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Get smart about Lionel's postwar F3s

How Lionel painted three classics

by Len Carparelli | photography by William Zuback



AN WE EVER GET enough of Lionel's F3 diesel locomotives? Collectors keep searching for these O gauge beauties, and operators get a real thrill out of running them as A-A, A-B, or even A-B-B-A lash-ups.

Over the years, postwar collectors have studied F3 variations and prototypes. We can learn even more about these models by investigating how Lionel painted and decorated them.

Background data

Lionel's F3 made its debut in 1948 and was based on the then-current model produced by the Electro-Motive Division of General Motors. That diesel, known as the Phase IV F3, looks almost identical to the F7, which didn't come out until 1950.

General Motors, like other locomotive builders and railroads at the time, was keen on supplying Lionel with the latest blueprints, designs, and colors for its locomotives and rolling stock. After all, O and O-27 gauge models provided free advertising for them.

At least one F3 was in the catalog every year through 1966. Five versions of the Santa Fe led the way, along with three New York Centrals, and two Western Pacifics. Nine other road names were used, each with a handsome paint scheme using multiple colors.

Experts have identified three notable body styles: early (screen top), middle (louver top with open portholes and two-piece horn), and late (closed portholes, one-piece horn, and molded-on cab ladders). They also refer to four major frame types, based on whether the model has one or two motors and whether the motors are mounted horizontally or vertically.

Glory to Santa Fe

Lionel decorated five F3s in the Santa Fe's famed warbonnet scheme. Four models belonged in the O gauge line (nos. 2333, 2343, 2353, and 2383); the no. 2243 was part of the O-27 line in 1955-56 and upgraded to O gauge for 1957.

Confusion has arisen among collectors about how Lionel decorated its Santa Fe F3s. Even the latest reference guides state that these diesels had "red, yellow, and black rubber-stamped detailing stripes." Having studied Lionel's painting techniques as a professional restorer for more than 30 years, I've concluded that Lionel never used rubber stamps, as we know them, to decorate its F3s.

Instead, workers relied on rightreading metal dies that were attached to a holding fixture or jig. These dies transferred ink to the completed part or parts in a method similar to offset printing. This process enabled two F3 body shells to be decorated at once.

For proof, look at the photograph of a Lionel paint-shop employee on page 46. This picture, originally published in a Newark, N.J., newspaper in 1950, shows a factory worker applying striping to a pair of Santa Fe shells. The black, red, and yellow "toothpaste" tubes in the foreground were posed, though they do hold printer's inks to "rubberstamp" the Santa Fes.

In addition, note the six metal dies bolted to the table in the center of the picture. Four are shaped to create the warbonnet curve (two wide right-hand and left-hand yellow stripes, plus two thinner right-hand and left-hand black stripes). The other two dies handle the



pair of straight red stripes at the bottom of the shell.

The roller pad the worker is holding in his right hand inks the six dies. The printing pad (in his left hand) is rolled over the pre-inked dies before he pulls it down the length of the table to roll over the surface of the F3 cabs.

He therefore prints three colors on two cabs, all at the same time. Then, because the cabs are situated "back to back" in the holding fixture, he can turn them over to print the other side.

Both rollers were made of rubber, hence the term "rubber stamping." To be precise, though, this process is really manually operated offset printing.

This "wet-on-wet" process ensures a perfect registration between colors every time. The printing pad travels along a "rack-and-pinion" arrangement that doesn't permit any sideways motion and ensures that each unit will be stamped in the same spot for uniform results.

The metal dies are then locked into their prearranged spots with Allen screws, assuring that two complete tricolored images will be simultaneously transferred to the cabs. This saves a lot of time as compared to how much would have been needed to apply the colors separately, not to mention the quality-control nightmare of correct color registration! The roof striping is added later by using the same wet-onwet process.

After the side striping was dry, a worker inserted each pair of models into a similar fixture to apply the roof stripes. The water decals for the nose and the GM logo were applied last.

Forerunner of pad printing

The printing method Lionel used was a crude forerunner of pad printing. That method, which is similar to screen printing, is used almost exclusively today to decorate many items, including model trains.

Modern pad printing is more durable, clearer, and sharper than Lionel's old "rubber stamp" method, due to engraved plates that allow for a more thorough and precise ink deposit on the decorated part. Like screen printing, pad printing never exhibits a "ghosting" or a double-strike effect. ▲ Special machines and bold colors are the secrets to the beauty of Lionel's F3s. Here you'll learn how three postwar classics, the nos. 2333 Santa Fe, 2245 *Texas Special*, and 2368 Baltimore & Ohio were painted and lettered. Models courtesy of Sommerfeld's Trains & Hobbies.

No postwar Lionel F3s were padprinted because the process hadn't been invented. Some were screenprinted, however, including the nos. 2245 *Texas Special* (white stripes), 2240 and 2367 Wabash (white), 2378 Milwaukee Road (orange), and 2379 Rio Grande (silver).

The lettering on the earliest Santa Fe F3s ("SANTA FE" and "BUILT BY LIONEL") was applied after the striping with conventional "rubber-stamping." I have seen original models that are lettered but not striped and viceversa. All I can figure is that, for unknown reasons, workers neglected one of the decorating steps.

Another mystery is why Lionel switched to heat-stamping the lettering after 1949. Most early "rubber-stamped" F3s, though hard to find in good condition, still maintain a fairly even, clear



graphic, no worse than other "rubberstamped" products from the late 1940s. Maybe someone thought – correctly, in my opinion – that heat-stamped lettering looked more impressive.

From tape to masks

By the way, all Santa Fe F3 A and B units manufactured prior to 1955 (like the New York Central, Southern, and Western Pacific models) were decorated by masking with die-cut tape. That meant masking multi-colored spray-painted items by hand, a tedious and time-consuming process.

That process didn't consistently yield top-quality results. Paint leaked under the masking tape when a unit was sprayed too heavily or the tape was not burnished prior to painting. Tape might not be placed accurately, which caused crooked or uneven decoration. Even worse was the possibility that the color sprayed on first would be ◄ This fascinating photograph, which was originally published in a Newark, N.J., Sunday newspaper supplement in 1950, sheds light on the techniques used by Lionel's paint department to decorate early Santa Fe F3s.

removed when the adhesive tape was ripped off.

Lionel had to find a method that provided more consistent results, while still maintaining quality control and saving money. Romualdo Camuso, a skilled craftsman who had been working at Lionel since the 1910s, came to the rescue by designing metal paint masks that enabled painters to add intricate schemes to F3s and other locomotives. The masks were used starting in late 1955. [Camuso's years at Lionel are covered in the November 1996 CLASSIC TOY TRAINS. – Ed.]

Every F3 cataloged from 1956 on was decorated using these masks. The only Santa Fe F3s to benefit from Camuso's ingenuity were the late-production no. 2243s and all the no. 2383s. The early models that collectors prize were masked using tape.

The Texas Special

Anyone who loved the red-and-silver Santa Fe F3 was sure to feel as passionate about another red beauty, the no. 2245 *Texas Special*. Lionel cataloged it as an A-B combination in 1954 and '55, and the shiny silver frame with white trim earned plenty of compliments.

The 2245 stands out in several ways. First, it was the first F3 that Lionel offered in its O-27 line, which thrilled

▼ Note the improper registration lineup in the yellow and black striping of this no. 2368 Baltimore & Ohio A unit. The sides were striped first using the wet-on-wet process that Lionel also used on Santa Fe F3s.



► An unusual example of a completely decorated Santa Fe F3 diesel, including heat-stamping, that somehow missed the striping process for the roof. It is also missing a decal on the nose. Mistakes like this were uncommon at Lionel in the postwar years.

kids who championed Lionel's lessexpensive line. It's also the only F3 other than the Santa Fe built in both horizontal- and vertical-motor versions. The horizontal 2245 was offered in 1954 before it was redesigned with the new no. 2321-type motor the next year.

Third, the 2245 is the only Lionel F3 that was neither heat-stamped nor "rubber-stamped." All the original models were screen-printed – and not very well!

Lionel used a "reverse-stencil" method to print the detail ("BUILT BY LIONEL" block, white stripe, and "THE TEXAS SPECIAL" script lettering) in one pass to save time and money. It likely printed two cabs at once, as was done with the Santa Fes.

Unfortunately, this printing method blurred the script lettering on many original 2245s. To be fair, screen-printing had not advanced to current levels, so the results achieved by Lionel were more than acceptable by the standards of the 1950s. Back then, screens broke down after a few hundred passes, causing white ink to leak (tiny white dots around the "BUILT BY LIONEL" block are evidence).

The script lettering, which is often blurred, gave credence to the mistaken theory that 2245s were "rubberstamped." No regular-production *Texas Specials* were "rubber-stamped."

The blurred lettering resulted because a thick deposit of ink was required for the long white stripe. For clear, sharp lettering, they would have had to screen it in a second pass using a second screen after the first coat of white ink had dried.

Other than the Santa Fes, the *Texas* Special is the only F3 that used both the early bodies with open portholes and the late one with closed portholes. I've seen two original *Texas Special* A units with closed portholes, both painted on a blue no 2368-type shell using later no. 50-100 one-piece horns. These very uncommon pieces were probably dealer replacement shells, issued in 1956 or '57.

► The script lettering on the original no. 2245 *Texas Special* A unit at the top of the photo lacks sharpness because it was screen-printed in just one pass. The restored *Texas Special* at the bottom of the photo looks much better because the red lettering was screen-printed over the white stripe.

B&O in blue and gray

In 1956, the same year the 2245 was dropped from the catalog, Lionel introduced what may be the most highly prized of all regular-production F3s, the no. 2368 Baltimore & Ohio. From a decorative standpoint, the 2368 (cataloged for only one year) is the most complicated Lionel F3.

There are five different colors on the body: blue, white, gray, yellow, and black. To save time and money, Lionel molded the bodies from blue plastic, requiring only that the white and gray areas be painted using masks that Camuso developed.

If Lionel striped the B&O cabs (two at a time) with the same kind of rubberstamping equipment that it used on the Santa Fes, then it needed six separate processes to decorate these new F3s. First, it painted the upper sides white, followed by painting the roof gray. Third, it rubber-stamped both sides at once and then rubber-stamped the nose. The fifth and sixth steps involved



heat-stamping the lettering on both sides.

The mask Camuso designed for painting the B&O A units white has engraved on one side, "2368 – M-6 A." This label identifies the mask ("M") as the sixth ("6") in the series for A-unit cabs ("A").

The device is a typical Camuso product. It's sturdy, efficient, and practical. It opens and closes like a book jacket and has the unique Baltimore & Ohio nose contour separating the blue and white. The roof mask for the 2368 is similar to the one Camuso later designed for the no. 2373 Canadian Pacific F3, except that it lacks the "arrow" openings on the sides.

