

# Hornby Drummond 700 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. Unclip the brake gear, and place to one side.
3. Undo the three screws holding the keeper plate.
4. Remove the keeper plate, then lift out the Hornby wheel sets.



Keeper plate removed – Hornby wheels

5. Assemble the Gibson replacement wheel sets. We did not use any spacing washers as the outside frames of the tender just provide enough room for the EM wheel sets, therefore allowing little side play.



Tender wheels assembled with no spacing washers.

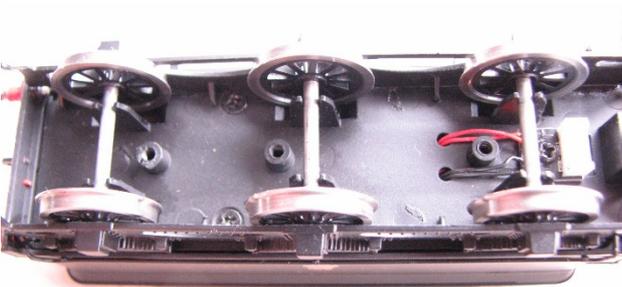
6. The pickups just reach the back of the tyre treads and needed little adjustment.

7. The outside edges of the wheel slots in the tender floor need a small amount of plastic removing to prevent the outside of the EM wheels fouling these. Not much needs removing, and a few strokes with a needle file soon had this done, so the wheels revolve freely.



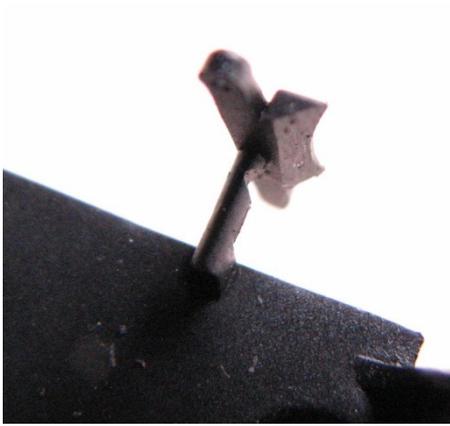
Removing the excess plastic.

8. Place the wheel sets into the chassis.



Gibson wheels installed.

9. The brake shoes need to be well chamfered on the front inside edges to prevent binding on the new wheels. We do this with a needle file, it being easier and safer than a sharp scalpel.....don't ask!!



Brake shoes chamfered for clearance.

10. Replace the keeper plate, and if the wheels revolve freely, fasten down with the three screws.

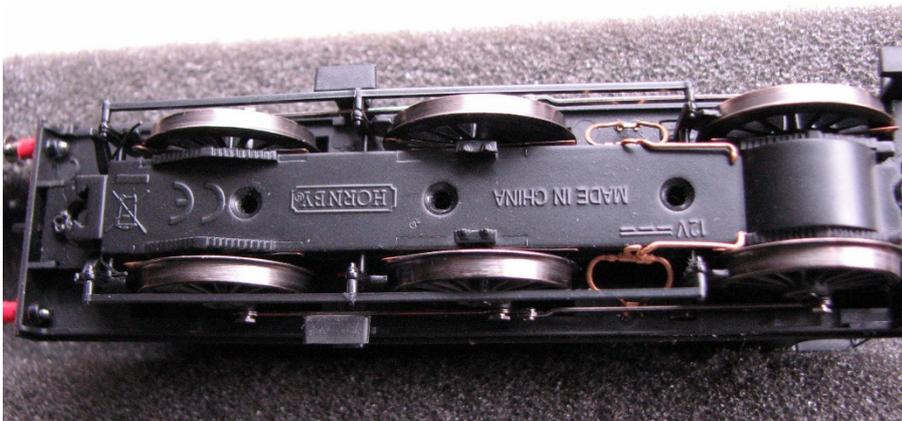
11. Brake rodding can be clipped back in place, and that completes the tender.



Completed tender.

### **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 holding the keeper plate, it will lift away from the front. This exposes the wheel sets and bearings.



Undo and remove 3 screws.



Keeper plate removed.

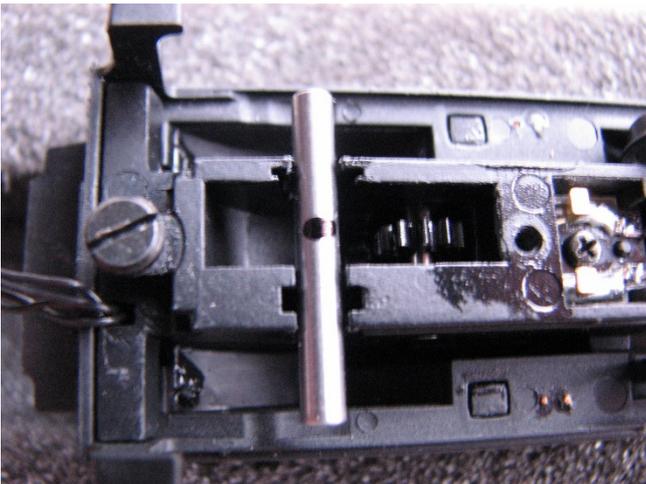
3. Lift out the coupled wheel sets. Undo the crankpin screws, recover the coupling rods and store safely. The crankpin screws can go into the spares box; we have no further use for these!

