

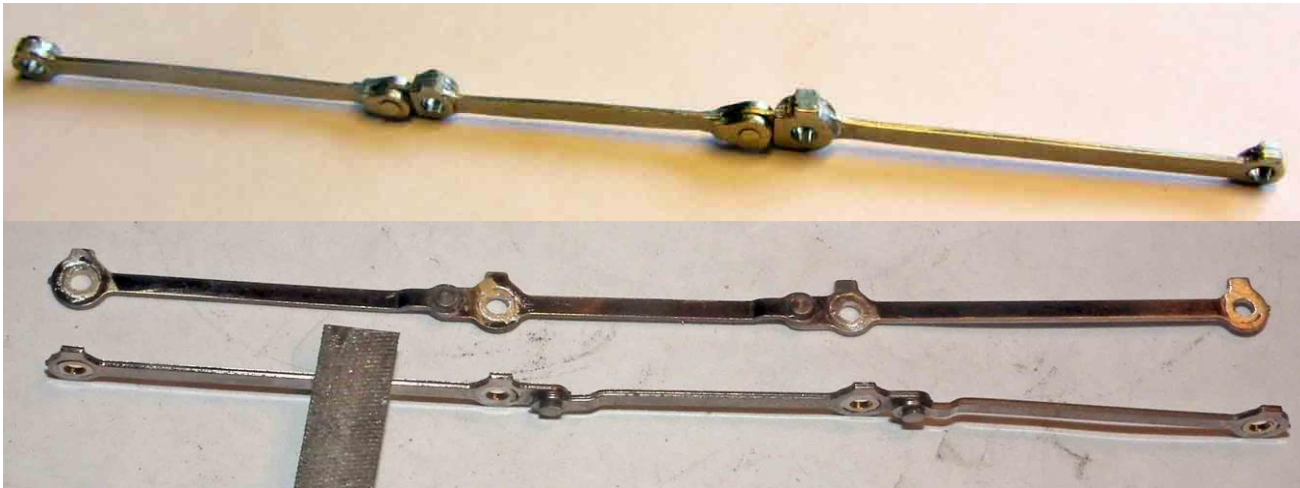
## C401 – GWR 42xx and 72xx Coupling Rods

The replacement rods were originally designed as part of the Brassmasters EasiChas for the Hornby 42xx and 72xx locos and Alan Gibson or Ultrascale replacement wheelsets. However, they can also be used to replace the original rods on the Hornby loco or with any other model of a 42xx or 72xx.

Brassmasters also produce replacement connecting rods for the 42xx and 72xx, which are available separately (C402).

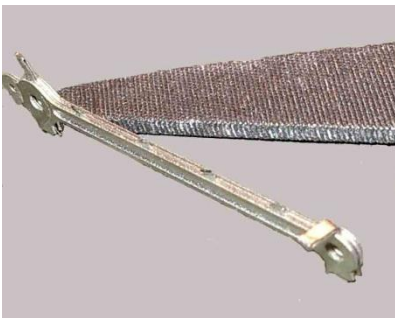
1. Each side is manufactured from 6 etches and hinged behind the second and third crank pins. There are also overlays for the bosses. The prototype rods have quite a complicated arrangement, and the model rods replicate this. You are advised to study the diagrams at the end of the instructions to ensure correct assembly.
2. The prototype rods have very thick bosses connected by what appears to be very thin rods. The fret includes all the layers to represent the prototype but on the Hornby model converted to P4 this inhibited the movement of the rear axle due to the over thick steps so that the loco would not go round less than 5'4" radius. With the rear layer removed the radius is was less than 3'. However, the removed layers have been left on the fret.

Compare the completed rods with the Hornby original ones (with bushes added)



Note – spares of most of the smaller components are provided on the etch, so don't be surprised when you have unused parts left at the end.