Scratching the surface

Masking tape and screens, rubberstamping equipment and paint masks – these were just some of the materials and machines that Lionel used in the postwar years to decorate its magnificent F3s. The many colors on the Santa Fe and Baltimore & Ohio units made them popular then and continue to impress collectors and operators today.

Of course, there were many other great F3s in the Lionel line. Some of them, like the Western Pacifics, were decorated before Camuso revolutionized painting at Lionel. Others, notably the Illinois Central, Canadian Pacific, and New Haven units, benefited from his ingenuity. There's plenty left to learn about how Lionel decorated these classic locomotives.

The full history of Lionel's most popular diesel models is told by Joe Algozzini in Lionel's Postwar F3's, available from Kalmbach Publishing Co. Call 1-800-533-6644 or visit kalmbachbooks.com.

This no. 2363 Illinois Central F3 from 1955 has vertical-mounted motors in the A unit. All of the later F3s (from 1955 onward) have chemically blackened trucks, including Santa Fe and *Texas Special* units that previously used silverpainted trucks.

2363

Growing diese

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CENTRAL

INCIS

Lionel's switch from horizontal to vertical motors quieted the popular locomotive

by Len Carparelli photos by William Zuback



IONEL'S CHERISHED postwar F3 – arguably its all-time bestseller – is a familiar face to many. But not everyone knows that Lionel's first diesel locomotive, at the height of its popularity, underwent a substantial change.

These beautiful engines, as much in demand now as when they were introduced in 1948, were ultimately built with both horizontal-mounted and verticalmounted motors. Why? The designs of other Lionel locomotives provide clues, but the locomotives themselves aren't talking and, a half-century later, the engineers who designed the F3s are long-since gone.

Today, we can only speculate why, but even if you're not a postwar F3 connoisseur, you can easily use external visual and aural clues to determine what's beneath the shell of any postwar F3.

Horizontal beginnings

In 1948, Lionel stepped up the pace of postwar toy train technology with the no. 2333 F3, Lionel's first diesel.

The F3 offered something new: a plastic body (as opposed to the familiar die-cast metal steam boiler and cab), a die-cast metal frame, a down-under

reverse-unit lever, and a battery-powered diesel horn.

Lionel's internal design for its F3, incorporating two horizontal openframe motors, would be the first of many postwar twin-motored O gauge units.

However, the initial F3 design was actually lifted from the double-wormdrive no. 671 and no. 726 steamers produced in 1946. By the time the F3 was issued in 1948, Lionel had already redesigned the mechanisms of those two steam locomotives using single-worm gear drives.

There lies the first mystery: Why did Lionel, during a period of innovation, settle on a somewhat dated drive system for its first F3s?

While the no. 2333 Santa Fe and New York Central F3s ran well – their twin motors saw to that – they did not run great. In the days before Magne-Traction they didn't pull very well either. Operators routinely shun them today in favor of Magne-Traction-equipped F3s, the nos. 2343 and 2353 in particular.

Just as surprising is that Lionel stayed with the horizontal, double-worm-gear drive on its F3 diesels for seven years, until 1955.

On the horizon

Lionel took pride in its fine, smoothrunning, well-tooled machinery. The F3, though successful, had a weakness that Lionel couldn't ignore. It growled.

Both horizontal motors, wired in tandem with a single reverse unit, produced a sound that many owners later regarded favorably. The audible growl from the diesel as it rolled down the main line had a certain realistic sound to it.

Lionel didn't share the enthusiasm for this unintentional sound system and began looking for ways to fix it. The answer could be found in new products.

In 1949, Lionel introduced its no. 622 NW2 diesel, an unassuming little "yard goat" switcher that contained many features that would figure prominently in future F3s.

For one, the NW2 used a new vertical "drop-in" motor (part no. 622-100) with a single worm shaft that connected directly to the geared drive axles of the motor truck. It was neat and tidy and also economical.

Second, the 622 tried out an experimental feature: Magne-Traction. Lionel's patented traction device, which consists of twin magnetized axles pressed





on to sintered-iron drive wheels, promised that a locomotive with Magne-Traction would literally stick to the rails better than ordinary locomotives.

Third, the motor in the 622 incorporated a new, Bakelite brushplate holder, which incorporated "hair-pin"-type brush springs and open brush wells. The tubular brush springs and holders of the previous era were gradually being phased out, although the 1948 and 1949 F3s still had fiber-board brushplates. But this, like many other features on the F3s, would change.

Interim changes

Lionel's 1955 catalog touted the

virtues of its redesigned diesels.

The first of those evolutionary changes took place in 1950.

Satisfied with the performance of

Magne-Traction on its 622s, Lionel introduced, to great fanfare, its new, exclusive feature to the public in 1950. To note the changeover to Magne-Tractionequipped F3s, Lionel gave these engines new and separate numbers – 2343 to the Santa Fe and 2344 to the New York Central. Previously, both Santa Fe and New York Central F3s had shared the same catalog number.

Magne-Traction inadvertently helped quiet the growling F3s. Because they operated with less wheel slip, the noisy mechanisms didn't have to work as hard to maintain speed.

Other internal changes – the use of the new 2343-type brushplates similar to those in the 622 – did little or nothing to alleviate noise.

In 1953, Lionel experimented with nylon drive gears and repositioned the horn and relay apparatus in the dummy unit. F3s built in 1953, however, growled just as loudly as earlier models.

Another drawback to the horizontalmotor design, at least in the eyes of youngsters in the early 1950s, was that the F3s simply weren't very fast. Considering that the real railroads touted F-unit powered passenger trains traveling close to 100 mph, Lionel's model didn't convey "speed." It even paled in comparison to Lionel's newest big diesel, the Lackawanna FM Train Master, introduced in 1954. The time had come for a redesign. On F3s made in 1955 and later, the truck sideframes are staked (instead of screwed) in place. This design requires a special tool to tighten them. The split-metal stake is visible through the crescent opening of the frame above. All postwar F3s used a battery to power the horn, but the swiveling battery cover plate changed. The newer diesels also had a different truck design, placing single pickup roller collector arms on each truck instead of two on one truck.



Horizontal vs. vertical

FEATURE	HORIZONTAL	VERTICAL	
1. Speed	Slower	Faster	
2. Power	Slightly lower	Slightly higher (debatable)	
3. Body-shell detail	Some have grab irons, separately applied cab ladders, some with roof screens, clear portholes, two-piece horn, two-piece pilot, generally sim- pler paint schemes	Lacking grab irons, molded-in cab lad- ders, no roof screens, one-piece horn, plugged portholes, no truck ladders, one-piece pilot, highly detailed paint schemes	
4. Couplers	Coil operated	Magnetic armature	
5. Truck sides	Painted black or silver	Chemically blackened	
6. Noise	Very loud	Moderate	
7. Mechanical features	Horn, headlight, two motors, Magne- Traction (except for 2333s)	Horn, headlight, Magne-Traction, one or two motors	
8. B units	Available for most, none for 2345, 2355 Western Pacific	Available for most, none for 2373 Canadian Pacific	
9. Dummy A units	Available for all	Available for only 2373 Canadian Pacific and 2383 Santa Fe	
10. Troubleshooting	Worm gears and axle bearings can wear out prematurely if subjected to continuous operation of heavy loads; coil-coupler wires break easily	Motor-mount screws and staked-on sideframes tend to loosen; coupler armature spring loosens easily	

Going vertical

Whatever the impetus, the new F3s, with vertical-mounted motors, were finally cataloged in 1955, designated as both single-motor (2240 series) and double-motor (2300 series) models.

Locomotives Lionel made in 1955 and 1956 included the nos. 2363 Illinois Central, 2367 Wabash, 2368 Baltimore & Ohio, and 2378 Milwaukee Road. In 1957, Lionel cataloged the nos. 2373 Canadian Pacific and 2379 Rio Grande F3s, followed in 1958 by a new Santa Fe F3, no. 2383.

The new vertical motor (part no. 2028-100, also used on the GP7 introduced in 1955) finally quieted the F3s.

New parts and trucks

In addition to the new motor, the entire F3 was retooled and consisted of all-new parts.

Lionel slightly altered the body assembly and completed a major redesign of the frame assembly. The new models also featured magnetic (instead of coil-operated) couplers, and the horn and horn relay were moved from the dummy unit back to the powered unit. Externally, new truck assemblies were the biggest change on vertical-motor F3s.

Previously, horizontal-motor F3s used only one truck, the front one, to mount both pickup-roller arms. The vertical units used new single-arm collectors on each truck. Naturally, the truck castings had to be altered accordingly.

The new dummy F3 A units, each with a light bulb in its cab, still maintained both collector arms on the front truck. As a result, unlike the earlier F3s, the power and dummy truck frames and collector assemblies were no longer interchangeable.

The new F3 trucks also sported staked-on sideframes rather than the screw-on sideframes of previous years. Unfortunately, these sideframes tend to loosen from the frame with age and use. Today, operators and service technicians who don't have a staking press often find it difficult to tighten the sideframes.

Similar problems with a staked-on front pilot caused troublesome sagging that sometimes resulted in an electrical short when the pilot touched the center rail or incidental uncoupling due to misaligned couplers. The new truck sideframes, now chemically blackened instead of painted, were 10 percent smaller than the horizontal type and no longer interchangeable. Lionel used these trucks not only in its new F3s and GP7s, but also on its redesigned switchers and 44-tonners. While they are slightly too small for the F3s and GP7s, they are slightly too large for Lionel's other models of General Motors diesels.

Which is better?

Speed and power aren't everything. I like the beauty and sound of those old "bulldog" F3 growlers on my layout. Others prefer the somewhat quieter verticalmotor F3s, although today's diesels, which use can-style motors, make any postwar locomotive seem loud.

Either way, the postwar F3 maintains an unrelenting following, more than half a century after it was first introduced.

We'll never know why Lionel engineers took so long to change the F3, and we'll never agree on which version is better. However, we can agree that the F3's manufacturing changes add to the lore of Lionel's most popular diesel.

Copy Clues

Spotting Lionel Train Master repaints



by Len Carparelli

photos by William Zuback and Jim Forbes

T IS BIG. It is rugged. When first manufactured, it was one of the most powerful locomotives on the rails – prototype or tinplate. "It" is the Fairbanks-Morse HP-24-66 Train Master diesel locomotive, a diesel that never gained the popularity and glamour of Lionel's F units, but proved to be one of the sturdiest and most reliable diesels ever modeled on three rails.

