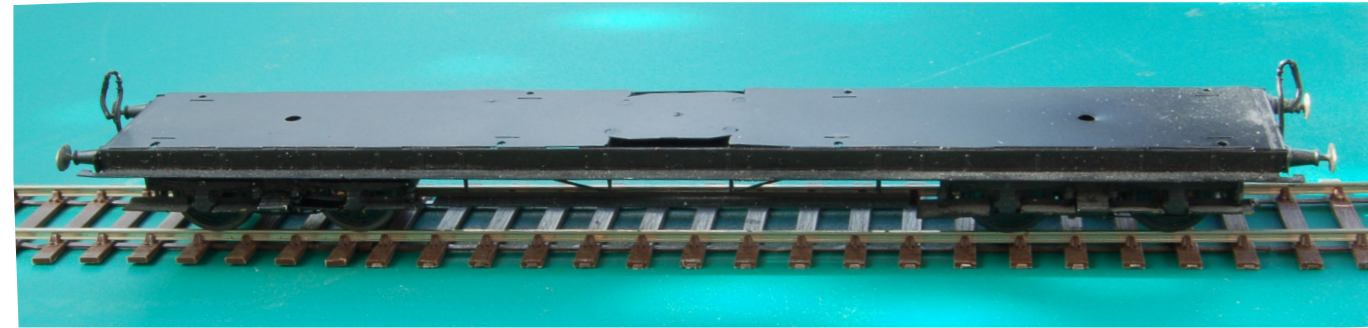


# Building Attock 49 foot carriage kits

## Part 1: underframes and bogies

Dave Carter explains how he assembled them in 4mm scale...



These 4mm coach kits have been around for years, produced by Micro Rail, then Alan Gibson and now David Geen. The three kits produced are the 4-compartment brake third; 8-compartment full third and the 7-compartment composite.

This article covers building the kits in two parts, firstly bogies and under frame, later the body. There are several repetitive jobs, in order to achieve consistent results jigs and fixtures have been used to obtain consistency. (These gadgets don't have to be complex or sophisticated.)

I have made a few modifications to the kits as supplied:

1. Separate the headstock from the body and fit to under frame.
2. Adjust the length of the bogie footsteps.
3. Make up and fit compensated axle suspension.
4. Hollow out cast axleboxes to clear pinpoint bearings.
5. Substitute machined door handles for the etched items supplied.
6. Fix body to bogie with 12 BA screws.
7. Modify the Queen posts.
8. Fit buffers from 51L Wizard Models, L&YR coach, oval head.

### The bogies

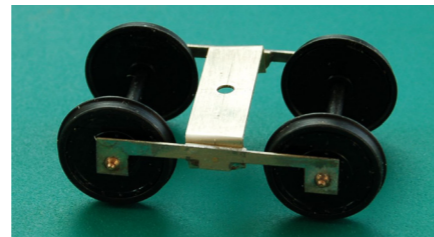
The bogies, as supplied, have internal axle bearings, brake hangers and blocks formed of folded 0.3mm brass sheet which does not provide either a good bearing area or any form of compensation. To fit EM or P4 wheels involves the use of spacer washers, to limit side play. Instead, I made up a simple rocking beam arrangement to take waisted pinpoint bearings. The photos and sketches show what I did.

The main bogie etching has plenty of rivets that need embossing from the rear half etched dots. Clean with a fibre glass brush while still flat on both sides. Linking the two axle box horns is a tie bar. This is etched on to the fret, to fold up. The real thing was a round steel bar and can best be reproduced by a length of 0.5mm nickel silver wire soldered in place. Either way, the step supports have to be bent to a right angle before the tie bar is positioned. The step supports are quite

