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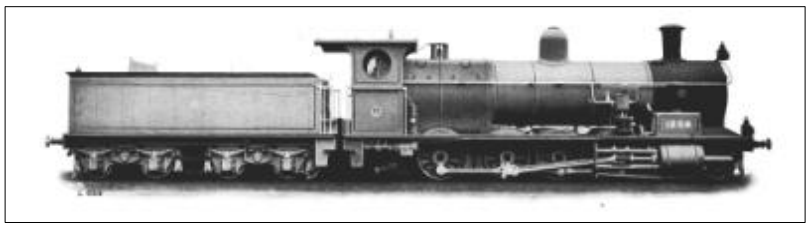
BUILD NOTE

N.S.W.G.R. D52 2-8-0 in HO Scale - 04/11/15

These two engines are representations of one of the most reliable and trouble-free steam freight classes on Australia's railways. The kit is from AR Kits / Footplate Models, though is made for them in the UK by DJH. A number of modifications have been made to the kits during the course of construction to mirror the way I tend to want to work, which might I trust might be of use to other builders of similar types of kit. Higher resolution images of the completed model are on the Gallery page .

Overview

The brief for these two locomotives was to have one as the 'class leader' in saturated form as number 524, with the second to be be an example of one of the engines taken over by the ROD during WWI for service in France whilst still at the builders', and never actually delivered to the NSWGR.

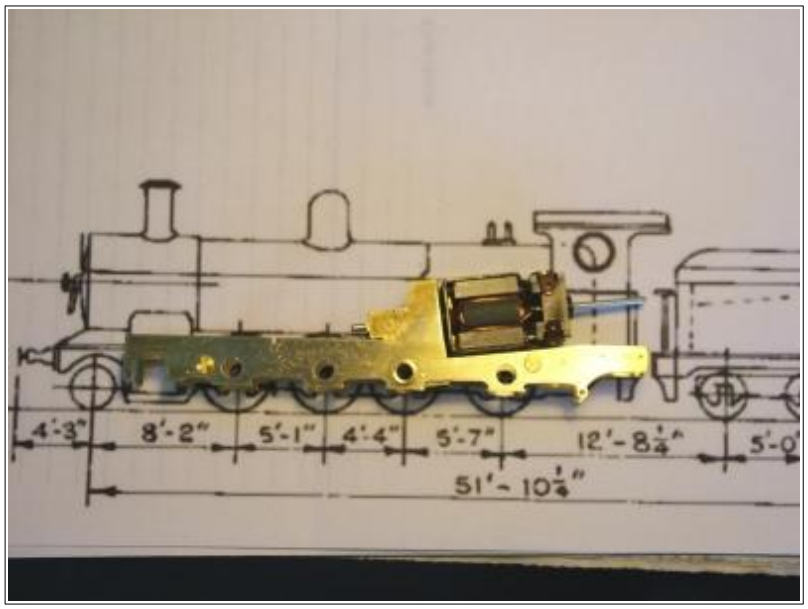


NBL builders photo of NSWGR D52 as taken over by ROD during WWI. Note the extended smokebox for superheater elements.

The first engines entered service in 1896, and were designed by the NSWGR in close co-operation with Beyer Peacock - though NBL, Nielson, Dubs and Clyde Engineering (in Australia) also had a share in the construction. Examples were also built for the Trans Australian line, and the South Maitland Railway (then the East Great Railway). Interestingly, the last engine in active service was 5069 was in fact a saturated steam example, which in 1973 was based at Port Waratah, in connection with the Newcastle coal traffic. Fortunately, it and superheated 5132 were sold in 1974 to the Hunter Valley Steam Railway and Museum, and have been saved for posterity.

Chassis

DJH intend their model to be built on the 'American' pick up system, which is essentially a '+' locomotive and a '-' tender, separated by an insulated drawbar. This gets around any issue of having to make up any current collectors for the driving wheels, and should make for a more free-running mechanism. However, I always think that you can never have too many current pick-up points - especially on a 16.5mm model - so have made arrangements for conventional phosphor-bronze wiper contacts on the back of each insulated wheel of the locomotive unit as well.

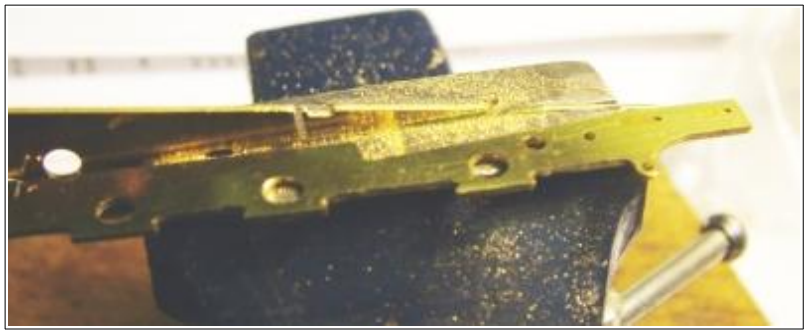


Loosly assembled chassis laid over scaled prototype's weight diagram to check clearances....


...and test assembled chassis with coupling rods but less brake gear, coupler mountings, pickups and of course cylinders and motion.

