Installing Sound Decoders and LEDs in Brass Steam Locomotives Part 2

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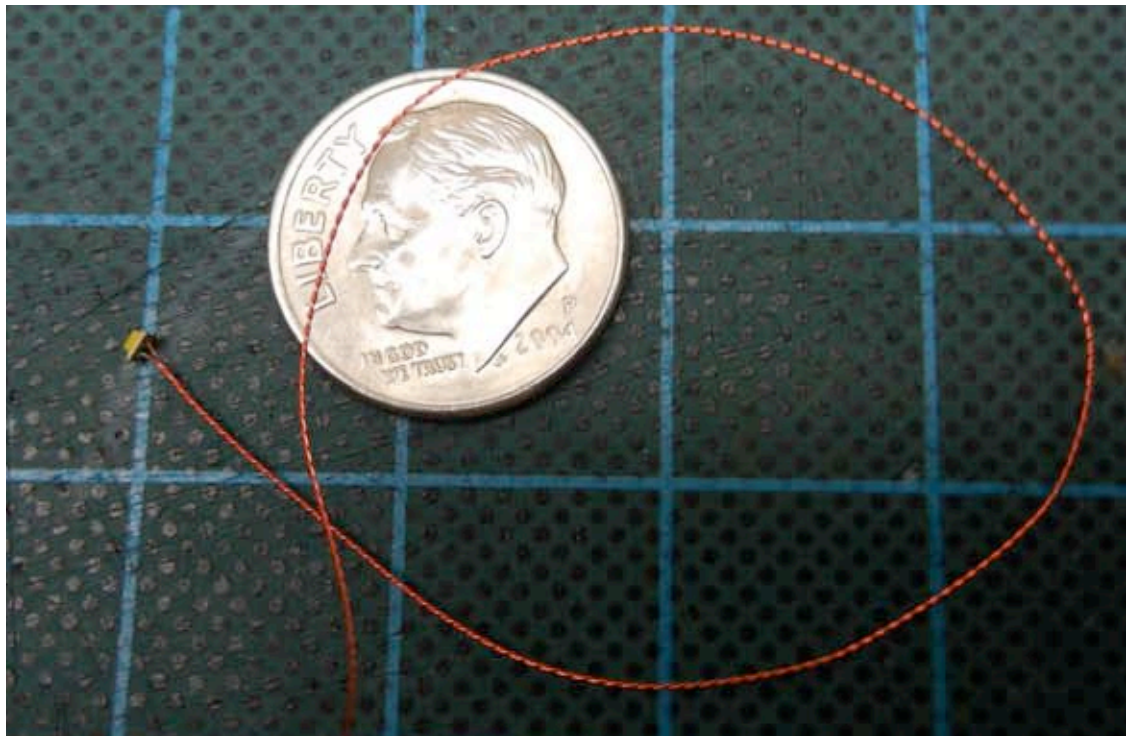
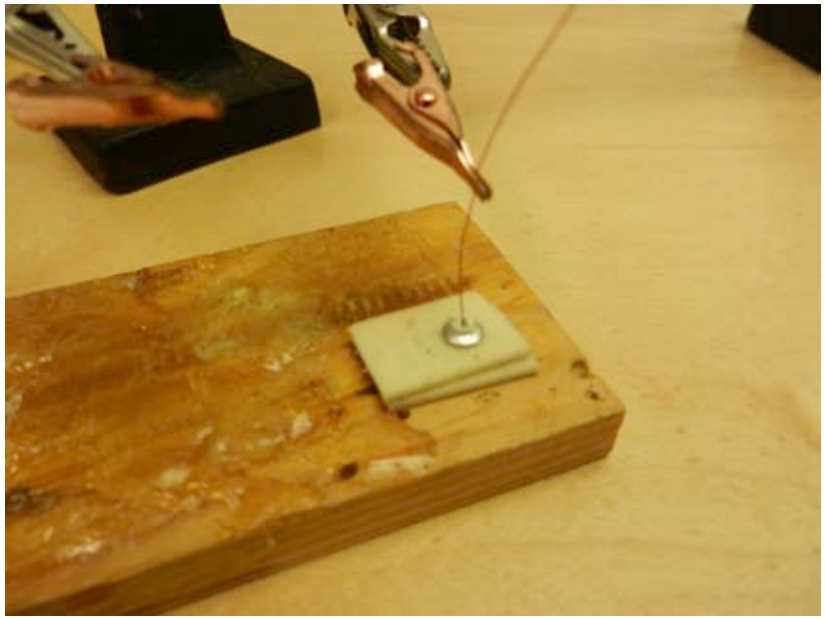
LEDs for Head and Backup Lights

