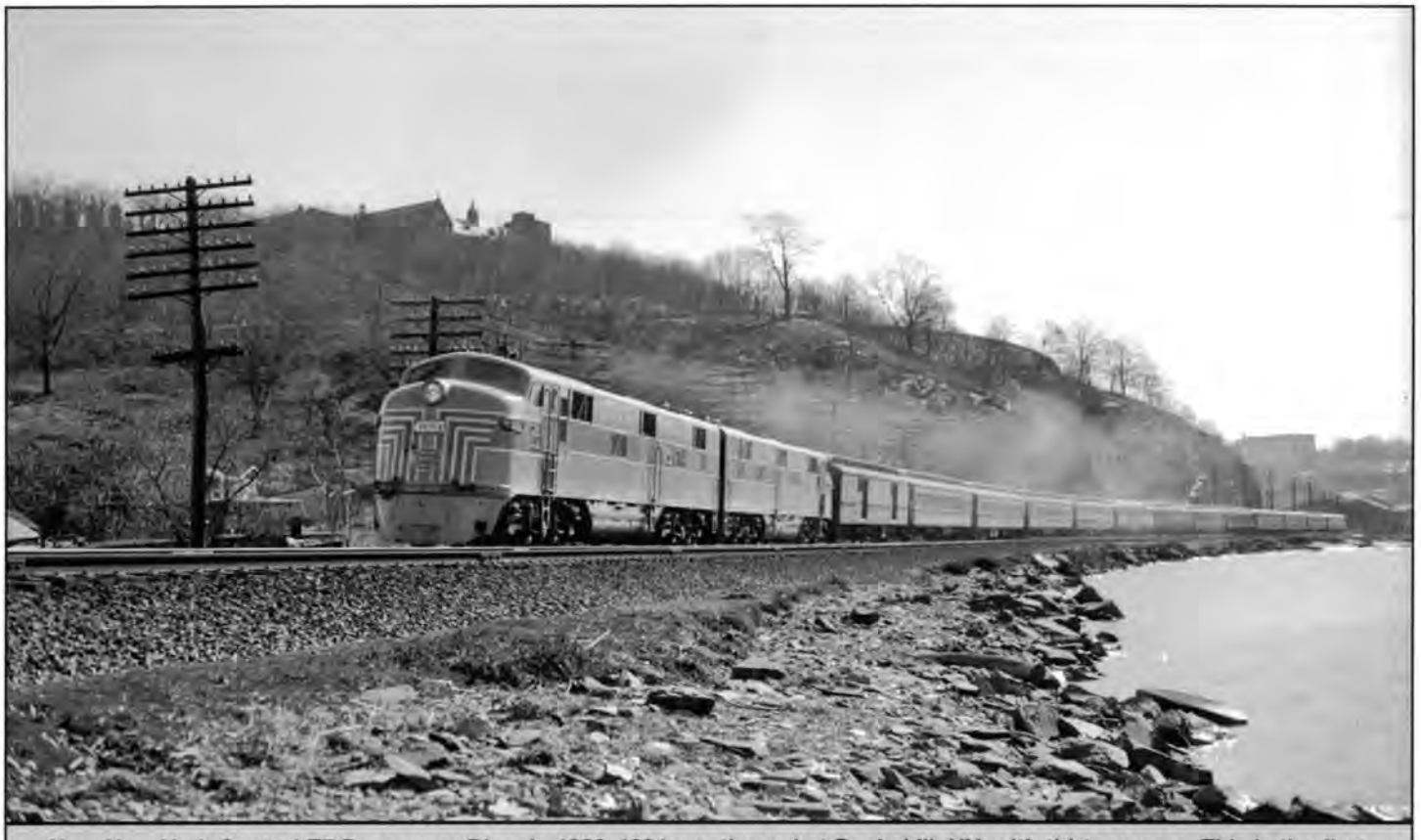
The Beauty Queens
Part 1

T. R. GERBRACHT

The first photographic record of the four new EMD E7 passenger locomotives ordered by the New York Central appears in NYC files dated March 24, 1945. The photograph of "A" units 4000 and 4001 has the notation "that they are hauling #5, The Mohawk." These first four diesel-electric passenger locomotives, road numbers NYC 4000-4003, represented a marked departure from the motive power policy that the railroad had followed since the Vanderbilt predecessor lines became the New York Central. Two weeks earlier, on March 10, most of the top railroad officials were at Schenectady, New York, where they assisted Governor Dewey in christening a "new type of steam locomotive," the first Niagara. Within the railroad, there were obviously advocates of other forms of motive power, specifically diesel.

BACKGROUND

The success of first-generation diesels on other railroads, starting as early as 1934 with the record-setting trip of the *Burlington Zephyr*, had resulted in several railroads operating EMD E series passenger diesels in the most demanding service. The 1938 *Locomotive Cyclopedia* contained an EMD advertisement for both switchers and passenger diesels. The switcher ad featured both 600 and 900 H.P. switchers for Burlington, Rock Island, Lehigh Valley, and a New York Central subsidiary, the Chicago River and Indiana. This was not a surprise, as the Electro-Motive Corporation



New New York Central E7 Passenger Diesels 4000-4001 westbound at Peekskill, NY, with thirteen cars. This is the first image of these engines in the Society's files, dated March 24, 1945. Negative 6798-1.

(EMC), the EMD predecessor company, had been shipping switchers for several years. The switcher ad was in black and white. Following the switcher ad, there was a two page color ad for EMD passenger diesels operating on Santa Fe, Baltimore and Ohio, Burlington, Seaboard Air Line, Rock Island, and Union Pacific. The descriptions under each illustration named the premium or flagship train for which the power was purchased: *Super Chief* for Santa Fe, *Capitol Limited* for B&O, *Denver Zephyr* for Burlington, *Orange Blossom Special* for SAL, *Rocket* for Rock Island, and *City of San Francisco* for UP. Many of these very early diesel passenger locomotives were equipped with Winton 201-A diesel engines.[1]

INDUSTRY TRENDS

These locomotives were very colorful, and no doubt left a favorable impression on someone at the Central, even though none of these operators of diesels served the same service area as the Central, nor were any of them direct competitors. The early passenger diesels and modern, lightweight trains claimed the distinction of improving passenger bookings, and the New York Central had been suffering annual declines in passenger volume since the peak pre-depression year of 1929. (There was a resurgence in passenger traffic during the years of World War II, probably due to gasoline rationing and the shortage of rubber for automobile tires, in addition to military travel, and the railroad's challenge after WW II was to try to retain as much of this passenger traffic as possible.) The new and colorful

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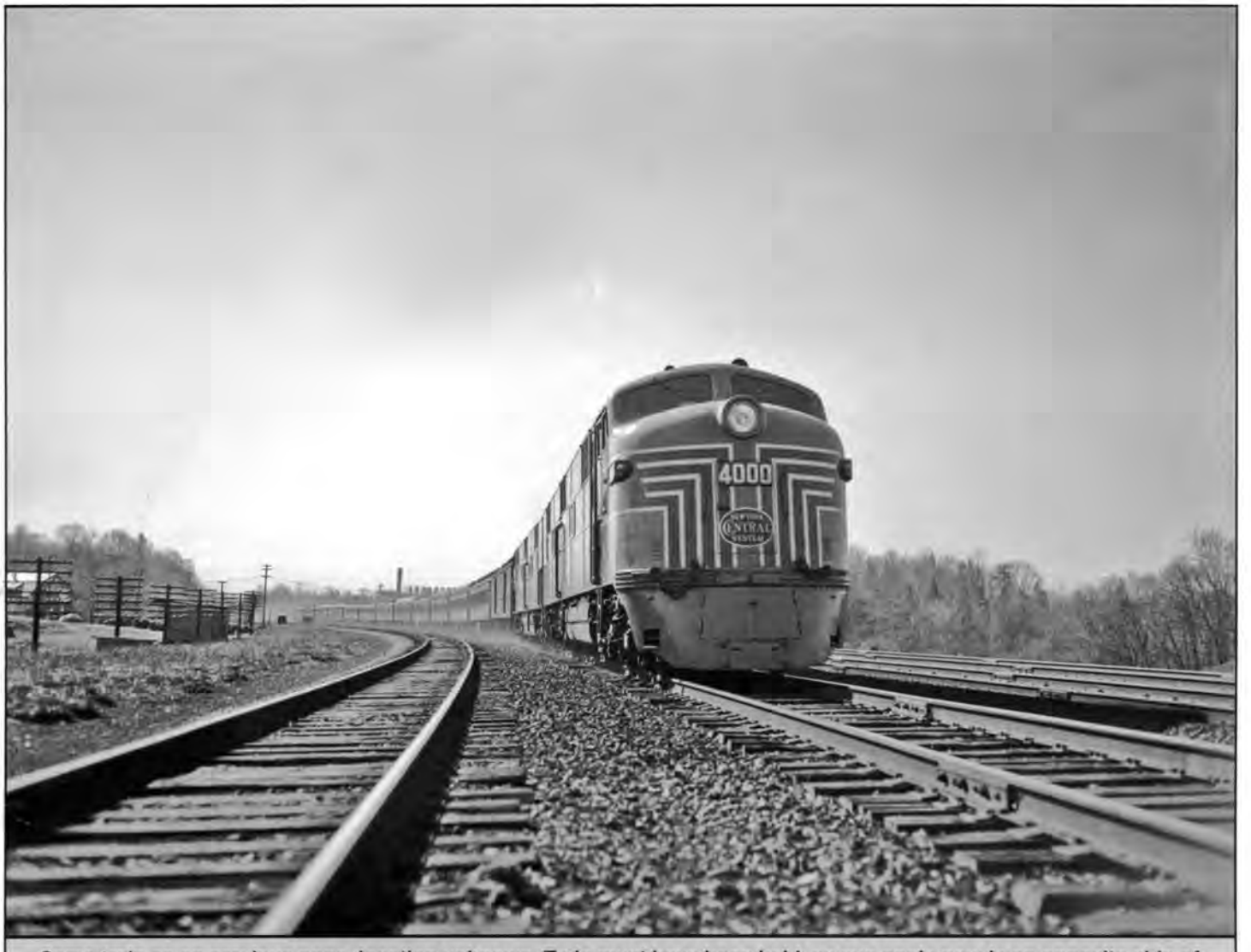


