

CONVERTING THE HORNBY E2

Francis Samish shows you how to lift this RTR locomotive out of the ordinary. Photographs by the author.



No.32103 basks in the late evening sunshine - shame about the overscale greenery and tension lock couplings giving the game away!

Built at the Brighton works of the London Brighton and South Coast Railway just before the first world war, the E2 series of 0-6-0 side tanks designed by Billinton lasted until the early 1960s. The first of the class dated back to 1913, and some were originally fitted with condensing equipment, thus having mechanical feedwater pumps rather than the more usual injectors. The entire class survived intact into the BR era, their short 8' + 8' wheelbase lending itself admirably to the task of shuffling wagons around the sharply curved Southampton docks complex - where some of the last survivors were even fitted with radio equipment!

The first five, BR Nos.32100 to 32104, were built with short side tanks, subsequent locos (32105 through to 32109) having extensions forward to increase water capacity. At one point, Crownline produced a conversion kit for the Hornby offering to make up into this later series.

As for the model itself, this captures the character of the original versions of these high-footplated tanks quite well although it does have some significant errors, the most obvious of which is that the model sits around 2mm higher off the rails than it should. Something that a number of other locos from this manufacturer suffer from. And while we are parcelling out the brickbats, the bunker is 4mm too short. So there!

It appears that sales of the E2 were never particularly good, and in the end, the body moulds were modified to create 'Thomas the Tank'. In theory then, any remaining examples out there should be well on their way towards becoming instant collectables. Lest readers suspect that I've committed sacrilege in the dubious cause of absolute prototypical accuracy, the raw material for this feature came in the form of an unfinished E2 body moulding and, believe it or not, a similarly forlorn 35 year old Tri-ang 'Jinty' chassis.

Actually, the Jinty chassis was running under its second body at the time surgery commenced, and had in the recent past also gained Romford wheels and an MW 5-pole open frame motor. Unlike the more modern all plastic Hornby chassis, the motor is sited towards the back of the loco, allowing for daylight under the boiler barrel, but at the expense of losing space in the cab.

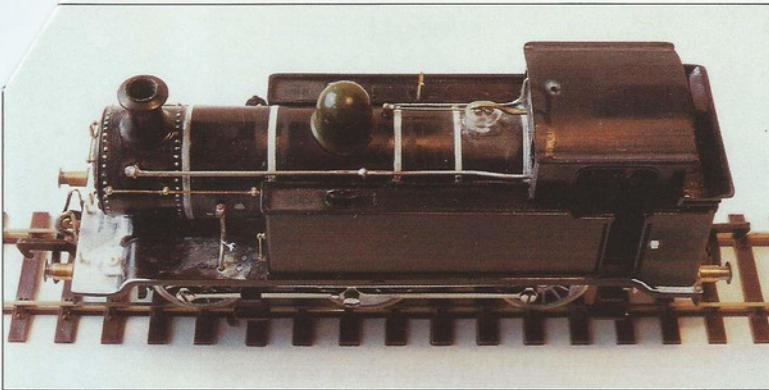
Before butchery commenced, both body and chassis were checked against a scale drawing, in this case from the Skinley range, and photographs of the real thing. After some cogitation, it was decided to accept that while the old Tri-ang wheelbase was spot on, in order to allow the original fixing screw hole to line up with the chimney, the whole mechanism would need to sit about nine scale inches (that's 3mm) further

forward than it ought to. Life however gets shorter the older one gets, and let's face it, if the all-important 'character' of a loco or item of rolling stock is retained in miniature, the object of the whole exercise has been attained. No one's going to rush out and try to measure the damn thing with a scale rule as it rumbles past on the layout.

What is important though, is to make sure the body sits absolutely level on the chassis. Much time was therefore spent with a flat glass surface and a steel rule held vertically up against the footplate and buffer beams. Packing pieces of plastic card in varying thicknesses were employed to get front and rear to sit just right. Because the old Jinty chassis uses two 'ears' to locate the rear in the original body, a sort of box arrangement was needed inside the E2 moulding to cater for this.

