam locomotive. No longer would drag freights at 10 to 15 miles an hour give the rapid service consistent with the demands of modern transportation.

Realizing this, Lima engineers designed and built at Lima's expense a locomotive that became the forerunner of the modern steam power plant which we know today.

It was obvious to the designers that high speed necessitated larger boiler capacity, which in turn demanded larger grate areas to avoid an excessive fuel rate. It was obvious, too, that the higher speeds would increase the stress on track structure unless a new design could possess the desired high horsepower without extending the limits of axle loads. This combination of requirements pointed to a redistribution of locomotive weight and the use of a 4-wheel trailing truck.

Lima A-1 was the forerunner of the 4-wheel trailing truck locomotive which today is synonymous with modern high-speed operation.

In addition, many innovations in locomotive design were included in the A-1 which have subsequently been accepted as standard practice and included in most locomotives built within the last decade.

h i s t o r y

Included among these were higher boiler pressure, cast steel cylinders for weight saving, Type E Superheater, and The Locomotive Booster.

The objectives in the design of this Lima Super-Power Locomotive were: Maximum power output per driving axle; most economical use of steam in the cylinders under all conditions of service; and a boiler with firebox capable of supplying abundant steam at high efficiency.

The results of the operation of this experimental locomotive were such as to revolutionize the old conception of railroading and to bring about a rapid speeding up of operations.

Operating conditions today demand the pulling of heavier trains at higher speeds with lower costs. Speeding up operation without reducing train tonnage (which is the same as an increase in gross ton-miles-per-train-hour) can only be accomplished with higher horsepower.

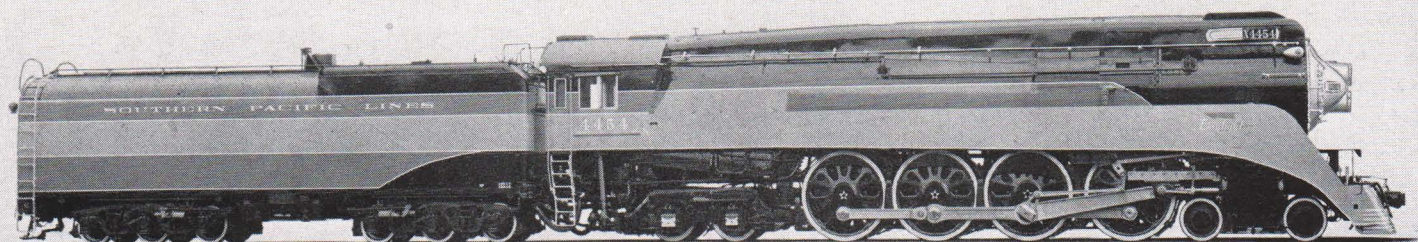
Low freight train speeds or securing increased speeds at the sacrifice of tonnage kill operating economies. Super-Power Locomotives not only start maximum train loads for a given weight on drivers, but they have the ability to haul heavier trains at higher speeds than was heretofore possible. This type of operation brings increased revenue to the railroads.

Thus, thanks to the ingenuity of Lima's designing engineers and their initiative which resulted in the construction of this experimental locomotive, the railroads have been able to meet the increased demand for speedy deliveries which are now accepted as a matter of course.

Following the great success of the Lima A-1, several hundred locomotives based substantially on this design were built for American railroads.

In the final analysis it is the earning power of locomotives that determines their value. To be worth while this must show an adequate return upon the investment. Super-Power Locomotives are doing this. They not only show handsome returns based on the direct savings effected in operation but by reason of the increased capacity which they add to the railroad they greatly expand the revenue-earning possibilities of the entire transportation plant.

SPECIFICATIONS



Built for Southern Pacific Lines

Class: 484-S-468

R. R. Class: GS-4

Road No. 4454

6 Class GS Locomotives ordered 1936, Nos. 4410-4415 14 Class GS-3 Locomotives ordered 1936, Nos. 4416-4429
20 Class GS-4 Locomotives ordered 1940, Nos. 4430-4449 10 Class GS-4 Locomotives ordered 1941, Nos. 4450-4459
10 Class GS-6 Locomotives ordered 1942, Nos. 4460-4469

	GAUGE OF TRACK	DRIVING WHEEL DIAMETER	FUEL Kind	CYLINDERS Diameter	Stroke	BOILER Diameter	Pressure	FIREBOX Length	Width
Class GS	4'-8½"	73½"	Oil	27"	30"	86"	250 Lbs.	127⅞"	102¼"
Class GS-3	4'-8½"	80"	Oil	26"	32"	86"	280 Lbs.	127⅞"	102¼"
Class GS-4	4'-8½"	80"	Oil	25½"	32"	86"	300 Lbs.	127⅞"	102¼"
Class GS-6	4'-8½"	73½"	Oil	27"	30"	86"	260 Lbs.	127⅞"	102¼"

	Driving	WHEEL BASE Engine	Engine and Tender	TRACTIVE POWER Main Cylinders	With Booster	FACTOR OF ADHESION	TUBES & FLUES Number	Diameter	Length
Class GS	20'-0"	45'-10"	94'-0½"	62200	74710	4.28	49 198	2¼" 3½"	21'-6"
Class GS-3	21'-6"	47'-8"	95'-10½"	62800	75000	4.25	49 198	2¼" 3½"	21'-6"
Class GS-4	21'-6"	47'-8"	96'-3"	64760	77760	4.28	49 198	2¼" 3½"	21'-6"
Class GS-6	20'-0"	45'-10"	94'-5"	64200	75500	4.42	49 198	2¼" 3½"	21'-6"

	AVERAGE WEIGHT IN WORKING ORDER, Pounds						GRATE AREA, Sq. Ft.	HEATING SURFACES, Square Feet				
	On Drivers	Truck	Front Axle	Rear Axle	Total Engine	Tender		Tubes	Flues	Comb. Cham.	Total Super-heater	
Class GS	266500	77400	46300	58200	448400	372880 (Loaded)	90.4	617	3885	350	4852	2086
Class GS-3	267300	83300	49500	59900	460000	372880 (Loaded)	90.4	617	3885	385	4887	2086
Class GS-4	275700	81300	56000	62000	475000	313730 (¾ Load)	90.4	617	3885	385	4887	2086
Class GS-6	283200	72700	50000	62500	468400	317800 (¾ Load)	90.2	617	3885	350	4852	2086

Class GS, TENDER, TYPE 12 WHEEL
Class GS-3, TENDER, TYPE 12 WHEEL
Class GS-4, TENDER, TYPE 12 WHEEL
Class GS-6, TENDER, TYPE 12 WHEEL

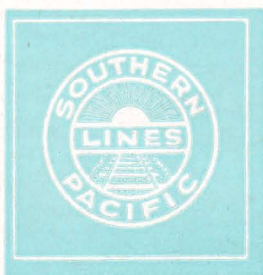
CAPACITY, WATER 22000 GALLONS
CAPACITY, WATER 22000 GALLONS
CAPACITY, WATER 23300 GALLONS
CAPACITY, WATER 23200 GALLONS

FUEL, 6010 GALS.
FUEL, 6010 GALS.
FUEL, 5880 GALS.
FUEL, 6080 GALS.





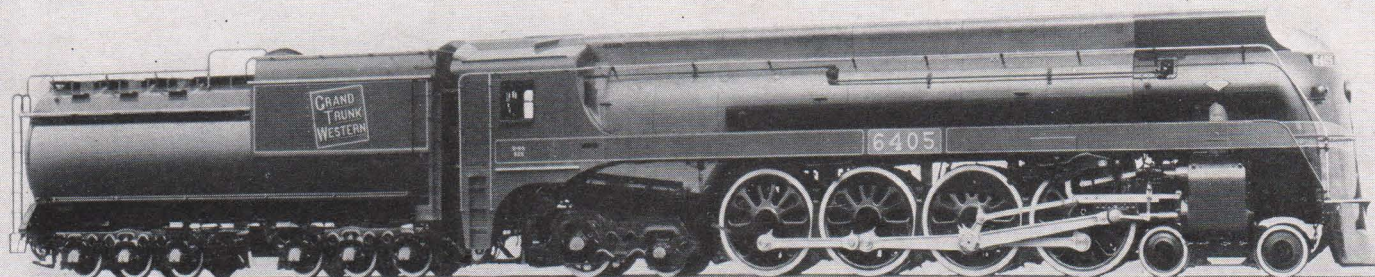
Service Record



Early in 1936 the Lima Locomotive Works delivered the first of six high-speed streamlined "Daylights." At the time that these locomotives were ordered they were to be used in fast passenger service between San Francisco and Los Angeles on the "Daylight" Streamliner. In 1937 the railroad ordered fourteen more of these locomotives. At this time, the railroad put on an extensive drive to regain some of its

L. C. L. freight and these locomotives were used on overnight "Hotshot" freight service on running schedules that closely approximated those of the crack "Daylights." In 1940 as passenger traffic was increasing and the "Hotshot" freight service was becoming increasingly popular, the railroad placed another order for twenty more of these locomotives. Additional orders for ten more locomotives each were placed in 1941 and 1942, making a total of sixty of these Lima-built streamliners, which, because of their power and adaptability, are used to speed both freight and passenger traffic.

SPECIFICATIONS



Built for Canadian National Ry's. (Grand Trunk Western)

Class: 484-S-383 R. R. Class: U-4-b Road No. 6405
Order Covers 6 Locos. 6405-6410

GAUGE OF TRACK	DRIVING WHEEL DIAMETER	FUEL Kind	CYLINDERS Diameter	Stroke	BOILER Diameter	Pressure	FIREBOX Length	Width
4'-8 $\frac{1}{2}$ "	77"	Soft Coal	24"	30"	79 $\frac{9}{16}$ "	275 Lbs.	126 $\frac{1}{8}$ "	84 $\frac{3}{16}$ "

Driving	WHEEL BASE Engine	Engine and Tender	TRACTIVE POWER Main Cylinders	FACTOR OF ADHESION	TUBES & FLUES Number	Diameter	Length
20'-0"	44'-11 $\frac{1}{2}$ "	82'-8 $\frac{1}{4}$ "	52500	4.53	43 146	2 $\frac{1}{4}$ " 3 $\frac{1}{2}$ "	21'-10"

AVERAGE WEIGHT IN WORKING ORDER, Pounds						GRATE AREA Sq. Ft.	HEATING SURFACES, Square Feet				
Trailer							Tubes & Flues	Firebox & Comb. Cham.	Arch Tubes & Syphons	Total	Super-heater
On Drivers	Truck	Front Axle	Rear Axle	Total Engine	Tender $\frac{2}{3}$ Load						
237900	62000	37700	45100	382700	226140	73.7	3458	296	98	3852	1530

TENDER, TYPE 12 WHEEL

CAPACITY, WATER 14300 GALLONS

FUEL, 20 TONS





Service Record

These 4-8-4 type locomotives are used in main line, high-speed passenger service between Chicago and Port Huron, running through the total distance of 334 miles. These locomotives are outstanding examples of the progressive strides that are being made in the streamlining of passenger locomotives to meet the demands of the traveling public for streamlined service — both in improved looks and in faster schedules.

The average monthly mileage of these engines is about 10,000, and the average train varies in length up to 15 cars. From the time these locomotives were put into this service, until the first changing of the driving tires for wear, they averaged 200,000 miles per locomotive which the railroad considers excellent service.

SPECIFICATIONS



Built for Chesapeake & Ohio Ry. Co.

Class: 484-S-477 R. R. Class: J-3A

Road No. 605

5 Locos. ordered 1935, Nos. 600-604

2 Locos. ordered 1941, Nos. 605-606

	GAUGE OF TRACK	DRIVING WHEEL DIAMETER	FUEL Kind	CYLINDERS		BOILER		FIREBOX	
				Diameter	Stroke	Diameter	Pressure	Length	Width
Class J-3	4'-8½"	72"	Soft Coal	27½"	30"	91½"	250 Lbs.	150½"	96¼"
Class J-3A	4'-8½"	72"	Soft Coal	27½"	30"	91½"	255 Lbs.	150½"	96¼"

	WHEEL BASE			TRACTIVE POWER		FACTOR OF ADHESION	TUBES & FLUES		
	Driving	Engine	Engine and Tender	Main Cylinders	With Booster		Number	Diameter	Length
Class J-3	19'-3"	46'-10½"	98'-5¼"	66960	81035	4.08	65 220	2¼" 3½"	21'-0"
Class J-3A	19'-3"	46'-10½"	98'-5¼"	68300	82700	4.24	62 220	2¼" 3½"	21'-0"

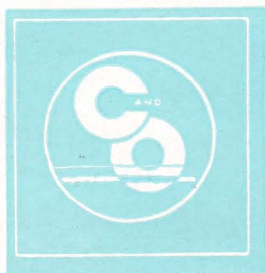
	AVERAGE WEIGHT IN WORKING ORDER, Pounds						GRATE AREA Sq. Ft.	HEATING SURFACES, Square Feet				
	On Drivers	Truck	Trailer		Total Engine	Tender ⅔ Load		Tubes & Flues	Firebox & Comb. Cham.	Arch Tubes & Syphons	Total	Super- heater
Class J-3	273000	89500	53000	61500	477000	304000	100	5013	396	129	5538	2342
Class J-3A	290000	92000	60500	61000	503500	309700	100.3	4974	396	124	5494	2305

Class J-3, TENDER, TYPE 12 WHEEL CAPACITY, WATER 22000 GALLONS FUEL, 25 TONS

Class J-3A, TENDER, TYPE 12 WHEEL CAPACITY, WATER 22000 GALLONS FUEL, 25 TONS

Both J-3 and J-3A Locomotives Equipped with THE LOCOMOTIVE BOOSTER



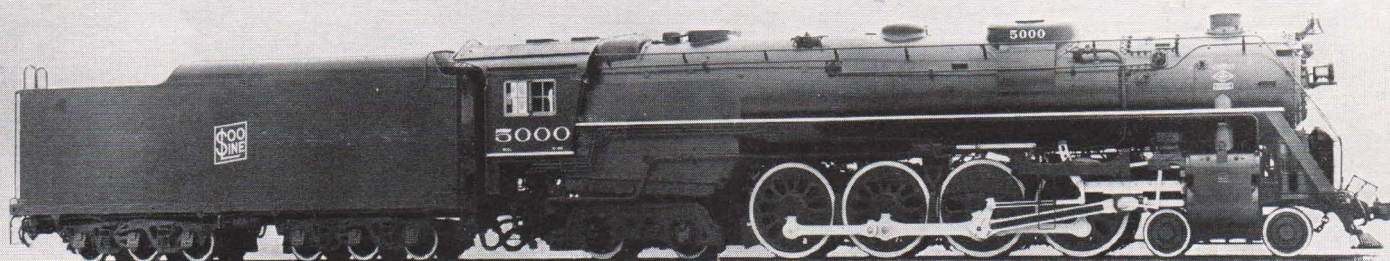


Service Record

In 1935 five 4-8-4 type locomotives (Class J-3) were ordered for main line passenger service between Charlottesville, Va., and Hinton, West Va., where they handle such trains as the George Washington, the Sportsman, and F. F. V., over the three ranges of the

Alleghenies, with maximum grades of 1.52%. These locomotives proved so successful on this run that an additional order for two more 4-8-4 type locomotives (Class J-3A) was placed in 1941, so that there are now seven of this class in service on the C & O.

SPECIFICATIONS



Built for Wisconsin Central Railway Co.

