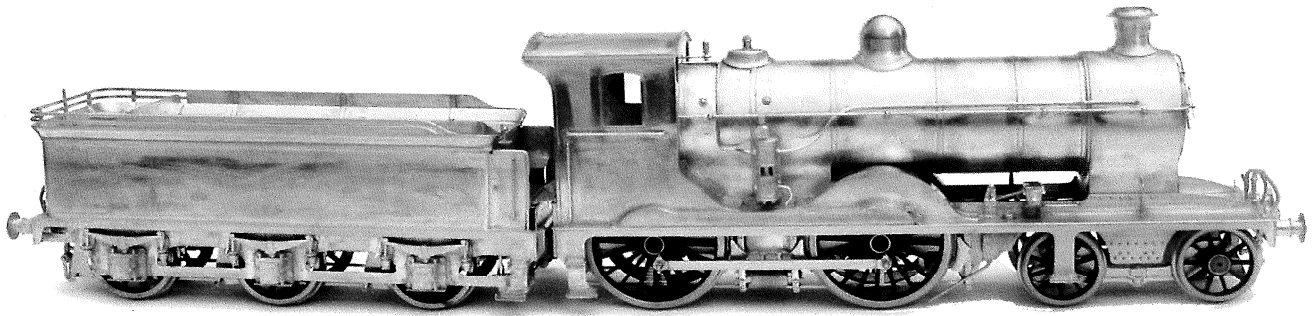


LNER CLASS D32 ADDITIONAL ASSEMBLY NOTES



The main instruction booklets are George's originals from when he first produced this kit. If you know what you are doing or have built one of George's kits before then you can work totally from them. When I built a sample model from this kit I found that in some areas I wanted to do things differently to George's design and I also found a number of small modifications on parts that were not covered. I have provided these additional notes in the hope that you will find them useful if read in conjunction with the main instructions.

A Basic Chassis is the Best Starting Point

1. I assembled the chassis, parts 35-41, in accordance with George's instructions but I did not fit the 1.2mm rod across the front of the chassis. I then opened out the holes in the motor mounting plate (this can be found on the brass tender etch) to take the axle bearings. I then folded the motor mount wings 90° and soldered the strengthening pieces to the outside faces. I then fitted the motor mount between the frames and located it with two axle bearings with an axle (lightly oil the axle) passed through them. Make sure that the bottom edge of the mount sits hard down onto the ashpan and then spot solder to the ashpan. With a 4-40 it is important to have very little side play on the driving wheels, so push the bearings out on the axle to reduce side play and then solder bearings into frames and motor mount. Use plenty of solder to get the motor mount as solid as possible (the oil on the axle will prevent any solder getting onto the axle) also solder the motor mount to the sideframes (you will find a couple of packing strips with the mount to bridge any gap between mount and sideframes).

Now screw the motor temporarily into place. Clearance for the motor in the firebox is very tight, so I felt that it was best to build up the body to a point where clearances could be checked before continuing with the chassis construction.

A Bit of Basic Body Building

I Deviated from George's instructions, as I wanted to get the valances and buffer beams onto the footplate as soon as possible. This was to give the footplate strength and help to keep it flat.

2. I fitted the coupling rod splasher sides, parts 66, first and then removed the waste strips, marked *. I then clamped the footplate in the vice and filled an extra 1mm of the footplate to give a little extra clearance for the coupling rods. I then fitted the rear buffer beam, part 97. I then formed up the steps on the valances, parts 95, I then found that I needed to file three notches into the top edge of each valance to clear the tabs of part 66 before fitting the valances. I then fitted the front buffer beam, parts 94.

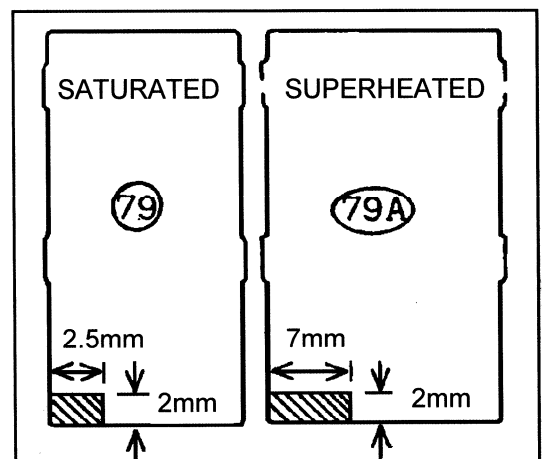
3. I then soldered the 8BA nuts to the footplate, locking the nut in place with a screw and remembering to put a little oil onto the screw thread to prevent the solder from creeping in and locking everything solid. I then cut a piece of 2"X1" wood to fit between the valances and buffer beams. This gives a solid surface to support the footplate as construction progresses.