The awesome pulling power of the Train Masters is well known to Lionel enthusiasts and these three-rail titans are the centerpieces of many collections and layouts throughout the country. Interestingly, all Train Master models remained fairly constant in appearance and engineering design throughout their tenure in Lionel's postwar catalogs.

The Train Master

Launched in 1954, Lionel's model of the 2,400-hp Train Master is a good model, both as a scale representation of the prototype and as a locomotive with great operating characteristics, thanks to what the 1955 Lionel catalog described as the "newly designed worm gear motor." This motor was used in Train Masters and the no. 2240-series single motor F3s. The same reliable motor would later power Lionel GP7s and 9s, EP5 electrics, and later F3s.

The Train Master was commemorated in nine different models from 1954 to 1966, though only in three road names: Jersey Central, Lackawanna, and Virginian.

The first Train Master was the no. 2321 Lackawanna. There were two basic versions of this engine, one with a red or maroon roof and one with a gray roof, although both bear the same road number. Many collectors, myself included, Train Masters are imposing locomotives and the glossy Jersey Central model at right is the most highly prized of them. Models courtesy of Joe Algozzini.

believe that the maroon-roof version was the earliest model produced since most 1954 no. 2223W sets include maroon roofs. Conversely, most, if not all no. 2243W sets from 1955 contain the more common gray roof variation.

From a manufacturing standpoint, all logic points to the maroon roof version as the earliest version since it required an extra step in the manufacturing process: masking the roof. By the way, all Lackawanna Train Masters actually have a maroon roof, on the gray version the roof wasn't masked when the gray paint was applied.

In fact, I believe that this is true of virtually all postwar Lionel diesels. The entire body was painted with a base coat: not just the sections you see on the finished product. For example, Western Pacific F3s are completely orange underneath, Santa Fe F3s are silver underneath, and New York Central F3s are light gray underneath.

The no. 2321 Lackawanna

All no. 2321 Lackawanna Train Masters (original and repaint) were spray painted both gray and maroon. In fact all original Lackawanna shells were hand-masked using die-cut masking tape. Lionel didn't begin to experiment with metal paint masks until 1955.

An interesting error is seen in photo on page 61. The sideby-side Train Masters appear the same, but look closer. The production worker used the wrong tape mask and the maroon band design on the right-hand side of the unit on





An example of a paint mask gone awry. Note the right-hand maroon stripe on the Train Master to the left. The stripe was painted upside down.

the left, is backward. Obviously, this would have been an impossible mistake if the assembly worker has been using a metal die (see Spotting Copies, CTT, May 1998).

The best rule of thumb for determining the originality of a no. 2321 is to examine the lettering and graphics. Originals are rubber-stamped and restorations are silk-screened. Silk screening is very clean and crisp, while original rubberstamping may leave the finished product with a blurry or grainy look.

Another clue is the yellow stripe alongside the cab.



Most original Lackawannas have yellow stripes that are too low. Repaints usually have more precise striping.

Almost every original no. 2321 has the stripe too low or out of register. The yellow stripe should border the gray and maroon colors, but it is almost always printed too far into the maroon band. Most restorations are lined up correctly!

The color of the plastic of the shell is also an indicator of authenticity. An original no. 2321 has gray paint on a gray shell, whereas some reproductions use blue plastic shells.

Hints of authenticity can also be found when examining the railings. All original Train Master railings have a notch in each piece (except for the single stanchion). The absence

Lackawanna and Virginian Train Masters

No.	Road name	Original	Restoration	First year
2321 and 2321R	Lackawanna in maroon top or gray top versions	Rubber-stamped graphics; gray shell only	Screen printed graphics, any color shell	1954
2331	Virginian/black	Rubber–stamped graphics, gray shell only	Screen printed graphics; any color shell; "Virginian" name is placed slightly higher than original	1955
2331	Virginian/blue, gray shell variation	Same as black 2331; same color yellow, some originals exist painted over 2321s	Screen printed graphics; any color shell; "Virginian" name is placed slightly higher than original	late 1955
2331 (1956)	Virginian	Same, blue shell only; deeper yellow; some painted blue, others unpainted blue plastic	Screen printed graphics; any color shell; "Virginian" name is placed slightly higher than original	1956
2322	Virginian	Same as above, all are painted blue on a blue shell	Screen printed graphics; any color shell; "Virginian" name is placed slightly higher than original	1965



Repainted Train Masters often have the letters VIRGINIAN applied slightly higher than the postwar version. This is due to a limitation in the screen printing process that requires space to accommodate the frame's edge.

of a notch suggests, at the very least, that the railings have been replaced.

Lastly, Lionel decals are all water-type and should show some signs of yellowing or discoloration from age.

The no. 2331 black Virginians

The black and gold no. 2331 Virginian Train Master made its debut in 1955 as a companion piece to the Lackawanna Train Master. Mechanically it is identical to the earlier model.

Like the 2321, it was produced on a gray painted shell although some restorations have been painted on blue plastic shells. The model was hand masked and usually exhibits a very heavy coat of yellow paint. Trying to cover black with a lemon yellow paint was a tough chore and Lionel wasn't One clue to identifying a Jersey Central repaint is letter spacing. An original has uneven spacing between the words "Jersey Central Lines" while a repaint is usually more professional in appearance and has the words equally spaced.

interested in applying two coats of paint. One thing that most restorations have in common is that the painting is typically neater than the original.

Again, like the 2321, all Virginians were rubber-stamped while restorations are screen printed and the lettering is placed higher on the sides of the locomotive (in order to accommodate the ledge of the silk screen). Silk-screened end safety stripes will also appear more crisp than original rubber stampings.

The no. 2331/2322 blue Virginian

The first blue and yellow Virginian Train Master appeared in either late 1955 or early 1956 and is, with the with the possible exception of the no. 2341 glossy Jersey Central, the rarest of the Fairbanks-Morse series. This version appears on a gray shell, is hand masked, and is painted the same yellow as the black and yellow Train Master.

Sometime in 1956 Lionel decided to mold FM shells out of blue plastic for both the Virginian and Jersey Central Train Masters. Interestingly enough, no original no. 2321 Lackawanna has ever surfaced on a blue shell, although the engine itself was cataloged in 1956. Perhaps Lionel only continued to offer it in order to help its dealers exhaust the previous year's inventory.

All multi-colored items from 1955 onward made use of brass and copper masks and the no. 2331 Virginian Train Master from 1956 was the first made using these new paint masks. Gone were die-cut paint masks and taping by hand.

The metal masks allowed painting to be more uniform in appearance and the break, or border between colors is softer and somewhat fuzzier than the crisp, sharp edges produced by masking tape. From a manufacturing standpoint, Lionel could save time and money and produce a more consistent product.

The blue Virginian Train Masters can be authenticated using the same reference points as the no. 2331 black and gold version. Additionally, most examples of the no. 2322 run in 1965-1966 and have a lime-green colored graphic as opposed to the brighter yellow of the 2331s. The 2331 Virginians can be found with both painted and unpainted blue plastic shells, while all 2322s are painted blue.

No. 2341 Jersey Central Train Masters

When considering Lionel's postwar locomotive production, few locomotives are as rare as a glossy no. 2341 Jersey Central Train Master. Oh, factory prototypes and errors would certainly compete for that title, but in a production year that gave us desirable products like the nos. 2368 B&O F3, 2240 Wabash F3, and 2378 Milwaukee Road F3, the glossy version of the Train Master is the rarest of the rare. Even in poor condition the 2341 is tough to find.

There is much speculation about why this is so. The Train Master was a premier engine possessing a deluxe position in Lionel's line. It is jam packed with features such as Magne-Traction two motors, horn, headlight, metal handrails, diecast trucks and underframe, and operating couplers. It wasn't cheap – \$40 – which would be about \$600 by today's standards. Still, the engine never took off with consumers.

Why?

Well, the Jersey Central was a small Eastern railroad that lacked name recognition in other regions. Other factors included competition from sleek, colorful F3 diesels, the overall quantity of product in the 1956 catalog, and going head-tohead with the Virginian Train Master. While the Virginian was also a small Eastern road, the paint scheme was nothing if not eye-catching, so the 2341 got lost in the shuffle.

This gem was only cataloged in 1956 and it came in two distinct versions: one with high gloss orange paint and the other with flat orange paint. No Jersey Central Train Masters were ever painted blue, the blue plastic shell was always left unpainted on the roof and sides.

The easiest way to tell an original Jersey Central engine from a repaint or restoration is to examine the lettering. Originals are heat-stamped and repaints are screen printed. To determine if the engine was heat stamped, simply feel the indentation, particularly the "BUILT 4-56 BY LIONEL" graphic. The Train Master table above can be a help as well.

As always, before making an expensive purchase, if you are unsure about an item's authenticity, you should always consult a knowledgeable and trusted friend or associate. Keep in mind that the seller may not know if an item is origi-

Jersey Central Train Masters

Original	Restoration
Heat stamped	Screen printed
Different spacing between words "Jersey" and "Central" on each side	Same spacing on some reproduc- tions; use caution as later restora- tions have the correct spacing
Underside of cab has no overspray, particularly on the bottom of the cab steps in each corner	All reproductions have this over- spray
Orange band is scooped out under mars light to accommodate paint mask	Some reproductions are painted straight across; those that are scooped out are usually too crisp and exact
All originals are unpainted royal blue plastic; the inside, roof, and blue side band were never painted	Most restored cabs have been painted blue; some that are left unpainted blue are a darker shade than original 1956 engines
Original water decals are always yellowed or discolored with age	Early restorations used pressure sensitive decals; later examples may have water decals, but not as dis- colored



Original warning stripes were often blurred or grainy when compared to the clean, precise edges of a repainted Virginian's warning stripes.

nal (especially if he is new to the hobby or if he doesn't normally deal with old trains). Happily, most train dealers and collectors are honest and chances are that if you're new to the hobby, it won't take too many trips to the local train meet to discover people you can trust.



SPOTTING COPES TIPS ON RECOGNIZING LIONEL GEEP REPAINTS

by Len Carparelli Photos by William Zuback

IONEL'S POSTWAR diesel locomotives are exceptionally well made and very well decorated. They are colorful, they run well, and they probably satisfied every 1950s kid's dream of being a locomotive engineer. Today, many people in the hobby value them more for their paint schemes than for how well they run.

As in almost any type of collecting, if something with collectible value can be duplicated, it will be duplicated. Sometimes the intent is to defraud, but not always. Reproductions can be made to satisfy collectors or operators who want a fresh-looking representation of one of these classics on their lines, but want it without having to pay high collector prices for like new or mint condition pieces. Trouble will arise when these repaints, often not marked as reproductions, pass from hand to hand. More than one novice has bought a repainted locomotive, thinking he or she has purchased the real thing.

