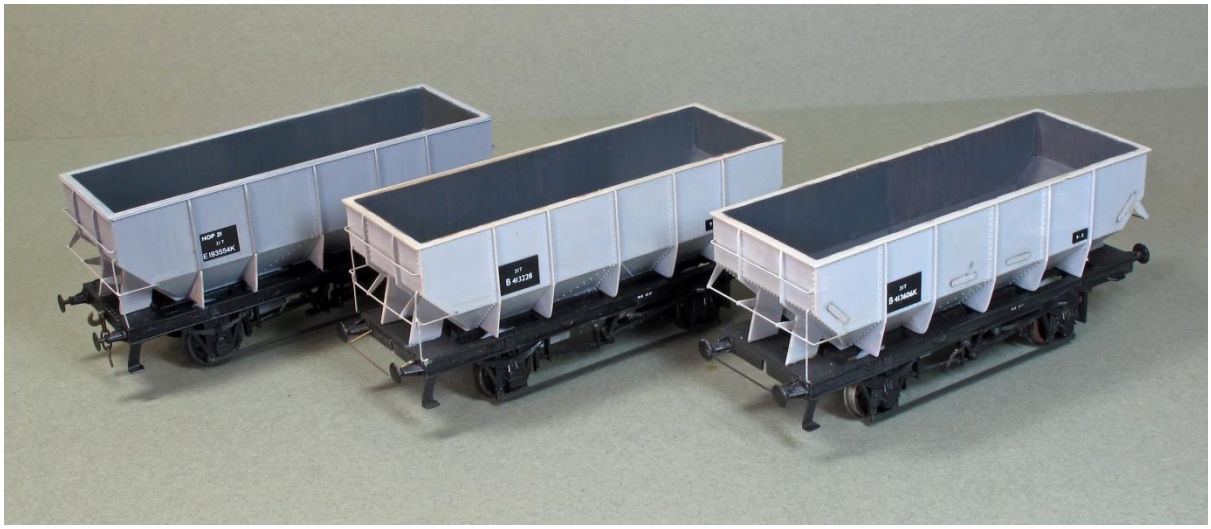
Detailing, Upgrading and Modifying Ready to Run Rolling Stock

By Karl Crowther

Today's RTR models are of a level of detail and accuracy that are hard to beat. There is scope, however, for further refinements to be done, and an opportunity to adapt a particular model to produce a type not currently available 'off the shelf'. Indeed it's a very wide field as I hope these examples will illustrate.

1. **Dapol 21T hopper with Dave Bradwell upgrade parts ('Dapwell' conversion)**



The Dapol 21T hopper has a beautiful body moulding which can be further enhanced by the use of this etched kit from Dave Bradwell. The model as it comes is in most respects OK, but the pattern of brake gear represented was unusual for the riveted pattern of 21T hopper. The design dates to NER days and the type of brake gear they used on these wagons had a form of clasp brakes and a distinctive 'high' brake lever. BR perpetuated the design, initially to the NER drawing, but it eventually saw a move to welded construction with Morton 4-shoe brake gear and levers of the more usual pattern (BR diagram 1/146). The model is thus a bit unusual in having the NER type of riveted hopper in combination with the BR type Morton brakes. The Dave Bradwell kit addresses this issue, and more…….

Needing a fleet of these vehicles, Dave Bradwell created this fret that builds into a scale chassis for one of the correct LNER pattern brake gear variants (for the riveted body), with additional parts to upgrade some aspects of a further three RTR wagons, while retaining the original chassis moulding. It is this little project we'll be dealing with here. Of course if you then feel inspired to have a go at the fully sprung chassis kit, all the better…..

The photo sequence will take you through what's involved.

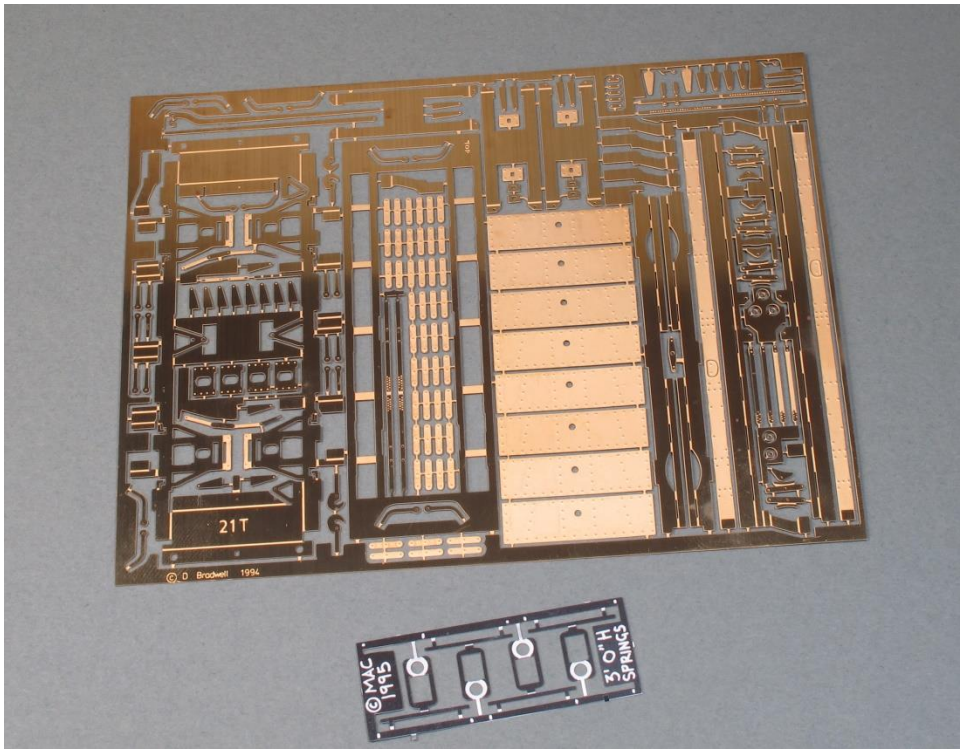


Photo 1

The Dave Bradwell brass fret. This includes parts to build a complete clasp brake/'high lever' chassis (correct for the riveted version), plus parts to upgrade a further three vehicles – this latter being the focus of our project here. The little stainless steel sub-fret underneath are the spring units for the full chassis.

