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Class J (483 and (Z) 29 2-8-0 locomotive

**Made in New Zealand by The Model Company.
Patterns by Paul Berntsen.**

History.

These locomotives were built by Baldwin, they went into service in 1891. Between 1916 and 1920 some of the J's were rebuilt with piston valve cylinders and superheated boilers. The 1924 renumbering saw the class reclassified '29 class'. Locos with the old non-superheated boilers were scrapped between 1926 and 1930. The superheated locos lasted until 1937.

Options.

The kit has enough parts to represent a J or 29 at any time. There are slide valve and piston valve cylinders, alternative cab sides, two chimneys, westinghouse pump and headlight. The instructions will mention alternate parts from time to time.

Research.

I recommend the purchase of the appropriate "Data Sheet" drawing as a valuable aid to detailing your model. (Class J(483) Page 102 of 'A Compendium of New South Wales Steam Locomotives' by Alex Grunbach has a description and photos. 'Standards In Steam, The 50 Class', by Ron Preston, has a chapter starting on page 13, 'Enter the 29 class'. This has excellent coverage of the class. Photos of the locomotives in their later years are very scarce, the best one I've seen is on p29 of the latter book.

General.

Please read the instructions right through and identify all parts before starting work. Decide which detail options you want to fit before starting as references will appear throughout the instructions.

Wash all white metal parts in hot soapy water and rinse well to remove the parting agent. Assembly methods include instant glue, 24 hour Araldite, white metal (70°) solder and low melt (145°) solder. The writer uses all these methods. 70° solder will only solder white metal so etched parts will need to be tinned with normal solder if 70° solder is to be used to attach them to white metal. 145° solder will work on both white metal and the etchings but more care is needed. For both these solders some form of temperature controlled iron is recommended. If you have doubts about your abilities to solder white metal then it is best to glue. I use instant glue, followed by a fillet of 24hr Araldite.

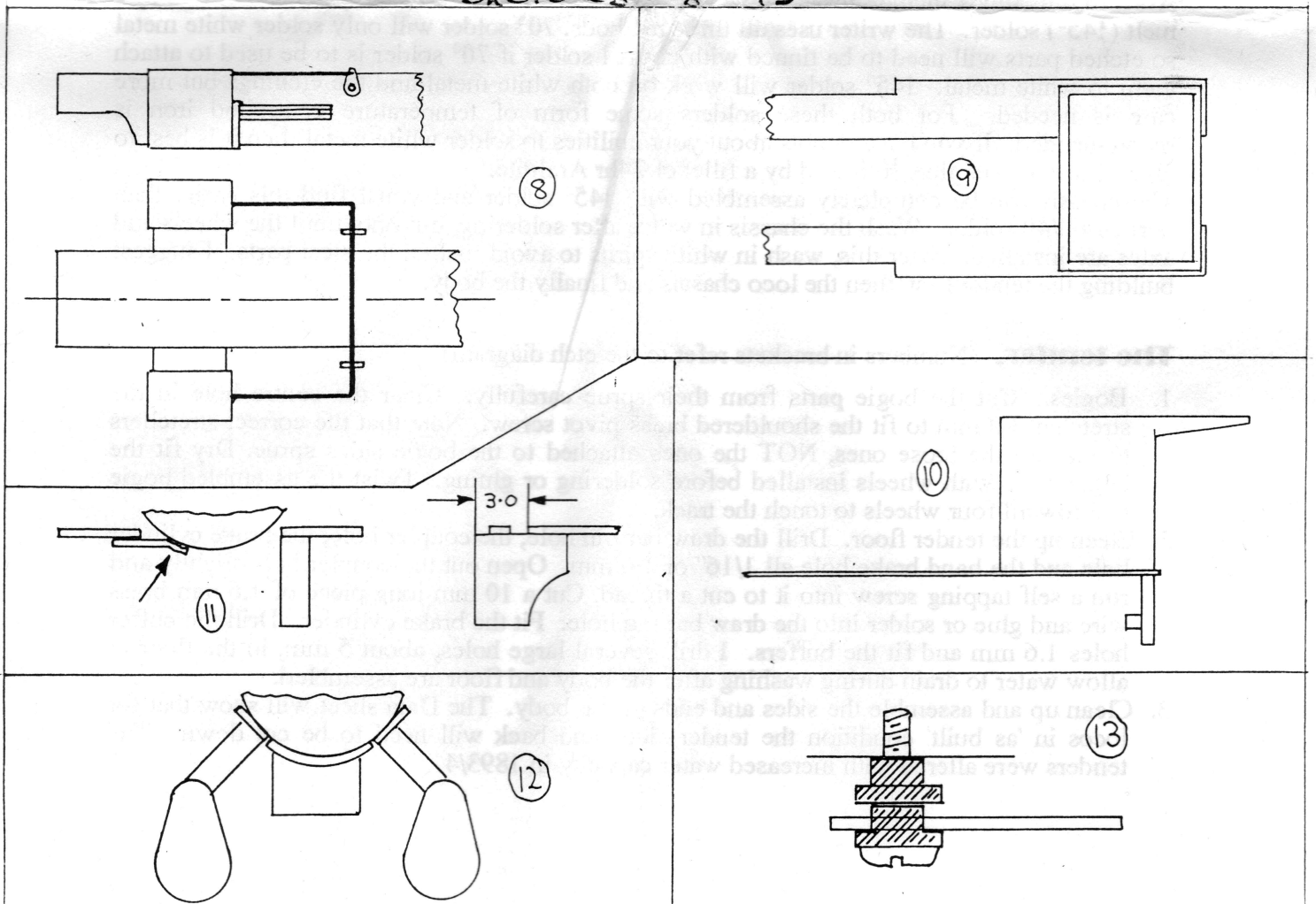
The chassis can be completely assembled with 145° solder and you'll find this easier than normal 60/40 solder. Wash the chassis in water after soldering, but only until the wheels and axles are installed. After this, wash in white spirits to avoid rust on the steel parts. I suggest building the tender first, then the loco chassis and finally the body.

