

Restoring and Repairing HO AHM Birney/Brill Trolleys

modeltrainsounds.com May 2025

The original Birney Trolley, designed by Charles Birney in 1915, went into service in many US cities up until the 1930's. Over 6000 cars were introduced manufactured by the J.G.Brill Company hence they are either referred to as Birney or Brill Trolleys.

Models

The Associated Hobby Manufacturers Inc.(AHM), Birney/Brill Trolley in HO scale is a popular model for small traction point to point layouts especially using the ModelTrainSounds.com (MTS) auto-reversing system. Most of the early AHM models bear the marking RSO made in Yugoslavia while later models were sold under the name Mehano from Slovenia. Non powered, no power pole trailer trucks were also introduced . Several Road Names models were sold with various livery color schemes including

1. P.T..C Philadelphia Transportation Company Green / Yellow
2. United Transit Lines Blue/White
3. Downtown Yellow/Black
4. Third Ave Railway System Red / Yellow
5. Municipal RY Grey/Red
6. Connecticut Yellow / Red
7. Public Service Amber/Black
8. Generic 50 Yellow/Orange



These models are powered by a custom 12 Volt brush motor using electrical track pickup from all 4 wheels. The motor uses a spiral screw on the shaft to drive one axle via gear cogs. A transom pole can also be used to power the model as an option though not recommended. A second no powered trailer car is also available . Lighting is provided by a small incandescent bulb powered via track pickup wires but only lights the front of the cabin.

Common Problems

Most of these models are purchased used so problems usually relate to either missing parts or poor running performance. These include

- 1, **Missing or broken** parts requiring one to find replacements parts
2. **Dirty Electrical Contacts.** Perform the cleaning procedure as described here..
3. **Non Operational Motors** . Replace the motor with a brushless motor
4. **Wobbly Wheels.** Remove the wheels and realign the metal wheels on the plastic axles to NMRA standards. Usually this means widening the distance to fit the HO track.
5. **Non working lights** Replace with a bi-directional LED setup

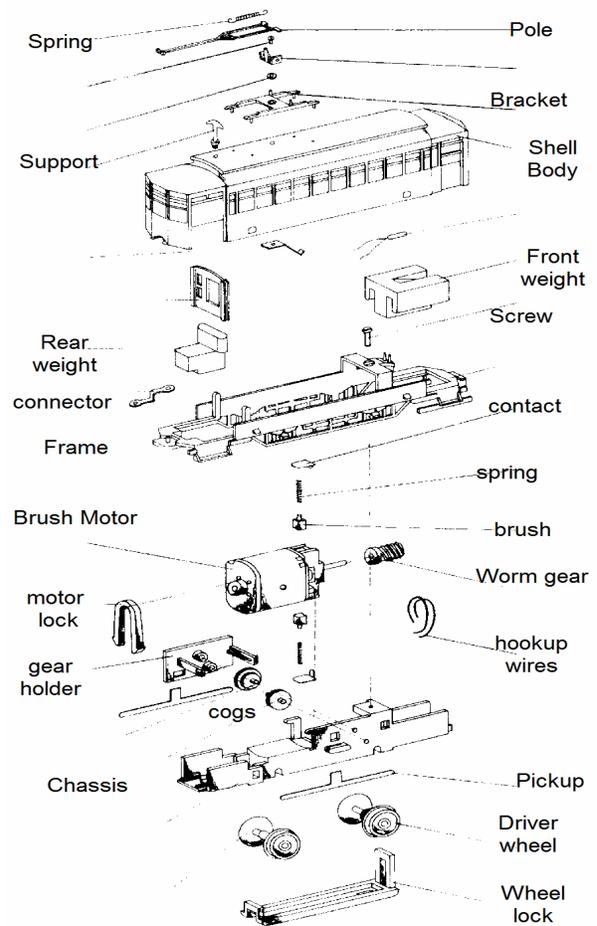
Trolley parts

This exploded view of the components is taken from the original insert in the packaging of these Trolleys by AHM

Cleaning and Lubrication

will require the following items

1. Light grade oil
2. White grease with toothpicks for application
3. Mineral spirits and Q tips
4. A small flat blade screwdriver
5. a safety razor blade



