

LNER Class J83, NBR Class D, Supplementary Instructions

(1-4) I soldered the valances to the footplate first. Fitting them hard up against the end of the etched slot at the bunker end of the footplate. Then fitted the rear buffer beam. Making sure that the slots for the bunker back are kept clear. I then fitted the front buffer beam. The long row of rivet heads on the buffer beam are at the top next to the footplate. I then soldered the nuts to the footplate by locking in place with a screw. If you put a little oil onto the screw thread this will help prevent solder creeping in and locking the screw solid. I found it helpful to fix with drawing pins, the footplate to a flat offcut of wood as I fitted valances and buffer beams. I fitted the coupling plates, parts 41, to the buffer beams before fitting them to the footplate.

(5-9) I formed the curved tank top by roughly bending around a piece of 4mm dia rod. Then formed it to the correct radius by gentle finger and thumb pressure, working a short section at a time. I found that the tank tops are a bit wide (I found this out later in construction when I could not fit the boiler in). File about $\frac{1}{2}$ mm from each tank top to give about 31mm between them. It is also a good idea to file a 45° angle on this edge to match the curve of the boiler.

I roughly pre formed around a 6mm dia drill shank, the two sections of cab opening beading, parts 8. I then fitted the front half first, spot soldering on the inside at the handrail end first. I then pushed the beading tightly into the curved corner with the drill shank and spot soldered into place. I then worked along the straight section and the top corner in the same way. I repeated this for the second half and trimmed back to make a butt joint with the first half of the beading at the top. I put a spot of solder onto the joint and then blended it in with a file.

I then soldered the two body sides to the footplate but found it useful to offer the cab front and bunker back into place as I did this. This helped to fix the position of the body sides in there slots. I then fitted the tank ends, parts 5 and inside tank walls, parts 9.

(10-11) I fitted the cab front flush with the ends of the cab sides. Then filled the slight gap between the front and tank top with solder, blending in with a file. I also filed the corner joints between front and cab sides to give a clean sharp corner, run a little solder onto the outside of the corner if necessary. I now think that it is a good idea to build up a basic chassis. This can then be used to check clearances as body construction progresses, particularly around the wheel splashers.

(61,62,75,76,69,70,71-74) I opened out the bearing holes in the frames with a tapered reamer. I then soldered the guard irons to the frames with 60/40 solder to give them a little more strength than 145° solder would give them. I then pushed out the rivet heads, formed up the ashpan sides and soldered them to the frames. I then fixed a side frame to a flat block of wood with drawing pins through the axle holes. I then fitted the stretchers to this side frame soldering the joints solid. The chassis fixing screw holes in the stretchers need slotting to line up with the footplate holes, the front one forward by about 2mm, the rear one forward by about 1mm. I then fitted the second frame in place. I tack soldered at the tabs on the stretchers, soldering the centre ones first and then the outer ones. I found it necessary to file slightly a couple of the notches in the frame to allow it to sit down onto the stretchers. I then removed the chassis from the block of wood, checked that it was straight and square, then soldered all the joints solid. I then fitted the front and rear bearings. I find it useful to slide an axle through the bearings as I solder them into the frames as this helps to keep them parallel. I fitted front and rear wheel sets but left the centre ones until later.