4. I then fitted the supports, parts 67, into the footplate and fitted the coupling rod splasher tops. I found that I only needed to form the main curves as the bottom reverse curves tended to form themselves as I pressed the top onto the side. I was very generous with the amount of solder I used and this enabled me to blend in the joints and square up the corners as I cleaned up with a file. I found it easier to assemble everything onto the footplate rather than to make up as a separate assembly and then to fit it to the footplate as George suggests.

5. I then made up and fitted the cab. I fitted parts 70, 71 and handrails to the cab sides and then formed up the splasher tops on the cab front as best as I could by using the cab sides as a guide. I then tack soldered the two cab sides to the footplate using the cab front to make sure they were the right distance apart and checking with a square and rule that they were opposite each other. Once the cab sides were tacked solid onto the footplate I was able to offer the cab front into place and make final adjustments to the curves on the splasher tops. I then tack soldered the cab front/splasher top in place. I then checked that I was happy that everything was square and then soldered all joints solid. I ran fillets of solder onto the outside face of the cab front/cab side corner joint and then cleaned up with a file to give a sharp square corner. I also found slight gaps at the bottom of the cab sides where they meet the coupling rod splashers. I filled these gaps with solder and scraped back with a knife point to form clean square joints.

6. I then made up the main splashers. I pinned the side, part 74, to a block of wood and then formed up the top, part 75, and soldered this to the front. I then removed the assembly and soldered it to the footplate and then fitted the splasher back, parts 73. Then I fitted the steps, parts 76.

7. I made up the smokebox assembly, parts 77-81 more or less following George's instructions. With a sharp file make a cutout at the bottom of the back edge of each smokebox spacer, parts 79, to allow clearance for the slide bars when the chassis is later fitted. I found it useful to scribe some centrelines on the smokebox wrapper and at the top of the smokebox front and back. These centrelines helped me to get the wrapper central and the assembly level and square. I pre-formed the wrapper around an offcut of 20mm water pipe, working around the pipe using fingers and thumbs. I did not solder the smokebox assembly into the footplate but used it as a guide to fit the frame extensions, parts 82, to the footplate. I found that a little filing and filling with solder was necessary to get a nice joint at the end of the frame extension where they meet the splasher tops.



8. I then made up the boiler, parts 84-87. Again I found it useful to mark some centre lines to help get the firebox formers central and square. I found that I had to re-profile the bottom of the firebox to get it to sit down onto the splasher tops. Work gently with a flat and half round file and keep offering the firebox into place until it sits down properly. The hole in the cab front and firebox rear former (part 87) should line up so that you can pass a drill shank through them. Once you are happy that the boiler/firebox will sit into place square and straight, offer up the smokebox assembly with a drill shank passed through the holes into the front of the boiler. You can now fit the chassis with the motor temporarily fitted to make sure that there is sufficient clearance in the firebox for the motor, cut out the two thin strips from the footplate to clear the top of the motor mount. I found that I had to remove a little material from the firebox rear former (part 87) to clear the motor.

Now that we are confident that the motor will fit we can place the boiler and smokebox to one side and return to constructing the chassis and under boiler detail.

Chassis Construction Continued With a Bit of Valve Gear

9. I fitted the valve gear, parts 42-45. This is a bit of a fiddle and I am still not sure how worthwhile all of it is on the finished loco, so you may want to omit some of it. I first laminated the eccentric rods and counter weights together. I then fitted the axle bearings and an axle in the same way as the rear axle. I then passed longer than necessary lengths of rod and wire through all the joints as I assembled the valve gear around the axle. I found it better to use 1.4mm copper rod for the counter weight shaft instead of 0.9mm wire as shown on the instructions. Everything will be twisting and flopping about but hopefully the overlong wire will prevent everything falling apart.