Lionel's Geeps

Introduced by Lionel in 1955, the Geeps were announced in the new catalog with the banner, "How often you've seen diesels like this on big railroads and dreamed you were at the throttle. Now you can be!"

How could we 1950s railroaders possibly resist the catalog's call? By 1955 dieselization of America's railroads was nearly complete. Over 2,600 Geeps were already in service and more were coming off the General Motors assembly line every day. Lionel, always on the cutting edge, had produced the very latest models for our own miniature railroad empires. The modern, utilitarian look and feel of the Geeps made them all the more realistic and desirable to young imaginations.

Lionel offered three road names on its General Motors GP7 model in 1955: the nos. 2028 Pennsylvania, 2328 Burlington, and 2338 Milwaukee Road. The 2328 Burlington and no. 2028 Pennsylvania were cataloged as O-27. The Burlington's list price was \$23.50, and the plainer Pennsy model cost \$18.50. Meanwhile, the No. 2338 Milwaukee Road appeared in the O gauge section of Lionel's catalog, and while mechanically identical to the 2328, it was offered at the higher price tag of \$25.00. The only possible reasoning for

Many of us love classic postwar Lionel Geeps, like these original Northern Pacific, Boston & Maine, Milwaukee Road, and Chesapeake & Ohio examples, but are you sure you can tell original Lionel products from restorations?

this curious price discrepancy was the fact that the no. 2338, with its two-color paint scheme, was slightly more expensive to manufacture.

A ATAS

Since Lionel had not begun using elaborate paint masks at that time, most of the prep work for decoration and graphics had to be done by hand on the assembly line. Lionel could then justify the added expense by offering the 2338 in its deluxe, O gauge line.

For some reason no new Geep road names were added in 1956; in fact, the 2028 was dropped from the catalog. Perhaps Lionel was concentrating on promoting some of its more glamorous engines instead. Remember, these were still heady days for Lionel, and that year's catalog marked the introduction of the no. 2350 New Haven EP-5 and six different F3s (the most road names ever offered on that postwar classic).

The GP series was a good seller for Lionel, and the firm cataloged GP7s and GP9s from 1957 through 1966. The company offered Geeps in a total of eight different road names. In

A restored orange-band no. 2338 Milwaukee Geep. Note the screen-printed lettering on both the cab logo, the road number, and "Built by Lionel." The orange band has been painted; originals are translucent, unpainted plastic.



TATE

Compare the newly applied 'Pennsylvania' with the shell's original Lionel markings. Although the lettering is in the same font, or typeface, note how much brighter and sharper the screen-printed lettering is.

2365



CLASSIC TOY TRAINS

TABLE 1: GP7 AND GP9 COMPARISON

Catalog number, road name, and year introduced		Original	Restoration	
2028	Pennsylvania 1955	Three variations, all rubber-stamped. Always found on an unpainted brown plastic shell. Never came with headlight lens, horns, or railings and should show no evidence of these trim items ever having been mounted.	All restorations are screen-printed; some original unpainted brown plastic shells have been recently re-lettered, but always by screen printing or decals.	
2328	Burlington 1955	Rubber-stamped.	Screen-printed.	
2338X	Milwaukee Road 1955	Orange band, see table 2	Orange band, see table 2	
2338	Milwaukee Road 1956	Common black version was always rubber-stamped; some versions were painted orange.	Screen-printed.	
2339	Wabash 1957	Heat-stamped; unpainted blue plastic shell. Two versions exist, royal blue and dark blue.	Screen-printed; painted blue. Color separation is usually much sharper than on an original.	
2337	Wabash 1958	Heat-stamped; painted blue, but lighter than both no. 2339 variations. The number 2337 is larger than it appears on no. 2339; always found with fixed coupler.	Screen-printed; 2337 number is identical to no. 2339; can be found with any style frame or couplers.	
2348	Minneapolis & St. Louis 1958	Three variations: black, gray, and red body mold, with red least common. Heat-stamped with white stripe painted last.	Any color shell; always screen- printed with sharper definition between color separation, white stripe.	
2349	Northern Pacific 1959	See table 3	See table 3	
2359	Boston & Maine 1961	Heat-stamped graphics, color separations are soft	Screen-printed graphics; color separations very crisp and sharp.	
2346	Boston & Maine 1965	Heat-stamped graphics, color separations are soft.	Screen-printed graphics; color separations very crisp and sharp.	
2365	Chesapeake & Ohio 1962	Heat-stamped lettering; same frame as no. 2028 shell. Has mounted trim, unlike earlier no. 2028.	Screen-printed lettering, any color shell or type of frame possible.	
2347	Chesapeake & Ohio 1965 (Sears, Roebuck & Co.)	Uncataloged set engine. Heat-stamped lettering, lighter blue than no. 2365, but otherwise identical body shell except for number. Deluxe frame with horn, relay, and fuel tanks. Unlike no. 2365, all known examples on black plastic shell.	Screen-printed lettering, any color shell or type of frame possible.	

TABLE 2: 2338 MILWAUKEE ROAD COMPARISON

Original

Orange unpainted plastic, translucent shell on all known examples – no exceptions.

All originals are rubber-stamped.

Most are painted black on the inside.

Original box is corrugated cardboard, no insert, and marked 2338X.

Restoration

Most restorations have been painted orange; those left unpainted show some tell-tale hints of black paint in the crevices.

Restorations are screen-printed, although some may have a decaled cab herald.

Most interiors are not painted black.

Most restorations are not offered with a box; beware orange-and-blue no. 2338 box, which is 1956 production.

chronological order they were: Pennsylvania, Burlington, Milwaukee Road, Wabash, Minneapolis & St. Louis (the first GP9), Northern Pacific, Chesapeake & Ohio, and Boston & Maine. Of these eight road names, 17 major variations exist, all of which are chronicled in Table 1.

Restored and original Geeps

All postwar GP7 and GP9 bodies are identical and interchangeable. Unlike the F3 diesels, the body mold for the Geeps remained unchanged until MPC purchased the company in 1969. The only differences are the color of the plastic and the presence or absence of the dynamic brake "blister" on the roof. For some reason Lionel used this detachable part to indicate the difference between GP7s and GP9s, which, prototypically speaking, was grossly inaccurate, as both engines could have been equipped with dynamic brakes.

Lettering on original Lionel Geeps is either heat-stamped or rubber-stamped; restorations are screen-printed or decaled. This is probably the best method for detecting an item's authenticity. An explanation of heat stamping, rubber stamping, and screen printing may be found on the next page.

The orange band 2338

The greatest controversy surrounding the GP-series engines centers on the early 1955 version of the no. 2338 Milwaukee Road. The first run of this road name was prototypically correct, with the lower orange band running all around the body shell.

Later production (either late 1955 or early 1956) has the orange band interrupted by solid black on both sides of the engineer's cab. The orange band version has "2338" rubber stamped in black; the more common "black" version is rubber stamped in white. By the way, the 1955 catalog correctly illustrates the rare, orange band variation, while the 1956 illustration is that of the more common black no. 2338.

Why Lionel decided to make this change is still a mystery; the most popular theory is that masking the side was more troublesome in production, and that to cut costs, that step was eliminated. The only problem with this theory is that, as a painter, I can tell you it really doesn't save time or money at all.

At the time Lionel was using die-cut masking tape to decorate these engines. The time spent ripping the tape from the roll and sticking it on the shell was less than 10 seconds, but remember, workers had to mask the rest of the shell regardless of whether they covered the cab section or not. Any time saved by not masking the cab was lost, since there were now more areas that needed to be painted black!

Another popular theory is that the rubber-stamped Milwaukee logo didn't adhere well to the unpainted plastic. The only problem with this theory is that it took years for the rubber stamping to start to wear off (if it did at all!), so this was unlikely to concern Lionel managers in 1955. Besides, the no. 6464-300 Rutland boxcars, no. 2331 Virginian Fairbanks Morse Train Masters, no. 2368 Baltimore & Ohio F3s, and no. 2363 Illinois Central F3s are all unpainted, rubber-stamped items that have shown little or no sign of wear over the years.

Certainly no rubber-stamped items showed much wear in the six to eight months between Milwaukee Geep production runs.

I believe that the most logical explanation is that Lionel simply ran out of the particular die-cut rolls of tape required to mask the cab section of the shell. Or maybe the order department erred and only delivered the two hood section pieces. Regardless, with a production deadline to be met, Lionel may have decided it was best to improvise: they had done so in the past, usually with satisfactory results.

As most collectors know, today the

Sharp-eyed readers may be able to date this motor assembly (right) to 1965 or 1966 by the fact that the armature windings are green, while the field windings are red. All 1955 vintage motors should have orange wire on both the field and armature assemblies.



The inside of the restored no. 2338 Geep shell has not been painted black, as most originals are. On the chassis, note the operating horn assembly (part no. 2367-55) has been replaced with a new part.



HEAT STAMP, RUBBER STAMP, OR SCREEN PRINTING?

L IONEL USED three methods for adding graphics to its products: heat stamping, rubber stamping, and to a lesser extent, an early form of screen printing. Heat stamping was the company's first choice because it was economical and produced clear, sharp results.

In the heat-stamping process, heat and pressure are applied to a tool or die containing the needed design or lettering. The heated tool forces its way through a colored (heat) ribbon and causes the paint or plastic to soften and rise around the indented design. This leaves a slightly three-dimensional indentation that you can feel with your fingernail. No solvents or inks are involved in the dry heat-stamping process. The applied graphics represent the melted ribbon foil from the heat-stamping machine.

Rubber stamping is a less precise method of applying graphics. The results are often grainy and shadowy, or they may smear or be blurry around the edges. This is because the process is a wet one, compared to heat stamping. The method uses ink and solvents and requires thin paint density. There is no indentation, so you can't feel the graphics as you can with heat stamping.

Lionel's rubber-stamping method was actually a crude version of today's pad printing. In this process a stamp or die (made of steel) is created with the desired image or lettering. It has raised lettering and always "reads right," opposed to a reverse or mirror image.

After being covered with ink, a rubber or silicon pad picks up the image and transfers it to the part. The results can be imprecise, to say the least.

On the other hand, today's screen-printing process is a precise and relatively inexpensive way to produce topquality paint restorations. This method is really just a sophisticated stencil system that allows ink to be forced through the open areas of an extremely fine screen and placed onto the surface of an item. This is an exceptionally clear printing method, leaving no shadow or outline (such as with rubber stamping) and causing no indentation in the shell. – *Len Carparelli*

ROMUALDO CAMUSO'S WORK OF ART



The brass and copper metal paint mask, above, was made for decorating the no. 2349 GP9. This mask, and others like it, were used to paint every multi-colored item made by Lionel from 1955 onward. The opened mask looks like a book, with two hinged sides resting on pre-set stops. Below, a Geep shell, previously painted black, is inserted into the holding fixture of the mask. The mask is closed and locked into place.



