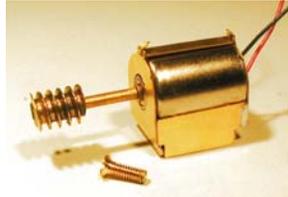


Nigel Lawton 009 Bachmann re-motoring kit



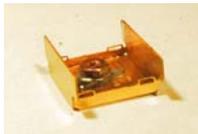
Note that the worm gear shown is not included in this kit.

This kit allows a 10mm diameter by 12mm long coreless motor to be fitted as a replacement motor to the Bachmann N scale 0-4-0 and 2-6-2 chassis. Soldering is required.

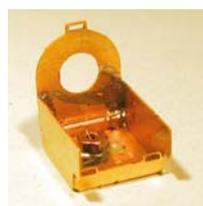
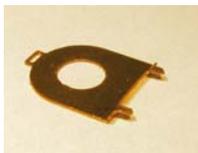
<http://www.geocities.com/nigellawton009/VeeTipper.html>

Please read all the instructions before starting to assemble the kit. The quality and function of the finished item will be improved by observing the notes included in these instructions.

Building the cradle



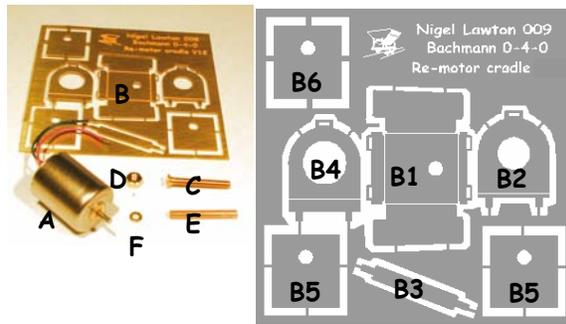
Remove the base (B1) from the fret using a sharp craft knife. Solder the 10BA (D) nut over the circular hole in the base on the side which has the half etched fold lines. All folds should be made with the half-etched fold line on the inside of the fold. Fold up the two small tabbed areas to 90° with the base. Then fold the two large tabbed areas to 90° with the base. Note that the large folded sections fit 'inside' the small ones at the corners.



Remove the front (B2) from the fret. Fold the item to 90° at the half etched line and then fold the two projecting tabs to 90° in the opposite direction. Fit the front to the base at the end closest to the nut so that the two projecting tabs point down towards the base. Solder on the inside with a small amount of standard solder.

Trial fit the cradle to its target chassis noting that the front should be towards the worm gear. Note that the front should also be just clear of the protruding contacts for the original motor. Fit the screw (C) and mark the point where it emerges from the bolt. If necessary cut the bolt to length and file until it is flush with the top of the nut when the

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This is not a toy and is not suitable for children



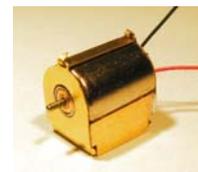
Each Bachmann re-motoring kit is made up from the following parts:-

- A) 1 x 10mm x 12mm mini motor
- B) 1 x mounting cradle and spacers brass fret.
- C) 1 x 10BA countersunk screw
- D) 1 x 10BA nut
- E) 1 x 1mm/1.5mm shaft adapter & 13mm extender
- F) 1 x thrust washer

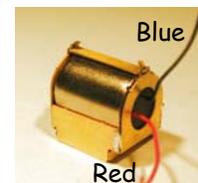
cradle is fitted to the chassis. Remove the cradle from the chassis to complete the build.



Remove the strap (B3) from the fret. Fit one end through the slot in the front and fold up or fold down and solder. Remove the back (B4) from the fret. Fold the item to 90° at the half etched line and then fold the two projecting tabs to 90° in the opposite direction. Trial fit the back to the base so that the two projecting tabs point down towards the base. Fit the slot at the top of the back into the strap. Check the cradle goes together neatly and adjust if necessary.



Remove the back and fit the motor (A). Note that the shaft protrudes from the front (the end with the smaller hole). The hole in the front engages with the slightly protruding bush around the shaft.



Make sure that the wires are fed out through the large hole in the back of the cradle and are positioned as shown in the photo. Re-fit the back and solder in place.

Removing the worm from the old motor.

This is a potentially worrying aspect of re-motoring but should not be a problem if you follow the instructions. Firstly if you have a 'worm puller' please ignore these instructions and use that. Secondly if you think you have a better way please don't follow my instructions. Finally I can not be held responsible for damage to worm gears removed using these instructions. Also this approach is almost certain to damage the motor, so don't do it if you expect to have a working Bachmann motor at the end of this!



To remove the worm you need a pair of combination pliers/cutters, an elastic band, a vice (vise), a 1mm-1.5mm drift (e.g. old drill shaft or watchmaker's screwdriver) and a 4oz hammer. Take the Bachmann motor with the gear fitted and grip the motor shaft in the wire cutter section of

the pliers fitted with a rubber band around the handles so that the exposed length of shaft between the worm and motor is gripped in the wire cutter blades. Rest this on top of your vice with the motor lightly clamped between the jaws of the vice so the pliers and motor do not fall off the vice.

Strike the end of the motor shaft with your hard steel drift driven by the 4oz hammer. You need to use the hammer's full weight and maybe a bit of extra muscle power. The aim is to get the shaft out with a few sharp knocks, so don't just bash away if you are not making progress. Some minor damage to the lower end of the worm is unavoidable, once the worm is removed use snipe nosed pliers and fine files to repair any distortion to and roughness on the worm.

Fitting the worm to the shaft extension

First check fit the extension shaft (E) to the motor shaft to ascertain which end is drilled to take the shaft. Do not strike the shaft extension to drive it on if tight as this may damage the motor, instead ease with a 1mm drill until it is a push fit. Trial fit the worm to the opposite end of the shaft extension taking care not to bend the brass tube. The worm should be an easy fit and it should be secured with non-permanent thread lock once you have checked its position relative to the worm gear with the motor cradle mounted in the chassis and the thrust washer in place. File the motor end of the shaft extension square if necessary. Before finally assembling the shaft and worm to the motor first fit the thrust washer (F) to the motor shaft up against the motor bearing and lubricate with a very small trace of model oil or model grease. Take care not to get any oil or grease on the shaft above the washer. Fit the shaft extension hard down onto the washer securing it with non-permanent thread lock applied sparingly to the adapter. The aim is to avoid getting thread lock on the washer and bearing. Allow the thread lock to set before proceeding.

Fitting the cradle to the chassis

Trial fit the completed cradle and motor to the target chassis. If possible without making the worm bottom out on its gear, secure with the screw through the chassis fixing hole. If the worm bottoms on the worm gear add spacer(s) 0.25mm (10 thou inches/mil) (B5), and/or 0.125mm (5 thou inches/mil) (B6) between the motor cradle and chassis until the mesh is good. Test run the motor and adjust further if necessary.

Connect the red wire from the motor to the left-hand side wheels pickup and the blue to the right hand side wheels pickup. This will make the chassis run in the 'same' direction as with the original Bachmann motor.