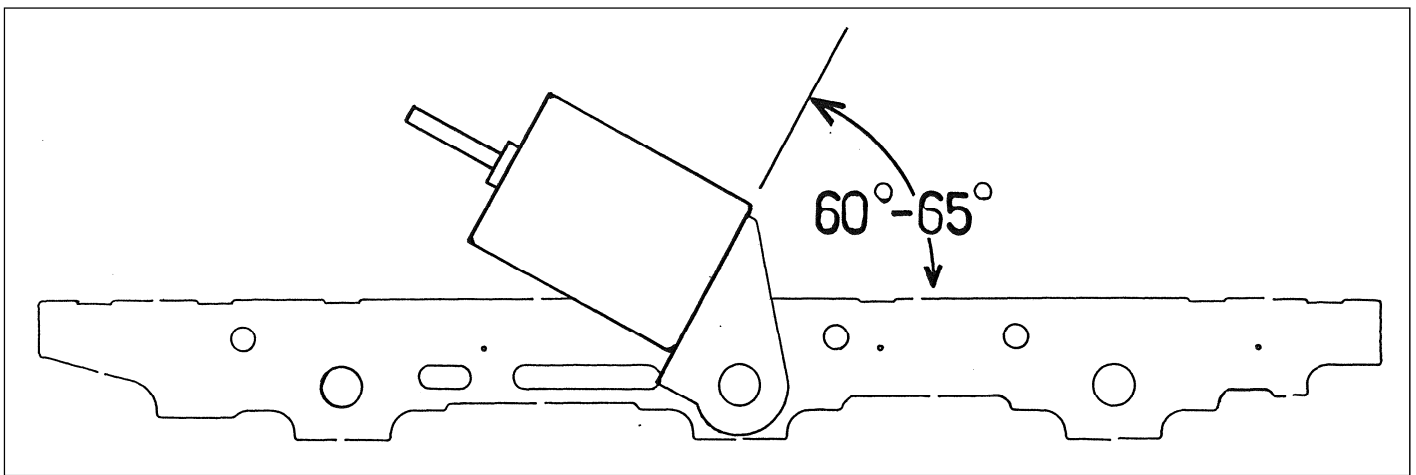
(34-37) I then fitted the cab boxes. These are out of sequence to the main instructions but because I found them a little fiddly. I found it helpful to be able to get in with the soldering iron with the cab back off. I formed the splasher tops using a pair of long nosed pliers. Making slight bends with short flats between.

(12-16) I used a strip of 1mm card as a spacer for the coal bars I then held them in place with a blob of blue tack as I turned the cab rear over to solder the coal bars on the inside. The blue tack tends to melt around the bars but if you use a ball of fresh blue tack and press it around the bars. This will lift off the melted blue tack.

I formed the curve on the bunker back by working with finger and thumb pressure around an offcut of $\frac{3}{4}$ " water pipe. I found that the bunker back was slightly narrower than the cab back and there was a slight gap at each side. I also filed about $\frac{1}{2}$ mm off the height. I ran a generous fillet of solder up each side on the outside face. Then dressed this back with a flat and half round file to form a sharp corner. I folded up and fitted the LNER coal plate. I found that the two sides needed folding slightly inside the etched dots and about 1mm needed trimming from the two ends where they joined the cab back. I clamped one end of the $\frac{1}{2}$ round wire in the vice and gently pulled it with a pair of pliers to straighten it. I then soldered it into the half etched grooves. I started at one side and worked around to the other before sniping to length. If you are fitting the NBR coal rails I would suggest assembling them first on a block of wood with 60/40 solder. Then fit them with 145⁰ solder.

(17-22) I drawing pined a boiler end to a block of wood and then soldered the boiler around it. The end will act as a former to help get an even radius curve to the boiler. I repeated for the second end and then soldered the overlap joint. I then offered the boiler between the tanks and found that I had to remove with a sharp file. A little metal from the tank tops to get a comfortable sliding fit (about 3mm between tanks). I also filed two notches on each tank top to correspond with the boiler bands. I pre formed the smokebox wrapper around a piece of $\frac{3}{4}$ " water pipe and a 7mm drill shank. I then soldered the wrapper around the smokebox front plate. Then fitted the spacers which I had to reduce in width to just under 18mm (the width of the wrapper less two metal thicknesses). I then fitted the smokebox rear plate. I then offered smokebox and boiler in place just to check that I was happy with the fit. I also offered in place the cast balance pipe and found that I had to file the holes in the tank fronts slightly oval to allow this to fit.

I think that this is now a good time to fit the motor mounting plate and centre bearings to the chassis. Open out holes in mounting plate to take bearings. I also opened out the holes for the motor fixing screws, offer motor up to check this. Fold up mounting plate and temporarily fit motor. Offer mounting plate into chassis and secure by passing bearings through holes in chassis side and mounting plate. The motor and mounting plate should now pivot around the bearings and allow you to select the best position for the motor. As the boiler is still removable and you can look down it at the smokebox end. You can check that the motor is not going to foul the boiler (I had to snip out two strips of footplate just inboard of the centre wheel cutouts to fit the chassis). I found that if I got the motor position right I did not have to cut off the back shaft and managed to fit a small 18mm diameter fly wheel. I feel that the motor mount should be soldered solid into the frames as this gives extra strength to the chassis and prevents the mount flexing, causing the gears to climb out of mesh. I found that the motor mount was a little narrower than the frames and used some waste strips from the chassis etch as packing between the mount and chassis.



