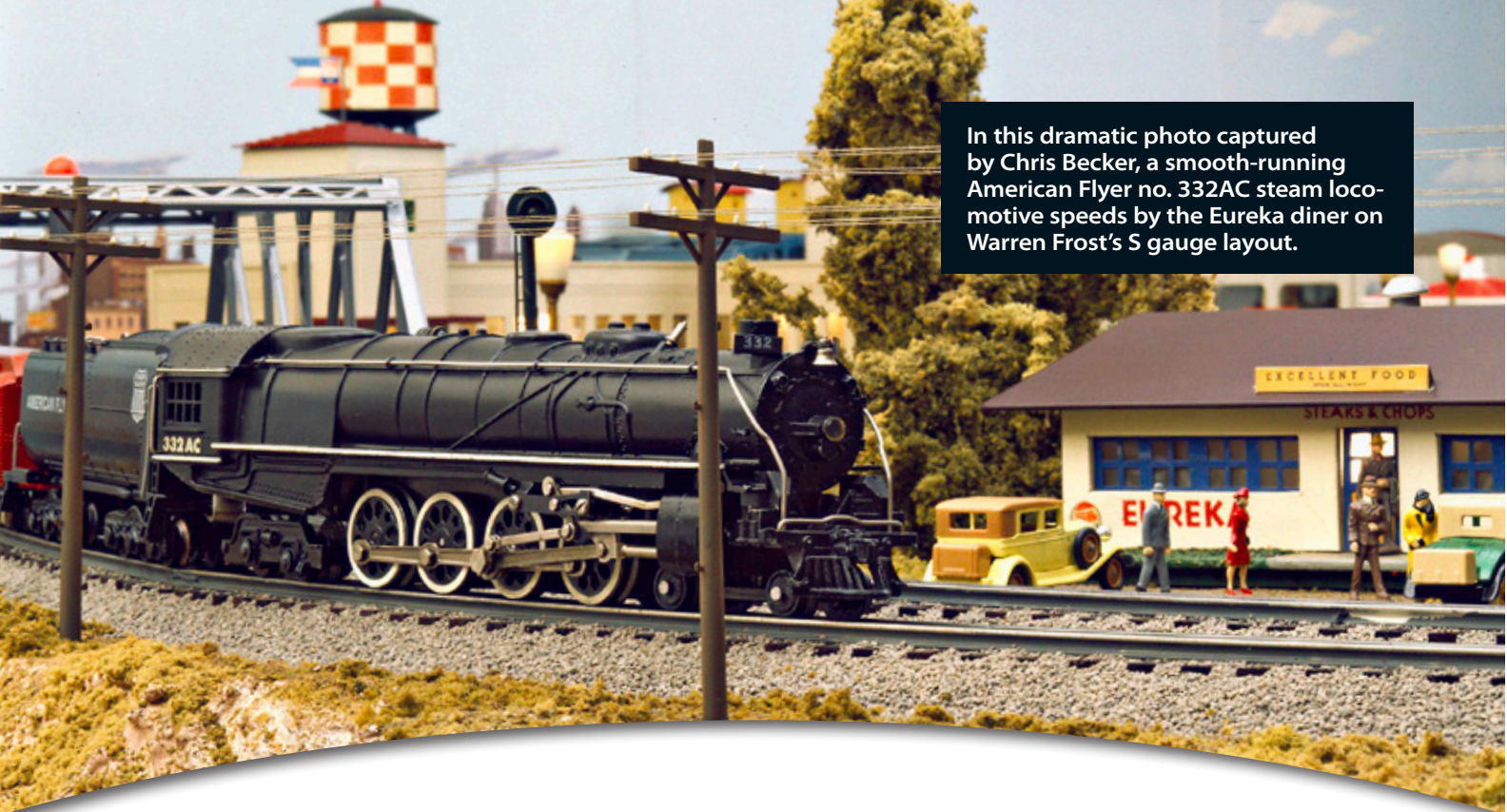


In this dramatic photo captured by Chris Becker, a smooth-running American Flyer no. 332AC steam locomotive speeds by the Eureka diner on Warren Frost's S gauge layout.



Servicing Flyer's **BIG STEAMERS**

11 steps to keep your engine
in good repair

story and photos by
Rocky Rotella

LIKE OTHER VINTAGE TOY TRAINS that sit for years boxed in a basement or dormant on a display shelf, even a desirable engine like an S gauge American Flyer 4-8-4 steam locomotive requires attention to stay in good working condition.