Disassembly

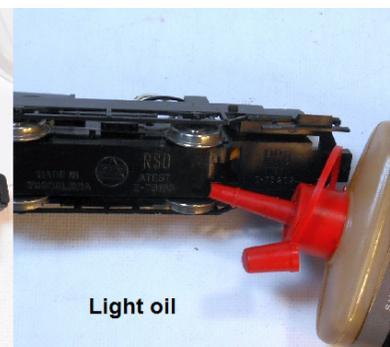
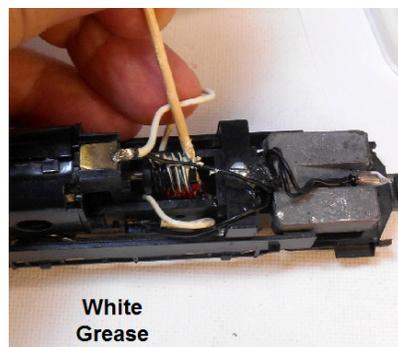
The shell can be removed from the holding tabs on the frame by spreading out the lower edge of the side wall of the body using a small screw driver or safety blade while gently lifting the shell off the chassis



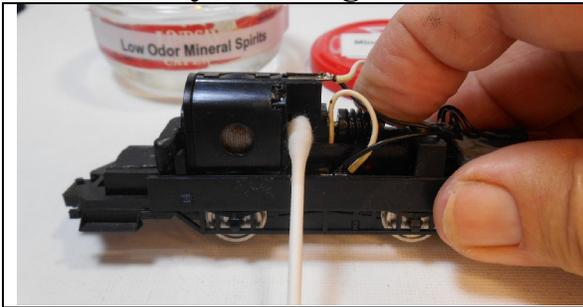
Lubrication

Remove the weights and spread the wires to gain access to lubricate the bearings of the motor, worm screw and gear cogs with a light smearing of white grease or oil.

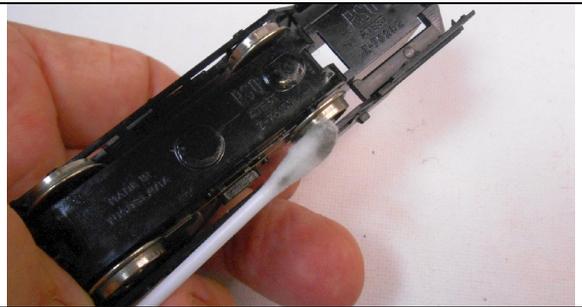
To lubricate the wheels a drop of oil can be added to each wheel axle without removing the wheels.



Preliminary Cleaning and Lubrication

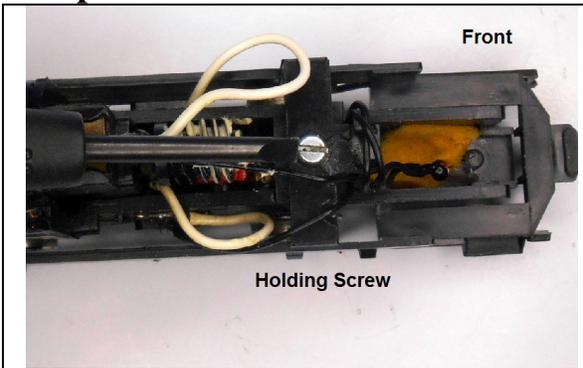


Clean the motor **armature** with a Q tip soaked in mineral spirits while rotating the worm screw manually

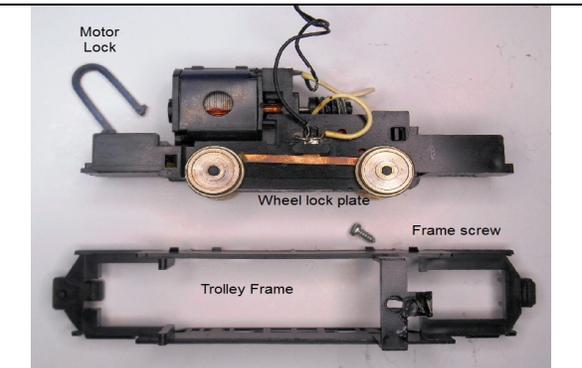


The tread of the **wheels** can also be cleaned using a Q tip and dipped in mineral spirits.