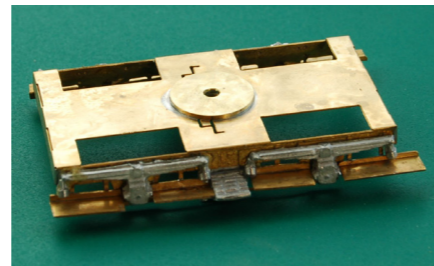
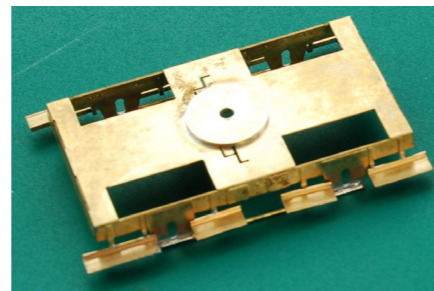
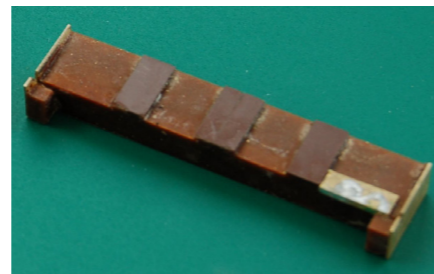
delicate and should be treated with care. I went rash and bought a fancy folding bar which was helpful folding the sides and ends up to a right angle.

Depending upon when the kit was bought, the axle box castings will have clearance for the brass bearing, or not! Mine didn't so I milled out a 2.0mm slot at the rear of the casting to clear the bearing and allow movement. All passenger stock, (except class 142s) has primary and secondary springing. The primary spring is above the axlebox, between wheel and bogie frame. The secondary spring is the full elliptical unit between the body and bogie, on the centre line. Between these parts, the four step boards have to fit. As they all move, there must be a clearance between steps and spring and axlebox. I have had problems with the bogie steps fouling the fixed underframe step! Using a photo of a prototype bogie I was able to scale the accurate length of the steps. These steps are better fitted before the white metal castings, and must be straight and at the correct spacing. To do this I made up a jig to hold the steps while they are soldered in place. Make sure that the solder runs round the back of the step, this reinforces the half etch fold line on the step bracket. The axleboxes can now be glued in place, I used Poly Zap. The secondary spring has to be modified, to make space for the suspension beams, see sketch.

Taking the inner axle bearing etch, break off the four axle bearing brackets, this leaves the brake blocks. While still flat, drill a 0.5mm hole in each block to take a cross rod when folded up. A length of 0.5mm wire soldered in place stiffens the brake hangers greatly. Set the brake blocks to line up with the wheel sets you are using. The brakes have to be fitted accurately onto the bogie frame etch. I turned up a stepped locating pin from some fibre rod to locate the two (concentric) holes, two spots of solder cream and a resistance soldering iron quickly fixes the brakes in place, glue would work just as well. I turned up several discs from 0.8mm brass sheet, 12mm o/d, x 2.3mm dia. bore. One of these is soldered on top of the bogie to act as a boss. Others can



The various stages of assembly described in the article. Below is the jig for aligning the steps.

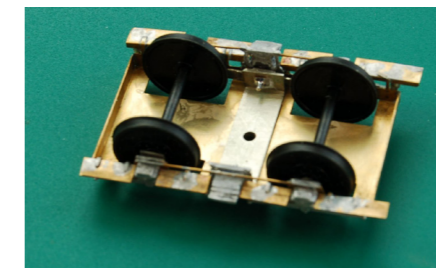
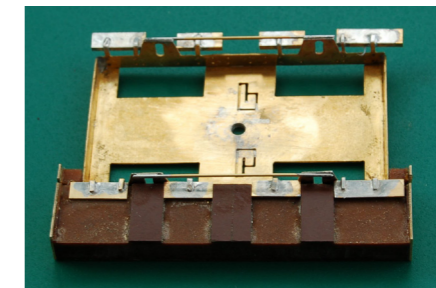


be used as spacer washers to get the correct ride height of 14mm rail to buffer centres. When soldering things together, where holes have to line up, a cocktail stick helps to keep everything in place. Complete the other bogie, as the first and they are ready to be cleaned up (an ultra sonic cleaner works wonders) and painted. I used Halfords' grey primer and satin black spray paint.

