

Converting a Bachman 4-6-0 Loco to Battery Power R/C

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The Bachman 4-6-0 "Big Haulers" are perhaps one of the easiest locos to convert. They are easy to work on and the tender has plenty of room for all of the components: Battery pack, Controller, Sound, Speaker, Switches and Jacks.

In this case, we have previously used electronics components to install: A 14.8V, 4400mah, Li-Ion battery pack, RailBoss 4 Plus controller, and Phoenix Sound P8 sound card and speaker. We will also need to install two reed switches for track magnet activation of the whistle, bell, and automatic station stops.

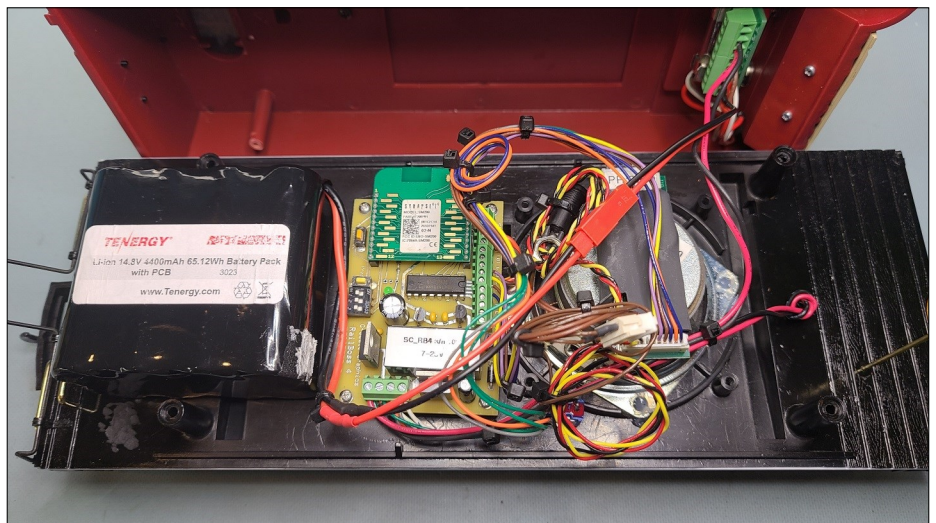
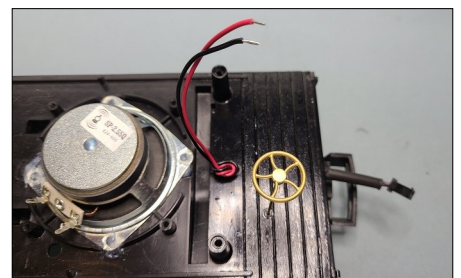
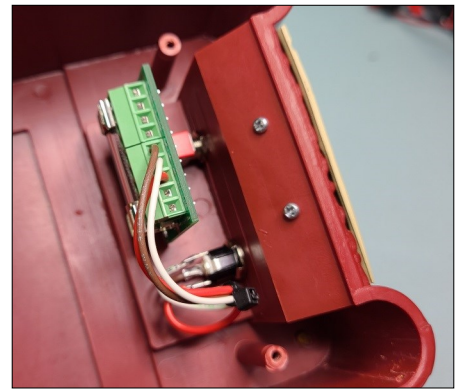
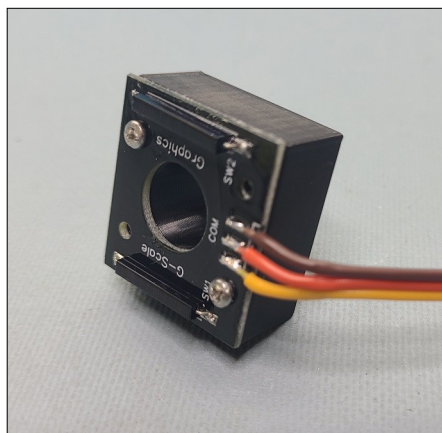
Where to start? Before we waste time on anything else, make sure the locomotive runs on track power and check the track voltage at running speed to insure the 14.8V battery will provide enough speed. This one runs nice between 8-12 V.

Now where will all this stuff go? Open up the tender and you will see a factory chuff board, 9V battery and holder. Remove all of this using a Dremel tool to make a flat floor.

The speaker location is dictated by the factory speaker grill in the middle of the tender floor. The factory speaker is a cheap 3", 0.5 watt. We will use our Phoenix 2.5", 3W speaker mounted with Silicone adhesive.

Maximum height inside the tender, without modifying the dummy wood load is 1.9", so everything must be lower than that. The battery pack will fit nicely in the rear of the tender, and the RailBoss between the battery and the speaker. Phoenix Sound can be glued to the top of the speaker after being insulated with heat shrink tubing.

Controls? We have a Battery Conversion Module with an On/Off switch and



a remote charging jack. There is also a Phoenix toggle switch for volume control. These need to be accessible by the operator. After careful measurement and inspection, it looks like the on/off switch and charge jack can be mounted on the front of the tender, but no room for the volume there. So the volume switch will be floor mount-

ed near the speaker and accessible from the Engineer's side of the tender.

The G-Scale Graphics reed switch module already has the reed switches spaced exactly 1.0" apart. It will be mounted under the rear truck of the

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tender. All we have to do shim it so the reed switches are about 0.1" above the rail. This will be done with a custom 3D printed shim. The shim is glued in place with Silicone adhesive, and the reed switch module is screwed to the shim. The Engineer side reed switch will activate the whistle, and the Fireman's side will sound the bell and/or station stops.