Just the same, some operators may neglect to properly lubricate their

engines or dismiss faltering performance as a symptom of age. Whatever the ailment may be, the typical remedy doesn't involve any more than careful disassembly, cleaning, and lubrication to restore these engines.

However, when the collectible value of a model rises, it's not uncommon to

find some owners who are reluctant to work on an expensive or rare item. Others may be intimidated by an engine's size or complex mechanisms.

In either case, servicing and maintaining a Flyer 4-8-4 locomotive isn't so difficult when you follow the simple instructions I've provided here. **CTT**

INITIAL INSPECTION

1 Test-run the locomotive

To start the process, I first tested my American Flyer no. 336 steam locomotive and noted any irregularities in its operation. I found that it ran fine, though not nearly as fast as some other units I've operated. Additionally, every so often a spark would come from beneath the chassis and the locomotive would sometimes short out.

With a few essential tools and a reference copy of K-Line Electric Trains' *Complete Service Guide for American Flyer Trains* (no. K-0003) at my fingertips, I began disassembling my locomotive and tender to investigate these operating ailments.



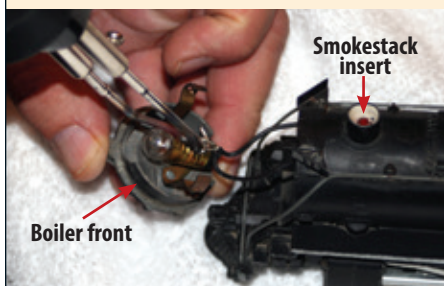
Essential tools and supplies

- Grease, Labelle no. 106 or similar
- Solder, rosin-core
- Soldering iron or gun
- Straight screwdrivers, medium- and small-tipped
- Oil, Labelle no. 102 or similar
- Wrenches, $\frac{3}{16}$ - and $\frac{1}{4}$ -inch open end

LOCOMOTIVE DISASSEMBLY

2 Remove the boiler front

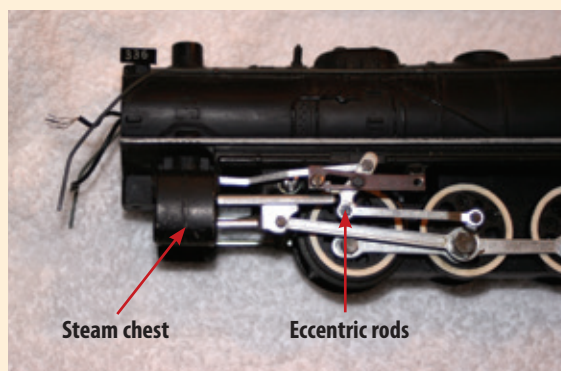
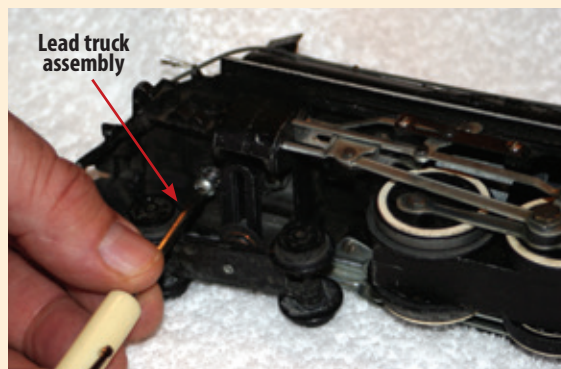
After placing the locomotive on a soft cotton towel, I began the disassembly process by removing the boiler front and disconnecting the two wires that power the headlight bulb. By sliding the boiler front forward, you'll expose the wires enough to detach them from the bulb using a hot soldering iron. In addition to removing the boiler front, I removed the red plastic smokestack insert from the smoke unit.



3 Detach the lead truck

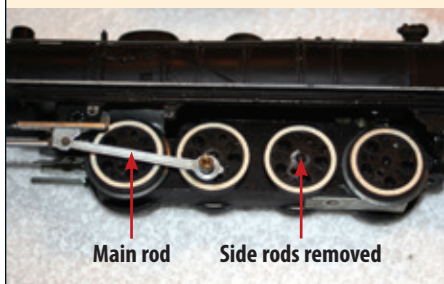
With the boiler front detached and set aside from the body, I laid the engine on its side and removed the screw that fastens the lead truck assembly to the chassis. Use caution when separating these parts. The boiler's handrails extend down into the pilot and must be carefully separated to avoid creating any unwanted bends.