(23-27) I found it easier to fit boiler bands and tank straps with the boiler removed from between the tanks. First scribe a line on each side of the boiler where it meets the tank tops (this will help you to position the tank straps). Remove the boiler and fit boiler bands and tank straps. I found it helpful to roughly pre form these around $\frac{3}{4}$ " pipe before soldering around the boiler. I refitted the boiler and from the underside, soldered the firebox end of the boiler to the cab front. I then soldered the underside edge of the boiler to the fold down tabs on the inside tank wall. Start at the front tabs and solder alternatively to a L/H tab then a R/H tab. If you solder down one side and then up the other there is a risk of the solder pulling the tanks inwards, distorting the body and twisting the footplate. Fit the third of part 27 to the cab front. Then fit smokebox, soldering to boiler front and footplate.

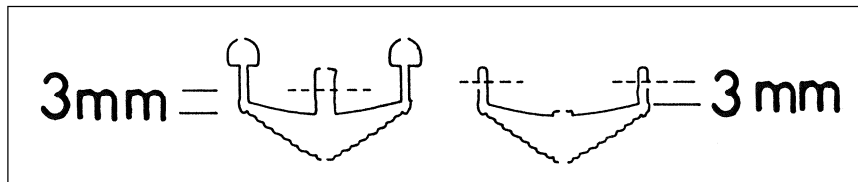
(28-31) I soldered the wing plate at the footplate and around the smokebox. Then filed around the smokebox to blend it in to the smokebox wrapper. I formed up the splasher tops to match the profile of the splasher sides. I then drawing pinned the splasher side to a block of wood. I then soldered the splasher top around the side, using the side as a former, I used 60/40 solder for this. I bent an L shape from 0.7mm wire and soldered this from the inside, through the small hole in the splasher top. I then sniped the wire off to form a 1mm peg onto which the sandbox pull rod will fit. I then cleaned up the face and trimmed the flat splasher top to match the side with a file. I then tack soldered the splasher side to the wing plate and adjusted it until it sat square and just covered the edge of the wheel cutout in the footplate. I then soldered the splasher side to the footplate by running a fillet of solder from the underside along the edge of the wheel cut out. I then ran a fillet of solder into the joint between splasher side and wing plate. Then filed the wing plate to blend it in to the splasher side. I then formed up and fitted the sandbox pull rods.

(38-47) I found that I had to file slightly the edges of the cab floor to get it to sit down correctly. I fitted the coal door to the cab rear extension before fitting into cab. I made up the two rear sandboxes before fitting into the cab. I also made up the reversing lever but placed it to one side to be fitted later with the rest of the castings in the cab.

(48-53) I formed up the two roof parts by gently working over a piece of $\frac{3}{4}$ " pipe with fingers and thumb. I then laminated the two parts together, the half etched top should be flush with the inside roof front and back, but slightly short at each side. Dress the sides with a file so that the side edging strips will be vertical. I then sniped out a square of etch surrounding the roof strips so that they were still tagged into the etch and surrounded by waste. I drawing pined them to a block of wood and then offered the roof up to the strips. Soldering them into place and then cutting them from the waste one at a time. I fitted front and back curved strips then the side strips. I found it easier doing it this way than trying to fit individual strips to the roof. I then fitted the roof fitting strips, tack soldering them in three places only. As I did not like the idea of getting too much heat into the roof and the strips falling off.

I prefer to leave fitting the steps until as late as possible. As these are a bit vulnerable to damage. So I now fitted the handrails. I have provided split pins to support these but you may wish to replace them with short, turned handrail knobs. I fitted the smokebox/boiler handrail first. This is best formed up in one piece and the sides are spot soldered to the tank fronts (I was happy with the shape of the second handrail that I made). I then fitted the tank top handrails, place a cast tank filler into place to check the shape. I then fitted the vacuum ejector pipe formed from 1.6mm brass rod. Looking at photos the position of this pipe varied from loco to loco, but make sure that you would be able to lift the tank filler. I then fitted cab handrails, shunters grab handrail and bunker handrail. Now I have the basic body constructed I prefer to complete the chassis.

(63-68) I found that the fitting of the angles and brackets, parts 63-66 was straight forward. I found that the springs mounted a little low, so I trimmed down the end legs of the spring faces (parts 68) to 3mm long and the centre of the spring back (parts 67) to 3mm long.



