

# Modeling railroad MAINTENANCE OPERATIONS



Model the work of “those other railroaders” with inspections and work trains

By **Dave Abeles** • Photos by the author

**W**hen we wave to the engineer on a train rolling past on the prototype, it’s easy to forget about all the other people needed to keep it rolling. There’s more going on behind the scenes to support that train than meets the eye.

Most important of these unsung jobs is maintenance – the art and science of keeping track, bridges, signals, and structures in a state of good repair, ensuring safe passage of trains carrying passengers and freight. It’s a hardworking, tough, and experienced group of people who surface track and change worn rail, calibrate switches and signals, and clean and repair railroad facilities and bridges. Unlike other modes of transportation, railroads own their property and infrastructure and must maintain it out of their own budgets.

It’s an expensive proposition. Most railroads employ an entire workforce of skilled labor and technical professionals



Signals are maintained and inspected according to the Code of Federal Regulations (CFR). On the Onondaga Cutoff, that means maintainers must climb the former NYC signal bridges, such as the maintainer seen here on the bridge at Control Point (CP) 277. The company pickup is typical for the sort of vehicles used for inspection trips.

just to maintain these assets. When we talk about “railroaders,” we must keep in mind that the word also includes these other railroaders – the ones who never run a train, but create, maintain, and

monitor the infrastructure to keep the trains moving.

Modeling maintenance operations adds a new level of realism to your layout regardless of era or prototype.

Conrail B23-7 1989, freshly outshopped after repainting, leads WOR-402, a work train on the Onondaga Cutoff. Dave Abeles shares ways you can add maintenance operations to your model railroad.





Maintenance activity adds depth of context to a scene and allows a viewer to see more of the whole picture. On my HO scale Conrail Onondaga Cutoff, modeling this group of railroaders provides for visual interest and operational challenges that help bring the layout and operation to life.

## Track, bridges, and signals

Track is foundational to railroading itself. Among the infrastructure group, the track guys like to say that they're the most important: they're the only ones absolutely required to run trains. No bridges? "Ahh, they can be filled in." No signals? "Run on the timetable." It's a fact that track maintenance is central to railroading, and most railroads have a battery of resources to make it happen.

Prototype track maintenance checks the gauge of the rail and condition of the ties, uses ultrasonic testing for rail integrity, cleans drainage ditches, and checks for settling along or under the track. Fortunately for modelers, manufacturers have produced an assortment of kits and ready-to-run equipment that helps us model this activity.

Bachmann makes a variety of track maintenance equipment in HO scale, including a motorized tamper and a motorized hi-rail truck in various road names. Walther's manufactures a Sperry Rail Car, a motorized former passenger car for rail inspection. Details West produces a kit to turn HO pickup trucks into non-motorized hi-rail trucks. Custom Finishing has an extensive line of cast-metal kits for on-track equipment, including ballast tampers, tamper-aligners, and other equipment.

Many vehicles on the railroads were customized by that road, so there's an opportunity for scratchbuilding or kit-bashing. Cabs for work trucks are available as resin castings from a variety of sources, including [ralphratcliffmodels.com](http://ralphratcliffmodels.com), and as 3-D printed models from sites like [shapeways.com](http://shapeways.com).

Another aspect includes some of the larger pieces of equipment used for different maintenance jobs. One of the most versatile is the Jordan Spreader, made by the Jordan Co. in a variety of configurations. These have many uses, including ditching, snowplowing, and ballast spreading. Walther's and Overland manufacture models of Jordan Spreaders in various scales, and Shapeways has 3-D printed options as well. Even if our models can't actually clear ditches, plow snow, or spread

On-track equipment is stored in yard tracks when not in use. For layouts, it's an opportunity to showcase custom models like this Jordan Spreader, an Overland brass import modified and painted by Dave, and a Russell snowplow, made by Walther's.



Storage trailers, common along maintenance yard areas, offer some fun modeling opportunities to include "fallen flag" paint jobs weathered to fit the era. Here a former Erie Lackawanna trailer and a former Penn Central boxcar perform storage duties for Onondaga maintenance crews. The truck is a custom resin cab on a Herpa frame with a scratchbuilt body, fitted with a Herpa boom.



Ballast tamping is a dusty, gritty job on the railroad. Thanks to Bachmann's motorized tamper, a moving tamper can be added to operating sessions. Decals from Microscale's Conrail Ballast Car set complete the model so that it looks right at home on Conrail.