- Richmond Controls Golden White 603 LEDs work well in headlights and backup lights (these can be purchased wired)



Installing MV Lenses and LEDs in Head and Backup Lights

- Place the MV lense on double sided foam tape and drill a #52 dimple in the back of the MV lense and set it in Mico Mark Micro Glaze or some other clear, removable adhesive



Installing MV Lenses and LEDs in Head and Backup Lights - Continued

- Once the adhesive dries, thread the wire into the light fixture.

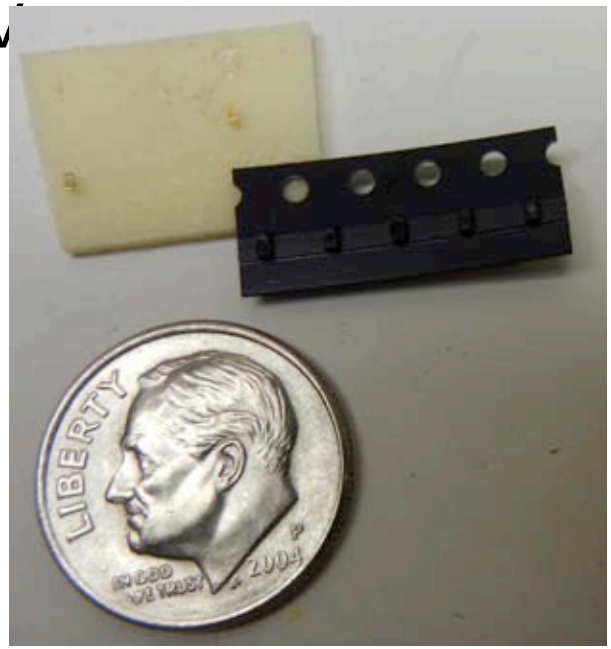
  Use the same adhesive to fasten it in (wires will easily fit through a #76 hole).
- Brightness can be selected by resistor value (this is 23K)

Using a Cary Light Fixture as an ATSF Tender Safety Light

- Cary BL-166 light approximates ATSF safety lights.
- Drill a #57 hole through the Cary light fixture.
- Drill a #55 hole in the tender to install the Cary fitting and a #76 hole to thread the wires
- After painting the fixture to match the tender, epoxy it in place on the tender

LEDs for Safety Lights

- Ngineering Nano 402 Red LEDS fit in the Cary Light. Unfortunately, I haven't found anyone who sells these wired and soldering to these is a challenge - this link shows a video demonstrating soldering to a 402 LED: http://www.youtube.com/watch?v=7gNPy9AsrV

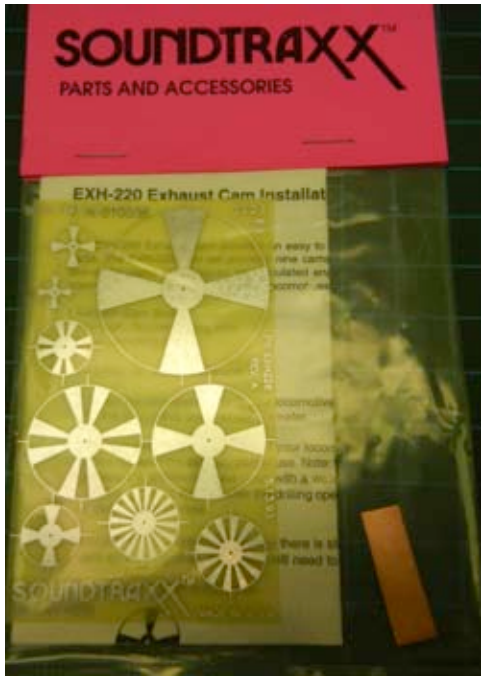


Installing an LED in the Cary Light Fixture

- Place the 402 LED in the Cary fitting. Thread the LED wires into the tender.
- Install a red MV LS 301 lens from which you have removed the foil backing with glaze.
- Fill the back of the Cary fixture with Squadron putty.
- Touch up with paint
  once the putty dries.
- Brightness controlled by
  resistor value (23K to 47K)

