



DIY HO Resistor Wheel Sets

For Occupancy Detection

Why DIY Resistor Wheel Sets?

- Less expensive than commercial resistor wheel sets.
 - Litchfield Station \$1.50/axle + PHS
 - InterMountain \$1.25/axle + PHS
 - DIY \$0.62/ axle incl PHS
- Much broader choice of wheel sets, eras, types, styles, size.
- You can use the last car to trigger “block unoccupied”.
- If you are in a push situation, that resistor car can trigger occupancy even though the engine never enters the block (siding, etc.)
- You get to control the sense current and sensitivity by resistor choice

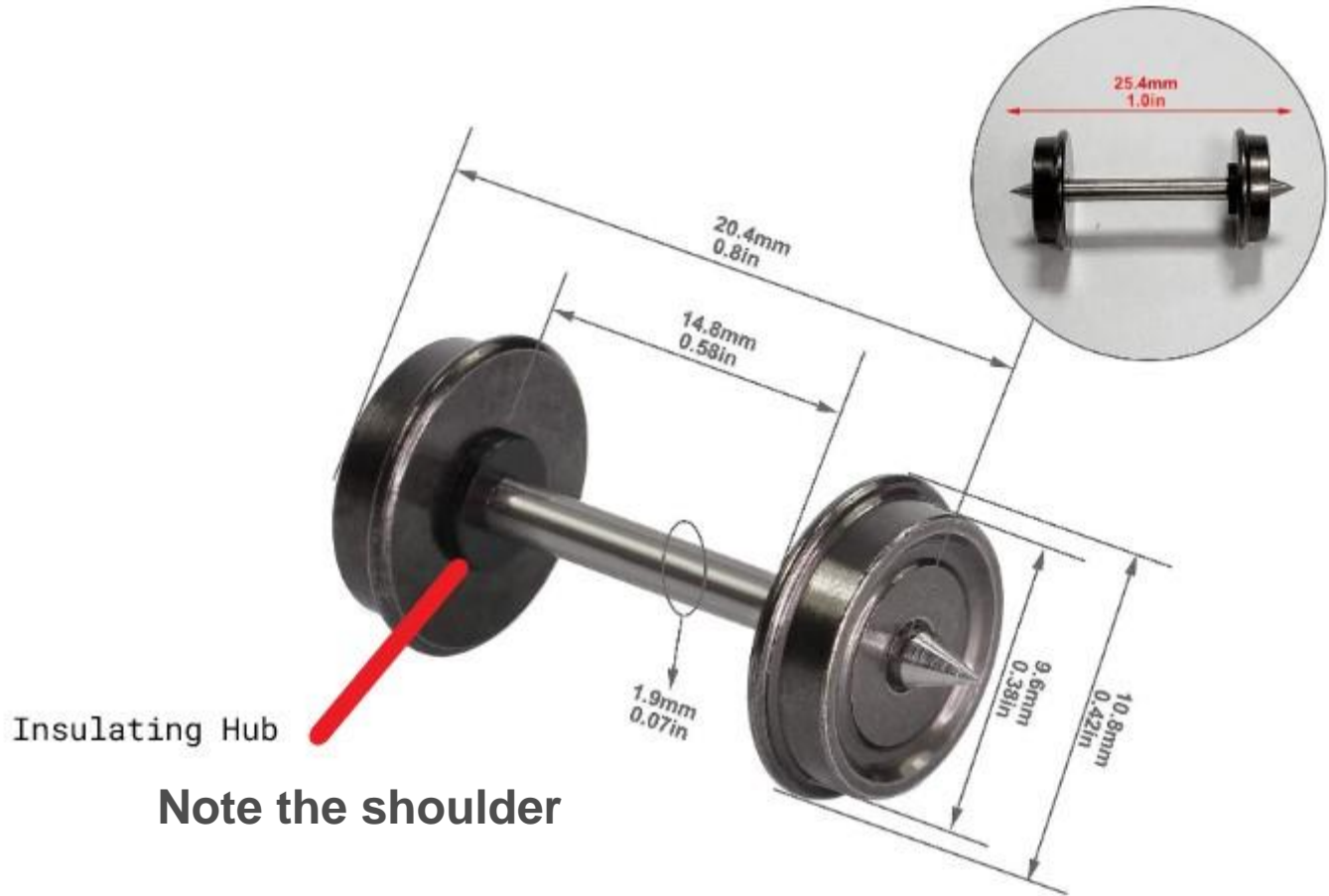


Materials

- **Insulated Wheel Sets**
- **Chip Resistors**
- **Bare Conductor Electric Paint**



