Hornby J15 EM Finescale Conversion

Before you start, it is a good idea to have some small containers or snap top poly bags to put screws and components in for safe keeping.....much better than crawling about on the floor trying to find lost bits!

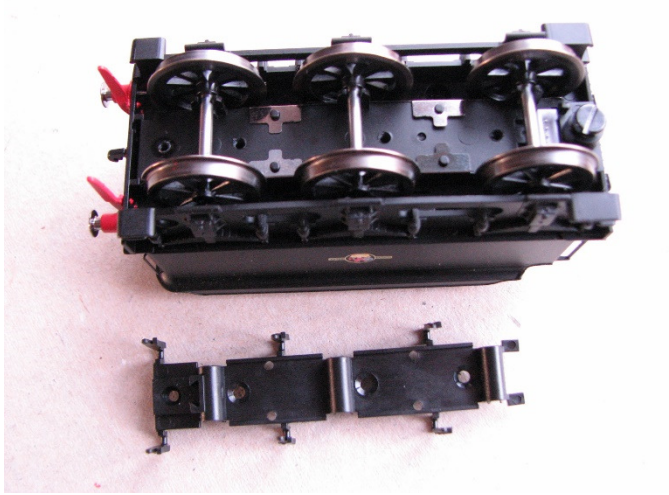
We suggest converting the tender first, as this will be needed to test the loco chassis later because of the electrical engine/tender connection plug and socket.

Tender Conversion

1. Invert the tender, and hold in a suitable device. We use a foam cradle – the Peco loco service cradle being ideal.

2. Unscrew the keeper plate.

3. Lift out the Hornby wheel sets.

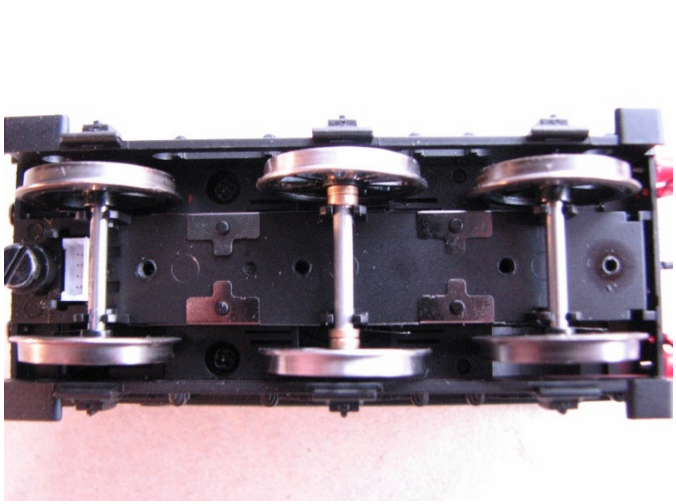


4. Mount the replacement Gibson wheels on their axles, setting the correct back to backs.

5. Include spacing bushes to take up the side play, we used 2 x 1mm plus 1 x 0.5mm each side on the leading and trailing wheels, leaving the 0.5mm one off the centre wheels.

Replacement wheels plus spacers.

6. Place the new wheel sets into the tender chassis, tweaking the pickups outwards slightly for the wider gauge.



Centre wheels replaced, note no 0.5mm spacer on centre wheels to allow greater side play on this axle.

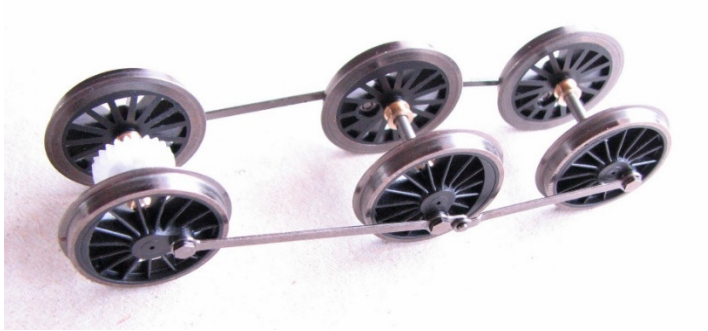
7. Before replacing the keeper plate, the brake shoes will need chamfering on their front inner edges to clear the wider gauge.