The tender. (Numbers in brackets refer to the etch diagram)

1. Bogies. Cut the bogie parts from their sprue carefully. Clear the centre hole in the stretcher 3.0 mm to fit the shouldered brass pivot screw. Note that the correct stretchers to use are the loose ones, NOT the ones attached to the bogie sides sprue. Dry fit the bogie parts with wheels installed before soldering or gluing. Twist the assembled bogie to allow all four wheels to touch the track.
2. Clean up the tender floor. Drill the draw bar pin hole, the coupler hole, the brake cylinder hole and the hand brake hole all 1/16" or 1.6 mm. Open out the coupler hole slightly and run a self tapping screw into it to cut a thread. Cut a 10 mm long piece of 1.6 mm brass wire and glue or solder into the draw bar pin hole. Fit the brake cylinder. Drill the buffer holes 1.6 mm and fit the buffers. I drill several large holes, about 5 mm, in the floor to allow water to drain during washing after the body and floor are assembled.
3. Clean up and assemble the sides and ends of the body. The Data sheet will show that for locos in 'as built' condition the tender sides and back will need to be cut down. The tenders were altered with increased water capacity in 1893/4.

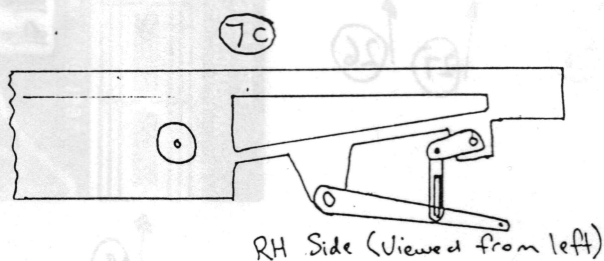
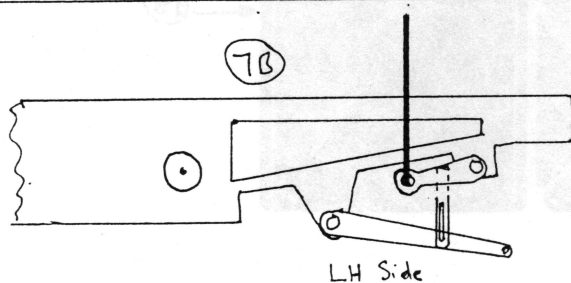
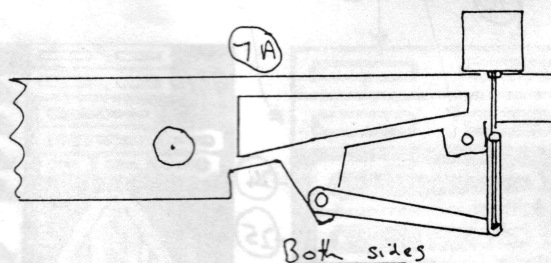
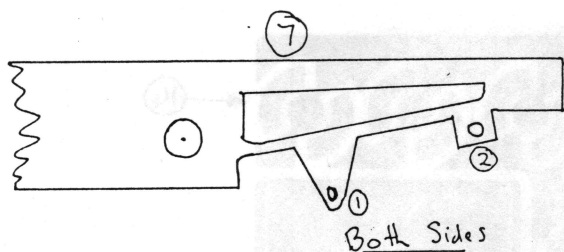
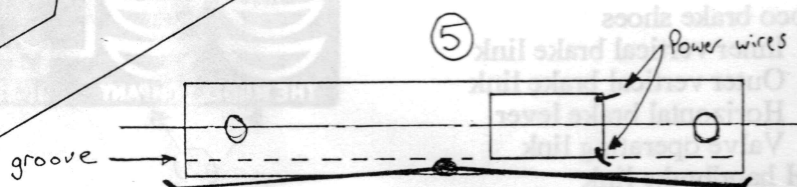
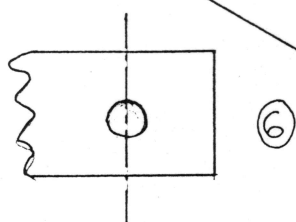
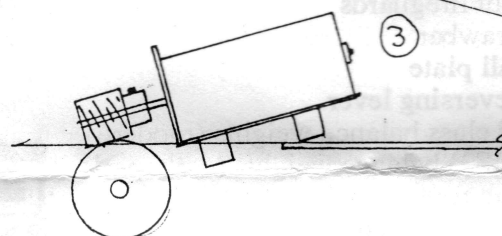
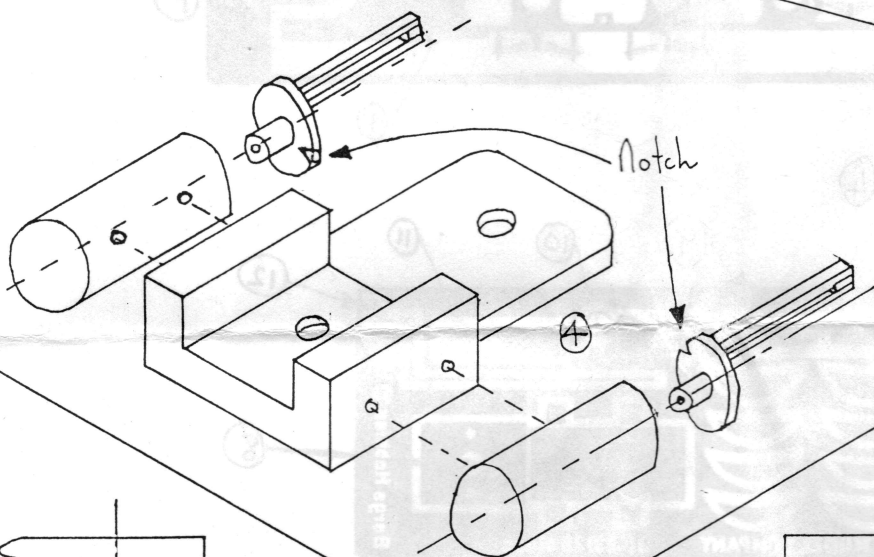
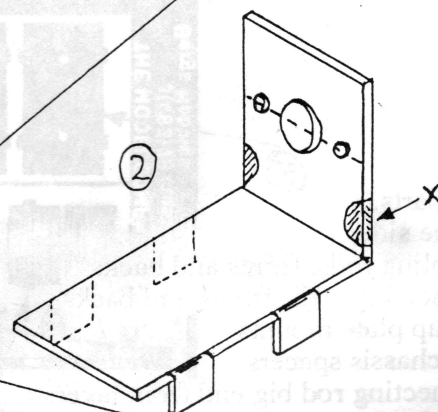
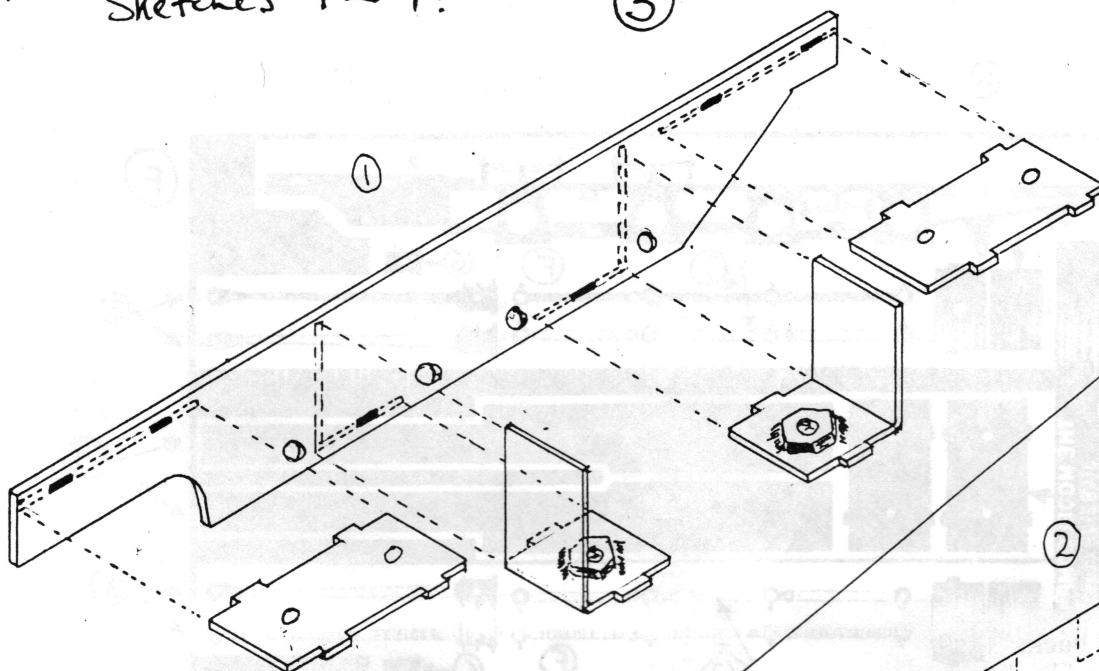
4. Clean up the front tender top and drill 1.6 mm holes for the water legs. Fit the the assembled sides and ends. Drill the rear deck 1.6 mm for the water filler and fit to the body.
5. Assemble the body to the floor. Rub the bottom of the body on a piece of emery paper on a flat surface to get a neat fit.
6. Cut the coal rails from the thin etch and fit them to the body. Tinning with normal solder and fitting with 70° solder is the strongest approach. If you glue, be sure to cover the joints with fillets of Araldite; the coal will cover these.
7. Fit the water legs, water filler and tool boxes. Tool box position varies with period, check photos for your location. Once the tenders were rebuilt to the kit form the toolboxes were generally at the front of the rear deck, across the deck, sloping side forwards.
8. Fit the steps to the front platform sides, just in front of the sides.
9. Drill the hand grab and hand rail holes 0.5 mm. Note there are two hangars and two hand rails on the front. The hand rails go from the marked hole at the top to a hole in the centre of the front platform side, just in front of the step. Bend and fit these handrails from the supplied 0.4 mm phosphor bronze wire.
10. Drill the water filler holes 0.5 mm and fit a handle from 0.4 wire.
11. Fit the brake standard to the tender deck. There is a dimple on the front left tender side. Drill this 0.5 mm and fit a bent piece of 0.4 mm wire to represent a tap.
12. Lamp iron positions are marked on the tender rear. Make these from flattened wire. If desired, the bogie restraining chain hooks can be bent from wire and fitted at the dimpled positions.
13. Fit the air hose to the rear buffer beam. None of my photos show where, but typically it should fit to the right of the coupler.
14. Wash and dry the tender, then fit the coupler of your choice. The kit is designed for Kadee 5's.