Insulated Wheel Sets (HO Scale)



Chip Resistors (10Kohm)

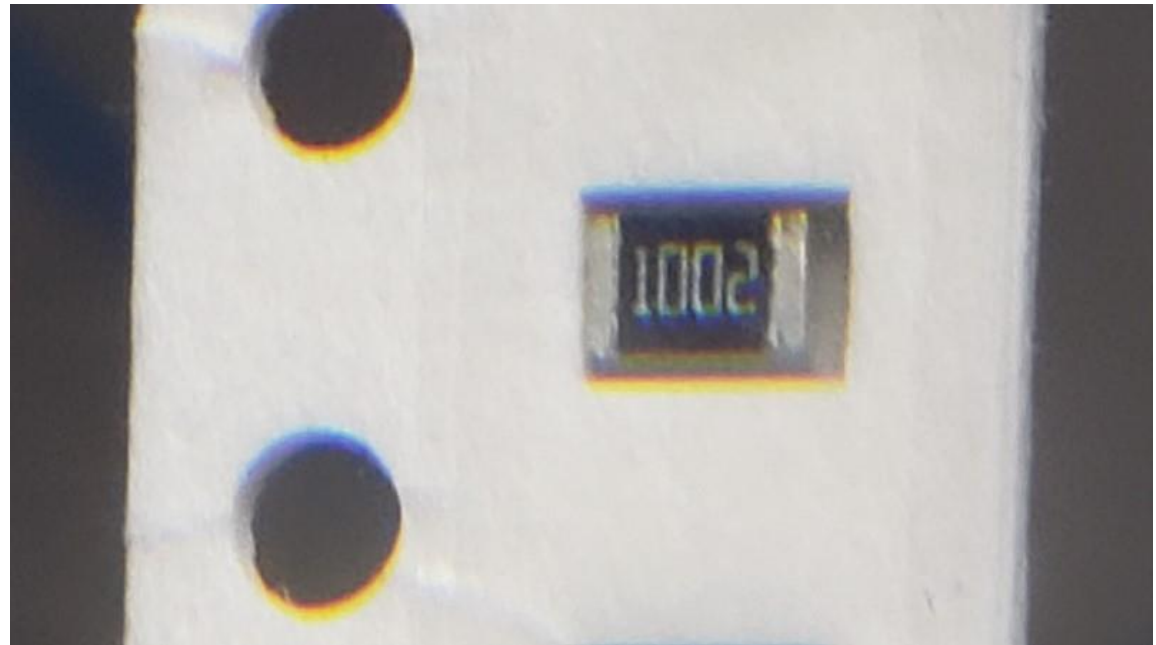
Size 8020



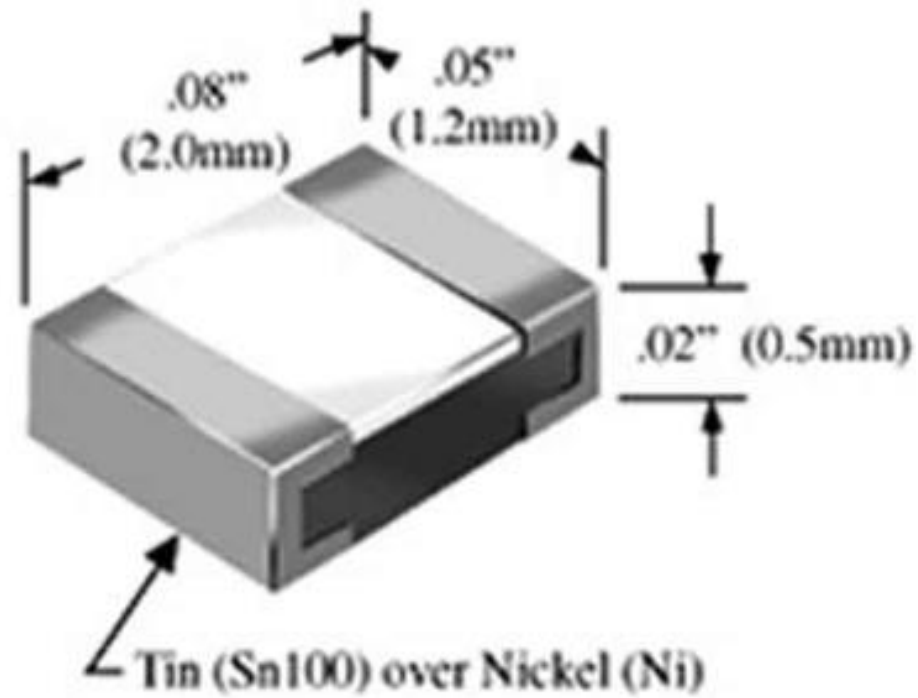
Chip On Tape Close-up

Note marking of 100 + 2 zeros = 10000 = 10K

Chip pushes out the back from front.



This chip size is 0.08" x 0.05" x 0.02" thick



Bare Conductor Electric Paint



Tools

- Flush saw – take the shoulder off the insulator
- Clean-up fine riffler files
- VERY pointy tweezers
- VERY FLAT inking plate (1/4" Float Glass)
- Brayer Roller
- Crab with magnifier (or magnifier headset)



Flush Saw



Notice no back. Teeth have no set.

Action is a pull saw.

Remove the shoulder on the wheel set insulator without damaging wheel.