8. Replace the keeper plate, and fit the accessory pack brake rigging if desired.

Loco Conversion.

1. Invert the loco having disconnected the engine/tender electrical socket and plug. We use a foam cradle – the Peco loco service cradle being ideal.

2. Undo the screws and remove the keeper plate from the chassis. This simply lifts away, there are no wires connecting it to the chassis, but take care not to damage any of the electrical contacts.

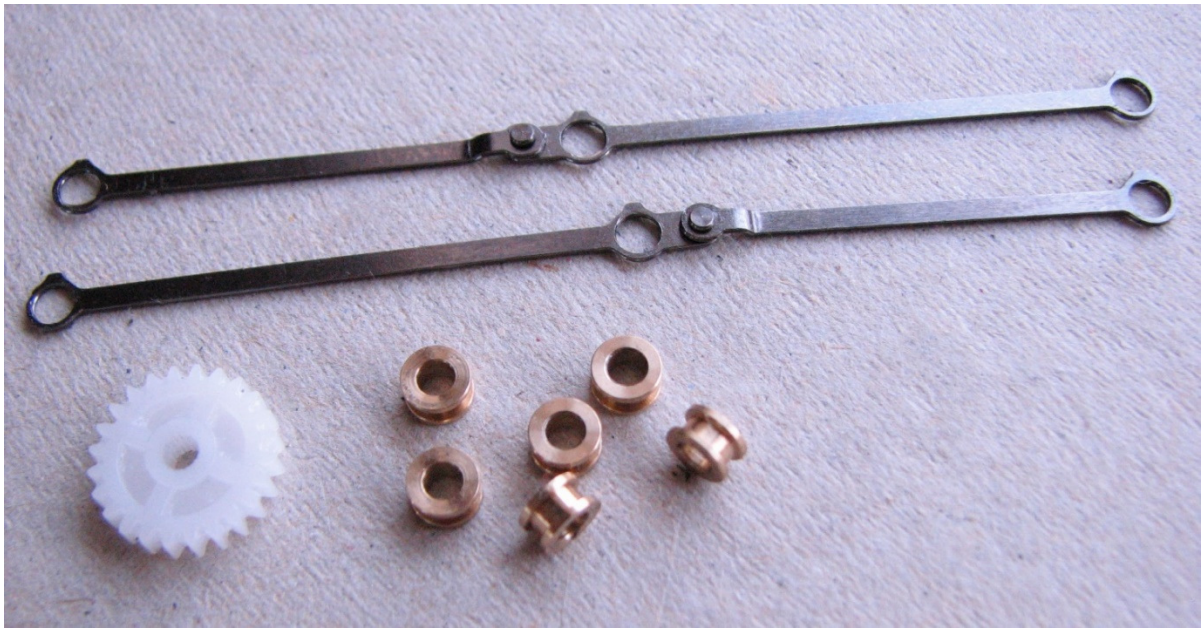


Wheels lifted out of the chassis.

3. Lift out the coupled wheel sets. Undo the crankpin screws, recover the coupling rods and store safely. The crankpin screws can go into the spares box; we have no further use for these!

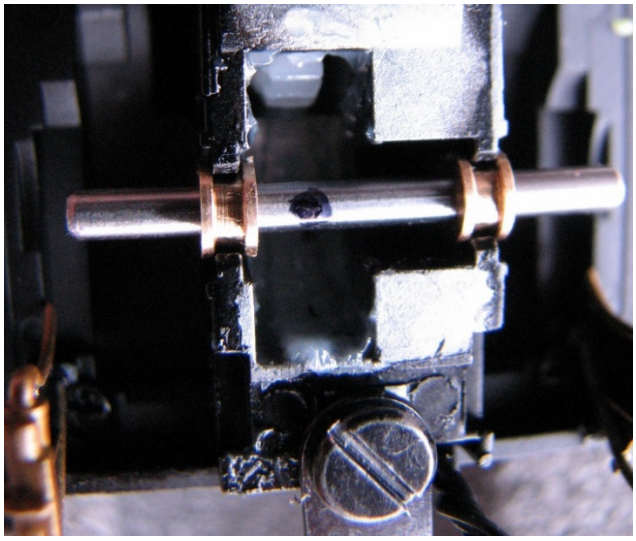
4. Remove the wheels from the axle by either twisting the wheels off by hand, or punching the axle through the wheels, then recover the gear by holding the axle vertically on a firm surface and pushing the gear straight down with your thumbs – DO NOT TWIST the gear as it is held on a splined surface and twisting may well damage the bore of the gear.