Class: 4-8-4-S-445 R. R. Class: O-20 Road No. 5000

Order Covers 4 Locos. 5000-5003

GAUGE OF TRACK	DRIVING WHEEL DIAMETER	FUEL Kind	CYLINDERS Diameter Stroke	BOILER Diameter Pressure	FIREBOX Length Width
4'-8½"	75"	Soft Coal	26" 32"	86" 270 Lbs.	132½" 96¼"

Driving	WHEEL BASE		TRACTIVE POWER	FACTOR OF ADHESION	TUBES & FLUES		
	Engine	Engine and Tender	Main Cylinders		Number	Diameter	Length
19'-9"	46'-9"	87'-9½"	66000	3.99	65 199	2¼" 3½"	21'-6"

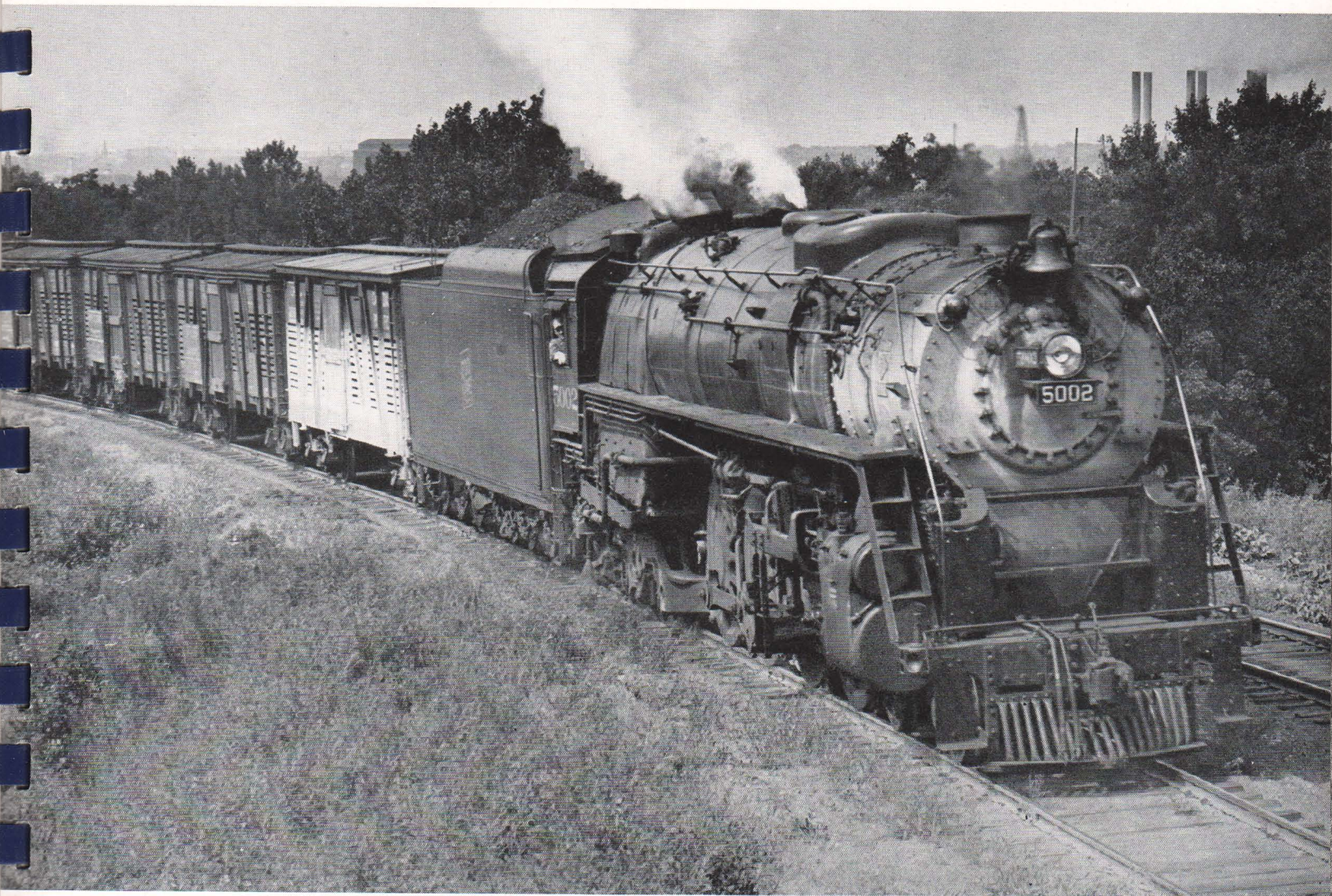
AVERAGE WEIGHT IN WORKING ORDER, Pounds						GRATE AREA Sq. Ft.		HEATING SURFACES, Square Feet				
On Drivers	Truck	Trailer		Total Engine	Tender ⅔ Load			Tubes & Flues	Firebox & Comb. Cham.	Arch Tubes	Total	Super-heater
		Front Axle	Rear Axle									
263000	76000	52300	54200	445500	252967	88.3		4719	376	47	5142	2120

TENDER, TYPE 12 WHEEL

CAPACITY, WATER 17500 GALLONS

FUEL, 24 TONS





Service Record



In January of 1938, four of these 4-8-4 locomotives were delivered by the Lima Locomotive Works to the Soo Line for use in main line through freight service between Minneapolis, Minn., and Chicago, Ill., a distance of 437 miles. These locomotives replaced seven 4-8-2 type locomotives that were being used for this service at the time. The runs involved cover four special divisions requiring four locomotives and train crews en route in each direction. The scheduled running time between

Minneapolis and Chicago is 18 hours and 40 minutes eastbound and 16 hours and 50 minutes westbound (total time elapsed between terminals). The actual running time (stopping time at intermediate terminals being deducted) is 16 hours and 20 minutes eastbound and 14 hours and 55 minutes westbound. Frequently runs are made in less time than is shown in the schedule.

During one year the four locomotives ran up an average per locomotive of over 100,000 miles. These locomotives have given excellent service, which is reflected in an increase in train speed and gross ton miles per train hour of as much as 30%. The maintenance expense of these locomotives has been entirely satisfactory to the railroad.

SPECIFICATIONS



Built for The New York Central System

Class: 4-8-2-S-401

R. R. Class: L-4B

Road No. 3135

15 Class L-3B Locos. ordered 1940, Nos. 3035-3049

25 Class L-4A Locos. ordered 1942, Nos. 3100-3124

25 Class L-4B Locos. ordered 1943, Nos. 3125-3149

	GAUGE OF TRACK	DRIVING WHEEL DIAMETER	FUEL Kind	CYLINDERS		BOILER		FIREBOX	
				Diameter	Stroke	Diameter	Pressure	Length	Width
Class L-3B	4'-8 $\frac{1}{2}$ "	69"	Soft Coal	25 $\frac{1}{2}$ "	30"	82 $\frac{7}{16}$ "	250 Lbs.	120 $\frac{1}{8}$ "	90 $\frac{1}{4}$ "
Class L-4A	4'-8 $\frac{1}{2}$ "	72"	Soft Coal	25 $\frac{1}{2}$ "	30"	82 $\frac{7}{16}$ "	250 Lbs.	120 $\frac{1}{8}$ "	90 $\frac{1}{4}$ "
Class L-4B	4'-8 $\frac{1}{2}$ "	72"	Soft Coal	26"	30"	84 $\frac{5}{16}$ "	250 Lbs.	120 $\frac{1}{8}$ "	90 $\frac{1}{4}$ "

	Driving	WHEEL BASE		TRACTIVE POWER		FACTOR OF ADHESION	TUBES & FLUES		
		Engine	Engine and Tender	Main Cylinders	With Booster		Number	Diameter	Length
Class L-3B	19'-0"	43'-1"	95'-11 $\frac{1}{2}$ "	60100	74000	4.41	50 198	2 $\frac{1}{4}$ " 3 $\frac{1}{2}$ "	20'-6"
Class L-4A	19'-0"	43'-1"	95'-11 $\frac{1}{2}$ "	60100	None	4.41	50 198	2 $\frac{1}{4}$ " 3 $\frac{1}{2}$ "	20'-6"
Class L-4B	19'-0"	43'-1"	95'-11 $\frac{1}{2}$ "	59900	None	4.45	50 198	2 $\frac{1}{4}$ " 3 $\frac{1}{2}$ "	20'-6"

	AVERAGE WEIGHT IN WORKING ORDER, Pounds					GRATE AREA, Sq. Ft.	HEATING SURFACES, Square Feet				
	On Drivers	Truck	Trailer	Total Engine	Tender $\frac{3}{4}$ Load		Tubes & Flues	Arch Tubes	Firebox & Comb. Cham.	Total	Super-heater
Class L-3B	265000	65100	63400	393500	303933	75.3	4303	35	338	4676	2103
Class L-4A	266000	70900	59100	396000	303933	75.3	4303	35	338	4676	2103
Class L-4B	266500	74900	59700	401100	309400	75.3	4303	35	338	4676	2103

Class L-3B, TENDER, TYPE 12 WHEEL
Class L-4A, TENDER, TYPE 12 WHEEL
Class L-4B, TENDER, TYPE 12 WHEEL

CAPACITY, WATER 15500 GALLONS
CAPACITY, WATER 15500 GALLONS
CAPACITY, WATER 15200 GALLONS

FUEL, 43 TONS
FUEL, 43 TONS
FUEL, 42 TONS





Service Record

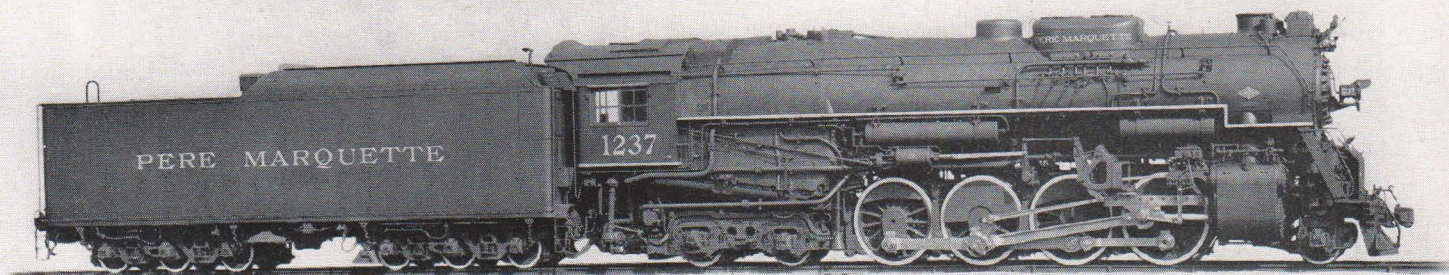


In the latter part of 1940, Lima delivered the first of fifteen L-3B Type locomotives to the New York Central for use on fast freight service between Harmon, N. Y., and Chicago, a distance of 925 miles. Then in 1942 the New York Central placed an order with Lima for twenty-five more 4-8-2s, designated as the L-4A Type, which are basically duplicates of the L-3B locomotives, except that they have larger driving wheels.

Another order for twenty-five, designated as the L-4B Type, was placed with Lima in 1943. The illustration shows an L-4B locomotive scooping water at 75 miles an hour into a specially designed tender tank.

The L-4B Type locomotives have proved to be particularly satisfactory as all purpose engines, capable of handling the fastest and heaviest passenger trains, as well as heavy fast freights. An outstanding characteristic of the L-4Bs is their especially rapid acceleration, and they are in daily use on such high-speed passenger trains as The Twentieth Century, the Pacemaker, and The Commodore Vanderbilt.

SPECIFICATIONS



Built for Pere Marquette Ry. Co.

Class: 2-8-4-S-456

R. R. Class: N-2

Road No. 1237

15 Class N Locos. ordered 1937, Nos. 1201-1215

12 Class N-1 Locos. ordered 1941, Nos. 1216-1227

12 Class N-2 Locos. ordered 1944. 7 without Boosters, Nos. 1228-1234. 5 with Boosters, Nos. 1235-1239

	GAUGE OF TRACK	DRIVING WHEEL DIAMETER	FUEL Kind	CYLINDERS Diameter	Stroke	BOILER Diameter	Pressure	FIREBOX Length	Width
Class N	4'-8½"	69"	Soft Coal	26"	34"	87½⅞"	245 Lbs.	135½⅞"	96¼"
Class N-1	4'-8½"	69"	Soft Coal	26"	34"	87½⅞"	245 Lbs.	135½⅞"	96¼"
Class N-2	4'-8½"	69"	Soft Coal	26"	34"	87½⅞"	245 Lbs.	135½⅞"	96¼"

	WHEEL BASE		Engine and Tender	TRACTIVE POWER		FACTOR OF ADHESION	TUBES & FLUES		
	Driving	Engine		Main Cylinders	With Booster		Number	Diameter	Length
Class N	18'-3"	42'-0"	87'-8¾"	69350	83750	4.01	74 202	2¼" 3½"	19'-0"
Class N-1	18'-3"	42'-0"	88'-2¾"	69350	None	4.01	73 202	2¼" 3½"	19'-0"
Class N-2	18'-3"	42'-0"	88'-2¾"	69350	83450	4.01	72 202	2¼" 3½"	19'-0"

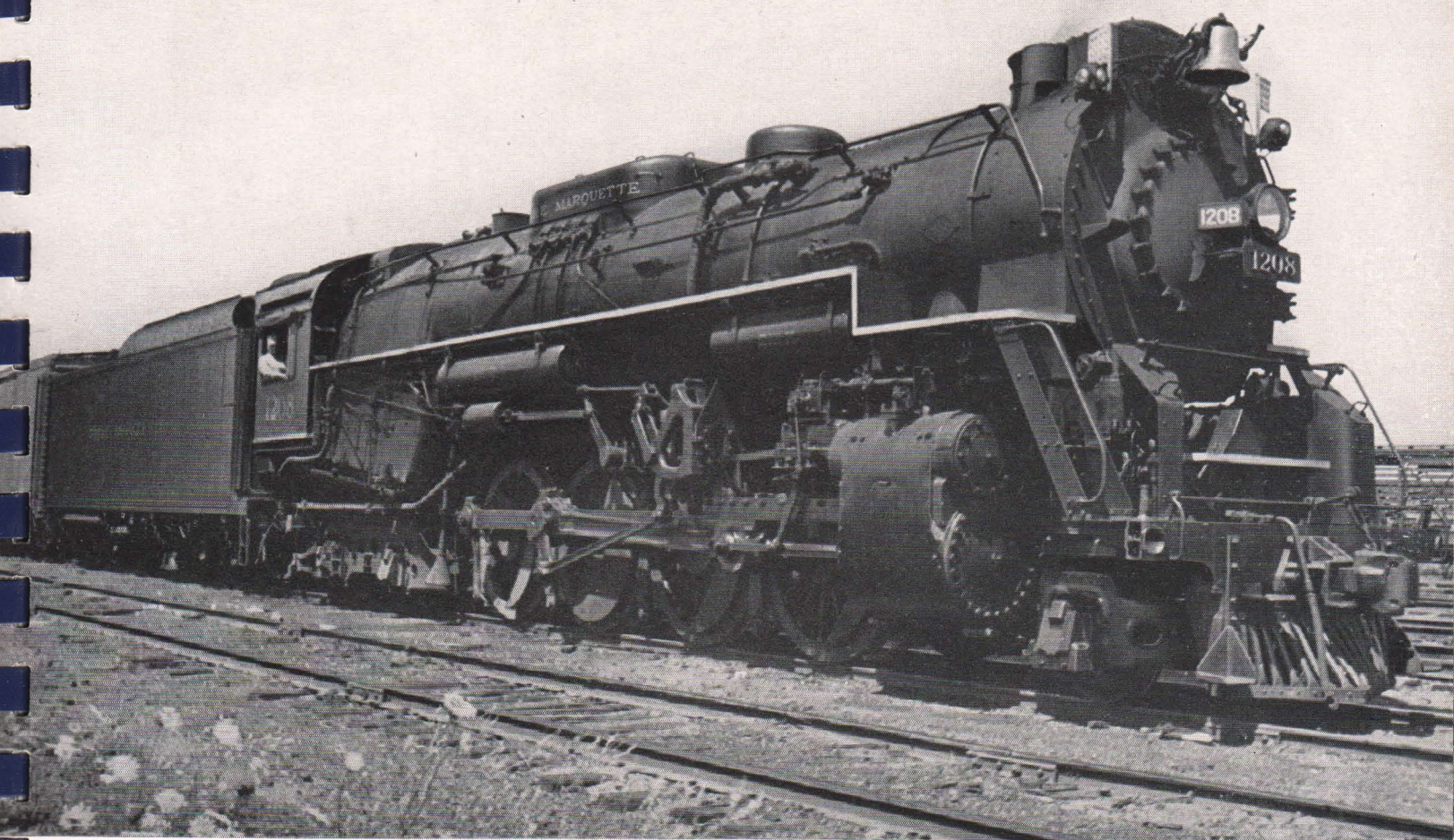
AVERAGE WEIGHT IN WORKING ORDER, Pounds							GRATE AREA, Sq. Ft.	HEATING SURFACES, Square Feet				
	On Drivers	Truck	Front Axle	Rear Axle	Total Engine	Tender $\frac{2}{3}$ Load	Tubes & Flues	Firebox & Comb. Cham.	Arch Syphons	Total	Super-heater	
Class N	278000	48000	53500	66000	445500	284600	90.3	4323	343	119	4785	1932
Class N-1	277600	50900	56000	58000	442500	284800	90.3	4311	344	122	4777	1932
Class N-2	278000	50500	59100	68500	456100	289260	90.3	4311	344	122	4777	1932

Class N, N-1, N-2, TENDER, TYPE 12 WHEEL

CAPACITY, WATER 22000 GALLONS

FUEL, 22 TONS





Service Record

PERE
MARQUETTE

In 1937 the Pere Marquette ordered fifteen locomotives of the Class N type for use in fast freight service between Chicago and Detroit, and between Toledo and Saginaw. The increasing demands for quick deliveries on the part of shippers have brought about an entirely new concept of the handling of freight. Today fast freight schedules must parallel those of fast passenger trains. The performance of these first fifteen Class N locomotives has been so successful, that twelve more were ordered in 1941 and an additional twelve in 1944, making a total of thirty-nine that are now being used in this same service.