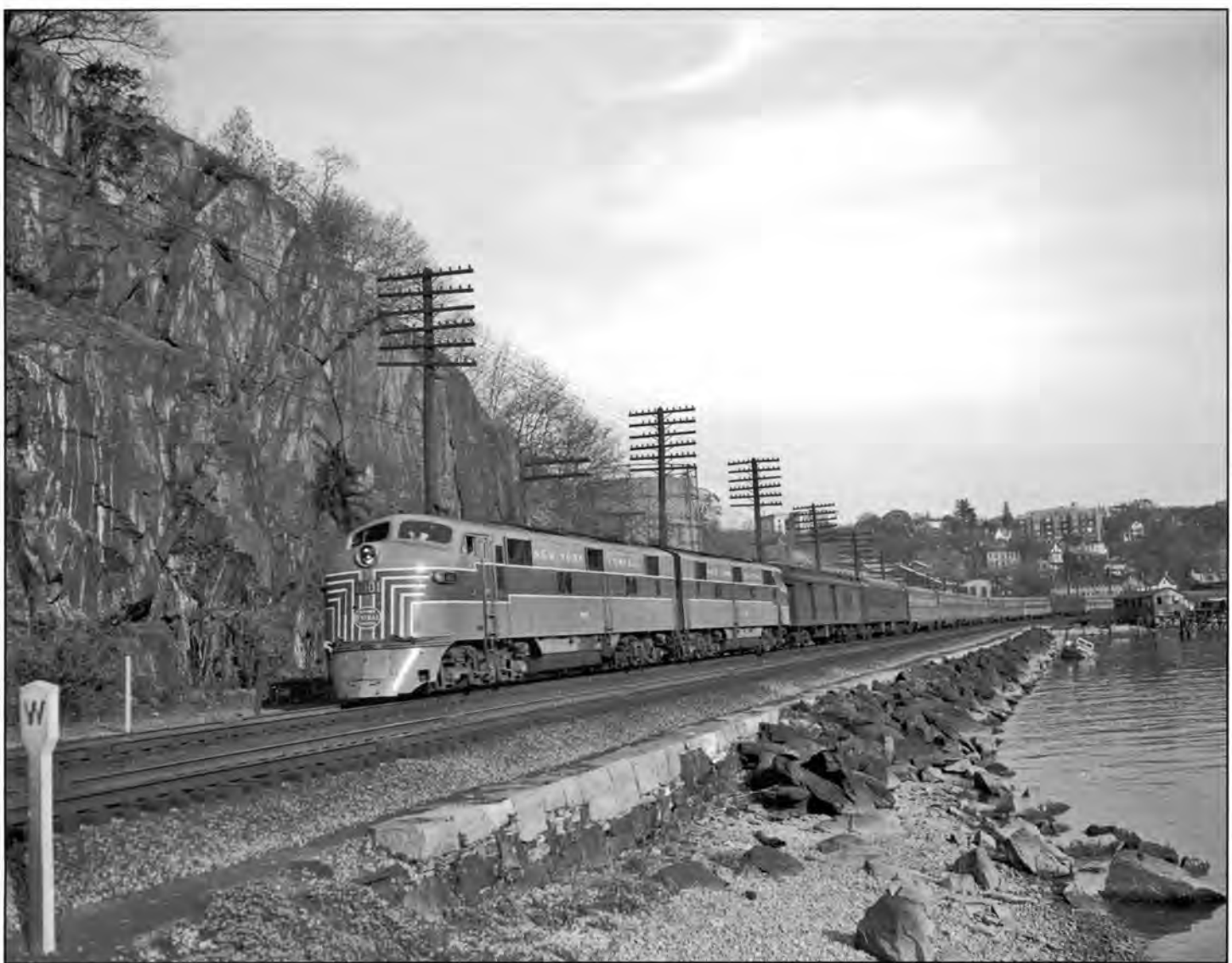
Same train as on previous page, location unknown. Train must have been held, as sun angle now is on opposite side of the tracks. Negative 6798-2.

diesels were touted in advertising as "modern," "clean," and "colorful," while steam was characterized as "old and dirty." So it is quite likely that the passenger traffic organization initiated the request to "do something," or at least was involved in the decision to proceed.

An event took place on January 1, 1941, that virtually assured that financial backing and engineering resources would be made available to dominate the diesel railroad passenger and freight locomotive markets. On that date, the subsidiaries Electro-Motive Corporation and Winton Engine were merged into the General Motors Corporation, and their organizations and assets became the Electro-Motive Division of the General Motors Corporation. General Motors had previously purchased the Electro-Motive Corporation, a gas electric design and sales outfit, in 1930. Also in 1930, the Winton Engine Co., Electro-Motive's chief supplier of gasoline engines and a builder of diesel engines, was purchased. These actions permitted EMD to market standardized diesel switchers and passenger engines through these subsidiaries by 1935.[2]

PROBLEMS AND SOLUTIONS

One of the chief drawbacks of the earliest diesels was that the installed horsepower was not high enough for them to be used on long and heavy passenger trains, especially so if the number of cars hauled on any given day



Locomotives 4001 and probably 4000, westbound at Peekskill, NY, with Train #41, *The Knickerbocker*, on April 15, 1945. The Duco automotive lacquer really shines, indicating perhaps that units were washed at Harmon. Negative 6823-1.

varied. The earliest passenger EMC diesels were a part of a unified, permanently coupled trainset that usually consisted of three or four cars. Some of these trainsets were built by the Budd Company and used welded stainless fabrication practices that made each car in the set very light in weight, compared with the 80-85 ton Pullmans and heavyweight coaches that were operated by most railroads at that time. The original *Burlington Zephyr*, for example, consisted of a three-car train and had a total weight of only 195,000 lbs.[3] By 1935 EMD had introduced multiple unit control on its diesel-electrics, and was therefore able to offer locomotives that could be coupled together to offer a number of horsepower combinations that could be adjusted for the length of the train and the severity of the grades that would be encountered, under the control of a single crew. MU control had been developed by Frank Sprague in the late 1800's for use on electric locomotives, so the concept was not new. Whether the adoption of this idea for diesels originated on a railroad or at builder EMD is unclear. A good example of the wisdom of the "building block" principle occurred on the Santa Fe Railroad. The Santa Fe was an early adopter of the diesel locomotive for freight service, and for good reasons. Santa Fe operated in a water-scarce region, and steam locomotives used a lot of water that had to be hauled to its point of use. The Santa Fe also had

