

MODELLER'S WORKSHOP

Converting the Bachmann L&Y tank to EM Gauge

PETE HILL describes how he converted this 00 gauge model to a finer scale...

When Bachmann announced the L&Y Radial tank, your Editor asked if I would produce an article on an EM Gauge conversion, so having finally obtained a round tuit, these jottings are the belated result. One reason for the delay was the driving wheels. The Alan Gibson range does contain the correct dimensioned wheel, but this is intended for the Crab and looks very chunky by comparison with the tank's wheels. Also, the Bachmann loco runs on 3mm diameter axles, so unless I could persuade young Colin of Alan Gibson to make a special wheel, I was restricted to the existing conversion pack range with 3mm axles.

Whilst thinking about this, I dismantled the loco and took some measurements which showed that Bachmann had used marginally undersize wheels, certainly over the tread and their tread diameter just happens to match the Gibson M7 wheel, albeit with a spoke too many, but also with a fairly close crank throw. This latter was important as there is not much clearance under the footplate, which is a metal casting. At this point in proceedings, John Holden asked if I would convert an LMS-liveried example for his Lime Street layout. As he was happy with the driving wheel compromise, this I did. Predictably, it was spotted earlier this year at an exhibition and this reached the ear of your Editor who tightened the thumbscrews marginally on yours truly....

Where to begin

Invert the loco in a suitable support to make life easier. Remove the tension lock couplings, and the very small screws which are located underneath these. One other large screw needs removing located off centre in the base plate, then the chassis will pull away from the body. If in doubt, refer to the instruction leaflet provided with the loco. With the chassis out of the body, undo the two small screws holding the circuit board in place. This gives some slack in the wiring which we will need when the keeper plate is removed. Incidentally, I put all these screws in small snap top poly bags (from our favourite online auction site) for safe keeping. They are far too easy to lose!

The next stage in the dismantling process is to hold the chassis securely upside down, unclip and remove the brake rodding; then remove the remaining two keeper plate screws, allowing the plate to be gently pulled upwards to clear the wheels. Care is needed as the pickup wires from the circuit board are connected through the chassis block to



the keeper plate, so violence at this stage needs to be avoided! As the keeper plate comes away be prepared for the two radial trucks to ping alarmingly in one direction or another, as there are springs under each to catch out the unwary. Make sure you gather up all the components of these trucks. Each has the truck body with copper contact strips on, a round plunger the axle rests in and a spring.

The coupled wheelsets can now be lifted out of the chassis, noting first how



Coupling rods, bushes and gear recovered from original wheels.

they are mounted in flanged bearings that sit in the casting.

The coupling rod screws can be undone and discarded to the 'might be useful one day box'. The wheels are then removed from their axles by brute force or another suitable method in order to collect the chassis bushes and the driving gear. The bushes simply slide off the axle, the gear needs to be pushed off, quite easy to do by standing the axle on end on a hard surface, and pushing straight down with the thumbs – do not twist the gear from the axle, as it is held in place on splines, so you risk damaging the bore of the gear by twisting. That completes the demolition, so the rebuilding can begin.

Preparing the wheels

Firstly, the Gibson axles need shortening to 22mm by whatever means you prefer. Lathes make life easy, but it is quite easy to do this with a small file, holding the axle between fingers. Just remember to keep turning the axle as you file to try to maintain a square end. Do remember to place a chamfer back on the shortened end! Before the gear can be fitted, its axle needs to be splined first. I place the axle in the chassis, measuring to ensure it is central, then mark with a permanent felt pen where the gear needs to go.

The axle is then placed on a cutting mat supported on a solid surface. I then use the edge of an 8 inch hand file, pressing down very firmly, and roll the axle under the file. This produces a good enough knurl or spline effect to retain the gear without any need for glues.....after all, Bachmann only press it onto a knurl or spline. If your gear seems a bit slack, then simply re-do the knurling until your gear is a firm fit. The gear boss goes towards the axle centre, and the plain side needs to be approximately 8mm from one end.



Wheels with crankpins and balance weights fitted.

Balance weights are cut from 10 thou Plastikard using an Olfa compass cutter, stuck on with superglue or rapid epoxy. Crankpins are fitted as per the Gibson instructions supplied in each packet.



Gear fitted to one axle, with another below to show the knurling by file effect.

Mounting and quartering

With the wheels and axles prepared, we now come to the mounting and quartering. I use the GW Models wheel press and quartering jig...panic not, it has nothing to do with that railway, rather it's George Watts Models! Begin by putting an axle into a wheel so that it just grips, not pushed right home, thread on some spacing washers, the two Bachmann bushes with their flanges innermost, then more spacing washers, mount this lot in one half of the jig, place the opposite wheel in the other half of the jig and bring the two together, squeeze hard and the wheels should be pressed onto the axle squarely, and quartered at the same time. You will find this a bit of a juggling act that could do with three hands, but it works very well. The process is then repeated for the other axle.

I mentioned spacing washers. These are needed to take up the side play due to the wider gauge, indeed, we need to take out all side play in both axles to prevent the wider gauged wheels fouling the metal casting inside the body. I use Gibson washers which come in packs with 1mm, 0.5mm and 0.25mm thicknesses. I found that the leading axle needed 2 x 1mm + 1 x 0.5 each side and the geared or trailing axle needed just 2 x 1mm washers each side. The chassis thickness is different for each axle! Once all the wheels are mounted on their axles, they can be placed into the chassis.