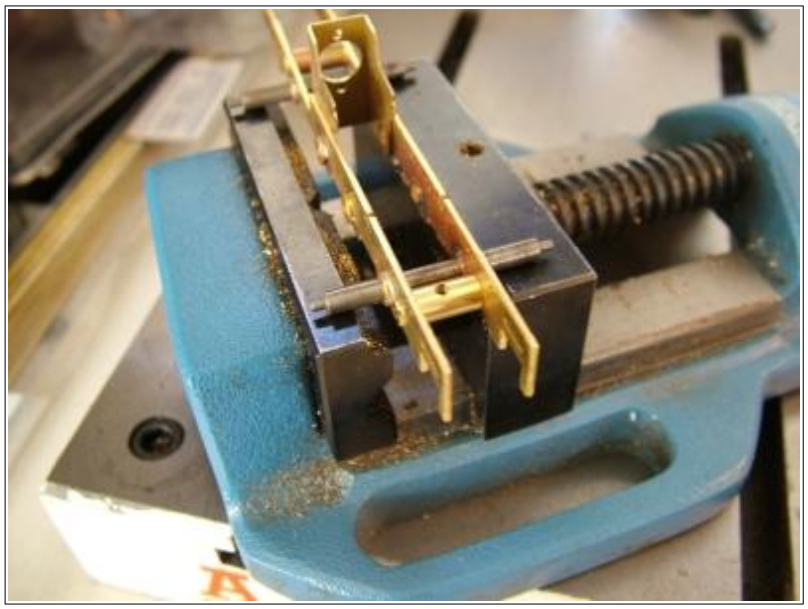
Given the small size of the engine in 3.5mm / foot scale, it is unerstandandable that DJH have opted for a motor in the boiler drivetrain driving through a NWSL spur gear tower arrangement, in an attempt to preserve daylight under the boiler. The Mashima round can motor supplied is actually mounted within the model's superstructure, in the firebox, with a section of flexible tube connecting the two slipped on once the body is on the chassis.

To my way of thinking, this means that you have to get all your driveline and chassis troubleshooting out of the way before completing the detailing of the superstructure. Plus, if you are as hamfisted as I am, there is always the risk of breaking something as you wiggle the motor and flexible drive back into place after final painting and detailing.



Using the vice as a cutting/filing guide - set the scribe line just above the top of the jaws.

I therefore opted for a simpler 40:1 direct worm and wheel and a 'new old stock' Anchoridge open frame motor, driving on the third axle. The width of the motor is enough to go within the firebox sides - just - but does need the chassis cut out on a slant to get it in. To get the correct angle, I scribed a line from the top of the 3rd axle bush hole to the top of the rear brass frame spacer, then soldered in some unused Perserverence motor mounts.



Setting the frames level with temporary axles - 1/8" bar - and an accurate machine vice. Once happy that no rocking is present, tiighten up frame spacer screws and solder together.

There is an unavoidable loss of daylight ahead of the firebox, but this is masked on the RH side in any case by an air tank. To assuage my conscience though, I did solder in a scrap of bent pre-curved whitemetal to plug the gap in the bottom of the second boiler barrel course that DJH intended for their moulded gear system.....

Trial fitting of chassis underneath assembled footplate and boiler. Middle boiler course has had section soldered in to plug gap left by moving drive from second to third axles. The superheater extended smokebox is for the ROD version of this pair.

Motor Mounting

The majority of modern motors use two mounting screws through the end of the frame, and in this particular case, access to the bottom one for tightening is impossible once the gearwheel is on the axle. The solution is to face off flush one side of the worm wheel - it is easier if you have a lathe, but can be done with a hacksaw and flat file - though not of course to the side with the grubscrew.... With the first and second axles out of the frame, and a shallow groove filed into the leading frame spacer, it was then possible to get a cross head screwdriver in, albeit at a slight angle. Gear backlash can now be set with the top screw snug, and when everything is to your satisfaction, the grubscrew is undone, the gear moved sideways on the axle, bottom motor screw then tightened, and then the gear slid back into place afterwards.

As the decision had already been made to provide the locomotive with current pick up wipers for the insulated wheel set side, brake pull rods between the frames were to be omitted so as to leave uninterrupted access for mounting the collector plates.

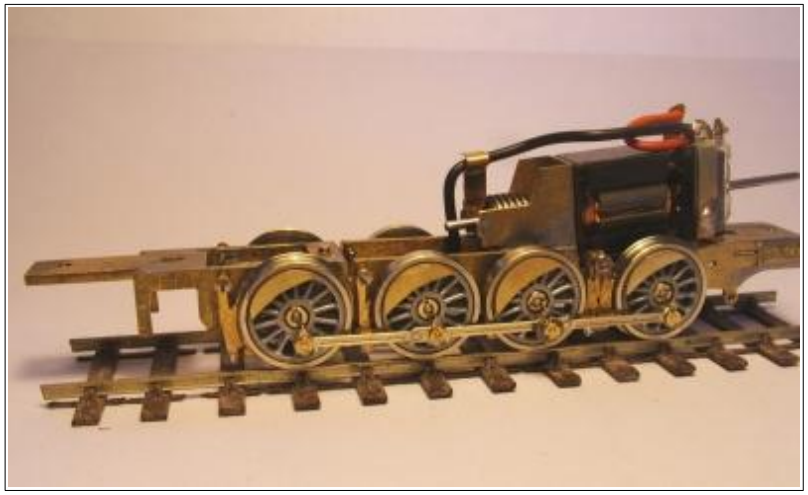
Brake Gear

The brake shoes were another matter. I ultimately settled for tapping the etched-in holes in the frames 14 BA, and then mounting each individually at the top with cheese-head screws and 3mm spacers for the front two pairs. The back set - which sit between the 3rd and 4th axles - are screwed into tapped and drilled brass sections about 1.5mm x 1mm soldered onto the chassis sides to bring the hanging points level with where they would have been had I not had to cut a diagonal out of the frames to get the motor in at the shallow enough angle I needed.

Making the six shoe spacer bushes was an hour or so's work on the lathe, not so much as regards the drilling out with a 1.2mm clearance drill, but when parting off. The rod I used is only 2mm in
diameter, and if the tool is dug in too deeply will bend at the slightest provocation - more so if it has already been weakened by being drilled through - forcing you to face off and start all over again.

Even so, with only a single screw holding them at the top - and being conductive material - these shoes will tend to shift if the engine is subjected to rough handling, or even a derailment. To give the front and most vulnerable pair some protection, I added some

whitemetal guard blocks sawn out from scrap castings to the bottom of the cylinder block. Not an ideal solution, but they are invisible unless you get down to eye level of this D52 - and then only if she is silhouetted against a low winter's sun!