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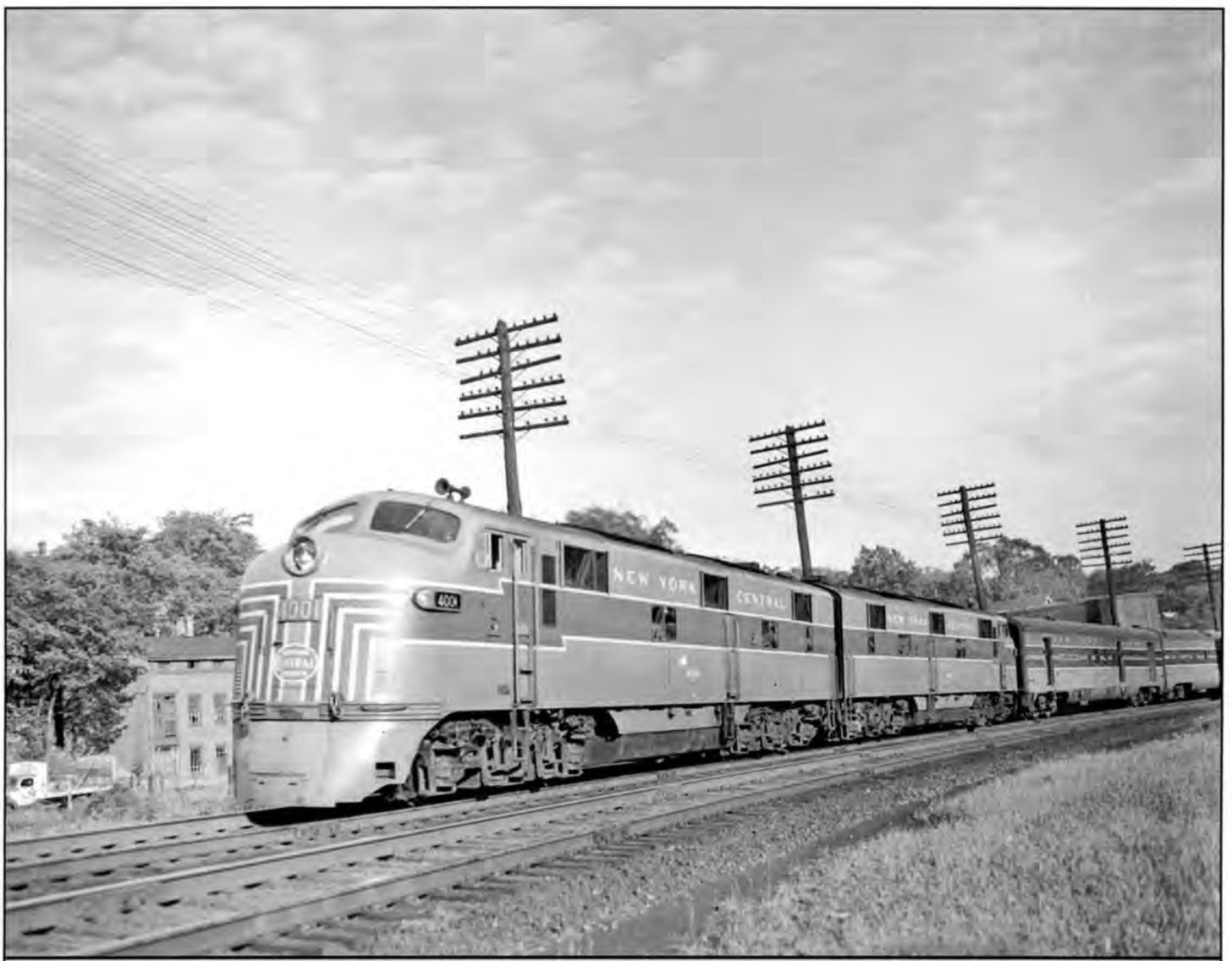
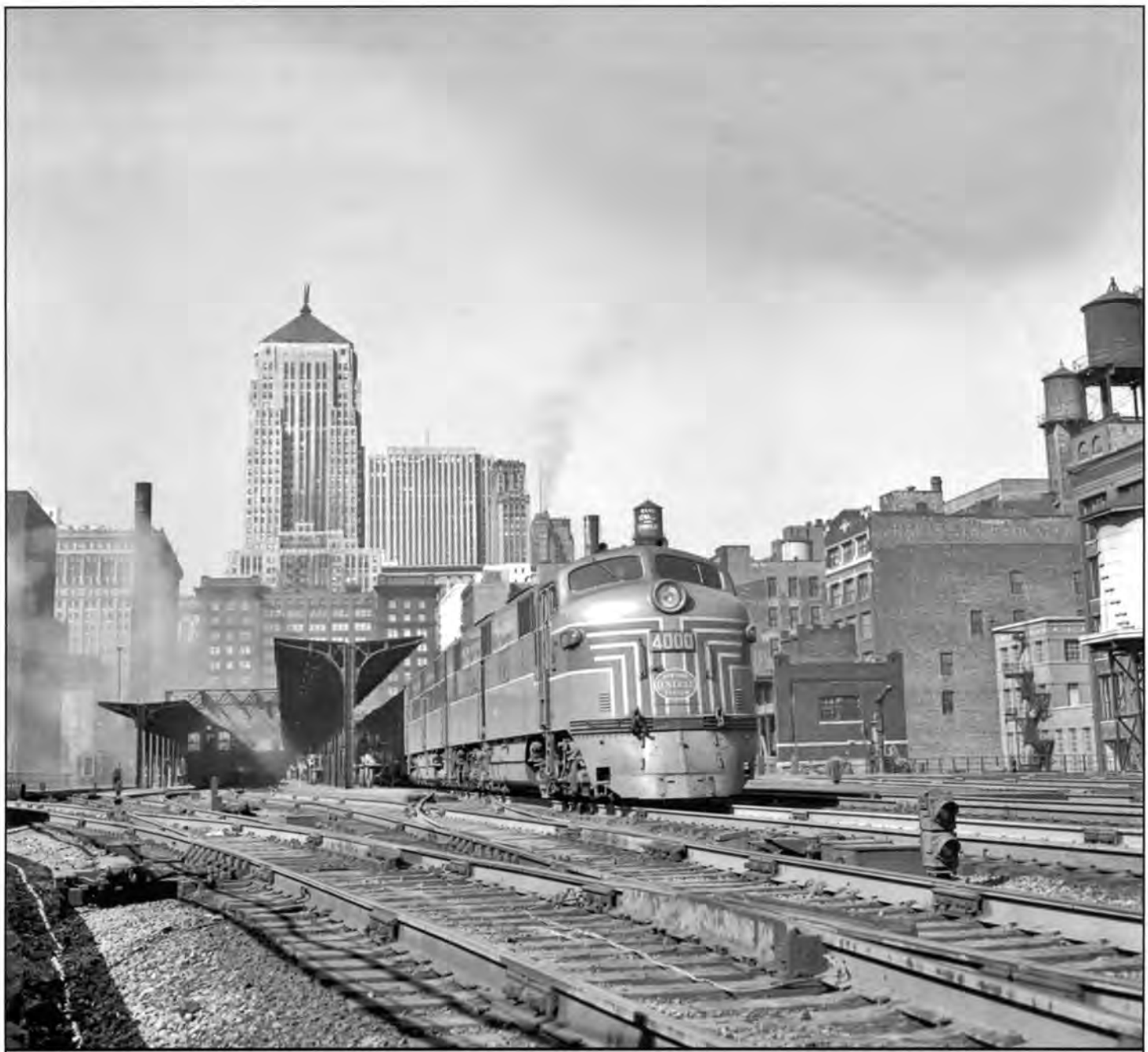


Power for #25 on June 9, 1945, has 4001 and 4000, still shiny. Negative 6886-2.