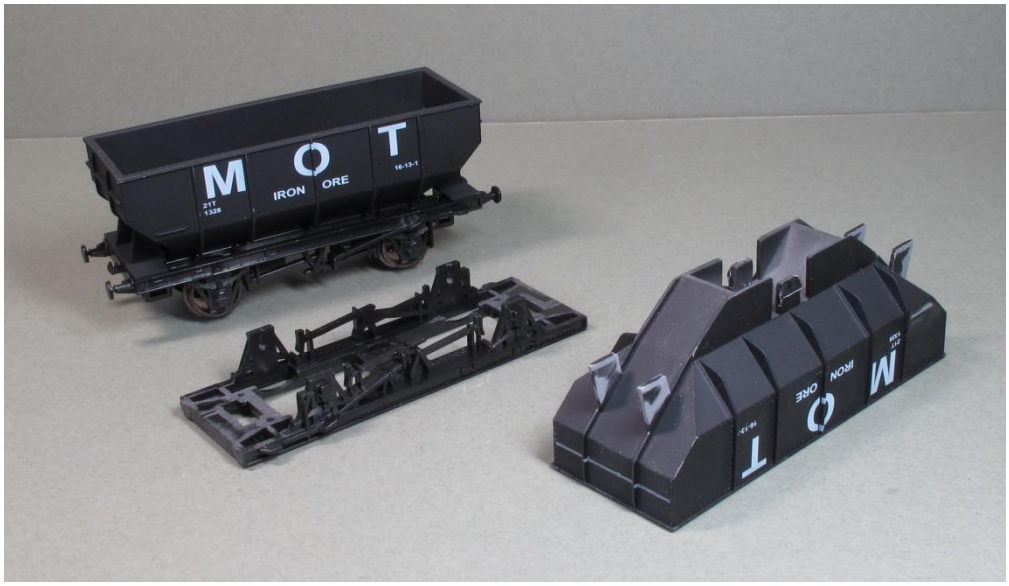


Photo 2

This shows an original model (lop left), with a dismantled one alongside. The two 'lugs' at the hopper base secure the chassis to the body, so the two are very easily separated. The main thing, really, that lets down the chassis is that the brake lever is a 'solid' moulding. Removal of this would likely be

difficult, so it's best to leave alone or you could end up having to rebuild the entire brake gear. And to be honest, from most angles this compromise isn't at all obvious. Here, I've cut away the coupling mount under each end of the chassis. Work on the body has included removal of the over-thick end platforms which will be replaced by an etched part, plus removal of the end and side handrails. The former are in the wrong position, and look better anyway if replaced with wire, while those on diagonally opposite sides are not present on all of the wagons.

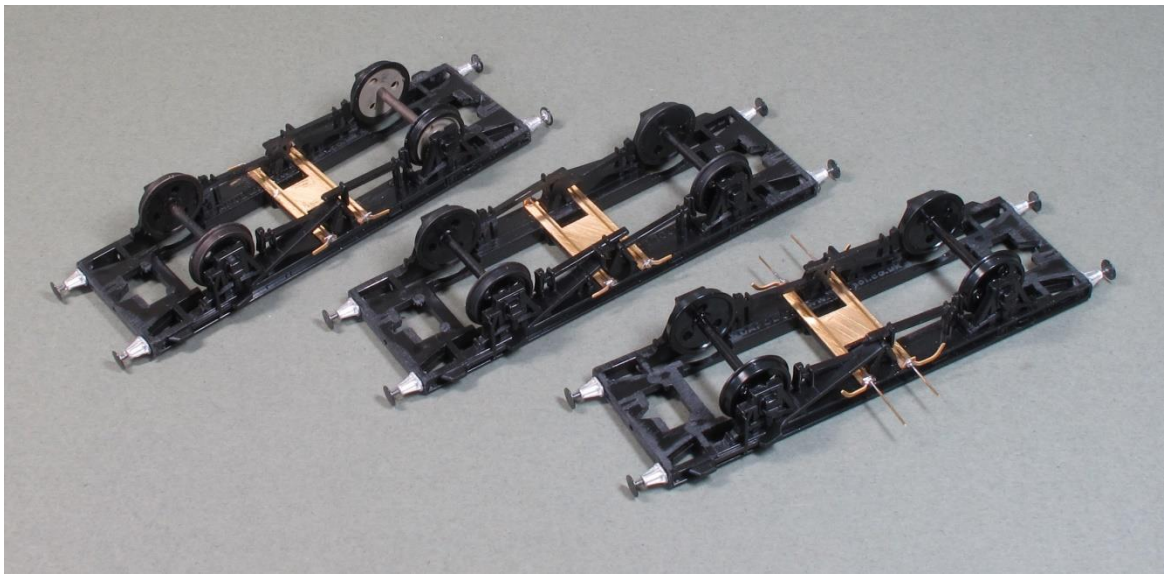


Photo 3

As the kit allows three vehicles to be detailed, that's what I chose to do (I need upwards of 30 of them, so that seemed the best way forward). You'll see that the kit includes the bottom door handles (missing from the Dapol model) which are fitted to a mounting plate glued to the underside of the chassis. 0.3mm brass wire provides the fixing point for the handles – you can see those on the RH moulding are still to be trimmed to length. I soldered the handles – OK if you use low melt solder and are quick with the iron. Also I didn't like the moulded buffers of the original underframes and so here have replaced them with castings from MJT (RCH pattern). At this stage I also drilled a central 'pilot hole' in the buffer beams to mark the position of the coupling hook.

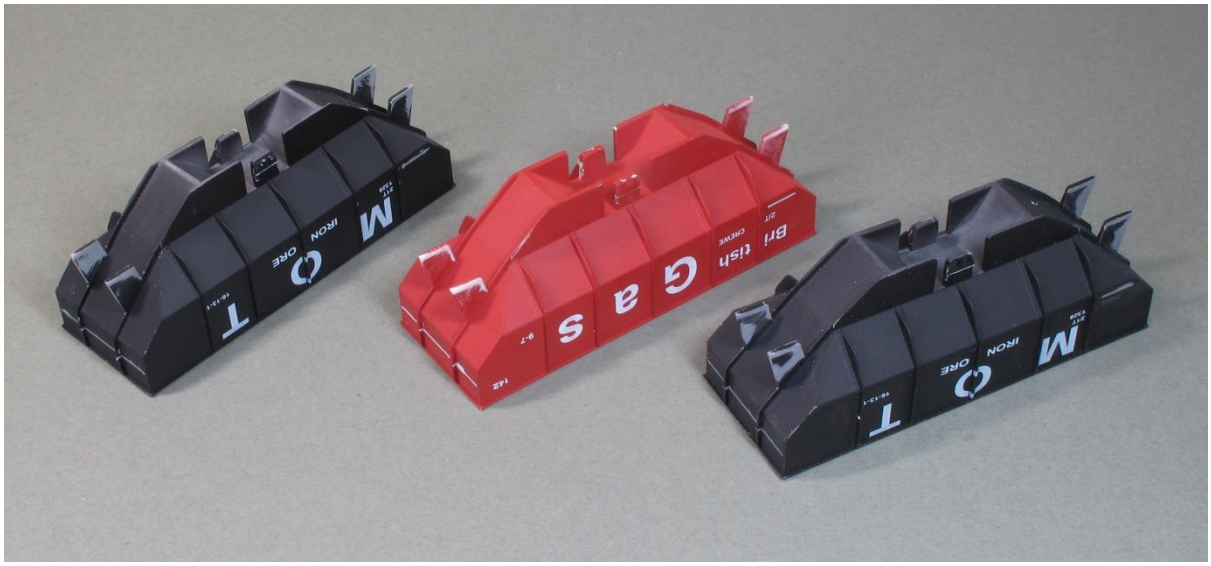


Photo 4

I've now prepared all of the hopper bodies. The original handrails were carefully removed using a rounded No. 10 scalpel blade. Make sure it's a brand new one, then carefully pare the handrail away, cutting sideways along its length. Finish off by scraping from side to side to remove the last traces. Again I used 0.3mm wire for the new end handrails fitted into 0.4mm holes. Remember, these need to be lower than the moulded originals (consult photos here).