Riffler Files

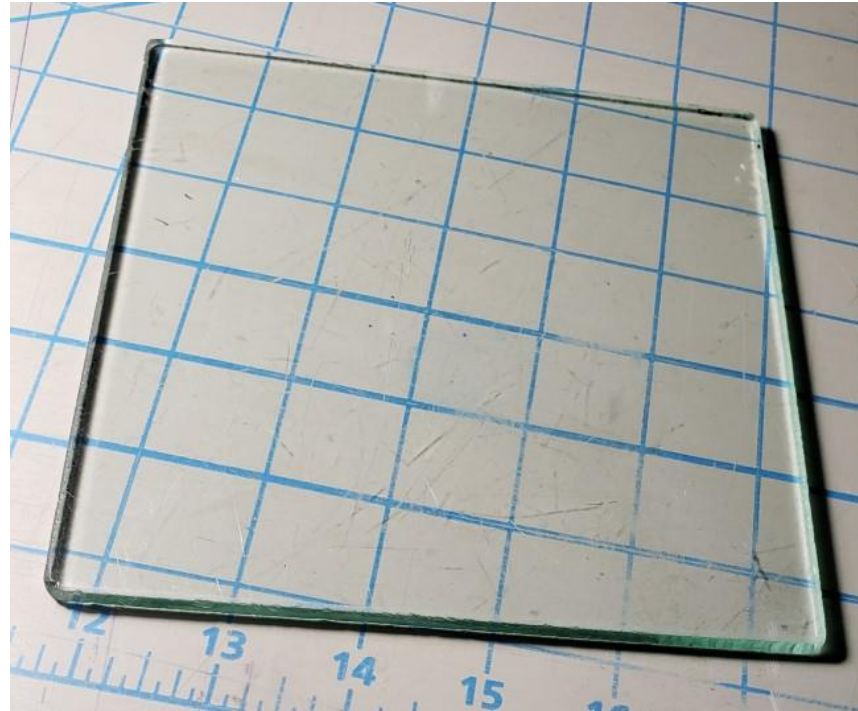
Cut 4 - Fine



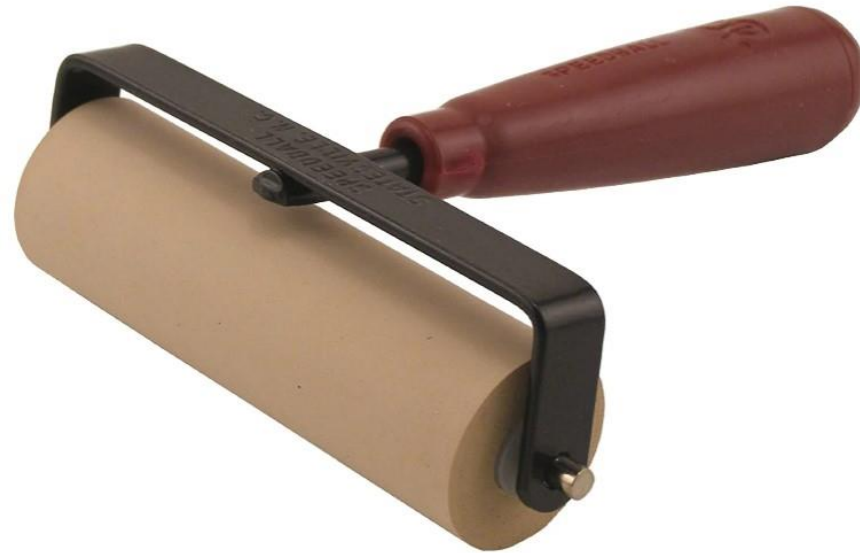
VERY Pointy Tweezers



Inking Plate



Brayer Roller



**This one is a 6". I use a 4".
This is a soft closed-cell material used
for spreading ink on a transfer plate.**

Techniques

- **Remove insulator shoulder from wheel set**, smooth and prep for resistor mounting
- **Ink the plate and roll out VERY thin layer** of conductive paint.
(.001" - .002")
- **Touch chip one end and other bottom edge** to paint layer.