Now we must solder everything solid and in its correct position. I first soldered the 1.4mm copper rod weight shaft to the side frames and then the weights onto the shaft, the weights should be 8.3mm from each side frame and 6.3mm apart. I then soldered the two-weight/eccentric rod joints. Everything should now be getting more solid and you should be able to twist the eccentric rods at the joint with long nosed pliers so that they are upright and parallel. Then solder the top joint between eccentric rod and part 43. This all sounds very complicated but George's instruction drawings show everything very clearly and you may find a look at the photos at the back of this booklet helpful.

The real trick is not to worry about getting everything correct first time but to get the assembly soldered together as best as you can and then to go around each joint making adjustments by twisting with pliers or resoldering until everything is correct. Then cut off the surplus ends of wire and clean up with a file.

I then skipped over fitting the brakes and coupling rods, parts 46-52, as I think these are best fitted later and preferred to make up the front frames.

A Little Deviation at the Front End

10. George's intention was that you soldered the front frames assembly permanently to the underside of the footplate. But you have to make up the assembly away from the footplate or you won't be able to fit the motion bracket and slide bars. Because of this I decided to make this a separate assembly that could be screwed into place and then screwed and glued permanently into place after painting. This would make painting and weathering the slidebars and crossheads easier.

I fitted the bogie carrier, part 54, to the side frames, parts 53, and then checked that the assembly would fit into the slots on the underside of the footplate (it is a good idea to keep offering the assembly to the footplate as construction continues). I then fitted the slidebar carrier, part 55, and motion bracket, part 56, then made up and fitted the four top slidebars. Make sure that the slidebars don't come too far through part 55 or they will foul the footplate (offer the assembly to the footplate and try the smokebox into place to check clearance). I then fitted the cast crossheads and the bottom four slidebars.

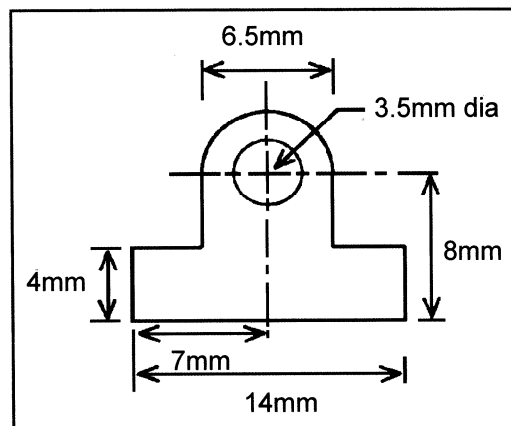
11. I then offered the assembly to the footplate and scribed a line on the underside of the footplate in front of the bogie carrier and along the frames to the buffer beam. I then removed the frame assembly and scribed a centre line. I then soldered an 8BA nut on this centreline, with its centre 3mm in front of the bogie carrier position. I then cut a piece of PCB sleeper strip 24.5mm long and drilled a hole in its centre, then cut down a screw and screwed the PCB strip to the nut with a thin piece of card packing between the strip and nut. I then offered the frame assembly back into place and soldered the PCB strip to the sideframes and bogie carrier. You should now have an assembly that will positively locate into the slots on the footplate and be held in place with the screw (a look at the photos at the back should make all this clear). I decided to cut the front of the frames at the top of the curved front bogie wheel cutout and solder the short pieces permanently to the underside of the footplate against the buffer beam. Now fit the long 8BA screw as the bogie pivot.

12. I then decided that I preferred to cut short the connecting rods, parts 63 & 64, and solder them permanently to the slide bars. I cut back the axle end of one half of a coupling rod by 18mm, then laminated it onto the second half and formed the forked joint at the crosshead end (check that the forked joint is a tight fit between the slidebars). Then fit the front frame assembly and main chassis with an axle fitted into the front bearings to the footplate. Then fit the connecting rod and solder the forked joint at the crosshead end to the slidebars. You can then remove the main chassis (pull out the axle) and cut back the second axle end of each connecting rod. A look at the photos at the back should make this all clear.