I then prepared and fitted the Slaters wheels. To prepare Slaters wheels first remove any plastic flash or moulding pips from the backs of the wheel by rubbing them flat on a piece of fine emery cloth (this flash can sometimes interfere with the plunger pickups). The crankpin screw head needs to be flush with the back of the wheel (this prevents binding on the bearing or cast spring) so it will be necessary to drill a countersink hole. Use a 2.5mm drill in a hand held pin chuck. Drill gently and keep checking with the head of the screw until the hole is the correct depth. The screw is designed to self tap into the plastic and then lock itself. I don't trust this and prefer to screw it in until the head is just proud of the wheel back. I then fill the countersink hole with Araldite and then screw it in until it locks. Leave the wheels until the Araldite has set and then clean off any excess Araldite by rubbing the wheel on the emery cloth. This should leave the screw head embedded in Araldite. You may find that the square axle end is a tight fit into the centre of the wheel and this needs correcting. With a fine flat file gently dress each of the four sides of the axle end. I find it helps to lay the bottom flat of the axle end onto the edge of a block of wood. This helps me keep the file parallel as I file the top flat. Offer the axle end into the wheel centre and repeat if necessary. You are aiming to get a gentle push fit but with no rocking or movement on the square. A good guide is to get it so that you can remove the wheel from the axle with just your finger nails around the steel tyre.

(87-91) I now prefer to make up and fit the coupling rods. The rods are made up in tow halves from a laminate of three etches with a detail etch fitted to the bosses. The way I do it is to separate one half section of 3 laminates from the etch at a time. Clean off the tabs so that the 3 laminates will fit together flush along there length. I then use 3 miniature electrical crocodile clips, one in the centre and one at each end just inside the crankpin holes, to hold the laminates together. I then pass drill shanks through the crankpin holes to line up the 3 laminates. Check by eye that the drill shanks are parallel and square to the rod.

Then using plenty of flux, solder along the top edge of the rod. Start in the centre and work out towards each crankpin hole. This reduces the risk of the laminates distorting and bowing apart with the heat. You should find that some solder has run between the laminates to the bottom edge (if it starts dripping out the bottom you are using too much solder). Reposition the crocodile clips and solder the bottom edge. Only use a little solder on the iron and you should find that it pulls any excess solder from the top edge, through the laminates to the bottom edge, leaving you with a neat top and bottom edge. Try to keep the overlap joint clear of solder (it can be cleaned out with a knife point). Remove the drill shank from the outer crankpin hole and reposition the centre crocodile clip so that it clamps the end boss tightly together. Solder around the boss until a little solder bubbles out into the centre of the crankpin hole. Repeat for the second half of the coupling rod.

Now fit the bosses, hold them in place with a knife point and use plenty of flux. With a little solder on the iron you should find that you only need to touch one edge and the solder will then flow under the boss to give a good joint. Now gently clean up and file all the edges so that the cusp of the 3 laminates blend in to give the impression of one solid piece.

Now open out the crankpin holes in the rods to accept the brass top hat bearing bushes. This is best done with a tapered broach or tapered engineers reamer (I have one that tapers from 3mm to 2mm and is 40mm long, see Yellow pages for a good engineers tool merchant, not cheap but will last a lifetime). With the reamer gently work from both sides of the rod until the bush is a smooth free fit into the hole. These bearing bushes are not soldered into the rods but locked onto the crankpin with a nut and washer. So it is important that they will revolve freely in the holes in the rods.

The wheelsets should have been quartered when they were fitted into the chassis (the crankpins on one side should lead the other by 90°). Fit rods and check that the wheels will turn without binding. If you do have a problem the best way to find it is to just fit the front rods and check these (in effect checking out two 0-4-0 chassis). Revolve the wheels until you hit the tight spot then check the rods. You should find that one rod still moves freely on the crankpins and this side is OK. You should find that the rod on the other side is tight on the crank pins and this is where the problem is.