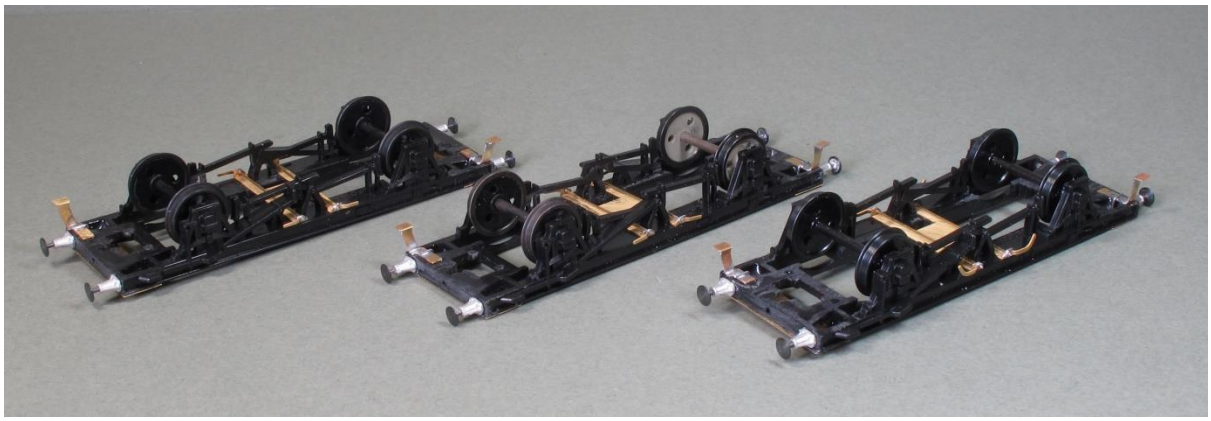


Photo 5

The next job on the chassis is to fit the end steps at diagonal corners. These are simple fold up and solder assemblies, designed to glue under the edges of the frames. I felt these would be vulnerable to getting knocked off, so I soldered a small L-shaped piece of wire to their baseplates. There's a recess here in the frames behind the buffers into which the ends of the wire will sit. Having attached the steps to the underside of the solebars, 5-minute epoxy was then used to glue the wire into these recesses, thereby providing a much firmer fixing. Incidentally, I model to EM Gauge and the wheels you see are the EM replacements. Luckily the wheels are a straight swap with the OO originals and don't catch on the brakes, though it has to be said that's because the brake blocks sit a long way from the wheel rims. Nonetheless it makes conversion to EM extremely straightforward!

Photo 6

The last job on the chassis is to add the new etched end platforms (again epoxied in place). There's a pattern of rivets on these which has to be oriented the correct way round. Also some wagons have a small handrail on the platforms at the opposite sides to the steps. For these you have to drill your own holes in the platforms, which I did on two of the wagons. That completes the chassis – they can now be given a scrub with 'Shiny Sinks' using an old toothbrush and then a wash in 'Flash' before being given a thorough rinse and then dried for spraying.

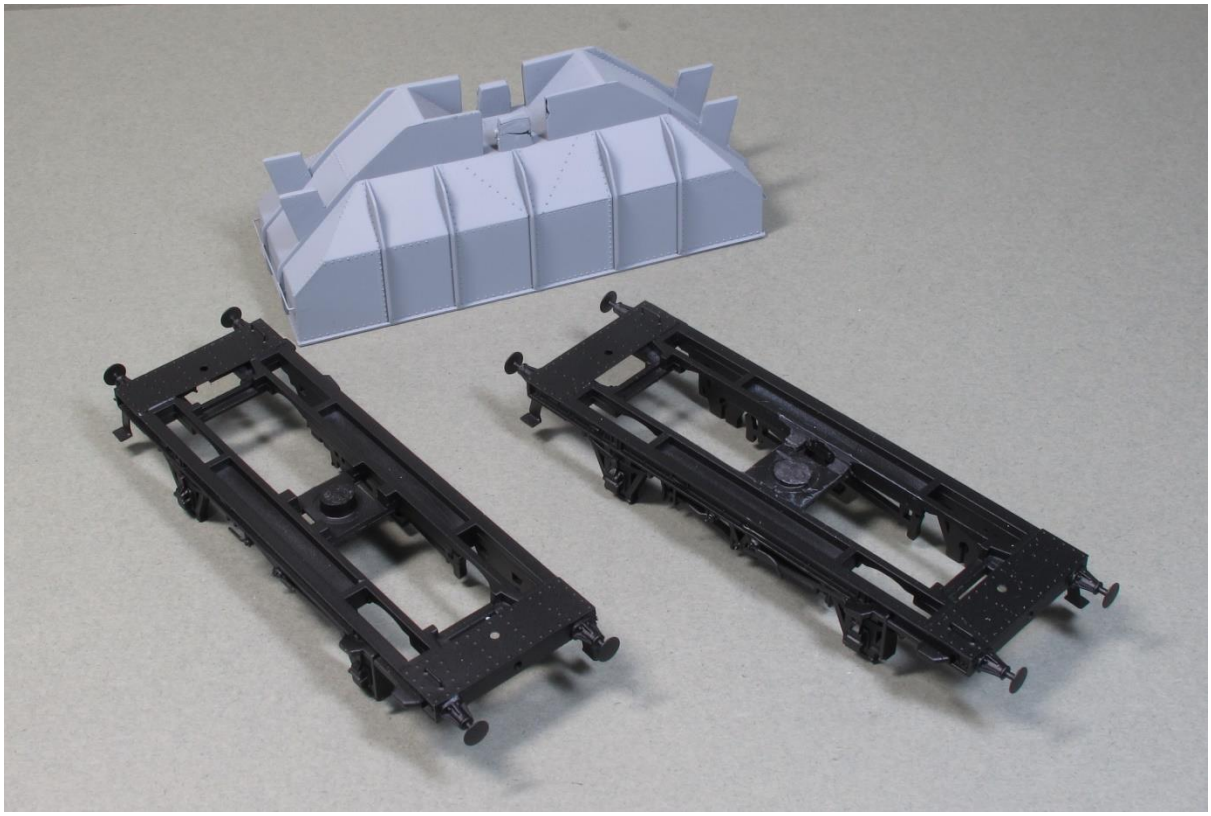


Photo 7

I sprayed a grey primer coat (Halfords) and then, the underframes in matt black. When it comes to re-fitting the bodies back to the underframes, a couple of things are first necessary. Firstly, cut away the large central moulding pip on the top side of the underframe, together with the areas either side as shown in the photo (right). Without this the hopper body won't sit properly on the solebars. I also take off the locating lugs on the hopper moulding. This makes it easier to trial fit onto the chassis, without having to release the clips every time. The fit's still quite snug in any case, but you can secure with some epoxy at the end. You may also have to shave down the bottom edges of the end hopper supports by around the thickness of the new end platforms. Just take a little off at a time, test-fitting the hopper body to the underframe as you progress. With that done you can now re-fit the wheels and can make a start on the remaining handrails.