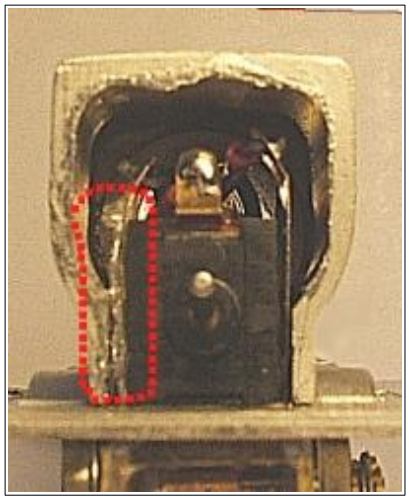
Chassis all tested and ready for trial fitting - again - into the superstructure. Note the close-to-the-tread brake shoes, each one secured by a 14 BA screw and spacing collar to a tapped hole in the chassis sideframe.

Even when done up tight, I have noticed that the brake shoes will move if the engine is subjected to less than delicate handling - or perish the thought, a derailment. Something that could cause a short on the insulated wheel side. Accordingly the front shoes at least are given a bit of protection in the form of whitemetal 'guards' soldered on underneath the rear of the cylinder blocks.

Electrical Hook-up

Though in real life the D50 and D52s were about the same size and capacity as a Great Central ROD 2-8-0 - that's the UK's Great Central Railway - in 3.5mm to the foot scale, there is not a lot of room to play with inside the body. Despite clearancing one side of the inner firebox with a round burr in a motor tool, the only safe solution was to extend the bottom motor tag upwards into the firebox crown area with some brass shim, and then solder the hook up wire to that. On the 'chassis live' side, I ran a matching strip up on top of the motor, and turned the top brush tag end on for an extra bit of room.

If a DCC decoder is ever required, there is plenty of room in the boiler barrel, and as the motor is not live to the frame except via the brushgear tags, installation should be relatively straightforward.



Clearance between the firebox sides of the belpaire boiler are very tight, which left no room for conventional 'thick' wire for electrical hook up, The area enclosed by the red dotted line to the left is actually a shim extension to the motor tag, which is covered in turn by an insulated sleeve of thin plastic - made from the same bag as some of the kit's parts sets came in. Waste not, want not...

Cylinders

Mention of cylinders means that it is time to look more closely at these components. I am always hesitant to mount cylinders directly onto a chassis - as DJH/AR KIts advise with this kit - on the grounds that once the slidebars and crossheads are in, there is no way of removing the wheels and axles, should this ever be required. Whether prior to painting the completed and fettled model, or to attend to wear or perhaps damage in service.

Choosing what I thought would be the quickest way to creating a self-contained sub assembly of block, slidebars and motion plate frame stretcher, I slotted out the original locating slits in the mainframes downwards, and then soldered the two whitemetal cylinder castings to a brass spacer plate. To be on the safe side, I also added another 1mm to the spacer's width, to give me more room behind the crossheads for the Romford 'de-luxe' crankpins, whichhave a screw on fixing rather than the more usual soldered-on brass washer on a peg arrangement. Incidentally, I always now buy two packsof these at a time, because I reckon on losing at least two or three of the tiny 12BA top hat nuts into the carpet pile underneath my workbench during a typical 16.5mm gauge loco build.

Arrangement for holding the two whitemetal cylinder blocks onto a metal brass stretcher

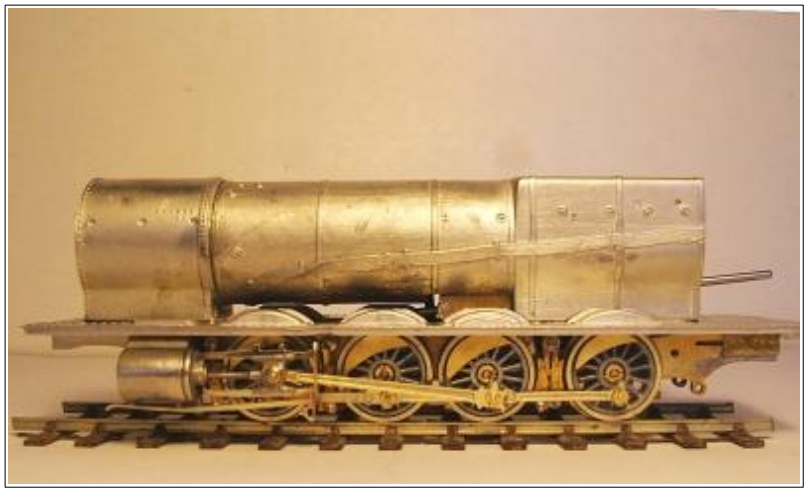
piece to allow the whole unit to become removable. Matchsticks were needed to get the clamping forces bearing on the locating pegs, as the castings did not have true enough surfaces for a straight 'pull' (or should that be push...?).

The back covers were soldered in with low melt solder, and then the nickle sliver slidebars were added - again with low melt, but with the nickle silver pre-tinned with ordinary soft solder to provide a better key. Nickle silver does not conduct heat away from its point of source as does brass, making it a less risky operation than might otherwise have been the case to subsequently soft-solder the motion plate on to the rearmost tips of each slidebar. The whole assembly is thereby strong enough to be removed - albeit by a somewhat awkward tilt and swivel motion - from the chassis, and is retained in place by the front body securing screw passing up through the cross stretcher and into the smokebox.

The Crossheads themselves come as a pair of rather nice lost wax castings.To remove the give-away 'brassy' sheen I usually tin these with soft solder to give at least a semblance of steel colour. Because there is no way to get them out again once the motion plate is soldered up, each one was filed so that instead of the 'U' channel embracing both sides of an individual slidebar, there is now a simple 'L'. A rectangle of scrap brass soldered to each connecting rod front eye stops the crosshead from falling out to the side, with the two parts held together with a 12BA nut and screw and a dab of Loctite on the thread to stop everything unwinding itself in service. Yes the arrangement is a bit sloppier than I would like, but no more so than what I have seen in some commercially-made brass locomotives elsewhere.