Sketches 8-13

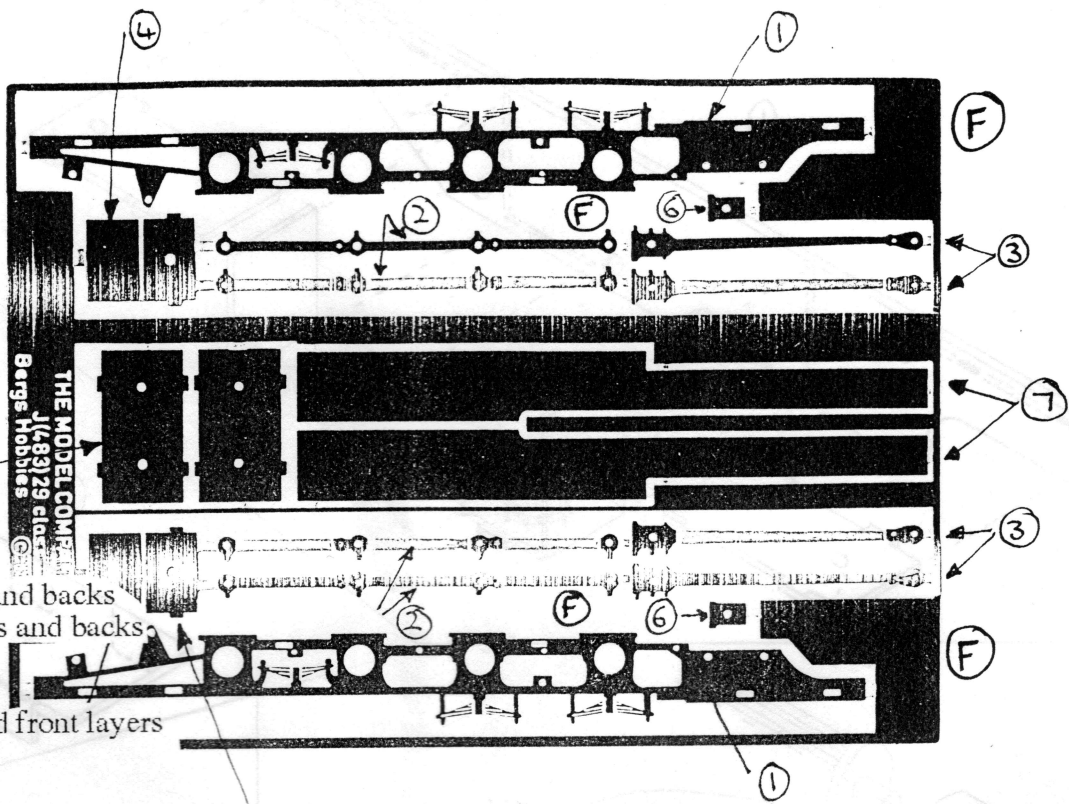


Sketches 1-7.