Queens... *(Continued)*

severe grades, and a diesel's very high drawbar pull at starting and at low speeds significantly increased tonnage ratings on districts where diesels were used. The first Santa Fe EMD FT model freight diesels consisted of semi-permanently coupled "A" and "B" units providing 2,700 H.P. Santa Fe coupled two of these "sets" together to dispatch a 5,400 H.P. locomotive. After operating EMD FT model freight diesels for a time, the Santa Fe inquired of EMD if they could modify the locomotives to remove the semi-permanent drawbar that connected the "A" and "B" units, and replace it with couplers. At that time, Santa Fe realized that it required only 4,050 H.P. for all but its most severe grades, and proposed to redeploy its entire diesel fleet as three-unit consists. The timing of this request was in the early days of World War II, when there were intensive efforts to remove operating bottlenecks on all main lines. For operation on its most severe grades, which were of limited distance, the railroad reinstituted the use of steam helpers



Another, more famous photo of E7 4000 with a mate at LaSalle St., Chicago, on #26 on September 8, 1945. Lighter color outline of the famous NYC red oval is clearly visible. Negative 6988-1.

to assist the three diesel units. This action made a significantly greater number of diesel locomotive sets available system-wide and for many more trains, and permitted the concentration of steam facilities where the logistics made them easier to support. EMD had the foresight to design this "building block" feature into its passenger locomotives by 1935, and the EMD ad in the 1938 *Locomotive Cyclopedia* showed EMD diesels in horsepower sets of 1,200, 3,000, 3,600, 5,400, and 6,000 H.P. In short, diesel locomotive consists could be varied in size and could be used anywhere, with a train of any weight.[4]

A CLIMATE FOR CHANGE

In the early 1940's, railroads operating in the northeast were almost universally committed to the steam locomotive. There was no shortage of water, and high quality coal was readily available. In addition, the major railroads in the northeast carried significant coal traffic. It was predictable that the EMD color ad showcased customers with service areas in the far west and the deep south. The only exception in the ad was the B&O. The B&O had a reputation of being willing to try new and, in some cases, unusual motive power, including steam locomotives with rigid frames and divided drives, use of water tube fireboxes, Caprotti valve gear, and other innovations. B&O loved to experiment, and under the direction of George H. Emerson, was regarded

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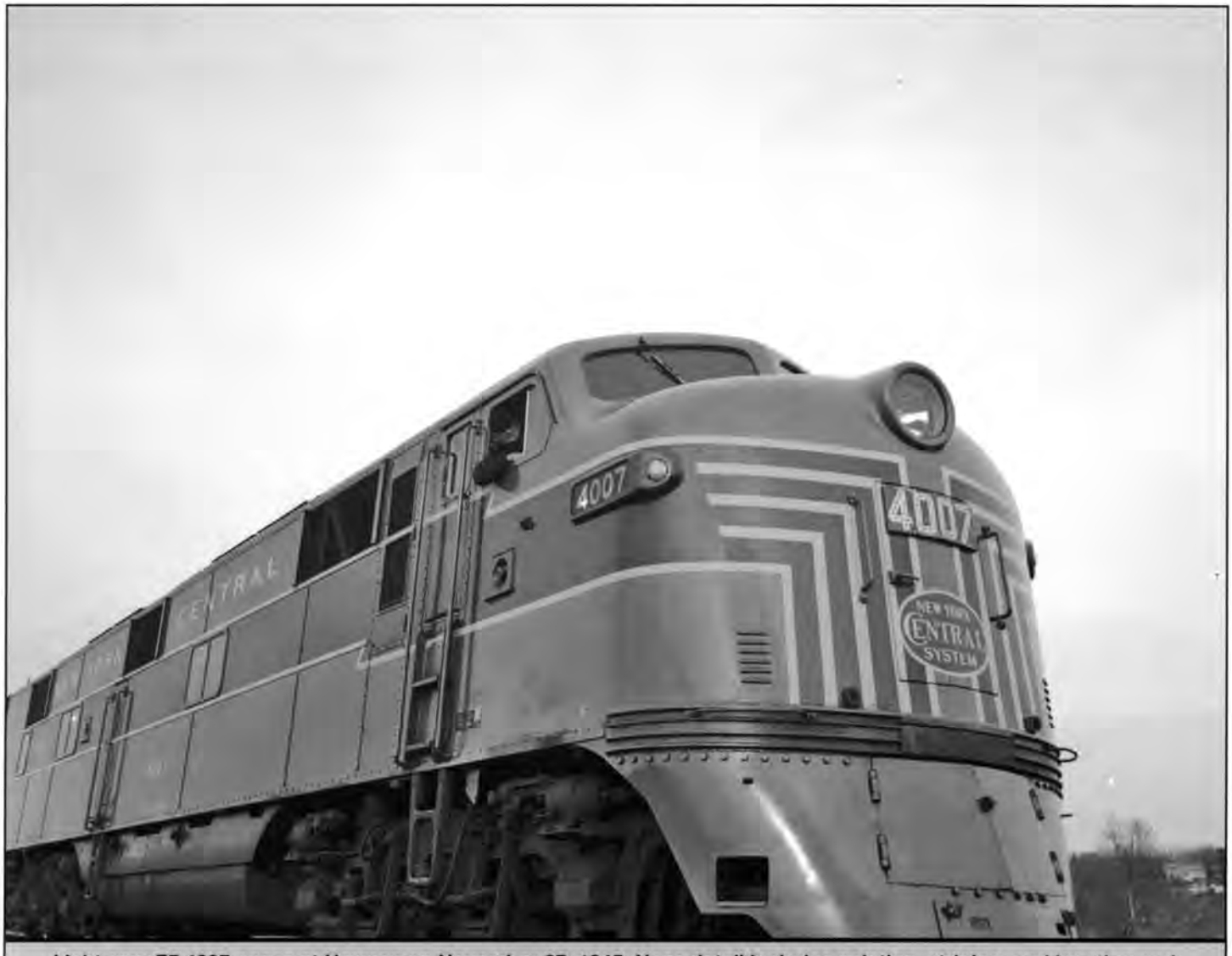


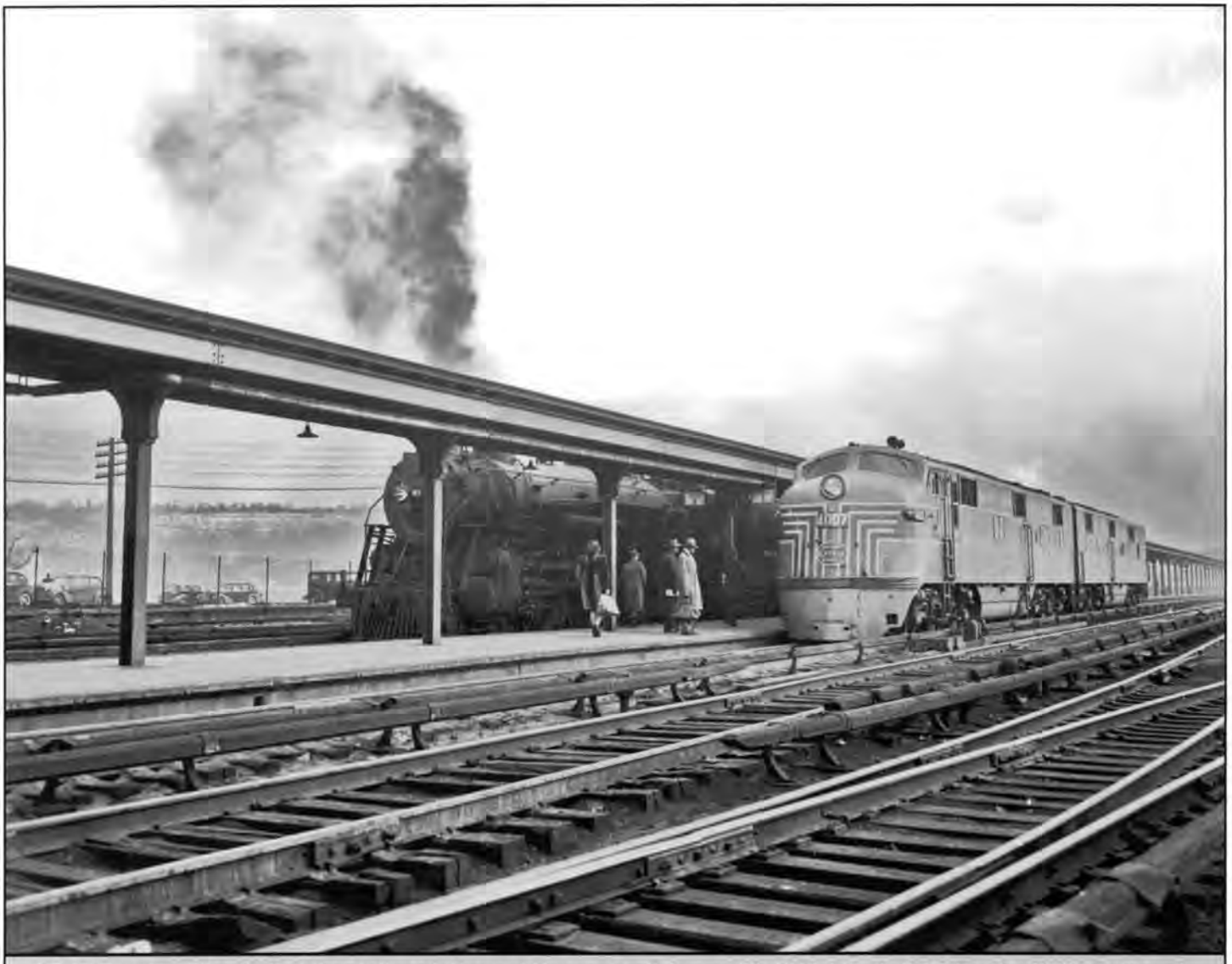
Light grey E7 4007 poses at Harmon on November 27, 1945. Nose detail includes painting, striping, and location and outline of the oval, the nose door details, as well as the front number plate composed of reflective buttons. Small number boards of the early E's were corrected with the E8 design, still several years away. Negative 7119.