- **Mount on wheel set** with end on axel and edge on wheel.



Remove Insulator Shoulder



**Ink the Plate .001" - .002"
with Bare Conductor paint.**



Touch chip to ink on ends and one bottom edge



Good Luck

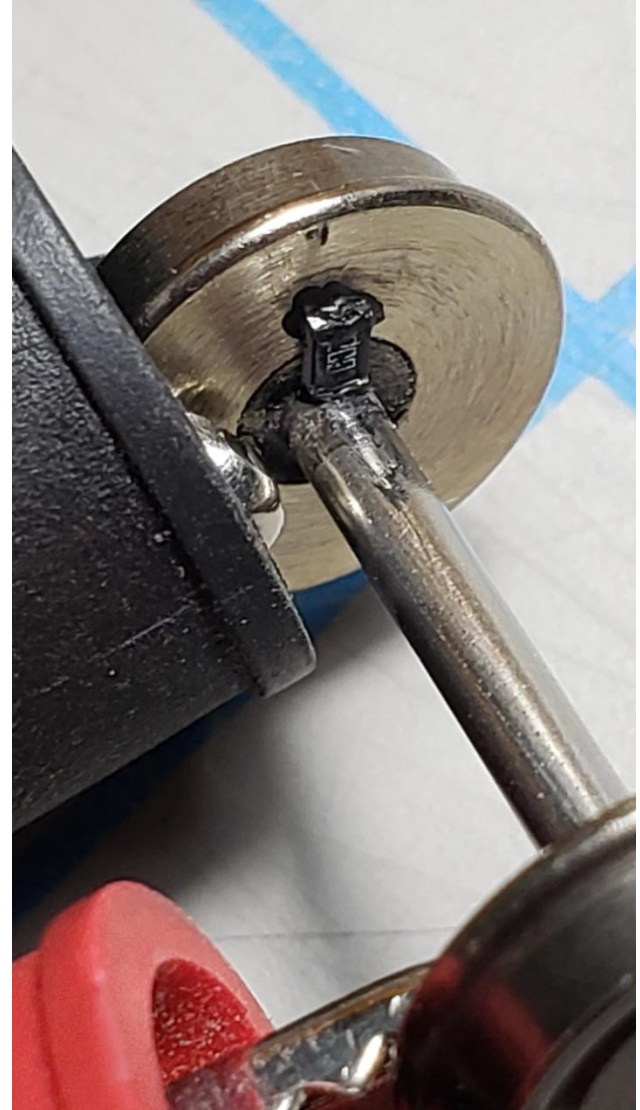
Use the crab or some bean bags to steady your hand.

Working time
30 seconds before
Paint skims over.

Mount on the Wheel Set



Measure




Will painting, weathering effect the installation?



NO – still 10K





**Are you
Done yet?**