A slot also needed to be cut right through the cab floor to accommodate the motor. The backhead detail was another early casualty to the same cause. Luckily, Hornby used relatively sophisticated multi-part moulding techniques in this model, which enables the boiler top casting to be easily prized free for such a major alteration.

Once the chassis was squeezed into place, marks could be made on the front weight block as to which areas needed to be removed prior to filling in the bottom of the boiler barrel proper with a segment of plastic tube. In the end, a large chunk of ancient Mazak was laboriously sawn



Boiler bands are cruelly enlarged in this view, as is the safety valve bonnet carved from solid perspex - this particular Hornby part now being unavailable.

out, and the resulting gap filed down to leave just two posts - one at the front for the fixing screw, and the other at the rear to take the RF suppresser tag.

Plastruc tubing was used for the boiler bottom insert. For some reason, this refused to bond to the Hornby plastic - even using MEK. As a last resort, Superglue was tried, with the whole lot smoothed over using first a fine flat file, and then slivers of wet and dry paper stretched taut, endwise over a piece of wood.

Careful perusal of the drawings and photographs revealed that the characteristic front and rear downsweep of the footplating at either end of the model was too deep now that the body sat at the correct height on the chassis. The solution was to add 40thou plastic card in these areas to thicken the top of the footplating there, and then to shave plastic away from underneath to restore the side valances to the match the height of the raised sections. Unfortunately, this meant some nifty work with filler and file to restore the 'S' shape profiles on the E2, not to mention blending in slivers of 20thou strip to mimic the overhang of steel footplating in these areas. As a footnote, bear in mind that for a BR period loco, the edges of the buffer beams viewed from the side are straight, rather than having the more elegant triangular valance pieces of the pre-group era.

Less than the usual amount of cast-on details have been provided by Hornby which is good news for us modellers, since there is less of it to remove in the quest for accuracy! A case in point are the two towers at the front of the tank tops which appear to have been part of the prototype's condensing apparatus. In BR days, they and the accompanying Wier steam driven feed pump had long since gone.

Boiler bands though were needed, applied cut over length from 20thou plastic strip about 1mm wide, with the ends trimmed to size hard up against the tank sides with a very sharp blade. It was too much to hope for that the front join line between the boiler top moulding and smokebox would coincide with a boiler band and so it proved.

Pictures of the real locos showed that rather than being smooth as in the Hornby model, the 12" to the foot smokebox was plentifully marked with a surfeit of rivets. After much soul-searching it was reluctantly decided to replicate these using

the 'plastic cube' method.

Actually, there is not much to this technique, merely nick the end of a 20thou plastic card strip lengthwise with a craft knife, then chop the 'cubes' off crosswise. The 'diced' plastic cubes are then picked up on the end of a brush dipped in solvent, and placed on the surface to be riveted. With practice, it is possible to become adept at getting the spacing more or less equal and the lines similarly more or less straight.

While the solvent is still soft, it is possible to push specific cubes around with the point of a craft knife blade so as to get them in the desired position. After all the cubes are in place and more or less set, more solvent is sloshed freely over the lines of the 'applique' rivets to round off the square corners.

Details on the E2 are few, as befits Edwardian steam power. The safety valve bonnet had to be formed from a perspex block laboriously ground using a motor tool, and filed to the right oblong shape, finally finishing off with a light scouring of a burnishing brush. It is still a little on the big side for 4mm, but this is balanced out by the safety valve easing lever which was sawn from a solid slab of brass, and fitted with hand-wound fuse wire springs. Not that you can see them now of course as after all that work, they are tucked down coyly in the well of the cover.

The right-hand side of the loco carries the LBSCR Westinghouse pump on a bracket built up off the footplate. This detail item was actually taken from a left over American Model Die Casting

sprue, but a slightly larger HO brass casting would work just as well. Alternatively, a perusal of the catalogues of messrs Gibson or Maygib might turn up something suitable.