Constant of the paint of the metal paint masks used to decorate every multi colored item painted by Lionel from the glamorous F3 diesels to the no. 151 semaphore arm.

Shown is one of Romualdo's works, the paint mask for the no. 2349 Northern Pacific GP9. Absolutely ingenious in design, the mask allows for exact paint decoration on each and every unit. It opens and closes like a book jacket, using piano hinges, brass and copper tubing, and other household materials, all held together by means of screws, rivets, and silver solder. The base plate is heavy brass, and Romualdo also made use of plumbers' fittings to lock the two sides together during operation.

The inside of the painting edges correspond to the exact reverse of the body mold, ensuring a snug fit and a minimum of paint overspray. Remarkably, the inside metal edges, although sharp, never scratch or blemish the body during insertion, decoration, or ejection.

Unfortunately, the ejector lever for the paint mask was removed and lost over time. The ejector lever is necessary to remove the body from the snug inner fixture without the operator ever having to touch the wet, freshly painted item.

The mask has an engraved plate bearing the number 2349-M-3A2R2.



The Geep shell above is painted red, with the pre-formed and -shaped mask automatically creating the correct design. Using an ejector lever, the shell is loosened from the holding fixture, allowing the operator to remove the freshly painted shell. It would be placed on the drying rack. Once dry, it would be placed in the next mask where the gold areas are painted. Below, the paint mask bears the engraved serial number: 2349-M-3A2R2.



This obviously has some meaning, and logic leads me to the following conclusions:

- 2349 obviously, the catalog number.
- M metal paint mask.

3 - either the number of colors on the finished product, or the third of this series of identical masks.

- A unknown.
- 2 unknown.
- R-Red, the color used to paint with this mask.

2 – The second color in the decorating process, undoubtedly instructions for the production department.

Lionel used several of the same mask for each of its production runs, and it is unlikely that more than five or six units were painted before the paint build-up had to be washed off the mask. Otherwise, the paint drips into the crevices, ruining the shell. Most likely Lionel had several persons on the production line whose job was simply to soak and/or wash the masks with paint thinners or mineral spirits. Once sprayed, the body shells were relegated to the drying racks to await insertion into the next mask for the final color decoration. Less material to buy, less handling of the product, less labor cost, and in the end a much better product!

By the way, the tall brass pipe in the center of the mask is not original factory production. It seems the previous owner decided that the best use of this remarkable and innovative device would be to convert it into a reading lamp, complete with lamp shade, light switch, and all! – *Len Carparelli* orange-band no. 2338 is the most valuable of the regular production run Geeps. What about the value of the no. 2347 Chesapeake & Ohio Geep, you ask? Although more scarce, we can't really include the no. 2347 since it was not a regular-production item, being an uncataloged engine made for Sears.

Opinions vary on the number of no. 2338 orange bands produced, from 100 to several thousand. Perhaps somewhere in the middle is accurate. I don't have production records from 1955, but if someone out there does, please come forward. Since it remains one of the most desirable (and expensive) of the GP series, the no. 2338 orange version deserves a table of its own for determination of authenticity. Table 2 may help vou here.

No. 2349 Northern Pacific Geep

When I began collecting trains in 1968, the most popular Geep was the no. 2349 Northern Pacific, not the no. 2347 Sears engine or even the no. 2338 orange-band Milwaukee. It wasn't until I was writing this article I realized why.

Prices then were one tenth of what they are today. Mint-in-the-box 2349s could be had for under \$125, and most other Geeps were under \$100. The Milwaukee was looked at as kind of an oddity, and most collectors of the day were more concerned about acquiring different road names, not the variations. The same logic applied to the Sears no. 2347. Since it was almost identical to the no. 2365, its desirability was lessened.

Of the remaining locomotives, the no. 2349 was not only the least common, but it was also one of the most striking in appearance, with its sleek black body and gold trim. It is still a favorite among collectors and operators for the very same reasons. Since many no. 2349s have been restored, distinguishing a mint original from one that has been redone is not always an easy task. However, a little knowledge goes a long way. The facts in Table 3 may help you avoid buying a repaint at original locomotive prices.

When buying a Geep, or any postwar locomotive for that matter, look for the shell's natural plastic color, the clarity of the paint job, and in some cases, even for signs of whether or not trim items appear to have been attached. A repainted locomotive can be a smart buy - if you are looking for a repaint and know that's what it is before any cash changes hands. A correctly repainted Geep can add color to a collection or layout. The trick is knowing what you are paying for!

TABLE 3: NO. 2349 NORTHERN PACIFIC COMPARISON

Original

Gray or black plastic shell on all known examples.

All originals are heat-stamped. Some examples have rubber-stamped "Radio Equipped." Original heat stamping is very bright, clear, gold leaf; even faded examples look very metallic.

Original box is corrugated cardboard, no insert, and can sometimes be found with orange-and-blue outer sleeve.

Have plastic coupler pivot plungers; gold frames that may may have been disc-sanded to reveal bare metal neccesary painted exactly as an original. Restorations are usually to complete the electrical circuit for horns, lights, etc.

Restoration

Restorations have been painted on any color shell.

Restorations are screen-printed, although some may use dry-transfer lettering. Screen-printed lettering will exhibit some of the gold particles used to manufacture the ink, even when dry, and looks a little grainy when compared to heat stamping.

Most restorations offered with no box.

Can be mounted on any frame. No restoration frame is neat, but are also incorrect.



Original (front) and restored (rear) no. 2349 Northern Pacific Geeps. The original lettering is bright. shiny, and very metallic-looking, since it was heat-stamped using gold-leaf ribbon. Using the screenprinting method, the ink used can only approximate, not duplicate, that metallic look.



These two shells illustrate some of the changes made to the mold by MPC. Approximately 5/8" below the cab window you can see two sets of louvers. On the postwar model, the front louvers extend all the way down to the bottom parting line. The MPC version has effectively cut these louvers in half. Also note along the engine hood section, the simulated access door lines have been drastically cut on the MPC version, while the postwar version has only a small section interrupted.

Dressing up a by Len Carparelli | photos by William Zuback

Learn how Lionel decorated GG1s so you can recognize a restoration

F3s, TRAIN MASTERS, ALCOS – you name it, and I've restored it during the past 25 years. Next to the Santa Fe F3, the locomotive restoration most requested is Lionel's Pennsylvania RR GG1.

No matter whether it's the singlemotor type (no. 2332) or the doublemotor engine (nos. 2330, 2340, and 2360), a great-looking GG1 wins compliments from collectors and operators. They're right to admire this O gauge electric because the early model helped inject new interest in Lionel's line and its twin-motor successor might have been the most powerful locomotive the firm ever produced.

Of course, if you're adding a GG1 to your roster, either to put on a shelf or run on a layout, you want to know whether you're buying a genuine original or one that has been restored in any way. Most restorers, including me, mark the locomotives as such in a clear and distinctive manner. Still, I recommend learning about the painting processes, decoration, lettering styles and methods, and so forth that Lionel used during the postwar era. That will help you recognize a restored GG1 and better appreciate the glory of an original.

Mysterious "black" no. 2332

As Roger Carp and Frank Pettit explain in the July 1997 issue of CLASSIC TOY TRAINS, the first GG1s to roll off the assembly line at Lionel's factory in New Jersey were no. 2332s with single motors and that unique "squawk box" which is supposed to sound like the real horn on a GG1.

I can't tell you how closely Lionel's horn comes to the actual one because I

was never lucky enough to hear a GG1 highballing down the Pennsy's main line. Maybe some readers can tell us whether Lionel was really on to something or if this is another example of Lionel not letting facts stand in the way of a good story!

A great deal of controversy surrounds the initial 1947 production run of GG1s. Were they black or just a very dark Brunswick green?

According to Irving Shull, who then managed Lionel's Service Department in New York, all GG1s off the assembly line in 1947 were painted black. That was because, he added, every locomotive in the product line for that year, including the no. 221 steam engine, which had come in gray in 1946, was black to expedite production. If you still have doubts, take a no. 671 Turbine or a no. 726 Berkshire from 1947 and compare it to a GG1 from that year. They should be identical in color. If they aren't, you have a Brunswick green 2332!

You see, 1947 was really Lionel's first year of full production following World War II. The line for 1946 was thrown together as Lionel struggled to change from wartime production of compasses, binnacles, and so forth to toy trains. A year later, though, the company was ready to meet the growing demand for trains and advertised an expanded line.

Highlighting the offerings was the no. 2332 GG1. However, it wasn't ready until very late in the year. Faced with the possibility that the new engine and all the outfits featuring a GG1 might have to be delayed until 1948, Lionel would never have made the situation worse by ordering gallons of paint specifically mixed to match the Pennsy's Brunswick green. It wanted to be sure everything was in stores in time to sell by the holidays. Lionel had plenty of black paint in stock, which is another factor that makes plausible the view that all locomotives were painted black in 1947.

What adds to the confusion is that in 1948, when Lionel finally did paint the GG1 body shells in the correct Brunswick green, the first batch off the line was too dark a shade of green. Lionel had to adjust the color.

Consequently, collectors may mistake a "too-dark" GG1 from 1948 for a true black version from the previous year. Having restored hundreds of GG1s in my career and being able to compare dozens at a time, I can attest to there being more than one shade of Brunswick green, none of which is as dark as the black models from 1947.





Yipes stripes!

The real cause of the delay in shipping GG1s in 1947 related to the striping. The process for decorating the body shells had not been perfected. In fact, no equipment existed in the printing field to handle this incredible task.

Therefore, Lionel had to invent and build its own equipment that would apply stripes in a consistent, economical, and attractive way. After all, the GG1 was the first new "non-steamer" offered by the firm after the war. Lionel knew its reputation would be on the line and so wanted the GG1 to be great.

In the end, Lionel striped and lettered its early GG1s using a process that train collectors erroneously refer to as "rubber stamping." In actuality, as I explained in the September 1996 issue of CTT, this process is a kind of offset printing using metal "right reading" dies that yields results similar to office and clerical rubber stamps. What caused problems was not the novel process since Lionel had been decorating locomotives and cars with this rubber-stamping technology. But now it had to accomplish two new tasks.

First, the stamping dies had to be more than 12 inches long and the five stripes on the GG1 had to be printed in a single "pass" or else the registration and lineup might not be consistent. Second, the striping had to roll around both ends of the irregular surface of the GG1 at almost 90 degrees at each end. Previous stampings had extended only a few inches over flat surfaces with little or no contour or irregularity.