Cylinders, slidebars and crossheads all assembled. The slidebars are low-melt soldered to the rear covers, and the motion plate is then soldered on using conventional solder. Crossheads have been thinned down, and secured to the connecting rod eyes with small nuts and cheesehead screws with a dab of loctite

The whole assembly is secured by the same fixing screw that holds the chassis onto the superstructure through the smokebox.



Everything together again, this time with the cylinders in place. Thre brake cylinder on this side still needs to be added beneath the footplace, but you can see how even at this close-up viewing distance, the absence of brake rodding is not really missed.

Current Collectors

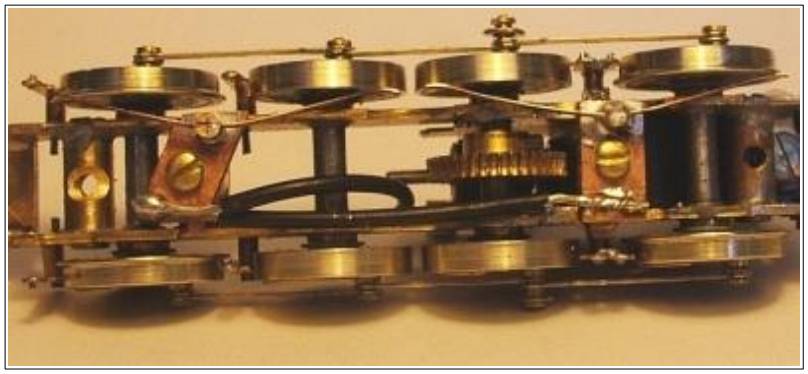
One of the big problems with current collectors in the smaller scales, is that of ensuring that the pick up wires or strips have enough flexibility to remain in contact with the tyre, yet not exert too high a level of 'drag' that might over-tax our tiny motors. The commercial manufacturers can get it 'just right' by stamping out and folding complex shapes out of thin phosphor bronze and suchlike that is not obtainable to ordinary mortals.

For the D52, I opted for two strips of copper clad, drilled in the centre for an M2 mounting screw, and at the insulated wheel extremity, a 1.5mm hole to take a slotted stepped brass peg. The pegs were turned from 2mm rod on the lathe, and made near-enough 1.6mm or 1.7mm to be a press fit into the copper clad. Before being sawn off their parent bar whilst still in the chuck, the ends were slotted to a depth of about 2mm using a razor saw.

They can be shortened to ensure that they are just less in length the thickness of the copper clad strip - to prevent them touching the chassis - by holding in the end of a suitable pin vise.

Each is then pressed into the copper-clad, with the slot in the end parallel to the wheels, and secured with a touch of solder.

2mm 10 thou - or 0.25mm - phosphor bronze strip is then popped into the slots after bending to shape, and another quick touch of solder secures all. Even if you linger with the iron, the solder at the base of the peg may run, but the peg itself won't move as it is still held by the copper clad.

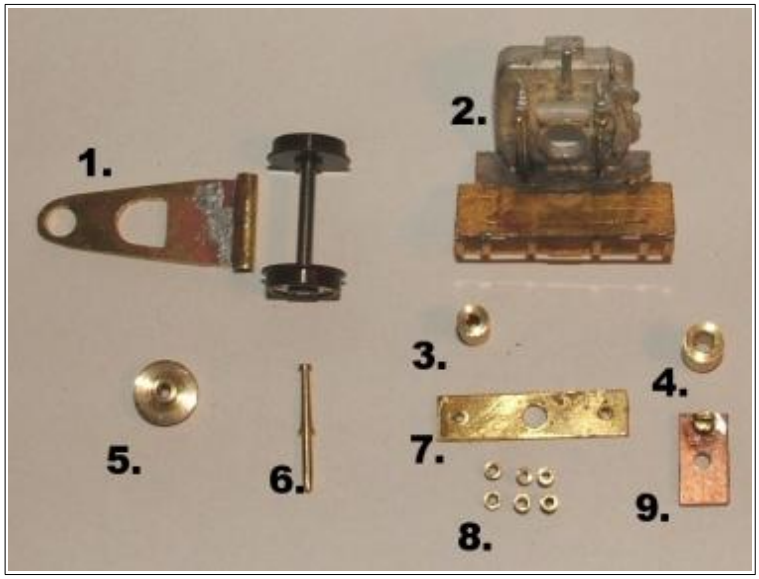


Close up of the current pick up arrangement. The front copper clad strip has to be at an angle like this because it in turn sits on a removable spacer to allow allow a cross head screwdriver in at the bottom motor mounting screw....and you wonder why these small mechanisms take so long to build!

The mounting screw holes on each of the copper clad strips are chamfered to eliminate any chance of the mounting screw shanks touching and forming an unwanted electrical connection, and fibre washers - 2mm axle spacers - are used under each screw head for the same reason.

Bits and Pieces

I tend to find that progress always seems to happen in rather large bounds. For weeks it seems as though all I am doing is making up fiddly sub-assemblies, and then all of a sudden they all come together into something that starts to resemble a locomotive. Little things like replacement tender handbrake columns - because try as I might, I just could not drill out the end of the casting supplied with a 0.6mm drill without it wandering - take perhaps 15 - 20 minutes on the lathe. Yet something as straightforward as the backhead and false cab floor took the best part of an hour, after trimming the casting to fit and soldering the parts together whilst keeping everything aligned.