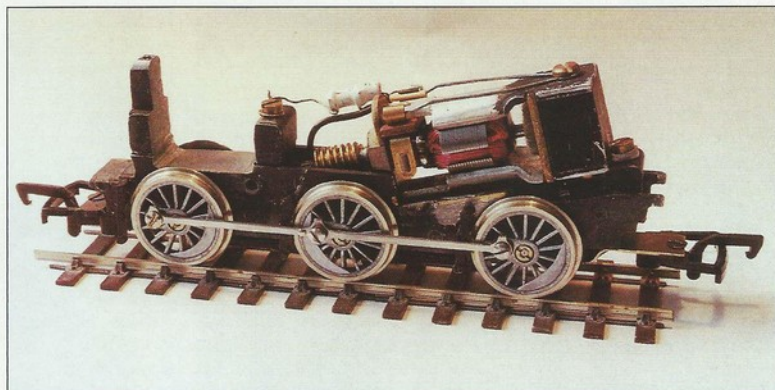
The pump steam exhaust was simply represented by stretched and straightened fuse wire, which was then carefully bent to shape to suit the model. Further back along the top of the boiler sits a globe valve and steam feed pipe made from an overscale handrail knob, straight brass wire for the control rod, and more fuse wire for the line back towards the underside of the cab roof.

Though both photograph and drawings show injectors under the cab sides, a left hand view of the locomotive was lacking whilst the project was underway. So, as other LBSCR locos in BR days appeared to have boiler barrel clack valves - yet the E2 photos I used showed none - a compromise was reached by modelling one on the left hand side only. That way, it was felt, the model would be at least half right, or half wrong, depending on your viewpoint!

Under the footplate, things get a little more interesting. The right hand side carries a long thin air tank, bound with three bands, and the plumbing for the injectors is affixed to the outside of this. Sprue scrap was used for the air reservoir, with brass wire and soldered-on brass strip clips to locate the injector steam pipe into holes drilled onto the tank surface. In fact, the pipe was made up integral with the injector as a single piece, solder and fuse wire being employed for this component.

The left hand side is simpler, since there is only a single steam feed to contend with, though the front end has to line up with that above the footplate leading up to the clack proper. Because of the shape of the pipe run, the injector had to be made up and fitted separately again from brass wire and fuse wire soldered together. Not an accurate facsimile by any means but there again, this is meant to be a working loco, not one that needs to win prizes at an exhibition!

A blower pipe was also fitted to run forward of the cab towards the smokebox on the left hand side. On the available photos, this appeared to be unsupported for most of its length. Again, stretched fuse wire was used, albeit somewhat on the thick side in hindsight. The elbow at the smokebox end being formed from rings of finer fuse wire soldered onto the main pipe at 45° to each other either side of the angled end.



Tri-ang Rovex chassis of around 1960 vintage forms the basis of the conversion. Note the MW005 5-pole X04-type motor, another blast from the past!



This bunker shot displays the lamp irons and spectacle glass protector bars to advantage. There should actually be five bars, but from the average viewing distance three bars look more 'right' than five.

Getting the handrail knobs to stay in the right place proved more of a problem. Basically, while the Hornby holes are more or less in the right place, they are too big for today's fine scale knobs so each hole needed to be plugged with Slaters Microstrip, then drilled out to the correct size after everything had set. Several tries were needed (more hole plugging!) to get both tank side handrails to sit the correct height off the footplate when viewed from the front. Note that though the Skinley drawing appears to show these positioned on the radius of the tank corner, careful examination of the photographs locates them further in, on the flat portion.

Since the E2 cab roof, back and sidesheets all come as a separate part, this component was left until last to be fitted for keeps. Apart from some thinning of edges, the major modifications here were to replace the cast-on glass protector bars at the rear with fuse wire, and to make up some perspex spectacle glasses. These four bits of perspex were somewhat of a cheat, since they were turned up on an extremely venerable Unimat SL lathe, but today's advanced glazing systems for model aircraft and military vehicle miniatures could probably do the job just as well once the model was painted.