The new locomotive was going to create trouble, yet Lionel did it! In fact, I calculate that once the process was in order, a GG1 could be striped every 60 seconds, which would amount to 960 during a 16-hour work day of two shifts.

To Lionel's credit, the striping was crisp, clear, and bold. Sadly, it didn't The sleek lines and subtle beauty of Lionel's GG1 electric, here a no. 2360 in its original wrapping paper, have made the locomotive a legend. Expert painter Len Carparelli explains how postwar engines were decorated and what distinguishes an original from a restoration. Jim Forbes photo

last. Most GG1s seen today have lost most if not all of their striping. Details fade beyond recognition over time.

Some GG1s from 1947 and '48 have a break or inadvertent space in the striping along the corner at the top of the curve. This resulted from the lineup being set too high so that the roller pad couldn't completely negotiate the sharp contour of the shell.

Lionel corrected this problem by situating the bodies in the "nests" differently until the striping was printed a bit lower. This change to a lower lineup was evident on twin-motor GG1s, which exhibit a break by the cab ladders and have stripe points cut off at each end.



The striping was set too high on this original no. 2332. As you can see, the roller pad used to spread ink on the shell couldn't accommodate the sharp curve of the body.



The most unusual GG1 may be the no. 2340. Its lettering has two distinct typefaces, serif on one side (shown here) and sans serif on the other.



Because the stripes on so many original GG1s fade badly, more collectors and operators elect to buy handsome restorations, such as this one, done by the author at L & L Screen Printing Co.

Some early GG1s appear to have been striped in silver. Looks can deceive, however, and no proof has surfaced that Lionel used silver. Gold was the color of choice, and when it fades over time it can take on only a golden hue.

I've examined GG1s with stripes that appeared to be everything from dull gray to pale gold. This inconsistency, so unlike Lionel, increases my suspicions that it never used silver, which wouldn't fade to gold. Also, you never see "silverstriped" twin-motor GG1s because by the 1950s the printing ink industry had improved its "color fast" metallic inks to the point that they didn't fade or run.

Having invested in the striping machinery, Lionel put it to good use over the coming years. It cataloged GG1s in 1947-50, 1955-58, and 1961-63; all of them, except for the no. 2360s offered in 1963, were striped with this unique "rubber stamping" process.

The exceptions had a single large stripe that was painted on. As for lettering and numbers, all single-motor 2332s were rubber-stamped; succeeding double-motor GG1s (nos. 2330, 2340, and 2360) had heat-stamped details, except for the 2360s from 1963. Their graphics were applied with water decals.

Changing body styles in the 1950s

Like the F3 diesel that followed it into the line, the GG1 endured Lionel's ongoing wish to keep improving its products. Throughout the GG1's history, engineers modified its body.

In 1948, just one year after the locomotive made its debut, it changed internally. Lionel reinforced the motor truck-mounting screw hole boss by adding %-inch of metal to the casting. Perhaps Lionel was concerned that this integral part of the assembly might break during rough play. Also in 1948 the design was altered by eliminating the recessed circle to accommodate the mounting of ornamental horns.

The 2332 ran unchanged in 1949, but major renovations were under way for 1950. In the firm's golden anniversary, it introduced the no. 2330 doublemotor GG1. Engineers modified the existing die to create the new shell. In fact, other than the pantographs, truck sideframes, and pilots, everything on the 2330 was brand new.

Lionel built a completely new locomotive from scratch, even using new wheels. By starting with two no. 622-100 vertically mounted motors and adding a pair of newly designed Magne-Traction trucks, Lionel guaranteed that the 2330 would be a winner. Nothing could outpull it! The most noticeable changes to the 2330 body involved eliminating the roof motor mount and its two roof screws. Also gone was the "squawk box." Lionel outfitted GG1s with the same horn and relay arrangement that graced the nos. 2343 New York Central and Santa Fe F3s. However, the E-unit slot remained; it was just repositioned from the center of the shell to the side. This caused the E-unit lever to protrude more than it did on earlier models, which detracts from the realism of the 2330s.

Internally, the body was altered to create a "cradle" to accommodate the battery needed to operate the horn. Inserting and removing the battery proved to be difficult, so youngsters often left the battery in before storing their GG1s. Over time, acid from the batteries could leak and ruin the shell, motor, and striping.

Externally, the 2330s exhibited some differences. Their lettering and numbers were heat-stamped, which made them more durable. Even locomotives whose stripes are worn and paint is chipped may display bright lettering.

After four years, Lionel brought out a new GG1 in 1955, the no. 2340. It came in Tuscan red or Brunswick green. Curiously, the lettering styles on this fivestriped GG1 differ on individual engines. Every example I've seen has serif lettering on one side and sans serif on the other. I can't explain this odd divergence. After all, both sides of the shell can be lettered using the same equipment by turning the body over to print the second side. If anyone knows more about this, I'd love to hear from you.

For 1956, Lionel cataloged its fivestriped GG1 in both colors as no. 2360. Why did the number change on the twin-motor GG1? The Lionel Service Manual sheds light on this question: "In 1955, when the manufacture of the GG1 Locomotive was resumed, its number was changed to 2340 with the expectations of several contemplated changes of design, which however were not put into production. Another number change to 2360 was made in 1956 for the same reason, but, again, the changes failed to materialize."

In 1957, Lionel significantly altered the engine's appearance to mimic what the Pennsylvania RR had done. GG1s lost their five stripes ("cat's whiskers") in favor of one bold, solid gold stripe running along each side with larger lettering and keystone. But the 1958 consumer catalog again pictured a fivestriped version in Brunswick green numbered 2360-1. Even more confusing is the fact that Lionel dropped the

TABLE I: CHRONOLOGY OF LIONEL POSTWAR GG1s

No.	Year	Color/Stripes	Motor	Body Style	Lettering
2332	1947	Black/Five	One	Type I: Single-motor body w/ non-reinforced motor mount (part no. 2332-5)	Rubber-stamping
2332	1948	Green/Five	One	Type IA: Single-motor body w/ reinforced motor mount (2332-5)	Rubber-stamping
2332	1949	Green/Five	One	Type IA: Single-motor body w/ reinforced motor mount (2332-5)	Rubber-stamping
2330	1950	Green/Five	Тwo	Type II: Double-motor body w/ graduated-height side-vent grid (2330-4)	Heat-stamping
2340	1955	Green/Five	Two	Type II: Double-motor body w/ graduated-height side-vent grid (2330-4); different typeface on each side	Heat-stamping
2340	1955	Tuscan/Five	Two	Type II: Double-motor body w/ graduated-height side-vent grid (2330-4); different typeface on each side	Heat-stamping
2360	1956	Green/Five	Two	Type II: Double-motor body w/ graduated-height side-vent grid (2330-4)	Heat-stamping
2360	1956	Tuscan/Five	Тwo	Type II: Double-motor body w/ graduated-height side-vent grid (2330-4)	Heat-stamping
2360	1957	Tuscan/One	Two	Type II: Double-motor body w/ graduated-height side-vent grid (2330-4)	Heat-stamping
2360	1958	Green/Five	Two	Probably leftover 1956 product	Heat-stamping
2360	1958	Tuscan/Five	Two	Probably leftover 1956 product	Heat-stamping
2360	1961	Tuscan/One	Two	Type IIA: "Teardrop" markers and same-height ventilators	Heat-stamping
2360	1962	Tuscan/One	Two	Type IIA: "Teardrop" markers and same-height ventilators	Heat-stamping
2360	1963	Tuscan/One	Two	Type IIA: "Teardrop" markers and same-height ventilators	Decals



Lionel inadvertently omitted the lettering from one side of this no. 2360 locomotive. This collectible piece indicates that the company striped its GG1s first and then stamped on the lettering and numbers. This sequence makes sense because, if an error were made with the striping, it could easily be washed off and done again. By contrast, replacing the striping would have been more difficult if the heat-stamped lettering was already in place.

TABLE II: DECORATION OF ORIGINAL AND RESTORED GG1s

No.	Year	Original Paint/Stripes	Restoration
2332	1947	Semi-gloss steam engine black paint/ "rubber-stamped" graphics; rubber- stamped keystone on some. Stripes and lettering fade over time.	Screen-printed graphics; screen-printed or decaled keystone. Look for glued or painted- over pantograph rivet on earlier examples. Most use Type IA body from 1948.
2332	1948	Medium- to high-gloss Brunswick green paint/"rubber-stamped" stripes.	Screen-printed graphics; screen-printed or decaled keystone on Type I or IA body.
2332	1949	Medium- to high-gloss Brunswick green paint/"rubber-stamped" stripes.	Screen-printed graphics; screen-printed or decaled keystone on Type I or IA body.
2330	1950	Semi-gloss Brunswick green paint/ heat-stamped lettering. Stripes and lettering are two different colors. Stripes fade, lettering does not.	Even-color graphics; never heat-stamped; any body type can be used.
2340	1955	Semi-gloss Brunswick green or Tuscan red paint/heat-stamped lettering. Stripes and lettering are two different colors; lettering on one side different typeface than on other. Stripes fade, lettering does not.	Even-color graphics; never heat-stamped; any body type can be used. Lettering on both sides is identical.
2360	1956	Semi-gloss Brunswick green or Tuscan red paint/heat-stamped lettering. Stripes and lettering are two different colors; Stripes fade, lettering does not.	Even-color graphics; never heat-stamped; any body type can be used.
2360	1957	Semi-gloss Tuscan red paint/heat-stamped lettering and rubber-stamped striping.	Usually have painted solid gold stripe and screen-printed lettering.
2360	1958	Semi-gloss Brunswick green or Tuscan red paint. Probably leftover 1956 product.	Even-color graphics; never heat-stamped; any body type can be used.
2360	1961 -62	Semi-gloss Tuscan red paint/heat-stamped lettering and painted gold stripe; color separation tends to be soft.	Usually have painted solid gold stripe and screen-printed lettering; color separation tends to be crisp.
2360	1963	Semi-gloss Tuscan red paint/decaled lettering (yellows with age) and painted gold stripe; soft color separation.	Usually have painted solid gold stripe and screen-printed lettering that hasn't yellowed with age; crisp color separation.



The striping was set too low on this original 2360. The ladder detail effectively cuts off the lower striping on the sides, and the points of the stripes are left off at the end.

GG1 from its line in 1959-60, only to bring it back as 2360 in Tuscan with a single solid gold stripe in 1961.

The only logical assumption I can draw from this unpredictable marketing approach is that orders in 1957 did not justify massive production of 2360s. Most likely, Lionel didn't manufacture GG1s in 1958 and cataloged unsold inventory of five-striped engines to help dealers exhaust supplies.