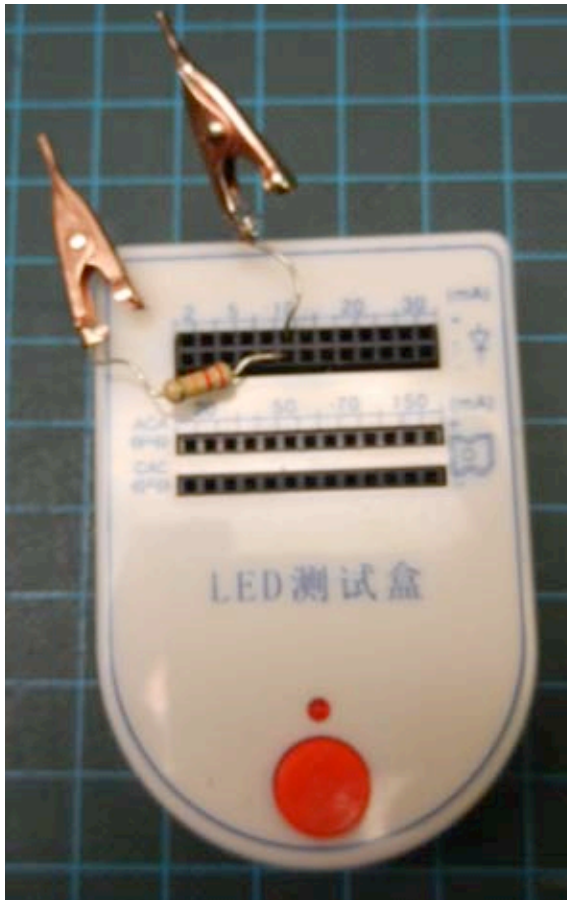
Installing Soundtraxx Cam

- If you want synchronized chuff (I prefer this) and the loco doesn't have a built in cam, the Soundtraxx cam is fairly easy to install and works fairly well.
- Alternative is autochuff, which can always be selected with a Configuration Variable (CV) software change.



Testing LEDs Between Install Steps

- The wires and connections are so small that checking operation of the LEDs between steps is very worth while (copper clips are from Radio Shack)
- LEDs are polarized, so reverse leads if it doesn't light



Search for the least expensive LED Tester on ebay $3.58. Ulrich's also sells this model

Installing Cam - Continued

- Remove side rod screws from rearmost drive wheel (watch for washers)
- Remove loco trucks (if any) and bottom plate
- Remove rear wheel (be careful not to lose springs if present)

Installing Cam - Continued

- Select a cam from Soundtraxx sheet that has four lobes and is big enough in diameter to meet inside of the driver rim
- Measure the drive axle diameter
- Scribe a circle with a compass the diameter of the driver wheel hub
- Drill a hole in the cam large enough to accommodate the axle
- Cut out the cam and make a radial cut between cam lobes to the hole