Photo 8

For the end handrails, the prototype saw a number of different arrangements and the fret allows for four different styles to be represented (there are others). These are a distinctive feature of the original and thus worth adding to your model. The differences are primarily to do with the shape and placement of the little triangular brackets that support the handrails. Dimensions are given for drilling the required holes to mount these. I found the best way was to determine the height above the end platform and set my digital Vernier calliper to this measurement. This could then be used to very gently mark a horizontal line onto the hopper end at the required height. Having marked the hole positions with a pointed scriber, a final check they were all horizontal was made by holding a steel rule against the hopper end. Any adjustments having been made, 0.4mm holes could then be drilled for the brackets.

The brackets themselves were identified on the fret and before removing them, their holes were drilled out 0.4mm at the etched dimples provided. After placing onto the model, a spare length of 0.3mm wire was passed through the brackets and once everything had been lined up, some of the wire was used as an applicator to apply a small bead of thin superglue around the base of each bracket. The wire handrails themselves could then be shaped and fitted – soldered (quickly!) to the brackets and secured where necessary to the hopper. Note here that the end(s) of the horizontal rail appear to have been turned down and simply welded to the side of the hopper. In Photo 8, the RH vehicle has the completed handrails fitted, while on the LH vehicle – one of the variant arrangements, you can see that the handrail brackets are attached not to the hopper body, but instead to the end hopper supports – you can still drill a mounting hole into these if you're very careful……..

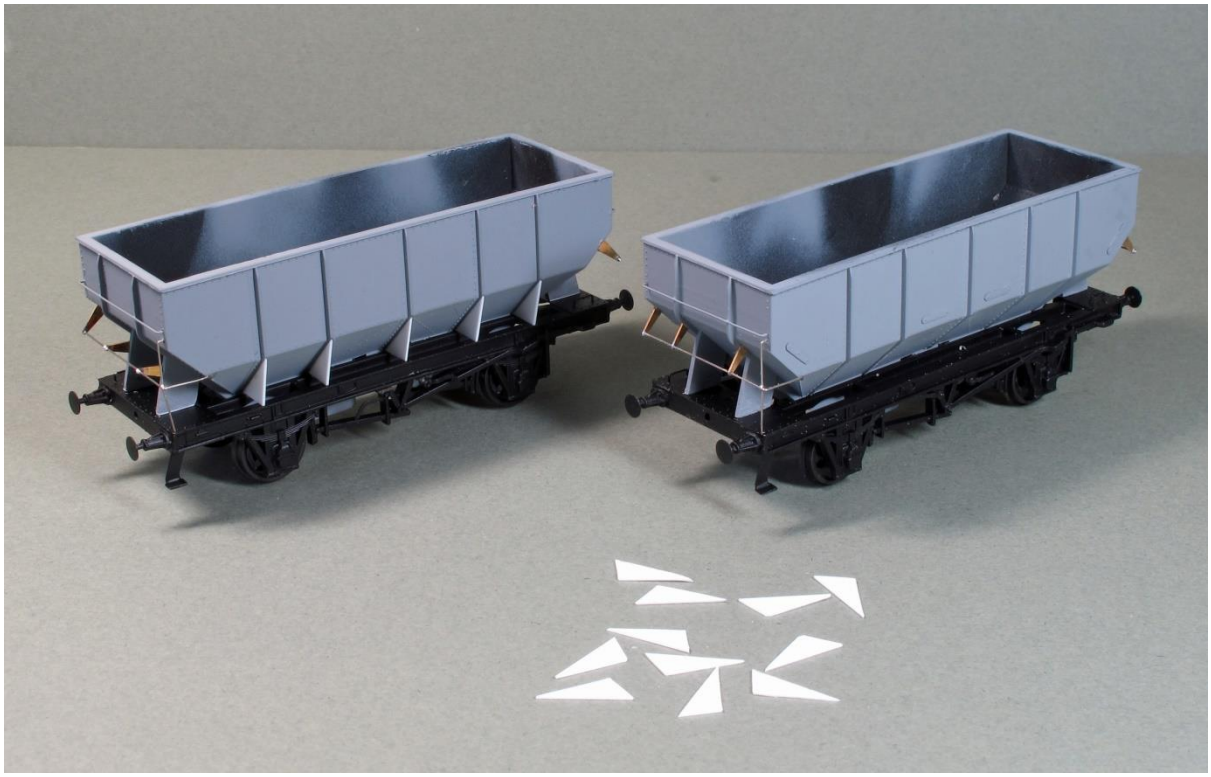


Photo 9

Having got this far, I then noticed that compared to some wagons I'd done several years ago, the triangular, side hopper supports didn't meet the solebars (should have spotted this one earlier!). Closer inspection of these current and the earlier models revealed that the mouldings were in fact of two very slightly different patterns and in particular the triangular side supports were actually quite differently shaped to those of my originals. In particular the bottom edge, which should be horizontal with the top of the frames, sloped upwards so that they didn't in fact rest on the frames. If you think about it this makes no sense at all in terms of the real thing because the brackets would not be performing their intended function of supporting the hopper body.

I therefore decided to remove the side supports and replace with new ones cut from 15thou styrene sheet. A series of approximate shapes were cut and then offered individually into position to allow final adjustments to the outline to be made. It didn't take that long to do all 3 wagons and well worth the effort in terms of improved appearance. This photo also illustrates the two handrail arrangements I attempted with this particular trio. It's also worth mentioning that you'll probably (like me) be trying your very best to get the handrails and neatly affixed and aligned. However, when you look at photos, they are invariably bucked and battered……..