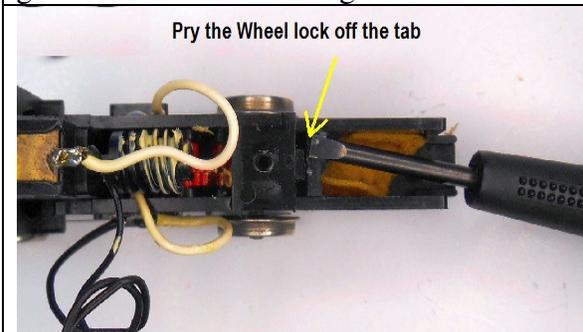
Deep Clean



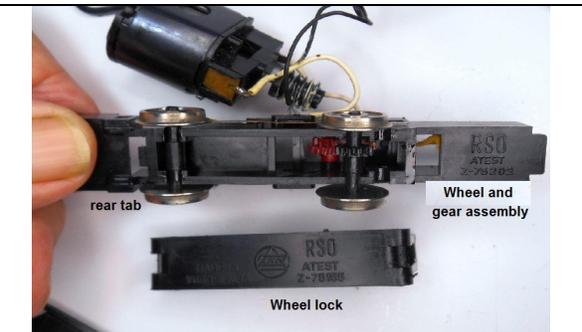
To access the wheel, contacts and driving gears remove the retaining screw .



The trolley frame can be lifted off the main chassis



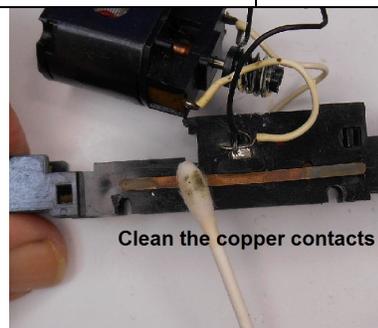
Remove the wheel lock plate by dislodging the upright bracket located behind the front weight and push it back off the rear tab.



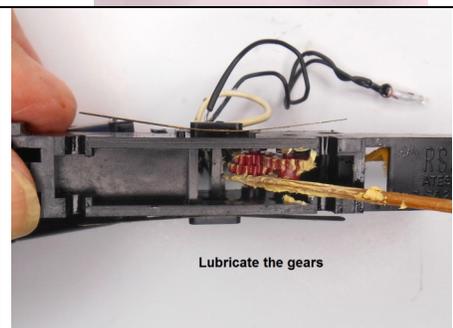
The wheels can be cleaned thoroughly.



Check Wheel alignment with an NMRA gauge



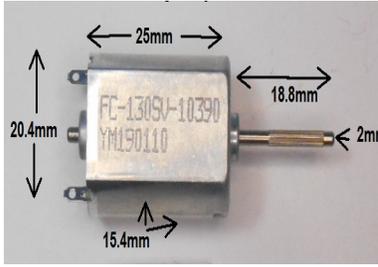
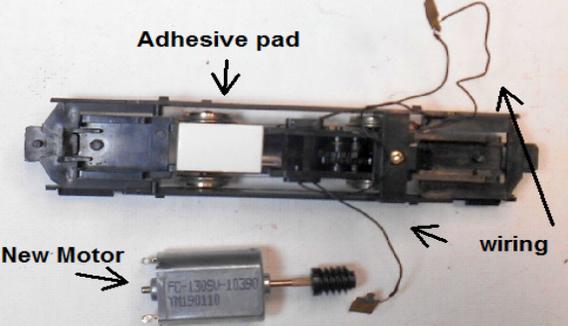
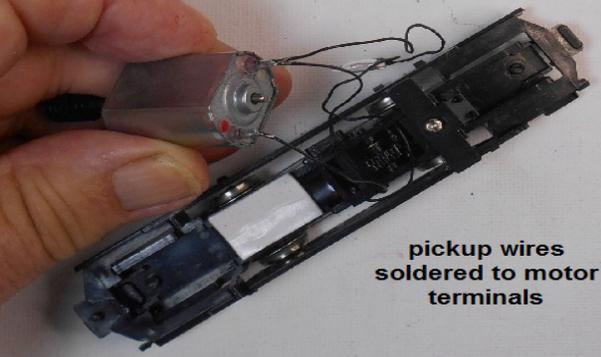
Clean the pickup contacts with a Q tip dipped in spirits.