as an innovator. The B&O was already a good customer of EMC, having dieselized its flagship *Capitol Limited* with 1,800 H.P. per unit EA and EB model diesels that shipped in May, 1937.[5] (B&O #50 started out as power for the first diesel-powered *Royal Blue* in August of 1935!)[6]

THE ORDER

EMD order No. E-639 was for a total of twelve E7 passenger locomotives for the New York Central. Eight of the locomotives were "A" units, road numbers 4000-4007. The New York Central class assigned to these locomotives was DPA-1A. Four "B" units were also ordered, road numbers 4100-03, class DPB-1A. However, only the first four "A" units were delivered in March, 1945. The remainder of this first order, consisting of four "A" units, road numbers 4004-07 and the four "B" units, was delivered later that year, in October. The EMD construction numbers for the eight "A" units were 2865-72 inclusive, and the construction numbers for the "B" units were 2873-2876.[7] EMD issued an attractive all-color "builder's painting" of the new locomotives in an attractive light grey color scheme, with specifications on the back of the image.[8]

The *Diesel Spotter's Guide* lists E7 production as beginning in February 1945.[9] The Central's initial four locomotives were on the property no later than mid-March 1945,[10] very early in the E7 production run. The railroad, in its history, had rarely purchased



E7 4007 and a "B" unit sit at the station platform at Harmon on February 28, 1946. Elderly K-3Q Pacific 4673 is adjacent. Negative 7200.

new locomotives without extensive testing, including the use of prototypes. With the end of the war near and the reports of industry success with EMD's in premium passenger service, the Central may have considered the risk of an outright purchase and a resultant performance failure to be low. The railroad may have projected that, with a change to a peacetime economy, supplies of new and technologically advanced products would be tight, and felt forced to commit with an order. The railroad did know that the EMD Model E6, the E7 predecessor, had ceased production in February, 1942 due to reallocation of critical locomotive components to freight service. (The famous EMD freighter, the FT, was in continuous production from 1939 to October of 1945, when the FT model was supplanted by the F2.)[11]

TECHNICAL SPECIFICATIONS

Carbody: The EMD E7's were the latest evolution of the E series, the first of which, with EMD 567 engines, were built in March, 1939. E series production continued through the E3, E4, E5, and E6 models until September, 1942, when component reallocation forced the production discontinuance referred to above. The immediate predecessor of the E7, the E6 model, was quite successful, with 87 cab units and 26 booster units produced.[12] The E7 series shared the same 6-1/2 x 12 journal size, the same 43-foot bolster centers, the same width of 10 feet, 6-7/8 inches over

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The electric has cut off, and 4007 heads west with her train. Train consist may indicate a secondary assignment. Negative 7200-3.

Queens... *(Continued)*

grab handles, and the same overall length over coupler pulling faces of 70 feet, 3 inches. (The NYC Locomotive Diagram Book shows 71 feet, 1-1/4 inches between coupler pulling faces.) The carbody itself was of streamlined appearance, with a "bulldog" nose angled at 80 degrees from horizontal.[13] The metal sides of the carbody were of the "stress skin" design; that is, the carbody side panels were structural members that contributed to overall carbody strength.

Diesel Engines: Each "A" or "B" unit was equipped with two EMD 12-cylinder, 567B diesel engines in a Vee configuration, two D-4 main generators, and four model D-7 traction motors, each motor driving the outer axles of each truck, with the center axles being idler axles.[14] Each diesel engine had an 8-1/2-inch bore and a 10-inch stroke, with a unit fuel injection system, and was rated at 1,000 H.P. at 800 rpm. Total installed horsepower in each unit was 2,179, with 2,000 H.P. for traction. The diesel engines within each carbody were

4000 H.P. DIESEL PASSENGER LOCOMOTIVE . . DESIGNED AND BUILT BY ELECTRO-MOT

capable of independent operation[15] and if one engine failed for any reason, the train could continue on the remaining three engines. The engines were located within the carbody facing each other, with each traction generator at the opposite end. Therefore, the traction generator for the #1 engine was located directly behind the back wall of the operator's cab. At the opposite end of the locomotive, at the #2 end, the traction generator of the #2 engine was located in close proximity to the steam heat boiler.

Running Gear and Capacities: The locomotives rode on 36-inch wheels (the FT freighters ran on 40-inch wheels), and had a gear ratio of 55:22, which permitted a maximum speed of 98 mph, with overspeed set at 95 mph. Each two-unit locomotive set carried 2,400 gallons of fuel, 32 cubic ft. of sand, and 3,200 gallons of boiler water for train steam heating purposes. The NYC Locomotive Diagram Book shows a "Fuel capacity in Distance" of approximately 750 miles for summer operation, and a winter capacity of

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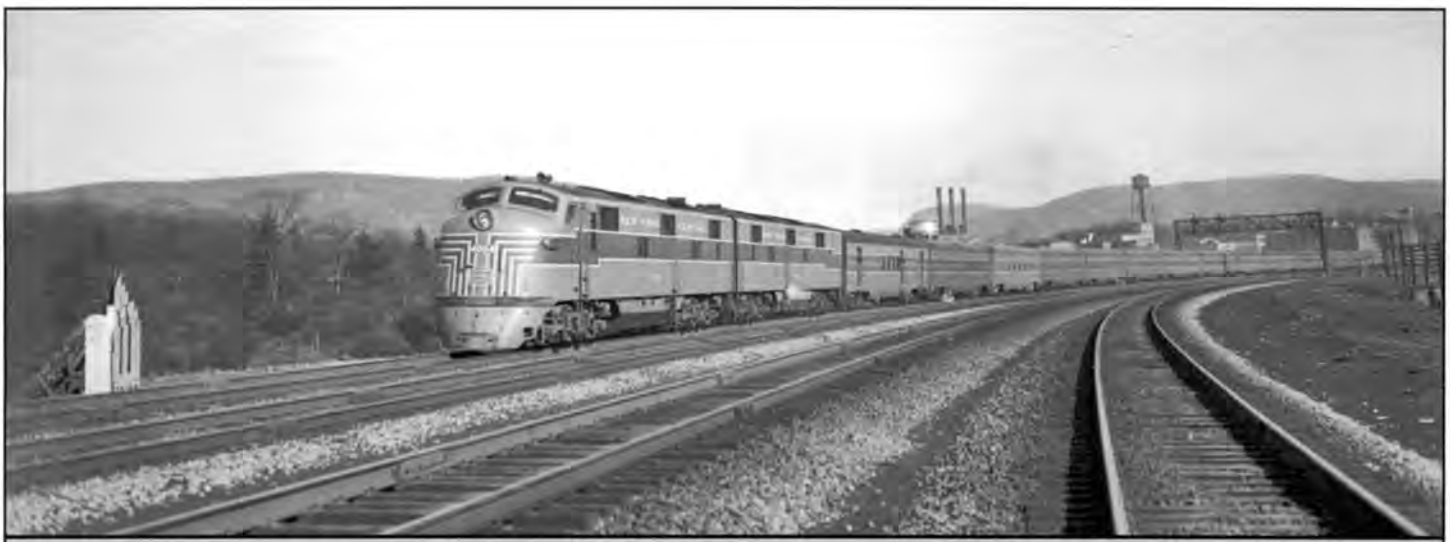
IVE DIVISION . . GENERAL MOTORS CORPORATION . . LA GRANGE, ILLINOIS, U. S. A.