One final job concerns the lack of axleguard ties – needed on the real thing to counteract the outward force of the brakes being applied. However, the moulded chassis lacks these so they were added from thin brass strip. When building etched kits I always keep long, thin bits of fret waste which comes in handy for tasks like this. Initially I just superglued them in place, but the bond to the plastic didn't seem all that good and very soon they were coming adrift. The solution was to drill a 0.4mm hole in the end of each piece of strip and then after supergluing onto the wagon, the holes

were drilled through the plastic axleguard so they could be pinned in place. A quick touch of the soldering iron with some low melt solder secured the job. You could of course add a second pin at the other side of each axleguard to represent the bolts that secure them on the originals……

That completes the construction aspect of this little project. Of course that leaves painting, lettering and weathering which I don't propose to deal with here. But to conclude, don't forget that Parkside also do kits for several of these wagon types, namely the ex-LNER type (PC 80) represented by the riveted Dapol moulding (which has the correct clasp brake/high lever pattern), the welded BR version – diagram 1/146 (PC 77) – with the Morton brake arrangement, plus the 1970s rebodied version (welded, with only the two side stanchions – PC78). Note here that both the ex-LNER and the BR pattern underframes were rebuilt, so you can have both brake types with the rebodied version – but the kit includes just the BR type (you could of course use either the Dave Bradwell kit, or indeed Parkside PC80 as an underframe source for this variant). Last but not least, for the BR diagram 1/146 hopper, if you want a sprung and superbly detailed chassis, a further option is the Rumney Models chassis kit (B.28). Taken as a whole, the Dapol Hopper, Dave Bradwell kit, Rumney Models and the Parkside offerings, there's scope for endless variety in a fleet of 21T hoppers!

As a further postscript to this, I was browsing Hatton's website and noticed they were selling unpainted versions of these Dapol hoppers for around half the cost of the decorated models (which are fine for my purposes), so I stocked up on donor vehicles to complete my remaining supply of Dave Bradwell parts….

2. **Hornby BR CCT**

The Hornby BR CCT is I believe, based around the ex-Lima version. It's a fine model with superb livery application. However it has one small flaw which I wanted to correct, this being the raised 'rim' around the windows which isn't there on the prototype. Also, given the long wheelbase, I wanted to include springing as part of my conversion to EM gauge.

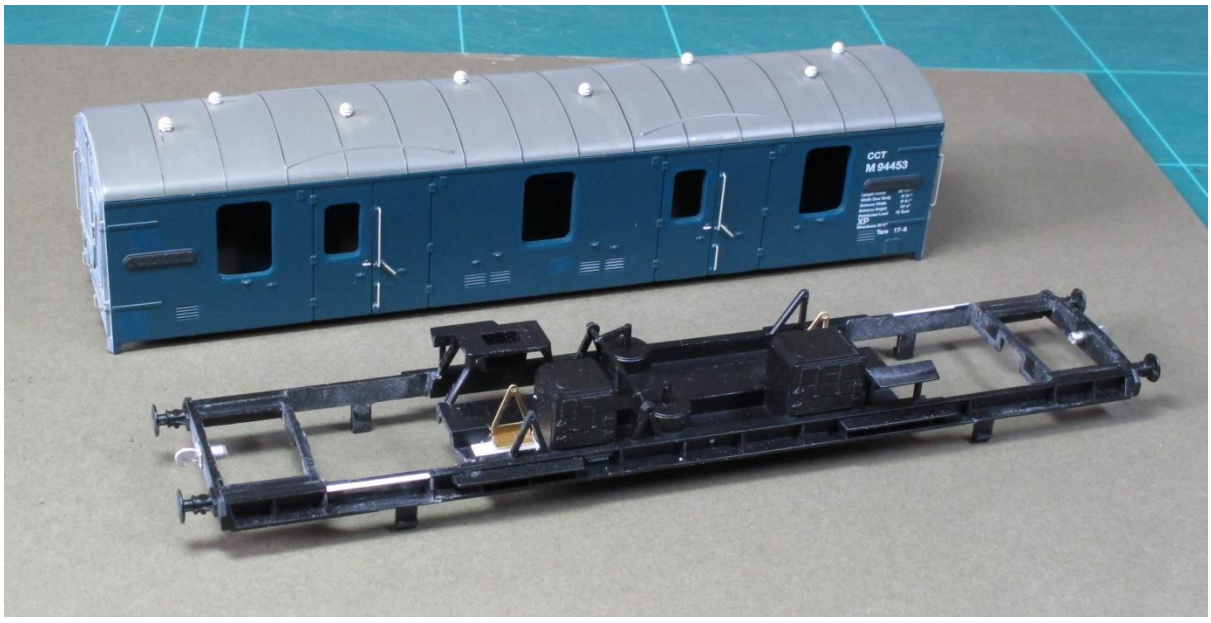


Photo 10

The first job was to dismantle the model. To remove the underframe there are four lugs near the ends that engage with the body. Carefully insert the end of a thin steel rule between the body and underframe, prise sideways and the underframe should come free. Next, if you want to remove the roof to work on that separately, the thing I worked out eventually is that the whole of the roof and the glazing form a single unit of clear plastic. Thus if you ta something like a cotton bud and gently push the glazing inwards at its bottom edges, the roof will eventually pull out from the body.

Dismantling done, I set to the body again using a No 10 scalpel blade. With this I very carefully carved away both the moulded handrails & door handles and the raised edges around the windows. Wanting to preserve the original livery I chose to patch paint affected areas – the colour match wasn't quite perfect, but looks OK after weathering. As well as the handrails I've also replaced the roof vents with whitemetal castings and pared down the rather too prominent ribs across the roof. On the underframe I've cut some quite big apertures to aid fitting of the Bill Bedford springing units, as well as taking off the moulded axleguards for re-working, plus I also did a partial upgrade in the brake gear area.

Photo 11

These are the new axleguard components using Bill Bedford springing units. As you can see, they are very simple fold up and solder assemblies. The bearings of the spring units slide up and down in the axleguard slots. *Please be very careful with the spring wire as it can pierce your fingers, and wear eye protection when cutting it.* A variety of axleguard styles are available – including standard RCH pattern, but these being the BR plate version. I wanted to replace the moulded brake levers but re-use the original axlebox/spring part of the W-irons. However, the brake levers were moulded 'solid' across the springs which meant that two of these could not be salvaged. Thus I was short of a pair of springs, so I made up new ones from laminations of styrene strip.