SPECIFICATIONS



Built for Detroit, Toledo & Ironton R. R.

Class 2-8-4-S-416 R. R. Class: None Road No. 704

4 Locos. ordered 1935, Nos. 700-703
2 Locos. ordered 1939, Nos. 704-705

Class 2-8-2-S-370 R. R. Class: None Road No. 803

4 Locos. ordered 1940, Nos. 800-803 4 Locos. ordered 1941, Nos. 804-807
4 Locos. ordered 1944, Nos. 808-811

	GAUGE OF TRACK	DRIVING WHEEL DIAMETER	FUEL Kind	CYLINDERS		BOILER		FIREBOX	
				Diameter	Stroke	Diameter	Pressure	Length	Width
No. 700	4'-8½"	63"	Soft Coal	25"	30"	88"	250 Lbs.	132½"	96¼"
No. 704	4'-8½"	63"	Soft Coal	25"	30"	88"	260 Lbs.	132½"	96¼"
Nos. 800 & 808	4'-8½"	63"	Soft Coal	23"	30"	82½"	260 Lbs.	114½"	84"

	Driving	WHEEL BASE		MAXIMUM TRACTIVE POWER	FACTOR OF ADHESION	TUBES & FLUES		
		Engine	Engine and Tender			Number	Diameter	Length
No. 700	16'-9"	39'-3"	86'-1¼"	63250	3.92	77 202	2¼" 3½"	18'-0"
No. 704	16'-9"	39'-3"	86'-1¼"	65800	3.78	77 202	2¼" 3½"	18'-0"
Nos. 800 & 804	16'-9"	37'-3"	75'-0¼"	55600	4.47	34 182	2¼" 3½"	20'-0"
No. 808	16'-9"	37'-3"	83'-10¾"	55600	4.47	34 182	2¼" 3½"	20'-0"

	AVERAGE WEIGHT IN WORKING ORDER, Pounds						GRATE AREA, Sq. Ft.	HEATING SURFACES, Square Feet				
	On Drivers	Truck	Front Axle	Rear Axle	Total Engine	Tender ½ Load		Tubes & Flues	Firebox & Comb. Cham.	Arch Tubes	Total	Super- heater
No. 700	248600	53900	46000	63000	411500	284200	88.3	4127	318	48	4493	1795
No. 704	248400	54500	48000	65100	416000	284200	88.3	4127	318	76	4521	1795
Nos. 800 & 804	248500	50100	Trailer 70900		369500	194166	66.9	3719	230	60	4009	1815
No. 808	248500	50100	Trailer 70900		369500	284200	66.9	3719	230	60	4009	1815

No. 700, 704 & 808,
No. 800 & 804,

TENDER, TYPE 12 WHEEL
TENDER, TYPE 8 WHEEL

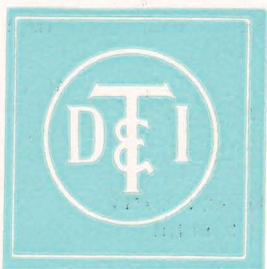
CAPACITY, WATER 22000 GALLONS
CAPACITY, WATER 14300 GALLONS

FUEL, 22 TONS
FUEL, 18 TONS



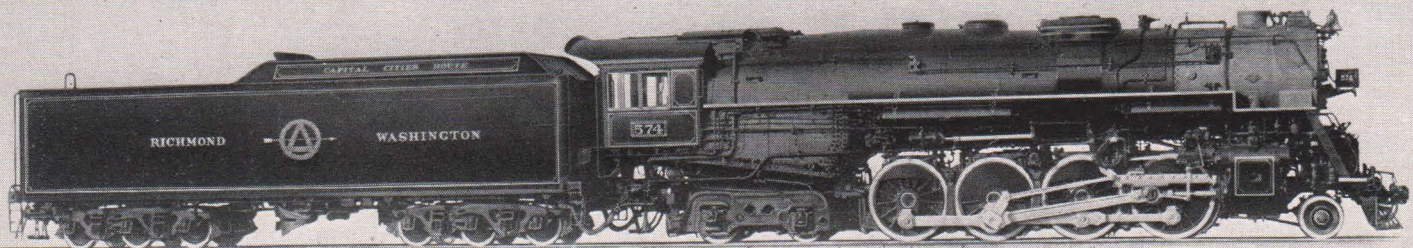


Service Record



In 1935 the Detroit, Toledo & Ironton Railroad Company placed an order with Lima for four 2-8-4 class locomotives. The performance of these was so thoroughly satisfactory that two more were ordered in 1939. The next year this railroad ordered four 2-8-2 class locomotives. This new power, which was used to augment the main-line locomotives then in service, was designated the 800 series and was part of the railroad's progressive program to keep abreast of traffic demands. In 1941 four more of these locomotives were added to the 800 fleet and four more again in 1944.

SPECIFICATIONS



Built for Richmond, Fredericksburg & Potomac R. R. Co.

Class: 2-8-4-S-433

R. R. Class: None

Road No. 574

10 Locos. ordered 1942, Nos. 571-580

GAUGE OF TRACK	DRIVING WHEEL DIAMETER	FUEL Kind	CYLINDERS Diameter	Stroke	BOILER Diameter	Pressure	FIREBOX Length	Width
4'-8 $\frac{1}{2}$ "	69"	Soft Coal	25"	34"	87 $\frac{15}{16}$ "	245 Lbs.	135 $\frac{1}{16}$ "	96 $\frac{1}{4}$ "

Driving	WHEEL BASE Engine	Engine and Tender	TRACTIVE POWER Main Cylinders	FACTOR OF ADHESION	Number	TUBES & FLUES Diameter	Length
18'-3"	42'-0"	94'-0 $\frac{3}{4}$ "	64100	4.23	73 202	2 $\frac{1}{4}$ " 3 $\frac{1}{2}$ "	19'-0"

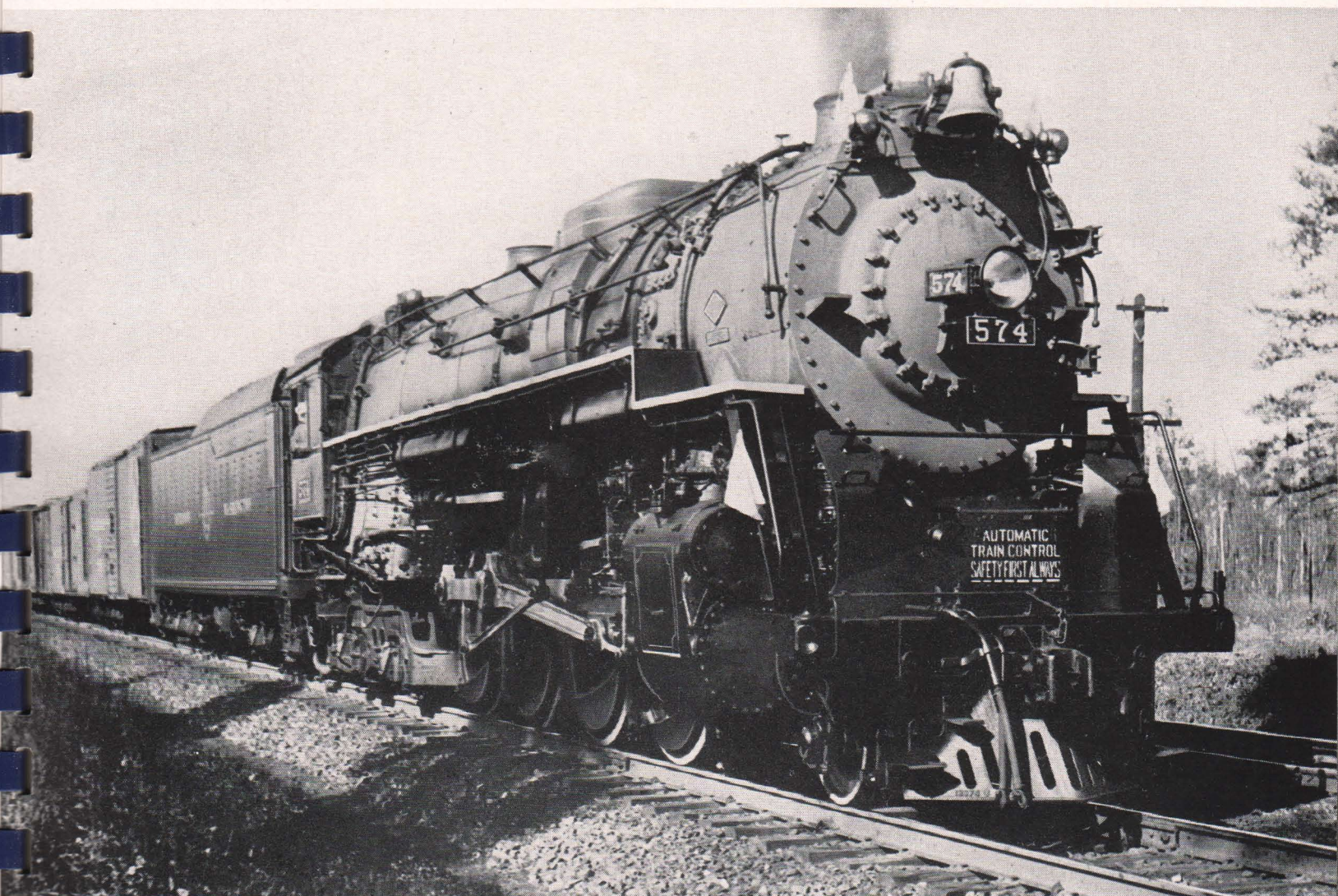
AVERAGE WEIGHT IN WORKING ORDER, Pounds						GRATE AREA, Sq. Ft.	HEATING SURFACES Square Feet				
On Drivers	Truck	Trailer			Tender $\frac{2}{3}$ Load	Tubes & Flues	Firebox & Comb. Cham.	Arch	Total	Super-heater	
		Front Axle	Rear Axle	Total Engine				Tubes & Syphons			
270900	50300	51200	60800	433200	303400	90.3	4311	344	117	4772	1932

TENDER, TYPE 12 WHEEL

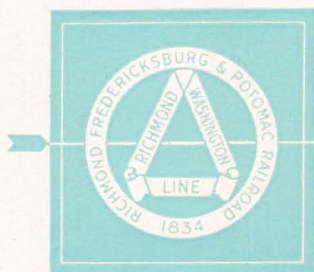
CAPACITY, WATER 22000 GALLONS

FUEL, 25 TONS





Service Record

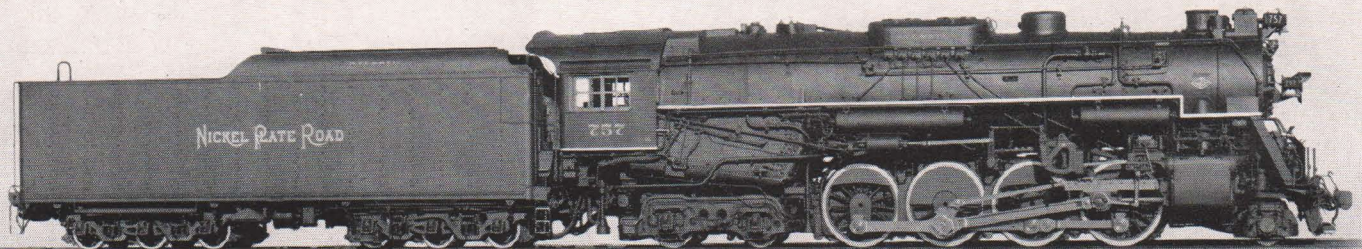


During the four and one-half years of the recent war, the freight tonnage of the Richmond, Fredericksburg and Potomac Railroad about equaled the total tonnage of the preceding fourteen years. This traffic included an enormous tonnage of important commodities previously transported by coastal steamships. In fact, the freight moved over the R. F. & P. during 1943 was over twice that

of the peak year of the First World War. This traffic was carried with an increase of but 81 % in trains operated in 1943 as compared with 1940, but the trains were much longer and far more heavily loaded.

An important factor in the successful handling of such tremendously increased demands upon its line was the Richmond, Fredericksburg and Potomac's progressive motive power program, which included the placing in service in 1943 of ten high-speed Lima 2-8-4 locomotives.

SPECIFICATIONS



Built for New York, Chicago & St. Louis R. R. Co. (Nickel Plate)

Class: 2-8-4-S-441

R. R. Class: S-2

Road No. 757

15 Locos. ordered 1941, Nos. 715-729

10 Locos. ordered 1942, Nos. 730-739

15 Locos. ordered 1943, Nos. 740-754

15 Locos. ordered 1943, Nos. 755-769

GAUGE OF TRACK	DRIVING WHEEL DIAMETER	FUEL Kind	CYLINDERS Diameter	Stroke	BOILER Diameter	Pressure	FIREBOX Length	Width
4'-8 $\frac{1}{2}$ "	69"	Soft Coal	25"	34"	87 $\frac{15}{16}$ "	245 Lbs.	135 $\frac{1}{16}$ "	96 $\frac{1}{4}$ "

	Driving	WHEEL BASE Engine	Engine and Tender	TRACTIVE POWER Main Cylinders	FACTOR OF ADHESION	TUBES & FLUES Number	Diameter	Length
Nos. 715-739	18'-3"	42'-0"	87'-8 $\frac{3}{4}$ "	64100	4.02	73 202	2 $\frac{1}{4}$ " 3 $\frac{1}{2}$ "	19'-0"
Nos. 740-769	18'-3"	42'-0"	87'-8 $\frac{3}{4}$ "	64100	4.12	73 202	2 $\frac{1}{4}$ " 3 $\frac{1}{2}$ "	19'-0"

	AVERAGE WEIGHT IN WORKING ORDER, Pounds						GRATE AREA, Sq. Ft.	HEATING SURFACES Square Feet				
	On Drivers	Truck	Trailer		Total Engine	Tender ¾ Load		Tubes & Flues	Firebox & Comb. Cham.	Arch		Super- heater
			Front Axle	Rear Axle						Tubes & Syphons	Total	
Nos. 715-739	258000	53500	50500	59000	421000	283400	90.3	4311	344	117	4772	1932
Nos. 740-769	264300	54000	61300	61200	440800	285270	90.3	4311	344	117	4772	1932

TENDER, TYPE 12 WHEEL

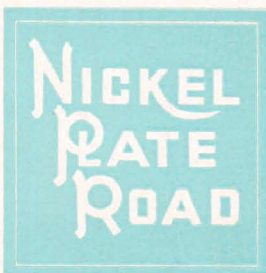
CAPACITY, WATER 22000 GALLONS

FUEL, 22 TONS





Service Record



In 1941 the Nickel Plate Road, to meet the increasing demands of its tremendous freight operations throughout the industrial Middle West, ordered from Lima fifteen 2-8-4 locomotives. Another order for ten of this same type was placed in 1942, and fifteen more were ordered early in 1943.