5. We also need to recover the six brass bushes the axles run in……these appear to be identical to each other, but you may wish to try and keep them in their original order. We didn't, and everything went back together ok!



Items required recovered from the driving wheels.

6. Take one of the replacement Gibson axles, thread two Hornby axle bushes on it, and place into the inverted chassis trailing axle slot above the drive gears. Measure each side to ensure you have it centralised, and mark with a pen (we used a permanent marker) directly above the gear in the chassis that the axle gear meshes with.

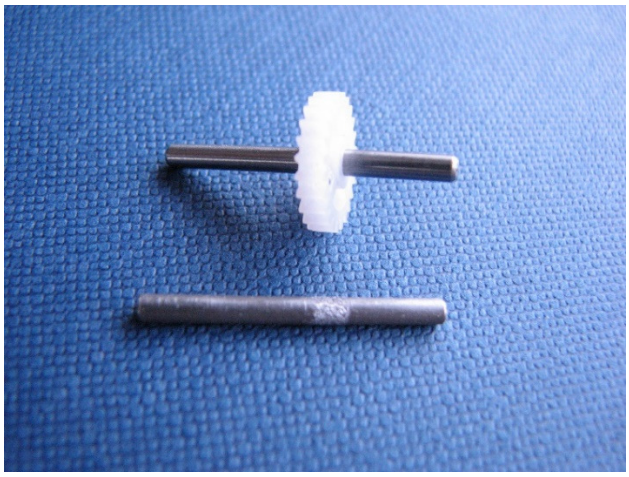


Marking gear position.

7. Place the axle onto a cutting mat or similar, take a hand file of around 6 inches in length, and using the edge of the file with teeth, roll the axle across the mat using the file and a fair degree of pressure at the point where you marked the axle. This will provide a splined effect on the axle sufficient to grip the axle gear wheel we removed from the Hornby axle. Do not allow the file to wander as we do not want any more splines on the axle other than underneath the gear itself.

Axle knurled for gear.

8. The gear can be pressed onto the axle by holding in your fingers until the splined effect is reached, then hold vertically on a firm surface and push down with thumbs either side until the gear reaches the desired position.



Gear on new axle, with a knurled example below.

9. The new wheels can now be prepared. Insert crankpin screws and apply balance weights if desired. We use 10 thou plasticard and a compass cutter to make these.

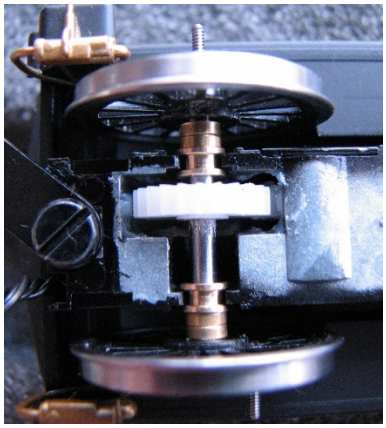
Wheel preparation.

10. Wheel set assembly can now begin.
Because Hornby in their wisdom chose to use 2mm diameter axles, the Gibson replacement wheels are of necessity a very tight fit onto such a slim axle. The wheels in our case were pressed onto the axle using a small vice, ensuring that the axle was at right angles to the wheels from all viewing angles!

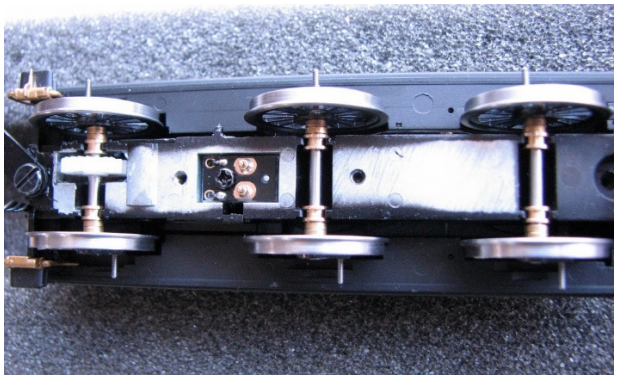
11. You will need some spacing washers to take up side play, and we found that 2x1mm thick each side gives a little side play. So push the axle just into one wheel, add one sides spacing washers, then the Hornby axle bushes followed by the opposite side set of spacing washers. Then place the second wheel on the axle, press the wheels fully on and set to the correct back to back. Quartering was by eye viewing through the spokes, as the usual axle press/quartering jig does not accommodate 2mm axles.