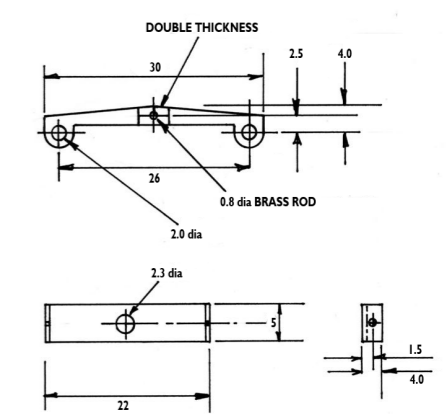
### The underframe

This was assembled much as the (limited) instructions. The solebars and footstep were folded at right angles and the solebar overlay soldered in place, with a resistance unit, after riveting and the right way up (gaps at top of vertical ironwork). The kit comes with unsprung cast buffers fixed to the body, I prefer the buffers to be part of the underframe. A piece of 6mm x 6mm brass angle was cut to the length between solebars, drilled at buffer and drawbar centres - the vertical face must be trimmed back to 4 mm, see sketch. The two etched buffer beam parts are soldered together, using cocktail sticks to line up the holes. The other flange is then soldered to the underside of the floor, take care that the length over outer faces of the buffer beam is 196mm. At this point I use a drilling jig to position the 8 x 1.3mm (0.052") holes to fix body to underframe. The drilling jig has two pegs that fit into the bogie centre holes. The queen posts fold down from the floor, these are rather flimsy and leave a big hole in the underframe. A length of 1/16" x 1/8" brass soldered inside the solebar strengthens the weakness and can be drilled to take a proper queen post. Alan Gibson sells cast brass post, or they can be fabricated from a length of brass tube and a short handrail knob, make sure that the holes are in line with the solebars, to take the 0.5 mm brass wire truss rod. The buffers sold by Wizard 51L are very good; the heads are ordinary round steel buffers which fit into etched elliptical overlays. Holding the buffer rod in a pair of tweezers, rub on flat wet and dry to clean off the turning pip and rough the surface. Separate the buffer overlays, a spot of Poly Zap in the recess, place the buffer into the recess and allow to set. The brass buffer casting has a 2.0mm boss that fits through the buffer beam, and has a slot. When the heads are fitted with springs (after painting) a spaced jig is placed to get correct (buffer length) with the ellipse horizontal to the buffer beam. The buffer tail is then bent horizontally into the slot so the buffer head cannot rotate - a neat arrangement. I replaced the whitmetal vacuum pipes with cast brass items (Alan Gibson) that can be soldered to the buffer beam as part of the underframe. Four small holes are etched in the floor, just inside the solebars for the truss rods. Take a broach or small drill and gently rotate while turning to an angle such that the wire passes through the floor more easily. Thread the 0.5mm brass wire through the queen posts, push one end through the floor and solder in place, feed

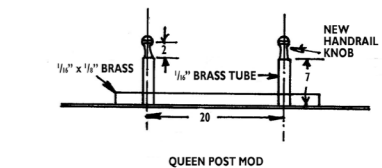
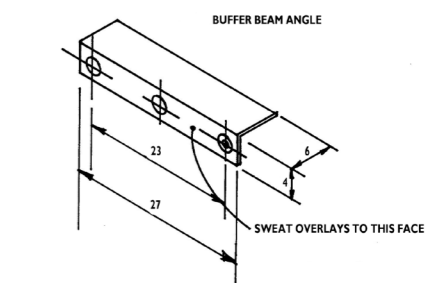
the other end through the floor, tension (push word for pull tight) and solder to floor. Clean off anything protruding above the floor, so as not to foul the body flange. Fold up the two boxes that make the centre castings, these have two tabs that fit into the floor. The instructions suggest soldering a nut inside, with an 8BA screw from the underside to hold the bogie in place. I soldered an 8BA screw in place, projecting down, with a nut underneath, spot of paint on thread to retain nut afterwards. (Many coaches simply sat on their bogies and were not retained!) Trim the screw to appropriate length before fitting. At this point the underframe is ready for a cleanup and paint as for the bogies.



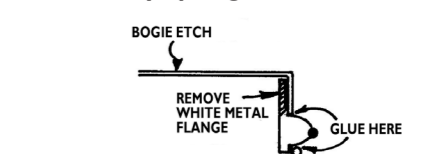
### Compensation beams



### Buffer beam and queen posts



### Secondary spring modifications



Left: A pair of prototype secondary spring sets in the Spring Shop at Horwich works.

### Underframe drilling jig