Track crews are always busy on the railroad. Here, the Onondaga Cutoff track gang prepares to change a frog in a switch at CP 282. The dispatcher and yardmaster will need to change their procedures while the work is completed. Both trucks feature cast-resin cabs and kitbashed Herpa frames with scratchbuilt bodies. Decals from Vernon Shops complete the models.

ballast on our rights-of-way, we can use these kits for static display or as run-through movements.

Railroad bridge maintenance includes trucks equipped with specialty booms and mechanical arms that lift heavy steel beams or wooden bridge timbers into place. Herpa makes booms that can be kitbashed onto trucks to represent knuckle booms, commonly used in bridge maintenance due to the tighter clearances restricting access. The firm also manufactures wheels and truck frames that are great starting points for kitbashing trucks.

Signal maintenance, also specialized, involves a number of federally-regulated inspections and preventive maintenance for signals, switches, and associated electronics. The signal department generally uses pickup trucks and some of the same boom trucks as the other groups, along with machines to place cable in ditches. With buried cable running between signal masts and signal cabinets along the right-of-way, signal maintenance requires close coordination from the track department when the track gangs with their mechanized equipment work in the area of signals and interlockings. (For more on signals and interlockings for your layout, my book *Guide to Signals & Interlockings* is available from Kalmbach Books).

## Trackside details

All railroad maintenance activities require skilled employees with specialized knowledge. Railroads use employees from a Bridge and Building Department (B&B for short) to handle bridge repairs



Working on bridges is a specialized and complicated process, especially when revenue moves are on adjacent tracks. The Onondaga B&B (Bridges and Buildings) team has one of its boom trucks on Track 1 to repair damaged walkway grates on bridge 277.76 over the old Erie Canal. The crew works from Track 1 so Track 2 can stay open for SD40-2 No. 6437, leading train SENF.

## Real situations, modeled solutions

**During a recent operating session** on my HO scale Onondaga Cutoff, I noted a passing LPG propane tank car that had lost a side ladder. I walked the route back around, hoping to find the ladder so that I could make a quick repair. I found the ladder on the through-truss bridge over the Erie Canal – as well as the culprit: the etched-brass walkway between the main tracks had come loose and snagged the ladder. The ladder pulled the walkway back over itself, creating a bent mess of brass that had torn the ladder from its mount.

Using the FRS radio, I called the Mohawk Dispatcher to report the defect. I became “Foreman Abeles” with the Onondaga B&B Department. The dispatcher responded by holding trains out of the area while I inspected the damage. Several trains, even priority piggyback trains, were delayed as a result. I placed a few maintenance trucks along the bridge to suggest a work zone on Track 1 and advised the dispatcher that trains could pass on track 2, but only at restricted speed to allow for a safer work zone for the B&B gang. The dispatcher then contacted the train crews via radio and each crew copied a NORAC Form D to get permission through the work area at restricted speed.

I was able to cut the walkway free and reinstall it with a few small dabs of Walthers Goo adhesive. Once the work was complete, I used the radio to cancel the Form D for the speed restriction.

Modeling the maintenance in real time added a layer of fun variety for operators and made for some fun tongue-in-cheek conversation about the Onondaga B&B crew’s work quality. – *Dave Abeles*

as well as repairs to stations and other company buildings. These people use on-track equipment and other vehicles to perform the work, but also a variety of materials we can include on our layouts.

Materials needed by maintenance crews in the form of new ties, spare rail, tie plates, and spikes are stocked wherever there’s a little extra space on railroad property, along with extra ballast and larger stone (called rip-rap) used to stabilize embankments during floods. These stores and piles are simple to model using commercially available ties

and rail, cut to length and stacked along the track.

There are two major categories of railroad bridge track – ballasted-deck and open-deck. Ballasted deck bridges use track placed in a ballast bed that’s continuous across the bridge. Open-deck bridges have wooden ties resting directly on the steel superstructure of the bridge and use backwalls to hold the non-bridge ballast off the bridge.