Final changes in the 1960s

The 2360 returned in 1961, only to be dropped again after 1963. A puzzle is why Lionel decided to use decals for the lettering and numbers in 1963. Not only do decals take longer to apply than heat-stamped lettering, but the result is not nearly as sharp or crisp. Don't forget that each model required 10 separate decals, none of which was made by Lionel. Why Lionel chose to purchase decals from Meyercord Co. of Chicago and Palm Bros. of Florida and then pay laborers to apply the decals remains a mystery, especially when you recall that heat-stamped graphics came out looking fine in 1961-62.

One plausible explanation, given Lionel's poor management at the time, is that the GG1 stamping equipment was thrown out or stolen! More likely, Lionel had a production deadline to meet and had fallen behind schedule. Rather than build new equipment, Lionel bought the decals and paid workers to apply them.

Restored GG1s

Although most GG1s emerge from the wars of time pretty much intact and still run like a charm, their appearance leaves a lot to be desired. Cosmetically speaking, a like-new or mint example is a true rarity. Even locomotives that have been cared for and seldom used often have little or no striping. In the case of no. 2332s, the lettering and number detail is often worn off, too.

These problems mean that professional restoration of GG1s is in great demand. Distinguishing between an original and a restoration isn't difficult because restored GG1s have stronger and bolder striping, thanks to dry-transfer ("rub-on") graphics or screenprinted details. Most twin-motor engines were heat-stamped and had "pronounced" graphics; in contrast, the decoration on restorations is flat and even.

I've never met a Lionel collector who said that he or she didn't like the GG1. The looks and power of this engine, the only die-cast "non-steamer" cataloged by Lionel in the postwar era,

Meet Richie Rocco – a.k.a. "The Striper"

THE STRIPER – IS THAT ONE of the weird villains Batman faced, like the Riddler or the Joker? Or could it be the nickname of a well-known basketball referee? Sorry. The gentleman who earned this moniker did so by spending hours adding stripes to the early runs of Lionel's no. 2332 GG1. Richie Rocco may not have invented an accessory or designed a favorite display, but when it comes to the GG1, he's a leading man.

Richie started at Lionel's factory in Hillside, N. J., in 1946, immediately after he graduated from high school. His older brother, Tony, already worked on the line, so it made sense for Richie to make his way to the plant and apply for a job. With demand for electric trains booming, he felt confident that he would be hired. It was just a matter of where.

Sent to the Painting Department, Richie worked under Anthony Falcone (the department's supervisor) and Angelo Festa (a general foremen). What exciting, meaningful responsibility did they assign to Richie? "I was in charge of rubber-stamping numbers on the cabs of

steam engines. Talk about tedious! I couldn't wait to get away and try something else," he laughs.

Meanwhile, as Richie learned, tool designers and tool makers were rushing to finish a special printing die that would add gold stripes to the painted die-cast shells of GG1s. The die (about the size of a picnic table) primarily consisted of a flat "right reading" metal block that had the striping detail "embossed" (slightly raised) on it. The block was secured near the middle of the entire die, along with a pair of fixtures that held two shells in place.

Richie listened intently as Falcone described his new job. He would be "the striper." Richie began by putting a shell in each fixture. One shell he turned so its right side faced up, and the other he placed so its left side was up. Next, he striped them by moving a roller pad that picked up ink and spread it over the metal block. Then a second roller pad picked up the ink from the block and rolled it



Richie Rocco, shown a few years later, handled the one machine built to apply stripes to GG1s in the late 1940s.

over the two shells. Finally, Richie removed the pair of GG1s and turned them over so he could stripe their opposite sides. One man using one machine to decorate two locomotives.

For a while, the change of pace proved to be interesting. Soon, however, Richie settled into a routine and felt boredom encroaching. What made the job somewhat

> frustrating to boot was that he couldn't check on the two shells at the same time. Instead, he had to walk around the die and then inspect the second shell to be certain that the ink had been applied correctly.

> "The trouble," Richie recalls, "was that a small piece of the die blocked my view of the other side. Cutting it off would solve the problem, so I found a hacksaw and clipped it off."

Unfortunately for "the striper," his surgery compromised the process. Richie had sliced off the indexing lever that allowed the stripes to be registered correctly. Without that metal piece, the quality of decoration deteriorated. Richie's superiors wondered what was wrong. Once

they discovered what had happened, they banished him from the factory. He left, embarrassed by what he'd done and sure he'd never be back.

He wasn't – for a month. Maybe that's how long it took Lionel's workers to repair the damage. Whatever the reason, Richie was called back, although his career striping GG1s was over. "I was transferred to the Reproduction Department," he explains, "where I assisted Louis Melchionne. Eventually, I moved over to Time Study and worked with Sal Rosanio and Ray Talarico. After being with Lionel for about 10 years, I left and went into the insurance business."

Everything turned out fine for Richie Rocco. More than 50 years later, he can chuckle over how he "fine-tuned" the GG1 printing die. And we can sigh with relief that Lionel survived the short yet memorable career of "the striper." – *Roger Carp*

make it a legend. It is the only locomotive outfitted with a pair of 622-100 motors, and the only single-unit engine with two electromagnetic couples. And it's the only locomotive cataloged under four different numbers while having just one road name.

Whether you operate or display your trains, if you don't have one of these marvels, consider making a GG1 your next major purchase. When you do buy, consult this article for tips on telling an original from a restoration.



Lionel used decals to letter the 1963 version of the no. 2360 GG1. This original set of decals was manufactured by Meyercord Co. of Chicago.

Lionel's EP-5



'Jet' electrics



Of the four postwar road names – the New Haven, the nos. 2351 Milwaukee Road, 2352 Pennsylvania, and 2358 Great Northern – only the New Haven operated real-life EP-5s. But the Lionel EP-5 isn't of interest to collectors because of its prototype heritage. Rather, collector interest in the locomotive focuses on its variationladen paint schemes, particularly the peculiar variation of the New Haven.

No. 2350 New Haven

The no. 2350 New Haven appeared in Lionel's catalog from 1956 until 1958. Unlike the real locomotive, nicknamed "Jet" because of its engine roar, Lionel's single-motored model ran quietly and smoothly. Lionel made an attempt at realism, and the locomotive's number plates – stamped "375" – show the actual number of one of New Haven's EP-5 locomotives. The 2350 is about 1½ inches shorter than it would be if it were a true O scale model and the real EP-5s road on six-axle trucks while Lionel used four-axle trucks.

Production of the no. 2350 is a bit of a mystery since there are five different examples, none of which fits into a clear pattern of which came first, which came second, and so on.

"Regular" 2350s

The most common and well-known example of the 2350 is usually referred to as the "regular" New Haven. It has the standard orange-black-white paint scheme, an orange "H", a white "N" and white "New Haven." It also has breaks in the white and orange color bands at the simulated molded-in access doors and cab sand ports.

Lionel created the breaks in these color bands to accommodate the silk screening used to process the colors. Silk-screen printing does not work well in holes, depressions, or surface irregularities, where the printing tends to blur, so artwork has to be designed to compensate. Although the white and orange stripes were silk-screened onto original "regular" New Havens, the locomotive lettering and numbers were







always heat stamped.

The "regular" New Haven also sports nose decals. That, in itself, is not an uncommon Lionel practice. What *is* unique is that they are not Lionel's usual water-soluble decals, but rather pressure-sensitive cellophane. Unfortunately, the decals have a tendency to flake and lift off with age and the white ink turns yellow as it oxidizes.

As a result, reproduction nose decals are often found on original New Havens. Reproduction nose decals are made from sheet vinyl, not cellophane, and are less brittle. Also, reproduction nose decals are made from white vinyl stock, and are printed only with orange and black ink, allowing the white vinyl to act as the base coat. Although replacing damaged original decals on an original 2350 New Haven will certainly increase its cosmetic appeal, it also decreases its value, since the locomotive is then considered partially restored.

Two types of original 2350 nose decals exist: three color (white, black and orange) and two color (white and orange), the latter which depends on clear patches to allow the painted black diamond on the shell's nose to show through.

Regular 2350 New Haven shells, like all New Havens, are spray painted black, usually over black plastic. However, Lionel also used some yellow plastic shells, most likely during the EP-5's 1957 production.

Painted-nose 2350s

The second variation of the 2350 New Haven uses graphics painted directly onto the nose rather than a decal. A silk screen process creates the orange and white details, while a rubber stamp is used for the "NH" logo. The black diamond is simply the base paint on the shell.

Collectors generally consider this painted-nose version of the 2350 to be

TOP AND CENTER LEFT: The "regular" no. 2350 New Havens set the standard that other 2350s ignore: the proper white "N" and orange "H" heatstamped lettering, silk-screen printing that necessitated the breaks in the orange and white stripes around the doors, and a nose decal or a painted nose. Both examples here are reproductions, one with a flexible white-vinyl decal (that replaces the original yellowed cellophane decal Lionel designed) and the other with a painted-on nose emblem and an exposed rivet. BOTTOM LEFT: Falling under the heading "what were they thinking," this orange "N" black "H" New Haven EP-5 remains one of the more interesting factory errors in postwar Lionel's history.

early production, based on the theory that Lionel originally had so much trouble with quality control that it was forced to resort to decals. Even today, screen printing on rounded or curved surfaces is difficult, requiring special machinery that wasn't readily available in the 1950s. Examples of decal versions have been reported with painted nose graphics underneath, a sign that Lionel likely tried to salvage some nosepaint rejects.

Orange "N" 2350s

The famous (or infamous) "reverse" color New Haven is quite simply a mistake in production, one that was not discovered in time to correct. The "N" and "New Haven" lettering is orange (instead of white), while the "H," "2350," and "BUILT BY LIONEL" lettering is black (instead of orange).

I can surmise fairly easily how this could have happened. Workers already had to deal with a complicated, confusing, brand new three-color scheme along with numerous decorating processes (spray painting, silk screening, rubber stamping, and heat stamping). To create such a mistake, all that it would take would be to set up the "N" and "New Haven" die in the hot stamping machines with an *orange* ribbon in place of the correct white ribbon.

I find it hard to believe that no one in the plant noticed the error before the final color process, which was supposed to create an orange "H." At that point, somewhere along the line, someone must have made the decision to stamp the "H" in black.

Ultimately, I don't know how many orange "N" New Havens were finally released by Lionel, but the quantity must have been considerable, otherwise Lionel would have simply thrown the incorrectly stamped bodies in the reject pile.

The orange "N" graphics are found on both decaled and painted nose EP-5s. That suggests that one of Lionel's more famous factory errors occurred right in the middle of production.

