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Weathering tips and techniques



Weathering



PHOTOS BY JIM FORBES

Back when I got started in the hobby I read an article on weathering in which the author stated that *everything* should be weathered. My reaction was like that of most beginners: Why weather anything? I felt my cars and locomotives looked quite realistic out of the box, so how could gunking them up help? I also worried that I'd ruin a perfectly good model.

Why weather?

"Weathering" is a catchall phrase used to describe finishing a model to duplicate the effects of time and use. Since it doesn't actually rain, snow, or beat down with relentless desert sun on our layouts (at least I hope you don't have those problems!) we need to resort to other materials and techniques to duplicate the ravages of Mother Nature in our plastic and plaster worlds.

But don't fall into the trap of weathering every model to the same degree. This is as bad for realism as no weathering at all. Instead, weather models to reflect various ages, maintenance practices, and locales.

For example, older cars should be weathered more than newly painted cars or brand-new equipment. Automobiles in daily use may look worn but they're rarely rusted through, especially today's autos which feature paints designed to prevent rust and corrosion.

Weathering techniques

I do a lot of weathering with an airbrush but I also use washes and chalk.



A wash of Polly Scale Grimy Black (9 parts Polly S airbrush thinner to 1 part paint) produces a basic road grime. Cover the entire model so the paint won't dry spotty.



If the car looks too filthy, simply moisten your thumb and rub it along the side of the car in a vertical motion. This removes most of the chalk from the model.

Frequently I'll combine all three (airbrush, wash, and chalk) on one model.

The most basic weathering is eliminating the plastic sheen from models. This single step does more to increase realism than anything. Painting all your trucks and wheels flat Grimy Black also helps since it eliminates that "floating on air" look shiny trucks impart.



Pastel chalks, available from art supply stores, are great for rust or heavy road dirt. Apply the chalk with a brush. I add more than I need, then brush away the excess.



Combining these techniques – a wash of Grimy Black and Rust paints, followed by rust-colored chalks – makes a night and day difference between the roofs of these cars.

The difference between an unweathered and weathered model is really startling, as the lead photo shows. The photos and captions explain how I used washes and powdered pastel chalks to age some N scale freight cars. The same techniques can be applied to buildings, roads, vehicles, locomotives, and even figures. Now get dirty. ☛



QUICK

&

DIRTY

freight car weathering



Easy ways to make rolling stock look more realistic

By John Pryke • Photos by the author

Many freight car weathering techniques produce a high degree of realism, but also tend to be time-consuming. If your layout has a large number of freight cars, you probably don't want to spend an entire evening weathering just one piece of rolling stock. As an alternative, I've developed a quick and dirty weathering method that requires only basic airbrushing skills and a little knowledge of the prototype.

Color selection

There are many paints on the market made specifically for weathering. Table 1 lists the water-based acrylic and organic-solvent-based enamel paints I used to duplicate the weathering pattern shown in fig. 1. It also lists the dilution formula

▲ In September 1948, an aging New Haven 2-8-2 hauls a peddler freight toward its next destination on John Pryke's HO scale layout. With a little prototype knowledge and an airbrush, John can apply weathering in a matter of minutes.

required to spray the paint through a fine airbrush tip without clogging. Weathering color choice is also dictated by a railroad's operating region. The color you choose to represent dirt and dust on a car's trucks and underbody is based on the area of the country that you model or on a car's home road. Table 2 shows some suggested truck and underbody colors for cars from different locations in North America.

Quick and dirty weathering

By using an airbrush with a fine tip and readily available enamel or acrylic model paints, you can weather one car in a few minutes or a batch of ten cars in less than an hour. It is important to follow each step in its proper sequence, as some prototype weathering (faded paint on side panels, soot on vertical side ribs) takes place over a long period, while other weathering (ballast dust on the underbody and accumulated

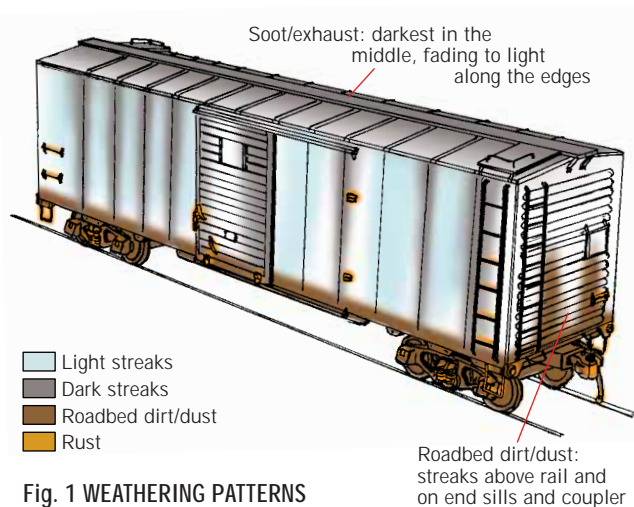


Fig. 1 WEATHERING PATTERNS



▲ Fig. 2 SMOOTH SIDES. For smooth-sided cars like this boxcar, John starts the weathering process by painting light streaks on the sides to simulate where dirt and grime have washed off of the roof.



▲ Fig. 3 RIBBED SIDES. When spraying light streaks on rib-sided cars such as this hopper, John aims the spray between the side posts. Starting at one end, he uses a quick top-to-bottom motion to spray each car panel individually.

soot on the roof) occurs faster and should be applied over it.

I spray one color at a time on all the cars that I'm painting, then switch to the next color and repeat the process. When using a fine tip, it's essential to keep your airbrush as clean as possible so that it doesn't clog or spray globs of paint. While painting, I wear disposable latex gloves (available at any drug store) to protect my hands.

I start by applying light streaks to the sides of the carbody, as shown in fig. 2, using a quick vertical stroke from top to bottom with my airbrush. If I am painting a rib-sided car, I spray only the panels (between the ribs) and keep the streak parallel to the ribs on either side. See fig. 3. I recommend practicing this technique on an index card or an old car shell until you are comfortable with it. Next, I paint thin, dark streaks on the ribs with a very narrow spray, again moving quickly from top to bottom. Figure 4 shows these vertical streaks on the Pennsy boxcar on the left.

When the weathering on the carbody is finished, I paint the underbody and trucks with a color that matches the ballast dust and dirt from the car's home region as shown in fig. 5. Using the same color, I also paint streaks halfway up the car's ends above each rail. See fig. 6. These are caused by roadbed dust kicked up by the next car in a train.

Control coat and soot

Next, I spray a control coat – Grimy Black diluted 50 percent with thinner – over the entire carbody. This makes a car's lettering look dull and mutes the weathering, avoiding stark contrasts in color. The more control coat you apply the older the car will look.

In fig. 4, I sprayed several passes of control coat on the car to the left; it looks like it has not seen any new paint in many years. The car on the right has only one light pass of control coat and looks like it was painted only a few months ago.

Finally, I spray the roof with a dusting of soot and/or diesel exhaust, with the heaviest coating along the center line and lightest along the edges. If you model the steam era, spray Engine Black to simulate soot – especially if your layout has hills or mountains. The amount of soot on car roofs will be heavy because steam engines work hard on grades throwing up lots of cinders.