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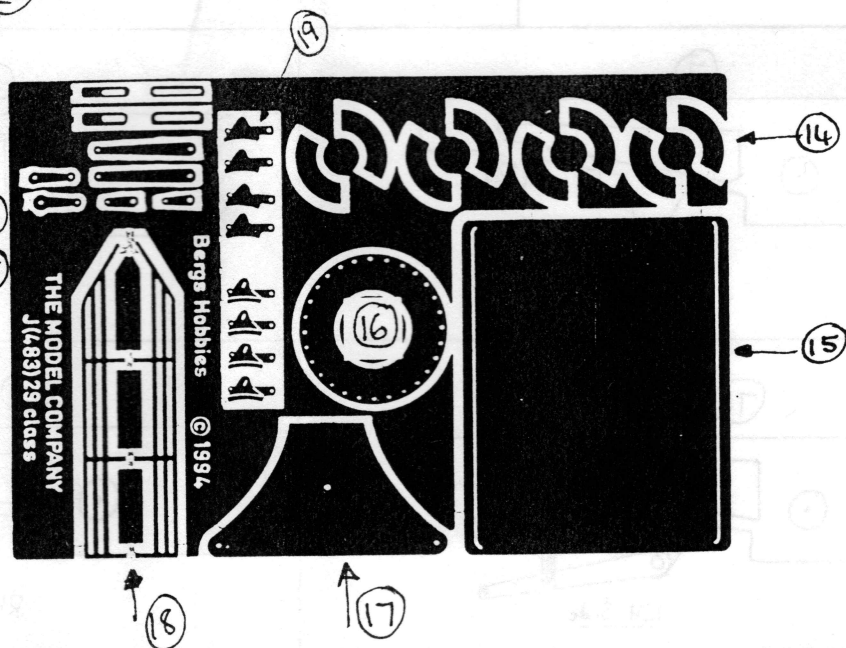
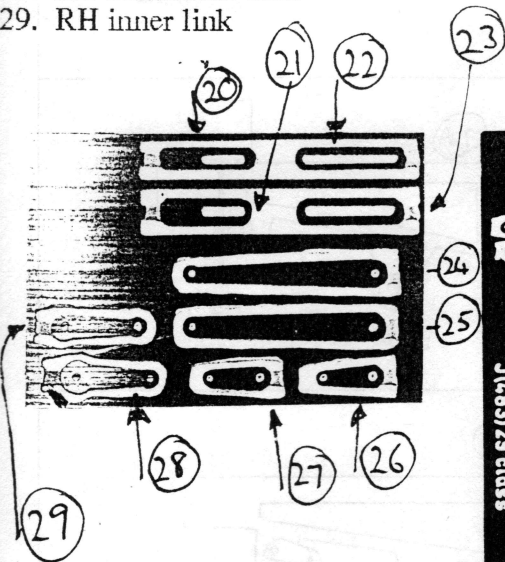
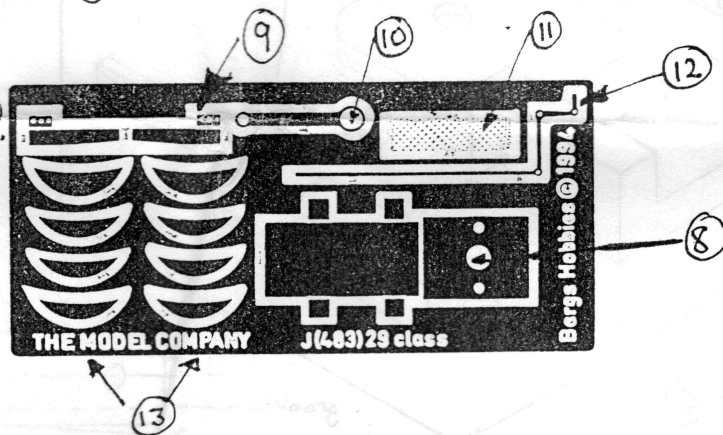


④ Etched Parts.



Etched parts.

1. Frame sides
2. Coupling rods, fronts and backs
3. Connecting rods, fronts and backs
4. Pickup plate mounts
5. End chassis spacers
6. Connecting rod big end front layers
7. Running boards
8. Motor mount
9. Front lifeguards
10. Drawbar
11. Fall plate
12. Reversing lever
13. 29 class balance weights (modern)
14. J(483) balance weights (early period)
15. Cab roof
16. Smokebox front
17. Front apron
18. Tender coal rails
19. Loco brake shoes
- 20/21. Inner vertical brake link
- 22/23. Outer vertical brake link
- 24/25. Horizontal brake lever
- 26/27. Valve operating link
28. LH handbrake link
29. RH inner link



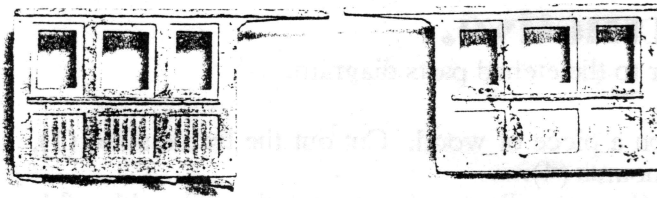
The locomotive.

Numbers in brackets refer to the etched parts diagram.