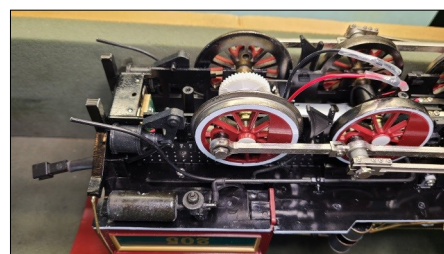
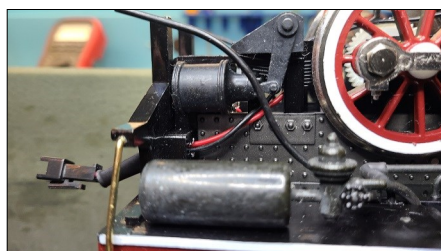
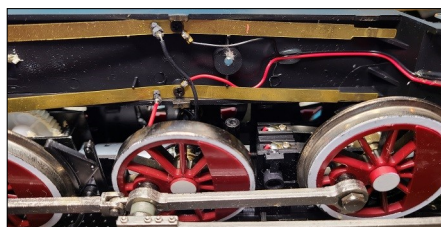
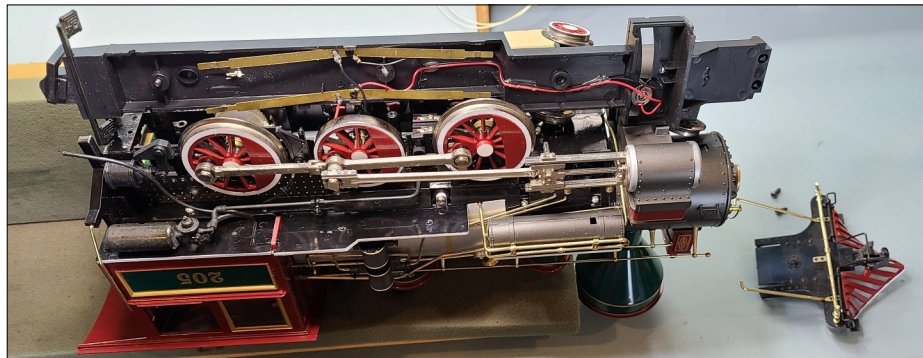
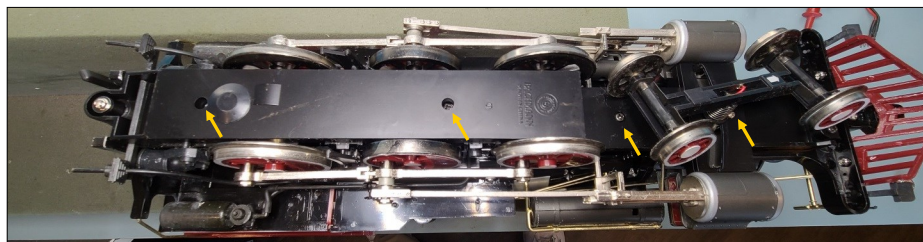
The battery pack, RailBoss 4 with mounting plate, and Phoenix Sound with heat shrink are secured using double-sided foam tape. Use this sparingly! 1" squares or less. It can be difficult to remove.

Wire everything per factory wiring diagrams using 20 ga. tinned stranded wire for the motor and battery wires, 22 ga. tinned stranded wire for the rest. Use tie wraps to neaten up the wire routing and make it easier to get the tender top back on. In this case a 2-wire connector between tender and loco will be used for the motor. The front headlight will still be powered from motor voltage. A connector is also used between battery pack and the Battery Conversion Module for safe connect/disconnect (no sparks). Phoenix Sound requires a computer and jack for programming. Since this is seldom, if ever, used, the jack will remain loose inside the tender.

Route the motor wires through the frame. Use black heat shrink tubing (unshrunk) as a shroud to cover wires and look more like a brake line. Tie off wires inside the tender for strain relief.

Excess wire from the Phoenix Sound card will be coiled up and tie wrapped, instead of cutting it off. You never know, it may be needed in a future installation.

Now to isolate the loco track power pickups from the motor so we can run multiple locos on the same track and with track powered locos. Open the bottom of the loco via 4 screws (I took out two more on the pilot, which wasn't necessary). You will see the two long brass pickup strips. Two wires go directly to the motor, the other two go



to the pilot pickups. Unplug the motor wires, remove the strips and just cut the wires at the front pilot.

There are some options for the wiring between the tender and the loco. In this install, I will be using only two wires for the motor to keep the wiring between them at a minimum. You could also use a 4 wire connector to include two wires to control the front light via the RailBoss. That provides constant light, running or stopped. Or you could take advantage of Bachman's built-in mechanical chuff switch, which is a white connector available on the back of the loco labeled "Chug" or "Speaker". I chose the easy route with 2-wires and voltage triggered chuff.

The two wire cable needs a hold in the back of the loco, and then route it

through the hole, into the motor cavity, and to the motor wires. Each side of the cable is loosely covered with black heat shrink to hide the red wire. The cable and motor wires are soldered together and covered with heat shrink tubing. Polarity doesn't matter, as we can easily fix that in the tender.

Reassemble to loco being careful not to pinch the wiring.

Connect the tender to the loco and give it a test run. The loco should move forward when first powered up (without changing direction on from the TX). If not reverse the motor wiring at the RailBoss. Likewise, there should be two toots when moving off forward. If not, reverse the motor wires going to the sound card.

That's it. Just play with it and program the RailBoss 4 and/or Phoenix Sound card to your liking.