Diesel exhaust is thinner, and car roofs require only a dusting of Oily Black.

Optional weathering details

Once a freight car has been weathered using the quick and dirty process, you can either put it in service "as is," or add some more weathering to make it unique.

- **Rust:** Stirrup steps, lower ladder rungs, door stops, truck springs, brake shoes, coupler faces, and end poling pockets usually display rusty spots. I hand-paint rust on these parts using a no. 5/0 brush (see fig. 7) as the last step in the weathering process.

- **Dust:** Cars from dry climates such as the Southwest often pick up a heavy coating of dust, which settles into every nook and cranny of the carbody. I spray Floquil Dust on these cars after the basic weathering is complete, but before spraying soot on the roof. I hold my airbrush above the roofline and spray down onto the sides and ends at a narrow angle, producing the dusty car in fig. 8.

- **Galvanized roofs:** During the transition era many boxcar roofs displayed patches of galvanized steel showing where the paint had started to peel away. I add these spots of bare metal after all of the car's weathering is complete except for the roof soot. Using a no. 1 brush and Polly Scale Undercoat Light Gray, I paint irregularly shaped blotches on the roof



TABLE 1 – Paint colors used for freight car weathering

Weathering pattern: Light streaks on side panels
Polly Scale (water-based acrylic): Erie-Lackawanna Gray
Floquil (enamel thinned with organic solvents): Grime

Weathering pattern: Dark streaks on ribs/rivets
Polly Scale: Grimy Black
Floquil: Grimy Black

Weathering pattern: Trucks and underbody
Polly Scale: see table 2
Floquil: see table 2

Weathering pattern: End streaks
Polly Scale: see table 2
Floquil: see table 2

Weathering pattern: Rust
Polly Scale: Rust
Floquil: Rust

Weathering pattern: Roof soot (steam era)
Polly Scale: Engine Black
Floquil: Engine Black

Weathering pattern: Roof soot (diesel era)
Polly Scale: Oily Black
Floquil: No match, use Oily Black

Weathering pattern: Dilution (for fine tip airbrush)
Polly Scale: 20-25 percent distilled water
Floquil: 15-20 percent Dio-Sol

Weathering pattern: Control coat
Polly Scale: Grimy Black, thinned 50 percent with distilled water
Floquil: Grimy Black, thinned 50 percent with Dio-Sol

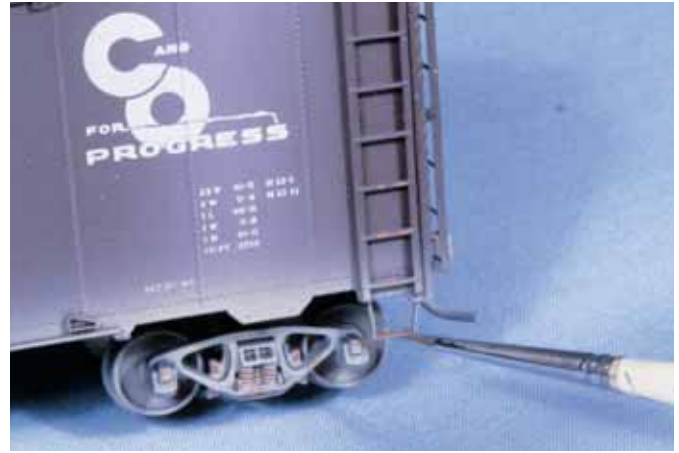
▲ Fig. 4 RIBS AND RIVETS. The Pennsylvania boxcar (left) has light streaks on its panels and dark streaks along its rivet lines. The Penny car also has a liberal coating of control coat (Grimy Black diluted 50 percent) to make it look older than the Baltimore & Ohio car (right).



▲ Fig. 5 ROAD DUST. John sprays Earth on the underframe, trucks, and lower portion of the bodies of his cars to simulate dust and dirt kicked up from the roadbed. He changes colors on cars that operate in different regions of North America as shown in table 2.



▲ Fig. 6 END STREAKS. Earth streaks over each rail on the ends of a car are caused by dirt sprayed up from the wheels of the next car in a train. Match the color used on the trucks and underframe.



▲ Fig. 7 RUST. John paints Rust onto any parts of the car that would receive a lot of wear. He added rust to the steps, ladder rungs, coupler faces, and truck parts of this boxcar with a 5/0 brush.



▲ Fig. 8 SOUTHWESTERN DUST. To create distinctive weathering on a car from the Southwest, John sprays Dust down the sides at a narrow angle from a point above the roof. The paint, like real dust, settles on all the upper surfaces of the car's details – ribs, ladders, even the wood grain – and really makes them stand out.



▲ Fig. 9 GALVANIZED ROOF. Using a no. 1 brush, John painted patches of Undercoat Light Gray on the roof of this boxcar to simulate paint peeling off a galvanized steel roof. He then sprays Engine Black over the roof (shown on the right-hand end of the car) to represent locomotive soot.

panels. I put larger blotches in the middle and only a few tiny ones, using the end of the brush's bristles, on the end panels as shown in fig. 9.

Advantages

My quick and dirty weathering process consists of a few simple steps that allow you to weather freight cars in a minimum amount of time with an airbrush and readily available paints. Rolling stock weathered using this process will look great on your pike “as is,” or you can easily add some of the optional techniques to make individual cars really stand out. ♣

John Pryke is a frequent contributor to the pages of MODEL RAILROADER. “Quick and dirty freight car weathering” is a follow-up to his article “Realistic weathering for steam locomotives,” featured in the August 2002 issue. John models the New Haven in HO scale.

► More on our Web site

To see a video clip of weathered freight cars in action on John's HO scale New Haven layout, go to www.modelrailroader.com.

TABLE 2 – Dirt color mixes for different regions

Region: Northeast
Polly Scale: Earth
Floquil: Earth

Region: Southeast
Polly Scale: 3 parts Earth,
1 part Oxide Red
Floquil: 3 parts Earth,
1 part Boxcar Red

Region: Midwest
Polly Scale: 3 parts Earth,
1 part Mud
Floquil: 3 parts Earth,
1 part Mud

Region: Mountain states
Polly Scale: 3 parts Earth,
2 parts MOW Gray
Floquil: 3 parts Earth,
2 parts Grime

Region: Desert southwest
Polly Scale: Dust
Floquil: Dust

Region: Northwest
Polly Scale: Dirt
Floquil: 3 parts Earth,
1 part Roof Brown

TABLE 3 – Additional weathering for specific cars



Caboose

Detail: Streaks on sides

Polly Scale: Erie-Lackawanna Gray
(light coat)

Floquil: Grime (light coat)

Note: Most cabooses display little weathering except for soot on the roof and dust on the trucks and underframe.

Chemical tank car

Detail: Dome

Polly Scale: Erie-Lackawanna Gray

Floquil: Grime

Detail: Streaks on tank

Polly Scale: Erie-Lackawanna Gray

Floquil: Grime

Detail: Drip marks under dome

Polly Scale: 3 parts Milwaukee Rd. Gray,
1 part Depot Buff

Floquil: Dust

Note: On chemical tank cars, I spray Grime on the dome and tank and then paint drip marks of Dust or very light gray with a 5/0 brush.