While I had the engine in this position, I removed the screw that fastens the steam chest to the locomotive body. I also removed the shoulder screws that fasten the trailing truck to the chassis and drawbar to the body.



4 Separate the side rods

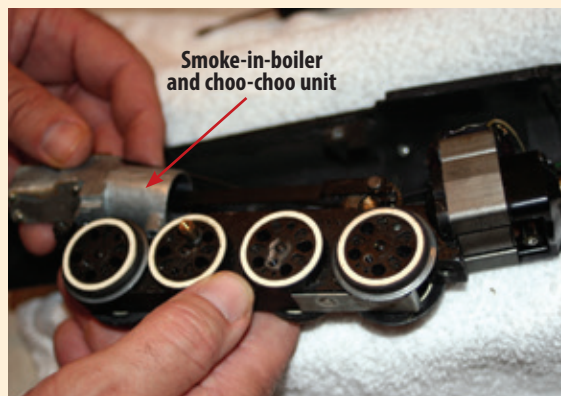
Removing the small hex-head bolts that fasten the side rods to the drivers requires $\frac{3}{16}$ - and $\frac{1}{4}$ -inch open-end wrenches. Once the side rods were disconnected, I removed the small screws that fasten the eccentric rods to the shell. I then flipped the engine over and removed the small screws that fasten the main rods to the body. The main and eccentric rods are fitted to a specific side of the engine, so be sure to note their position before removing them.



5 Separate the chassis from the body

After detaching the entire side-rod assembly, I removed two large screws from the sides of the engine and another from the bottom to separate the chassis from the body. To completely remove the chassis, shift the chassis forward about $\frac{1}{4}$ inch so it clears the mounting tabs at the rear of the body.

Next, I removed the screws that fasten the smoke-in-boiler and choo-choo unit to the chassis. Moving these components out of the way makes it easier to inspect the condition of the wiring and note anything that appears weak or in need of repair.



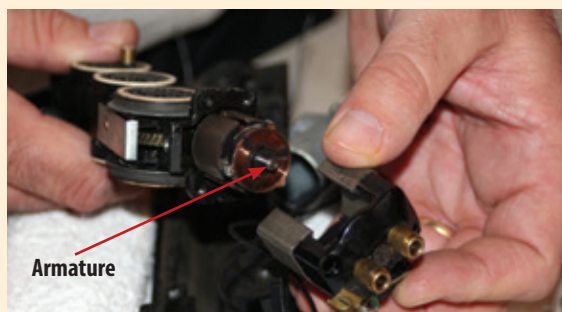
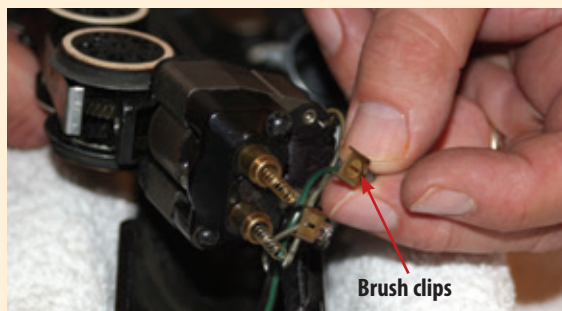
LOCOMOTIVE DISASSEMBLY CONT'D.

6 Remove the motor

The motor must be removed in order to completely disassemble the chassis. Start by carefully removing the brush clips. The brushes are under spring tension, and removing their retaining clips without care can send the small springs flying.

After removing the springs, I separated the field from the armature by removing the two long screws that secure the brush cover to the chassis. Watch closely for the two small brushes to tumble out.

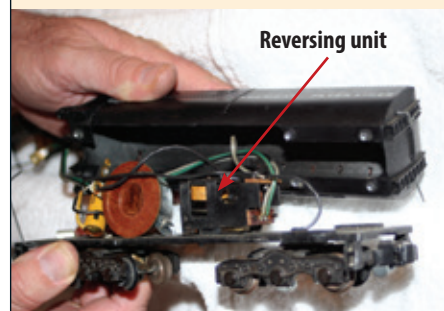
Now, rotating the armature counterclockwise will free it from the chassis. Note the position of the small thrust washers on the front and rear shafts of the armature – these must be restored to their original positions during reassembly. After disassembling the chassis, the field and smoke unit will slide out through the cab.