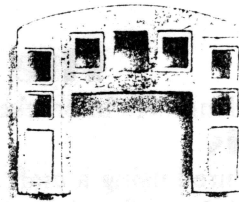
The Chassis

1. Cut parts as required using a craft knife on a piece of wood. Cut out the frame sides (1), the end spacers (5) and the pickup plate mounts (4).
2. Note which end of the chassis is the front (F on the diagram) and mark the rods with a felt pen. The rods must be correctly oriented.
3. Referring to assembly sketch 1, fold the pickup plates 90°, folding with the fold inwards. Solder the front end spacer and the front pickup mount to the left hand frame. Support the frame on a block of wood to allow the tabs to fit right through the frame.
4. Solder the rear end spacer and the rear pickup mount to the right hand frame, then solder the two frames together. This procedure should ensure a square, flat frame. Don't proceed further until you've achieved this.
5. Drill the following holes 2.0 mm : rear hole - front spacer; both pickup plate mounts; rear hole - rear spacer. Solder 2.0 mm nuts on top of the pickup plate holes. (sketch 1)
6. Fit the axle bearings through the frame holes and solder with the flanges to the outside.
7. Wash the chassis in water and dry. Test fit the driver axles through their bushes. Fit the worm wheel and third axle temporarily to aid fitting the motor and mount.
8. Solder 0.4 mm brass wires into the brake shoe holes in the frames and cut off, leaving 4 mm outside the frames.
9. Sketches 2 and 3 show the motor mount and it's position on the chassis. Drill out the screw holes 1.5 mm and clean out the centre hole so it fits over the front motor bush. Fold up the front 90° with the fold to the inside and fold down the 4 legs. Test fit to the chassis, the mount should slide in snugly. Run some solder into the front fold to strengthen it and then file half rounds at X in sketch 2. This is to clear the insulated power wire which must run under the motor. More on this later at step 23. Wash, then fit the motor, oriented vertically. Fit the worm, boss towards the motor, shaft flush with outer end. Slide the mount into the frames with the worm centred over the wormwheel and the rear feet touching the rear chassis spacer. Slip a thick piece of cotton between the worm and wormwheel to set the correct mesh. When all is OK, solder the rear feet, then remove the worm and motor. Remove the gear wheel and axle, then solder the front of the mount. Wash the chassis, then re-assemble and check the mesh. By removing the worm and motor, the mesh can be adjusted by bending the front of the motor mount.
10. Fit crank pins to wheels, then fit wheels and axles to chassis. Fit insulated wheels to right hand side, flanged at end axles, flange less to centre two axles. Fit Peco washers to control side play, I fitted 1 to LH front, 2 RH front, 1 each side - 2nd axle, 2 each side - 3rd axle and one each side - 4th axle. Don't forget to fit the worm-wheel to the 3rd axle or to quarter the wheels by setting the RH wheels 90° forward of the LH ones.
11. Solder the rod fronts and backs into pairs, mark the fronts with a small notch on the rear of the rods. A tapered cocktail stick is a good aid to aligning the crankpin holes. Clean up the rod sides and fit pieces of 0.7 mm wire at the knuckles, then clear the crankpin holes 1.0 mm and try the rods on the chassis. Make sure that you've got front to front, and check this EACH TIME, it's so easy to get them wrong and get a bind. If the rods bind, open out all the holes slightly with a round needle file, using a twisting motion. Don't do too much, then sight down the holes with the rods at the 3 o'clock position to see the offending hole. When the chassis runs freely, fit paper washers over the crankpins, EXCEPT THE THIRD AXLE, before quickly soldering the supplied washers on. I use 145° solder. Clip off the surplus crankpin and smooth the front.
12. Fit the brake shoes, filing as required to get to fit. I filed the curve where the shoe touches the wheel. The combination of Romford wheels and a very tight fit on the prototype makes this a tricky job but with patience they will fit. If the shoe touches the wheel on the non insulated side it doesn't matter but clearance is required on the insulated wheels. Fit your chosen counterweights, two styles of etched ones are supplied. Square ended for early period and crescent for later period. I fitted these with 5 min epoxy, taking care to fit the insulated side with the counterweight away from the nickel silver driver tyre.
13. The cylinder assembly comprises three white metal castings and two brass ones. Choose

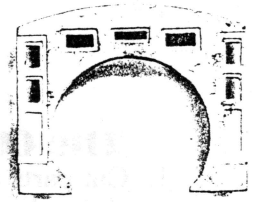
Locomotive white metal. (6)



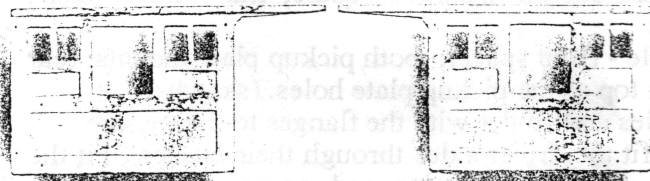
Old J cab sides



Cab back



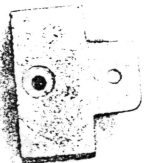
Cab front



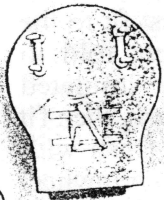
29 class cab sides



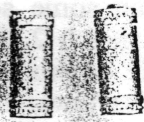
Rear cab support.