Coal hopper

Detail: Top ¼ of carbody

Polly Scale: Engine Black

Floquil: Engine Black

Detail: Hopper doors

Polly Scale: Engine Black

Floquil: Engine Black

Detail: Panels

Polly Scale: Erie-Lackawanna Gray
(light coat)

Floquil: Grime (light coat)

Detail: Side posts

Polly Scale: Grimy Black

Floquil: Grimy Black

Note: I spray Control Coat liberally over these cars to simulate the coal dust.

Covered cement hopper

Detail: Drips and streaks on car side
(use stencil)



Polly Scale: Concrete

Floquil: Concrete

Detail: Side posts

Polly Scale: Concrete

Floquil: Concrete

Detail: Bottom of hoppers

Polly Scale: Concrete

Floquil: Concrete

Detail: Coating on trucks

Polly Scale: 1 part Concrete, 1 part Earth

Floquil: 1 part Concrete, 1 part Earth

Note: I paint drip marks on the side panels by spraying through a narrow V-shaped stencil, made from an index card. When the stencil is removed a neat drip mark remains.

Car Type: Gondola

Detail: Panels

Polly Scale: Erie-Lackawanna Gray

Floquil: Grime

Detail: Ribs

Polly Scale: Rust over Grimy Black

Floquil: Rust over Grimy Black

Detail: Interior of car

Polly Scale: Rust

Floquil: Rust

Note: If the car is used for carrying other materials such as pipe loads, spray the ribs Grimy Black and only lightly dust the interior with Rust.

Petroleum tank car

Detail: Dome

Polly Scale: Engine Black

Floquil: Engine Black

Detail: Streaks on tank

Polly Scale: Engine Black

Floquil: Engine Black

Detail: Drip marks under dome

Polly Scale: Oily Black

Floquil: Oily Black

Note: I use a 5/0 brush to add Oily Black drips around the filler hatch, down the sides of the dome, and a short way down the tank.

Refrigerator car

Detail: Streaks on sides

Polly Scale: Erie-Lackawanna Gray
(light coat)

Floquil: Grime (light coat)

Detail: Door hinge pins

Polly Scale: Rust

Floquil: Rust

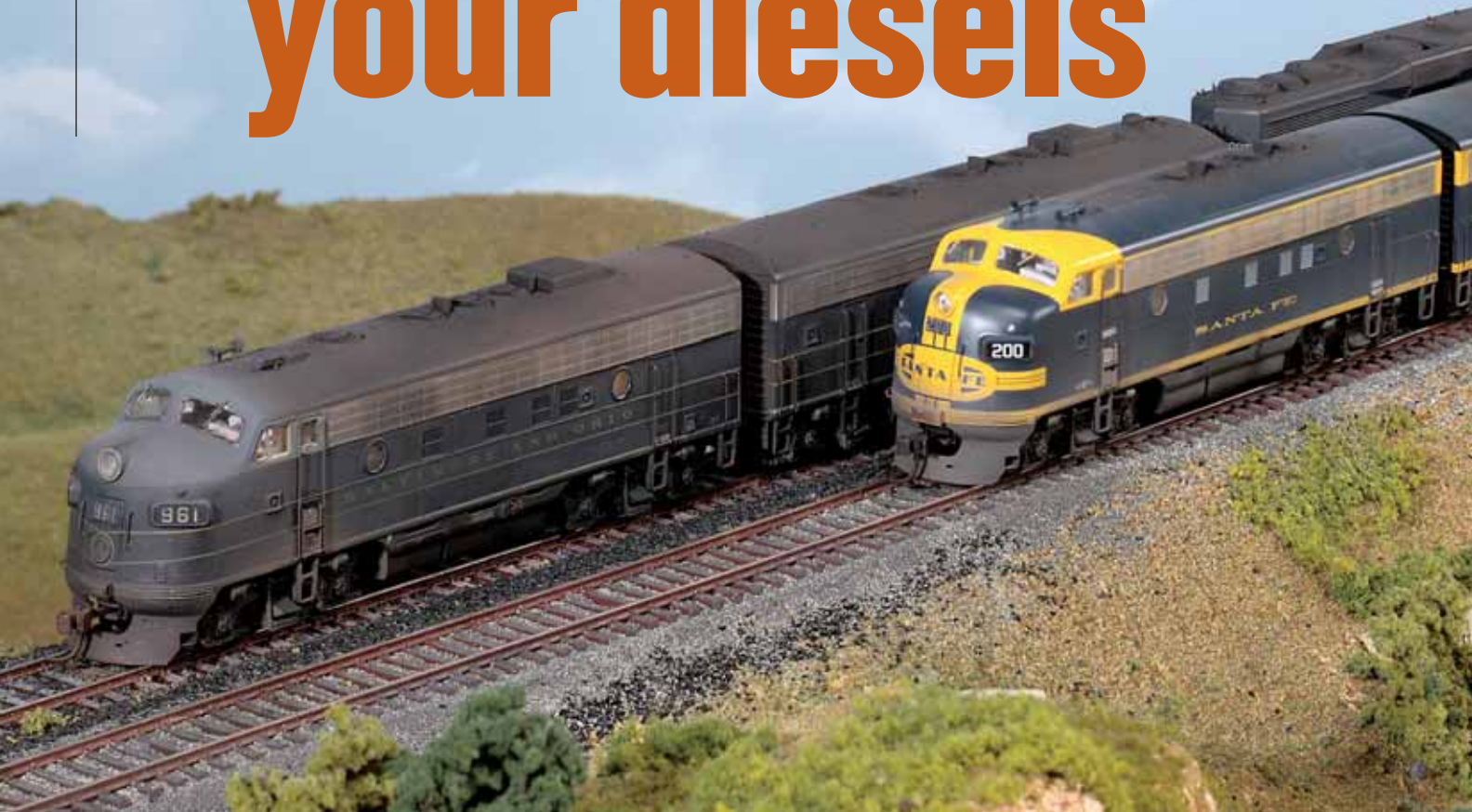
Detail: Drips under ice hatches
(use stencil)

Polly Scale: Rust (light coat)

Floquil: Rust (light coat)

Note: I paint Rail Brown on the ice hatch hinges and handles, as well as on the door hinges. On steel reefers, I spray a few, very light rust drips through a stencil onto the sides just under the hatches.

Weathering your diesels



Filth? Yes. Rust? Yes. Faded paint? Absolutely. And those are just the start of the fun.

By Terry Thompson

Model photos by Jim Forbes, prototype photos by Carl Swanson

Okay, let's have a show of hands. How many of you weather your structures, and maybe even some rolling stock, but leave your diesels as squeaky clean as the day they left the factory? I thought so! What are you waiting for?

I'll confess that at one time I was reluctant to weather locomotives. "What if I want to sell it?" I thought. Then I decided that while I wasn't sure whether I would sell any given locomotive, I was sure that my power would

look better if I weathered it – and that I'd enjoy it more. Now weathering a new diesel is one of my favorite parts of the hobby.