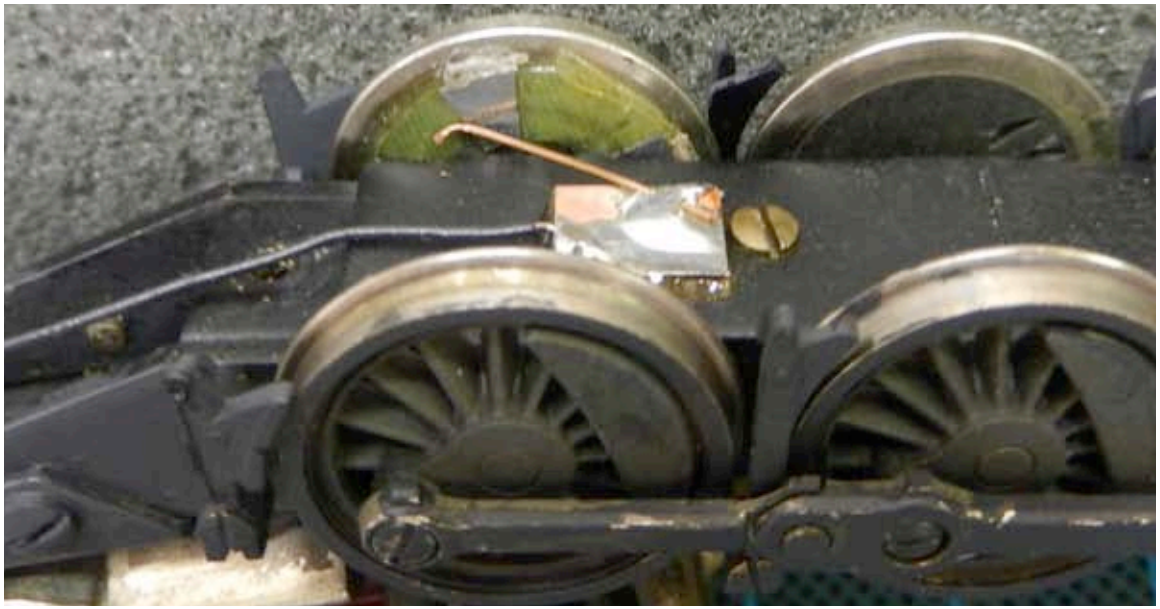
Installing Cam - Continued

- Epoxy the cam (silver side exposed) to the back of the spokes on the right side (conductive) driver wheel with one of the lobes centered on the rod screw hole.
- Clamp cam to be sure it is flush against the wheel
- When the epoxy is dry (overnight best), paint conductive paint between each cam lobe and wheel rim.
- Reinstall the wheel taking care that springs or wire suspension elements are in place.
- Reinstall the side rod screws

Installing Cam Follower

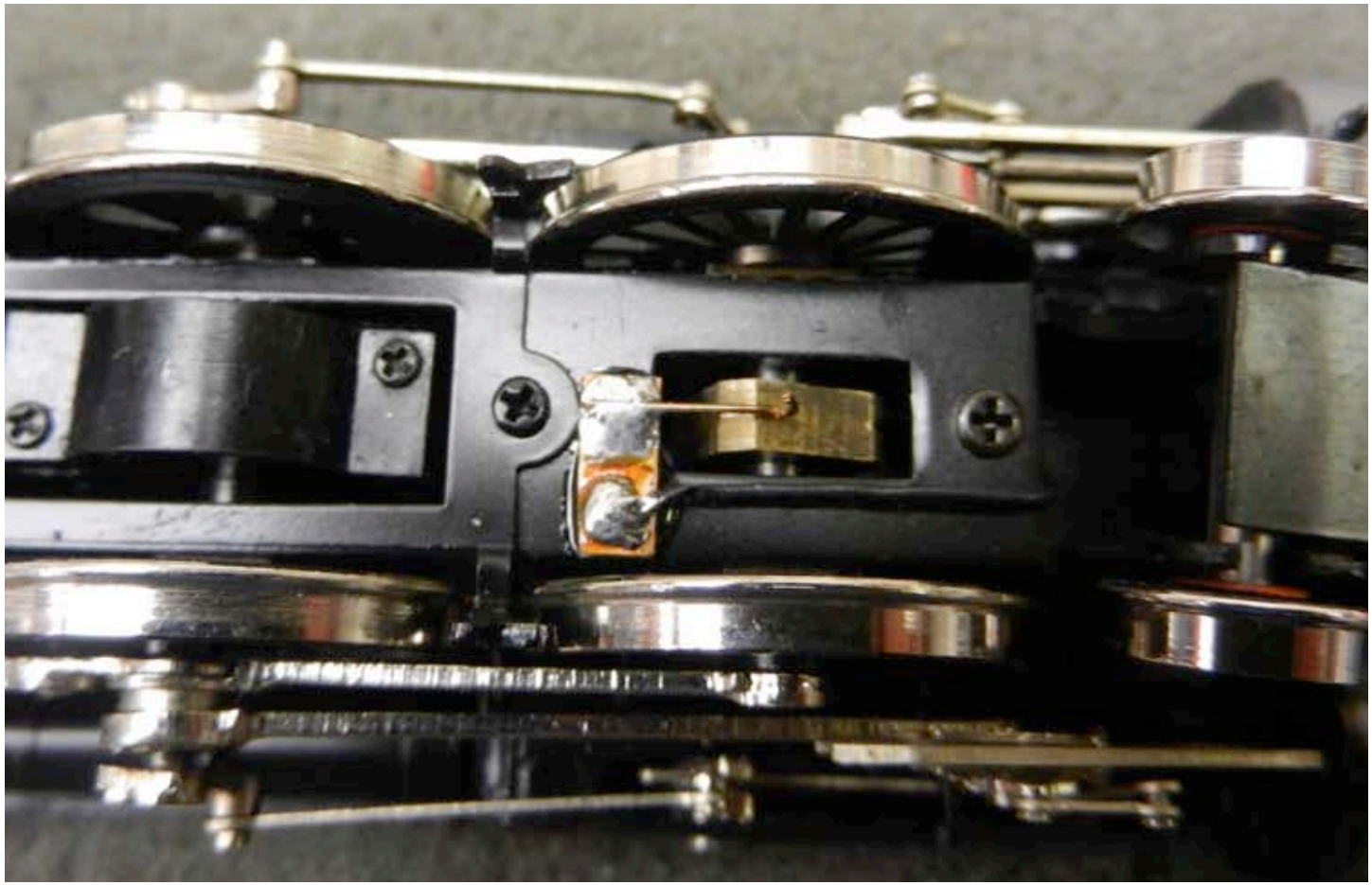
- Cut a small piece of the PC board material in the cam kit such that it will fit on the loco bottom plate as shown.
- Place a spot of solder on the PC board.
- Solder a short piece of the phosphor bronze wire from the cam kit to the PC board and form as shown.