Some common bridge parts are kept on hand, but the majority of railroad bridges are custom-built for a specific

# Getting it done

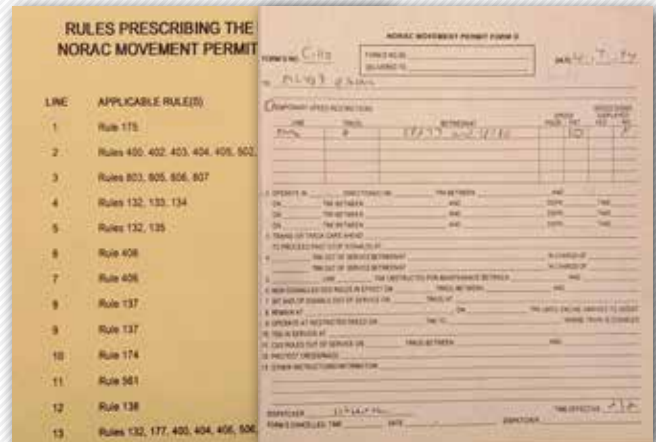
**Maintenance operations can add** a lot to your railroad's operating scheme. While most inspections can happen without interfering with normal train activity, some inspection work and a large amount of maintenance requires dedicated time for track to be out of service to revenue trains. This can be woven into the sequence of operations and often requires special paperwork and permission to ensure only the maintenance crews occupy the track.

If maintenance is being performed by a locomotive with cars, often that movement is treated like any extra train. Examples include ballast trains, rail trains, and trains setting out new ties for future replacement.

For other on-track equipment that doesn't reliably shunt the signal system, there are two major types of track permissions for maintenance activity: foul time and designating a track out of service. Foul time is for activity that doesn't disturb the track bed or affect the integrity of the track. It's appropriate when an off-track crane is lifting supplies closer to the track or for most inspection activity. Designating a track as "out of service" is used for maintenance that may affect the stability of the track. This includes ballast tamping, bridge repairs, rail replacement, culvert construction and the like.

Operationally, foul time is granted and released via verbal permission from the dispatcher or operator for a maintenance crew to be on a certain track for a certain amount of time. On the other hand, because physical work on track or bridge potentially impacts the structural integrity of the track itself, it needs more formal authority.

Written permission is required to remove track from service and return it to service under the rulebook that governs that track. For northeastern railroads, this includes the Northeast Operating Rules Advisory Committee (NORAC)



Conrail is a member of the Northeast Operating Rules Advisory Committee (NORAC) and uses NORAC Form D to grant track authority for maintenance. Each book comes with a list of rules applicable to different jobs and a number of blank sheets used to ensure both the dispatcher or operator and the movement have the same information. Form Ds are also used for speed restrictions, like this one issued to ML403, a westbound auto rack train.

Form D, while railroads using the General Code of Rules (GCOR) follow the GCOR Track Permit procedure. These rules provide specific directions for removing a track from service.

Once the work is complete, the rules also govern required inspections and approvals before regular train operations can be resumed over the track – since track integrity is involved, everyone needs to be absolutely sure that track will not fail underneath a train. Like the prototype, you can use paperwork to take track out of service to simulate maintenance or to simulate speed restrictions to be handed to passing trains. – *Dave Abeles*

location, so standardized parts are relatively rare. Still, bridge ties are often kept on hand for use on open-deck bridges. While these too are often customized, wooden ties can be quickly cut to length using hand saws. Steel shapes, girders, and trusses can be modeled easily from leftover bridge kit parts from as well as shaped plastic from firms such as Plastruct or Evergreen.

A few old truck trailers or containers are often used as storage for small items, tools, and materials that are more sensitive to the weather. This is a good opportunity to include a heavily weathered trailer, perhaps from an earlier era or a predecessor railroad, on your layout. Prototype photos are great to guide your weathering effort as well as deciding where to place the storage trailers.

Finally, thanks to several figure manufacturers, we can populate our work locations with maintenance crews from multiple eras. Bachmann, JTT, Preiser, and others offer painted and unpainted



Bachmann also released a DCC-equipped hi-rail work truck that makes for some variety during operating sessions. Here, truck TC-5180 works around the superelevated curve at MP 279.8 on a routine track patrol.

track workers and maintenance figures. These are available in modern versions with high-visibility vests and hard hats and more traditional versions from earlier eras when such clothing and Personal Protective Equipment (PPE) wasn't required.

## A wave from the cab

Take some time to place some maintenance supplies and personnel trackside. An old siding or area can be used to stage a Jordan Spreader or other equipment or to display a maintenance vehicle or a kitbashed truck. A working hi-rail truck or ballast tamper can run between trains, adding a sense of prototype flavor to your railroad. Next time you're moving a regular revenue train on your model railroad, you can imagine giving a wave to the maintenance crews you've located around the layout. Remember: there are a lot of different kinds of railroader, and each one plays a role in keeping the trains moving!

*Dave Abeles is a frequent contributor to Model Railroader magazine and its special publications, including Model Railroad Planning 2024, available to order now. His track plan appeared in Model Railroad Planning 2018.*