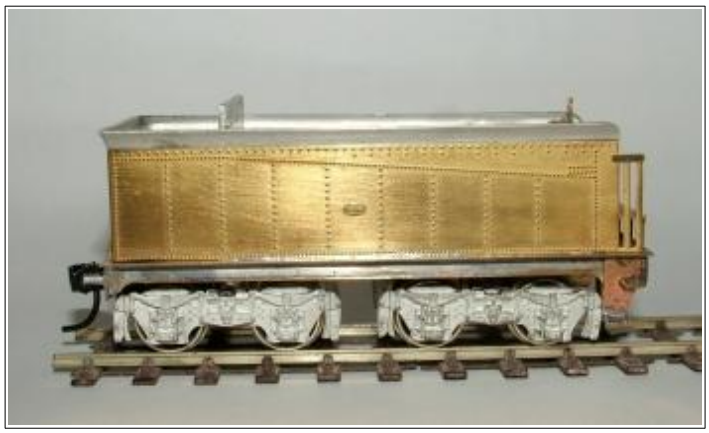
Just a few of the D52's components: 1. replacement brass pony truck, 2. backhead on false cab floor from kit, 3. turned and tapped 2mm bush for smokebox to chassis securing screw, 4. spacer bush for front loco pick up plate, 5. half-height tender truck bush for insulated stretcher, 6. replacement handbrake column for tender, 7. inner securing plate for tender insulated stretcher, 8. 14BA clearance screw spacers for brake shoes on loco (2 short, and 4 long...), 9. current collector plate with brass post for phosphor-bronze

wheel wipers.

Tender

This took a lot longer than it should have done, mainly because I spet too much time thinking about how I could engineer a fool-proof current connection that would allow one tender truck to pick up current from the negative rail, and its mate from the positive.

The kit's bogies are comprised of whitemetal sideframes and a fold up stretcher. Turned inserts are fixed to each sideframe, and these in turn are intended to be screwed to the stretchers. I decided to take the bull by the horns and solder the inserts to the stretcher, and then fix the sideframes with low melting point solder, using the wheel sets on a piece of OO gauge track to keep everything in the correct plane. Despite using blocks of wood to press the sideframes together, it was very much a touch and go operation, but at the end of the day the tender seems to sit level enough....



Completed tender less toolbox and water filler which will be added after filling and sanding of top rails

The tender top is a whitemetal casting, and at first this did not seem to be narrow enough to sit between the folded up etch. However, a bit of brute force and ignorance has made for a snug force fit, after some clearancing for the added blanking plates soldered on the inside to cover the kit's mounting holes for late era access ladders on the rear. Tiny angle plates were also added at behind the outer ends of the rear bufferbeams to both add strength and to back etched-in notches for the lower end of the ladder, which are not present on the NBL works photos of the WD engines.

On a more general note, with a slot and tab etched kit like this, it pays to ensure that you have a clean edge to each tab corner, and that the slots are opened out to their full width and length - I use an old junior hacksaw blade for this. Don't worry of you can't run a bead of solder all the way along a stretch of platework. Far better to have it securely tacked in several key places, than risk the solder running and getting in between rivet detail that is etched close to bottom edges. A coat of half-decent primer at the painting stage will easily fill these sorts of gaps.

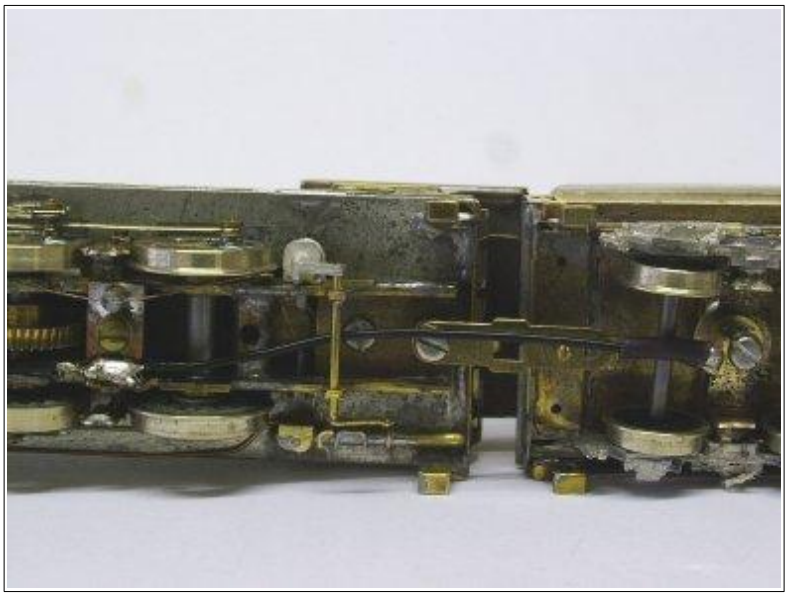
Along the way I had to turn up a replacement brake column, and fit slimmer shank buffers as per the works photo. These are actually GWR 4mm coach buffers from Westward that I had lying in the drawer for over 20 years for just such an eventuality. Superglue was used to fix these in place, with the heads to be slipped in after painting but before the model receives its final light weathering.

Tender Current Collection

The AR Kits standard method of current collection is via the 'American system' - loco being live to one rail, tender to the other, and an insulated drawbar to separate the two. The kit has a very clever sprung system to eliminate any separate bridge wire between the two. Having already set up the loco to collect current independently, I decided to use one tender truck for the positive, and the other for the negative.

The negative truck needed then to sit on its own insulated drawbar - a bit of copper clad paxolin, with a half-height turned and 2mm tapped truck mounting bush soldered to it. I could have merely stuck this to the tender floor, but felt by providing a proper tapped and screwed mounting plate inside the tender body would be a more trouble-free solution in service. The tag from loco to tender will ultimately be fixed to the insulated truck securing screw. I originally wanted to use little sub-miniature connectors of the type now being used by Bachmann on their tender locomotives, but there just did not seem to be room without putting an unsightly socket in the front of the tender bulkhead.

Underneath of tender showing copper clad strip to insulate forward truck from brass body. Tag secured by truck mounting screw will take current to loco....

