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BUILD NOTE

Britrail Black 5 EM conversion - 04/11/15

Before the days of today's ultra detailed ready-to-run models from the likes of Bachmann or Hornby, a small number of brass models made either in Japan, Korea or latterly China were brought to the UK market. Britrail was one such manufacturer, and I was recently asked to convert one of their ex-LMS 'Black 5' 5MT OO gauge models to EM.

Overview

The model's specification includes a Portescap coreless motor and gearbox, sprung leading and trailing drivers, and is of all-brass soldered construction - right down the buffers! The driving wheels interestingly enough are the old Romfords, complete with squared spokes. The tender appears to be constructed as a unit complete with sideframes, and then the plastic centred wheels put in afterwards. Scale couplings are fitted, but no provision is made for autocouplers.



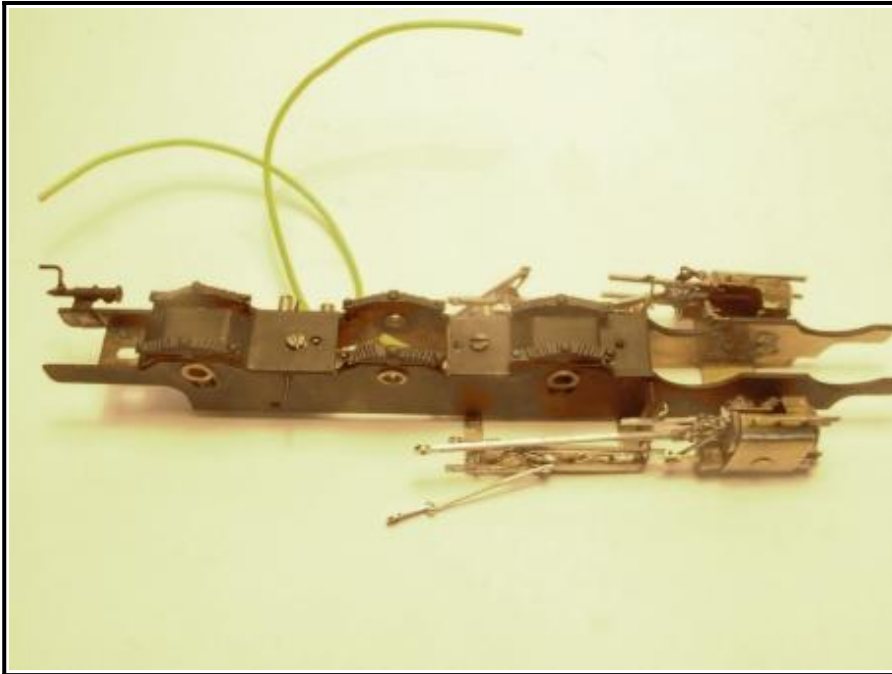
Britrail Black 5 as converted to 18mm EM gauge and awaiting painting

As received, the model needed a little bit of remedial work. It had apparently been dropped at some time, and there was a kink in the front buffer beam that had to be carefully corrected, and the footplating valence resoldered. I did notice too that whilst the buffers were all sprung, their securing nuts were secured with solder, making removal for painting later a bit problematic.

EM from OO

Conversion from OO to EM theoretically only requires that the wheels be moved out by 1.5 mm to 18mm from the 16.5mm gauge 4mm /3.5mm scale 'standard'. However, on the Britrail model, clearances are very tight around the valve gear area, matters being made worse by the need to allow for 'cant' and sideplay of the front drivers because of the sprung axle arrangement. In fact, the makers had already angled the double slidebars outwards to get room even in 16.5mm.

I ultimately had to move the Walschaerts gear mounting frame outwards on both sides to allow both the connecting rod to move freely, and avoid the eccentric rod binding up on the expansion link. Beware of the fact that all the pins on the valve gear are soldered not riveted - dwell too long with the iron and the whole lot drops apart. How do I know, you ask...



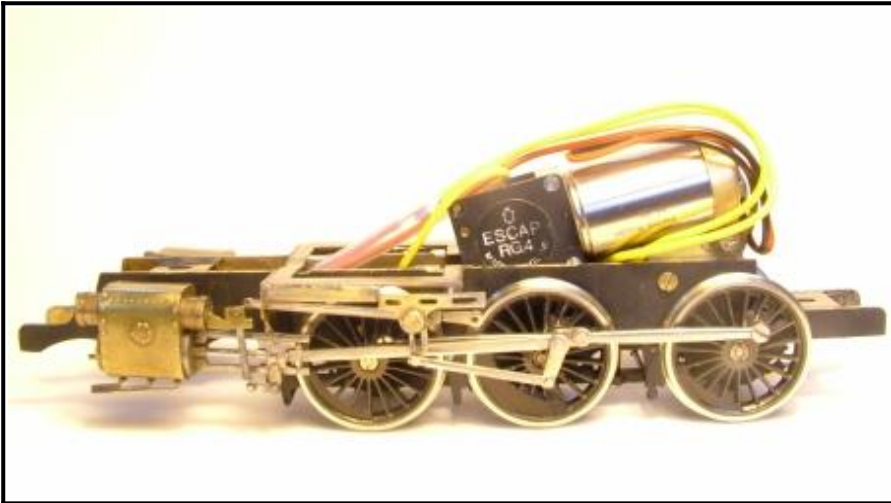
Black 5 chassis less wheels - you can just about make out the plunger pickups sticking out on the other side. Note how all the valve gear is soldered on to the cylinders, which means that you need to remove the front and centre drivers one at a time...