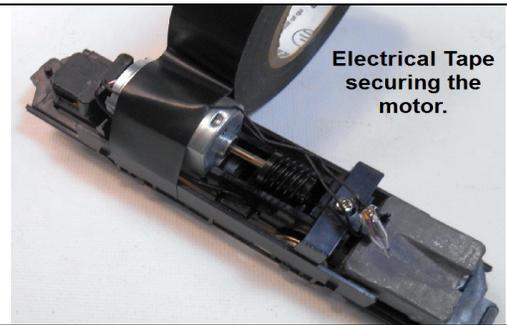
Lubricate the lower gears with a smear of grease.

Motor Replacement for HO AHM Trolley.

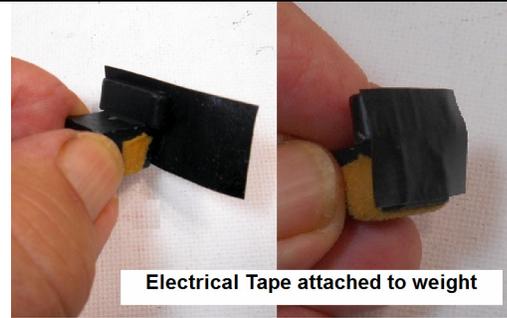
The original brush type motors for these trolleys were custom made in Yugoslavia in the 1960s. The brushes may wear out or the retaining brush springs may have become broken or missing. Newer 12 volt brushless can motors can be found that fit within the frame, have a long enough rotating 2 mm diameter shaft that can accommodate the plastic worm screw taken from the old motor. This screw can be carefully dislodged from the old motor using small pliers. A motor that meets these requirements is the Model FC-130SV-10390.

		
<p>Brushless motor replacement for a non-reparable motor.</p>	<p>Removing worm screw with by prying it off with small pliers from the shaft.</p>	<p>The old or replacement worm screw is pushed onto the shaft of the new motor</p>
<p>The motor will be inserted into the frame with a piece of cut to size double sided adhesive tape. This is used as a cushion and stabilizes the motor. The wires from track pickup will be attached to the motor. The old paddle connectors used by the old motor are removed by cutting at the connection.</p>		
<p>The end wires are stripped and tinned with solder. In order to maintain correct polarity the positive terminal is identified by the red dot adjacent to the terminal. It will receive the single wire (on the right when facing forward) and the Negative terminal will have the combined wires soldered to it. This is on the left side.</p>		
<p>The motor is positioned onto the padded cradle and the worm gear lined to contact the forward gear mechanism. Note that the terminals are located in the back and that the Positive terminal is below and negative on top to accommodate the length of the wires. The terminal can be bent if necessary and should be protected from contacting any metal including the rear weight.</p>		

Electrical tape can be used to secure the motor in the hosing and ensure that the worm gear is in correct contact with the forward cog gear.. The tape is attached to each side of the chassis. Test the unit on the track to make sure it runs smoothly and make any adjustments if necessary.



In replacing the lead weight in the back of the trolley a piece of electrical tape is used to insulate the lead weight from contacting the motor terminals. The tape is applied and then cut to fit. If all is working well then after internal lubrication the shell can be reattached to the body and the unit is ready for the layout.



. Since LEDs only work in one polar direction it is necessary to use 2 LEDs with the pins set opposite in order to produce bidirectional illumination, A 750-1000 ohm resistor is also needed to limit current to the LEDs to around 20 milliamps.

Positioning of the LEDs in the cabin is best in the center to give more even illumination in both directions. Use the same wires to wire in the LEDs and resistor.

<p>Lighting Components</p> <p>2mm LED Heat shrink 1K Res</p>	<p>Prepared LEDs with Resistor</p> <p>Testing</p>	<p>Add Heat Shrink</p> <p>Heat with protection</p> <p>position in center</p>
<p>Preparation of the LEDs</p>		<p>Installation of the LEDs</p>

HELP

To assist with these repairs replacement Motors and an LED light kits are available at the website modeltrainsounds.com listed under Project 20B.

<p>HO Trolley Light Kit</p> <p>2mm LED Heat shrink 1K Res</p>	<p>HO AHM Trolley Replacement Motor</p> <p>25mm 20.4mm 18.8mm 2mm 15.4mm FC-1309V-10390 YM190110 Double sided Pad heat shrink</p>
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