

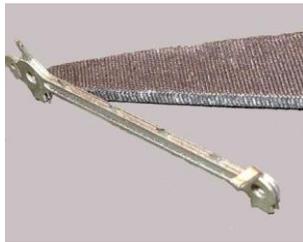
## Brassmasters C203 – A3 and A4 Replacement Coupling Rods

The replacement rods were originally designed to go with the Brassmasters' EasiChas for the Hornby A3 and A4 and Alan Gibson or Ultrascale replacement wheelsets. However, they can also be used to replace the original rods on the Bachmann loco or with any other model of an A3 or A4.

Brassmasters also produce replacement connecting rods for the A3 and A4, available separately.

1 Each side is manufactured from 4 etches and hinged behind the centre crank pin. There are also overlays for the bosses.

2 Cut a leading left hand rod [1] and a leading right hand rod [2] from fret.



3 If using Markits wheels, find the largest drill that will pass through the crankpin holes; if using the original Hornby wheels, Alan Gibson or Ultrascale wheels, open the crankpin holes using a 1.5 mm drill. When complete, drill a hole using the same size drill perpendicular in a scrap piece of wood. Leave the drill in the hole in the wood. Tin the mating surfaces of a pair of coupling rods and place over the drill. This holds one end of the rods accurately ready for soldering. It is critical to align the two halves exactly in order to make one rod so take some time tweaking. See photo.

4 If modelling in 00 or EM, take the leading boss [3] and the main boss [4] and, holding each boss in place in turn with a cocktail stick, solder in place on the outside of the rod using the same technique as for joining the rods. For P4 only use the main boss as there is insufficient clearance behind the slidebars for the leading boss.

5 Place a little flux along the top surface of the rod and apply heat; the solder on the soldering iron will run down between the rods and join them. The secret is to apply only a little solder at a time. Solder will fill the "cusp" and give the impression of a solid rod. See photo. Repeat for the whole length of the rod.

6 Repeat for the other leading rod using the second set of parts [1,2,3 and 4], making sure the overlays are on the opposite side of these rods to make a pair.

7 Next take the trailing rod outer [5] and the trailing left hand rod inner [6] and solder them together.

8 Solder the a fork overlay [7] to the forked end of the trailing rod and a trailing boss [8] to the trailing end.

9 Repeat paragraph 5 for this rod.

10 Repeat for the other trailing rod using the second set of parts [5, 6, 7 and 8], making sure the overlays are on the opposite side of these rods to make a pair.

11 Carefully blend the bosses into the front face of the rods.

12 Each set of rods has a knuckle joint to manufacture. The rods are joined with a small rivet pushed through from the front leaving about 0.2 mm proud. If there is excessive solder between the rod layers the rivets will not project, in this case countersink the back of the rods and this will allow the solder to reach the rivet. See photo.



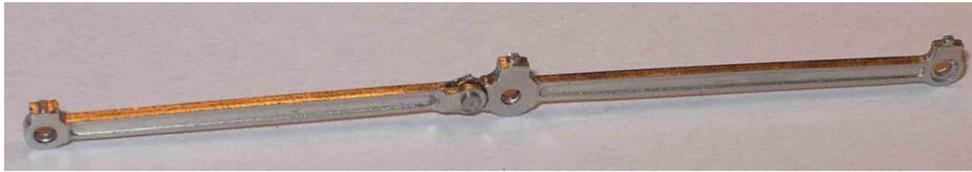
13 To stop solder flooding the joint apply a little oil to the surfaces not to be soldered - this will prevent the solder running into the joint. Keep the rear of the rod clean. Solder can then be quickly applied with a very hot iron to the back of the rod to fix the rivet in place. Clean off excess solder leaving enough to keep a strong joint. See photo of completed rods.

14 The front boss is designed to be recessed thereby allowing the crankpin 'nut' to be screwed flush. See photo.

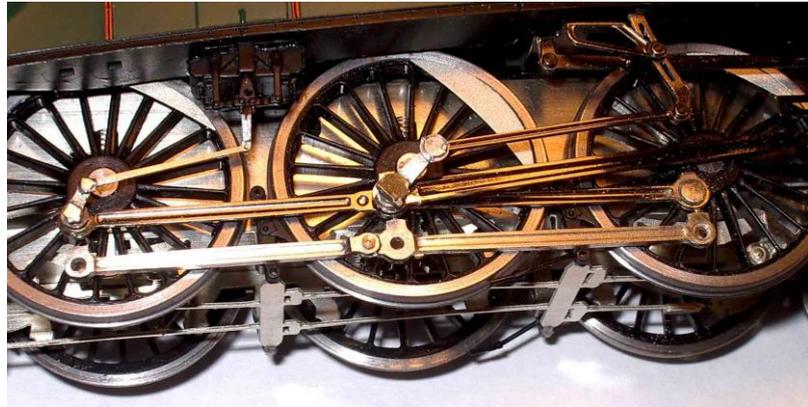
15 Open up the crankpin holes in order that the rod will either rotate on the crankpin screw (if using Markits wheels) or on the



crankpin bushes (if using Alan Gibson or Ultrascale wheels). This can be done with a reamer, broach or a fine Swiss file



16 And comparing the Hornby rods and the replacements (actually an A4 but the A3 ones are identical) see photo.



Note: on the A4 the axle protrudes beyond the wheel face, therefore ensure the rods do not catch on the axles. If necessary, fit washers behind the rods.

17 There are a number of spare bosses on the etch in case of damage/loss. Also there are additional items provided on the fret for the return cranks and return crank bearings – see the A3 EasiChas instructions on the Brassmasters' website for their use.