As with all rail equipment, diesels have a variety of moving parts, static parts, parts that get hot, parts that get wet, parts that are subject to the wind, and parts that are touched – often roughly. Weathering model diesels, however, is different from weathering freight cars or steam locomotives. It's no harder, though. Even better, well-

It's simple to weather your locomotives so they look more like prototype diesels, as Terry did with these F units. Read on as he shows you why real diesels weather the way they do and how you can duplicate those effects.

executed weathering can add so much realism that many viewers will think you've added extra detail to a model that's actually out-of-the-box.

In the August 2002 and February 2003 issues of *MODEL RAILROADER*, John Pryke showed the simple techniques he uses to weather steam locomotives and freight cars. In this article, I'll show how you can use a few of John's techniques plus a few that might be new to you to make your diesels more realistic. Let's get started. ☪



Wheels can be weathered to different extents to match the rust, grease, and oxidation they exhibit on a real locomotive. The wheel on the left is unpainted, the wheel in the center is painted to simulate a new wheel, and the one on the right has been weathered with a rust color.



The brand-new wheels and trucks on this SD70M shine in the sunlight, but they're already collecting rust and dirt. You can improve even a "new" locomotive by painting wheels with a few specks of dirt.

Wheels

Let's start with the wheels. Because they are not painted, they could conceivably be gray on a brand-new locomotive, but they rust almost immediately. As time passes the wheels darken from additional oxidation and a combination of dirt, brake dust, and grease.

First, I clean any oil from the faces of the wheels using a cotton swab dipped in Windex. Mix an oxide red (I use one of several different Polly Scale and Tamiya colors; which color isn't terribly important) and black of the same brand, then brush that mix onto the faces of the wheels. Don't worry if you get some on the treads – Windex will take it off if you don't let it dry too long. Just moisten a paper towel, lay it on some track, and run the locomotive over that.

I also paint couplers with an oxide red blend, but always with an airbrush so that I don't gum up the moving parts. Spray so the paint is nearly dry when it hits the coupler – this gives you a realistic rough finish.

Sideframes

I love painting sideframes because I am firmly convinced that time spent on them has a greater payoff than on any other area. The first step is to remove any flash or parting lines and add detail parts. Next, decide what your base color will be. Most railroads use either black or silver. I don't recommend using either flat black or straight silver for your base because you want to be able to mix accent colors that are both lighter and darker than your base color. Give yourself some latitude by starting with a color that's either slightly lighter (if you're using black) or darker (for silver) than the pure color.

Apply the base color to start. Though the particular brand of paint isn't terribly important, I prefer an acrylic paint. Next, mix a slightly darker blend and spray or



Sideframe steps (top to bottom): dark gray, highlights added, shadows added, overall grime added.

brush it on the inner areas. Once you're satisfied with the results, mix a slightly lighter blend and paint the pieces farthest from the rails (and closest to the viewer). This "painting for depth"

increases the apparent relief of the part. I use an airbrush for this step and often spray from below with the darker color and from above with the lighter color.

Once the paints are thoroughly dry, brush on a wash of burnt umber oil paint thinned with

Turpenoid. Make sure the sideframe is laying flat so that the wash will settle into the low spots.

The Turpenoid won't remove dried acrylic paint, but it can soften or even

remove enamels – this is why it's important to use acrylics for your base colors. I don't usually dry-brush (see below) sideframes, but it's another option if done judiciously. That means don't use white, which is just too obvious.



Rust spots and paint chips can really draw attention to the details of your sideframes. Use colors representative of the area where your locomotive works.

Accenting the sideframes

Add interest to your trucks with accents. You will sometimes see a bit of silver on the brake cylinder piston rod. When brake shoes are changed, the paint is often chipped from bolts or other nearby surfaces, which means small rust spots appear. I just brush tiny spots of rust-colored paint onto the places where I want an accent.

The lower surfaces of a truck will often develop a layer of crud.



Note the many distinct colors on the sideframes of this GP9. Carefully airbrushing dirt and grime or brushing chalk onto your model will give it this realistic look.

Some locomotives have grease near their axle bearings. Most trucks will have a light-to-heavy coating of dust and grime from the area where the locomotive works. Hint: this color should also be one of the colors you use when painting your track. I usually airbrush this from slightly above the truck using a very thin mix of the color. Chalks work well also, and they're especially good if you want to highlight particular spots.

SCALE COLOR

Some modelers adjust their paint colors according to a theory called “scale color.” Here’s the short version: because air is not totally transparent, objects appear lighter in color the farther away from them we are. The smaller the scale of a model, the “farther away” we are from it visually. Thus N is farther away than O or G *in scale* even at the same *actual* distance.

Great theory, but what does it mean? Simply that it doesn’t hurt to lighten all your colors a bit, especially in the smaller scales, or if your layout room is somewhat dark. – T.T.

Bearing plates

Many diesels have shiny bearing plates on the sides of gear-boxes (“Accenting the sideframes,” page 67), which are at the center of the truck. These plates are distracting if left unpainted.

Degrease them with a swab dipped in either Windex or a mix of dish soap and water. I don’t use lacquer thinner here for two reasons – it will rinse all the oil from the axle bearings, and it can damage some plastics. Dry the plates, then brush or spray them (with an airbrush – a rattle can will get paint everywhere) flat black.



Notice the dirt specks, rust marks, and steel details added to the pilots. The grime-covered m.u. hoses on the bottom locomotive fit right in!

Pilots

Ah, the pilot. So little space, so many opportunities. You’ll see stone chips, dents, and hoses that not only add color but also add their own chips in the paint. There’s also the dirt that came from any units that were ahead of your diesel, *and* the effects of rainwater and wind – what a beautiful thing!

Most pilots start out body color. Add grime using your airbrush or chucks, and add stone chips using rust-colored paint. I will occasionally add the tiniest bit of silver in a chip, but don’t overdo it. If your locomotive has multiple-unit hoses, they should be a grimy black, with steel or rust-colored ends. If you’re feeling sporty, put some thick, dirt-colored paint in your airbrush, crank up the air pressure, and add some specks. On some airbrushes, notably Iwata and Tamiya brushes, you can also create this effect by removing the cap and nozzle from the brush before you spray.

I don’t add plows, but you can accent a plow with some rust-colored paint. Rubbing a little silver Rub-n-Buff or SNJ metal powder along the very bottom can give it a just-used shine (look at a bulldozer blade to see what I mean); for a slightly less stark effect use a cotton swab to rub some graphite powder on the lower part of the plow.



Frames and tanks

Not every locomotive has a visible frame, but on those that do, weather the frame with the same colors you used on the truck sideframes. I don’t spend nearly as much time on this step. All I normally do is airbrush the frame with the basic frame color then dust it with the grime color.

The fuel (and water) tank, however, is a very different matter. Tanks are large and highly visible canvases for you to weather. Once again, start with the basic frame color, then add a bit of lightened frame color along the upward-facing surfaces and darkened frame color on the downward-facing. The ends of real fuel and water tanks are literally blasted by grime, however, so make sure to put some vertical streaks of grime there, roughly in line with the wheels. Fuel will inevitably get spilled on the tank, so brush a streak of lighter (on a black tank) or darker (on a silver tank) paint under the fuel filler. (Remember,

Note how the fuel tank on this SD40 has been heavily colored with grime, dust, and spilled fuel.