Final detailing of the body centred around the area of the smokebox door. New items which were required for this BR era Southern tank included a smokebox door number plate and a shed plate, both made from plastic card. The dart locking handle was soldered up from bits of etched screw coupling links and a tiny brass washer, all mounted on wire and then soldered together.

The two angled lamp irons either side provided something of a poser. At one stage, serious consideration was given to doing without any lamp irons at all because of them! Eventually, each 'L' section was filed to shape, and then an arm on each one was folded back - one right, one left - to form the mounting pegs. Superglue secured the two brackets into holes drilled just above the bottom door hinge brace.

Curiously, whilst the front of these engines had the full complement of Southern six position headcode brackets, the bunker rears only seem to have been fitted with the orthodox set of four. All these irons were basically strip brass, superglued into place.

Buffers were an old set of Cav'dish sprung items - sadly only with steel heads rather than the plated brass of earlier and more affluent times. Unlike some of today's buffers, these have 12BA screwed shanks, which allows you to take them on and off as construction progresses to check clearances. Since the ultimate aim was to fit the model with tension-lock couplers, only the hook was modelled on the buffer beam. For the same reason, only the vacuum and air pipes were modelled and these were set to be well clear of the moving parts of the couplings. The E2s had steam heat as well, certainly those at Southampton docks had them for the special vans used for banana traffic.

After all this, the work required on the chassis was almost an anticlimax. Romford wheels were already fitted, with the original axle holes being upgraded with the correct size $\frac{1}{8}$ " bore bushes. Remember when thinking of carrying out any similar conversion, that the gear wheel also needs to be pushed to suit the smaller diameter axle. You have to use the same Rovex or Tri-ang worm and wheel combination, because standard Romford or other gears won't fit.

Romford wheels now come with tapped holes for the same company's crankpins but the thread is the same BA size used by Hornby for their coupling rod retaining screws. This meant that the old rods could be re-used, after some gentle shaping to get the profile down slimmer and more 'fishbelly' like the prototype.

Balance weights were added to each wheel by cutting out circles of 20thou plastic card and then forming crescent-shaped pieces ready for supergluing to the wheel. Once the cyano was dry, each balance weight was cleaned up to the correct shape with a sharp blade as required. The centre weights are of course bigger than the outer

sets, since they have to cope with the extra rotating masses of the cranks and big ends on this axle.

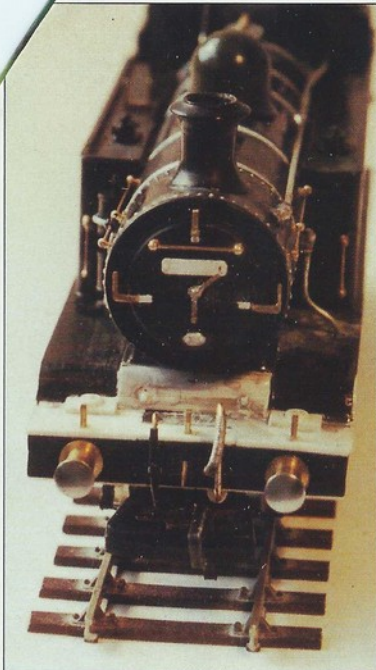
Where the brake shoes for this model came from is anyone's guess. They were plucked from the scrapbox, force fitted into 1mm holes drilled into the steel plate frames, and then set to be just clear of the tyre treads. Because the section under the motor was lower than the rest of the chassis, brass strip sections were soldered in to provide sufficient depth for the shoe mounting holes in this area. Even so, one hanger needed to be doubly secured with superglue to correct a sloppy fit.

One of the last mechanical jobs before painting was to make up extension plates for the tension lock couplings. These were required to take the coupling faces out beyond the buffer heads - well just level with actually - so as to pre-empt any problems with long wheelbase and bogie stock on typical OO curves of 2' radius.