The performance of these locomotives was so satisfactory that an additional order for fifteen was placed later in 1943, giving the Nickel Plate a fleet of fifty-five of these modern Lima-built steam locomotives, capable of hauling its heavy trains at the high speeds necessary to meet present-day traffic requirements.

SPECIFICATIONS



Built for Boston & Maine R. R.

Class: 462-S-340 R. R. Class: P-4-b

Road No. 3715

5 Locos. ordered 1934, Nos. 3710-3714

5 Locos. ordered 1936, Nos. 3715-3719

GAUGE OF TRACK	DRIVING WHEEL DIAMETER	FUEL Kind	CYLINDERS Diameter Stroke	BOILER Diameter Pressure	FIREBOX Length Width
4'-8½"	80"	Soft Coal	23" 28"	75¾" 260 Lbs.	114½" 84"

WHEEL BASE			TRACTIVE POWER		FACTOR OF ADHESION	TUBES & FLUES		
Driving	Engine	Engine and Tender	Main Cylinders	With Booster		Number	Diameter	Length
14'-0"	36'-11"	77'-7"	40900	52800	5.12	203 40	2¼" 5½"	20'-0"

AVERAGE WEIGHT IN WORKING ORDER, Pounds					GRATE AREA Sq. Ft.	HEATING SURFACES, Square Feet				
On Drivers	Truck	Trailer	Total Engine	Tender ⅔ Load		Tubes	Flues	Firebox & Syphons	Total	Super-heater
209800	61500	68500	339800	195000	66.9	2380	1148	320	3848	966

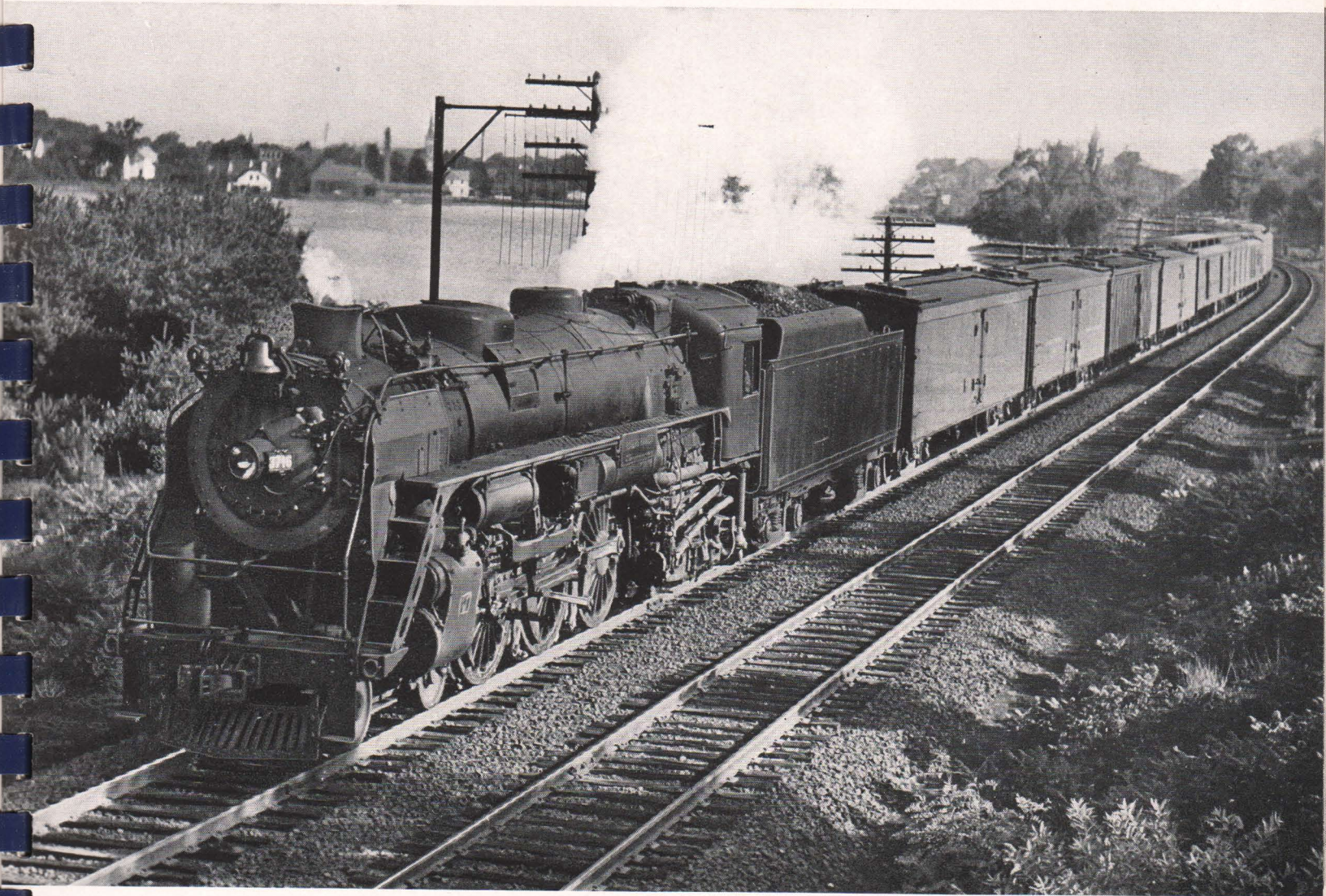
TENDER, TYPE 8 WHEEL

CAPACITY, WATER 12000 GALLONS

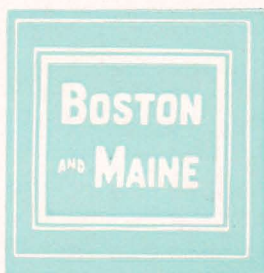
FUEL, 18 TONS

Equipped with THE LOCOMOTIVE BOOSTER





Service Record



Early in 1934 the management of the Boston and Maine, after a comprehensive study, decided that economy as well as efficiency could be better accomplished if new modern Pacific type locomotives were purchased to replace the old lighter Pacific type that were in use. On the basis of the conclusions reached, five heavy-type Pacific locomotives were purchased from the Lima Locomotive Works in 1934 and five more in 1937.

The records since these locomotives have been placed in service show that the savings estimated at the time the new Lima locomotives were purchased were conservative. Not only has the increased utilization of these units on the heavy passenger trains brought about greater savings than expected due to reductions in double-headers and second sections, but present indications are that there may be a greater saving in maintenance costs than those set up in the estimated savings. It has been further demonstrated that during the off-peak passenger business there has been a further opportunity to utilize these heavy Pacific locomotives in certain forms of freight train service, especially lightly loaded fast merchandise trains. Such diversified use has not only produced substantial savings in the form of fuel and maintenance as compared with the performance of the much heavier freight power, but has also increased availability of the heavier freight locomotives whenever relieved by the Pacifics.

SPECIFICATIONS



Built for The Kansas City Southern Ry. Co.

Class: 2104-S-509 R. R. Class: J

Road No. 900

Order Covers 10 Locos. 900-909

Nos. 900-904 are oil burning

Nos. 905-909 are coal burning

	GAUGE OF TRACK	DRIVING WHEEL DIAMETER	FUEL Kind	CYLINDERS		BOILER		FIREBOX	
				Diameter	Stroke	Diameter	Pressure	Length	Width
Oil	4'-8½"	70"	Oil	27"	34"	92"	310 Lbs.	150"	102½"
Coal	4'-8½"	70"	Soft Coal	27"	34"	92"	310 Lbs.	150"	102½"

	WHEEL BASE			TRACTION POWER	FACTOR OF ADHESION	TUBES & FLUES		
	Driving	Engine	Engine and Tender	Main Cylinders		Number	Diameter	Length
Oil	24'-4"	48'-8"	98'-5"	93300	3.75	73 183	2¼" 3¾"	21'-0"
Coal	24'-4"	48'-8"	98'-5"	93300	3.79	73 183	2¼" 3¾"	21'-0"

AVERAGE WEIGHT IN WORKING ORDER, Pounds							GRATE AREA Sq. Ft.	HEATING SURFACES, Square Feet				
			Trailer					Tubes & Flues	Firebox & Comb. Cham.	Arch Tubes	Total	Super- heater
	On Drivers	Truck	Front Axle	Rear Axle	Total Engine	Tender 2/3 Load						
Oil	350000	50600	53200	55200	509000	278480	107	4654	446	54	5154	2075
Coal	353300	51500	53600	55600	514000	285590	107	4654	446	54	5154	2075

Oil	TENDER, TYPE 12 WHEEL	CAPACITY, WATER 21000 GALLONS	FUEL, 4500 GALS.
Coal	TENDER, TYPE 12 WHEEL	CAPACITY, WATER 20700 GALLONS	FUEL, 25 TONS





Service Record

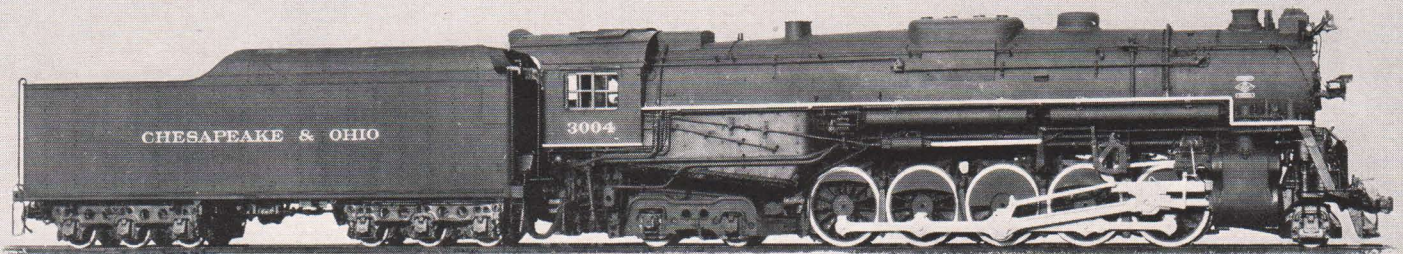


In 1937 the Kansas City Southern placed in fast freight service ten 2-10-4 locomotives, replacing mallet power on the heavier trains and two lighter locomotives on the fast through freight trains. The use of these locomotives to replace the heavier, mallet type of locomotives, as well as the lighter type of freight locomotive, is a graphic example of the diversified uses of the modern super-power steam locomotive. It is

this high availability of super-power locomotives coupled with low maintenance and high speeds that has prompted leading railroads throughout the country to replace heavy or light locomotives with all service super-power steam engines.

These locomotives are in daily service between Kansas City, Mo., and De Queen, Ark., and have given excellent performance from the standpoint of meeting the fast schedules with good train load and, at the same time, producing economy in fuel consumption as well as in maintenance.

SPECIFICATIONS



Built for Chesapeake & Ohio Ry. Co.

Class: 2104-S-566 R. R. Class: T-1

Road No. 3004

Order Covers 40 Locos. 3000-3039

GAUGE OF TRACK	DRIVING WHEEL DIAMETER	FUEL Kind	CYLINDERS		BOILER		FIREBOX	
			Diameter	Stroke	Diameter	Pressure	Length	Width
4'-8½"	69"	Soft Coal	29"	34"	99¾"	260 Lbs.	162"	108¼"

Driving	WHEEL BASE		Main Cylinders	With Booster	FACTOR OF ADHESION	TUBES & FLUES		
	Engine	Engine and Tender				Number	Diameter	Length
24'-4"	49'-3"	99'-5¾"	91584	106584	4.07	59 275	2¼" 3½"	21'-0"

AVERAGE WEIGHT IN WORKING ORDER, Pounds					GRATE AREA Sq. Ft.	HEATING SURFACES, Square Feet					
On Drivers	Truck	Trailer		Total Engine		Tender ⅓ Load	Tubes & Flues	Firebox & Comb. Cham.	Syphons	Total	Super- heater
373000	61000	66000	66000	566000	330670	121.7	5990	477	168	6635	3030

TENDER, TYPE 12 WHEEL

CAPACITY, WATER 23500 GALLONS

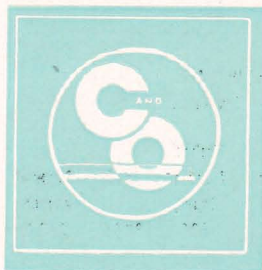
FUEL, 30 TONS

Equipped with THE LOCOMOTIVE BOOSTER



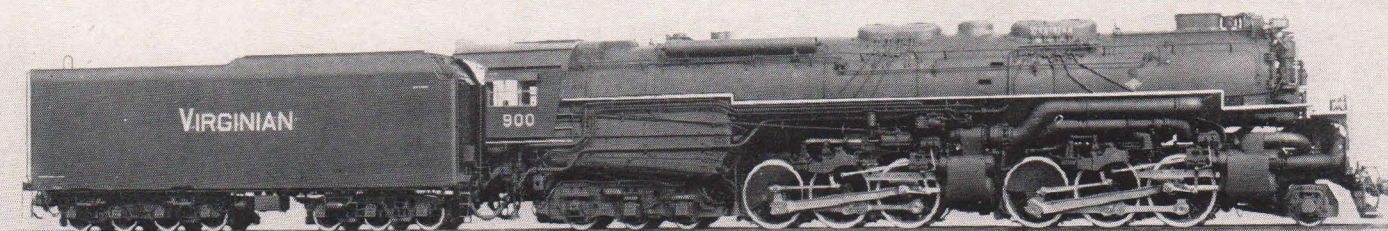


Service Record



Forty of these 2-10-4 type locomotives (Class T-1) are in operation on the Chesapeake & Ohio and are being used in heavy freight service between Russell, Kentucky, and Toledo, Ohio. These locomotives regularly handle trains of 160 loaded coal cars with a tonnage of 12,000 or over.

SPECIFICATIONS



Built for The Virginian Railway Co.