Cylinder spacer



Firebox back



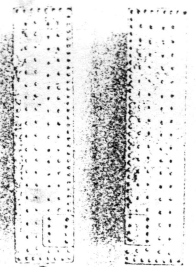
Large air tanks



Small air tank



Smokebox saddle



Firebox sides



Front buffer beam



Front bogie



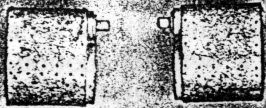
Steam pipes



Sandboxes



Smoke door



Piston valve cylinders



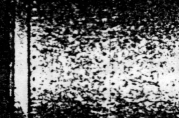
Slide valve cylinders



Dome

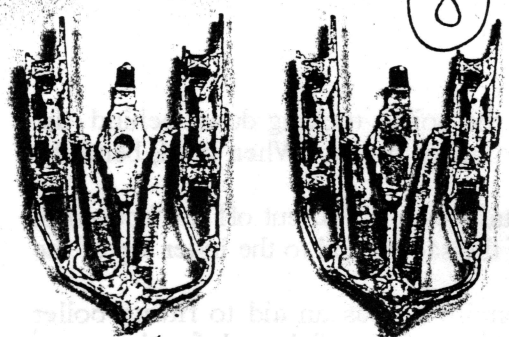


29 class chimney

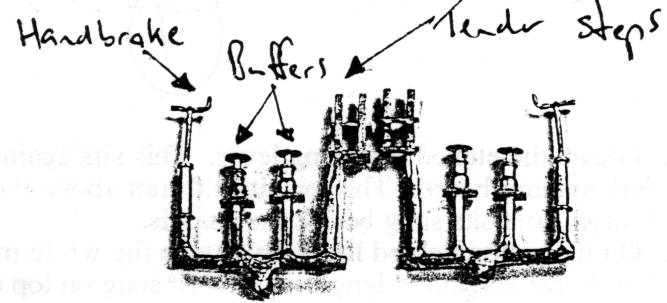


14. Locate the etched reversing lever. This sits against the boiler, tucking down behind the RH running board. The top sits 1.0 mm above the running board. When hard, bend the bottom so it sits snug beside the chassis.
15. On the piston valved locos only, take the white metal steam pipes, cut off the bottom of the flange and cut to length so they fit snug on top of the saddle and to the inner top of the cylinders. (Sketch 12)
16. The top centre line on the boiler can be lightly pencilled in as an aid to fitting boiler fittings. Drill a 2.0 mm hole, on the centre line, 12 mm in front of the cab for the turret. Drill the handrail holes 0.8 mm. Drill the clack valve holes 1.0 mm. Drill two 1.5 mm holes, 5 mm back for the smokebox front and 2.5 mm up from the handrail line.
17. The boiler fittings and cab fittings can be glued in place quickly and neatly by using full strength Araldite and baking under a desk lamp. The alternative is to use instant glue or 5 minute epoxy.
18. Pencil a vertical line 10.5 mm from the cab front on the RH side. Sit the boiler assembly on it's side, prop the front until level and glue the Westinghouse pump in place, making sure it is parallel to the cab.
19. Drill a 0.8 mm hole in the rear of the dome, 5.0 mm up from the bottom. Glue in the main safety valve. The dome should now be glued in place. It's centre should be 32 mm from the cab front. If desired, the dome could be plugged, a wire pin fitted and a suitable hole drilled on the top boiler line.
20. Choose the chimney to suit your period, the brass 'flower pot' for early period or the white metal flanged one for the 29 class. These too, could be pinned if desired. The chimney centre line is 16 mm from the smokebox front.
21. On the 29 class, fit the headlight to the smokebox top at the front and turbogenerator immediately in front of the cab.
22. Fit handrail knobs and blowdown doors to boiler and ashdoors to smokebox bottom, centred 7 mm from smokebox front.
23. Locate clack valves and remove curved pipe on bottom. Fix in place on boiler side.
24. A nice selection of cab fittings is provided. Unfortunately information on their location is sparse, on the 29 non-existent! The reverser wheel goes on the RH firebox side, so it's wheel is centred in the cab window. The W/H brake stand goes between the reverser and the firebox rear, RH side. The handbrake goes on the LH side, 10mm from the cab rear. I doubt if this was still there on the 29's. The regulator goes on top of the firebox, 10 mm from the cab front. The lubricator goes 9 mm from the cab back, also on top of the firebox.
25. On the J as built, the injectors provided fit halfway into the cab front, on the line of the handrails. As the piping runs half in the cab and half out, their fitting is a bit of a snag. Either remove the front pipe, cut a hole in the cab front to fit the injector through and replace the pipe, or cut the injector in half. The data sheet is a big help here. On the 29 the injectors are a mystery, except to say that they are lifting injectors, under the running boards.
26. Locomotive piping is to be fashioned from the supplied copper wire. Remove the insulation and straighten the wire by holding one end in your vice and pulling the other end with pliers. Fit the clack valve pipes up to the injectors on early locos and down to footplate level at the cab front on later locos. Drill 0.8 mm holes in the running board just in front of the W/H pump and just behind. Fit a pipe from the LH top part of the pump down through the running board and cut off underneath. The second pipe goes from the bottom RH side of the pump, also through the running board and cut off. The W/H exhaust goes from the RH top part, along the boiler and into the smokebox 7 mm from the front and 4 mm down from the handrail line.
27. Fit handrails from 0.4 mm brass wire. Slide them through without attempting to pre-form them, then tweak to shape once they are in place. Drill clearance holes in the cab front to accept the handrail ends.
28. Locate the etched front platform. Fit the buffer beam, dimples to the outside and flush with the front. Drill the buffer holes 1.6 mm and the coupler hole 1.0 mm and fit these parts. Locate the lifeguards, bend the top angle and fit to the buffer beam on the outside, just inside the buffers, with the angle facing inwards. Tweak the ends out to match track centres. Drill 1.0 mm holes in the deck top 14 mm apart and 6 mm back from the front,

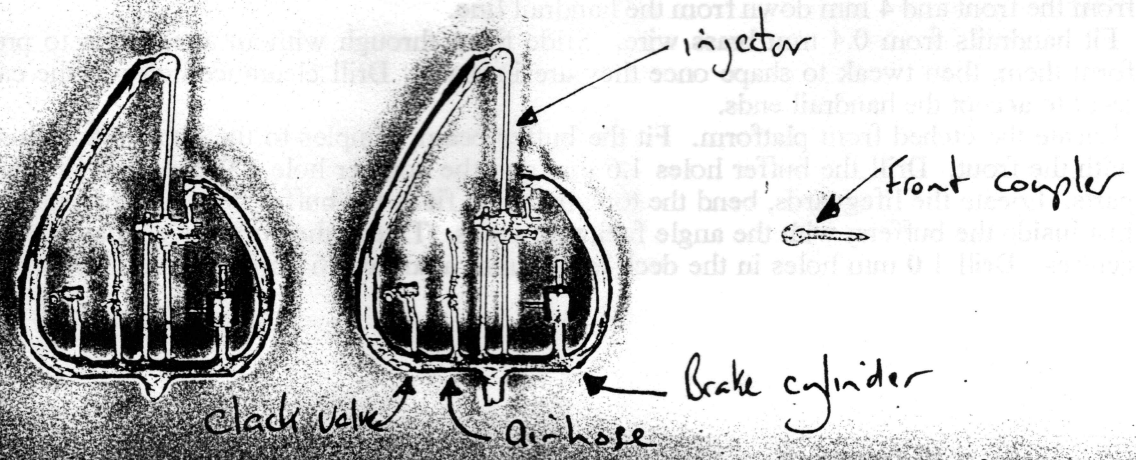
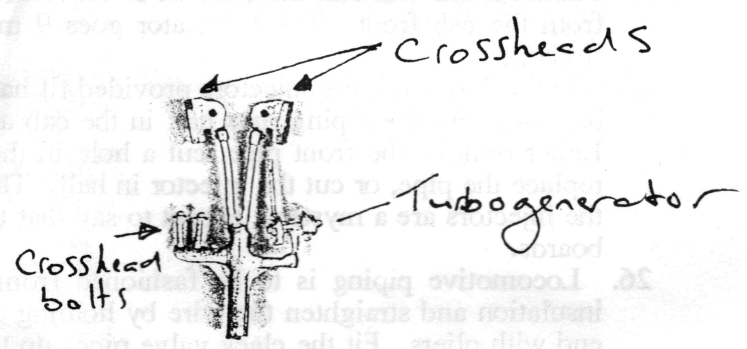
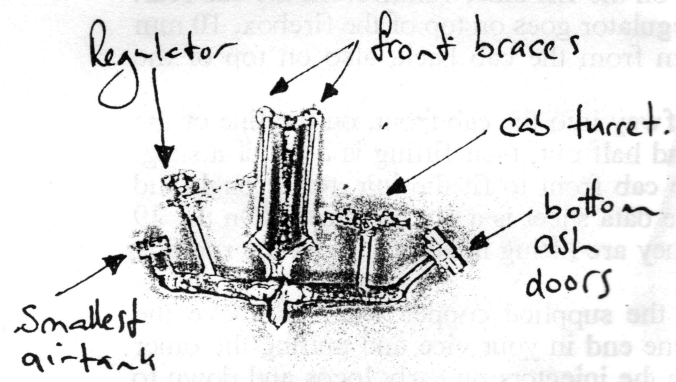
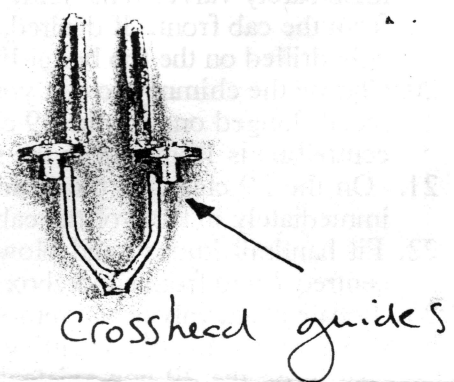
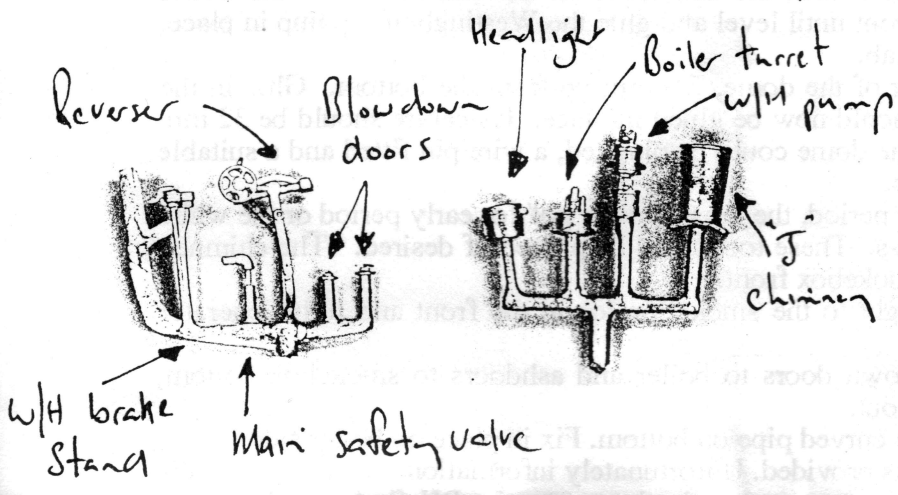
8