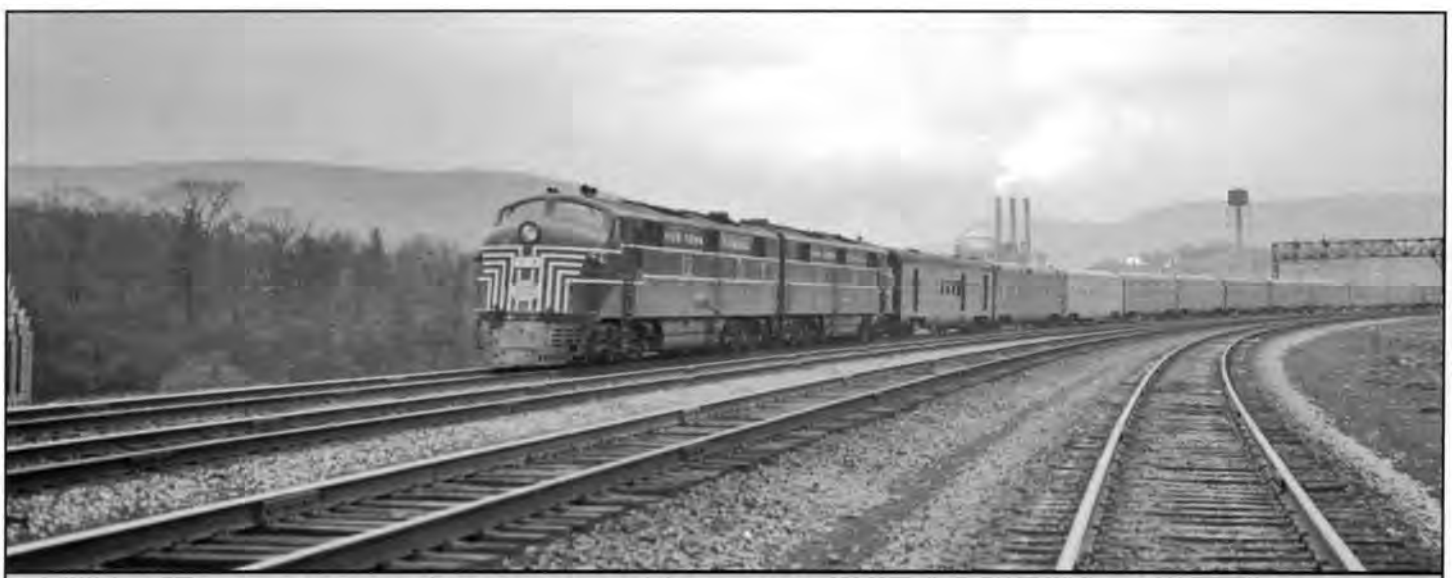
approximately 570 miles, including heat. Total full-service weight of each two-unit consist was 640,600 lbs.[16]

PERFORMANCE SPECIFICATIONS

Maximum calculated tractive effort at starting, assuming 25% wheel-to-rail adhesion, was 103,860 lbs.[17] (The NYC Diagram Book shows a maximum tractive effort of 54,500 lbs. at 25% adhesion, for a total of 109,000 lbs. for two units.) The continuous tractive effort rating point with the 98 mph gearing was 18,400 lbs. per unit at 35.0 mph, and 1,717 H.P. per unit. The locomotive diagram for these locomotives was updated as changes in equipment occurred. While each of these locomotives was originally equipped with four D-7-F traction motors, later changes noted that these locomotives were equipped with D-7, D-17, or D-27 traction motors. These locomotives were not equipped with dynamic brakes, as the nearly gradeless mainline of the railroad did not indicate a need for it, and the use of dynamic braking for train handling was not generally understood at that time. The locomotives were designed so that forward transition would occur automatically. However, backward transition, or the reconnection



E7 4004 with Eastbound #26 traverses Fleischmann's Curve at MP 40, Peekskill, NY, on April 7, 1946. Negative 7240-1.



Black units 4003 and 4002 with #26 on Fleischmann's Curve at Peekskill on April 4 or 5, 1946. This may be the first trip with the ATSF through Pullman from California. Negative 7240-3.

of the traction motor circuits for a reduction in speed, was manual, and the engineer was required to move the throttle to the idle position at a speed of 25 mph when reducing speed for a stopping point. The decay in generator voltage would permit the transition relay to drop out, permitting the motor reconnection required for the next start. (This is somewhat analogous to downshifting an automobile with a standard transmission when slowing down and preparing to stop.) All auxiliary machines within the carbody were belt driven. Each two-unit consist was arranged for "double end control from either cab," so that turning of the units at the end of each run was not required. This feature alone would improve utilization of the new locomotives by reducing turnaround time before the units could be sent out on another train.

THE COLOR SCHEMES

Two-tone Grey: What was not entirely settled at the time of delivery of the first twelve locomotives was the color scheme. Part of the reason for this may have been some disagreement or uncertainty regarding the assignments for these new locomotives. The flagship train of the railroad was the *20th Century Limited*, train numbers 25 and 26. These trainsets consisted of Pullman Standard cars that were a light grey in color, with a darker grey band edged in Opex blue paint. (At some time after delivery, most likely in 1940, the Opex blue banding was eliminated, and a black border edge having a 3-inch width

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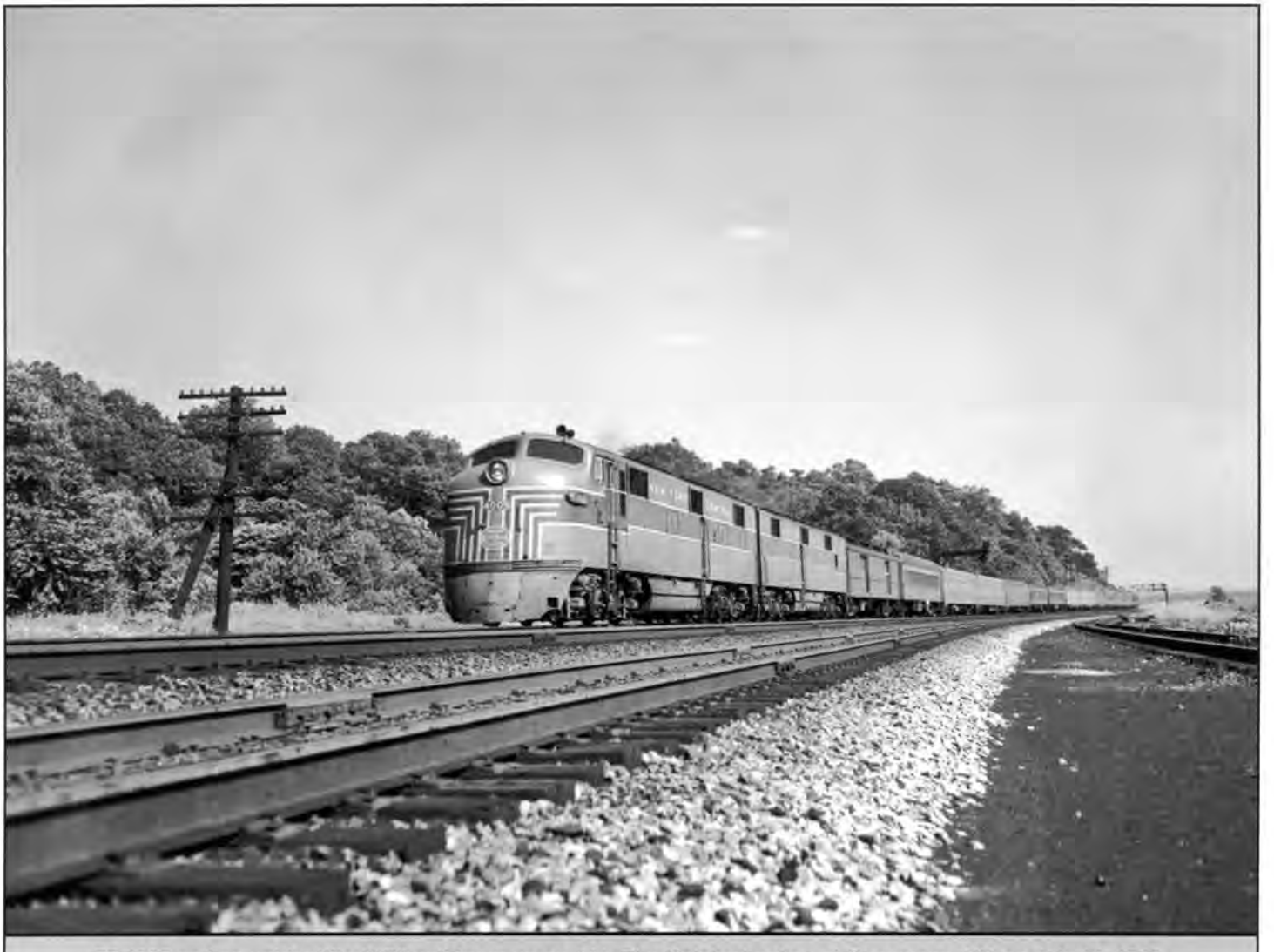
Another day and another view of #26 with ATSF through Pullman, pulled by E7 4000. April, 1946. Negative 7240-4.