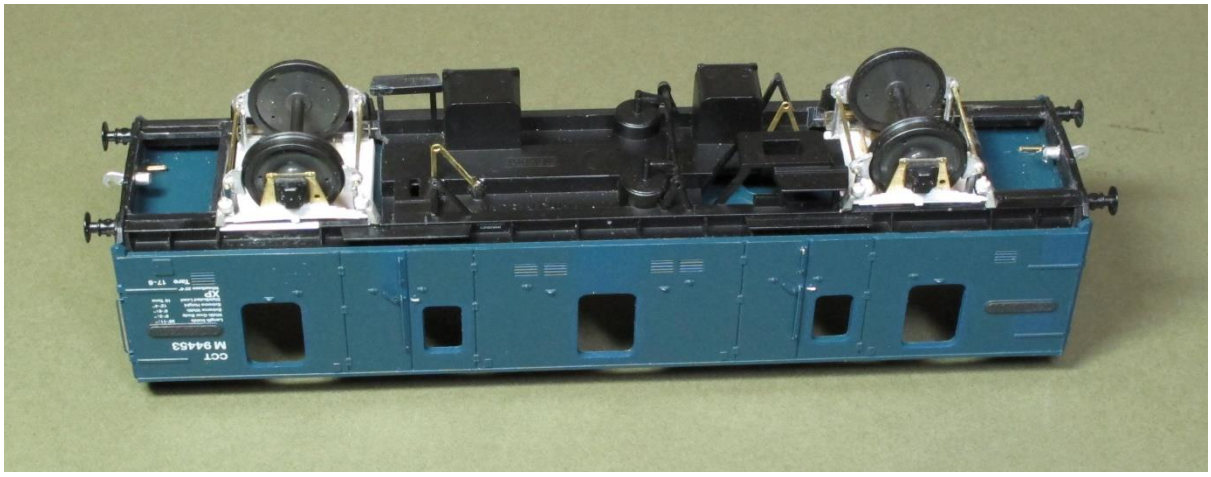


Photo 12

The spring units were fitted onto ‘bases’ of styrene sheet glued across the floor pan openings that were made earlier. You just need to check if any packing pieces are needed to get the correct ride height. You can also see here how I’ve re-mounted the original axleboxes and (on this side) the new springs (the new J-hangers each end of the springs were cut from some whitemetal castings I had in stock). I’ve also built up the clasp brakes using some castings from ABS.

Photo 13

The re-touched body with new sprung axleguards now fitted. Note also the new handrails from brass wire.

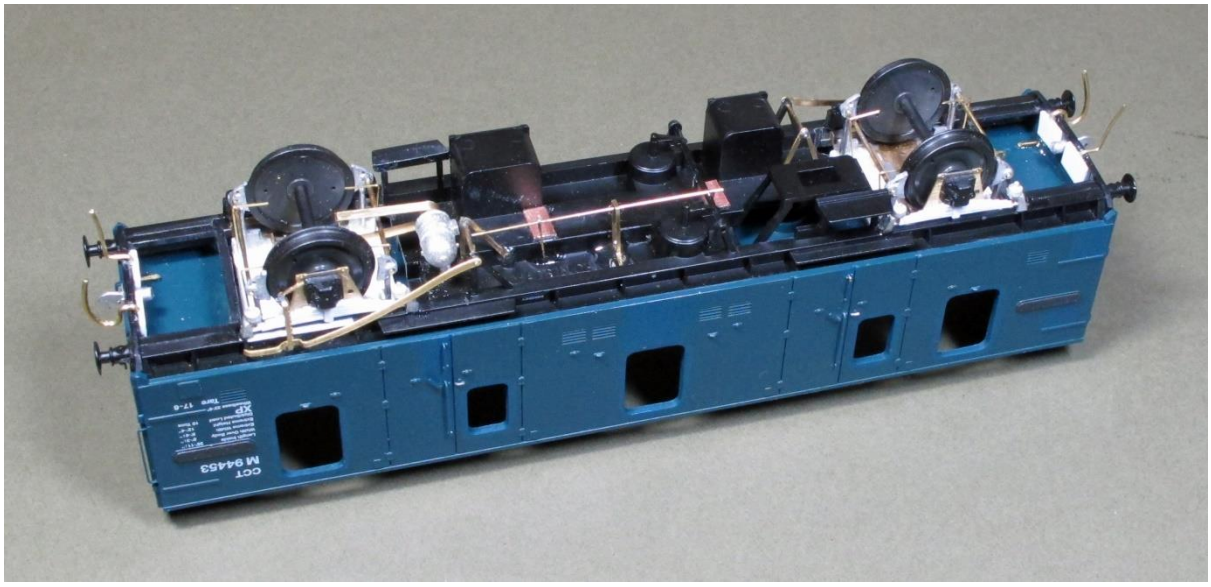


Photo 14

I've now added the remaining brake gear components including brake safety loops, dynamo, brake levers and representations of vacuum and air brake pipework (just bent up from brass wire). Now complete, these new additions were painted up in matt black.

Photo 15

To complete, new glazing was made up from clear acrylic, shaped individually to each opening to give a nice flush effect. A thin application of Johnson's Klear (now under the name of Pledge Multi Surface Floor Polish) was made round the inside edges to fix the glazing in place. The final touch was

to reinstate the window bars using pre-painted lengths of 0.3mm nickel-silver wire, after which some subtle airbrush weathering was applied. Of course there's no reason why you should not retain the original glazing, but I feel it looks that just that bit more refined with it re-done as above. The completed vehicle is seen here on my Hebble Vale Goods layout.

3. Hornby Trout to Mackerel Conversion

- *Based on an article originally prepared for the EM Gauge Society Newsletter*

Photo 16

The Hornby Trout appears to be an excellent model; it matches closely the prototype dimensions, is very finely detailed and certainly looks the part. Conversion to EM is a doddle too as the brakes line up nicely with EM wheelsets, with just a small chamfer needing on the rear edges of the brake blocks to achieve free running. In comparison with the more modern-looking Catfish and Dogfish, the Trout and its close cousins; the slightly smaller capacity Herring and Mackerel, were somewhat unusual in having solebars that faced inwards, giving them quite a distinctive appearance.

Having a pair of Trout to play with, the thought came of whether conversion of one example to either Herring or Mackerel might be possible. The answer to that, simply is 'yes' but only if you're prepared to accept a modicum of compromise – and of course, to take a razor saw to that beautifully moulded hopper body! The reason for compromise is that the Trout has wheelbase of 12'6" whereas that of both the Mackerel and Herring is slightly longer at 13'0". Other than that, there is a close family resemblance across all three vehicles, the main difference being in the capacity/height of the hopper – the Trout is the larger at 25 tons, then the Herring at 20 tons and finally the Mackerel at 17 tons.

A quick search on RMWeb revealed that Paul James had indeed done a Trout to Mackerel conversion, which gave me great encouragement (see end of article for link). His thread gives an excellent blow-by blow account with plenty of photos showing how it was all done. There are also

instructions on how to dismantle the model, so I won't repeat that here (though it's not that difficult). Paul also mentions the website of the Barrowmore Model Railway Group where you can view a number of BR wagon diagram books and find drawings of the relevant vehicles. There is further information in David Larkin's 'Civil Engineers Wagons Volume 1', and last but not least is Paul Bartlett's amazingly useful Wagon Photo Website (again, full details at the end).

Of course, you could avoid the need to compromise and cut the Trout chassis in half and insert the missing 6-inches. However, the lower portion of the side stanchions, being attached to the solebar tops, wouldn't then match up with those on the side of the hopper, so you'd also need to cut these off and reposition them as well. I figured this was a step too far and would risk spoiling the nicely detailed underframe and I could live with the compromise in this instance.