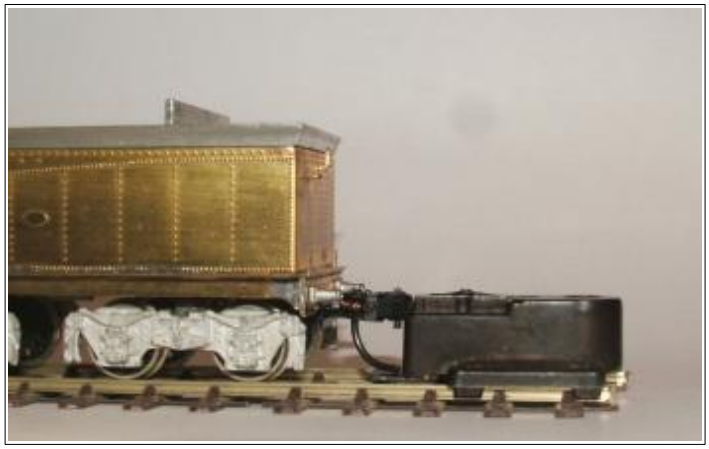


...and the final version of the loco-tender electrical connection. Tag is secured with the bogie mounting screw.

Coupler Height Checking

The kit is designed for Kadees, but these really need to set at just the correct height to operate successfully. Metal coupler mounts also need to be set and checked just so at quite an early stage of construction, as you can't just take a craft knife to a brass plate frame to trim off half a millimeter or so. I was lucky in that the tender came out at just the right height to use one of the new underset Kadee 147 standard length units. These 'whisker' units have a far more rigid and robust pocket, which allows you to tighten up the mounting screw with far less risk of deforming the pocket and thereby inhibiting side to side swing of the coupler. I used a standard length coupler, though it could still prove to be a trifle short once the loco is on the layout - but if that is the case, it will be a simple matter to substitute a longer shank, as the mounting screw is readily accessible.

I always put a coupling on the front of a loco, even if it detracts a bit from the front view, as you never know when a turntable might not be available, and the lack of one makes shunting the pick-up goods at wayside stations somewhat problematic.... The chassis had in any case already been built with an extension forward underneath the front footplate, level with the top of the frames. This proved to be too high, so a 1.6mm brass plate was needed to bring the Kadee No.26 - a long shank version of the evergreen No. 5 - to the correct height. The knuckle may protrude a bit too far forward than I would like, but is going to be the lesser of the two evils given the likely overhang when shunting bogie stock through reverse curves.



Checking the tender coupler height with Kadee height gauge. I used the new Kadee whisker 147 standard length underset coupler here on the AR Kits fold-up bracket.

Superstructure progress

The cab on NSWGR engines is quite distinctive - at least to someone who spent his formative years next to the East Coast mainline during the late 50s. The kit provides this as a three sided fold-up etch, and which despite my best endeavours, came out with slim glimpses of daylight between the sides and front weatherboard. To fill these gaps meant soldering in some lengths of brass wire - a job that's not too difficult, providing the wire is tackled in two goes from each end, rather than trying to form a bead by running the iron along the corner in one sweeping movement.

Etched cab assembly secured to whitemetal locomotive superstructure. The front and side handrails need to be soldered on before the cab is fixed with lower melting point solder. Note the new -shorter - top steps.

The cab actually forms a structural part of the superstructure, and has a threaded brass block soft soldered to the front inside edge to take the rear chassis to body mounting screw. It is also tacked around the inside of the firebox with low melt solder to stiffen the entire 'backbone' of the body. The enginemens' footplating, backhead assembly and fall plate are all added afterwards as a unit, fixed in with Loctite superglue.

Handrail posts being lined up along one side of the boiler. As AR Kits' use etched posts to accommodate the handrail and steam line to the Westinghouse pump, each one had to he drilled out beforehand on the vertical drill with a 0.6mm bit.

Straight and level handrails need straight handrail wire to start with! Even if there are pre-drilled holes in the boiler, it is usually possible to ‘tweak’ the knob or stanchion up or down a bit to get the handrail level with the footplate. If your kit manufacturer provides a hole in

the front of the cab or tankside, chances are that it will not exactly be in the right place, but a little kink placed in the end of the handrail will usually give enough ‘cant’ to get things lined up, and which once painted, will be hardly visible.

Forming the continuus smokebox handrail so beloved by English locomotive designers is always a fraught process, as not only has the arc from the front to be just right, but the ends also need to be bent in just so so as to mate with the knobs on the smokebox sides.

Handrail Forming

However, I'll admit to using something of a cheat here, by making the smokebox handrail separately, and having a split halfway inside the first handrail knob on the boiler. This way, you only need to be working with a short length of brass wire, rather than be faced with the palaver of sliding everything all the way down a series of fixed tiny knob holes. Or worse, grappling with lots of loose kobs doing their utmost to slide off the end of the wire and onto the carpet....

In an ideal world - or a larger scale and of all-brass construction - a touch of solder would secure both boiler and smokebox handrail sections, but this being HO scale, I used Loctite superglue....

Using two pin vices to clearance handrail knobs.. Entice one tip of a pair of tweezers into the hole in the handrail knobs, then carefully transfer the knob into the jaws of the vice. Easier said that done in 3.5mm/foot scale!

Today, we are blessed from the Trade by a plethora of virtually scale-sized fittings, though manufacturing economies mean that the modeller sometimes needs to his or her own ‘quality control’. Handrail knobs, especially in 4mm and under, can benefit by being clearanced by their actual wire sized drill. Holding them for this operation is easy with a pair of pin vices as here - with the bonus that there’s far less chance of their straying during this delicate operation.

On the other hand, stray away from the mainstream - with to be fair to the trade, is nowhere near as narrow as it once was - and there comes the point where specialist parts will invariably have to be made. Take the case of the prominent 'thingummy' on the D52's running plate just ahead of he cab on the RH side. After careful scrutiny of the only photo

reference that I was passed, I am putting my money on it being a Wier feed pump.