13. I made up the bogie, parts 58-62, in accordance with George's instructions. The only difference was that I soldered the 8BA nuts to the bogie spacer and fitted and soldered the ¼" screws into the side frames, parts 58, before fitting the equalising beams. I then returned to completing the main chassis.

Towards a Rolling Chassis

14. Now you may have already noticed that because of the motor position you will not be able to fit the plunger pickups for the rear wheels through the etched holes in the sideframes. You can make and fit wire wiper pickups but as I prefer plungers I decided to fit them at the back of the chassis. I cut out two plates as shown, from scrap etch and soldered them from behind, against the sideframe. The cab steps will help to hide them. Drill the 3.5mm hole to take the pickup first and then cut out the profile with a piercing saw. Fit a made up pickup into the hole in the plate and offer up a wheel fitted to an axle, so that you can determine the exact position of the plates. You may also find it useful to drill some holes in the chassis spacer so that you can route the wires back to the motor. I also felt that it was a good idea to fit extra wire wiper pickups to the outer wheel sets of the tender. Fourtrack Models, (22 Grange Rd, Harrow, Middx, HA1 2PP, 020 8863 7338) produce a miniature plug and socket set that is useful to enable you to split loco from tender. Again a look at the photos at the back should make this clear.



15. I then fitted the crankpin screws into the wheels and fitted the wheel sets into the chassis. The Slater's crankpin screws are designed to self-tap into the plastic of the wheel with the screw head fitting into a rebate hole in the back of the wheel. If your Slater's wheels are anything like the set I had then there is a problem here. I found that the screw virtually pushed through the hole without tapping a thread. To overcome this I locked the crankpin screw into place with the turned brass coupling rod bearing and a nut (this will square up the crankpin screw). I then filled the rebate hole in the back of the wheel with Araldite, so that the screw head was encapsulated.

16. I then made up the coupling rods, parts 52 & 52A. Be careful when you open out the crankpin holes with a tapered reamer, as there is not a lot of the boss left when the hole is the correct diameter (I would have preferred the bosses to have been slightly over scale). I then fitted the rods to check that the chassis will run free. Now remove the rods but leave the wheel sets in place to help with the positioning of the brake gear.

Completing the Chassis

17. I fitted the brake gear, parts 46-51, in accordance With George's instructions. First fit 0.9mm brass wire across the chassis to hang the brakes from, the rear wire will have to be fitted as two short stubs. I fitted the clasp brakes with the cast brake cylinder and this was the only point at which I deviated from George's intentions. George had intended the cast cylinder to be fitted against the ash pan but on the prototype loco it was mounted onto two (flat strip) brackets dropping down from the main frames. I soldered two strips of waste etch to project down from the chassis to form this mounting. If you look on the N/S chassis etch at the point where four of parts 57 were located side by side, you will find strips of waste, of the correct width and spacing.

If you snip this out of the etch along with the waste that connects one end, you can hold onto the waste as you spot solder the two strips to the chassis at the correct spacing. Then snip the brackets to length and then repeat this on the other side before snipping off the waste.

Once the brake gear is on that should be the chassis construction completed. Snip out the 0.9mm brass brake hanger wires that cross between the frames and refit wheel sets and rods before placing the chassis to one side and returning to the body construction. If I am happy that I have got a free rolling chassis I prefer to fit motor and pickups after I have painted the chassis. As the wheels must come off for this you can glue the balance weights on then, but get them in the correct position on the wheels, unlike me, as I got the front ones wrong and cant get them off the wheels again. You will find it useful to offer the chassis into place to check clearances as the body construction continues.

Body Construction Continues

18. Its now best to fit any detail that will be difficult to do after the boiler is fitted. Fit grab handles to frames above the front steps. As I was building a superheated loco I fitted the mechanical lubricator, parts 83. The main instructions mention lost wax brass but I don't think that this ever existed and found that it was easy to make up from the etched parts. I used a long length of 1.4mm copper rod to form the drive shaft, cutting back after everything was soldered solid. I also felt that the cast lubricator sat a little high compared to prototype photos and so I cut 2mm from the base. I also fitted the steam reverser lever, part 99. You should find a look at the photos at the back helpful when fitting the lubricator.