3. Cut the coupling rod front left inner [1] and the coupling rod front left outer [2] from fret.

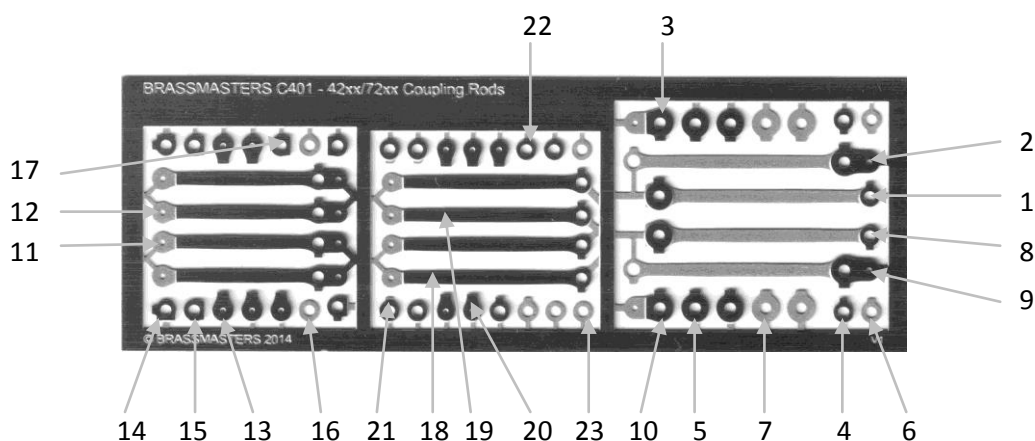


4. If using Markits wheels find the largest drill that will pass through the crankpin holes; if using the original Hornby wheels, Alan Gibson or Ultrascale wheels, open the crankpin holes using a 1.5 mm drill. When complete drill a hole using the same size drill perpendicular in a scrap piece of wood. 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.

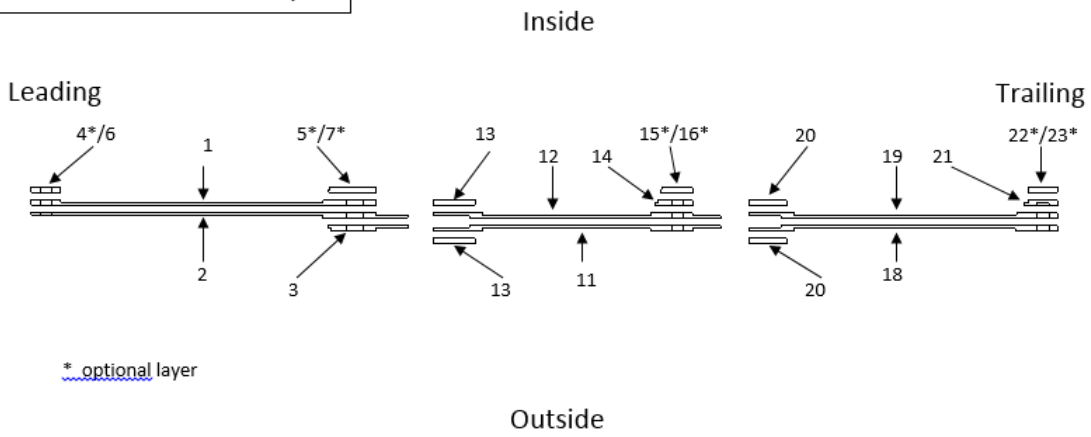
5. Now take the coupling rod front left trailing boss front overlay [3] and solder to the outside of the trailing boss.

6. For the thicker boss parts [4 and 5] can be added to the back of the leading and trailing bosses respectively. [6 and 7] provide a half etched alternative. Using the appropriate bosses, apply each boss holding it in place with a cocktail stick and solder in place using the same technique as for joining the rods.
7. 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. Repeat for the whole length of the rod. Clean up each rod with files.
8. Repeat for the right hand front rods [8, 9 & 10]. (Parts [4 – 7] can be used for the thicker boss.)

9. Next take the coupling rod middle left hand [11] and coupling rod middle right hand [12] and solder them together using the same method as before.
10. Solder a coupling rod middle leading fork overlay [13] to the outside and inside of the leading forked end of the middle rod. Solder a coupling rod middle trailing boss rear first overlay [14] to the back of the trailing boss.
11. For the thicker boss, option [15] should be soldered to the back of the trailing boss. [16] provides a half etched alternative.
12. Repeat 7 for the middle rod.
13. Repeat for the right hand middle rods [11, 12, 13 & 14]. (Part [17] for the thicker boss or [16] for the half etched alternative)
14. Lastly take the coupling rod rear lh [18] and the coupling rod rear rh [19] and solder them together.
15. Solder a coupling rod rear leading fork overlay [20] to the outside and inside of the leading forked end of the rear rod. Solder a coupling rod rear trailing boss rear overlay [21] to the back of the trailing boss.
16. For the thicker boss, parts [22] can be added to the back of the trailing boss. [23] provides a half etched alternative.
17. Repeat for the right hand trailing rods [18 – 23].
18. File the stepped end of the fork overlays so that they blend into the face of the rod. Clean up the rods paying particular attention to the joints.
19. Each set of rods has two knuckle joints to manufacture. The front, middle and rear 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.
20. 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 above of completed rods.
21. 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.
22. For Hornby wheels, all the crankpins except the ones for the driving wheels (the longer ones that go through the connecting rod) will need the bearing surface reducing in diameter to go through the hole drilled in the rods. This is best done in a lathe but can be done easily in a mini drill (or even a hand drill held in a vice) using a file. For the driving wheels, open out the hole in the coupling rod to clear the Hornby crankpin.



Left hand rod viewed from top



Right hand rod viewed from top