It is only about 8.7mm tall in HO scale, and luckily is masked somewhat by the forward edge of the cab. The turning of the component was not so bad, it was trying to solder three 0.5mm lengths of brass wire into locating slots sawn around the periphery of the component to represent the real thing's spacer bars between the pump chamber and the steam cylinder, that were the nerve-wracking bits.

Wier feed pump. It is only a vague representation, but I hope at normal viewing distance it will do the trick...

Adding the remainder of the detail fittings was then a matter of checking off items from the 'to-do' list. The kit provides for two air tanks, but as the works photo showed none on the RH side, I have opted to only fit one on the left. There is a very indistinct picture I have seen of the engines in Belgian railways' service after WWI, but the tanks are of a completely different shape, now on the RH side, and in any case, the rearmost one seems to have replaced the Wier pump.

LH side showing single air tank. Eagle-eyed readers will notice that there's no whistle - but rest assured, that will be added after painting to the cab roof.

The bottom four lamp irons are bent up from doubled over 0.08mm strip, borrowing from Guy Williams' method for making GWR fitments, though for the vulnerable smokebox top I cheated and filed the whole thing - mounting peg and all - from the solid. As before, all these small items are added using Loctite superglue, using a pin to apply adhesive directly to the model.

Smokebox detail, illustrating the arrangement of lamp irons. Two either side of the smokebox, one on top, and four along the front edge of the footplate.

Track Testing

With final details in place, it was time to begin track testing. I always do this with all the fiddley bits in place, reasoning that if they survive the rough handling of body assembly and removal, they will all stay put after painting and finishing. Also, you get a better idea of how the model will perform with the body on the chassis, as the engine is then at its 'working' weight.

Though the loco now picks up from all eight wheels, one of the tender bogies is reversed and insulated, to give additional left hand side track current collection via two axles. I had planned to use a sub-miniature connector to allow simple disconnection of loco and tender, but there just was not enough room, so put a tag on the lead from the locomotive that screws onto the pivot of the front bogie. The drawbar, being brass, takes the opposite polarity from the track 'live' tender and feeds this into the uninsulated loco chassis side.

Here is the complete loco on the workbench before final track testing. The Weir feed pump and its associated under footplate 'plumbing' - or at least my poor representation of it - is all in place, as are all the lines to the Westinghouse pump. Later NSWGR engines appear to have had more formal air filtration arrangement, but the NBL works photo appears to show just a simple perforated air port direct to atmosphere.

My 'test track' if you can call it that, features Peco code 75 rail, and is laid out on a sweeping bends culminating in a 24" radius corner section, with a 'tween-baseboard join smack in the middle of this curve. Apart from consistend slow speed operation, what you are looking for at this late stage of the build are instances of intermittent shorting between wheels, loco or tender frame, or unexpected stoppages caused by binding anywhere in the mechanism.

A case in point on this model were the connecting rod oil boxes fouling on the underside of the footplate. A moment's work with a dental burr in the motor tool, gave sufficient clearance for the rods to go around without binding.

Proof of the pudding. Completed D52 running through the outside loop of my embryo 4mm Cornish china clay layout. A far more arduous test than might appear, as there is about 18 months worth of accumulated grime on the rails there, not to mention a 24 inch radius curve with a baseboard join at a slant over it...

Dissassembly For Paint

Painting a model locomotive - even one with a simple black all-over livery as the D52 -

can, in my experience, take fully a month to do properly, taking into account the time needed to allow paint coats to dry, and lettering and numbers to be applied.

I start by disassembling the mechanism as far as possible into its component parts. Taking care to keep driving axles and their matched coupling rods together, so that everything will go back in the same order.

Recently I have taken to using cellulose thinners to wash and degrease both body and mechanism components. Sometimes this is not possible, so in these cases I will use either a brass suede brush , a piece of fine emery, or a fiberglass burnishing pen to buff and key just the surfaces to be painted. This presupposes that the model is assembled using adhesives and fillers that are impervious to cellulose. For the record, while white spirits may be less aggressive, this can leave an oily residue.

Naturally this means that you can't use oil or cellulose-based fillers, so I have now switched to Ronseal's High Performance Wood Filler, which is a two-pack product, and which - touch wood - has so far proved resistant.

For the main superstructure assemblies - tenders, locomotive superstructures - I will then go over these with a mist of cellulose automotive primer from a spray can, in a series of fine coats, leaving about four or five minutes between each coat, and stopping just before the model starts to look 'wet' - easier said than done!

After a day's drying time, this is followed by another coat of satin black - again cellulose automotive, from a spray can, and applied in the same way.

With these two coats in place, I start to work in the detail areas of the model with Humbrol oil-based paint. Matt black for smokeboxes, cab roofs, insides of tenders and floors. If there are areas where transfers need to be applied, these are finished locally with gloss vanrnish. Again, another couple of days or perhaps more is needed for the Humbrol to fully dry.

Incidentally, if - like me - you have been long frustrated by this brand of paint's variable drying time and finish, especially as regards the matt shades, try stirring in a couple of drops of Terebene - available as Rustins Driers from most builders' merchants.

Transfers

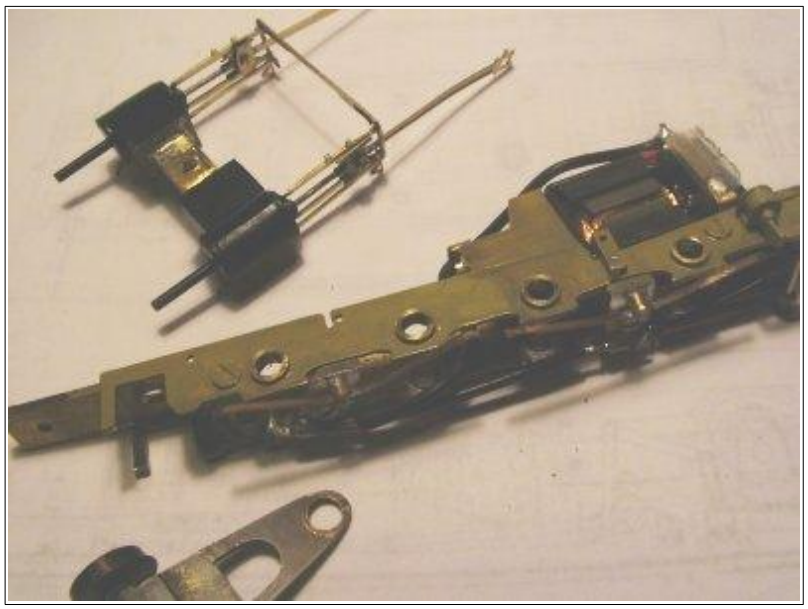
These were home-brewed using a dot matrix printer and white transfer film purchased through e-bay. White, because computer printers can't print white, so the transfer is printed out as a 'negative' with the surrounding colour being matched to that of the locomotive tender, tank or cabside.