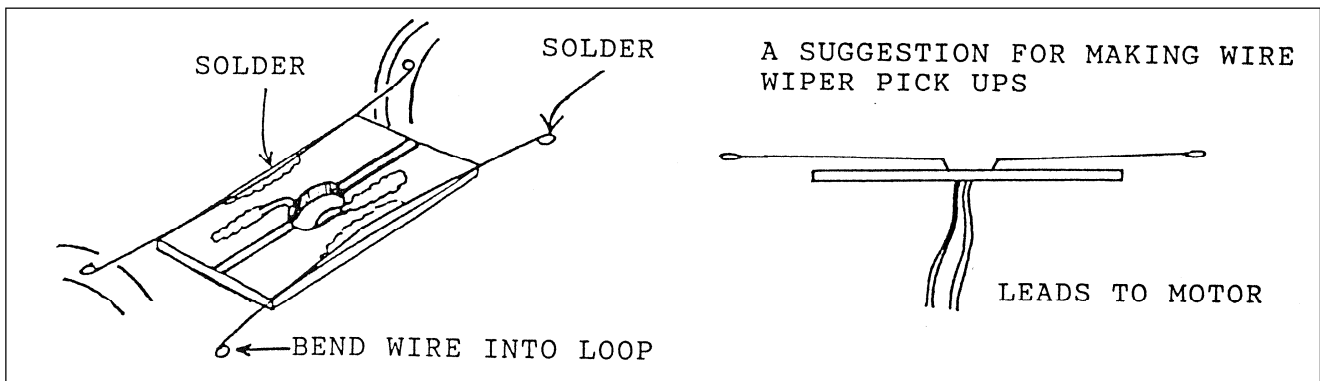
Normally the problem is a crankpin screw that is not square in the wheel (unless you have reamed the hole in the rod out of square) if it is on the centre wheel, swap it for an end wheel. With a round file gently file oval the hole in the rod until it fits freely onto the crank pins. Refit all rods and check chassis again.

At this stage dont worry about slight tight spots. If you can push the chassis along the bench without the wheels skidding along all is OK. Because the wheels are best removed for painting the chassis the chances are that they will not go back on in the same place. The correct point to make final adjustments is after painting and fitting pickups but before fitting the motor. If you have filed a crankpin hole oval it is worth marking this wheel so that you can match it up again on reassembly.

(77-86) I soldered the brake blocks to the hangers, making up a L/H and R/H set. I then fitted 45mm lengths of 0.9mm brass wire across the chassis and soldered the brake blocks to these. Check that the wheels wont bind against the brake blocks. I used 60/40 solder for all the brake gear to give extra strength. I then fitted the cross beams and front and central pull rod. I then threaded a length of 1.2mm copper rod through the hole in one chassis side. Then threaded onto the rod one brake linkage (part 83) then rear pull rod (part 82) then second brake linkage (part 83) before threading the rod through the second chassis side. I then soldered the copper rod and brake pull rod solid. Then fitted part 84, soldering all links solid. Sandpipes are made from 0.9mm brass wire. There are holes in the footplate to mount these onto the body but I preferred to mount them onto the chassis. I drilled holes in the top of the chassis sides and mounted the sand pipes into these by bending the wire 90°. The front sandpipes run behind the front brake blocks.

If you are using wire wiper pickups, I have provided some PCB sleeper strip and 0.45mm hard brass wire to fabricate them from. You may wish to glue the PCB across the chassis with Araldite and mask off the copper before painting the chassis. I prefer to use Slaters plunger pickups and if this is your first loco I suggest you give them a try first.

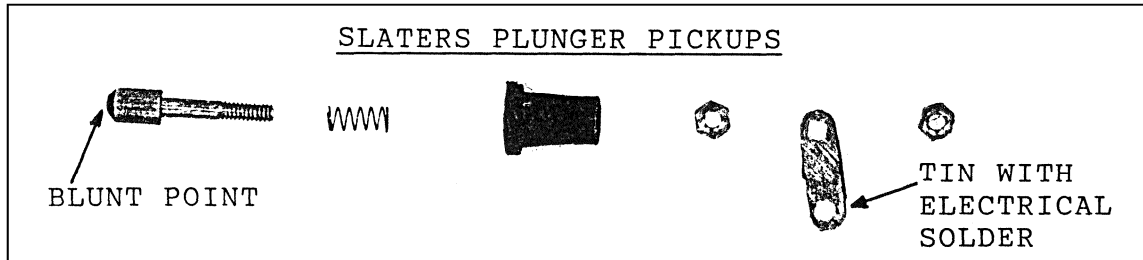
Now paint the chassis and front faces of the wheels. I use spray tins of car touch up paint. Use cellulose grey primer first (Simonize gives a fine spray but some of the cheap makes are a bit thick) then a couple of light coats of satin black (I find matt black a bit lumpy). A light coat of matt varnish is also a good idea (I use Railmatch enamel spray matt varnish). Try to warm the chassis up first by putting in the airing cupboard and warm the paint tin by putting on a radiator or standing in warm water (about 35°C). This helps to give an even coat without runs. Try to spray in the dry and at about 25°C (dont use the kitchen unless you are a bachelor). You can mask off the wheel treads and put a twist of paper into the bearing holes if you wish or scrape off before the paint has gone really hard.