The radial trucks

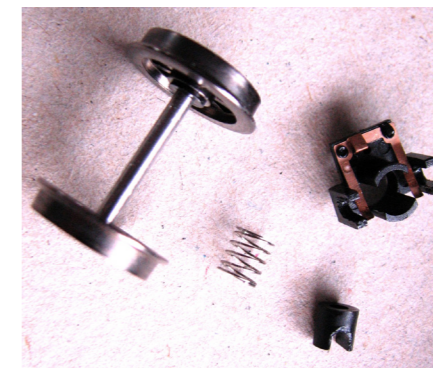
The next step is to deal with the radial trucks. These are designed with one wheel live to the axle to pick up current from one side at one end, and obviously the opposite side at t'other end. Gibson wheels are plastic centred, so we need to connect one wheel on each axle to its axle. Not that difficult...

Begin by pressing out the plastic spoke moulding from the tyre, finger pressure should be sufficient. Take a length of 0.33 phosphor bronze wire, and solder



Connecting wire from the rim to the axle.

to the back of the tyre, so that the end of the wire comes approximately to the centre of the tyre thickness. Take a knife shaped needle file, and cut a small notch in line with a spoke in the edge of the axle hole. Press the plastic centre back into the tyre, threading it under the soldered wire, so that the wire is in line with the spoke you filed the little notch



Radial truck components.

against. Thread the wire through the axle hole so that it lies flat along the back of the spoke and is therefore hidden from normal viewing. Then press the axle into the hole, trapping the wire. The opposite wheel plus spacing washers can then be fitted. I used Gibson 2mm bore washers, 2 x 1mm thick each side.

Re-assembly

The axles can then be installed into the chassis along with the radial truck parts we removed earlier, noting that one side of each truck has a small projecting piece of pickup strip... this is the side our live wheel needs to go at each end... obviously opposite side at each end, otherwise you will have created a dead short! Carefully reinstall the keeper plate, and fasten with two screws. At this stage, it is worth placing the chassis on the track and applying power, a) to make sure the driven axle revolves OK and b), that we have the radial wheels the correct way round without any direct short.

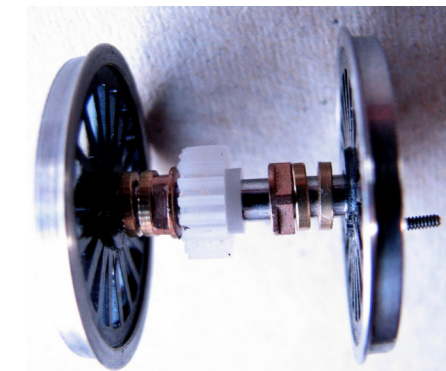
The last task is the coupling rods. The holes in the Bachmann coupling rods are too large for Gibson crankpins, and so we need to bush these. The ever helpful Mr Seymour has introduced a pack of turned brass bushes for just this purpose. To fit them we need to file the chemical blackening off the rear of the rod around the hole, and it is a good idea to twiddle a round needle file inside the holes to clean these back to bright metal also. The bush should be a snug fit in the hole, sometimes you may need to open the rod holes a touch with a cutting broach to accept these bushes. These are then soldered into the rods. If over enthusiastic with the solder, you will fill the bushes completely, but don't panic! As the solder sets, it will leave a dimple dead centre of the filled hole, so just drill out the surplus solder with a small drill and pin vice twiddled between fingers.

The bushes may now need to be opened out marginally with a cutting broach to be a decent running fit on the

Gibson crankpin bushes. The rods can now be fitted to the wheels, followed by crankpin nuts and tighten these up.

Testing

Now you can place the completed chassis on the track and track test your handiwork. Once satisfied, cut off the surplus length of crankpin and tidy up with a file. The chassis and body can now be re united, and again track tested. I have found with the two conversions I have done that no grinding away of metal inside the tanks or underneath the



Driven axle showing gear, bushes and spacing washers.

footplate was needed for EM gauge.

I hope these ramblings prove useful to fellow modellers, and our Membership Officer certainly seemed impressed when he came across it at ExpoEm this year.

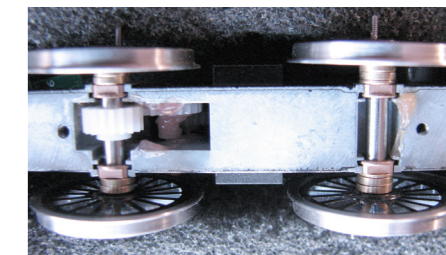
Materials list

Alan Gibson range:

- M7 driving wheels (EM conversion pack 35)
- Radial wheels – 3' 8" 10 spoke G4844 x 2
- Pack of 1/8" bore brass shim washers 4M67/3
- Pack of 2mm bore brass shim washers 4M67/2
- Pack of Coupling rod bushes 4800
- 0.33 phosphor bronze wire

The wheel press and quartering jig is from G W Models, 11 Croshaw Close, Lancing, West Sussex BN15 9LE t:01903 767231.

George does not have a web presence, or accept plastic, but does an excellent mail order service with a cheque.



New wheels reinstalled

Bachmann Tank in P4

Dave Carter is offering a service to members who wish to convert their Bachmann 2-4-2Ts to P4; he will adapt the body to accept a P4 underframe. Further details will be in Magazine 265.