Fuel tanks can be weathered and given extra dimension by carefully adding a lighter color to the top of the tank and a darker one to the bottom. Vertical streaks in line with the wheels will give the ends of the tank a realistic grime-blasted look.

ber, you’re not seeing the actual fuel, but rather the dirt that stuck there while the surface was wet.) If your locomotive also carries water, it should be cleaner under that fill cap. And if the air reservoirs are visible over or behind the tank, weather them as you did the tank – lighter above, darker below.



Fade the lettering on your locomotives by spraying with a slightly lighter version of the base color. Vary the fading by how much paint you apply. The Santa Fe F3s have a light overspray of a heavily thinned dark blue. The Baltimore & Ohio GP30 has a heavier coat of the same color. The New York Central Geep and B&O Fs have oversprays of black.

Body sides and ends

Several factors determine the weathering of the sides of the locomotive. The same road grime that clings to the trucks, pilot, and frame also covers the sides, though less heavily, and the ends suffer the occasional rock hit. In addition, the sun's ultraviolet radiation causes paint to fade. So does the rain and any cleaners the railroad might use on the unit, and the minute particles of dirt that pass over the locomotive will blast the paint off over a long period of time.

Depending on the locomotive, I sometimes fade the paint and the lettering. This sounds a lot harder than it is, as long as you have an airbrush. Find or mix a paint that's slightly lighter (just slightly, though) than the body color, and make an airbrush mix that's thinner than you would spray if you were painting the unit, but heavier (more viscous)

than a wash. Spray some of it on a piece of styrene to make sure you'll be able to lay down color without having droplets of paint visible. I often add a drop or two of Liquitex flow enhancer to the mix to make sure it covers evenly. Once you're satisfied, spray a few light coats of the paint onto the locomotive, including the lettering. If you have the right mix, you'll lighten the body color and (almost magically!) make the lettering look faded. Sometimes it helps to keep a new body nearby for comparison.

Once you've faded the paint to your satisfaction, add a light layer of grime with chalks or paint. This is another point at which to keep the word "judicious" in mind. I've seen models over the years that were excessively weathered with Floquil Grimy Black, Dust, or both, and that's what they look like – a model covered in paint. Remember, be

The heavier rust spots on the kickplates and pilot and the more pronounced "bow wave" give the B&O F unit a more weathered appearance than the Santa Fe unit.

subtle. On cab units (streamlined diesels) in particular, make the grime heaviest along the bottom edge of the body.

In HO or larger scales, it's even possible to fade individual panels (or doors) by airbrushing the lighter color into the center of the panel and leaving the edges in the original (darker) color. If you go this far, you can follow up by drybrushing the model (with a brush that has had virtually all of the paint already rubbed off onto a card) with the lighter color. Doing this highlights the raised areas, like the joints between panels on an F unit, making the shadowed areas more visible. As an alternative, you can fade the model then highlight panels and doors by airbrushing a darker color around the outer edges of the panels and doors. (If you're good enough to do this in N or Z scale, please send a photo of your work!)



By cranking up the air pressure in your airbrush, you can add dirt specks to the pilot of your diesel. Adding rust, steel, and dirt to your steps and walkways is just as easy using an airbrush or brush. Real soil will give your locomotive a more textured look.

Footboards, steps, walkways, and doors

These areas attract not only road grime but also whatever the crew members might track onto them. They also get scuffed and chipped, which means that you'll see bare metal and then rust. Add grime with your airbrush or chalks, then accent with rust, steel, and dirt. For a nice textured effect, sprinkle just a bit of real soil over wet dirt-colored paint. On steps, the outer and center parts of the tread are the most likely areas to have the paint worn off and the areas most likely to remain free of rust. Kick plates and doors get similar treatment, and handrails will likewise have chips, wear, and areas polished smooth.

Roof – fading and exhaust

A locomotive's roof (page 71) will fade more severely than its sides, so make sure to fade the paint there. Diesel exhaust is a bluish black, and while it most often blows opposite to the direction of the locomotive's travel, most power will eventually have a bit of it on nearly every part of the roof. Simulate it with a flat black, with a bit of very dark blue added if you like. On a black locomotive, it's doubly important to fade the paint, because otherwise you won't be able to see the exhaust residue!

Roof – fans

The fans on a model diesel are very visible. On some diesels, I'll airbrush the tops black and then drybrush with body color to bring back the grill detail, and on others I'll leave the fans body colored and use a wash to increase the apparent depth.

Some model railroaders like to highlight fan blades with silver or steel so that they're especially visible. I can't get too excited about that, though, because an operating locomotive would have its fans running, making the blades a blur.



This C&NW GP15-1 has an especially weather-beaten appearance because of its use in drag-freight operations around heavy industries.

Special effects

Senior editor Carl Swanson noted that how a locomotive weathers is especially dependent on three factors: geography, service, and age. For example, the trucks and frames of locomotives that serve in mountainous territory will often have a dusty appearance from the sand that they use to get traction, but their bodies are often blackened from being in smoky tunnels (Southern Pacific fans know what I mean!). Locomotives that work in iron ore country (or in steel mills) will often have a reddish appearance.

Locomotives in heavy service, like drag freight operation or pusher service, will often have a more weather-beaten appearance than a

locomotive in passenger or inter-modal service. And don't forget to consider a locomotive's age – a GP9 would likely look considerably different by the 1970s than it did in the '50s. (If you're really getting specific, consider whether the period you're modeling is toward the beginning or end of a particular paint scheme's time frame.)

I admit that I sometimes get a little carried away with weathering, but if you look at the prototype (and you don't even have to look very closely), you'll see that locomotives are dirty pieces of machinery. There is a point in weathering beyond which you can overdo it, but with practice you'll develop an eye for what looks right.

SOURCES

Tamiya

Paints and airbrushes
www.tamiya.com

Iwata

Airbrushes
www.iwata-medea.com

Rub-n-Buff

Metal paste available at craft stores

SNJ

Powdered metal
P.O. Box 292713
Sacramento, CA 95829

Polly Scale

Acrylic paints in railroad and military colors

Turpenoid

Paint thinner available at craft stores

Roof – heat

The roof is also where heat affects a locomotive's paint most severely. The exhaust stack(s) will have no paint on their sides – paint them rust, with black at the very top and a transition to body color at the bottom. The dynamic brake grids will often lose their paint in the same way. A light coating of rust, or even shades of rust with some heat discoloration (bluish color) in the center, will accent them. If your locomotive has a steam generator, don't forget to show the effects of heat in that area also.

Even if you didn't overspray your locomotive with body color to fade the lettering, a coat of a lightened version of the body color will help imitate the fading that comes from the sun's rays. On darker locomotives it also allows the exhaust stains to be visible. On my NYC diesels, I always lighten the roofs, even if the locomotive is otherwise quite clean. If you really want to see the details, drybrush with an even lighter color.



Notice the different levels of weathering on the roofs of these three locomotives. The B&O F7 (top) was weathered extensively, with fading, exhaust, and heat damage evident on both the roof and fans. The B&O GP30 wears a slightly less weather-beaten look, while the ATSF F3 has black only around the fan and stacks.