Wheels and bushes assembled on an axle.

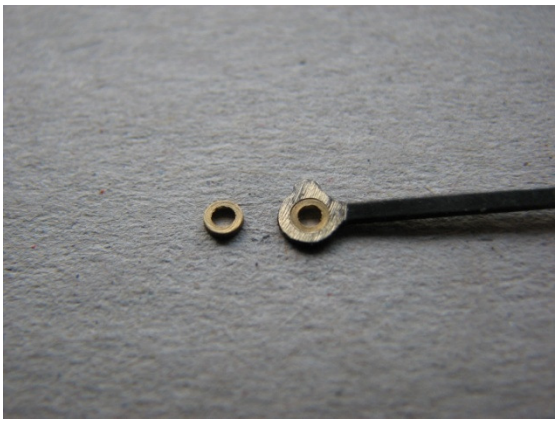
12. Repeat this for the remaining axles.


Driven axle with spacing washers placed in chassis.

13. Once all 3 axles are assembled and placed into the chassis, the keeper plate can be replaced and screwed down. It is always worth placing on the track and applying power gently at this point, just to ensure that all is well and we have free running of the driven axle. Remember with this loco, you will have to plug the loco chassis to the tender again to get it to work!


Wheels and bushes in place.

14. Next are the coupling rods. The Hornby rods require their large holes reducing in size by bushing. First, clean the rear of the rods around each hole by filing all plating off to expose the base metal. Also clean the inside of the hole prior to soldering from the back of the rod. Solder each bush in turn. If you accidentally fill the bushes solid with solder, don't panic! Allow all to cool, and you should notice in the middle of your filled in hole there is a slight depression in the centre – use this as your centre mark to run a drill through – simply hold a drill in a pin vice and twiddle away with moderate pressure on a firm surface – not the polished dining table preferably!

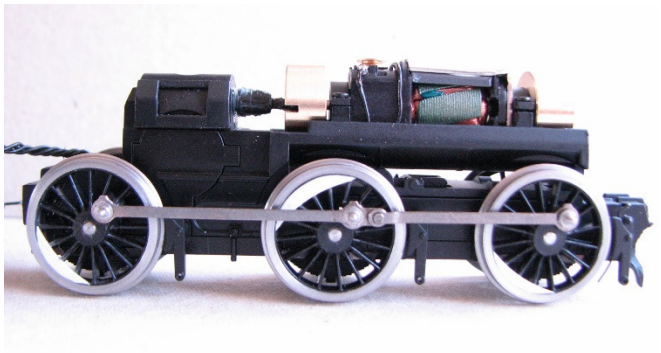


Bush inserted into rod ready for soldering.

15. The last job on the rods is to make sure the bushed holes are a fairly slack fit over the Gibson crankpin bushes – ream out as required with a cutting broach.

16. Place a short Gibson crankpin bush over each crankpin on one side of the chassis, place the correct coupling rod onto the bushed crankpins and retain with the crankpin nuts. You may wish to tighten these finally with fine nose pliers now, or later; but ensure you have firm hold of the wheel so as any turning pressure from the pliers does not move the wheel on the axle, thereby upsetting the quartering.

17. Repeat the previous step for the opposite side of the chassis.



Converted loco chassis ready for track test.

18. The loco should now be plugged electrically into the tender and both placed on the track, power being applied gently to ensure all is well.

19. Once satisfied with the running, the crankpins should be re checked for security, trimmed and tidied up as required.

20. Engine brake gear can now be finally clipped back into place.

Pete Hill

August 2015

ITEMS USED

4800/56
4847 x 3
4M42B
4800
4M67/3
4m67/2