Class: 2-6-6-6-S-753 R. R. Class: AG Road No. 900
8 Locos. ordered 1944, Nos. 900-907

GAUGE OF TRACK	DRIVING WHEEL DIAMETER	FUEL Kind	CYLINDERS		BOILER		FIREBOX	
			Diameter	Stroke	O.D. Front	Pressure	Length	Width
4'-8 $\frac{1}{2}$ "	67"	Soft Coal	22 $\frac{1}{2}$ "	33"	100 $\frac{9}{16}$ "	260 Lbs.	180"	108 $\frac{1}{4}$ "

Driving	WHEEL BASE		MAXIMUM TRACTIVE POWER	FACTOR OF ADHESION	TUBES & FLUES		
	Engine	Engine and Tender			Number	Diameter	Length
34'-8"	62'-6"	112'-11"	110200	4.49	58 219	2 $\frac{1}{4}$ " 4"	23'-0"

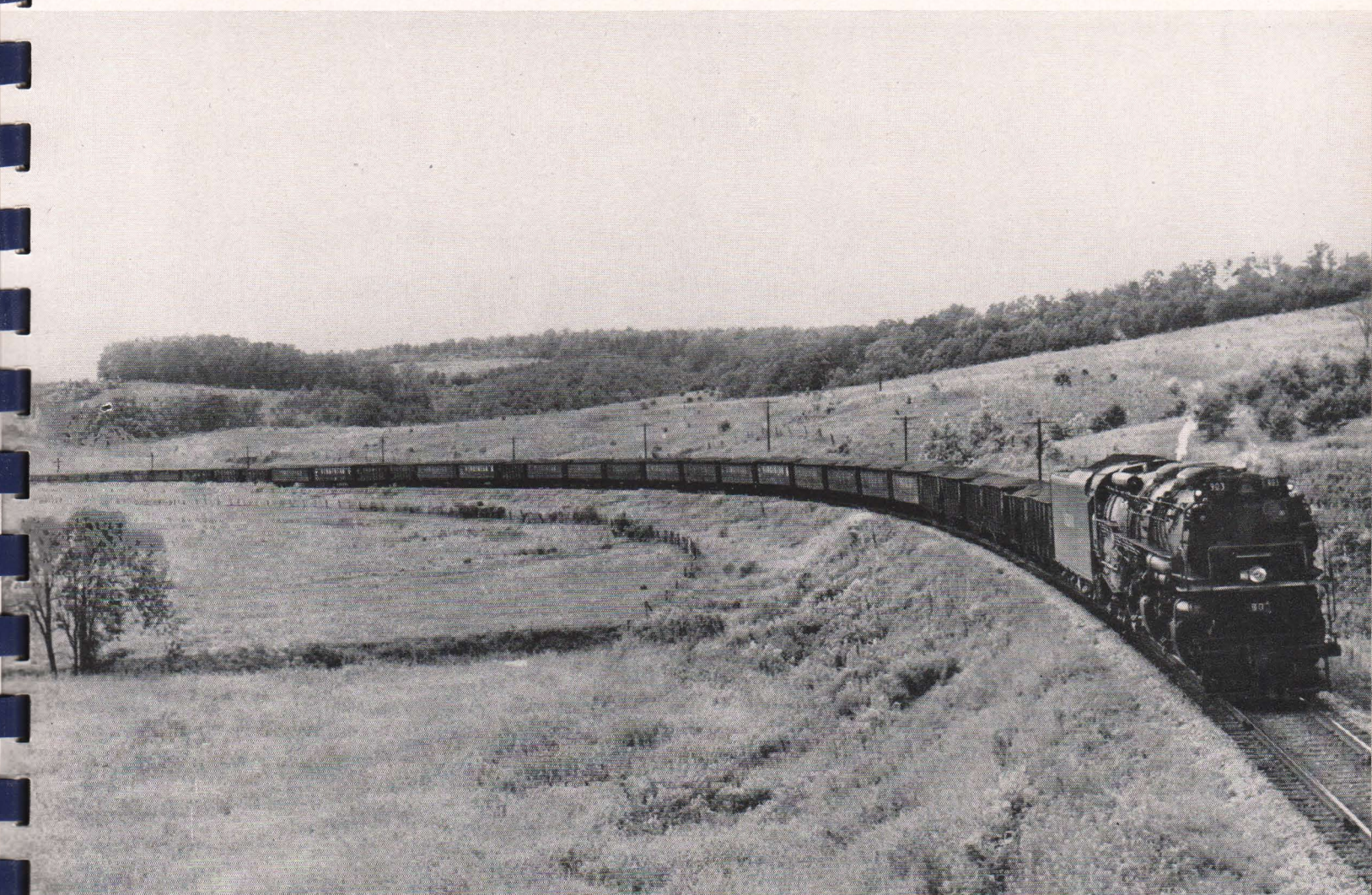
AVERAGE WEIGHT IN WORKING ORDER, Pounds					GRATE AREA, Sq. Ft.	HEATING SURFACES Square Feet				
On Drivers	Truck	Trailer	Total Engine	Tender $\frac{3}{4}$ Load		Tubes & Flues	Syphons	Firebox & Comb. Cham.	Total	Super-heater
495000	67500	190500	753000	351500	135.3	6033	162	600	6795	2922

TENDER, TYPE 14 WHEEL

CAPACITY WATER 26500 GALLONS

FUEL, 25 TONS



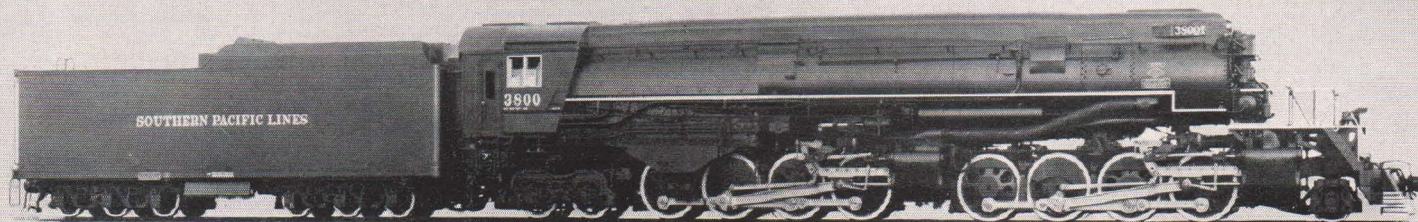


Service Record

VIRGINIAN

For more efficient handling of its heavy coal traffic from mines in West Virginia to seaboard at Norfolk, The Virginian Railway Company in 1945 placed in service a fleet of eight Lima-built four-cylinder, six-coupled, articulated steam locomotives. These powerful 2-6-6-6 locomotives are capable of handling heavy freight trains, over mountain grades, at sustained high speeds

SPECIFICATIONS



Built for Southern Pacific Lines

Class: 2-8-4-S-689.9 R. R. Class: AC-9 Road No. 3800

Order Covers 12 Locos. 3800-3811

GAUGE OF TRACK	DRIVING WHEEL DIAMETER	FUEL Kind	CYLINDERS Diameter	Stroke	BOILER Diameter	Pressure	FIREBOX Length	Width
4'-8 $\frac{1}{2}$ "	63 $\frac{1}{2}$ "	Soft Coal	24"	32"	109 $\frac{1}{8}$ "	250 Lbs.	205 $\frac{21}{32}$ "	102 $\frac{1}{4}$ "

Driving	WHEEL BASE Engine	Engine and Tender	TRACTIVE POWER Main Cylinders	FACTOR OF ADHESION	TUBES & FLUES Number	Diameter	Length
44'-7"	66'-3"	112'-11 $\frac{7}{8}$ "	124300	4.27	86 260	2 $\frac{1}{4}$ " 3 $\frac{1}{2}$ "	22'-0"

AVERAGE WEIGHT IN WORKING ORDER, Pounds						GRATE AREA Sq. Ft.	HEATING SURFACES, Square Feet			
Trailer						Tubes & Flues	Firebox			Super-heater
On Drivers	Truck	Front Axle	Rear Axle	Total Engine	Tender $\frac{2}{3}$ Load		Circu-lators	& Comb. Cham.	Total	
531200	48300	48900	61500	689900	320700	139.3	6329	124	465 6918	2831

TENDER, TYPE 12 WHEEL

CAPACITY, WATER 22120 GALLONS

FUEL, 28 TONS





Service Record



The mallet locomotive has made remarkable strides in the past few years. Heretofore, this type of locomotive was used for the sole purpose of hauling long, slow freights. Since this type of locomotive has been modernized, however, it has proved itself to be highly successful on high-speed, fast freight runs and on high-speed passenger runs where the terrain demands

locomotives high in hauling capacity to meet the requirements of the ruling grades. In the latter part of 1939, Lima Locomotive Works delivered twelve of these 2-8-8-4 type super-power steam locomotives to the Southern Pacific Company. These locomotives are being used successfully on high-speed freight and passenger services in mountainous territory and have proved themselves to be the economical answer to the problem of hauling heavy loads at high speeds.

SPECIFICATIONS



Built for Chesapeake & Ohio Ry. Co.

Class: 2-6-6-S-725 R. R. Class: H-8 Road No. 1633

10 Locos. ordered 1940, Nos. 1600-1609 10 Locos. ordered 1941, Nos. 1610-1619
10 Locos. ordered 1943, Nos. 1620-1629 15 Locos. ordered 1944, Nos. 1630-1644

GAUGE OF TRACK	DRIVING WHEEL DIAMETER	FUEL Kind	CYLINDERS Diameter	Stroke	BOILER Diameter	Pressure	FIREBOX Length	Width
4'-8 $\frac{1}{2}$ "	67"	Soft Coal	22 $\frac{1}{2}$ "	33"	109"	260 Lbs.	180"	108 $\frac{1}{8}$ "

Driving	WHEEL BASE Engine	Engine and Tender	MAXIMUM TRACTIVE POWER	FACTOR OF ADHESION	TUBES & FLUES Number	Diameter	Length
34'-8"	62'-6"	112'-11"	110200	4.27	48 278	2 $\frac{1}{4}$ " 3 $\frac{1}{2}$ "	23'-0"

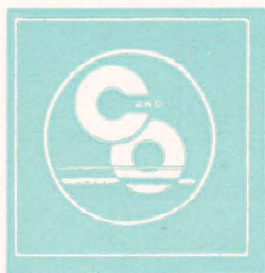
AVERAGE WEIGHT IN WORKING ORDER, Pounds					GRATE AREA Sq. Ft.	HEATING SURFACES, Square Feet				
On Drivers	Truck	Trailer	Total Engine	Tender $\frac{2}{3}$ Load		Tubes & Flues	Syphons	Firebox & Comb. Cham.	Total	Super-heater
471000	64500	189000	724500	341600	135.2	6478	162	600	7240	3186

TENDER, TYPE 14 WHEEL

CAPACITY, WATER 25000 GALLONS

FUEL, 25 TONS



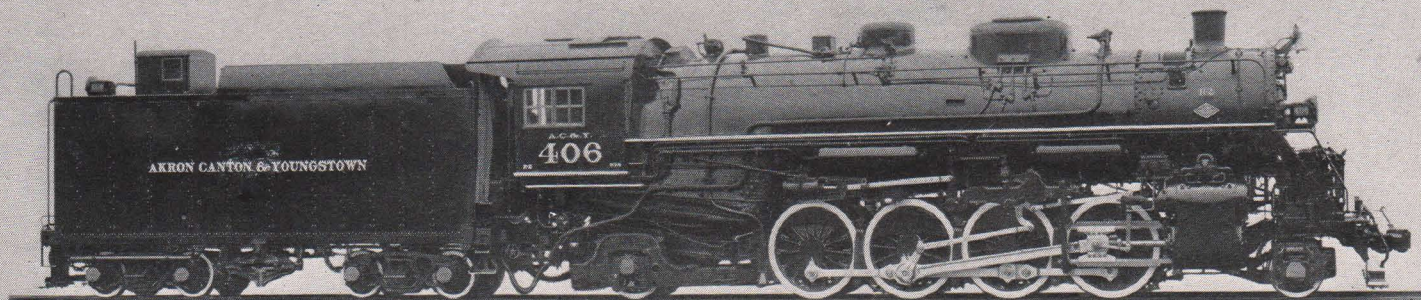


Service Record

During 1941, ten of these locomotives, which are the first design of the 2-6-6-6 wheel arrangement and the most powerful four-cylinder, six-coupled articulated locomotives ever built, were delivered to the Chesapeake & Ohio Railroad. Designed specifically for operation over the Allegheny

Mountains where the line reaches an elevation of 2,072 ft. above sea level and grades are in excess of 1.14 per cent, with curves of 6 deg., these locomotives are being used to supplement the Chesapeake & Ohio's class T-1 2-10-4 type locomotives now in operation between Russell, Ky., and Toledo, Ohio. These "Allegheny" locomotives proved so successful in this tough mountain service that the Chesapeake & Ohio ordered 10 more of duplicate design in 1941, another 10 in 1943, and an additional 15 in 1944.

SPECIFICATIONS



Built for Akron, Canton & Youngstown Ry. Co.

Class: 2-8-2-S-327 R. R. Class: R-2

Road No. 406

2 Locos. ordered 1940, Nos. 404-405

1 Loco. ordered 1944, No. 406

GAUGE OF TRACK	DRIVING WHEEL DIAMETER	FUEL Kind	CYLINDERS Diameter	Stroke	BOILER Diameter	Pressure	FIREBOX Length	Width
4'-8½"	64"	Soft Coal	26"	30"	78" O.D.	200 Lbs.	114⅛"	84¼"

Driving	WHEEL BASE Engine	Engine and Tender	MAXIMUM TRACTIVE POWER	FACTOR OF ADHESION	TUBES & FLUES Number	Diameter	Length
16'-9"	37'-4"	71'-6¾"	53800	4.23	190	2¼"	18'-0"
					45	5½"	

	AVERAGE WEIGHT IN WORKING ORDER, Pounds					GRATE AREA, Sq. Ft.	HEATING SURFACES, Square Feet				
	On Drivers	Truck	Trailer	Total Engine	Tender ⅔ Load		Tubes & Flues	Arch Syphons	Firebox & Comb. Cham.	Total	Super-heater
Nos. 404, 405	227500	35800	56400	319700	176733	66.7	3164	85	258	3507	972
No. 406	233100	36800	57400	327300	177430	66.7	3164	85	258	3507	1246

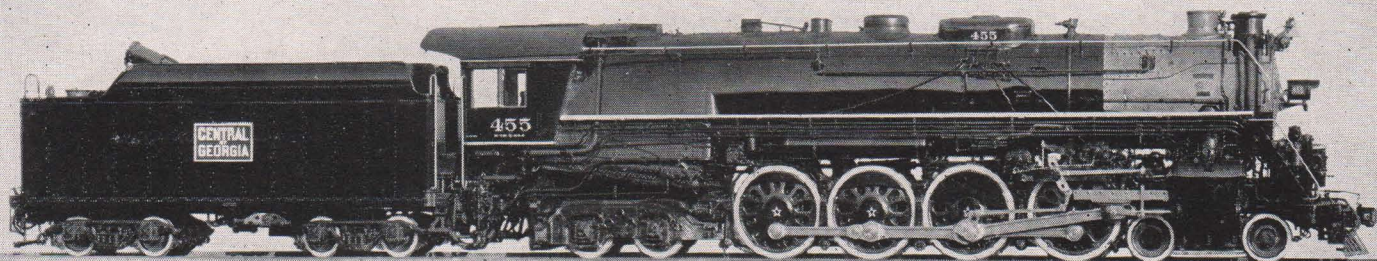
TENDER, TYPE 8 WHEEL

CAPACITY, WATER 12400 GALLONS

FUEL, 16 TONS



SPECIFICATIONS



Built for Central of Georgia Railway Co.

Class 4-8-4-S-447 R. R. Class: K Road No. 455
8 Locos. ordered 1942, Nos. 451-458

GAUGE OF TRACK	DRIVING WHEEL DIAMETER	FUEL Kind	CYLINDERS		BOILER		FIREBOX	
			Diameter	Stroke	Diameter	Pressure	Length	Width
4'-8 $\frac{1}{2}$ "	73 $\frac{1}{2}$ "	Soft Coal	27"	30"	86"	250 Lbs.	127 $\frac{1}{16}$ "	102 $\frac{1}{4}$ "

Driving	WHEEL BASE	Engine and Tender	TRACTIVE POWER	FACTOR OF ADHESION	TUBES & FLUES		
	Engine		Main Cylinders		Number	Diameter	Length
20'-0"	45'-10"	83'-6"	63200	4.11	56 159	2 $\frac{1}{4}$ " 4"	21'-6"

AVERAGE WEIGHT IN WORKING ORDER, Pounds						GRATE AREA	HEATING SURFACES, Square Feet				
On Drivers	Truck	Front Axle	Rear Axle	Total Engine	Tender $\frac{2}{3}$ Load	Sq. Ft.	Tubes & Flues	Arch Tubes & Syphons	Firebox & Comb. Cham.	Total	Super-heater
260000	78900	54200	54100	447200	196500	90.2	4270	85	350	4705	2059

TENDER, TYPE 8 WHEEL

CAPACITY, WATER 13000 GALLONS

FUEL, 21 TONS



SPECIFICATIONS



Built for Western Maryland Railway Co.

Class: 150-3 Shay Geared Road No. 6

1 Loco. ordered 1944, No. 6

GAUGE OF TRACK	DRIVING WHEEL DIAMETER	FUEL Kind	CYLINDERS No.	Diameter	Stroke	BOILER O.D. Front	Pressure	FIREBOX Length	Width
4'-8 $\frac{1}{2}$ "	48"	Soft Coal	3	17"	18"	62 $\frac{3}{8}$ "	200 Lbs.	114"	61 $\frac{1}{4}$ "

Truck	WHEEL BASE Engine	Engine and Tender	MAXIMUM TRACTION POWER	FACTOR OF ADHESION	TUBES AND FLUES Number	Diameter	Length
5'-8"	35'-2"	49'-0"	59740	5.42	156 28	2" 5 $\frac{3}{8}$ "	13'-6"

AVERAGE WEIGHT IN WORKING ORDER, Pounds		GRATE AREA Sq. Ft.	HEATING SURFACES, Square Feet			
On Drivers	Total Engine		Tubes & Flues	Firebox & Arch Tubes	Total	Super- heater
324000	324000	48.5	1623	226	1849	429

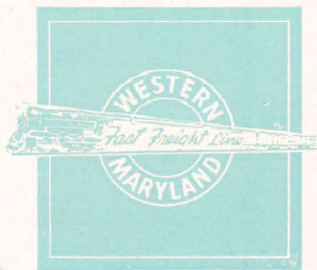
CAPACITY, WATER 6000 GALLONS

FUEL, 9 TONS





Service Record



For use on heavy grades and switchbacks in mountainous mining regions, the Western Maryland Railway placed this Class 150-3 truck Shay geared locomotive in service in 1945, to supplement similar motive power already in operation.