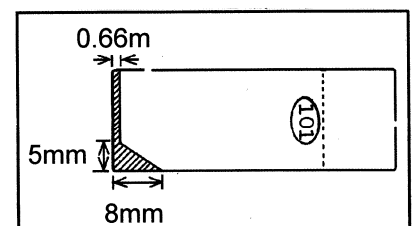
19. I then fitted the boiler bands, parts 88 & 90, around the boiler (leave rear band, part 93, until later). I then located the boiler and smokebox onto the footplate, using drill shanks through holes, and checked that everything was square, and then tack soldered the boiler/smokebox joint. I then removed the assembly and permanently soldered the boiler/smokebox joint, fitting a ring of tinned copper wire to represent the joint ring.

20. I then fitted the boiler/smokebox assembly to the footplate. I located the cab end with a drill shank and the smokebox should locate between the frames. I tack soldered either side of the firebox to the footplate (coupling rod splashers). I then found that the boiler was not quite level and was running down towards the smokebox by about 1/2 mm. I fitted a thin strip of scrap brass etch as packing between the front of the smokebox and the footplate before tack soldering this joint (I may have introduced this error with my building but do check by eye that your boiler is straight and parallel to the footplate).

With most loco kits it is at this point of fitting boiler to footplate that the greatest danger of the footplate twisting occurs. So after tack soldering in the three places check that the footplate is still square and then solder solid at the bottom of the smokebox. Then check again and then solder about half the length of one firebox joint, check again, then solder half of the joint on the other side, check again, then solder the rest of the joints. By doing it this way you are working evenly on each side and so there is less risk of twisting as the cooling solder pulls the joint together and if something does twist you have a chance of getting the joint apart again.

21. I then fitted frame extensions, parts 91, boiler band extensions, parts 92 (I found these a little short and had to splice in a sliver of scrap etch between parts 91 & 92) and rear boiler band, part 93, to hide the gap between firebox and cab front. I was very generous with solder so that it filled any gaps and then scraped back with a knife blade to blend everything in.

22. I then fitted the cab interior. I found that I had to trim the cab boxes slightly but everything else fitted with only a little bit of dressing with a file. The box lids are a little narrow and so I positioned them so that there was a slight gap between them and the cab side. I made up the fall plate, part 105, but did not fit it until later as I find that it gets in the way until most of the detail work is completed.