Painting commenced with a spray coat of Humbrol grey primer. Do not be tempted to use car paints on plastic, since the solvents are far too harsh and will 'raise' all filled lines and cut marks. Then a greyish/black mix was brushed over the entire model, brush strokes being in straight vertical lines always, so that any marks would show as rain and dirt streaking. The shade was mixed up 'on the fly', giving subtle variations in shading to different sections of the engine. Areas where transfers needed to be applied later - tank sides, smokebox door number plate - received a coat of clear varnish. The same mix was used on the chassis, brake blocks and wheels.

To be on the safe side, the model was decked out with the early 'Lion on a unicycle' BR totem, from an old Kemco waferslide set - the scrapbox will never be the same after this model! Running numbers also came from the same source.

Matt varnish was used to seal in the transfers. Light weathering was then applied using the same

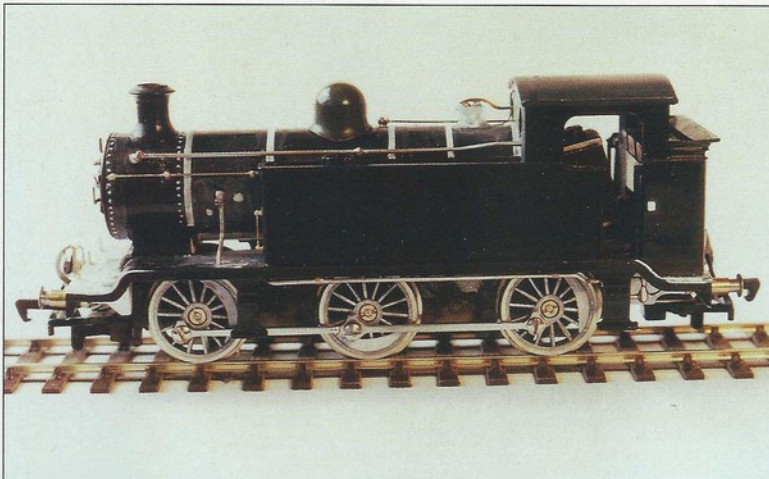


White plastic shows where the front footplate has been built up to compensate for height, now that the body is the correct height off the rails.

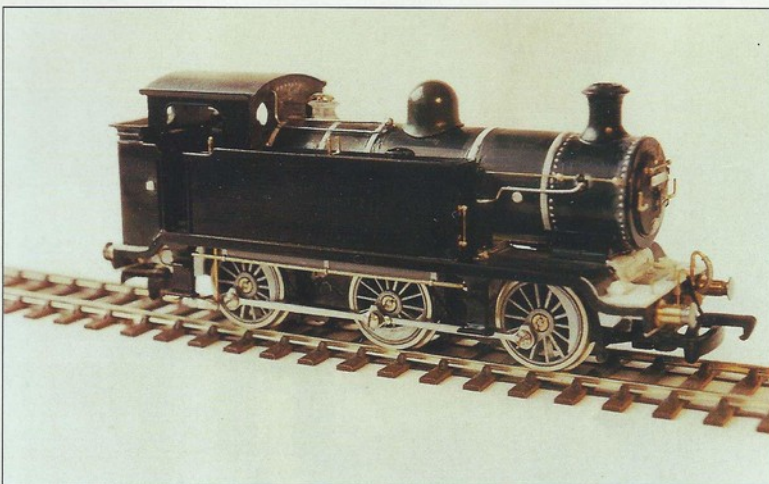
matt varnish as the base, but worked together with shades of orange, for rust, track colour and greyish-black. Much of this work was done with a 'dry' brush - one with virtually all the paint wiped off - to create a 'dusted on dirt' effect.

Once dry, the turned perspex spectacles were fitted into place together with the whistle, and the bunker coaled up with real coal secured with PVA adhesive. Now, all our E2 needs is a train to pull, and a layout to run on, but that, as they say, is another story.

The evening sun highlights the detailing on the converted Hornby E2.



Left hand side of the model showing blower piping and clack valve on boiler barrel. Balance weights on Romford drivers are sheet plastic crescents secured with superglue.



Right hand side has air pump for Westinghouse brake. Coupling rods are again the Rovex originals, slimmed down to a less toylike profile.