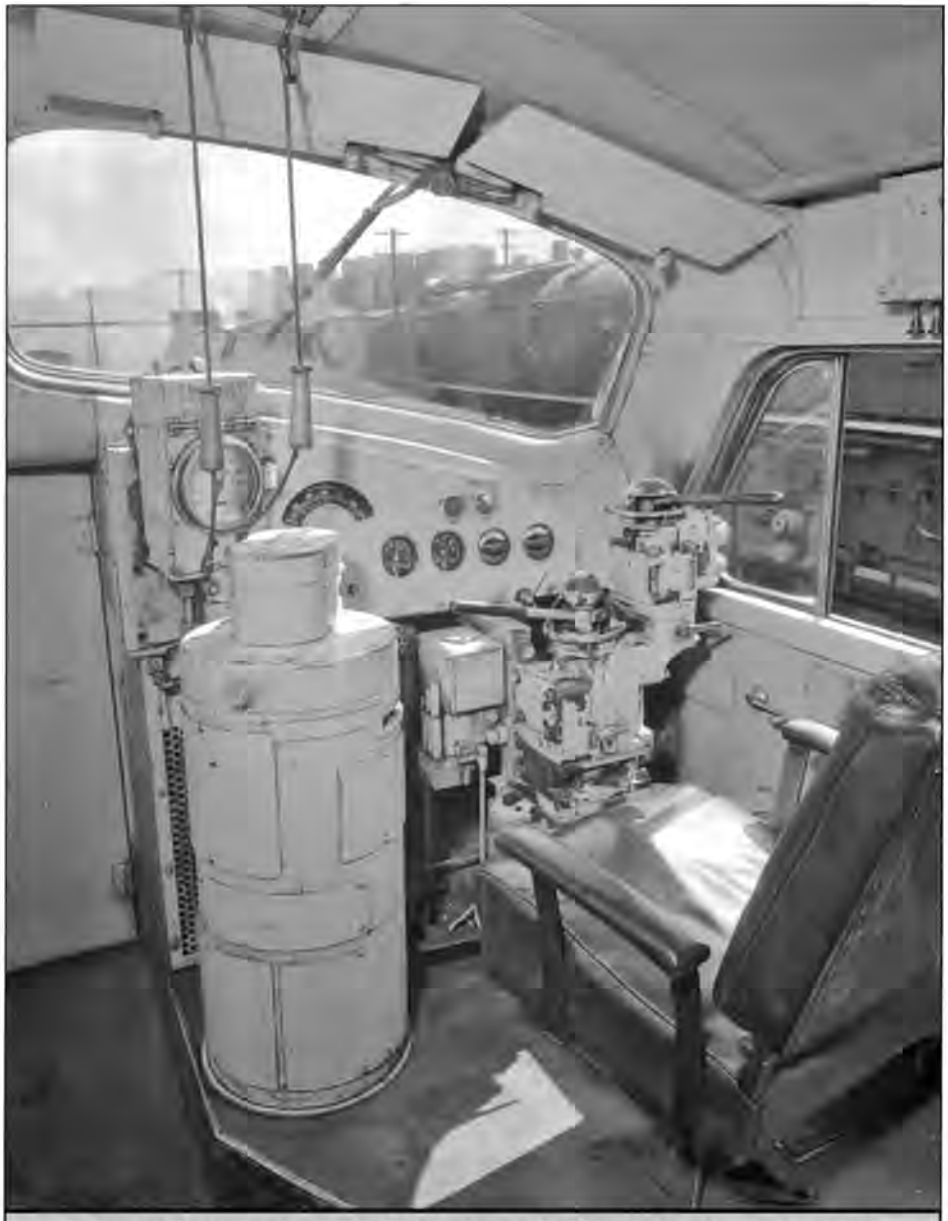
separated the light grey from the dark grey.)[18] There were other trains in the fleet that consisted of Budd-built stainless steel cars, and of course many trains were assigned a combination of dark green Pullman equipment, and older, darker colored New York Central "heavyweight" equipment. As delivered, road numbers 4000 and 4001, and 4004-4007 were painted light grey, with a dark grey band. The New York Central "Oval" on the nose had a red background with "imitation aluminum" lettering. The lightning stripes were "imitation aluminum," and consisted of five stripes on the nose, with a jagged lightning-bolt-edged band, with rounded corners, under the engineer's and fireman's cab windows, and continuing to the end of the carbody. The stripes and dark grey band that started on the nose, just above the pilot, almost reached the headlight and did include the small number boards. The "imitation aluminum" edges of the dark grey band had a rounded contour at the "jag", which existed on only one end of the locomotive, including both "A" and "B" units. Refer to the as-built photo and to NYC drawing Q-72510 for exact details. The roof hatches that covered each diesel engine were painted black, and are barely visible in the builder's photograph. The front pilot of each "A" unit was also light grey, as well as the fuel tank fascia, and the front coupler was hidden by a set of hinged doors. The underside of the fuel tank and the trucks were painted a glossy black. In addition to the lighted number boards on the "A" units, both "A" and "B"



E7 4005 and an unidentified "B" unit team up on #41, *The Knickerbocker*, at Oscawana, NY, on July 14, 1946.

units had the road number and locomotive classification, DPA-1A and DPB-1A, at the midpoint of the carbody, above the fuel tank. The end result was an understated elegance that reflected the aura of the premium trains that they would pull.

The Black Units: What is interesting is that another color scheme was selected for two of the first four locomotives delivered. Road numbers 4002 and 4003 were painted solid black, with "aluminum lettering and striping." (There is some disagreement among NYC aficionados whether the "aluminum lettering and striping" was white or aluminum. The source for the aluminum reference is based on information provided by the late H. L. Vail in *New York Central System Diesel Locomotives* by Edson, with Vail and Smith, on page 101. An earlier reference to the color scheme was published in the Second Quarter, 1984, issue of *Central Headlight* in an article titled "Painting and Lettering The 20th Century Limited of 1938 and Subsequent Changes, A Second Look," by H. L. Vail. Lans Vail reconfirmed the aluminum reference to me in a conversation,[19] and told me that it was included on the EMD painting and lettering drawing. The Society does not now appear to have that drawing in its files. The argument for white striping was that the cars were striped in white, although the white car striping did not predominate until after the 1948 *20th Century Limited* was re-equipped by Pullman Standard.) The Vail-Edson book incorrectly lists the road numbers of the black carbody units as 4001 and 4003. Based on photographic evidence in the Society's files, the all-black carbody units were 4002 and 4003.



A view of the controls of E7 4002, including 8-ET brake equipment and 120 mph speedometer. Note the white running board stripe on the fireman's side of S-1b Niagara 6024, indicating that both sides of the Niagaras were striped at Alco. Niagara is almost new, delivered April 19, 1946. Negative 7433-2.

Visible in many early photos of all of these units in service, the locomotives were equipped with a plate with the four-digit locomotive road number in reflective material, located under the headlight and positioned vertically between the first and second nose stripe, and mounted on the top of the nose door. The reason for this is probably the difficulty that railroad personnel had in identifying specific engine