TIPS FOR HAPPY AIRBRUSHING

- Never shake paint – always stir. Shaking leaves paint around the top of the jar, where it dries into clumps. Those clumps are the best way to clog an airbrush. Using a screen on your pickup tube can help, as can straining your paint before spraying.
- Stir thoroughly. It takes longer than you would think to remix a bottle of paint that has settled, especially if a large percentage of its pigment is clay (common on tans, grays, and browns).
- If using a single-action brush, close it (run the needle forward or twist the tip closed) if it will sit for more than 20 seconds. Thinned paint dries quickly.
- Drain your water trap each time you spray. It can't work if it's full.
- Make sure your thinner is clean. Dirt or lint (been doing the old tip the can onto the towel trick?) can clog your brush, or at least appear in your paint.
- Lubricate your airbrush according to the instructions, and don't abuse it by over-tightening the threads.
- Some parts, including washers, gaskets, needles and tips, will wear out. Paint is abrasive (due to the pigment – many contain titanium dioxide), and solvents are harsh chemicals. Keep spares so you can keep modeling.
- If you think you bent your airbrush's needle, check it by pulling it across a towel while rotating the needle. Do *not* check it by running it back into the brush – that just ensures that you'll ruin the tip or your airbrush as well.
- If you own needle and tip sets in multiple sizes, keep the sets separate. They all look very similar, but they don't all work together.
- If you can afford to, it's a good idea to have separate airbrushes for solvent-based paints and acrylic paints. The two paint types don't mix well, and sometimes paint left in an airbrush can form clots when exposed to a solvent.
- When you reassemble a double-action brush, the action should be crisp. If the needle sticks in the nozzle or the action seems mushy, there's still paint in the nozzle. Clean it again.
- If you get bubbles in your color cup or feed jar, you have an air leak, probably where the tip joins the nozzle. Check your brush's instructions to see whether you can repair it.
- Weathering mixes are much thinner than regular airbrush mixes, so their pigments settle faster. Remember to stir every few minutes.
- Flow enhancer can help substantially when spraying acrylics – a few drops per jar of weathering mix is plenty.
- Lower your air pressure when spraying thinned mixes of solvent based paints to avoid spidering. You can spray from surprisingly close to a model with low pressure, well-thinned paint, and an airbrush with a small aperture (I use an Iwata brush with an .18mm tip for really fussy work). Removing the cap (or installing a crown cap, if available) can let you get even closer because the blowback can dissipate more easily, but be careful – once the cap is off, your needle has no protection.
- Most manufacturers have a recommended airbrush mix, but consider that a starting point only. Different colors (even different bottles of paint) will behave differently. Mix, then test, then adjust if necessary before you start painting your model.
- Test your mix on a similar substrate – if the model is styrene, test on styrene, and so on. - T.T.

► More on our Web site

Before you start your next airbrushing project, read tips on how to clean single-action, double-action, and hybrid airbrushes at www.modelrailroader.com

Weathering your structures



Adding that realistic **run-down** feeling to **structures** in any scale

By Steve Harris • Photos by the author

It doesn't take much railfanning to realize that most prototype structures and rolling stock show the effects of sun, wind, rain, snow, and years of use or neglect. In fact, some lineside buildings and pieces of railroad equipment have more bare wood or rusted steel on them than their original paint and primer. You can easily learn several tricks that will allow you to achieve the weathered look of the prototype on your own models.

The key is to develop an eye for color. Look closely at any piece of landscape art, and you'll see that the artist

used many different colors to achieve what at a distance appears to be a solid color. This same principle holds true in real life. Almost nothing in the real world is only one color, but instead a combination of distinct separate hues when observed closely. Even shadows add their own color to the surface.

The blend of color that makes up what we see in the real world, particularly on structures that have suffered the effects of nature, can be reproduced in our modeled world using various commercially available art and office supplies and easy-to-make stains. Fol-

lowing are some of the methods I've used to mimic the effects of age and the elements on my own models. With some practice and careful observation of real structures, you should be able to give your models a greater touch of realism too. ☛

lowing are some of the methods I've used to mimic the effects of age and the elements on my own models. With some practice and careful observation of real structures, you should be able to give your models a greater touch of realism too. ☛

Steve Harris lives with his wife in Valley Center, Calif., a suburb of San Diego. He models the Rio Grande Southern in HO_{n3} and built his layout in an office trailer. Steve's modeling work has also been featured in the Narrow Gauge & Short Line Gazette.



Using alcohol-based stains

Isopropyl alcohol is a good medium for making your own stains by adding India ink or shoe dye for pigments. I use alcohol instead of water because it penetrates well, dries fast, and is less likely to warp wood. Isopropyl alcohol is also inexpensive and available at any drugstore. Get the highest percent alcohol you can find, as it contains less water.

I use leftover film cans to mix and store my dyes and stains, labeling the cans to show the formula I used. Start by filling the film can nearly full with alcohol, then use an eyedropper to add ink or shoe dye. As the brew darkens, test it on a piece of scrap material and add drops of ink or dye as necessary. A comparison of shoe dye and ink stain on scribed wood siding is shown in the top photo.

Alcohol and India ink stain applied to wood gives it a weathered gray look as if it had been out in the sun for many years. I use it for things like station platforms and loading docks.

Alcohol and shoe dye gives wood a darker, creosoted appearance. It works well on things like ties, trestles, and timber cribbing, as seen in the second photo. Any shoe dye will work, as long as it does not produce a shiny finish. I use a mixture of half brown and half black dye.



Powdered pastels

I like to use powdered pastels and pigments to get a soft-edged color application that looks to me more natural than if painted with a brush or airbrush. To cover a broad area, simply brush the pastel powder on the model. For more control in a small area, or to scrub the powder into the surface, use a Microbrush disposable applicator. A little pastel powder goes a long way, so be sure to practice before you apply it to

your model. When you have the color where you want it, fix it in place by applying a light coat of Testor's Dullcote. Because the Dullcote tends to make the coat of weathering less apparent, you may need to apply more pastel powder and Dullcote.

I make my weathering powders by rubbing colored pastel sticks on a piece of drywall sanding screen mounted on two wood blocks as shown in the photo. I place a sheet of paper under the mesh to catch the powder (a fold down the middle will help you dump it). Sometimes I grind up several colors and mix them to get the shade I want. I save these mixtures in a plastic parts box for future use.

I also use Bragdon Enterprises weathering powders (pre-ground) which seem to affix themselves to surfaces a little better.



Pastel pencils

Pastel pencils allow you to quickly and precisely apply color to areas that are too small for powdered pastels. These are great for coloring individual boards on plank, scribed, or clapboard siding as well as door and window trim.

For a weathered wood-siding look, I use several different colors, being careful not to overlap the edges of the boards. I use two or three shades of gray, a couple of browns, and sometimes a little black. I blend the colors by rubbing them with a blending stump, which looks like a crayon made from rolled up paper, though a piece of thick cardstock cut to a sharp point works just as well. To get an even-more-blended look or to bleed the colors, rub it with a little alcohol.

On the building at right, I first stained the individual boards using



the alcohol-and-dye technique, then weathered the wood with the pastel pencils. I used a white pencil to add the remnants of paint in the protected area under the eaves, then blended the color into the unpainted area with a blending stump.