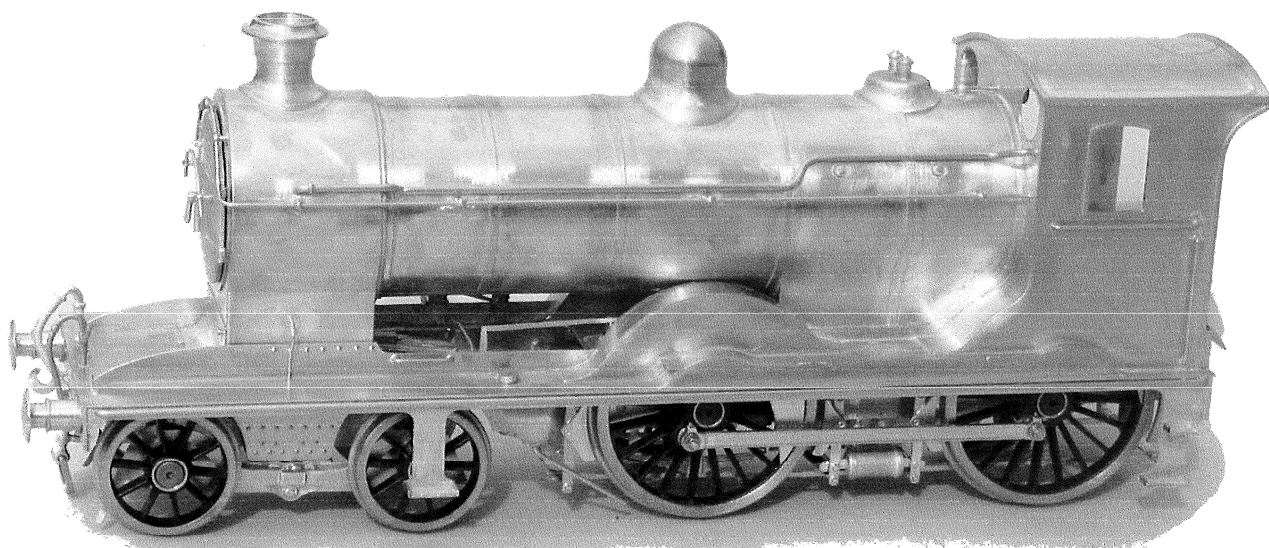


23. I then made up the cab roof, again in accordance with George's instructions. I found it easier to solder the roof edge strips, parts 109 & 110, to the roof by leaving the strips in the fret and offering the roof onto them and then soldering and then sniping out the strip from the etch. It is a lot easier to get the roof square to the strip attached to the etch than to get the individual strips square onto the roof. I checked that the roof would fit OK and then placed it to one side to be fitted later.

24. I then curved and fitted the valve cover door, part 98, fitting two pins to represent handles. The bend needs making just behind the hinges and I used the ¼ " dia shaft of an electricians screwdriver (the sort with a rubber insulation sleeve covering the blade). I find this sort of screwdriver very useful for forming curves on half etched parts with raised detail as the raised detail presses into the rubber but the rest of the material is still supported as you make the bend. I then fitted the Westinghouse pump carrier, part 113.

Castings Pipe Work and Handrails

25. Now to fitting some castings and pipe work, if you follow the same order as I fitted them you should find that you are not trying to fit pipes behind handrails that you have already fitted or doing high temperature soldering next to white metal castings. I first fitted the cast safety valve base then drilled holes in the body of the Westinghouse pump to take the pipe work that is made from 0.9mm (20 SWG) tinned copper wire. I then mounted the pump onto its plate and fitted the pipe runs (straighten the wire by clamping one end in the vice then grip the other end with pliers and give a gentle pull) a look at the photos will be helpful with the pipe runs. I then fitted the boiler handrail and then the vacuum brake ejector pipe made from 1.4mm copper rod, running from the hole in the L/H cab front to a hole on L/H smokebox. There is also a vacuum brake train pipe made from 1.4mm copper rod running along the L/H valance just below the footplate.



26. I then fitted the cast washout plugs, whistle and brake ejector in the cab. I then checked the backhead for fit between the cab boxes and had to file a little from each side of the casting. I then fitted the cab roof, tacking first and checking that it fitted square before soldering solid. I then fitted the chimney, dome and pipe work at the bottom of the smokebox side. I then made up the smokebox door by fitting the curved handrail that was on later superheated locos, lampiron and door handle. I then placed the smokebox door to one side to be glued on with Araldite just before painting.

27. I then fitted the sandboxes below the footplate; Temporarily fit the chassis to help with positioning. Refer to main drawing for position and you want about a 2½ mm gap between the sandbox back and the chassis frame. Before fitting I marked the position of the sandbox filler cap hole in the footplate onto the sandbox top and drilled a 2½ mm hole in the casting, so that when the sandbox was fitted I could still fit the sandbox filler cap into the hole in the footplate with

a spot of glue. Drill out the sandboxes to take the sandpipes made from 0.9mm brass wire. Drill these holes nice and deep so that the sandpipes have a really strong fixing, as the loco body will rest on these pipes when the chassis is removed. Fit sandpipes as the last job before painting.

Final Detailing

28. I then fitted the lampirons, made up the coupling and soldered it solid into its slot in the buffer beam, fitted Westinghouse air and vacuum brake pipe and then the buffers. I then fitted the tender fall plate. The tender draw bar, part 114, has two holes in it but I found that the inner hole coupled the tender to close for the curves on my layout and the outer hole to far apart to look right. I bent a set in the bar at the inner hole and reinforced the bend with solder, this reduced the distance between loco and tender by about 2mm which was about right for my layout. Anyway experiment with this distance to suit the curves on your layout.

That should now be everything fitted and ready for painting. I hope that you have enjoyed building your loco as much as I have enjoyed building mine. I also hope that you have found these extra notes helpful, there is a few problem areas in the construction which I have tried to highlight and describe how I got around them, but I think that George has produced a sound design for this loco. I think that the finished loco looks quiet a handsome wee beastie.

Happy Modelling
Jim McGeown