7 Take apart the tender

Remove the six screws that fasten the tender shell to the frame and then lift the top off. Like the pilot on the engine, the tender's front and rear handrails extend down into the frame and must be removed carefully to avoid causing damage.

After removing the shell, I inspected the wiring and repaired anything that looked weak or broken. If you noted any issues when you previously tested the reversing unit, this is the best time to address those. The reversing unit on my engine functioned just fine, so I sprayed a shot of aerosol contact cleaner directly onto the drum and fingers for good measure.



CLEANING UP

8 Wash the chassis, body, and tender shell

I used a soft bristle toothbrush to gently wash the chassis, body, and tender shell with a mixture of warm water and mild liquid dish soap. With the goal of removing accumulated dirt and grime that often

affect a locomotive's appearance and performance, I carefully avoided scrubbing the letters, numbers, and the white running boards.

After washing and rinsing each piece thoroughly, I used a lint-free

cotton towel to gently dab them dry. I followed this with a few blasts of compressed air to blow away any water remaining in hidden or hard-to-reach crevices.



REPAIRING A BROKEN DRIVER

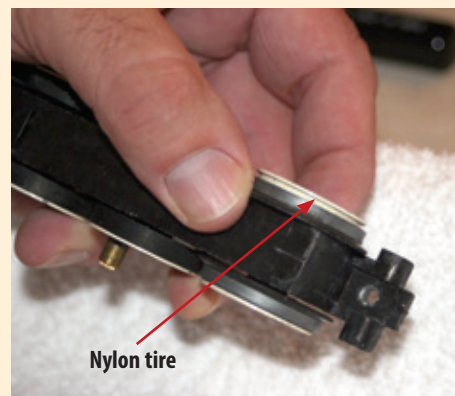
9 An alternative to replacing parts

While washing the chassis I noticed that the outer rim of one drive wheel had slipped off the nylon tire. If a misaligned rim comes in contact with the chassis, it can lead to erratic operation or even a short circuit – much like what occurred during my inspection.

Although replacing the entire driver may be the best solution, the American Flyer 4-8-4's prototypical drivers are unlike those on any other Flyer engine. Consequently, a quality replacement part can be difficult

to find. As an alternative to replacing the entire wheel, I found that applying a small amount of quick-set adhesive (super glue) around the tire and then repositioning the outer rim solved the problem.

If you perform this repair, be sure to pay close attention to the rim's alignment while the glue sets. Even the slightest misalignment can cause the engine to wobble down the track.



LOCOMOTIVE LUBRICATION

10 Clean and rebuild the mechanisms

I cleaned the commutator face on the armature with rubbing alcohol and removed any residue in the grooves with a toothpick. Then I placed a small amount of Labelle no. 102 oil on the thrust bearings and reinstalled the armature in the chassis. After reassembling the brush cover and field, I cleaned and reinstalled the brushes and springs, and finally the brush clips.

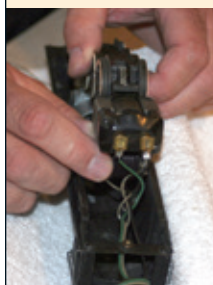
Next, I reinstalled the smoke-

in-boiler and choo-choo unit, the steam chests, and the pilot, and then the side rods – but not before polishing them with Blue Magic, a metal polishing paste typically found at hardware and automotive parts stores. A few minutes spent buffing the side rods with this paste helped restore their original sheen.

Before reinstalling the gear plate, I lubricated the main-drive gear with a liberal amount of Labelle no.

106 grease. You'll want to spin the armature by hand to ensure that the entire assembly received sufficient lubrication.

I followed this with a small amount of no. 102 oil to lubricate the axles of the lead- and trailing-truck axles, drivers, and any moving point on the side rods. After reassembling the tender, I also lubricated its axles and pick-up tabs.



11 Reassembly and testing

The final steps in reassembly included reinstalling the trailing truck and smokestack insert, reconnecting the wires to the headlight bulb, and reinstalling the boiler front. Once it was completely reassembled, I set the engine back on the track for a

test run. The locomotive not only cleaned up beautifully, but it ran smoothly at low speed. Also, it no longer sparked or shorted out, and its top speed was noticeably faster than it ever was before the servicing and repairs. All the effort was worth it.