Fitting Slaters plunger pick ups. Some people dont like using these but I have found them very good and fit them to all my locos. First I drill out the back hole in the plastic housing 1.4mm. I then run a 2.4mm drill down the inside of the plastic housing twisting the drill between finger and thumb. This will deepen the hole slightly and also remove any wisps of plastic that may jamb the plunger. By twisting the drill between finger and thumb there is no risk of the drill binding and drilling right through the end. With a file blunt the point of the plunger. Then fit spring onto plunger and fit into housing running a nut onto the back end. When fully depressed the plunger should sit virtually flush with the end of the housing. It is important that you use the etched solder tag that is locked between two nuts on the end of the plunger. If you try to solder the electrical wire direct to the plunger you will melt the threaded end into the plastic housing.

This will cause the plunger to jam in use even if it feels free before fitting (this is probably what the people who don't like plungers have done). I tin one end of the etched tag with electrical solder before locking between the nuts. In this way I can solder the tinned end of an electrical wire very quickly onto the tag with no risk of heat getting to the plunger.

If you are a little unsure you can solder the wire to the tag. Then lock it between the nuts and thread the wire and plunger through the hole in the chassis. Once the plunger is fitted into the chassis I run a ring of Araldite around the housing on the inside face of the chassis side. Now fit wheels and rods (fitting gearwheel onto centre axle). Check for smooth running.



The worm gear is pushed onto the motor shaft until the end is flush with the end of the shaft. I push the worm $\frac{1}{2}$ onto the shaft, then pick up some superglue on a piece of wire and coat the inside bore of the worm, then push the worm home.

Mount the motor (don't drop the screws as they come with the motor and I don't know how to get replacements) and connect up wires. The motor mounting holes are slotted to enable you to make adjustments in gear mesh for the best running. A little light oil on the bearings and motor bearings is a good idea. You should now have a completed sweet running chassis.

I then completed the body construction. I fitted the cast balance pipe to the tank front. Then detailed the cab by fitting castings for brake standard, sandgear, dials and brake ejector. The backhead needs a little filing at the base to clear the cab boxes, also fit regulator. I then fitted the etched reverser to the L/H box.

(54-60) I then fitted the footsteps. I found it best to solder the treads to the back plates first and then solder the back plate to the underside of the footplate. The shunters step is a bit of a fiddle but I found a couple of miniature electrical crocodile clips useful to clip parts together as I soldered them.

I then fitted the remaining castings and detail to the body, these are:-

Valve cover, fitted centrally in front of smokebox. Drill out two holes and glue in two cut down track pins to represent handles.

Whistle, mounted onto cast base for NBR locos, mounted into boiler by drilling a hole just back of the rear tank strap. Bend a slight set into brass wire steam pipe from cab.

Safety valve base on LNER locos, drill out base and fit cast cross pop valves.

Dome, NBR locos had large dome with two lock down safety valves fitted. LNER locos had small dome.

For LNER locos fit a lamp bracket at the top of the smokebox and then fit chimney.

Smokebox (onion) lubricators. There is etched holes just below the smokebox handrail knob that was meant for these. I found that this hole was to high and drilled a second hole 1.5mm below this. This will then allow the lubricator to fit below the handrail knob.

Blower valve, drill a 0.75mm hole into casting about 3mm deep. Mount casting onto smoke box and fit an operating rod running back to the cab, made from 0.7mm brass wire.

Fit five lamp brackets (parts 32) to the rear footplate behind the bunker. Make up and fit coupling hook, I solder this solid into the slot and cut off the shank. Fit brake pipes and buffers to rear buffer beam.

Fit five lamp brackets (parts 32) to the front footplate, note etched marks to help with position. Fit coupling hook, brake pipes and buffers to front buffer beam.

I glued the smokebox door handle into the smokebox door with supper glue. Then fitted the smokebox door in place with Araldite. You will have to open up the etched hole in the smokebox front slightly. I then glued in place with Araldite the tank fillers and front sandbox fillers. This should then be the loco body completed and ready for painting. Paint in a similar way to the chassis. Transfers for lettering are available from HMRS,