Soundtraxx Cam and Follower



If you get a double chuff from a lobe, turn the completed model over in a foam cradle and attach some alligator clips from the track leads, one to the loco and one to the tender. Run the loco slowly to find the lobe causing the double chuff. Usually light sanding with 600 grit stick or changing the bend in the follower will eliminate the double chuff.

Factory Cam with Follower Added



Improving Tender Wheel Pickup

- Adding removable wires from the tender truck to the tender will improve left wheel pickup.

Improving Tender Wheel Pickup - Continued

- Drill #52 holes through the tender floor and solder female pins from NCE connector or the like from DigiKey
- Solder a small flexible wire to the truck with a male pin attached as shown
- Soldering to the brass tender is easiest with resistance soldering tweezers or a 250 watt gun
- Adding all wheel pickup will of course give the best operation

Sources for Decoder Installation Parts

- **Decoders, NCE Connectors, TCS Connectors, Kapton Tape, Heat Shrink Tubing, and Speakers and Enclosures**

  Tony's Train Xchange

  http://www.tonystrains.com/list.htm

  Phone: 1-800-978-3472

  FAX: 802-878-5550

  57 River Rd., Suite 1023

  Essex Jct., VT 05452

  info@tonystrains.com

Sources for Decoder Installation Parts

Continued

- **Richmond Controls -** Golden White GW0603 LEDs http://www.richmondcontrols.com/

- **Ngineering -** Lighting Products

  Safety Light Red LED N1032-5 or -15 (quantity)
  http://www.ngineering.com/index.htm

  See also their Soldering Products

  They have an iron, solder, and bell wire made for use with these LEDs.

Sources for Decoder Installation Parts Continued

- **M.V. Products** Clear and Red Light Lens
  Walthers or your Hobby Store (special order)

- Nickel Print Cat. No. 840-20G PC Bd Trace repair (use with Soundtraxx cam)
  http://www.amazon.com/MG-Chemicals-Nickel-Liquid-Container/dp/B008OA94T6

Sources for Decoder Installation Parts Continued

- **Radio Shack**

  0.5 or 1.0 Amp, 250V Fast Blow Fuses

  27K Ohm and 47K Ohm, 35V Resistors

  0.032 dia 60/40 Rosin-Core Solder

  Paste Rosin Soldering Flux

- **Ulrich Models**

  Loy's Decoder Tester

  http://www.ulrichmodels.biz/servlet/the-273/Decoder-Testor/Detail?sfs=519e0e54

Useful Tools

Jewelers screwdrivers
Tweezers
Exacto knife
Weller variable temp soldering iron
Volt/Ohm/Amp Meter

Useful Tools - Continued

6” Digital Caliper (Harbor Freight has at good prices)
Wire stripper (some of these work better than others)