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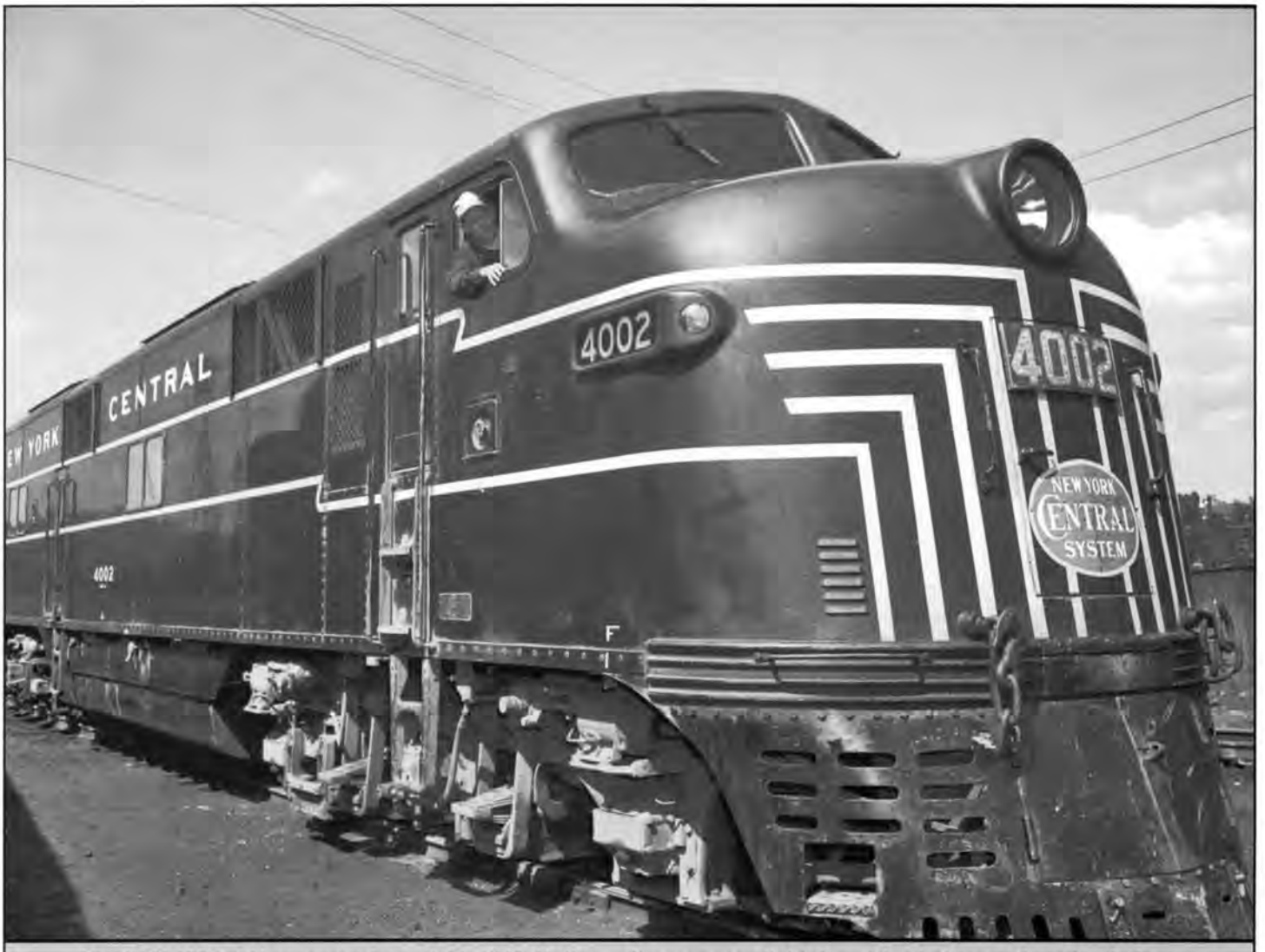
Queens... *(Continued)*

numbers at night or in bad weather. EMD eventually did solve this problem by greatly enlarging the front number boards of the E8 locomotives when this model was introduced in August of 1949. There are many "late" photographs of NYC E7's with smaller number boards, the darker grey carbody and lighter grey banding, with the numbers painted on the top edge of the nose door. Evidently, this was a requirement for those "E" units that continued the use of the small number boards that were standard E7 production.

Based on the selection of the early color scheme of a light grey carbody with dark grey band, it appears reasonable to conclude that at least six of the first eight "A" units and the four "B" units were intended for *Century* service, but this has not been confirmed. What is certain is that two of the first four locomotives, black road numbers 4003 and 4002, were photographed on June 8 on the *20th Century Limited*. The next day, the two grey E7s, numbers. 4001 and 4000, were photographed on the Century! The company photographer had previously photographed *The Knickerbocker* on April 15 with the 4001 and 4000. This would seem to indicate that the new locomotives were not exclusively assigned to the *Century*, but were on a cycle that utilized the locomotives to the maximum extent possible.



Black E7 4002 at Harmon on August 19, 1946. Notice soft corners on lightning stripe below engineer's window, a feature of this early paint scheme, and early style pilot. Holes in pilot were reportedly to provide additional air circulation to the traction motors. Negative 7476-1.

Notes

1 *Diesel Spotter's Guide*, Pinkepank, pp. EMD56-59

2 *The American Locomotive Company, A Centennial Remembrance*, Steinbrenner

3 Op. Cit., Pinkepank, p. EMD-57

4 *1938 Locomotive Cyclopedia*, EMD Advertisement, pages 924-925

5 *B&O Power*, Staufer, p. 316

6 Ibid., Staufer, p. 316

7 *New York Central System Diesel Locomotives*, Edson, Vail, Smith, p. 100

8 EMD Specification Card, EMD, T. R. Gerbracht collection

9 Op. Cit., Pinkepank, p. EMD-75

10 Op. Cit., Edson, Vail, Smith, p. 100

11 Op. Cit., Pinkepank, p. EMD-44

12 Op. Cit., Pinkepank, p. EMD-75

13 *Trains* Magazine, April, 1994, Morgan, pp. 46

14 Op. Cit., EMD Specification Card

15 *New York Central Locomotive Diagram Book*, pp. DPA-1a

16 Ibid., NYC Diagram Book, pp. DPA-1a

17 Ibid., NYC Diagram Book, pp. DPA-1a

18 *New York Central's Lightweight Passenger Cars, Trains, and Travel*, Geoffrey Doughty, p. 101

19 Conversation with H. L. Vail, 5/18/86

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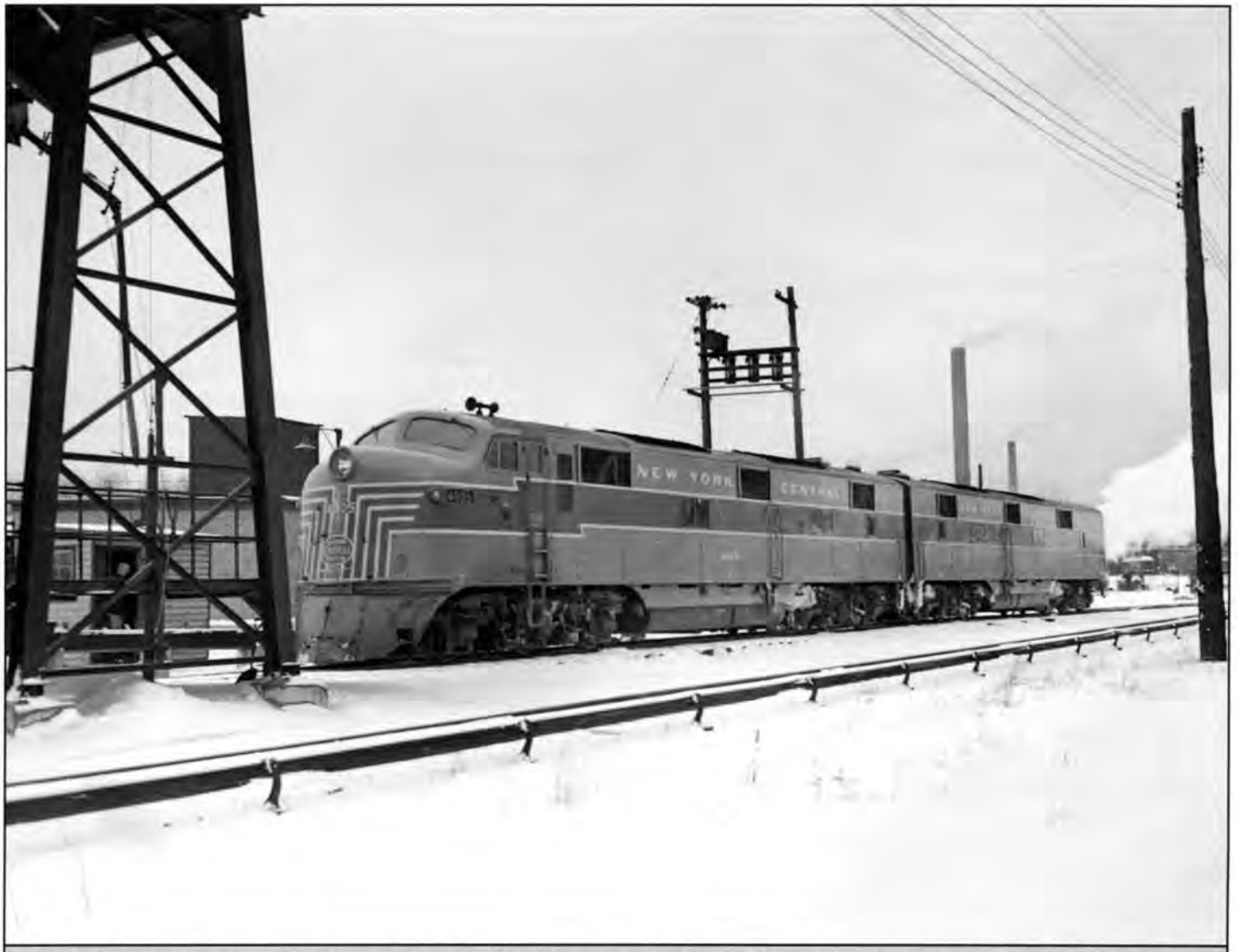

E7 4005 and an unidentified "B" unit idle at the Harmon sand tower. Photo is undated; based on the negative number, it is probably the winter of 1946-47. Negative 7628.