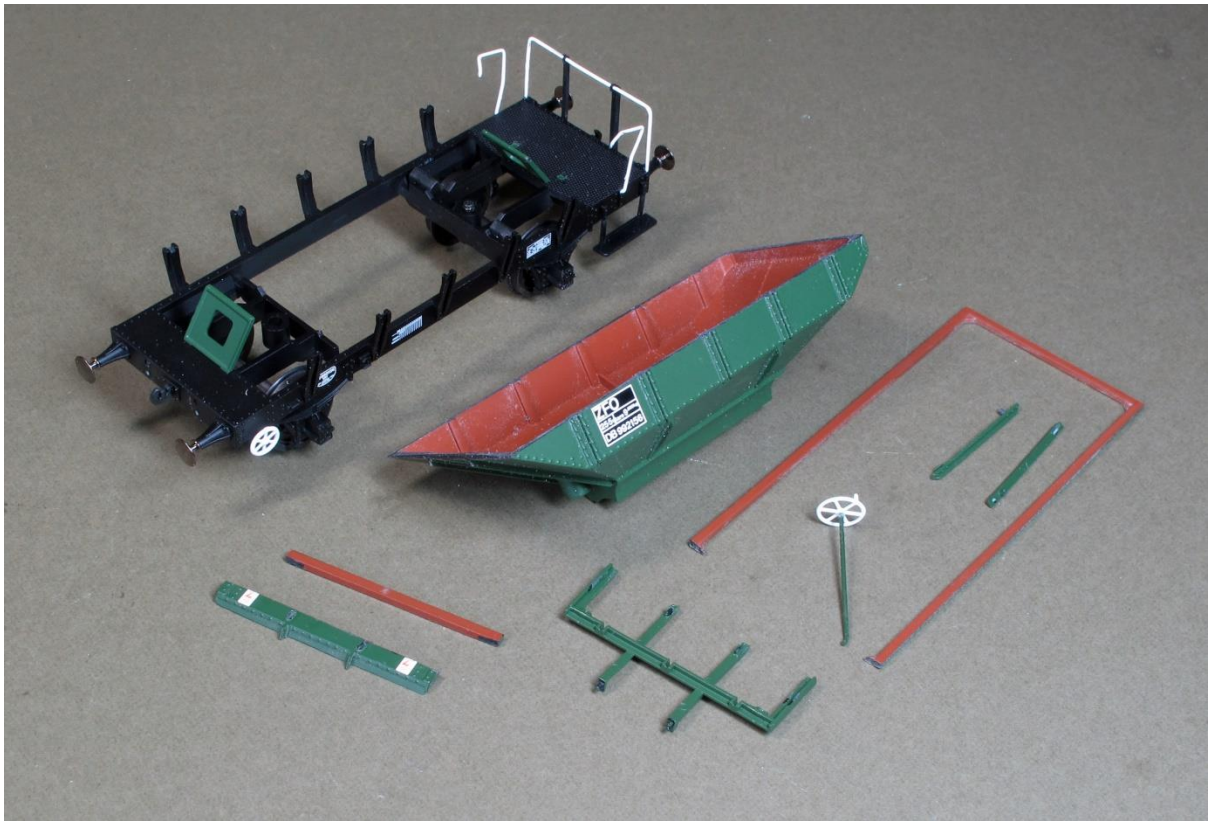


Photo 17

The main part of the work involves cutting down the hopper moulding to the correct height. Briefly this involves: 1.Cut off the end of the hopper at the handwheel end. 2. Remove the top flange from both the main hopper and the part you've just taken off (both for later reinstatement). 3. Cut down the hopper to the required height (making allowance for the depth of the top flange of course). 4. Shorten the hopper by the required amount at the non-handwheel end (see below). 5. Re-attach the hopper end and after leaving the glue to set for 24 hrs or so, cut this back to the same height as the rest of the hopper. 6. Finally, replace the top flange.

Step 4 above is relevant because the internal length of the hopper should be 68mm as opposed to the Trout which is 72mm, but then we know the chassis is 2mm shorter than it should be. To try and keep the overall relative proportions of hopper and chassis, Paul suggested adopting an internal hopper length of 66.5mm, which is what I did. There is still a slight issue in that the stanchions at the

non-handwheel end will sit too far toward the headstock on the short end platform. Again, compromise is of the essence because if you kept the body at the correct height and shortened this end of the hopper any more, its vertical face would then be proportionately too tall relative to the prototype. Hope that's all clear (probably not!). Photo 18 (below) shows a comparison of the modified hopper as compared with the original Trout.

Photon 18

Original Hornby Trout (left) with the cut-down hopper body of the Mackerel (right).

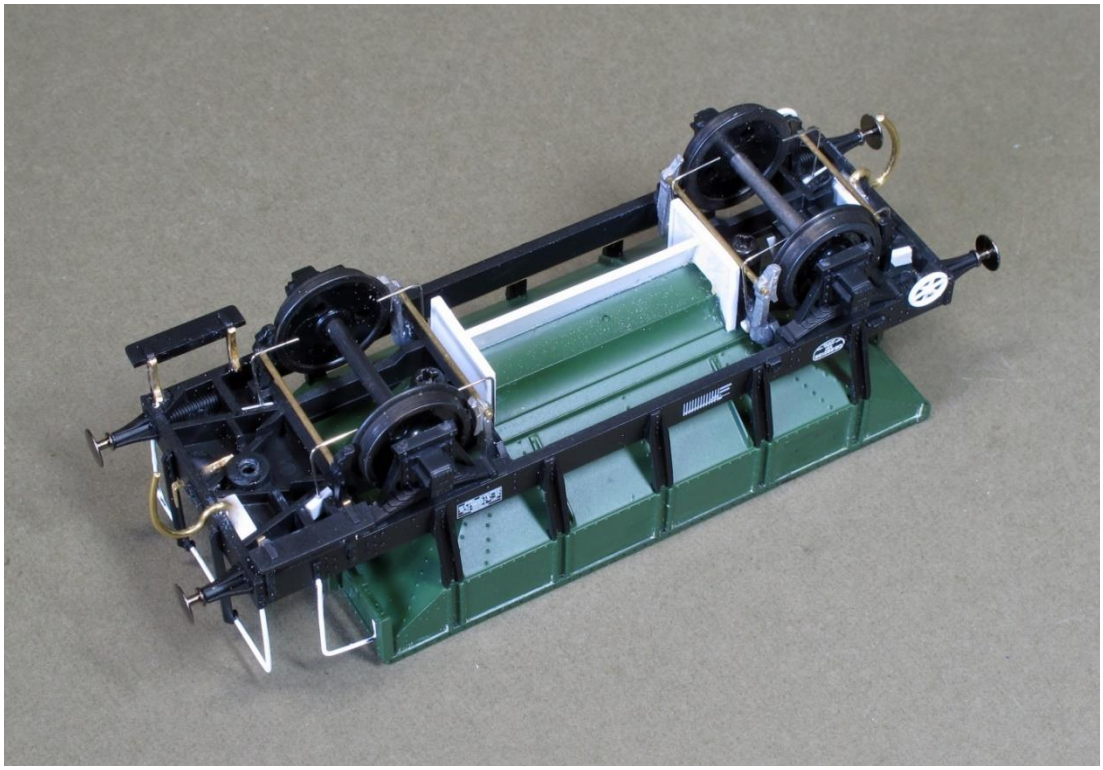


Photo 19

One final consideration with the hopper is that on the Trout there are three discharge chutes (centre and one each side), whereas on the Mackerel and Herring there's just the central one. Thus you need to build a representation of the bottom discharge door at the base of the hopper, which I did from 10-thou Plastikard and Microstrip, using the photos on Paul's RMweb pages and those from Paul Bartlett's website as a guide.