I also use pastel pencils on my wood-sided rolling stock to tone down the white lettering, as shown on the boxcar above.



Drybrushing

Artists often lighten the tips of objects to simulate the reflection of the sun. I accomplish the same effect on my models by using the drybrushing technique. Drybrushing is just what it sounds like. For a broad area like a roof, use a wide, flat brush and wipe off most of the paint on a piece of cardstock or paper towel until the paint is streaky. Then lightly whisk it over the area you want to highlight.

For example, on the Rico station roof above, I first stained the roof with shoe dye and let it dry. Then, I drybrushed thinned white paint on the roof to highlight just the tips of the shingles.



Scratching back

Use this technique on styrene siding to simulate wood or to make a painted wall look worn. First spray the model with two or more coats of the undercoat paint. Then after each coat has dried thoroughly, lightly “scratch back” through the painted surface with a scratch brush (a fine wire brush) or fine sandpaper to expose the undercoat. Be careful, because it’s easy to scratch too

much and expose the white styrene.

I used the scratch-back technique on my model of the Ophir depot. First I sprayed the styrene walls with a mixture of Floquil Roof Brown and white and let the first coat dry completely. Next, I sprayed the walls with Floquil Depot Buff. Then, using a folded piece of fine sandpaper, I lightly scratched the buff coat back to the first coat to get the look of worn paint.



Etched corrugated roofing

After many years of exposure to the elements, corrugated metal siding and roofing begins to rust, leaving jagged, decayed edges. Dipping model panels in etchant can produce this same look. Because of its harmful effects, make sure you use etchant in a well-ventilated area, according to the manufacturer’s

instructions, and wear proper eye and skin protection.

First, cut sections of metal corrugated material into the sizes you’re going to use on your structure. Pour a little etchant into a plastic container, then drop a panel into the etchant. After a few seconds, the panel will begin to bubble indicating that the etchant is starting to work. After a few more seconds, lift out the panel with a pair of tweezers, rinse it thoroughly in cold water to stop the etching process, and lay it out to dry on a paper towel. The resulting panels are fragile, so handle them carefully.

In addition to eating away some of the metal, the etchant also conveniently discolours them with a blotchy weathered look. If you had a different color in mind, spray paint or dust them with pastels.

I used this technique on some of the panels on my model of the Ophir tram house. Before assembling the structure, I painted the panels, including the etched ones, different shades of Floquil brown. I then used pastel powders to give them the final rusty touch.

TIPS FOR BETTER RESULTS

- Whenever possible, use a photo of the prototype you are modeling as your guide. It is much easier to catch details held in photographs of the real thing than trying to work from memory.
- Before using any weathering technique, test it on a piece of scrap material. This will give you a preview of the final look and help avoid nasty surprises. Also, with a little experimentation, you may even find a better approach.
- Plan ahead and weather your model as early in the building stage as possible. Though some techniques can be applied to the finished model, many, such as scratched or peeling paint, must be done before assembly. It’s also easier to work on a wall when it’s flat on your workbench.
- Doors and windows show the effects of the weather too, so remember to make your trim pieces appear as tired as your walls.
- Be prepared to do it again. Mistakes will happen and sometimes the only way to master a technique is to be willing to try again. – S. H.



Correction film paint

I use correction film to simulate peeling paint. To start, I stain the siding with the color I want to show through the peeled paint. I then place correction film over the surface and burnish it with a burnishing tool or ball-point pen just like when using a dry transfer. The technique transfers some, but not all, of the white material to the wall, leaving lots of places where the “paint” has peeled away. If you want more of a peeling effect, use a scratch brush to expose more of the undercoat.

BILL OF MATERIALS

Bragdon Enterprises

FF60 rust and soot weathering powders

Ko-Rec-Type

1ES correction film

Micromark

82466 scratch brush

Pastel pencils

Bruynzeel pastel pencils

<http://www.marcopaper.com/bruynzeelpastel.htm>

Pastel pencils can be purchased in sets or as open stock.

Pastel sticks

Alphacolor

www.currys.com/drymedia/product-info2.asp?SubcatID=640&catID=3

Soft square pastel sticks come in a variety of sets including grays and earth tones.

Radio Shack

276-1535 PCB etchant

WEATHERING A BALTIMORE & OHIO DEPOT

Exposed roof sections weathered with alcohol and ink stain

Shingles highlighted with drybrushing



Walls treated with alcohol and ink stain base then drybrushed with thinned paint colors

Random individual boards and trim colored with pastel pencils

Paper signs weathered with brown shoe dye stain

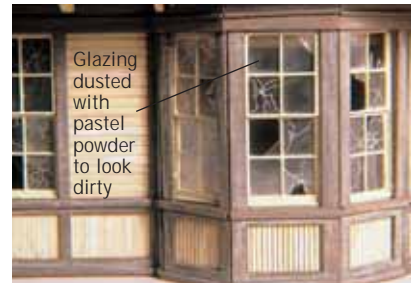
Building the American Model Builders' Baltimore & Ohio depot kit shown on the cover in its dilapidated condition presented an enjoyable weathering challenge. I treated it as if the depot hadn't seen any paint or other maintenance for many years. That gave me the opportunity to employ a number of my favorite techniques.

I started with the walls. Time and weather fade paint and turn exposed wood a silver gray. Before removing the sides from their material sheets, I stained them with a base coat of alcohol and ink. The stain accentuated the seams between the boards and gave the walls the correct weathered-gray look.

Next, I made a custom paint mix for the station using 10 parts Floquil Reefer White, 1 part Reefer Yellow, 10 parts Depot Buff, and 2 parts thinner. (Always start with the lightest color and slowly add the others to it.) The result was a thin, faded version of the original buff color. (Before adding most of the white and the thinner, I painted the underside of the overhanging roof, which would still be closer to the original color as it had not been exposed to weather.)

I drybrushed the paint over the gray walls, keeping in mind that each board would have weathered in a manner slightly different from its neighbor. With thinned paint I could build up the final color in successive coats, providing variety. Finally, I used three different colors of gray pastel pencils lightly drawn over individual boards.

I made the broken windows by cutting clear styrene with a no. 11 hobby-knife blade and a little patience. My goal was to make each window a little different from the others – some are



Glazing dusted with pastel powder to look dirty

missing entire panes, some have a few shards remaining, others are simply cracked. After installing the glazing, I dusted it with powdered pastels to make the glass look dirty.

I wanted some of the bare sub-roof to show through the shingles, so in several places I scribed the roof panels to represent planking and then gave them a wash of ink stain.

The slate roof material comes in precut strips with peel-and-stick backing. I sprayed it with Floquil Southern Pacific *Lark* Dark Gray, then lightly airbrushed over that coat with Reefer Gray and SP Lettering Light Gray. Unfortunately, the solvent in the paint caused the adhesive to come off the shingles. As a result, I had to glue the strips on one at a time. A water-based paint would work better.

I painted the trim Roof Brown. After gluing the trim in place, I weathered it with a gray pastel pencil.

I made the depot signs on my computer, printing them in color on glossy paper and then fading the lettering with a wash of white acrylic paint. I also lightly weathered the signs with a wash of thinned shoe dye stain. Once I had glued them in place, the depot was complete – another model made to look as though it had been ravaged by the effects of nature and time. – S. H.