Tender bogies



Brass castings.



- end of the piston rod behind the top of parts 22 and 23. Take parts 20 and 21 and solder to 24 and 25, outside, vertically and 4mm from the outside end. (Sketch 7B) On the LH side part 28 fits from pin 2 to sit on 20. An 0.7 mm wire fits from behind the small end of 28, vertically, and is cut off 1.5 mm below the top of the firebox side. This is the handbrake operating rod. (Sketch 7B). On the RH side part 29 fits on pin 2 and sits on 20/21 but as it has no handbrake rod it needs to be shortened as in sketch 7C.
22. Now for the valve rods. Between wheels 1 and 2 there is a pair of frame holes at the top. Clear these 0.8mm and solder an 0.7 mm wire 20 mm long across the frames. Carefully drill all holes in etched parts 26 and 27, 0.8 mm. Fit 26 and 27 to the wire ends, vertically and then bend more 0.7 mm wire to make an 'L' shape 21 mm x 5 mm. Fit this between 26 and 27 and the valve chest holes as in sketch 8.
 23. This completes the chassis. Feed the motor wires through the half rounds in the motor mount, refit the motor and reattach the wires to the motor. Test run the chassis.

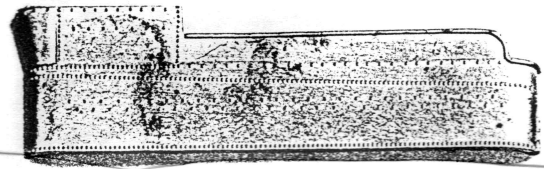
The Body.

1. Locate the boiler, smokebox and firebox rear. Fit the smokebox into the boiler, aligning the bottom scribe marks. Fit the firebox rear, noting the horizontal scribe line which aligns with the bottom edges of the motor opening portion of the boiler.
2. Locate the smokebox saddle, drill the dimple 3/32" and fix to the chassis, hole forwards.
3. Sit the boiler assembly on the chassis and file the sides of the firebox rear and the top of the motor opening where it fits above the firebox sides. Not much metal needs to be removed so work slowly to achieve a good fit. The firebox foot should sit flat on the chassis rear, tight up behind the firebox sides. Make a mark through the rear hole on the rear chassis mount onto the underneath of the firebox foot. The mark should lie on the longitudinal scribe line. Drill this hole 1.5 mm and open the hole out until a 2.0 mm x 6 mm screw can cut it's own thread. If you have a 2.0 mm tap then drill tapping size 1.7 mm and tap. Fit the boiler to chassis, fit screw and then repeat the operation at the front, this time using the long countersunk 2.0 mm screw provided. This hole should also lie on the scribe line. If desired, a 2.0 mm nut could be fitted inside the smokebox.
4. Locate the etched smokebox front and white metal smokebox door, fit to smokebox.
5. Locate the cab sides and choose the ones which suit your period. The early sides had large side windows while the 29 class had these windows filled in and made smaller. Both styles are provided. Locate the cab front and back, these are the same for both periods. Open out the cab front until it slides neatly along the boiler from the back. Assemble the cab sides, front and back, noting that the cab sides fit OVER the front and back. (See also stage 25, regarding injectors.)
6. Locate the etched running boards and clean up. Fit underneath the cab with 0.5 mm showing at the sides and rear. (Sketch 9.)
7. Locate the rear cab support and fit underneath the rear of the cab 0.5 in from the back. (Sketch 10)
8. With the boiler screwed to the chassis, the cab/running boards should slide onto the boiler, with the cab rear support ledge sitting on the chassis rear. The running boards may need to be filed on their inside edges, to clear the firebox sides. Fix cab/running boards to boiler by fixing the joint between the two at the boiler top. If gluing, allow to harden thoroughly before removing body from chassis. Handle carefully and fix underneath by gluing between the boiler and running boards within the cab as well as gluing a piece of scrap between the rear cab support and the firebox rear foot.
9. Make 2 or 4 scraps of etch waste and fix between boiler and running boards as in sketch. Keep 5.0 mm back from the running board front.
10. Fit sandboxes underneath running boards as in sketch 11.
11. Now we'll fit the airtanks. These can be glued or soldered by soldering on a strip of etch waste and bending a foot to solder to the running board. Fit large air tanks with their rears 11.0 mm from rear of running boards and outer side flush with outer edge of running boards.
12. Fit the small white metal airtank to RH side with it's rear 33.5 mm from running board rear and flush with the outside.
13. The smallest, brass, airtank fits between the large RH tank and the rear, flush with the outside.

