

# AGGIORNAMENTO TECNICO:

## Repowering the Lima N Scale E444



by Blaine Bachman

Side-tracked for some years in the world of North American railway modelling, I became well acquainted with Kato-produced products. Over time, I estimate that I owned in the neighborhood of 50 Kato and Kato/Atlas locomotives. Now that I have returned wholeheartedly to modelling the Italian scene, I miss their amazing reliability and functionality.

Studying the old production Lima E444 (with the truck-mounted motor) I became aware that the distance between the axles and the distance between truck centers were nearly identical to those of the Kato/Atlas RS-3, a North American shunting locomotive. Atlas also used this mechanism in the RS-11 and the very early (1980's) model of the GP-7 and GP-9. I quickly formulated the idea of combining the most desirable elements of these two models - the Kato/Atlas mechanism and the Lima body shell - to construct a locomotive able to pull trains with the operating realism to which I had become accustomed.

(Please note that the recently produced Kato RS-2 might be used for this conversion. However the electrical pick-up system is significantly different from that of the RS-3, requiring a different technique in modifying the truck side frames.)

As with all how-to articles, I urge you to read this one beginning to end a couple of times before you start.

### **Prepare the RS-3 Mechanism:**

To begin, remove the body shell from the RS-3. This much is easier said than done. Carefully study the isometric drawing that is included with the engine from the factory. Note that it is first necessary to remove the cab so that you can gain access to the tabs holding the shell to the frame.

Once the body shell is off, remove the plastic fuel tank. Then, loosen the two screws just enough to allow the trucks to drop free; set the mechanism aside, well away from the working area so that little bits of flotsam and jetsam don't end up inside. Using a hobby saw, remove the side frames from the trucks by cutting at the outermost edge of the metal inner frame.

In order to get a proper looking model, particularly as to height, you must cut the coupler mounting boxes from the trucks and devise a body-mount solution to match your choice of couplers. My model carries Fleischmann Profi couplings (with the close coupling mechanism).

### Salvage the Needed Parts from the E444:

Turning to the E444, disassemble the locomotive and set the body aside. Remove the trucks from the underframe and cut the side frames off as you did on the RS-3.

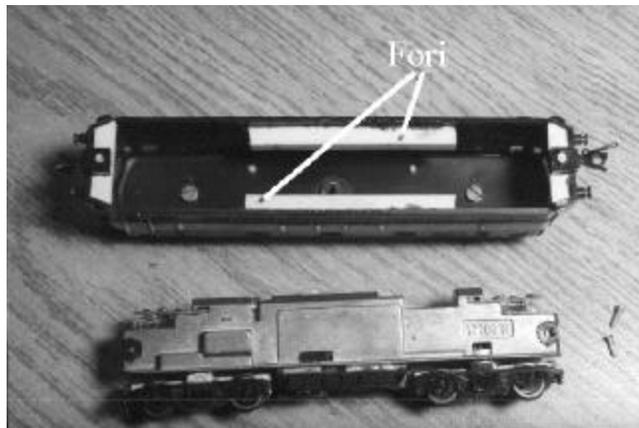
Depending on the vintage of your E444 shell, you may find a plastic tube designed to house a mounting screw protruding from the center of the roof inside the shell. This intrusion is easily removed with end-cutting pliers. I found that it is also advisable to remove the clear plastic glazing piece. I used Microscale's Micro Krystal Kleer (or artist's gloss medium) to add flush-fitting "glass" to the shell. Lacking this product, you could replace the windows with suitably-sized pieces of clear plastic carefully glued in place.

### Assemble the "Puzzle":

You now have four side frames to glue onto the RS-3 truck mechanisms. It's best to do this with a quick setting two-part epoxy as it will give you time to get everything perfectly aligned, fill any voids, and give a fairly strong bond.

Once the epoxy has set, test everything. Roll the trucks by hand on a piece of track and verify that nothing rubs. Remount the trucks to the mechanism and test under power for proper operation through curves and points. When you are satisfied with the results, move on to the next step.

As the body shell is considerably wider than the RS-3 mechanism, a body mounting system will have to be devised. I measured the inside width of the shell and subtracted the measurement of the outside width of the mechanism (above the "lip" that runs along the bottom edge). I then divided the remainder in half to get the width of the pieces of plastic I would have to glue to along the inner sides of the shell in order to provide a mounting surface. My calculation came up to 0.120" per side, but you should double check as I have found some slight differences from shell to shell. Prepare the two pieces of plastic, but don't glue them in place just yet.



Drill two holes through the lip of the mechanism to provide places to attach it to the mounting surfaces using tiny machine screws (see photo). Mark and drill pilot holes in the two plastic mounts (prepared in the previous paragraph) and attached them to the mechanism. Test fit the mechanism inside the shell and verify that it is a snug fit; trim or shim the plastic mounts (in equal amounts on each side) as needed.

Apply a bead of plastic cement to the surface of the plastic mounts and carefully slip the entire assembly into the shell. I use Faller Pro cement as it is thick enough to provide a bit of a friction bond while it sets, yet thin enough to not ooze out all over everything and create a sticky mess. Set the locomotive on a piece of track and adjust the height, ensuring that the buffers match the typical height and the shell is level all around (end to end and side to side). You may want to temporarily support the ends of the body shell on suitably-sized plastic or wooden blocks while the glue sets.

If your original E444 mechanism was one with the plastic underframe, you can cut it apart to salvage the gridded panels between the trucks and attach them to the RS-3 mechanism with epoxy. If the piece is metal, make RTV rubber moulds of the area and cast duplicate parts in epoxy or casting resin, or scratch build them to your satisfaction. Paint these parts with FS dark blue. While you have the paints out, put a coat of flat black on any of the bare metal surfaces visible from a normal viewing angle. Do not paint the surfaces where the metal truck inner frames touch the metal mechanism - this is where the electricity is conducted from the wheels to the frame and thence to the motor.

### **In Conclusion:**

Affix your preferred coupling solution to the body shell using whatever odd bits of plastic may be necessary to provide a suitable mounting surface. As the RS-3 mechanism has directional lighting, you may want to provide a sort of light baffle around the cab windows and direct the light to the headlights using fibre optic strands or some other solution. (There's also plenty of room inside for a Digital/DCC decoder!)

Now place your E444 on the track, back onto a rake of UIC-X coaches, test the air pressure, and gently pull out onto the main. You and your 1:160 passeggeri will be pleased with the smooth ride.

### **Post Script:**

Since performing this conversion, I have found that the Kato F-3/F-7 mechanism is also a suitable choice and has the added benefit of being flywheel equipped. Again, it is best to use the version with the earlier trucks so as to avoid significant work in maintaining the power pick-up of the later low-friction trucks. It's also necessary to trim some of the metal from the rear of the Kato chassis to fit inside the shell.



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