In addition to its ability to handle heavy loads up steep grades — operating on some as steep as 10 per cent—this Shay holds loads on down grades because of its gear drive. It is designed to take any curve on which standard cars can be operated. It is also particularly efficient as a switching locomotive, due to the rapidity with which it can accelerate with a load and its ability to spot cars in minimum time.

An important feature in its construction is that the piston valve cylinders are mounted independently of the boiler, being supported on heavy girder frames.

SPECIFICATIONS

Built for

United States War Department

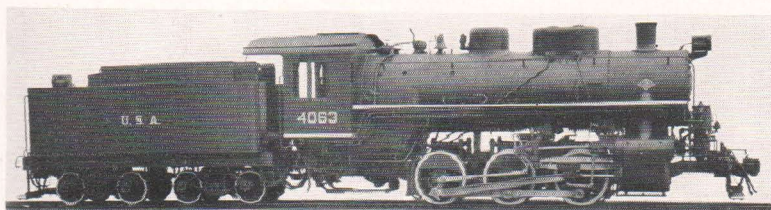
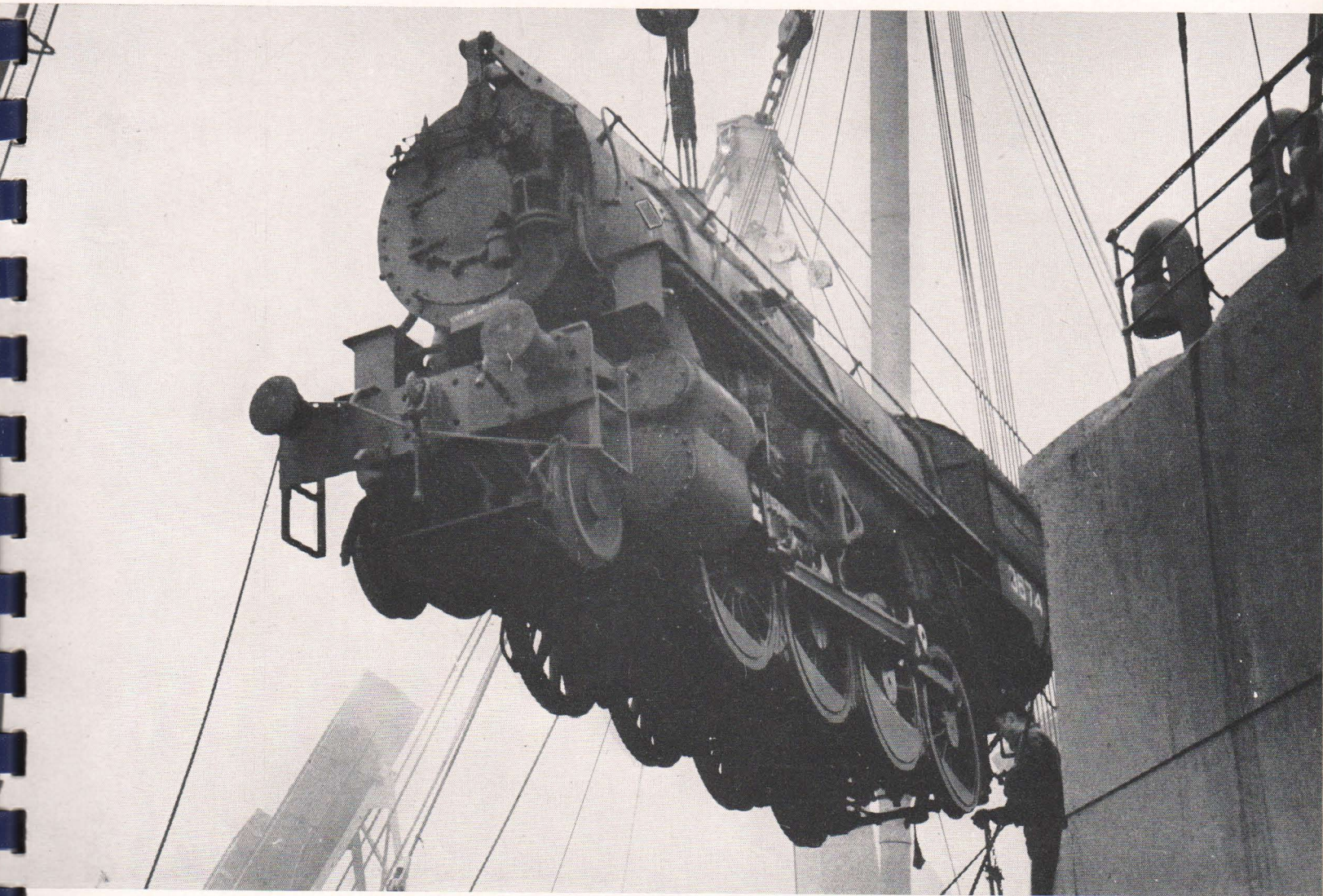
	GAUGE OF TRACK	DRIVING WHEEL DIAMETER	FUEL Kind	CYLINDERS Diameter	Stroke	BOILER Diameter	Pressure	FIREBOX Length	Width
Type 0-6-0	4'-8 $\frac{1}{2}$ "	50"	Soft Coal	21"	28"	67"	190 Lbs.	72 $\frac{1}{8}$ "	66 $\frac{1}{4}$ "
Type 2-8-0	4'-8 $\frac{1}{2}$ "	57"	Soft Coal	19"	26"	68 $\frac{3}{4}$ "	225 Lbs.	84 $\frac{1}{8}$ "	70 $\frac{1}{4}$ "
Type 2-8-0	4'-8 $\frac{1}{2}$ "	50"	Soft Coal	21"	26"	70"	210 Lbs.	88 $\frac{1}{8}$ "	70 $\frac{1}{4}$ "
Type 2-8-2	4'-8 $\frac{1}{2}$ "	60"	Oil	21"	28"	68"	200 Lbs.	102 $\frac{1}{8}$ "	66 $\frac{1}{4}$ "

	WHEEL BASE			MAXIMUM TRACTIVE POWER	FACTOR OF ADHESION	TUBES & FLUES		
	Driving	Engine	Engine and Tender			Number	Diameter	Length
Type 0-6-0	11'-0"	11'-0"	43'-0 $\frac{1}{2}$ "	40000	3.93	291	2"	15'-0"
Type 2-8-0	15'-6"	23'-3"	51'-7 $\frac{3}{4}$ "	31500	4.45	150	2"	13'-6"
						30	5 $\frac{3}{8}$ "	
Type 2-8-0	14'-6"	23'-1"	56'-8 $\frac{7}{8}$ "	37100	4.32	173	2"	13'-6"
						30	5 $\frac{3}{8}$ "	
Type 2-8-2	15'-9"	32'-9"	58'-6"	35000	4.11	137	2"	17'-6"
						30	5 $\frac{3}{8}$ "	

	AVERAGE WEIGHT IN WORKING ORDER, Pounds					GRATE AREA Sq. Ft.	HEATING SURFACES, Square Feet				
	On Drivers	Truck	Trailer	Total Engine	Tender Loaded		Tubes & Flues	Flues	Firebox	Arch Tubes	Super- heater
Type 0-6-0	157300			157300	108560	33.1	2273		122	13	2408
Type 2-8-0	140000	21000		161000	115500	41.0	1622		128	15	1765
					($\frac{2}{3}$ Load)						471
Type 2-8-0	160500	19500		180000	100000	43	1781		138	18	1937
					(Loaded)						467
Type 2-8-2	144000	19500	36500	200000	131000	47	1250	735	162		2147
											623

Type 0-6-0	TENDER, TYPE 8 WHEEL	CAPACITY, WATER 6000 GALLONS	FUEL, 9 TONS
Type 2-8-0	TENDER, TYPE 8 WHEEL	CAPACITY, WATER 6500 GALLONS	FUEL, 10 TONS
Type 2-8-0	TENDER, TYPE 8 WHEEL	CAPACITY, WATER 6500 GALLONS	FUEL, 10 TONS
Type 2-8-2	TENDER, TYPE 8 WHEEL	CAPACITY, WATER 6500 GALLONS	FUEL, 2500 GALS.





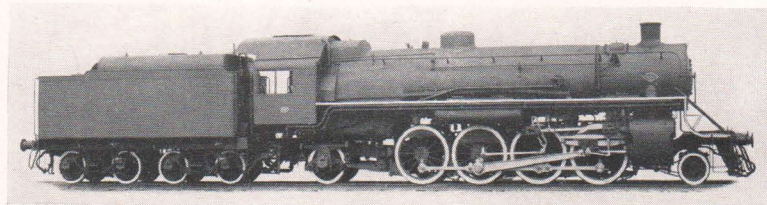
Type 0-6-0



Type 2-8-0



Type 2-8-0



Type 2-8-2

SPECIFICATIONS



Built for Société Nationale des Chemins de Fer Français

Class: 2-8-2-S-250 R.R. Class: R Road No. 141-R-1

180 Locos. ordered 1945, Nos. 141-R-1—141-R-180

80 Locos. ordered 1945, Nos. 141-R-1021—141-R-1100

20 Locos. ordered 1945, Nos. 141-R-1101—141-R-1120

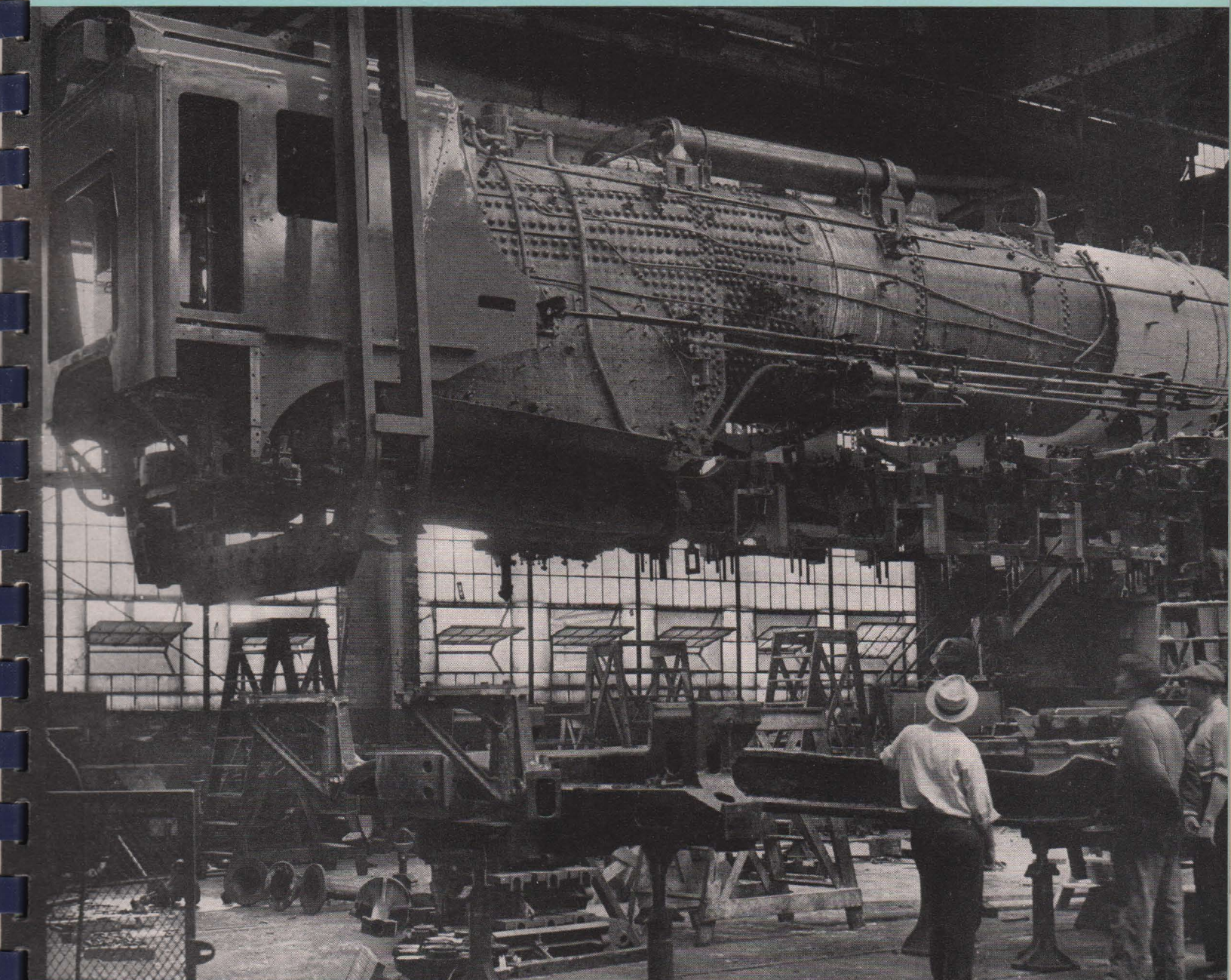
GAUGE OF TRACK		DRIVING WHEEL DIAMETER		FUEL Kind	CYLINDERS		BOILER		FIREBOX	
					Diameter	Stroke	Diameter	Pressure	Length	Width
4'-8½"		65"		Soft Coal	23½"	28"	73½"	220 Lbs.	102⅛"	78¼"

Driving		WHEEL BASE		TRACTIVE POWER		FACTOR OF ADHESION	TUBES AND FLUES		Length	
		Engine	Engine and Tender				Number	Diameter		
17'-0"		35'-8"	66'-8"	44500		3.96	175 36	2" 5⅜"	17'-0"	

AVERAGE WEIGHT IN WORKING ORDER, Pounds					GRATE AREA	HEATING SURFACES, Square Feet				
On Drivers	Truck	Trailer	Total Engine	Tender Loaded	Sq. Ft.	Tubes & Flues	Firebox & Comb. Cham.	Syphons	Total	Super-heater
176379	34052	39569	250000	160000	55.5	2405	231	63	2699	704