Painting and weathering track



PHOTOS BY JEFF WILSON

Often we pay so much attention to painting and weathering locomotives and freight cars that we forget the track they run on is worthy of similar attention.

Today's ready-to-use track generally has fine detail, including close-to-scale tie plates and spike heads, accurate rail profile, and wood grain molded into the plastic ties. However, the bright nickel-silver rail and shiny plastic ties detract from the appearance. A little time and paint can easily take care of this.

You can take painting track to as high a degree of detail as you want. Simply painting the ties and rail a uniform shade of flat brown is an improvement. You can go on to paint and weather the rail, individual ties, and even spikes and tie plates.

Preparation

You can paint track before or after it's installed on a layout. The advantages of prepainting track are that you can do it in a spray booth or outdoors without worrying about paint fumes or getting stray paint on your layout or scenery.

One disadvantage of prepainting flextrack is that the plastic spike heads mask the rail, and as you bend the track some of the spikes move, revealing shiny areas that were shielded from the paint. See fig. 1. Simply touch up these areas with a brush.

Painting track after it's laid lets you get it working properly, with all feeder wires and gaps in place, before painting. If you do this, paint the track before adding scenery. Should you have to paint track in a scenicked area, use masking tape and paper to protect the scenery from overspray.

A disadvantage of painting track in place is that it can be awkward to get an airbrush into tight areas. Using solvent-based paint or spray cans is also a hazard in an enclosed room.

Track appearance is important, but not as vital as locomotive electrical contact. For good contact it's important to ensure that you can easily remove paint from the railheads.

One way to do this is by applying a light coat of oil to the railheads before painting. Once the rail is painted a Bright Boy or similar track cleaner will

With a few simple techniques and some paint, you can turn shiny nickel-silver track into a near replica of the real thing.

easily remove the paint. Figure 2 shows how to apply the oil with a cloth. It doesn't take much – just wrap a corner of a rag around a fingertip and rub the cloth along the railhead, taking care not to get oil on the ties or sides of the rails.

Turnouts require special care to avoid gumming up the moving parts with paint. Before painting, mask along the points and throw bar as shown in fig. 3. Brush-paint these areas later.

You'll also have to clean paint from the rail before soldering feeder wires and from the rail ends before adding rail joiners.

Consider the colors you want to use. Wood ties on a heavily used main line are replaced often, thus are usually black



Fig. 1 SPIKE MASKS. When prepainting flex-track the spikes sometimes move, revealing unpainted rail. Touch these up with a brush.



Fig. 2 OILING RAILHEAD. Applying a light coat of oil with a piece of soft cloth makes it easier to remove the paint later.



Fig. 3 TURNOUTS. You can airbrush turnouts as you do flextrack, but mask the points and throw bar and paint these areas by hand.



Fig. 4 COMPARISON. Simply painting flex-track a uniform shade of brown is an improvement compared to unpainted flextrack.



Fig. 8 TIES. Give individual ties washes of black, gray, grimy black, and brown. The grayer a tie is, generally the older it is.

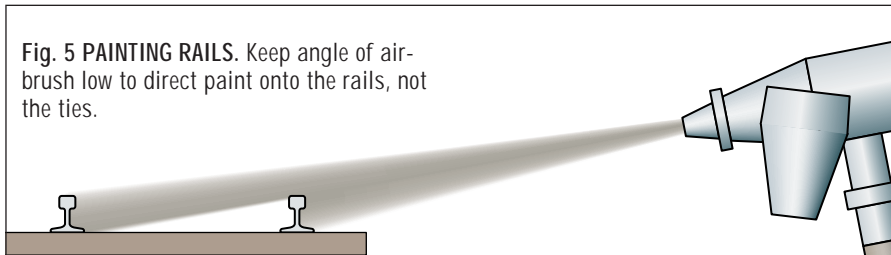


Fig. 5 PAINTING RAILS. Keep angle of air-brush low to direct paint onto the rails, not the ties.

ILLUSTRATION BY RICK JOHNSON



Fig. 6 TRACK AND ROADBED. Painting the roadbed, rails, and ties greatly improved the appearance of this Life-Like True-Track.



Fig. 7 PAINTING ROADBED. Give the roadbed a wash of Grimy Black or any medium gray to black color to cover the plastic appearance.



Fig. 9 OILY STREAK. Drag a brush of Oily Black paint down the middle of the track to simulate grease and oil drippings.

Weathering

You can stop at this point and have nice-looking track, but for a truly outstanding appearance you'll need to break out a fine brush and highlight the details.

Paint individual ties with washes of grays, browns, and blacks for a varied appearance. See fig. 8. These highlights should be subtle on mainline track, with more variations on lightly used track. I keep four mixes handy: black, grimy black, gray, and Railroad Tie Brown. Go ahead and dip your brush in more than one mix to create varied effects.

Well-used track often has a blackish streak down the middle created by grease and oil dripping from locomotives and cars. Re-create this effect with Polly Scale Oily Black paint as fig. 9 shows.

If you really want to take your track to another level, get out a fine-point brush and some rust-colored paint and highlight the tie plates and spike heads. Although this often isn't practical for an entire layout, it adds fine detail to foreground scenes.

When you're finished, use an abrasive track cleaner to gently polish the railheads, and you're ready for trains.

None of these techniques are difficult, and a bit of time and paint are all it takes to turn ordinary track into a worthy stage for your detailed locomotives and cars. ♣

Jeff Wilson is a former associate editor for MODEL RAILROADER.

or dark brown and are uniformly spaced. Spurs and lightly traveled branch lines often have older ties that have weathered to medium or light gray, with much more variation in color and spacing.

Rail can be found in many shades of dark brown and dark rust while spurs, sidings, and branch lines sometimes have a brighter rust color.

Painting

Start by painting the ties and rail a dark brown color. If you have an airbrush you can use any flat dark brown, such as Polly Scale Railroad Tie Brown, Roof Brown, or Rail Brown, or mixtures of all.

Spray cans also do the job in short order. For the samples shown here I used Krylon spray paints including nos. 8142 Brown, 8147 Medium Brown, and 1317 Ruddy Brown Primer.

Cover the ties and rails from all angles, making sure the paint coats the sides of the rails. Figure 4 shows a strip of flextrack after painting.

The next step is to highlight the rails with streaks of lighter colors. An airbrush is handy for finer control, but you can use spray cans if you're careful. Aim directly from the sides, just hitting the outside of the rail nearest you and the inside of the far rail. You can also do this step with a brush, but it will take a bit of time. See fig. 5. Don't worry if a little paint gets on the ties.

Combination track and roadbed

As fig. 6 shows, painting greatly improves the appearance of combination track and roadbed. Start by separating the track and roadbed if possible, then paint the track in the normal way.

Figure 7 shows how I gave the roadbed a wash of Polly Scale Grimy Black (one part paint, ten parts Polly S Airbrush Thinner). You can use other colors as well. Once they're dry, press the pieces back together.

If you're working with track that can't be separated, brush-paint the rails, give the roadbed a wash, and paint the ties individually.

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