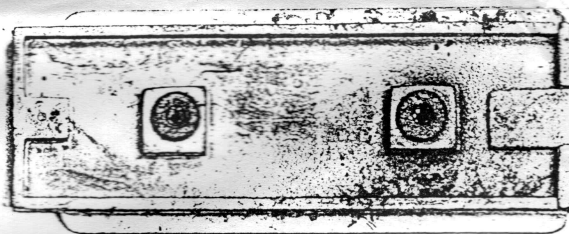
- the cylinders you require. Slide valve, with the square box on top for the J(483) or piston valve, with round tops for 29 class. Drill out the side locating holes 1.0 mm. Locate the cylinder spacer and drill it's side dimples 1.0 mm. Cut 4 pieces of 1.0 mm wire to serve as locating pins and trial fit the parts together. The spacer block goes with it's flat face to the bottom. See sketch 4 for an exploded view of the cylinder assembly. Glue or solder this assembly together. Drill the top dimples 0.8 on the rear of the piston valve cylinders. On the slide valve cylinders make a mark 6 mm up from the piston rod centre line and in the centre rear of the valve chest. See Sketch 4A.
14. Locate the crosshead guides brass casting. Cut off the sprue and clean up, noting the notch indicating left and right. The notch goes to the INSIDE. Drill out the piston rod hole 1.2 mm. Offer up the guide castings to the cylinders. Note where the front covers fit, the rear needs to copy this. File a little off the guide peg on the outside if necessary. Glue or solder into place.
 15. Locate the brass crosshead/piston rod castings and clean these up. Smooth the piston rods and cut them to 9 mm long. Trial fit the crossheads into the guides and smooth as necessary to get a smooth running fit. Drill the small hole in the crosshead top 0.8 mm.
 16. Assemble the connecting rods, noting the front layer to build up the big end thickness. Drill the holes in each end 1.0 mm. The crosshead bolt is on the same casting as the crosshead. Fit though the crosshead, fit a paper washer and fit the connecting rod, making sure it is the right way up, the oil cup goes upwards.
 17. Fit cylinder assembly temporarily to chassis with a 2.0 mm bolt and nut.
 18. Offer up the crosshead/rod assemblies to the loco. The big end needs a 1 mm spacer between it and the coupling rod, either make a wire washer or cut a slice of suitable tube. Use a piece of 0.7 mm wire through the top hole to keep the crosshead in it's guide. Some adjustments may be necessary to get everything working. A little material can be filed off the back of the crosshead and also the front crankpin bush can be thinned. If the crosshead hits the rear of the cylinders then move the cylinder block forwards slightly. When everything works freely, solder or glue the cylinder block to the frame **WITHOUT MOVING IT**. Fit a paper washer on the third crank pin and solder on the washer as before. Remove the front bolt and wash and dry the chassis well. I use white spirits, to prevent the axles rusting.
 19. Locate the PC board pickup plate and file to fit between the frames underneath the chassis. Starting with the plate sitting snug behind the cylinder spacer block, mark out and cut out a clearance hole for the wormwheel. Then mark out and drill two 3/32" holes to match those in the pickup plate mounts. File an insulating groove as in sketch 5. Use two 4 mm x 2 mm screws to hold the pickup plate in place. Cut a piece of phosphor bronze pickup wire and fit it as in the sketch. Fit extra pickups to the centre wheels if desired. Cut two pieces of insulated pickup wire and solder to the pickup plate as per sketch, leading them up through the wormwheel hole and to the motor tags. Test run the chassis and ensure it runs the same way as your other locos or forwards when positive power is at the right hand rail. If you have a short, as I did, check that brake shoes are clearing wheels and there are no burrs on the pickup plate or anywhere else. Lightly oil the chassis and worm and give your chassis a good run.
 20. Disconnect the motor wires and remove motor. Locate the white metal firebox sides. They fit on top of the chassis with the square plate forwards and downwards. Scribe a line across the chassis top as shown in sketch 6. Note that the hole is the rear chassis spacer hole. Removing metal from the rear, make the firebox sides 32 mm long. Sit the RH one in place with it's rear on the scribe line. Scribe an arc around the rear wheel and where the third wheel covers the firebox side. Remove the rivets from these areas on the RH side only to prevent shorts. Fix the firebox sides in place. It may be necessary to add further insulated washers behind the rear RH wheel to prevent shorts.
 21. The rear brake rigging is next. Start the rear brake rigging by fitting a 0.7 mm, 20 mm long wire across the frames at holes 1. in sketch 7. It protrudes equally each side. A second wire the same size fits through holes 2. After soldering, remove the portion of this second wire between the frames. Take the long levers 24 and 25 off the etch, drill the large end holes 0.8 mm and solder to the ends of wire 1. (Sketch 7A.) Now take parts 22 and 23 and solder vertically outside 24 and 25. (Sketch 7A) Locate the brass brake cylinder castings and clean off both the feed sprue and short side wire. Solder the

to accept the deck braces. Fit deck braces. I soldered these from underneath, then bent them to fit against the smokebox. Fit the apron to the chassis, then fit the airhose to the deck top with a copper pipe running back alongside the smokebox saddle and disappearing into the chassis area.

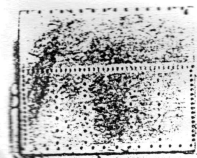
29. Locate the drawbar and carefully open out the little hole to 1.6 mm to be an easy fit on the tender drawbar pin. Open out the large hole to 3.0 mm to be an easy fit on the shouldered plastic bush supplied. The drawbar assembly uses two shouldered plastic bushes and fits under the head of your 2 mm x 6 mm rear body screw. See sketch 13.
30. Fit the etched fall plate by fixing into the top of the cab rear opening. It can be fitted rigid as it will sit slightly above tender deck level.
31. Roll the cab roof and fit rainstrips from wire, fitting into the roof grooves.
32. That's it! Assemble your loco, test run and then wash and dry thoroughly before painting. Check carefully for surplus glue and solder - an undercoat is handy for highlighting these faults.



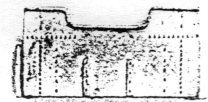
Tender sides



Tender floor



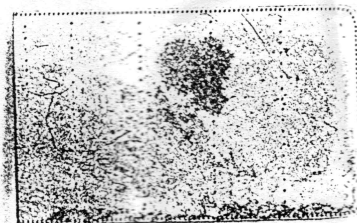
Back



Front



Rear deck

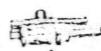


Front tender deck top.



Toolboxes

Water filler.



Brake cylinder



Water legs