TENDER, TYPE 8 WHEEL			CAPACITY, WATER 8070 GALLONS			FUEL 12.62 TONS		
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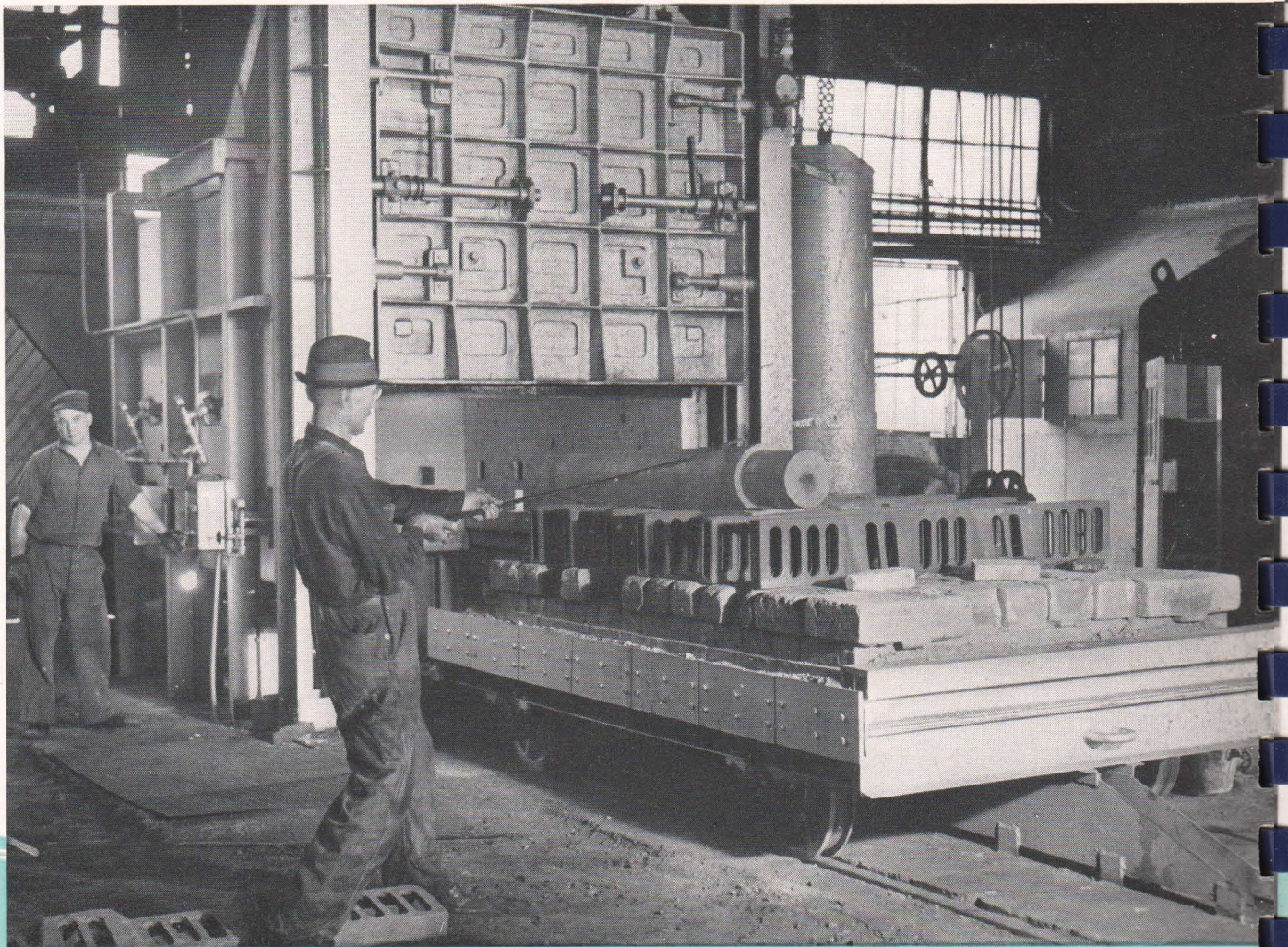


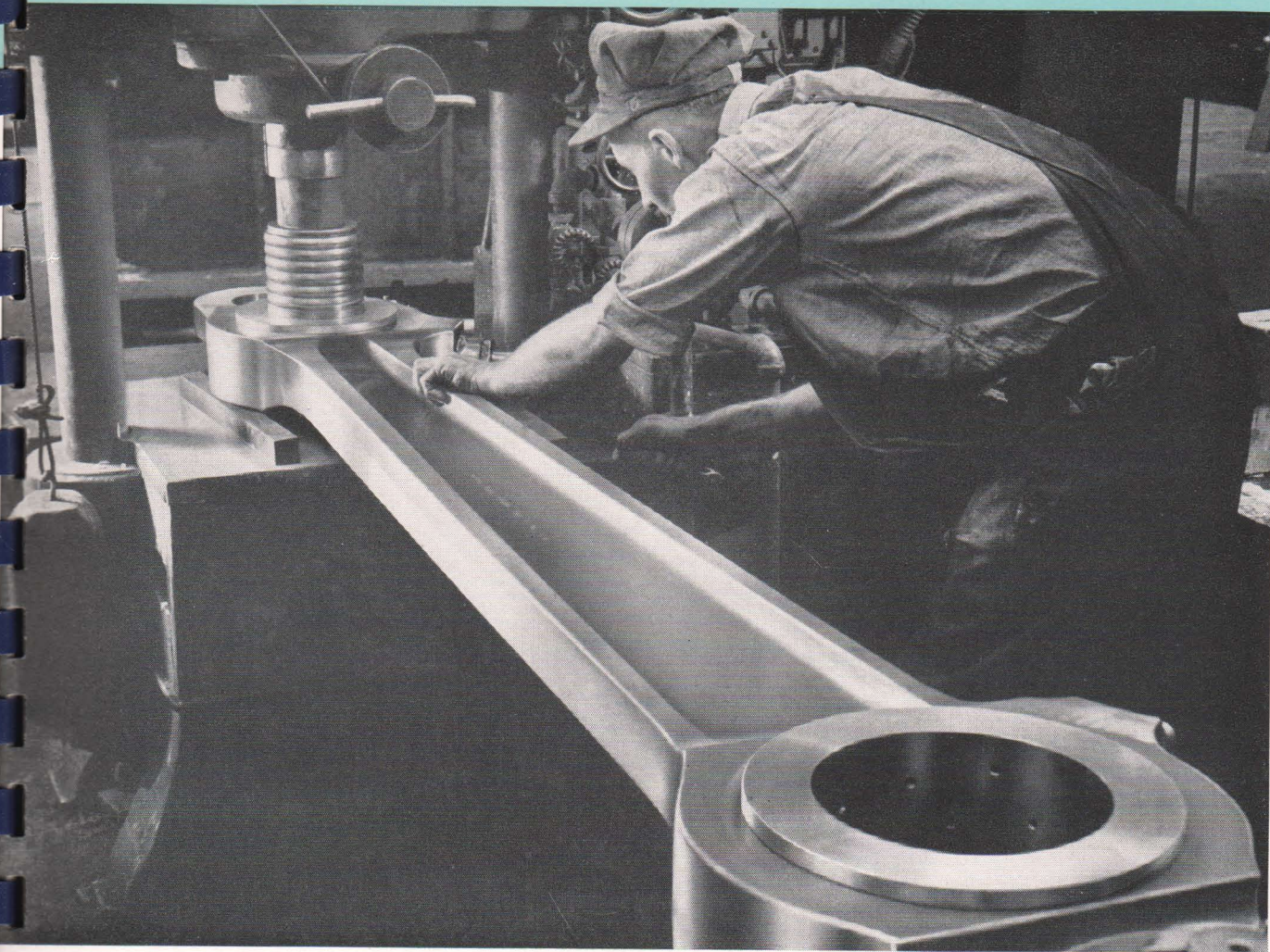
BEHIND THE SCENES AT LIMA

ON THE following pages are reproduced some typical photographs "behind the scenes." These photographs illustrate some of the outstanding methods and machinery that go into the making of Lima-built, super-power steam locomotives. Thanks to these methods and machinery that have made Lima famous for quality, Lima locomotives are low in maintenance and high in availability. Through their dependability and economy of maintenance, Lima-built locomotives have made . . . and are making . . . a second-to-none reputation.

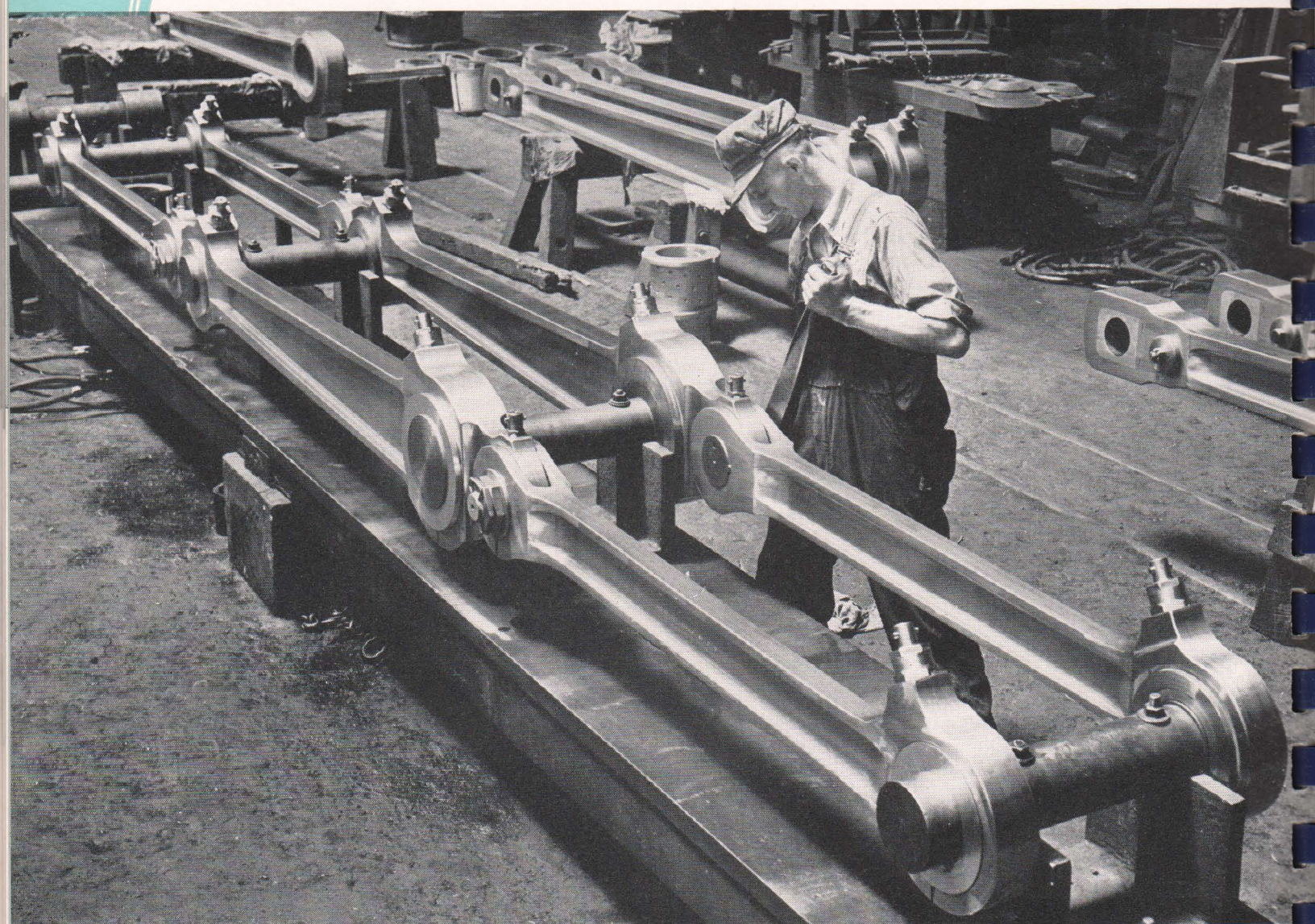
ALL FORGINGS are heat-treated and our modern furnace equipment provides uniform heating of the part to be treated while automatic pyrometric control insures the precise temperature needed for heat-treating any analysis of steel.

Lima's heat-treating facilities bring out the best in alloy steels.





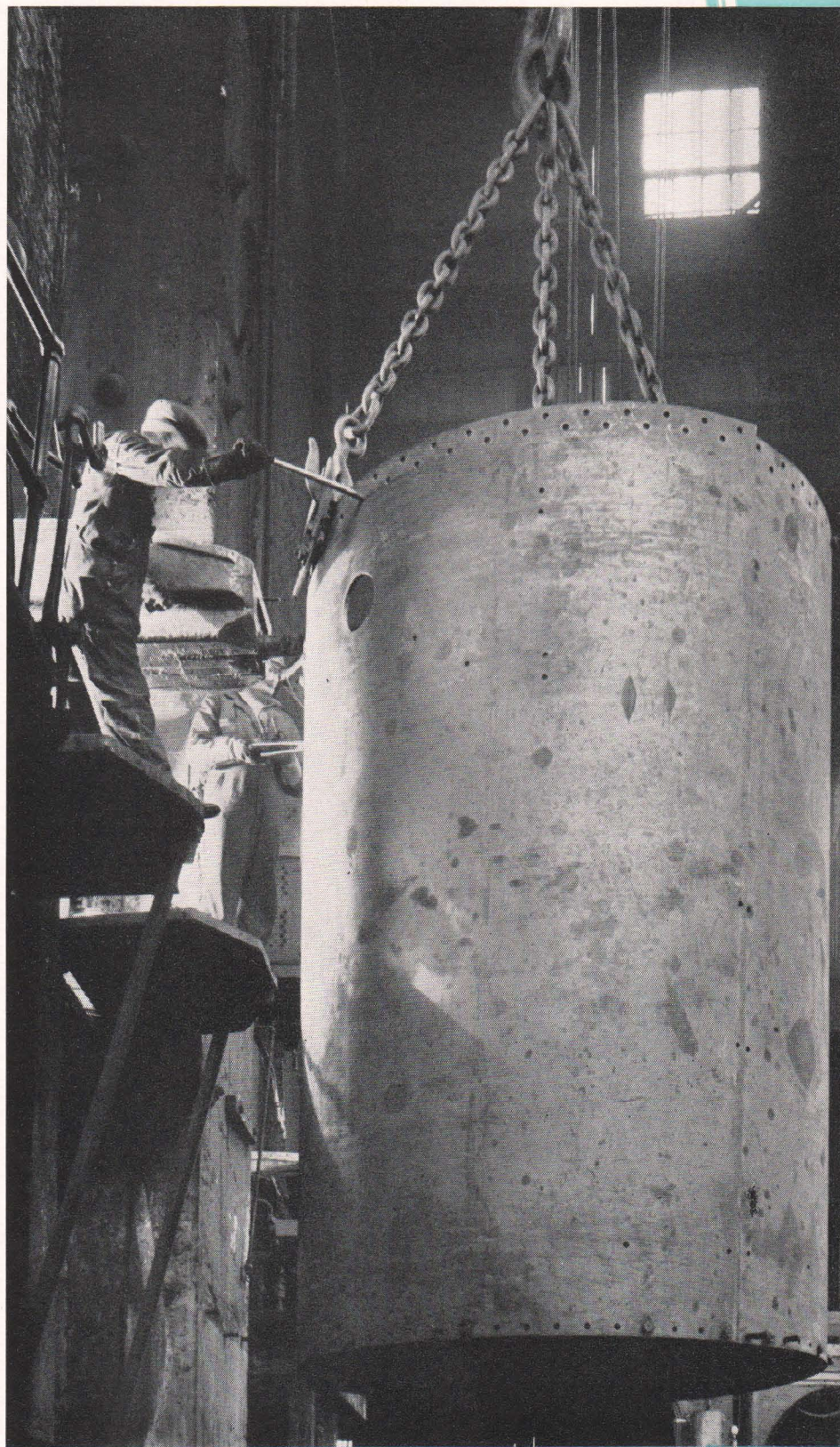
LIMA'S reputation as a builder of locomotives of high operating efficiency and low maintenance cost is based upon the extra care that goes into the manufacture of each Lima-built engine. This results from the special methods and equipment employed by Lima with a view to lowering maintenance costs. An example is the pressing operation illustrated above whereby the rod bushings are burnished to a high finish to provide perfect wearing surfaces and longer lasting bearings.