It did mean however that I was able to reacquaint myself with the old dodge of using slivers of tracing paper between the various links when soldering bits of valve gear together!

Rather than use the existing wheels, I fitted the new Markits wheelset that has been specifically designed for the Black 5, right down to the webs between crankpin and rim. Spacing the wheels out from the frame either side was a matter of turning up a set of six 0.5mm thick 1/8 inch bore brass washers on the lathe and then using Markits fibre spacers where necessary to pack out to the required distance.

Britrail has used plunger pickups rather than the conventional wipers, and these introduce another variable that needed to be taken into account. The springs are quite strong, and as there is only one set of plungers on one side - the wheels being rim-insulated one side and plain live to frame upon the other - each wheel is effectively 'skewed' as the locomotive proceeds along the track. On the wider gauge of 18mm, this is accentuated even more, as the frames and axle bearings remain at OO gauge distance apart, as the pickup plungers now operate in a greater arc of 'twist'.

Of course, this could all have been rectified by making a completely new frame with rigid axles, and the correct distance apart from EM gauge...but where do you stop?



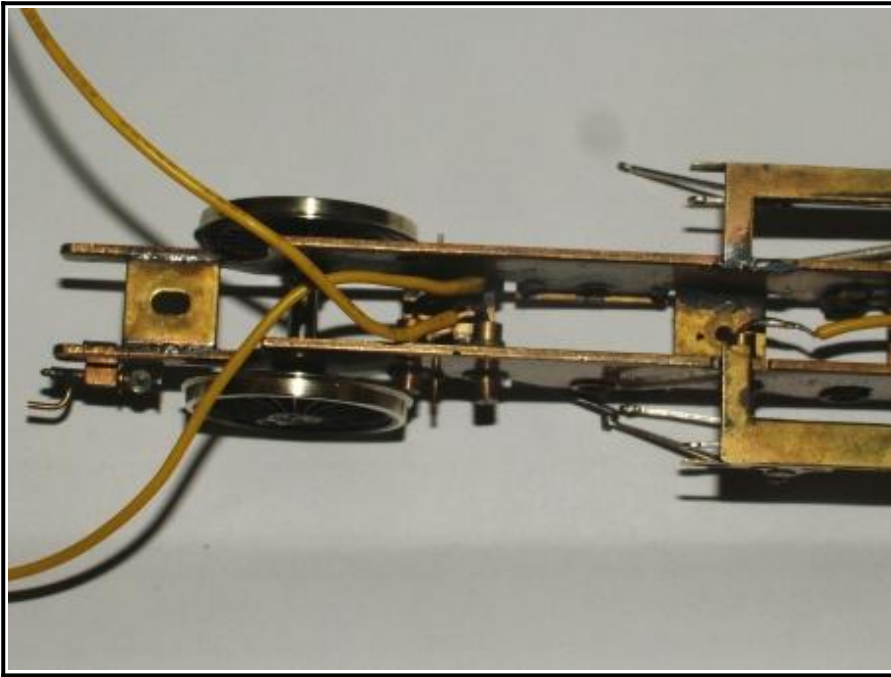
Chassis complete and ready to roll. The relocated Walschearts gear frames further outwards necessitated a corresponding cut out to get them to sit flush with the outside edges of the footplate valences.

As things stood, a compromise was in order, where the front drivers were packed out to have minimal sideplay - as much for the connecting rod front pins to clear the back of the crossheads - with the centre axle left to float' sideways. It can't move that much anyway because of the plunger spring force, but I will have to rely on the fact that the 48 inch minimum radius pointwork the engine is intended to operate upon will ultimately have in enough 'slop to gauge' to allow the wheelbase to pass through without problems

Plunger Pickup extension

It was impractical to extend the OO Britrail pickups to EM, so that making a new set was the only option. Space between the frames is very tight, and in any case, I did not want to get a soldering iron anywhere near the insulating sleeves in which they operate, which are themselves sited within tube soldered into the sideframes.

My solution was to turn some rod down to the same size as the existing - but with the requisite 0.75mm additional 'reach' - remember, you only need to halve the additional track width, because you are only working on one side. Each rod was then drilled through by 0.8mm and a stepped phosphor bronze 'tang' soldered in. The tang is bent over at the outer end and the resulting solder bead filed into a dome shape - this is the contact point - and the other end of the tang serves to locate the pressure spring, and then has a piece of insulated hook-up wire soldered to its inner end in turn.



Close up of the pickup plungers with phosphor-bronze strip 'tangs' just visible. To eliminate any chances of shorting, insulation tape has been applied to the inside of the frames opposite the plungers.

This means that you can thread wire, spring and plunger proper into the bush, bend the tang back to clear the inside of the frames when it is all safely installed.

As a footnote to drilling brass to any depth more than about 0.5mm with drills of under 1 mm, use a 'pecking' motion when drilling. First to clear the chips, and to avoid the brass expanding in the bore as the drill gets deeper and so causing the drill to bind and break in the hole. Cutting fluid helps too - even though the perceived wisdom with brass is always to work it 'dry', allowing its lead content to act as the lubricant.