For the underframe, in addition to the wheelbase, there are two further differences between the Trout and Mackerel/Herring. Firstly the Trout only has brake shoes acting on the 'outboard' rims of the wheels, whereas the other two have either side clasp brakes. I made up these inner brake shoes from some suitable ABS whitemetal castings, and included a representation of the brake yokes from 0.6mm brass wire (adding these also to the outer brakes), plus brake safety loops (0.3mm wire). These I either secured into holes drilled into the wagon underframe, or fitted into tiny cubes of Plastikard that were then attached to suitable places on the underframe.

Photo 20

The other main difference is that both the Mackerel and Herring were vacuum braked, whereas the Trout wasn't. I sourced a vac cylinder from my spares box (from a Parkside 21T hopper, I think) and made up the supporting brackets from styrene offcuts. The prominent brake pipe running on top of the solebar was formed from 0.8mm brass wire, as were the vac hoses on the headstocks. One final detail was to add a lamp iron to the headstocks. These were made from 0.8mm wire first filed flat on both sides, bent to an L-shape and inserted to a hole in the headstock. A short piece of 10 thou x 30 thou Microstrip was then used to represent the lower portion of the bracket, with the bolts securing it to the solebar, from cubes of 10 thou square strip.

A couple of final issues to be addressed were ones of my own making. Firstly the finely moulded steps at the handwheel end had become bent markedly inwards during all the serious handling of the underframe. I tried to bend them back into position, but the plastic had become weakened and I was worried they might eventually break off completely. I sourced some thin strips of fret waste and once bent into an L-shape were then fitted behind each of the footstep supports, securing these to both the latter and also the wagon floor with epoxy. The final slight niggle was also due to firm handling – namely the two little handwheels mounted at the vacuum cylinder end of the solebar had broken off! I repaired these by drilling a 0.3mm hole through the centre of each wheel and fitting to a shaft of brass rod, mounted through another hole of the same size drilled into the mounting bracket.

That was the work completed and so the hopper body could then be sprayed matt black and then the model finally reassembled. The transfers were from Fox, and prior to adding these I gave the hopper outer sides a couple of coats of Johnson's/Pledge Klear, followed by a further coat to bed in the transfers afterwards. The whole wagon was then sprayed with Testors Dullcote (matt lacquer). After leaving a few days to harden, it was then given a light weathering coat of a thinned mix of matt black and Humbrol matt Leather (No 62), followed by the established technique of wiping with cotton buds.

Photo 21

Alongside the original Trout the Mackerel makes quite a contrast and adds further variety to the ballast hopper wagon fleet. A Herring next, perhaps? (when I can find another Hornby Trout…..).

Photo 22

The completed Mackerel with original Hornby Trout again on Hebble Vale Goods

Well I hope that's all been of interest and has inspired you to have a go at a spot of 'wagon bashing'…..

Suggested Reading

There are numerous books on the subject, both prototype and model; the following is a selection of those I have in my collection:

Paul Bartlett and Darren Sherwood. Hopper Story: LNER/BR 21 tonners. Model Rail September Issue 2002. Includes a build of the Dave Bradwell chassis kit.

Geoff Kent*. The 4mm Wagon Part One – Opens, Minerals and Hoppers. Wild Swan Publications Ltd. ISBN 1-874103-03-8.

Geoff Kent. The 4mm Wagon Part Two – General Merchandise Vans, Special Purpose Vans and Tank Wagons. Wild Swan Publications Ltd. ISBN 1-874103-24-0.

Geoff Kent. The 4mm Wagon Part Three – Conflats & Containers, Wagons for Long Loads & Steel, Brake Vans and Finishing Touches. Wild Swan Publications Ltd. ISBN 1-874103-97-6.

**Just one of a series of three volumes, all of which are highly recommended. And of course, Geoff has also written extensively about various wagon building projects over the years in Model Railway Journal.*

On the Internet

Barrowmore Model Railway Group

Lots of info including a selection of wagon diagrams:

http://www.barrowmoremrg.co.uk/Prototype.html

Paul Bartlett's Wagon Pages are an amazing resource:
https://paulbartlett.zenfolio.com/paulbartlettsrailwaywagons

EM Gauge Society – well worth a visit

www.emgs.org

Paul James's thread on RMweb:

http://www.rmweb.co.uk/community/index.php?/topic/47085-swindon-123s-new-workbench-trout-into-mackerel-will-go-part-3-the-hopper-discharge-door/

Kier Hardy's EM layouts website

Loads of great stuff here, layouts, locos, rolling stock etc. (plus info on my two layouts; Hebble Vale Goods and The Kentside Branch!).

https://www.emgauge70s.co.uk/layout_index.html

Suppliers (not an exhaustive list, but some of the ones I've found really useful)

Cambridge Custom Transfers; Extensive range of transfers in various scales.

https://www.cctrans.org.uk/

Eileen's Emporium: General modelling tools & supplies, Bill Bedford Springing units etc. Parkside Kits.

https://www.eileensemporium.com/

Hobby Holidays

General modelling tools and supplies, paints etc. and lots more.

https://www.hobbyholidays.co.uk/categories.php?cat=7

Lanarkshire Models & Supplies: Buffers, vac pipes/cylinders, coupling hooks, head/tail lamps, buffer kits and other whitemetal castings.

http://www.lanarkshiremodels.com

Dart Castings/MJT/Monty's Models: Wide range of wagon & coach components, plus extensive range of whitemetal etc. figures.

https://www.dartcastings.co.uk/mjt.php

Fox Transfers: Extensive range to letter and detail your wagons etc.

https://fox-transfers.co.uk/

Mike Clark Masokits: Etched wagon suspension and other detailing components such as brake gear. Hosted Trader on Scalefour Society Website (Catalogue Download Facility):

https://traders.scalefour.org/masokits/

Ambis Engineering: Etched detailing components, wagon underframes etc.

http://www.ambisengineering.co.uk/

Wizard Models (including 51L, Comet Models, Mainly Trains, Bill Bedford, HMRS and a whole host of others). Very broad range of products from complete kits to individual detail components such as wagon axleboxes, buffers etc.

https://www.wizardmodels.ltd/

Railtec Transfers: Excellent range of transfers in 2, 4 & 7mm scales

https://www.railtec-models.com/

Rumney Models: Etched wagon kits and detailing parts, buffer/axlebox etc. castings

http://website.rumneymodels.co.uk/