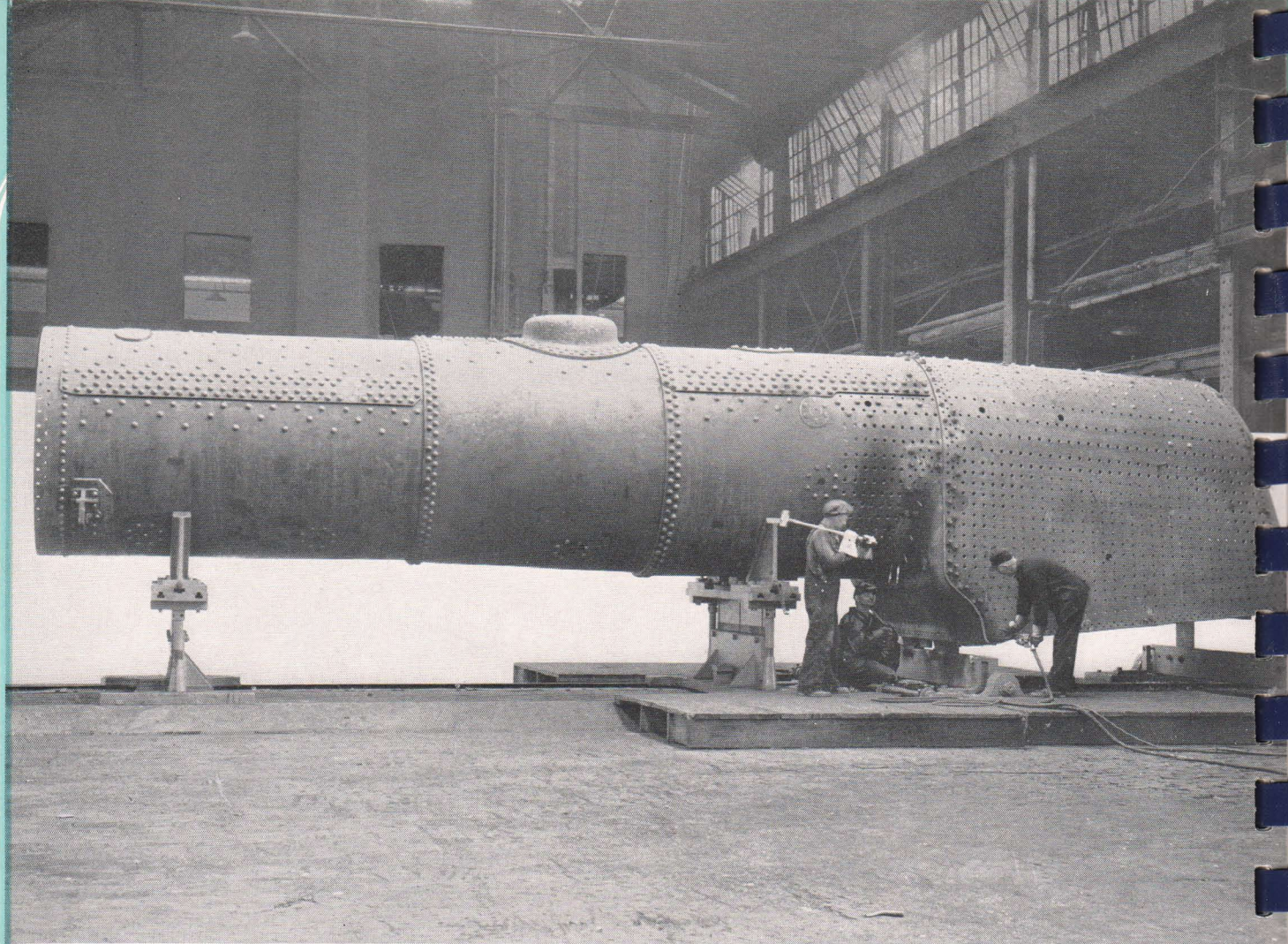


SATISFACTORY locomotives must conserve maintenance as well as produce ton-miles. Typical of the care and accuracy with which Lima power is constructed, is the rod assembly jig illustrated above. The machined rods must fit on these jigs thus insuring interchangeability and avoiding the necessity of adjustment when the rods are applied to locomotives. This care in rod manufacture is one of the reasons why Lima-built locomotives "break-in" easily.

GUESSWORK is eliminated when riveting boilers at Lima. Every rivet that goes into a boiler has a grave responsibility and, for that reason, the riveting pressure at the Lima Locomotive Works is carefully and accurately controlled.

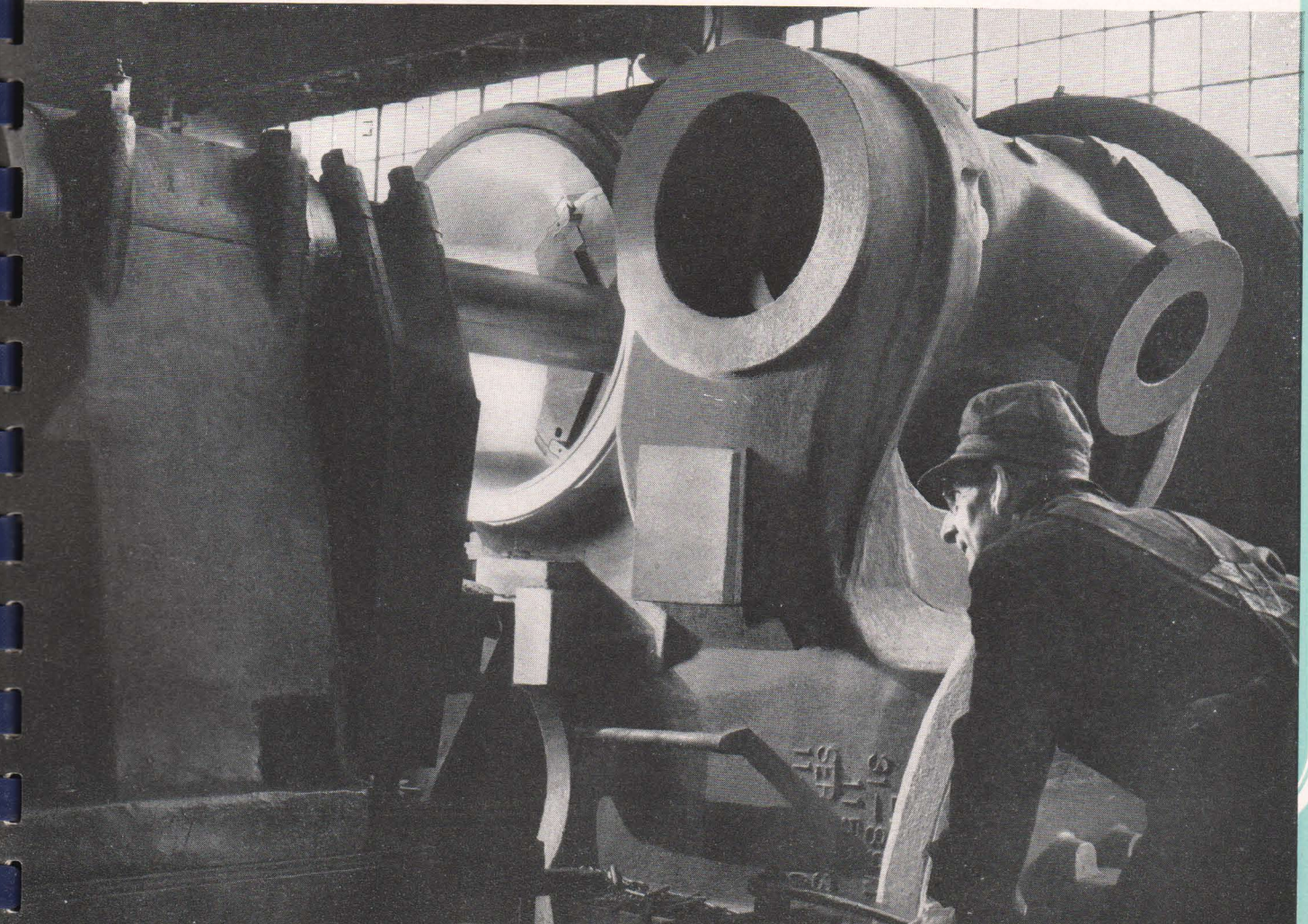
Here is a "behind-the-scenes" view of the Lima bull-riveter. There is no guessing here as to whether the riveting pressure has done its job. Electric controls are automatically set to provide the proper riveting time and pressure which vary with the thickness of the plate and the size of the rivet.

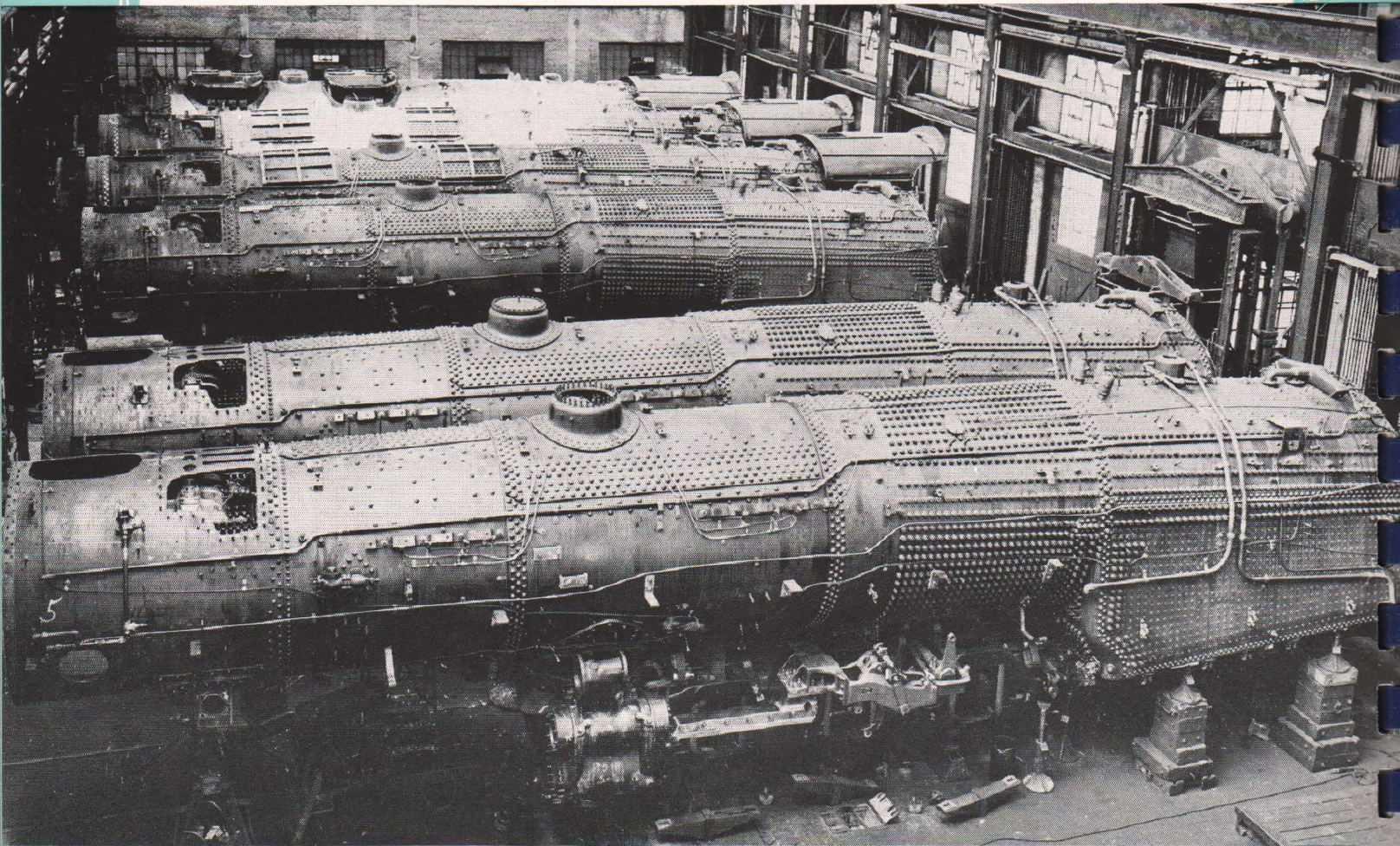




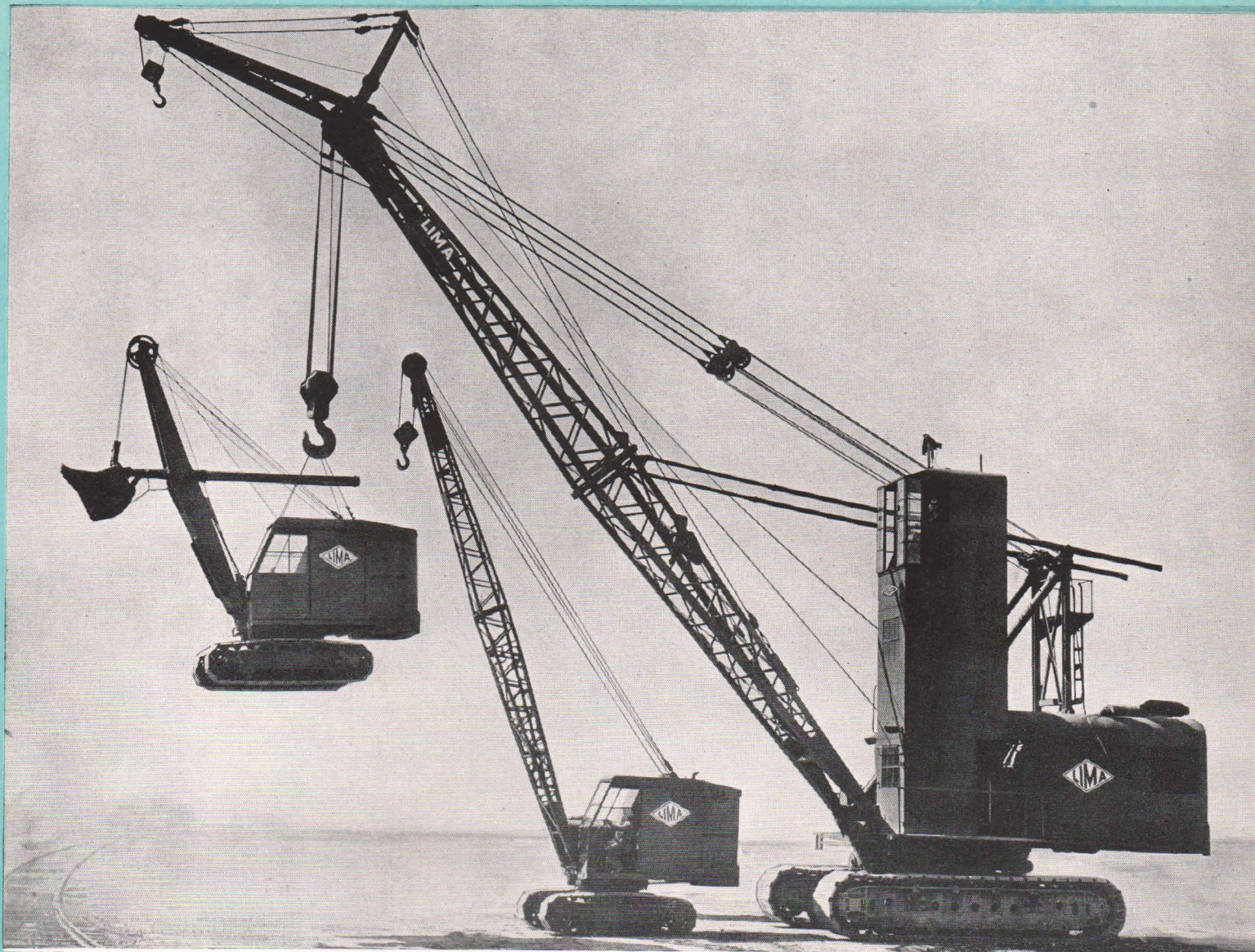
TYPICAL of the special machinery used in building "low maintenance" locomotives is the boiler jig illustrated above. Here, perfect alignment between boiler shell and back end is assured. It is through such methods as this that Lima has earned a reputation as a builder of low-maintenance steam power.

THE INSIDE of a Lima cylinder will never be seen by the public . . . yet no other part will have a higher finish. The public looks at the outside of a locomotive and is satisfied if appearances are pleasing, but you can't fool steam. That is why all working parts of Lima locomotives are built with such careful adherence to exact dimensions and specifications. Lima builds power that not only looks good outside, but looks even better inside . . . where it counts.





HIGH speed and high power are making ever-increasing demands on the locomotive . . . Closer tolerances and greater strength of parts are fundamental to low maintenance and dependability . . . Hence the importance to the railroads of the builder's facilities and reputation for a sound product . . . Such a reputation Lima has long enjoyed.



HERE is equipment modern as a streamlined locomotive and built to the same standards of "Lima Quality."

In the same shops where Lima has established its outstanding reputation as a Locomotive Builder, skilled workmen, using high-quality materials, build power shovels, cranes and draglines to the same "Lima Quality" standards. LIMA shovels range in capacity from three-quarter cubic yard to five and one-half cubic yards. Crane capacities range from 12 tons to 100 tons.