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 Hornby bushes the axles revolve in and place to one side for safe keeping.

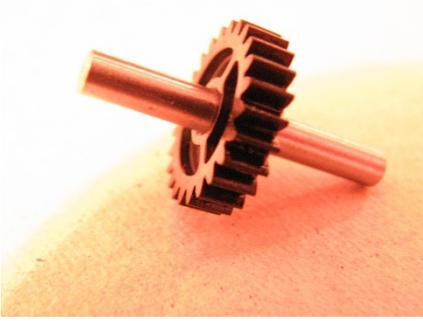
6. The axles are used as supplied – no shortening required.

7. Take one of the replacement Gibson axles, and place into the inverted chassis driven 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 on the axle.

8. 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. 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. This can be simply checked by placing in the chassis and measuring if in doubt.



Gear on new axle.

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.



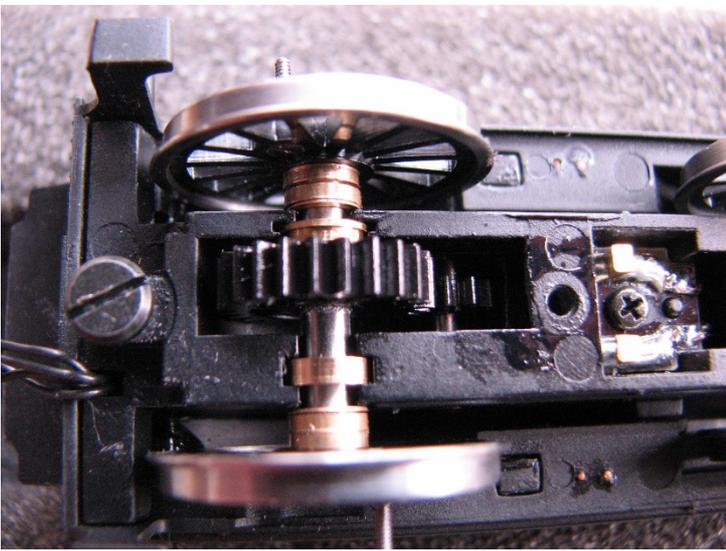
Wheel preparation.

10. Wheel set assembly can now begin. Also you will need some spacing washers to take up side play, and we find that 2 x 1mm + 1 x 0.25mm thick each side gives just a little side play but allows free running. So push the axle just into one wheel, add one sides spacing washers, then the Hornby bushes, followed by the opposite side set of spacing washers. The wheels can now be pressed home to gauge. We use a GW Models wheel and quartering press for this task.

11. Repeat this for the remaining axles.



The driven axle with spacing washers and Hornby bushes.



Driven axle installed

12. The brake shoes need chamfering on the rear of their leading edges, otherwise they act as very good brakes on our wheels, which we do not really want! There is just enough room between the outside brake rods for the EM wheel sets.

13. Once all axles are assembled and placed into the chassis, then the keeper plate can be replaced and screwed down. Tweak the pickups out slightly to accommodate the wider gauge, easier to do before replacing the keeper plate.

14. 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!



Assembled wheels installed in the chassis.

15. 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. The Gibson rod bushes may require the rod holes to be opened a bit further with a taper broach to allow the bushes to be pressed in. This also cleans 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!

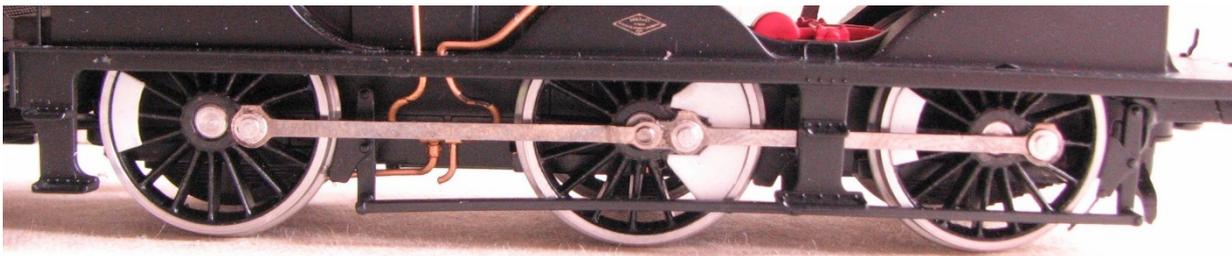


Bush inserted into rod ready for soldering.

16. 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.

17. 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.

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



Rods fitted to loco.

### **Loco Body.**

The loco body needs a slight modification to prevent the coupling rod bosses from hitting the underside of the running plate.

Hornby have moulded a slight cut out, but this needs to be made a little deeper. You can also remove a small amount from the top of the oil boxes on the rod boss if you wish.

Take care, as there is not a lot of thickness in these areas of the footplate moulding!



## Final Work.

1. 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.
2. Once satisfied with the running, the crankpins should be re checked for security, trimmed and tidied up as required, before replacing the chassis into the loco body.
3. Brake gear can now be finally clipped back into place.
4. Lubricate all the new parts.
5. Track test.



**Pete Hill**

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### Parts Used

4800/59 Driving Wheel Pack  
4M42B Crankpin Set  
4800 Conversion Washers  
4M67/3 Washers  
4847NW x 3 Tender Wheels