Perhaps Lionel thought the complexity of the paint scheme would hide the color errors in the eyes of the buying public. If so, Lionel was right, in a sense. This variation went virtually unnoticed until Lionel trains became collectibles, years after postwar production ceased.

Solid-door 2350s

As the name implies, the "solid door" or "through the door" variation has no breaks in the paint where the

A Geep in disguise?

Even before Lionel ever sold its first EP-5, it already had a time-tested locomotive in hand – the EP-5 essentially is a GP or F3 in disguise.

Based on General Electric's 4,000-hp Ignitron Rectifier class EP-5 passenger locomotive, Lionel's model approached, if not fully reached, the "scale" end of Lionel's buying public while still making use of familiar designs that, essentially, kept costs down.

Lionel decided on its tried and true 2028-100 vertical motor, which had been successfully employed in the train maker's popular GP7 and would later be used in the redesigned F3 series.

The EP-5's trucks are a combination of the GP and F3 trucks – Blomberg four-wheel trucks with apron "skirts" on both ends to accommodate its unusual dual cab configuration.

Rail enthusiasts have pointed out that these EMD trucks are incorrect for General Electric's EP-5, which in real life used two six-wheel trucks of a different design. However, considering that the EP-5's E-unit, horn, and relay equipment are also identical to the ones in both the GPs and F3s, it's obvious that Lionel was looking to contain the costs of making this new mid-priced engine. (Its retail price was \$35, while in 1956 Lionel's "deluxe" engines listed for \$50.) In fact, the only new tooling Lionel created for this new locomotive was the body shell and frame. Even the pantographs were "lifted" from a GG1.

In Lionel's promotional literature, early EP-5 prototypes were basically two F3s cut and glued together back to back, creating a dual cab look. Later on, Lionel produced a sample for the 1956 Toy Fair with "LIONEL" emblazoned on the side where the "NH" logo would normally appear.

Lionel used different color plastic for its EP-5 shells. In my years of experience painting postwar trains, I have seen shells in black, yellow and light gray plastic.

One of the most annoying flaws found on EP-5s today are vertical cracks on the cab noses on both ends. The cracks, sometimes appearing as small hairline fractures and sometimes worse, usually run upward from the bottom and can extend as high as the headlight. The cracks are caused by the constant stress placed on the plastic body shell from the riveted body-mounting bracket. Seam lines from the molding die indicate that the body plastic is weakest at those points. The "clinch" from the machine rivets is more secure than any one of us could do by hand.

Unfortunately, no preventive medicine exists for this malady, and non-cracked examples of EP-5s are in great demand. While the versions with nose decals tend to hide the problem, even mint-in-the-box examples have surfaced with nose cracks.

All postwar EP-5 shells are engraved with the tooling number "2350-5" on the inside near the center of the cab, regardless of the roadname or exterior engine number. The part numbers, listed by the Lionel Service Manual and described as "body assembly," were 2350-2 (New Haven), 2351-2 (Milwaukee Road), 2352-2 (Pennsylvania), and 2385-2 (Great Northern). Undoubtedly the "2385-2" is a typo, since we know the correct number of the GN EP-5 to be no. 2358.

The number "375" appears on every postwar EP-5 number board. However, some number boards were "missed." I have observed several examples with blank number plates. These are not the reproductions or after-market parts. The way to tell the difference is simple: the plastic on original number plates (which are an integral part with the window shell) has usually yellowed with age. – *Len Carparelli*

simulated molded-in access doors meet the orange and color-band stripes. This variation was created by spray painting the orange and white colors over the black base rather than using a silkscreening process.

Speculation abounds whether this was early production or just a late 1958 replacement shell issued by Lionelauthorized Service Stations. Either argument is plausible.

Because the 2350's documented prototype was a "through the door" model, Lionel may have initially experimented with spray painting all three colors before settling on silk screening as a cost saver. Another possible "early production" scenario is that metal paint masks (typically created by Lionel's general foreman Romualdo Camuso) may not have been ready in time for 1956 production, forcing Lionel to revert to silk screening as an alternate production method.

Conversely, if the silk screens had been destroyed or mislaid by 1958, Lionel may have chosen to spray paint remaining shells rather than absorb the cost of making new screens and fixtures. Also, silk-screen printing requires an experienced screen printer, and by 1958 Lionel had eliminated silk-screen printing from its production facilities.

It's possible that Lionel may not have manufactured any new New Haven EP-5s after 1958, relying only on excess inventory until the locomotive was dropped from the catalog.

No. 2351 Milwaukee Road

The 2351 was billed as "the spectacular Milwaukee electric" and New Haven's "new running mate" in the 1957 catalog, which even featured the new locomotive on the cover. Perhaps that was over-hype, given that the model was basically a repaint, but that's the way Lionel's advertising department wanted to promote it.

Regardless, the Milwaukee was a handsome and colorful paint scheme. All the lettering graphics on the no. 2351 were heat stamped, and unlike its "running mate," no true variations of the no. 2351 Milwaukee exist.

All production models were painted maroon and black on yellow body shells, though the Milwaukee's yellow was represented either by the unpainted yellow plastic or by a light coat of yellow paint. The difference is almost indistinguishable and should not be considered a variation as such.

An original no. 2351 does, however,



The no. 2351 Milwaukee Road EP-5 had only a quasi-variation. Some examples simply relied on the coloring provided by the yellow plastic shell instead of a light coat of yellow paint.

have an interesting irregularity in its paint that makes it distinguishable from reproductions: a unique "half moon" pattern of overspray located on the inside of the cab right behind the windshield on every original example.

This pattern is the result of paint masks. The interior form of the mask

undoubtedly allowed paint to wander where it wasn't supposed to, creating this unique design.

The Milwaukee Road EP-5 was discontinued after 1958, and again Lionel may have simply exhausted excess inventory from the previous year rather than making additional units.

No. 2352 Pennsylvania

Perhaps inspired by the success of its popular GG-1 electric, in 1958 Lionel turned to a popular eastern road name to adorn its newest EP-5: the Pennsylvania Railroad.

Two variations of the no. 2352 exist: a chocolate-brown paint and a deeper brown paint similar to the no. 2373 Canadian Pacific of the previous year. Neither is in any more demand than the other.

Lionel certainly found an easy enough paint job. Paint it brown, stick it in the paint mask, paint the roof gold, and heat stamp the lettering, then apply the keystone logos (this time using water decals).

An interesting yet hidden aspect of the 2352's paint scheme is that the solid stripe actually is not an unbroken line. It breaks in the middle, right where the side decal goes. I believe Lionel integrated the break to specify to its assembly line workers precisely where to mount the decal, assuring that all the decals would be correctly centered on the shell.

Restorations have no such break in the striping and are usually silk-screen printed. Original 2352s were heat stamped in bright gold, similar to the no. 2349 Northern Pacific GP9, both of which have an unfortunate tendency to dull with age.





Following the success of its GG1, Lionel decided to apply its popular Pennsy scheme to the EP-5. Some models had a darker brown paint than others did, but neither variation is more sought after. Note the nose crack that plagues most original EP-5s.

A no-number variation? All EP-5s were supposed to have the number "375" in their nose number boards, but some were left blank originally. You can tell the difference between a blank reproduction and a blank original by looking at the clear plastic. The originals are decisively yellow with age.

No. 2358 Great Northern

Lionel's final foray into EP-5s took place in 1959 with the introduction of the colorful no. 2358 Great Northern electric locomotive.

The Great Northern electric has no known variations. All examples are heat stamped, carry the "half moon" overspray pattern inside and under the windshield and are identical electrically and mechanically with all previous EP-5 locomotives. Every Great Northern I have observed was painted starting with a light gray plastic shell and utilizing the Camuso paint masks.

Like the 2350 New Haven, the 2358 used nose decals, which again have struggled with time. Decals often flake noticeably, particularly over the mounting rivet on the noses.



However, unlike the New Haven, the 2358 never got a painted-nose job before production ceased and the model was dropped from the catalog after 1960. It was the last of the postwar Lionel EP-5s.

In no. 2358 Great Northern livery, the EP-5 has color and pizzazz, but a limited production period and flaky nose decals make it a hard-to-find piece in excellent condition.

EP-5 ORIGINAL AND RESTORATION COMPARISON TABLE					
No.	Years made	Color scheme/ variation type	Original	Restoration	
2350	1956-58	"Regular" New Haven	Black/white/orange scheme. Semi-gloss "steam locomotive" black spray paint, screen-printed stripes, heat-stamped lettering cellophane decal nose.	Screen-printed graphic flexible vinyl decal nose. Look for glued- or painted-over pantograph rivet on earlier examples. Most are restored using later 1958 light gray body.	
2350	1956-58	Painted-nose New Haven	Same as above, except that nose colors are silk screened white, then orange. "NH" logo rubber-stamped in white. Black diamond is spray-painted body color.	Screen-printed graphic orange and white nose graphic is sprayed on. "NH" logo is screen- printed. Found on any color plastic body.	
2350	1956-58	Orange "N" New Haven	Same as "regular" 2350, except for the reversed heat-stamped graphic colors. Stripes and lettering are two distinctly very different colors, unlike restorations.	Same as "regular" 2350, except that all restorations exhibit an even color graphic and are never heat stamped and therefore have no indentations. Any body type possible.	
2350	1956-58	Painted-nose/orange "N" New Haven	Same as painted-nose 2350 except for reversed colors of heat-stamped graphic.	Same as normal painted-nose with incorrect color graphic.	
2350	1956-58	Solid door New Haven	Same as "regular" 2350 except with spray- painted white and orange stripes. Heat- stamped lettering.	Same as "regular" 2350 except with spray- painted white and orange stripes. Silk- screened lettering.	
2351	1957-58	Milwaukee Road	Dark red/yellow/black scheme, with all colors sprayed onto yellow plastic shells. Some (probably 1957 production) used yellow plastic in lieu of yellow paint. Heat-stamped letters. All have "half-moon" overspray pattern behind windshield on inside of shell.	Spray-painted colors on any color shell. Silk-screened lettering. None have "half- moon" overspray pattern.	
2352	1957-59	Pennsylvania	Tuscan/gold scheme, with two variations in the brown coloring. Heat-stamped graphics in bright gold leaf. Break in gold stripe under decal.	Silk-screened graphics. No break in striping detail.	
2358	1959-60	Great Northern	Green/orange/yellow scheme, usually with a "soft" color separations. "Half-moon" overspray pattern as on 2351. Heat-stamped lettering. All originals have water decals.	No "half moon" pattern. Somewhat "crisper" color separations. Screen-printed graphics. Many examples found with older pressure- sensitive decals.	