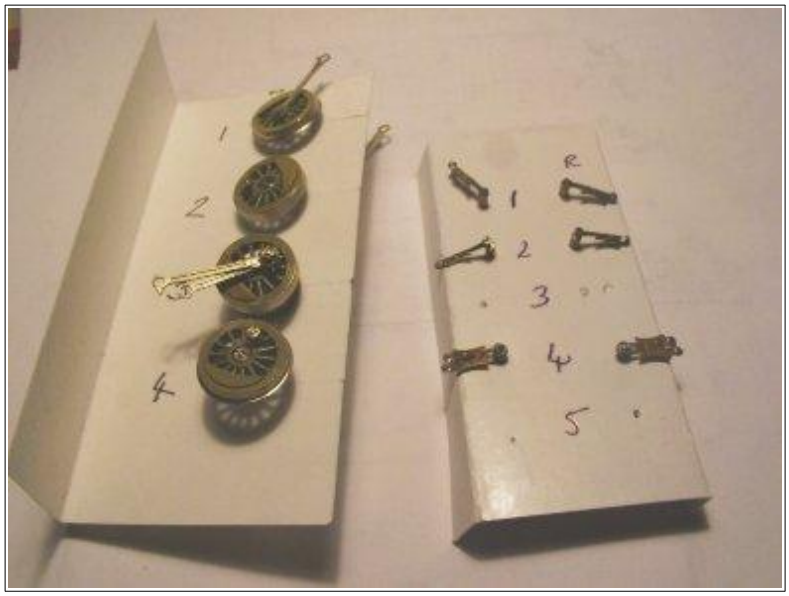
ROD transfers were home made using white transfer fiilm and a dot matrix printer. Matt varnish protective spray still to be applied.

These did not come out as opaque as I would have liked, so what I did was dry brush Humbrol satin black - a close match to the automtive matt black I used as the basecoat - up as close to the lettering as I dared. Under normal viewing distances, the subterfuge should be almost undetectable, though I did have to correct a couple of stray black smudges with a 2 O brush and an eyeglass....

Mechanism Painting and Reassembly

Moving parts demand a different approach, because merely spraying them runs the risk of gumming up bearing holes, and tapped threads. Wheels are a case in point, and these need careful work with a brush between the spokes - even if you are using the new generation Romfords with their blackened finish, as this is still not truly matt.


Painting the chassis. Horrible pea green colour is primer coat of zinc chromate on brass sideframes. I've been lazy and left the motor in place.



Wheels, axles and brake blocks are all mounted onto numbered card in the same sequence as they have come off the mechanism, so that everything will go back together in the same order.

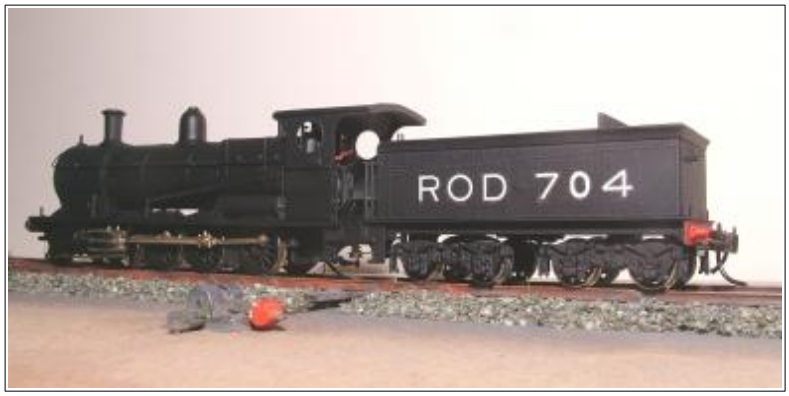
Final Touches

Patience is a virtue at this late stage of any build, as it is so easy to rush things and spoil the finish if for any reason the paint has not thorougly dried. Loctite Lock N'seal for instance, will attack oil-based paints if it strays, and the only cure for any seepage is to clean down to bare metal and touch in with the appropriate shade once more. For the same reason, I try not to lubricate mechanisms until all the painting is done - and then only with a drop of light oil applied with the end of a piece of wire.

Other jobs that needed to be done at this point included assembly of the brake shoes and hangers, and a final check to see that no stray flecks of paint had got onto the locomotive wheel treads. The vulnerable westinghouse pipes on loco and tender recieved a touch with some flat grey mix paint, and a any nicks or abrasions were touched in with a small brush.

Coal for the tender is the real thing, dropped onto the coalspace loose, and then fixed with diluted PVA glue. I resist the temptation to 'pile it high' as I feel that a part-filled tender hints at an engine that is part way through its run rather than just off the coaling stage.

Looking at the photographs, I have to say that the engine has come out a lot better than I expected now that a coat of paint has covered the patchwork quilt of low melt solder, suberglue and filler. Much of the extra work involved was to do with backdating the model to turn-of-the-century ex-works condition, and - it has to be admitted - being half a globe away from primary sources of prototype information.



Rear 3/4 view of ROD 704. The lettering is not 100 per cent, but you need to get up close with a magnifying glass to see the join....